SHEDDING LIGHT ON HEALTH IMPLICATIONS OF FOOD INSECURITY ON STATEN ISLAND

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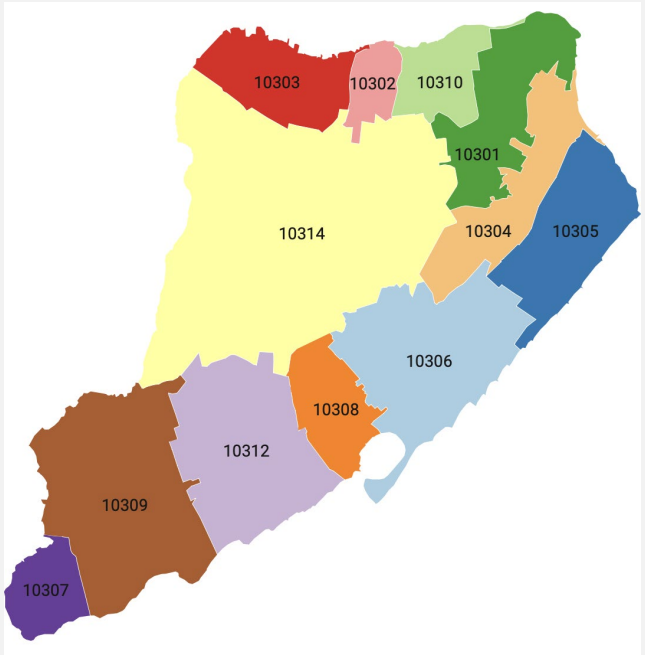
INTRODUCTION

- We are investigating how income inequality affects food access and health on Staten Island.
- Thousands of Staten Islanders living in food deserts along the North Shore struggle to access fresh fruits and vegetables (SI Live, 2024).

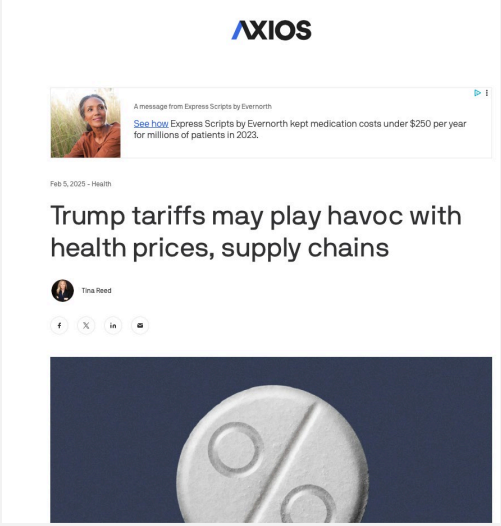
FOOD INSECURITY STATEN ISLAND

- The limited availability of fresh produce in food deserts poses a major risk to the immediate and long-term health of residents.
- Residents residing in North Shore ZIP codes typically have higher rates of obesity, diabetes and high blood pressure compared to those living in other parts of the borough.



