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REPORT

FINAL REPORT

Direct Certification with Medicaid for Free and Reduced-Price Meals (DCM-F/RP) Demonstration, Year 1

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We gratefully acknowledge these many contributions and accept sole responsibility for any errors or omissions in the report.

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The demonstration of Direct Certification with Medicaid for Free and Reduced-Price Meals (DCM-F/RP) allows authorized States and school districts to use information from Medicaid data files to identify students eligible to receive free or reduced-price (F/RP) meals under the National School Lunch Program (NSLP) and School Breakfast Program (SBP). DCM-F/RP is expected to expand the number of students who are certified to receive free school lunches and breakfasts without needing to complete an application and will, for the first time, make it possible to certify students for reduced-price school meals without an application. If some of these students would not have otherwise completed an application, we would expect that DCM-F/RP would also increase the total numbers of students certified to receive free or reduced-price meals. Changes in certification could affect the numbers of reimbursable school meals served at each price point and, if students respond to lower prices by increasing their participation (that is, by taking a school meal more often), might also increase the overall participation rate. If DCM-F/RP leads to an increase in the number of free and reduced-price meals served, it will affect Federal reimbursement costs. In addition, DCM-F/RP will likely affect the costs that States incur for administering the NSLP and SBP.[1] The U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) contracted with Mathematica Policy Research to examine the effects of DCM-F/RP on these and other outcomes, and to describe the implementation experiences of States and districts.

A. The school meals programs and direct certification

The NSLP is the largest child nutrition program in the United States, providing lunches to 30 million students each school day in Federal fiscal year (FY) 2017. Along with the SBP, the NSLP is a cornerstone of the government's efforts to provide nutritious meals to schoolchildren and an essential resource for many families. All students enrolled in schools participating in the NSLP or SBP are eligible to receive subsidized school meals, but the meal reimbursements that the USDA provides are much larger for meals served to students who are certified to receive meals for free or at reduced prices. Districts use two methods to certify students for free or reduced-price meals:

1. **Certification through application.** For students to be certified based on an application, households must either provide detailed information on household size and income or demonstrate that they are "categorically eligible" because they participate in one of several public assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families (TANF), or the Food Distribution Program on Indian Reservations (FDPIR). School district staff assess the application information to determine whether the household meets eligibility requirements.
2. **Direct certification.** In the direct certification process, State agency or school district staff typically match administrative records from programs that confer categorical eligibility with student enrollment records to identify and automatically certify eligible students for free

[1] DCM-F/RP could also lower the costs districts incur to process paper applications, but the study does not examine that outcome.

school meals. Districts that certify students are required to conduct direct certification with SNAP and encouraged to also directly certify students in TANF and FDPIR households.[2]

Some schools and districts use alternative procedures that do not involve certifying individual students each year, and instead serve meals to all students for free. Districts participating in Provision 2 or Provision 3 conduct certification in a base year and are reimbursed in later years based on claims from that base year. Under the Community Eligibility Provision (CEP), authorized school districts and schools in high-poverty areas receive the Federal free reimbursement rate for between 64 and 100 percent of meals served—depending on the percentage of "identified students," those certified for free meals through means other than applications—and receive the lower, paid reimbursement rate for the remaining meals.

B. Demonstrations using Medicaid data for direct certification

Using Medicaid data for direct certification presents an opportunity to reach additional students. However, because Medicaid participation does not confer categorical eligibility, States and districts must use income information from Medicaid eligibility or enrollment files to determine whether a student is eligible for free or reduced-price meals under the DCM demonstrations.

The Healthy, Hunger-Free Kids Act of 2010 (HHFKA; P.L. 111-296) required FNS to conduct a demonstration that added Medicaid to the list of programs used to directly certify students for free school meals in selected States and districts. Under this demonstration, students were eligible for free meals if they were enrolled in Medicaid and in a household with Medicaid gross income not exceeding 133 percent of the Federal Poverty Level (FPL) for the family size used for determining Medicaid eligibility. Five States began conducting DCM in school year (SY) 2012–2013, and two others joined the demonstration over the subsequent two years.

Beginning in SY 2016–2017, FNS initiated a new demonstration that differs from the previous DCM demonstration in several ways. First, the income threshold for free meal certification based on Medicaid data was set at 130 percent of the FPL, aligning with the standards for establishing NSLP/SBP eligibility based on income reported on an application. Second, the DCM-F/RP States also use the Medicaid data to identify students in households eligible to receive reduced-price meals and directly certify them at that level. Students can be certified for reduced-price meals under DCM-F/RP if their household income is between 130 and 185 percent of the FPL. Finally, guidelines for assessing eligibility were revised to reflect changes in Medicaid income and household definitions under the Patient Protection and Affordable Care Act of 2010, often referred to as the Affordable Care Act or ACA.

Seven States began participating in the DCM-F/RP demonstrations in SY 2016–2017: California, Florida, Massachusetts, Nebraska, Utah, Virginia, and West Virginia. All these States implemented DCM-F/RP statewide except for California, where only 14 districts participated in the demonstration during the first year. Three of these seven States—California, Florida, and Massachusetts—had participated in the previous demonstration before DCM-F/RP. The

[2] Students documented as foster children, homeless, migrant, runaway, or participating in Head Start can also be directly certified for free school meals.

demonstration expanded to include all California districts in SY 2017–2018, and eight additional States were authorized to begin DCM-F/RP that year.

C. Evaluation of the DCM-F/RP demonstration

FNS contracted with Mathematica Policy Research to conduct a study of the DCM-F/RP demonstration. This report describes the experiences of States and districts during the first year of implementation, SY 2016–2017, and examines outcomes related to certification, participation, and costs through descriptive and comparative analyses. A subsequent report will examine outcomes in the second year of the demonstration.

The certification, participation, and Federal reimbursement outcomes were analyzed using a pre/post design for States implementing DCM-F/RP statewide and a comparison group design for California. For most States, effects of the demonstration on percentages of students certified, participation (numbers of meals served), and Federal reimbursements are measured by comparing the outcomes in the year before the demonstration to those same outcomes in the first year of the demonstration. In this pre/post design, although the statistical model used to estimate changes accounts for the influence of included time-varying characteristics (such as local economic conditions) and any time-invariant characteristics (such as whether a district is public or private) on the outcomes of interest, time-varying factors not included in the model and unrelated to the demonstration (such as changes in student preferences for school meals) could still be driving some of the observed changes in outcomes. For California, the analysis measures effects by comparing the outcomes of the districts participating in the demonstration in SY 2016–2017 to those not participating that year. However, the 14 California districts implementing DCM-F/RP in SY 2016–2017 were not selected randomly, and the estimated effects could be due to differences between the treatment and control groups that are not controlled for through the statistical methods used.

Because California, Florida, and Massachusetts had conducted DCM for free meals during the baseline year under the previous DCM demonstration, analyses of effects related to free meals are presented only for the four States new to DCM. Florida and Massachusetts were excluded from the analysis of reduced-price certification outcomes because the necessary data were unavailable for those two States. In addition, West Virginia was excluded from analyses of participation and Federal reimbursements because its first DCM-F/RP match was in June 2017, after school had closed in most districts.

D. Summary of Year 1 findings

Implementation processes and challenges. States and districts integrated DCM-F/RP into their usual direct certification processes. Key differences under the demonstration included the assessment of eligibility based on income and household size information in the Medicaid files, and the addition of new program codes to indicate DCM-free and DCM-reduced-price. State agencies encountered challenges while preparing for the demonstration, including difficulties identifying which Medicaid aid categories included the information needed to assess students' eligibility for DCM-F/RP.[3] The process of revising interagency agreements to include DCM-

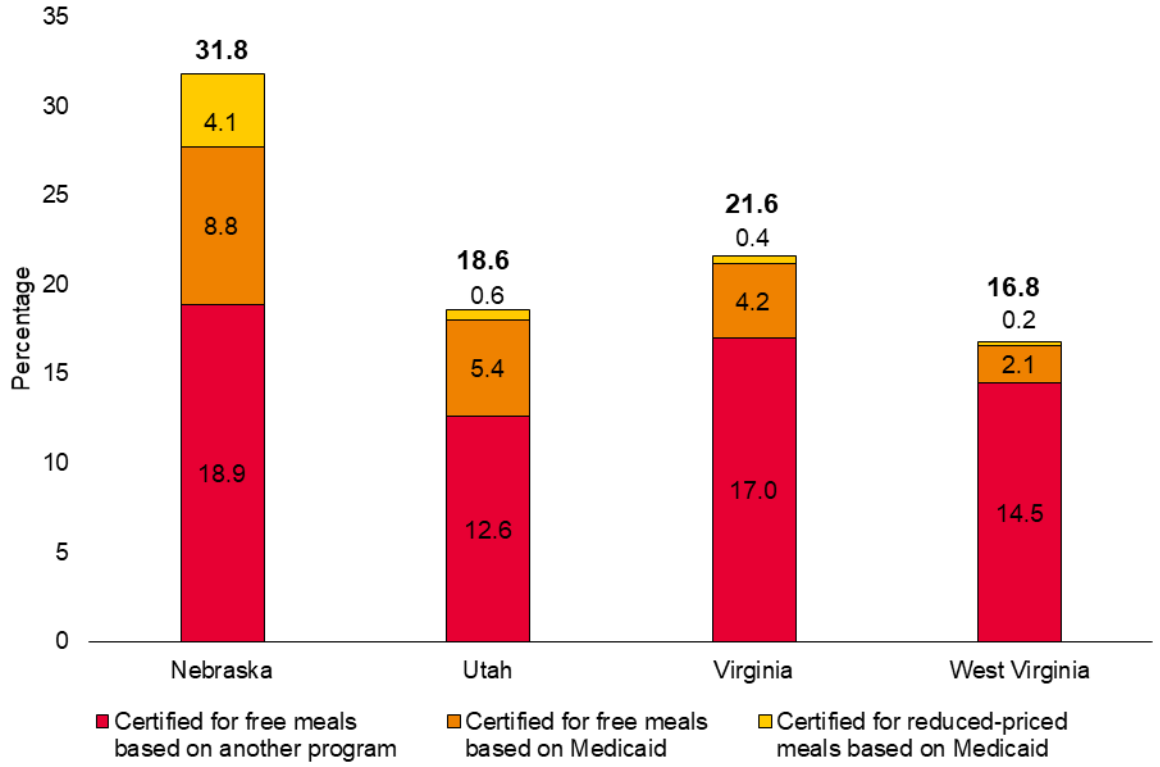
[3] Medicaid aid categories, established by each State, are designations indicating the criteria by which an individual qualifies for Medicaid assistance, including income limits and other eligibility criteria, such as age.

F/RP and creating a Medicaid data extract containing eligible children could be time-consuming, resulting in delays in implementation in some States. At the district level, a key challenge was that point-of-service systems did not always include Medicaid as a program option or recognize that direct certification could confer reduced-price status. These issues required district staff to manually certify DCM-F/RP matches.

Certification. Substantial numbers of students were directly certified through DCM-F/RP in the first year of the demonstration. Across the four States new to DCM, more than 100,000 students were directly certified for free meals based on Medicaid data. An additional 22,000 students were directly certified for reduced-price meals based on DCM-F/RP in the five States that provided the necessary data for that measure.

In terms of percentages, between 2.1 and 8.8 percent of students were directly certified for free meals based on DCM-F/RP in the four States new to DCM in SY 2016–2017, compared to none in the prior year; all these changes were statistically significant (Figure ES.1). (For comparison, between 16.6 and 27.7 percent of students were directly certified for free meals based on any program in these States, so DCM-F/RP represents a sizeable portion of all direct certifications.) The percentage of students directly certified for free meals based on any program also increased in each State, by between 2.5 and 8.0 percentage points.

Figure ES.1. Percentage of enrolled students directly certified in SY 2016–2017, by State new to DCM



Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Each outcome in this figure reflects the percentage of students who attend schools that certify individual students and are directly certified based on the specified program, among all students enrolled in the district. California, Florida, and

Massachusetts are excluded from this figure because they participated in a prior demonstration of DCM for free meals during the baseline year. Values in this figure are regression adjusted.

Between 0.2 and 4.1 percent of students were directly certified for reduced-price meals based on DCM-F/RP in the five States that provided the necessary data; these changes were statistically significant. For these two outcomes, because no students were certified through DCM-F/RP in these States in the baseline year, the full change between baseline and SY 2016–2017 is attributable to the demonstration, although experiences in other years or other States could differ.

Although some students directly certified based on Medicaid would have been certified for free or reduced-price meals by application in the absence of the demonstration, overall certification rates—including students certified by application as well as those directly certified—also improved during the first year of DCM-F/RP implementation in some States. All four of the States new to DCM experienced statistically significant increases (of between 2.0 and 3.9 percentage points) in the total percentage of students certified for free meals. The total percentage of students certified for reduced-price meals also increased significantly in one State (Nebraska) but was significantly lower in treatment districts than in comparison group districts in California. In three of the four States new to DCM, the increases in the percentage of students directly certified for free meals during the first year of DCM-F/RP resulted in increases in the percentage of districts eligible for CEP.

Participation. The increases in certification rates translated into increases in the percentage of lunches served for free but had mixed effects on other participation outcomes. For the NSLP, no State in the analysis sample experienced a statistically significant increase between the baseline and DCM-F/RP year in the NSLP participation rate (the average number of lunches served per student per day). However, the percentage of lunches served for free increased in all three States new to DCM in the analysis (a statistically significant 1.4 percentage point increase for the pooled sample), and the percentage of lunches served at a reduced-price decreased by a smaller amount (a statistically significant 0.6 percentage point decrease for the pooled sample). This pattern suggests that more lunches were served to students who moved from reduced-price status to free due to DCM-F/RP than were served to students who moved from paid status to reduced-price through DCM-F/RP. The pooled sample of statewide implementation States that participated in the previous demonstration experienced a statistically significant 0.8 percentage point increase in the percentage of lunches served at a reduced price, but a decrease (of 0.018 meals) in average lunches served per student per day. However, the small magnitude of the changes in meals served per student per day limits the practical importance of the findings for this outcome.

For the SBP, the participation findings vary by State. For each of the three breakfast participation outcomes, one or two States experienced a small but statistically significant increase and one or two had a small but statistically significant decrease between baseline and SY 2016–2017. The participation rate increased by 0.010 meals for one pooled sample (States new to DCM) and decreased by 0.009 meals in the other pooled sample (States that participated in the previous DCM demonstration). The percentage of breakfasts served at a reduced price increased by 0.07 percentage points for the pooled sample of States that participated in the previous DCM demonstration but decreased by 0.06 percentage points in the pooled sample of States new to DCM. There were no statistically significant changes for the relevant pooled sample in the percentage of breakfasts served for free.

Federal reimbursement costs. The findings on Federal reimbursements were mixed, and generally differed by whether a State was new to DCM. All three States new to DCM that were included in this analysis experienced small statistically significant increases in some Federal reimbursement outcomes (ranging from $0.01 to $0.03 increases in reimbursements per student per day and from $0.02 to $0.05 in the blended reimbursement rate), but the results were not consistent across outcomes. Among the three States that had participated in the previous DCM demonstration, two experienced decreases in Federal reimbursement outcome measures between the baseline and DCM-F/RP year. Florida saw consistent decreases in all four reimbursement measures, and Massachusetts had a decrease in SBP reimbursements per student per day. These decreases between the two school years were inconsistent with the anticipated direction of the effect of the demonstration. Although the regression adjustments were intended to control for time-invariant district characteristics and changes in economic conditions that might affect outcomes, regressions cannot control for unmeasured time-variant factors. In addition, as with small changes in other outcomes, the magnitude of the changes in Federal reimbursements could limit their practical importance.

State administrative costs. The total administrative costs incurred by State agencies to implement DCM-F/RP (over and above other certification costs) during the first year of the demonstration varied widely by State, ranging from approximately $13,000 to $257,000. Medicaid eligibility agencies typically incurred higher costs (averaging about $73,000 across States) than child nutrition agencies (averaging about $15,000). In the two States with the highest costs, the largest expenditure—comprising the majority of their total costs—was for work done by Medicaid agency contractors to develop the queries for identifying eligible children in the data.

The majority of these costs were for start-up activities, which averaged $84,000 across the seven demonstration States. Costs for ongoing activities after the first DCM-F/RP match were substantially smaller, averaging just $4,000 per State in the first year of the demonstration. This pattern suggests that continuing DCM-F/RP in later years likely would not require substantial additional resources.

E. Limitations

Limitations of the DCM-F/RP demonstration design and available data necessitate caution in interpreting the findings. An experimental design, like that used for the first DCM demonstration, was not possible for the new demonstration, so the effects of DCM-F/RP are estimated using less rigorous methods, as discussed in Section C.

The timing of implementation also affected both the potential of the demonstration to affect outcomes in SY 2016–2017 and the data available for the analysis. Only two of the seven States in the first year of the demonstration conducted their first DCM-F/RP match by the beginning of the school year. West Virginia was excluded from some analyses because its first DCM-F/RP match was in June 2017, after school had closed in most districts. For other States that conducted their first DCM-F/RP first match after October 2016, limited availability of data meant that the baseline certification outcomes are measured as of a different month than the DCM-F/RP year data. If certification rates increased over the school year, those changes could be confounded with the effects of DCM-F/RP on some outcome measures.

Other limitations relate to the data available. Specific certification data elements were unavailable for Nebraska, leading to the estimation of two key outcome measures for that State by combining data sources. In addition, some districts were excluded from the analysis sample due to incomplete or inconsistent administrative data, and other undetected errors could remain in the data. Finally, findings related to State administrative costs and to State and district processes and challenges are based on staff reports, which reflect the perspectives of respondents and could be subject to recall error.

F. Summary and next steps

In summary, the evaluation found that DCM-F/RP resulted in substantial numbers of students directly certified to receive free or reduced-price meals based on Medicaid data, comprising more than one-quarter of all students directly certified for free or reduced-price meals. Although some of these students would have been certified by another method in the absence of the demonstration, the total percentage of students certified for free meals grew between the baseline year and SY 2016–2017, and the total percentage of students certified for reduced-price meals grew in some demonstration States. These increases in certification rates did not translate into consistent increases in participation (meals served) or Federal reimbursements, however. State administrative costs for implementing DCM-F/RP varied widely, but the large majority of the costs were for start-up rather than ongoing activities. States and districts experienced some challenges during the first year of the DCM-F/RP demonstration, and several conducted their first DCM-F/RP late in the school year. The next report of the evaluation will focus on SY 2017–2018, the second year of implementation for the seven States in the first cohort and the first year of DCM-F/RP implementation for eight additional States.

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I. INTRODUCTION

The demonstration of Direct Certification with Medicaid for Free and Reduced-Price Meals (DCM-F/RP) allows authorized States and school districts to use information from Medicaid data files to identify students eligible to receive free or reduced-price (F/RP) National School Lunch Program (NSLP) and School Breakfast Program (SBP) meals.). The Food and Nutrition Service (FNS) contracted with Mathematica Policy Research to conduct a study of the first two years of this demonstration to describe the implementation process and explore the effects on certification, participation, Federal reimbursements, and State administrative costs. This report presents the findings from the first year of the demonstration evaluation, school year (SY) 2016–2017.

A. The school meal programs and direct certification

The NSLP is the largest child nutrition program in the United States, providing lunches to 30 million students each school day in Federal fiscal year (FY) 2017 (Food and Nutrition Service 2018). Along with the SBP, the NSLP is a cornerstone of the government's efforts to provide nutritious meals to schoolchildren and an essential resource for many families. All students enrolled in schools participating in the NSLP or SBP are eligible to receive subsidized school meals, but the meal reimbursements that the U.S. Department of Agriculture (USDA) provides are much larger for meals served to students who are certified to receive meals for free or at reduced prices. Students in families with incomes at or below 130 percent of the Federal poverty level (FPL)—$31,590 for a family of four during school year (SY) 2016–2017—are eligible for free meals, as are students who participate in one of several public assistance programs. Reduced-price meals are provided to students whose families have incomes between 130 and 185 percent of the FPL (between $31,590 and $44,955 for a family of four during SY 2016–2017). Districts use two methods to certify students for free or reduced-price meals:

1. **Certification through application.** For students to be certified based on an application, households must either provide detailed information on household size and income or demonstrate that they are "categorically eligible" because they participate in one of several public assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families (TANF), or the Food Distribution Program on Indian Reservations (FDPIR). School district staff assess the application information to determine whether the household meets eligibility requirements.
2. **Direct certification.** In the direct certification process, State agency or school district staff typically match administrative records from programs that confer categorical eligibility with student enrollment records to identify and automatically certify eligible students for free school meals. All districts and private schools that certify students are required to conduct direct certification with SNAP at least three times each year. FNS encourages more frequent direct certification as well as direct certification of students in TANF and FDPIR households.[4]

[4] Students documented as foster children, homeless, migrant, runaway, or participating in Head Start can also be directly certified for free school meals.

Direct certification is intended to ensure that students receive the meal benefits for which they are eligible and improves program integrity by reducing program error. It also relieves some of the burden that applying for school meals programs places upon parents, and in turn reduces the burden that reviewing and approving or denying those applications places upon school district staff.

Some schools and districts use alternative procedures that do not involve certifying individual students each year and instead serve free meals to all students. Districts participating in Provision 2 or Provision 3 conduct certification in a base year and are reimbursed in later years based on claims from that base year.[5] Under the Community Eligibility Provision (CEP), authorized school districts and schools in high-poverty areas receive the Federal free reimbursement rate for between 64 and 100 percent of meals served—depending on the percentage of "identified students," those certified for free meals through means other than applications—and receive the lower, paid reimbursement rate for the remaining meals.[6]

B. Demonstrations using Medicaid data for direct certification

More than 11.1 million students were directly certified for free school meals in SY 2014–2015 (Moore et al. 2016) because of the benefits noted above. Using Medicaid data to directly certify students presents an opportunity to reach additional students that are eligible for the program. However, because Medicaid participation does not confer categorical eligibility, States and districts must use income information from Medicaid eligibility or enrollment files to determine whether a student is eligible for free or reduced-price meals under the DCM demonstrations.

The Healthy, Hunger-Free Kids Act of 2010 (HHFKA; P.L. 111-296) required FNS to conduct a demonstration that added Medicaid to the list of programs used to directly certify students for free school meals in selected States and districts. Under this demonstration, which began in SY 2012–2013, students were eligible for free meals if they were enrolled in Medicaid and in a household with Medicaid gross income not exceeding 133 percent of the FPL. (This first DCM demonstration certified students only for free meals, not for reduced-price meals.) The legislation specified the use of gross income "before the application of any expense, block, or other income disregard" rather than net income for determining eligibility under DCM. However, the eligibility determination relied on the definition of household used by the Medicaid agency, which can differ from that used on school meal applications. Under this first demonstration, Florida, Illinois, Kentucky, New York City, and Pennsylvania began conducting DCM in SY

[5] Under Provisions 2 and 3, schools operate a base year in which they serve all meals at no charge but use standard program procedures to certify free and reduced-price eligible students and count meals by eligibility category. In subsequent (non-base) years, the schools continue to serve all meals at no charge but do not certify students and take only a daily aggregate count of meals served.

[6] Schools, groups of schools, or entire districts are eligible for the CEP if at least 40 percent of their students in a previous year were identified as eligible for free meals through means other than submitting an application—such as through direct certification. Per-meal reimbursement rates under the CEP are based on the percentage of identified students. The reimbursement rate is computed by multiplying the percentage identified by 1.6, reimbursing the resulting percentage of meals at the free rate, and reimbursing the remaining meals at the paid rate. When 62.5 percent of students are identified, all meals are reimbursed at the free rate.

2012–2013, Massachusetts and the rest of New York State in SY 2013–2014, and California in SY 2014–2015.

Beginning in SY 2016–2017, FNS initiated a new demonstration that authorized selected States and districts to directly certify students for free and reduced-price meals using Medicaid data. This DCM-F/RP demonstration differs from the previous DCM demonstration in several ways. First, the income threshold for free meal certification based on Medicaid data was set at 130 percent of the FPL, aligning with the standards for establishing NSLP/SBP eligibility based on income reported on an application. Second, the DCM-F/RP States also use the Medicaid data to identify students in households eligible to receive reduced-price meals and directly certify them at that level. Students can be certified for reduced-price meals under DCM-F/RP if their household income is between 130 and 185 percent of the FPL. Finally, to reflect changes in Medicaid income and household definitions under the Patient Protection and Affordable Care Act (ACA) of 2010, guidelines for assessing DCM-F/RP eligibility were revised as follows:

- For students receiving Medicaid in categories where income is defined as the sum of the Modified Adjusted Gross Income (MAGI) for each individual included in the household, eligibility is assessed based on MAGI before application of the 5 percent of FPL disregard that is used in assessing eligibility for Medicaid benefits.[7] This definition covers most Medicaid cases.
- For students receiving Medicaid in aid categories for which MAGI is not used, DCM-F/RP eligibility is assessed based on the family's gross income before "any expense, block, or disregard," that is, without applying any State-specific income exclusions or modifications States might use when determining Medicaid eligibility.

Under both definitions, the same income guidelines used for determining eligibility for free or reduced-price meals based on an application are applied to the income information from the Medicaid data file for the household as defined by Medicaid. Specifically, students can be certified for free meals under DCM-F/RP if their household income as determined by Medicaid is at or below 130 percent of the FPL for the family size used for determining Medicaid eligibility and for reduced-price meals if their household income is between 130 and 185 percent of the FPL.

Seven States began participating in the DCM-F/RP demonstrations in SY 2016–2017: California, Florida, Massachusetts, Nebraska, Utah, Virginia, and West Virginia. All these States implemented DCM-F/RP statewide except for California, where only 14 districts participated in the demonstration during the first year. California's implementation of DCM-F/RP also differs in that the income threshold for free meal eligibility is 133 percent of the FPL, as opposed to 130 percent of the FPL in the other States. The demonstration expanded to include all California districts in SY 2017–2018, and eight additional States—Connecticut, Indiana, Iowa, Michigan, Nevada, Texas, Washington, and Wisconsin—were authorized to begin DCM-F/RP that year.

[7] When determining Medicaid eligibility based on MAGI, which is the method used for most Medicaid cases, States disregard a portion of the applicant's income equal to 5 percent of the FPL. Applying this disregard is the equivalent of raising the income eligibility thresholds for Medicaid by 5 percent of FPL.

The success of DCM-F/RP depends on the ability of State agencies and school districts to access information on household size and gross income in Medicaid eligibility files, assess children's eligibility based on this information, and match them to student enrollment files. Within the implementation States and districts, two technical factors limit the pool of students that could be reached by the demonstration. First, the potential effect of DCM-F/RP on students' access to free school meals is limited because a large proportion of Medicaid enrollees also receive SNAP benefits or assistance from other programs used to directly certify students for free meals. If these children are already directly certified, they will not receive any additional benefit from DCM-F/RP. Second, the potential of the demonstration to certify students for reduced-price meals (185 percent of the FPL) depends on the Medicaid eligibility thresholds, which vary by State and Medicaid aid category.[8] Table I.1 shows the maximum household income limit for the principal MAGI group—the most common eligibility category—in each demonstration State. In States with Medicaid income limits below 185 percent of the FPL, DCM-F/RP will not be able to reach students with incomes between the Medicaid income limit and 185 of the FPL. In some States, the Medicaid income limit is only a few percentage points above the threshold for free meals (130 percent of the FPL), resulting in an extremely narrow band of income that could result in certification for reduced-price meals through DCM-F/RP. However, the limits shown in Table I.1 are not adjusted to reflect the 5 percent disregard typically applied to MAGI before assessing eligibility for Medicaid, and other Medicaid aid categories have different income limits.

Table I.1. State Medicaid income eligibility limit, as a percentage of the Federal poverty level

State	Ages 6–18
California	261%
Florida	133%
Massachusetts	150%
Nebraska	213%
Utah	133%
Virginia	143%
West Virginia	133%

Source https://www.medicaid.gov/medicaid/program-information/medicaid-and-chip-eligibility-levels/index.html.

Note: The limits reflected here are not adjusted to reflect the 5 percent disregard typically used to assess eligibility for Medicaid. Eligibility limits are for the primary MAGI group; States have other Medicaid aid categories with different Medicaid income limits.

C. Evaluations of the demonstrations

FNS has sponsored evaluations of the two demonstrations in which Medicaid data is used for direct certification: (1) DCM and (2) DCM-F/RP.

[8] Medicaid aid categories, established by each State, are designations indicating the criteria by which an individual qualifies for Medicaid assistance, including income limits and other eligibility criteria, such as age, disability, or receipt of Supplemental Security Income.

Evaluation of the DCM demonstration. FNS contracted with Mathematica Policy Research and its subcontractor Insight Policy Research (the "study team") to conduct a study of the first two years of the DCM demonstration (SY 2012–2013 and SY 2013–2014).[9] In five States, districts were randomly assigned to either a treatment group that implemented DCM or a control group that did not.[10] Using this experimental design, the study examined whether DCM led to changes in the percentage of students certified, participation rates (the numbers of meals served per student per day), Federal reimbursements, and certification costs incurred by districts. It also assessed State-level administrative costs and identified the challenges that States and districts faced when implementing DCM in seven demonstration States.

The evaluation found that, DCM positively affected certification and NSLP and SBP participation outcomes in some demonstration States but not others. These increases resulted in additional Federal reimbursements in some States, but there was no impact on district costs for certifying students. State DCM administrative costs varied widely, but the majority of the costs were for start-up rather than ongoing activities. The impact findings for this study are internally valid estimates of the impact of DCM for the participating evaluation districts in the participating States. However, the study was not intended to be nationally representative, and the findings cannot be generalized to a broader (or otherwise different) set of States and districts. In later chapters, we briefly compare the findings from the DCM evaluation to those of the current study.

Evaluation of the first year of the DCM-F/RP demonstration (SY 2016–2017). FNS contracted with the same team to conduct a study of the DCM-F/RP demonstration, which is the focus of this report. The first year of the DCM-F/RP evaluation addresses four key objectives, listed in Table I.2, and associated research questions listed in the following chapters. Answering research questions associated with Objective 1 requires in-depth examination of States' and districts' processes for implementing DCM-F/RP, including synthesizing information on implementation processes and resources, analyzing respondents' perceptions of factors related to matching success, and identifying challenges and best practices. Objectives 2 and 3 focus on the potential of DCM-F/RP to reach students who would not be directly certified through another program; addressing the research questions under these objectives will involve analysis of certification and DCM-F/RP matching outcomes. Objective 4 addresses the possible effects of DCM-F/RP on school meal participation, Federal reimbursement costs, and State administrative costs.

To address these objectives, the study team collected three key types of data: (1) district-level administrative records on certification and participation, (2) workbooks detailing costs incurred by State agencies in implementing DCM-F/RP, and (3) qualitative information on implementation processes and challenges State agency staff encountered during implementation. The sample for the first year of the DCM-F/RP demonstration evaluation includes all seven States that began conducting DCM-F/RP in SY 2016–2017: California, Florida, Massachusetts,

[9] Two reports present findings on the effects of the DCM demonstration (Hulsey et al., 2014 and Hulsey et al., 2016).

[10] Random assignment was not possible in Kentucky and Pennsylvania, which implemented DCM statewide. California, which did not join the demonstration until the third year, was not included in the evaluation.

Nebraska, Utah, Virginia, and West Virginia.[11] Some analyses include all districts in each State, while others focus on a subsample of districts or on State-level activities or are limited to States that provided specific types of data.

Table I.2. DCM-F/RP study objectives

Objective number	Objective	Related research questions	Relevant chapter(s)
1	Describe the processes and resources used by States and/or districts to match Medicaid data with school enrollment data and communicate the direct certification results to households, and the challenges to attaining high matching rates.	A.1–A.8	VII
2	Explore the potential of direct certification with Medicaid to reach children who are eligible for free or reduced-price school meals but are not certified to receive the meals.	B.1–B.5	III
3	Explore the potential of direct certification with Medicaid to directly certify eligible children who are enrolled for free or reduced-price school meals based on a household application.	B.1–B.4	III
4	Estimate the effect of DCM-F/RP on school meal participation, Federal reimbursement costs, and State administrative costs.	C.1–C.3	IV, V, and VI

An experimental design, like that used for the first DCM demonstration, was not possible for the new demonstration, so the effects of DCM-F/RP are estimated using less rigorous methods. For most States, effects on certification, participation, and Federal reimbursements are measured by comparing the outcomes of districts in the year before the demonstration to those same outcomes in the first year of the demonstration. In this pre/post design, differences between the two years could reflect year-to-year trends in outcomes in addition to the effects of the demonstration. Although we use a regression model to control for the influence of some time-varying characteristics, factors not included in the model could be driving some of the observed changes. In California, effects are measured by comparing the outcomes of the districts participating in the demonstration in SY 2016–2017 to those not participating that year, but the small number of purposively selected treatment group districts limits the power and generalizability of this comparison group design. Other outcomes, including State administrative costs, are explored through descriptive analyses.

D. Overview of report

This report presents the findings from SY 2016–2017, the first year in which the DCM-F/RP demonstration was implemented. Chapter II summarizes the methods used to collect data and conduct analyses. Chapters III through V contain key findings on the effects of DCM on certification, participation, and Federal reimbursement outcomes, respectively. Chapter VI describes key findings related to State administrative costs, and Chapter VII discusses DCM-F/RP processes and the experiences of States and districts during implementation. Chapter VIII summarizes our conclusions and the limitations of the findings. Appendices provide additional detail on methodology and supplemental tables.

[11] The eight additional States that began conducting DCM-F/RP in SY 2017–2018 will be included a later report on the second year of the demonstration.

II. METHODS

This evaluation measures the effects of DCM-F/RP on certification, participation, and Federal reimbursement costs, based on (1) a comparison of outcome measures in the year prior to the demonstration to those in the first year of the demonstration in most States and (2) a comparison of outcomes in treatment districts to those in districts not implementing DCM-F/RP in SY 2016–2017 in California. It also assesses State-level administrative costs and explores the processes and experiences of States and districts implementing DCM-F/RP.

The findings in this report for Nebraska, Utah, Virginia, and West Virginia reflect the experiences of States using Medicaid data to conduct direct certification for the first time in SY 2016–2017. The findings for California, Florida, and Massachusetts—States that participated in the earlier demonstration of DCM for free meals—reflect the new elements of DCM-F/RP, beyond the existing DCM systems in those States.

This chapter summarizes the data collection and analysis methods used, and Appendix A provides additional details.

A. Sample

The Year 1 analysis included seven States: California, Florida, Massachusetts, Nebraska, Utah, Virginia, and West Virginia. Six of the demonstration States implemented DCM-F/RP in all school districts statewide. The exception was California, which included 14 districts in the treatment group that implemented DCM-F/RP in SY 2016–2017.

Across the seven demonstration States, the quantitative analysis sample included 2,246 districts; the qualitative analysis sample included 14 (Table II.1).[12] The evaluation sample for quantitative analyses included all school districts with complete certification and participation data for both the baseline and DCM-F/RP year, with a few exceptions, described in Appendix A. However, some outcomes are relevant for only a subset of demonstration States, as discussed in Section C (pages 9–12). The qualitative data collection included two districts in each State where matching is conducted at the State level and four districts in the one State (Virginia) where local staff have primary responsibility for direct certification matching.

In presenting findings in the subsequent chapters, we group the demonstration States in three sets: (1) the four States that were new to DCM: Nebraska, Utah, Virginia, and West Virginia; (2) the two statewide implementation States that participated in the earlier demonstration of DCM for free meals: Florida and Massachusetts; and (3) California, which implemented DCM-F/RP in only a subset of districts in SY 2016–2017 and therefore has a different study design.

[12] In California, the quantitative analysis sample included 14 treatment districts and 961 comparison group districts.

Table II.1. Year 1 analysis sample

State	Number of State agencies in qualitative analysis	Number of districts in qualitative analysis	Number of DCM-F/RP districts in quantitative analysis
State that implemented DCM-F/RP in subset of districts in SY 2016–2017			
California	3	2	14[a]
Statewide DCM-F/RP States that participated in the first DCM demonstration			
Florida	2	2	257
Massachusetts	2	2	377
Subtotal	**4**	**4**	**634**
DCM-F/RP States that are new to DCM			
Nebraska	2	2	350
Utah	3	2	100
Virginia	2	4	121
West Virginia	2	0[b]	66
Subtotal	**9**	**8**	**637**
Total	**16**	**14**	**1,285**

Note: The quantitative analysis uses a comparison design for California and a pre/post design for all other States.

[a]Because California did not implement the demonstration statewide in SY 2016–2017, districts in that State are divided into treatment and comparison groups for the purposes of the quantitative analysis. The treatment group includes the 14 districts that implemented the demonstration in SY 2016–2017. The comparison group is based on 961 districts that did not implement the demonstration, weighted such that their characteristics are similar to the treatment group.

[b]District interviews were not conducted in West Virginia, which conducted its first DCM-F/RP match after the school year had ended for most districts in the State.

B. Data collection

The evaluation included the following primary data collection activities in the first year of the demonstration:

- **Administrative records data.** District-level administrative records data collected for each period fall into two broad categories: (1) enrolled students by certification status and basis for certification and (2) information on monthly participation (that is, meals served) for the NSLP and SBP. To enable pre/post comparisons (and weighting in California), we collected these data for both the first school year of the demonstration, SY 2016–2017, and a baseline year. The baseline year is the year prior to the demonstration for most States (SY 2015–2016), but California's baseline is the year before the State began the first DCM demonstration (SY 2013–2014). Depending on data availability, we also collected data on SY 2016–2017 direct certification match results for some States . In addition, we collected public information on characteristics of districts and their communities, such as poverty and unemployment rates.
- **State administrative cost data.** We collected monthly data on the administrative costs of setting up and operating DCM-F/RP at the State level—over and above time spent on other direct certification activities (including, for those participating in the previous DCM demonstration, using Medicaid to directly certify students for free meals)—through Excel logs completed by staff for the State child nutrition and Medicaid eligibility agencies. We

conducted follow-up telephone conversations to ensure accurate interpretation of the data provided.

