



**Maryland**

STATE DEPARTMENT OF EDUCATION

# The Impact of the Community Eligibility Provision (CEP) on Maryland Students

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Office of Research

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**MARYLAND STATE DEPARTMENT OF EDUCATION**

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## Executive Summary

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This study investigates the implementation and impact of the community eligibility provision (CEP) in Maryland schools. The Community Eligibility Provision (CEP) is a federal school-based meal service option that allows high poverty schools to provide free breakfast and lunch to all students at no cost. CEP was introduced over the period 2015 to 2022 in Maryland, with some years seeing a large number of schools adopt CEP and other years seeing few new schools adopting the program.<sup>1</sup> The largest increases in new CEP schools were in 2015-2016 when the majority of new schools were in Baltimore City and in 2020-2021 when the majority of new schools were in Baltimore County.

The study finds:

- On average, participation in free meals increased 13-15 percentage points after CEP was introduced in schools. This change was immediate although there is also some evidence that participation declined after the initial spike.
- There were small increases in absenteeism after the introduction of CEP. For example, chronic absenteeism increased 2.1 percentage points compared to eligible non-CEP schools, and this difference was found to be statistically significant. In secondary schools, chronic absenteeism increased by 4.6 percentage points.<sup>2</sup>
- There were also small decreases in suspensions. In secondary schools, the rate of suspensions decreased by 9%.
- There is also some evidence that impacts changed over time. Analysis of data for the 2016 cohort of schools, for example, shows a small drop in absenteeism and chronic absenteeism in the first year of CEP implementation followed by increases in the years after, while suspensions increased slightly followed by decreases in the years afterward.
- Analysis of test scores is limited by data availability, but there is some evidence that schools saw an immediate decline in test scores after the introduction of CEP followed by a rebound, particularly in math.

Although the analysis in this study is not able to establish why these impacts were observed, it offers some explanations:

- For one, the study finds no evidence that the high-level conclusions are impacted by data reliability in and after pandemic-affected school years.
- The study also does not find that conclusions are affected by the implementation of other programs, such as Maryland Meals for Achievement (MMFA), during the period of analysis.

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<sup>1</sup> CEP was begun as a pilot program, with a small number of schools in Washington County and Baltimore City administering the program prior to 2014-2015.

<sup>2</sup> Secondary schools are those that include grades 6-12 only.

## Introduction, Context, and Research Questions

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CEP is a federal school-based meal service option for schools and is a key provision of The Healthy, Hunger Free Kids Act (USDA, 2016). It allows high poverty schools to provide free breakfast and lunch to all students at no cost.

Schools participating in CEP:

- Must provide breakfast and lunch for all participating students at no charge.
- Are reimbursed using a formula based on the Identified Student Percentage (ISP) (discussed in the data section); and
- Must cover any costs of providing meals to students that exceed the federal reimbursement with non-federal funds throughout the school year.

According to data from the Office of School and Community Nutrition Programs (OSCNP), CEP started in Maryland in 5 schools in Washington County during the 2013-2014 school year, followed by 25 schools from multiple counties in 2014-2015. Although the causal impact of CEP on participation and student outcomes has been measured in various states, fewer studies have been conducted specifically in Maryland. Previous studies on CEP can be grouped into two types: studies measuring the impact of CEP on meal participation and studies measuring the impact of CEP on other outcomes, such as student performance, discipline, and attendance.

### STUDIES ON MEAL PARTICIPATION:

- In Texas, CEP increased school breakfast participation by 4.59 percentage points and lunch participation by 4.32 percentage points. (Schneider et al., 2021)
- CEP increased meal participation in New York state by 11.5 percentage points for breakfast and 8.5 percentage points for lunch in primary schools and 4.7 percentage points for breakfast and 8.4 percentage points for lunch in secondary schools (Rothbart et al., 2023).
- Data from Pennsylvania (2013-2014) and Maryland (2016-2017) shows that CEP is associated with an 8% increase in meal counts (Pokorney et al., 2019).
- Using national data, Ruffini (2022) shows that CEP increased the number of breakfast meals by 38 percent and lunches by 12 percent.

### STUDIES ON OTHER OUTCOMES:

- CEP participation reduced suspensions in Oregon by 10% for all students and 22% for students from grades 9 through 12. (Domina et al., 2024).
- Using national data, Gordon and Ruffini (2018) found that CEP participation reduced suspensions by 15 percent for elementary students and 6 percent for middle school students.
- CEP increased overall math performance by approximately 0.05 standard deviations (Gordanier et al., 2020; Ruffini, 2022)
- Data from Wisconsin showed no association between CEP and attendance rates in the initial year of implementation but a decrease in the proportion of students with low attendance in the following year, specifically for students who were ever economically disadvantaged. (Bartfeld et al., 2020).

**STUDIES SPECIFIC TO MARYLAND:**

A qualitative study analyzed the perspectives of food service staff on the barriers and facilitators to CEP implementation in CEP participating Maryland school districts and its influence on the students, school operations, and food system (Hecht et al. 2021). The authors found that the perceived benefits of CEP included an increase in meal participation, reduction of stigma in students and financial strain on parents, and an improvement in staff morale. The perceived barriers included concerns that the implementation of CEP would impact schools' eligibility for other state and federal programs, due to changes in how students would be identified based on their income. The authors did not find any perceived influence on the food system, such as wasted food.

A recent study conducted by Johns Hopkins University found food insecurity was almost twice as high among families at three CEP-eligible - but not participating - schools compared to five similar schools that were participating in CEP (Gross et al., 2018). A second study found small increases in school attendance and suspension rates for Baltimore City schools after the introduction of CEP (Gross et al., 2017).<sup>3</sup> To the best of the authors' knowledge, there are no causal studies that identify the impact of CEP implementation on all CEP implemented school districts of Maryland.

This report addresses the research questions below:

**RQ1:** What is the impact of CEP on student access to free meals?

**RQ2:** What is the impact of CEP on absenteeism, suspensions, and student achievement?

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<sup>3</sup> Differences with the current study include the time-period of analysis (2015 to 2016 only), the sample of schools (Baltimore City and Montgomery Counties, only) and other methodological choices.

