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The Effects of Lump-Sum Food Benefits During the COVID-19 Pandemic on Spending, Hardship, and Health

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Abstract

This paper examines how providing families with lump-sum in-kind assistance during the pandemic affected food hardship, economic well-being, and maternal health. The researchers study the introduction of a new program, P-EBT, that provided grocery vouchers worth approximately $300 per student during spring and summer 2020. Using cross-state variation in program timing, they find that families spent $18-42 per student per week in the 6 weeks after benefit receipt. Household food insufficiency and children's food insecurity among low-income families declined by 27-49% in the month following receipt, and maternal mental health improved by 0.9 standard deviation.

1. Introduction

Economic downturns frequently lead to increased food insecurity as the number of households being unable to afford basic necessities rises. The experience during the COVID-19 pandemic was no different. During spring and summer 2020 when unemployment soared to unprecedented levels, about 27% of households with children reported sometimes or often being unable to afford food (U.S. Census Bureau Household Pulse Survey 2020). While this high level of insecurity partially reflected the severe downturn, factors unique to the pandemic setting, such as stay-at-home orders, school closures, and business restrictions likely contributed to this hardship. Over this period, federal and state governments implemented numerous innovative programs in an effort to stabilize the economy and households' balance sheets (Ruffini and Wozniak 2021). In many cases, however, empirical evidence on the effects of these programs remains unknown, even years later. Yet the pandemic-era policy environment provides a valuable opportunity to examine the effectiveness of safety net expansions, which may inform how policymakers design responses to future economic crises.

Nutrition assistance programs are particularly important to evaluate as food hardship presents both short- and long-term costs (Hoynes and Schanzenbach 2019). For children, food insecurity is associated with worse health (Case, Fertig, and Paxson 2005) and poorer academic outcomes (Jyoti, Frongillo, and Jones 2005) such as lower test scores and difficulty getting along with others (Howard 2011). In the long-term, exposure to adverse economic shocks during childhood negatively affects health and economic outcomes into adulthood (Hoynes and Schanzenbach 2018). Therefore, the food insecurity patterns we observe today shape well-being and economic performance not just now, but potentially for decades to come.

While many permanent programs, such as the Supplemental Nutrition Assistance Program (SNAP, formerly food stamps) are countercyclical (Bitler and Hoynes 2016, Ganong and Liebman 2018), there are reasons to expect that the existing safety net may be inadequate in helping households weather an economic downturn, particularly one in which schools and businesses are closed. Households frequently exhaust monthly SNAP benefits in the first weeks after receipt, leading to fluctuations in both consumption and nutritional intake over the month (Hastings and Washington 2010, Wilde and Ranney 2000, Shapiro 2005, Seligman et al. 2014, Hamrick and Andrews 2016). Increasing SNAP payments has been shown to reduce this volatility (Todd 2015, Todd and Gregory 2018).

The existing literature investigates consumption responses to nutrition assistance examines programs that are recurrent monthly in-kind benefits, like SNAP. More broadly, the literature on consumption responses to safety net programs has focused on either recurrent in-kind benefits or intermittent one-time cash transfers (such as the Earned Income Tax Credit (EITC) or stimulus checks) and has not included measures of subjective well-being. Therefore, it is unclear how families respond to one-time, lump-sum increases in nutrition assistance as such programs are unprecedented.

In this paper, we provide new information on the spending responses of a one-time, in-kind transfer, and how this influx of resources maps onto measures of reported well-being, including food hardship and maternal mental health. We examine these questions in the context of additional nutrition assistance during the spring and summer of 2020 when widespread school closures due to the onset of the COVID-19 pandemic cut off access to school meals for more than 20 million students who had been receiving free or reduced-price school meals. In response, Congress authorized a new program, Pandemic Electronic Benefit Transfers (Pandemic EBT, or "P-EBT"),

to provide grocery vouchers equivalent to the dollar value of missed school meals to families that were affected by COVID-related school closures and whose children were eligible to receive free school meals. P-EBT was different from many existing programs in that it provided lump-sum, in-kind benefits; in contrast, other assistance programs are recurrent cash or in-kind transfers or are lump sum cash payments.

As a state-led program operating for the first time during a crisis, there was substantial idiosyncratic variation across states in the implementation of P-EBT that was uncorrelated with other state policy or political conditions. We leverage variation in the initial disbursement of benefits from April through August 2020—a period with universal school closures—combined with biweekly data on food hardship and household well-being, as well as weekly data on EBT spending to provide some of the first evidence on how P-EBT affected spending, food hardship, and household well-being.[3]

We find that that P-EBT benefits are spent across many weeks. Average weekly state-level EBT spending per student eligible for free or reduced-price meals increased by $18-42 in each of the subsequent six weeks after P-EBT payments are first made in a state. This spending pattern is both more modest and more sustained than the sharp, short-lasting increase in spending immediately after households receive other forms of assistance like SNAP (Hastings and Washington 2010; Wilde and Ranney 2000, Todd 2015, Todd and Gregory 2018, Shapiro 2005) or the EITC (Alagangady et al. 2023). Moreover, volatility in SNAP redemptions is less pronounced in the month after families receive P-EBT. These spending patterns suggest that families spend one-time nutrition assistance differently than routine benefits and that such transfers

[3] See Bonomo et al. (2024) for a more detailed investigation of household shopping patterns.

can smooth short-term spending volatility, consistent with earlier work finding greater consumption smoothing with increased SNAP benefits (Todd and Gregory 2018).

In the month following disbursement, families also report lower levels of food hardship, with household reports of food insufficiency falling by 30 percent and very low food security among children falling by approximately half. We also find short-term improvements in mothers' mental health. While the improvements in mental health are concentrated in the weeks immediately after receipt, the reduction in reported food insufficiency persists for at least a month after disbursement—the period for which we observe higher benefit spending. That reduced food hardship coincides with the period over which spending increases points to the potential of additional assistance to reduce nutritional fluctuations over the benefit month, with potential consequences for healthcare utilization (Hamrick and Andrews 2016, Seligman 2014, Cotti, Gordanier and Ozturk 2020). While annual cash-based assistance has been shown to improve maternal mental health (Evans and Garthwaite 2014), our results provide novel evidence that in-kind nutrition assistance can yield similar benefits. Both the improvement in maternal mental health and reported reduction in food hardship dissipate more quickly than the spending response.

2. The COVID-19 pandemic and the P-EBT program

2.1 Early COVID pandemic

In spring 2020, the U.S. economy experienced the sharpest contraction on record as businesses and schools closed in the wake of the COVID-19 pandemic. The economy hit a trough in April 2020, when the unemployment rate soared to 14.8%. Although it retrenched quickly from this high, the unemployment rate remained elevated throughout the summer, standing at 7.8% in September 2020 compared to 3.5% a year prior. Accordingly, household income fell due to job

loss and reduced working hours, particularly at the lower end of the income distribution (Shrider et al. 2021).

Some existing safety net programs, such as SNAP and Unemployment Insurance (UI), served as automatic stabilizers and partially replaced this lost income (Hembre et al. 2024, Bitler et al. 2023a). In addition, these programs were modified in an attempt to stabilize the economy—for example, UI was expanded in benefit amount and eligibility and SNAP benefits were increased for most households and the requirement to recertify for benefits was temporarily suspended for current participants (Hembre et al. 2024, Ruffini and Wozniak 2021, Bitler et al. 2020a, 2020b, 2020c). In addition, Congress created new programs and passed new rules. In addition to P-EBT, more than 160 million families received stimulus checks ("Economic Impact Payments") of up to $1,200 per adult and $600 per child prior to our analysis period in April 2020 (U.S. Internal Revenue Service 2024). There were also eviction moratoria in place in various forms throughout our sample period from March 2020 through August 2021 (Keene et al. 2023). Appendix Figure A1 shows the timing of several of the largest programs implemented or expanded during the period using daily Treasury disbursement data (throughout this period, P-EBT is reported with SNAP). The figure shows that of these programs, UI was the largest during our analysis period. The large cash assistance payments through the Economic Impact Payments (EIP) and expanded Child Tax Credit (CTC) were made outside of our sample window.

The net effect of these policy changes was a reduction in the annual poverty rate under the Supplemental Poverty Measure (SPM), a metric that includes taxes and transfers (Fox and Burns 2021). However, when using a monthly measure of income, SPM poverty increased beginning in April 2020 after most of the initial round of stimulus checks had been paid (Parolin et al. 2022).

Despite the robust policy response, many families faced economic challenges. UI payments were delayed in many states (Ruffini and Wozniak 2021) and some families were ineligible for additional assistance, including the lowest-income families already receiving the maximum SNAP amount, immigrants, and those who did not qualify for UI (Bitler et al. 2020a, 2020b). For many families, the hardship from lost income was compounded by widespread childcare and school closures and rising food prices.

One factor that likely contributed to this hardship was the loss of school meals related to school closures. The school meals programs (collectively the National School Lunch Program and the School Breakfast Program) are a substantial source of nutrition assistance to school-aged children. In 2019, approximately 20 million children – 38 percent of the population aged 5-17 – received a free school meal on a typical school day; for comparison about one in five receive SNAP benefits (USDA 2024, King and Giefer 2021). The school meals programs are also a sizable in-kind transfer to low-income families with a fungible value of approximately $6.50 per student per school day in 2023, compared to a maximum per-person SNAP benefit of about $8 per (calendar) day for a family of three (USDA 2022). To receive free school meals, students' families must certify that their family income is no more than 130 percent of the federal poverty line (in 2023, $32,318 for a single parent with two children and $39,000 for a family of four), receive SNAP or Temporary Assistance for Needy Families (TANF), or attend a school that offers a schoolwide free meals program.[4]

[4] Schoolwide free meals programs include Provisions I-III, and the Community Eligibility Provision (CEP). In 2019, approximately 14 million students attended a CEP school (Billings and Carter 2020), most of whose families also received SNAP.

To compensate families for the value of forgone school meals, Congress authorized a new program in March 2020, P-EBT, to provide families with benefits in the amount of the value of the free school breakfasts and lunches missed due to pandemic-related school closures.[5]

2.2 Design of P-EBT

P-EBT was a new program that functioned similarly to SNAP: families that were eligible for free and reduced-price school meals received benefits on an EBT debit card, which could then be used to purchase food at most grocery stores.[6] P-EBT was a voluntary, federally funded, state-led program: states and territories had to apply to USDA by submitting an implementation plan. While every state and territory eventually submitted a plan and received approval to implement P-EBT for the 2019-20 school year, states implemented the program on different schedules (Gupta et al. 2021). Crucial for this analysis, states varied in how much time it took to develop an implementation plan (which was driven in large part by whether student-level data were readily available and could be integrated with SNAP EBT systems), obtain approval from USDA, and begin disbursing benefits (Koné Consulting, 2020).