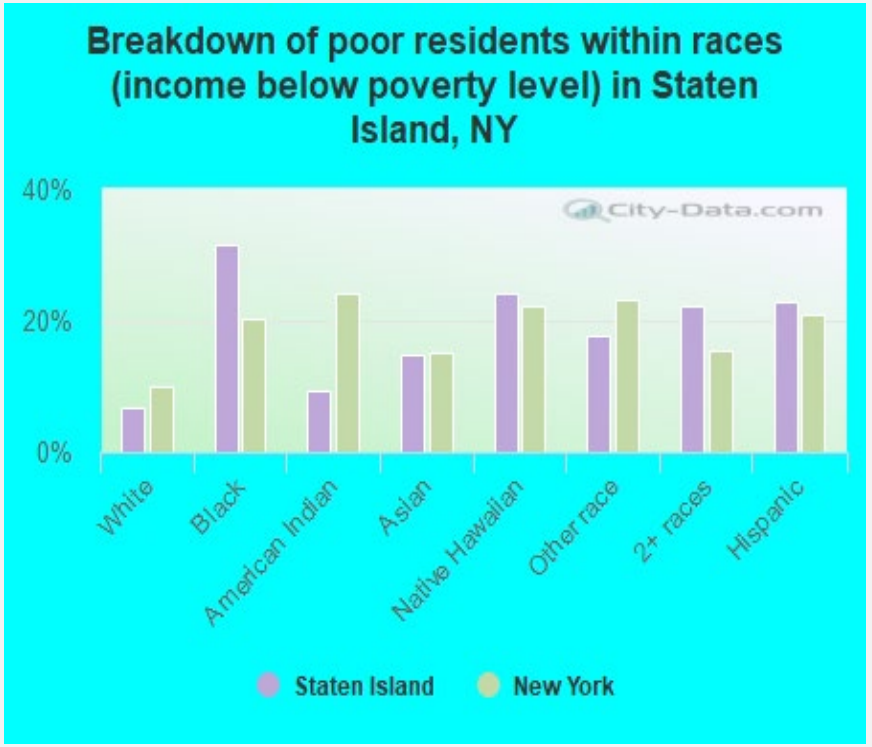
THEORETICAL FRAMEWORK: INCOME INEQUALITY & HEALTH OUTCOMES

- We use public health and economic theories that explain how inequality leads to worse health through limited access to food



SAMPLE DESIGN

- Stratification based on income, household size, and ethnicity.
  - Ensures inclusion of low-income, immigrant, and underrepresented communities.
- Stratified Random Sampling of 1,000 households.
  - Targeted recruitment to reflect Staten Island's racial and socioeconomic diversity.
- Oversampling in vulnerable areas for precision.
  - Working with local organizations to improve outreach and participation.



SAMPLE DESIGN

- Sample Representativeness Strengthening
  - **Stratified Random Sampling**: Ensures inclusion of low-income, immigrant, and underrepresented communities.
  - **Oversampling**: Targeted recruitment to reflect Staten Island's racial and socioeconomic diversity.
  - **Community Partnerships**: Working with local organizations to improve outreach and participation.
    - SIPCW
    - La Colmena
    - Hunger Task Force
    - Forest Avenue COMEunity Fridge

SURVEY + TIMELINE

- We ran a pilot with 300 people to refine our approach.

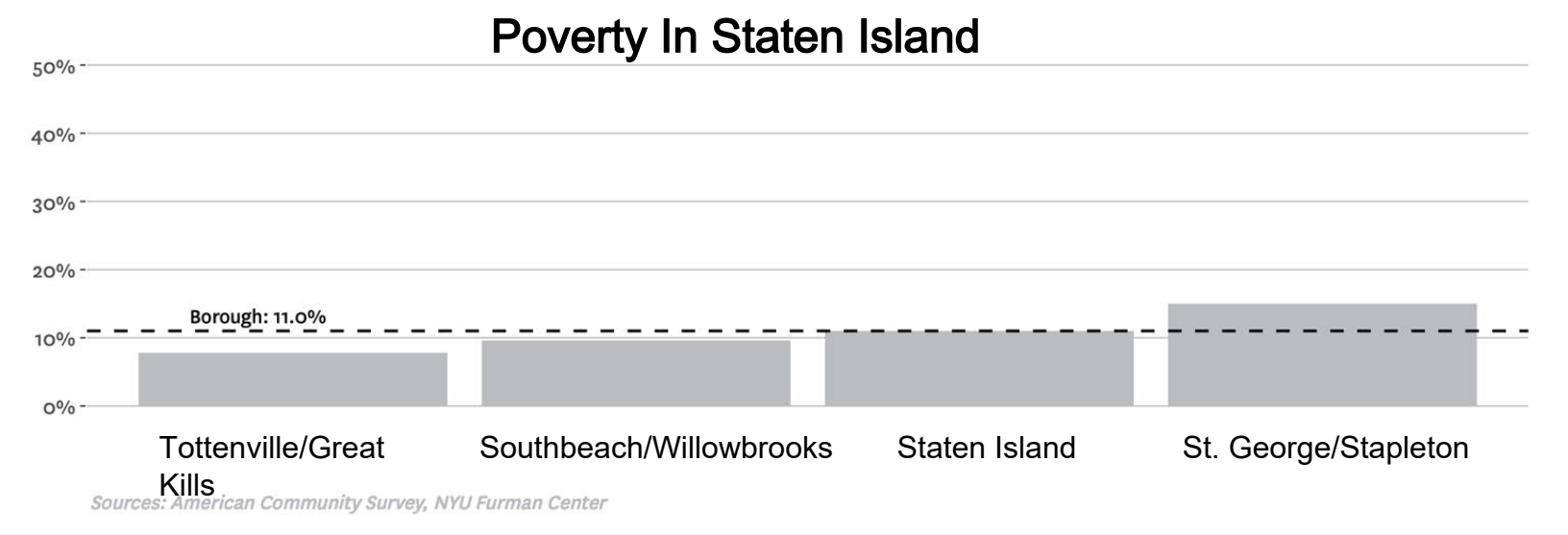
- Full project will take 3 years
  - Data Collection (1000 households)
  - Data analysis
  - Writing + Outreach