## Data

This study draws on student- and school-level data from MSDE. To determine the ISP for CEP participation, LEAs and schools divide the number of identified students as of April 1 by the number of enrolled students as of April 1, and then multiply by 100. The term “identified students” refers to children who are directly certified for free school meals based on their participation (or a household member’s participation) in other means-tested 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).

Upon initial calculation, the ISP must represent the number of identified students and the student enrollment as of April 1 prior to CEP implementation.

For schools participating in CEP, the ISP multiplied by 1.6 equals the percentage of meals claimed at the free rate. The remaining meals served, up to 100 percent, are reimbursed at the paid rate.<sup>4</sup> For this study, schools are considered eligible if 40% or more of their students are ISP, or if 40% or more students are ISP in their LEA.

Student-level absenteeism, suspension, and state standardized test score data are from MSDE. Table 1 shows the availability of this data over the period of study. In terms of test scores, data includes PARCC test scores from 2015-2019, and MCAP test scores from 2022-2024. In terms of absenteeism and suspensions, data spans 2012 to 2023. To include pre-period data for all cohorts of schools, the analysis makes use of the availability of yearly data for these measures<sup>5</sup>. All measures are aggregated to the school level.

**Table 1: Availability of Outcome Data**

Outcome	Years Available (Spring)
Percent of Students Receiving Free Meals	2015-2024
Absenteeism and Suspensions	2012-2023
Test Scores	2015-2019, 2022-2024

<sup>4</sup> The 1.6 “multiplier” used to calculate the percentage of lunches and breakfasts to be claimed at the Federal free rate is identified in the NSLA as the default initial multiplier. An analysis conducted around the time that the HHFKA was being drafted demonstrated that, for every 10 children directly certified, up to 6 additional children were eligible for free or reduced-price meals based on a school meal application. An evaluation of CEP in the pilot States suggested that the 1.6 multiplier is an accurate reflection of the relationship between the free and reduced-price student percentage and the ISP in a typical participating LEA.

Logan, Christopher W., Patty Connor, Eleanor L. Harvill, Joseph Harkness, Hiren Nisar, Amy Checkoway, Laura R. Peck, Azim Shivji, Edwin Bein, Marjorie Levin, and Ayesha Enver. *Community Eligibility Provision Evaluation*. Project Officer: John R. Endahl. Prepared by Abt Associates for the U.S. Department of Agriculture, Food and Nutrition Service, February 2014.

<sup>5</sup> Note that in the pandemic-affected years of 2019-2020 and 2020-2021, there were differences across LEAs in terms of how absenteeism and suspensions were measured. For this reason, caution is urged in interpreting data from these years.

Because of changes in CEP eligibility criteria over time (see below) and because as of this writing not all outcome data for the 2023-2024 school year is yet available, this year is excluded from the analysis. Note that state-wide standardized tests were not administered in 2020 and 2021. The resulting merged dataset includes 16,762 school-by-year observations over the 2012 through 2023 school years, including 1,483 unique schools.

Table 2 shows the number of schools by their eligibility and CEP status. The column “eligible” represents schools that either have  $\geq 40\%$  ISP or were part of an LEA where the overall ISP was  $\geq 40\%$  for that school year. The table highlights two important considerations that guide the analysis:

- The largest cohorts of new CEP schools were in 2016 (189 new schools) and in 2021 (127).
- In 2023, the number of eligible schools increased dramatically, due to changes in how ISP was calculated. For the sake of transparency and to avoid making further restrictions on the dataset, primary analyses include data from the 2023 school year, although caution is warranted in interpreting findings. Supplementary analyses, including those that restrict the years of analysis, are shown in Appendix B.

**Table 2: Number of Schools by CEP Eligibility, Status, and Year**

Year (Spring)	CEP Existing	CEP New	Non-CEP Eligible	Non-CEP Other
2012	0	0	0	1,417
2013	0	0	0	1,414
2014	0	3	377	1,029
2015	3	15	363	1,037
2016	18	189	169	1,090
2017	202	8	145	1,109
2018	204	18	81	1,090
2019	216	8	57	1,109
2020	213	4	41	1,132
2021	213	127	78	966
2022	331	5	68	979
2023	327	5	520	524



Appendix Table 1 shows more information about the descriptive characteristics of schools for specific cohorts. Of the 189 new CEP schools in 2016, 177 (94%) were in Baltimore City. Of the 127 new schools in 2021, 83 (65%) were in Baltimore County, 19 (15%) were in Wicomico County, and 12 (9%) were in Prince George's County.<sup>6</sup> Although most new CEP schools in 2021 were in Baltimore County, new schools in Wicomico represented the majority of the 24 total Wicomico schools in that year. This indicates that even if a LEA contributes a small share of new schools each year, it may represent a large and substantive change in school meals availability in that LEA.

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<sup>6</sup> An additional 7 were from Harford, 5 from Washington and 1 from Howard.

## Methodology

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**The purpose of this report is to examine the measurable impact of CEP on available outcomes. In short, this involves examining changes in outcomes for CEP schools over time. Consider the schools that first received CEP in 2016; the analysis below, at its simplest, examines how average outcomes for those schools changed in the years leading up to 2016 and in the years after 2016. Note, however, that CEP was administered to schools in multiple years, so not accounting for important differences across schools and across time may not provide the best estimate of the impact of CEP.**

Therefore, the analysis combines a quasi-experimental (regression-based) difference-in-differences analysis with a simple trend analysis for the two largest cohorts of CEP schools (2016 and 2021). The latter analysis should be thought of as a “best guess,” as it takes a large number of steps to produce estimates of impact, characterize measurable uncertainty of those estimates, and control for alternative explanations that could drive different outcomes across schools. The former should be thought of as the simplest and most straightforward way of examining results. Because the 2016 and 2021 cohorts were considerably larger than other cohorts, an examination of these schools provide the best cases with which to examine trends in the impact of CEP. Nevertheless, there may be cases where the conclusions of the quasi-experimental and simple trends analyses differ, so care should be taken to understand how the two approaches are distinct. Appendix A provides greater technical details about the quasi-experimental analysis.

