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**Evaluation of the National
School Lunch Program
Application/Verification
Pilot Projects**

**Volume I: Impacts on
Deterrence, Barriers, and
Accuracy**

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EXECUTIVE SUMMARY

The U.S. Department of Agriculture (USDA) sponsored the NSLP Application/Verification Pilot Projects to test ways to improve the process for certifying students for free or reduced-price meals. This report presents findings on the impacts of two alternatives to the current application-based certification process—Up-Front Documentation and Graduated Verification—that were tested in 12 public school districts over a three-year period.

Background

Millions of U.S. children participate in the National School Lunch Program each day, receiving free or reduced-price lunches that make an important contribution to their overall nutrition. But concern has mounted that many of the children approved as eligible for free or reduced-price meals may in fact be ineligible because their family income is too high. Under the existing eligibility process, families are required to state their income on the application for benefits but do not need to submit any additional documentation. Districts select a small sample of applications for income verification, which is done later in the year.

To address the question of whether the eligibility process could be made more accurate, the U.S. Department of Agriculture sponsored pilot projects testing two new approaches to certifying eligibility: (1) Up-Front Documentation, and (2) Graduated Verification.

Districts using Up-Front Documentation required families to document their income or receipt of public assistance at the time they submitted their application for free or reduced-price lunches. Districts then used this documentation to make an eligibility determination, but did not verify any approved applications later in the school year.

Districts using Graduated Verification allowed families to use the standard application process, which does not require income documentation, but changed key aspects of the usual verification process. After verifying a small sample of approved applications, these districts verified additional applications if 25 percent or more of the applications in the initial test resulted in benefit reduction or termination.

Study Design and Methodology

The study used a comparison design to select additional districts not participating in the three-year pilots but with similar economic characteristics and geographic locations. Researchers then compared the two types of districts to estimate impacts on the accuracy of the certification process, as well as to what degree it deterred ineligible families or discouraged eligible families from applying. Data for the study came from telephone and in-person interviews with about 3,000 households with children enrolled in the study districts in fall 2002, and from administrative records provided by the schools.

Key Findings

- ***Deterrence of Ineligible Families:*** *Neither Up-Front Documentation nor Graduated Verification resulted in observable deterrence of erroneous certifications.* The rates of erroneous certification among ineligible students were less than 5 percent in Up-Front Documentation comparison districts and less than 10 percent in Graduated Verification comparison districts. Neither Up-Front Documentation nor Graduated Verification had a statistically significant negative effect on the rate of erroneous certifications. In other words, neither pilot had a statistically significant deterrent effect.
- ***Barriers for Eligible Families:*** *Both sets of pilot procedures caused barriers among some eligible students.* Rates of certification among each group of eligible students examined were lower in pilot districts than in comparisons districts. Some of these differences were statistically significant, indicating that Up-Front Documentation and Graduated Verification led to increased barriers among eligible students.
- ***Accuracy Among Certified Students:*** *Compared to current procedures, neither set of pilot procedures changed certification accuracy at a level that could be detected in the study.* Overall, about 18 percent of students certified for free meals were ineligible for the benefits they were receiving. However, the estimated impacts of Up-Front Documentation and Graduated Verification on certification accuracy were small and not statistically significant.

SUMMARY OF FINDINGS

The National School Lunch Program (NSLP) and School Breakfast Program (SBP) serve about 3.9 billion free and reduced-price meals to children annually. The food consumed at these meals makes up an important component of these children's overall nutritional intake. In recent years, concerns have grown about the integrity of the program's system for establishing eligibility for free or reduced-price meals. Several data sources suggest that the number of children approved for free or reduced-price meals from families with incomes too high to qualify for the benefits they receive is large and perhaps growing.

The U.S. Department of Agriculture (USDA) sponsored the NSLP Application/Verification Pilot Projects to test ways to improve the process for certifying students for free or reduced-price meals. This report presents findings on the impacts of two alternatives to the current application-based certification process—Up-Front Documentation and Graduated Verification—that were tested in 12 public school districts. It examines the impacts of pilot procedures on three key sets of measures of program performance:

1. The rate of certification among ineligible households
2. The rate of certification among eligible households
3. Certification accuracy—the proportion of certifications that are correct

In launching the pilots, USDA was seeking to identify changes to the certification process that would deter certification among *ineligible* households without causing barriers to certification among *eligible* households. The end goal was an overall improvement in certification accuracy as compared to the accuracy achieved with current certification procedures. Each pilot procedure was evaluated in terms of these measures.

Current Certification Procedures

Under federal guidelines, children living in families with incomes of 130 percent or less of the federal poverty level qualify for free meals, while those in families with income of between 130 and 185 percent of poverty qualify for reduced-price meals. In addition, children receiving food stamp, Temporary Assistance for Needy Families (TANF), or Food Distribution Program on Indian Reservations (FDPIR) benefits are categorically eligible for free meals. For every NSLP meal served, FNS provides a reimbursement in cash and commodities whose amount depends on the child's meal price status. For school year 2002-2003, the reimbursement rates were \$2.34 for each free meal, \$1.94 for each reduced price meal, and \$0.36 for each paid meal.

Most children who become certified for free meals do so because their family submits an application on which they report their income and household size or food stamp/TANF/FDPIR case number. Under standard federal rules, no documentation of applicants' income or benefit receipt is required at the time of application. In the verification process, however, districts must

select a small sample of applications that have already been approved and collect income or benefit documentation from approved families in order to verify their eligibility for free or reduced-price meals.

Pilot Certification Procedures

Nine districts included in the evaluation implemented *Up-Front Documentation*. Under this pilot, districts required all applicants for free or reduced-price meals to provide documentation, either of their income or receipt of public assistance, with the application. Benefits were not granted if the application did not include the required documentation. After the applications and documentation were reviewed and approved, the districts were not required to conduct any subsequent verifications.

Three districts included in the evaluation implemented *Graduated Verification*, under which the standard verification process was enhanced. Districts using Graduated Verification first conducted the standard verification process by verifying a small sample of approved applications. Unlike the standard process, however, these districts conducted up to two additional rounds of verification. If at least 25 percent of the initially verified applications had their benefits reduced or terminated as a result of the verification process, districts were required to verify an additional 50 percent of remaining applications. Similarly, if 25 percent of these second-round applications resulted in benefit reduction/termination, districts were required to verify all remaining applications. The parents of students whose benefits were reduced/terminated as a result of verification were required to submit documentation with their application if they applied for benefits in the following year.

Design of the Impact Evaluation

To estimate the impacts of these procedures, the pilot evaluation compared average outcomes among a sample of households in pilot districts with the outcomes of a sample of households in comparison districts. The comparison districts were selected to be similar to the pilot districts, except that they did not use the pilot procedures.

Approximately 3,000 households with children enrolled in the 12 pilot and 12 comparison districts were interviewed in this study. The sample included approximately 1,300 households approved for free or reduced-price meals and approximately 1,700 households whose children were not approved for either free or reduced-price meals in October 2002. About two-thirds of the sample were in Up-Front Documentation pilot and comparison districts, and one-third was in the Graduated Verification pilot and comparison districts.

The key data obtained in the survey were used to calculate an independent estimate of students' eligibility for free or reduced-price meal benefits. The survey provided a consistent method of measuring household composition and household income by person and by source. The study acquired data from the school district on the actual approved meal price status of each sampled student.

Changes in Key Administrative Measures Following Implementation of the Pilots

USDA released a descriptive analysis of the first year of pilot project operations in 2002 (U.S. Department of Agriculture 2002). USDA's descriptive analysis of administrative data from the first year of pilot implementation showed that rates of certification for free and reduced-price meals declined following implementation of Up-Front Documentation and Graduated Verification, though USDA's analysis did not determine whether the decline was driven by fewer ineligible students or fewer eligible students becoming certified. The analysis also showed that participation in the free and reduced-price categories declined following implementation of the pilots, while participation at the full-price level increased. This resulted in modest reductions in overall participation rates.

In contrast to the administrative data used in the first-year analysis, the evaluation survey provides information on the underlying eligibility status of the households in the pilot and comparison districts during the *third* year of pilot implementation. This data can be used to assess the cumulative effects of using the pilot procedures for three years as compared to standard current procedures on the following:

- ***Deterrence*** (lower certification rates among ineligible households)
- ***Barriers*** (lower certification rates among eligible households)
- ***Certification Accuracy*** (the proportion of certifications that are correct)

What Were the Characteristics of Pilot and Comparison District Students?

We examined the characteristics of the pilot districts and their populations and compared them with the nation as a whole to determine whether and how the districts that volunteered to test the pilot procedures might differ from the nation as a whole. Districts that implemented Up-Front Documentation were relatively well-off in terms of socioeconomic status. In the pre-pilot period, less than one-quarter of students were certified for free or reduced-price meals, compared with one-third of students nationally. The percentage of school-age children with incomes below 100 percent of the federal poverty level in these districts was about 9 percent, compared with 15 percent in the typical district nationally in 1999. The racial/ethnic distribution of the pilot districts also differed from that of the average district nationally—nearly 9 of 10 pilot district students were white, compared with 8 of 10 nationally.

The number of students attending the average Up-Front Documentation district exceeded the number in the average public school district nationally. However, no very large districts implemented Up-Front Documentation. The largest of these pilot districts enrolled about 20,000 students (although only one-third of its schools participated in the pilot). Although less than 2 percent of districts nationally enroll more than 25,000 students, about one-third of all public school students nationally are enrolled in these very large districts. Furthermore, no Up-Front Documentation pilot districts were located in the central cities of metropolitan areas, though some were located in smaller cities adjacent to these central cities.

Graduated Verification pilot districts were more disadvantaged than the average public school district nationally. In 1999, 42 percent of students in these pilot districts were certified for free or reduced-price meals, and 22 percent of school-age children in them had incomes below 100 percent of the federal poverty level. Graduated Verification pilot districts had larger minority populations—18 percent of students were black and 14 percent were Hispanic.

We also compared the characteristics of students in the pilot and comparison samples in order to assess the extent to which our comparison district selection procedure produced samples of students with similar characteristics. A high degree of similarity is desirable because it supports using the experiences of the comparison group as a benchmark for what the experiences of the pilot group would have been if the pilot procedures had not been used.

With a few exceptions, characteristics of students in the Up-Front Documentation pilot district sample were similar to those of students in the comparison district sample. However, the parents of pilot district students tended to be better educated than those of students in comparison districts, and pilot district households were also more likely to have incomes above 400 percent of the federal poverty level. Importantly, no statistically significant pilot-comparison differences in students' pre-pilot certification rates or racial/ethnic distributions were found. Nor were there differences between pilot and comparison districts in the proportion of students whose low incomes make them eligible for free or reduced-price meal benefits.

Similarly, few significant differences existed between the characteristics of students selected for the sample in Graduated Verification pilot districts versus the comparison districts. One of the few such differences was that pilot district sample members were somewhat less likely to be black than those in comparison districts. Again, the pre-pilot certification rates of the two groups were not statistically different from one another.

We concluded that the pilot and comparison districts were reasonably well matched, and that they provide a reasonable basis for estimating demonstration impacts. However, the analysis underscored the importance of controlling statistically for individual differences in the characteristics of students and their families as we estimated demonstration impacts.

Findings on the Impacts of Up-Front Documentation

The evaluation's impact analysis addressed the questions of how the pilot procedures affected deterrence and barriers, as well as two broader summary measures—program accuracy and targeting efficiency. To estimate impacts, we compared mean outcomes among students in pilot and comparison districts after controlling for the characteristics of these students' households in a regression framework. The findings of the analysis of impacts of Up-Front Documentation are summarized below.

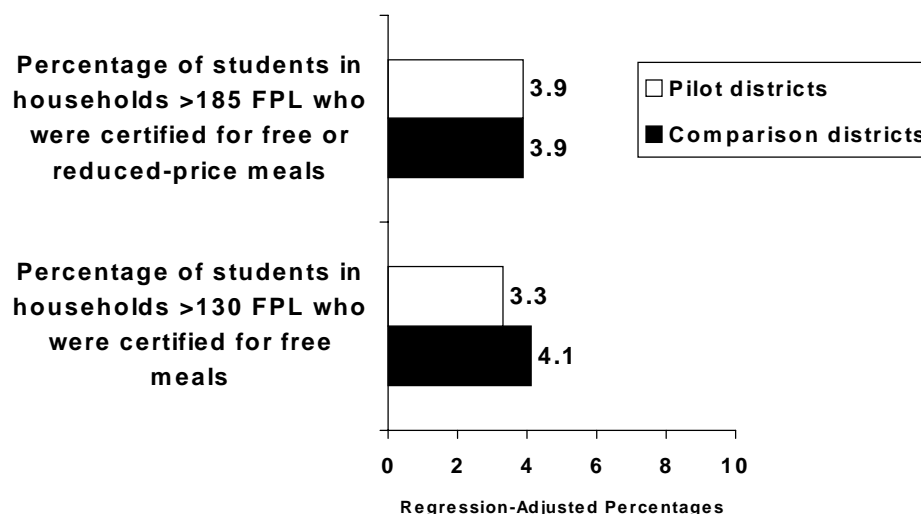
In Up-Front Documentation pilot and comparison districts, well under 5 percent of all ineligible students were erroneously certified. Erroneously certified students were defined as those who were *ineligible for free or reduced-price meals* on the basis of their income as measured by the survey (in October and November for most students) but who were certified for free or reduced-price meals (as measured by district records provided to us in fall 2002). However, the number of erroneously certified students as a percentage of all certified students is

larger—for example, 18 percent of all students certified for free meals in comparison districts were ineligible for these benefits.

Up-Front Documentation did not result in measurable deterrence of erroneous certifications. We defined deterrence as the difference between pilot and comparison districts in the rate of erroneous certification (certification of ineligible students). When students in households with income greater than 185 percent of poverty are considered, the proportion of ineligible students who were certified for free or reduced-price meals was the same in pilot and comparison districts after we controlled for household characteristics. On the other hand, when we focus on students above 130 percent of poverty—holding constant household characteristics—4.1 percent of students ineligible for free meals in comparison districts (that is, with incomes above 130 percent of poverty) were certified for these benefits; the percentage of ineligible students certified for free meals was lower in pilot districts, at 3.3 percent. This difference, while moderately large in percentage terms, was not statistically significant.

Many students eligible for benefits were not certified. In both Up-Front Documentation pilot and comparison districts, substantial proportions of children eligible for free or reduced-price meals were not certified for these benefits. In comparison districts, for example, between half and two-thirds of all students eligible for free or reduced-price meals (excluding those directly certified and depending on the specific group considered) were certified, implying that one-third to one-half were not certified.

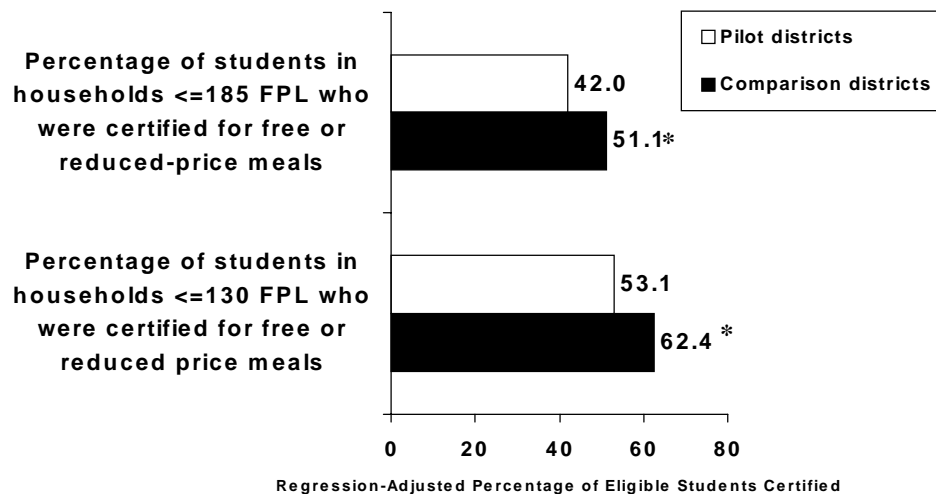
Deterrence: Rates of Certification Among Ineligible Students (Up-Front Documentation)



Note: Neither of the pilot-comparison differences shown is statistically significant at the .05 level.

The Up-Front Documentation Pilots caused barriers to certification among some eligible students. Up-Front Documentation was estimated to lead to a statistically significant reduction in the percentage of eligible students certified for free or reduced-price meals. Holding constant household characteristics, 42 percent of eligible students in pilot districts were certified for free or reduced-price meals, compared with 51 percent of those in comparison districts. Including directly certified students increased these percentages, but the percentages were in the same broad range and the pilot-comparison difference remained statistically significant.

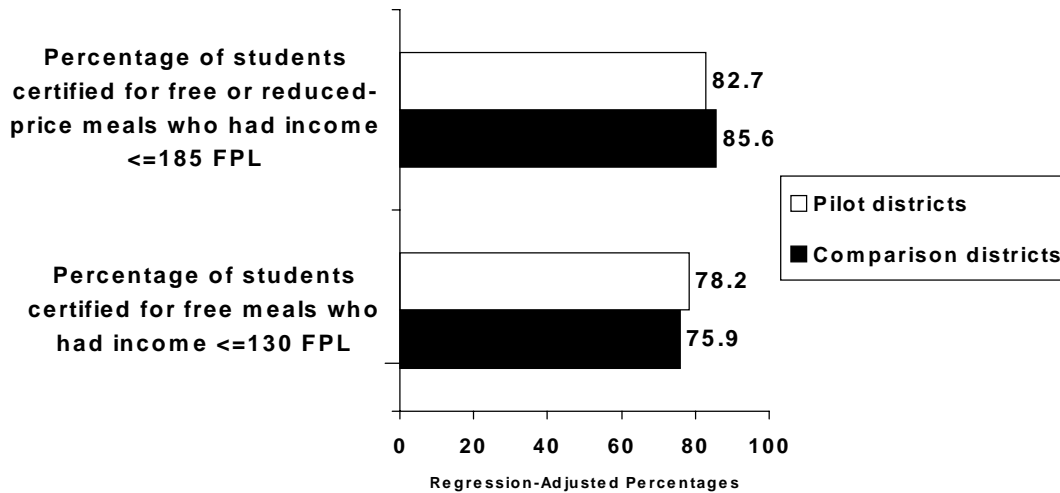
Barriers: Rates of Certification Among Non-Directly Certified Eligible Students (Up-Front Documentation)



Note: *indicates the pilot-comparison differences is statistically significant at the .05 level.

Compared to current procedures, Up-Front Documentation did not change accuracy or targeting efficiency at a level that was statistically significant. The estimated impact of Up-Front Documentation on the proportion of certified students eligible for the benefits they were receiving depended on whether we were looking at free meal certification or free and reduced-price meal certification. While the pilot was estimated to have a positive impact on the accuracy rate for free meals, its estimated impact on the accuracy rate for free or reduced-price meals was negative. Neither estimate was statistically significant. The estimated impact of Up-Front Documentation on targeting efficiency was negative but small and not statistically significant (data not shown). Holding constant household characteristics, for example, the proportion of all non-directly certified students with a free/reduced-price meal certification status consistent with their eligibility status was 79 percent in pilot districts and 81 percent in comparison districts.

Accuracy Rates Among Certified Students—Excludes Directly Certified Students (Up-Front Documentation)



Note: Neither of the pilot-comparison differences is statistically significant at the .05 level.

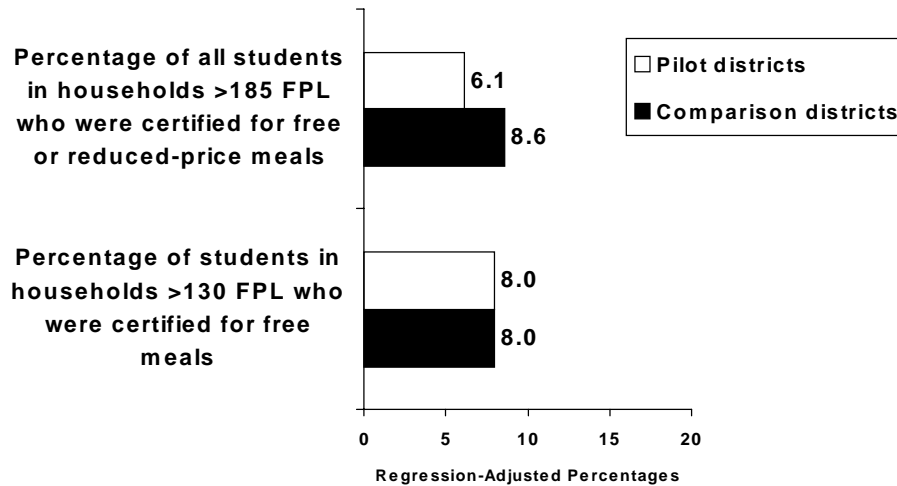
Findings on the Impacts of Graduated Verification

In Graduated Verification comparison districts, less than 10 percent of ineligible students were erroneously certified. Among students *ineligible for free or reduced-price meals* on the basis of their income, just under 10 percent were certified for free or reduced-price meals, while 9 percent of students ineligible for free meals were certified for free meals. Again, the number of erroneously certified ineligible children is larger as a percentage of all certified students—for example, 18 percent of students certified for free meals (excluding directly certified students) were ineligible for these benefits.

The deterrent effects of Graduated Verification were not statistically significant. Holding constant household characteristics, 8.6 percent of students ineligible for free or reduced-price meals in comparison districts were certified, while the certification rate among this group in pilot districts was only 6.1 percent. However, this difference was not statistically significant at the 0.05 level. Among students ineligible for free meals, 8.0 percent were certified for free meals in both pilot and comparison districts.