There is relatively little variation in the per-child amount awarded through the first P-EBT disbursement. By formula, payments per student were calculated as the daily federal reimbursement to schools for free-price breakfasts and lunches ($5.70 in the 48 contiguous states and D.C.) multiplied by the average number of school days missed due to pandemic-related school closures.[7] Most states closed schools within days of March 15, 2020, and were closed for the rest

[5] Because we examine a period in which school was not in session for nearly all students, we are unable to speak to the relative efficiency of providing nutrition assistance through school-based or household programs. Bauer et al. (2023) note that when children are in primarily eating meals at home, providing resources directly to families is likely more efficient than when students are in congregate settings. Some evidence on this point is provided by the low take-up rates of "grab-and-go" brownbag school meals in the early months of the pandemic (Bauer et al. 2020).
[6] In particular, P-EBT could be used to purchase SNAP-eligible foods at food retailers that accept SNAP benefits.
[7] Rates were $6.66 and $9.16 per day in Hawaii and Alaska, respectively.

of the academic year, so cross-state differences in the payment amount was determined by planned vacation days and timing of the end of the school year. Almost all states made a single lump-sum payment for the number of school days missed from March 2020 through the end of the school year.[8] Based on information in state plans issued to USDA, the average payment was $311 per child, with a difference in disbursement amounts between the 25th ($268) and 75th ($332) percentile of states of $64 per student. This average P-EBT payment amount is nearly twice the maximum per-person monthly SNAP benefit for a family of 3 in 2020 ($170).

Families that were participating in SNAP did not need to apply to the program or go through other administrative burdens to obtain the benefits. For these families, P-EBT was automatically added to their existing EBT cards. Families that were not on SNAP but were receiving free school meals were issued new EBT cards loaded with the P-EBT benefits. In states like California, Florida, Missouri, and Texas, non-SNAP families had to proactively apply for the benefits through portals that states or schools developed. Other states, such as Minnesota, Nevada, and Ohio, relied on existing administrative linkages across programs when possible. Yet other states, such as Louisiana, developed these administrative linkages to process P-EBT.

No matter how strong the administrative linkage was, some eligible non-SNAP students could not be identified immediately, requiring additional follow-up and retroactive payments at later dates. This process and the need to issue new EBT cards resulted in later and more varied disbursements for SNAP non-participants. While many states issued at least some payments to non-SNAP households the same day as SNAP households, in other states, the first non-SNAP households received payments 3-4 weeks later. Because administrative burdens and the timing of receipt varied substantially across and within states for the non-SNAP population, we focus on

[8] About 84% of students lived in states that reported making one payment to SNAP families during summer 2020 (U.S. Department of Education 2023).

families that were income-eligible for SNAP and therefore less likely to be affected by such application processes and retroactive payments and for whom we can better identify the timing of receipt. This population is a large share of children who eventually received P-EBT, as approximately 60% of students who receive free or reduced-price meals participate in SNAP (Federal Register 2016).

2.3 Timing of P-EBT disbursements

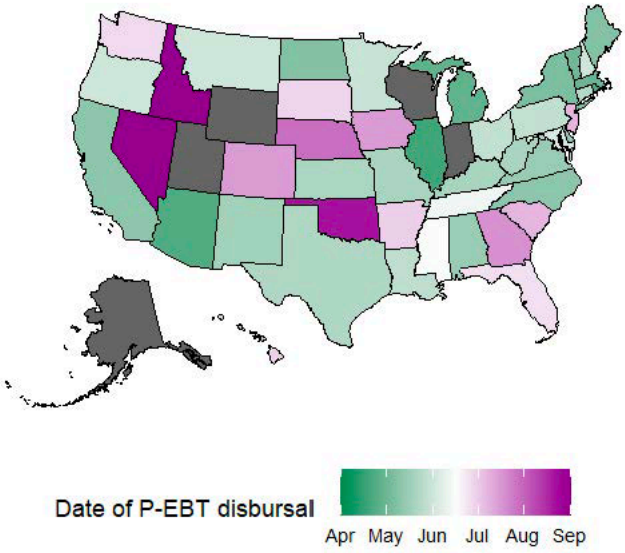
Below we estimate the impact of P-EBT payments on a series of outcomes using event-study and difference-in-differences frameworks. We combine several sources of information to construct a database that captures the first date that P-EBT benefits were paid to SNAP-participating families in each state from April through August 2020. Our first source is drawn from correspondence with state and D.C. school nutrition officials between June 2020 and August 2022. We contacted each state at least three times and we received information on P-EBT disbursement dates from 46 states (of the remaining five states, four reported that they had not disbursed benefits by the end of August 2020). Subsequently we issued Freedom of Information Act (FOIA) requests to all 50 states and D.C. requesting more detailed information about the dates of disbursement, the populations receiving each disbursement (SNAP recipient households, non-SNAP recipient households, school-aged children, and childcare populations), the number of children or families receiving each disbursement, and any application processes. Forty-one states and D.C. provided specific date and population information through the FOIA process. From these sources we have reports of exact dates of initial P-EBT payments to SNAP-participating families. We collect a third source of P-EBT payment timing from USDA public reports that include only the month(s) (but not specific days) in which payments were made.

In eleven cases, there were discrepancies between the payment dates provided through the FOIA requests and those obtained via the earlier correspondence. We reconciled both sources with the state-by-month disbursement information published by USDA and selected the date that corresponded to the first month that states began issuing benefits.[9] When there was disagreement within the month between the FOIA and initial requests, we use the date provided through the FOIA request. We drop five states (AK, IN, UT, WI, and WY) with conflicting dates across all three sources. Appendix Table A1 summarizes the date provided through each measure and the states used in the event-study and difference-in-differences analyses.[10]

Figure 1 illustrates timing in initial P-EBT disbursements across states over time. The first states issued benefits in April 2020 and the last states that made payments during our analysis period issued them in August 2020. Note that the five states that are dropped due to irreconcilable dates are in gray.

[9] We include Michigan even though the reported dates fall in different months because they are within 3 days of each other and include Idaho as all sources report payments were issued after the end of our analysis period.
[10] Appendix Table A8 replicates our analysis using the first month that P-EBT appears in the USDA data without leveraging any information collected from state officials. For both measures of food hardship, improvements are sharply attenuated under this approach, highlighting the importance of more precise daily payment data, particularly when considering safety net programs where changes are immediate or short-lived (Aladangady et al. 2023).

Figure 1: P-EBT initial payment timing



Note: Figure shows when each state issued the first P-EBT payment. States shaded in gray are excluded from the analysis; states in dark purple had not disbursed the first payment by mid-August 2020.

The identifying assumption for a causal interpretation in our event-study and difference-in-differences models below is that the timing of states' initial payment of P-EBT benefits is not correlated with the timing of other factors affecting food hardship, spending, or family well-being. While this assumption is not directly testable, Appendix Table A2 presents results from a regression where the dependent variable is either the day (column 1) or HPS survey wave (column 2) of initial P-EBT disbursement among states that made payments between April through August 2020. States with a larger school-age population (as a share of the total population) tended to implement P-EBT later in the period. However, no other state demographic, economic, policy or political factor in the model predicts P-EBT timing, including measures of welfare state generosity (minimum wage, EITC), administrative burden (proxied by broad-based categorical eligibility for SNAP and UI processing delays), or COVID responses (mask mandate or stay-at-home-order). Altogether, these observable characteristics account for less than 40% of the timing of P-EBT disbursement, supporting the assumption that implementation timing is as-good-as-

random across states. To further ensure that our results are not capturing COVID policy responses changing at the same time, all of our results control for whether a stay-at-home order, mask mandate, or indoor restaurant closure was in effect, as well as the share of UI claims processed during the survey month that were within 1 week or 2 weeks of claim filing, and the share delayed by more than 10 weeks.

3. Data

We combine survey and administrative data with timing of P-EBT payments to measure the impact of payments on spending and well-being. We describe each data source below.

3.1 Administrative data on state-level benefit spending and economic conditions

To determine how quickly P-EBT benefits were spent after states issued payments to families, we obtain administrative data on benefit spending from the USDA's Store Tracking and Redemption System (STARS) for 2015 through 2020. Establishing such a "first-stage" is crucial, particularly in the policy environment discussed in Section 2.1 when there were a number of policy changes occurring in spring and summer 2020. STARS provides the dollar amount of all EBT spending (SNAP until 2020 and P-EBT and SNAP combined from 2020) at the state-by-week level. These aggregate data do not separate P-EBT from SNAP spending or distinguish spending by SNAP households from those who received P-EBT but not SNAP. With these caveats in mind, the STARS data allow us to examine how total EBT spending responds following initial P-EBT payments. We divide the total redemptions by the number of students eligible for free- or reduced-price meals in order to provide a measure that is comparable across states and use data covering the same period for which we have HPS data (described below, April 23 through August 31, 2020).

We also use state-level administrative data on the unemployment rate and number of workers claiming UI to test whether P-EBT timing was correlated with other state-level economic factors. These data are provided by the federal Department of Labor and show the insured unemployment rate (the number of workers receiving UI benefits divided by the number of jobs covered by UI) and the UI claimant rate per FRP student (the number of UI claims divided by the number of students eligible for free- or reduced-price meals). Again, we use data for the period covered by the HPS data.

3.2 Household Pulse Survey data

Data on food hardship and reported household well-being come from the Census Bureau's Household Pulse Survey (HPS). We use the first 13 waves of HPS data collection spanning April 23 through August 31, 2020. During this period, HPS was collected approximately every two weeks. HPS data include standard demographic information, the respondent's state of residence, and questions about households' economic and health status. The nature of these questions, combined with the high frequency of the data, provides a unique opportunity to identify the short-term effects of policy changes across the country.

We examine the effects of P-EBT on two measures of food hardship. First, "food insufficiency" is defined as whether the respondent reports that their household sometimes or often did not have enough to eat over the previous seven days. Second, very-low food security among children is whether the respondent reports that in the last seven days the children in the household sometimes or often did not eat enough because the household could not afford food.

Respondents are also asked to report the frequency over the past week that they experienced a range of poor mental health symptoms, with options ranging from not at all, to several days, to

nearly every day. Outcomes include the four following domains: being nervous, anxious, or on edge; being unable to stop worrying; having little interest or pleasure in doing things; and being down, depressed or hopeless. We combine responses to these four questions, standardizing them into a z-score to measure mothers' current mental health so that higher values indicate worse mental health. We also explore a "stock" version of health measures as the response to where one's health "in general" ranges from excellent to poor. As a measure of general household financial health, we use the response to a question on the respondent's confidence their household will be able to afford the kinds of food they need over the next four weeks.

Respondents are also asked to report their total spending on food to prepare and eat at home over the past week, including purchases made with SNAP.[11] We scale this spending by the number of children in the household, and take its log. This measure of spending is complementary to the STARS data; while it has the advantage of being available for our target population (SNAP-eligible households), it is prone to concerns of measurement error: Appendix Figure A2 shows the distribution of reported spending prior to receiving P-EBT. During this period, nearly 15% of households in our sample reported spending exactly $200 and 70% report food spending in multiples of $50.[12] Given the pronounced heaping, this measure of spending, while having the advantage of focusing on our low-income population with children, is prone to concerns of attenuation bias.

SNAP benefits typically do not fully cover households' food budgets and represent less than 67% of grocery spending for 26% of SNAP recipients (Hoynes, McGranahan, and Schanzenbach 2015). Although P-EBT can only be used for grocery purchases, for some families

[11] Respondents were instructed to exclude any spending on alcoholic beverages.
[12] In contrast, only 4% of households overall (3.6% of households reporting SNAP receipt) in the 2019 December Current Population Survey report spending exactly $200 on food in the prior week, and 35% (overall and among SNAP recipients) report spending in multiples of $50.

this assistance is inframarginal in the sense that they would normally spend more than their SNAP benefit plus P-EBT within several months.[13] As a "near-cash" benefit, P-EBT could have alleviated other financial pressures and allowed families to increase spending on housing, utility bills, or other expenses. However, other measures of consumption hardship were not routinely asked over our sample period, and questions related to making housing payments are confounded by national and state eviction moratoria over our sample period. Therefore, with the available data, we are unable to directly speak to more general spending patterns.