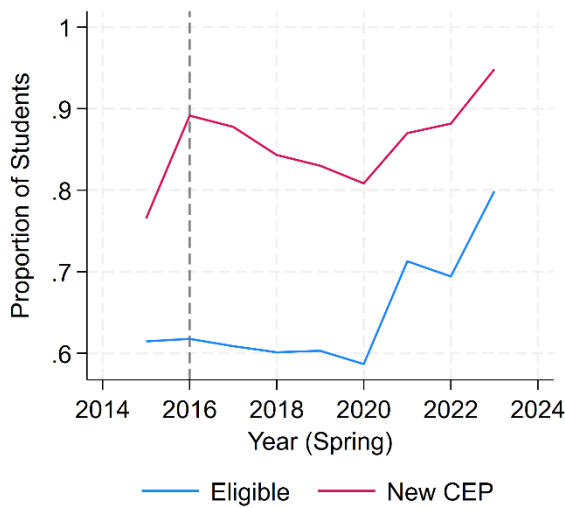
## Findings

### IMPACT OF CEP ON ACCESS TO FREE MEALS

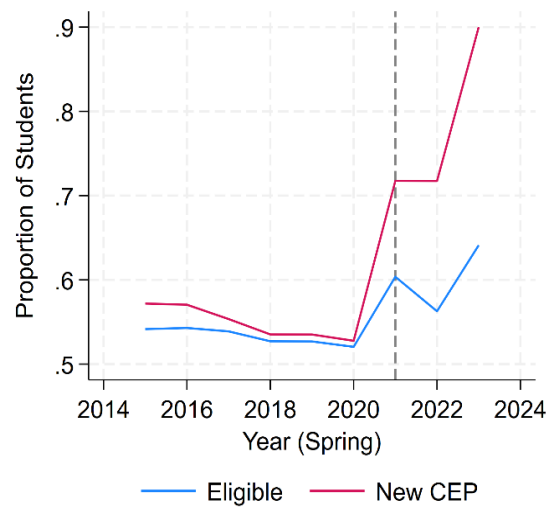
Figure 1 shows a simple trend analysis for the proportion of students receiving free meals, for the 2016 (Panel A) and 2021 (Panel B) new cohorts of CEP schools. For the sake of comparison, trends for eligible non-CEP schools from the same two years are shown. The proportion of students receiving free meals in CEP schools was higher than the proportion of students receiving free meals in non-CEP schools both in 2016 and 2021. For the 2016 cohort, after the introduction of CEP the proportion of students receiving free meals increased from 0.77 to 0.89 before falling to approximately 0.81 in the 2019-2020 school year. For the 2021 cohort, the proportion of students receiving free meals increased from 0.53 to 0.72 in the first year of CEP. In addition to the clear increases in school meal participation after the introduction of CEP, the figures show dramatic changes in free meal participation (across all schools) in the school years after 2019-2020. This suggests some caution is warranted in drawing conclusions regarding CEP effectiveness during these years.

Figure 1: Proportion of Students Receiving Free Meals, by Cohort

Panel A: 2016



Panel B: 2021



**Note:** Figures show the proportion of students receiving free meals for new cohorts of CEP schools. Vertical dotted lines indicate the year in which CEP was first administered for new CEP schools.

Table 3 shows results from the quasi-experimental analysis of the impact of CEP on the proportion of students receiving free meals. To provide greater clarity, it separates schools into elementary (only), middle and/or high schools (only), and all schools (including combined schools). The table shows the proportion of students receiving free meals in CEP schools increased between 13.5 to 15 percentage points in elementary and secondary schools, which is between 20 to 21% of the free and reduced meal mean for eligible schools.

**Table 3: Impact on Proportion of Students Receiving Free Meals (2015-2023)**

Parameter	Elementary	Secondary	All
<b>Coeff.</b>	0.150***	0.135***	0.135***
<b>S.E.</b>	(0.025)	(0.020)	(0.020)
<b>N</b>	1,875	913	3,674

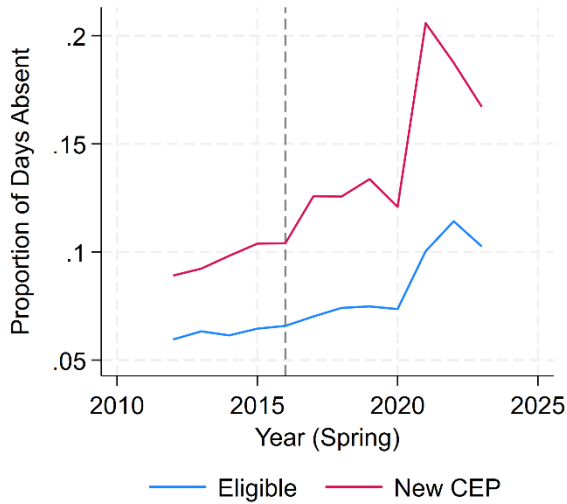
**Note:** Table shows results of the quasi-experimental analysis of the impact of CEP on the proportion of students receiving free meals. See Appendix A for more information on regressions.

