



U.S. DEPARTMENT OF AGRICULTURE

Third National Survey of WIC Participants (NSWP-III)

BRIEF REPORT 10: FACTORS ASSOCIATED WITH CERTIFICATION ERROR AND PROGRAM RETENTION



This research was supported by the U.S. Department of Agriculture, Food and Nutrition Service. The findings and conclusions in this publication are those of the author(s) and should not be construed to represent any official USDA or U.S. Government determination or policy.

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TABLE OF CONTENTS

List of Tables	ii
List of Exhibits.....	ii
Abstract.....	1
Introduction	3
Background	3
Research Objective and Questions	5
Report Organization	5
Study Methodology	6
Source of Data	6
Survey Content	6
Analysis	6
Main Findings	9
Characteristics Associated with Certification Error	9
Characteristics Associated with Income Eligibility Error.....	11
Characteristics Associated with WIC Retention.....	13
Conclusion	18

LIST OF TABLES

Table 1. NSWP-III Survey Summary.....	6
Table 2. Coefficient Estimates from Logistic Regression Model of Certification Error Among Non-Adjunctively/automatically Income Eligible Participants	10
Table 3. Coefficient Estimates from Logistic Regression Model of Income Eligibility Error.....	11
Table 4. LA Site Characteristics Associated with Levels of Retention, FY 2018	15
Table 5. LAs With Staff Positions That Were Vacant, by Retention Rate, FY 2018	15
Table 6. Household Participation in Other Social Services Programs and Association with WIC Participation	16
Table 7. Former WIC Participant Enrollment in Other Programs.....	17

LIST OF EXHIBITS

Exhibit 1. Percentage of LAs Classified as Having High, Medium, and Low Retention, FY 2018	14
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ABSTRACT

Background: The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is a key part of the nation’s public health infrastructure, providing nutritious supplemental foods, nutrition education, breastfeeding support, and referrals to health and social service programs for low-income pregnant and postpartum women, infants, and children up to age 5 who are at nutritional risk. The National Survey of WIC Participants (NSWP) series is designed to provide national estimates of WIC participants, State agencies’ (SAs) and local agencies’ (LAs) characteristics, and improper payments resulting from participant certification errors in WIC. The term “certification error” is used for a broader concept that includes income eligibility error (error due to household income higher than the WIC eligibility requirement) and other errors, such as category error, residency error, and identity error. NSWP is conducted approximately every 10 years. This brief is part of a series of 10 briefs that describe findings from the NSWP-III study, which collected data in 2019.

Objective: One component of the current study, National Survey of WIC Participants-III (NSWP-III) and the focus of this brief is to examine factors associated with certification error and WIC retention.

Methods: Data were collected from the following sources during the summer and fall of 2019: a web survey completed by 82 WIC SA directors, a web survey sent to a nationally representative sample of LAs (weighted $n = 1,979$; unweighted $n = 714$), an in-person survey that was administered to nationally representative recently certified (within 8 weeks of certification) WIC participants (weighted $n = 893,469$; unweighted $n = 1,697$), a program experiences survey with nationally representative current WIC participants that was administered either in-person or over the telephone (weighted $n = 6,397,412$; unweighted $n = 1,648$), and a telephone interview with a convenience sample of 125 former WIC participants.

Findings:

- The odds ratio for the probability of having certification error for participants whose SA uses electronic benefit transfer (EBT) relative to those whose SA does not use EBT is low (0.259) and statistically different than one. This indicates that participants whose SA uses EBT are 74.1 percent ($1.00 - 0.259 = 0.741$) less likely to have certification error. Similar to certification errors, participants whose SA uses EBT are 64 percent ($1.00 - 0.362 = 0.638$) less likely to have income eligibility error compared to participants whose SA does not use EBT.
- Approximately a quarter (23.5 percent) of LAs had a reported retention rate classified as high, 47.5 percent had a reported retention rate classified as medium, and 29.0 percent had a retention rate classified as low.¹
- Participants who left WIC and returned to WIC were more likely to have ever participated in SNAP (86 percent) compared to participants who never dropped out of WIC (73 percent). There was no association found between WIC participation and participation in other social services programs besides SNAP.

¹ LAs were categorized as having low, medium, or high retention rate based on the distribution of the average FY 2018 reported retention rates. LAs were flagged as high retention rate if the LA’s average reported retention rate was 90.0 percent–100.0 percent, medium retention rate if the LA’s average reported retention rate was 44.6 percent–89.9 percent, or low retention rate if the LA’s average reported retention rate was 0.0 percent–44.5 percent.

- On the other hand, among former WIC participants, participation in Temporary Assistance for Needy Families (TANF) was the only social services program found to be associated with leaving WIC due to issues with recertification.

Conclusion: This brief assessed potential factors associated with certification error and participant retention in WIC. Notably, State EBT status was shown to be associated with lower rates of certification error—this is a promising finding given implementation requirements set by The Healthy, Hunger-Free Kids Act of 2010, PL 111-296. Future studies could reassess the certification error rate once all SAs implement EBT. Also, among current and former WIC participants, participation in both WIC and most other social services programs was found to have no impact on WIC participant retention.