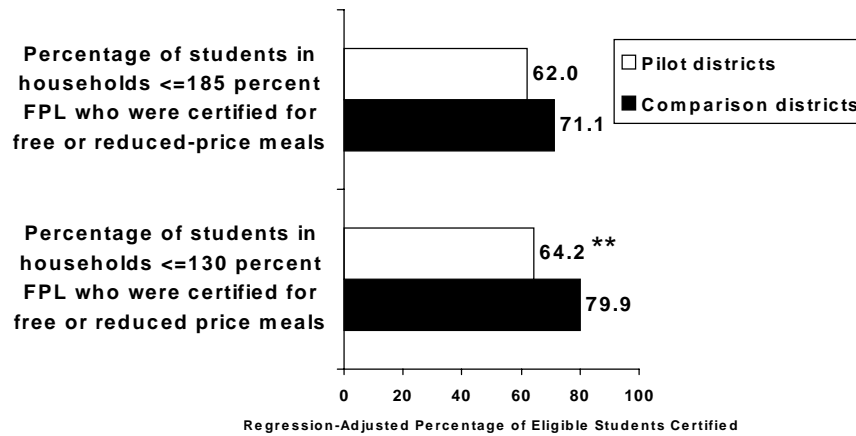
The Graduated Verification pilots caused barriers to certification among some eligible students. Among students eligible for free meals and not directly certified, the percentage certified for free or reduced-price meals was 64 percent in pilot sites and 80 percent in comparison sites. This 16 percentage point difference was statistically significant at the .01 level. Among those eligible for free and reduced-price meals who were not directly certified, the certification rate was 62 percent in pilot districts and 71 percent in comparison districts. This 9 percentage point difference was not statistically significant at the .05 level.

Deterrence: Certification Rates Among Ineligible Students (Graduated Verification)



Note: Neither of the pilot-comparison differences shown is statistically significant at the .05 level.

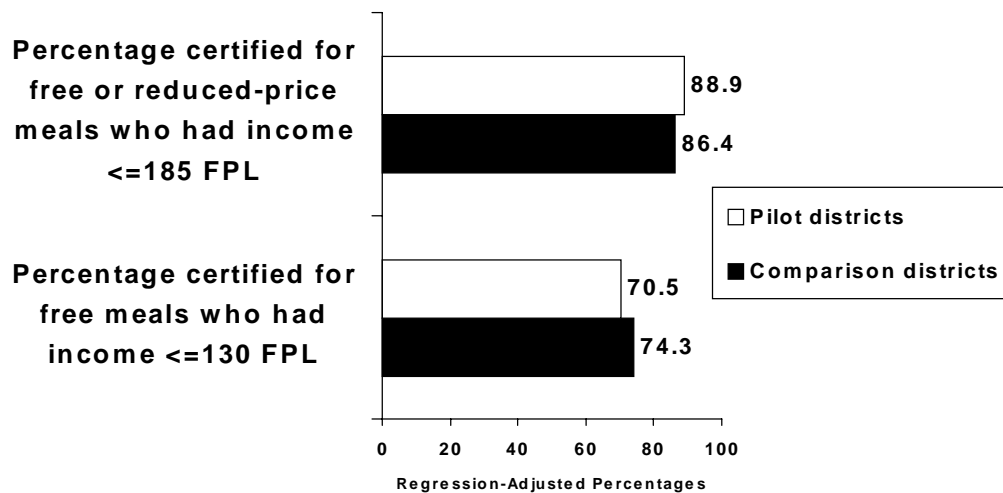
Barriers: Certification Rates Among Non-Directly Certified Eligible Students (Graduated Verification)



Note: **indicates the pilot-comparison difference is statistically significant at the .01 level.

Graduated Verification did not change accuracy or targeting efficiency at a statistically significant level. The estimated impact of Graduated Verification on accuracy was negative but not statistically significant among students certified for free meals, and positive but not statistically significant among students certified for free or reduced-price meals. The estimated impact of Graduated Verification on targeting efficiency was small, negative, and not statistically significant.

Accuracy Rates Among Certified Students—Excludes Directly Certified Students (Graduated Verification)



Note: Neither of the pilot-comparison differences is statistically significant at the .05 level.

I. INTRODUCTION

The National School Lunch Program (NSLP) and the School Breakfast Program (SBP) are important elements of the U.S. system for safeguarding the health and well-being of its school-age children. In fiscal year 2002, the programs served more than 3.9 billion free or reduced-price school meals to students (U.S. Department of Agriculture, Food and Nutrition Service Web Site, August 2003). They provided an important component of the overall nutritional intake of many of these children.

Efficient, accurate administration of the program is essential for ensuring effective targeting of benefits and high levels of public confidence in its operations.¹ In recent years, however, concerns have been raised about the integrity of the program's process for establishing eligibility for its benefits. In response, the U.S. Department of Agriculture (USDA) has sought the voluntary participation of School Food Authorities (SFAs) to test ways of improving the process for certifying students to receive free and reduced-price meals. This report presents the results of an evaluation of two of the approaches tested in the NSLP Application/Verification Pilot Projects: Up-Front Documentation and Graduated Verification. The evaluation is based on data collected during school year 2002-2003, the third year of pilot operations.

The rest of this introduction describes the policy context and problem, the design of the pilots, and the policy questions that the evaluation will address.

¹For brevity, we refer in this report to eligibility and certification for the NSLP. Students approved for free or reduced-price lunches also qualify automatically for free or reduced-price school breakfasts.

A. IMPORTANCE OF PROGRAM INTEGRITY

The NSLP was enacted with the passage of the National School Lunch Act of 1946 to “safeguard the health and well-being of the Nation’s children and to encourage the domestic consumption of nutritious agricultural commodities and other foods.” In 1975, Congress expanded the federal role in providing students with access to nutritious food by authorizing the creation of a permanent school breakfast program: the SBP. The NSLP and SBP provide federal financial assistance and commodities to schools serving meals that meet specified nutritional standards. Although USDA subsidizes (with cash reimbursements and commodities) all school lunches and breakfasts, the subsidies are largest for children approved for free or reduced-price meals. Children in families whose incomes are 130 percent or less of the federal poverty guidelines or who are members of families receiving benefits of the Food Stamp Program, Temporary Assistance for Needy Families, or the Food Distribution Program on Indian Reservations (FS/TANF/FDPIR) qualify for free meals; those in families with incomes between 130 and 185 percent of the guidelines qualify for reduced-price meals. For every NSLP meal served, FNS provides a reimbursement in cash and commodities whose amount depends on the child’s meal price status. For school year 2002-2003, the reimbursement rates were \$2.34 for each free meal, \$1.94 for each reduced-price meal, and \$0.36 for each paid meal.

1. Reasons for Policy Concern

Like all programs that use means tests to direct benefits to low-income households, the school nutrition program must balance competing objectives: (1) ensuring that approved children are income eligible, (2) maintaining ease of access for eligible children, and (3) keeping the costs and burdens of administering eligibility determination reasonable both for SFAs and for families. Meeting the first objective can sometimes increase administrative costs and make it

more difficult for eligible children to participate. Making access simpler or streamlining administration might result in more benefits going to people who do not qualify for them.

Accurate certification of children for free and reduced-price school meals is important for two reasons. First, continued public support for the NSLP requires an eligibility determination process that keeps erroneous payments—that is, reimbursements for free or reduced-price meals obtained by children from households that are not income eligible—to a minimum. The federal cost of the NSLP and SBP was approximately \$7.6 billion in fiscal year 2000. Second, many federal and state programs designed to provide additional resources to districts with large numbers of at-risk students now allocate funding on the basis of the number of children approved for free and reduced-price school meals. For example, states and districts frequently allocate federal funding under Title I of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 2701 et seq.) to individual schools according, in part, to the percentage of students approved for free and reduced-price meals. States and districts also allocate other state-funded education programs on the basis of these school-level measures.

While it is important to minimize the number of ineligible children certified for free and reduced-price meals, policymakers are concerned that eligibility determination procedures do not create significant barriers to the certification and participation of eligible children. Indeed, such barriers defeat a key objective of means-tested programs: to make sure these public programs are accessible to all who are eligible.

2. Concerns About Inaccuracy

Several studies over the past 25 years have found that a substantial number of children from ineligible households were certified for free or reduced-price meals. These findings have contributed to the interest in reducing certification errors. A study sponsored by USDA's Food and Nutrition Service (FNS) (U.S. Department of Agriculture 1990) examined the outcomes of

verification reported by a representative sample of SFAs and in-home interviews with a representative sample of households that did not respond to the SFA's verification request. Data presented in this study suggest that about 15 percent of children certified as of December 1986 were in households not eligible for the benefits they had been approved for in early fall 1986.² In an audit covering school years 1994-1995 and 1995-1996 for a representative sample of Illinois SFAs, USDA's Office of Inspector General (1997) estimated that 19 percent of all verified children had their benefits reduced or terminated.

FNS also was concerned that the number of children approved for free meals nationally exceeded the estimated number of children in families with annual income less than 130 percent of the federal poverty level. This evidence and other program oversight activity suggested that a substantial number of households misreport eligibility information in order to be approved for free and reduced-price school meals.³

B. THE PILOT DEMONSTRATIONS AND KEY POLICY QUESTIONS

To address concerns about misreporting and approval of ineligible children, in January 2000, FNS invited state agencies and SFAs to test one of four specific new strategies (or propose their own alternative strategy). Two of these four strategies, Up-Front Documentation and

²From U.S. Department of Agriculture 1990, Exhibit 5.1, 10.9 percent of cases verified in December 1986 in districts using random sampling responded and had their benefits reduced or terminated, and 12.9 percent had their benefits terminated because they did not respond to the SFA's request for verification. From Exhibit 5.4, in-home audits conducted in May 1987 found that one-third of nonresponders whose benefits were terminated were not eligible for the benefits they were approved for in early fall 1986. Multiplying this percentage ineligible by the 12.9 percent who were nonresponders and adding the product to 10.9 gives an estimate of 15.2 not eligible for the benefit they were receiving. It should be noted that this very likely overstates the percentage not eligible for their benefits in December 1986 because some of the cases found ineligible as of the May 1987 interview may have been eligible in December 1986 but experienced a change in income between December and May.

³*Federal Register*, vol. 65, no. 14, January 21, 2000, p. 3410.

Graduated Verification, are examined in the evaluation reported herein. Up-Front Documentation strengthens the application process by requiring documentation at the time of application. Graduated Verification strengthens the verification process through graduated increases in the number of cases verified if the percentage of cases whose benefits are reduced or terminated as a result of verification exceeds specific thresholds. As background for understanding the approaches to improving the application and verification process and their potential effects, we briefly describe the current rules and procedures.

1. Background on Current Application and Verification Procedures

Responsibility for administering the NSLP and SBP at the district level rests with the SFA, which provides meals that meet nutritional requirements and, for purposes of claiming reimbursement from USDA, keeps counts of meals served free, at reduced price, and at full price. The SFA also is responsible for (1) notifying families that free and reduced-price meals are available to children from families that meet certain income-for-family-size standards; (2) distributing blank application forms and instructions, receiving completed applications, and informing families that they must report to the SFA any increase in their income of \$50 per month or greater; (3) reviewing the information on forms to establish which students are approved (certified) and which applying students are not eligible (and, therefore, are not certified); and (4) notifying families of their children's certification status.

The current verification process requires that each SFA conduct verifications of selected applications by December 15 of each year.⁴ Districts initiate the process by sending the family a

⁴SFAs have the option of conducting verification with a *random sample* of applications, with a *focused sample* of applications, or with *all applications*. A random sample is supposed to be a simple random sample of all approved applications. If a random sample is used, it must include the lesser of 3,000 or 3 percent of applications. In a focused sample, verification efforts center on students in families that have incomes close to the upper cutoff of eligibility or that

request for documentation of their income or food stamp/TANF status. If the family provides documents that show that their income exceeds the eligibility limit, their benefits are reduced or terminated. If they fail to provide documentation, the SFA is required to terminate benefits.

An important feature of the application process is that SFAs are permitted (but not required) to use “direct certification” for certifying approval of children from families that receive food stamps or cash assistance. Under direct certification, the food stamp or welfare agency identifies to the school district those children in families that receive these income supports; the school district can approve these children for free meals with no application. SFAs are not required to perform verification for students approved for free meals by direct certification.

2. Key Features of the Demonstrations Being Evaluated

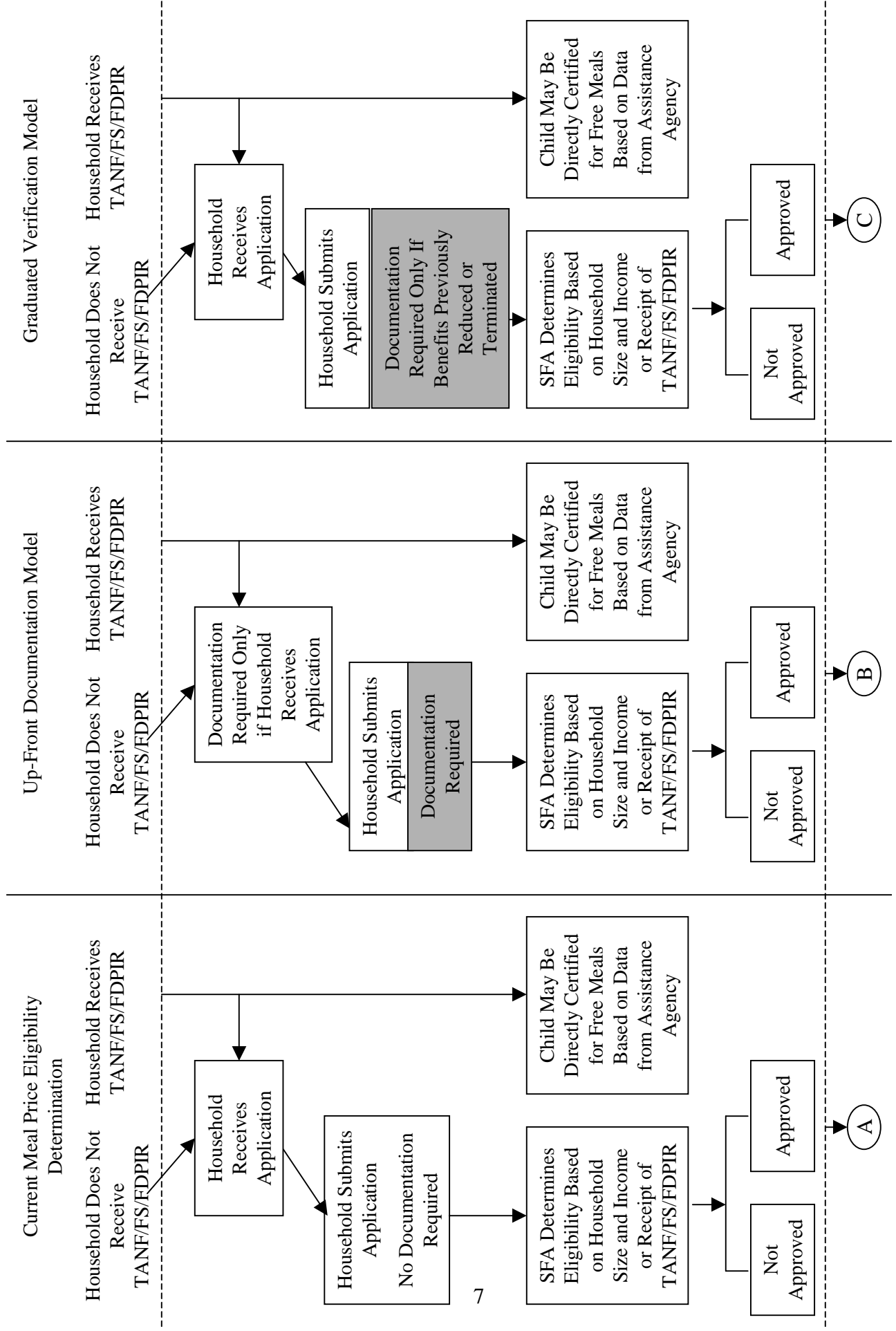
A clear picture of how the pilot procedures changed existing processes is necessary to understand the evaluation findings and to assess how they might apply if they were implemented nationally. Figure I.1 shows the processes and highlights the distinctive features of each pilot model.

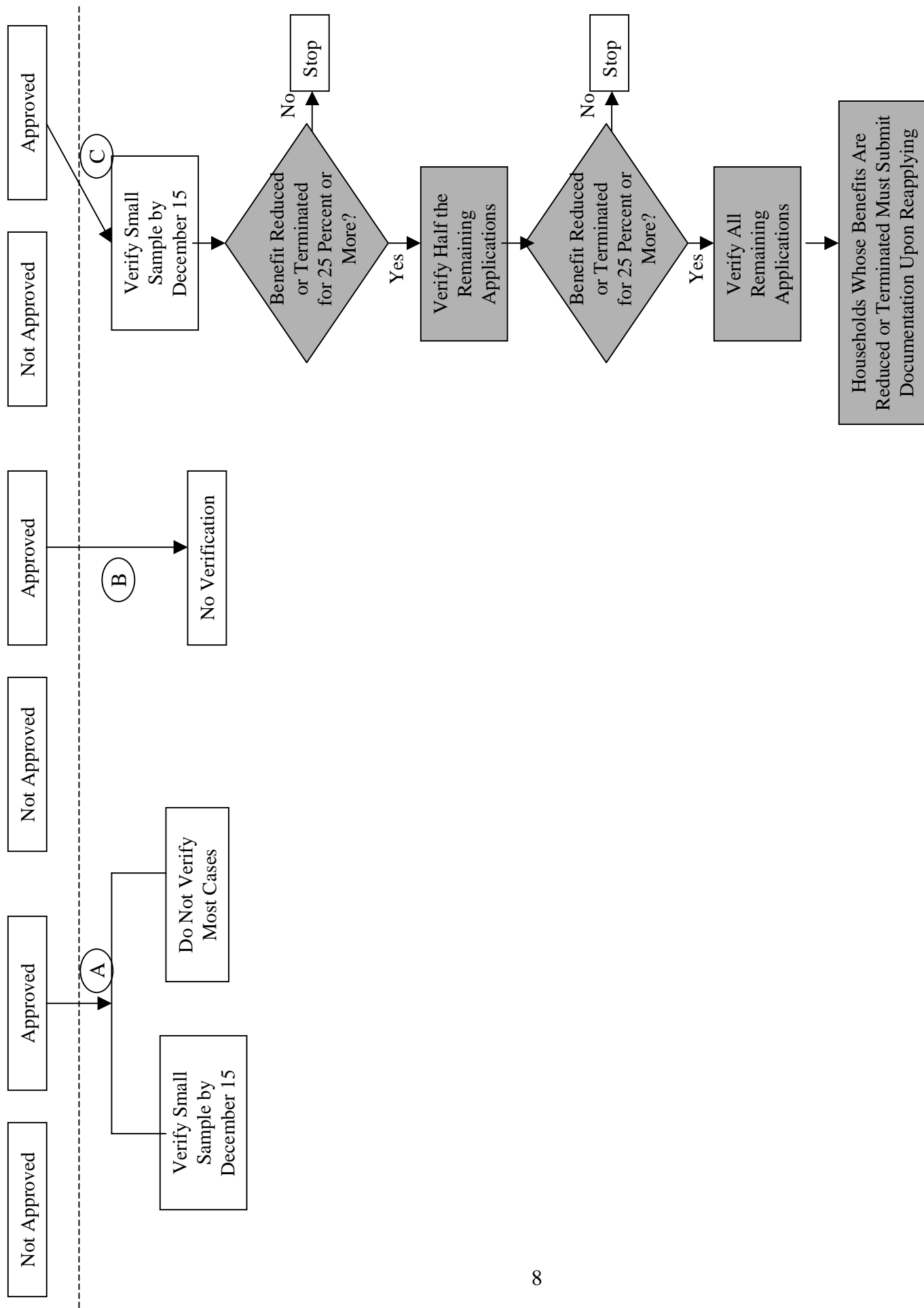
Nine SFAs in the evaluation tested Up-Front Documentation during school year 2000-2001 through school year 2002-2003. Under Up-Front Documentation, SFAs required all applicants for free and reduced-price meals to provide, with the application, documentation either of their income or of their receipt of TANF or food stamp benefits. Benefits cannot be granted if the application does not include a complete application, including documentation. After the applications and documentation are reviewed and approved, the SFAs need not conduct any

(continued)

receive TANF or food stamps. Such a sample must include the lesser of 1 percent of all applications or 1,000 applications selected from families whose income is within \$100 of the income limit for their family size, plus the lesser of 0.5 percent of all applications or 500 applications selected from those receiving TANF or food stamps.

FIGURE I.1
SUMMARY OF CURRENT AND PILOT PROJECT ELIGIBILITY AND VERIFICATION PROCEDURES
(Shaded Boxes Indicate New Requirements Created by the Pilot Procedures)





subsequent verifications. The requirement for Up-Front Documentation applies only to families who submit an application; no documentation is required for students approved through direct certification.

Three districts participating in the evaluation tested Graduated Verification, under which application procedures are strengthened and, in certain circumstances, the verification process is enhanced. First, households who were applying for free or reduced-price meals and whose benefits had been terminated or reduced in the prior year as a result of SFA verification activities were required to provide documentation of their incomes or their categorical eligibility at the point of application. Second, in addition to conducting the standard verification of 3 percent of participating households, the SFA was required to conduct additional verifications as follows:

- If 25 percent or more of the initially verified applications led to a termination or reduction of free or reduced-price meal benefits, the SFA had to verify an additional 50 percent of the remaining applications.
- If 25 percent or more of these second-round verifications resulted in terminations or reductions in benefits, the SFA had to verify all the remaining applications.