## IMPACT OF CEP ON ABSENTEEISM AND SUSPENSIONS

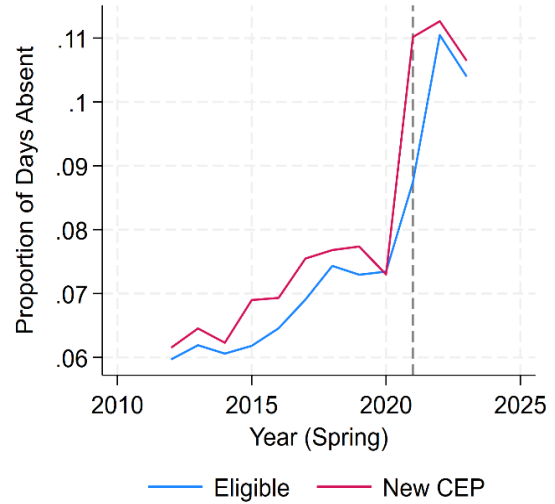
Figure 2 Panels A-F show a simple trend analysis for the rate of absenteeism, the proportion of students that were chronically absent, and the proportion of students that were suspended, for the 2016 and 2021 cohorts of new CEP schools. Panel A shows that after staying constant from 2014-2015 to 2015-2016, the rate of absenteeism increased from 0.10 to 0.13 in CEP schools and stayed elevated relative to non-CEP schools. Panel B shows that for the 2021 cohort, absenteeism increased from 0.07 to 0.11 in new CEP schools. It is important to note that schools in Maryland were largely virtual during the 2020-2021 school year and attendance may have been inconsistently measured. Nevertheless, absenteeism increased to a lesser extent in non-CEP schools (from 0.07 to 0.09). Panel C shows that chronic absenteeism declined in new CEP schools in 2016 from 0.33 to 0.31, before increasing again and remaining elevated relative to non-CEP schools. Panel D shows a similar trend for the 2021 cohort for chronic absenteeism as compared to overall absenteeism, with a large spike but with the caveat of measurement questions for this year. Panel E shows that the proportion of students suspended increased for the 2016 cohort of CEP schools, from 0.06 to 0.07, between 2014-2015 and 2015-2016 before slightly declining relative to non-CEP schools thereafter. For the 2021 cohort, the rate of suspensions declined to near zero for all schools in the 2020-2021 school year, making it difficult to draw firm conclusions from the data.

Figure 2: Absenteeism and Suspensions, by Cohort

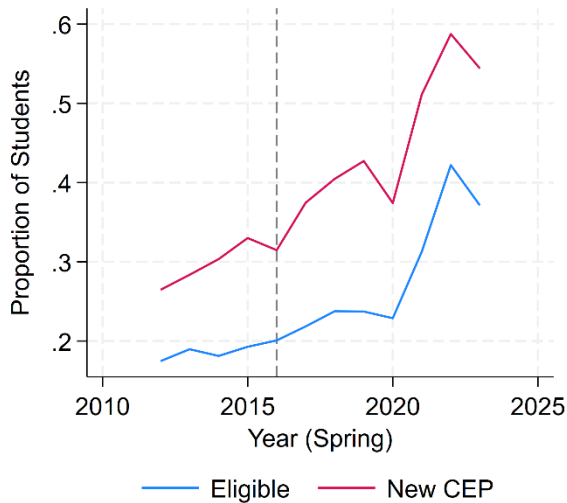
Panel A: Rate of Absenteeism, 2016



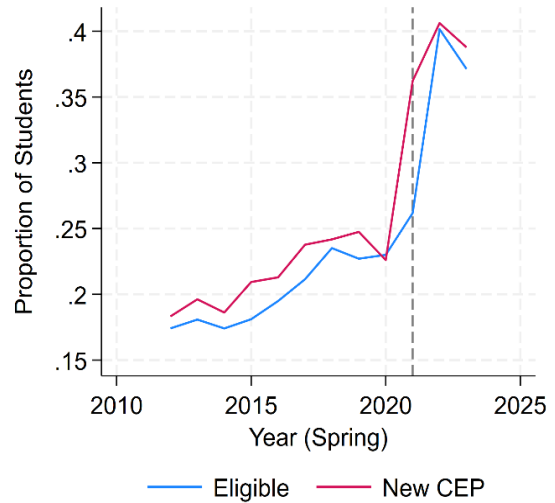
Panel B: Rate of Absenteeism, 2021



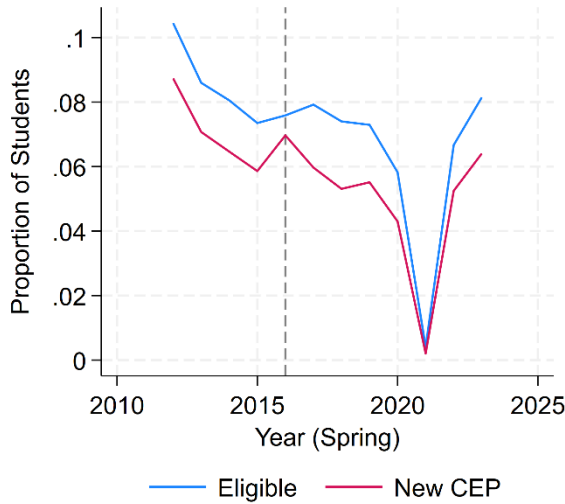
Panel C: Chronic Absenteeism, 2016



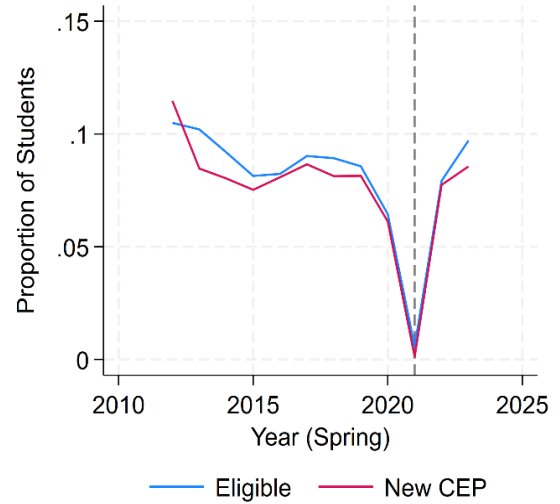
Panel D: Chronic Absenteeism, 2021



Panel E: Rate of Suspensions, 2016



Panel F: Rate of Suspensions, 2021



**Note:** Figures show school average rates of absenteeism and suspension for the 2011-2012 through 2022-2023 school years, weighted by prior enrollment. Vertical dotted lines indicate the year in which CEP was first administered for new CEP schools.

Table 4 shows results from the quasi-experimental analysis of the impact of CEP on absenteeism and on suspension. The table shows that there were statistically significant increases in absenteeism in the years after CEP implementation for the 2016 and 2021 cohorts. For example, Panel A shows that absenteeism increased by 12% in secondary schools, which is statistically significant at the 5% level.<sup>7</sup> Further, Panel B shows that chronic absenteeism increased by 1.4 to 4.6 percentage points depending on the school level. Despite this, Panel C shows that there were also statistically significant declines in the rate of suspensions. The rate of suspensions in secondary schools, for example, declined by 9% in the years after CEP implementation. As will be discussed in the Limitations section, caution is warranted in interpreting these estimates as a causal impact of CEP participation.

