Chapter Two
Data

This chapter describes the selection of States for the study and the characteristics and contents of the administrative databases. The characteristics of the data are presented in detail, consistent with study goals to examine the feasibility of record linkage and consider the potential limitations of administrative data. Procedures for standardizing and cleaning the data prior to record linkage are also documented.

Selection of States for the Study

This study collected administrative data extracts from FSP and WIC programs in three States (Florida, Iowa, and Kentucky). These three States were selected based on the contents of their administrative databases, as reported during the Phase 1 survey conducted for this project. Two criteria were used to select States:

- **Common identifiers.** FSP and WIC client databases each had to have four common individual identifiers as *required* data fields in their client database: name, address, date of birth, and either Social Security Number (SSN) or phone number. A *required* data field is a field that is not supposed to be blank.
- **Record retention.** Participant records must be available for a three-year period, from January 2000 through December 2002. We preferred not to ask States to provide data from offline archives, to minimize burden.

The first criterion was used because individual identifiers such as name, date of birth, SSN, address, and phone must be present to establish a match across files. The presence of four identifiers gave us the flexibility to examine record linkage results under different matching scenarios, defined by the number of match variables. The second criterion was chosen arbitrarily so that we would have "enough" data to examine patterns of participation across the two programs over time.

Among the 26 States surveyed in Phase 1 of the study, only four States met the first criterion: FSP and WIC programs each have name, address, date of birth, and SSN in their client databases as required data fields. These States include the three participating in the study (Florida, Iowa, and Kentucky) plus Tennessee.[18] There were no surveyed States in which both FSP and WIC databases have name, address, date of birth, and phone as required data fields.[19] Table 2 shows all personal identifiers reported to be in the participant databases for the three selected States.[20]

Online record retention varied across the FSP and WIC programs in the three States selected for the study. FSP and WIC programs operate under federal regulations requiring record retention for a minimum of three years (7 CFR 275.4; 7 CFR 246.25), but offline archival can be used to satisfy those requirements. Kentucky FSP and WIC programs reported that client records are never taken

[18] Tennessee was chosen to participate in the study, but the Food Stamp Program was unable to provide data.

[19] Eight additional States met relaxed criteria such that name, address and date of birth are required for FSP and WIC; SSN is required for FSP and available but not required for WIC; and phone number is available but not necessarily required by either FSP or WIC.

[20] In FSP files, address appears on the records of household heads, but can be linked to each household member.

Table 2—Personal identifying information reported to be in FSP and WIC information systems

	First name	Last name	SSN	Date of birth	Addre-ss	Mailing addre-ss	Phone numb-er	County	Gend-er	Race/ ethnici-ty	Prima-ry langu-age	Date of first certifi-cation	Start & end dates of each cert. period	Month-ly indica-tors of partici-pation	WIC Only		
															Food Stamp case numb-er	TANF case numb-er	Medic-aid case numb-er
Florida																	
Food Stamp Program																	
Household head	✔	✔	✔	✔	✔	❑	❑	✔	✔	✔	✔	❑	❑	❑			
Other family members	✔	✔	✔	✔	—	—	—	—	✔	✔	—	—	—	—			
WIC Program																	
Women	✔	✔	✔	✔	✔	❑	❑	✔	✔	✔	—	✔	✔	—	❑	❑	❑
Infant/child	✔	✔	✔	✔	✔	❑	❑	✔	✔	✔	—	✔	✔	—	❑	❑	❑
Iowa																	
Food Stamp Program																	
Household head	✔	✔	✔	✔	❑	✔	❑	❑	❑	❑	—	✔	❑	—			
Other family members	✔	✔	✔	✔	❑	✔	❑	❑	❑	❑	—	✔	❑	—			
WIC Program																	
Women	✔	✔	✔	✔	✔	—	❑	✔	✔	✔	✔	—	✔	✔	—	—	❑
Infant/child	✔	✔	✔	✔	✔	—	❑	✔	✔	✔	✔	—	✔	✔	—	—	❑
Kentucky																	
Food Stamp Program																	
Household head	✔	✔	✔	✔	✔	❑	❑	✔	✔	✔	✔	✔	✔	✔			
Other family members	✔	✔	✔	✔	—	—	—	—	✔	✔	✔	✔	✔	✔			
WIC Program																	
Women	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	—	✔	✔	✔	—	—	—
Infant/child	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	—	✔	✔	✔	—	—	—

✔ Indicates data field is required to be filled; ❑ indicates data field is available but not required to be filled; — indicates data field is not available.

Source: *Survey of Food Assistance Information Systems,* Abt Associates, 2002.

offline. Florida FSP and WIC programs take records offline after cases have been inactive for 21 and 30 months, respectively. Iowa FSP and WIC programs take records offline after cases have been inactive for 24 and 66 months, respectively. All programs were asked to provide extracts containing persons active at any time during the three-year period from January 2000 to December 2002. Only Kentucky FSP was unable to provide data for the three-year period and instead provided data for one month (December 2002). It took several months for some State programs to fill the data request. Original requests were made in November 2002 and all data extracts were received by May 2003.

In addition to record retention policies, overwriting policies for individual data fields are relevant when collecting data retrospectively and linking data across systems. For example, when a person's name changes due to marriage, divorce, or adoption, some systems retain the old name in a separate data field, or history file, and some systems overwrite the old data. If a person is active in FSP and WIC at the same point in time, but enrolled at different points in time, then some identifying information may not match. The Phase 1 survey identified only one State (Kentucky) where both FSP and WIC data systems do not overwrite four identifying fields: name, date of birth, SSN, and address. The overwriting/retention rules reported in the Phase 1 survey for the selected States are shown in table 3.

The three selected States vary in caseload size. Table 4 shows FSP and WIC caseload information reported by USDA for the three States in the study. Florida is by far the largest with 5.1 percent of total U.S. food stamp participants and 4.3 percent of total U.S. WIC participants. Iowa has less than one percent of total FSP and WIC participants. Kentucky has 2.4 and 1.5 percent of total FSP and WIC participants, respectively.

Characteristics of Administrative Data Extracts

This section describes the characteristics of FSP and WIC data extracts, in terms of file size and format, records selected for matching, data elements, data quality, and participant dynamics within program over the three-year period. FSP and WIC programs in Florida and Iowa provided data for all persons participating in their program at any time during the period January 2000 through December 2002. Kentucky WIC also provided data for the three-year period, while Kentucky FSP provided data for one month (December 2002).

Table 3 – Overwriting and retention rules for personal identifying information in FSP and WIC programs in selected States

State	Program	Overwriting and retention of Name, Date of birth, SSN, Address, Telephone number[a]
Florida	FSP	Retain all except date of birth
	WIC	Overwrite all
Iowa	FSP	Overwrite all
	WIC	Overwrite all
Kentucky	FSP	Retain all except telephone number
	WIC	Retain all

[a] Indicates whether old information is retained in separate data field when change is made, or whether old information is overwritten and lost.