INTRODUCTION

Background

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is a key part of the nation's public health infrastructure, providing nutritious supplemental foods, nutrition education, breastfeeding support, and referrals to health and social service programs for low-income pregnant and postpartum women, infants, and children up to age 5 who are at nutritional risk. The U.S. Department of Agriculture Food and Nutrition Service (FNS) administers WIC by providing Federal grants to 89 State agencies (SAs), including 50 States and the District of Columbia; 33 Indian Tribal Organizations (ITOs); and the 5 U.S. Territories of American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands. In 2019, the average monthly WIC participation was 6.4 million participants nationwide.²

WIC applicants must meet all of the following eligibility requirements to be certified:³

- Categorical
- Residential
- Income
- Nutrition risk

Categorical: WIC participants must be one of the following:

- Pregnant (during pregnancy and up to 6 weeks after the birth of an infant or the end of the pregnancy)
- Non-breastfeeding postpartum (up to 6 months after the birth of the infant or the end of the pregnancy)
- Breastfeeding postpartum (up to the infant's first birthday)
- An infant (up to the infant's first birthday)
- A child (up to the child's fifth birthday)

Residential: Applicants must live in the State where they apply or meet the ITO-established residency requirements in areas where WIC is administered by an ITO.

Income: Applicants must have income at or below the WIC Income Eligibility Guideline applicable in each State, or they must be determined adjunctively or automatically income eligible based on participation in certain programs. The SA's income eligibility guideline must be between 100 percent and 185 percent of the Federal Poverty Guidelines (issued each year by the U.S. Department of Health and Human Services).

Nutrition Risk: Finally, applicants must be at nutrition risk, which is determined by a competent professional authority on the staff of the local WIC agency, at no cost to the applicant. This study did not

² U.S. Department of Agriculture, Food and Nutrition Service. (2019). *WIC Program: National level annual summary*. <https://fns-prod.azureedge.net/sites/default/files/resource-files/wisummary-6.pdf>

³ U.S. Department of Agriculture, Food and Nutrition Service. (2020). *WIC eligibility requirements*. <https://www.fns.usda.gov/wic/wic-eligibility-requirements>

examine the nutrition risk requirement of WIC eligibility since nutritional risk is not considered a source of over-certification based on the Institute of Medicine's report titled, "Dietary risk assessment in the WIC program," which states that those "who meet the eligibility requirements of income, categorical, and residency status are presumed to also meet the requirement of nutrition risk based on failure to meet Dietary Guidelines".⁴ In a 2003 study, Ver Ploeg and Betson acknowledged that the vast majority of participants who meet other eligibility requirements are likely to meet some nutrition risk criteria, thus nutritional risk was assumed.⁵

A WIC participant applies for WIC benefits and is deemed eligible based on any of the eligibility requirements listed above. For this study, certification errors were determined when participants did not meet one of the WIC eligibility requirements but were still certified for the WIC program. Information obtained from an in-person survey with recently certified WIC participants (within 8 weeks of certification) was used to determine whether participants met each of these eligibility requirements.

1. Category certification error could occur if participants did not satisfy the necessary categorical criteria at the time of the certification appointment. For example, a 14-month-old classified as an infant would constitute a category certification error, because certification as an infant is applicable only up to the last day of the month of the infant's first birthday. Similarly, children may be certified up to last day of the month of their 5th birthday. Among infant and child participants, birth dates were requested during the interview for this study. The Study Team used the reported date of birth to assess whether the applicant was up to 12 months old for an infant applicant and up to 60 months old for a child applicant at the time of certification appointment.⁶ For pregnant, breastfeeding postpartum, and non-breastfeeding postpartum participants, confirmation of their category status was based on self-reported responses.
2. Residency error was determined if SA-accepted proof of residency was not provided during the certification appointment, or if their document had a residential address outside the State (unless the document was within an area in another State to which reciprocity applies).
3. Income eligibility error for certified participants could occur when the household income documentation provided by the applicant was greater than the WIC Income Eligibility Guideline in the applicant's State. Income eligibility error among certified participants could also occur when the applicant could not provide proof of participation in an adjunctive/automatic eligibility program.
4. Identity errors may occur when applicants do not provide a SA-accepted proof of identity.

Program Retention From 2009 to 2019, the average monthly participation in WIC decreased from 9.1 million to 6.4 million participants. This report focuses on factors associated with WIC retention. The distribution of the reported fiscal year (FY) 2018 average retention rates among LAs that responded to the retention questions on the survey was used to classify high, medium, and low retention.

⁴ Institute of Medicine. (2002). *Dietary Risk Assessment in the WIC Program*. Washington, DC: The National Academies Press. <https://fns-prod.azureedge.net/sites/default/files/WICDietaryRisk.pdf>.

⁵ Ver Ploeg, M., & Betson, D. M. (2003). Estimating Eligibility Based on Meeting Nutritional Risk Criteria. In *Estimating Eligibility and Participation for the WIC Program: Final Report*. National Academies Press. <https://www.nap.edu/download/10804>.

⁶ Consistent with the procedure followed in NSWPII, the study did not identify potential category errors for pregnant, breastfeeding postpartum, or non-breastfeeding postpartum participants.

Research Objective and Questions

One component of NSWP-III is to provide information on the factors associated with certification error and program retention.⁷ Specifically, the brief report addresses the following research questions:

Certification Error

- What are potential correlates of certification error due to income ineligibility?
- What are potential correlates of each type of certification error?
- Is SA residency requirement that WIC participants must reside within the service delivery area of the LA correlated with certification error?
- Is offsite certification associated with a higher likelihood of certification error?
- How are staffing characteristics associated with certification error?

Program Retention

- What LA characteristics are associated with higher and lower retention rates?
- Among current WIC participants, is participation in other programs (e.g., Supplemental Nutrition Assistance Program [SNAP], National School Lunch or Breakfast Program [NSLP or SBP], Summer Food Service Program [SFSP], Child and Adult Care Food Program [CACFP], the Emergency Food Assistance program [TEFAP], local/community food bank or pantry, Head Start/Early Head Start, and the Commodity Supplemental Food Program [CSFP]) associated with WIC retention or dropout?
- Among former WIC participants, is other program participation (e.g., SNAP, NSLP, SBP, SFSP, CACFP, Medicaid, Temporary Assistance for Needy Families [TANF])) associated with WIC program retention? Is there an association between other program participation and participants' decisions to leave WIC?