4. Empirical strategy

When investigating outcomes from the HPS, we leverage cross-state variation in the timing of the first P-EBT disbursement in a difference-in-differences or event-study framework. Starting with the simpler difference-in-differences approach, for each outcome *y* for family *i* living in state *s* at time *t*, we estimate:

$$y_{ist} = \beta PEBT_{st} + X'_{ist}\theta + \delta_s + \gamma_t + \varphi'_s t + \varepsilon_{ist} \qquad (1)$$

where the coefficient of interest, β, measures whether P-EBT was first disbursed in the 2 weeks prior to the start of the survey wave. During the period studied, the HPS data only include information on the total number of children and whether there are any school-age children (but not the number of school-age children). Since we cannot determine the actual amount families received (number of school-aged children times per student amount), our approach uses a binary treatment measure equal to one if P-EBT was disbursed within 2 weeks before the start of the HPS wave. Since the HPS is conducted on an approximately bi-weekly basis over our analysis period,

[13] USDA did not set a standard expungement date for P-EBT but advised states to cancel any benefits that had not been spent after 365 days (USDA 2020).

our measure corresponds to receiving P-EBT in the previous 0-4 weeks.[14] To avoid comparisons between newly treated and previously treated states (Goodman-Bacon 2021, Roth et al. 2023), we exclude states that made a disbursement more than 2 weeks before the start of the survey wave. Accordingly, each state is "treated" for up to two HPS waves and the "control" observations are states that had not yet made P-EBT payments by the start of the survey wave. We further explore dynamic responses in an event-study framework and using shorter (1 week prior to the start of the survey wave) and longer (3 week) treatment windows (Appendix Table A4).

X'_{ist} is a vector of standard control variables, including respondent age, race/ethnicity, educational attainment, marital status, the number of children and adults in the household, and the state unemployment rate during the reference period. In addition, we control for other state-specific policy responses to the pandemic that may have affected food hardship, specifically whether the state of residence made SNAP Emergency Allotment payments in the month of observation, the monthly share of usual SNAP disbursements paid during in the 2 weeks leading up to the survey wave, whether a state had a mask mandate or stay-at-home-order at the start of the survey wave, and the share of UI claims processed within 1, 2, or more than 10 weeks of the claiming date.[15] δ_s, γ_t, and $\varphi'_s t$ are state fixed effects, survey-week fixed effects, and state-specific linear time trends,

[14] At one extreme, if P-EBT was issued the day before the survey period began, households surveyed the first day would have had P-EBT for 1 day when they answered the survey. At the other extreme, if P-EBT was disbursed 13 days before the start of the survey period, households that were interviewed towards the end of the period (approximately 1-2 weeks after the survey period began) would have received P-EBT approximately 3-4 weeks prior.

[15] Emergency Allotment payments increased monthly SNAP benefits by an average of approximately 40% in families with children (Bitler et al. 2023a).

respectively.[16] All analyses use person weights for the respondent, and standard errors are clustered at the state level.[17]

We extend the difference-in-difference set-up to an event-study framework in order to track the evolution of hardship over time and to assess the plausibility of the parallel trends assumption (i.e., that states were not on different trajectories in the weeks leading up to payments). The event-study framework takes the same structure as the difference-in-difference approach, but replaces β with a vector of event-time indicators for the *j* weeks leading up to and following P-EBT payments:

$$y_{ist} = \sum_{j \neq -1} \beta_j \, PEBT_{s,t=j} + X'_{ist}\theta + \delta_s + \gamma_t + \varphi'_s t + \varepsilon_{ist} \qquad (2)$$

If the effect of P-EBT varies across states that issued payments at different times, the approach in Equation (2) will yield a biased estimate of β_j (Sun and Abraham 2021). To address this concern, we additionally follow the recommendation in Roth et al. (2023) and report results from a stacked event-study design in Appendix Figure A4, as in Cengiz et al. (2019).[18] Results from this approach are very similar to the standard TWFE event study, suggesting that heterogeneous effects over time are not an acute concern in this setting.

States are only included in the event study approach if there is a balanced panel—that is, the state is observed for each of the *j* weeks before and after payments were made. Given the relatively small number of time periods (13 HPS waves), the varying dates over which states first issued payments, and differences in the length of the HPS waves, the states included in a balanced-sample event-study approach vary by the window included in the analysis. To show sensitivity to

[16] Appendix Table A7 provides results without state trends, which are somewhat attenuated relative to the main findings.

[17] Results are substantially unchanged if instead we weight by quasi-household weights, defined as the person weight divided by the number of adults in the household. HPS began including household weights after our analysis period.

[18] Specifically, we estimate $y_{istc} = \sum_{j \neq -1} \beta_j \, PEBT_{sc,t=j} + X'_{ist}\theta + \delta_{sc} + \gamma_{tc} + \varepsilon_{istc}$ where each cohort of treated states *c* is matched to states that implemented P-EBT in ~*c* > *c* (e.g.: a later period) and all fixed effects are interacted with the treatment cohort *c*. The stacked event study is conducted using corrected sample weights as in Wing et al. (2024).

the analysis window, we provide three sets of event-study results: 1) survey waves starting 2 weeks before a state made P-EBT payments through 4 weeks after (Figure 3); 2) survey waves starting 4 weeks prior to P-EBT payments through a full week after (Appendix Figure 2); 3) survey waves starting 4 weeks prior to P-EBT through 4 weeks after in a stacked event study design following Cengiz et al. (2019) and Roth et al. (2023). The states used in each sample are reported in Appendix Table A1 and the DD results for each subsample, as well as the stacked DD for the stacked event study, are provided in Appendix Table A3.

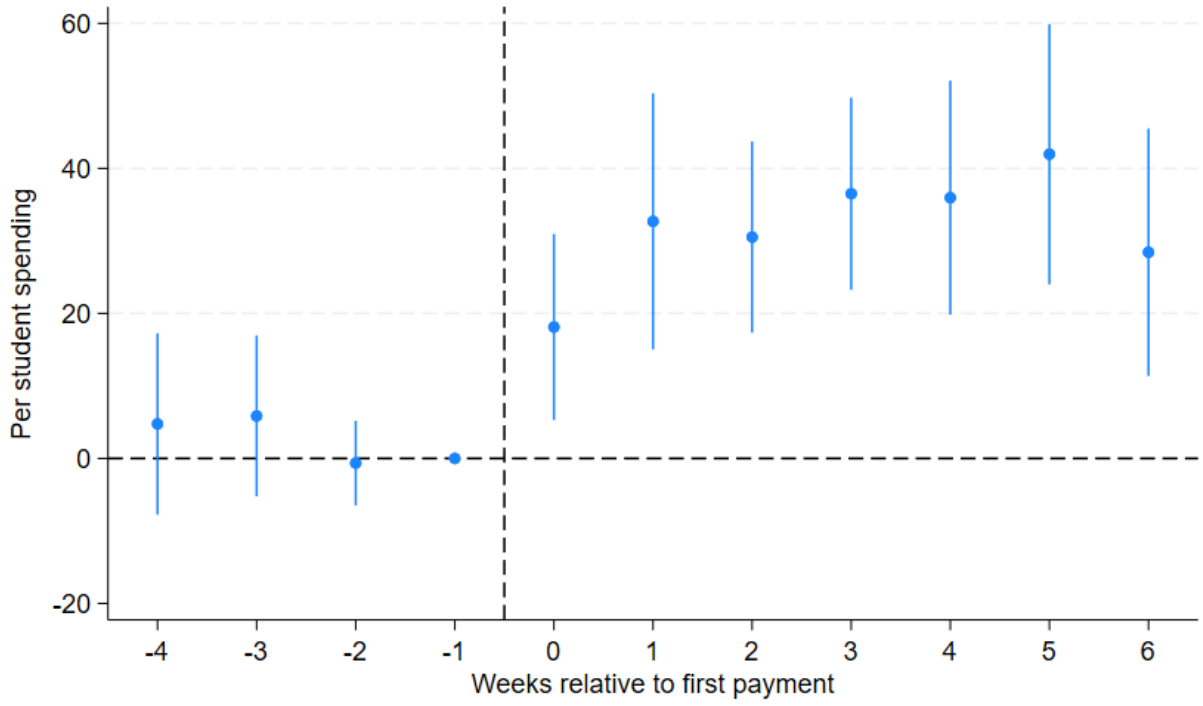
When we use the state-by-week STARS data to measure the duration of the spending response or the UI data to examine other state-level economic conditions, we estimate similar event-study frameworks that exclude household demographic characteristics which are not available in those data.

5. Results

5.1 Benefit spending

Figure 2 shows results of an event-study analysis of the impact of initial P-EBT disbursement on total state-level EBT spending divided by the number of public-school students eligible for free- or reduced-price meals in the state, using state-week data from USDA's administrative STARS data. We limit the analysis to the subset of states for which we have a balanced panel (i.e., states that initially disbursed P-EBT at least 6 weeks before September 1, 2020) and normalize EBT spending to 0 in the week prior to P-EBT disbursement.

Figure 2: Timing of State-Level EBT spending



Notes: Figure shows event studies on state-week EBT spending per-FRP-eligible public-school student relative to the week prior to disbursement using the approach in Equation 2. Sample includes a balanced panel of 16 states that disbursed P-EBT between May 30 and July 15, 2020. Vertical bars denote 95% confidence intervals of robust standard errors clustered by state.

The small, insignificant coefficients in weeks -4 through -1 show that EBT spending (reflecting SNAP EBT spending) was not trending in the weeks leading up to P-EBT treatment—supporting the plausibility of the parallel trends assumption that will be explored more below.[19] After states first made P-EBT payments, average state-level EBT spending per student eligible for free or reduced-price (FRP) meals promptly and significantly increased by $18 to $42 over each of the subsequent six weeks. As the average P-EBT payment was $311 per student, these patterns indicate that approximately 63% of benefits were spent within the six weeks after states made payments and suggest that families may have saved some funds to draw upon over the following

[19] Formal tests that the pre-period trend is equal to zero are frequently underpowered (Roth 2022).

weeks. This spending response is on the upper bound of the 37-66% total spending response among low-income and low-asset households after the first Economic Impact Payment, which provided unrestricted cash and was disbursed at the beginning of the P-EBT rollout period in mid-April 2020 (Cox et al. 2020, Meyer and Zhou 2020, Misra et al. 2021, Chetty et al. forthcoming, Cooper and Olivei 2021, Baker et al. 2023). The spending responses are much larger than earlier stimulus payments made during the 2001 and 2008 recessions for the full population (Johnson et al. 2006, Parker et al. 2013), suggesting that P-EBT helped families meet substantial unmet need. More generally, the significant increase in EBT spending after P-EBT was paid out supports a "first-stage" of the program—that is, families spent the money after receipt.

