APPENDIX



Figure A1

**Notes:** The plot above shows SNAP/CalFresh benefits that were redeemed at RMP participating restaurants as a percentage of total benefits issued in each treatment cohort. Treatment cohorts are as follows: 2003 includes San Francisco (in green with circle markers), 2005 includes Los Angeles (in red with diamond markers), 2007 includes Sacramento and Santa Clara (in black with square markers), 2012 includes Alameda, San Diego and San Luis Obispo (in blue with cross markers), 2013 includes Orange and Santa Cruz (in orange with circle markers) and 2018 includes Riverside (in grey with diamond markers). Some values were redacted by FNS and are not shown in the plot.



Figure A2. Relationship between number of participating restaurants and redemptions

**Notes:** This figure explores the relationship between number of participating restaurants and redemptions per 100,000 SNAP benefit recipients. Both variables are measured in natural logarithms. Each data point on the plot represents a county-year. The figure also displays the correlation coefficient between the two variables.

|  |  |
| --- | --- |
| **Panel A** | **Panel B** |

Figure A3. Event studies for food insecurity related outcomes

**Notes:** The figure above shows event study estimates from stacked difference-in-differences for various outcomes related to food insecurity. Outcomes in panel A are standardized such that the mean and standard deviation for the control group equals zero and one, respectively. Panel A includes outcomes based on the following questions in California BRFSS about the past twelve months; (i) how often someone couldn’t afford to eat balanced meals? (in red with cross markers), (ii) how often did they cut their meal size? (in orange with circle markers), and (iii) how often did the food bought not last and they couldn’t afford to get more food? (in blue with diamond markers). Outcomes in panel B include indicators based on the following questions about the past twelve months; (i) whether the person or a household member cut the size of their meal due to limited food or money? (in red with cross markers), (ii) whether they ate less then they wanted to or felt like they should eat less because there wasn’t enough money? (in orange with circle markers), (iii) and were they ever hungry but didn’t eat because they couldn’t afford enough food? (in blue with diamond markers). Average effect is measured in standard deviation units in panel A and in percentage points in panel B. Standard errors are clustered at the county level.

TABLE AI: RMP TREATMENT YEARS

|  |  |  |  |
| --- | --- | --- | --- |
| (1)  County Name | (2)  Year of First Authorized Restaurant | (3)  Indicator for RMP equals 1 | (4)  Years when Redemption Amount Is Redacted |
| Alameda | 2012 | 2013-2020 | none |
| Humboldt | 2019 | none a | all |
| Kern | 2005 | none b | all |
| Los Angeles | 2005 | 2006-2020 | none |
| Madera | 2021 | none | none |
| Monterey | 2013 | none c | all |
| Orange | 2013 | 2014-2020 | 2013-2017 |
| Riverside | 2011 | 2018-2020 d | 2011 |
| Sacramento | 2007 | 2008-2020 | none |
| San Bernardino | 2014 | none e | all |
| San Diego | 2012 | 2013-2020 | 2012 |
| San Francisco | 2003 | 2004-2020 | 2003-2004 |
| San Luis Obispo | 2012 | 2013-2020 | 2012 |
| San Mateo | 2014 | none f | all |
| Santa Barbara | 2013 | none g | all |
| Santa Clara | 2007 | 2008-2020 | 2007 & 2009 |
| Santa Cruz | 2013 | 2014-2020 | 2013-2015 |
| Stanislaus | 2006 | none h | all |
| Ventura | 2010 | 2011-2020 | 2010-2020 |

a Humboldt County had a single restaurant from 2019-2021

b Kern County had a single restaurant from 2005-2007 and none afterwards.

c Monterey County had a single restaurant in 2013 and none afterwards

d Riverside had 2 restaurants in 2011 and had no restaurants from 2012 to 2017.

e San Bernardino had less than 4 restaurants in any given year.

f San Mateo County had 17 restaurants from 2014 to 2018 and had zero restaurants from 2019-2020.

g Santa Barbara County had a single restaurant in 2013 and none after.

h Stanislaus had a single restaurant from 2006 to 2007 and none after

**Notes:** Column (1) in the table above provides a list of counties in California that are included in the CA-BRFSS and had RMP participating restaurants before the statewide adoption of RMP. Column (2) indicates the year that the first restaurant was authorized in the county by FNS. Column (3) provides the years between 2000 and 2020 that the county is considered treated. All counties are considered never treated if--(1) They never had more than five participating restaurants; or (2) Within a few years of initial authorization, the number of participating restaurants decreased to zero. Column (4) provides the years for which the redemption information was redacted for the county.

TABLE AII: RMP PARTICIPATING RETAILERS

|  |  |
| --- | --- |
| Name of the Restaurant | Percentage |
| Subway | 16.71 |
| Jack in the Box | 10.53 |
| Pizza Hut | 6.85 |
| KFC | 5.88 |
| El Pollo | 5.34 |
| Domino’s Pizza | 5.29 |
| Carl’s Jr. | 5.21 |
| Burger King | 4.47 |
| McDonald’s | 3.55 |
| Del Taco | 2.90 |
| Yoshinoya | 2.33 |
| Wendy’s | 1.86 |
| **Total** | **70.93** |

**Notes:** The table lists the restaurants that make up approximately 71 percent of all participating retailers in the Restaurant Meals Program in California. Percentages are computed using total number of participating restaurants from 2000 to 2020 based on the data made available by FNS.