Source: 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.

Table 4 – Number of participants in FSP and WIC programs in three selected States

State	Food Stamp Program[a]		WIC[b]	
	Number of participants	Percent of U.S. total	Number of participants	Percent of U.S. total
Florida	888,000	5.1	340,601	4.3
Iowa	124,000	0.7	62,798	0.8
Kentucky	418,000	2.4	121,098	1.5
U.S. Total	17,297,000	100.0	7,855,537	100.0

[a] Source: *Characteristics of Food Stamp Households: Fiscal Year 2001* (USDA, 2003).
[b] Source: *WIC Participant and Program Characteristics 2000* (Bartlett et al., 2002).

File size and format

The characteristics of the data files are shown in table 5, and the number of unique persons in those files is shown in table 6 (first column). Most data files were provided as flat file ASCII files, except Florida WIC data were in MS-Access format. Within program, file size varied across States according to caseloads. Within Florida and Iowa, FSP files were larger than WIC files due to larger caseloads and different record structure. The FSP files contained records for the entire caseload, even though only records for women of childbearing age, infants, and children would be matched to WIC data.

FSP data files contained one record per participant per month, while WIC data files contained one record per participant per certification.[21] This difference has two implications. First, identification of FSP participants in a given month was straightforward using the "year/month" indicator that was present on the file, while identification of WIC participants in a given month was based on certification date together with length of certification period.[22] The second implication is that FSP files identified participants who received benefits in a given month, whereas WIC files identified enrollees regardless of whether they picked up benefits for a particular month. The distinction between enrollees and participants is not considered important for this study because much of the analysis examined persons participating in FSP or WIC at any time during the three-year period.[23]

Data files from Florida, the largest of the three States, were nearly 10 times larger than data files from Iowa, the smallest State (measured by approximate file size). Florida FSP data consisted of over 30 million person-month records for 2.6 million participants during the three-year period, and the data occupied over 8 gigabytes of disk space. In contrast, data from the Iowa FSP program consisted of nearly 2.5 million person-month records for 337 thousand participants, and occupied less than one gigabyte of disk space.

[21] WIC certification records are also used in the USDA, Food and Nutrition Service biennial *Studies of WIC Participant Characteristics*.

[22] Most WIC applicants are certified for 6-month periods, except infants are certified up until their first birthday.

[23] As discussed later, when FSP files showed a one-month break between two spells of participation, FSP participation was imputed to provide a continuous spell. The elimination of these spurious breaks in participation makes the FSP data more comparable to WIC enrollment data.

Table 5—Administrative data files received from FSP and WIC programs

	File format	Period	Approx. file size	Total number of records[1]
Florida				
Food Stamp Program	ASCII	3 years	8 gigabytyes	32,802,926
WIC Program	MS-Access	3 years	515 MB	1,933,424
Iowa				
Food Stamp Program	ASCII	3 years	883 MB	2,451,181
WIC Program	ASCII	3 years	59 MB	362,494
Kentucky				
Food Stamp Program	ASCII	1 month	75 MB	474,685
WIC Program	ASCII	3 years	121 MB	684,999

1 Number of records in FSP files is equal to number of person-months during 3-year period. Number of records in WIC files is equal to number of certifications during 3-year period.

Table 6—Analysis samples

	Total number of persons[1]	Women, Infants, and Children (W-I-C)[2]	
		All persons active 2000-2002	Active caseload in December 2002
Florida			
Food Stamp Program	2,621,488	1,194,425	388,817
WIC Program	981,464	981,464	403,477
Iowa			
Food Stamp Program	337,083	180,171	60,345
WIC Program	163,649	163,649	70,239
Kentucky			
Food Stamp Program	474,685	na	200,013
WIC Program	329,785	329,778	131,174

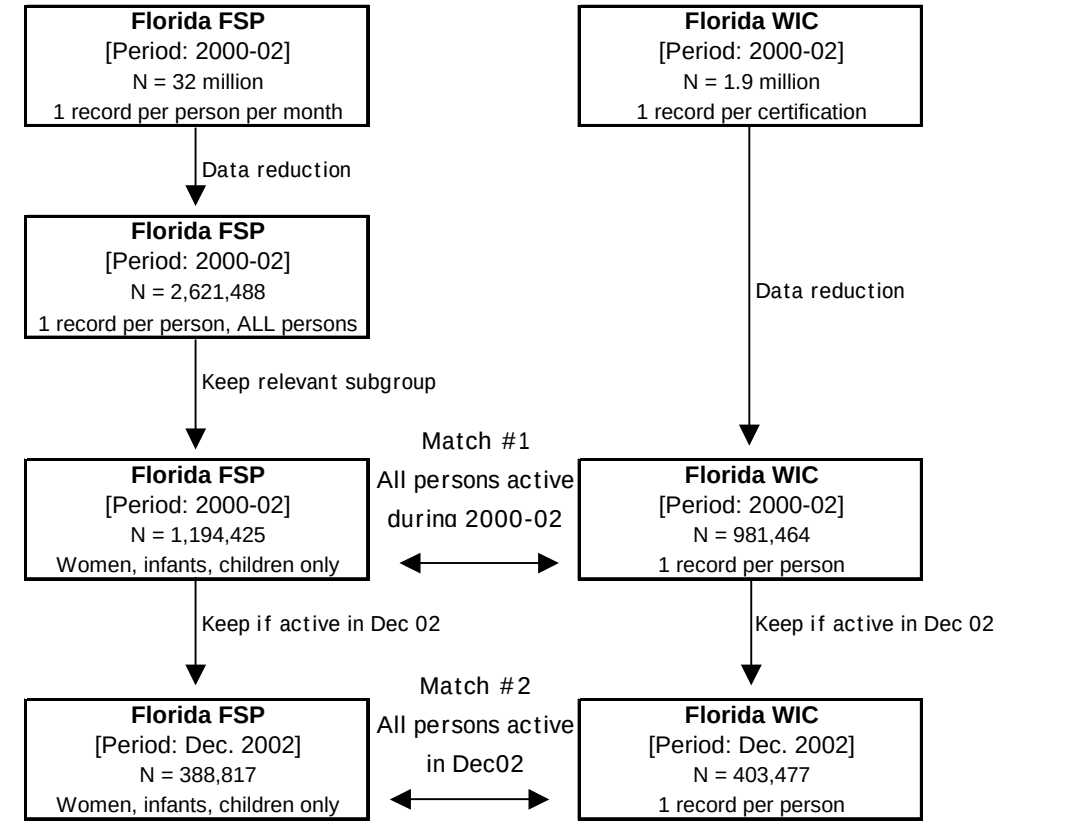
1 FSP count of persons includes entire caseload and is not limited to women, infants, and children.
2 W-I-C in FSP caseload are identified by age: women of childbearing age (15-45), infants, and children up to age 5.
na = not available.