<sup>7</sup> Because the rate of absenteeism is log-transformed for the regression analysis, the coefficient estimates of 0.11 is exponentiated to get a value of 1.12 (or an increase of 12%).

**Table 4: Impact on Absenteeism and Suspensions (2012-2023)****Panel A: Rate of Absenteeism (logged)**

Parameter	Elementary	Secondary	All
<b>Coeff.</b>	0.014	0.110*	0.035
<b>S.E.</b>	(0.020)	(0.040)	(0.020)
<b>N</b>	2,422	1,272	4,897

**Panel B: Proportion of Students Chronically Absent**

Parameter	Elementary	Secondary	All
<b>Coeff.</b>	0.014*	0.046**	0.021*
<b>S.E.</b>	(0.006)	(0.014)	(0.008)
<b>N</b>	2,422	1,272	4,897

**Panel C: Proportion of Students Suspended (logged)**

Parameter	Elementary	Secondary	All
<b>Coeff.</b>	-0.006	-0.093*	-0.072
<b>S.E.</b>	(0.139)	(0.041)	(0.049)
<b>N</b>	2,125	1,211	4,396

**Note:** Table Panels show results of the quasi-experimental analysis of the impact of CEP on absenteeism and suspensions. See Appendix A for more information on regressions.

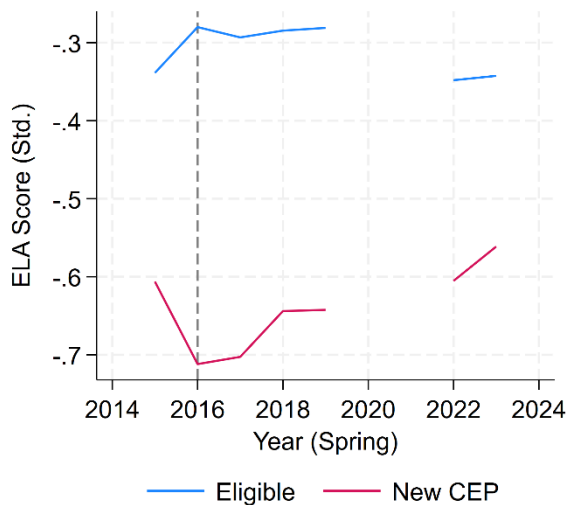
### IMPACT OF CEP ON TEST SCORES

Figure 3 Panels A through D show simple trend analyses for average ELA and math standardized test scores for the 2016 and 2021 cohorts of new CEP schools. Panel A shows that standardized ELA scores for the 2016 cohort of CEP schools declined from -0.61 to -0.71 between 2014-2015 and 2015-2016, while they increased slightly for non-CEP schools. ELA scores move in opposite directions for these groups of schools in subsequent school years, with scores in CEP schools increasing and those in non-CEP schools decreasing. Panel B shows the consequences of the gap in information for the 2021 cohort of CEP schools; only two years of data are available beginning in the year after the first year of implementation, so no firm conclusions should be drawn from these data. Interestingly, trends in ELA scores for CEP and non-CEP schools for both the 2021 and 2016 cohorts follow a similar pattern, with declines in 2016 for CEP schools and increases for non-CEP schools. This suggests that factors other than CEP implementation were driving differential test score outcomes for these groups of schools over the post-implementation period.

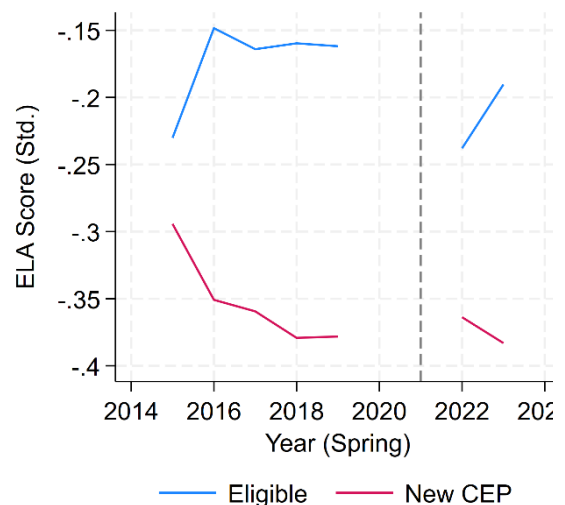
Figure 3 Panel C shows trends in standardized math scores for the 2016 cohort of schools. Similar to ELA scores, math scores for CEP schools declined in the first year of implementation (from -0.65 to -0.72) before rebounding. However, in the case of math, scores increase each year to the point that they are higher than they were before CEP implementation. Panel D shows trends for the 2021 cohort of schools, though, again, no firm conclusions should be drawn from this analysis. Due to the abbreviated time series available with test scores, a complementary quasi-experimental analysis is not feasible.