Report Organization

The following sections of this brief report detail the findings related to the research questions referenced above. The report concludes with a summary of key findings and discussion of the study limitations and recommendations for future research. The report also references appendices that include technical details of the survey methodology, copies of the surveys, and analytic tables.

⁷ Please visit the FNS website at <https://www.fns.usda.gov/research-analysis> to access the other NSWP-III brief reports and the prior NSWP studies. Specifically, *Brief Report 4: Retention and Potential Barriers to Participation Among WIC Participants* includes findings on WIC participant retention and potential barriers to participation and *Brief Report 8: Certification Error Rates and Estimates of Improper Payments in WIC* includes findings on case error rates and dollar error rates.

STUDY METHODOLOGY

Source of Data

The findings in this brief are based on data collected from five NSWP-III surveys during the summer and fall of 2019. Table 1 lists the surveys fielded and associated operational details.

Table 1. NSWP-III Survey Summary

Survey	Type of Data Collection	Mode of Data Collection	Estimated Length of Survey ^a	Data Collection Period	Number of Completes	Response Rate
SA Survey	Census	Web survey	66 minutes	June 3, 2019–October 11, 2019	82	92.1%
LA Survey	National sample	Web survey	60 minutes	June 3, 2019–October 11, 2019	714	82.8%
CS	National sample	In-person survey	42minutes	June 23, 2019–November 10, 2019	1,697	34.3%
PES	National sample	In-person and telephone survey	30 minutes	June 23, 2019–November 10, 2019	1,648	36.2%
FPS	Case study	Telephone interview	30 minutes	June 24, 2019–October 25, 2019	125	67.0% ^b

Notes: ^a Estimated length of survey is based on estimates developed during survey instrument pretesting. Cooperation rate is the proportion of all cases interviewed of all eligible participants or denied applicants ever contacted. Response rates are the number of complete interviews with participants or denied applicants divided by the number of eligible participants or denied applicants in the sample.

^b This number reflects the cooperation rate, not response rate. Since the FPS is a case study, the cooperation rate is a more suitable calculation. Cooperation rate equals the number of completed cases divided by the sum of the number of completed cases and number of refusal cases. For comparison purposes, the cooperation rate for the CS was 54.5 percent and the cooperation rate for the PES was 66.4 percent.

Survey Content

The SA, LA, PES, FPS, and CS surveys were developed in collaboration with FNS and were reviewed by an independent panel that included experts in WIC policy and operations. In addition, each survey was pilot tested with nine respondents to assess the ease of comprehension (e.g., confusing wording or layout, failure to grasp concepts) and length of time to complete.

Analysis

SA data. The SA data are derived from a census. Therefore, sampling adjustments, weighting, and tests of significance are not applicable. Descriptive results are presented for all 82 SAs that responded to the survey.

WEIGHTING

LA data. The LA data from 718⁸ agencies were weighted to represent all 1,797 LAs that were part of the original sample frame. Please refer to the Technical Appendix A report for details on the weighting of the LA data.

PES and CS data. The PES data were weighted to represent the total population of WIC participants, and the CS data were weighted to represent the population of WIC participants who were certified within 8 weeks of the NSWP-III recruitment window in 2019. As such, the weighted descriptive PES results are representative of all 6,397,412 WIC participants nationally, and the weighted descriptive CS results are representative of all 893,469 recently certified WIC participants nationally. For more details on the weighting process, please refer to Technical Appendix B for PES and Appendix D for CS.

FPS data. As a list of all former WIC participants does not exist and due to the use of qualitative research methods for the former participants survey, the FPS was a telephone interview with a convenience sample of 125 former WIC participants. A convenience sample is a non-probability sample in which the researcher uses participants that are available to participate in the research study. Therefore, sampling adjustments and weighting are not applicable. Although these data were obtained from a diverse sample of WIC participants across multiple SAs, the results from this survey are not weighted to be representative of the national WIC population and should not be interpreted as such.

SURVEY RESULTS

When presenting data from the PES and CS, survey results are presented as weighted percentages and means. The FPS required the use of a comprehensive qualitative analysis approach. Thematic content analysis was conducted to develop the FPS findings (please see Appendices C and H for detailed descriptions of the qualitative analyses and results).^{9,10}

STATISTICAL TESTING

Statistical testing used included the Chi-square test and logistic regression. Chi-square tests were conducted to determine association between two variables. In cases for which the tables had very small or zero cells, the Chi-square test could not be conducted.

The Study Team examined possible predictors of case error using data from the CS, SA Survey, and LA Survey, as well as the State administrative data. Single-equation multivariate models examined the relationship between case error and characteristics including urbanicity of LAs, type of agency of the LA, types of income sources, agency size, and State EBT status. During model selection, correlation between explanatory variables was examined to test multicollinearity. The Study Team fit a model by entering uncorrelated variables simultaneously into the model. Based on this first model, the Study Team followed an iterative approach by dropping covariates that were not significant and examining their Akaike Information Criteria (AIC) and R-squared. AIC helps compare the fit of models, and the R-squared provides the portion of variation in the dependent variable (i.e., case errors) that is explained by the explanatory variables (i.e., SA/LA/participant characteristics). The best model was determined to be that

⁸ Four partially completed surveys were also included with 714 completed surveys in the analysis.

⁹ Daly, J., Kellehear, A., & Gliksman, M. (1997). *The public health researcher: A methodological approach*. Melbourne, Australia: Oxford University Press.

¹⁰ Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 80–92.

with the lowest AIC and highest R-squared. The Study Team selected the model that captured the largest amount of variation in the case error.