In assessing how the pilots can be expected to affect the accuracy of the benefit determination process, it is useful to consider the possible sources of inaccuracy identified through the current verification process. These include:

- Intentional misreporting of circumstances at the time of application
- Inadvertent misreporting of circumstances at the time of application
- SFA errors in processing information provided by the household about their circumstances
- Unreported increase in household income of more than \$50 per month or departure of a household member between application and the point at which verification is conducted

Requiring documentation could deter intentional misreporting, as households are less willing to understate the amount of income from a given source. However, it would not detect the situation in which a household reports and documents one income source but conceals another. Requiring documentation at application could reduce inadvertent misreporting if families do not understand the distinction between their net income and their gross income (the latter is used in meal price certification).

Increasing the number of applications verified increases the likelihood of detecting inaccuracies due to changes in household income or composition. The pilot projects may also affect the application behavior of *eligible* families, the most likely potential effect being that some eligible families would be discouraged from applying. The likely effects on administrative error are uncertain.

3. Administrative Data on Changes in Certification Following Implementation of the Demonstrations

USDA published a report on the first-year experiences of SFAs implementing Up-Front Documentation and Graduated Verification (USDA 2002).⁵ The analysis compared administrative data on the number of students approved for free and reduced-price meals and the numbers of meals served before the pilots were implemented and during the first year of pilot operation. In Up-Front Documentation pilot districts, the numbers of students approved declined relative to averages in the two years prior to the demonstration. The number of free approvals declined by 20 percent, and the number of reduced-price approvals declined by 9 percent. The

⁵The report also examined the experiences of seven SFAs that implemented pilot procedures whereby verifications were conducted for students approved by direct certification. On the basis of findings that rates of ineligibility were very low (6.6 percent of those verified had their benefits reduced or terminated), FNS decided not to include the Verify Direct Certification pilots in the present evaluation.

number of free meals served declined by a proportion similar to the change in free certifications, the number of reduced-price meals was essentially unchanged, and the number of paid meals increased.

In Graduated Verification districts, the analysis examined experience near the end of the first year of implementation in the four pilot districts. Just over one-third of children in these districts (36 percent) who were approved by application and selected for verification experienced a reduction or termination in their benefits. In the three districts, in which initial verification results triggered expanded verification, the number of free meals served in April and May 2001 declined by 20 percent compared to a similar period in the prior two years, and the number of reduced-price meals declined by 8 percent, while total meals declined by just 1 percent.

4. Research Objectives

The pilot evaluation extends the analysis that was possible using administrative data for the pilot sites during the first year of operation. It examines the underlying eligibility status of households in the pilot districts and in similar comparison districts during the third year of pilot implementation. The evaluation data can be used to assess the cumulative effects of operating the pilot procedures on deterrence (lower certification rates among ineligible households), barriers (lower certification rates among eligible households), and certification accuracy (the proportion of certifications that are correct).

The evaluation of the Up-Front Documentation and Graduate Verification pilot projects addressed the following six objectives and associated questions:

1. ***Assess Deterrence and Barrier Effects of the Demonstration.*** Did the demonstrations reduce the likelihood that an *ineligible* household would apply for and have their child be approved for free or reduced-price school meals? Did it reduce the likelihood that an *eligible* student would be approved for free or reduced-price school meals?

2. ***Assess Impacts on the Accuracy and Targeting Efficiency of Certification.*** How did the application/verification pilot demonstrations affect the proportion of children who were approved for free or reduced-price meals (based on an application) that were eligible for each level of benefit? Did it affect the percentage of all students who were certified and eligible or not certified and ineligible?
3. ***Assess the Effects of the Demonstration on NSLP Participation.*** How did the pilots affect participation in the NSLP, as measured by the numbers of free, reduced-price, and paid meals consumed relative to the number of students in the school?
4. ***Assess the Administrative Burden of Demonstration Procedures.*** What costs do SFAs incur in administering the free and reduced-price meal certification process, and how does each of the application/verification processes being tested change administrative burden?
5. ***Assess the Fidelity of Implementation.*** Did the pilot sites administer the demonstration procedures in accordance with the agreed-to protocols? What problems were encountered in implementation, and how were they resolved?
6. ***Describe the Characteristics of Students.*** What are the characteristics of students approved for free meals, approved for reduced-price meals, and not approved for either in terms of racial/ethnic group, type of location, income group, and other characteristics of the household? How do the characteristics of students in the pilot districts compare with those in comparisons and with the country as a whole?

This report presents the study findings on the impacts of the pilot projects on deterrence, barriers, accuracy, and targeting, and describes the characteristics of students in the pilot districts. Subsequent reports will present findings on the demonstrations' effects on applications, participation, and implementation and administrative costs.

II. STUDY BACKGROUND

This chapter provides background on the study. The first section briefly describes the study design, while the second describes the pilot sites in which the study was implemented. Additional details on these topics are contained in Volume II of this report.

A. OVERVIEW OF STUDY DESIGN

To estimate effects of the pilot demonstrations on deterrence, barriers, accuracy, and targeting efficiency, we used a comparison district design. This design requires comparing outcome measures for students potentially affected by the demonstrations with those of otherwise similar students who were not exposed to the demonstration rules. In particular, a single, carefully matched comparison SFA was recruited to serve as the benchmark for each pilot SFA. We selected representative samples of students and collected data in the same manner in the comparison SFAs as in the pilot SFAs. We calculated estimates of impacts on measures of barriers and deterrence by computing the average value of the key outcomes in each pilot and comparison district (after controlling for key student characteristics), computing the difference between the pilot and comparison district in each site pair, and then computing the mean of these differences. We derived estimates of the impacts on accuracy and targeting efficiency from these estimated impacts on barriers and deterrence. We present separate impact estimates for the Up-Front Documentation and Graduated Verification pilot projects.

The remainder of this section provides key details of this approach to measuring the impacts of Up-Front Documentation and Graduated Verification. First, we describe the selection and recruitment of comparison districts. Next, we present the process by which we designed and selected the sample of students to be included in the analysis. The third section summarizes the

data collection process. Finally, we describe various aspects of our strategy for estimating the impacts of the pilot demonstrations.

1. Selection and Recruitment of Comparison Districts

The selection of comparison sites was guided by several criteria. It was especially important that each comparison be similar to its pilot district in having (1) similar NSLP application and eligibility determination procedures, as measured by the use of direct certification; (2) similar rates of free and reduced-price certification prior to the pilot; (3) similar district enrollment and grade span, and racial and ethnic composition; and (4) similar percentages of students from families with incomes below 130 percent of the federal poverty level. We also sought comparison districts that were geographically close to the pilots and were similar in terms of their urban/suburban or rural setting. It was also important that each choice be viewed as reasonable by knowledgeable local people.

To develop our list of comparison district candidates, we followed a three-step process that started with all public school districts nationwide. First, we restricted the choice set for each pilot to include districts within the same state and districts serving the same grade span.¹ Second, we created a quantitative index of similarity for each district that remained a candidate after the above restrictions were imposed. The index normalized (to remove the effects of scale for different measures included in the index), and then weighted, the various characteristics included in the index. The scale included six components: (1) size, (2) race/ethnicity, (3) poverty, (4) proximity, (5) level of certification in the NSLP, and (6) level of participation in the

¹We initially planned to restrict the candidate pool to school districts with similar urban/rural/suburban status as measured in the NCES Common Core data set. However, initial testing revealed that this restriction eliminated some plausible candidates that we felt should be included, so we relaxed this requirement.

NSLP. We experimented with different algorithms for weighting the various components. Our preferred weighting gave 25 percent of the weight each to the poverty, certification, and participation components; 15 percent to proximity; and 5 percent each to size and race/ethnicity.²

For the third step in the selection process, we asked people who know the areas in which the pilot districts are located, and know the schools in those areas, to provide their assessment of whether each candidate district on our short list was a reasonable choice. That is, we asked whether each candidate would be viewed by a knowledgeable person as providing a valid benchmark for the pilot district. We also asked whether any of the candidates were obviously poor choices because of differences that were not apparent from the data available to select the short list. After completing this third step, we arrived at a decision on the top candidate (or, in some cases, the top two candidates), and then asked these districts to participate in the study.

The process for asking districts to participate as comparison districts varied by state. In some states, the state coordinator of the NSLP (or someone from that person's office) made the request on behalf of the study, while in others a person from the pilot site who knew a senior official at the candidate comparison site made the first contact.

If a candidate district refused, we identified additional candidates and/or devised alternative ways to gain entry with the potential comparison district to have our request considered by someone in a position to make a decision on the district's behalf. For half of the 12 pilot districts included in the evaluation, we successfully recruited the first candidate that we approached. For two pilot districts, we had to approach two comparison district candidates because the first turned us down, and for three pilot districts, we had to approach three candidates because the first two turned us down. For one of the pilot districts, we approached seven potential

²The other weighting systems considered gave similar rankings.

comparison districts before finding a willing participant. Most districts that declined to participate did so because of concerns that the community would view the study interview as intrusive. Volume II provides additional details on these efforts.

2. Sample Design and Sample Selection

The study ultimately included (1) nine Up-Front Documentation pilot districts plus one comparison district for each pilot, and (2) three Graduated Verification pilot districts plus one comparison district for each of two pilots and two comparison districts for one pilot district. The next step was to select a sample of students. This sample was designed to be representative of all students who were not approved for free meals by direct certification in each pilot district and its comparison district and who were enrolled in the school district at the time of data collection. For purposes of efficiency, FNS decided to exclude from the survey sample all students who were directly certified.³ The sample was stratified by district and by meal price status. Within each pilot model group, approximately equal numbers of observations were allocated to each district and to each meal price status group within it.

The sampling and data collection schedule was designed so as to meet the objective providing FNS with preliminary tabulations of the data by the end of February 2003. According to this schedule, the data collection occurred between October and December 2002, at about the

³The incomes of directly certified students are subject to careful assessment and documentation as a condition for receiving TANF or food stamp or FDPIR benefits. Furthermore, FNS found that by December of the school year 4.1 percent of students directly certified prior to the beginning of the school year remained enrolled and had their benefits reduced or terminated (Food and Nutrition Service, Office of Analysis, Nutrition, and Evaluation, 2002). This finding suggests that only about 4 percent of directly certified students remained enrolled and experienced an increase in income to above 130 percent of poverty. Therefore, including these students in a survey designed primarily to measure income relative to poverty would have provided less information than a larger number of interviews with the students who were not directly certified.

same time that the verification process takes place in most districts. To meet this schedule, we began obtaining the lists necessary for sampling right at the beginning of the school year. For most districts, we acquired four separate lists of (1) all students enrolled in the district, (2) all students directly certified, (3) all students approved for free meals, and (4) all students approved for reduced-price meals.⁴ Lists varied in their format and content, and as to whether they were hard copy or electronic. All full enrollment lists and all lists of students directly certified were for the current school year. Because of the accelerated sampling and data collection schedule, however, the lists of students approved for free or reduced-price meals used for sampling purposes in some districts were as they existed at the end of the 2001-2002 school year.

Processing lists for sample selection entailed identifying and removing duplicate entries on each list, and matching each of the three meal price status lists with the student enrollment list. This process eliminated from the sampling frame any students who were directly certified, and created three sampling strata: (1) students approved for free meals on the basis of an application, (2) students approved for reduced-price meals, and (3) the balance (students paying full price).

The initial samples included a total of 3,685 students: 1,178 in nine Up-Front Documentation pilot districts, 1,201 in nine Up-Front Documentation comparison districts, 637 in three Graduated Verification pilot districts, and 669 in four Graduated Verification comparison districts.⁵

⁴The details of this process varied across districts and are presented in Volume II.

⁵Two neighboring districts served as the comparison for the Dilworth-Glyndon-Felton district in Minnesota: half the comparison sample was selected from each of the comparison districts.

3. Data Collection

The key data for the analysis of impacts are measures of household income and number of persons in the household, which are needed to classify each sample household as having (1) income less than 130 percent of the federal poverty level (eligible for free meals), (2) income between 130 and 185 percent of the federal poverty level (eligible for reduced-price meals), or (3) income above 185 percent of the federal poverty level (not eligible for free or reduced-price meals). The study's survey was conducted primarily to gather the household size and income information necessary to classify each member of the sample into the correct income eligibility category. The survey was also used (1) to gather information about experiences with the lunch program, (2) to obtain parents' perceptions of the program, and (3) to collect data that relate to the characteristics of households that could be used to adjust statistically for differences in the average characteristics of students in the pilot sample and students in the comparison sample.

An extensive literature on the accuracy of income reporting in surveys indicates that responses to questions asking "What was your household's total income for last month?" are subject to considerable reporting error.⁶ Better estimates are obtained by asking whether each household member had income for each of several possible sources of income and, if so, what amounts each person received from each source. Having survey respondents obtain and refer to pay stubs or other written documentation also improves the accuracy of income reporting (Bogen et al. 1992). Income reporting errors in surveys tend to be greater proportionately among lower-income families, in part because the incomes of such families are often less regular and more variable.

⁶Marquis et al. 1993 and 1994; and Moore et al. 2000.

In light of this collective experience (and given the study's objectives), we used a two-step interview process designed to minimize the burden on families in responding to the survey and to obtain the necessary data efficiently, while allowing us to accurately classify each family's income status. In the first step, we conducted a telephone interview with the parent or guardian of each student selected for the study sample. In the telephone interview, respondents were asked about experiences with and perceptions of the NSLP and about characteristics of their family. They were also asked one question about the number of persons in their household and a short series of questions about their total family income that allowed us to classify their family income as above or below 400 percent of the federal poverty level.

If in the telephone interview the reported family income was above 400 percent of poverty, for analytical purposes we classified the family as having income above 185 percent of poverty. We chose 400 percent of poverty as the cutoff because we judged that very few respondents whose true income was less than 185 percent of the federal poverty level would report an income as high as 400 percent of poverty in response to the global question about total family income.

If in the telephone interview the parent reported a family income of less than 400 percent of poverty, we attempted to conduct an in-depth in-home interview with the family. This interview asked a detailed set of questions about the persons living in the household and about their economic relationships. Then, for each adult who was part of the economic unit to which the sampled student belonged, we asked the respondent to identify sources of income and to provide details about each source, including the amount. We also asked respondents to retrieve documentation of amounts, such as pay stubs, and then to refer to these documents in giving the amounts of income by person and source.

Survey data collection started on October 16, 2002, and was completed on January 6, 2003. Most interviews were conducted in November and December 2002. Respondents were asked to

report on household income in the month prior to the month in which the interview was conducted. This reference month was typically October (57 percent) or November (30 percent), but was September (13 percent) or December (less than 1 percent) for a small proportion of respondents.

4. Estimating Impacts on Deterrence, Barriers, Accuracy, and Targeting Efficiency

Our basic approach to estimating impacts was to compare the mean values of the outcome measures (as shown in Table IV.2) in each pilot-comparison site pair, and then to compute the average of these pilot-comparison differences. This process was straightforward in the case of estimating impacts on deterrence and barriers. For example, to estimate effects on deterrence for students in families with income exceeding 185 percent of the federal poverty level in Up-Front Documentation districts, we computed the percentage of students in households with income exceeding 185 percent of poverty who are approved for free or reduced-price meals in each of the nine pilot and comparison districts, computed the difference between this measure in each pilot and comparison site pair, and calculated the mean of these nine differences. In calculating the differences between pilot and comparison site pairs, we controlled in a regression framework for exogenous student and household characteristics that potentially could influence the outcome. Each pilot-comparison site pair contributes equally to the overall impact estimate. Once the impacts on deterrence and barriers were estimated, we derived the impacts on accuracy and targeting efficiency from those previous estimates, as described below.

a. Measuring Outcomes of Interest

To estimate impacts on deterrence, barriers, accuracy, and targeting efficiency, we first had to construct variables that would operationalize these concepts. Each of these general outcomes depends in some way on individual students' certification status—whether they are approved for

free or reduced-price meals—and household income—whether they are income eligible for free or reduced-price meals. Table II.1 shows in tabular format various combinations of students’ certification status and income that are relevant for the study. The table is designed so that all enrolled students in a district can be assigned to one of the cells. The rows of the table show students’ certification status—whether students are directly certified, certified free by application, certified reduced-price, or not certified. The columns shows their household income—whether they are income-eligible for free meals (income no more than 130 percent of poverty), eligible for reduced-price meals (income between 131 and 185 percent of poverty), or not eligible for either (income above 185 percent of poverty).⁷

Variables measuring our outcomes of interest can be represented by counts of students in particular rows and columns of Table II.1. To measure free/reduced-price deterrence, for example, we use the certification rate among students with incomes above 185 percent of poverty. This measure can be represented by the fraction $(D+H)/P$, since P represents the total number of students with incomes above 185 percent of poverty and $(D+H)$ represents the number of these income-ineligible students who are certified for free or reduced-price meals. Other outcome variables can be defined similarly.

Concerns about the level of inaccuracy in certification for free and reduced-price meals motivated the testing of pilot procedures to improve certification accuracy. The central questions surrounding accuracy addressed in the evaluation are: What percentage of students certified for free and reduced-price meals are ineligible for the benefits they receive? How did the

⁷Students’ eligibility for free meals also depends on whether they are receiving FS/TANF/FDPIR. For the sake of simplicity, we assume in the table that all those receiving FS/TANF/FDPIR have incomes of no more than 130 percent of poverty, and so are subgroups of the first column in the table (and denoted A, B’, F’, J’, and N’).

TABLE II.1
STUDENTS' POSSIBLE COMBINATIONS OF INCOME AND CERTIFICATION
STATUS

Certification Status	Income-Eligibility Status			Total
	$\leq 130\%$ FPL ^a	131 to 185 Percent FPL	> 185 Percent FPL	
Directly Certified ^b	A	---	---	A
Certified Free by Application	B	C	D	E
Certified Reduced-Price	F	G	H	I
Not Certified (Paid)	J	K	L	M
Total	N	O	P	Q

^aThis column potentially includes both students receiving food stamp or Temporary Assistance for Needy Families (FS/TANF) benefits and students not receiving these benefits. For simplicity, we assume that no FS/TANF recipients have incomes above 130 percent of the federal poverty level (FPL). We denote the groups of students on FS/TANF in the various certification categories as: A (directly certified, where all directly certified students are assumed to be on FS/TANF), B' (certified free), F' (certified RP), J' (paid), N' (total).

^bWe assume that all directly certified students have incomes below 130 percent of the FPL.

procedures tested in the NSLP Application/Verification Pilot Projects affect this percentage? Referring to measures of accuracy in Table II.1, the percentage of students certified for free meals who are accurately certified is $(A+B)/(A+B+C+D)$. Accuracy depends on (1) the number of eligible students who are certified for free meals ($A + B$) and (2) the number of ineligible students who are not certified for free meals ($C + D$). The accuracy rate will increase as the number of eligible students who are certified increases, and it will increase as the number of ineligible students certified decreases. Basically, the goal is that fewer ineligible students and more eligible ones are approved.

Our approach to the analysis recognizes that improving certification accuracy requires different responses from two key groups of students: to maximize the improvement in accuracy income-ineligible students must reduce their likelihood of becoming certified, while income-eligible students must not reduce their likelihood of becoming certified. We recognize the possibility that the pilot demonstrations may induce different responses among the two groups by estimating certification rates separately for ineligible students and eligible students. If Up-Front Documentation and Graduated Verification were successful in reducing certification among ineligible students, we refer to this effect as evidence of deterrence. However, to the extent that these interventions led to a reduction in certification among eligible students, we would refer to this effect as evidence of barriers. Recent policy discussions have focused on the ratio of the number of students approved for free meals nationally according to FNS administrative data ($A+E$ in Table II.1) to the number of students nationally in households with income less than 130 percent of the poverty level (N in Table II.1). A weakness in the available national data is that they do not allow us to examine separately the status of eligible and ineligible students. Without information on the percentage of eligible students certified (or the percentage of ineligible students certified), the ratio of the number of students approved nationally to the

number eligible nationally provides no insight into the percentage of students nationally who are certified inaccurately. If, for example, the number approved and the number eligible were equal to one another, this could either result from perfect accuracy (with all eligible students and no ineligible students certified) or from a highly inaccurate system (if a large number of ineligible students were certified but an equally large number of eligible students were not certified). The study survey provided the critical information on whether eligible/ineligible students are certified for the pilot and comparison districts, and our outcome measures use this information.

In this report, we present data on two measures of certification deterrence (Table II.2): (1) the percentage certified for free meals among those with incomes above 130 percent FPL (CD_1), and (2) the percentage certified for free or reduced-price meals among those with incomes above 185 percent FPL (CD_2).

