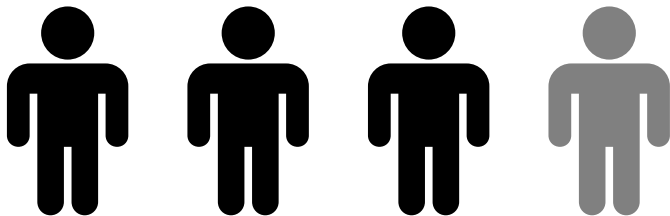



# Dissertation Proposal: Health Care Costs and Household Finance

Madeline Reed

## One-in-Four Adults Are Forgoing Care Due to Out-of-Pocket Costs





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# Framework: Liquidity and Health Care

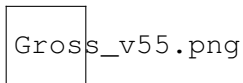


Figure: Gross et. al (2020)

# Framework: Liquidity and Health Care



Gross et. al (2020)

# Study 1: The Liquidity Sensitivity of Out-of-Pocket Health Care Expenditure: Effects from the EITC

- ▶ Earned Income Tax Credit (EITC)
- ▶ MEPS data 2010 to 2016
  - ▶ Tracks health care use and costs at a monthly level
  - ▶ Flags people with low or no deductibles, as well as HDHPs
  - ▶ Restricted Data: State of residence and measures of household savings
- ▶ Methods: Difference-in-Difference-in-Differences (DDD)  
Treatment in the model is the interaction of state, EITC eligibility and treatment months.

# Study 1: The Liquidity Sensitivity of Out-of-Pocket Health Care Expenditure: Effects from the EITC

- ▶ How does an exogenous **income shock** change health care consumption?
- ▶ Is the response to an exogenous income shock larger for individuals in employer sponsored plans with **higher deductibles**?
- ▶ Is the response to an exogenous income shock larger for individuals in employer sponsored plans **without savings**?
- ▶ Is the response to an exogenous income shock larger for **Black people**?

## Study 2- Out-of-Pocket Health Care Expenditure: Effects on Household Food Security

- ▶ Gundersen and Gruber (2001)
- ▶ Data: MEPS 2016-2017
  - ▶ Outcome: Food Insecurity at Round 4.
  - ▶ Financial assets in protecting households from food insecurity after change in out-of-pocket cost
- ▶ Descriptive Method: Lagged Dependent Variable Model

FS\_panel\_aug20.png

Figure: MEPS Panel 21: 2016 - 2017



## Study 2- Out-of-Pocket Health Care Expenditure: Effects on Household Food Security

- ▶ How does a change in the relative budget share on **out-of-pocket costs** affect the change in **household food security**?
- ▶ Does the amount of **savings** mediate the effect of a change in the relative budget share on health expenditure on household food security?

# Study 3: The Effects of the Pandemic Relief on Basic Health Care Consumption

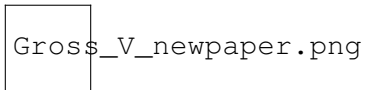
- ▶ Household Pulse Survey (collected April 2020- July 2021)
  - ▶ Census
  - ▶ Cross- sectional
  - ▶ Bi-weekly
  - ▶ Large Sample N= 76,000 Households
  
- ▶ Delaying or foregoing care
  
- ▶ State level
  - ▶ Lock-downs
  - ▶ Ending of the federally funded unemployment benefits. Federal Pandemic Unemployment Compensation (FPUC).
  - ▶ Vaccination rates
  - ▶ Cell phone mobility data

## Study 3: The Effects of the Pandemic Relief on Basic Health Care Consumption

- ▶ What factors are associated with reduction in **delaying or forgoing health care** during the COVID-19 pandemic?
- ▶ How did **Federal Pandemic Assistance** reduce this delaying of care, based on state differences?

# Contributions

- ▶ Different test of liquidity sensitivity of health care. Population is U.S. working age adults.
- ▶ Adds to food security literature by investigating relationship between out-of-pocket costs and food insecurity
- ▶ Spill-over effects of withdrawal of Federal Pandemic Unemployment Compensation.
- ▶ Add to overarching literature of public health, insurance, household finance by investigating health care seeking among people experiencing financial hardship, especially liquidity constrained



**Figure:** Gross et al. 2021

## Sample Size 1: The Liquidity Sensitivity of Out-of-Pocket Health Care Expenditure: Effects from the EITC

<b>Plan Deductible</b>	<b>White</b>	<b>Black</b>	<b>Latinx</b>	<b>Other</b>	<b>Total</b>
No	748	459	616	520	2,775
Low	2,061	811	890	822	5,104
HDHP	1,437	393	413	451	2,936

Asians, as well as Hispanics and Blacks, are oversampled.

## Sample Size 1: The Liquidity Sensitivity of Out-of-Pocket Health Care Expenditure: Effects from the EITC

<b>Plan Deductible</b>	<b>White</b>	<b>Black</b>	<b>Latinx</b>	<b>Other</b>	<b>Total</b>
EITC eligible	387	290	393	202	1,272
Non- EITC eligible	3,859	1,373	1,526	1,591	8,349

**Table:** Table of Changes in State EITC

<b>Year</b>	<b>New</b>	<b>Increase</b>	<b>Decrease</b>
2010		KS	NJ
2011	CT	ME	WI
2012			MI
2013		IL, IA	CT, KS, NC
2014		CT, IA, MD, OH, OR	
2015	CO	MD, MA, NJ,	RI
2016	CA	MD, NJ, RI	

The column "New" displays states which introduced state EITC during the year. The columns "Increase" and "Decrease" means a state changed the generosity of its state EITC during a given year.