NONRESPONSE BIAS ANALYSIS

The Office of Management and Budget (OMB) recommends nonresponse bias analysis any time the survey response rate is less than 80 percent.¹¹ Since an 80 percent response rate was achieved for the SA and LA Surveys, the Study Team did not conduct nonresponse bias analysis. The PES achieved a 36.2 percent response rate, and the CS achieved a 34.3 response rate, so nonresponse bias analyses were conducted to determine whether there were respondent characteristics significantly associated with nonresponse that may have potentially introduced bias into the surveys. Conducting a nonresponse bias analysis requires that the characteristics examined be available for both respondents and nonrespondents.¹³ Therefore, the Study Team reviewed the sampling frame, which came from administrative data provided by States, to identify variables that were available for all respondents sampled for the survey. Language spoken at home and WIC certification category were identified as statistically significant factors associated with the participant's likelihood to complete the PES. FNS Region, certification category, and race/ethnicity were identified as statistically significant factors associated with a participant's likelihood of completing the CS. These variables were then used to calculate adjustment factors to represent those who did not respond to the survey.

Per OMB guidelines, an item nonresponse analysis should be conducted if item response rate is less than 70 percent.¹³ Among the SA and LA Surveys, the Study Team found one item in each survey that had less than a 70 percent response rate, which was the item that collected the total number of certified and retained participants by certification category for 5 FYs in a matrix format. The Study Team used available sampling frame variables, as well as examined the survey questionnaires, to identify characteristics of the SA or LA that could potentially affect the respondent's answers to certain questions. For the SA data, none of these characteristics were found to be associated with response rate. For the LA data, FNS Region was found to be associated with responding or not responding to the question. This finding suggests that there is potential bias in producing estimates from this question, so caution should be taken when interpreting the results (See Appendix A for additional details). Item nonresponse bias analysis was not applicable to the PES or the CS because a response was required on all screens.

¹¹ Office of Management and Budget. (2006, September). *Office of Management and Budget: Standard guidelines for statistical surveys*. https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/statpolicy/standards_stat_surveys.pdf.

MAIN FINDINGS

Characteristics Associated with Certification Error

Certification error may result in a WIC participant being incorrectly determined eligible for WIC. There are four different types of certification errors: identity, category, residence, and income eligibility errors. The Study Team examined the association of various SA and LA characteristics with certification error. This analysis did not include participants who were considered adjunctively or automatically income eligible¹² or applicants who were incorrectly deemed ineligible.¹³ The Study Team examined characteristics associated with certification error using the process described below.

1. First, the Study Team examined the explanatory variables¹⁴ for multicollinearity using statistical tests such as Chi-square tests for independence, Pearson correlation coefficient statistics, and Variance Inflation Factor. Certain independent variables were excluded from the regression analyses due to multicollinearity. The remaining explanatory variables were included in the regression models such that none of them were correlated.
2. Next, the Study Team explored the relationship of the included explanatory variables with certification error using the Chi-square test.
3. Since multiple variables were found to be associated with certification error, the Study Team ran logistic regression models to see how these characteristics relate to certification error when analyzed in a multivariate setting. The explanatory variables were simultaneously entered into the logistic regression model.
4. Goodness-of-fit statistics like the pseudo-R squared, and model complexity statistics like the Akaike Information Criterion (AIC) were recorded along with the association of each variable with certification error.
5. Next, the Study Team removed the variable identified to have the least association with certification error, and another logistic regression model was run using one less variable until the model had only one variable left.
6. Finally, the Study Team compared the goodness-of-fit statistics for each model to select the final model. The model with the lowest value for the AIC and the highest pseudo R-squared value was deemed to be the final model.

The final model consisted of two SA and LA characteristics—namely, SA EBT usage and relationship of LA to SA. Table 2 shows the results of the final model, which are discussed below.

¹² Less than 1 percent of participants who were considered adjunctively or automatically income eligible were determined to be erroneously certified.

¹³ Applicants who were incorrectly deemed ineligible are part of the DAS analysis.

¹⁴ Explanatory variables included FNS Region, LA urbanicity, SA EBT usage (SAs with Statewide rollout of EBT were considered to have SA EBT usage), number of participants served by entire SA, relationship of LA to SA, number of participants served by entire LA, and LA has vacant staff positions. The Study Team included language spoken at home and economic unit size as controls in the logistic regression model. See Appendix I, Objective II Table 4a.1 for additional details.

Table 2. Coefficient Estimates from Logistic Regression Model of Certification Error Among Non-Adjunctively/automatically Income Eligible Participants

Explanatory Variables	Final Model	
	Odds Ratio	95% Confidence Interval
SA EBT Usage		
Yes vs. No	0.259***	(0.104, 0.650)
Relationship of LA to SA		
Local Government LA vs. State-Affiliated LA	0.027***	(0.002, 0.291)
Non-Government LA vs. State-Affiliated LA	0.172***	(0.053, 0.556)
Akaike Information Criteria (AIC)	52334.686	
Pseudo R-squared	19.50%	
Weighted <i>n</i>	70,097	
Unweighted <i>n</i>	114	

*** Statistically significant at $p \leq 0.001$.

Notes: State-affiliated LAs include LAs that are part of the SA and LAs that are a tribal entity/organization administering WIC. Local government LAs include local government entities administering WIC and clinics under an LA. Non-government LAs include nonprofit organizations that have been contracted to run WIC and other types of LAs not mentioned above. Variables controlled for in this model are economic unit (EU) size (EU less than or equal to 3 vs. 4 or more) and language spoken at home (English vs. Spanish/Other).