Analysis samples

Table 6 shows the number of unique persons in each data file, and the number of unique persons in the analysis samples. Figure 4 provides a flowchart from the original data files to the analysis files, using Florida as the example. Two main steps are shown in the flowchart: data reduction (FSP and WIC) and selection of subgroups (FSP only). The original FSP data files were reduced from one record per person per month to one record per person with an array of monthly participation indicators. Similarly, WIC files were reduced from one record per certification to one record per person with an array of certification dates.[24]

[24] This is a simplified characterization of the data reduction; a more detailed discussion appears in chapter 3.

Figure 4 – Flowchart of data processing and selection of analysis samples



The analysis samples include all WIC participants and the subset of FSP participants identified as women of childbearing age (15-45 years old), infants, or children up to age 5 (hereafter referred to as W- I-C). All WIC participants are used for matching even though only persons with income not exceeding 130 percent of the federal poverty level are potentially eligible for FSP, subject to resource limits (see table 1). This subset of WIC participants cannot be identified with precision, however, because definitions of household and household income vary between FSP and WIC. In addition, the availability of income data in WIC administrative databases varies among States.[25] For these reasons, a subset of records was not selected from WIC databases prior to matching.

Two analysis samples were used: 1) W-I-C who were active at any time during 2000-2002, and 2) W-I-C who were active in December 2002. These samples are denoted "Match #1" and "Match #2" in figure 4. December 2002 was chosen because data from Kentucky FSP were received for that month only.

Table 7 provides a count of women, infants, and children included in the matching routines from the December 2002 caseloads of each State. W-I-C represent 38 to 45 percent of *total* FSP caseloads and

[25] The biennial census of WIC participants reported in *WIC Participant and Program Characteristics 2000* found that income was reported on the records of only 87 percent of WIC participants in April 2000. Administrative records from seven States (including Kentucky) had income missing for over 30 percent of WIC participants.

Table 7—Number and percent of women, infants, and children (W-I-C) in FSP and WIC caseloads, December 2002

	Food Stamps		WIC	
	Number	Percent of total caseload	Number	Percent of total caseload
Florida				
Total W-I-C	388,817	38.19	403,477	100.00
Women				
Age 15-18	33,379	3.28	10,214	2.53
Age 19-34	122,500	12.03	78,815	19.53
Age 35-45	71,677	7.04	9,577	2.37
Total	227,556	22.35	98,606	24.44
Infants	29,953	2.94	112,352	27.85
Children				
Age 1	34,030	3.34	63,476	15.73
Age 2	33,712	3.31	50,384	12.49
Age 3	32,066	3.15	42,822	10.61
Age 4	31,500	3.09	35,837	8.88
Total	131,308	12.90	192,519	47.71
Iowa				
Total W-I-C	60,345	45.03	70,239	100.00
Women				
Age 15-18	4,085	3.05	1,745	2.48
Age 19-34	22,348	16.68	14,171	20.18
Age 35-45	10,782	8.05	1,069	1.52
Total	37,215	27.77	16,985	24.18
Infants	4,655	3.47	17,227	24.53
Children				
Age 1	4,781	3.57	11,650	16.59
Age 2	4,764	3.56	9,242	13.16
Age 3	4,660	3.48	8,232	11.72
Age 4	4,270	3.19	6,903	9.83
Total	18,475	13.79	36,027	51.29
Kentucky				
Total W-I-C	200,013	42.14	131,174	100.00
Women				
Age 15-18	16,205	3.41	3,895	2.97
Age 19-34	75,515	15.91	27,246	20.77
Age 35-45	37,539	7.91	1,597	1.22
Total	129,259	27.23	32,738	24.96
Infants	14,016	2.95	33,965	25.89
Children				
Age 1	14,384	3.03	21,261	16.21
Age 2	14,526	3.06	16,463	12.55
Age 3	14,149	2.98	14,122	10.77
Age 4	13,679	2.88	12,625	9.62
Total	56,738	11.95	64,471	49.15

100 percent of WIC caseloads. FSP enrolls more women of childbearing age than WIC (because FSP enrolls women who are not pregnant or postpartum). WIC enrolls more infants and children than FSP. The ratio of WIC infants to FSP infants varied across States: 3.7 in Florida and Iowa, and 2.4 in Kentucky. The ratio of WIC children to FSP children also varied across States: 1.5 in Florida, 2.0 in Iowa, and 1.1 in Kentucky. These differences are consistent with different Medicaid eligibility provisions, which affect WIC enrollment through WIC adjunct income eligibility.[26]

The number of records entering the matching routine exceeds the number expected to match, for four reasons. First, FSP women of childbearing age include women not eligible for WIC because they are not pregnant or postpartum. Pregnant women cannot be identified in the FSP data and postpartum women may be identified with error if the mother-infant pair does not reside together or if there is a lag in enrolling the infant in the FSP. Second, all FSP W-I-C are income-eligible for WIC, but they may not necessarily meet WIC nutritional risk criteria. Third, some WIC participants across all categories of W-I-C are not eligible for FSP because their income exceeds 130% of poverty (WIC eligibility threshold is 185% of poverty).[27] Fourth, some persons eligible for both programs will not be matched because they have decided to participate in only one program, even though they may be eligible for both.

The subsets of FSP records selected for matching were taken from caseloads that are described in table 8. This table shows the distribution of persons and households participating in FSP by household type, and the percent of persons from each household type that are potentially eligible for WIC. In all three States, approximately 40 percent of all FSP participants are in single-adult households with children. Infants and children under age five represent 15 to 17 percent of FSP participants, and women of childbearing age represent 22 to 27 percent. Children under 5 years of age are present in more than half of single-adult-households-with-children[28], and nearly 90 percent of those households contain women of childbearing age (not shown in table).

Data elements

The data elements provided in each data file are shown in table 9. Five main types of data elements were requested for each program participant: personal identifiers, contact information, program participation dates, household income, and indicators of participation in certain other public programs.

The three States participating in this study were purposefully selected based on the data fields present in their program databases. For the most part, table 9 coincides with table 2 (information reported to the Phase 1 survey). The data extracts from all programs contain first and last name, date of birth, SSN, gender, and race. All FSP programs provided information on participants' relationship to household head. All WIC programs provided certification category and guardian names for infants and children. Contact information includes street address, city, State, ZIP code, and phone number.

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[26] Florida and Iowa Medicaid eligibility for infants is 200% of poverty compared to 185% of poverty in Kentucky. Florida and Iowa have Medicaid continuous eligibility provisions, which may explain higher ratios of WIC to FSP children in those States. (See footnote to table 1.)