**Figure 3: Standardized Test Scores, by Cohort**

**Panel A: ELA scores, 2016**

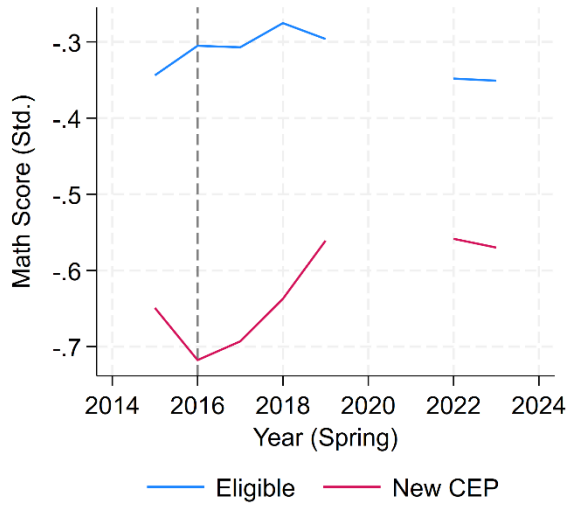


**Panel B: ELA scores, 2021**

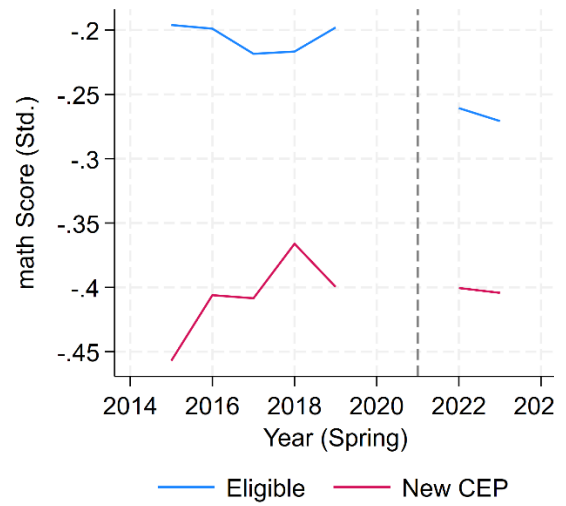




Panel C: Math Scores, 2016



Panel D: Math Scores, 2021



**Note:** Figures show school average ELA and math standardized scores for the 2014-2015 through 2022-2023 school years, weighted by prior enrollment. Vertical dotted lines indicate the year in which CEP was first administered for new CEP schools.

## Summary and Conclusion

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The following points summarize the analysis of CEP implementation:

- CEP was introduced unevenly over the period 2015 to 2023 in Maryland, with some years seeing a large introduction of new CEP schools and other years seeing few new schools adopting the program.
- The largest increases in new CEP schools were in school year 2015-2016, when the majority of new schools were in Baltimore City, and in school year 2020-2021, when the majority of new schools were in Baltimore County.

The following points summarize the analysis of CEP impacts:

- On average, participation in free meals increased 13-15 percentage points after CEP was introduced in schools.
  - This change was immediate, although there is some evidence (i.e., the 2016 cohort of schools) that participation declined after the initial spike.
  - This is higher than the impact found in Texas and New York (Schneider et al., 2021, Rothbart et al., 2023), but lower than impact found using national data (Ruffini, 2022).
- There were small increases in absenteeism and decreases in suspensions after the introduction of CEP. For example, chronic absenteeism increased 2.1 percentage points compared to eligible schools, and this difference was found to be statistically significant. In secondary schools, chronic absenteeism increased by 4.6 percentage points, while the rate of suspensions decreased by 9%.
  - This report provides some evidence that impacts changed over time. Analysis of data for the 2016 cohort of schools, for example, shows a small drop in absenteeism and chronic absenteeism in the year of CEP implementation followed by increases in the years after, while suspensions increased slightly followed by decreases in the years afterward.
  - The impact on suspensions is close to the impact observed in Oregon (Domina et al., 2024) and higher than the impact found using national data (Gordon and Ruffini 2018).
- The analysis of test scores is limited by a lack of data from 2020 and 2021. For the 2016 cohort of CEP schools, there were immediate declines in test scores followed by a rebound, particularly in math. This finding is elaborated in the discussion section, but the lack of trend data limits the ability to more convincingly establish that this improvement was caused by CEP.

The above analysis examines the impacts of CEP in schools after it was implemented according to the available data, but it is possible these changes were not due directly to the impacts of CEP. The following points address alternative explanations for study findings, which are explained in more detail in Appendix B:

- **Data limitations in and after 2019-2020** – For a multitude of reasons, data from 2019-2020 and afterward may be considered less reliable than prior data. In short, analysis focusing only on pre-covid-affected years finds broadly similar results to the full analysis, suggesting study conclusions are not affected by any data limitations in these years.

- **The effect of other programs and/or resources** – Although it is not possible to investigate the potential effects of the many other programs and/or resources implemented in Maryland schools during the time period of analysis, additional analyses do not find evidence that implementation of the Maryland Meals for Achievement (MMFA) differentially affected one group of schools (CEP and/or CEP-eligible) over another. Nevertheless, this is one area that is worth carefully considering in interpreting the findings of this study.
- **Schools moving from CEP-eligible to CEP** – Although it is possible for schools to have changed their status from “CEP-eligible” to “CEP” over the period of analysis, additional analyses do not support the idea that this affected study conclusions.

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## Appendix A: Technical Details on Methodology

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The analysis of CEP impacts uses a difference-in-differences design, modeling changes in outcomes using a series of two-way fixed effects linear regression models for cohorts of schools. Based on availability of outcome data, analysis of impacts on free meals includes the years 2015 through 2023, and analysis of impacts on absenteeism and suspension includes the years 2012 through 2023. Formally, the models use the following equation:

$$Y_{st} = \beta_0 + \beta_1 CEP_{st} + \gamma_t + \mu_s + \epsilon_{st}$$

In this equation,  $Y_{st}$  is an outcome variable (the percentage of students receiving free meals, attendance, suspensions, or test scores) for school  $s$  in academic year  $t$ , and  $CEP_{st}$  is a dummy variable that equals 1 if a school received CEP in that year or a year prior, and zero if a school was yet to receive CEP or was eligible but never received CEP. This equation includes fixed effects (separate dummy variables) for academic year ( $\gamma_t$ ) and school ( $\mu_s$ ). All models include weights that equal the proportion of total students at a school for the first year it appears in the dataset (weights sum to one). To produce the event study graphs in Appendix C, the above equation is re-estimated by replacing the  $CEP_{st}$  variable with a series of separate dummies for each event time, with  $t = -1$  (1 year prior to CEP) set as the reference period. For schools that were eligible but never received CEP, their  $t$  is equal to zero. All standard errors are clustered by LEA.