Source: Appendix I, Objective II Table 4a.2; NSWP-III Certification Survey (Income Eligibility Section, pages 15–40).

SA CHARACTERISTICS

The analysis of SA characteristics indicated that SA EBT usage was significantly correlated ($p \leq 0.001$) with certification error. Among the non-adjunctively/automatically income eligible participants, the odds ratio of 0.259 indicates that participants whose SA uses EBT are less likely (by 74 percent) to have certification error compared to participants whose SA does not use EBT (Table 2). A possible explanation for this finding is that SAs that transitioned to EBT could have increased operational efficiencies and, therefore, potentially lowered error rates compared to SAs using paper-based vouchers. At the time of this study (summer/fall 2019) and among the SAs that responded to the SA survey, 70 percent of SAs ($n = 57$) had implemented EBT, and 30 percent of SAs ($n = 25$) had not implemented EBT.

The Study Team also conducted a Chi-square test of association to test the relationship between SAs' policies and certification error among all cases (adjunctively/automatically and non-adjunctive/automatically income eligible respondents). The Chi-square test showed that the SA residency requirement of WIC participants residing within service delivery area of the LA was significantly ($p \leq 0.01$) correlated with certification error (Appendix I, Objective II Table 4a.4). SAs with this additional requirement had an error rate of 5.12 percent compared to an error rate of 1.98 percent for SAs that did not have this requirement. For the Chi-square test, the other SA policies were not significantly associated with certification error or could not be computed due to cells with zero observations (Appendix I, Objective II Table 4a.4).¹⁵

¹⁵ A Chi-square test could not be performed on LA policies because the design correction was not positive. See Appendix I, Objective Table 4a.4 for more details.

LA CHARACTERISTICS

The Study Team hypothesized that the relationship of LAs to SAs could play an important role in determining the error rates from an operational and oversight perspective. The Study Team found a significant association ($p \leq 0.001$) between the relationship of LAs to SAs and certification error using the logistic regression model referenced above. Among the non-adjunctively/automatically income eligible participants, the odds ratio of 0.027 indicates that participants whose agency is affiliated with the local government are less likely (by 97.3 percent) to be in error than participants whose agency is State affiliated. The odds ratio of 0.172 indicates that participants whose agency is not government affiliated are less likely to have certification error than participants whose agency is State affiliated (Table 2). Other LA characteristics, including region of LA and the number of participants served by LA, were not significantly associated with certification errors (Appendix I, Objective II Table 4a.1).¹⁶

Characteristics Associated with Income Eligibility Error

Income eligibility error is one component of certification error. Income eligibility error cases were defined as those cases that were not adjunctively or automatically income eligible and reported income greater than the SA-accepted income threshold (e.g., 185 percent of the Federal Poverty Guidelines). Adjunctively or automatically income eligible participants were excluded from this analysis, as the income eligibility error could only occur among not adjunctively or automatically income eligible participants. The Study Team examined the association between various characteristics of SAs and LAs with income eligibility error using the same procedures described above for the certification error analysis.

Table 3 shows the results of the final model, which is discussed below. Note that, given the available data, the best possible model had a pseudo R-squared value of 16 percent, which may be interpreted as the model being insufficient to explain the entire variation in the income eligibility error. However, the explanatory variables clearly have a large effect on the income eligibility error, as shown by the magnitude of the odds ratio and the fact that their relationship with the dependent variable is statistically significant. Other factors could also possibly explain the variation in income eligibility error; however, these factors were not available in the data.

Table 3. Coefficient Estimates from Logistic Regression Model of Income Eligibility Error

Explanatory Variables	Final Model	
	Odds Ratio	95% Confidence Interval
SA EBT Usage		
Yes vs. No	0.362*	(0.140,0.933)
Relationship of LA to SA		

¹⁶ The Rao-Scott Chi-square test could not be computed for the association between certification errors and staff vacancies, and certification errors and certification at alternative sites (e.g., satellite, mobile, or offsite clinics at a hospital, school) because the design correction is not positive. After excluding adjunctively or automatically income eligible cases from the analysis, LA urbanicity was found to be multicollinear with State EBT status. Between the two variables, the State EBT status was still significantly related to certification error while LA urbanicity was no longer significantly related to certification error; hence, it was dropped from the logistic regression model. See Appendix I, Objective II Table 4a.1 for additional details.

Explanatory Variables	Final Model	
	Odds Ratio	95% Confidence Interval
Local Government LA vs. State Affiliated LA	0.027*	(0,001.492)
Non-Government LA vs. State Affiliated LA	0.131**	(0.031,0.548)
AIC	50044.58	
Pseudo R-squared	16.00%	
Weighted <i>n</i>	70097	
Unweighted <i>n</i>	114	

* Statistically significant at $p \leq 0.05$

** Statistically significant at $p \leq 0.01$.

Notes: State-affiliated LAs include LAs that are part of the SA and LAs that are a tribal entity/organization administering WIC. Local government LAs include local government entities administering WIC and clinics under an LA. Non-government LAs include nonprofit organizations that have been contracted to run WIC and other types of LAs not mentioned above.

Source: Appendix I, Objective II Table 4a.3; NSWP-III Certification Survey (Income Eligibility Section, pages 15–40).

SA CHARACTERISTICS

The analysis indicated that SA EBT usage was significantly correlated ($p \leq 0.05$) with income eligibility error, which aligns with the findings for certification error discussed above. Among the non-adjunctively/automatically income eligible participants, the odds ratio of 0.362 indicates that participants whose SA uses EBT are less likely (by 64 percent) to have certification error due to income ineligibility compared to participants whose SA does not use EBT (Table 3). SAs that used EBT had a lower error rate of 1.60 percent compared to SAs that did not use EBT (3.21 percent) (Appendix I, Objective II Table 4a.1).