5.2 Assessing Pre-Trends from Administrative Unemployment Data

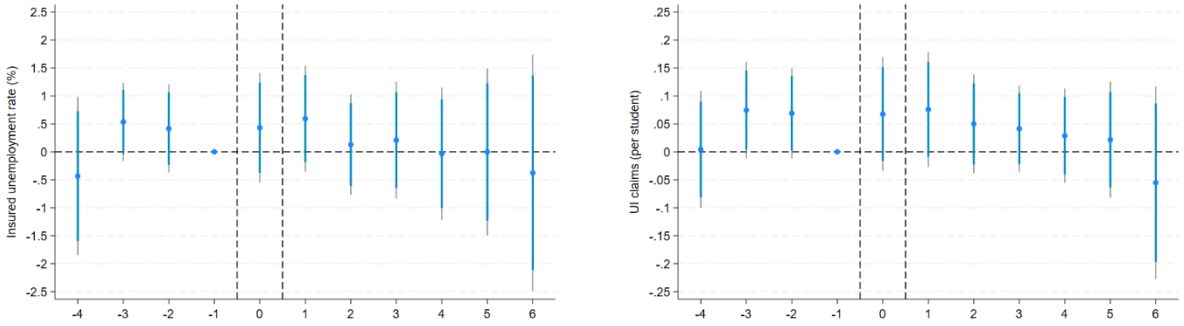
Figure 2 provides some visual evidence in support of the parallel trends assumption by illustrating that EBT redemptions were not differently trending prior to when families received P-EBT payments. We further explore the parallel trends assumption by assessing whether food hardship or related economic factors were trending prior to P-EBT payments in a manner that may confound our ability to separately identify the effect of P-EBT. We start by showing event-study results from other large administrative datasets that provide a balanced panel of state-week observations. As with the STARS data, since the unemployment administrative data are reported each week, the event studies with these data include a longer timeframe and more states than event study analyses with the HPS. In the next section we also explore pre-trends in the more limited HPS sample that includes our food hardship and health outcomes.

Figure 3 examines pre-trends in the unemployment rate and UI claims in the weeks prior to P-EBT payments. If these measures of unemployment declined prior to (or coincident with)

P-EBT payments, it would signal an improving state economy that may itself contribute to declines in food hardship. Instead, we do not observe any significant changes in unemployment or UI claims in the weeks leading up to or following P-EBT receipt. Therefore, these patterns bolster confidence in the parallel trends identifying assumption by suggesting that the timing of P-EBT was unrelated to other concurrent changes in economic conditions .

Figure 3: Event study of administrative unemployment outcomes

a. Insured unemployment rate b. Continuing claims per student



Notes: Figure shows event studies on state-week unemployment data using the approach in Equation 2. Sample includes a balanced panel of 16 states that disbursed P-EBT payments between May 30 and July 15, 2020. Vertical blue (gray) bars denote 90 (95) percent confidence intervals with robust standard errors clustered by state.

5.3 Dynamics of food hardship and household well-being

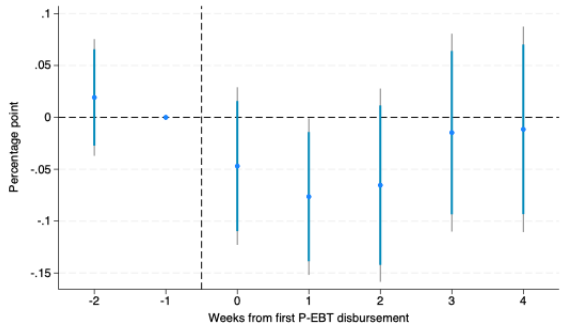
Figure 4 presents event-study analyses of the HPS data, examining dynamics in food hardship and other measures of household well-being in the 18 states that made payments between May 15 and June 16 (for which we have a balanced panel of HPS observations two weeks prior to P-EBT payments through four weeks after).[20] We restrict the analysis to respondents with children who were enrolled in school during the 2019-20 school year and that had household incomes

[20] Since the HPS waves are not exactly weekly waves and there are long gaps between the first and second and 12th and 13th waves, the length of the event study period and the number of states used in these analyses is more limited than the event studies with either the STARS or UI data.

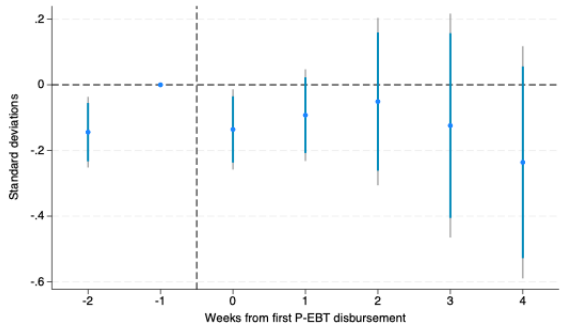
approximately less than 130 percent of the poverty line in 2019 to proxy eligibility for SNAP (sensitivity to this definition is tested in the appendix).[21]

Figure 4: Household well-being event study

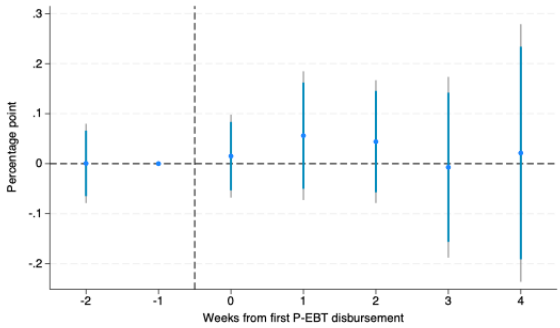
a. Food insufficiency in HH



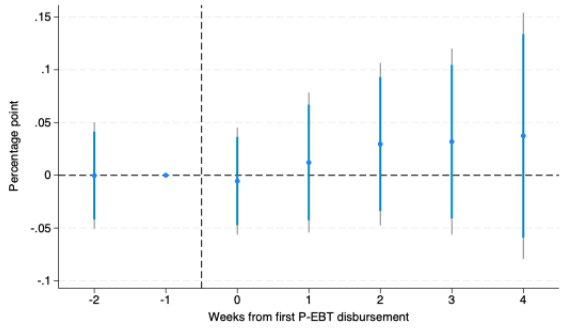
b. Poor mental health index (mother)



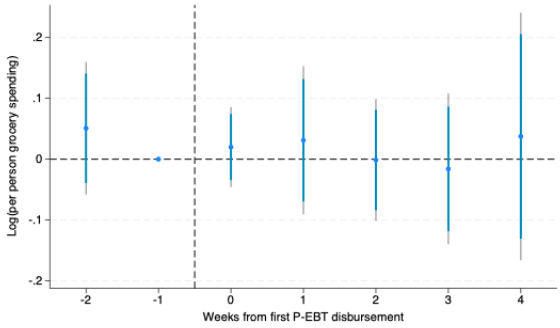
c. Poor or fair physical health (mother)



d. Very confident can afford food in next 4 weeks



e. Log(grocery spend)/child



Notes: Figure shows event studies on a balanced panel of 18 states that made P-EBT payments between May 15 and June 16, 2020. Event time indicates the number of weeks between the P-EBT payment and the end of the Pulse survey wave. Specifications include controls for respondent race/ethnicity, gender, educational attainment, and age,

[21] Household income in the Pulse survey is reported in $10,000 to $50,000 increments, ranging from less than $25,000 to $200,000. We measure the income-to-poverty ratio by taking the midpoint income in a respondent's reported income category divided by the poverty threshold for its household size and exclude households with a ratio that is greater than 130 percent (similar to Han et al., 2020). Appendix Table A6 shows results using alternative income thresholds.

as well as controls for household size, the number of children in the household, state and time-period fixed effects, and state trends. Sample restricted to households with children and with income below 130 percent of the federal poverty line. Regressions weighted by respondent sample weights. Vertical blue (gray) bars denote 90 (95) percent confidence intervals with robust standard errors clustered by state.

As shown in panel a, in the three weeks after P-EBT payments were made, the share of adults reporting food insufficiency in their household over the prior week dropped by 4.8 to 7.6 percentage points. Consistent with the parallel trends assumption, there were no differences in food insufficiency prior to P-EBT payments.

Because of sample limitations, our balanced panel event study that includes data 4 weeks after payment can only include 2 weeks before payment (see Appendix Table 1), limiting the ability to investigate pre-trends. We can observe a longer, 4-week pre-period for the 16 states that implemented P-EBT between May 27 and July 7 and thus have a balanced panel of observations for 4 weeks prior through a full week after P-EBT disbursement. These results, shown in Appendix Figure A3, show no substantial trends in family well-being in the weeks leading up to when families received payments.

Panels b and c examine impacts on health outcomes. Although P-EBT is targeted to children, for many reasons including the fungibility of money and the fact that food is generally shared within the household, it is reasonable to investigate impacts on other members of the household. Indeed, prior work documents within-family spillovers of child-specific nutrition assistance (Bitler et al. 2023b; Bhattacharaya, Currie, and Haider 2006). Panel b shows that the index of poor mental health among mothers declines after initial P-EBT payments. There is no significant change in the share of mothers reporting poor or fair physical health (panel c)—an outcome unlikely to be malleable in the short run, and likely best interpreted as a placebo test.

Although P-EBT provided families with a meaningfully large transfer (approximately $300 per student), we do not observe broader improvements in their perceived financial security as

measured by the respondent's high confidence in their ability to afford the food they need over next four weeks (panel d). Note that only 13% of the sample reports high confidence prior to P-EBT payment. One potential explanation for the lack of future confidence, despite reported reductions in food hardship, is that P-EBT was perceived as a temporary program during summer 2020 (it was not re-authorized for the 2020-21 school year until October 2020, and implementation guidance for further payments was not finalized until January 2021) and most states issued a single payment. Therefore, even though the amounts they had *already received* reduced families' food hardship, since they did not anticipate another payment, they were not optimistic about future affordability.

As shown in panel e, impacts of P-EBT payments on log grocery spending per child are imprecisely measured. On average, the pre-treatment spending mean was $103 per child, but as described in the data section above there is substantial measurement error in this variable (Appendix Figure A2). Using a similar research design with the Nielsen Homescan Data, Bonono et al. (2024) find that log grocery spending per child in SNAP-eligible households with children increases by 0.11 after P-EBT payments are made, and the increase persists over several weeks. With the limitations of the spending variable in the HPS and larger estimates from better data, we are reluctant to draw strong conclusions on grocery spending from the HPS.

We also implement a stacked event-study approach that is robust to settings where not all states receive treatment at the same time (Roth et al. 2023), following Cengiz et al. (2019) and Wing et al. (2024) with a balanced panel of 9 "treated" states that implemented P-EBT between

May 27 and June 16 (a shorter timeframe to also allow 4-weeks of post-event time). Again, we do not find any notable trends in any measure of family well-being in the month prior to receipt.[22]

5.4 Food hardship and household well-being: Difference-in-differences results

We leverage more of the cross-state variation in P-EBT timing using a difference-in-differences approach, described in equation (1). The difference-in-differences results are more than a parametric summary of the event-study results because, by relaxing the need to create a balanced panel, we can include all 46 states that provided information on P-EBT payments, since all of these states made payments after April 9, 2020 (i.e. within 2 weeks prior to the start of the first HPS survey wave or later). Difference-in-differences results for the smaller event-study samples are broadly similar and are presented in Appendix Table A3.

In the month after P-EBT payments were made, the share of adults reporting food insufficiency in their household over the prior week declined by 8.3 percentage points, or 27% of the pre-disbursement mean (column 1). HPS began collecting information on very low food security among children in the week of June 4, 2020 (wave 7). Results for this outcome are necessarily restricted to waves after this point; 27 states—including nearly all of the states included in the event-study analyses above (Figure 4)—had already issued benefits by then. We find a larger reduction in very low food security among children, which fell by 17.7 percentage points, or approximately 49% (column 2).