- **Qualitative data.** We conducted site visits to all seven demonstration States to learn about their DCM-F/RP processes and experiences in SY 2016–2017. Each visit included both interviews and observations of key activities. Respondents included staff of State child nutrition agencies, State Medicaid eligibility agencies, and school districts. Later in the school year, we conducted follow-up telephone interviews with each State and district to learn how the demonstration progressed since the site visit.

C. Key outcome measures

The evaluation examines outcomes measured at the district level in four domains: certification, participation (that is, receipt of school meals), Federal reimbursement costs, and State-level administrative costs.

1. Certification outcomes

The most direct potential benefits DCM-F/RP offers to students and their families are (1) certification for free or reduced-price meals when they might otherwise pay a higher price for school meals and (2) certification without having to complete an application. In addition, an increase in the number of students directly certified could affect whether a district meets key thresholds related to the CEP. Aligned with these benefits, our primary certification measures for each district are:

- Percentage of students certified for free meals based on DCM.
- Percentage of students certified for reduced-price meals based on DCM.
- Percentage of students directly certified for free meals.
- Percentage of students certified for free meals.
- Percentage of students certified for reduced-price meals.
- Whether the district directly certified more than 40 percent of students for free meals.
- Whether the district directly certified more than 62.5 percent of students for free meals.[13]

Each of these outcomes is measured for the baseline year and for a point in SY 2016–2017 after the State conducted its first DCM-F/RP match. For States participating in the previous DCM demonstration, DCM-F/RP would affect only outcomes related to reduced-price meals, so those States are excluded from analyses of outcomes related to free meals.

Students attending special provision schools in a non-base year receive free meals but are not certified individually for free or reduced-price meals and therefore are not counted in the

[13] The last two measures relate to thresholds relevant for the CEP and are defined excluding schools that are already participating in the CEP. Analyses of these two outcomes exclude districts composed entirely of CEP schools; the sample sizes after this exclusion are shown in Table III.5.

numerators of the first five outcome measures, although the denominators include all students enrolled in the districts.[14] However, because the last two measures relate to thresholds relevant for the CEP, they are defined excluding schools that are already participating in the CEP or another special provision in a non-base year, and they are not defined for districts composed entirely of such schools. (The sample sizes after this exclusion are shown in Table III.5.)

Most States provided the data elements needed to compute these seven core measures directly, by dividing the number of students in the certification category by the total number of students enrolled in schools in the district. However, Florida and Massachusetts did not provide data on the number of students certified for reduced-price meals based on DCM-F/RP, which is necessary for computing the key certification outcomes relevant in States participating in the previous DCM demonstration, and therefore are not included in those analyses. In addition, Nebraska did not provide all data required to compute the percentages of students directly certified for free and reduced-price meals based on DCM-F/RP but provided partial data that we combined with data on match results to estimate those key certification outcomes for that State, as described in Appendix A.

In addition to the core certification measures, we computed measures related to match results for three States: Florida, Massachusetts, and Nebraska. For Nebraska (the only State that was able to provide the necessary data), we also computed the following measures:

- Number of students matched to free-eligible Medicaid records.
- Number of students matched to reduced−price-eligible Medicaid records.
- Percentage of each of these groups that were:
  - matched to another program used for direct certification, by program conferring eligibility (SNAP, TANF, foster care).
  - not matched to another program through the State match.

Florida and Massachusetts did not provide the necessary information for key certification outcomes but instead provided the results of the State agency's direct certification matching. Because the match results States provide to districts can differ from direct certification outcomes, we do not attempt to use them as a proxy for DCM-F/RP certifications.[15] However, we constructed an alternative measure using the match-results data for use in a separate analysis of match results related to DCM-F/RP in these States:

[14] The alternative would be to exclude CEP and other non-base-year special provision schools from the analyses. However, DCM-F/RP could affect eligibility for CEP in subsequent years, and the Year 2 analysis will examine that outcome, which will require including CEP schools.

[15] There are several reasons State match results might differ from direct certification outcomes. For example, students directly certified through extension of eligibility to other children in the household or based on local sources of direct certification (such as eligible migrant or homeless students in many States) do not appear in the State match results. Students matched at the State level who transfer, graduate, or drop out of school might not be directly certified. In addition, some students matched to reduced-price-eligible Medicaid records might be approved for free meals by application, and thus would not be directly certified.

- Percentage of students matched and identified as eligible for reduced-price meals based on DCM-F/RP.

2. Participation outcomes

Because the number of school meals served to students depends on the size of the district, as well as the certification status and participation behavior of students, we focus on outcome measures that account for size rather than comparing raw numbers of meals served. Our primary participation measures, each defined separately for the lunch and breakfast programs, are:

- **Average daily participation** (that is, the average number of meals served per student per school day), defined as the total number of reimbursable meals served divided by the product of the total number of students enrolled in the district and the number of operating days during the relevant time period.
- **The percentage of meals served for free**, defined as the number of meals served for free divided by the total number of reimbursable meals served.
- **The percentage of meals served at a reduced price**, defined as the number of meals served for a reduced price divided by the total number of reimbursable meals served.

Because participation data do not reflect DCM-F/RP until after the first match is conducted, each participation outcome is based on the months after the first match occurs, which varied by State. We aggregated numbers of meals across all months in the 2016–2017 school year, beginning with August for Florida and Nebraska, November for Utah, and May for Massachusetts and Virginia. (Because West Virginia did not conduct its first DCM-F/RP match until June, after school had ended for most districts, that State is not included in the analysis of participation.) The baseline measures cover the same set of months for the baseline school year.

3. Federal reimbursement outcomes

Our primary measures of the impact of DCM-F/RP on Federal reimbursements are also defined to control for the size of districts and computed separately for the lunch and breakfast programs, using the same set of months as used for the participation outcomes:

- **Reimbursements per student per school day,** defined as total Federal reimbursements for meals served to students divided by the product of the total number of students enrolled in the district and the number of operating days in the relevant set of months.
- **The blended reimbursement rate** (BRR)**,** defined as total Federal reimbursements divided by the number of meals served. The BRR measures the average reimbursement per meal served.

The BRR reflects the distribution of meals served across the free, reduced-price, and paid categories and thus is influenced by changes in certification status of students who participate in the school meals programs. The reimbursement cost per student per day equals the BRR multiplied by the average number of meals served per student per day and, thus, also reflects any change in the total number of meals per student resulting from DCM-F/RP. Both measures also depend on the FNS reimbursement rates, which vary by meal type (Appendix Table A.1). Reimbursement rates increase each year, so to control for this aspect of variation that is unrelated

to the demonstration in the pre/post analyses, we use SY 2015–2016 reimbursement rates for each meal type in computing these measures, for both years.[16]

4. State administrative cost outcomes

Unlike the certification, participation, and Federal reimbursement measures, which do not reflect the effects of the demonstration until the first DCM-F/RP match is conducted, the State cost measures cover the entire school year—including months before the first DCM-F/RP match—to capture the costs of planning, preparation, and testing. The primary State administrative costs outcome measure is the total administrative cost, in dollars, of conducting DCM-F/RP across all relevant State agencies, months, activities, and cost categories. We also examine these costs separately by:

- Agency type (child nutrition agencies and Medicaid eligibility agencies).
- Start-up costs (those that occurred up to and including the month of the first DCM-F/RP match) and ongoing costs (those that occurred after the month of the first DCM-F/RP match).
- Direct labor costs, other direct costs, and indirect costs.

In addition, we measure the cost of DCM-F/RP per thousand students enrolled, directly certified for free meals, and directly certified for free or reduced-price meals based on Medicaid.

D. Analysis methods

The evaluation uses both quantitative and qualitative analyses. Quantitative analyses include estimation of effects on certification, participation, and Federal reimbursement outcomes and an analysis of State administrative costs. We conducted descriptive analyses for Medicaid data matching and State administrative cost outcomes and qualitative analyses of DCM-F/RP processes and the challenges States and districts encountered in their first year of implementation.

Comparing Year 1 with prior year in States implementing DCM-F/RP statewide. In all States except California, we estimated the effects of DCM-F/RP on certification, participation, and Federal reimbursement outcomes by comparing the measure in the baseline year to the same measure in SY 2016–2017. We use regression models to control for changes in observed characteristics, such as economic conditions, between baseline and the first DCM-F/RP year and to improve the precision of the estimates. However, the estimates do not control for characteristics not included in the model, such as changes in preferences. For example, if there was an unmeasured change unrelated to the demonstration that affected key outcomes—such as an improvement in school meal quality that increased participation among students, or greater availability of competitive foods that decreased interest in reimbursable school meals—the resulting change in participation could be misconstrued as an impact of the demonstration. Appendix A includes details of the regression models.

[16] Because the analysis for California uses a comparison group design, those measures use SY 2013–2014 rates for the baseline year and SY 2016–2017 rates for the demonstration year.

Comparing treatment and comparison districts in California. Because California implemented DCM-F/RP in 14 districts in SY 2016–2017, instead of statewide, we used a comparison group approach to evaluate the impact of the demonstration in this State. The comparison group included all public school districts (excluding those composed of Residential Child Care Institutions) in California that did not participate in the demonstration. We used the data for the comparison districts to derive a set of weights that make them as comparable as possible to the treatment districts with respect to a set of observed district characteristics, including baseline values of most key outcome variables (detailed in Appendix A) that could potentially bias the demonstration effect estimate. As with the regression adjustments, this weighting controls only for the characteristics used in deriving the weights and not for other characteristics. If the treatment districts differ from the control districts on an unmeasured characteristic unrelated to the demonstration that influenced key outcomes, those differences could be incorrectly attributed to the demonstration. We estimated the demonstration effect by comparing the means for the outcomes of the treatment group to the weighted means of the comparison group.

Descriptive analyses of match results. In addition to the comparative analyses focusing on the key certification outcomes, we conducted descriptive analyses of measures collected only in SY 2016–2017. These included tabulations of State DCM-F/RP match results for (1) Nebraska, the only State to provide data necessary to partially address research questions B.3 and B.4; and (2) Florida and Massachusetts, which did not provide the data needed to compute key certification measures. We also tabulated the various measures of State administrative costs, including overall costs and breakdowns by agency and type of cost.

Qualitative analyses. To reduce and synthesize the qualitative data for analysis, the study team developed analytic memo templates—one for States and one for districts—and an analytic framework in Excel based on the research questions under Objective 1 of the study. Shortly after each site visit and follow-up telephone interview, the site teams summarized the raw data into the analytic memo templates. Senior qualitative researchers synthesized the data into the Excel analytic framework, including summaries of each step in the State or district's DCM-F/RP process, as well as State and district characteristics, to use in identifying patterns. Key themes were translated into research findings.

E. Limitations

Several limitations of the DCM-F/RP Year 1 demonstration, the evaluation design, sample, data, and methods should be noted. Appendix A provides a more detailed discussion of these and other limitations. The findings in this report should be interpreted cautiously in light of these limitations.

Design. Because most demonstration States implemented DCM-F/RP statewide, the evaluation used a pre/post design, in which the estimated effect of the demonstration is the change in a given outcome not explained by changes in measurable characteristics that occurred at the same time. Although the regression model accounts for the influence of included time-varying characteristics and any time-invariant characteristics on the outcomes of interest, time-varying factors not included in the model and unrelated to the demonstration could still be

driving some of the observed changes. Therefore, the estimates of effects might reflect factors other than DCM-FRP.

These limitations do not apply to California, for which we used a comparison group design. However, although the weighting process used for that State eliminates the potential bias due to the characteristics used in developing the weights (listed in Appendix A), it does not correct for bias potentially due to unobserved or unmeasured district characteristics.

Sample. The DCM-F/RP evaluation is based on samples of States that are not representative of all States nationally and samples of districts that are not necessarily representative of all districts in their respective States. In particular, only 14 California districts implemented DCM-F/RP in SY 2016–2017, and these districts were not selected randomly. The estimated effects presented in this report for the States should not be interpreted as indicative of the likely effects of statewide adoption of DCM-F/RP in California.[17]

Implementation timing. This report focuses on data from the first year of DCM-F/RP implementation (SY 2016–2017), during which only two of the seven States conducted the first DCM-F/RP match by the beginning of the school year. Most notably, West Virginia did not begin until June, after school had closed in most districts, so we did not include West Virginia districts in the qualitative data collection, and we do not present measures of participation and Federal reimbursements for the State. Although we do present measures of certification, the students certified after the end of school would not have received any free or reduced-price meals based on the demonstration that year. Even in States that conducted the first DCM-F/RP match earlier in the year, some districts may have implemented later than others, and start-up challenges may have affected implementation and outcomes. For example, participation effects might be limited if students do not adjust quickly to changes in certification status. Year 2 findings may differ substantially from those presented here. The substantial differences in the sets of months used for the participation and Federal reimbursements analyses in different States (the full school year for Florida and Nebraska; November–June for Utah; and May–June for California, Massachusetts, and Virginia) also make cross–State comparisons potentially misleading, due to seasonality in participation.

In addition, implementation later than October had implications for the certification data available for the demonstration. First, because the available baseline certification data were as of the end of October, they covered a different time of year than the DCM-F/RP year data in most States. If certification rates increase over the school year, those changes could be confounded with the effects of DCM-F/RP on some outcome measures (such as the total percentages of students certified or directly certified for free or reduced-price meals). Second, although States implementing the demonstration before the end of October could use data collected for the FNS-742 as a source for most of the information needed for the certification analysis, the FNS-742 would not reflect the results of the demonstration in States conducting the first DCM-F/RP match after October. Instead, they had to develop other processes to collect the certification data needed for the DCM-F/RP evaluation, such as a survey of districts. The different sources for the baseline

[17] California will implement DCM-F/RP statewide in SY 2017–2018, so the report on the second year of the demonstration will provide an assessment of the expansion of DCM-F/RP in that State.

and DCM-F/RP year could result in systematic differences in data quality. Anecdotally, staff from some districts reported difficulty obtaining the data needed for the evaluation.

Data. There are several additional limitations related to the data available for the evaluation. Specific certification data elements were unavailable for some States, leading two (Florida and Massachusetts) to be excluded from core certification analyses and two key measures for another State (Nebraska) to be estimated by combining data sources. In addition, some districts were excluded from the analysis sample due to incomplete or erroneous administrative data, and those omitted districts might differ systematically from districts for which data were available. There could be other errors remaining in the data that we were not able to detect.

Findings related to State administrative costs and State and district processes and challenges are based on staff reports. Recall error is possible, particularly for costs incurred during the early part of the school year, due to the lag between the beginning of the demonstration and the beginning of data collection. In addition, differences between States should be interpreted with caution due to possible differences in respondents' judgements of whether a cost would have been necessary in the absence of DCM-F/RP.

Qualitative analyses reflect the perspectives of respondents, including staff from a fairly small number of school districts. Although the 14 districts in the qualitative analysis sample were purposively selected to reflect diversity of the demonstration districts along several dimensions, the sample is relatively small and not statistically representative of all districts in the demonstration. In addition, although we attempted to interview the staff with the most complete knowledge about DCM-F/RP processes in each location at both State and district levels, staff could not always provide information on every topic included in the interview protocols. For example, State and district staff were often unable to provide information on their matching rates and instead discussed anecdotally the factors that can impact matching success. Findings reflect the perspectives of the respondents, and qualitative assessments of timing and matching success are not as rigorous as quantitative analyses could be if data were available.

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III. EFFECTS ON CERTIFICATION OUTCOMES

The DCM-F/RP demonstration allows States and school districts to directly certify students for free and reduced-price meals based on Medicaid data. The most direct measure of the effects of the demonstration are changes in certification outcomes, including the proportions of students directly certified through DCM-F/RP, directly certified based on any program, and certified for free or reduced-price meals through any method.

The analyses presented in this chapter address the research questions under Objectives 2 and 3 of the study (Table III.1), which relate to certification outcomes and the results of matching Medicaid and other program data to student enrollment data, a key intermediate step in the direct certification process. In the first part of the chapter, we describe the effects on certification for free and reduced-price meals (to address research questions B.1 and B.2) and on the proportion of districts reaching thresholds related to the CEP (research question B.5). We then discuss findings related to the results of DCM-F/RP matching (research questions B.3 and B.4). Finally, we note how these findings relate to those of the evaluation of the earlier DCM demonstration.

Table III.1. Research questions and objectives related to certification and data-matching outcomes

Question number	Research questions
Objectives 2 and 3. Explore the potential of direct certification with Medicaid to (1) reach children who are eligible for free and reduced-price school meals but are not certified to receive the meals and (2) directly certify eligible children who are enrolled for free and reduced-price school meals based on a household application.	
B.1	• For each demonstration State, in the school year prior to the demonstration, what is the number and percentage of students certified for: - Free meals based on direct certification by source (SNAP, TANF, FDPIR, other)? - Free meals based on application by type (categorical, income-based)? - Reduced-price meals based on application? - Paid meals?
B.2	• For each demonstration State, in each demonstration school year, what is the number and percentage of students certified for: - Free meals based on direct certification by source (SNAP, TANF, FDPIR, Medicaid, other)? - Free meals based on application by type (categorical, income-based)? - Reduced-price meals based on application? - Reduced price meals based on DCM-F/RP? - Paid meals?
B.3	• For each demonstration State with the database capability to address these questions, in each demonstration school year, what is the total number of students directly certified for free meals using Medicaid data? What is the: - Total number of free DCM-F/RP matches that were already directly certified for free meals based on direct certification by source (SNAP, TANF, FDPIR, other)? - Total number of free DCM-F/RP matches that were already certified for free meals based on application by type (categorical, income-based)? - Total number of free DCM-F/RP matches that were already certified for reduced-price meals based on application? - Total number of free DCM-F/RP matches that were not certified for either free or reduced-price meals?

Question number	Research questions
Objectives 2 and 3. Explore the potential of direct certification with Medicaid to (1) reach children who are eligible for free and reduced-price school meals but are not certified to receive the meals and (2) directly certify eligible children who are enrolled for free and reduced-price school meals based on a household application.	
B.4	• For each demonstration State with the database capability to address these questions, in each demonstration school year, what is the total number of students directly certified for reduced-price meals using Medicaid data? What is the: - Total number of reduced-price DCM-F/RP matches that were already directly certified for free meals based on direct certification by source (SNAP, TANF, FDPIR, other)? - Total number of reduced-price DCM-F/RP matches that were already certified for free meals based on application by type (categorical, income-based)? - Total number of reduced-price DCM-F/RP matches that were already certified for reduced-price meals based on application? - Total number of reduced-price DCM-F/RP matches that were not certified for either free or reduced-price meals?
B.5	• How would DCM-F/RP change the distribution of districts that would be eligible to participate in the Community Eligibility Provision? - How many more districts would have an identified student percentage (ISP) of greater than 40 percent? - How many more districts would have an ISP of greater than 62.5 percent?

A. Effects on certification for free meals

In the pooled sample, which combines districts across the four States new to DCM, 5.0 percent of students were directly certified for free meals through DCM-F/RP (Table III.2). The percentage ranged from 2.1 in West Virginia to 8.8 in Nebraska.[18] No students were directly certified for free meals based on Medicaid in these States during the baseline year, before DCM-F/RP was implemented. The difference between baseline and Year 1 is statistically significant for each State and the pooled sample. Students certified to receive free meals based on Medicaid data comprised almost one-quarter of all students directly certified for free meals in States new to DCM in SY 2016–2017. These students would not have been directly certified in the absence of the DCM-F/RP demonstration, although they could have been approved for free meals by application.[19] (The new demonstration would not be expected to affect free certifications in States that participated in DCM for free meals prior to DCM-F/RP, so we do not examine free outcomes in those States.)

For the pooled sample, the demonstration explained nearly all the change in the percentage of students directly certified for free meals (5.0 of the 5.5 percentage-point change) between the baseline year and SY 2016–2017. In one of the four States the percentage-point change in total free direct certifications was smaller than the percentage of students certified through DCM-F/RP, indicating that the percentage of students directly certified for free meals would have decreased in the absence of the demonstration.

[18] The methodology for estimating the percentage of students directly certified for free meals based on DCM-F/RP in Nebraska differed from that used in the other States. See Appendix A for details.

[19] The change in total percentage of students certified for free meals, discussed below, estimates the percentage of students certified for free meals who would not have been in the absence of the demonstration.

Table III.2. Effects of DCM-F/RP on certifications for free meals

State	Percentage of students directly certified for free meals based on Medicaid			Percentage of students directly certified for free meals			Percentage of students certified for free meals		
	Baseline year	DCM-F/ RP year	Change	Baseline year	DCM-F/ RP year	Change	Baseline year	DCM-F/ RP year	Change
Nebraska	0	8.8	8.8*	19.7	27.7	8.0*	32.8	36.7	3.9*
Utah	0	5.4	5.4*	12.0	18.0	6.0*	25.6	28.7	3.2*
Virginia	0	4.2	4.2*	16.1	21.2	5.1*	28.0	31.2	3.2*
West Virginia	0	2.1	2.1*	14.1	16.6	2.5*	17.2	19.1	2.0*
Pooled sample	0	5.0	5.0*	15.3	20.9	5.5*	26.7	30.1	3.4*

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Percentages are calculated based on all students enrolled in districts included in the analysis. Each outcome in this table reflects the percentage of students who are certified for free meals based on the specified method; students attending schools that do not certify individual students, such as special provision schools in non-base years, are not counted as certified. Florida and Massachusetts are excluded from this table because those States participated in a prior demonstration of DCM for free meals during the baseline year, so the DCM-F/RP demonstration only affects reduced-price meals. Values in this table are adjusted using fixed-effects regression. Appendix A lists the variables included in the regression adjustments. Changes shown in the table may differ slightly from calculated differences due to rounding.

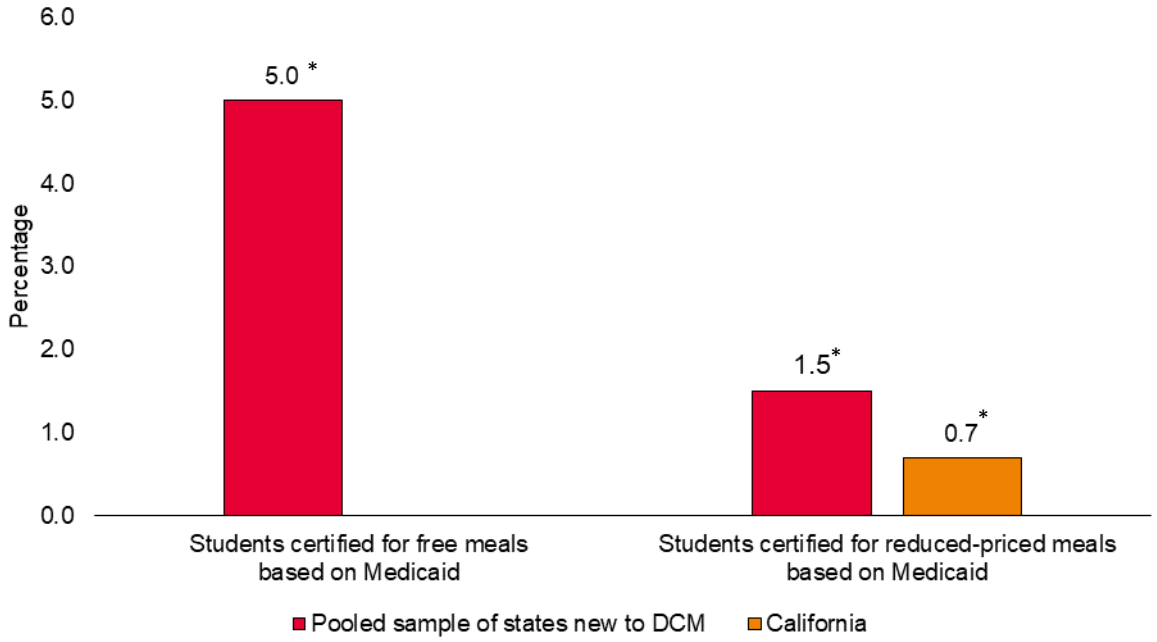
*Change between the baseline year and SY 2016–2017 is significantly different from zero at the .05 level, two-tailed test.

The change in the total free meal certification rate across the pooled sample (3.4 percentage points) was smaller than the percentage of students certified free through DCM-F/RP (5.0 percent). This reflects the fact that many students directly certified free based on Medicaid would have been certified free by application in the absence of the demonstration. Even if it did not change these students' status, the DCM-F/RP demonstration reduces administrative burden on families and district staff because they do not need to submit an application. In addition, increasing the number of students directly certified for free meals improves schools' and districts' chances of qualifying for CEP. DCM-F/RP likely contributed to the increase in the overall free certification rate as well, by certifying some students who otherwise would not have been.

B. Effects on certification for reduced-price meals

The demonstration had smaller effects on the percentage of students directly certified for reduced-price meals based on Medicaid. In the pooled sample, 1.5 percent of students were directly certified for reduced-price meals through DCM-F/RP (Figure III.1). As with free certifications, there was substantial variation across States, with the changes between the baseline and DCM-F/RP year ranging from 0.2 percent in West Virginia to 4.1 percent in Nebraska (Table III.3). In the California treatment districts, 0.7 percent of students were directly certified for reduced-price meals.

Figure III.1. Percentage of students directly certified based on Medicaid



Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Each outcome in this figure reflects the percentage of students who attend schools that certify individual students and are directly certified based on Medicaid data, among all students enrolled in the district. Outcomes related to free meals are not shown for California because that State participated in a prior demonstration of DCM for free meals during the baseline year, so the DCM-F/RP demonstration only affects reduced-price meals. Values in this figure are adjusted using fixed-effects regression.

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

Table III.3. Effects of DCM-F/RP on certification for reduced-price meals

	Percentage of students directly certified for reduced-price meals based on Medicaid			Percentage of students certified for reduced-price meals		
State	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
Nebraska	0.0	4.1	4.1*	8.5	10.4	1.9*
Utah	0.0	0.6	0.6*	7.3	7.2	–0.1
Virginia	0.0	0.4	0.4*	6.1	5.7	–0.3
West Virginia	0.0	0.2	0.2*	2.3	2.5	0.2
Pooled sample	0.0	1.5	1.5*	6.1	6.6	0.6*

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Percentages are calculated based on all students enrolled in districts included in the analysis. Each outcome in this table reflects the percentage of students who are certified for reduced-price meals based on the specified method; students attending schools that do not certify individual students, such as special provision schools in non-base years, are not counted as certified. Florida and Massachusetts are excluded from this table because the necessary data were not available for those States. Values in this table are adjusted using fixed-effects regression. Appendix A lists the variables included in the regression adjustments. Changes shown in the table may differ slightly from calculated differences due to rounding.

*Change between the baseline year and SY 2016–2017 is significantly different from zero at the .05 level, two-tailed test.

Nebraska's proportion of students directly certified for reduced-price meals (4.1 percent) stands out from the other States.[20] This is likely partly because Nebraska, unlike most other States, used a Medicaid income eligibility threshold above 185 percent of the FPL—high enough to include the entire range of students eligible for reduced-price meals (Table I.1). California, the State with the next highest rate of reduced-price direct certification, also used a Medicaid income eligibility threshold over 185 percent of the FPL. The remaining States used much lower Medicaid eligibility thresholds—143 percent of the FPL in Virginia and 133 percent of the FPL in Utah and West Virginia—leaving only a narrow range of income above the threshold for free meals (130 percent of the FPL) in which to identify students eligible for reduced-price meals.

The total percentage of students certified for reduced-price meals increased slightly between the baseline and DCM-F/RP year for the pooled sample. This was largely due to the 1.9 percentage-point change in Nebraska. The percentage of students certified for reduced-price meals did not change significantly in any other State new to DCM.

In California, the percentage of students certified for reduced-price meals was significantly lower in the treatment districts than in comparison districts (Table III.4). This could be an indirect effect of the previous DCM demonstration, through which the 14 DCM-F/RP districts have directly certified students for free meals since SY 2014–2015. Participation in DCM in years prior to SY 2016–2017 likely increased their direct certification rates, making it easier for their schools to qualify for special provisions for SY 2016–2017. The DCM-F/RP treatment districts had much higher rates of participation in CEP and non-base-year Provision 2 or 3 than control districts. Students attending special provision schools in a non-base year are not certified individually for free or reduced-price meals and therefore are not counted as certifications in this analysis.

Table III.4. Effects of DCM-F/RP on certification outcomes in California

Outcome	Treatment group	Comparison group	Difference
Percentage of students			
Directly certified for reduced-price meals	0.7	0.0	0.7*
Certified for reduced-price meals	6.3	8.6	-2.3*

Source: Administrative records for SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Percentages are calculated based on all students enrolled in districts included in the analysis. Each outcome in this table reflects the percentage of students who are certified based on the specified method; students attending schools that do not certify individual students, such as special provision schools in non-base years, are not counted as certified. Measures related to certification for free meals are omitted from this table because California participated in a prior demonstration of DCM for free meals, so the DCM-F/RP demonstration only affects reduced-price meals. Values for the comparison group in this table are weighted to balance the baseline (SY 2013–2014) characteristics of the comparison group and the treatment group. Appendix A lists the characteristics used to construct the weights. Differences shown in the table may differ slightly from calculated differences due to rounding.

*Difference between the treatment and comparison groups is significantly different from zero at the .05 level, two-tailed test.

[20] The methodology for estimating the percentage of students directly certified for reduced-price meals based on DCM-F/RP in Nebraska differed from that used in the other States. See Appendix A for details.

C. Effects on CEP thresholds

The Community Eligibility Provision (CEP) allows schools, groups of schools, or entire districts to offer free meals to all students if at least 40 percent were identified as eligible for free meals through means other than submitting an application, such as through direct certification. Per-meal reimbursement rates under the CEP are based on the percentage of identified students and increase with the percentage of identified students up to 62.5 percent of students, at which point all meals are reimbursed at the free rate. The DCM-F/RP demonstration has the potential to increase the identified student percentage by enabling districts to directly certify more students for free meals than they otherwise would.

Table III.5 shows the percentage of districts in the pooled sample that met the threshold for CEP minimum eligibility and those that met the threshold for maximum reimbursement under CEP. This analysis differs from the other analyses in this chapter in two ways. First, it excludes schools participating in the CEP or Provision 2 or 3 in a non-base year in either the baseline or DCM-F/RP year. (Tables III.2–III.4 present percentages of students who are certified based on a specified method. Students attending schools that do not certify individual students, such as special provision schools in non-base years, are not counted as certified in those measures.) Second, the outcomes are percentages of districts, rather than percentages of students.[21]

Table III.5. Effects of DCM-F/RP on key thresholds related to the CEP

State	Number of districts in		Percentage of districts with more than 40 percent of students directly certified for free meals			Percentage of districts with more than 62.5 percent of students directly certified for free meals		
	Overall analysis sample	Analysis sample for this table	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
Nebraska	350	343	1.4	6.2	4.7*	0.3	0.6	0.2
Utah	100	96	1.4	2.8	1.4	0.0	0.0	0.0
Virginia	121	116	8.9	24.7	15.8*	0.5	0.4	0.0
West Virginia	66	37	11.2	40.1	28.9*	0.0	0.0	0.0
Pooled sample	637	592	3.6	11.3	7.8*	0.2	0.5	0.3

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: The percentages shown in this table are based on students attending schools not participating in the CEP or Provision 2 or 3 in a non-base year. Districts in which all schools participated in a special provision (in a non-base year) in either SY 2015–2016 or SY 2016–2017 were excluded from this analysis. Florida and Massachusetts are excluded from this table because those States participated in a prior demonstration of DCM for free meals during the baseline year, so the DCM-F/RP demonstration only affects reduced-price meals. Values in this table are adjusted using fixed-effects regression. Appendix A lists the variables included in the regression adjustments. Changes shown in the table may differ slightly from calculated differences due to rounding.

*Change between the baseline year and SY 2016–2017 is significantly different from zero at the 0.05 level, two-tailed test.

The percentage of districts in the pooled sample with more than 40 percent of students directly certified for free meals increased from 3.6 percent to 11.3 percent. This change was

[21]Because the data are at the district level, the analysis does not indicate whether individual schools or groups of schools within districts might have met these CEP thresholds.

driven by Virginia and, especially, West Virginia, which had a large proportion of districts just below the 40 percent line in the baseline year. Nebraska and Utah, which had larger increases in the percentage of students directly certified for free meals, had smaller changes in district-level CEP eligibility, and the difference was not statistically significant in Utah. In these two States, a smaller proportion of districts were just below the 40 percent threshold in the baseline year.

There were no significant changes in the percentage of districts with more than 62.5 percent of students directly certified for free meals, either in pooled or State-specific results. One reason for this is that schools with high identified student percentages likely chose to participate in CEP, and therefore do not certify individual students, so they are not included in the analysis presented in Table III.4.

D. Program overlap in Nebraska match results

In addition to the certification results, one State was able to provide details of the results of its match of the file of children eligible for DCM-F/RP to the full school enrollment data. This match is a key step in the direct certification process, and the data allow an analysis of the overlap between Medicaid matches and matches to data from other programs. This analysis partially addresses research questions B.3 and B.4, but the data to address these questions fully were not available from any State.[22]

Among students matched to free-eligible Medicaid records in Nebraska's State match, approximately one-third were also matched to other program records—overwhelmingly SNAP (Table III.6). The demonstration did not affect the final certification status for these students because all other programs supersede Medicaid in the direct certification hierarchy.

The remaining two-thirds of students matched to free-eligible Medicaid records were not matched to other program records in the State match. The demonstration likely changed the certification status for many of these students. However, some of the students likely would have been certified for free meals in the absence of the demonstration. Some might have been directly certified for free meals at the district level, either through extended eligibility (if they resided in a household with other students directly certified through SNAP or TANF) or if they qualified as an eligible migrant or homeless student. Others might have been certified for free or reduced-price meals by application. Some students identified in the statewide student information system and included in the first match of the school year might graduate over the summer, transfer out of State, or drop out before classes begin in the fall. The data needed to determine how many matched students would have been certified through local processes were not available.

[22] Specifically, among students who were matched to free or reduced-price-eligible Medicaid records, no State could provide separate counts of those approved for free or reduced-price meals based on an application and those who were not.

Table III.6. Full direct certification match results for students matched to DCM-eligible Medicaid records in Nebraska

Outcome	Number	Percentage
Students matched to free-eligible Medicaid records in State match	**36,664**	**100.0**
Among those, highest priority direct certification match		
SNAP[a]	11,791	32.2
TANF[a]	1	0.0
Foster care[a]	525	1.4
Medicaid only[b]	24,347	66.4
Students matched to reduced-price-eligible Medicaid records in State match	**13,988**	**100.0**
Among those, highest priority direct certification match		
SNAP[a]	512	3.7
TANF[a]	0	0.0
Foster care[a]	8	0.1
Medicaid only[b]	13,468	96.3

Source: Administrative records for SY 2016–2017 (DCM-F/RP year) provided by State administrators.

[a]Direct certification based on these programs takes priority over direct certification based on Medicaid. Therefore, the DCM demonstration did not change the certification status or basis for these students.

[b]Some of these students might have been directly certified for free meals at the district level, either based on programs matched locally or through extension to students residing in a household with a directly certified student. Others might have been approved for free or reduced-price meals by application. Others might not have been approved for free or reduced-price meals in the absence of DCM.

Among students matched to reduced−price-eligible Medicaid records in Nebraska's State match, less than 4 percent also matched to other program records. This result is not surprising, as most students with household incomes that qualify them for reduced-price meals would not qualify for programs conferring categorical eligibility for free meals, such as SNAP. Some of these students would likely not have been certified for free or reduced-price meals in the absence of the demonstration. However, some might have been certified for free meals through the same mechanisms described in the previous paragraph. Others might have been certified for reduced-price meals by application in the absence of DCM-F/RP.

E. Other State match results

Two States, Florida and Massachusetts, did not provide counts of reduced-price Medicaid direct certifications, so it was not possible to estimate the effects of the demonstration on the outcomes presented in Table III.3.[23] Instead, they provided counts of State-level matches to reduced−price-eligible Medicaid records. Appendix Table B.6 presents State-level match counts for those two States plus Nebraska, the only other State that provided State match data.

It is difficult to assess how the State match rates in Appendix Table B.6 might have translated into final direct certifications for Florida and Massachusetts. The match counts include students attending CEP and other non-base-year special provision schools that do not certify individual students. Furthermore, analysis of Nebraska's data suggests that State match results do not neatly correspond to final direct certifications. The previous section notes some reasons that

[23] Florida and Massachusetts participated in the original DCM demonstration, so the DCM-F/RP demonstration would not affect their free certifications.

reduced-price matches might not be certified based on DCM-F/RP. A factor that could work in the opposite direction is extension of benefits to other students in the household, which could result in some students being certified through DCM-F/RP despite not being matched.

Florida and Massachusetts matched a smaller percentage of students to reduced−price-eligible Medicaid records than Nebraska, suggesting they might have had DCM-F/RP certification rates for reduced-price meals that were closer to those of the other demonstration States, all of which had lower rates than Nebraska. Florida and Massachusetts had Medicaid eligibility thresholds lower than the threshold for reduced-price meal eligibility of 185 percent of the FPL, consistent with all study States other than California and Nebraska (Table I.1).