Barriers are assessed through two measures for students with incomes below 130 percent FPL: the first measure (CB_1a) counts as appropriately certified only those students correctly certified for free meals, and the second measure (CB_2a) counts as appropriately certified those with incomes below 130 percent FPL who are correctly certified for free meals and those who are incorrectly certified for reduced-price meals. The two measures treat differently those students who have incomes below 130 percent FPL and were approved for reduced-price meals. The first measure considers this group as not appropriately certified, and thus potentially subject to a barrier. The second measure considers this group as appropriately certified, and thus not subject to a barrier. The third barrier measure (CB_3a) assesses barriers for students with incomes below 185 percent FPL. The fourth measure (CB_4a) assesses barriers for a specific subgroup of interest: students who are recipients of TANF or food stamps but were not directly certified for free meals. Each of these four measures is presented separately for students who were not directly certified for free meals (CB_1a – CB_4a), and for all students (including those

TABLE II.2
OUTCOME MEASURES USED IN THE IMPACT ANALYSIS

Variable Designation/Description	Variable Formula
Measures of Certification Deterrence:	
CD_1: Percentage certified for free meals among those with income > 130 percent FPL	$(C+D) / (O+P)$
CD_2: Percentage certified for free or reduced-price (F/RP) meals among those with income > 185 percent FPL	$(D+H) / P$
CD_3: Percentage certified for level of benefits for which they are not eligible among those with income > 130 percent FPL ^a	$(C+D+H) / (O+P)$
Measures of Barriers:	
<i>Estimates excluding directly certified</i>	
CB_1a: Percentage certified for free meals among those with income ≤ 130 Percent FPL and not directly certified	$B / (N-A)$
CB_2a: Percentage certified for free or RP meals among those with income ≤ 130 Percent FPL and not directly certified	$(B+F) / (N-A)$
CB_3a: Percentage certified for free or RP meals among those with income ≤ 185 Percent FPL and not directly certified	$(B+C+F+G) / (N-A+O)$
CB_4a: Percentage certified for free meals among those on FS/TANF and not directly certified	$B' / (N' - A)$
<i>Estimates including directly certified</i>	
CB_1b: Percentage certified for free meals among those with income ≤ 130 Percent FPL	$(B+A) / N$
CB_2b: Percentage certified for free or RP meals among those with income ≤ 130 Percent FPL	$(B+A+F) / N$
CB_3b: Percentage certified for free or RP meals among those with income ≤ 185 Percent FPL	$(B+A+C+F+G) / (N+O)$
CB_4b: Percentage certified for free meals among those on FS/TANF	$(B'+A) / N'$
Measures of Certification Accuracy:	
<i>Estimates excluding directly certified</i>	
CA_1a: Percentage with income ≤ 130 Percent FPL among those certified for free meals by application	B / E
CA_2a: Percentage with income ≤ 130 Percent FPL and certified free or with income between 131-185 Percent FPL and certified RP among all those certified for free or RP meals by application	$(B+G) / (E+I)$
CA_3a: Percentage with income ≤ 130 Percent FPL and certified free or with income ≤ 185 Percent FPL and certified RP among all those certified for free or RP meals by application	$(B+F+G) / (E+I)$
CA_4a: Percentage with income ≤ 185 Percent FPL among all those certified for free or RP meals by application	$(B+C+F+G) / (E+I)$
<i>Estimates including directly certified</i>	
CA_1b: Percentage with income ≤ 130 Percent FPL among all those certified for free meals	$(B+A) / (E+A)$
CA_2b: Percentage with income ≤ 130 Percent FPL and certified free or with income between 131-185 Percent FPL and certified RP among all those FRP certified	$(B+A+G) / (E+A+I)$
CA_3b: Percentage with income ≤ 130 Percent FPL and certified free or with income ≤ 185 Percent FPL and certified RP among all those FRP certified	$(B+A+F+G) / (E+A+I)$
CA_4b: Percentage with income ≤ 185 Percent FPL among all those certified for free or RP meals ^b	$(B+A+C+F+G) / (E+A+I)$

Table II.2 (*continued*)

Variable	Designation/Description	Variable Formula
Measures of Certification Targeting Efficiency:		
<i>Estimates excluding directly certified</i>		
CTE_1a:	Percentage with income \leq 130 Percent FPL and certified free OR with income 131-185 Percent FPL and certified RP OR with income $>$ 185 Percent FPL and not certified among all students not directly certified	$(B+G+L) / (Q-A)$
CTE_2a:	Percentage with income \leq 130 Percent FPL and certified free or RP OR with income 131-185 Percent FPL and certified RP OR with income $>$ 185 Percent FPL and not certified among all students not directly certified	$(B+F+G+L) / (Q-A)$
CTE_3a:	Percentage with income \leq 185 Percent FPL and certified free or RP OR with income $>$ 185 Percent FP and not certified free or RP among all students not directly certified ^b	$(B+C+F+G+L) / (Q-A)$
<i>Estimates including directly certified</i>		
CTE_1b:	Percentage with income \leq 130 Percent FPL and certified free OR with income 131-185 Percent FPL and certified RP OR with income $>$ 185 Percent FPL and not certified among all students	$(B+A+G+L) / Q$
CTE_2b:	Percentage with income \leq 130 Percent FPL and certified free or RP OR with income 131-185 Percent FPL and certified RP OR with income $>$ 185 Percent FPL and not certified among all students	$(B+A+F+G+L) / Q$
CTE_3b:	Percentage with income \leq 185 Percent FPL and certified free or RP OR with income $>$ 185 Percent FP and not certified free or RP among all students ^b	$(B+A+C+F+G+L) / Q$

^a We have not yet used this outcome measure in our impact analysis but plan to do so in a future report.

^b Students in group C in Table II.1 are eligible for reduced-price meals but approved for free meals. Accordingly, these students are excluded from the numerator of the accuracy measures CA_2a and CA_2b (that is, not counted as correctly certified). However, they are included in the numerator of the accuracy measure (CA_4a and CA_4b) (that is, counted as correctly certified). The rationale for counting these cases as correct in measures CA_4a and CA_4b is that the cost to the federal government of this error is lower than the costs of erroneously certifying a student with income exceeding 185% FPL. When children eligible for reduced-price meals but approved for free meals get a NSLP reimbursable meal, the amount of the erroneous payments that FNS is at risk of making to school districts is limited to 40 cents per meal—the difference between a reduced-price reimbursement and a free reimbursement. It is much smaller than the amount of erroneous payments FNS is at risk of making to school districts reimbursed for meals received by children approved for free meals who are eligible for neither free nor reduced-price meals.

directly certified) (CB_1b – CB_4b). Together, these measures support a broad examination of whether and to what extent the pilot procedures may have created barriers to the certification of some eligible students.

The certification accuracy measures combine information on deterrence and information on barriers to show the percentage of eligible students among those who are certified. We include one measure that examines accuracy among students approved for free meals (CA_1a) and three measures that examine accuracy among students approved for free or reduced-price meals (CA_2a – CA_4a). The three measures that examine accuracy for students approved for free or reduced-price meals adopt different perspectives on whether approval of students for a benefit other than the one they were eligible for is appropriate. The first measure of free and reduced-price meal accuracy (CA_2a) counts as accurate only those receiving the correct benefit. The second measure (CA_3a) counts as accurate those receiving the correct benefit or who are certified for a lower level of benefits than they are entitled to. It is the percentage of free/reduced-price approved students who are not overcertified. Finally, the third measure of free and reduced-price meal accuracy (CA_4a) classifies as accurate any student who is certified for free or reduced-price meals even if they are overcertified but have income less than 185 percent FPL. This measure counts as accurate students in Group C in Table II.1, who are eligible for reduced-price meals but certified for free meals. It is the percentage of free and reduced-price approved students whose income is not over 185 percent FPL. While this set of measures does not cover all of the possible definitions of accuracy, it aims to cover a broad range of the possible definitions in order to identify whether the pilot projects may have affected accuracy for some students. The same set of measures is calculated including directly certified students (CA_1b – CA_4b).

Finally, for targeting efficiency, we present three measures using the three variants of the definition of accuracy for students approved for free and reduced-price meals (CTE_1a, CTE_2a, CTE_3a). Each measure of targeting efficiency differs from the corresponding measure of accuracy by including students paying full price in the numerator and students above 185 percent FPL in the denominator.

As is clear from Tables II.1 and II.2, measuring the outcomes of interest requires information on students' certification status and household income. We obtained information on certification status from the administrative data provided by districts—the lists of students in different certification categories.

Household income information was obtained from the telephone and in-home surveys, as described in Section A.3. The data collection process, however, resulted in some cases in which households failed to provide complete income information. If the household provided no information on their income, they were dropped from the analysis file and the sample weights were constructed to account for the fact that these households were nonrespondents with respect to household income. However, there were two situations in which respondents provided partial income. First, some respondents completed the telephone (part 1) interview, and provided information that their income was below 400 percent of poverty—thus making them a target for the in-home (part 2) interview—but failed to respond to the in-home interview. We refer to these as totally missing part 2 income. Second, other respondents completed both interviews, but failed to provide data on one or more items during the in-home interview necessary to calculate total household income. We refer to these cases as partially missing part 2 income.

Of our total sample of 3,685 students, part 1 interviews were completed for 3,020, of which 401 households reported income above 400 percent of poverty so that a part 2 interview was not attempted. Among the 2,619 students for whom part 2 interviews were attempted, interviews

were completed in 2,125 cases. Thus, 494 cases were totally missing part 2 income. Among part 2 respondents, 1,880 provided complete income information and 245 were partially missing part 2 income. We estimate that 5 percent of the cases released for interview were ineligible, usually because the child was no longer enrolled in the district. Therefore, the overall unweighted percentage of cases with a completed part 2 interview or a part 1 interview indicating income above 400 percent of poverty was 72 percent. The percentage with a part 1 interview was 86 percent.⁸

In cases with totally missing part 2 income (but with valid part 1 income) and in cases with partially missing part 2 income, we imputed total household income. The decision to impute income in these cases as opposed to dropping them from the analysis file was based on two factors. First, we had substantial—albeit not complete—information on household income for these cases, so that the imputed value of income was based to a large degree on actual income information reported by the households. Second, we felt that dropping these cases would potentially result in our estimates being biased if the households dropped from the analysis were different in key ways from households included in the analysis.

To impute household income when part 2 income was totally missing, we used information on the reported part 1 income of these households along with information on the relationship between part 1 and part 2 income provided by sample households with complete income information from both sources. In particular, we used the complete income information from this group of households to estimate a set of logistic regression models predicting households' part 2 income-eligibility category (free/RP/paid) based on reported part 1 income and other household characteristics. We used the parameters of this model along with the reported part 1

⁸See Chapter IV of Volume II.

income information and other household characteristics reported on the part 1 survey to impute the part 2 income-eligibility status of households that did not complete the part 2 interview.

For cases with partially missing part 2 income, we first identified what components of income were missing. Households with partially missing income information may have failed to report income from any of a number of different income sources brought into the household by any of a number of different household members. Once the missing source/household member was identified, we imputed its value based on typical values for that source and type of household member among respondents for whom we had valid data. Specifically, four imputation methods were used: (1) data edits, (2) median replacement, (3) Bernoulli random imputations, and (4) sequential hot-deck imputations. Once these missing sources were imputed for a given household, we combined their values with the valid part 2 income information they provided to generate an overall estimate on income (and income eligibility category) for that household.

For more details on the process by which we imputed household income for cases with partially or totally missing part 2 income, see Volume II, Chapter VIII. That chapter also contains the results of sensitivity analyses we conducted to assess the degree to which the specific imputations procedures we used influenced the estimated impacts on the key outcomes of interest in the analysis.

b. Methods for Obtaining Impact Estimates

We used regression methods to estimate how districts' mean levels of outcomes related to deterrence and barriers were influenced by the pilot demonstration.⁹ These regression methods

⁹ For additional details on the methods described in this section, see Volume II, Chapter IX.

allowed us to control for exogenous household- and student-level characteristics in estimating pilot impacts.

The general model used to estimate impacts on deterrence/barriers was:

$$(1) \quad y_i = c + X_i b + \sum_{j=2}^K d_j DP_{ij} + \sum_{k=1}^K a_k [DP_{ik} * P_i] + e_i$$

where: y_i = outcome of interest for student i

X_i = vector of characteristics of student i hypothesized to affect outcome y_i

DP_{ij} = binary indicator of whether student i was in the j th pilot-comparison district pair

P_i = binary indicator of whether student i was in a pilot district

e_i = random error term

The outcomes of interest for deterrence/barriers are shown in Table II.2. The model, which was estimated separately for Up-Front Documentation and Graduated Verification districts, was estimated using ordinary least squares (OLS). Essentially, the outcome was regressed on student characteristics, a set of binary variables (called *district pair* variables) that each represented a pilot district along with its matched comparison district, and a set of variables formed by interacting a district pair variable with a binary variable indicating whether the student's district was a pilot district. The coefficients on these interaction terms (a_1 through a_K , where K represents the number of pilot districts that implemented Up-Front Documentation or Graduated Verification) represent the impacts of the demonstration in each of the pilot districts. The mean value of these coefficients is our estimate of the overall impact of Up-Front Documentation or Graduated Verification on the outcome of interest.

To estimate impacts on outcomes related to deterrence, we based the estimation on samples of students ineligible for free meals or for free/reduced-price meals. To estimate impacts on

outcomes related to barriers, we used samples of students eligible for benefits, excluding directly certified students. We could not include directly certified students in the regression models because we did not collect survey data from these students and thus had no information on their characteristics.

To generate estimated impacts on measures of barriers among *all* eligible students (including those directly certified), we relied on the assumption that all directly certified students were eligible for free meals at the time the survey data were collected. By using this assumption, along with information on the proportion of students in each district who were directly certified, we translated our estimate of the impact of Up-Front Documentation or Graduated Verification on barriers among non-directly certified students into an estimate of this impact among all eligible students.¹⁰

Estimating impacts on accuracy and targeting efficiency proceeded differently from estimating impacts on deterrence/barriers. Measures of deterrence and barriers are defined according to the certification status of a sample of either eligible or ineligible students. Thus, impacts on these outcomes could be estimated using a regression model in which the dependent variable was the student's certification status and the explanatory variables included the pilot status of the student's district (along with various other variables). By contrast, measures of accuracy are defined according to the eligibility status—that is, the household income level—of a sample of certified students. We did not estimate a regression model in which income eligibility status (free eligible/RP eligible/not eligible) was a dependent variable and pilot status and other student characteristics were explanatory variables because this would have implied that

¹⁰We used a similar set of procedures to translate our estimates of impacts on accuracy and targeting efficiency among non-directly certified students to estimates on these outcomes among all groups of students that included those directly certified.

we believed that pilot status could potentially influence students' income level, and we did not believe this. Furthermore, the sample of such a regression would have been endogenous, since the pilot demonstration is hypothesized to influence students' certification status, and the regression model would not have produced unbiased estimates of the impact of Up-Front Documentation or Graduated Verification on accuracy.¹¹

To estimate impacts of Up-Front Documentation and Graduated Verification on accuracy and targeting efficiency, we used the results of the estimated impacts on deterrence and barriers, along with basic probability theory. In particular, the estimated impacts on deterrence and barriers reveal how the pilot interventions affected certification rates among ineligible students (deterrence) and among eligible students (barriers). To examine accuracy and targeting efficiency, we need to know how the pilots affected the proportion of certified students eligible for benefits (to address accuracy) and the proportion of all students with consistent certification and eligibility statuses (to address targeting efficiency). So long as we know the proportion of students eligible versus ineligible, we can derive the impact on eligibility among certified students based on the estimated impacts on certification among eligible and ineligible students. Volume II, Chapter IX shows precisely how these estimated impacts on accuracy and targeting efficiency have been derived.

5. Limitations of the Study

Like all studies, this one is subject to several limitations that should be clearly understood so that the findings are used appropriately. We note these here.

¹¹A similar set of problems with the targeting efficiency outcome measures prevented us from estimating targeting efficiency regression models.

a. Comparison Group Design

First, the impacts of the pilot projects on deterrence, barriers, and accuracy are measured by comparing the outcomes of families in the pilot districts with the outcomes of families in comparison districts. The identification of suitably matched comparison districts was done with great care, and we controlled statistically for a range of personal and family characteristics that could influence the outcomes. As shown in the next chapter, the comparison district matching process produced a set of comparison districts and a sample of families with characteristics similar to those of the pilot districts. However, while, in our judgment, these comparison districts provide a reasonable basis for measuring net impacts of the pilot interventions, there remains an element of uncertainty about the quality of the benchmark that we cannot quantify.

b. Sample Size Limitation

Second, as in most studies, resource constraints limited the size of the samples that it was possible to interview. For most outcomes, the study samples are of sufficient size to give us confidence that if the pilot projects caused an impact of a policy relevant magnitude—such as an impact of 20 to 30 percent of the mean outcome in comparison districts, our sample would provide a high likelihood of detecting the impact. However, for some variables, limits on sample sizes place an important constraint on our ability to detect significant demonstration effects. For example, in examining deterrence effects, while the sample can detect impacts of a small *absolute* magnitude, these impacts are fairly large in *relative* terms. In Up-Front Documentation pilots, our sample has an 80 percent chance of detecting an impact of two percentage points using a two-tailed test with a 95 percent confidence level (such as a reduction in the percentage of students certified among students with incomes exceeding 185 percent of the federal poverty

level from 4 percent to 2 percent). However, an impact of two percentage points would represent a reduction of 50 percent relative to the mean of the outcome in the comparison districts.

c. Issues of Generalizability

Third, the small number of demonstration sites and the voluntary nature of the decision to participate in the pilot projects necessarily limit our ability to draw conclusions about what would happen if the policies tested were to be implemented nationwide. Just nine districts included in the study implemented Up-Front Documentation and just three implemented Graduated Verification. Furthermore, these districts were part of a very small group nationwide that volunteered to test new procedures designed to improve the accuracy of the process for administering NSLP certification. We document in Chapter III how these districts as a group compare with the nation as a whole in terms of some readily observable characteristics of the districts. However, one can only speculate on how these districts differed from others nationwide in terms of unobservable characteristics that are likely to affect the outcomes of interest in the evaluation.

B. IMPLEMENTATION OF THE PILOT PROJECTS AND THE EVALUATION

In January 2000, FNS published a *Federal Register* notice inviting SFAs to participate in one of four pilot projects that could operate for the three-school-year period from fall 2000 to spring 2003 (*Federal Register*, January 21, 2000). In response to the request for applications, at the start of school year 2000-2001, 10 SFAs began operating the Up-Front Documentation Model, 4 began operating the Graduated Verification Model, and 7 began operating the Verify Direct Certification Model (Table II.3). Two additional SFAs responded later and began operating the Up-Front Documentation Model at the start of school year 2001-2002. Thus, a total of 12 SFAs operated the Up-Front Documentation Model.

TABLE II.3

DISTRICTS PARTICIPATING IN THE NSLP APPLICATION/VERIFICATION PILOT PROJECTS

Project District	Still Operating Pilot as of Fall 2002	Included in Study	Reason for Exclusion
Up-Front Documentation Districts			
Glenview, IL	Yes	No	District had been doing 100 percent verification for several years
Kismet, KS	No	No	Dropped out after year 1
Morenci, AZ	Yes	No	No match possible
Blue Ridge, PA	Yes	Yes	
East Stroudsburg, PA	Yes	Yes	
Pleasant Valley, PA	Yes	Yes	
Stroudsburg, PA	Yes	Yes	
Maplewood, OH	Yes	Yes	
Salem, OH	Yes	Yes	
Creve Coeur, IL	Yes	Yes	
Oak Park, IL	Yes	Yes	
Williamson, TN	Yes	Yes	
Graduated Verification Districts			
Dilworth-Glyndon-Felton, MN	Yes	Yes	
Dunkirk City, NY	Yes	Yes	
Grandview, MO	No	Yes	District withdrew from pilot after year 2 but remained in evaluation
St. Mary's, Paterson, NJ	Yes	No	District not included in evaluation due to implementation difficulties
Verify Direct Certification Districts			
Alma, MI	Yes	No	Evidence in "National School Lunch Program Application/ Verification Pilot Project: Report on First Year Experience" indicated high rate of certification accuracy among directly certified students
Bessemer, AL	Yes	No	
Blount County, TN	Yes	No	
East Baton Rouge, LA	Yes	No	
Kenai Peninsula, AK	Yes	No	
Middlebury, IN	Yes	No	
Perry County, AL	Yes	No	

Of these three models, the Verify Direct Certification Model was excluded from the evaluation. Under this model, students who were approved through direct certification were subject to the standard verification procedures similar to those used with households approved on the basis of an application. Analysis of the first-year experience of these seven SFAs showed that very few directly certified students become ineligible later in the same school year. On the basis of this finding, FNS decided not to include the Verify Direct Certification pilots in the evaluation reported herein.¹²

Nine of the 12 SFAs that tested Up-Front Documentation and 3 of the 4 that tested Graduated Verification are included in the evaluation described in this report. Reasons for excluding districts that operated the demonstration were diverse. Morenci, Arizona, was excluded because we could not identify a credible comparison district. St. Mary's, Paterson, New Jersey, was excluded because it had experienced difficulty implementing the pilot procedures, and therefore would not have provided a valid test of pilot procedure impacts. Glenview, Illinois, was excluded because it had been verifying all cases soon after application for approximately 20 years. Kismet, Kansas, was excluded because it stopped using demonstration procedures after one year of operation.

This evaluation analyzes program operations and impacts in 12 of the pilot SFAs during a specific period—the third and final year of the planned implementation period, school year 2002-2003. Table II.4 shows the history of pilot project implementation in these 12 SFAs, as well as which districts used direct certification during which years before and during the pilot implementation period. Students certified for free meals by direct certification are specifically not subject to the demonstration procedures. Furthermore, as noted above, these directly

¹²See U.S. Department of Agriculture 2002.

TABLE II.4

PERIOD OF OPERATION OF THE NSLP APPLICATION VERIFICATION PILOT PROJECTS AND
USE OF DIRECT CERTIFICATION BY PILOT SFAs INCLUDED IN THE EVALUATION

	Operated Pilot Project				School Year				Used Direct Certification			
	1998– 1999	1999– 2000	2000– 2001	2001– 2002	2002– 2003	1998– 1999	1999– 2000	2000– 2001	2001– 2002	2002– 2003		
Up-Front Documentation Districts												
Blue Ridge, PA	No	No	Yes	Yes	Yes	No	Yes	Yes	No	No		
East Stroudsburg, PA	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Pleasant Valley, PA	No	No	No	Yes	Yes	dk	Yes	Yes	Yes	Yes		
Stroudsburg, PA	No	No	No	Yes	Yes	dk	Yes	Yes	Yes	No		
Maplewood, OH	No	No	Yes	Yes	Yes	Yes	Yes	No	No	No		
Salem, OH	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No		
Creve Coeur, IL	No	No	Yes	Yes	Yes	No	No	No	No	Yes		
Oak Park, IL	No	No	Yes	Yes	Yes	No	No	No	No	Yes		
Williamson, TN	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Graduated Verification Districts												
Dilworth-Glyndon-Felton, MN	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Rounds of Verification			3	2	dk							
Dunkirk City, NY	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Rounds of Verification			1	3	2							
Grandview, MO	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes		
Rounds of Verification			3	3	1							

dk = unknown.

certified students have been excluded from the study's student- and family-level data collection and much of the analysis. However, a district's decision whether or not to use direct certification could have affected the average characteristics of students who are included in the study's population of interest. Three SFAs in the evaluation stopped using direct certification and two started using it during the course of the pilot project (Table II.4).