[27] In addition to income and asset limits, there are non-financial FSP eligibility restrictions – particularly those related to citizenship, residency, and immigration status – that might impact a WIC participant's eligibility for food stamps.

[28] Children under age five are 15.84 percent of the total Florida caseload and 8.69 percent of children under age 5 are in single-adult households: 8.69 / 15.84 = 55%.

Table 8—Distribution of persons and households participating in FSP by household type, December 2002

	Persons		Households		Percent of persons who are		Total percent potentially eligible for WIC
	Number	Percent	Number	Percent	Children under age 5	Women of child-bearing age	
Florida, Total	1,017,979	100.00	480,847	100.00	15.84	22.35	38.20
With children							
Single adult	427,853	42.03	135,425	28.16	8.69	13.16	21.85
Married couple	125,175	12.30	28,787	5.99	2.17	2.75	4.93
Multiple adults	90,695	8.91	20,112	4.18	1.73	2.57	4.30
Children only	80,700	7.93	39,156	8.14	3.24	0.51	3.75
Without children							
Single adult, elderly	109,431	10.75	109,431	22.76	0.00	0.00	0.00
Single adult, not elderly	113,826	11.18	113,826	23.67	0.00	2.71	2.71
Multiple adults, elderly	50,085	4.92	24,366	5.07	0.00	0.11	0.11
Multiple adults, not elderly	20,214	1.99	9,744	2.03	0.00	0.54	0.54
Iowa, Total	134,005	100.00	59,699	100.00	17.27	27.77	45.04
With children							
Single adult	59,548	44.44	20,421	34.21	10.28	15.17	25.46
Married couple	29,738	22.19	6,824	11.43	4.41	5.32	9.73
Multiple adults	10,036	7.49	2,331	3.90	1.55	2.17	3.71
Children only	3,443	2.57	2,051	3.44	1.03	0.39	1.42
Without children							
Single adult, elderly	7,295	5.44	7,295	12.22	0.00	0.00	0.00
Single adult, not elderly	17,775	13.26	17,775	29.77	0.00	3.83	3.83
Multiple adults, elderly	2,335	1.74	1,141	1.91	0.00	0.05	0.05
Multiple adults, not elderly	3,835	2.86	1,861	3.12	0.00	0.84	0.84
Kentucky, Total	474,685	100.00	198,176	100.00	14.91	27.23	42.14
With children							
Single adult	190,618	40.16	65,258	32.93	8.52	13.54	22.05
Married couple	113,939	24.00	27,530	13.89	3.97	6.06	10.03
Multiple adults	56,110	11.82	13,253	6.69	1.97	3.39	5.36
Children only	6,052	1.27	3,327	1.68	0.44	0.28	0.73
Without children							
Single adult, elderly	24,228	5.10	24,228	12.23	0.00	0.00	0.00
Single adult, not elderly	47,089	9.92	47,089	23.76	0.00	2.52	2.52
Multiple adults, elderly	14,163	2.98	6,800	3.43	0.00	0.11	0.11
Multiple adults, not elderly	22,486	4.74	10,691	5.39	0.00	1.34	1.34
U.S. Average, FY2001[1]	17,300,000	100.00	7,450,000	100.00	16.64	27.32	43.96
With children							
Single adult	8,494,000	41.65	2,690,000	31.74	–	–	–
Married couple	2,658,000	13.03	572,000	6.75	–	–	–
Multiple adults	1,426,000	6.99	325,000	3.84	–	–	–
Children only	831,000	4.08	405,000	4.78	–	–	–
Without children							
Single adult, elderly	1,220,000	5.98	1,220,000	14.40	–	–	–
Single adult, not elderly	2,017,000	9.89	2,017,000	23.80	–	–	–
Multiple adults, elderly	712,000	3.49	300,000	3.54	–	–	–
Multiple adults, not elderly	3,034,000	14.88	945,000	11.15	–	–	–

[1] Source: USDA, Food and Nutrition Service. *Characteristics of Food Stamp Households: Fiscal Year 2001,* Alexandria, VA: 2003. From this source, the sum of individual categories does not match the table total because participants and households were counted in multiple categories.

– Data not available.

Table 9—Data elements in the FSP and WIC administrative data extracts

	Food Stamp Programs			WIC Programs		
	Florida	Iowa	Kentucky	Florida	Iowa	Kentucky
Personal identifiers						
Participant ID	✔	✔	(1)	✔	✔	✔
Case number	✔	✔	✔			
First name	✔	✔	✔	✔	✔	✔
Last name	✔	✔	✔	✔	✔	✔
Middle initial			✔		✔	✔
Date of birth	✔	✔	✔	✔	✔	✔
Social Security Number (SSN)	✔	✔	✔	✔	(2)	✔
Sex	✔	✔	✔	✔	✔	✔
Race code	✔	✔	✔	✔	✔	✔
Language			✔		✔	
Relationship to household head	✔	✔	✔			
Certification category				✔	✔	✔
Contact information						
Address						
Street	✔	✔	✔	✔	✔	✔
City	✔	✔	✔	✔	✔	✔
State	✔	✔	✔	✔	✔	✔
Zip code	✔	✔	✔	✔	✔	✔
Phone	✔	(3)	✔	✔	✔	✔
County (office) code	✔	✔	✔	✔	✔	✔
Dates of program participation						
Month/Year indicator	✔	✔	(1)			
Certification date				✔	✔	✔
Certification end date				✔		
WIC family information						
Family ID				✔		
Guardian first name				✔	✔	✔
Guardian last name				✔	✔	✔
Guardian middle initial						✔
Income						
Family (household) size	✔	✔	✔	✔	✔	✔
Income		✔	✔	✔	✔	✔
Participation in other programs						
Food Stamps				✔	✔	✔
Medicaid		✔		✔	✔	✔
TANF				✔	✔	✔
Cash assistance	✔	✔	✔			
FSP/TANF/Medicaid ID	✔			✔		

✔ Indicates data element is present.
(1) These fields were not needed because Kentucky FSP provided only one month of data.
(2) SSN is not a separate data field. Participant ID contains own SSN (women) or mother's SSN (infants/children), if available. Else the participant ID contains the day and year that the record was entered in the system.
(3) Phone numbers do not include area code.

Information about participation in certain other programs is present in both FSP and WIC client databases. The FSP programs in all three States are integrated with TANF, providing a reliable indicator of cash assistance on each person-month record. Iowa FSP records also include an indicator of Medicaid participation. WIC programs are not integrated with other public assistance programs, but their databases contain indicators of adjunct income eligibility (participation in TANF, FSP, or

Medicaid) because applicants may be certified without income documentation if they document participation in these means-tested programs. As noted earlier, indicators of adjunct income eligibility may underestimate actual rates of participation in each program because reporting of one program is sufficient to establish WIC eligibility, even if persons participate in more than one adjunct program. In addition, these indicators capture participation in adjunct programs at the time of WIC certification but do not reflect enrollment in adjunct programs after WIC certification.

