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# Feasibility and Accuracy of Record Linkage To Estimate Multiple Program Participation

## Volume III, Results of Record Linkage

By Nancy Cole and Ellie Lee, Abt Associates Inc.

ERS project representative: Mark Prell, 202-694-5408  
mprell@ers.usda.gov

### Abstract

This study investigated the feasibility of linking administrative data from multiple USDA food assistance and nutrition programs. This report contains findings from Phase II of the study, which collected and linked 2000-02 administrative data on clients of the Food Stamp Program (FSP) and the Special Supplemental Program for Women, Infants, and Children (WIC) in Florida, Iowa, and Kentucky. The report finds that the percentage of FSP infants (children) with contemporaneous participation in WIC ranged from 84 to 94 percent (50 to 57 percent). Meanwhile, the percentage of WIC infants (children) with contemporaneous participation in FSP ranged from 22 to 38 percent (29 to 50 percent). Most FSP women who gave birth during the 3-year period participated in WIC for some period (83 percent in Florida and 91 percent in Iowa). Phase II also examined the relative timing of participation across programs and the individual and household characteristics associated with multiple program participation.

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# Executive Summary

This study investigated the feasibility of linking administrative data from multiple USDA food assistance and nutrition programs (FANPs). Linked data provide a means of examining rates of multiple program participation, dynamics of participation across programs, and the characteristics of families who participate in some, but not all, FANP programs for which they are eligible. The study was conducted in two phases.

Phase I of the study examined the characteristics and content of administrative databases that maintain information about participants in food assistance programs. Information about administrative databases was collected with the Survey of Food Assistance Information Systems. Respondents to the survey included State directors of the Food Stamp Program (FSP), the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and Child Nutrition Programs (CNPs) in 26 States representing 76 percent of total FSP and WIC participants in the United States. The main goal of the survey was to determine the potential for record linkage across programs.

Results of phase 1 were reported in *Volume I: Record Linkage Issues and Results of the Survey of Food Assistance Information Systems*.<sup>1</sup> That report includes:

- Review of research uses of administrative data;
- Description of record linkage methods; and
- Description of information systems containing participant information for the Food Stamp Program, WIC, and Child Nutrition Programs.

Phase II of the study, reported in this volume, collected retrospective administrative data from food stamp and WIC programs in three States (Florida, Iowa, and Kentucky) covering a three-year period (January 2000 through December 2002). FSP and WIC records were matched using probabilistic record linkage methods. Match results were used as estimates of multiple program participation within each State. This report includes:

- Estimates of multiple program participation in FSP and WIC;
- Description of the relative timing of participation across programs;
- Examination of the individual and household characteristics associated with multiple program participation.

In addition, information about the feasibility of record linkage is presented through a discussion of the content of administrative databases, the prevalence of missing or non-standardized data, the rate of change in participant information over time, and the methods used for record linkage.

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<sup>1</sup> Cole, Nancy. *Feasibility and Accuracy of Record Linkage To Estimate Multiple Program Participation: Volume I, Record Linkage Issues and Results of the Survey of Food Assistance Information Systems*, E-FAN-03-008-1 and *Feasibility and Accuracy of Record Linkage To Estimate Multiple Program Participation: Volume II, Survey of Food Assistance Information Systems – Survey Instruments*, E-FAN-03-008-2

## Findings of the Survey of Food Assistance Information Systems

The findings of the Survey of Food Assistance Information Systems in 26 States indicated variation in the characteristics of participant databases within and between the FSP and WIC programs. Systems differed with respect to the number and types of available person identifiers, extent of data verification, and rules for data retention and overwriting. These findings suggest that administrative data needed for file matching vary in reliability across States and programs. The survey also found that participant data from the Child Nutrition Programs are currently unavailable at the State level except from a handful of States.

The characteristics of information systems that are most relevant to research on multiple program participation are:

- There is currently no integration between information systems for FSP, WIC, and Child Nutrition Programs.
- All 26 States surveyed have statewide information systems for FSP and WIC; only 5 States maintain information about eligibility for the National School Lunch Program at the state level.
- The potential to link FSP and WIC data using Social Security Numbers (SSNs) as a primary identifier may be limited. In all 26 sampled States, FSP collects and verifies the SSN of each participant. Reporting of SSN by WIC applicants, however, varies by State: 5 States require SSNs, if available; SSN is optional in 15 States; and 6 States do not collect SSN. Only one WIC program reported that SSNs are verified.
- The potential to link FSP and WIC data for persons participating in both programs at different points in time may be limited by the overwriting policies on individual data fields such as last name (which may change due to marriage, divorce, or adoption), address and telephone number. More than three-fourths of WIC programs overwrite this information when it changes, rather than retaining the information. FSP programs are more likely to retain old information in their on-line systems.