TABLE AIII—RESULTS: Body Mass Index (BMI)

|  |  |  |
| --- | --- | --- |
|  | BMI | |
|  |  | (1) |
|  |  | -0.038  (0.389) |
| County by stack FE |  |  |
| Cohort by stack FE |  |  |
| Year by stack FE |  |  |
| Controls |  |  |
| Observations |  | 20,156 |

**Notes:** The table explores the effect of the introduction of Restaurant Meals Program on BMI. Specifically, it presents estimates of coefficient from equation (1) with BMI as the outcome variable. Column (1) estimates equation (1) using my preferred specification. Controls consist of age, gender, marital status, insurance status, smoking status, race/ethnicity, employment status, and education level. Standard errors in parentheses are clustered at the county level.

TABLE AIV—ROBUSTNESS: OBESITY RESULTS EXCLUDING EACH TREATMENT COHORT IN TURN

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Difference-in-Differences | | | | |  | Triple Difference-in-Differences | | | | |
|  | (1)  Main specification | (2)  Excluding treatment cohort 2005 | (3)  Excluding treatment cohort 2007 | (4)  Excluding treatment cohort 2012 | (5)  Excluding treatment cohort 2013 |  | (6)  Main specification | (7)  Excluding treatment cohort 2005 | (8)  Excluding treatment cohort 2007 | (9)  Excluding treatment cohort 2012 | (10)  Excluding treatment cohort 2013 |
| Obesity | -0.018  (0.027) | 0.000  (0.040) | -0.016  (0.030) | -0.021  (0.026) | -0.031  (0.028) |  | -0.019  (0.025) | 0.002  (0.031) | -0.023  (0.026) | -0.010  (0.031) | -0.037  (0.024) |
| Observations | 20,156 | 14,767 | 15,548 | 14,770 | 15,383 |  | 42,871 | 31,525 | 33,358 | 31,230 | 32,500 |

**Notes:** This table explores the robustness of my baseline results to excluding counties belonging to each treatment cohort in turn. It presents estimates of coefficient from Equation (1) in columns (1) to (5) and estimates of coefficient from Equation (2) in columns (6) to (10). Difference-in-differences estimates are computed using county by stack fixed effects, year by stack fixed effects and controls. Tiple difference-in-differences estimates are computed using county by stack fixed effects, age group by stack fixed effects, year by stack fixed effects, county by year by stack fixed effects, county by age group by stack fixed effects, year by age group by stack fixed effects and controls. The outcome variable is obesity. Controls consist of age, gender, marital status, insurance status, smoking status, race/ethnicity, employment status, and education level. Standard errors in parentheses are clustered at the county level.

TABLE AV—ROBUSTNESS CHECKS: FOOD INSECURITY OUTCOMES

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1)  Main specification | (2)  Balanced window for each stack (2 pre- and 6-post) | (3)  Including 2012 stack | (4)  Excluding later adopting counties | (5)  Excluding later and ever adopting counties | (6)  Age 60 years | (7)  Excluding Medi-Cal recipients with income above 200% FPL |
| *Past 12 months—ever?* |  |  |  |  |  |  |  |
| Cut meals | -0.110  (0.086) | -0.058  (0.092) | -0.121  (0.079) | -0.101  (0.096) | -0.205a  (0.102) | -0.087  (0.056) | -0.154a  (0.080) |
| Ate less | -0.140  (0.103) | -0.104  (0.106) | -0.131  (0.090) | -0.101  (0.108) | -0.250\*  (0.100) | -0.079  (0.074) | -0.195  (0.118) |
| Hungry | -0.365\*\*\*  (0.088) | -0.396\*\*\*  (0.107) | -0.311\*\*\*  (0.084) | -0.337\*\*\*  (0.094) | -0.375\*\*  (0.112) | -0.236\*\*\*  (0.061) | -0.341\*\*  (0.113) |
| *Past 12 months—how often?* |  |  |  |  |  |  |  |
| Couldn’t afford | -0.094  (0.080) | -0.094  (0.086) | -0.089  (0.070) | -0.056  (0.080) | -0.191\*  (0.075) | -0.019  (0.071) | -0.095  (0.095) |
| Cut meals | -0.224\*  (0.083) | -0.152  (0.100) | -0.217\*  (0.080) | -0.213\*  (0.086) | -0.287\*\*  (0.090) | -0.166\*\*  (0.053) | -0.248\*  (0.094) |
| Food didn’t last | -0.125  (0.114) | -0.143  (0.131) | -0.091  (0.096) | -0.134  (0.124) | -0.261a  (0.128) | 0.001  (0.112) | -0.102  (0.121) |
| *FI index-Any* | -0.213\*  (0.089) | -0.194\*  (0.092) | -0.193\*  (0.080) | -0.191a  (0.096) | -0.319\*\*  (0.086) | -0.116a  (0.065) | -0.232\*  (0.103) |
| *FI index-All* | -0.205\*  (0.085) | -0.167a  (0.085) | -0.187\*  (0.077) | -0.178a  (0.091) | -0.305\*\*\*  (0.081) | -0.120a  (0.070) | -0.207a  (0.104) |

ap0.10, \*p0.05, \*\*p0.01, \*\*\*p0.001

**Notes:** The table explores the robustness of primary results to varying window, control groups, and inclusion criteria for outcomes related to food insecurity. Column (1) replicates the estimates of coefficient of equation (1) from my primary specification which includes unbalanced stacks for the 2005 and 2007 cohorts. Column (2) provides estimates with a 2 pre- and 6 post-year window for both stacks, column (3) adds the 2012 stack to the primary sample, column (4) excludes all later adopting counties from the control group, column (5) excludes all those counties from the control group that ever had a single RMP participating restaurant, column (6) provides estimates for all above 60, and the last column provides estimates after excluding Medi-Cal recipients whose income is above 200% FPL. ‘FI index-Any’ and ‘FI index-All’ refer to the food insecurity indices created with and without any missing components, respectively. All regressions include county by stack fixed effects, year by stack fixed effects and controls. Standard errors in parentheses are clustered at the county level. All outcomes are in standard deviation units.