FSP and WIC data systems each assign unique participant IDs to individuals. These IDs provide a link between records over time within each system.[29] An additional identifier in the FSP is the participant's case number, identifying the household unit that applied to the program. FSP participants may, however, be associated with multiple case numbers over time if the composition of the household changes. Usually there is a change in case number when there is a change in household head. Some of the analysis presented in chapter 4 excludes "complicated" households containing individuals who changed case number during the study period.[30]

The FSP case number provides a link among FSP household members. In contrast to the FSP, which enrolls households, WIC enrolls individuals. Even so, some WIC programs assign a family ID in addition to a participant ID for use in appointment scheduling and other administrative functions (see Cole, 2003). Among the three WIC programs in this study, only Florida assigns a family ID. As shown in table 9, WIC records for infants and children contain a guardian name that could be used to link family members, but this link was not needed for the analysis presented in this report.[31]

Personal identifiers include first and last name, date of birth, SSN, gender, and race. These data items were the primary items used to link records from FSP and WIC. All identifiers except last name are expected to be stable over time, except for data entry errors or use of abbreviations or nicknames for the first name. Last names may change over time due to marriage, adoption, or divorce.

Contact information consists of components of the address field, telephone number, and county. Contact information is not necessarily stable over time, but it is helpful in linking contemporaneous records from two different data files.

Dates of program participation identify the active caseload at a point in time, and were used to examine the dynamics of program participation and multiple program participation. As discussed above, FSP files contain one record for each active participant each month. Each record has a "year/month" indicator. WIC data contain one record per certification period, and each record contains a certification date. The Florida WIC program also provided the "certification end date" in their data file even though it was not a requested data field; certification end dates were imputed for Iowa and Kentucky based on certification date and program rules. The certification date start and end dates can be used to identify the active caseload at a point in time.

The contents of data extracts are consistent across programs, with the following exceptions:

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[29] Some WIC programs have participant IDs that are unique within the local agency, but not unique within the State. In these States, participant IDs change when participants move and transfer to a new agency and the link between longitudinal records is broken (Cole, 2003). Florida, Iowa, and Kentucky assigned unique IDs within the State.

[30] The percent of W-I-C in "complicated households" was 6 percent in Iowa and 8 percent in Florida.

[31] Mother-child pairs could be linked by mother's name and guardian names; siblings could be linked by guardian names.

- Language: Available from only two programs and was not used in matching routines.
- SSN: Iowa WIC does not have SSN in a separate data field. If SSN is provided by an applicant, it is used as part of the participant ID; however, a mother's SSN may be used as part of her child's participant ID. SSNs were extracted from participant IDs for women, but not for infants and children.
- Telephone: Iowa FSP did not include area code.[32]
- Family ID: Kentucky and Iowa WIC do not maintain a family ID.[33]
- Income: Florida FSP did not provide income.
- WIC dates: Florida was the only program to provide certification end dates; these dates were imputed for the other two programs.
- Adjunct ID: Florida WIC was the only WIC program to maintain the FSP/TANF/Medicaid ID number in addition to indicators of participation in those programs. This data field was not used in the record linkage routines, but was used in examining the results of record linkage.

Quality of participant data

Data files were evaluated for prevalence of missing data and standardization of address fields. Missing data are indicated by blank fields or fields filled with zeros or nines. Standardization implies that the same data appears identically within the data file. For example, city names might be standardized at data entry by choosing cities from a list rather than keying in city names, thus eliminating spelling variations.

Examination of the December 2002 caseloads showed that FSP and WIC files in all three States had no missing data for participant names and virtually no missing data (less than .01 percent) for date of birth and gender. Race was almost never missing on WIC records and was missing on less than 2 percent of FSP records. Each of the address components (street address, city, and ZIP code) was missing on less than 2 percent of FSP and WIC records.[34]

The data fields subject to quality problems are shown for FSP and WIC in tables 10 and 11, respectively. SSN and telephone number were subject to missing data; city was not standardized; and

[32] Iowa FSP and WIC data were matched using telephone number without area code. Iowa is divided into five area codes, however, so it was possible that telephone numbers in two different area codes would provide a false match. This was not considered a significant problem because telephone number was only one of several identifiers used for matching.

[33] Florida reported that family IDs are reliable for "some currently participating family members" (Cole, 2003). Family IDs might not be reliable for linking family members whose participation was not contemporaneous.

[34] It is difficult to accurately assess the amount of missing data for street addresses without geocoding the data, which was not done. Casual observation revealed that this data field was occasionally used for comments – for example, to indicate a contact person outside the family.

Table 10—Percent of FSP records with missing or non-standardized data, December 2002

	Number of records	Percent with missing data for		Percent with nonstandardized data for	
		SSN	Telephone	City	ZIP code
Florida					
Total FSP	388,817	1.3	6.2	10.3	0.3
Women	227,556	0.4	6.2	10.5	0.3
Infants	29,953	12.8	6.2	10.0	0.4
Children	131,308	0.3	6.0	10.1	0.3
Iowa					
Total FSP	60,345	1.2	12.9	2.7	0.1
Women	37,215	0.1	13.5	2.7	0.1
Infants	4,655	14.7	12.8	2.8	0.0
Children	18,475	0.2	11.7	2.8	0.1
Kentucky					
Total FSP	200,013	0.0	6.6	28.6	0.1
Women	129,259	0.0	6.4	29.1	0.1
Infants	14,016	0.0	7.3	27.8	0.1
Children	56,738	0.0	6.7	27.6	0.1

Table 11—Percent of WIC certification records with missing or non-standardized data, December 2002

	Number of records	Percent with missing data for		Percent with nonstandardized data for		Quality of income data	
		SSN	Telephone	City	ZIP code	Missing income	Income equal zero
Florida							
Total WIC	403,477	26.6	3.7	25.8	0.5	0.9	3.7
Women	98,606	13.7	3.6	29.2	0.6	0.8	4.3
Infants	112,352	71.4	3.7	22.1	0.6	1.2	4.9
Children	192,519	7.1	3.8	26.1	0.5	0.8	2.7
Iowa							
Total WIC	70,239	76.6	2.8	6.3	0.3	0.0	8.7
Women	16,985	3.0	2.7	6.4	0.3	0.0	12.5
Infants	17,227	100.0	2.7	6.2	0.3	0.0	12.3
Children	36,027	100.0	2.8	6.4	0.3	0.0	5.2
Kentucky							
Total WIC	131,174	11.0	4.1	31.8	0.8	43.1	14.7
Women	32,738	1.2	3.7	31.2	0.7	30.0	14.7
Infants	33,965	33.5	5.5	31.0	1.4	53.1	16.8
Children	64,471	4.2	3.6	32.5	0.6	44.4	13.6

Note: Iowa WIC does not have a separate data field for SSN. See text discussion.