LA CHARACTERISTICS

Similar to certification errors, the Study Team hypothesized that the relationship of LAs to SAs could play an important role in determining the income eligibility error rates from an operational and oversight perspective. Relationship of LAs to SAs was significantly associated ($p \leq 0.05$) with income eligibility error in the logistic regression analysis. Among the non-adjunctively/automatically income eligible participants, the odds ratio of 0.027 indicates that participants whose agency is affiliated with the local government are less likely (by 97.3 percent) to be in error than those whose agency is State affiliated. The odds ratio of 0.131 indicates that those whose agency is not government affiliated are less likely (by 87 percent) to have income eligibility error than participants whose agency is State affiliated (Table 3).¹⁷

The Study Team also conducted a Chi-square test of association to test the relationship between LA characteristics and policies and income eligibility error among all cases (adjunctively/automatically and non-adjunctive/automatically income eligible respondents). The Chi-square test showed that the urban LAs had a greater income eligibility error than rural LAs (2.50 percent versus 0.37 percent) and that LA urbanicity was significantly associated ($p \leq 0.01$) with income eligibility error. Urban LAs tend to process a much higher volume of participants in a shorter period of time, which may lead to high error rates, especially if appointments are rushed. Other LA characteristics, including region of LA and the number of

¹⁷ State-affiliated LAs include LAs that are part of the SA and LAs that are a tribal entity/organization administering WIC. Local government LAs include local government entities administering WIC and clinics under an LA, such as a health department. Non-government LAs include nonprofit organizations and hospitals that have been contracted to run WIC and other types of LAs not mentioned above.

participants served by LA, were not significantly associated with income eligibility errors (Appendix I, Objective II Table 4a.1).¹⁸

Characteristics Associated with WIC Retention

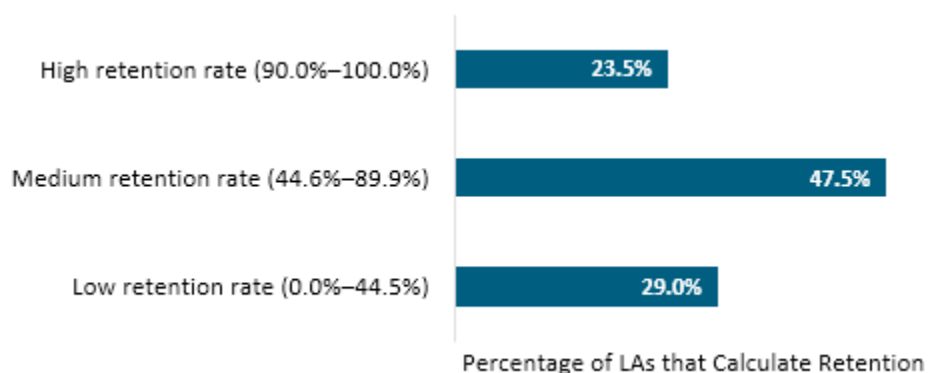
LA CHARACTERISTICS

While WIC retention refers to keeping WIC-eligible participants enrolled in WIC, no standard method exists for determining WIC retention rates. In addition, there is no Federal requirement for SAs or LAs to calculate WIC retention rates. Thus, the LA Survey asked the respondents whether they calculated WIC retention rates and, if so, how they defined retention. The survey also asked LAs to complete a table within the survey that consisted of reporting the total number of participants certified and retained by certification category for the past 5 FYs. The Study Team used this information to calculate the average reported retention rates from FY 2014 through FY 2018.

The majority of LAs (84.1 percent; $n = 452$) do not calculate retention rates, and the remaining 15.9 percent ($n = 85$) reported calculating retention rates (Appendix F, Table 11a). Of the 15.9 percent of LAs that indicated they calculate retention rates, 36.5 percent ($n = 31$) provided data to calculate retention rates by certification category; therefore, these findings should be interpreted with caution. The Study Team calculated the average reported retention rate across all certification categories for FY 2018 and categorized the LA as having a low, medium, or high retention rate based on the distribution of the average FY 2018 reported retention rates. LAs were flagged as high retention rate if the LA's average reported retention rate was 90.0 percent–100.0 percent (greater than or equal to the 75th percentile), medium retention rate if the LA's average reported retention rate was 44.6 percent–89.9 percent (between 25th and 74th percentile), or low retention rate if the LA's average reported retention rate was 0.0 percent–44.5 percent (less than 25th percentile).

The overall average reported retention rate across all LAs was 67.9 percent (Appendix F, Table 11e). Of LAs reporting a retention rate, 23.5 percent were classified as having a high retention rate, 47.5 percent were classified as having a medium retention rate, and 29.0 percent were classified as having a low retention rate (Exhibit 1).

¹⁸ After excluding adjunctively or automatically income eligible cases from the analysis, LA urbanicity was found to be multicollinear with State EBT status. Between the two variables, the State EBT status was still significantly related to income eligibility error while LA urbanicity was no longer significantly related to income eligibility error; hence it was dropped from the logistic regression model.

Exhibit 1. Percentage of LAs Classified as Having High, Medium, and Low Retention, FY 2018

Notes: Weighted $n = 73$; unweighted $n = 31$.

Source: Appendix F, Table 11f; NSWP-III Local Agency Survey, question 33.

The distribution of LAs by the average reported retention rate for FY 2018 varied by LA characteristic (relationship of the LA to SA, number of participants served by month, and LA urbanicity), but Chi-square tests did not yield any significant associations. Higher retention rates were seen among State affiliated LAs (46.2 percent) compared to local government LAs (18.7 percent). A medium retention rate was observed for more than two-thirds (77.5 percent) of non-government LAs, and a low retention rate was seen for 49.5 percent of local government LAs (Table 4).