[22] Appendix Table A3 shows that food insufficiency and maternal mental health is qualitatively similar with the smaller subsample of states used in each event study sample under the approach in Equation 1, albeit less precisely estimated for the sample in Appendix Figure A3. The confidence intervals for physical health, food confidence, and grocery spending also substantially overlap, although results are not significant in any of the samples.

Table 1. P-EBT impacts on household food hardship, well-being, and spending

	(1)	(2)	(3)	(4)	(5)	(6)
	Sometimes/often not having enough to eat in HH	Children have very low food security	Poor mental health index (mothers)	Poor or fair physical health (mothers)	Very confident can afford food next 4 weeks	Log grocery spending per child
P-EBT disbursed within 2 weeks of start of survey wave	-0.0831**	-0.1768*	-0.0927*	0.0006	0.0028	0.0147
	(0.0399)	(0.0895)	(0.0533)	(0.0414)	(0.0278)	(0.0426)
N	20306	7595	14510	14572	20320	19263
DV mean prior to disbursement	0.2749	0.3625	0.2602	0.2906	0.1326	4.6305
State linear time trends	X	X	X	X	X	X

Notes: Table shows effect of being in a state that disbursed the first P-EBT payment within 2 weeks of the beginning of the survey wave. States are dropped from the analyses after treatment so that the control group in each period is states that have not yet disbursed payments. All specifications include controls for respondent race/ethnicity, gender, educational attainment, and age, as well as controls for household size; the number of children in the household, the state unemployment claimant rate; the share of SNAP Emergency Allotment payments and SNAP benefits disbursed in 2 weeks before the survey period; whether there is an active stay-at-home order, mask mandate, or indoor restaurant closure at the start of the survey wave; share of UI claims processed within 1, 2, and more than 10 weeks of claiming date; state and time-period fixed effects; and state linear time trends. Sample restricted to households with children who attended school and with income below 130 percent of the federal poverty line. Regressions weighted by respondent sample weights. Robust standard errors clustered by state. Data from Household Pulse Survey waves 1-13 (columns 1, 3-6) or waves 7-13 (column 2). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Columns (3) and (4) examine impacts on mothers' health. The index of poor mental health among mothers (column 3) declines by 0.09 standard deviation after initial P-EBT payments. Note that this effect fades and is no longer statistically significant 3 weeks after payment, as shown in Appendix Table A4. There is no change in the share of mothers reporting poor or fair physical health (column 4). Consistent with the event-study results presented previously, we do not find broader improvements in the respondent's confidence in their ability to afford the food they need over next four weeks (column 5). Recalling the substantial heaping in the self-reported grocery spending, log grocery spending per child increases by a statistically insignificant 0.015 after initial P-EBT payments are made (column 6).

Similar dynamics are shown in Appendix Table A4, which applies alternative reference periods to the difference-in-differences approach for the entire sample. Here, we find that the change in food hardship is most pronounced in the 0-4 weeks after disbursement (within 2 weeks of the start of the survey wave) and is slightly attenuated when looking at either narrower or broader windows. In contrast, the improvements in both physical and mental health are front-loaded so that the effect is larger in the 0-3 weeks following payment (within 1 week of the start of the survey wave).

Figures 2 and 3 provided visual evidence that P-EBT payments did not coincide with other substantial changes in economic conditions or SNAP benefit redemptions and Appendix Table A2 showed that P-EBT timing was not fully explained by other state-level political, economic, or demographic factors. To further examine whether the results in Table 1 may be reflecting broader changes in food hardship over this period, we estimate the difference-in-difference approach on two "placebo" samples that were ineligible to receive P-EBT. Table 2 reports results for families without children (panel a) and families with income above 200% of the federal poverty guideline (panel b).[23] For both groups, there is no economically or statistically significant improvement in food hardship or health outcomes. These patterns bolster confidence that our results are capturing the effect of P-EBT, rather than unobserved factors affecting all families at the same time as disbursement.

[23] Higher-income households with children were eligible to receive P-EBT if they attended a school offering schoolwide free meals; however, due to application processes and the need to identify these students, higher-income students typically received P-EBT 4-6 weeks after SNAP families.

Table 2. Placebo Test: P-EBT impacts on household food hardship, well-being, and spending among ineligible populations

	(1)	(2)	(3)	(4)	(5)	(6)
	Sometimes/ often not having enough to eat in HH	Children have very low food security	Poor mental health index (mothers/ women ages 18-54)	Poor or fair physical health (mothers/ women ages 18-54)	Very confident can afford food next 4 weeks	Log grocery spending per child
Panel a: Families without children						
P-EBT disbursed within 2 weeks of start of survey wave	-0.0102		-0.0209	-0.0242	0.0007	-0.0378**
	(0.0069)		(0.0459)	(0.0231)	(0.0099)	(0.0175)
N	315724		65804	66055	296155	279159
DV mean prior to disbursement	0.0844		0.2970	0.1813	0.5095	4.0731
Panel b: Families with children, income > 200% poverty line						
P-EBT disbursed within 2 weeks of start of survey wave	0.0100	0.0203	0.0007	-0.0012	0.0123	0.0030
	(0.0104)	(0.0227)	(0.0506)	(0.0188)	(0.0218)	(0.0314)
N	89761	33673	48610	48791	89771	85959
DV mean prior to disbursement	0.0518	0.0753	-0.0407	0.0862	0.5302	4.8617
State linear time trends	X	X	X	X	X	X

Notes: Table shows effect of being in a state that disbursed the first P-EBT payment within 2 weeks of the beginning of the survey wave. States are dropped from the analyses after treatment so that the control group in each period is states that have not yet disbursed payments. All specifications include controls for respondent race/ethnicity, gender, educational attainment, and age, as well as controls for household size; the number of children in the household, the state unemployment claimant rate; the share of SNAP Emergency Allotment payments and SNAP benefits disbursed in 2 weeks before the survey period; whether there is an active stay-at-home order, mask mandate, or indoor restaurant closure at the start of the survey wave; share of UI claims processed within 1, 2, and more than 10 weeks of claiming date; state and time-period fixed effects; and state linear time trends. Sample restricted to households without children (panel a) and households with children who attended school and with income above 200 percent of the federal poverty line (panel b). Regressions weighted by respondent sample weights. Robust standard errors clustered by state. Data from Household Pulse Survey waves 1-13 (columns 1, 3-6) or waves 7-13 (column 2). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5.5 Robustness

Our results have focused on families likely to be eligible for SNAP based on their reported income bin relative to the poverty threshold because we can better identify P-EBT payment timing for this

sample. In Appendix Table A6 columns 1-4 we probe the robustness of our food insufficiency results across alternative "low-income household" definitions: requiring the maximum (instead of median) income in the bins to be below 130% of the poverty threshold (column 1), expanding the sample to include households that are income-eligible for reduced-price meals (185% of the poverty threshold, column 2), using a fixed income threshold (column 3), or a proxy (educational attainment) for low-income (column 4). Results are similar, albeit less precise, when using the smaller sample obtained from implementing a more restrictive income threshold (column 1). For other low-income samples (columns 2-4), the estimated reduction in food insufficiency is somewhat smaller, but the reductions in very low food security among children and improvements in maternal mental health are generally similar.

Appendix Table A7 shows results excluding state trends, under which we observe similar reductions food insufficiency in the household (7.1 percentage points, 26% of the pre-payment mean) and slightly attenuated, but more precise, reductions in children having very low food security of 29% (10.4 percentage points).

6. Discussion

An unusual feature of P-EBT is that it was provided as a sizeable, one-time, lump-sum payment, in contrast to other forms of nutrition assistance (SNAP, WIC, summer benefits) that are provided as recurrent, monthly benefits. Although the generalizability of our findings may be limited due to their setting within the COVID-19 pandemic, this novel policy experiment can give us insights into the dynamics of food hardship as well as how spending responds to resource shocks.

We find that P-EBT benefits, which averaged $311 per child, reduce food insufficiency among households eligible for SNAP by 27 percent. This magnitude is broadly consistent with other findings for benefits paid to low-income families with children. For example, experimental evidence from Summer-EBT pilot programs conducted in 2011-13 found that $230 per child in grocery vouchers (in 2020 dollars) reduced very low food security—the concept closest to food insufficiency as measured in the HPS—by 31 percent and food insecurity by 16 percent (Klerman et al. 2017). Further, towards the end of the COVID-19 pandemic in July-December 2021, the fully refundable Child Tax Credit (CTC) provided $250 per month to families for each child age 17 or younger ($300 for each child younger than 6), a similar amount to the grocery vouchers provided through P-EBT. Parolin et al. (2021) find that these CTC payments reduced food insufficiency among low-income families with children by 27 percent relative to those without children.[24]

Another consideration is how P-EBT compares with SNAP spending and how a new program interacted with existing nutrition assistance programs. There is a strong pattern in SNAP spending over the "benefit month" in which spending peaks shortly after benefits are issued each month (Franckle et al. 2019, Hastings and Washington 2010, Goldin et al. 2022, Kuhn 2021, Todd 2015, Todd and Gregory 2018). In contrast, the spending response to P-EBT was both more modest and sustained, as shown in Figure 2. We directly compare benefit redemption patterns across these two programs in Appendix Table A5. While SNAP recipients receive payments once per month, most states stagger benefit payment dates across their caseloads over the month making it impossible for us to estimate general SNAP spending patterns in the state-week STARS data. However, a few low-population states (New Hampshire, North Dakota, Rhode Island, South

[24] Using a non-experimental approach, Gundersen, Kreider and Pepper (2018) estimate that an additional recurring $183 per month for SNAP families with children would reduce food insecurity by 57 percent.

Dakota, and Vermont) issue all SNAP benefits within a single-week period, allowing us to identify the timing of SNAP payments.

As shown in column (1), relative to the week when benefits are issued, SNAP spending in the 2015-19 period sharply increases in the week following disbursement, followed by a rapid decrease in subsequent weeks. Columns 2-3 show the equivalent "cycle" of EBT spending in the month after P-EBT receipt, indicating a more muted pattern. Although these estimates are imprecisely estimated due to small sample sizes, point estimates echo the pattern in Figure 2 and do not show a decrease for at least 6 weeks. This comparison shows that lump-sum P-EBT payments are spent differently than monthly recurrent SNAP payments. Finally, to look at interactions between the two programs, column 4 replicates column 1 for the SNAP month in the first SNAP disbursement cycle following P-EBT payments. In this month, families spent about $14 more per child in the week they received SNAP benefits, spending remained elevated over the following three weeks, and the drop-off in spending was less pronounced than prior to receiving P-EBT. Altogether, these findings confirm prior work that additional assistance leads to both increased spending and smoother spending patterns over the benefit month (Todd and Gregory 2018).

Although we find reductions improvements in food hardship and increases in benefit redemption, households do not report spending significantly more in the HPS data. With big caveats in mind, taking the imprecisely estimated coefficient in Table 1 at face value implies a $1.50 per child per week increase in grocery spending, substantially smaller than the average $29 per student increase in EBT spending in the first 4 weeks after disbursement (Figure 2). There are several potential explanations for the differences we find for P-EBT benefit redemptions and grocery spending. First, as discussed in Section 3.2, we view the HPS grocery spending results

with substantial skepticism due to measurement error. For example, related work that uses more accurate retail scanner data finds log grocery spending increases by more than 0.10 (Bonomo et al. 2024).