WIC income data showed high percents of missing data or zero values. It is important to note, however, that records with missing data were included in the record linkage procedures. As explained in chapter 3, probabilistic record linkage uses all available information. Missing data in one or more data fields does not necessarily preclude a match.

SSN was never missing on Kentucky FSP records. For Florida and Iowa, SSN was missing on only 1 percent of FSP records overall, but on over 10 percent of infant records. FSP requires an SSN for certification, so it is likely that missing data reflects the delay in SSN issuance for newborns. WIC does not require SSNs for certification, which is reflected in higher rates of missing data compared with FSP. SSNs are missing across all WIC participant categories, although the highest rates are for infants.[35] The table shows that SSN is missing for all Iowa infants and children. As discussed above, Iowa WIC does not have a separate data field for SSN; SSN was extracted from the participant ID for women, but SSNs embedded in the participant ID of infants and children were not extracted because they were likely to be the mother's SSN.

Telephone numbers are potentially valuable for record linkage because they are long numeric fields that are unique to households. Missing telephone numbers are more common in FSP than WIC; 6 and 7 percent of FSP records in Florida and Kentucky, and 13 percent in Iowa are missing telephone number. Only 2 to 4 percent of WIC records are missing telephone number across the three States.

Tables 10 and 11 show the percent of city names and ZIP codes that are not standardized in the sense that they do not match exactly to a master list of place names (cities, towns, county divisions) and ZIP codes in the State.[36] Spelling variations in city names compromise the usefulness of these data for record linkage. For example, there are 960 place names in Florida but over 7,000 unique city names are in the WIC data files (e.g., over 40 spelling variations were recorded for Fort Lauderdale). Kentucky has the highest prevalence of non-standardized city names at 29 and 32 percent of FSP and WIC records, respectively. The percent of non-standardized city names in FSP and WIC was 10 and 26 percent in Florida, and only 3 and 6 percent in Iowa.

The lack of standardized city names was not consistent with responses to the Phase 1 survey: Florida and Kentucky FSP indicated that city and ZIP codes were standardized.[37] Because city names were not standardized, it was not clear that this data field should be used for matching. In addition, ZIP codes could be more useful for matching because they have more geographic precision than cities, which may contain multiple ZIP code areas. Nonetheless, it was thought to be beneficial to include both city and ZIP code in matching routines because potential errors in data are generated differently. ZIP code errors are most likely to result from transposition of numbers, resulting in a ZIP code that references the wrong city. On the other hand, city errors are unlikely to occur in the sense that the wrong city is referenced, but city names are subject to spelling errors and spelling variations.[38]

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[35] Missing SSNs on WIC records may reflect enrollment of persons without access to SSNs, such as illegal aliens.

[36] The master list of city names and ZIP codes was current as of September 2003, from the ZIPList5 database available from CD Light, LLC (zipinfo.com).

[37] FSP and WIC programs in all three States indicated that ZIP codes are not validated (source: Phase 1 survey).

[38] As discussed in chapter 3, city and ZIP codes were matched using different criteria with an exact match required for ZIP code but a string comparison (allowing for spelling variations) used for city.

Table 11 shows the quality of income data for WIC programs. The WIC income eligibility cutoff is higher than FSP eligibility limits, so income could potentially be used to select records from WIC files prior to record linkage. As shown in table 11, however, over 40 percent of Kentucky WIC records are missing income data, and a large percent of records in Iowa and Kentucky have zero income (9 and 15 percent, respectively).[39] As noted above, WIC records were not selected based on income prior to record linkage.

Availability of historical data for personal identifiers

In theory, the data files obtained for this study could provide estimates of the rate of change in household information over time (e.g., name changes due to marriage, divorce, adoption) and the rate of mobility (e.g., address and telephone changes) for FSP and WIC populations. In practice, however, the rates of change in individual identifiers depends on whether information systems overwrite or retain data, and the way in which data extracts are created.

Table 3 reported the overwriting and retention rules reported in the Phase 1 survey for name, date of birth (DOB), SSN, address, and telephone number. Iowa FSP, Iowa WIC, and Florida WIC reportedly overwrite all identifiers when information changes (thus losing old information, except in off-system archives). Florida FSP overwrites only DOB; Kentucky FSP overwrites only telephone number; and Kentucky WIC reported no overwriting.

Tables 12 and 13 show the availability and prevalence of historical changes in identifying information observed in the data. There are some inconsistencies between reported overwriting policies and actual data, which may be due to the methods used to create data extracts. Florida FSP data show no change in personal identifiers (even though there is reportedly no overwriting) and high rates of change in contact information. Iowa FSP data show near zero rates of change in personal identifiers (consistent with overwriting of all information) and high rates of change in contact information (not consistent with overwriting).[40]

WIC data from Florida and Iowa are consistent with the overwriting policies discussed above –these programs reportedly overwrite all data and the data files show no change in personal identifiers over time. Florida WIC shows small rates of change in contact information indicating a possible change in policy over time or an effort to standardize data.

Observed rates of change in personal identifiers are likely to be equal or close to true rates of change for Iowa FSP and Kentucky WIC. The rates of change are measured over a one-year period.[41]

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[39] Missing income data has been reported in the *WIC Participant and Program Characteristics* reports as associated with adjunct income eligibility (Bartlett et al., 2000 and 2002). However, adjunct income eligibility does not imply income below a single national cutoff because Medicaid eligibility thresholds vary by State and may exceed the WIC threshold of 185% of poverty. As of October 1, 2000, Medicaid eligibility was 200 percent of the poverty level for pregnant women and infants in Iowa, and for infants in Florida.

[40] Florida FSP provided person-level records and case-level records (contact information) in separate files and most likely lost the historic person-level information in the way that the data were extracted. Iowa FSP data extracts were created from month-end archives, thereby preserving the historical data.

[41] This analysis was based on the most recent 12 months of participation for FSP participants with at least 6 months of participation, and the two most recent certification records for WIC participants. Restricting the sample to a one-year period eliminates the potential downward bias if long-term participants are more stable than short-term participants.