Several special situations are relevant to understanding and assessing the evaluation findings. First, as shown in Table II.4, two Up-Front Documentation SFAs included in the study (Pleasant Valley and Stroudsburg, Pennsylvania) began pilot operations in 2001-2002 and were operating the demonstration for their second year, rather than their third year, when the evaluation was conducted. Second, one Graduated Verification SFA included in the evaluation (Grandview, Missouri) did not operate under the pilot rules during the third pilot year. Grandview withdrew from the pilot project as of June 30, 2002, because, according to the superintendent, pilot operation had reduced the number of Grandview students approved for free and reduced-price meals in the first two pilot years, which had adversely affected the district's receipt of state funding to an unacceptable degree.¹³

With support of Grandview district officials, we decided to keep Grandview in the study. Because the extensive verifications done in the two prior years of full pilot operations and implementation of the requirement that households terminated provide documentation when applying in the next school year, we judged that whatever deterrent and barrier effects the pilot had would have been observed in school year 2002-2003. However, some families could have been affected by the district's decision to withdraw from the pilot, because Grandview did not

¹³Personal communication from Paul Strasberg regarding letter from Grandview Superintendent John Martin to Paul Strasberg, April 2002.

require families whose students' benefits were reduced or terminated in school year 2001-2002 to provide documentation of their income when applying in school year 2002-2003, as the pilot protocol intended.

A third group of special situations that affects interpretation of the findings is coverage of the district. In most pilot and comparison sites, the entire district is part of the study, but there are two exceptions. In one pilot site—Williamson County, Tennessee—the pilot project operated in 9 of the 29 schools in the district; it did not operate in the other 20 schools. However, the corresponding comparison site—Wilson County, Tennessee—includes the entire school district.¹⁴ In one pilot comparison pair—Oak Park pilot site and its comparison, Valley View—the pilot site is a single-school high school district, while the comparison site is one high school within a much larger district. Accordingly, in this site pair we were unable to achieve full comparability in this key feature of the administrative setting.

¹⁴We decided to include the entire district because we lacked school-level data with which to match a subset of the Wilson County schools to the Williamson pilot schools.

III. CHARACTERISTICS OF THE PILOT AND COMPARISON DISTRICTS

One objective of this study is to describe the characteristics of the students, families, and districts included in the evaluation. This descriptive analysis addressed two groups of questions: (1) What do the demonstration districts and their populations look like and how do they compare with the nation as a whole? and (2) Do the comparison districts provide a credible benchmark for the pilots?¹ To address these questions, we used individual-level interview data on the families in our sample and district-level data available from the National Center for Education Statistics (NCES), the U.S. Census Current Population Survey (CPS), and FNS.

We first describe the characteristics of the Up-Front Documentation and Graduated Verification pilot districts and compare them to the nation as a whole. We then present the pre-pilot differences between the pilot and comparison districts. Finally, we discuss differences between the pilot and comparison district students and families in our sample.

A. CHARACTERISTICS OF THE PILOT DISTRICTS

SFAs in the pilot districts volunteered to participate in the NSLP Application/Verification Pilot Projects. Since pilots were not specifically selected to be representative of the nation as a whole, the pilot sites may differ in some ways from the average public school district nationally. Table III.1 shows selected characteristics of the Up-Front Documentation and Graduated Verification pilot districts and all public school districts nationwide. This table and the discussion in this section are based on pre-pilot data, specifically the NCES Common Core of Data (CCD) from the 1999-2000 school year and 1999 poverty data from the CPS.

¹Volume II of this report addresses a third related issue, the comparison of survey respondents to nonrespondents to assess whether the sample successfully interviewed is similar to the sample selected.

TABLE III.1

PRE-PILOT CHARACTERISTICS OF UP-FRONT DOCUMENTATION AND GRADUATED
VERIFICATION PILOT DISTRICTS

Characteristics	Pilot Districts ^a		Nationwide Districts
	Up-Front Documentation	Graduated Verification	
Region			
Northeast	0.0	33.3	14.2
Mid-Atlantic	44.4	0.0	9.7
Midwest	44.4	33.3	23.2
Mountain Plains	0.0	33.3	19.5
Southeast	11.1	0.0	7.0
Southwest	0.0	0.0	13.4
West	0.0	0.0	13.1
Urbanicity			
Central Cities	0.0	0.0	8.2
Non-Central City Areas within MSAs	66.7	100.0	40.7
Non-MSAs	33.3	0.0	51.1
District Size ^b			
Number of schools (mean)	7.6	6.7	5.6
Number of students (mean)	4,874.7	2,612.3	2,925.1
Student Enrollments (Percentages)			
0 to 500	0.0	0.0	38.3
500 to 1,000	11.1	0.0	15.5
1,000 to 2,500	22.2	66.7	21.8
2,500 to 5,000	33.3	33.3	12.9
5,000 to 10,000	22.2	0.0	6.4
10,000 to 25,000	11.1	0.0	3.6
25,000+	0.0	0.0	1.5
Title I Eligible Schools (Percentage) ^c	40.6	57.8	54.8
Schoolwide Title I Schools (Percentage) ^c	0.0	6.7	18.7
NSLP Certification Status (Percentages) ^c			
Free	16.6	33.3	25.7
Reduced-price	6.2	9.0	7.7
Percentage of School-Age Children Below 100 Percent of FPL in 1997 ^d	10.4	19.4	17.0
Percentage of School-Age Children Below 100 Percent of FPL in 1999 ^d	9.3	22.4	14.6
Race/Ethnicity (Percentages) ^c			
White, non-Hispanic	88.4	65.8	79.4
Black, non-Hispanic	6.9	18.3	8.8
Hispanic	3.4	14.1	8.3
Native American	0.2	1.3	2.8
Asian, Pacific Islander	1.1	0.5	1.6
Limited English Proficiency (Percentage) ^c	0.2	5.5	4.0
Sample Size	9	3	16,887

TABLE III.1 (*continued*)

Source: 1999 Poverty data from the 2000 Census; all other data from the NCES Common Core of Data (1999-2000 school year).

Note: Each district is weighted equally in each column of this table, thus the characteristics presented are representative of the average district, not the average student.

^aCharacteristics are presented for the subset of pilot districts included in this evaluation. Morenci, Glenview, and St. Mary's are excluded.

^bIncludes all schools and students in the district, regardless of pilot participation. Only 9 of the 29 schools in Williamson participated in the pilot.

^cData not available for all sites: race and Title 1 information was missing for one Up-Front Documentation district, certification data were missing for two districts, and limited English proficiency data were missing for five districts. Complete data were available for all Graduated Verification sites.

^dPercentage of children ages 5 to 17 with household income below 100 percent of the federal poverty level. This is a lower threshold than is used to determine eligibility for free NSLP meals.

The pilot sites in our study were concentrated in the Midwest and Mid-Atlantic states. Four were in Pennsylvania, two in Illinois, and two in Ohio; Minnesota, Missouri, New York, and Tennessee each contained one pilot study site. Both Up-Front Documentation and Graduated Verification pilot sites were disproportionately located in non-central city locations within metropolitan areas, compared with public school districts nationwide.

Up-Front Documentation pilots were also somewhat larger than districts nationally, but no very large districts were represented in the demonstration. Pilot districts included more schools (7.6, on average, compared to 5.6 nationwide) and more students (almost 4,900, compared to a national average of about 2,900). Most pilot districts served between 1,000 and 10,000 students, while more than half of public school districts across the country included fewer than 1,000 students. Only one of the pilot districts contained more than 10,000 students, and none contained more than 25,000.² While fewer than 2 percent of public school districts nationally included more than 25,000 students, these very large districts enrolled about one-third of all public school students nationally.

Up-Front Documentation districts had lower poverty rates among school-age children than all districts nationwide (9 percent, on average, compared to 15 percent), and the pilots included fewer Title I schools.³ Correspondingly, a smaller percentage of students in Up-Front Documentation pilot districts were certified to receive free or reduced-price meals in the pre-pilot period than in the country as a whole (23 percent, compared to 33 percent).

²The largest Up-Front Documentation pilot district, Williamson, contained just over 20,000 students, but only 9 of the 29 schools in that district participated in the demonstration.

³Title I is a federal program to assist economically and educationally disadvantaged students to achieve academically at the same level as their peers. Schools are eligible to receive Title I funding based on the level of poverty among the students served. In schoolwide Title I schools,

Finally, Up-Front Documentation pilot districts served lower proportions of minority students and students with limited English proficiency (LEP) than the national average. For example, only 3 percent of students in pilot districts were Hispanic, compared to 8 percent in other districts.

Graduated Verification pilot districts were more similar to the nation as a whole in several respects. For example, with 6.7 schools and about 2,600 students in the average Graduated Verification pilot, they were closer than Up-Front Documentation districts to the national average in size. Again, however, the very largest public school districts were not represented in the Graduated Verification pilot districts, the largest of which enrolled only about 4,200 students.

Several indicators suggest that Graduated Verification districts were somewhat less affluent than the typical district nationally. Their percentage of school-age children in families with income below 100 percent of the federal poverty level (22 percent) was higher than the national average. Graduated Verification districts also had higher-than-average rates of NSLP certification (33 percent certified free and 9 percent reduced-price), and somewhat higher percentages of Title I eligible schools (58 percent). In addition, they included higher-than-average proportions of African American and Hispanic students and LEP students.

The voluntary nature of participation in the demonstration and the small number of pilot sites, by themselves, limit our ability to draw conclusions from the demonstrations about the likely effects of wider implementation of the pilot procedures. The differences noted here underscore the need for caution in applying the findings from the pilots to the national program.

(continued)

Title I funds can be used for all students. In other schools, Title I funds can be used only for students who meet certain eligibility criteria.

B. COMPARING PILOT AND COMPARISON DISTRICTS DURING THE PRE-PILOT PERIOD

The characteristics of Up-Front Documentation comparison districts matched those of the corresponding pilots closely.⁴ The Graduated Verification comparison districts differed a bit more from their pilots, but were nevertheless generally similar. Table III.2 shows selected characteristics of the Up-Front Documentation and Graduated Verification pilot and comparison districts during the pre-pilot period. For most of the characteristics included in this table and discussed in this section, data on the year just before the pilot began were available in summer 2002 and used in selecting comparison sites.⁵ However, the most recent CPS poverty data available at the time of comparison site selection covered 1997, so for that characteristic we present both 1997 data (to assess the quality of the matching process) and 1999 data (to compare baseline characteristics).

In Up-Front Documentation comparison districts, the average number of schools and students, the poverty rates among school-age children, and the race/ethnicity of students were all quite similar to those characteristics in the pilot districts.⁶ The percentages of students certified

⁴Our comparison site selection process is summarized in Chapter II and described in detail in Volume II, Chapter II.

⁵Specifically, the data sources used in selecting comparison sites were 1999 enrollment and NSLP certification and participation data from the FNS Minimum Data Set, 1997 poverty data from the CPS, and remaining data from the NCES CCD on the 1999-2000 school year. Chapter X of Volume II presents more recent data and discusses how pilot and comparison sites changed over time.

⁶Although the poverty rates among school-age children in pilot and comparison districts were similar in both 1997 and 1999, they were closer in 1997. The poverty rate declined between 1997 and 1999 in both pilot and comparison districts, but the reduction was somewhat greater in pilots, resulting in a slightly larger gap between pilots and comparisons than was observed at the time of comparison site selection.

TABLE III.2

PRE-PILOT CHARACTERISTICS OF UP-FRONT DOCUMENTATION AND
GRADUATED VERIFICATION PILOT AND COMPARISON DISTRICTS

Characteristics	Up-Front Documentation			Graduated Verification		
	Pilot Districts	Comparison Districts	Difference	Pilot Districts	Comparison Districts	Difference
District Size						
Number of schools (mean) ^a	7.6	7.0	0.6	6.7	9.5	-2.8
Number of students (mean) ^a	4,874.7	5,012.4	-137.7	2,612.3	4,575.2	-1,962.9
Student Enrollments (Percentage) ^a						
0 to 500	0.0	0.0	0.0	0.0	0.0	0.0
500 to 1,000	11.1	11.1	0.0	0.0	33.3	-33.3
1,000 to 2,500	22.2	33.3	-11.1	66.7	0.0	66.7
2,500 to 5,000	33.3	22.2	11.1	33.3	0.0	-33.3
5,000 to 10,000	22.2	11.1	11.1	0.0	66.7	66.7
10,000 to 25,000	11.1	22.2	-11.1	0.0	0.0	0.0
25,000+	0.0	0.0	0.0	0.0	0.0	0.0
Title I Eligible Schools (Percentage) ^b	40.6	45.1	-4.5	57.8	73.2	-15.4
Schoolwide Title I Schools (Percentage) ^b	0.0	6.3	-6.3	6.7	22.5	-15.8
NSLP Certification Status (Percentage)						
Free	16.5	16.5	0.0	34.9	32.2	2.7
Reduced-price	5.9	5.9	0.0	9.6	9.6	0.0
NSLP Participation (Percentages) ^b						
Average Daily Participation Rate						
Among all students	42.9	45.8	-2.9	66.2	60.8	5.4
Among students certified free	74.5	76.1	-1.6	80.8	78.2	2.6
Among students certified reduced-price	70.8	72.0	-1.2	69.5	73.3	-3.8
Among students not certified	35.8	36.6	-0.8	56.1	47.6	8.5
Percentage of School-Age Children Below 100 Percent of FPL in 1997 ^c	10.4	10.3	0.1	19.4	18.8	0.6
Percentage of School-Age Children Below 100 Percent of FPL in 1999 ^c	9.3	9.9	-0.6	22.4	16.4	6.0
Race/Ethnicity (Percentages) ^b						
White, non-Hispanic	88.4	88.7	-0.3	65.8	70.6	-4.8
Black, non-Hispanic	6.9	6.9	0.0	18.3	24.0	-5.7
Hispanic	3.4	3.0	0.4	14.1	4.0	10.1
Native American	0.2	0.0	0.2	1.3	0.9	0.4
Asian, Pacific Islander	1.1	1.3	-0.2	0.5	0.6	-0.1
Limited English Proficiency (Percentage) ^b	0.2	0.9	-0.7	5.5	1.4	4.1
Sample Size^d	9	9		3	3	

Source: NCES Common Core of Data (1999–2000 school year); 1999 FNS Minimum Data Set; 2000 Census.

Note: Each district is weighted equally in each column of this table; thus, the characteristics presented are representative of the average district, not the average student.

^aIncludes all students and schools in the district, regardless of pilot participation.

^bData not available for all sites: race and Title 1 information was missing for one Up-Front Documentation pilot/comparison pair, limited English proficiency data were missing for five pilot/comparison pairs, and NSLP participation data were missing for six pairs. Complete data were available for all Graduated Verification sites.

^cPercentage of children ages 5 to 17 with household income below 100 percent of the federal poverty level. This is a lower threshold than is used to determine eligibility for free NSLP meals.

^dAlthough two comparison districts, Breckenridge and Lake Park Audubon, were selected for the pilot district Dilworth-Glyndon-Felton, Minnesota, the comparison districts were treated as a single district as the comparison observation in the analysis. The simple mean of the relevant variables is used in computing the comparison.

to receive free and reduced-price meals were almost identical. The NSLP participation rates were also similar, although slightly lower in pilot districts. One difference was that Up-Front Documentation pilots had lower proportions of Title I schools than comparisons (41 percent Title I eligible schools, compared to 45 percent, and 0 percent schoolwide Title I schools, compared to 6 percent).

Because the evaluation included only three Graduated Verification districts (compared with nine Up-Front Documentation districts), there was less chance for differences between each Graduated Verification pilot district and its comparison to be offset by a difference in the opposite direction in another pilot-comparison district pair. Thus, somewhat larger differences existed in the baseline characteristics of Graduated Verification pilot and comparison districts, as compared with Up-Front Documentation pilot and comparison districts. However, the overall characteristics of Graduated Verification pilot districts—particularly the baseline rates of free and reduced-price meal certification—were still quite similar to those of comparison districts.

Relative to their comparison districts, Graduated Verification pilot districts had fewer schools (6.7, compared to 9.5) and lower average enrollment (about 2,600 students, compared to 4,600). The 1997 data available at the time of comparison site selection showed similar rates of poverty among school-age children in pilot and comparison districts (about 19 percent). However, the gap in child poverty rates widened from 1997 to 1999, as the percentage of children in poverty in pilot districts rose to 22 percent while the rate in comparison districts fell to 16 percent. Pilots included lower proportions of Title I eligible schools (58 percent, compared to 73 percent) and included higher proportions of Hispanic students (14 percent, compared to

4 percent).⁷ Graduated Verification pilots had higher rates of participation in the NSLP than their comparison sites, especially among students not certified (56 percent, compared to 48 percent).

C. DIFFERENCES IN THE CHARACTERISTICS OF STUDENT FAMILIES IN THE PILOT AND COMPARISON SAMPLES

Once the comparison sites were chosen, we selected a stratified sample of students from each pilot and comparison district.⁸ The sample included students approved for free meals by application, students approved for reduced-price meals by application, and students not certified for free or reduced-price meals. Students directly certified for free meals were specifically excluded from the sample. This group was excluded because the demonstration was expected to have no effect on them, since directly certified students were not subject to the NSLP application and verification procedures that were being modified in the pilots. However, their exclusion renders the sample not representative of the district population as a whole (the population described in Tables III.1 and III.2), since directly certified students are predominantly on the lower tail of the income distribution and may comprise a sizable portion of the lower tail.⁹ The

⁷When we selected comparison districts for the Graduated Verification pilot sites, we were aware that we would be unable to select a comparison district for Dunkirk, New York, that matched well in terms of the percentage of Hispanic students, since the percentage of Hispanic students in Dunkirk is much higher than in neighboring districts. After selecting Jamestown, New York, as a comparison district however, we employed a sampling strategy in which Hispanic students were oversampled. As a result, the difference in the percentage of Hispanic students among sample members in pilot and comparison districts (11.5 percent in pilot districts versus 8.6 percent in comparison districts) was smaller and not statistically significant.

⁸Chapter III of Volume II describes the sample selection process in detail.

⁹Districts can directly certify students who are receiving cash public assistance or food stamps. Use of direct certification among all of districts in school year 2002-2003 is shown in Table II.4. Comparison districts matched their pilot district in using or not using direct certification, except in Blue Ridge, Pennsylvania (which did not use direct certification) and Montrose, Pennsylvania (which used direct certification).

TABLE III.3

CHARACTERISTICS OF SAMPLE MEMBERS IN UP-FRONT DOCUMENTATION AND
GRADUATED VERIFICATION PILOT AND COMPARISON DISTRICTS

Characteristics	Up-Front Documentation			Graduated Verification		
	Pilot Districts	Comparison Districts	Difference (Standard Error)	Pilot Districts	Comparison Districts	Difference (Standard Error)
Household Size						
Number of household members (mean)	4.2	4.3	-0.12 (0.06)	4.3	4.5	-0.17 (0.10)
Number of children in household (mean)	2.2	2.3	-0.08 (0.05)	2.4	2.5	-0.09 (0.09)
Household Structure (Percentages)						
Two-parent household	75.3	77.8	-2.57 (2.03)	67.3	71.2	-3.87 (3.30)
Single-parent household	23.5	20.8	2.71 (1.99)	31.8	26.4	5.36 (3.27)
Other household structure	1.2	1.4	-0.14 (0.57)	0.9	2.4	-1.49* (0.73)
Survey Respondent's Educational Attainment (Percentages)						
Lacks a high school diploma	7.0	10.1	-3.19* (1.33)	13.0	11.8	1.17 (2.36)
High school diploma only	41.1	41.1	0.09 (2.45)	29.8	33.4	-3.66 (3.43)
Some postsecondary education but lacks a college degree	26.9	30.3	-3.36 (2.32)	39.4	40.7	-1.27 (3.68)
College degree or more	25.0	18.6	6.47** (2.05)	17.9	14.1	3.75 (3.00)
Employment Status of Household Members						
Survey respondent is employed (percentage)	70.8	74.2	-3.37 (2.24)	77.3	73.8	3.52 (3.04)
Number of employed adults in household (mean)	1.5	1.6	-0.13** (0.04)	1.5	1.5	0.05 (0.06)
Household Income (Percentages)						
Less than 130 percent of FPL ^a	19.9	21.0	-1.04 (1.70)	29.5	29.1	0.41 (2.88)
131 to 185 percent of FPL	12.4	13.2	-0.79 (1.62)	15.9	14.3	1.56 (2.54)
186 to 400 percent of FPL	35.2	41.4	-6.26* (2.44)	35.8	38.9	-3.15 (3.62)

TABLE III.3 (continued)

Characteristics	Up-Front Documentation			Graduated Verification		
	Pilot Districts	Comparison Districts	Difference (Standard Error)	Pilot Districts	Comparison Districts	Difference (Standard Error)
More than 400 percent of FPL	32.5	24.4	8.09** (2.27)	18.8	17.6	1.18 (3.12)
NSLP Eligibility						
Eligible for free meals	19.9	21.0	1.04 (1.70)	29.5	29.1	0.41 (2.88)
Eligible for free meals or reduced-price meals	32.3	34.2	-1.83 (2.36)	45.4	43.4	1.97 (3.62)
Not eligible for free meals	80.1	79.0	1.04 (1.70)	70.5	70.9	-0.41 (2.88)
Not eligible for free meals or reduced-price meals	67.7	65.8	1.83 (2.36)	54.6	56.6	-1.97 (3.62)
Percentage Receiving Public Assistance						
Percentage receiving food stamp benefits	6.9	6.9	-0.03 (1.06)	13.8	13.2	0.67 (2.27)
Percentage receiving TANF	1.3	1.6	-0.34 (0.57)	5.4	5.9	-0.54 (1.68)
Percentage receiving other benefits ^b	13.1	9.4	3.72 (1.98)	12.0	13.5	-1.44 (2.44)
Percentage Residing in Public Housing or Receiving Housing Subsidy	2.5	2.2	0.37 (0.65)	8.0	6.9	1.04 (1.62)
Percentage Who Own Their Home	77.3	76.1	1.23 (1.98)	65.1	67.2	-2.08 (3.24)
Vehicle Ownership (Percentage)	86.0	88.3	-2.28 (1.90)	82.6	83.5	-0.87 (3.04)
Number of Vehicles Owned by All Household Members (Mean)	1.8	1.8	-0.07 (0.06)	1.6	1.6	-0.02 (0.09)
Household Mobility						
Number of Times Respondent Has Moved During Past Two Years (Means)	0.3	0.2	0.03 (0.03)	0.3	0.3	0.01 (0.05)
Has Moved and Changed School Districts During Past Two Years (Percentage)	10.9	9.3	1.57 (1.51)	10.5	8.5	1.96 (1.97)
Race/Ethnicity (Percentages)						
White, non-Hispanic	83.4	84.5	-1.10 (1.71)	63.3	58.5	4.83 (3.13)
Black, non-Hispanic	6.7	6.1	0.68 (1.18)	18.8	24.0	-5.22* (2.27)
Hispanic	2.0	2.8	-0.80 (.069)	11.5	8.6	2.91 (2.33)
Native American	0.7	0.2	0.50 (0.35)	0.5	0.2	0.33 (0.29)

TABLE III.3 (continued)

Characteristics	Up-Front Documentation			Graduated Verification		
	Pilot Districts	Comparison Districts	Difference (Standard Error)	Pilot Districts	Comparison Districts	Difference (Standard Error)
Asian, Pacific Islander	0.4	1.2	-0.85 (0.44)	0.3	0.5	-0.19 (0.39)
Other	2.7	2.2	0.44 (0.78)	0.3	2.0	-1.67* (0.73)
Mixed race	4.2	3.1	1.13 (0.96)	5.4	6.3	-0.98 (1.97)
English Primary Language Spoken at Home (Percentage)	97.3	97.1	0.18 (0.80)	92.9	90.5	2.43 (2.21)
Grade Level of Child (Percentages)						
Grade 9 to 12	37.6	34.4	3.20 (2.17)	29.9	28.4	1.53 (3.46)
Grade 6 to 8	20.7	25.0	-4.29* (2.06)	28.0	23.5	4.49 (3.42)
Grade 3 to 5	20.9	22.6	-1.61 (2.06)	22.2	20.9	1.27 (2.86)
Grade 1 to 2	14.1	12.2	1.92 (1.70)	12.7	16.7	-4.01 (2.72)
Kindergarten or Pre-K	6.1	5.8	0.35 (1.20)	7.0	10.4	-3.43 (2.27)
Pre-Pilot Free or Reduced-Price Certification Status (Percentage) ^c	24.1	21.6	2.89 (2.08)	38.2	39.3	-1.14 (3.94)
Sample Size	950	988		530	535	

Note: Each district is weighted equally in this table. Within districts, households are weighted to adjust for nonresponse.