Another hypothesis for the divergence between benefit redemptions and reported grocery spending is that the spending response was much larger among higher-income households that received P-EBT because their children attended a school that offered schoolwide free meals (who are excluded from this analysis). However, Bonomo et al. (2024) find that higher-income families in areas with schoolwide free meals increased their log grocery spending per student by 0.05, a coefficient smaller than but not statistically significantly different from the spending impact among SNAP-eligible households. Since most students receiving a free meal are income-eligible for SNAP, these results suggest that responses among higher-income households cannot reconcile the differences between the redemption and self-reported spending data.

Finally, another potential explanation is that most P-EBT spending could have gone to finance families' existing grocery budgets so of the $29 redemptions, only $1.50 financed additional purchases and $27.50 went to usual spending. This implied marginal propensity to consume (0.04) is smaller than estimates from Hastings and Shapiro (2018) who examine changes in spending at a single grocery chain after the onset or termination of SNAP receipt (0.50) but is within the range of the (imprecise) estimates from Hoynes and Schanzenbach (2009) who examine consumption responses to the introduction of SNAP.

7. Conclusion

We find that lump-sum, in-kind assistance through grocery vouchers can protect families against food hardship and improve maternal mental health. Our analysis leverages weekly data on

households along with the exact date of the introduction of the P-EBT program during the first summer of the pandemic and shows that the program reduced food hardship among low-income families across the month after they received benefits. We find that food insufficiency declines by approximately 30 percent after benefit receipt—a magnitude that is consistent with results from studies of other benefit programs aimed at low-income families with children including the expanded CTC payments made during COVID-19 and experimental evidence from Summer EBT demonstration projects. We further find that families appear to have smoothed their consumption by spending down their P-EBT by $18-42 each week for at least six weeks after disbursement. The reductions in food hardship that we observe are especially pronounced given the large increase in economic vulnerability that many low-income families experienced during the pandemic (Bitler et al. 2020a). These findings indicate that providing additional nutrition assistance during times of crisis can alleviate hardship.

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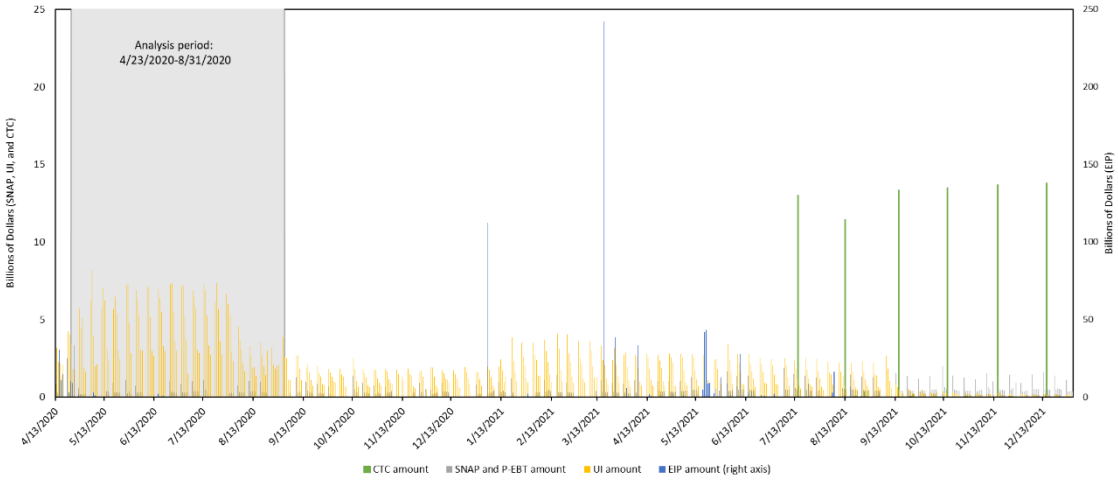
The Effects of Lump-Sum Food Benefits during the COVID-19 Pandemic on Spending, Hardship, and Health

Appendix

Lauren Bauer
Krista Ruffini
Diane Whitmore Schanzenbach

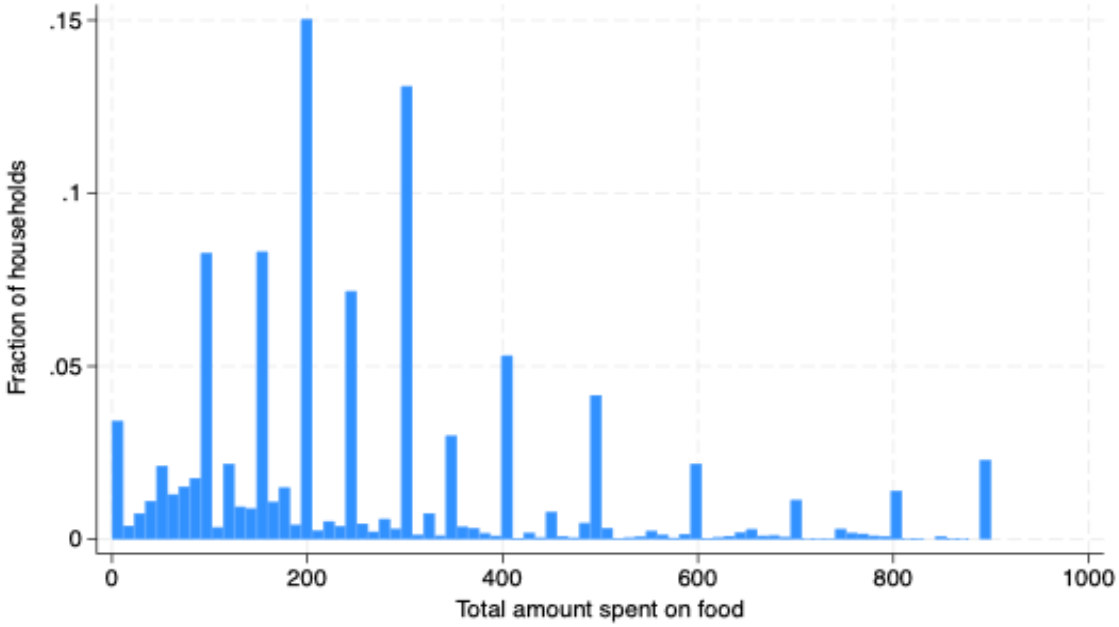
Appendix Figures

Appendix Figure A1: Analysis period and federal safety net spending, 2020-2021



Notes: Figure shows the daily outlays from the Treasury Department on CTC, SNAP and P-EBT (combined), UI, and EIP programs. Shaded gray area denotes analysis period.

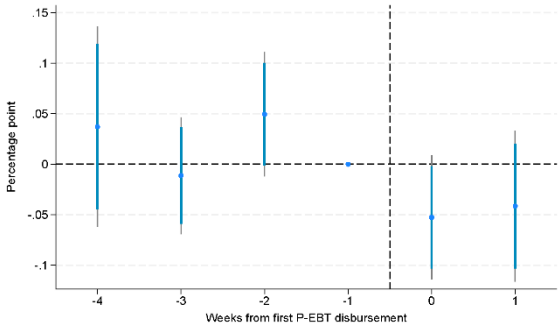
Appendix Figure A2: Distribution of reported weekly grocery spending



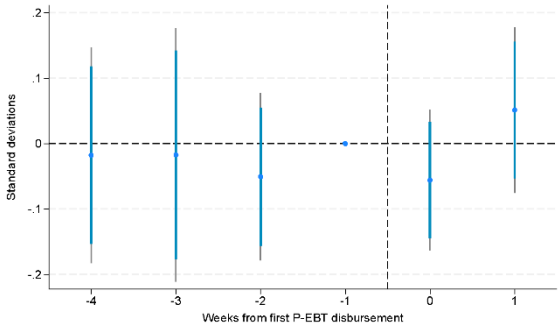
Notes: Figure displays the reported dollar amount spent on food in the past month among the analysis sample (households with children who attended school and with income below 130 percent of the federal poverty line) in HPS waves 1-13.

Appendix Figure A3: Household well-being event study, extended pre-period

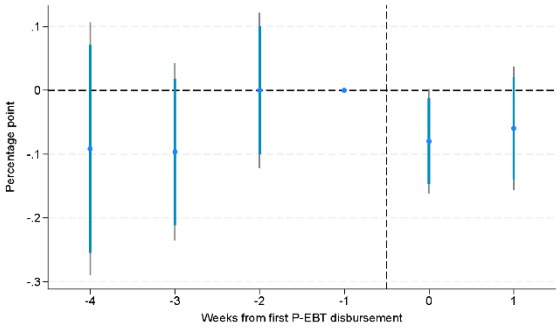
a. Food insufficiency in HH



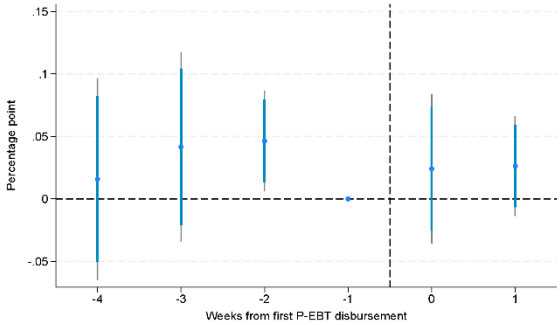
b. Poor mental health index (mother)



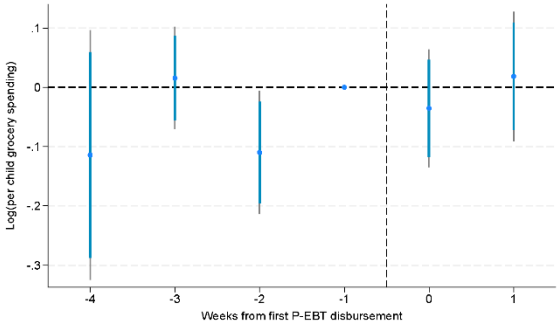
c. Poor or fair physical health (mother)



d. Very confident can afford food in next 4 weeks



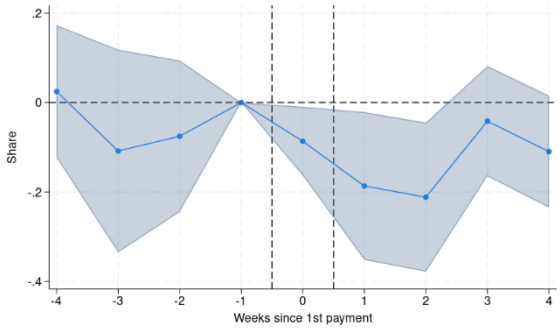
e. Log(grocery spend)/child



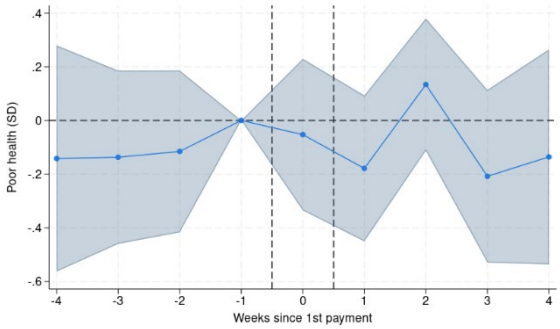
Notes: Figure shows event studies on a balanced panel of 16 states that made P-EBT payments between May 27 and July 7, 2020. Event time indicates the number of weeks between the P-EBT payment and the end of the Pulse survey wave. Specifications include controls for respondent race/ethnicity, gender, educational attainment, and age, as well as controls for household size, the number of children in the household, state and time-period fixed effects, and state trends. Sample restricted to households with children and with income below 130 percent of the federal poverty line. Regressions weighted by respondent sample weights. Vertical blue (gray) bars denote 90 (95) percent confidence intervals with robust standard errors clustered by state.