Higher retention rates were also seen among small LAs that served up to 750 participants per month (45.4 percent), whereas low retention rates were more common among LAs that served 750 to 1,999 participants per month (58.5 percent). The majority (92.7 percent) of large LAs (serving 4,500 or more participants per month) were categorized as having a medium retention rate (Table 4).

Among completely rural LAs, 71.3 percent were found to have high retention rates and the rest medium retention rates. In comparison, 54.2 percent of mostly rural LAs were found to have a low retention rate and 45.8 percent medium. For mostly urban LAs, half of the LAs (50.6 percent) were found to have a medium retention rate, followed by 28.2 percent with low and 21.2 percent with high retention rates (Table 4).

Table 4. LA Site Characteristics Associated with Levels of Retention, FY 2018

Retention Rate Classification	Relationship of LA to SA			Number of Participants Served by Entire LA				Urbanicity		
	State Affiliated	Local Government	Non-Government	Up to 750	750 to 1,999	2,000 to 4,499	4,500+	Completely Rural	Mostly Rural	Mostly Urban
High (90.0%–100.0%)	46.2	18.7	0.0	45.4	14.7	13.5	7.3	71.3	0.0	21.2
Medium (44.6%–89.9%)	37.6	31.8	77.5	24.5	26.8	44.5	92.7	28.7	45.8	50.6
Low (0.0%–44.5%)	16.1	49.5	22.5	30.0	58.5	42.1	0.0	0.0	54.2	28.2
Chi-square	‡			$\chi^2 = 5.298^{\wedge}$				$\chi^2 = 0.305^{^^}$		
P-value	‡			$p = 0.071$				$p = 0.858$		
Weighted <i>n</i>	27	24	22	26	9	19	19	8	11	54
Unweighted <i>n</i>	12	9	10	10	4	8	9	3	4	24

‡ Chi-square test could not be conducted due to small cell sizes.

[^] For the purposes of the Chi-square test, the categories "Up to 750" and "750 to 1,999" were combined into one category, "Up to 1,999"; and the categories "2,000 to 4,499" and "4500+" were combined into one category, "2,000+."

^{^^} For the purposes of the Chi-square test, "Mostly Rural" and "Completely Rural" categories were combined into one category: "Rural."

Notes: Retention rates were reported for FY 2018. Data were missing for 65.5 percent of LAs that calculated retention. LAs were categorized as having low, medium, or high retention rate based on the distribution of the average FY 2018 reported retention rates from question 33 of the LA survey. LAs were flagged as high retention rate if the LA's average reported retention rate was 90.0 percent–100.0 percent, medium retention rate if the LA's average reported retention rate was 44.6 percent–89.9 percent, or low retention rate if the LA's average reported retention rate was 0.0 percent–44.5 percent.

Source: Appendix F, Table 11f; NSWP-III Local Agency Survey, question 33.

The Study Team also examined the percentage of LAs with at least one vacant staff position by average retention rate for FY 2018. Approximately three quarters of LAs with a high retention rate (73.9 percent) reported staff vacancies, half of LAs with a medium retention rate (49.4 percent) reported staff vacancies, and more than half of LAs with low retention rates (51.5 percent) reported vacant staff positions (Table 5). While these findings indicate that frequency of vacant staff positions has no effect on retention and, possibly, that the effect is the opposite, small sample size and lack of data limit this analysis.

Table 5. LAs With Staff Positions That Were Vacant, by Retention Rate, FY 2018

Retention Rate Classification	LAs with At Least One Vacant Staff Positions (%)	Weighted <i>n</i>	Unweighted <i>n</i>
High (90.0%–100.0%)	73.9	5	3
Medium (44.6%–89.9%)	49.4	19	9
Low (0.0%–44.5%)	51.5	12	5

Notes: Data were missing for 42.1 percent of LAs with low retention rates, 44.2 percent of LAs with medium retention rates, and 69.3 percent of LAs with high retention rates. Question 27 did not allow respondents to indicate whether a position was not applicable for their LA and did not instruct respondents to enter 0 if there were no staff to report in each column. The rate of missing data may be attributed to these limitations.

Source: Appendix F, Table 9h; NSWP-III Local Agency Survey, questions 27 and 33C.

PARTICIPATION IN OTHER SOCIAL SERVICES PROGRAMS AMONG CURRENT WIC PARTICIPANTS

PES respondents were asked whether they or any family members had ever participated in the following programs: SNAP, Head Start/Early Head Start, NSLP or SBP, SFSP, TEFAP, CACFP, local/community food bank or pantry, and CSFP. The Study Team examined whether prior experience with any other social services program was related to continuous participation in WIC. Participants who left WIC and returned to WIC were more likely to have ever participated in SNAP (86 percent) compared to participants who never left WIC [73 percent]) (Table 6).

Table 6. Household Participation in Other Social Services Programs and Association with WIC Participation

Program	Overall	Left WIC While Eligible and Returned to WIC	Continuous Participation in WIC
Any program (%)	83.0	92.1	85.7
SNAP** (%)	70.4	86.0	73.3
Head Start/Early Head Start (%)	22.5	28.6	28.5
NSLP or SBP (%)	45.9	43.3	51.8
SFSP (%)	12.5	13.2	14.4
TEFAP (%)	7.6	10.7	7.7
CACFP (%)	14.3	18.7	15.9
Local/community food bank or pantry (%)	25.1	24.0	29.0
CSFP (%)	4.4	3.1	4.9
Total number of respondents (weighted <i>n</i>)	6,397,412	941,469	2,563,963
Total number of respondents (unweighted <i>n</i>)	1,648	204	578

** Statistically significant at $p \leq 0.01$ ($\chi^2 = 8.47$, $p = 0.0036$).

Notes: Respondents were asked whether they or any family members had ever participated in the other social service programs.