## Findings of FSP and WIC Record Linkage

Multiple program participation was examined by within-State linking of FSP and WIC data from Florida, Iowa, and Kentucky. These three States were selected for the study based on favorable characteristics of their FSP and WIC information systems, as reported in the phase I survey.<sup>2</sup> Thus, the feasibility of record linkage in these three States may not be indicative of the potential for successful record linkage in other States.

Records from the FSP and WIC programs were matched using probabilistic record linkage software from the U.S. Bureau of Census. Match results were used as estimates of multiple program participation within each State. Two measures of multiple program participation were examined:

- **Contemporaneous participation** – participation in FSP and WIC at a point in time; measured by matching all FSP participants active in December 2002 to all WIC participants active in December 2002.

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<sup>2</sup> The FSP and WIC programs in these three States each have name, address, date of birth, and SSN in their administrative databases as required fields that are not supposed to be blank. These are the key identifiers used for record linkage.

- **Exposure** – participation in FSP and WIC at any time during the three-year period from January 2000 through December 2002; measured by matching all persons participating in FSP at any time during the three-year period, to all persons participating in WIC at any time during the three-year period.

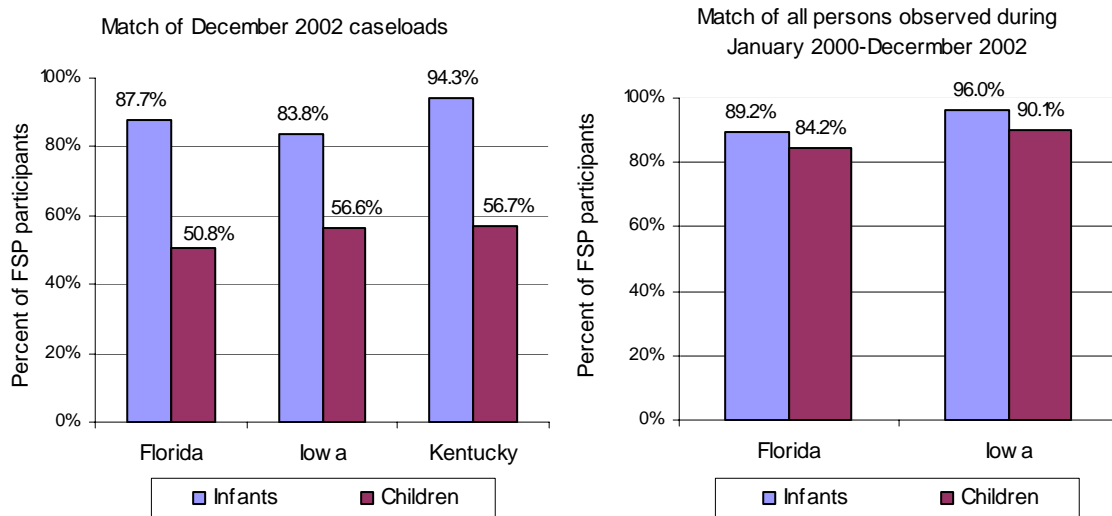
**Infants and children.** Rates of multiple program participation are shown in figure 1 for FSP infants and children (rates of exposure during the three year period could not be estimated for Kentucky). Contemporaneous match rates are significantly higher for FSP infants compared with FSP children.

Over 80 percent of FSP infants in all three States had contemporaneous participation in WIC, while 50 to 57 percent of FSP children had contemporaneous participation in WIC. The difference between infants and children reflects declining WIC participation with age. Rates of exposure to WIC during the three-year time period are only 5-6 percentage points higher for infants, compared to children.

For WIC participants, rates of contemporaneous multiple program participation and rates of exposure to FSP are lower than corresponding rates of participation in WIC among FSP participants. For WIC participants, rates of participation in FSP are limited by the fact that only a subset of WIC participants are income-eligible for FSP. Rates of multiple program participation for WIC infants and children are shown in figure 2.

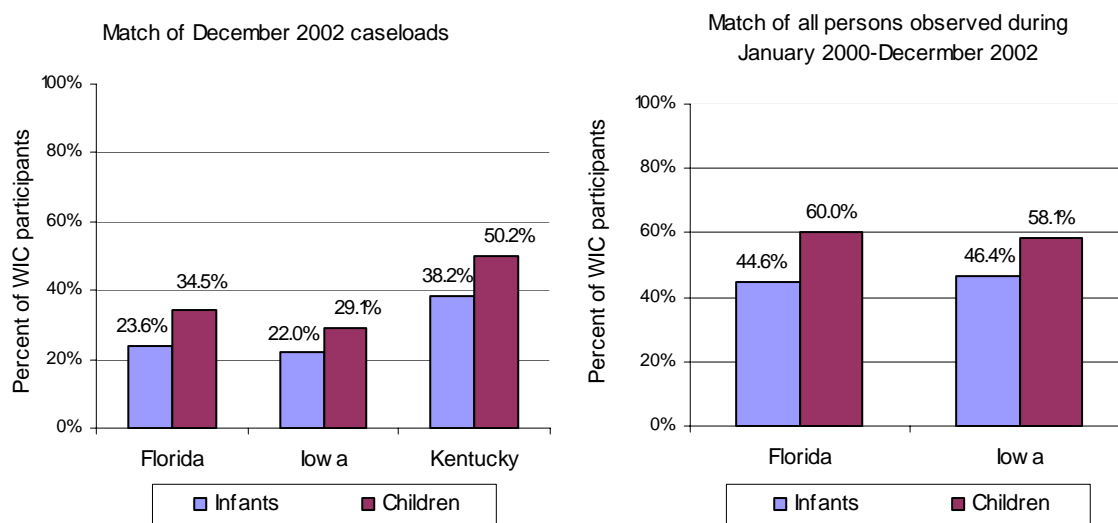
- The percent of WIC infants with contemporaneous participation in FSP was 24 percent in Florida, 22 percent in Iowa, and 38 percent in Kentucky.
- The percent of WIC children with contemporaneous participation in FSP was 35 percent in Florida, 29 percent in Iowa, and 50 percent in Kentucky.