F. Comparisons with other findings

The reports of the evaluation of the first DCM demonstration provided estimates of the impacts of that demonstration on some of the outcomes discussed in this chapter. The samples and designs differed, but the earlier evaluation provides a useful point of reference.[24] Estimated effects on the percentages of students certified for free meals through direct certification and overall are higher in the current study than in the earlier evaluation. In the pooled sample of the earlier study, the proportion of students certified for free meals was 1.5 percentage points higher in the treatment districts than the control districts in the first year of DCM. Overall free meal certifications were 0.7 percentage points higher (Hulsey et al., 2014). In the second year, the differences grew to 3.3 percentage points for direct certifications and 2.7 percentage points for total free certifications (Hulsey et al. 2016).

[24] The previous evaluation compared outcomes for districts randomly assigned to a treatment group that conducted direct certification for free meals using Medicaid data to those of a control group that did not participate in DCM.

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IV. EFFECTS ON PARTICIPATION OUTCOMES

DCM-F/RP could increase school meal participation—that is, the number of meals served—if more students are certified to receive free or reduced-price meals and those students choose to obtain school meals more often in response to the reduction in price. Even if the behavior of students does not change and overall participation does not rise, the proportion of meals served for free or at a reduced price could change. The proportion of meals served for free or at a reduced price could increase if students who had been participating at full price continue to participate but now receive free meals or reduced-price meals. If students who had been participating at a reduced price continue to participate but now receive free meals, that would increase the proportion of meals served for free but decrease the proportion of meals served for a reduced price. However, other factors unrelated to DCM-F/RP could also influence school meal participation.

The participation analysis focuses on three main outcomes, each defined separately for lunches and breakfasts:

1. The participation rate, defined as average number of meals served per enrolled student per day.
2. The percentage of meals that were served for free.
3. The percentage of meals that were served at a reduced price.

Each outcome is defined based on SY 2016–2017 participation beginning in the month of the first DCM-F/RP match in the State, and for the same set of months in the baseline year.

We group the demonstration States in three sets to present findings: (1) the two statewide implementation States that participated in the previous demonstration of DCM; (2) States that were new to DCM; and (3) California, which implemented DCM-FRP in a subset of districts and therefore uses a comparison group design for estimating effects.[25] For States where DCM was implemented previously, we examine only outcomes that could have been affected by changes in reduced-price participation, as the new demonstration should not have affected the percentage of meals served for free in those States.

The analyses in this chapter address the first set of research questions under Objective 4 of the study (Table IV.1). The other research questions under this objective are discussed in Chapters V and VI. This chapter presents findings on the effects of DCM-F/RP on these participation outcomes, first for the NSLP and then for the SBP, and discusses how these findings relate to those on certification presented in the previous chapter and those of the evaluation of the earlier DCM demonstration. Tables in Appendix C present unadjusted versions of the results in this chapter.

[25] Although West Virginia was new to DCM, it is excluded from these analyses because the first DCM-F/RP match was conducted after the end of the school year for most districts, resulting in no opportunity for participation.

Table IV.1. Research questions and objectives related to participation, Federal reimbursement, and State administrative costs

Question number	Research questions	Relevant chapter
Objective 4. Estimate the effect of DCM-F/RP on school meal participation, Federal reimbursement costs, and State administrative costs.		
C.1	• How does DCM-F/RP impact the average number of meals served (breakfast and lunch separately) per student per day? • How does DCM-F/RP impact the percentage of meals (breakfast and lunch separately): - Served for free? - Served at a reduced price?	IV
C.2	• How does DCM-F/RP impact the total Federal reimbursement costs for meals served to students per school day? • How does DCM-F/RP impact the blended reimbursement rate (BRR), defined as total Federal reimbursement costs divided by the number of meals served?	V
C.3	• How does DCM-F/RP affect: - The total State administrative costs relative to existing costs for direct certification broken down by agency (child nutrition or Medicaid)? - Start-up costs versus ongoing costs?	VI

A. Effects on NSLP participation outcomes

The implementation of DCM-F/RP was associated with increases in the percentage of lunches served for free, but results were mixed for the other two NSLP participation outcomes (Tables IV.2 and IV.3). The statistically significant differences between baseline and SY 2016–2017 outcomes were in opposite directions for States that participated in the first DCM demonstration compared to those that did not. The demonstration had no statistically significant effect on NSLP participation outcomes in California or Massachusetts.

The NSLP participation rate—the number of lunches served per student per day—did not increase between the baseline year and SY 2016–2017 in any individual State. However, Florida experienced a statistically significant decrease of 0.042 lunches per student per day (Figure IV.1). Pooling across the statewide implementation States that participated in the first DCM demonstration (Florida and Massachusetts) yielded in a smaller statistically significant decrease of 0.018 meals. These decreases between the two school years were inconsistent with the anticipated direction of the effect of the demonstration. Although the regression adjustments were intended to control for time-invariant district characteristics and changes in economic conditions that might affect outcomes, regressions cannot control for unmeasured time-variant factors. In the pooled sample of States that were new to DCM, there was a small, statistically significant increase of 0.004 lunches served per student per day. However, the magnitude of this change limits the practical importance of the finding, despite its statistical significance.[26] An

[26] Another way of looking at magnitude of an effect is to compute an effect size. The effect size for this increase of 0.004 lunches per student per day is 0.035, which we calculated by dividing the change by the pooled standard deviation. Generally, an effect size of 0.250 standard deviations or larger is considered to be substantively important (U.S. Department of Education, 2017). We were able to identify these small impacts as statistically significant because the model used to estimate effects explains a very large proportion of variance in this outcome. This holds true for all pre/post analyses of this outcome.

increase of 0.004 meals in the average number of meals per student per day translates to less than one additional meal per student across a full school year.

There were statistically significant increases in the percentage of lunches served for free in each of the three States new to DCM, ranging from 0.8 to 2.4 percentage points, between the baseline year and SY 2016–2017. These changes drove an increase of 1.4 percentage points in the pooled sample, a change that was also statistically significant. As previously mentioned, States that participated in the first DCM demonstration were not included in the analysis of this outcome.

Table IV.2. Effects of DCM-F/RP on NSLP participation

	Average number of lunches served per student per day			Percentage of lunches served for free			Percentage of lunches served at a reduced price		
State	Baseline year	DCM-F/ RP year	Change	Baseline year	DCM-F/ RP year	Change	Baseline year	DCM-F/ RP year	Change
DCM-F/RP States that participated in the first DCM demonstration									
Florida	0.595	0.552	-0.042*	n.a.	n.a.	n.a.	4.4	5.3	0.9*
Massachusetts	0.454	0.458	0.004	n.a.	n.a.	n.a.	3.0	3.5	0.5
Pooled sample	**0.553**	**0.534**	**-0.018***	**n.a.**	**n.a.**	**n.a.**	**4.1**	**4.9**	**0.8***
DCM-F/RP States that are new to DCM									
Nebraska	0.653	0.656	0.003	40.8	43.2	2.4*	9.9	9.2	-0.7*
Utah	0.486	0.490	0.005	39.7	40.8	1.1*	10.3	9.8	-0.5*
Virginia	0.476	0.480	0.004	54.1	54.8	0.8*	8.6	8.1	-0.5*
Pooled sample	**0.506**	**0.510**	**0.004***	**47.5**	**49.0**	**1.4***	**9.3**	**8.8**	**-0.6***

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: The results for each State reflect all months after the State conducted its first DCM-F/RP match in SY 2016–2017. West Virginia is excluded from this table because it conducted its first DCM-F/RP match in June, after school had ended for most districts in the State. Outcomes related to free meals are not shown for Florida and Massachusetts because those States participated in a prior demonstration of DCM for free meals during the baseline year, so the DCM-F/RP demonstration only affects reduced-price meals. Values in this table are adjusted using fixed-effects regression. Appendix A lists the variables included in the regression adjustments. Changes shown in the table may differ slightly from calculated differences due to rounding.

n.a. = not applicable.

*Change between the baseline year and SY 2016–2017 is significantly different from zero at the .05 level, two-tailed test.

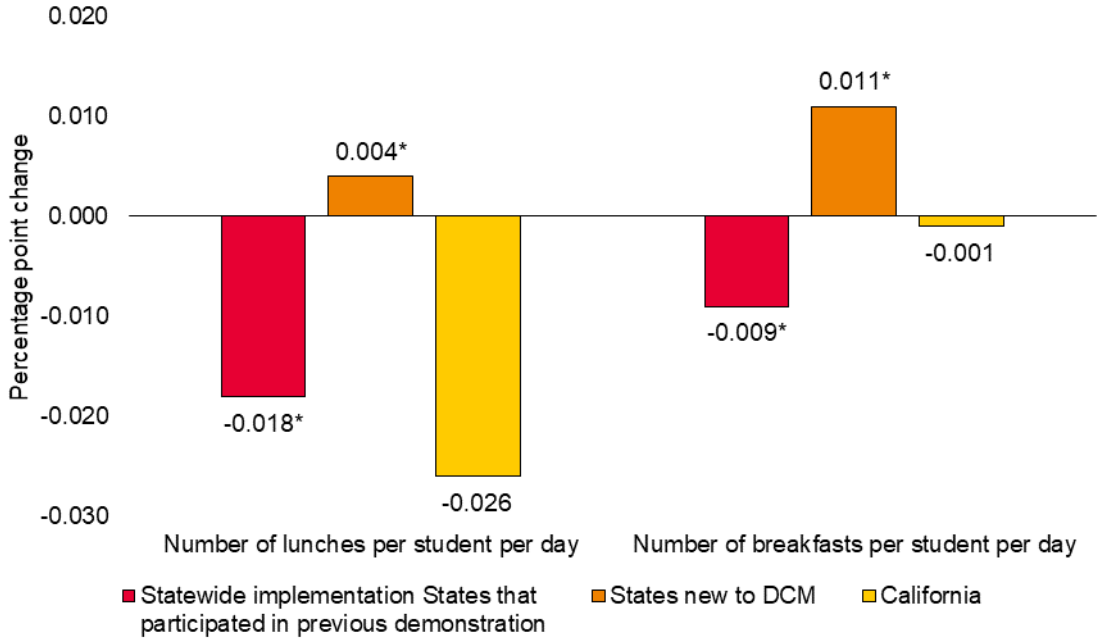
Table IV.3. Effects of DCM-F/RP on school meal participation in California

Outcomes	Treatment group	Comparison group	Difference
NSLP			
Average number of lunches served per student per day	0.401	0.428	-0.026
Percentage of lunches served at a reduced price	8.9	11.1	-2.2
SBP			
Average number of breakfasts served per student per day	0.192	0.193	-0.001
Percentage of breakfasts served at a reduced price	8.1	10.5	-2.5

Source: Administrative records for SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: The results reported in this table are obtained by aggregating across the months after California conducted its first DCM-F/RP match in SY 2016–2017 (in May). Outcomes related to free meals are not shown because California participated in a prior demonstration of DCM for free meals, so the DCM-F/RP demonstration only affects reduced-price meals. Values for the comparison group in this table are weighted to balance the baseline (SY 2013–2014) characteristics of the comparison group and the treatment group. Appendix A lists the characteristics used to construct the weights. Differences shown in the table may differ slightly from calculated differences due to rounding. There are no statistically significant differences in this table.

Figure IV.1. Effects of DCM-F/RP on numbers of meals served per student per day



Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: The results for each State reflect all months after the State conducted its first DCM-F/RP match in SY 2016–2017. Values in this figure are adjusted using fixed-effects regression.

n.a. = not applicable.

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

One State, Florida, experienced an increase in the percentage of meals served at a reduced price, while three States new to DCM experienced decreases in that outcome. In Florida, the percentage of lunches served at a reduced price increased by 0.9 percentage points, driving a 0.8 percentage point increase in the pooled sample of States that participated in the first DCM demonstration; these increases were statistically significant. In contrast, each State in this analysis that was new to DCM—Nebraska, Utah, and Virginia—experienced a statistically significant decrease in the percentage of lunches served at a reduced price, ranging from 0.5 to 0.7 percentage points. These decreases resulted in a 0.6 percentage point decrease in the pooled sample.

As noted above, there was no clear expectation of how the demonstration might affect the percentage of meals served at a reduced price in States new to DCM because two aspects of DCM-F/RP work in opposite directions for reduced-price meals: students moving from reduced-price to free status potentially decrease the proportion of meals served at a reduced price, while participating students moving from paid to reduced-price status potentially increase that proportion.[27] The decreases in the percentage of lunches served at a reduced price in States new to DCM could indicate that participation among those who moved from reduced-price to free meals changed more than participation among those who moved from paid to reduced-price status. Students changing from reduced-price to free meals might be more likely to participate than those moving from paid to reduced-price meals, because those who received reduced-price meals in the absence of DCM-F/RP had to complete an application to become certified. Completing an application could indicate a greater interest in school meals and therefore a higher participation rate.

It is useful to also examine the changes in the percentage of meals served for free in combination with the percentage served at a reduced price. In each State new to DCM, the magnitude of the increases in percentage of meals served for free was larger than the decreases in the percentage of meals served at a reduced price, resulting in an increase in the overall percentage of meals served for free or at a reduced price, despite the decline in the percentage at a reduced price. This pattern suggests that more meals were served to students who were certified for free meals through DCM-F/RP but would have been certified for reduced-price meals in the absence of the demonstration than were served to students certified for reduced-price meals through DCM-F/RP who would not have been certified otherwise.

B. Effects on SBP participation outcomes

DCM-F/RP had mixed results for SBP participation outcomes (Tables IV.3 and IV.4). For each of the three SBP participation outcomes, one or two States experienced a statistically significant increase and one or two had a statistically significant decrease between baseline and SY 2016–2017.

[27] For States that participated in the previous DCM demonstration, any shift to free status would have occurred before baseline, so the new demonstration could only result in students moving from paid to reduced-price status.

Table IV.4. Effects of DCM-F/RP on SBP participation

State	Average number of breakfasts served per student per day			Percentage of breakfasts served for free			Percentage of breakfasts served at a reduced price		
	Baseline year	DCM-F/ RP year	Change	Baseline year	DCM-F/ RP year	Change	Baseline year	DCM-F/ RP year	Change
DCM-F/RP States that participated in the first DCM demonstration									
Florida	0.289	0.268	-0.022*	n.a.	n.a.	n.a.	3.8	4.6	0.8*
Massachusetts	0.189	0.160	-0.028*	n.a.	n.a.	n.a.	3.0	2.6	-0.4
Pooled sample	**0.256**	**0.247**	**-0.009***	**n.a.**	**n.a.**	**n.a.**	**3.6**	**4.3**	**0.7***
DCM-F/RP States that are new to DCM									
Nebraska	0.200	0.205	0.005	59.5	61.6	2.0*	11.2	10.0	-1.2*
Utah	0.119	0.125	0.006*	66.3	66.5	0.2	10.6	10.3	-0.3
Virginia	0.211	0.234	0.023*	72.0	70.6	-1.4*	8.6	8.1	-0.5*
Pooled sample	**0.187**	**0.197**	**0.011***	**68.7**	**68.7**	**0.0**	**9.4**	**8.8**	**-0.6***

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: The results for each State reflect all months after the State conducted its first DCM-F/RP match in SY 2016–2017. West Virginia is excluded from this table because it conducted its first DCM-F/RP match in June, after school had ended for most districts in the State. Outcomes related to free meals are not shown for Florida and Massachusetts because those States participated in a prior demonstration of DCM for free meals during the baseline year, so the DCM-F/RP demonstration only affects reduced-price meals. Values in this table are adjusted using fixed-effects regression. Appendix A lists the variables included in the regression adjustments. Changes shown in the table may differ slightly from calculated differences due to rounding.

n.a. = not applicable.

*Change between the baseline year and SY 2016–2017 is significantly different from zero at the .05 level, two-tailed test.

Similar to the lunch finding, the direction of the changes in average number of breakfasts served per student per day varied by whether the States had participated in the first DCM demonstration. Florida and Massachusetts experienced statistically significant decreases of 0.022 meals and 0.028 meals, respectively, in the average number of breakfasts served per student per day. The pooled sample of States that participated in the first DCM showed a decrease of 0.009 meals. In contrast, Utah and Virginia experienced statistically significant increases in the average number of breakfast served per student per day, of 0.006 and 0.023 meals, respectively. As previously noted, the small magnitude of the changes in this outcome limits their practical importance even when they are statistically significant. This outcome did not change significantly in Nebraska or California.

Among the States new to DCM, results related the percentage of breakfasts served for free were mixed, with an increase between the baseline year and SY 2016–2017 in one State and a decrease in another State. Specifically, Nebraska experienced a 2.0 percentage point increase while Virginia experienced a 1.4 percentage point decrease. The percentage of breakfasts served for free did not change significantly in Utah or the pooled sample of States new to DCM. States that participated in the previous DCM demonstration were not included in this analysis.

One State experienced an increase in the percentage of breakfasts served at a reduced price between the baseline year and SY 2016–2017, while two States had decreases. In Florida, the percentage of breakfasts served at a reduced price increased by 0.8 percentage points, driving a 0.7 percentage point change in that outcome in the pooled sample of States that participated in the first DCM demonstration. However, Nebraska and Virginia experienced decreases in the percentage of breakfasts served at a reduced price of 1.2 and 0.5 percentage points, respectively.

Pooling the States that were new to DCM yielded a 0.6 percentage point decrease in this outcome. There were no statistically significant changes in Massachusetts, Utah, or California. As discussed above regarding NSLP outcomes, the two potential effects of DCM-F/RP on the proportion of meals served at a reduced price work in opposite directions. The decreases in this measure in some States could indicate that participation among those who moved from reduced-price to free meals was higher, or changed more, than participation among those who moved from paid to reduced-price status. In Florida, where students could be certified for free meals through the prior DCM demonstration, the circumstances under which students would move from reduced-price to free meals between the baseline year and SY 2016–2017 did not apply, and the percentage of breakfasts served at a reduced price increased.

Two states experienced changes in both the percentage of breakfasts served for free and the percentage served at a reduced price. For Nebraska, the increase in the percentage served for free was larger than the decrease in the percentage served at a reduced price, resulting in an increase in the overall percentage of meals served for free or at a reduced price. In Virginia, however, the percentage of meals served for free or at a reduced price declined between the baseline year and SY 2016–2017. Combined with the increase in the overall participation rate in Virginia, the pattern of findings across SBP participation outcomes in that State implies that participation in the SBP increased among students not certified for free or reduced-price meals.

C. Comparisons with other findings

As discussed in Chapter III, DCM-F/RP resulted in statistically significant increases in certification outcomes, including increases in the overall percentages of free certifications in all States new to DCM and, in one State, the percentage of reduced-price certifications. Focusing first on the NSLP participation outcomes, the increases in the percentage of students certified for free meals translated to increases in the percentage of lunches served for free in each State. The increase in the reduced-price certification rate in Nebraska is not necessarily inconsistent with the decrease in the percentage of lunches served at a reduced price in in that State, because this decrease was smaller than the increase in the percentage of lunches served for free. This pattern could be explained by greater participation among students certified for free meals through DCM-F/RP who would have been certified for reduced-price meals in the absence of the demonstration than among students certified for reduced-price meals through DCM-F/RP who would not have been certified otherwise. The increased certifications did not yield a statistically significant increase in the NSLP participation rate in any individual State.

The results for SBP participation outcomes were less consistent with the certification findings. For example, although the increase in the percentage of students certified for free meals translated into an increase in the percentage of breakfasts served for free in Nebraska, the percentage of breakfasts served for free did not change in Utah and decreased in Virginia, despite increases in the free certification rate in all three States.

Two earlier reports provided estimates of the impacts of the previous demonstration of DCM. Although the samples and designs in those studies differed from the current evaluation, they examined some of the same participation outcomes discussed in this chapter. Similar to the current study, the evaluation of the previous demonstration found mostly positive effects on the percentage of lunches and breakfasts served for free across States and years, and mixed effects

on the average number of meals served per student per day. (The earlier demonstration did not examine the percentage of meals served at a reduced price.) In particular, in both years of the earlier demonstration and under DCM-F/RP, there were more positive effects than negative or noneffects on the percentage of meals served for free (Hulsey et al. 2015, Hulsey et al. 2016). For the percentage of meals served per student per day across meal types under the earlier studies, DCM had some positive effects in some States, negative effects in others, and no statistically significant impact for most. Results for this outcome were mixed under the current study as well, although a statistically significant decrease was more common.

V. EFFECTS ON FEDERAL REIMBURSEMENT OUTCOMES

If DCM-F/RP influences the number of free, reduced-price, and paid meals served, as discussed in the previous chapter, it will also affect the Federal reimbursements provided to districts. These reimbursements are revenues for the districts but are costs from the Federal perspective. As discussed in Chapter II, reimbursement rates vary by meal type, recipient's certification status, district- or school-level measures of need, and whether the district meets school nutrition performance standards.

To address the second set of research questions under Objective 4 (Table IV.1), this chapter focuses on two outcome measures, each defined separately for lunches and breakfasts:

1. Reimbursements per student per day, defined as average daily reimbursements per student enrolled.
2. Blended reimbursement rate (BRR), which measures the average reimbursement rate per meal served.

The BRR reflects the distribution of meals served across the free, reduced-price, and paid categories and is thus influenced by changes in certification status of students who participate in the school meals programs. Reimbursement cost per student per day equals the BRR multiplied by the average number of meals served per student per day (one of the outcomes presented in Chapter IV) and thus also reflects any changes in the total number of meals per student resulting from DCM-F/RP. Even if participation and the distribution of meals by certification status does not change, the outcome measures could change if districts or schools qualify for additional payments (based on need or fulfillment of school nutrition performance standards) in one year but not the other. For example, if the number of districts eligible for needs-based reimbursements changes between years, reimbursements would change, even if the number of meals served at each certification status remained constant.

Each measure is based on reimbursements for meals served beginning with the month of the first DCM-F/RP match in the State in SY 2016–2017 and the same set of months for the baseline year. As detailed in prior chapters, the first DCM-F/RP match occurred in August for Florida and Nebraska, November for Utah, and May for California, Massachusetts, and Virginia.

NSLP base rates (that is, before any adjustments based on need or fulfillment of performance standards) in SY 2015–2016 were $3.07 for free lunches, $2.67 for reduced-price lunches, and $0.29 for paid lunches. Free breakfasts were reimbursed at a base rate of $1.66, reduced-price breakfasts at $1.36, and paid breakfasts at $0.29. Appendix Table A.1 presents the full sets of rates for SYs 2013–2014, 2015–2016, and 2016–2017. Because reimbursement rates increase each year, outcomes based on these rates would be expected to increase from the baseline year to the demonstration year even if the demonstration had no effect. To remove this aspect of variation that is unrelated to the demonstration, we hold rates constant at baseline levels (SY 2015–2016 reimbursement rates) in the pre/post analyses. Because the analysis for California uses a comparison group design, those measures use SY 2013–2014 rates for the baseline year and SY 2016–2017 rates for the demonstration year.

This chapter presents findings on the effects of DCM-F/RP on NSLP and SBP Federal reimbursement outcomes and discusses how these findings relate to those on participation presented in Chapter IV and how they compare to findings from the evaluation of the first DCM demonstration. Tables in Appendix D present unadjusted versions of the results. As in the previous chapter, we group the States by whether they participated in the first DCM demonstration and exclude West Virginia from the results because it conducted its first DCM-F/RP match in June, after school had ended for most districts in the State.

A. Effects on NSLP Federal reimbursement outcomes

DCM-F/RP had mixed effects on NSLP reimbursements among the six States in the Federal reimbursement analysis (Tables V.1 and V.2). In two States, both NSLP Federal reimbursement outcome measures increased between the baseline year and SY 2016–2017. In another State, both outcome measures decreased between those years.

Table V.1. Effects of DCM-F/RP on NSLP Federal reimbursement costs

	Federal reimbursements per student per day (dollars)			Blended reimbursement rate (dollars)		
State	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
DCM-F/RP States that participated in the first DCM demonstration						
Florida	1.61	1.48	-0.13*	2.71	2.67	-0.04*
Massachusetts	0.96	0.98	0.01	2.12	2.14	0.02
Pooled sample	**1.42**	**1.37**	**-0.05***	**2.57**	**2.57**	**-0.01**
DCM-F/RP States that are new to DCM						
Nebraska	1.13	1.16	0.03*	1.73	1.78	0.05*
Utah	0.83	0.85	0.02*	1.70	1.72	0.02*
Virginia	0.98	1.00	0.02	2.07	2.08	0.01
Pooled sample	**0.96**	**0.98**	**0.02***	**1.90**	**1.93**	**0.03***

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: The results for each State reflect all months after the State conducted its first DCM-F/RP match in SY 2016–2017. West Virginia is excluded from this table because it conducted its first DCM-F/RP match in June, after school had ended for most districts in the State. Values in this table are adjusted using fixed-effects regression. Appendix A lists the variables included in the regression adjustments. Changes shown in the table may differ slightly from calculated differences due to rounding.

*Change between the baseline year and SY 2016–2017 is significantly different from zero at the .05 level, two-tailed test.

In Nebraska and Utah, NSLP reimbursements per student per day increased by $0.03 and $0.02, respectively, between the baseline year and SY 2016–2017. Pooling over the sample of States new to DCM yielded a $0.02 increase in this outcome. NSLP reimbursements per student per day decreased by $0.13 in Florida and by $0.05 in the pooled sample of States that participated in the first DCM demonstration. These changes were statistically significant. Similar to the participation findings for Florida, the decrease in this State is inconsistent with the anticipated direction of the effect of the demonstration, possibly due to unmeasured, time-variant factors. Additionally, the small magnitude of this decrease and the other changes described above limits the practical importance of the findings, despite their statistical significance. There

were no statistically significant changes to NSLP reimbursements per student per day for California, Massachusetts, or Virginia. Each of these three States first certified students through DCM-F/RP at the end of the school year.

Table V.2. Effects of DCM-F/RP on Federal reimbursement costs in California

Outcomes (dollars)	Treatment group	Comparison group	Difference
NSLP			
Federal reimbursements per student per day	1.08	1.12	–0.03
Blended reimbursement rate	2.70	2.60	0.10
SBP			
Federal reimbursements per student per day	0.34	0.34	0.00
Blended reimbursement rate	1.81	1.76	0.05

Source: Administrative records for SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: The results reflect all months after California conducted its first DCM-F/RP match in SY 2016–2017 (in May). Values for the comparison group in this table are weighted to balance the baseline (SY 2013–2014) characteristics of the comparison group and the treatment group. Appendix A lists the characteristics used to construct the weights. Differences shown in the table may differ slightly from calculated differences due to rounding. There are no statistically significant differences in this table.

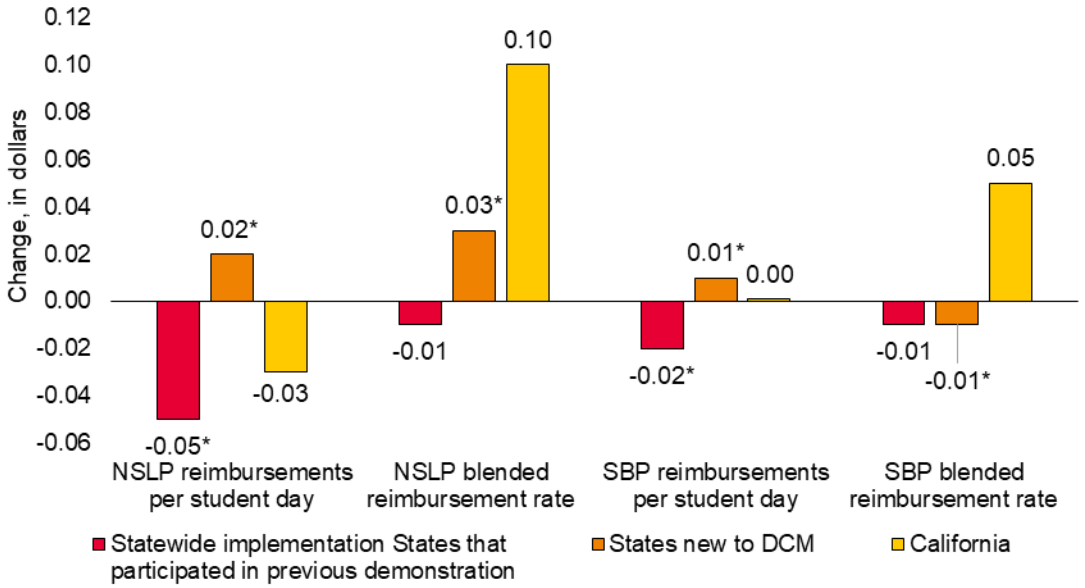
Differences in the BRR followed a similar pattern to that for Federal reimbursements per student per day. The NSLP BRR increased between the baseline year and SY 2016–2017 by $0.05 in Nebraska and $0.02 in Utah. The BRR also increased by $0.03 for the pooled sample of States that were new to DCM ($0.03). The NSLP BRR, similar to NSLP reimbursements per student per day, decreased in Florida (by $0.04). All of these changes were statistically significant, but small in magnitude. There were no statistically significant changes in the BRR in California, Massachusetts, Virginia, or the pooled sample of States that participated in the first DCM demonstration (Figure V.1).

B. Effects on SBP Federal reimbursement outcomes

Similar to the results for NSLP reimbursements, the results for SBP reimbursements were mixed, differing by whether a State was new to DCM. Nebraska, Utah, Virginia, and the pooled sample of States that were new to DCM experienced statistically significant increases in at least one SBP reimbursement outcome. However, Florida, Massachusetts, Virginia, and both pooled samples experienced decreases in at least one outcome. (Table V.3). DCM-F/RP did not have a statistically significant effect on either SBP reimbursement outcome in California (Table V.2).

Between the baseline year and SY 2016–2017, each of the three States that were new to DCM experienced statistically significant increases in SBP Federal reimbursements per student per day: an increase of $0.01 in Nebraska and Utah, and an increase of $0.03 in Virginia. These increases combined to yield an increase of $0.01 in the pooled sample of States that were new to DCM. In contrast, two of the three States that participated in the first DCM demonstration experienced statistically significant decreases: $0.04 in Florida and $0.06 in Massachusetts. The pooled sample of statewide implementation States that participated in the first DCM demonstration experienced a $0.02 decrease. All these changes were small in magnitude, which limits the practical importance of the findings.

Figure V.1. Effects of DCM-F/RP on key Federal reimbursement outcomes



Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Note: The results for some outcomes reported in this figure are obtained by aggregating across months. Values in this figure are adjusted using fixed-effects regression.

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

One State experienced a statistically significant increase in the SBP BRR, while two States experienced a decrease. The BRR increased by $0.02 in Nebraska and decreased by $0.01 in Florida and by $0.03 in Virginia. The BRR also decreased by a statistically significant amount of $0.01 in the pooled sample of States that were new to DCM, but did not change significantly in California, Massachusetts, Utah, or the pooled sample of States that participated in the previous DCM demonstration. While small, the decreases between the two school years in some States were inconsistent with the anticipated direction of the effects of the demonstration, and might be due to unmeasured, time-variant factors.

Table V.3. Effects of DCM-F/RP on SBP Federal reimbursement costs

State	Federal reimbursements per student per day (dollars)			Blended reimbursement rate (dollars)		
	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
DCM-F/RP States that participated in the first DCM demonstration						
Florida	0.51	0.47	-0.04*	1.76	1.75	-0.01*
Massachusetts	0.34	0.28	-0.06*	1.77	1.78	0.01
Pooled sample	**0.45**	**0.43**	**-0.02***	**1.76**	**1.76**	**-0.01**
DCM-F/RP States that are new to DCM						
Nebraska	0.29	0.30	0.01*	1.43	1.45	0.02*
Utah	0.18	0.19	0.01*	1.53	1.54	0.00
Virginia	0.34	0.37	0.03*	1.62	1.59	-0.03*
Pooled sample	**0.29**	**0.31**	**0.01***	**1.57**	**1.56**	**-0.01***

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: The results for each State reflect all months after the State conducted its first DCM-F/RP match in SY 2016–2017. West Virginia is excluded from this table because it conducted its first DCM-F/RP match in June, after school had ended for most districts in the State. Values in this table are adjusted using fixed-effects regression. Appendix A lists the variables included in the regression adjustments. Changes shown in the table may differ slightly from calculated differences due to rounding.

*Change between the baseline year and SY 2016–2017 is significantly different from zero at the .05 level, two-tailed test.

C. Comparisons with other findings

Because average daily reimbursements per student are dependent on the number of daily meals per student and the BRRs are dependent on the distribution of the meal types (free, reduced-price, or paid), we expect the Federal reimbursement findings to be generally consistent with the participation findings. Specifically, average daily reimbursements per student will generally increase when the school meals participation rates increase. Likewise, the BRR generally increases when the percentage of meals served for free or at a reduced price increases (assuming no large changes in the number of schools qualifying for the base rates).

The Federal reimbursement findings presented in this chapter are generally consistent with the participation findings discussed in Chapter IV. For most States, the effects of DCM-F/RP on average daily reimbursements per student aligned as expected with the effects on the related participation outcome (meals served per student per day). Only Nebraska and Utah experienced a statistically significant change in one NSLP outcome that was not accompanied by a change in the same direction in the related outcome. For breakfast, Nebraska was the only State where the findings did not align.

We could not assess the alignment of the percentage of meals served for free or at a reduced price to the BRR for States that participated in the first DCM demonstration because we did not examine the percentage of meals served for free in those States (for reasons discussed in Chapter IV). For States where we examined that outcome, changes to the BRR generally aligned with changes in the percentage of free or reduced-price meals served. The combined percentage of lunches served for free or at a reduced price increased for each of the States new to DCM, and the BRR for lunches increased in two of the three States and in the pooled sample. The outcomes for breakfasts aligned for all three States included in the analysis.

Similar to the participation outcomes, both the current study and the study of the first two years of the previous DCM demonstration found mixed effects of DCM on Federal reimbursement outcomes. However, unlike the current study, the study of the prior DCM demonstration found more impacts on the BRR than on Federal reimbursements per student per day. Specifically, in the first year of the prior DCM demonstration, the evaluation found no statistically significant impacts on reimbursements per student per day for either meal in the pooled sample but positive impacts on the BRR for both meals (Hulsey et al. 2015). In the second year of the earlier demonstration, while the evaluation found no statistically significant impacts on lunch reimbursements per student per day for either of the pooled samples (States that implemented DCM in the first year of the demonstration and those that joined in the second year), it found positive impacts in one of the pooled samples for breakfasts (Hulsey et al. 2016). For the BRR, it found positive impacts for one of the pooled samples for lunches and for the

other pooled sample for breakfasts. However, the differences in the samples and designs across demonstrations make it difficult to draw any firm conclusions.

VI. EFFECTS ON STATE ADMINISTRATIVE COST OUTCOMES

Implementing the DCM-F/RP demonstration may benefit students, but it also requires an investment of time and resources on the part of the agencies involved. At the State level, Medicaid eligibility agencies produced files of children enrolled in Medicaid, typically after assessing eligibility for DCM-F/RP and restricting the file to eligible children, and provided the data to child nutrition agencies. The child nutrition agencies incorporated this new program data into existing direct certification processes, which typically involved matching the Medicaid data with student enrollment data, providing direct certification results (or lists of eligible students, in local-matching States) to districts, and communicating with FNS, other State agencies, and districts about the demonstration. Even in States that were not new to DCM, child nutrition and Medicaid eligibility agencies needed to add steps to determine and display reduced-price meal eligibility. More details on these processes are provided in Chapter VII. This chapter describes the State-level administrative costs associated with DCM-F/RP that agencies incurred from the time the State was approved for the demonstration through the end of SY 2016–2017.[28] These costs are defined as all expenditures over and above those that would be necessary in the absence of DCM-F/RP, including those for other types of certification (such as direct certification with SNAP and, for States involved in the previous demonstration, with DCM for free meals).

The analyses presented in this chapter address the third set of research questions under Objective 4 (Table IV.1). Two key outcomes examined here directly address the two parts of research question C.3:

- Total administrative costs of DCM-F/RP by State and agency type.
- Start-up costs (those incurred up to and including the month of the first match) and ongoing costs (those incurred in later months).

This chapter also explores the following additional measures that add detail and perspective to aid in understanding patterns observed in the key outcomes listed above:

- The breakdown of costs by category: direct labor costs, direct costs other than labor, and indirect costs.
- Costs of DCM-F/RP per 1,000 students enrolled or directly certified.

After discussing each of these outcomes in turn, this chapter ends by comparing the results to those of the evaluation of the previous DCM demonstration.