# State EITC

$$Y_{it} = \beta_1 EITC_i * FebMarch_t * State_s + \beta_2 FebMarch_t * EITC_i + \beta_3 State_s * EITC_i + \beta_4 FebMarch_t * State_s + \beta_5 EITC_i + \beta_6 State_s + \beta_7 FebMarch_t + \beta_7 Year_t + \beta_8 X_{it} + \varepsilon_{it} \quad (1)$$

Where  $Y_{it}$  is monthly out-of-pocket health spending for *individual<sub>i</sub>* in *year<sub>t</sub>* and *state<sub>s</sub>* is the state that an individual lives and is eligible for state EITC. Person level controls,  $X_{it}$ .

Controls: race, health status, mental health status , marriage status, poor , age, age squared, age cubed, number of people in the household, number of children in the household, education level, plan deductible (1=no , 2=low, 3=high), month, region (North, South, East, West) and year fixed effects (2011 - 2016). Cluster at the Primary Sampling Unit.

## Stacked difference-in-differences

- ▶ State data are divided into “timing groups” defined by the year in which they experience a change in their state-EITC. States which experience the change in the same year are in the same timing group.
- ▶ For each timing groups, control group is created which includes all of the states which never adapted EITC. A separate dataset is created for each timing group. In each dataset, states which changed EITC are considered the treatment group, and those which did not in that year form the control group.
- ▶ In each data set event time is defined as years since the EITC change.
- ▶ Each data set is stacked together to create one "long" data set. In this data set, every treated state is included once, however each control state is included for each timing group.

## Sample Size 2:

Table: Food security round 4, by race

<b>Food Security</b>	<b>White</b>	<b>Black</b>	<b>Latinx</b>	<b>Other</b>	<b>Total</b>
Secure	2,356	877	1,154	470	4,857
Insecure	347	311	370	82	1,110

# Transition of Food Security

Marginal Security Round 2	Marginal Security Round 4		Total
	Secure	Insecure	
Secure	4241	350	4591
Insecure	569	755	1324
Total	4810	1105	5915

## Lagged Dependent Variable Model

$$Y_{it} = \beta_1 \mathbf{Y}'_{it-1} + \beta_2 \mathbf{X}'_{it} + \beta_3 \mathbf{D}_{it} + \mathbf{error}_{it} \quad (2)$$

where  $Y_{it}$  is food insecurity for *household<sub>i</sub>* at  $t = 4$ . The lagged dependent variable or the food security status for each household at  $t = 2$  is included as  $\mathbf{Y}'_{it-1}$ . Again,  $\mathbf{X}'_{it}$  are demographic characteristics and  $\mathbf{D}_{it}$  is an indicator of a household's out-of-pocket costs.

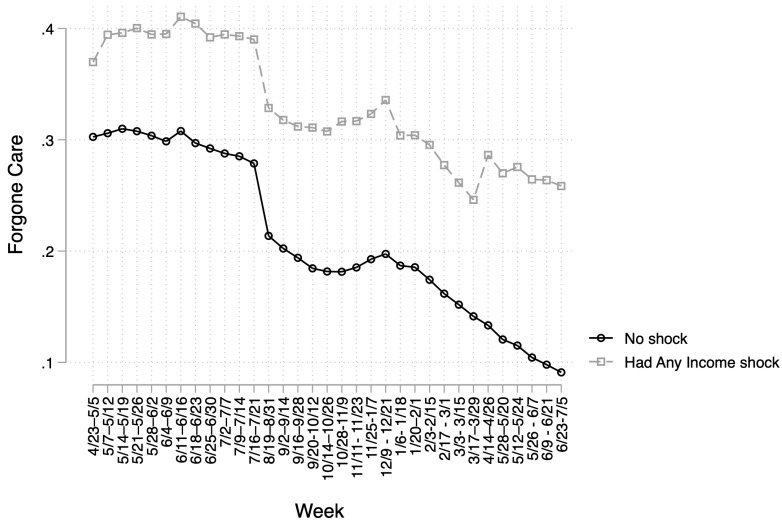
## Lagged Dependent Variable Model - 2

$$Y_{it} = \beta_1 \mathbf{Y}'_{it-1} + \beta_2 \mathbf{X}'_{it} + \beta_3 \mathbf{D}_{it} * \mathbf{Z}_{it} + \beta_3 \mathbf{D}_{it} * \mathbf{W}_{it} + \mathbf{error}_{it} \quad (3)$$

A household's prior round food security is included in the model  $\mathbf{Y}'_{it-1}$  along with a vector of demographic controls  $\mathbf{X}'_{it}$ . The treatment variable of household out-of-pocket costs is  $\mathbf{D}_{it}$ , the round 3 out-of-pocket costs.  $\mathbf{Z}_{it}$  is an indicator for whether the household was food secure in round 2.  $\mathbf{W}_{it}$  is an indicator if the household was food insecure in round 2.

## Lagged Dependent Variable Model

- ▶ Using a lagged dependent variable in a cross-sectional equation provides a simple way to account for historical factors that cause current differences in the dependent variable that are difficult to account for in other ways.
- ▶ EX: Some households live further away from grocery store. Many of the same unobserved factors contribute to both high current and past food insecurity.



**Figure:** Forgone care among those with Job loss. Note: Before 4/14/21 'since March 2020'. Starting on 4/14 'in the last 4 weeks'



# The Bidirectional Relationship Between Food Security and Health Costs

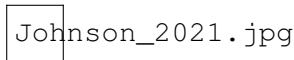


Figure: Johnson et al 2021