Appendix Figure A4: Household well-being event study, stacked design

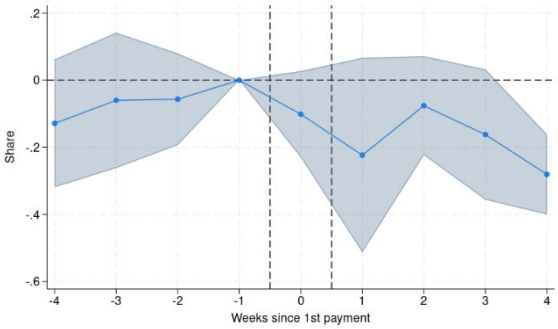
a. Food insufficiency in HH



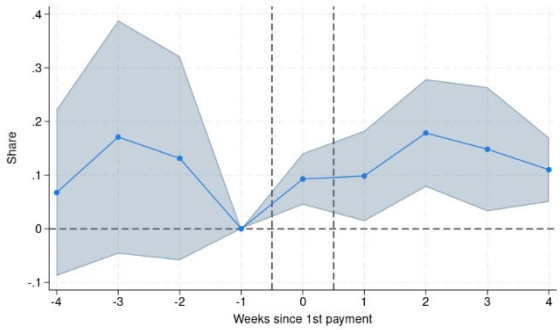
b. Poor mental health index (mother)



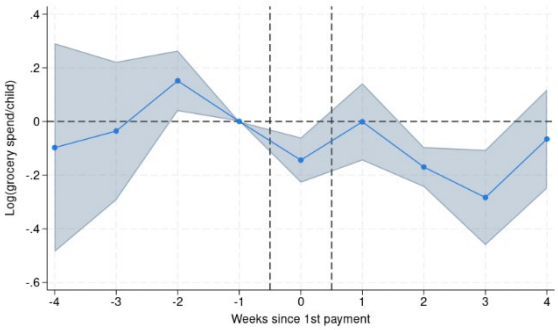
c. Poor or fair physical health (mother)



d. Very confident can afford food in next 4 weeks



e. Log(grocery spend)/child



Notes: Figure shows event studies on a balanced panel of 9 states that made P-EBT payments between May 27, 2020 and June 16, 2020, following the stacked event study approach in Cengiz et al. (2019) and Wing et al. (2024). Event time indicates the number of weeks between the P-EBT payment and the end of the Pulse survey wave. Specifications include controls for respondent race/ethnicity, gender, educational attainment, and age, as well as controls for household size, the number of children in the household, state and time-period fixed effects, and state trends. Sample restricted to households with children and with income below 130 percent of the federal poverty line. Control group consists of states that will make payments at least 5 weeks after each "cohort." Regressions weighted by respondent sample weights, adjusted for cohort size as in Wing et al. (2024). Shaded area denotes 95 percent confidence intervals with robust standard errors clustered by stateXstack.

Appendix Tables

Appendix Table A1: Reported First Pandemic EBT Disbursement, by Source

State	Original correspondence (Bauer et al. 2020)	FOIA request (Bauer et al. 2024)	Reported to USDA	In DD analysis	Used in event study analyses: Balanced -4 to +1 (5/27/2020-7/7/2020)	Balanced -2 to + 4 (5/15/2020-6/16/2020)	Stacked -4 to + 4 (5/27/2020-6/16/2020)
Alaska	7/7/20	10/20/21	8/20				
Alabama	5/3/20	5/15/20	5/20	X		X	
Arkansas	6/30/20	n/a	6/20	X	X		
Arizona	4/23/20	4/23/20	4/20	X			
California	5/11/20	n/a	5/20	X			
Colorado	7/15/20	5/25/21	7/20	X			
Connecticut	5/24/20	5/24/20	5/20	X		X	
District of Columbia	5/22/20	5/1/20	5/20	X			
Delaware	5/11/20	n/a	5/20	X			
Florida	6/30/20	6/25/20	6/20	X	X		
Georgia	N/A	7/18/20	7/20	X			
Hawaii	6/24/20	6/29/20	6/20	X	X		
Iowa	7/15/20	5/11/21	7/20	X			
Idaho	N/A	6/22/21	8/20	X[1]			
Illinois	4/20/20	4/19/20	4/20	X			
Indiana	5/20/20	n/a	3/20				
Kansas	5/21/20	n/a	5/20	X		X	
Kentucky	5/22/20	5/20/20	5/20	X		X	
Louisiana	5/15/20	5/27/20	5/20	X	X	X	X
Massachusetts	4/30/20	4/30/20	4/20	X			
Maryland	6/4/20	n/a	6/20	X	X	X	X
Maine	5/5/20	5/8/20	5/20	X			
Michigan	5/1/20	4/28/20	3/20	X			
Minnesota	5/30/20	5/30/20	5/20	X	X	X	X
Missouri	5/19/20	5/20/20	5/20	X		X	
Mississippi	6/16/20	10/2/21	6/20	X	X	X	X
Montana	N/A	7/15/20	7/20	X			
North Carolina	5/12/20	5/11/20	5/20	X			
North Dakota	5/9/20	5/8/20	5/20	X			
Nebraska	7/28/20	4/20/20	7/20	X			
New Hampshire	6/1/20	9/1/20	6/20	X	X	X	X
New Jersey	6/16/20	7/7/20	7/20	X	X		
New Mexico	5/18/20	n/a	5/20	X		X	
Nevada	N/A	8/29/20	8/20	X			

New York	5/1/20	n/a	5/20	X			
Ohio	5/28/20	5/28/20	5/20	X	X	X	X
Oklahoma	7/9/20	8/21/20	8/20	X			
Oregon	6/1/20	n/a	6/20	X	X	X	X
Pennsylvania	5/26/20	5/28/20	5/20	X	X	X	X
Rhode Island	4/20/20	4/19/20	3/20	X			
South Carolina	7/7/20	6/7/20	7/20	X	X		
South Dakota	7/1/20	6/28/20	6/20	X	X		
Tennessee	6/12/20	n/a	6/20	X	X	X	X
Texas	5/22/20	6/3/21	5/20	X		X	
Utah	N/A	3/1/21	8/20				
Virginia	5/13/20	5/15/20	5/20	X		X	
Vermont	5/27/20	5/2/20	5/20	X			
Washington	6/28/20	6/27/20	6/20	X	X		
Wisconsin	4/27/20	5/3/22	3/20				
West Virginia	5/20/20	n/a	5/20	X		X	
Wyoming	6/8/20	5/10/21	3/20				

Notes: Table shows the date that each state first issued Pandemic EBT payments, provided from correspondence with state officials used in Bauer et al. 2020 (column 2); FOIA requests conducted September 2022 through 2024 (column 3); as reported to USDA (column 4). Michigan is included in the analysis as the reported dates are 3 days apart. Idaho is included in the analysis despite the disagreement in disbursement date because all reported disbursement dates occur after summer 2020. Columns 6-8 report the subset of states used in each event study analysis.

Appendix Table A2: Timing of First Pandemic EBT Disbursement and State Characteristics

	(1)	(2)
	Payment date	HPS wave of payment
Log(population)	-3.377	-0.382
	(5.5850)	(0.7306)
% age 5-17	1005.177**	131.549**
	(473.751)	(59.162)
% age 65+	412.723	46.629
	(593.256)	(81.843)
Minimum wage	-1.806	-0.107
	(3.620)	(0.471)
State EITC rate	-43.174	-5.667
	(36.977)	(4.751)
Legislature Republican controlled	-18.198	-1.504
	(20.878)	(2.601)
Governor Republican	-1.810	-0.248
	(9.804)	(1.328)
Implemented Medicaid expansion	-0.896	-0.027
	(14.403)	(1.857)
% students FRP	2.411	0.230
	(2.006)	(0.247)
Median income	0.001	0.000
	(0.001)	(0.000)
SNAP BBCE	-6.577	-0.534
	(14.494)	(1.580)
Mask mandate Apr-Sep 2020	-4.068	-0.183
	(13.902)	(1.702)
Ever stay-at-home order	-16.674	-2.274
	(14.158)	(1.866)
April 2020 % UI claims processed w/in 14 days	-59.256	-8.112
	(49.053)	(6.172)
N	45	45
R^2	0.395	0.389

Notes: Table shows results from a regression where the dependent variable is the calendar date (column 1) or Household Pulse Survey wave (column 2) a state made the first Pandemic EBT disbursement, as reported in Appendix Table A1. Sample includes all states included in the analysis, with the exception of ID since ID's disbursement date is not consistently reported (see Appendix Table A1).

Appendix Table A3: P-EBT impacts on household food hardship, well-being, and spending, event study samples

	(1)	(2)	(3)	(4)	(5)
	Sometimes/often not having enough to eat in HH	Poor mental health index (mothers)	Poor or fair physical health (mothers)	Very confident can afford food next 4 weeks	Log grocery spending per child
Panel a: Event study sample, balanced [-2,4]					
P-EBT disbursed within 2 weeks	-0.1481**	-0.2256*	-0.0499	-0.0572	0.1186
of start of survey wave	(0.0681)	(0.1081)	(0.1045)	(0.0506)	(0.1043)
N	7416	5520	5543	7422	7006
DV mean prior to disbursement	0.2731	0.2704	0.2717	0.1409	4.5735
Panel b: Event study sample, balanced [-4,1]					
P-EBT disbursed within 2 weeks	-0.0674	-0.0985	-0.0984	0.0150	-0.0368
of start of survey wave	(0.0645)	(0.1249)	(0.0911)	(0.0457)	(0.0915)
N	8978	6522	6555	8992	8510
DV mean prior to disbursement	0.2880	0.2712	0.2826	0.1371	4.6232
Panel c: Stacked DD sample, balanced [-4,4], Equation 1					
P-EBT disbursed within 2 weeks	-0.2336***	-0.0830	0.0780	0.0744	0.0988
of start of survey wave	(0.0415)	(0.1011)	(0.0871)	(0.0573)	(0.0557)
N	5176	3813	3832	5181	4906
DV mean prior to disbursement	0.2729	0.1993	0.2405	0.2445	4.4313
Panel d: Stacked DD sample, balanced [-4,4], Cengiz et al. (2019) DD					
P-EBT disbursed within 2 weeks	-0.1120***	0.0333	-0.0640	0.0593*	-0.1893***
of start of survey wave	(0.0328)	(0.0858)	(0.0475)	(0.0323)	(0.0418)
N	6339	4614	4635	6342	6024
DV mean prior to disbursement	0.2665	0.2007	0.2177	0.2528	4.4036