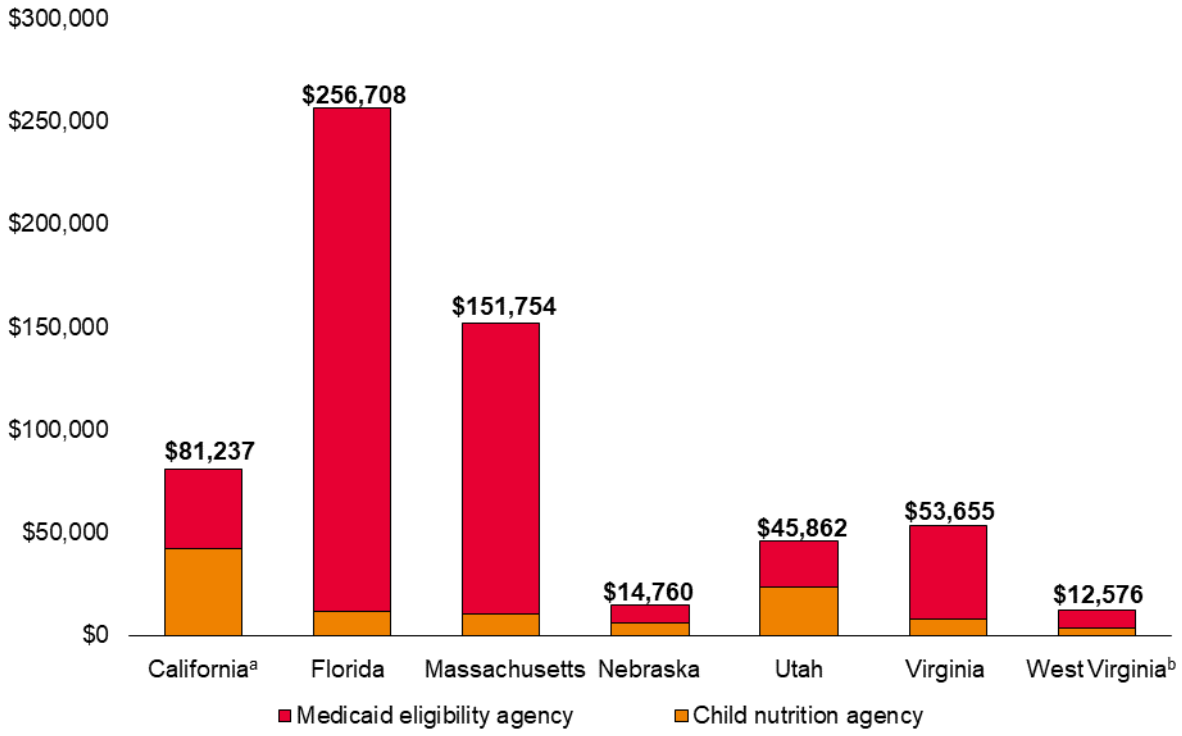
A. Total State administrative costs

Administrative costs incurred during the first year of DCM-F/RP averaged about $88,000 but varied greatly between States (Figure VI.1). Costs ranged from less than $13,000 to nearly $257,000. West Virginia and Nebraska had the lowest costs during the first year of DCM-F/RP,

[28] SY 2016–2017 is generally defined as July 2016 through June 2017 for the purposes of this demonstration. However, Florida, Nebraska, Utah, Virginia, and West Virginia began incurring costs related to DCM-F/RP planning or preparation prior to July 2016, and these costs are included in this analysis. The earliest reported costs were in March 2016.

at $13,000 and $15,000, respectively. Florida had the highest overall costs among DCM-F/RP States, at $257,000, followed by Massachusetts at $152,000. The factors driving these costs are explored in subsequent sections of this chapter. The States with the highest DCM-F/RP costs were the three that had participated in the previous DCM demonstration, suggesting that adding the reduced-price component is not a trivial effort even for States already conducting DCM for free meals.

Figure VI.1. State administrative costs incurred in the first year of DCM-F/RP implementation



Source: Cost-tracking workbooks completed quarterly by State administrators for SY 2016–2017.

Note: California, Florida, and Massachusetts participated in the previous DCM demonstration prior to DCM-F/RP.

[a]Salaries for staff of California child nutrition agencies used in this analysis are the highest rates for each position, rather than salaries for specific staff. For that reason, costs shown may slightly overestimate actual costs.

[b]Due to data limitations, fringe benefits in West Virginia were imputed. Medicaid eligibility agency costs in West Virginia exclude contractor costs because their work fell within the scope of the agency's maintenance and operations contract with the eligibility system vendor.

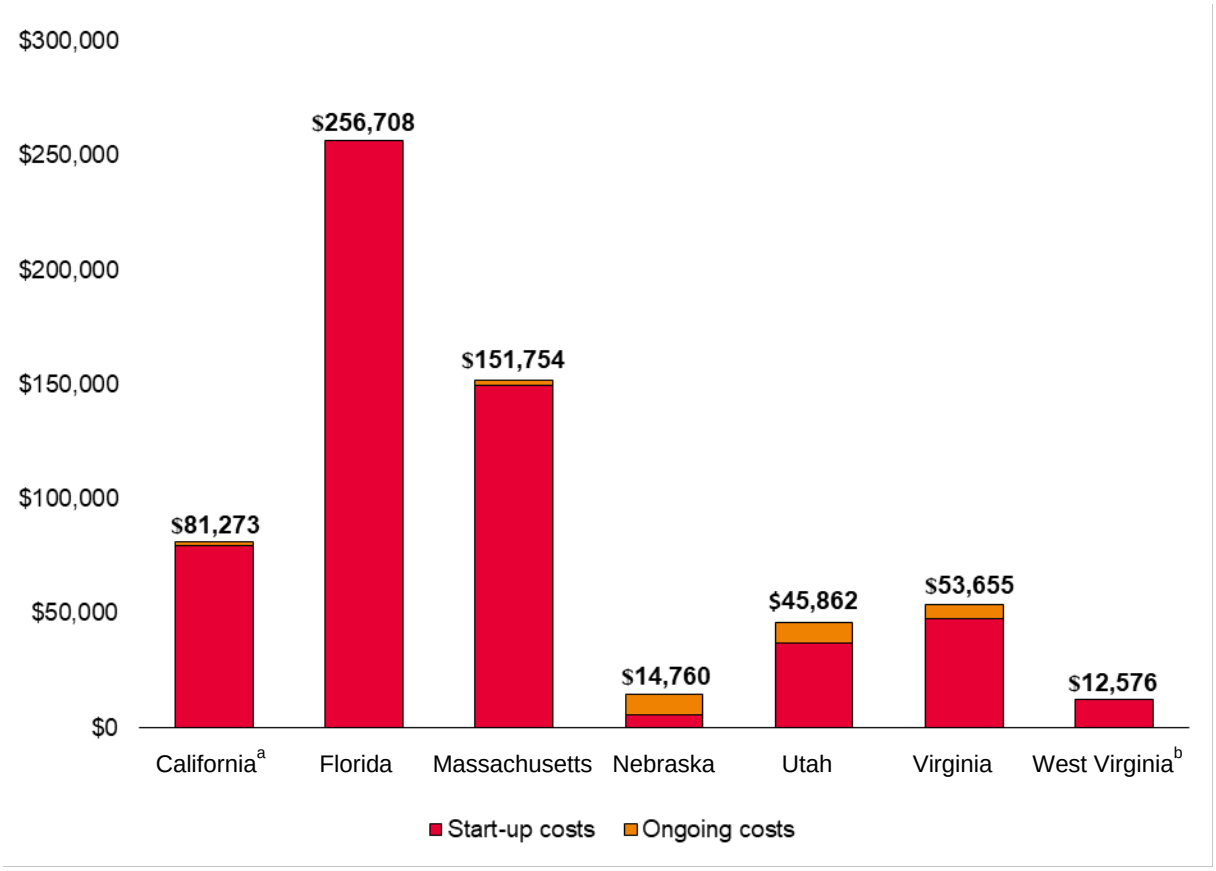
B. Start-up and ongoing costs

Implementing the DCM-F/RP demonstration involves upfront costs as new procedures and systems get underway, as well as costs related to continuous maintenance that may be required once the demonstration is in place. For this study, we define *start-up costs* as those costs that were incurred up to and including the month of the first DCM-F/RP match (August 2016 for Florida and Nebraska; November 2016 for Utah; May 2017 for California, Massachusetts, and Virginia; and June 2017 for West Virginia) and *ongoing costs* as those costs that occurred in subsequent months. Start-up costs therefore include the expense of planning and preparing for DCM-F/RP, including the programming and testing required to create the Medicaid data extract used in the initial match. Ongoing costs would include those incurred for any changes to the

programming required later, as well as any actions needed to conduct each subsequent round of DCM-F/RP.

Start-up costs of DCM-F/RP were substantially higher than ongoing costs for almost every State agency during the first year of the demonstration (Figure VI.2). Across States, average start-up costs were approximately $84,000, compared to average ongoing costs of $4,000. Although this difference suggests that costs decline after the first DCM-F/RP match, the ongoing costs represent activities over only two months for some States. The results from the second year of the evaluation will provide a more complete picture of ongoing costs for a full year of DCM-F/RP activities.

Figure VI.2. Start-up and ongoing State administrative costs incurred in the first year of DCM-F/RP implementation



Source: Cost-tracking workbooks completed quarterly by State administrators for SY 2016–2017.

Note: California, Florida, and Massachusetts participated in the previous DCM demonstration prior to DCM-F/RP.

[a]Salaries for staff of California child nutrition agencies used in this analysis are the highest rates for each position, rather than salaries for specific staff. For that reason, costs shown may slightly overestimate actual costs.

[b]Due to data limitations, fringe benefits in West Virginia were imputed. Medicaid eligibility agency costs in West Virginia exclude contractor hours because their work fell within the scope of the agency's maintenance and operations contract with the eligibility system vendor.

Given the predominance of start-up over ongoing costs, the variation discussed above between States' total administrative costs were driven largely by differences in their start-up costs. For example, the highest start-up cost amounts were approximately $257,000 in Florida,

followed by $150,000 in Massachusetts; the lowest were in Nebraska ($6,000) and West Virginia ($13,000).

Although Nebraska had the lowest start-up costs among the demonstration States, around $6,000, it also had the highest ongoing costs, around $9,000. The ongoing costs in Nebraska were driven by Medicaid eligibility agency time spent revising the eligibility assessment process to exclude certain Medicaid aid categories that had erroneously been included initially (this issue is discussed further in Chapter VII). In addition, Nebraska conducted its first DCM-F/RP match at the beginning of the school year, so ongoing costs represent ten months of activity.

Ongoing costs tended to be smallest for States that implemented later in the school year, since there were fewer months left during which to incur costs. While all States incurred start-up costs, two States (Florida and West Virginia) did not incur any ongoing costs. For West Virginia, this is because the State did not conduct its first DCM-F/RP match until June 2017—very close to the end of the school year. Agencies in Florida did not incur any ongoing costs in SY 2016–2017 (beyond those already associated with direct certification through other programs) because the DCM-F/RP process was fully automated following start-up.

C. Costs by agency type

In most States, Medicaid eligibility agencies incurred higher DCM-F/RP costs than child nutrition agencies (Table IV.1). The Medicaid eligibility agencies in Florida and Massachusetts incurred costs many times larger than the child nutrition agencies in those States, and Medicaid eligibility agency costs were more than twice as high as child nutrition agency costs in Virginia and West Virginia. The gap in costs between agencies was much smaller in Nebraska. In California and Utah, costs incurred by the child nutrition agency were higher than those incurred by the Medicaid eligibility agencies, although the differences were small. In California, the child nutrition agency incurred about $42,000, compared to about $39,000 for the Medicaid eligibility agency. Costs were approximately $24,000 and $22,000 for the two agency types, respectively, in Utah, where two agencies played roles related to Medicaid eligibility in the demonstration. The pattern of higher costs among Medicaid eligibility agencies relative to child nutrition agencies is likely due to the key responsibilities of each type of agency in the DCM-F/RP process, discussed in Chapter VII.

Differences in States' Medicaid eligibility agency costs drove much of the variation in total administrative costs between States. Florida's Medicaid eligibility agency incurred the highest costs among Medicaid eligibility agencies, at approximately $245,000, followed by Massachusetts's Medicaid eligibility agency at $141,000. Start-up costs for the Medicaid eligibility agencies (discussed further in the next section) were the source of these costs, which in turn drove the overall high costs for DCM-F/RP in these two States (Appendix Table E.1). Nebraska and West Virginia, which had low overall State costs, also had the lowest costs among Medicaid eligibility agencies, around $8,000 and $9,000 respectively.

Table VI.1. State administrative costs of DCM-F/RP, by State agency type

State	State administrative costs in the first year of DCM-F/RP implementation (dollars)		
	Child nutrition agency	Medicaid eligibility agency	Total
DCM-F/RP States that participated in the first DCM demonstration			
California[a]	42,114	39,123	81,237
Florida	11,570	245,138	256,708
Massachusetts	10,473	141,281	151,754
Pooled sample	**64,157**	**425,543**	**489,700**
DCM-F/RP States that are new to DCM			
Nebraska	6,287	8,473	14,760
Utah	23,583	22,279	45,862
Virginia	8,130	45,525	53,655
West Virginia[b]	3,848	8,728	12,576
Pooled sample	**41,847**	**85,006**	**126,853**

Source: Cost-tracking workbooks completed quarterly by State administrators for SY 2016–2017.

[a]In SY 2016–2017 California implemented DCM-F/RP in 14 districts, while all other States implemented DCM-F/RP statewide. Salaries for staff of California child nutrition agencies used in this analysis are the highest rates for each position, ratefher than salaries for specific staff. For that reason, costs shown may slightly overestimate actual costs.

[b]Due to data limitations, fringe benefits in West Virginia were imputed. Medicaid eligibility agency costs in West Virginia exclude contractor costs because their work fell within the scope of the agency's maintenance and operations contract with the eligibility system vendor.

D. Direct labor costs, direct costs other than labor, and indirect costs

Total administrative costs for the State agencies consist of (1) direct labor costs, including wage and fringe benefits for time spent on DCM-F/RP, (2) direct costs other than labor, including payments to contractors, and (3) indirect costs, which can include administrative support and facilities costs. For most agencies, direct labor accounted for the majority of costs, typically followed by other direct costs and then indirect costs (Appendix Table E.2). Massachusetts' Medicaid eligibility agency incurred the highest labor costs among State agencies, about $146,000, while West Virginia's child nutrition agency had the lowest at under $4,000. Labor costs are driven largely by the number of hours agency staff spend, and an assessment of these hours can shed light on staff burden, as discussed in Chapter VII.

Among agencies reporting direct costs other than labor, the largest amounts were for contractor costs. Seven State agencies used contractors for some tasks related to DCM-F/RP, and four of these—both Florida agencies, Massachusetts' Medicaid eligibility agency, and Utah's child nutrition agency—incurred contractor costs that eclipsed their agency staff labor costs.[29] In each case, these were start-up costs. Florida's Medicaid eligibility agency had the highest contractor cost amount, approximately $219,000 for program development and testing, which accounted for almost 90 percent of the agency's total costs. Massachusetts' Medicaid eligibility agency incurred about $96,000 in costs for work completed by contractors—more than two-thirds of the agency's total costs. As in Florida, these contractor costs were for time spent developing and testing programs. However, Massachusetts is unique among the DCM-F/RP

[29] The other three State agencies using contractors for DCM-F/RP were Nebraska's child nutrition agency and the Medicaid eligibility and child nutrition agencies in Virginia.

States in that its Medicaid eligibility agency operates the direct certification matching system, so it is possible that these costs related to incorporating reduced-price eligibility into the match process. The data do not provide additional explanation for the high Medicaid contractor costs in these States; it may be that the different structures of States' Medicaid data systems make it easier for some of them to provide the information needed for DCM-F/RP than others. Utah's child nutrition agency hired contractors to upgrade its State direct certification system to include Medicaid and to update its direct certification reporting system for districts to include reporting on Medicaid free and reduced-price direct certification numbers.

Indirect costs can include administrative support and facilities costs and are typically reported as a percentage applied to direct labor costs, other direct costs, or both. Among the agencies reporting indirect costs, the highest were for California's child nutrition agency, around $11,000. This agency reported similar types of expenses included in the indirect rate, but the rate was higher than in other States.

E. Costs per thousand students enrolled or directly certified

Administrative costs might be higher for States with more enrolled students, directly certified students, or students certified through DCM-F/RP if larger eligibility and match files make the demonstration more costly to implement. To normalize costs by number of students, we examined costs for the first year of DCM-F/RP per thousand students enrolled, per thousand students directly certified for free meals (through any program), and per thousand students directly certified for free or reduced-price meals based on Medicaid. Costs per thousand students enrolled shows costs of DCM-F/RP relative to the size of the student population, and costs per thousand students directly certified for free meals can provide context for including Medicaid within the wider pool of direct certification programs. The costs per thousand students directly certified for free or reduced-price meals based on Medicaid provides a cost-benefit measure for students impacted by the demonstration.

Across the seven States, State administrative costs for the first year of DCM-F/RP implementation averaged $94 per thousand students enrolled, $364 per thousand students directly certified for free meals, and $1,452 per thousand students directly certified for free or reduced-price meals through Medicaid. Because these include both start-up and ongoing costs, they are likely to decline in later years of the demonstration.

By each of these three measures, Nebraska's DCM-F/RP costs were lowest across the demonstration States, consistent with the State's low overall cost for DCM-F/RP in SY 2016–2017 (Appendix Table E.3). In Nebraska, DCM-F/RP costs were $43 per thousand students enrolled (the same as Virginia's costs by that measure), $162 per thousand students directly certified for free meals, and $401 per thousand students certified through DCM-F/RP.

California had the highest costs for each of the three per-student measures, followed by Massachusetts. For example, administrative costs per thousand students enrolled were $201 and $157, respectively for those two States. Massachusetts' high numbers for these measures is consistent with the State's relatively large overall costs discussed earlier in this chapter. California's high per-student costs relative to other States were driven by the fact that California implemented DCM-F/RP in only 14 districts in SY 2016–2017, so State-level fixed costs such as programming the Medicaid data extract and updating the direct certification matching system to

accommodate reduced-price direct certifications were divided across a smaller student population. However, because these fixed costs are presumably nonrecurring, the State might be well positioned to implement DCM-F/RP statewide at a lower cost in SY 2017–2018.

Florida, which had high overall costs for DCM-F/RP, had costs per thousand students enrolled or directly certified for free meals that were in a similar range with those of other demonstration States. Florida has a high population relative to the other States, so although Florida's total costs appear high, they may represent a similar investment when viewed in terms of the number of students the States serve.

F. Comparisons with other findings

The evaluation of the first DCM demonstration study examined the costs incurred by State agencies in implementing direct certification for free meals using Medicaid data. Two States (Kentucky and Pennsylvania) implemented the demonstration statewide and three others (Florida, Massachusetts, and New York) implemented DCM in a subset of districts. Some States began in an earlier school year than others, but given the substantial differences between start-up and ongoing costs, we focus our comparisons on each State's first year of implementation.[30]

Overall State administrative costs in the first year of implementation were somewhat lower for DCM than DCM-F/RP, ranging from $5,000 to $209,000 (in 2017 dollars), compared to the $13,000 to $257,000 range for DCM-F/RP. The higher costs for DCM-F/RP could indicate that implementing the reduced-price component of the demonstration involved substantial additional effort for the State. In fact, Florida and Massachusetts—which participated in both demonstrations—reported substantially higher administrative costs in their first year of DCM-F/RP than in their first year of DCM.

Similar to DCM-F/RP for most States, start-up costs were higher than ongoing costs during the first year of DCM. However, while Medicaid eligibility agencies incurred higher DCM-F/RP costs than child nutrition agencies in most States, DCM costs were higher for child nutrition agencies than for Medicaid eligibility agencies in half the States.

[30] That is, we compare the SY 2016–2017 findings on State administrative costs from the current demonstration to those for Florida, Illinois, Kentucky, and Pennsylvania in SY 2012–2013 and for Massachusetts and New York State in SY 2013–2014 from the previous demonstration.

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VII. IMPLEMENTATION PROCESSES AND CHALLENGES

In addition to estimating the effects of DCM-F/RP, this evaluation documents the implementation process and examines challenges and successes experienced by States and districts in the first year of the demonstration. The analyses presented in this chapter address research questions under Objective 1 (Table VII.1), which required examination of States' and districts' processes and resources used for DCM-F/RP (research questions A.1–A.4), respondents' perceptions of factors that influence matching success (research questions A.5–A.6), and identified challenges and best practices (research questions A.7–A.8).

Table VII.1. Research questions and objectives related to DCM-F/RP processes

Question number	Research questions
Objective 1. Describe the processes and resources used by States and/or districts to match Medicaid data with school enrollment data and communicate the direct certification results to households, and the challenges to attaining high matching rates.	
A.1	• How is DCM-F/RP currently implemented or performed in each State and district? • What are the State/district information systems, databases, and data elements used for DCM-F/RP? • How frequently are the matches occurring? • Are there different procedures and matching protocols for public school districts and private schools, or large school districts versus small or medium-sized districts? • How feasible and effective are the different matching systems? • Are procedures in place to extend eligibility to other children because they are members of the same household as a child identified as receiving Medicaid benefits? How is this extended eligibility process constructed?
A.2	• What testing or monitoring is conducted to ensure that the Medicaid matching list has been produced correctly (that is, students in Medicaid households are accurately identified as eligible for free or reduced-price meals)? • What monitoring is conducted to ensure that students reported as directly certified by Medicaid are not already directly certified by SNAP, TANF, or FDPIR?
A.3	• For how many individual students (number and percentage) was the match performed at the State level, at the school district level, and at both levels?
A.4	• How much staff time was required by State and local employees to complete the match? • How did the staff time differ among the different districts and States? • What led to particularly large and small staff time burdens?
A.5	• What are the relationships among DCM-F/RP implementation procedures, State information systems and databases, and State DCM-F/RP matching rates?
A.6	• How did success in matching vary by State and school district characteristics including, but not limited to, urban/rural, public/private, higher versus lower percentage of students certified for free/reduced-price meals, State and local data systems, levels of DC-SNAP as a percentage of free certifications, or by recipient characteristics (including, but not limited to, race, ethnicity, family/household size and composition, name difference of members of the family/household, etc.)?
A.7	• What challenges were encountered in implementing the match to Medicaid data in the study States? • Are these challenges different for public versus private schools? Large school districts versus small/medium school districts? • How were each of these challenges resolved?

Question number	Research questions
Objective 1. Describe the processes and resources used by States and/or districts to match Medicaid data with school enrollment data and communicate the direct certification results to households, and the challenges to attaining high matching rates.	
A.8	• What are the best practices that could be used to provide technical assistance to future DCM-F/RP States to achieve high data-matching rates? • What improvements or system changes in computer database elements or name-matching algorithms could States make to improve DCM-F/RP matching rates? • What proven, new, and emerging approaches to data matching might be most useful to FNS, States, and districts in improving DCM-F/RP in the future?

The analysis relies on information on implementation experiences drawn from interviews with staff of State child nutrition agencies, Medicaid eligibility agencies, and school districts across the seven States during SY 2016–2017; observations of State and district direct certification processes; and documentation collected from States about their direct certification systems and processes.[31] The analysis of burden also reflects data on hours reported as part of the cost data collection discussed in the previous chapter. This chapter summarizes the DCM-F/RP process in each of the seven States and describes the burden of the demonstration on State and district staff, the challenges encountered, and best practices identified during the first year of the demonstration.

A. DCM-F/RP processes

Demonstration States and districts incorporated DCM-F/RP into well-established procedures for conducting direct certification for free meals. Three States—California, Florida, and Massachusetts—had previously used Medicaid to directly certify students for free meals through participation in the previous DCM demonstration. For these States, adding direct certification for reduced-price meals to the process entailed revising the eligibility determination process to identify Medicaid recipient children with household incomes between 130 and 185 percent of the FPL and incorporating the new basis of certification for reduced-price meals into their systems at State and district levels.

Although the other four demonstration States—Nebraska, Utah, Virginia, and West Virginia—did not participate in the previous DCM demonstration, all used SNAP (as required nationwide) and TANF data for direct certification, and some also conducted direct certification using foster care data. However, unlike Medicaid, participation in these programs confers categorical eligibility for free meals, so States can directly certify any student matched to administrative records from these programs. The need to use information on household size and income to identify eligible children is a key difference between DCM-F/RP and direct certification with other programs. States new to DCM needed to identify the data source that contained the necessary information for assessing eligibility, modify existing data transfer and matching processes to incorporate the additional program type, and track which students were

[31] We did not interview districts in West Virginia because the State conducted its first DCM-F/RP match after the school year had ended for most districts in SY 2016–2017.

identified as eligible by the State and directly certified by districts for free and reduced-price meals based on Medicaid.

The remainder of this section describes how the States and districts implemented DCM-F/RP in SY 2016–2017, in the context of their general direct certification processes, highlighting notable differences between the States' approaches. Appendix Table F.1 summarizes each State's process for implementing DCM-F/RP, and flowcharts of each State's process (Appendix Figures F.1–F.7) identify the specific agencies and data systems involved in DCM-F/RP.

1. Planning and preparation

State child nutrition agencies were responsible for coordinating demonstration efforts, beginning with preparing the application to FNS. Child nutrition agencies convened meetings with their partners—including State Medicaid eligibility agencies—to discuss the demonstration. When authorization to begin the demonstration was received, agencies reviewed the guidelines for assessing children's eligibility for DCM-F/RP, which was a key responsibility of the Medicaid eligibility agencies in the demonstration. Child nutrition agencies typically oversaw changes to the direct certification matching system, which was operated by the child nutrition agency in most demonstration States. Child nutrition agency staff also produced training materials for district staff to help them prepare for the demonstration and templates for letters to send to households of children certified through DCM-F/RP.

Implementing the demonstration typically required interagency data-sharing agreements or memorandums of understanding (MOUs) to allow Medicaid eligibility agencies to transfer data identifying children eligible for free or reduced-price meals through DCM-F/RP. However, these were typically revisions of existing agreements because in each State the agencies housing the Medicaid eligibility data also provided the SNAP, TANF, or foster care data used for direct certification.[32] Additionally, the three States that participated in the original DCM demonstration had already been providing data on free-eligible Medicaid participants prior to launching DCM-F/RP.

Six States implemented DCM-F/RP statewide.[33] The exception, California, implemented DCM-F/RP in 14 pilot districts in SY 2016–2017 (the same 14 districts that participated in the previous DCM demonstration) and planned to expand to statewide implementation in SY 2017–2018.

The preparatory steps, along with the development and testing of the data extract identifying eligible children, could take time. Only two of the seven States—Florida and Nebraska—conducted the first DCM-F/RP match before the beginning of school in the first year of the demonstration. Utah did so in November 2016; California, Massachusetts, and Virginia in May

[32] In six of the States—all but Massachusetts—the Medicaid eligibility agency is also the SNAP agency, and they provided the SNAP (and TANF) data for direct certification. In Massachusetts and Nebraska the Medicaid eligibility agency also administers foster care and provided foster care data for direct certification.

[33] Virginia excluded private schools from DCM-F/RP because private schools conduct direct certification differently from public districts. The Department of Social Services conducts direct certification matching on behalf of private schools.

2017; and West Virginia in June, after the school year had ended for most districts. Most of these States implemented about a month later than intended. The longest delay, in West Virginia, was due largely to the time it took to complete the interagency MOU, but technological and staffing constraints were contributing factors.

2. Identifying eligible children

To conduct DCM-F/RP, States must first identify eligible children within the Medicaid data. Unlike SNAP and other programs used for direct certification, Medicaid participation does not confer categorical eligibility for free school meals. Instead, States must conduct an income-eligibility test to determine DCM-F/RP eligibility. This process involved two components:

1. States had to identify which Medicaid administrative records contained sufficient information to determine eligibility. Records had to contain complete information on a child's household's size and income. This information is available for some but not all Medicaid aid categories.[34] For example, some Medicaid aid categories are used for individuals categorically eligible for Medicaid who therefore are not required to report complete information on household size and income when applying. These aid categories do not provide sufficient information for States to determine whether participants are eligible for DCM-F/RP.
2. For Medicaid records with complete information on household size and income, State agencies used this information to calculate household income as a percent of the FPL and compared this to the income-eligibility thresholds for free or reduced-price meals. States identified children residing in households with income eligible below 130 percent of the FPL as eligible for free meals, and those with household incomes between 130 and 185 percent of the FPL as eligible for reduced-price meals.

In all seven demonstration States, the Medicaid eligibility agency was responsible for assessing eligibility and producing the DCM-F/RP eligibility file identifying children eligible to be directly certified for free or (separately) reduced-price meals through DCM-F/RP.[35] The process of developing the specifications and programming (and testing, discussed below) the queries to produce the files of eligible children required careful consideration and effort upfront. Even for States that had participated in the first DCM demonstration, revising the structure and content of the information to be extracted from the Medicaid data system to include reduced-price eligibles following the guidelines of the new demonstration was a process. After first file used for DCM-F/RP matching, production of subsequent files was automated. The Medicaid eligibility agency then securely transferred these files to the child nutrition agencies for matching against student enrollment data.

[34] Medicaid aid categories, established by each State, are designations indicating the criteria by which an individual qualifies for Medicaid assistance, including income limits and other eligibility criteria, such as age, disability, or receipt of Supplemental Security Income.

[35] In States where more than one Medicaid eligibility agency is involved in determining eligibility for and administering the Medicaid program, staff of the agency assessing eligibility for DCM-F/RP sometimes consulted with policy experts at the other agency to help identify relevant categories.

In six of the seven demonstration States, the Medicaid eligibility agencies had access to the data necessary to calculate household income as a percent of the FPL. However, in California, the State agency did not have access to income data; only the county social services offices had that information. Instead, the State agency had information about the specific Medicaid aid category each participant qualified under. Some aid categories required an income test and, for those categories, the State's data indicated an income range the child's household fell into. State staff used these income ranges to identify children that met the eligibility requirements for free or reduced-price meals. A complicating factor was that the income ranges did not start or end at 130 percent of the FPL (the threshold for free meal eligibility) or 185 percent of the FPL (the threshold for reduced-price meal eligibility). The ranges for several aid categories terminated at 133 percent of the FPL. Therefore, when California applied to participate in the demonstration, the State requested and received authorization from FNS to use 133 percent of the FPL as the threshold for free-meal eligibility through DCM-F/RP. The income ranges for aid categories that the State used to identify eligibility for reduced-price meals had lower limits as low as zero and the upper limits ranging from 134 to 185 percent of the FPL. Because there was no way for the State to identify whether children in some of these categories have household incomes above or below 133 percent in categories, all children in them were classified as eligible for reduced-price meals based on DCM-F/RP.

3. Matching Medicaid and student enrollment records

The data-matching process for DCM-F/RP varied among States but was generally consistent with the matching process used for direct certification based on participation in SNAP and other programs. Six of the seven demonstration States—all but Virginia—conducted central direct certification matching, in which the primary match between program participation data and school enrollment data is at the State level.[36] The child nutrition agency was responsible for matching in most of these States, but the umbrella department overseeing the SNAP and Medicaid eligibility agency operated the matching system in Massachusetts and the State Department of Technology housed the matching system in California. The seventh State, Virginia, conducted only local matching; the child nutrition agency divided the DCM-F/RP eligibility file by ZIP code or county and forwarded to each district the portions corresponding to its local area, for the districts to match locally.

Medicaid data. The DCM-F/RP matching process requires transferring data files containing income-eligible Medicaid participants to matching systems and comparing them with student enrollment records using a predetermined algorithm. In all seven demonstration States, the Medicaid eligibility agency provided files identifying the income-eligible children receiving Medicaid. In each State, the Medicaid eligibility agency also provided the data needed for direct certification with another program (SNAP, TANF, or foster care) and was able to provide the Medicaid data using data-transfer procedures already in place. However, the Medicaid data are

[36] California conducted central matching for the 14 districts participating in DCM-F/RP and local matching in the remainder of the State. Local matching by districts or county public assistance offices for free-eligible Medicaid participants was also permitted until October 2016.

not always drawn from the same database at the agency or transferred in the same file (Appendix Figures F.1–F.7).

Student enrollment data. The other type of data needed to conduct matching for DCM-F/RP is student enrollment data, which central-matching States obtained from two broad sources:

1. **Statewide Student Information Systems (SSISs).** California, Nebraska, Utah, and West Virginia matched against student enrollment data residing in the SSIS.[37]
2. **Direct upload.** Florida and Massachusetts relied on districts uploading enrollment data directly to the direct certification matching system. Nebraska and Utah offered this as an option to districts, as well.

In Virginia, the sole local-matching State, districts conduct the match against their local enrollment system.

Matching algorithms. Among States matching centrally, four (California, Florida, Massachusetts, and Utah) conducted a deterministic match and two (Nebraska and West Virginia) used probabilistic matching (Table VII.2). Deterministic matches typically used three or four data elements, most commonly first name, last name, and date of birth. California—the only State to modify its matching algorithm to accommodate DCM-F/RP—used five data elements for more stringent DCM-F/RP matching criteria.[38]

Table VII.2. Data elements and algorithms used in DCM-F/RP matching

	California	Florida	Massachusetts	Nebraska	Utah	Virginia	West Virginia
Matching features							
Match type	Deterministic	Deterministic	Deterministic	Probabilistic	Deterministic	Varies by district	Probabilistic
Phonetic match[a]	x	x				Varies by district	x
Nickname match[b]		x				Varies by district	x
Date of birth accommodation[c]						Varies by district	x
Number of data elements required for exact match	5	2–4[d]	3	4	3[e]	3+[f]	7
Data elements							
First name	●	●	●	○	●○	○	○
Last name	●	●	●		●○	○	○
Suffix	–	–	○	–	–	–	–
Date of birth	●	●	●	○	●○	○	○
Gender	●	●	–	○	–	○	–
Race	–	●	–	–	–	–	–
Social Security number	○	●	–	–	–	○	○
Address	●	–	–	○	–	○	○

[37] In Nebraska, private school enrollment data were sourced from a separate statewide system.

[38] The match algorithm California used for Medicaid was more stringent than that used for SNAP and TANF match to reduce the risks of false positives, which was a concern for the State because Medicaid is a larger program than SNAP or TANF.

	California	Florida	Massachusetts	Nebraska	Utah	Virginia	West Virginia
County	–	–	–	–	–	–	○
Guardian first name	–	–	–	–	–	○	○
Guardian last name	–	–	–	–	–	○	○

Source: Interviews with State staff; State documentation of matching processes.

● = Data element is required for an exact match.

○ = Data element can be used to identify an exact or possible match.

– = Data element is not used for matching.

[a]A phonetic match uses an algorithm to index names by sound or pronunciation. The index can be used to match names that may have minor differences in spelling.

[b]A nickname match identifies common nicknames for a particular name.

[c]Date of birth accommodation identifies potential errors in that data element, such as transposing the day and month fields.

[d]Florida has a 16-level deterministic match. Some matches required as few as two data elements (SSN and date of birth), whereas others required four data elements (last name, first name, date of birth, and gender).

[e]Utah conducts matching using two different systems that both use the same deterministic match. The first system—which all districts must use at least three times a year—produces exact matches when all data elements match and possible matches when two of the data elements match. The second option, which is available only to districts that use the State-sponsored district enrollment and POS system, produces only exact matches.

[f]In Virginia, matching is done locally. The State requests that districts match on at least three data elements, and districts select which data elements to use. The table indicates the data elements that the State provides to districts.

In Virginia, the one State using district-level matching, the matching process and algorithm varied across districts. Districts received program eligibility files from the State and matched them against their local enrollment data. The child nutrition agency required districts to match on at least three data elements. Districts selected which elements to use and could choose to use deterministic or probabilistic matching processes. The four Virginia districts visited for the evaluation used the same matching methods for DCM-F/RP as direct certification with other programs. Three used deterministic algorithms and one ran a probabilistic match. The number of data elements used ranged from three to eight. In two districts, only the first match of the school year was automated; staff conducted subsequent matches, including the sole DCM-F/RP match, manually.[39] Staff in all four districts reviewed unmatched Medicaid records or possible matches to find additional matches with their enrollment file.

Private districts conducted direct certification the same way as public districts in most States. However, in Nebraska, private districts uploaded their enrollment to a different State system than public districts. Virginia excluded private schools from DCM-F/RP because the Department of Social Services conducted direct certification matching for private schools. A small number of private schools in West Virginia did not use the statewide point-of-service (POS) system.

[39] Both of these districts were small and found it easy to match manually. In additional, their POS systems were not updated to prevent reduced-price direct certifications from overwriting a free certification based on an application.

4. Testing and monitoring

> "[We worked] through the rules and validated at literally each step that we had the right people included."
>
> - Medicaid eligibility agency staff

States tested and monitored creation of the DCM-F/RP eligibility file and the matching process before the first DCM-F/RP match, and some States performed additional tests throughout the school year. A key difference between DCM-F/RP and standard direct certification is the need for States to identify which program participants meet the income-eligibility standards for free or reduced-price meals, so this step was a focus of the initial testing. To ensure the DCM-F/RP eligibility file was produced correctly and contained only eligible Medicaid records, all States tested creation of the file prior to conducting the first match against student enrollment data.[40] When creating test files, Medicaid eligibility agencies confirmed that the correct Medicaid aid categories were included. Most agencies selected sample cases from different Medicaid aid categories to verify that they were assigned the correct certification status and program type. For instance, West Virginia pulled a percentage of its records and manually verified that a child's gross household income, household size, Medicaid aid category, and date of birth aligned with the State's specifications. Most States also tested to ensure that the certification hierarchy, described below, was preserved in the lists to be provided to districts.

Ongoing monitoring of the DCM-F/RP process was less common. Staff in central-matching States indicated that eligibility file creation and matching were conducted automatically based on the specifications and programming established before the first DCM-F/RP match, and additional testing after this initial match was unnecessary. However, States did indicate they would, and did, initiate reviews in response to questions from districts or parents about the match results, errors that required a change, additional FNS guidance, or changes to State databases or systems that could affect direct certification.

5. Dissemination of match results to districts

Central-matching States made match results available to their districts using the same process used for direct certification with other programs. In most States (California, Florida, Massachusetts, Utah, and Nebraska), district staff must log into a State-administered system to download the results. In Florida and Nebraska, district staff received an email when new matches were available. In Massachusetts, district staff triggered each match and downloaded the results once the match was complete. The same was true in Utah for districts uploading current enrollment files to the online matching and claims system, rather than accessing matches conducted against data stored in the SSIS. In California, the match was run the same time each month, so district staff knew when to access the results.