**Figure 1 — Percent of FSP infants and children participating in WIC**



Note: Kentucky could not be matched over the period January 2000 through December 2002 because Kentucky FSP data were available for December 2002 only.

**Figure 2 — Percent of WIC infants and children participating in FSP**



Note: Kentucky could not be matched over the period January 2000 through December 2002 because Kentucky FSP data were available for December 2002 only.

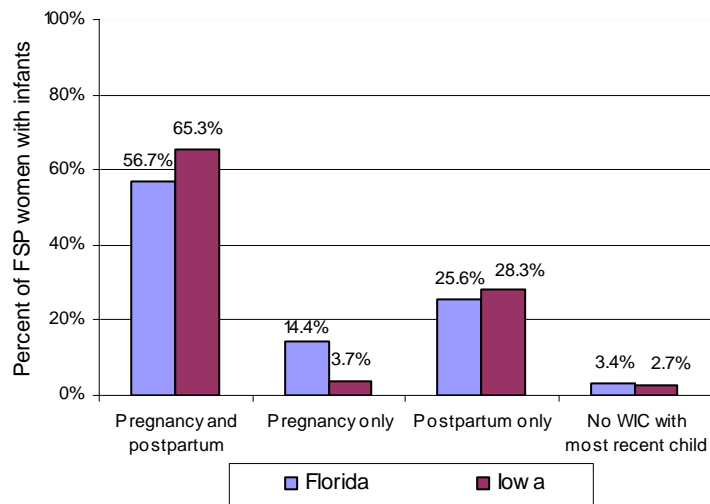
Rates of exposure of WIC infants and children to FSP during the three-year period were 45 and 60 percent for infants and children in Florida, respectively; and 46 and 58 percent for infants and children in Iowa, respectively. (This statistic could not be estimated for Kentucky).

Multivariate analysis was used to examine the characteristics of FSP participants who also participate in WIC (the converse was not examined because not all WIC participants are eligible for FSP). This analysis shows that the likelihood that FSP children participate in WIC declines with age and is negatively associated with residence in a metropolitan area. Hispanic children in Florida and Kentucky were more likely to participate in WIC than other racial/ethnic groups, and black children in Iowa and Kentucky were less likely to participate in WIC than other racial/ethnic groups. In all three States, the likelihood of WIC participation is positively associated with the number of adults in the household, the number of children under age five, a married household head, and receipt of TANF. Medicaid enrollment is positively related to WIC participation in Iowa (the only State with Medicaid information). Since the analysis was limited to FSP participants, the TANF and Medicaid results suggest that WIC participation is more likely when children are enrolled in *multiple* other public assistance programs.

**Women.** Most FSP women who gave birth during the three-year period (2000-2002) participated in WIC for some period of time (78 percent in Florida and 85 percent in Iowa). Half of FSP women with infants were enrolled in FSP prior to WIC. Among FSP women with infants who participated in WIC, the timing of participation is shown in figure 3: 57 percent in Florida and 65 percent in Iowa participated in WIC during pregnancy and postpartum. However, more than one-quarter (26 percent in Florida and 28 percent in Iowa) participated in WIC only postpartum and not during the prenatal period.



**Figure 3 — Timing of WIC participation for FSP women with infants**



Note: Sample is limited to FSP women with infants who participated in WIC at some time during January 2000 – December 2002. The percent of FSP women with infants who participated in WIC in Florida and Iowa was 78 and 85 percent, respectively.

The multiple program participation results from this report cannot be generalized beyond the three States included in the study. The range of issues examined, however, can be applied to further studies. Linked administrative data may be less costly than survey data and provide a means of examining a large number of issues associated with multiple program participation. For example, the current study might be replicated with a larger time period so that the interaction of FSP and WIC can be examined for cohorts of children from birth to age 5. These methods may also be applied to data from other public assistance programs. Unfortunately, NSLP data were not available for the record linkage portion of this study, but future efforts to link NLSP and FSP could help us understand variations in FSP participation rates among school-age children.