## Appendix B: Threats to Validity

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The following investigates potential threats to the conclusions of the quasi-experimental analysis:

- **Data limitations in and after 2019-2020** – There are at least three reasons for why data from the 2019-2020 school year and afterward should be treated with some caution: 1) In Maryland (as elsewhere), there were widespread school closures starting in the spring of 2020 and into the 2020-2021 school year. 2) As is clear from the graphs, there were large changes in CEP eligibility starting in the 2020-2021 school year. 3) There are some concerns that key outcomes (namely, suspensions and attendance) were measured inconsistently in the 2019-2020 and 2020-2021 school years. One way to avoid problems arising from these data limitations is to focus only on the school years prior to 2019-2020. The graphs of outcome trends for the 2016 cohort of schools generally support the conclusions of the quasi-experimental analysis. Additionally, Appendix Table 3 repeats the quasi-experimental analysis but restricts to the 2011-2012 to 2018-2019 school years. The table shows broadly similar patterns in impact estimates for these cohorts as for the full analysis, with some differences in magnitudes by school level.
- **The effect of other programs and/or resources**– Although it is not possible to investigate the potential effects of the many other programs and/or resources implemented in Maryland schools during the time period of analysis, it is helpful to consider how they could impact study conclusions. Because the analysis in this report focuses on differences in trends in outcomes between schools, other programs and/or resources would have to have been implemented in a way that differentially affected a specific group of schools (CEP or CEP-eligible) over time. The following address a couple of points in this regard:
  - Maryland Meals for Achievement (MMFA) – Appendix Table 4 shows there is no evidence that MMFA was implemented at differential rates between groups of schools over the period of analysis; in other words, CEP schools do not appear to be more or less likely to implement MMFA in the year of, the year prior to, or the year after CEP implementation.
  - “Parallel trends” - the difference-in-differences analysis relies on the assumption of “parallel trends;” that trends in outcomes would have followed a parallel path even if CEP had never been implemented in any schools in Maryland. Although this cannot be directly tested, it is common to look for evidence by inspecting the presence of pre-period differential trends. In Appendix Figure 1, if the trend lines in these plots move diagonally toward or away from zero in the years leading up to CEP implementation, this is taken as evidence for a violation of pre-trends. Importantly, formal statistical tests for the joint significance of the pre-period coefficients shown in each of the plots suggests violations for percentage of free meals for all schools ( $p = 0.09$ ), and logged percentage of students suspended for elementary schools ( $p = 0.08$ ), though these are not statistically significant at the 5% level. Overall, this is not considered to be strong evidence for a violation of pre-trends, but there is some reason to be cautious.
- **Schools moving from CEP-eligible to CEP** – This is also related to a common technical issue arising when the roll-out of a program is “staggered,” such as with CEP where different cohorts of schools adopt the program at different times (Baker et al., 2022). One way to ease concerns related to this critique is to simply show raw trends in outcome measures, as we have done with the 2016 and 2021 cohorts. A further way is to supplement with an analysis using stacked regression (Baker et al., 2022; Chin, 2022), the results of which are presented in Appendix 5. The pattern of results is similar; increases in the percentage of students participating in free meals, increases in absenteeism, and declines in suspensions.

## Appendix C: Additional Tables and Figures

**Table 1: Descriptive Characteristics of Schools**

Characteristic	2016 Cohort Eligible	2016 Cohort CEP	2021 Cohort Eligible	2021 Cohort CEP	All Schools in First Year Receiving CEP <sup>^</sup>
<b>Number of Students</b>	520	474	511	582	512
<b>Female</b>	0.47	0.48	0.47	0.47	0.48
<b>Race/Eth</b>					
<b>Asian</b>	0.02	0.01	0.01	0.04	0.02
<b>Black</b>	0.34	0.83	0.33	0.51	0.66
<b>Hispanic/Latino</b>	0.14	0.08	0.15	0.14	0.11
<b>White</b>	0.43	0.08	0.43	0.24	0.18
<b>Other</b>	0.07	0.01	0.07	0.07	0.04
<b>Serv. Group</b>					
<b>Students w/ Disabilities</b>	0.15	0.19	0.15	0.16	0.18
<b>Multilingual Learners</b>	0.08	0.04	0.08	0.09	0.07
<b>Rec. Free &amp; Reduced Meals</b>	0.71	0.74	0.66	0.54	0.67
<b>Number of Schools</b>	169	189	78	127	366

**Note:** Table shows student characteristics of schools by cohort and CEP status. Each value shown is a proportion unless otherwise indicated. <sup>^</sup> Although there were 377 total CEP schools that successfully merged with EDW data, 11 of them changed CEP status over the time period so they are dropped from the analysis.

Non-transformed impact estimates

**Table 2: Impact on Absenteeism and Suspensions (Non-transformed)**

**Panel A: Rate of Absenteeism**

Parameter	Elementary	Secondary	All
<b>Coeff.</b>	-0.001	0.016*	0.004
<b>S.E.</b>	(0.003)	(0.006)	(0.003)
<b>N</b>	2,422	1,272	4,897

**Panel B: Proportion of Students Suspended**

Parameter	Elementary	Secondary	All
<b>Coeff.</b>	-0.000	0.002	0.000
<b>S.E.</b>	(0.004)	(0.005)	(0.003)
<b>N</b>	2,422	1,272	4,897

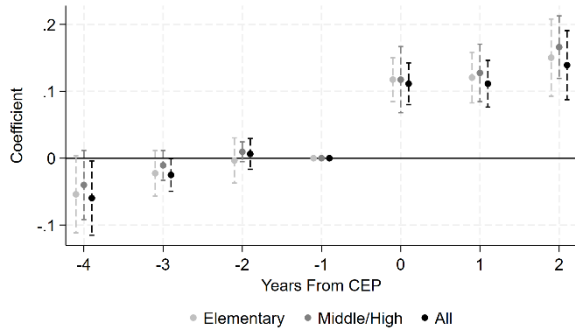
**Note:** Table Panels show results of separate regressions that use equation xx to estimate the impact of CEP on the proportion of students receiving free meals. See appendix A for more information on regressions.