Source: Appendix G, Table 6d.5; NSWP-III Program Experiences Survey, questions 8, 9, and 38A.

PARTICIPATION IN OTHER SOCIAL SERVICES PROGRAMS AMONG FORMER WIC PARTICIPANTS

Former WIC participants were asked whether they were enrolled in SNAP, NSLP, or SBP; Food Distribution Program on Indian Reservations (FDPIR); SFSP; CACFP; Medicaid; or TANF during their WIC certification period. Many (84.8 percent; $n = 106$) former participants reported being enrolled in at least one other assistance program during the time of their most recent WIC participation. Most respondents (79.2 percent; $n = 99$) reported they were concurrently enrolled in Medicaid, while a smaller number of respondents was enrolled in SNAP (40.8 percent; $n = 51$) or NSLP (24.0 percent; $n = 30$). The fewest respondents reported being enrolled in various other programs (Table 7).

Table 7. Former WIC Participant Enrollment in Other Programs

Former WIC Participants Enrolled in at Least One Other Program	Percentage	Number
Yes	84.8	106
No	15.2	19
Enrollment by Program		
Medicaid	79.2	99
SNAP	40.8	51
NSLP	24.0	30
TANF	9.6	12
SFSP	7.2	9
CACFP	6.4	8
FDPIR	1.6	2
Total		125

Notes: The findings are based on responses from 125 former WIC participants. Respondents could be enrolled in more than one program; these percentages will not sum to 100. Enrollment status is based on respondents' recollection of their participation in other programs at the time of their last certification appointment. Former WIC participants were interviewed within 1 year of leaving WIC.

Source: Appendix H, Table 3a.1; NSWP-III Former Participant Survey, question 30.

Former participants' use of other assistance programs at the time of their recent certification was compared to their self-reported decisions to leave WIC. Participation in TANF was found to be associated ($p < 0.05$) with leaving WIC due to issues with recertification (Appendix H, Table 3c.2). These results are exploratory. Inferences about the population of former participants cannot be made based on these survey findings because the FPS utilized convenience sampling and is not representative of former WIC participants nationwide.

Among those WIC respondents who also received TANF ($n = 12$), some respondents ($n = 5$) described challenges with recertification, including missing appointments and issues scheduling for recertification due to challenges balancing work and family responsibilities.

"The WIC program, why did we leave? Okay. I left the program because I had a job and I was working and then I started missing my appointments because I was too busy. I didn't have the time, when I get off work, I have to get my kids and then the WIC office would be closing because I was on the first shift."

"I just haven't had time to make a appointment due to my work schedule. So that's only reason why."

CONCLUSION

This report brief assessed potential factors associated with certification error and participant retention in WIC. Notably, State EBT status was shown to be associated with lower rates of certification error – this is a promising finding given EBT implementation requirements set by The Healthy, Hunger-Free Kids Act of 2010, PL 111-296. Future studies could reassess the certification error rate once all SAs implement EBT.

Of the LAs that reported data to calculate participant retention rates, the average reported retention rate varied across LAs; however, when examining the degree of retention (i.e., high, medium, low) by LA characteristics, there were no significant differences. In addition, the study findings related to current and former WIC participant retention and participation in other social service programs showed that participation in both WIC and most other programs did not impact WIC participant retention.

As with all research studies, limitations of the design and methodology are possible. Associations between some subgroups could not be tested due to small cell sizes. Also, the retention rates presented in this brief should be interpreted with caution due to low response rates for questions that ask for the data needed to calculate retention at the LA level. For the regression analyses, the pseudo R-squared values were low, so these models explained only part of the variation in the corresponding error. However, the models selected were the best models possible, given the data limitation. Lastly, the FPS is a case study; thus, is not designed to be representative of all former WIC participants nationwide.

Prepared by Capital Consulting Corporation (CCC) and 2M Research Services for the USDA Food and Nutrition Service (Project Officer: Karen Castellanos-Brown)

Suggested citation:

Magness, A., Chakravorty, A., Williams, K. Papa, F., Santos, K., Gordon, E., Morrissey, N., Okyere, D., Nisar, H., Bajowski, F., & Singer, B. (2021). *National Survey of WIC Participants: Factors Associated with Certification Error and Program Retention: Brief Report #10*. Prepared by Capital Consulting Corporation and 2M Research Services. Contract No. AG-3198-K-15-0077. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, Project Officer: Karen Castellanos-Brown. Available online at: <https://www.fns.usda.gov/research-and-analysis>.

Acknowledgments:

The Study Team would like to thank the WIC State and local agency staff, and current and former WIC participants who participated in the study. We greatly appreciate the guidance provided throughout the entire project by our partners at the U.S. Department of Agriculture, Food and Nutrition Service, with special assistance from Karen Castellanos-Brown, Courtney Paolicelli, Jennifer Teters, Lisa Southworth, Marta Kealey, Jessica Owen Day, and Karen Meade.

We also greatly appreciate the feedback and support from our Expert Panel Members: Carol Eyermann, Donna Hines, Mindy Jossefides, Julie Reeder, and Jackson Sekhobo. The Study Team also would like to thank our partners at Abt Associates for their support with this effort. We also appreciate Paul Ruggiere, Mary Ann Latter, Moyo Kimathi, Amy Wieczorek-Basl, Yuhan Huang, Shu Li, and the rest of the data collection and analysis staff who contributed to this study. MacKenzie Regier, Cindy Romero, Gail Clark, and Joshua Townley provided invaluable quality assurance support throughout the study.

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