State-administered POS systems did not require district staff to log into a separate State system to obtain match results and transfer them to a local POS system to complete direct certification. In West Virginia, exact matches were automatically directly certified in the

[40] In California, testing and monitoring of the DCM eligibility list was more challenging. The State used a triple blind process, whereby the three agencies involved in creating the list lacked access to each other's data to validate match results. This arrangement also made it more difficult to troubleshoot problems, and the agencies had to work collaboratively and communicate to test the file and identify and resolve issues.

statewide POS system, with no district staff action required. District staff received an alert in the POS system when possible matches were ready for review. One of the direct certification options in Utah also certified exact matches automatically. This was possible for districts that used the State-administered enrollment system as a POS system—an optional feature popular with smaller districts, according to State staff.

All central-matching States produced lists of exact matches for each district, which typically included matches for other programs as well (with codes to indicate program). Nebraska and West Virginia also provided possible matches, as did Utah's State online claims and matching system. Most States included all exact matches in a single file, but Florida produced separate lists of free matches and reduced-price matches. Florida's system also provided lists of unmatched student records and unmatched students who have the same address as a matched student.

The systems in five States (Florida, Massachusetts, Nebraska, Utah, and West Virginia) had individual student lookup capabilities allowing districts to check for DCM-F/RP (or other direct certification) eligibility by entering information for a single student. District staff used these features to investigate possible matches and explore the eligibility of incoming transfer students.

6. Certification of DCM-F/RP matches

Districts conducted the final steps in the direct certification process in much the same way as before the demonstration. After obtaining match results from the States (or, in Virginia, from their own matching process), districts updated their POS systems with students' new certification status and basis, drafted and mailed new DCM-F/RP letters to households, extended certification to other students in the household, and in some cases attempted to certify possible matches.

> "[DCM-F/RP] was way easier than I expected it to be. It was very easy to process."
>
> - District staff

To complete DCM-F/RP, districts had to record DCM-free and DCM-reduced-price certifications in their POS systems. In most districts visited for the study, this required updating the POS system to include Medicaid as a program option and to recognize direct certification as a method for reduced-price meals. However, POS updates were not always updated before the beginning of DCM-F/RP, leading districts to certify students manually in the interim (described further in Section C).

Direct certification practices varied in minor ways among the districts visited for the evaluation, depending to some extent on district characteristics. Although smaller, rural districts used many of the same POS vendors as their larger, more urban counterparts, some small districts visited were more likely to match (in Virginia) or update students' certification status manually (in other States), regardless of whether their POS systems were updated for DCM-F/RP. Large districts with access to daily matches generally reported downloading their matches more frequently than smaller districts. Larger districts downloaded matches several times per week at the start of the school year and scaled back these downloads as the year progressed.

7. Extension of certification to other students in the household

Students who reside in the same household as a student certified by DCM-F/RP are eligible to receive the same benefits through a process called extension. All seven demonstration States relied on districts to identify unmatched students living in the same household as a certified student. Florida was the only State in which State agency staff assisted with the process, by providing a list of all unmatched students with the same address as a matched student to facilitate extension at the local level.

> "[In Medicaid] you end up with many different households within one unit. That's difficult for us to hone in on and figure out who's actually in the household…. It's not easily identifiable."
>
> - Medicaid eligibility agency staff

Districts employed several methods to extend DCM-F/RP certifications (Appendix Table F.2), none of which were unique to DCM-F/RP. Districts checked household identifiers within their enrollment or POS systems to identify opportunities for extension. All districts sent a letter to families notifying them of their direct certification results and instructing them to report any other students living in the household. Another extension strategy was for district staff to identify unmatched students in a household. This strategy was observed in small districts, where staff are familiar with their student population and could sometimes identify siblings who had different meal statuses without any investigation. Some districts opted to invest more time and effort into extending match results. Some reviewed student surnames, parent or guardian names, and addresses to identify other students in the household.

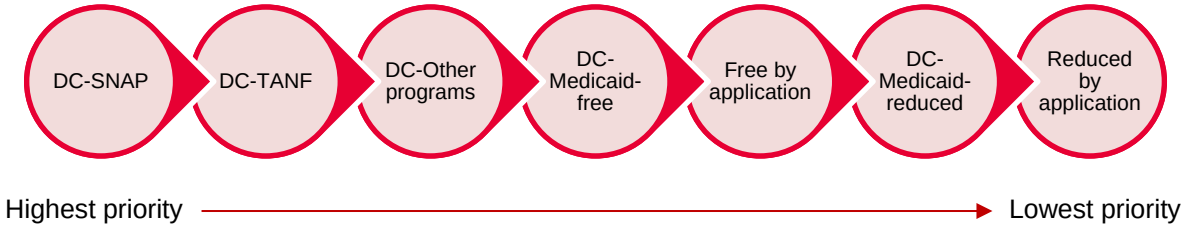
8. Maintaining the certification hierarchy

FNS has established a certification hierarchy that indicates which certification status and basis of certification should take precedence for students eligible through multiple methods or programs. The certification status (free, reduced-price, or paid) is the aspect of certification that matters to students, but districts must also track information on the basis of certification necessary for reporting to State agencies and FNS. Free certification supersedes reduced-price for students identified as eligible for both (for example, eligible for free meals based on direct certification and for reduced-price meals through an application). Within a certification status, direct certification supersedes approval by application. This prioritization ideally reduces administrative burden on district staff because direct certifications are not subject to verification, the annual process through which district staff verify that information submitted on a sample of applications is accurate. Additionally, within direct certifications for free meals, the hierarchy determines which programs supersede others for students eligible through multiple programs. Direct certification through SNAP supersedes all other methods of certification. This helps States meet the SNAP direct certification performance target set by Congress: States are required to directly certify for free meals at least 95 percent of school age children participating in SNAP.

All States had experience maintaining the certification hierarchy prior to the demonstration, but implementing DCM-F/RP required States to incorporate free and reduced-price Medicaid direct certifications into the existing certification hierarchy (Figure VII.1). FNS instructed States to consider free Medicaid direct certifications as the lowest priority free direct certification—below all other programs—but above approval by application. Reduced-price direct certifications supersede approval for reduced-price meals by application but are prioritized below free certifications by any method. Before DCM-F/RP, direct certification was only used for free

meals and always took precedence over approval by application. Because DCM-F/RP introduced the possibility of direct certification for reduced-price meals, staff had to ensure that reduced-price direct certifications through DCM-F/RP did not overwrite free certifications based on application.

Figure VII.1. DCM-F/RP certification hierarchy



In most States, State agencies and districts shared responsibility for maintaining the certification hierarchy (Appendix Table F.3).[41] To accomplish this, (1) States had to ensure the highest-level program in the hierarchy took precedence in the match result file provided to districts, and (2) districts had to maintain the hierarchy locally within their POS systems. It was especially important for districts to prevent a reduced-price match from overwriting a student's free status because this would negatively affect what students pay for meals. States and districts also had to update the certification status of students who moved up the hierarchy (that is, changed from paid to free or reduced-price or from reduced-price to free) throughout the school year, and districts had to record the basis of certification locally. State staff educated districts on the hierarchy, stressing that all other programs supersede Medicaid and that reduced-price direct certification should never overwrite the status of a student receiving free meals.

Most States included only the highest priority program in the direct certification match results provided to districts, to reduce the chance of recording a student as certified based on a lower priority program. California and Massachusetts accomplished this by matching different program data to the enrollment data sequentially, according to the hierarchy, and removing matched students from the enrollment used file at each step. Utah filtered the combined program file according to the hierarchy prior to matching, so that the record for each child retained only the highest priority program indicator. Florida filtered the match results, so that each matched student retained only the highest priority program indicator. West Virginia enforced the hierarchy through the State-maintained POS system nearly all districts in the State used.

Nebraska and Virginia placed more responsibility on districts for maintaining the hierarchy. Nebraska provided match results showing all programs each student matched to, relying on district staff or their POS systems to choose the correct program. Nebraska planned to use its direct certification improvement grant to modify its system to include only the record for the highest priority program. Virginia, a local matching State, distributed its first DCM-F/RP eligibility list to districts in spring 2017. The list included all children eligible for DCM-F/RP,

[41] Districts in West Virginia and those in Utah that used a State-sponsored POS system relied on the State to maintain the certification hierarchy.

regardless of whether they had appeared on prior eligibility files based on other programs, and the State relied on district staff to retain earlier program information for students directly certified previously.[42]

9. Timing of DCM-F/RP processes

The amount of time between Medicaid or school enrollment and DCM-F/RP certification depends on the frequency of updates to the Medicaid and student enrollment data used, the State or district's matching schedule, and in most States the frequency of district staff actions to complete the certification in their local POS systems. The frequency of direct certification matching in general ranged from daily to the FNS-required minimum of three times per year, with most central-matching States allowing for daily matches (Table VII.3). The matching schedule was the same for Medicaid as for SNAP and TANF, except as affected by late implementation of DCM-F/RP in the first year of the demonstration in several States. Although Florida and Nebraska conducted the first DCM-F/RP match before the beginning of the school year, Utah did so in November 2016; California, Massachusetts, and Virginia in May 2017; and West Virginia in June. This reduced the number of times DCM-F/RP matching took place in some States, relative to the schedule for a full school year. For example, Virginia distributed only one Medicaid data file to districts for matching during SY 2016–2017, and West Virginia's first DCM-F/RP match occurred after the school year had ended for most districts.

Table VII.3. DCM-F/RP data and match frequency

State	Frequency student enrollment data updated	Frequency Medicaid data provided	Match frequency
California	At least 2 times per year	Monthly	Monthly
Florida	At least 3 times per year	Daily	Daily
Massachusetts	At least 3 times per year	Real time	At least 3 times per year (districts trigger matches)
Nebraska	At least twice per year	Daily	Daily
Utah			
Claims and matching system	At least 3 times per year	Daily	At least 3 times per year
State-sponsored district enrollment system	Daily	Daily	Daily
Virginia	Daily[a]	6 times per year	6 times per year
West Virginia	Real time	Weekly	Daily

Source: Interviews with State and district staff; State documentation of matching processes.

Note: The frequencies in this table reflect the schedule for a full school year. In States that implemented the demonstration late in SY 2016–2017, DCM-F/RP was conducted less often.

[a]Based on the four Virginia districts visited.

Matching frequency varied among States, from daily to less than monthly. In five States—California, Florida, Massachusetts, Nebraska, and Virginia—the timing of direct certification was largely determined by districts. Florida and Nebraska matched daily using the latest enrollment file uploaded by districts and emailed districts whenever they identified a new match.

[42] Virginia filters the first direct certification eligibility file of the year, sending to districts only the highest priority program for each child, but this list did not include DCM-F/RP in SY 2016–2017 because the demonstration began later in the school year. Subsequent lists during the school year typically contain only new students or those who moved up the hierarchy or across county lines.

However, matching could occur using outdated enrollment data if districts did not upload files on a regular basis. In addition, these States relied on district staff accessing new matches as they became available. California matched monthly (including DCM-F/RP for the first time in May) but also relied on districts uploading current enrollment data and accessing match results each month. Districts in Massachusetts set their own matching schedule and could trigger a match within the State system daily or the minimum of three times per year, but DCM-F/RP results were not included in the matches until May. Lastly, Virginia provided six direct certification eligibility lists (with DCM-F/RP included only in the last one in SY 2016–2017) and instructed districts to match each one, but it was up to the districts to conduct the matches.[43]

One State, West Virginia, set the direct certification schedule for all districts that used the statewide POS system.[44] West Virginia matched daily using current student enrollment data available through the State's SSIS, including DCM-F/RP beginning in June 2017 (after the school year had ended for most districts). However, Medicaid data were provided on a weekly basis, which could result in a slight delay in direct certification compared with daily Medicaid data updates.

In Utah, the matching schedule could be State- or district-driven depending on the system used to complete the match. For districts using the State-sponsored student enrollment system, matching occurred daily using current student enrollment and Medicaid data. For districts that used this system as their POS system, it automatically updated students' certification status. All districts had to trigger a match at least three times per year using the State online claims and matching system, but they could do so more frequently if desired.

B. Burden

State agency and district staff generally perceived that the demonstration did not impose much burden on them, even in States reporting relatively high costs from contractors. However, a few common activities proved arduous for staff to complete (Appendix Table F.4). The analysis in this section draws on qualitative data from interviews with State and district staff about the time required to implement DCM-F/RP and the activities associated with the demonstration that required the greatest effort. District staff also provided perspectives on ways burden might decrease in the future. The discussion of State-level burden here also incorporates quantitative information from the cost data (discussed in the previous chapter) on numbers of labor hours staff devoted to DCM-F/RP (Table VII.4).

[43] Virginia districts received program eligibility files from the State six times a year, but Medicaid records were only provided once in 2016–2017 because the State implemented DCM-F/RP late in the school year.

[44] A small number of private schools and RCCIs in the State did not use the statewide POS system.

Table VII.4. State agency staff hours spent on DCM-F/RP, by State and agency type

State	Hours				
	Child nutrition agency		Medicaid eligibility agency		
	State agency staff	Contractors	State agency staff	Contractors	Total
DCM-F/RP States that participated in the first DCM demonstration					
California[a]	511	0	704	0	1,214
Florida[b]	0	NA	610	1,872	2,482
Massachusetts	147	0	526	1,996	2,669
Pooled sample	**654**	**NA**	**1,840**	**3,868**	**6,362**
DCM-F/RP States that are new to DCM					
Nebraska	111	NA	129	0	240
Utah	150	NA	325	0	475
Virginia	86	NA	783	0	869
West Virginia[c]	91	0	180	0	271
Pooled sample	**438**	**NA**	**1,417**	**0**	**1,855**

Source: Cost-tracking workbooks completed quarterly by State administrators for SY 2016–2017.

Notes: Totals shown in the table may differ slightly from calculated totals due to rounding.

[a]Salaries for staff of California child nutrition agencies used in this analysis are the highest rates for each position, rather than salaries for specific staff. For that reason, costs shown may slightly overestimate actual costs.

[b]All hours reported by the Florida child nutrition agency were for contractors. The agency did not report any direct labor hours for agency staff.

[c]Due to data limitations, fringe benefits in West Virginia were imputed. Medicaid eligibility agency costs in West Virginia exclude contractor costs because their work fell within the scope of the agency's maintenance and operations contract with the eligibility system vendor.

NA = not available.

1. State level

The qualitative data indicate that implementing DCM-F/RP was usually more burdensome for Medicaid eligibility agencies than for child nutrition agencies. This finding aligns with the quantitative cost analysis discussed in Chapter VI: staff of Medicaid eligibility agencies consistently spent more hours on DCM-F/RP activities than child nutrition agency staff (Table VII.4). Although Medicaid eligibility agency staff generally indicated that the most challenging aspect of the demonstration was identifying eligible Medicaid aid categories, the most burdensome aspect was developing and testing the Medicaid data query that assessed eligibility and produced the file of children to be matched to student data.

Unlike Medicaid eligibility agencies, there was no single activity across child nutrition agencies that was the most time-consuming. State child nutrition agencies were largely responsible for coordinating demonstration efforts, updating direct certification matching systems, and communicating with districts about the demonstration. California's child nutrition agency spent more than three times as many hours on the demonstration as the next closest child nutrition agency (Table VII.4). California put substantial effort into training and educating the 14 districts participating in the demonstration, and it was the only State that reached out to all major district POS vendors to discuss the changes they would need to make to their POS systems.

Although States that had conducted DCM under the previous demonstration reported they were well prepared for DCM-F/RP and already had an understanding of the complexities of assessing eligibility, this knowledge did not appear to translate into reduced burden for the Medicaid eligibility agency staff (and their contractors), as exhibited by the hours reported in Table VII.4. It is possible that agency staff in Florida and Massachusetts found it easier to transition to the new demonstration than the cost data might suggest because contractors were responsible for making some of the more challenging changes, including developing and testing the revised programming to identify eligible children in the Medicaid system and, in Massachusetts, updating the direct certification matching system.

2. District level

The qualitative data indicate that the burden of the demonstration on district staff varied between districts. Some district staff reported that the demonstration required additional effort in large part due to their POS systems not being updated to include the new certification categories. As a result, staff in those districts had to spend time manually certifying their DCM-F/RP match results, although this was already standard practice in some small districts. These manual updates could potentially be burdensome for larger districts, although the burden was somewhat mitigated in SY 2016–2017 because the demonstration launched after the start of the school year—and therefore after the bulk of certification activity—in most States.

> "The most critical thing is that your [POS vendor] is on board and knows what they're doing…. That made it so fluid for us."
>
> - District food service coordinator

Districts that receive possible matches from States reported that DCM-F/RP could result in additional possible matches that need reconciling. Increases in possible matches were greater in larger districts. This issue was most prominent in Utah because reconciled matches still appeared on subsequent possible match lists, meaning that the list got longer throughout the school year. This problem in Utah would exist without DCM-F/RP, but the demonstration appeared to exacerbate it by increasing the size of the list.

District staff—particularly in States that conducted their first DCM-F/RP match later in the school year in SY 2016–2017— expected to see some decrease in burden beginning in SY 2017–2018. They noted that DCM-F/RP may reduce the number of applications submitted during the next school year, and schools that newly adopted CEP as a result of the effects of DCM-F/RP on direct certification rates would reduce the number of applications a district must process. Districts also reported that DCM-F/RP could decrease time spent on verifications. A few districts that collect outstanding meal balances reported that by certifying more students, they should be able to decrease the amount of time they spend reconciling debt.

> "[adding] Medicaid was a piece of cake. It really wasn't difficult at all. It's the same thing we do for direct cert[ification with other programs]."
>
> - District food service supervisor

C. Challenges and Resolutions

States and districts encountered several challenges in implementing the DCM-F/RP demonstration (Appendix Table F.5).

Identifying Medicaid aid categories. Several States encountered difficulties determining which of their State's Medicaid aid categories contained the household size and income information needed to determine whether children were eligible for DCM-F/RP.[45] The Medicaid eligibility agencies in these States required additional information to identify appropriate categories, and the child nutrition agencies had difficulty providing guidance because they were not familiar with the Medicaid program. Consultations with State Medicaid policy experts and FNS helped agencies identify the appropriate categories, particularly excluding those for populations categorically eligible for Medicaid and those in Medicaid waiver groups where gross income was either incomplete or not validated.

> "Medicaid is very, very complicated and differs by State. We all have general guidelines that we need to follow … but the income varies … [and] a lot of States get waivers to provide [Medicaid] to different populations at higher income levels. I don't see how [FNS] could provide anything universally to all States. I think it's best just to deal with the States themselves."
>
> - Medicaid eligibility agency staff

Errors in eligibility files. Despite expert consultations and testing of the DCM-F/RP process, there were occasional errors in the program data or match results files. Three States—Nebraska, Utah, and Virginia—included some ineligible Medicaid aid categories in their results, at least initially. After identifying the problem through conversations with FNS, Nebraska provided corrections and asked districts to revise the certification status of effected students. The other two States did not make corrections because the erroneous certifications were small in number and the school year was nearly over when the problem was discovered. Florida inadvertently included students eligible for free meals based on DCM-F/RP in a file of students eligible for reduced-price meals. The State resolved this error, informed districts of the mistake, and provided a corrected file. Virginia did not de-duplicate its eligibility file according to the hierarchy as it had intended.[46] As a result, the file included children who had appeared in a previous file, creating some risk that district staff might incorrectly change the eligibility status of students who had already been directly certified for free meals based on SNAP.

Lack of awareness of the demonstration. States reported that, despite the training child nutrition agencies provided, some districts were unaware of the demonstration—entirely or in key details. Although districts visited were generally aware of DCM-F/RP, a few reported they first learned about it when they saw DCM-F/RP program codes in their match results. Throughout the school year, States educated districts unaware about the demonstration when they called to inquire about the new program codes. One common question received from parents was whether all students receiving Medicaid were categorically eligible for free school meals. One State reported that some districts were uncertain if they could extend DCM-F/RP certifications to other students in the household; in a different State, one district visited was not extending any DCM-F/RP reduced-price certifications.

POS systems unprepared to accommodate DCM-/RP. One pervasive challenge districts encountered was the lack of preparation among some POS vendors to accommodate the

[45] The number of categories varied across States. Massachusetts reported the most, with more than 150 categories that required review.

[46] The State planned to correct this in subsequent files, but because Virginia implemented DCM-F/RP toward the end of the school year, only one DCM-F/RP eligibility list was provided to districts in SY 2016–2017.

demonstration. This problem required staff in some districts to enter DCM-F/RP results manually. Some POS systems prioritized all direct certifications—including for reduced-price meals—over all applications, which could decrease a student's benefit level if staff did not make manual corrections for any students eligible for free meals based on an application but identified as eligible for reduced-price meals through DCM-F/RP. This was the case for the statewide POS system in West Virginia—a problem the POS vendor was working to correct for SY 2017–2018. In five of the other States, at least one district visited reported that their vendor was unprepared to maintain the certification hierarchy. In another State, both districts visited were unaware whether their vendor had made the updates necessary for the demonstration. Greater awareness among some districts and earlier communication to POS vendors about DCM-F/RP in advance might have resulted in more district POS systems being updated prior to the start of the demonstration. However, some vendors were reluctant to update their systems to accommodate the demonstration or required districts to pay for the update.

> "Certain software vendors were not ready or were not cooperative."
>
> - Child nutrition agency staff

Although both large and small districts reported POS system difficulties, this challenge appeared to be less burdensome for small districts, some of which were already manually updating students' status after the first match of the school year. Involvement in the previous DCM demonstration did not insulate districts from POS system challenges because the reduced-price component could pose different complications. Adding a new program code for Medicaid to the list of programs used to directly certify students for free meals was often a simpler change than incorporating reduced-price status as a possible outcome of direct certification. In addition, the potential consequences of an error in applying the hierarchy were more serious under DCM-F/RP because erroneously overwriting a free status based on application with a reduced-price status based on direct certification would affect the price a student paid for school meals, whereas an error in recording the basis of certification for free meals would not have an immediate effect on the student.

D. Best practices and reported factors affecting matching success

Many factors can affect matching success within a State or district (Appendix Table F.6), most of which are not unique to DCM-F/RP. This section describes characteristics and processes that facilitated or hindered DCM-F/RP implementation, and Appendix Table F.7 summarizes strategies for improving matching success, based on perspectives of State agency staff and inferences from the study team.

1. Student and household characteristics

States and districts described several student and household characteristics that can affect matching success. Respondents frequently indicated that inconsistently recorded student names can decrease matching success. For instance, in Virginia, district staff enter a student's name as it appears on his or her birth certificate, whereas Medicaid caseworkers enter whichever name the client provides to the caseworker. Complex names with punctuation and special characters were more likely to lead to a possible match or nonmatch, rather than an exact match, because States and districts were sometimes inconsistent in how they entered these data. Such names could be more prevalent among certain populations. For instance, staff in some districts noted hyphenated surnames are common among Hispanic populations, and that such names are more prone to data

entry error or transposition, which can lead to a possible match or nonmatch. One State using the Soundex phonetic coding algorithm noted that it was more adept at matching European names than Hispanic, Asian, or Middle Eastern names. Differences in surnames between data sources could also make extension of eligibility more difficult for districts that relied on a student's last name to identify other students in the household.

Staff in a few States discussed how address changes can decrease matching success and extension of eligibility. States that use address in a deterministic match, like California, can have difficulty matching on this data element if the Medicaid or student population moves frequently. Districts in local-matching States like Virginia also can have difficulty matching students that move frequently because the State provides a list of eligible children based on the county or ZIP code within the Medicaid data, which may not reflect recent movement within or between districts.

2. District-level factors

District and State respondents identified several key district-level factors that can affect matching success. Respondents noted that matching success can depend on a district's size and resources. Large districts often had POS vendors and dedicated IT staff who support direct certification matching. Small districts and private districts may have staff who juggle multiple responsibilities and have less time to dedicate to direct certification. However, because small districts often had fewer students on their direct certification match lists and were familiar with their student population, it was easier for them to resolve possible matches and identify opportunities for extension of eligibility.

District staff responsible for direct certification can also have a large impact on matching success. Staff who regularly upload enrollment data to their State's systems, download matches on a consistent basis, and investigate possible matches may see gains in their direct certification numbers. Staff knowledgeable about the certification hierarchy are also more likely to certify students under the correct program and ensure a student received the correct level of benefits.

Matching success can also depend on a district's vendor. Vendors that are prepared for the DCM-F/RP match may be more likely to maintain the certification hierarchy and certify students under the correct program. In a local-matching State like Virginia, a prepared vendor would allow a district to conduct an automated match within its POS system, which may translate into additional matches. A vendor that is unprepared for DCM-F/RP might require a district to certify students manually, which could be burdensome for larger districts and may introduce errors into the certification hierarchy.

3. State-level factors

The sophistication of State information systems, databases, and implementation procedures could contribute to the success of DCM-F/RP. States use probabilistic matching algorithms, phonetic and nickname matching, and date of birth accommodations to increase matching opportunities by identifying close matches that can be certified and possible matches for additional review by districts. Multitiered deterministic algorithms also create more opportunities to match a student than a single deterministic match. Several States were either considering moving to a probabilistic match or refining their existing probabilistic match. Virginia also

planned to move to central matching, which would allow the State greater control over direct certification matching.

Another means of improving direct certification is to use current data, conduct frequent matching, and facilitate extension of eligibility. States that access daily or real-time Medicaid and student enrollment data for matching can increase matching success and timeliness by ensuring that they use the most recent data for direct certification. States that do not have access to current enrollment data may not match new students who transfer into the district during the school year. Direct certification matching systems that match daily and allow districts to look up individual students can also boost matching success, extension, and certification timeliness. Although a State may match frequently (providing data to directly certify new Medicaid enrollees), in some States there is no guarantee that a district will access its matches on a regular basis. In these cases, automated emails notifying districts of new matches can prompt the district to download its matches and certify students more quickly. State-administered POS systems have the potential to help expedite direct certification by certifying exact matches automatically, eliminating the need for districts to access their matches or take active steps to maintain the certification hierarchy.

The quality of State's Medicaid data also can affect matching success. States with character limits in their Medicaid data systems can truncate names, leading to nonmatches. Expanding character limits may allow States to better match students with long names. One State's Medicaid database did not contain any punctuation, which likely contributed to nonmatches against its enrollment data, which did contain punctuation. To ensure consistent data entry, some States require caseworkers to enter Medicaid data in a specific format, which can increase matching success. For instance, West Virginia requires caseworkers to enter a client's date of birth by selecting it from a calendar, and invalid selections automatically generate an error message. Another method to reduce nonmatches is to standardize enrollment and Medicaid data before matching the two datasets. Nebraska runs an automated script that standardizes birthdates and removes all special characters, suffixes, and spaces from the datasets. California standardizes addresses in the program data by converting them to the U.S. Postal Service's format before conducting a match, and the two California districts included in the site visits clean student address data to increase the chance of generating a positive match. Standardizing data in this fashion can be an effective way to boost matching success in States with deterministic matching algorithms.

One State suggested that the size of a State's Medicaid population can also affect matching success. Because the Medicaid population was so large in California, the chance of false positives—that is, a student being incorrectly identified as a match—is greater. In response to this challenge, California adopted a more stringent match than its SNAP and TANF match, which likely lowered the matching success for DCM-F/RP.[47]

[47] California uses a five-point deterministic match for DCM-F/RP. For DC-SNAP and DC-TANF, the State conducts a multitiered deterministic match, with the least stringent match on three data elements.

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VIII. CONCLUSIONS AND LIMITATIONS

The DCM-F/RP demonstration authorizes States to directly certify students for free or reduced-price meals based on income eligibility assessed through Medicaid data. This evaluation is documenting the experiences of States and districts during the implementation process and assessing the potential of DCM-F/RP to expand the number of eligible students who are certified to receive free or reduced-price school meals without needing to submit applications, increase the numbers of reimbursable meals served, and affect the administrative costs State staff incur during the certification process. This chapter summarizes key findings from the first year of the demonstration.

A. Summary of key findings

1. Certification, participation, and Federal reimbursements

Under the DCM-F/RP demonstration, substantial numbers of students were directly certified to receive free or reduced-price meals based on Medicaid data, comprising more than one-quarter of all students directly certified for free or reduced-price meals. Although some of these students would have been certified by another method in the absence of the demonstration, the total percentage of students certified for free meals grew between the baseline year and SY 2016–2017, and the total percentage of students certified for reduced-price meals grew in some demonstration States. These increases in certification rates did not translate into consistent increases in participation or Federal reimbursements, however. Although most demonstration States experienced increases in the percentages of lunches served for free, changes in other participation or Federal reimbursement outcomes were mixed.

Limitations of the DCM-F/RP demonstration design and data should be considered in interpreting the findings summarized here. The certification, participation, and Federal reimbursement outcomes were analyzed using a pre/post design for States implementing DCM-F/RP statewide and a comparison group design for California. The pre/post design estimated the effect of the demonstration as the change in a given outcome not explained by changes in measurable characteristics that occurred at the same time. Although the statistical model used to estimate changes accounts for the influence of included time-varying characteristics (such as local economic conditions) and any time-invariant characteristics (such as type of district) on the outcomes of interest, time-varying factors not included in the model and unrelated to the demonstration (such as changes in student preferences for school meals) could still be driving some of the observed changes. In California, because the 14 districts implementing DCM-F/RP in SY 2016–2017 were not selected randomly, the estimated effects could be due to differences between the treatment and control groups that are not controlled for through the statistical methods used.

Some States were excluded from analyses of certain outcomes. First, because DCM-F/RP would not have affected free certifications in States that participated in the previous DCM demonstration (California, Florida, and Massachusetts), the evaluation did not examine outcomes related to free meals in those three States. Second, because key certification data elements were unavailable for Florida and Massachusetts, those States were excluded from core certification analyses. Finally, West Virginia was excluded from analyses of participation and Federal reimbursements because its first DCM-F/RP match was in June 2017, after school had closed in

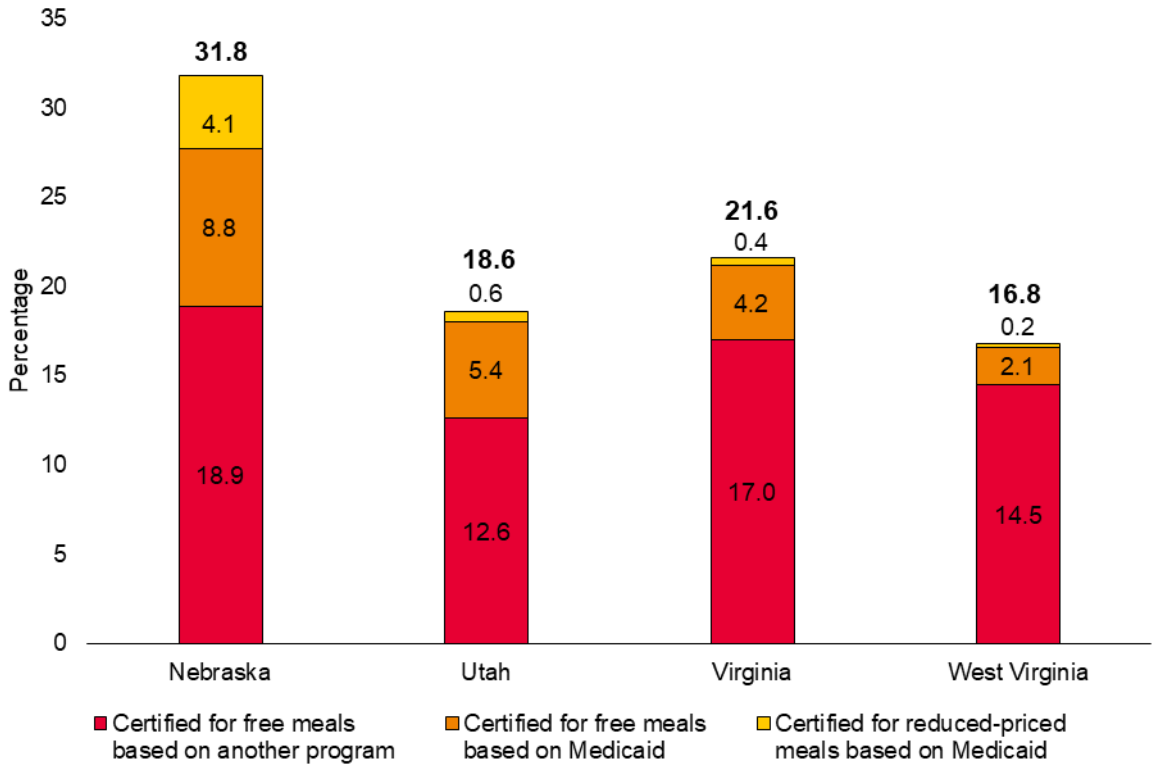
most districts. Chapter II and Appendix A provide a more detailed discussion of these and other limitations.

Certification. Substantial numbers of students were directly certified through DCM-F/RP in the first year of the demonstration. Across the four States new to DCM, more than 100,000 students were directly certified for free meals based on Medicaid data. An additional 22,000 students were directly certified for reduced-price meals based on DCM-F/RP in the five States that provided the necessary data for that measure. In terms of percentages, between 2.1 and 8.8 percent of students were directly certified for free meals based on DCM-F/RP in the four States new to DCM in SY 2016–2017 (Figure VIII.1), compared to none in the prior year; all these changes were statistically significant. (For comparison, between 16.6 and 27.7 percent of students were directly certified for free meals based on any program in these States, so DCM-F/RP represents a sizeable portion of all direct certifications.) Between 0.2 and 4.1 percent of students were directly certified for reduced-price meals based on DCM-F/RP in the five States that provided the necessary data; these changes were statistically significant. For these two outcomes, because no students were certified through DCM-F/RP in these States in the baseline year, the full change between baseline and SY 2016–2017 is attributable to the demonstration, although experiences in other years or other States could differ.

Although some of these students would have been certified for free or reduced-price meals by application in the absence of the demonstration, overall certification rates improved during the first year of DCM-F/RP implementation in some States. All four of the States new to DCM, experienced statistically significant increases (of between 2.0 and 3.9 percentage points) in the total percentage of students certified for free meals. The total percentage of students certified for reduced-price meals also increased significantly in one State (Nebraska) but was significantly lower in treatment districts than in comparison group districts in California. In three of the four States new to DCM, the increases in the percentage of students directly certified for free meals during the first year of DCM-F/RP resulted in increases in the percentage of districts eligible for CEP.

Participation. The increases in certification rates translated into increases in the percentage of lunches served for free but had mixed effects on other participation outcomes. For the NSLP, no State in the analysis sample experienced a statistically significant increase between the baseline and DCM-F/RP year in the NSLP participation rate (the average number of lunches served per student per day). However, the percentage of lunches served for free increased in all three States new to DCM in the analysis (a statistically significant 1.4 percentage point increase for the pooled sample), and the percentage of lunches served at a reduced-price decreased by a smaller amount (a statistically significant 0.6 percentage point decrease for the pooled sample). This pattern suggests that more lunches were served to students who moved from reduced-price status to free due to DCM-F/RP than were served to students who moved from paid status to reduced-price through DCM-F/RP. The pooled sample of statewide implementation States that participated in the previous demonstration experienced a statistically significant 0.8 percentage point increase in the percentage of lunches served at a reduced price, but a decrease (of 0.018 meals) in average lunches served per student per day. However, the small magnitude of the changes in meals served per student per day limits the practical importance of the findings for this outcome.

Figure VIII.1. Percentage of enrolled students directly certified in SY 2016–2017, by State new to DCM



Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Each outcome in this figure reflects the percentage of students who attend schools that certify individual students and are directly certified based on the specified program, among all students enrolled in the district. Values in this figure are regression adjusted.

For the SBP, the participation findings vary by State. For each of the three breakfast participation outcomes, one or two States experienced a small but statistically significant increase and one or two had a small but statistically significant decrease between baseline and SY 2016–2017. The participation rate increased by 0.010 meals for one pooled sample (States new to DCM) and decreased by 0.009 meals in the other pooled sample (States that participated in the previous DCM demonstration). The percentage of breakfasts served at a reduced price increased by 0.07 percentage points for the pooled sample of States that participated in the previous DCM demonstration but decreased by 0.06 percentage points in the pooled sample of States new to DCM. There were no statistically significant changes for the relevant pooled sample in the percentage of breakfasts served for free.

Federal reimbursement costs. The findings on Federal reimbursements were mixed, and generally differed by whether a State was new to DCM. All three States new to DCM that were included in this analysis experienced small statistically significant increases in some Federal reimbursement outcomes (ranging from $0.01 to $0.03 increases in reimbursements per student per day and from $0.02 to $0.05 in the blended reimbursement rate), but the results were not consistent across outcomes. Among the three States that had participated in the previous DCM

demonstration, two experienced decreases in Federal reimbursement outcome measures between the baseline and DCM-F/RP year. Florida saw consistent decreases in all four reimbursement measures, and Massachusetts had a decrease in SBP reimbursements per student per day. These decreases between the two school years were inconsistent with the anticipated direction of the effect of the demonstration. Although the regression adjustments were intended to control for time-invariant district characteristics and changes in economic conditions that might affect outcomes, regressions cannot control for unmeasured time-variant factors. In addition, as with small changes in other outcomes, the magnitude of the changes in Federal reimbursements could limit their practical importance.