Notes: Table shows effect of being in a state that disbursed the first P-EBT payment within 2 weeks of the beginning of the survey wave for the subsample of states used in each event study analysis: Figure 2 (panel a), Appendix Figure A3 (panel b), and Appendix Figure A4 (panels c-d). Panels a-c exclude states after the treatment period so that the control group in each period is states that have not yet disbursed payments. Panel d adopts the stacked DD approach as in Cengiz et al. (2019) where control states are those that made payments five or more weeks after each treatment "cohort". All specifications include controls for respondent race/ethnicity, gender, educational attainment, and age, as well as controls for household size; the number of children in the household, the state unemployment claimant rate; the share of SNAP Emergency Allotment payments and SNAP benefits disbursed in 2 weeks before the survey period; whether there is an active stay-at-home order, mask mandate, or indoor restaurant closure at the start of the survey wave; share of UI claims processed within 1, 2, and more than 10 weeks of claiming date; state and time-period fixed effects; and state linear time trends. Sample restricted to households with children who attended school and with income below 130 percent of the federal poverty line. Regressions weighted by respondent sample weights (panels a-c), adjusted for cohort size as in Wing et al. (2024). Robust standard errors clustered by state. Data from Household Pulse Survey waves 1-13. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A4: Robustness to Alternative Timing Windows

	(1)	(2)	(3)	(4)	(5)	(6)
	Sometimes/ often not having enough to eat in HH	Children have very low food security	Poor mental health index (mothers)	Poor or fair physical health (mothers)	Very confident can afford food next 4 weeks	Log grocery spending per child
Panel a: P-EBT disbursement week before survey wave						
P-EBT disbursed within 1 week of start of survey wave	-0.0694	0.0013	-0.1740***	-0.0453	-0.0285	0.0290
	(0.0434)	(0.1083)	(0.0521)	(0.0439)	(0.0226)	(0.0605)
N	17688	6197	13779	12728	17702	16785
DV mean prior to disbursement	0.2749	0.3625	0.2647	0.2906	0.1326	4.6305
Panel b: P-EBT disbursement within 3 weeks before survey wave						
P-EBT disbursed within 3 weeks of start of survey wave	-0.0838**	-0.0669	-0.0270	0.0218	-0.0009	0.0535
	(0.0352)	(0.0897)	(0.0494)	(0.0397)	(0.0199)	(0.0456)
N	12667	9316	17347	16463	22991	16394
DV mean prior to disbursement	0.2602	0.3625	0.2647	0.2906	0.1326	0.2602

Notes: Table shows effect of being in a state that disbursed the first EBT payment within 1 week (panel a) or 3 weeks (panel b) of the beginning of the survey wave. States are dropped from the analyses after treatment so that the control group in each period is states that have not yet disbursed payments. All specifications include controls for respondent race/ethnicity, gender, educational attainment, and age, as well as controls for household size; the number of children in the household, the state unemployment claimant rate; the share of SNAP Emergency Allotment payments and SNAP benefits disbursed in 2 weeks before the survey period; whether there is an active stay-at-home order, mask mandate, or indoor restaurant closure at the start of the survey wave; share of UI claims processed within 1, 2, and more than 10 weeks of claiming date; state and time-period fixed effects; and state linear time trends. Sample restricted to households with children and with income below 130 percent of the federal poverty line. Regressions weighted by respondent sample weights. Robust standard errors clustered by state. Data from Household Pulse Survey waves 1-13 (columns 1, 3-6) or waves 7-13 (column 2). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A5: Timing of SNAP and Pandemic EBT Spending, Relative to Week of Disbursement

	(1)	(2)	(3)	(4)
	SNAP timing	P-EBT timing	P-EBT timing	SNAP timing month after P-EBT disbursement
Disbursed last week	11.5284**	4.7463	4.7463	13.8857**
	(2.9291)	(2.8384)	(2.8702)	(3.8538)
Disbursed 2 weeks ago	-3.4671**	8.2964	8.2964	0.6945
	(1.1472)	(9.0963)	(9.1983)	(1.2234)
Disbursed 3 weeks	-10.9085***	1.5821	1.5821	-4.4551**
	(1.5724)	(4.2801)	(4.3281)	(1.4195)
Disbursed 4 weeks ago			2.1917	
			(4.8273)	
Disbursed 5 weeks ago			1.0555	
			(6.5631)	
Disbursed 6 weeks ago			8.7669	
			(7.6631)	
Constant	21.3575***	31.1910***	31.1910***	34.0805***
	(0.7697)	(3.7684)	(3.4528)	(1.3309)
N	944	20	35	20
Years	Jan 2015-December 2019	April-August 2020	April-August 2020	April-August 2021

Notes: Table shows regression where the dependent variable is the amount of SNAP (column 1) or Pandemic EBT (columns 2-3) spending per student at the state-week level relative to the week of disbursement. Robust standard errors clustered by state. Data from USDA STARS. States included are ND, NH, RI, SD, and VT. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A6: Pandemic EBT impacts on household food hardship, well-being, and spending, alternative income groups

	(1)	(2)	(3)	(4)
	< 130% poverty line (conservative)	< 185% poverty line (median)	Income < $50,000	No more than HS education
Panel a: Food insufficiency in HH				
P-EBT disbursed within 2 weeks of start of survey wave	-0.0769*	-0.0532*	-0.0527*	-0.0255
	(0.0420)	(0.0269)	(0.0301)	(0.0288)
N	14709	32485	33270	18594
DV mean prior to disbursement	0.2950	0.2441	0.2472	0.1977
Panel b: Children have very low food security				
P-EBT disbursed within 2 weeks of start of survey wave	-0.1391	-0.1705**	-0.1896**	-0.1848***
	(0.0967)	(0.0682)	(0.0710)	(0.0648)
N	5428	12317	12572	7017
DV mean prior to disbursement	0.3841	0.3071	0.3166	0.2461
Panel c: Poor mental health index (mothers/women ages 18-54)				
P-EBT disbursed within 2 weeks of start of survey wave	-0.0163	-0.1089**	-0.0702	-0.0753
	(0.0746)	(0.0515)	(0.0542)	(0.0524)
N	10615	22320	23171	10976
DV mean prior to disbursement	0.2699	0.2276	0.2316	0.1752
Panel d: Poor or fair physical health (mothers/women ages 18-54)				
P-EBT disbursed within 2 weeks of start of survey wave	0.0097	0.0136	0.0119	0.0160
	(0.0468)	(0.0356)	(0.0352)	(0.0310)
N	10659	22410	23266	11035
DV mean prior to disbursement	0.3010	0.2568	0.2638	0.2482
Panel e: Very confident can afford food next 4 weeks				
P-EBT disbursed within 2 weeks of start of survey wave	0.0152	-0.0125	0.0115	-0.0026
	(0.0236)	(0.0265)	(0.0265)	(0.0250)
N	14719	32515	33300	18626
DV mean prior to disbursement	0.1238	0.1530	0.1451	0.2334
Panel e: Log grocery spending per child (per person, HH without children)				
P-EBT disbursed within 2 weeks of start of survey wave	0.0165	0.0051	-0.0211	-0.0153
	(0.0545)	(0.0379)	(0.0409)	(0.0503)
N	14010	30950	31573	17499
DV mean prior to disbursement	4.6174	4.6277	4.6734	4.7452

Notes: Table shows effect of being in a state that disbursed the first EBT payment within 2 weeks of the beginning of the survey wave. States are dropped from the analyses after treatment so that the control group in each period is states that have not yet disbursed payments. All specifications include controls for respondent race/ethnicity, gender, educational attainment, and age, as well as controls for household size; the number of children in the household, the state unemployment claimant rate; the share of SNAP Emergency Allotment payments and SNAP benefits disbursed in 2 weeks before the survey period; whether there is an active stay-at-home order, mask mandate, or indoor restaurant closure at the start of the survey wave; share of UI claims processed within 1, 2, and more than 10 weeks of claiming date; state and time-period fixed effects; and state linear time trends. Sample restricted to households with children and with income in an income bin fully below 130% of the poverty line (column 1), an income bin with a midpoint below 185% of the poverty line (column 2), below $50,000 (column 3), or respondent having no more than a high school education (column 4). Regressions weighted by respondent sample weights. Robust standard errors clustered by state. Data from Household Pulse Survey waves 1-13 (panels a, c-e) or waves 7-13 (panel b). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A7: Pandemic EBT impacts on household food hardship, well-being, and spending, no state trends

	(1)	(2)	(3)	(4)	(5)	(6)
	Sometimes/often not having enough to eat in HH	Children have very low food security	Poor mental health index (mothers)	Poor or fair physical health (mothers)	Very confident can afford food next 4 weeks	Log grocery spending per child
P-EBT disbursed within 2 weeks	-0.0711***	-0.1041**	-0.0157	-0.0029	0.0206	0.0287
of start of survey wave	(0.0177)	(0.0443)	(0.0308)	(0.0309)	(0.0171)	(0.0390)
N	20306	7595	14510	14572	20320	19263
DV mean prior to disbursement	0.2749	0.3625	0.2602	0.2906	0.1326	4.6305

Notes: Table shows effect of being in a state that disbursed the first EBT payment within 2 weeks of the beginning of the survey wave. States are dropped from the analyses after treatment so that the control group in each period is states that have not yet disbursed payments. All specifications include controls for respondent race/ethnicity, gender, educational attainment, and age, as well as controls for household size; the number of children in the household, the state unemployment claimant rate; the share of SNAP Emergency Allotment payments and SNAP benefits disbursed in 2 weeks before the survey period; whether there is an active stay-at-home order, mask mandate, or indoor restaurant closure at the start of the survey wave; share of UI claims processed within 1, 2, and more than 10 weeks of claiming date; and state and time-period fixed effects. Sample restricted to households with children and with income below 130 percent of the federal poverty line. Regressions weighted by respondent sample weights. Robust standard errors clustered by state. Data from Household Pulse Survey waves 1-13 (columns 1, 3-6) or waves 7-13 (column 2). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A8: Pandemic EBT impacts on household food hardship, well-being, and spending, monthly disbursement dates reported to USDA

	(1)	(2)	(3)	(4)	(5)	(6)
	Food insufficiency in HH	Children have very low food security	Poor mental health index (mothers)	Poor or fair physical health (mothers)	Very confident can afford food next 4 weeks	Log grocery spending per child
Panel a: P-EBT disbursed current month, as reported to USDA						
P-EBT current month	-0.1370	0.0096	0.1051	-0.0880*	0.0681**	-0.0036
	(0.1011)	(0.0457)	(0.0655)	(0.0440)	(0.0268)	(0.0527)
N	7514	22099	15835	15902	22112	20978
DV mean	0.3531	0.2701	0.2386	0.2838	0.1299	4.6226
Panel b: P-EBT disbursed current or last month, as reported to USDA						
P-EBT current or last month	-0.0717	-0.0151	0.0962***	-0.0244	0.0095	-0.0171
	(0.0731)	(0.0245)	(0.0344)	(0.0311)	(0.0171)	(0.0392)
N	16072	32151	22881	22976	32182	30564
DV mean	0.3531	0.2701	0.2386	0.2838	0.1299	4.6226

Notes: Table shows effect of being in a state that disbursed the first EBT payment in the current month (panel a) or current or next month (panel b) of the beginning of the survey week, according to monthly disbursement information reported to USDA. States are dropped from the analyses after treatment so that the control group in each period is states that have not yet disbursed payments. All specifications include controls for respondent race/ethnicity, gender, educational attainment, and age, as well as controls for household size; the number of children in the household, the state unemployment claimant rate; whether there is an active stay-at-home order, mask mandate, or indoor restaurant closure at the start of the survey wave; share of UI claims processed within 1, 2, and more than 10 weeks of claiming date; state and time-period fixed effects; and state linear time trends. Sample restricted to households with children and with income below 130 percent of the federal poverty line. Regressions weighted by respondent sample weights. Robust standard errors clustered by state. Data from Household Pulse Survey waves 1-13 (columns 1, 3-6) or waves 7-13 (column 2). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.