Table 12—Availability and prevalence of historical changes in personal identifying information for FSP participants[1]

	Florida				Iowa			
	Total	Women	Infants	Children	Total	Women	Infants	Children
Number participants with > 6 months of participation	595,245	351,592	63,332	180,321	93,229	56,558	9,353	27,318
Percent with change in personal identifiers[2]								
First name	0.0	0.0	0.0	0.0	0.3	0.2	0.6	0.3
Last name	0.0	0.0	0.0	0.0	2.0	2.9	1.0	0.5
Date of birth	0.0	0.0	0.0	0.0	0.2	0.1	0.6	0.2
SSN	0.0	0.0	0.0	0.0	0.5	0.2	3.1	0.3
Gender	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Race	0.0	0.0	0.0	0.0	1.0	0.8	2.6	0.8
Percent with change in contact information								
Telephone	42.7	41.2	44.4	45.2	20.4	19.3	23.8	21.6
Street name[3]	49.1	47.8	51.6	50.8	36.0	34.3	41.1	37.8
City	13.4	12.6	14.5	14.3	13.3	12.5	15.6	14.1
County	4.6	4.4	5.0	4.9	11.6	11.3	12.7	11.9
ZIP code	23.4	22.2	25.5	25.1	21.6	20.4	25.2	23.1

1 Prevalence of change in identifying information is evaluated over the last 12 months of participation for participants with at least 6 months of participation.
2 Change from missing to nonmissing is not counted, and vice-versa.
3 Change is evaluated after parsing the street name from the address field with the Census standardization software.

Table 13—Availability and prevalence of historical changes in personal identifying information for WIC participants[1]

	Florida				Iowa				Kentucky			
	Total	Women	Infants	Children	Total	Women	Infants	Children	Total	Women	Infants	Children
Number participants with multiple certfications	523,049	184,636	77,135	261,278	95,968	31,200	11,430	53,338	176,375	60,871	20,971	94,533
Percent with change in personal identifiers[2]												
First name	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.9	3.3	0.5
Last name	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	3.1	6.1	4.1	1.0
Date of birth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.8	0.2
SSN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gender	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.9	0.2
Race	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.9	0.2
Percent with change in contact information												
Telephone	1.7	1.4	2.5	1.7	0.0	0.0	0.0	0.0	28.8	30.6	36.0	26.1
Street name[3]	1.6	1.4	2.4	1.5	0.0	0.0	0.0	0.0	26.3	28.8	36.9	22.4
City	7.5	5.7	9.7	8.2	0.0	0.0	0.0	0.0	10.2	11.3	14.0	8.6
County	0.2	0.2	0.3	0.2	0.0	0.0	0.0	0.0	4.0	4.8	5.6	3.1
ZIP code	1.0	0.8	1.5	1.0	0.0	0.0	0.0	0.0	13.2	14.6	18.7	11.1

1 Prevalence of change in identifying information is evaluated over the last two certification records for participants with multiple certifications.
2 Change from missing to nonmissing is not counted, and vice-versa.
3 Change is evaluated after parsing the street name from the address field with the Census standardization software.

Evidence from these programs suggests that personal identifiers are unlikely to change over time. Rates of changes in first name, DOB, SSN, gender, and race are less than one percent (except for infants) and most likely reflect corrections to erroneous entries and not true changes. Changes in last name are rare (one percent or less) for children in both Iowa FSP and Kentucky WIC. Evidence from Kentucky WIC, however, suggests that approximately five percent of women and infants change last name within a one-year period, possibly reflecting changes in marital status after childbirth.

Observed rates of change in contact information are likely to be equal or close to true rates of change for Florida FSP, Iowa FSP, and Kentucky WIC. Evidence from these programs indicate that 20 to 43 percent of program participants change telephone number within a year, 26 to 49 percent change street address, and 10 to 13 percent move to a new city.[42] Unfortunately, none of the three States provide direct within-State comparison of the mobility of FSP participants versus WIC participants.

Because none of the three States provided historical changes in identifiers for both FSP and WIC, record linkage results could be biased. Loss of data due to overwriting policies increases the potential for false negatives – that is, a failure to find a match when a match exists. The low rates of change for most personal identifiers suggest that this is not a large problem. However, changes in last name for WIC participants can pose a problem in establishing a match to FSP because marriage is a primary trigger for exit from FSP (Blank, 1993). Women who participate in both FSP and WIC but exit FSP after marriage may be observed with their maiden name in FSP and married name in WIC.

The high rates of change in contact information must be taken into account when specifying criteria for establishing a match between FSP and WIC records. For example, criteria can be specified such that corresponding address information helps to establish a match, while non-corresponding address information does not preclude a match.

Participation Dynamics Within FSP and WIC

The data for this study were collected retrospectively, resulting in a three-year snapshot of FSP and WIC caseloads, except for Kentucky FSP. For individuals observed in these files, participation histories may be truncated because participation may have started prior to the sample period (left-truncation) or continued after the sample period (right-truncation). Only one cohort of children is observed for a 36-month period from birth – infants born in January 2000.

Tables 14 and 15 show the distributions of FSP and WIC participants by total months of participation during the 3-year period. The total months need not be continuous, which means that the distributions contain participants with either single spells or multiple spells within the period. Infants and children are categorized according to age when first observed in the data file. The tables show unconditional and conditional percents. Unconditional percents are calculated over all participants observed during the three-year period. Conditional percents are calculated using a conditioned sample consisting of participants first observed more than 6 months (or 12 or 24 months) prior to the end of the sample period. For example, the conditional percent of participants with at least 12 months of participation is calculated over all participants who entered the program more than 12 months before the end of the sample period. Conditional percents provide better estimates of the distribution of months of participation in the face of right-truncation.

[42] Among Florida FSP participants with a change in telephone number, 2 percent changed area code without changing the remaining 7-digits of the telephone number. Iowa FSP data did not include area codes.

Table 14—FSP participant dynamics: Number of months of participation during 2000-2002

	Unconditional percent		Conditional percent			
	Florida	Iowa	Florida		Iowa	
	Percent		Conditioned Sample Size	Percent[1]	Conditioned Sample Size	Percent[1]
Total W-I-C						
Number participants	1,194,425	180,171	–	–	–	–
Cumulative duration of						
> 6 months	60.0	59.3	1,082,163	66.2	160,894	66.4
> 12 months	38.5	38.9	950,731	48.4	142,600	49.2
> 24 months	16.4	15.7	711,949	27.5	102,335	27.7
Ever received cash assistance	33.8	55.9	–	–	–	–
Women of childbearing age						
Number participants	710,771	109,037	–	–	–	–
Cumulative duration of						
> 6 months	58.3	58.2	645,609	64.2	97,894	64.9
> 12 months	37.0	38.3	571,808	46.0	87,396	47.8
> 24 months	15.8	16.2	433,888	25.8	63,711	27.7
Ever received cash assistance	29.8	49.3	–	–	–	–
Infants						
Number participants	199,759	28,685	–	–	–	–
Cumulative duration of						
> 6 months	58.3	58.4	173,588	67.1	24,194	69.3
> 12 months	34.7	35.3	140,594	49.3	19,846	51.0
> 24 months	11.2	10.2	87,221	25.8	11,495	25.4
Ever received cash assistance	41.4	69.0	–	–	–	–
Children						
Number participants	283,895	42,449	–	–	–	–
Cumulative duration of						
> 6 months	65.3	62.5	262,966	70.5	38,806	68.4
> 12 months	45.0	42.8	238,329	53.6	35,358	51.4
> 24 months	21.6	18.3	190,840	32.1	27,129	28.6
Ever received cash assistance	38.5	64.1	–	–	–	–

[1] The denominators of the conditional percents are the conditioned sample sizes, which are the numbers of FSP participants first observed more than 6 months (or 12 or 24 months) prior to the end of the sample period. For example, the number of Florida FSP participants who had cumulative durations greater than 6 months was 716,297 (i.e., 59.97 percent of all 1,194,425 participants), which represents 66.2 percent of the 1,082,163 in the conditioned sample.