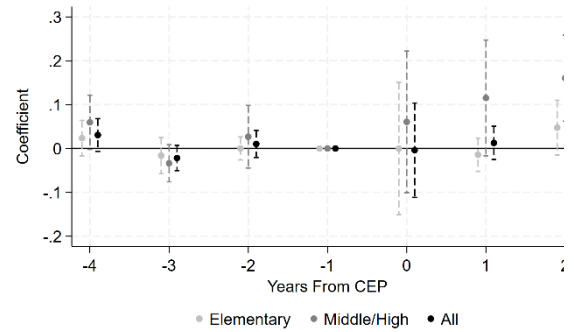
Event Study Results

Figure 1: Event Study Results

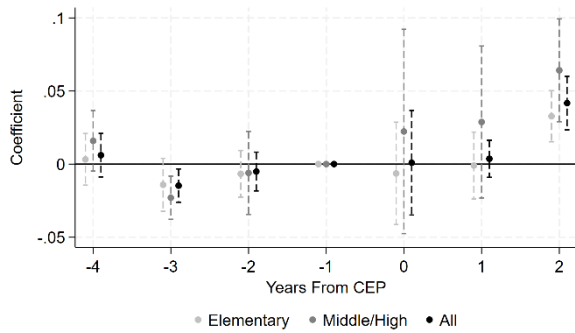
Panel A: Percentage of Students Receiving Free Meals



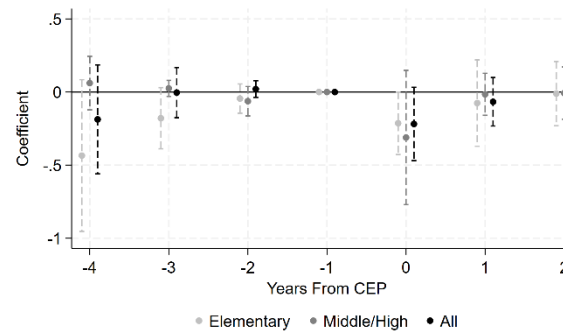
Panel B: Rate of Absenteeism (logged)



Panel C: Rate of Chronic Absenteeism



Panel D: Rate of Suspensions



**Note:** Figure Panels show results of separate regressions to estimate the impact of CEP on the proportion of students receiving free meals. 95% confidence intervals are shown. See Appendix A for more information on regressions.

Impact estimates for non-Covid-affected years

**Table 3: Impact on Participation, Absenteeism and Suspensions (2012-2019)**

**Panel A: Participation in Free Meals (2015-2019)**

Parameter	Elementary	Secondary	All
Coeff.	0.114***	0.139***	0.108***
S.E.	(0.013)	(0.020)	(0.012)
N	1,016	518	2,040

**Panel B: Rate of Absenteeism (logged)**

Parameter	Elementary	Secondary	All
Coeff.	0.031	0.172***	0.070**
S.E.	(0.015)	(0.031)	(0.019)
N	1,567	843	3,230

**Panel C: Proportion of Students Chronically Absent**

Parameter	Elementary	Secondary	All
Coeff.	0.026***	0.073***	0.037***
S.E.	(0.006)	(0.014)	(0.007)
N	1,567	843	3,230

**Panel D: Proportion of Students Suspended (logged)**

Parameter	Elementary	Secondary	All
Coeff.	-0.221*	0.018	-0.134
S.E.	(0.099)	(0.070)	(0.066)
N	1,500	833	3,098

**Note:** Table Panels show results of separate regressions that estimate the impact of CEP on the proportion of students receiving free meals, absenteeism, and suspensions. See Appendix A for more information on regressions.

Adoption of MMFA

**Table 4: Implementation of Maryland Meals for Achievement (MMFA), by CEP Cohort**

Year	2015 Cohort Elig.	2015 Cohort CEP	2016 Cohort Elig.	2016 Cohort CEP	2017 Cohort Elig.	2017 Cohort CEP	2018 Cohort Elig.	2018 Cohort CEP	2019 Cohort Elig.	2019 Cohort CEP	2020 Cohort Elig.	2020 Cohort CEP	2021 Cohort Elig.	2021 Cohort CEP	2022 Cohort Elig.	2022 Cohort
2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2016	0.06	0.60	0.79	0.06	0.76	0.88	0.79	0.94	0.88	0.67	0.85	1.00	0.76	0.67	0.72	0.40
2017	0.05	0.60	0.80	0.05	0.78	0.88	0.80	0.83	0.89	0.67	0.88	1.00	0.77	0.71	0.75	0.40
2018	0.05	0.69	0.83	0.05	0.81	0.88	0.80	0.94	0.91	0.50	0.90	1.00	0.79	0.79	0.78	0.40
2019	0.05	0.69	0.81	0.05	0.81	0.88	0.80	0.89	0.89	0.75	0.90	1.00	0.77	0.82	0.75	0.40
2020	0.05	1.00	0.83	0.05	0.82	0.88	0.83	0.89	0.93	0.75	0.90	0.75	0.81	0.83	0.79	0.40
2021	0.91	1.00	0.84	0.91	0.85	1.00	0.83	0.89	0.95	0.75	0.93	1.00	0.82	0.91	0.81	0.40
2022	0.06	0.92	0.87	0.06	0.85	1.00	0.84	1.00	0.93	0.88	0.90	0.75	0.82	0.90	0.81	0.40

**Note:** Table shows the proportion of schools by cohort, CEP status and year implementing MMFA. See Table 2 for counts of schools in each cohort and note that counts may differ by year due to school closures.

Impact estimates using stacked regression

**Table 5: Impact on Participation, Absenteeism and Suspensions (2012-2023)**

**Panel A: Participation in Free Meals (2015-2023)**

Parameter	Elementary	Secondary	All
<b>Coeff.</b>	0.125***	0.148***	0.112***
<b>S.E.</b>	(0.025)	(0.011)	(0.015)
<b>N</b>	449,581	199,955	749,030

**Panel B: Rate of Absenteeism (logged)**

Parameter	Elementary	Secondary	All
<b>Coeff.</b>	0.066	0.109	0.091
<b>S.E.</b>	(0.047)	(0.076)	(0.047)
<b>N</b>	649,051	324,072	1,184,257

**Panel C: Proportion of Students Chronically Absent**

Parameter	Elementary	Secondary	All
<b>Coeff.</b>	0.035*	0.056*	0.042**
<b>S.E.</b>	(0.016)	(0.025)	(0.015)
<b>N</b>	649,051	324,072	1,184,257

**Panel D: Proportion of Students Suspended (logged)**

Parameter	Elementary	Secondary	All
<b>Coeff.</b>	0.002	-0.077	-0.018
<b>S.E.</b>	(0.170)	(0.103)	(0.056)
<b>N</b>	589,218	319,630	1,099,752

**Note:** Table Panels show results of separate regressions that use a stacked regression to estimate the impact of CEP on the proportion of students receiving free meals, absenteeism, and suspensions. See Appendix A for more information on regressions.