2. State administrative costs

The administrative costs incurred by State agencies to implement DCM-F/RP (over and above other certification costs) varied widely by State, ranging from approximately $13,000 to $257,000. Medicaid eligibility agencies typically incurred higher costs (averaging about $73,000 across States) than child nutrition agencies (averaging about $15,000) during the first year of the demonstration. In the two States with the highest costs, the largest expenditure—comprising the majority of their total costs—was for work done by Medicaid agency contractors to develop the queries for identifying eligible children in the data.

The majority of these costs were for start-up activities, which averaged $84,000 across the seven demonstration States. Costs for ongoing activities after the first DCM-F/RP match were substantially smaller, averaging just $4,000 per State in the first year of the demonstration. This pattern suggests that continuing DCM-F/RP in later years likely would not require substantial additional resources.

3. Implementation processes and challenges

States and districts integrated DCM-F/RP into their usual direct certification processes. Key differences included the assessment of eligibility based on income and household size information in the Medicaid files, and the addition of new program codes to indicate DCM-free and DCM-reduced-price. State agencies encountered challenges while preparing for the demonstration, including difficulties identifying which Medicaid aid categories included the information needed to assess students' eligibility for DCM-F/RP. The process of revising interagency agreements to include DCM-F/RP and creating a Medicaid data extract containing eligible children could be time-consuming, resulting in delays in implementation in some States. At the district level, a key challenge was POS systems not recognizing Medicaid as a program option or that direct certification could confer reduced-price status, requiring staff to manually certify DCM-F/RP matches.

B. Analyses planned for Year 2

A subsequent report will examine findings from the second year of DCM-F/RP implementation in the Cohort 1 States. More complete data will be available for some States in that year, which will reflect a full school year of DCM-F/RP for all seven States. In addition, the sample will expand to include the eight States that began implementing DCM-F/RP in the 2017–2018 school year, as well as the remaining districts in California, which is expanding the demonstration statewide in the second year.

The next report will also include comparisons of findings from Years 1 and 2 of the demonstration. For the six Cohort 1 States that implemented the demonstration statewide in both years, we will compare the effects on certification, participation, and Federal reimbursement outcomes estimated for the first year of the demonstration with the effects estimated for the second year. These analyses will explore, for example, whether the percentages of students directly certified based on Medicaid are maintained—or even expanded—and whether the patterns of participation and Federal reimbursement outcomes change when DCM-F/RP is conducted at the beginning of the school year for all seven States. We will also compare State administrative costs, including average monthly ongoing costs incurred in the first and second years of the demonstration for Cohort 1 States to assess whether ongoing costs tend to remain at the low levels observed in the first year of the demonstration. In addition, we will examine qualitative changes to Cohort 1 States' and districts' implementation of DCM-F/RP in Year 2 of the demonstration.

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APPENDIX A

METHODS

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This appendix describes the samples and the data collection and analysis methods used for the DCM-F/RP Year 1 report.

A. Sample

FNS solicited applications from States to participate in the DCM-F/RP demonstration and selected seven—California, Florida, Massachusetts, Nebraska, Utah, Virginia, and West Virginia—to begin implementing DCM-F/RP in SY 2016–2017. Eight additional States were selected to begin DCM-F/RP in SY 2017–2018 and will be included in the second year of the study.[48]

All but one of the demonstration States implemented DCM-F/RP in all school districts statewide. The exception was California, which included 14 districts in the treatment group that implemented DCM-F/RP; the remaining public school districts in the State formed a comparison group that did not directly certify students through Medicaid.[49] The 14 treatment districts in California are the same set that participated in the previous DCM demonstration and were purposively selected by the State before that demonstration began.

In the States that implemented DCM-F/RP statewide, the evaluation sample for quantitative analyses included all school districts, with the following exceptions:

- Districts missing all certification data or all participation data for either baseline or DCM-F/RP year. Based on their names, the majority of these appeared to be charter schools, private schools, or facilities serving special populations rather than regular public school districts.
- Districts composed entirely of Residential Child Care Institutions (RCCIs) that had no certified students.
- Districts with zero or missing number of students.
- Districts with serious data problems that could not be resolved.
- Districts missing secondary data used as covariates in regressions.

In addition, because private schools in Virginia were not included in the DCM-F/RP demonstration, they were not included in the evaluation. Private schools were included in the sample in other States, except California. Because all 14 California treatment districts are public school districts, we excluded private districts and RCCIs in defining the California comparison group. These various exclusions resulted in a total sample of 2,246 districts across the seven demonstration States, compared to 2,833 and 2,825 districts in the raw data files for the baseline year and SY 2016–2017, respectively.[50]

[48] The second cohort of States includes Connecticut, Indiana, Iowa, Michigan, Nevada, Texas, Washington, and Wisconsin.

[49] Because all 14 California treatment districts are regular public school districts, we excluded private districts and RCCIs in defining the comparison group.

[50] In California, the sample includes 14 treatment districts and 961 comparison group districts.

Table II.1 shows the numbers of State agencies and districts included in Year 1 of the demonstration evaluation. However, some analyses focused on subsets of the overall sample:

- **Selection of districts for qualitative data collection.** From the main analysis sample in each State, we drew a subsample of districts for qualitative data collection. Specifically, we selected four districts in the one State (Virginia), where local staff have primary responsibility for direct certification matching, and two districts in each State where matching is conducted at the State level. Districts were purposively chosen within each State to ensure variation along characteristics such as enrollment, percentage of students certified to receive free or reduced-price meals, and percentage of students directly certified.
- **Outcomes relevant for a subset of States.** Some outcomes are relevant for only a subset of demonstration States**.** Outcomes related to free meals are not presented for States that participated in the earlier demonstration of DCM for free meals (California, Florida, and Massachusetts), because the DCM-F/RP demonstration would not have had an effect on those outcomes in those States. Reduced-price certification outcomes are not presented for two States (Florida and Massachusetts) that did not provide the necessary data. Participation and reimbursement outcomes are not presented for West Virginia because that State conducted its first DCM-F/RP match at the end of the school year, after most schools had closed already, so there was no opportunity for participation.

B. Data collection

We collected three key types of data in the first year of the demonstration: (1) district-level administrative records data on certification and NSLP and SBP participation, (2) data on the administrative costs incurred by State agencies for DCM-F/RP activities, and (3) qualitative data on DCM-F/RP implementation processes and challenges.

1. Administrative records data

Administrative data on certification and meal participation were collected for each district in the demonstration States. To enable pre/post comparisons, the data were collected from each State child nutrition agency for both the first school year of the demonstration, SY 2016–2017, and a baseline year. The baseline year is the year prior to the demonstration (SY 2015–2016) for most States, but California's baseline is SY 2013–2014—the year before the State began the first DCM demonstration.[51] District-level data collected for each period fall into two broad categories: (1) information on enrolled students by certification status and basis for certification and (2) monthly participation (that is, meals served) information for the NSLP and SBP. The specific data elements collected largely align with the district-level data that States typically collect from districts for administrative reporting.

[51] The selection of this baseline year, rather than the year immediately prior to DCM-F/RP, reflects the fact that the analysis for California uses a comparison group design, and the treatment group consists of the same districts that participated in the first demonstration. The two demonstrations might affect some of the same key outcomes, so years after the first demonstration began would not serve as an effective baseline.

Core certification data. We collected data on certification status, method, and basis, including data elements reported on form FNS-742, plus the numbers of students directly certified for free meals and for reduced-price meals based on Medicaid.[52] For the baseline year, the reference date for the certification data provided is the last operating day in October, the date used for the FNS-742, because the data were available for that point in time. States that conducted their first DCM-F/RP match at the beginning of the school year in SY 2016–2017 could report data for the last operating day of October 2016, as well. However, States that conducted DCM-F/RP later in the year reported the data certification elements as of about a month after their first DCM-F/RP match. The core certification data elements collected include the following:

- Total number of students enrolled in the district.
- Number of students certified for free meals.
- Number of students certified for reduced-price meals.
- Number of students certified by each method of certification, such as:
  - Application, by whether based on categorical eligibility or income.
  - Direct certification, by program (SNAP, Medicaid, and so on).[53]

Two States, Florida and Massachusetts, could not provide all the requested certification data elements and instead provided the results of the State's direct certification matching. Although the match results States provide to districts can differ from direct certification outcomes for several reasons and do not address the study's research questions, we constructed alternative measures using these data, as described in Section C.

Supplemental certification data. Only one of the demonstration States, Nebraska, was able to provide additional administrative data on DCM-F/RP match results and prior certification information, which are not included in the FNS-742 but are required to partially address research questions B.3 and B.4. Specifically, we collected information on (1) the total number of students identified as eligible for free meals, and separately, for reduced-piece meals based on the DCM-F/RP match—regardless of whether this match was recorded as the basis of their certification status; and (2) for each group, the distribution by direct certification basis. None of the other demonstration States were able to provide the supplemental data. Even in Nebraska, the available supplemental data do not include sufficient information to fully address Research Questions B.3–B.4 because the data on prior certification include only direct certification match results and not application results.

[52] Not all States were able to provide all requested certification data elements. Florida and Massachusetts had to be excluded from some analyses, and we estimated some of the key outcomes for Nebraska, as discussed in Section C.

[53] Most States provided the number of students certified to receive free meals but not subject to verification as a more readily available proxy for the number directly certified. In addition, although we also requested as complete a breakdown as available of the number of students directly certified by program, the information available for the baseline year was typically limited to SNAP and a combined number for programs other than SNAP.

NSLP/SBP participation data. Data were collected from State child nutrition agencies on the total numbers of reimbursable lunches and breakfasts served, by reimbursement category (free, reduced-price, paid) in each month during the baseline year and SY 2016–2017, for each district in the evaluation sample. To facilitate analyses of Federal reimbursement costs, we also collected data on the numbers of meals in districts certified as meeting new school meal pattern and nutrition regulations, which receive an extra six cents per lunch served, and the numbers reimbursed at the slightly higher "needs-based" NSLP rates or "severe-needs" SBP rates for which some districts or schools qualify.[54] All rates for SY 2013–2014, 2015–2016, and 2016–2017 are detailed in Table A.1.

Table A.1. NSLP and SBP Federal reimbursement rates, SY 2013–2014, SY 2015–2016, and SY 2016–2017

	NSLP Federal reimbursement rates (dollars)			SBP Federal reimbursement rates (dollars)		
Rate type	Free	Reduced-price	Paid	Free	Reduced-price	Paid
SY 2013–2014						
Without six-cent performance-based increase						
Standard rate	2.93	2.53	0.28	1.58	1.28	0.28
Needs-based or severe-needs rate	2.95	2.55	0.30	1.89	1.59	0.28
With six-cent performance-based increase						
Standard rate	2.99	2.59	0.34	n.a.	n.a.	n.a.
Needs-based or severe-needs rate	3.01	2.61	0.36	n.a.	n.a.	n.a.
SY 2015–2016						
Without six-cent performance-based increase						
Standard rate	3.07	2.67	0.29	1.66	1.36	0.29
Needs-based or severe-needs rate	3.09	2.69	0.31	1.99	1.69	0.29
With six-cent performance-based increase						
Standard rate	3.13	2.73	0.35	n.a.	n.a.	n.a.
Needs-based or severe-needs rate	3.15	2.75	0.37	n.a.	n.a.	n.a.
SY 2016–2017						
Without six-cent performance-based increase						
Standard rate	3.16	2.76	0.30	1.71	1.41	0.29
Needs-based or severe-needs rate	3.18	2.78	0.32	2.04	1.74	0.29
With six-cent performance-based increase						
Standard rate	3.22	2.82	0.36	n.a.	n.a.	n.a.
Needs-based or severe-needs rate	3.24	2.84	0.38	n.a.	n.a.	n.a.

Sources: SY 2013–2014 rates: https://www.gpo.gov/fdsys/pkg/FR-2013-07-26/pdf/2013-17990.pdf;
SY 2015–2016 rates: https://www.gpo.gov/fdsys/pkg/FR-2015-07-17/pdf/2015-17600.pdf;
SY 2016–2017 rates: https://www.gpo.gov/fdsys/pkg/FR-2016-08-05/pdf/2016-18650.pdf

Note: These rates exclude additional commodity payments for school lunches.

n.a. = not applicable.

[54] For the NSLP, entire districts may qualify for needs-based rates. For the SBP, severe-needs rate eligibility varies by school.

After the initial certification and participation files were received from each State, the study team examined the data in each file and compiled lists of questions, including general clarification on the format of the data received, questions on how to use or interpret specific data elements, and descriptions of unusual patterns identified for individual districts. For some data files, these questions revealed major data problems that required the State to provide a corrected file. In others, the questions could be addressed individually. Some questions about specific districts' data could not be resolved by the States; in these cases, depending on the severity of the issue, the district was either dropped from the analysis, included with a missing value for the problematic variables, or kept unchanged.

Secondary data. We collected additional types of data from Federal websites, rather than from demonstration State staff. First, to use in computing reimbursement amounts, we collected public Federal per-meal NSLP and SBP reimbursement rates from FNS' website (http://www.fns.usda.gov/school-meals/rates-reimbursement) for each school year covered by the participation data (Table A.1). In addition, we collected information from public sources on district and county characteristics; this was used to control for changes in economic characteristics between the years and to improve the precision of the estimates of demonstration effects. In particular, we collected:

- **Census Small Area Income and Poverty Estimates (SAIPE):** annual county-level income and poverty rates.
- **Bureau of Labor Statistics Local Area Unemployment Statistics (LAUS):** monthly county-level unemployment rates.

The SAIPE data are defined based on a calendar year rather than a school year. We collected 2013 data to approximate the baseline school year for California, 2015 data to approximate the baseline school year for the remaining States, and 2016 data to approximate the first demonstration year. In addition, we collected data elements from FNS-742, such as whether a district was public or private, to use in restricting the California comparison group.

2. State administrative cost data

Data on the State-level administrative costs of launching and operating DCM-F/RP were collected from staff of the Medicaid eligibility and child nutrition agencies involved in the demonstration.[55] These data covered costs of DCM-F/RP over and above those of other certification activities—including, for those participating in the previous DCM demonstration, using Medicaid to directly certify students for free meals.[56]

[55] In one State (Utah), two agencies played substantial roles related to Medicaid eligibility in the demonstration and completed cost workbooks.

[56] Though we aimed to collect only costs over and above other certification activities, some State agencies were not able to fully disentangle the various certification processes and costs. For example, the West Virginia Medicaid agency contractor hours were excluded from the cost logs because their work fell within the scope of the agency's maintenance and operations contract with the eligibility system vendor, even though the agency reported that the contractor did work specific to DCM-F/RP implementation.

Excel workbooks (sets of spreadsheets) were created for the Medicaid eligibility and child nutrition agencies and were distributed after Office of Management and Budget (OMB) clearance was received (in December 2016). The workbooks recorded hours per month spent on each activity, with separate activity lists for the Medicaid eligibility and child nutrition agencies. The list of the main activities in which State agency staff were involved (such as negotiating data-sharing agreements, developing specifications for Medicaid extracts to be used in matching, developing and testing the programs that created the extracts and assessed eligibility for DCM-F/RP, and matching Medicaid and student data) were based largely on those used in the study of the first DCM demonstration. Hours were recorded for each staff position, and a separate page in the workbook collected salary and fringe benefit information. Additional pages in the workbook were provided for other direct and indirect costs (such as contractors, website vendors, management, human resources, accounting, IT services, and building maintenance).

All Medicaid eligibility and child nutrition agencies completed three State cost workbooks, covering different periods: (1) July–December 2016, (2) January–March 2017, and (3) April–June 2017. The first workbook covered a longer period than the latter two because, although the school year began in July 2016, we did not receive OMB clearance until December 2016. States that began work on DCM-F/RP before July 2016 reported those costs as well.[57] Cost data provided were approximate, particularly when the forms were filled out substantially later than the reported month. Most of the relevant State agencies provided cost data in the workbooks for all months during which DCM-F/RP activity occurred. To facilitate the process for two Medicaid eligibility agencies, we collected their cost information by telephone or email and transferred it into the workbooks. For one child nutrition agency and two Medicaid eligibility agencies that spent minimal or no time on DCM-F/RP in later time periods, the agencies provided all necessary information in an email or verbal response rather than completing a full workbook.

We conducted clarification calls with the State agency staff who completed the first cost workbooks to confirm that the information in the workbooks was complete and that the evaluation team was interpreting the information correctly. For the two Medicaid eligibility agencies that reported their costs by telephone, the clarification questions were incorporated into the conversation so that no additional call was required. One or two calls were completed with each agency that completed workbooks. When reviewing the cost workbooks for completeness and reasonableness, we also compared data to the findings from the site visits and follow-up calls, if available. Any questions were resolved through telephone and email communication with State agencies.

3. Qualitative data

The qualitative data collection included site visits and follow-up telephone interviews with demonstration States and districts to learn about their DCM-F/RP processes and experiences.

Site visits. The study team conducted site visits to all seven demonstration States in SY 2016–2017. Each visit lasted two to three days and was conducted by a two-person team. Visits

[57] The time frame for the first period for Virginia's Medicaid eligibility agency does not align with other agencies because the Virginia Medicaid eligibility agency combined its April through July 2016 costs, and we were not able to separate costs incurred before the first month of the data period for other States.

typically occurred approximately one to two months after the State's first DCM-F/RP match, but visits to States that conducted DCM-F/RP at the beginning of the school year were delayed until after OMB clearance was received. Site visits included both interviews and observations of key activities, and respondents included both State agency and school district staff.

The study team identified the main agencies involved in the demonstration using States' DCM-F/RP applications and information obtained during introductory discussions at the beginning of the study. Site visits included the child nutrition agency and Medicaid eligibility agency in each State, and additional agencies as necessary. Our main contact at each agency helped identify key personnel involved in DCM-F/RP. Child nutrition agency respondents included staff responsible for supervising DCM-F/RP implementation in the State, staff that supported districts' direct certification efforts, and technical staff responsible for facilitating direct certification matching. Respondents at the Medicaid eligibility agency included policy staff involved in planning and preparing for the demonstration and technical staff responsible for identifying eligible children within the Medicaid data. Technical staff sometimes included contractors responsible for maintaining State Medicaid systems. In California and Utah, a third agency had a key role in the demonstration, and the study team interviewed them by telephone after the site visits.

Study team members visited two districts in each of the five States with State-level matching and four districts in the State with local-level matching, for a total of 14 districts (Table II.1). We did not visit districts in West Virginia because that State conducted its first DCM-F/RP match after the school year had ended for most districts. We used FNS-742 data to purposefully select districts and ensure variation among characteristics such as size, urbanicity, and the percentage of students certified for free and reduced-price meals. They also considered a district's geographic convenience to the State capital and involvement in DCM-F/RP start-up activities when selecting districts to include in the study. Child nutrition agency staff in each State discussed the district selections with the study team and provided feedback and insights on each district.

We conducted semistructured interviews with State agency and school district staff. Prior to each interview, the study team tailored the protocols to the specific characteristics of the State and the participant(s) being interviewed. During the interviews, the study team reordered questions and asked probes and follow-up questions to obtain a comprehensive account of DCM-F/RP implementation. Interviews lasted approximately one hour.

Interviews provided detailed descriptions of DCM-F/RP procedures at the State and district levels (Table A.2). The study team asked staff about the changes needed to conduct DCM-F/RP, including changes to data systems, staff procedures, and interagency agreements and operations. We also asked about the time and resources needed to add DCM-F/RP to their standard process for direct certification and about how they monitor and tested the process and results.

In addition to the interviews, the site visits included direct observations of DCM-F/RP processes and direct certification systems at State agencies and districts. We asked to observe how staff access data used for direct certification, conduct matching, and certify students within POS systems. While on site, the study team also collected any available documentation

describing the State or district's DCM-F/RP procedures, such as certification letters and descriptions of matching procedures.

Table A.2. Interview topics

Child nutrition agency	Medicaid eligibility agency	School districts
Planning and preparation	Planning and preparation	Planning and preparation
Assessing eligibility	Assessing eligibility	Obtaining the data
Matching process	Quality assurance	Timing of certification
Match schedule	Medicaid data quality	Matching and certification process
Dissemination of data to districts	Medicaid file transfer	Time and resources
Outcomes	Challenges and resolutions	Outcomes
Challenges and resolutions	Best practices and lessons learned	Challenges and resolutions
Best practices and lessons learned		Best practices and lessons learned

Follow-up telephone interviews. The study team conducted follow-up telephone interviews toward the end of the school year to obtain updated information on how the DCM-F/RP demonstration changed in each State since the site visit. The follow-up interviews also provided an opportunity to address knowledge gaps and clarify topics discussed during the site visit. We conducted telephone interviews with respondents at each of the State agencies and districts that they visited during the site visits, with the exception of one district in Nebraska.[58]

The follow-up interviews provided an opportunity to learn how the demonstration progressed in each State and district. The study team asked about changes to the DCM-F/RP process, staff time and resources needed to conduct DCM-F/RP, and progress in resolving existing challenges. We also asked about any new challenges that arose since the site visit and used the interviews to address issues or topics that warranted additional attention.

C. Key outcome measures

The quantitative analysis examines measures in four domains: certification, participation, Federal reimbursements, and State administrative costs.

1. Certification outcomes

To address Research Questions B.1, B.2, and B.5, we computed for each district measures of the percentages of students with each certification status, method, and basis, as well as the identified student percentage. The primary certification measures for each district are:

- Percentage of students certified for free meals based on DCM.
- Percentage of students certified for reduced-price meals based on DCM.
- Percentage of students directly certified for free meals.
- Percentage of students certified for free meals.
- Percentage of students certified for reduced-price meals.

[58] District staff were not responsive despite repeated attempts to contact them to complete the interview, including enlisting the assistance of the State child nutrition agency.

- Whether the district directly certified more than 40 percent of students for free meals.
- Whether the district directly certified more than 62.5 percent of students for free meals.

For States participating in the previous DCM demonstration, DCM-F/RP would affect only outcomes related to reduced-price meals, so those States are excluded from analyses of outcomes related to free meals.

Students attending special provision schools in a non-base year receive free meals but are not certified individually for free or reduced-price meals. These students are therefore not counted in the numerators of the five "Percentage of students certified" outcomes, although the denominators include all students enrolled in the districts. However, because the last two measures relate to thresholds relevant for the CEP, they are defined excluding schools that are already participating in the CEP or another special provision in a non-base year and are not defined for districts composed entirely of such schools. (The sample sizes after this exclusion are shown in Table III.5.)

Most States provided the data elements needed to compute these seven core measures directly, by dividing the number of students in the certification category by the total number of students enrolled in schools in the district. However, Florida and Massachusetts did not provide the necessary information for key certification outcomes relevant in States participating in the previous DCM demonstration and therefore are not included in those analyses. In addition, Nebraska did not provide counts of direct certifications based on Medicaid, but we were able to estimate the percentages of students directly certified for free and reduced-price meals based on DCM-F/RP for that State using the following approaches:

- **Free based on DCM-F/RP.** Nebraska did provide counts of (1) total free direct certifications based on programs other than SNAP and (2) free direct certification matches made by the State, by program. To estimate the percentage of students certified for free meals based on DCM-F/RP for each Nebraska district, we computed the percentage of all non-SNAP free matches that were Medicaid matches, then applied that factor to the number of non-SNAP direct certifications.
- **Reduced-price based on DCM-F/RP.** Nebraska provided counts of reduced-price certifications based on DCM-F/RP for 67 of the 350 districts included in the analysis. We calculated the ratio of reduced-price-eligible Medicaid matches to reduced-price direct certifications among these 67 districts. We then applied this ratio to counts of reduced-price-eligible Medicaid matches for each of the remaining districts to estimate counts of reduced-price direct certifications and used that to estimate the percentage of students certified for reduced-price meals based on DCM-F/RP.

Supplemental measures. For Nebraska (the only State that was able to provide the necessary supplemental data), we also computed measures related to Research Questions B.3 and B.4, including:

- Number of students matched to free-eligible Medicaid records.
- Number of students matched to reduced-price-eligible Medicaid records.

Each of these groups includes both students matched only to Medicaid records and students also matched to SNAP or another program, which take priority over Medicaid. For each group, we examined additional measures:

- Percentage matched to another program used for direct certification, by program conferring eligibility (SNAP, TANF, foster care).
- Percentage not matched to another program through the State match.

State match results. Although Florida and Massachusetts did not provide the necessary information for key certification outcomes, they did provide the results of the State agency's direct certification matching, including DCM-F/RP matches. Because the match results States provide to districts can differ from direct certification outcomes, we do not attempt to use them as a proxy for DCM-F/RP certifications. However, we constructed an alternative measure using the match results data, for use in a separate analysis of match results related to DCM-F/RP in these States:

- Percentage of students matched and identified as eligible for reduced-price meals based on DCM-F/RP.

2. Participation outcomes

To address Research Question C.1, we examine three primary participation measures, each defined for the lunch and breakfast programs separately:[59]

- **Average daily participation** (that is, the average number of meals served per student per day), defined as the total number of reimbursable meals served divided by the product of the total number of students enrolled in the district and the number of operating days during the relevant time period.
- **The percentage of meals served for free**, defined as the number of meals served for free divided by the total number of reimbursable meals served.
- **The percentage of meals served at a reduced price**, defined as the number of meals served for a reduced price divided by the total number of reimbursable meals served.

Because participation data does not reflect DCM-F/RP until after the first match is conducted, we defined each participation outcome based on the months after the first match occurs, which varied by State. We aggregated numbers of meals across all months in the 2016–2017 school year, beginning with the month in which the State conducted its first DCM-F/RP match: August for Florida and Nebraska, November for Utah, and May for California, Massachusetts, and Virginia. (Because West Virginia did not conduct its first DCM-F/RP match

[59] These participation measures are defined for all districts, including those operating CEP and other special provisions, but the interpretation will differ. In schools and districts where all meals are served for free, the implementation of DCM-F/RP would not be expected to affect these outcomes in the first year of the demonstration. However, if the demonstration increases the percentage of students directly certified, it could increase the number of CEP schools in the second year, which would affect these measures at that time.

until June, after school had ended for most districts, that State is not included in the analysis of participation.) The baseline measures cover the same set of months for the baseline school year.

3. Federal reimbursement outcomes

To address Research Question C.2, we combined elements from the participation data with public Federal per-meal NSLP and SBP reimbursement rates to define two primary Federal reimbursement outcome measures, each defined for the NSLP and SBP separately:

- **Reimbursements per student per school day,** defined as total Federal reimbursements for meals served to students divided by the product of the total number of students enrolled in the district and the number of operating days in the relevant set of months.
- **The blended reimbursement rate,** defined as total Federal reimbursements divided by the number of meals served. The BRR measures the average reimbursement per meal served.

Like the participation measures, these Federal reimbursement measures are defined for the set of months from the first DCM-F/RP match in SY 2016–2017 through the end of the school year and for the same months in the baseline year. West Virginia is excluded from this analysis because the State did not conduct its first DCM-F/RP match until after the school year had ended for most districts. Both measures depend on the reimbursement rates FNS pays, which vary by meal type (Table A.1). Because reimbursement rates increase each year, we use SY 2015–2016 reimbursement rates for each meal type in computing these measures for both years, to control for this aspect of variation that is unrelated to the demonstration in the pre/post analyses.[60]

4. State administrative cost outcomes

The State administrative costs of DCM-F/RP are defined as those in excess of expenditures that would be necessary in the absence of the new demonstration. The primary outcome measures for the State administrative costs include:

- Total administrative cost, in dollars, of conducting DCM-F/RP across all relevant State agencies, months, activities, and cost categories.

Additional measures include costs disaggregated by:

- Administrative costs of DCM-F/RP by agency type (child nutrition agencies and Medicaid eligibility agencies).
- Start-up costs, defined as those that occurred up to and including the month of the first DCM-F/RP match, and ongoing costs, defined as those that occurred after the month of the first DCM-F/RP match.[61]

[60] Because the analysis for California uses a comparison group design, those measures use SY 2013–2014 rates for the baseline year and SY 2016–2017 rates for the demonstration year.

[61] One State agency reported start-up activities during the month following the month of the first DCM-F/RP match. For this agency, we defined costs associated with those activities in that particular month as start-up costs.

- Direct labor costs, other direct costs, and indirect costs.

In addition, we measure the cost of DCM-F/RP per thousand students enrolled, directly certified for free meals, and directly certified for free or reduced-price meals based on Medicaid.

Unlike the certification, participation, and Federal reimbursement measures, which do not reflect the effects of the demonstration until the first DCM-F/RP match is conducted, the State cost measures cover months before the first DCM-F/RP match to capture the costs of planning, preparation, and testing. State administrative cost measures cover July 2016 through June 2017 for all demonstration States, and four States also reported incurring costs related to DCM-F/RP planning or preparation prior to July 2016.

D. Analysis methods

We conducted analyses using the appropriate methods for each type of data.

1. Quantitative analyses

To assess effects on certification, participation, and Federal reimbursement cost outcomes data, we used comparative analyses tailored to the State's DCM-F/RP implementation type: statewide or in a subset of districts. We conducted descriptive analyses for Medicaid data matching and State administrative cost outcomes.

Estimation method for States implementing DCM-F/RP statewide. In all States except California, we estimated the effects of DCM-F/RP on certification, participation, and Federal reimbursement outcomes by comparing the measure in the baseline year to the same measure in SY 2016–2017. We use a fixed effects model to control for changes in outcomes between baseline and the first DCM-F/RP year and to improve the precision of the estimates. Regression-adjusted baseline and Year 1 means were computed using Stata analytic software. To generate State-specific estimates and pooled estimates for each outcome, we fitted the following linear district-level fixed effects regression model:

$$(1)\quad y_{it} = \alpha + \beta\, post_t + \lambda X_{it} + \delta_i + \varepsilon_{it}$$

where λ_{it} is the outcome of interest for district i in year t (pre- or post-demonstration); $post_t$ is a binary indicator that is equal to one in the demonstration year and zero in the baseline year; X_{it} is a set of time-varying district characteristics, δ_i is a district fixed effect; and ε_{it} is a random error term. The following time-varying district characteristics were included:

- Log of enrollment.
- Percentage of students attending schools participating in a special provision.
- SAIPE median household income for the county.
- SAIPE poverty rate for the county.

- LAUS unemployment rate for the county.[62]

Table A.3 shows, for each State implementing statewide, the values of the covariates measured for the year before DCM-F/RP began (SY 2015–2016) and those for the first DCM-F/RP year (SY 2016–2017), weighted by district size. For two States (Florida and Massachusetts), we found a statistically significant decrease in the unemployment rate between the two years (Table A.3). There were no other statistically significant differences between baseline and SY 2016–2017 covariates.

Table A.3. Regression covariates (weighted by enrollment)

	Baseline year	DCM-F/RP year	Change
Florida			
Unemployment rate for the county (percentage)	5.5	4.9	–0.5*
Median household income for the county	$49,507.58	$51,272.02	$1,764.44
Poverty rate for the county (percentage)	15.9	14.8	–1.0
Number of students enrolled (log)	11.1	11.1	0.0
Percentage of students attending special provision schools in a non-base year	19.2	20.9	1.8
Massachusetts			
Unemployment rate for the county (percentage)	4.9	3.7	–1.2*
Median household income for the county	$71,618.86	$75,496.73	$3,877.87
Poverty rate for the county (percentage)	11.6	10.6	–1.1
Number of students enrolled (log)	8.5	8.5	0.0
Percentage of students attending special provision schools in a non-base year	15.3	21.7	6.4
Nebraska			
Unemployment rate for the county (percentage)	3.1	3.3	0.2
Median household income for the county	$56,313.34	$57,604.54	$1,291.20
Poverty rate for the county (percentage)	12.4	11.4	–1.0
Number of students enrolled (log)	8.4	8.4	0.00
Percentage of students attending special provision schools in a non-base year	1.0	1.1	0.2
Utah			
Unemployment rate for the county (percentage)	3.7	3.5	–0.2
Median household income for the county	$64,045.20	$66,953.47	$2,908.27
Poverty rate for the county (percentage)	11.1	10.1	–01.0
Number of students enrolled (log)	10.1	10.1	0.0
Percentage of students attending special provision schools in a non-base year	0.9	0.9	–0.0

[62] The unemployment rate was not included in the model for two outcomes: the percentage of districts with more than 40 percent of students directly certified for free meals and the percentage of districts with more than 62.5 percent of students directly certified for free meals

	Baseline year	DCM-F/RP year	Change
Virginia			
Unemployment rate for the county (percentage)	4.5	4.1	–0.4
Median household income for the county	$74,460.13	$75,547.42	$1,087.29
Poverty rate for the county (percentage)	11.4	11.1	–0.3
Number of students enrolled (log)	10.2	10.2	0.0
Percentage of students attending special provision schools in a non-base year	6.0	7.5	1.5
West Virginia			
Unemployment rate for the county (percentage)	7.0	6.3	–0.8
Median household income for the county	$42,956.48	$44,297.75	$1,341.27
Poverty rate for the county (percentage)	18.0	17.9	–0.2
Number of students enrolled (log)	8.9	8.9	0.0
Percentage of students attending special provision schools in a non-base year	50.7	62.8	12.1

Source: Bureau of Labor Statistics Local Area Unemployment Statistics and Census Small Area Income and Poverty Estimates data for 2015 and 2016 and administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Changes shown in the table may differ slightly from calculated differences due to rounding.

*Change between the baseline year and SY 2016–2017 is significantly different from zero at the .05 level, two-tailed test.

All regressions were weighted using the denominator of the outcome ("dependent") variable as a weight. For example, for the percentage of students directly certified for free meals based on Medicaid (and several other outcomes), the weighting variable was enrollment. This method was used to obtain aggregated estimates, which weighted districts according to their size. The two outcomes defined as a percentage of districts (those meeting key thresholds for CEP eligibility and reimbursement) are not weighted.

Estimation method for California. California implemented DCM-F/RP in 14 districts in SY 2016–2017, instead of statewide. This implementation pattern allows for the use of a more rigorous approach to evaluate the impact of the demonstration in this State: a comparison group design. We used as a comparison group all public school districts in California that were not exposed to the demonstration.[63] This design feature allows for the use of weighting techniques rather than a matching technique. We used the data from all the comparison districts to derive a set of weights that makes them as comparable as possible to the treatment districts with respect to a set of observed district characteristics that could potentially bias the demonstration effect estimate.

To obtain such a set of weights we used a technique known as entropy balancing (Hainmueller 2012). Entropy balancing is a data-processing technique that achieves covariate balance in quasi-experimental studies. Unlike a propensity score approach, it does not fit a model but rather directly produces a set of weights (skipping the modeling step) that satisfy a set of prespecified balance conditions (such as balance of the means of the treatment and comparison

[63] We excluded private schools and RCCIs from the comparison group because the 14 treatment districts were all regular public school districts.

groups of the district characteristics that could bias the impact estimate). In this study we wanted to achieve balance with respect to the baseline characteristics listed in Table A.4 and these other district characteristics: number of students enrolled, percentage of students attending special provision schools, percentage of students certified for free meals that were certified based on an application, number of students certified for free or reduced price meals, unemployment rate, median household income, and poverty rate. Entropy balancing produced a set of weights for the comparison districts that achieved perfect balance. Even without the weights, we found no statistically significant differences between the values of the outcome variables measured for California baseline year—which is the year before the previous DCM demonstration began in that State (SY 2013–2014)—for districts in the treatment group and those of the comparison group and (Table A.4).

Table A.4. Baseline characteristics for treatment and comparison districts in California

Characteristic	Treatment districts	Comparison districts	
		Unweighted	Weighted[a]
Certification outcomes			
Percentage of students directly certified for free meals[b]	18.9	16.9	18.9
Percentage of students certified for free meals	44.0	44.2	44.0
Percentage of students certified for reduced-price meals	8.9	8.5	8.9
Participation outcomes			
Average number of lunches served per student per day	0.4	0.5	0.4
Percentage of lunches served for free	70.1	66.4	70.1
Percentage of lunches served at a reduced price	12.1	11.2	12.1
Average number of breakfasts served per student per day	0.2	0.2	0.2
Percentage of breakfasts served for free	79.5	67.1	79.5
Percentage of breakfasts served at a reduced price	9.8	9.2	9.8
Federal reimbursement outcomes (dollars)			
Federal NSLP reimbursement costs per student per day	1.1	1.2	1.1
Blended NSLP reimbursement rate[c]	2.5	2.4	2.5
Federal SBP reimbursement costs per student per day	0.3	0.4	0.3
Blended SBP reimbursement rate[c]	1.7	1.4	1.7

Source: Administrative records provided by State administrators for SY 2013–2014.

Note: There are no statistically significant differences in this table.

[a]The values in this column are weighted to balancing baseline (SY 2013–2014) characteristics of the comparison group and the treatment group.

[b]Includes all students certified to receive free meals but not subject to verification, including those directly certified based on information from the SNAP, FDPIR, or TANF agency; foster children; homeless or migrant children; income-eligible Head Start participants; residential students in RCCIs; and nonapplicants approved by local officials.

[c]The blended reimbursement rate is the average per meal reimbursement rate.

Since the weights obtained with entropy balancing eliminated the baseline differences for the selected characteristics listed above between the treatment districts group and the comparison group, the outcome analysis is greatly simplified. To obtain an estimate of the demonstration effect, we computed a weighted *t*-test and compared the means for the outcomes of the treatment group to the weighted means of the comparison group.