USE OF EXISTING DATA SOURCES

- Census & Panel Study of Income Dynamics (PSID) datasets lack granularity.
- Primary data collection ensures localized insights on food security & health.

WHY STATEN ISLAND?

- Unique socio-economic contrasts within an urban environment.
- Provides a localized model for generalization to other urban settings.



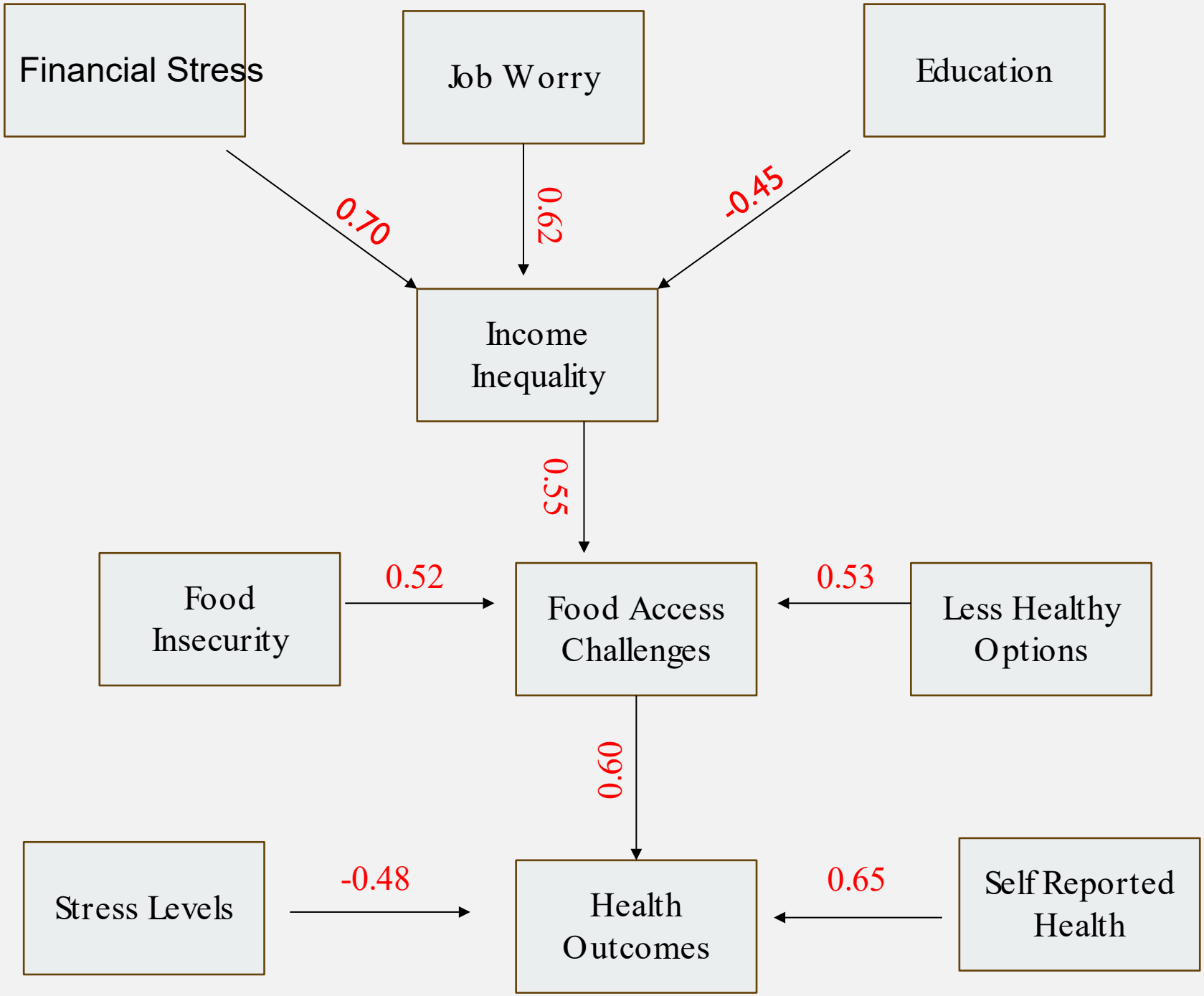
RESEARCH APPROACH & METHODOLOGY

Strengthening Causal Inference Argument

- **Longitudinal Data Collection**: To strengthen causal inference, we track the **same households** over multiple years, reducing biases from individual differences.
- We employ **Structural Equation Modeling** (SEM) to examine the direct and indirect effects of socio-economic factors on food insecurity

PRELIMINARY FINDINGS FROM PILOT STUDY (N=300)

- Our early results show income inequality hurts food access, and poor food access leads to worse health.


Financial Stress
Job Worry
Education
0.70
0.62
-0.45
Income Inequality
0.55
Food Insecurity
0.52
Food Access Challenges
0.53
Less Healthy Options
0.60
Stress Levels
-0.48
Health Outcomes
0.65
Self Reported Health

PRELIMINARY CONCLUSIONS

Statistical results suggest a **clear causal pathway:**

- financial stress, job insecurity, and education → income inequality
- income inequality → food access and health outcomes **(need for more evidence with additional analysis)**

PRELIMINARY CONCLUSIONS

1. Stress matters.
2. Causal effect of income inequality on health outcomes, mediate by food access.

BRIDGING RESEARCH & POLICY: IMPACT ON STATEN ISLAND

- **Community Partnerships**: Collaborating with local food banks, shelters, and public health organizations to translate findings into actionable programs.