– Not applicable

Table 14 shows the percent of FSP participants with greater than 6, 12, and 24 months of participation on both a conditional and unconditional basis.[43] The unconditional percentages indicate that about 60 percent of FSP participants in Florida and Iowa are observed with more than 6 months of participation within a three-year period, 39 percent have more than 12 months participation, and 16 percent have more than 24 months participation. Conditional percentages indicate that 66 percent, about 50 percent, and 28 percent have more than 6, 12, and 24 months of participation, respectively.

[43] The percent of FSP participants with duration in a particular range can be obtained from the difference in cumulative percents. For example, the percent of Florida FSP participants with 12 to 24 months of participation is equal to the percent with ">12 months" less the percent with ">24 months", which is 38.5 – 16.4 = 22.1 percent.

Table 15—WIC participant dynamics: Number of months of participation during 2000-2002

	State					
	Florida		Iowa		Kentucky	
	Unconditional percent	Conditional percent	Unconditional percent	Conditional percent	Unconditional percent	Conditional percent
Total WIC						
Sample size[1]	981,464	856,511	163,649	145,252	329,778	295,585
Cumulative duration of						
> 6 months	76.0	87.1	83.6	94.2	83.6	93.3
> 12 months	39.8	53.5	47.3	61.2	46.7	59.6
> 24 months	10.5	22.5	13.5	26.1	10.1	20.2
Percent with multiple certifications	53.3	64.2	58.6	69.6	53.5	63.0
Percent with continuous multiple certifications[2]	29.5	35.1	43.0	50.7	41.0	48.0
Women						
Sample size[1]	336,940	289,509	52,441	45,831	102,262	90,290
Cumulative duration of						
> 6 months	64.5	75.1	82.8	94.8	82.9	93.9
> 12 months	20.7	29.3	33.5	45.3	36.1	48.3
> 24 months	0.7	1.8	2.0	4.5	2.0	4.4
Percent with multiple certifications	54.8	62.6	59.5	67.9	59.5	68.1
Percent with continuous multiple certifications[2]	38.5	43.6	47.8	54.2	49.0	55.7
Infants						
Sample size[1]	352,390	290,956	52,391	43,412	108,463	90,835
Cumulative duration of						
> 6 months	80.4	97.4	82.5	99.6	82.4	98.4
> 12 months	46.6	70.6	52.9	79.7	48.1	71.0
> 24 months	11.8	36.4	14.5	44.2	7.6	22.2
Percent with multiple certifications	43.0	62.2	47.4	69.3	35.5	50.2
Percent with continuous multiple certifications[2]	22.9	32.6	33.4	48.2	28.0	39.2
Children						
Sample size[1]	292,134	276,046	58,817	56,009	119,053	114,460
Cumulative duration of						
> 6 months	83.9	88.8	85.3	89.6	85.4	88.8
> 12 months	53.6	60.4	54.6	60.7	54.6	59.8
> 24 months	20.2	27.9	22.8	30.4	19.5	28.0
Percent with multiple certifications	64.0	67.6	67.9	71.1	64.6	67.3
Percent with continuous multiple certifications[2]	27.0	28.4	47.3	49.4	46.0	47.8

[1] The sample size for unconditional percents is the total number of persons participating in WIC at any time during the three-year period (e.g., 981,464 in Florida). The sample size for conditional percents is different for each measure, but can be derived from the table. The sample size shown for conditional percents is the conditioned sample size is for duration > 6 months. Conditioned sample size is equal to (unconditional percent) / (conditional percent) x (unconditional sample size). For example, 0.76/0.871 x 981464 = 856,386, which differs from 856,511 shown in table due to rounding of percents.

[2] Continous participation is defined by a "next" certification date within 30 days of the previous termination date, for all certification periods.

Within a three-year period, children have more months of FSP participation than women and infants. For example, using the conditional figures, 32 percent of children in Florida FSP participated longer than 24 months, compared with 26 percent of women and infants (the difference between children and others is smaller in Iowa). Intra-group differences between unconditional and conditional percents indicate that the impact of right-truncation is greatest for infants.

Duration of WIC participation is shown in table 15. Between 87 and 94 percent of WIC participants in the three States were enrolled in WIC for more than 6 months (on a conditional basis); 53 to 61 percent were enrolled at least 12 months; and 20 to 26 percent were enrolled more than 24 months. Table 15 shows that over 95 percent of WIC infants in all three States were enrolled more than 6 months, compared with 75-95 percent of women and 89-90 percent of children. Durations of more than 6 months are consistent with regulations allowing infants to be certified up until their first birthday, while women and children may be re-certified after an initial 6-month period. The conditional percent of WIC participants with multiple certifications (shown in table) is slightly higher for children (67-71 percent across States) compared with women (63-68 percent) and infants (50-69 percent).

WIC women have the shortest participation durations in the data, consistent with WIC eligibility that is limited to periods around childbirth. Table 15 shows that it is very unlikely for women to be enrolled in WIC more than 24 months within a 36-month period. WIC durations for women vary by State; the percent enrolled more than 12 months is 20 percentage points higher in Iowa and Kentucky, compared with Florida. WIC infants are initially enrolled in WIC up until their first birthday, and then, if still eligible, may be recertified as children.[44] The conditional percents show that 71 to 80 percent of infants were enrolled more than 12 months (i.e., re-enrolled as children) and fewer than half remain in WIC more than 24 months (the percents range from 22 to 44 percent across States). Compared with infants, those initially observed as children have somewhat lower conditional percentages of enrollment for at least 12 months (60-61 percent vs. 71-80 percent) and lower conditional percentages of enrollment for at least 24 months (28-30 percent vs. 22-44 percent).

Comparison of tables 14 and 15 shows that, within a three-year time period, women participate in FSP longer than in WIC – about 27 percent of FSP women and less than 5 percent of WIC women participate longer than 24 months. In contrast, infants participate in WIC longer than in FSP –about 26 percent of FSP infants and 22-44 percent of WIC infants participate longer than 24 months. Children are more likely to participate in WIC for more than 6 months, compared with FSP. But duration of at least 12 or 24 months is comparable for children in FSP and WIC.

[44] Most WIC infants are enrolled during the first three months after birth (91 percent in Iowa, 89 percent in Kentucky, and 83 percent in Florida).