Descriptive analyses of certification and match results. For all States, in addition to the comparative analyses focusing on the key certification outcomes defined in the previous section, we conducted descriptive analyses tabulating the distribution of students by certification status, method, and basis—including whether applications were approved on the basis of income or categorical eligibility, and as much detail on direct certification basis as provided—for the year prior to the demonstration and in the first year of the demonstration (Tables B.5a–B.5e). We also used descriptive methods for analyses that did not involve comparisons between years or treatment and comparison groups. These included tabulations of State DCM-F/RP match results for (1) Nebraska, the only State to provide supplemental data necessary to partially address research questions B.3 and B.4 about the number of students matched to eligible Medicaid records who were also eligible for free or reduced-price meals through other methods, and (2) Florida and Massachusetts, which did not provide the data needed to compute key certification measures.

Descriptive analyses of State administrative costs. The estimates of costs State agencies incurred in conducting DCM-F/RP are based on the reports of staff at State child nutrition and Medicaid eligibility agencies in all demonstration States of the time spent and other costs incurred for DCM-F/RP beyond those that would be necessary for direct certification with SNAP and other programs in SY 2016–2017. Unlike certification and participation, detailed administrative cost records were not available for the baseline year, and asking respondents to retrospectively estimate costs incurred over a year prior would have prompted serious concerns about recall error. Instead, the analysis of State administrative costs relies on staff to reports the additional costs of DCM-F/RP.

State administrative cost data analysis covers July 2016 through June 2017 for all demonstration States, and five (Florida, Nebraska, Utah, Virginia, and West Virginia) also reported incurring costs related to DCM-F/RP planning or preparation prior to July 2016. This includes the period of time when the States began planning and preparing for DCM-F/RP through the end of the first year of the demonstration, by which point all seven States had conducted at least one DCM-F/RP match.

Monthly data from each agency were combined into one cost workbook for the agency that contained all data for the entire school year. In Utah, two State agencies played a role related to Medicaid eligibility for DCM-F/RP, and costs for both of these agencies were aggregated into a single workbook. The following calculations were completed in the workbook for each agency.

The information provided on salary (which could be reported on an hourly, weekly, biweekly, bimonthly, monthly, or annual basis) and fringe benefits (which could be reported as a percentage or dollar amount) were combined to calculate an hourly rate for each staff position.[64] The monthly hours reported for each staff position to conduct each DCM-F/RP activity were summed to create quarterly totals for each activity, which were then multiplied by the staff's hourly rate to provide quarterly total costs per staff position for each activity. These costs were then summed across all quarters and staff positions to yield the total labor costs for all DCM-F/RP activities for each agency in SY 2016–2017, which we then summed across agencies to

[64] Fringe benefits were imputed, at a rate of 46 percent, for the West Virginia child nutrition agency staff because the staff were unsure of the fringe amount or percentage.

obtain State-level labor costs. Indirect costs were summed for all months, as were other direct costs. All three types of costs were summed together, creating total costs per agency and State to implement DCM-F/RP for SY 2016–2017.

Start-up costs were determined for each State by summing those costs that occurred up to and including the month of the first DCM-F/RP match, and ongoing costs were computed by summing costs for later months. The number of months included in each of these measures therefore varies by State depending on the timing of the first match. For example, ongoing costs cover only one month in California, Massachusetts, and Virginia, and West Virginia had no ongoing costs in SY 2016–2017 because the State did not conduct its first DCM-F/RP match until June 2017.

Additionally, State administrative cost data were combined with certification data to compute three measures of the cost of DCM-F/RP per student. The total administrative cost for each State was divided by (1) the number of students enrolled, (2) the number directly certified for free meals, and (3) the number directly certified for free or reduced-price meals based on Medicaid to create estimates per thousand students.

Pooled estimates. Within each State, district-level results are aggregated to present an estimate for demonstration districts across the State. To summarize the results obtained across the demonstration States, the analysis presents "pooled estimates," which are derived by aggregating across States. Because the interpretation of the findings differs for States that participated in the earlier DCM demonstration than for those that were new to DCM, we present pooled estimates separately for those two sets of States. Because the evaluation design for California was different than the other States, we present those findings in separate tables and do not include California in pooled estimates.

Pooled estimates pertain only to the particular collection of districts included in the evaluation sample; they are not intended to have any broader generalizability. In particular, the aggregated estimate for demonstration districts within California does not estimate the likely effects of DCM-F/RP if it were implemented throughout the State, and the pooled estimate across States does not estimate the likely effects if DCM-F/RP were implemented across the country.

2. Qualitative analyses

Qualitative data collection included interviews, observations, and documents from each State. The study team took detailed notes throughout each interview and observation and, with the respondents' permission, recorded the discussions. These activities resulted in a large amount of qualitative data that needed to be reduced and synthesized for analysis. To facilitate this process, the study team developed analytic memo templates—one for States and one for districts—based on the eight sets of research questions under Objective 1 of the study.

Shortly after each site visit and follow-up telephone interview, the site teams cleaned their notes, then summarized the raw qualitative data into the analytic memo templates, adding key insights where possible. They reviewed recordings, as necessary, to fill in any gaps in their notes or memos. After each site visit, teams shared their memos to help identify emerging trends within the data and topics for discussion during the follow-up telephone interviews. Teams also

used information from State DCM-F/RP applications to draft a flowchart of each State's DCM-F/RP process—noting the agencies, systems, and databases involved—and refined the flowcharts using information acquired during the site visits and follow-up interviews.

Qualitative researchers reviewed all memos, flowcharts, and collected documents. They synthesized the data into an analytic framework in Excel that was developed based on the research questions under Objective 1. As many of the research questions are descriptive in nature, the framework contained summaries of each step in a State or district's DCM-F/RP process, and the study team referred to both this and the memos to detail implementation of the demonstration. The framework also included State and district characteristics, such as matching level (central or local), district size, and urbanicity. This permitted us to identify patterns across different States and districts by specific characteristics. Key themes were translated into research findings.

APPENDIX B

SUPPLEMENTAL TABLES RELATED TO CERTIFICATION OUTCOMES

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Table B.1. Effects of DCM-F/RP on certifications for free meals (unadjusted)

State	Percentage of students directly certified for free meals based on Medicaid			Percentage of students directly certified for free meals			Percentage of students certified for free meals		
	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
Nebraska	0	6.4	6.4	20.6	26.8	6.2	33.4	36.2	2.8
Utah	0	4.9	4.9	12.7	17.3	4.6	26.1	28.2	2.0
Virginia	0	3.8	3.8	16.9	20.3	3.4	28.8	30.5	1.7
West Virginia	0	2.3	2.3	16.7	14.0	-2.7	20.3	16.0	-4.4
Pooled sample	**0**	**4.2**	**4.2**	**16.4**	**19.8**	**3.4**	**27.8**	**29.1**	**1.3**

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Each outcome in this table reflects the percentage of students who are certified for free meals based on the specified method; students attending schools that do not certify individual students, such as special provision schools in non-base years, are not counted as certified. Florida and Massachusetts are excluded from this table because those States participated in a prior demonstration of DCM for free meals during the baseline year, so the DCM-F/RP demonstration only affects reduced-price meals. Tests of statistical significance were not conducted for unadjusted values.

Table B.2. Effects of DCM-F/RP on certification for reduced-price meals (unadjusted)

State	Percentage of students directly certified for reduced-price meals based on Medicaid			Percentage of students certified for reduced-price meals		
	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
Nebraska	0.0	4.0	4.0	8.4	10.5	2.1
Utah	0.0	0.5	0.5	7.3	7.3	0
Virginia	0.0	0.4	0.4	6.0	5.8	-0.2
West Virginia	0.0	0.2	0.2	2.8	2.0	-0.8
Pooled sample	**0.0**	**0.9**	**0.9**	**6.3**	**6.4**	**0.1**

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Note: Each outcome in this table reflects the percentage of students who are certified for reduced-price meals based on the specified method; students attending schools that do not certify individual students, such as special provision schools in non-base years, are not counted as certified. Florida and Massachusetts are excluded from this table because the necessary data were not available for those States. Tests of statistical significance were not conducted for unadjusted values.

Table B.3. Effects of DCM-F/RP on key thresholds related to the CEP (unadjusted)

State	Number of districts	Percentage of districts with more than 40 percent of students directly certified for free meals			Percentage of districts with more than 62.5 percent of students directly certified for free meals		
		Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
Nebraska	343	1.5	6.1	4.7	0.3	0.6	0.3
Utah	96	0.0	4.2	4.2	0.0	0.0	0.0
Virginia	116	8.6	25.0	16.4	0.0	0.9	0.9
West Virginia	37	13.5	37.8	24.3	0.0	0.0	0.0
Pooled sample	**592**	**3.4**	**11.5**	**8.1**	**0.2**	**0.5**	**0.3**

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Schools or districts are eligible for the CEP if at least 40 percent of their students were identified as eligible for free meals through means other than submitting an application, such as through direct certification. Per-meal reimbursement rates under the CEP are based on the percentage of identified students. The reimbursement rate increases with the percentage identified up to 62.5 percent of students, at which point all meals are reimbursed at the free rate. The percentages shown in this table are based on students attending schools not participating in the CEP or Provision 2 or 3 in a non-base year. Districts in which all schools participated in a special provision (in a non-base year) in either SY 2015–2016 or SY 2016–2017 were excluded from this analysis. Florida and Massachusetts are excluded from this table because those States participated in a prior demonstration of DCM for free meals during the baseline year, so the DCM-F/RP demonstration only affects reduced-price meals. Tests of statistical significance were not conducted for unadjusted values.

Table B.4. Effects of DCM-F/RP on certification outcomes in California (unadjusted)

Outcome	Treatment group	Comparison group	Difference
Directly certified for reduced-price meals	0.7	0.0	0.7
Certified for reduced-price meals	6.3	8.1	–1.8

Source: Administrative records for SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Note: Each outcome in this table reflects the percentage of students who are certified based on the specified method; students attending schools that do not certify individual students, such as special provision schools in non-base years, are not counted as certified. Measures related to certification for free meals are omitted from this table because California participated in a prior demonstration of DCM for free meals, so the DCM-F/RP demonstration only affects reduced-price meals. Tests of statistical significance were not conducted for unadjusted values.

Table B.5a. Change in distribution of students by meal certification category in Nebraska (unadjusted)

Outcome	Baseline year		DCM-F/RP year		Change	
	Number	Percentage	Number	Percentage	Number	Percentage[a]
Total students	**336,155**	**100.0**	**339,444**	**100.0**	**3,289**	**100.0**
Students certified for free meals	**112,178**	**33.4**	**122,857**	**36.2**	**10,679**	**2.8**
Directly certified students	69,286	20.6	91,001	26.8	21,715	6.2
Based on Medicaid	0	0.0	21,567	6.4	21,567	6.4
Based on SNAP	65,014	19.3	67,580	19.9	2,566	0.6
Based on other program	4,272	1.3	1,854	0.5	–2,418	–0.7
Based on letter method	108	0.0	221	0.1	113	0.0
Students certified free by application	42,784	12.7	31,635	9.3	–11,149	–3.4
Based on income	38,519	11.5	27,418	8.1	–11,101	–3.4
Based on categorical eligibility	4,265	1.3	4,217	1.2	-48	0.0
Students certified for reduced-price meals	**28,281**	**8.4**	**35,715**	**10.5**	**7,434**	**2.1**
Students directly certified based on Medicaid	0	0.0	13,586	4.0	13,586	4.0
Students certified by application	28,281	8.4	22,129	6.5	-6,152	–1.9
Students not certified for meal benefits	**195,696**	**58.2**	**180,872**	**53.3**	**–14,824**	**–4.9**
Students in CEP or non-base year Provision 2 or 3 schools[b]	3,308	1.0	3,892	1.1	584	0.2
Uncertified students in non-special provision schools	192,388	57.2	176,980	52.1	-15,408	–5.1

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Differences shown in the table may differ slightly from calculated differences due to rounding. Tests of statistical significance were not conducted for unadjusted values.

[a]This column shows the change in the percentage in each category, not the percentage change.

[b]Schools are counted as Provision 2 or 3 only if they operate the special provision for both breakfast and lunch. Those operating special provisions for only one meal are considered not special provision.

Table B.5b. Change in distribution of students by meal certification category in Utah (unadjusted)

Outcome	Baseline year		DCM-F/RP year		Change	
	Number	Percentage	Number	Percentage	Number	Percentage[a]
Total students	**577,456**	**100.0**	**584,661**	**100.0**	**7,205**	**100.0**
Students certified for free meals	**150,868**	**26.1**	**164,721**	**28.2**	**13,853**	**2.0**
Directly certified students	73,132	12.7	101,000	17.3	27,868	4.6
Based on Medicaid	0	0.0	28,554	4.9	28,554	4.9
Based on SNAP	68,887	11.9	60,927	10.4	–7,960	–1.5
Based on other program	4,245	0.7	11,519	2.0	7,274	1.2
Based on letter method	0	0.0	0	0.0	0	0.0
Students certified free by application	77,736	13.5	63,721	10.9	–14,015	–2.6
Based on income	67,660	11.7	56,934	9.7	–10,726	–2.0
Based on categorical eligibility	10,076	1.7	6,787	1.2	–3,289	–0.6
Students certified for reduced-price meals	**41,972**	**7.3**	**42,566**	**7.3**	**594**	**0.0**
Students directly certified based on Medicaid	0	0.0	2,852	0.5	2,852	0.5
Students certified by application	41,972	7.3	39,714	6.8	–2,258	–0.5
Students not certified for meal benefits	**384,616**	**66.6**	**377,374**	**64.5**	**-7,242**	**–2.1**
Students in CEP or non-base year Provision 2 or 3 schools[b]	5,169	0.9	5,123	0.9	–46	0.0
Uncertified students in non-special provision schools	379,447	65.7	372,251	63.7	–7,196	–2.0

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Differences shown in the table may differ slightly from calculated differences due to rounding. Tests of statistical significance were not conducted for unadjusted values.

[a]This column shows the change in the percentage in each category, not the percentage change.

[b]Schools are counted as Provision 2 or 3 only if they operate the special provision for both breakfast and lunch. Those operating special provisions for only one meal are considered not a special provision.

Table B.5c. Change in distribution of students by meal certification category in Virginia (unadjusted)

Outcome	Baseline year		DCM-F/RP year		Change	
	Number	Percentage	Number	Percentage	Number	Percentage[a]
Total students	**1,223,819**	**100.0**	**1,235,970**	**100.0**	**12,151**	**100.0**
Students certified for free meals	**351,914**	**28.8**	**376,966**	**30.5**	**25,052**	**1.7**
Directly certified students	207,392	16.9	251,348	20.3	43,956	3.4
Based on Medicaid	0	0.0	46,706	3.8	46,706	3.8
Based on SNAP	195,262	16.0	194,054	15.7	–1,208	–0.3
Based on other program	12,130	1.0	10,588	0.9	–1,542	–0.1
Based on letter method	0	0.0	0	0.0	0	0
Students certified free by application	144,522	11.8	125,618	10.2	–18,904	–1.6
Based on income	126,895	10.4	108,016	8.7	-18,879	–1.6
Based on categorical eligibility	17,627	1.4	17,602	1.4	-25	0.0
Students certified for reduced-price meals	**73,848**	**6.0**	**71,624**	**5.8**	**–2,224**	**-0.2**
Students directly certified based on Medicaid	0	0.0	5,222	0.4	5,222	0.4
Students certified by application	73,848	6.0	66,402	5.4	–7,446	–0.7
Students not certified for meal benefits	**798,057**	**65.2**	**787,380**	**63.7**	**–10,677**	**–1.5**
Students in CEP or non-base year Provision 2 or 3 schools[b]	73,258	6.0	92,480	7.5	19,222	1.5
Uncertified students in non-special provision schools	724,799	59.2	694,900	56.2	–29,899	–3.0

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Differences shown in the table may differ slightly from calculated differences due to rounding. Tests of statistical significance were not conducted for unadjusted values.

[a]This column shows the change in the percentage in each category, not the percentage change.

[b]Schools are counted as Provision 2 or 3 only if they operate the special provision for both breakfast and lunch. Those operating special provisions for only one meal are considered not special provision.

Table B.5d. Change in distribution of students by meal certification category in West Virginia (unadjusted)

Outcome	Baseline year		DCM-F/RP year		Change	
	Number	Percentage	Number	Percentage	Number	Percentage[a]
Total students	**280,723**	**100.0**	**280,734**	**100.0**	**11**	**100.0**
Students certified for free meals	**57,029**	**20.3**	**44,813**	**16**	**–12,216**	**–4.4**
Directly certified students	46,926	16.7	39,237	14	–7,689	–2.7
Based on Medicaid	0	0	6,528	2.3	6,528	2.3
Based on SNAP	44,536	15.9	31,598	11.3	–12,938	–4.6
Based on other program	2,390	0.9	1,111	0.4	–1,279	–0.5
Based on letter method	0	0.0	0	0.0	0	0.0
Students certified free by application	10,103	3.6	5,576	2	–4,527	–1.6
Based on income	9,099	3.2	5,014	1.8	–4,085	–1.5
Based on categorical eligibility	1,004	0.4	562	0.2	–442	–0.2
Students certified for reduced-price meals	**7,913**	**2.8**	**5,573**	**2**	**–2,340**	**–0.8**
Students directly certified based on Medicaid	0	0	495	0.2	495	0.2
Students certified by application	7,913	2.8	5,078	1.8	–2,835	–1
Students not certified for meal benefits	**215,781**	**76.9**	**230,348**	**82.1**	**14,567**	**5.2**
Students in CEP or non-base year Provision 2 or 3 schools[b]	142,214	50.7	176,288	62.8	34,074	12.1
Uncertified students in non-special provision schools	73,567	26.2	54,060	19.3	–19,507	–6.9

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Differences shown in the table may differ slightly from calculated differences due to rounding. Tests of statistical significance were not conducted for unadjusted values.

[a]This column shows the change in the percentage in each category, not the percentage change.

[b]Schools are counted as Provision 2 or 3 only if they operate the special provision for both breakfast and lunch. Those operating special provisions for only one meal are considered not special provision.

Table B.5e. Change in distribution of students by meal certification category in pooled sample of States new to DCM (unadjusted)

Outcome	Baseline year		DCM-F/RP year		Change	
	Number	Percentage	Number	Percentage	Number	Percentage[a]
Total students	**2,418,153**	**100.0**	**2,440,809**	**100.0**	**22,656**	**100.0**
Students certified for free meals	**671,989**	**27.8**	**709,357**	**29.1**	**37,368**	**1.3**
Directly certified students	396,736	16.4	482,586	19.8	85,850	3.4
Based on Medicaid	0	0.0	103,355	4.2	103,355	4.2
Based on SNAP	373,699	15.5	354,159	14.5	–19,540	–0.9
Based on other program	23,037	1.0	25,072	1.0	2,035	0.1
Based on letter method	108	0.0	221	0.0	113	0.0
Students certified free by application	275,145	11.4	226,550	9.3	–48,595	–2.1
Based on income	242,173	10.0	197,382	8.1	–44,791	–1.9
Based on categorical eligibility	32,972	1.4	29,168	1.2	–3,804	–0.2
Students certified for reduced-price meals	**152,014**	**6.3**	**155,478**	**6.4**	**3,464**	**0.1**
Students directly certified based on Medicaid	0	0.0	22,155	0.9	22,155	0.9
Students certified by application	152,014	6.3	133,323	5.5	–18,691	-0.8
Students not certified for meal benefits	**1,594,150**	**65.9**	**1,575,974**	**64.6**	**–18,176**	**–1.4**
Students in CEP or non-base year Provision 2 or 3 schools[b]	223,949	9.3	277,783	11.4	53,834	2.1
Uncertified students in non-special provision schools	1,370,201	56.7	1,298,191	53.2	–72,010	–3.5

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: Changes shown in the table may differ slightly from calculated differences due to rounding. Tests of statistical significance were not conducted for unadjusted values.

[a]This column shows the change in the percentage in each category, not the percentage change.

[b]Schools are counted as Provision 2 or 3 only if they operate the special provision for both breakfast and lunch. Those operating special provisions for only one meal are considered not special provision

Table B.6. Results of State direct certification matching

Percentage of students	Florida	Massachusetts	Nebraska
Matched to and deemed eligible for reduced-price meals based on Medicaid	1.6	1.9	4.0

Source: Administrative records provided by State administrators for SY 2016–2017.

Notes: The values shown in this table are based on all students, including those attending schools participating in a special provision in a non-base year.

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APPENDIX C

SUPPLEMENTAL TABLES RELATED TO PARTICIPATION OUTCOMES

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Table C.1. Effects of DCM-F/RP on NSLP participation (unadjusted)

State	Average number of lunches served per student per day			Percentage of lunches served for free			Percentage of lunches served at a reduced price		
	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
DCM-F/RP States that participated in the first DCM demonstration									
Florida	0.577	0.571	–0.006	n.a.	n.a.	n.a.	4.7	4.9	0.2
Massachusetts	0.454	0.458	0.004	n.a.	n.a.	n.a.	3.6	3.0	–0.7
Pooled sample	**0.545**	**0.542**	**–0.003**	**n.a.**	**n.a.**	**n.a.**	**4.5**	**4.5**	**0.0**
DCM-F/RP States that are new to DCM									
Nebraska	0.656	0.654	–0.002	41.0	43.0	2.0	9.9	9.3	–0.6
Utah	0.488	0.488	0.000	40.0	40.4	0.4	10.4	9.7	–0.7
Virginia	0.481	0.475	–0.006	54.0	54.9	0.9	8.6	8.1	–0.5
Pooled sample	**0.510**	**0.506**	**–0.004**	**47.8**	**48.7**	**0.9**	**9.3**	**8.7**	**–0.6**

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: The results for each State reflect all months after the State conducted its first DCM-F/RP match in SY 2016–2017 (in August for Florida and Nebraska, November for Utah, May for Massachusetts and Virginia, and June for West Virginia). Outcomes related to free meals are not shown for Florida and Massachusetts because those States participated in a prior demonstration of DCM for free meals during the baseline year, so the DCM-F/RP demonstration only affects reduced-price meals. Tests of statistical significance were not conducted for unadjusted values.

n.a. = not applicable.

Table C.2. Effects of DCM-F/RP on SBP participation (unadjusted)

State	Average number of breakfasts served per student per day			Percentage of breakfasts served for free			Percentage of breakfasts served at a reduced price		
	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
DCM-F/RP States that participated in the first DCM demonstration									
Florida	0.277	0.279	0.002	n.a.	n.a.	n.a.	4.1	4.3	0.2
Massachusetts	0.169	0.180	0.011	n.a.	n.a.	n.a.	3.2	2.4	–0.8
Pooled sample	**0.250**	**0.254**	**0.004**	**n.a.**	**n.a.**	**n.a.**	**3.9**	**3.9**	**0.0**
DCM-F/RP States that are new to DCM									
Nebraska	0.201	0.204	0.004	60.0	61.1	1.1	11.0	10.2	–0.8
Utah	0.120	0.124	0.004	66.6	66.2	–0.4	10.6	10.2	–0.4
Virginia	0.218	0.228	0.010	71.8	70.8	–1.0	8.6	8.1	–0.5
Pooled sample	**0.189**	**0.196**	**0.007**	**69.0**	**68.5**	**–0.5**	**9.3**	**8.8**	**–0.5**

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Notes: The results for each State reflect all months after the State conducted its first DCM-F/RP match in SY 2016–2017 (in August for Florida and Nebraska, November for Utah, May for Massachusetts and Virginia, and June for West Virginia). Outcomes related to free meals are not shown for Florida and Massachusetts because those States participated in a prior demonstration of DCM for free meals during the baseline year, so the DCM-F/RP demonstration only affects reduced-price meals. Tests of statistical significance were not conducted for unadjusted values.

n.a. = not applicable.

Table C.3. Effects of DCM-F/RP on school meal participation in California (unadjusted)

Outcomes	Treatment group	Comparison group	Difference
NSLP			
Average number of lunches served per student per day	0.401	0.469	–0.068
Percentage of lunches served at a reduced price	8.9	11.0	–2.1
SBP			
Average number of breakfasts served per student per day	0.192	0.243	–0.051
Percentage of breakfasts served at a reduced price	8.1	9.8	–1.8

Source: Administrative records for SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Note: The results reported in this table are obtained by aggregating across the months after California conducted its first DCM-F/RP match in SY 2016–2017 (in May). Outcomes related to free meals are not shown because California participated in a prior demonstration of DCM for free meals, so the DCM-F/RP demonstration only affects reduced-price meals. Tests of statistical significance were not conducted for unadjusted values.

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APPENDIX D

SUPPLEMENTAL TABLES RELATED TO FEDERAL REIMBURSEMENT COST OUTCOMES

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Table D.1. Effects of DCM-F/RP on NSLP Federal reimbursement costs (unadjusted)

State	Federal reimbursements per student per day (dollars)			Blended reimbursement rate (dollars)[a]		
	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
DCM-F/RP States that participated in the first DCM demonstration						
Florida	1.55	1.54	–0.01	2.68	2.70	0.01
Massachusetts	0.96	0.98	0.02	2.11	2.15	0.03
Pooled sample	**1.40**	**1.40**	**0.00**	**2.56**	**2.58**	**0.02**
DCM-F/RP States that are new to DCM						
Nebraska	1.14	1.16	0.02	1.73	1.77	0.04
Utah	0.84	0.84	0.00	1.72	1.71	–0.01
Virginia	0.99	0.99	–0.01	2.07	2.08	0.01
Pooled sample	**0.97**	**0.97**	**0.00**	**1.91**	**1.92**	**0.01**

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Note: The results for each State reflect all months after the State conducted its first DCM-F/RP match in SY 2016–2017 (in August for Florida and Nebraska, November for Utah, May for Massachusetts and Virginia, and June for West Virginia). Tests of statistical significance were not conducted for unadjusted values.

[a]The blended reimbursement rate is the per-meal reimbursement rate.

Table D.2. Effects of DCM-F/RP on SBP Federal reimbursement costs (unadjusted)

State	Federal reimbursements per student per day (dollars)			Blended reimbursement rate (dollars)[a]		
	Baseline year	DCM-F/RP year	Change	Baseline year	DCM-F/RP year	Change
DCM-F/RP States that participated in the first DCM demonstration						
Florida	0.49	0.49	0.01	1.75	1.76	0.01
Massachusetts	0.30	0.32	0.02	1.76	1.78	0.02
Pooled sample	**0.44**	**0.45**	**0.01**	**1.75**	**1.76**	**0.01**
DCM-F/RP States that are new to DCM						
Nebraska	0.29	0.30	0.01	1.44	1.44	0.01
Utah	0.18	0.19	0.01	1.54	1.53	–0.01
Virginia	0.35	0.36	0.01	1.62	1.59	–0.02
Pooled sample	**0.30**	**0.31**	**0.01**	**1.57**	**1.56**	**–0.02**

Source: Administrative records for SY 2015–2016 (baseline) and SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Note: The results for each State reflect all months after the State conducted its first DCM-F/RP match in SY 2016–2017 (in August for Florida and Nebraska, November for Utah, May for Massachusetts and Virginia, and June for West Virginia). Tests of statistical significance were not conducted for unadjusted values.

[a]The blended reimbursement rate is the per-meal reimbursement rate.

Table D.3. Effects of DCM-F/RP on Federal reimbursement costs in California (unadjusted)

Outcomes (dollars)	Treatment group	Comparison group	Difference
NSLP			
Federal reimbursements per student per day	1.08	1.23	–0.15
Blended reimbursement rate[a]	2.70	2.51	0.20
SBP			
Federal reimbursements per student per day	0.34	0.43	–0.09
Blended reimbursement rate[a]	1.81	1.54	0.26

Source: Administrative records for SY 2016–2017 (DCM-F/RP year) provided by State administrators.

Note: The results reflect all months after California conducted its first DCM-F/RP match in SY 2016–2017 (in May). Tests of statistical significance were not conducted for unadjusted values.

[a]The blended reimbursement rate is the per-meal reimbursement rate.

APPENDIX E

SUPPLEMENTAL TABLES RELATED TO STATE ADMINISTRATIVE COST OUTCOMES

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Table E.1. State start-up and ongoing administrative costs of DCM-F/RP, by State agency type

State	State administrative costs in the first year of DCM-F/RP implementation (dollars)												
	Pre-SY 2016–2017[a]		Quarter 1 (July–Sep. 2016)		Quarter 2 (Oct.–Dec. 2016)		Quarter 3 (Jan.–March 2017)		Quarter 4 (Apr.–June 2017)		Total		
	Child nutrition agency	Medicaid eligibility agency	Child nutrition agency	Medicaid eligibility agency	Child nutrition agency	Medicaid eligibility agency	Child nutrition agency	Medicaid eligibility agency	Child nutrition agency	Medicaid eligibility agency	Child nutrition agency	Medicaid eligibility agency	Total
DCM-F/RP States that participated in the first DCM demonstration													
California[b]													
Start-up costs	n.a.	n.a.	13,111	8,360	14,028	8,700	11,482	11,447	3,492	8,899	42,114	37,406	79,520
Ongoing costs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0	1,717	0	1,717	1,717
Florida[c]													
Start-up costs	0	245,138	11,570	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	11,570	245,138	256,708
Ongoing costs	n.a.	n.a.	0	0	0	0	0	0	0	0	0	0	0
Massachusetts													
Start-up costs	n.a.	n.a.	439	1,477	2,608	17,643	1,365	96,320	5,545	24,493	9,957	139,933	149,890
Ongoing costs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	517	1,348	517	1,348	1,865
DCM-F/RP States that are new to DCM													
Nebraska													
Start-up costs	1,663	0	2,127	2,000	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3,790	2,000	5,790
Ongoing costs	n.a.	n.a.	208	100	670	6,373	1,526	0	92	0	2,497	6,473	8,970
Utah													
Start-up costs	6,359	0	8,480	9,516	6,763	6,032	n.a.	n.a.	n.a.	n.a.	21,602	15,548	37,150
Ongoing costs	n.a.	n.a.	n.a.	n.a.	964	235	540	3,188	477	3,308	1,981	6,731	8,712
Virginia[d]													
Start-up costs	0	4,829	2,247	14,286	473	5,586	2,675	2,523	2,538	12,331	7,933	39,555	47,488
Ongoing costs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	197	5,970	197	5,970	6,167
West Virginia[e]													
Start-up costs	0	588	846	2,436	2,241	2,436	211	2,324	550	944	3,848	8,728	12,576
Ongoing costs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	0	0

Source: Cost-tracking workbooks completed quarterly by State administrators for SY 2016–2017.

Notes: Start-up costs are defined as costs that occur up to and including the month of the first DCM-F/RP match (August for Florida and Nebraska; November for Utah; May for California, Massachusetts, and Virginia; and June for West Virginia). All costs in later months are classified as ongoing costs. Totals shown in the table may differ slightly from calculated totals due to rounding.

[a]Some States incurred costs associated with planning or implementing changes for DCM-F/RP before the start of the school year. The earliest reported costs were in March 2016.

[b]Salaries for staff of California child nutrition agencies used in this analysis are the highest rates for each position, rather than salaries for specific staff. For that reason, costs shown may slightly overestimate actual costs.

[c]Agencies in Florida did not incur any ongoing costs in SY 2016–2017 beyond those already associated with direct certification through other programs because the DCM-F/RP process was fully automated following start-up.

[d]Costs reported by the Virginia Medicaid eligibility agency for pre-SY 2016–2017 cover April–July 2016. Costs reported for Quarter 1 cover August–September 2016.

[e]Due to data limitations, fringe benefits in West Virginia were imputed. Medicaid eligibility agency costs in West Virginia exclude contractor hours because their work fell within the scope of the agency's maintenance and operations contract with the eligibility system vendor. Agencies in West Virginia did not incur any ongoing costs in SY 2016–2017 because the State began implementing DCM-F/RP near the end of the school year.

n.a. = not applicable.

Table E.2. Labor and other direct and indirect State costs of DCM-F/RP, by State agency type

State	State administrative costs in the first year of DCM-F/RP implementation (dollars)					
	Direct labor costs		Other direct costs		Indirect costs	
	Child nutrition agency	Medicaid eligibility agency	Child nutrition agency	Medicaid eligibility agency	Child nutrition agency	Medicaid eligibility agency
DCM-F/RP States that participated in the first DCM demonstration						
California[a]	30,569	39,123	232	0	11,313	0
Florida[b]	0	26,633	11,570	218,505	0	0
Massachusetts	9,680	45,581	0	95,700	794	0
Pooled sample	**40,249**	**111,337**	**11,802**	**314,205**	**12,107**	**0**
DCM-F/RP States that are new to DCM						
Nebraska	5,111	8,473	1,176	0	0	0
Utah	5,749	22,279	17,000	0	834	0
Virginia	6,910	45,525	350	0	870	0
West Virginia[c]	3,527	8,728	0	0	321	0
Pooled sample	**21,297**	**85,006**	**18,526**	**0**	**2,024**	**0**

Source: Cost-tracking workbooks completed quarterly by State administrators for SY 2016–2017.

Notes: Costs consist of direct labor costs, including wage and fringe benefits, for time spent on DCM-F/RP; other direct costs, including payments to contractors; and indirect costs.

[a]Salaries for staff of California child nutrition agencies used in this analysis are the highest rates for each position, rather than salaries for specific staff. For that reason, costs shown may slightly overestimate actual costs.

[b]All costs for the Florida child nutrition agency were other direct costs for payments to contractors. The agency did not report any direct labor costs.

[c]Due to data limitations, fringe benefits in West Virginia were imputed. Medicaid eligibility agency costs in West Virginia exclude contractor costs because their work fell within the scope of the agency's maintenance and operations contract with the eligibility system vendor.

Table E.3. State administrative costs of DCM-F/RP per 1,000 students enrolled or directly certified

State	State administrative costs in the first year of DCM-F/RP implementation (dollars)		
	Per 1,000 students enrolled	Per 1,000 students directly certified for free meals	Per 1,000 students directly certified for free or reduced-price meals based on Medicaid
DCM-F/RP States that participated in the first DCM demonstration			
California[a]	201	1,115	5,025
Florida	92	260	NA
Massachusetts	157	956	NA
Pooled sample	**118**	**401**	**NA**
DCM-F/RP States that are new to DCM			
Nebraska	43	162	401
Utah	78	486	1,460
Virginia	43	213	1,033
West Virginia[b]	45	321	1,791
Pooled sample	**52**	**267**	**997**

Sources: Cost-tracking workbooks completed quarterly by State administrators for SY 2016–2017 and enrollment and direct certification data from administrative records provided by State administrators for SY 2016–2017.

[a]In SY 2016–2017 California implemented DCM-F/RP in 14 districts, while all other States implemented DCM-F/RP statewide. Salaries for staff of California child nutrition agencies used in this analysis are the highest rates for each position, rather than salaries for specific staff. For that reason, costs shown may slightly overestimate actual costs.

[b]Due to data limitations, fringe benefits in West Virginia were imputed. Medicaid eligibility agency costs in West Virginia exclude contractor costs because their work fell within the scope of the agency's maintenance and operations contract with the eligibility system vendor.

NA = not available. In Florida and Massachusetts, the numbers of students directly certified for free and reduced-price meals based on Medicaid only were not available.

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APPENDIX F

SUPPLEMENTAL TABLES RELATED TO IMPLEMENTATION PROCESSES AND CHALLENGES

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Table F.1. Summaries of State DCM-F/RP processes

State	Summary of DCM-F/RP process
California	Each month, the Department of Health Care Services assesses DCM-F/RP eligibility and sends a file identifying children eligible for DCM-F/RP and those participating in SNAP or TANF to a mainframe maintained by the California Office of Technology. The child nutrition agency provides a monthly student enrollment file to the same mainframe, extracted from the statewide student information system (SSIS), which districts must update at least twice a year. Staff from the Department of Social Services trigger a four-step deterministic match, which generates exact matches. DCM-F/RP records are matched in the final step, and those records must match exactly on five data elements. The criteria for this match are more stringent than California's match with other programs because Medicaid is a larger program, and the State wanted to reduce the likelihood of false positives. A combined list of exact matches is made available in the SSIS for district staff to download.
Florida	Each day, the Medicaid eligibility agency provides a file identifying children eligible for DCM-F/RP and those participating in SNAP or TANF, which the child nutrition agency matches against the last enrollment file uploaded by districts to the direct certification system. The system attempts a 16-level deterministic match daily, using a combination of data elements, and employs nickname and phonetic algorithms to help identify positive matches. It sends an email to districts notifying them of any new matches. The child nutrition agency makes available separate lists of exact free matches (including Medicaid and other programs), exact Medicaid-reduced-price matches, and unmatched students for download in the direct certification system, as well as a list of unmatched students who have the same address as a matched student.
Massachusetts	The matching system maintained by the umbrella department overseeing the SNAP and Medicaid eligibility agencies accesses real-time data on children eligible for DCM-F/RP and foster children from a Medicaid database and data identifying children participating in SNAP or TANF from a separate database. District staff trigger a match by uploading enrollment data to the matching system, which conducts a deterministic match on three data elements and provides a combined list of exact matches and unmatched students for district staff to download.
Nebraska	Each day, the Medicaid eligibility agency provides a file identifying children eligible for DCM-F/RP, children participating in SNAP or TANF, and foster children to the direct certification system maintained by the child nutrition agency. The system pulls student enrollment data daily from three systems: (1) the SSIS for public schools, (2) the enrollment system for private schools, or (3) the online application and claims system for public and private schools. The direct certification system conducts a probabilistic match daily on four data elements and emails districts when a new match is identified. A list of exact and possible matches are made available for district staff download through the State claims system.
Utah	Each day, the Medicaid eligibility agency provides a file identifying children eligible for DCM-F/RP and children participating in SNAP or TANF to two systems maintained by the child nutrition agency. (A separate agency provides data on foster children weekly.) Matching occurs in two systems: the State online claims system and the State-sponsored district enrollment, used by many but not all districts. The systems both used the same algorithm, a deterministic match on three data elements. The first option is available to all districts and produces exact matches when all data elements match and possible matches when two of the data elements match. All districts must use this option at least three times a year. It matches against enrollment data housed in the SSIS, or districts can upload a current file to the claims system for matching. The second option is available only to districts that use the State-sponsored system; it produces only exact matches. The State-sponsored district enrollment system can also function as a POS system. For districts using that function, exact matches are certified automatically each day.
Virginia	Six times per year, the Medicaid eligibility agency assesses eligibility and provides a file identifying children eligible for DCM-F/RP and children participating in SNAP or TANF to the child nutrition agency. The child nutrition agency separates the file based on county code or ZIP codes to create an eligibility file for each district that contains children eligible for direct certification, and it distributes a file to each district. Districts conduct matching locally and must use a minimum of three data elements.