- **Policy Briefs & Reports**: Developing clear, accessible summaries of research findings for policymakers, ensuring data-driven decision-making.
- **Engagement with Staten Island Officials**: Presenting findings to city council members, borough leadership, and local policymakers to inform food security initiatives.
- **Workshops & Public Forums**: Organizing community discussions on food insecurity solutions, engaging both policymakers and residents.
- **Long-Term Strategy**: Establishing a research-policy task force to sustain efforts beyond the study period.

QUESTIONS?

Dr. Giacomo DiPasquale
Assistant Professor, Wagner College

APPENDIX

THE RESEARCHERS

***Giacomo Di Pasquale**, PhD*
Assistant Professor,
Economics

***Elisa Parazzi**, junior/senior*
Nicolais School of Business

***Lily Condron**,*
freshman/sophomore
PA Program

WHY 1000 HOUSEHOLDS?

- **Statistical Reliability**: A sample of 1,000 households provides a margin of error of approximately ±3% at the 95% confidence level — suitable for estimating food insecurity and inequality rates with precision.
- **Representative Scope**: Staten Island has about 170,000 households. Surveying 1,000 represents around 0.6% of the population — a strong base for generalizing findings across diverse neighborhoods.
- **Supports Advanced Analysis**: A sample of this size is robust enough for multivariate techniques like Structural Equation Modeling (SEM), allowing us to explore complex relationships between variables.
- **Policy Benchmark**: Public health and social science surveys in NYC frequently use comparable sample sizes per borough, making our data comparable to existing city-wide datasets.
- **Feasibility**: Balances analytical rigor with practical considerations of time, cost, and response rates, especially for mixed-mode surveys (e.g., online + phone).

WHY SEM?

What is SEM?