^a The lowest income category (less than 130% of FPL) includes families categorically eligible for free meals (based on receipt of TANF or food stamps or foster child status), regardless of their actual income.

^b Other benefits include Social Security, Unemployment Insurance, general assistance, housing assistance, or other public assistance.

^c Students in grades K-2 were excluded from this calculation, since must would not have been enrolled in school, and thus not had access to the NSLP, at baseline. Sample sizes for this statistic are 674 Up-Front Documentation pilot households, 744 Up-Front Documentation comparison households, 387 Graduated Verification pilot households, and 357 Graduated Verification comparison households.

FPL = federal poverty level.

*Significantly different from zero at the .05 level.

**Significantly different from zero at the .01 level.

rest of this chapter focuses on the students in this sample and their families, using data collected through interviews with households.

The characteristics of sampled families in the pilot and comparison sites were generally similar. Table III.3 shows key characteristics based on survey data. Many characteristics, including pre-pilot NSLP certification rates, home and vehicle ownership, household mobility, and primary language spoken at home, did not differ significantly between families in pilot and comparison sites. However, there were some differences between pilot and comparison districts. These differences are described below, separately for Up-Front Documentation and Graduated Verification districts.

Up-Front Documentation

Sample members in Up-Front Documentation pilots tended to have higher education levels than those in comparison families. More pilot district parents had a college degree or more (25 percent, compared to 19 percent of comparisons), and fewer lacked a high school diploma (7 percent, compared to 10 percent of comparisons). In addition, households in Up-Front Documentation pilot districts tended to have higher incomes, despite including fewer working adults on average (1.5, compared to 1.6). Pilot district households were more likely to have incomes above 400 percent of poverty (33 percent, compared to 24 percent), although the proportion below 185 percent of poverty was quite similar (32 percent, compared to 34 percent). This result was driven primarily by two very-high-income pilot sites: Oak Park and Williamson.

Differences in the pre-pilot certification status of sample members in Up-Front Documentation pilot and comparison districts were not statistically significant, although a

slightly higher percentage in the pilot districts were certified in the pre-pilot year (24 percent, compared to 22 percent).¹⁰

Graduated Verification

The Graduated Verification pilot districts and their comparisons districts were similar in terms of household size, educational attainment of the survey respondent, employment status, income distribution, and most other characteristics considered. However, Graduated Verification pilot district households were less likely to have a household structure other than one-parent or two-parent household (0.9 percent, compared to 2.4 percent) and were more likely to be single-parent households (32 percent, compared to 26 percent) than comparisons (although the latter difference is only statistically significant at the 10 percent level). Fewer students in pilot districts were African American (19 percent, compared to 24 percent of comparisons), although these racial differences were due to differences in one pilot/comparison site pair.

The pre-pilot free or reduced-price certification rates of students in Graduated Verification pilot and comparisons sites were nearly identical, at 38 percent in pilot districts and 37 percent in comparison districts.¹¹ This difference was not statistically significant.

D. SUMMARY

In summary, we believe the comparison site selection process produced a set of comparison districts whose characteristics matched those of the pilot districts fairly closely. Although the differences are small, the interview data indicate that some pilot-comparison district differences

¹⁰Students in grades K-2 were excluded from this calculation, since most would not have been enrolled in school and thus would not have had access to the NSLP at baseline.

¹¹Our sample excludes students directly certified at the time of the survey. However, students who were not directly certified at that time (and thus are included in our sample) may have been directly certified in the pre-pilot period.

exist, which could influence the outcomes whose impacts we are measuring. Thus it is important to control statistically for those individual-level differences in estimating the impacts of the pilot projects. Accordingly, the impacts presented in Chapter IV are based on statistical models that have controlled carefully for pilot-comparison group differences other than the pilot intervention itself. Overall, we believe the comparison district samples provide a reasonable basis for estimating the demonstration impacts.

IV. IMPACTS OF THE PILOT PROJECTS

Estimating the impacts of Up-Front Documentation and Graduated Verification as implemented in the pilot districts was a major goal of the evaluation. This chapter presents estimates of the impacts of the pilot projects on a range of outcomes. These estimates will address the pilot projects' influence on deterrence, barriers, accuracy, and targeting efficiency.

Two key questions this chapter addresses are (1) whether the pilot projects deterred ineligible students from becoming certified, and (2) whether the projects raised barriers to certification among eligible students. Accordingly, the primary analyses will involve estimating impacts on *deterrence* and *barriers*. However, there are other aspects of the effects of the pilots on certification among eligible and ineligible students, aspects related to broader measures of how the intervention affected the program's overall success in providing benefits to eligible students and not to ineligible ones. In examining impacts on *accuracy*, for example, we measured how the pilots affected the percentage of certified students eligible for the benefits they are receiving. *Targeting efficiency* accounts for the extent to which (1) certified students are eligible for benefits, and (2) eligible students are certified.

We estimated program impacts using a nonexperimental, comparison group approach as described in Chapter II and Volume II of this report. In particular, we carefully selected a set of districts to serve as comparisons to the pilot districts, and selected samples of students from both pilot and comparison districts. We then used survey and administrative data collected for these students to determine their certification status, eligibility for free or reduced-price meals, and other household characteristics. To determine the impact of the pilots on outcomes of interest, we compared mean values of the outcomes among students in pilot districts with those of

students in comparison districts, while controlling for other relevant household characteristics in a regression framework.

One aspect of the sampling strategy affects the interpretation of results and should be noted. The student samples excluded students who were directly certified for free meals by the district and included only students who were certified by application or who were not certified. The rationale for excluding directly certified students was that the Up-Front Documentation and Graduated Verification interventions altered the procedure under which students applied for free or reduced-price meals and under which the districts processed the applications and conducted the verification. Since directly certified students were not required to complete an application to become certified, the pilot interventions presumably did not influence their behavior. Thus, the main results presented in this chapter are representative only of those students who were not directly certified.

A limitation of this sampling strategy is that comparison districts were selected on the basis of being similar to pilot districts in terms of their overall student characteristics rather than the characteristics of only non-directly certified students. Thus, to the extent that pilot and comparison districts differed in the proportion of their students who were directly certified, their non-directly certified student populations could have had different characteristics even if their overall student populations were similar. To minimize problems caused by this limitation, we attempted to select comparison districts that were similar to pilot districts in their direct certification status.¹ In addition, for selected results presented in the chapter, it was possible to

¹Overall, we were fairly successful in selecting comparison districts that were similar to pilot districts with respect to direct certification. Among all districts in the evaluation, 11 of the 12 sets of pilot-comparison pairs matched in terms of their 2002-2003 direct certification status. Only the pilot district Blue Ridge, which did not use direct certification, did not match its comparison district, Montrose, which did use direct certification. Also, among district pairs in

estimate the mean value of the outcome both among non-directly certified students in a district and among all students in a district.² Where possible, we present both sets of estimates.

For each evaluation objective addressed in this chapter, we present our findings in two steps. First, we present estimates of the mean values of outcome measures among students in the pilot and comparison districts, without controlling for differences in the characteristics of these households. This gives a sense of how pilot and comparison districts differed and gives a context for better understanding the impact estimates. The second step involves presenting the impact estimates based on regressions in which preexisting differences in the characteristics of households in the pilot and comparison districts were controlled.

A. THE IMPACTS OF UP-FRONT DOCUMENTATION

Nine of the districts included in the evaluation implemented Up-Front Documentation, whereby students applying for free or reduced-price meals were required to provide documentation of their household circumstances (income/household size and/or receipt of food stamps, TANF, or FDPIR benefits). The impacts of Up-Front Documentation on deterrence/barriers, and accuracy/targeting efficiency are shown below.

(continued)

which both the pilot and comparison district used direct certification, the proportion of directly certified students in the pilot and its comparison district tended to be similar.

²Presenting estimates of mean values of outcomes among all students required us to make an assumption about the eligibility status of all directly certified students. Based on findings in a recent study that very high proportions of students approved by direct certification are eligible for free meals later in the school year, we assumed that all directly certified students were eligible for free meals (see Food and Nutrition Service 2002).

1. Impacts of Up-Front Documentation on Deterrence and Barriers

a. Did Up-Front Documentation Deter Ineligible Students from Becoming Certified?

Some students whose income made them ineligible for free or reduced-price meals were certified in both pilot and comparison districts. In comparison districts, for example, 4.0 percent of students ineligible for free or reduced-price meals were certified, and 3.9 percent of students ineligible for free meals alone were certified for free meals (CD_2 and CD_1 in Table IV.1). Although these rates in the Up-Front Documentation comparison districts were near the low end of possible values, they represented a significant number of students in these districts, because the large majority of the students in the districts were ineligible for free or reduced-price meals.³

In the Up-Front Documentation pilot districts, the rate of certification among students ineligible for free or reduced-price meals was similar to the rate in comparison districts—3.8 percent, compared with 4.0 percent (CD_2 in Table IV.1). Among students ineligible for free meals, the certification rate in pilot districts was slightly lower (3.4 percent) than the rate in comparison districts (3.9 percent).⁴ This simple difference between pilot and comparison districts does not necessarily imply, however, that Up-Front Documentation caused the certification rate to be lower in the pilot district. To estimate the impact of Up-Front Documentation on certification among ineligible students, we must control for important differences in the characteristics of sampled households in pilot and comparison districts.

³For example, the average Up-Front Documentation comparison district had an enrollment of 3,351 non-directly certified students, of which 65.8 percent (or 2,205 students) were ineligible for free or reduced-price meals. Thus, an estimated 88 students ineligible for free or reduced-price meals (or 4 percent of 2,205) were certified in these districts.

⁴See Volume II for district-level estimates of certification among ineligible students.

TABLE IV.1

RATES OF CERTIFICATION AMONG INELIGIBLE STUDENTS IN UP-FRONT DOCUMENTATION
PILOT AND COMPARISON DISTRICTS
(Standard Errors in Parentheses)

Certification Rate:	Percentage of Ineligible Students	
	Pilot Districts	Comparison Districts
Free Certification Among Students with Income >130% FPL (CD_1)	3.4 (0.5)	3.9 (0.4)
Free/Reduced-Price Certification Among Students with Income >185% FPL (CD_2)	3.8 (0.5)	4.0 (0.5)
Sample Size		
Students with Income > 130% FPL	688	689
Students with Income > 185% FPL	532	525

Note: Definitions of measures are provided in Table II.2.

FPL = federal poverty level.

Table IV.2 shows the estimated impact of Up-Front Documentation on deterrence, based on regression models described in detail in Chapter II of this volume and Chapter IX of Volume II. The first two columns show regression-adjusted percentages of ineligible students who were certified for free or reduced-price meals and are analogous to the two columns of results presented in Table IV.1. The third column shows the difference between the regression-adjusted percentages in pilot versus comparison districts, the estimated impact of the pilot, and the standard error of this estimate.

The estimated impacts of Up-Front Documentation on measures of deterrence are small in absolute value and not statistically significant. Among students ineligible for free or reduced-price meals, the estimated impact of the pilot on free or reduced-price certification (CD_2) is zero. Among students ineligible for free meals, the estimated impact of the pilot is negative, has a magnitude of 0.8 percentage points, and also is not statistically significant (CD_1). If this estimate of 0.8 percentage points were correct, it would represent a substantial reduction in the number of students receiving benefits they were not eligible to receive because the base to which it is applicable includes 80 percent of all students (that is, 80 percent of students in Up-Front Documentation pilot districts are not eligible for free meals). However, the estimate is not statistically significant, and could be due to sampling error.

To assess the robustness of the estimated impacts of Up-Front Documentation on deterrence, we conducted a series of sensitivity checks that examined whether the results of our analysis would have differed qualitatively if (1) our procedures for imputing income had been different, and (2) the specification of the regression model had been different. The basic conclusions of our analysis did not qualitatively change in any of these alternative specifications/imputation procedures.⁵

⁵See Volume II for more details on our sensitivity checks.

TABLE IV.2

ESTIMATED IMPACT OF UP-FRONT DOCUMENTATION PILOT PROJECTS ON DETERRENCE
(Standard Errors in Parentheses)

Measure of Deterrence	Regression-Adjusted Percentage of Ineligible Students		Impact
	Pilot	Comparison	
Free Certification Among Students with Income >130% FPL (CD_1)	3.3	4.1	-0.8 (0.78)
Free/Reduced-Price Certification Among Students with Income >185% FPL (CD_2)	3.9	3.9	0.0 (0.75)

Note: Definitions of measures are provided in Table II.2.

FPL = federal poverty level.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

b. Did Up-Front Documentation Raise Barriers to Certification Among Eligible Students?

Up-Front Documentation could have created barriers to certification of eligible students through at least four mechanisms: (1) the household decided not to apply because they did not want to provide documents to the school district; (2) the household wanted to apply but did not have the necessary documents; (3) the household submitted an application without documentation or with documentation that the school district judged to be incomplete, and then never submitted complete documentation; or (4) the SFA may have had an increased probability of making an administrative error resulting in the denial of free or reduced-price meal benefits to an income-eligible household because of the increased complexity of the administrative process. This may not be an exhaustive list of ways in which barriers could be created.⁶

Certification for free or reduced-price meals among eligible students in the Up-Front Documentation evaluation districts was far from universal. Excluding directly certified students, in comparison districts, only about half (53.9 percent) of students eligible for free meals were certified for them (CB_1a) and 62.4 percent of those eligible for free meals were approved for either free or reduced-price meals (CB_2a) (Table IV.3). Similarly, among students eligible for free or reduced-price meals but not directly certified, 50.5 percent were certified for free or reduced-price meals (Cb_3a). Among FS/TANF recipients not directly certified, 69.7 percent were certified free by application (CB_4a).

Certification rates among all students eligible for benefits (including those directly certified) were somewhat higher. For example, 58.9 percent of all students eligible for free meals in comparison districts were certified for them (CB_1b). The rates of certification among students

⁶A future report will analyze applications in an attempt to shed light on some of the reasons.

TABLE IV.3
RATES OF CERTIFICATION AMONG ELIGIBLE STUDENTS IN
UP-FRONT DOCUMENTATION PILOT AND COMPARISON DISTRICTS
(Standard Errors in Parentheses)

Certification Rate Among:	Percentage of Eligible Students	
	Pilot Districts	Comparison Districts
Estimates Excluding Directly Certified Students		
Free Certification Among Students with Income \leq 130% FPL and Not Directly Certified (CB_1a)	47.3 (3.1)	53.9 (2.0)
Free and Reduced-Price Certification Among Students with Income \leq 130% FPL and Not Directly Certified (CB_2a)	53.0 (3.3)	62.4 (2.0)
Free and Reduced-Price Certification Among Students with Income \leq 185% FPL and Not Directly Certified (CB_3a)	42.4 (2.2)	50.5 (1.6)
Free Certification Among FS/TANF Recipients Who Are Not Directly Certified (CB_4a)	68.9 (6.7)	69.7 (3.9)
Estimates Including Directly Certified Students^a		
Free Certification Among All Students with Income \leq 130% FPL (CB_1b)	55.3 (3.4)	58.9 (2.8)
Free and Reduced-Price Certification Among with Income \leq 130% FPL (CB_2b)	60.1 (3.6)	66.6 (3.0)
Free and Reduced-Price Certification Among All Students with Income \leq 185% FPL (CB_3b)	47.7 (2.6)	53.7 (2.2)
Free Certification Among All FS/TANF Recipients ^b (CB_4b)	79.2 (n.a.)	78.8 (n.a.)
Sample Size		
Students with Income \leq 130% FPL and Not Directly Certified	262	299
Students with Income \leq 185% FPL and Not Directly Certified	418	463
Students on FS/TANF and Not Directly Certified	103	95

Note: Definitions of measures are provided in Table II.2.

^aStandard errors of the estimates including directly certified students were estimated using bootstrapping methods whereby we selected 1,000 replicate samples with replacement from the relevant analysis sample, calculated the relevant estimate that included directly certified students for each replicate sample, and computed the standard deviation of these 1,000 bootstrapped estimates, which is reported as the standard error in the table.

^bStandard errors could not be estimated due to small sample sizes in some sites.

FPL = federal poverty level; n.a. = not available.

eligible for *free* meals were higher if certification was defined more broadly to include those certified for free *or* reduced-price meals. Among all students eligible for free meals in comparison districts (including directly certified students), 66.6 percent were certified for free or reduced-price meals (CB_2b). Among all those eligible for free or reduced-price meals, 53.7 percent were certified for free or reduced-price meals (CB_3b). Certification rates were also higher when directly certified students are included for FS/TANF recipients because directly certified students comprised a larger fraction of the FS/TANF population than of the entire population of students eligible for free meals (CB_4b).

Before household characteristics are controlled for, certification rates among eligible students in pilot districts were lower than the rates in comparison districts. Among those eligible for free meals, for example, 47.3 percent of those in Up-Front Documentation pilot districts were certified (compared with 53.9 percent in comparison districts ([CB_1a]) and 53.0 percent of those eligible for free meals were approved for either free or reduced-price meals (compared with 62.4 percent in comparison districts ([CB_2a])). Including directly certified students, the free certification rate among eligibles (CB_1b) increased to 55.3 percent in pilot districts—closer to, but still below, the 58.9 percent certification rate in comparison districts.⁷

After controlling for household characteristics, the pilot is estimated to reduce the certification rate among some eligible students. This suggests that the Up-Front Documentation requirement created barriers to certification among at least some eligible students. When only free meal certification of students eligible for free meals is considered, the estimated impact on certification rates is –6.2 percentage points but not statistically significant. (See Line 1 of Table

⁷See Chapter IX of Volume II for estimated certification rates among eligible students by district.

IV.4.) However, when we consider impacts on the probability that these eligible students are certified for either free or reduced-price meals (CB_2a), there is a 9.3 percentage point reduction, and the estimate is statistically significant at the .05 level. Similarly, among those eligible for free or reduced-price meals (excluding students directly certified), the pilot was estimated to lead to a statistically significant reduction of 9.1 percentage points in the free or reduced-price certification rate (CB_3a in Table IV.4). These estimated effects translate into a 15 percent reduction in certification among students eligible for free meals and an 18 percent reduction in the certification rate among students eligible for free or reduced-price meals. Among FS/TANF recipients not directly certified, the estimated effect of the pilot on the free certification rate (CB_4a) was also negative but not statistically significant at the 0.05 level.

To provide perspective on the effects of the pilot projects on barriers across the entire eligible population, including directly certified students, we calculated mean regression adjusted outcomes by district for all students, including the directly certified. These regression-adjusted outcomes for all eligible students were estimated as described in Chapter IX of Volume II, by using (1) the regression adjusted percentage of non-directly certified eligible students who were certified (as presented in the top panel of Table IV.4), and (2) the percentage of all eligible students who were directly certified. These estimates including directly certified students are shown in the lower panel of Table IV.4. Like the estimates including directly certified students shown in Table IV.3, the certification rates of all students, including directly certified, are similarly higher, and the differences between them in the pilot and comparison districts—our estimate of the impact—are smaller than for the corresponding estimates excluding directly certified students.

