

Urban-Rural Differences in a Chain Supermarket's Sales to SNAP Shoppers before and since COVID-19

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Background

- SNAP was formed to address food insecurity and improve diet quality^{1,2}
- Rural environment tends to have higher poverty rates, lower access to nutritious food, and face economic decline.³
- Rural SNAP participants are especially vulnerable to poor health outcome compared to participants in urban areas.³
- COVID-19 affected supply chains and had major economic and social impacts – especially in low income populations.⁴

Methods

- Transaction data from a large grocery store chain with 496 stores in 86 of North Carolina's 100 counties
- Counties classified as rural or urban using USDA definitions
- SNAP shoppers identified by payment type
- >32,000 store-month observations from October 2019 to December 2020
- Outcomes: Share of total calories purchased from nutritionally-relevant food groups
 - Fruits, vegetables, legumes and nuts (FVLN all)
 - FVLN without salt/fat/sugar (FVLNNA)
 - Sugar sweetened beverages (SSB)
 - Junk food (JF)
 - Processed meats and seafood (PM)
- Used random effects linear regression models with robust standard errors adjusting for county-level demographic composition, food environment index⁵ and store characteristics

Pre/Post COVID-19 Onset Share of Calories

| Food Category | Pre COVID (95% CI) | Post COVID (95% CI) | Difference (95% CI) |
|--|-----------------------|-----------------------|-------------------------|
| Fruits, Vegetables, Nuts, and Legumes without Additives | 8.26% (8.18, 8.33) | 8.20% (8.13, 8.27) | -0.06% (-0.11, 0.00) |
| All Fruits, Vegetables, Nuts, and Legumes with and without Additives | 13.56% (13.42, 13.71) | 13.37% (13.24, 13.50) | -0.20%** (-0.53, -0.10) |
| Sugar Sweetened Beverages | 10.33% (10.10, 10.55) | 9.89% (9.71, 10.08) | -0.43%** (-0.53, -0.33) |
| Junk Food | 31.36% (31.22, 31.49) | 30.04% (29.91, 30.17) | -1.32%** (-1.41, -1.22) |
| Processed Meats and Seafood | 5.51% (5.44, 5.58) | 5.60% (5.54, 5.66) | 0.87%** (0.05, 0.13) |

Estimates from random effects regression models including only SNAP sales per month observations, comparing October 2019-December 2019 (pre) to October 2020-December 2020 (post). Models were adjusted for county demographic differences, percent of total transactions that are SNAP, percent of total loyalty cards that are SNAP, Mean number of nonSNAP transactions, and Food Environment Index deviations. **Pre/post differences are statistically significant at an alpha of 0.05.

Predicted Share of Calories From FVLN all, SSBs, JF, and PM



Results

- A store being located in a rural county was significantly associated with lower share of calories from sugar sweetened beverages and junk food.
- Before and After COVID-19 Onset
 - Lower share of cal from FVLN all, SSBs, and JF
 - Higher share of cal from PM

Implications

- Needs for stronger SNAP vendor standards with specifications on stocking more healthful foods
- Incentive/Disincentives for SNAP participants to buy more healthful foods and less unhealthy foods
- Need for protective measures around supply chains during major global events to ensure healthy options are available for SNAP participants

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