State	Summary of DCM-F/RP process
West Virginia	Each week, the Medicaid eligibility agency assesses DCM-F/RP eligibility and provides a file identifying children eligible for DCM-F/RP and children participating in SNAP or TANF to the statewide direct certification and POS system. (The same agency provides data on foster children each month.) The direct certification system, maintained by the child nutrition agency, conducts a daily match against real-time enrollment data from the SSIS. The match uses a probabilistic algorithm with seven data elements. Exact matches are automatically certified in the POS system. District staff log into the system to review high- and medium-probability possible matches.

Source: Interviews with State staff.

Figure F.1. Flowchart of DCM-F/RP process in California

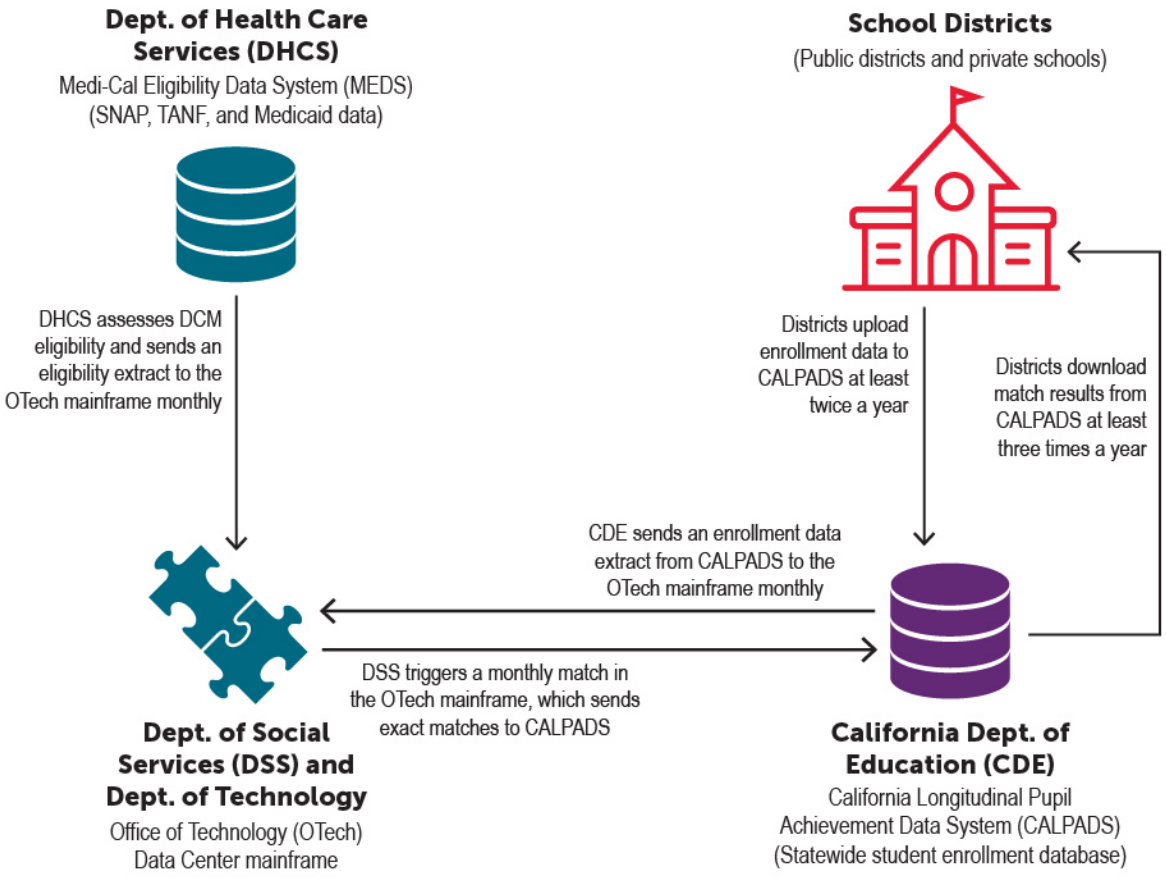

Figure F.2. Flowchart of DCM-F/RP process in Florida

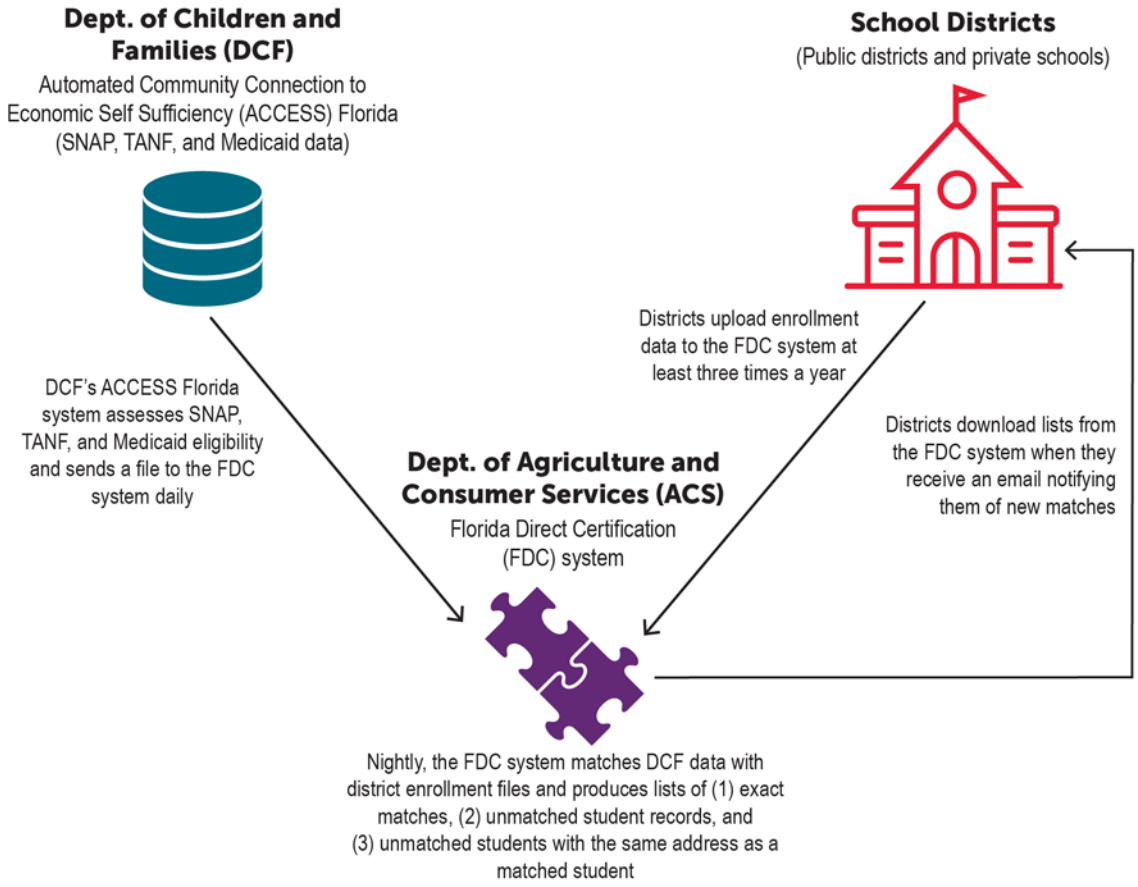

Figure F.3. Flowchart of DCM-F/RP process in Massachusetts

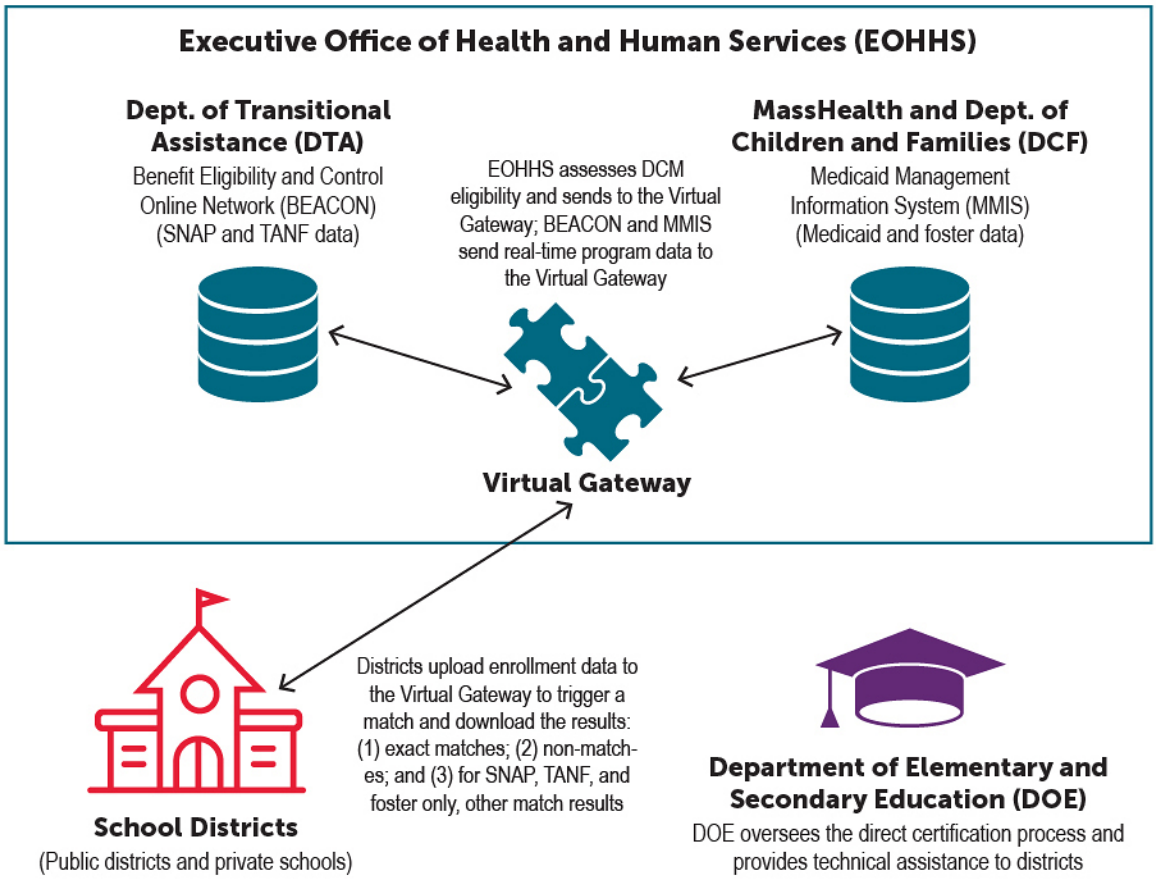

Figure F.4. Flowchart of DCM-F/RP process in Nebraska

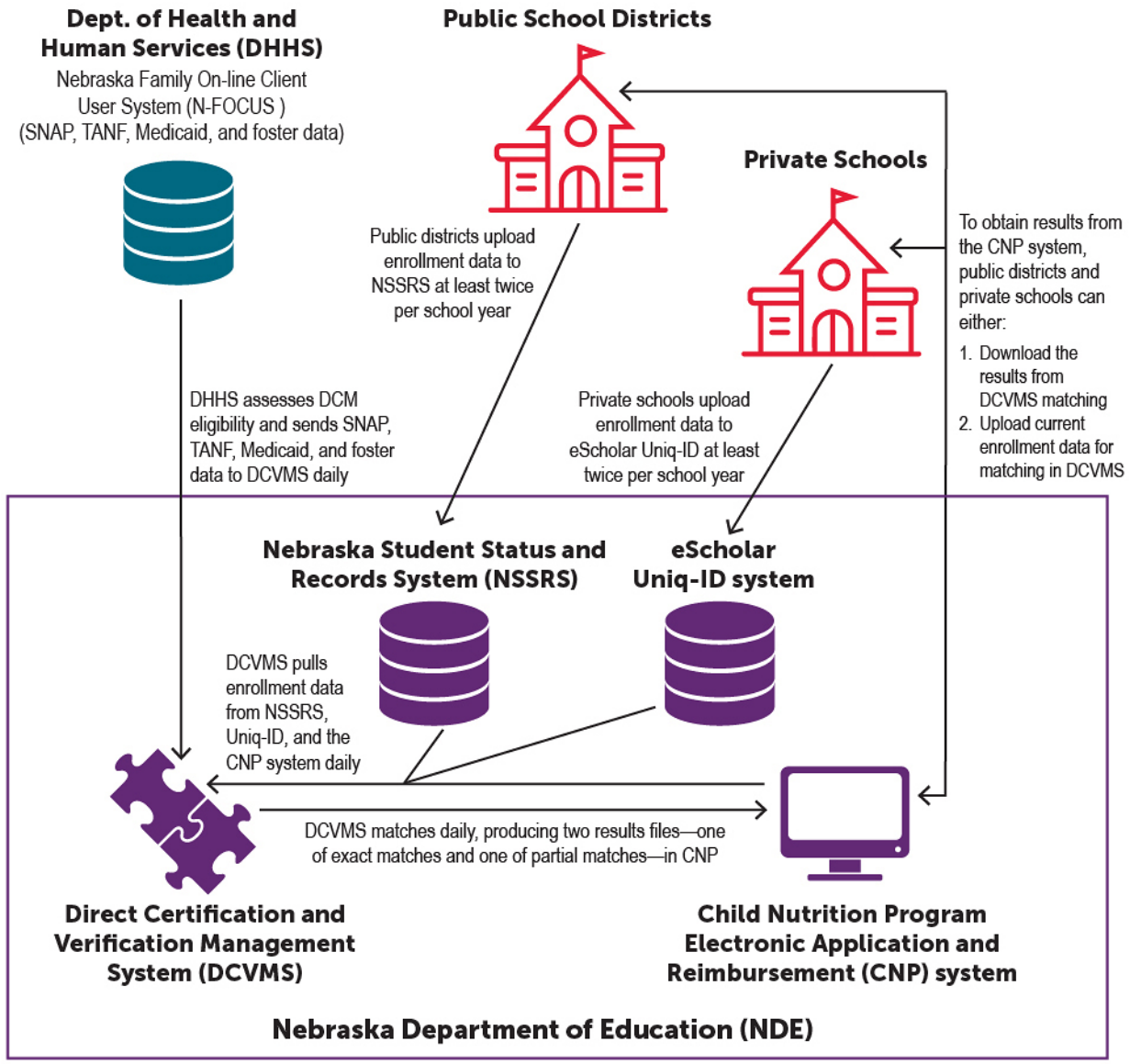

Figure F.5. Flowchart of DCM-F/RP process in Utah

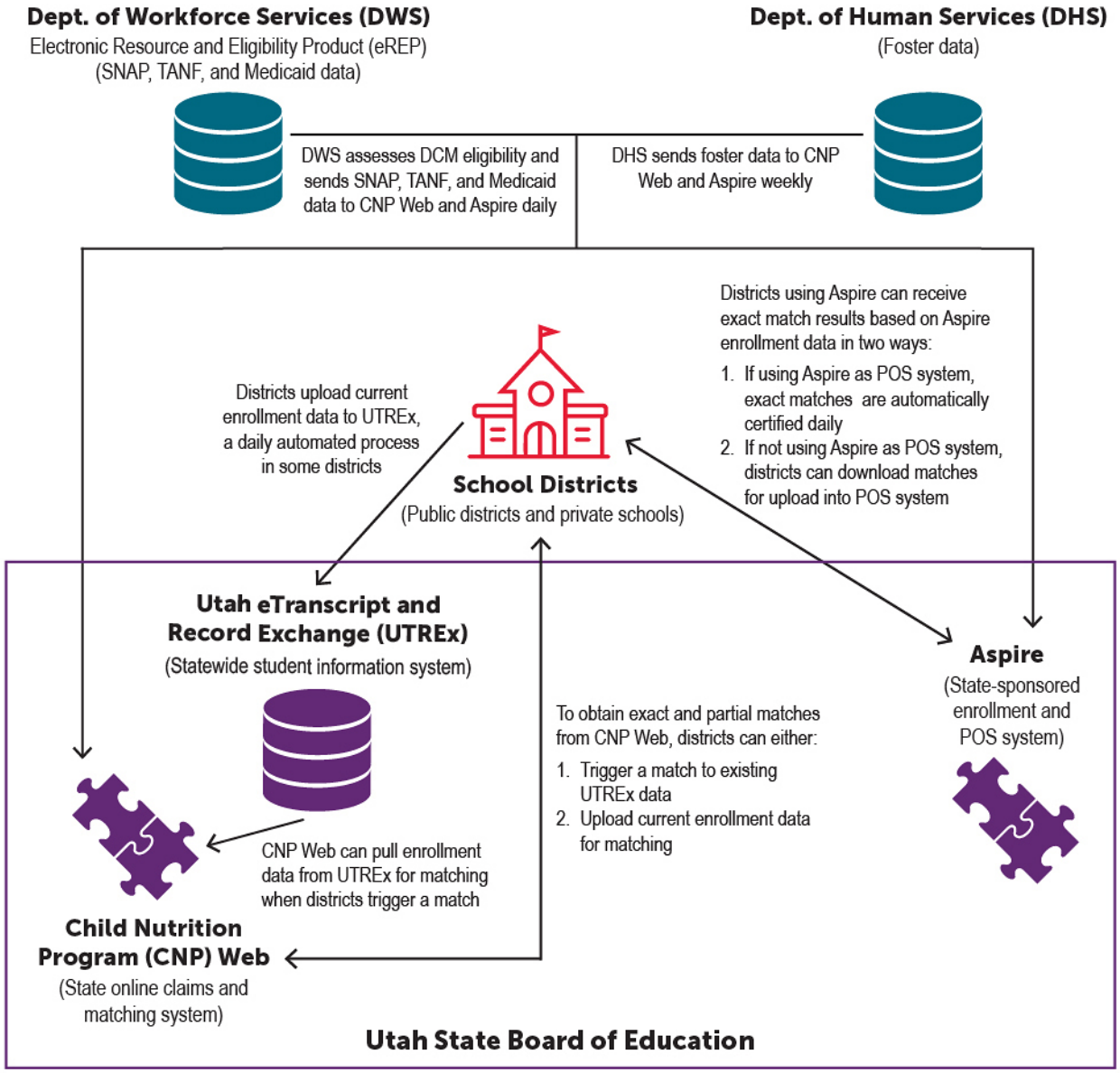

Figure F.6. Flowchart of DCM-F/RP process in Virginia

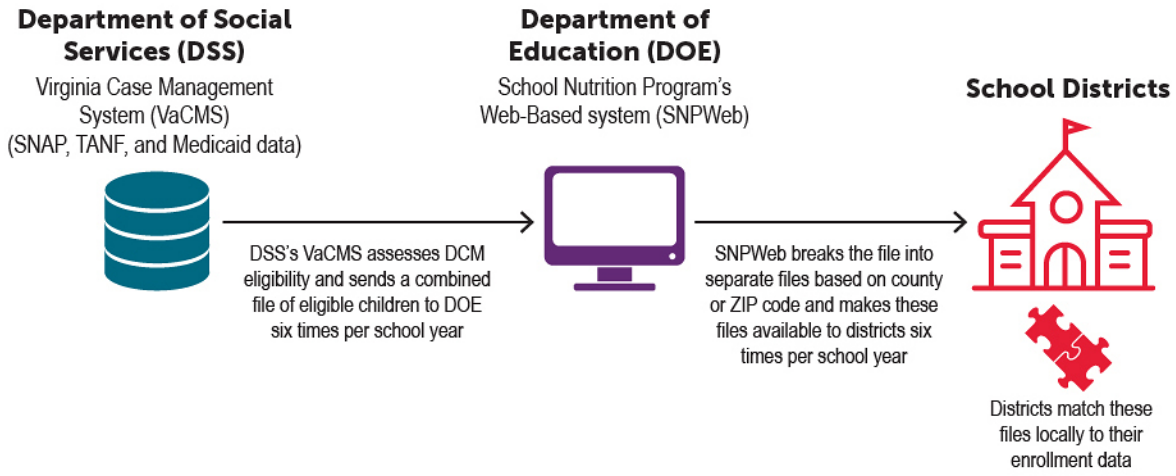

Figure F.7. Flowchart of DCM-F/RP process in West Virginia

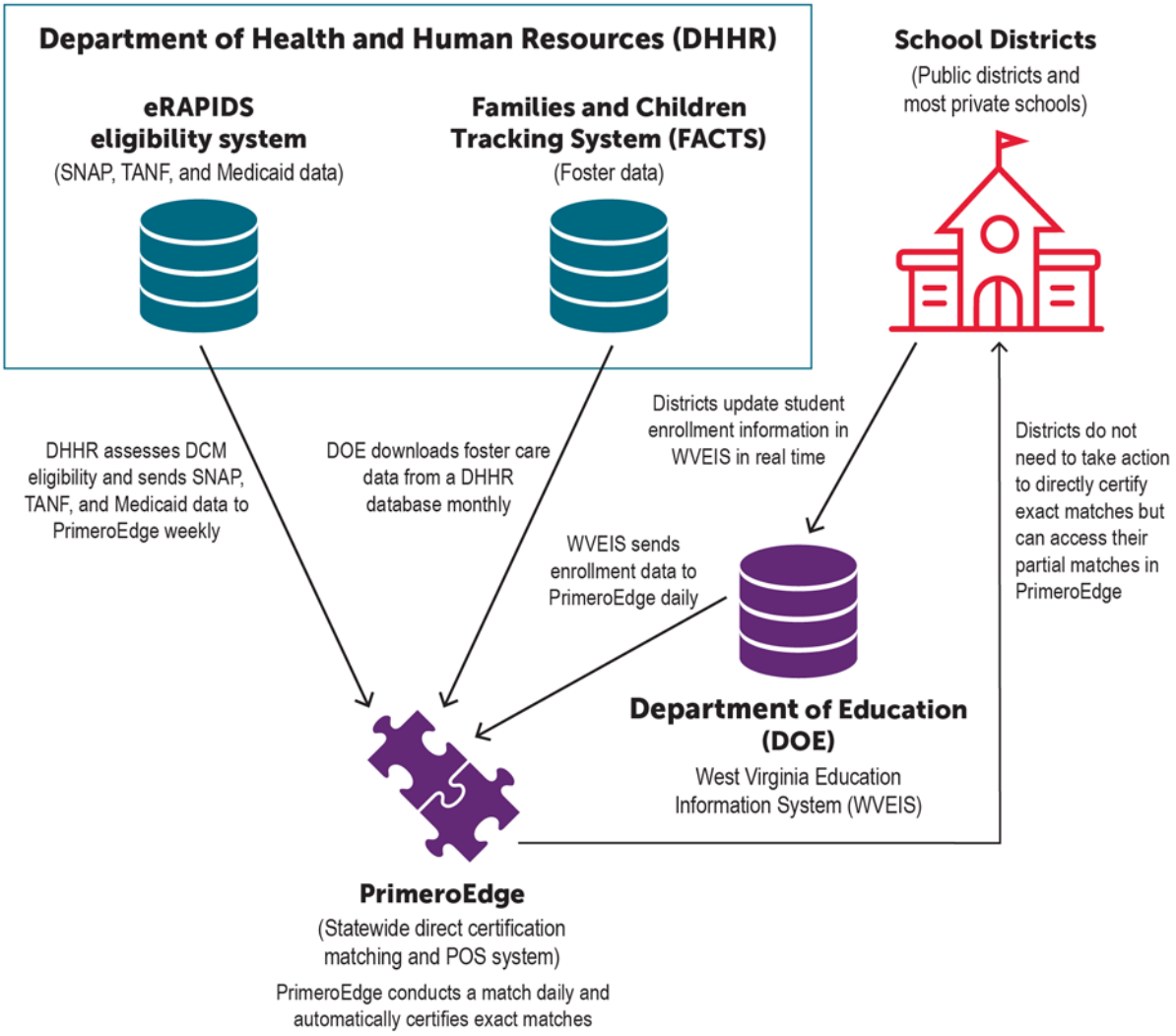

Table F.2. Methods used by States and districts to extend direct certification to other students in the household

Method	Description
State-level approaches	
List of children eligible for extension	No State extended the Medicaid match result to other students in the household at the State level. One State provided districts a list of all unmatched students having the same address as a matched student.
District-level approaches	
Letter notification	All districts sent notification letters to households with directly certified students. These letters instructed parents/guardians to report other students living in the household who were not directly certified for free or reduced-price meals.
Manual review	Districts manually reviewed the list of direct certification matches to identify opportunities for extension of benefits to other students in the household. Districts that used this approach often did so by looking up last names, parent/guardian names, or addresses.
Maintain a household identifier	Districts maintained household IDs or family groupings in their enrollment or POS system to identify school-age children who are living together. Districts that maintained a household ID frequently used it to identify opportunities to extend benefits.
Staff referral	District staff familiar with their student population and family groupings noticed when members of a household had a different certification status. They informed the staff responsible for direct certification, who then extended benefits.
Reference applications	Districts referenced prior school meal applications to identify other students in the household. Districts that used this approach compared these students to those directly certified and extended certification where appropriate.
Investigate negative balances	Districts described investigating students who were accruing school meal debt to see if they had a sibling who was directly certified. Districts that practiced this approach hoped to reduce negative balances.

Source: Interviews with State and district staff. District interviews were not conducted in West Virginia because it conducted its first DCM-F/RP match after the school year had ended for most districts in the State.

Note: These extension methods are the same for SNAP and TANF.

Table F.3. Methods used to maintain the certification hierarchy

State	Process for maintaining the certification hierarchy
California	Matches are conducted sequentially according to the certification hierarchy. At each step, matched students are removed from the student enrollment file used for the next step, thereby creating the hierarchy. For each match after the first one of the school year, the State removes any children from the enrollment file who previously matched under DC-SNAP.
Florida	Florida's matching system is programmed to retain only the highest priority match for each student. The child nutrition agency informs districts of the highest program in the certification hierarchy that matched to each student and provides a report showing which students moved from DCM-RP to DC-free.
Massachusetts	Massachusetts' matching system matches first on SNAP, then TANF; however, Medicaid is matched prior to foster care. Foster children receiving Medicaid are excluded from the DCM eligibility file (because they do not provide income information when applying for Medicaid), which eliminates the possibility of overlap between the Medicaid and foster care files, thereby maintaining the certification hierarchy.
Nebraska	All direct certification matches are provided to districts. The districts are responsible for certifying students using the highest-level program in the certification hierarchy.
Utah	The State Medicaid eligibility agency establishes the certification hierarchy for SNAP, TANF, and Medicaid before matching is conducted and provides a combined eligibility file that indicates only one program per child. Foster care data are provided separately, so the matching systems apply the hierarchy between foster care and the other programs. The statewide POS system automatically recertifies students as DC-SNAP if they previously matched under another program.
Virginia	As a local matching State, district staff and vendors are responsible for maintaining the correct certification hierarchy. To aid districts, the State only sends the highest priority program for the first eligibility file of the school year. Each subsequent file only includes children who are absent from previous files, move to a different location, or match to a program higher on the hierarchy. However in Year 1, all eligible Medicaid cases were provided to districts regardless of whether they appeared in a prior eligibility file.
West Virginia	The certification hierarchy is written into the statewide POS system where the match occurs. This system retains only the highest priority match for each student and ensures that a student matched to a SNAP record is reclassified as DC-SNAP if previously certified under another program. The system also allows staff to view historical matches. West Virginia discovered in summer 2017 that the hierarchy was not being implemented correctly in the statewide POS system and was working with its vendor to correct this issue.

Source: Interviews with State and district staff. District interviews were not conducted in West Virginia because it conducted its first DCM-F/RP match after the school year had ended for most districts in the State.

Table F.4. Reported effects of DCM-F/RP on staff time burdens

Staff time burdens	Description
State staff: Increased burden	
Programming and testing	State agencies invested time in updating their data systems to identify eligible children and apply the certification hierarchy. Depending on the complexity of the systems involved, this could be a time-consuming process for States. Testing was also needed to ensure that eligible children were identified within the Medicaid data, the match was occurring as expected, and the modifications made to State systems did not have any unanticipated consequences.
Communicating with districts	Child nutrition agencies had to train districts about the demonstration and respond to questions.
District staff: Increased burden	
Manual certification	Because point-of-service vendors were not always prepared for the demonstration, some districts had to manually certify their DCM-F/RP matches to ensure the correct certification hierarchy was maintained. This could prove more time-consuming for districts with large student bodies.
Reconciling possible matches	In States that provide possible matches in addition to exact matches, DCM-F/RP could increase the size of a district's possible match list, which district staff often review manually.[a] The size of a possible match list can vary depending on district size and sophistication of the probabilistic matching algorithms. Reconciling possible matches appeared less burdensome in small districts due to the length of their lists and familiarity with their student population.
District staff: Decreased burden	
Applications and verification	Although most States implemented DCM-F/RP after the beginning of the school year in SY 2016–2017, districts generally expected to see a reduction in the number of applications in SY 2017–2018. Some also anticipated that DCM-F/RP would help more schools qualify for CEP, reducing applications further. Districts also expected to see a slight reduction in the time spent on verifications.
Reconciling debt	Districts that collected outstanding meal balances predicted that DCM-F/RP would reduce the number of families they have to pursue to collect debt or complete a school meals application.

Source: Interviews with State and district staff. District interviews were not conducted in West Virginia because it conducted its first DCM-F/RP match after the school year had ended for most districts in the State.

[a]In State-level matching States, possible matches were provided in Nebraska, Utah, and West Virginia.

Table F.5. DCM-F/RP challenges and resolutions for demonstration States and districts

Challenge	Description	Resolution
Incorporating match results	*Vendor readiness.* Vendors did not always update their software to accommodate the DCM-F/RP match. As a result, some districts had difficulty tracking DCM-RP match results, maintaining the correct certification hierarchy, and ensuring that DCM-RP eligibility did not overwrite free meal certification status.	Vendors worked to update their software. Districts updated or reviewed Medicaid match results manually while waiting for a software update. If systems did not include indicators for DCM-RP, districts would record these matches locally. States also trained districts not to reduce benefits during the school year.
	Vendor willingness. In a few States, vendors were reluctant to update their software for DCM-F/RP because it was a demonstration, and others asked districts to pay for the updates.	Some districts agreed to pay for the updates. One State coordinated with districts using the same vendor to request the same software update.
	State readiness. DCM-RP overwrote free-by-application in one State's POS system.	The State's software vendor was working to correct this issue.
Understanding demonstration rules	*Understanding demonstration guidelines.* Some Medicaid eligibility agencies needed additional guidance to identify children eligible for DCM-F/RP. The child nutrition agencies typically lacked expertise in Medicaid, making it difficult for them to address questions about eligibility.	States that included a Medicaid policy expert in the planning stages found these experts helpful in identifying eligible children. States also contacted FNS for guidance. Direct conversations between FNS and the Medicaid eligibility agency were helpful.
	Including correct Medicaid aid categories. Three States included ineligible aid categories in the DCM match results. These categories included recipients who were not required to provide income information when applying for Medicaid. Other States included ineligible aid categories in their test files.	States, with assistance from FNS, identified incorrect categories and removed them from the test file or from subsequent matches. One State retracted its file and had districts update students' status accordingly. Two States did not retract their files because the number of erroneous matches was small and it was the last match of the school year.
	Misperceptions about categorical eligibility. Some families were under the impression that any child receiving Medicaid was eligible for free school meals.	States provided training to districts about the DCM-F/RP eligibility criteria and how to respond to questions from parents.
District awareness	*Awareness of demonstration.* States disseminated information about DCM-F/RP through webinars, trainings, emails, and updates to websites and system interfaces. Despite these communication and outreach efforts, some districts were unaware of DCM-F/RP and how it would affect their local processes.	States provided additional communication about DCM-F/RP and offered technical assistance to districts.

Source: Interviews with State and district staff. District interviews were not conducted in West Virginia because it conducted its first DCM-F/RP match after the school year had ended for most districts in the State.

Table F.6. Factors affecting matching success in DCM-F/RP demonstration States and districts

Reported factors	Description
Student and household characteristics	
Frequent address changes	For States that match on address, transitory low-income populations can be difficult to match or extend benefits to. One State noted that urban districts are more likely to contain transitory populations.
Name complexity	Names with punctuation and special characters—hyphens and spaces—were more likely to lead to a possible match or nonmatch. Program and enrollment data occasionally transposed hyphenated surnames or omitted the hyphen. Complex names could be more prevalent among certain populations. For example, districts noted that hyphenated surnames are more common among Hispanic students. Differences between surnames of students in blended families could also make extension of benefits more difficult.
District characteristics	
District size and resources	Large districts often have POS systems and IT staff that can support direct certification matching. However, small districts' staff are more likely to be familiar with their student population, which can help them identify students for direct certification matching and extension without the aid of a POS system.
Staff availability and knowledge	The availability and willingness of staff to send updated enrollment data to States, access match results, and/or investigate possible matches can impact certification timeliness and matching success. Staff knowledge about DCM-F/RP and the certification hierarchy could also impact certification in local POS systems.
Technology	Vendors who served districts in multiple DCM-F/RP States or who had experience with the prior demonstration generally appeared to be aware of the demonstration. Some of these vendors made the necessary updates to accommodate DCM-F/RP matches, which could improve the certification results recorded in local POS systems.
State characteristics	
Data-entry restrictions	State agencies can require data standardization as part of the data-entry process. For example, one State required case workers to enter birth dates using a calendar. Data standardization might increase the accuracy of data elements.
Size of Medicaid population	States with large Medicaid populations may have more students that share the same name and date of birth, which can increase the risk of false positives. This led one State to adopt a more stringent algorithm for DCM-F/RP matching.
State system capabilities	The features and capabilities of State systems can potentially affect direct certification matching success: Individual student lookup capabilities can make it easier for districts to investigate a student's direct certification status and extend benefits to other students in the household. The number, type, and stringency of matching algorithms can affect matching success. For instance, one State attempts 16 different deterministic matches using different data elements and algorithms, whereas other States attempt a single deterministic match. Providing possible matches to districts may increase matching success and extension of benefits to other students in the household. State-administered point-of-service systems can automatically update students' certification status without any action by the district. They also allow the State to establish the correct direct certification hierarchy, instead of relying on districts' vendors to update their systems or district staff to manually update certification status. Statewide student information systems may increase matching success if they require frequent enrollment updates.

Source: Interviews with State and district staff. District interviews were not conducted in West Virginia because it conducted its first DCM-F/RP match after the school year had ended for most districts in the State.

Note: Most reported factors affecting DCM-F/RP matching success also impact the matching success of direct certification with SNAP, TANF, or other programs.

Table F.7. Strategies for improving DCM-F/RP matching success

Strategy	Description
Matching algorithms	
Advanced matching algorithms	Advanced matching algorithms are designed to account for inconsistencies between datasets to improve matching success. These include: Phonetic matching—matches names that have multiple spellings based on sound. Nickname matching—matches given names to common nicknames. Date of birth accommodation—accounts for potential data entry errors in the date of birth field.
Multilevel matching	Running multiple matching algorithms using different data elements may boost matching success, especially for States with a deterministic match. For example, one State conducted a 16-level deterministic match using various combinations of four data elements.
Probabilistic matching	Probabilistic match scores indicate the likelihood of a correct match. This helps districts narrow the pool of possible matches to those most likely to match. States can help districts reconcile possible matches by providing the data elements that failed to match, as well as additional program data that were excluded from the matching algorithm.
Data elements	
Expand character limits	Character limits in data systems may truncate names and prevent matches. Expanding these limits may increase match success.
Household ID	Grouping families together within an enrollment and/or POS system can facilitate extension of benefits to other students in the household.
Reformat data	One State standardized birth dates and removed all spaces, hyphens, suffixes, and other special characters from both the program and enrollment data. This reformatting was expected to increase matching success.
Processes and systems	
Daily matching	Most States where program and/or enrollment data are updated on a daily basis conducted a daily match. Daily matching can decrease certification wait time and increase the number of matches.
Email notification	States that notify districts of new match results can decrease certification wait time. This can also encourage districts to promptly resolve possible matches throughout the school year.
Technology	A State or district's technology—enrollment systems, POS systems, student look-up functions, and so on—can impact matching success and timeliness. Student information systems ensure that States and districts have access to the most current student enrollment information when conducting a match or extending benefits. Robust systems can lead to timely updates of students' certification status, maintain the certification hierarchy, and help identify possible matches.
Training, communication, technical assistance	Districts are often responsible for maintaining the certification hierarchy and extending benefits to other students in the household. Frequent training, communication, and technical assistance can help ensure that the certification hierarchy is maintained and increase extension of benefits to other students in the household.

Source: Interviews with State and district staff. District interviews were not conducted in West Virginia because it conducted its first DCM-F/RP match after the school year had ended for most districts in the State.

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