TABLE IV.4

ESTIMATED IMPACT OF UP-FRONT DOCUMENTATION PILOT PROJECTS ON BARRIERS
(Standard Errors in Parentheses)

Measure of Barriers	Regression-Adjusted Percentage of Eligible Students		Impact
	Pilot	Comparison	
Estimates Excluding Directly Certified Students			
Free Certification Among Students with Income <= 130% FPL and Not Directly Certified (CB_1a)	47.6	53.7	-6.2 (4.46)
Free and Reduced-Price Certification Among Students with Income <= 130% FPL and Not Directly Certified (CB_2a)	53.1	62.4	-9.3* (4.50)
Free and Reduced-Price Certification Among Students with Income <= 185% FPL and Not Directly Certified (CB_3a)	42.0	51.1	-9.1* (3.61)
Free Certification Among FS/TANF Recipients Who Are Not Directly Certified (CB_4a)	66.1	72.6	-6.4 (7.57)
Estimates Including Directly Certified Students ^a			
Free Certification Among All Students with Income <= 130% FPL (CB_1b)	55.4	58.9	-3.5 (4.01)
Free and Reduced-Price Certification Among with Income <= 130% FPL (CB_2b)	60.0	66.7	-6.7 (4.17)
Free and Reduced-Price Certification Among All Students with Income <= 185% FPL (CB_3b)	47.1	54.3	-7.2* (2.96)
Free Certification Among All FS/TANF Recipients ^b (CB_4b)	74.5	81.3	-6.7 (NA)

Note: Definitions of measures are provided in Table II.2.

^aStandard errors of the estimates including directly certified students were estimated using bootstrapping methods whereby we selected 1,000 replicate samples with replacement from the relevant analysis sample, calculated the relevant estimate that included directly certified students for each replicate sample, and computed the standard deviation of these 1,000 bootstrapped estimates, which is reported as the standard error in the table.

^bStandard errors could not be estimated due to small sample sizes in some sites.

FPL = federal poverty level; NA = not available.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

2. Impacts of Up-Front Documentation on Program Integrity: Summary Measures

An important objective of the NSLP's system for determining eligibility for free or reduced-price meals is to ensure that benefits go to students who are eligible for them (and who want to receive them) and do not go to students who are ineligible. Districts with the highest levels of deterrence among ineligible students and the fewest barriers to certification among eligible students will have the greatest success in meeting this objective. So far, this chapter has presented the results of analysis that examines deterrence and barriers separately. We now present estimates of the influence of Up-Front Documentation on two sets of program success measures that summarize the effects on deterrence and barriers: (1) certification accuracy, and (2) targeting efficiency. Certification accuracy is measured by the percentage of students certified for free or reduced-price meals who are eligible for the level of benefits they are receiving. Targeting efficiency measures the extent to which eligible students receive benefits and ineligible students do not.

a. How Did Up-Front Documentation Affect Certification Accuracy?

Most certified students in the Up-Front Documentation evaluation districts were eligible for the benefits they were receiving. Excluding directly certified students, 77.5 percent of students certified for free meals in comparison districts were eligible for these benefits (CA_1a), and 86.5 percent of those certified for free or reduced-price meals had incomes less than 185 percent of poverty (CA_4a) (Table IV.5).⁸ We also calculated accuracy for free and reduced-price meals

⁸Among the group with incomes not over 185 percent of the federal poverty level, the measure (CA_4a) counts as accurately certified children who are eligible for reduced-price meals but certified for free meals. While these children are not correctly certified, the amount of erroneous reimbursement that FNS is at risk of making is smaller than the erroneous reimbursement for a meal received by children approved for free meals who are eligible for free or reduced-price meals. The free and reduced-price accuracy measure (CA_2a) and not overcertified measures (CA_3a) count children eligible for reduced-price meals who are certified for free meals as inaccurately certified.

TABLE IV.5

CERTIFICATION ACCURACY RATES AMONG CERTIFIED STUDENTS IN
UP-FRONT DOCUMENTATION PILOT AND COMPARISON DISTRICTS
(Standard Errors in Parentheses)

Certification Accuracy Rate	Percentage of Certified Students	
	Pilot Districts	Comparison Districts
Estimates Excluding Directly Certified Students		
Free Certification Accuracy Among Free Approved, Non-Directly Certified Students (CA_1a)	79.6 (2.8)	77.5 (2.7)
Free and Reduced-Price Certification Accuracy Among Free and Reduced-Price Approved, non-Directly Certified Students (CA_2a)	71.2 (2.6)	68.8 (2.6)
Not Overcertified Among Free and Reduced-Price Approved, Non-Directly Certified Students (CA_3a)	78.3 (2.4)	77.8 (2.5)
Not Over 185% FPL Among Free and Reduced-Price Approved, Non-Directly Certified Students ^a (CA_4a)	85.6 (1.9)	86.5 (1.9)
Estimates Including Directly Certified Students^b		
Free Certification Accuracy Among All Free Approved Students (CA_1b)	84.7 (2.1)	81.4 (2.5)
Free and Reduced-Price Certification Accuracy Among All Free and Reduced-Price Approved Students (CA_2b)	76.8 (2.3)	72.4 (2.3)
Not Overcertified Among All Free and Reduced-Price Approved Students (CA_3b)	82.5 (2.0)	80.4 (2.1)
Not Over 185% FPL Among All Free and Reduced-Price Approved Students ^a (CA_4b)	88.6 (1.6)	87.9 (1.7)
Sample Size		
Students Certified for Free Meals and Not Directly Certified	204	222
Students Certified for Reduced-Price Meals and Not Directly Certified	319	376

Note: Definitions of measures are provided in Table II.2.

^aStudents in group C in Table II.1 are eligible for reduced-price meals but approved for free meals. Accordingly, these students are excluded from the numerator of the Free and Reduced-Price Certification Accuracy measure (CA_2a) (that is, not counted as correctly certified). However, they are included in the numerator of the “not over 185% FPL” accuracy measure (CA_4a) (that is, counted as correctly certified). The rationale for counting these cases as correct in measure CA_4a is that the cost to the federal government of this error is lower than the costs of errors in approving students income exceeding 185% FPL. When children eligible for reduced-price meals but approved for free meals get a NSLP-reimbursable meal, the amount of the erroneous payments that FNS is at risk of making to school districts is limited to 40 cents per meal—the difference between a reduced-price reimbursement and a free reimbursement. It is much smaller than the amount of erroneous payments FNS is at risk of making to school districts reimbursed for meals received by children approved for free meals who are eligible for neither free nor reduced-price meals.

^bStandard errors of the estimates including directly certified students were estimated using bootstrapping methods whereby we selected 1,000 replicate samples with replacement from the relevant analysis sample, calculated the relevant estimate that included directly certified students for each replicate sample, and computed the standard deviation of these 1,000 bootstrapped estimates, which is reported as the standard error in the table.

using a precise definition according to which only those with incomes less than 130 percent of poverty and certified free plus those with incomes between 131 and 185 percent of poverty and certified reduced-price are counted as accurately certified. Under this definition (CA_2a), 68.8 percent of certified cases were accurately certified. Finally, using a definition which counts as accurate any student who is not certified for a higher level of benefits than the student is eligible for (CA_3a), 77.8 percent of non-directly certified students are accurately certified. Including directly certified students increased the accuracy rate slightly for the measures shown in the table. For example, free meal accuracy increased from 77.5 to 81.4 percent.

Accuracy rates in Up-Front Documentation pilot districts were roughly the same as rates in comparison districts. Table IV.5 shows the accuracy rate for free meals (excluding directly certified students) (CA_1a) to have been slightly higher in pilot than comparison districts (79.6 versus 77.5 percent), but the percentage certified for free or reduced-price meals who had incomes less than 185 percent of poverty (CA_4a) to have been slightly lower in pilot districts (85.6 versus 86.5 percent).

To estimate the impact of the pilot on accuracy, we used the results of the models that estimated the impacts of the pilot on deterrence and barriers (along with information on the percentage of eligible and ineligible students in each district), as described in Chapter IX of Volume II. This methodology highlights the fact that accuracy rates in the evaluation districts were influenced by the extent to which the districts deterred ineligible households from becoming certified and, conversely, lowered barriers and promoted certification among eligible students. Deterring ineligible students from becoming certified improved accuracy, for obvious reasons. However, lessening barriers to certification among ineligible households also improved accuracy, since each additional eligible student who became certified, all else equal, pushed the accuracy rate—the proportion of all certified students who were eligible—closer to one.

Correspondingly, greater barriers to certification among eligible students reduced accuracy, since having fewer certified students who were eligible implied that districts would have proportionally more who were ineligible, all else equal.

Overall, Up-Front Documentation did not have a statistically significant effect on the accuracy rate. The estimated impact of the pilot on the accuracy rate among those certified for free meals (CA_1a) was small and positive, while the estimated impact on the percentage of those certified for free or reduced-price meals who had incomes of no more than 185 percent of poverty (CA_4a) was small and negative (Table IV.6). In each case, however, the estimate was not statistically significant at the 0.05 level and may have been due to sampling variability.

b. How Did Up-Front Documentation Affect Targeting Efficiency?

The targeting efficiency rate is defined as the percentage of a district's students whose eligibility and certification statuses were consistent with each other—they were either eligible and certified or not eligible and not certified. Targeting efficiency is lower to the extent that a district has either students who are eligible but not certified (because they faced barriers) or are not eligible but certified (because deterrence failed). Again, the impact of Up-Front Documentation on targeting efficiency depended on its effects on both deterrence and barriers.

We present three targeting efficiency measures. These measures correspond to the three measures for accuracy among students certified for free or reduced-price meals presented in Table IV.5. For example, the first targeting efficiency measure excluding directly certified students (CTE_1a) counts as being correctly targeted: (1) students certified for free meals with incomes less than 130 percent of poverty, (2) students certified for reduced-price meals with incomes 131-185 percent of poverty, and (3) students not certified for free or reduced-price

TABLE IV.6

ESTIMATED IMPACT OF UP-FRONT DOCUMENTATION PILOT PROJECTS ON
CERTIFICATION ACCURACY
(Standard Errors in Parentheses)

Measure of Certification Accuracy	Regression-Adjusted Percentage of Certified Students		Impact
	Pilot	Comparison	
Free Certification Accuracy Among Free Approved, Non-Directly Certified Students (CA_1a)	78.2	75.9	2.3 (5.2)
Not Over 185% FPL Among Free and Reduced-Price Approved, Non-Directly Certified Students (CA_4a)	82.7	85.6	-2.9 (3.8)

Notes: Definitions of measures are provided in Table II.2. Standard errors of the impact estimates were estimated using bootstrapping methods, whereby 1,000 subsamples were selected with replacement from the relevant analysis sample, the impact estimates were computed with each subsample, and the standard deviation of these 1,000 impact estimates was computed, and reported as the standard error.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

meals with incomes above 185 percent of poverty. The targeting efficiency rate is defined as the number of students correctly classified as a percentage of all students not directly certified.

More than three-quarters of students in Up-Front Documentation pilot and comparison districts were “efficiently targeted.” In comparison districts, for example, using the first definition of targeting efficiency (CTE_1a), 77.4 percent of students had a certification status for free or reduced-price meals consistent with their eligibility status (Table IV.7). Using the third measure of accuracy and targeting efficiency (CTE_3a), 80.8 percent of non-directly certified students had a certification status consistent with their eligibility status. Targeting efficiency was affected by inclusion of directly certified students only to a small degree because directly certified students are a relatively small fraction (about 3 percent on average across the districts) of all students in the Up-Front Documentation districts (CTE_1b, CTE_2b, and CTE_3b in Table IV.7). Finally, across all measures, targeting efficiency rates in pilot districts were nearly identical to the efficiency rates in the comparison districts.

The estimated impact of Up-Front Documentation on targeting efficiency was small and not statistically significant. Controlling for household characteristics, the regression-adjusted targeting efficiency rates in pilot and comparison districts (CTE_3a) were close to one another, and the small negative impact could have been due to sampling variability (Table IV.8).

B. THE IMPACTS OF GRADUATED VERIFICATION

The second approach taken by districts participating in the demonstration and included in the evaluation was to increase the scale of their verification efforts, if initial verification efforts resulted in large proportions of verified households whose benefits were reduced or terminated. Three districts included in the evaluation implemented the Graduated Verification pilot program. As with Up-Front Documentation, the purpose of Graduated Verification was to deter ineligible

TABLE IV.7

RATES OF TARGETING EFFICIENCY AMONG STUDENTS IN UP-FRONT DOCUMENTATION
PILOT AND COMPARISON DISTRICTS
(Standard Errors in Parentheses)

Targeting Efficiency Rate	Percentage of Students	
	Pilot Districts	Comparison Districts
Estimates Excluding Directly Certified Students		
Targeting Efficiency Measure 1 Among Non-Directly Certified Students (CTE_1a)	77.6 (1.5)	77.4 (1.4)
Targeting Efficiency Measure 2 Among Non-Directly Certified Students (CTE_2a)	78.7 (1.5)	79.1 (1.4)
Targeting Efficiency Measure 3 Among Non-Directly Certified Students (CTE_3a)	80.2 (1.4)	80.8 (1.4)
Estimates Including Directly Certified Students^a		
Targeting Efficiency Measure 1 Among All Students (CTE_1b)	78.3 (1.4)	77.9 (1.3)
Targeting Efficiency Measure 2 Among All Students (CTE_2b)	79.3 (1.4)	79.6 (1.3)
Targeting Efficiency Measure 3 Among All Students (CTE_3b)	80.8 (1.4)	81.3 (1.3)
Sample Size		
All Students	950	988

Notes: Definitions of measures are provided in Table II.2. Efficient targeting is defined as being correctly assigned to either the certified or the noncertified group given household income. It is calculated as the percentage of students who are either (1) eligible for benefits and certified, or (2) not eligible for benefits and not certified.

^aStandard errors of the estimates including directly certified students were estimated using bootstrapping methods whereby we selected 1,000 replicate samples with replacement from the relevant analysis sample, calculated the relevant estimate that included directly certified students for each replicate sample, and computed the standard deviation of these 1,000 bootstrapped estimates, which is reported as the standard error in the table.

TABLE IV.8
ESTIMATED IMPACT OF UP-FRONT DOCUMENTATION PILOT PROJECTS ON TARGETING
EFFICIENCY
(Standard Errors in Parentheses)

Measure of Targeting Efficiency	Regression-Adjusted Percentage of All Students		Impact
	Pilot	Comparison	
Targeting Efficiency Measure 3 Among Non-Directly Certified Students (CTE_3a)	79.4	81.2	-1.8 (1.8)

Notes: Definitions of measures are provided in Table II.2. Standard errors of the impact estimates were estimated using bootstrapping methods, whereby 1,000 subsamples were selected with replacement from the relevant analysis sample, the impact estimates were computed with each subsample, and the variance of the estimates in these repeated calculations was computed.

Although we were unable to estimate impacts on targeting efficiency measure 1 among non-directly certified students for this report, we plan to estimate these impacts and include them in a supplemental appendix to this report to be completed later.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

students from becoming and remaining certified without reducing certification levels among eligible students.

1. Impacts of Graduated Verification on Deterrence and Barriers

a. Did Graduated Verification Deter Ineligible Students from Becoming Certified?

About 1 in 10 students (9.7 percent) ineligible for free or reduced-price meals in Graduated Verification comparison districts were certified, as were 8.6 percent of those ineligible for free meals (CD_2 and CD_1 in Table IV.9). Certification rates among ineligible students in pilot districts were somewhat lower than those in comparison districts. Among those ineligible for free or reduced-price meals in pilot districts (CD_2), only 4.8 percent were certified, about half the rate in comparison districts. The pilot-comparison difference in certification among students ineligible for free meals (CD_1) was not as large, with 7.4 percent of those in pilot districts certified for free meals.⁹

After controlling for household characteristics, the pilot-comparison differences in deterrence were smaller and were not statistically significant (Table IV.10). Among students ineligible for free or reduced-price meals (CD_2), the estimated impact of the pilot on the free/reduced-price certification rate was negative and relatively large (–2.5 percentage points, a reduction of nearly 30 percent) but not statistically significant.¹⁰ Among students ineligible for free meals (CD_1), the estimated impact of the pilot was zero.¹¹

⁹See Chapter IX of Volume II for district-level certification rates among ineligible students.

¹⁰The 95 percent confidence interval of this estimate was –5.93 to +0.93 percentage points.

¹¹We conducted a set of sensitivity checks on the findings regarding the estimated impacts of Graduated Verification similar to the set we conducted on the estimated impacts of Up-Front Verification. Again, we found that the conclusions from our primary analysis—presented in this chapter—were not substantially altered.

TABLE IV.9

RATES OF CERTIFICATION AMONG INELIGIBLE STUDENTS IN GRADUATED VERIFICATION
PILOT AND COMPARISON DISTRICTS
(Standard Errors in Parentheses)

Certification Rate:	Percentage of Ineligible Students	
	Pilot Districts	Comparison Districts
Free Certification Among Students with Income >130% FPL (CD_1)	7.4 (0.9)	8.6 (1.1)
Free/Reduced-Price Certification Among Students with Income >185% FPL (CD_2)	4.8 (0.7)	9.7 (2.1)
Sample Size		
Students with Income > 130% FPL	310	319
Students with Income > 185% FPL	202	221

Note: Definitions of measures are provided in Table II.2.

FPL = federal poverty level.

TABLE IV.10

ESTIMATED IMPACT OF GRADUATED VERIFICATION PILOT
PROJECTS ON DETERRENCE
(Standard Errors in Parentheses)

Measure of Deterrence	Regression-Adjusted Percentage of Ineligible Students		Impact
	Pilot	Comparison	
Free Certification Among Students with Income >130% FPL (CD_1)	8.0	8.0	0.0 (2.25)
Free/Reduced-Price Certification Among Students with Income >185% FPL (CD_2)	6.1	8.6	-2.5 (1.75)

Note: Definitions of measures are provided in Table II.2.

FPL = federal poverty level.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

Thus, the estimates provided no evidence that Graduated Verification had a *large* impact on certification among ineligible students. However, the limited statistical power of the analysis leaves more uncertainty about whether the pilot had a small or moderate deterrent effect.

b. Did Graduated Verification Raise Barriers to Certification Among Eligible Students?

Graduated Verification could have raised barriers to certification among eligible students in two ways. First, because students certified for free or reduced-price meals were more likely to be subjected to the verification process in Graduated Verification districts, any households not wishing to go through this process might have been discouraged from applying for free or reduced-price meals in the first place. Second, households that were subjected to verification in the previous year and who had their benefits reduced or terminated were required by the Graduated Verification procedures to submit documentation the next time they applied for benefits, if this happened within a year of the time their benefits were reduced or terminated. Although the pilot districts did not always implement this requirement consistently, either this requirement or the stigmatizing effects of having their benefits in the previous year cut could have discouraged households from subsequently applying for benefits.¹²

In Graduated Verification comparison districts, 69.1 percent of non-directly certified students eligible for free meals were certified for these benefits, and 81.1 percent of those eligible for free meals were approved for free or reduced-price meals (CB_1a and CB_2a, in Table IV.11). Among those eligible for free or reduced-price meals, 72.2 percent were certified for free or reduced-price meals (CB_3a). Among FS/TANF recipients not directly certified, 72.4 percent were certified (CB_4a). Including directly certified students, 79.2 percent of comparison

¹²A forthcoming report on the evaluation will describe implementation of the pilot procedures.

TABLE IV.11

RATES OF CERTIFICATION AMONG ELIGIBLE STUDENTS IN GRADUATED VERIFICATION
PILOT AND COMPARISON DISTRICTS
(Standard Errors in Parentheses)

Certification Rate Among:	Percentage of Eligible Students	
	Pilot Districts	Comparison Districts
Estimates Excluding Directly Certified Students		
Free Certification Among Students with Income \leq 130% FPL and Not Directly Certified (CB_1a)	55.8 (4.3)	69.1 (4.0)
Free and Reduced-Price Certification Among Students with Income \leq 130% FPL and Not Directly Certified (CB_2a)	62.2 (4.6)	81.1 (4.2)
Free and Reduced-Price Certification Among Students with Income \leq 185% FPL and Not Directly Certified (CB_3a)	60.4 (3.3)	72.2 (3.0)
Free Certification Among FS/TANF Recipients Who Are Not Directly Certified (CB_4a)	69.2 (11.2)	72.4 (9.5)
Estimates Including Directly Certified Students^a		
Free Certification Among All Students with Income \leq 130% FPL (CB_1b)	72.0 (3.1)	79.2 (3.1)
Free and Reduced-Price Certification Among with Income \leq 130% FPL (CB_2b)	76.2 (3.1)	87.0 (2.9)
Free and Reduced-Price Certification Among All Students with Income \leq 185% FPL (CB_3b)	70.3 (2.8)	78.5 (3.1)
Free Certification Among All FS/TANF Recipients ^b (CB_4b)	87.2 (3.5)	88.0 (4.1)
Sample Size		
Students with Income \leq 130% FPL and Not Directly Certified	220	216
Students with Income \leq 185% FPL and Not Directly Certified	328	314
Students on FS/TANF and Not Directly Certified	107	90

Note: Definitions of measures are provided in Table II.2.

^aStandard errors of the estimates including directly certified students were estimated using bootstrapping methods whereby we selected 1,000 replicate samples with replacement from the relevant analysis sample, calculated the relevant estimate that included directly certified students for each replicate sample, and computed the standard deviation of these 1,000 bootstrapped estimates, which is reported as the standard error in the table.

FPL = federal poverty level.

district students eligible for free meals (CB_1b) were certified for these benefits, while 78.5 percent of those eligible for free or reduced-price meals (CB_3b) were certified for either free or reduced-price meals.