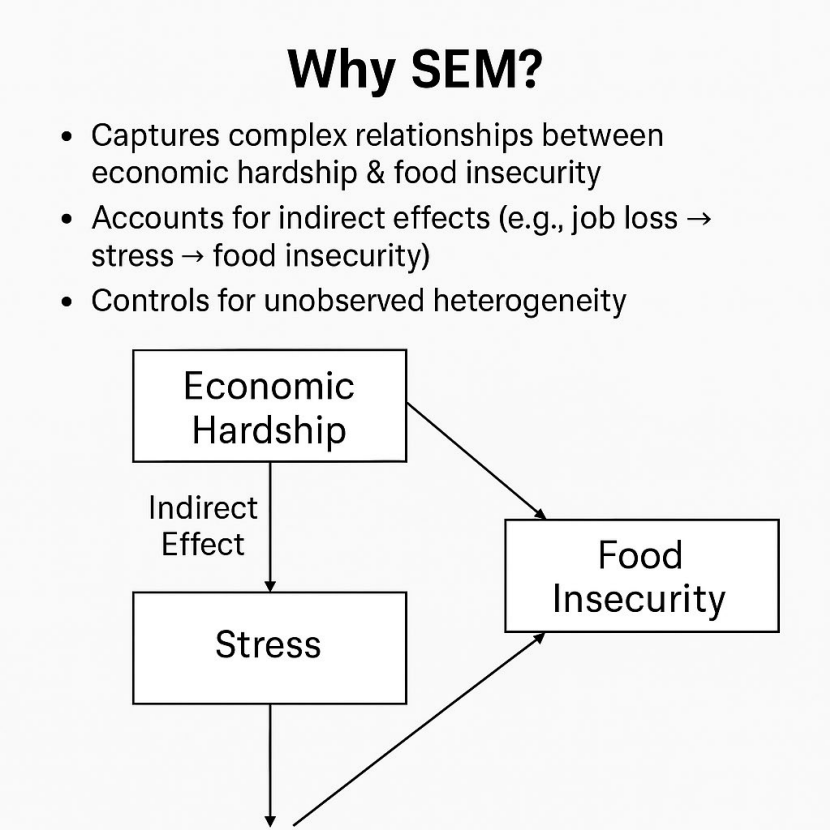
- A statistical technique that models complex relationships between multiple variables.
- Allows for both direct and indirect effects, capturing **how** different factors interact.

Why SEM for Food Insecurity?

✅ **Captures Complexity** – Food insecurity is influenced by income, employment, household structure, and psychological stress simultaneously.
✅ **Controls for Confounding Factors** – SEM accounts for hidden variables affecting food security.
✅ **Tracks Indirect Effects** – Example: Job loss → Stress → Food Insecurity, rather than just job loss → food insecurity.
✅ **Enhances Causal Interpretation** – Longitudinal data + SEM helps distinguish correlation from causation.

SEM IN OUR STUDY

- We use SEM to model the relationship between **economic instability, household dynamics, and food security outcomes over time**.
- Helps policymakers understand **not just IF but HOW** economic shocks impact food access.



SPECIFIC RESEARCH ACTIVITIES

- **Measure Income Inequality**: Using Gini coefficients + additional controls to provide robustness.
- **Identify Key Factors**: Employment, education, food access.
- **Analyze Health Outcomes**: Diet-related diseases & mental health impacts.
- **Develop Policy Recommendations**: Evidence-based strategies for intervention.

PRELIMINARY FINDINGS FROM PILOT STUDY (N=300)

- Income inequality significantly impacts food access ($\beta = 0.55$, $p = 0.002$) and health outcomes ($\beta = 0.42$, $p = 0.010$).
- Food access strongly predicts health outcomes ($\beta = 0.60$, $p = 0.001$), suggesting a mediating effect.
- Financial stress and job worry are major drivers of inequality, while education helps reduce it.
- Food insecurity and dietary constraints (e.g., less fresh food, fewer healthy options) worsen health outcomes.
- Self-reported health is a strong predictor of health outcomes, while stress negatively impacts health.

SEM REGRESSION RESULTS

Variables	Coef.	Std. Error	p-value	95% Co Interval	Sig
Income Inequality → Food Access	0.55	0.08	0.002	(0.39, 0.71)	***
Income Inequality → Health Outcomes	0.42	0.07	0.010	(0.28, 0.56)	**
Food Access → Health Outcomes	0.60	0.09	0.001	(0.42, 0.78)	***
Financial Stress → Income Inequality	0.70	0.05	0.000	(0.60, 0.80)	***
Job Worry → Income Inequality	0.62	0.06	0.001	(0.50, 0.74)	***
Education → Income Inequality	-0.45	0.07	0.015	(-0.59, -0.31)	*
Food Insecurity → Food Access	0.58	0.08	0.003	(0.42, 0.74)	**
Less Fresh Food → Food Access	0.50	0.07	0.005	(0.36, 0.64)	**
Less Healthy Options → Food Access	0.53	0.06	0.004	(0.41, 0.65)	**
Self-Reported Health → Health Outcomes	0.65	0.09	0.001	(0.47, 0.83)	***
Stress Levels → Health Outcomes	-0.48	0.08	0.007	(-0.64, -0.32)	**