Certification rates among eligible students in pilot districts were substantially lower than the rates in comparison districts. For example, 55.8 percent of eligible students in Graduated Verification pilot districts were certified for free meals, compared with 69.1 percent among eligible comparison group students (CB_1a). Including directly certified students reduced this difference somewhat, but not did eliminate it (CB_1b). Similar differences existed in the rates of certification for free or reduced-price meals among all eligible students in pilot versus comparison districts.

The differences between the pilot and comparison districts in the certification rates of students eligible for free meals persisted after controlling for household characteristics. Among students eligible for free meals and not directly certified, the estimated impact on the rate of free certification was –13.3 percentage points, and the estimated impact on the rate of free or reduced-price certification was –15.6 percentage points (CB_1a and CB_2a in Table IV.12). Both estimates were statistically significant. The estimated impact on the certification rate among non-directly certified students eligible for free or reduced-price meals (CB_3a) was –9.1 percentage points. This point estimate was not statistically significant at the .05 confidence level. Finally, the estimated impact on the certification rate among FS/TANF recipients not directly certified (CB_4a) was –12.7, but, again, not statistically significant.

The impact estimates for each certification measure for all eligible students, including those directly certified, was smaller than the corresponding estimate when directly certified students are included (CB_1b – CB_4b in Table IV.12). Patterns of statistical significance are likewise similar.

TABLE IV.12

ESTIMATED IMPACT OF GRADUATED VERIFICATION PILOT PROJECTS ON BARRIERS
(Standard Errors in Parentheses)

Measure of Barriers	Regression-Adjusted Percentage of Eligible Students		Impact
	Pilot	Comparison	
Estimates Excluding Directly Certified Students			
Free Certification Among Students with Income <= 130% FPL and Not Directly Certified (CB_1a)	56.0	69.3	-13.3* (6.14)
Free and Reduced-Price Certification Among Students with Income <= 130% FPL and Not Directly Certified (CB_2a)	64.2	79.9	-15.6** (6.16)
Free and Reduced-Price Certification Among Students with Income <= 185% FPL and Not Directly Certified (CB_3a)	62.0	71.1	-9.1 (5.33)
Free Certification Among FS/TANF Recipients Who Are Not Directly Certified (CB_4a)	64.8	77.5	-12.7 (9.97)
Estimates Including Directly Certified Students^a			
Free Certification Among All Students with Income <= 130% FPL (CB_1b)	72.2	79.2	-7.0 (3.70)
Free and Reduced-Price Certification Among with Income <= 130% FPL (CB_2b)	77.4	86.2	-8.8* (3.56)
Free and Reduced-Price Certification Among All Students with Income <= 185% FPL (CB_3b)	71.2	77.6	-6.4 (3.73)
Free Certification Among All FS/TANF Recipients ^b (CB_4b)	85.8	89.8	-4.0 (4.20)

Note: Definitions of measures are provided in Table II.2.

^aStandard errors of the estimates including directly certified students were estimated using bootstrapping methods whereby we selected 1,000 replicate samples with replacement from the relevant analysis sample, calculated the relevant estimate that included directly certified students for each replicate sample, and computed the standard deviation of these 1,000 bootstrapped estimates, which is reported as the standard error in the table.

FPL = federal poverty level.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

2. Impacts of Graduated Verification on Program Integrity: Summary Measures

a. How Did Graduated Verification Affect Certification Accuracy?

As in Up-Front Documentation districts, most certified students in Graduated Verification districts were eligible for the level of benefits they were receiving at the time of the survey. Excluding directly certified students, 73.0 percent of those certified for free meals in comparison districts had incomes of no more than 130 percent of the federal poverty level, which made them eligible for these benefits (CA_1a in Table IV.13). Including directly certified students, this accuracy rate for free meals was 81.9 percent (CA_1b). Among students certified for free or reduced-price meals in comparison districts, 85.3 percent had incomes of no more than 185 percent of poverty with directly certified students excluded (CA_4a), and 89.0 percent had incomes at this level with directly certified students included (CA_4b).¹³ Using the precisely correct definition according to which only those with incomes less than 130 percent of poverty and certified free plus those with incomes between 131 and 185 percent of poverty and certified reduced-price were counted as accurately certified (CA_2a), 64.9 percent of non-directly certified cases are accurately certified. Finally, using a definition which counts as accurate any student who was not certified for a higher level of benefits than the student was eligible for (CA_3a), 72.4 percent of non-directly certified students were accurately certified. Accuracy rates for free meals in Graduated Verification pilot districts among those certified by application were slightly lower than rates in comparison districts (71.6 compared to 73.0 percent). The

¹³Among the group with incomes not over 185 percent of the federal poverty level, this measure counts as correctly certified children who are eligible for reduced-price meals but certified for free meals. While these children are not correctly certified, the amount of erroneous payments that FNS is at risk of making is smaller than the erroneous reimbursement for a meal received by children approved for free meals who are eligible for free or reduced-price meals. The free and reduced-price accuracy (measure CA_2a) and not overcertified measures (CA_3a) count children eligible for reduced-price meals who are certified for free meals as inaccurately certified.

TABLE IV.13

CERTIFICATION ACCURACY RATES AMONG CERTIFIED STUDENTS IN
GRADUATED VERIFICATION PILOT AND COMPARISON DISTRICTS
(Standard Errors in Parentheses)

Accuracy Rate	Percentage of Certified Students	
	Pilot Districts	Comparison Districts
Estimates Excluding Directly Certified Students		
Free Certification Accuracy Among Free Approved, Non-Directly Certified Students (CA_1a)	71.6 (4.4)	73.0 (3.3)
Free and Reduced-Price Certification Accuracy Among Free and Reduced-Price Approved, non-Directly Certified Students (CA_2a)	69.1 (3.7)	64.9 (3.4)
Not Overcertified Among Free and Reduced-Price Approved, Non-Directly Certified Students (CA_3a)	75.2 (3.3)	72.4 (3.3)
Not Over 185% FPL Among Free and Reduced-Price Approved, Non-Directly Certified Students ^a (CA_4a)	90.8 (1.9)	85.3 (2.9)
Estimates Including Directly Certified Students^b		
Free Certification Accuracy Among All Free Approved Students (CA_1b)	84.4 (2.1)	81.9 (2.1)
Free and Reduced-Price Certification Accuracy Among All Free and Reduced-Price Approved Students (CA_2b)	80.0 (2.1)	73.7 (2.5)
Not Overcertified Among All Free and Reduced-Price Approved Students (CA_3b)	84.1 (1.9)	79.3 (2.4)
Not Over 185% FPL Among All Free and Reduced-Price Approved Students ^a (CA_4b)	94.1 (1.2)	89.0 (2.1)
Sample Size		
Students Certified for Free Meals and Not Directly Certified	221	229
Students Certified for Reduced-Price Meals and Not Directly Certified	287	314

Note: Definitions of measures are provided in Table II.2.

^aStudents in group C in Table II.1 are eligible for reduced-price meals but approved for free meals. Accordingly, these students are excluded from the numerator of the Free and Reduced-Price Certification Accuracy measure (CA_2a) (that is, not counted as correctly certified). However, they are included in the numerator of the “not over 185% FPL” accuracy measure (CA_4a) (that is, counted as correctly certified). The rationale for counting those cases as correct in measure CA_4a is that the cost to the federal government of this error is lower than the costs of errors in approving students with incomes exceeding 185% FPL. When children eligible for reduced-price meals but approved for free meals get a NSLP-reimbursable meal, the amount of the erroneous payments that FNS is at risk of making to school districts is limited to 40 cents per meal—the difference between a reduced-price reimbursement and a free reimbursement. It is much smaller than the amount of erroneous payments FNS is at risk of making to school districts reimbursed for meals received by children approved for free meals who are eligible for neither free nor reduced-price meals.

^bStandard errors of the estimates including directly certified students were estimated using bootstrapping methods whereby we selected 1,000 replicate samples with replacement from the relevant analysis sample, calculated the relevant estimate that included directly certified students for each replicate sample, and computed the standard deviation of these 1,000 bootstrapped estimates, which is reported as the standard error in the table.

FPL = federal poverty level.

percentage of students certified for free or reduced-price meals who were eligible was higher in Graduated Verification pilot districts than in comparison districts for all three of the accuracy measures examined when directly certified students were excluded. When directly certified students were included, all four accuracy measures were higher in the pilot sites than in the comparison sites.

The estimated impacts of Graduated Verification were mixed, and not statistically significant. The estimated impact of the pilot on the accuracy rate for free meals was negative and not statistically significant, while the impact on the percentage of cases certified for free or reduced-price meals who were in households with incomes below 185 percent of poverty was positive and not statistically significant (CA_1a and CA_4a in Table IV.14). This finding of inconsistent estimated effects on accuracy for free and for free or reduced-price meals and large standard errors of the estimates is similar to the pattern of findings of Up-Front Documentation on accuracy rates, presented in the previous section.

b. How Did Graduated Verification Affect Targeting Efficiency?

More than three-quarters of students in Graduated Verification pilot and comparison districts were “efficiently targeted.” In comparison districts, for example, using the first definition of targeting efficiency, 75.6 percent of students had a certification status for free or reduced-price meals consistent with their eligibility status (CTE_1a in Table IV.15). Using the broadest third measure of targeting efficiency (CTE_3a), 82.6 percent of non-directly certified students had a certification status consistent with their eligibility status. Including directly certified students in the targeting efficiency measure increased the percentage correctly targeted by two to three percentage points. Finally, targeting efficiency rates in pilot districts were nearly identical to the efficiency rates in the comparison districts.

TABLE IV.14

ESTIMATED IMPACT OF GRADUATED VERIFICATION PILOT PROJECTS ON
CERTIFICATION ACCURACY
(Standard Errors in Parentheses)

Measure of Accuracy	Regression-Adjusted Percentage of Certified Students		Impact
	Pilot	Comparison	
Free Certification Accuracy Among Free Approved, Non-Directly Certified Students (CA_1a)	70.5	74.3	-3.7 (5.2)
Not Over 185% FPL Among Free and Reduced-Price Approved, Non-Directly Certified Students (CA_4a)	88.9	86.4	2.6 (3.7)

Notes: Definitions of measures are provided in Table II.2. Standard errors of the impact estimates were estimated using bootstrapping methods, whereby 1,000 replicate samples were selected with replacement from the relevant analysis sample, the impact estimates were computed with each subsample, and the standard deviation of these 1,000 impact estimates was computed and reported as the standard error.

FPL = federal poverty level.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

TABLE IV.15

RATES OF TARGETING EFFICIENCY AMONG STUDENTS IN GRADUATED VERIFICATION
PILOT AND COMPARISON DISTRICTS
(Standard Errors in Parentheses)

Targeting Efficiency Rate	Percentage of Students	
	Pilot Districts	Comparison Districts
Estimates Excluding Directly Certified Students		
Targeting Efficiency Measure 1 Among Non-Directly Certified Students (CTE_1a)	74.3 (2.2)	75.6 (2.4)
Targeting Efficiency Measure 2 Among Non-Directly Certified Students (CTE_2a)	76.6 (2.2)	78.3 (2.4)
Targeting Efficiency Measure 3 Among Non-Directly Certified Students (CTE_3a)	80.4 (2.1)	82.6 (2.4)
Estimates Including Directly Certified Students^a		
Targeting Efficiency Measure 1 Among All Students (CTE_1b)	77.4 (1.9)	78.6 (2.0)
Targeting Efficiency Measure 2 Among All Students (CTE_2b)	79.2 (1.8)	80.9 (2.0)
Targeting Efficiency Measure 3 Among All Students (CTE_3b)	82.7 (1.8)	84.8 (2.0)
Sample Size		
All Students	530	535

Notes: Definitions of measures are provided in Table II.2. Efficient targeting is defined as being correctly assigned to either the certified or the noncertified group given household income. It is calculated as the percentage of students who are either (1) eligible for benefits and certified, or (2) not eligible for benefits and not certified.

^aStandard errors of the estimates including directly certified students were estimated using bootstrapping methods whereby we selected 1,000 replicate samples with replacement from the relevant analysis sample, calculated the relevant estimate that included directly certified students for each replicate sample, and computed the standard deviation of these 1,000 bootstrapped estimates, which is reported as the standard error in the table.

After controlling for household characteristics, the estimated impact of Graduated Verification on targeting efficiency was small (–3.2 percentage points) and not statistically significant at the .05 level (Table IV.16).

C. INCOME LEVELS OF INELIGIBLE STUDENTS WHO ARE CERTIFIED

The findings on deterrence indicate that approximately 4 percent of ineligible households were certified for free or reduced-price meals in Up-Front Documentation comparison districts (Table IV.1) and that 9 to 10 percent of ineligible households were certified in Graduated Verification comparison districts (Table IV.9). This section presents data on the income distribution of these ineligible certified families.

Table IV.17 provides the relevant data for Up-Front Documentation and Graduated Verification pilot and comparison districts. The table shows the percentages of the total ineligible population who are certified (repeated from Table IV.1 and Table IV.9). The income distribution of the ineligible households is shown below each estimate of the percentage in the total eligible population. For example, in the Up-Front Documentation comparison districts, 3.9 percent of students not eligible for free meals (households with income above 130 percent of the federal poverty level) were certified for free meals. Among those ineligible certified households in our sample in the Up-Front Documentation comparison sites, 66.4 percent had incomes between 131 and 185 percent of the federal poverty level, 25.3 percent had incomes between 186 and 250 percent of the federal poverty level, 6.4 percent had incomes between 251 and 400, and 1.9 percent had incomes above 400 percent of the federal poverty level. In the Graduated Verification comparison sites, 73.0 percent of students not eligible for free meals in our sample had incomes between 131 and 185 percent of poverty, 19.5 percent had incomes between 186 and 250 percent of poverty, 6.6 percent had incomes between 251 percent and 400 percent of poverty, and 0.9 percent had incomes above 400 percent of poverty. In each set of comparison

TABLE IV.16

ESTIMATED IMPACT OF GRADUATED VERIFICATION PILOT PROJECTS ON TARGETING EFFICIENCY
(Standard Errors in Parentheses)

Measure of Targeting Efficiency	Regression-Adjusted Percentage of All Students		Impact
	Pilot	Comparison	
Targeting Efficiency Measures Among Non-Directly Certified Students (CTE_3a)	80.0	83.2	-3.2 (2.7)

Notes: Definitions of measures are provided in Table II.2. Standard errors of the impact estimates were estimated using bootstrapping methods, whereby 1,000 subsamples were selected with replacement from the relevant analysis sample, the impact estimates were computed with each subsample, and the variance of the estimates in these repeated calculations was computed.

Although we were unable to estimate impacts on the first targeting efficiency among non-directly certified students (CTE_1a) for this report, we plan to estimate these impacts and include them in a supplemental appendix to this report to be completed later.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

TABLE IV.17

INCOME DISTRIBUTION OF CERTIFIED INELIGIBLE STUDENTS IN PILOT AND COMPARISON SITES

	Up-Front Documentation		Graduated Verification	
	Pilot Districts	Comparison Districts	Pilot Districts	Comparison Districts
Free Certification Rate Among Students with Income >130% FPL (CD_1)	3.4	3.9	7.4	8.6
Percentage Distribution of Household Income Among Ineligible Students Certified for Free Meals:				
Income between 131% and 185% FPL	48.6	66.4	80.3	73.0
Income between 186% and 250% FPL	33.1	25.3	9.6	19.5
Income between 251% and 400% FPL	10.7	6.4	4.8	6.6
Income > 400% FPL	7.6	1.9	5.3	0.9
Free and Reduced-Price Certification Rate Among Students with Income >185% FPL (CD_2)	3.8	4.0	4.8	9.7
Percentage Distribution of Household Income Among Ineligible Students Certified for Free or Reduced-Price Meals:				
Income between 186% and 250% FPL	64.5	69.5	62.4	83.1
Income between 251% and 400% FPL	23.0	24.5	17.4	13.8
Income > 400% FPL	12.5	6.0	20.2	3.1
Sample Size				
Students with income > 130% FPL	688	689	310	319
Students with income > 185% FPL	532	525	202	221
Students with income >130% FPL and certified for free meals	50	43	55	59
Students with income >185% FPL and certified for free or reduced-price meals	56	51	28	39

Note: Definitions of certification measures are provided in Table II.2. Estimates are based on weighted tabulations in which differing sample selection probabilities of the different meal-price status groups are used.

FPL = federal poverty level.

sites, well over half the sample who were certified for free meals but ineligible for them had incomes in a range that made the student eligible for reduced-price meals.

D. SUMMARY

In this section, we briefly summarize the impact findings for the Up-Front Documentation and Graduated Verification pilot projects.

1. Up-Front Documentation

In the Up-Front Documentation pilots, the estimated impacts of the demonstration on deterrence were small in absolute terms or close to zero, and not statistically significant. Among households with incomes greater than 130 percent of poverty, the estimated impact of the pilot intervention on the percentage certified for free meals was -0.8 percentage points. Among those with incomes greater than 185 percent of poverty the estimated impact was essentially zero. We note that although -0.8 percentage point is small in absolute terms, if this were correct, it would represent a substantial proportionate reduction in the percentage of students receiving free meal benefits who were not eligible for them on the order of 20 percent. However, the estimate is imprecise and could be due to sampling error. Estimated impacts on families eligible for free or reduced-price meals indicate that the Up-Front Documentation pilot created barriers for some eligible families. We defined eligible families in three different ways, and found statistically significant barrier effects for two of the measures. The third measure also produced an estimate suggesting barriers, but was not statistically significant at the .05 level (Table IV.16). For households receiving TANF or food stamps but not directly certified, the estimated impact was also negative but it was not statistically significant.

The estimated impacts on accuracy and targeting were in the range of two to three percentage points, some estimates were positive and some were negative depending on the

precise measure, and none was statistically significant. Overall, we conclude that Up-Front Documentation has no appreciable effect on accuracy or targeting.

2. Graduated Verification

The Graduated Verification pilot projects exhibit a similar pattern of findings to those of the Up-Front Documentation pilot projects. Point estimates of the impacts on deterrence are mixed. For households above 130 percent of poverty, the estimated impact is essentially zero. For households above 185 percent of poverty, the estimated impact is -2.5 percentage points (or nearly 30 percent of the comparison group mean), but not statistically significant. We can be confident that impacts of 5 percentage points or larger did not occur, but because of limited sample sizes, we cannot be confident that smaller ones did not occur.

Two measures of certification rates among students from families with incomes less than 130 percent of poverty indicate that Graduated Verification created barriers for this group. A measure of certification among students from families with incomes less than 185 percent of poverty also indicates that Graduated Verification reduced certification for this group, although the impact estimate was not statistically significant at the .05 level. The estimated impacts on certification among students receiving TANF or food stamps also shows that certification rates of this group declined, but the estimated impacts are not statistically significant.

Finally, the impacts on accuracy and targeting were in the range of three to four percentage points. Some were positive, some were negative, and none was statistically significant.

REFERENCES

- Bogen, K., J. Moore, and K. Marquis. "Pretest Results of an Alternative Measurement Design for the Survey of Income and Program Participation." Paper presented at the Annual Meetings of the American Association for Public Opinion Research, St. Petersburg, FL, May 16-19, 1992. Published in the SIPP Working Papers Series, #9204.
- Bogen, K., J. Moore, and K. Marquis. "Can We Get Respondents to Use Their Personal Income Records?" Paper presented at the Annual Meetings of the American Association for Public Opinion Research, Danvers, MA, May 11-15, 1994. *Proceedings of the Section on Survey Research Methods, American Statistical Association*, pp. 1252-1257.
- Bogen, K., N. Krasko, J. Moore, and K. Marquis. "Preliminary Field Results of an Alternative Measurement Design for the Survey of Income and Program Participation." Paper presented at the Annual Meetings of the American Association for Public Opinion Research, St. Charles, IL, May 20-23, 1993. Published in the *1993 Proceedings of the Section on Survey Research Methods, American Statistical Association*, pp. 1027-1031.
- Federal Register*. "National School Lunch Program: Pilot Projects, Alternatives to Free and Reduced Price Application Requirements and Verification Procedures" *Federal Register*, vol. 65, no. 14, January 2000, pp. 3409-3415.
- Gleason, Philip and Carol Sutor. "Children's Diets in the Mid-1990s: Dietary Intake and Its Relationship with School Meal Participation." Final report submitted to the U.S. Department of Agriculture, Food and Nutrition Service. Princeton, NJ: Mathematica Policy Research, Inc., January 2001.
- Marquis, K., J. Moore, and K. Bogen. "Effects of a Cognitive Interviewing Approach on Response Quality in a Pretest for the SIPP." *Proceedings of the Section on Survey Research Methods, American Statistical Association*, 1993, pp. 318-323.
- Marquis, K., J. Moore, and K. Bogen. "An Experiment to Reduce Measurement Error in the SIPP: Preliminary Results." *Proceedings of the Section on Survey Research Methods, American Statistical Association*, 1994, pp. 725-729.
- Moore, Stinson, and Welniak. "Income Measurement Error in Surveys: A Review." *Journal of Official Statistics*, vol. 16, no. 4, 2000, pp. 331-361.
- U.S. Department of Agriculture, Food and Nutrition Service, Web Site. [www.fns.usda.gov] Accessed August 2003.
- U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation. "National School Lunch Program Application/Verification Pilot Project: Report on First Year Experience." Publication no. CN-02-AV. Alexandria, VA: USDA 2002.

U.S. Department of Agriculture, Office of Inspector General. "Food and Consumer Service National School Lunch Program Verification of Applications in Illinois." Audit report no. 27010-001-Ch. Washington, DC: USDA, August 1997.

U.S. Department of Agriculture, Food and Nutrition Service. "Study of Income Verification in the National School Lunch Program: Final Report: Volume 1." Washington, DC: Office of Analysis and Evaluation, 1990.