

#### INTRODUCTION

- Nutrition-related chronic conditions are more prevalent among lowincome populations, including in Oklahoma:
  - One in 6 (22.3%) adults living in households with incomes below \$15,000 have diabetes (vs 12.4% in the general population).<sup>1</sup>
  - Nearly one-third (31.5%) of adults were diagnosed with hypertension in 2007, with 38.2% of these individuals having a household income below \$25,000.<sup>2</sup>
- Food insecurity and low income are linked to inadequate fruit and vegetable (F/V) intake, increasing the risk of chronic disease and premature mortality.<sup>3,4</sup>
- Supplemental Nutrition Assistance Program (SNAP) provides lowincome households with additional resources for food.<sup>5</sup>
- Nutrition incentive programs, such as Double Up Oklahoma (DUO), increase spending capacity for SNAP recipients to purchase fresh fruits and vegetables (F/Vs).<sup>5,6</sup>
- The Produce is Vital in Diverse Environments (PROVIDE) Study aims to assess the impact of DUO on nutrition, food insecurity, and health outcomes among SNAP recipients.



Figure 1. PROVIDE Study recruitment at a grocery store.

**STUDY AIM:** These preliminary analyses explored the association between nutrition-related chronic conditions, food insecurity, and F/V intake at baseline among SNAP recipients in the PROVIDE study.

## **METHODS**

- Study Design: Preliminary cross-sectional analysis of PROVIDE study baseline data collected from April 13, 2024, to January 26, 2025.
- **Study Population:** Adults from SNAP households residing in DUO expansion or matched-control communities in Oklahoma.
- Eligibility criteria:
  - Age 18 years or older
  - Spent at least 25% of their SNAP benefits at participating stores
  - Willing to participate in follow-up
- Measures:
  - Hypertension, prediabetes and diabetes: self-reported diagnosis.
  - Food security: USDA Adult 10-item Food Security Survey Module.
    - Food insecurity includes:
      - Low food security limited or uncertain access
      - Very low food security not getting enough food (e.g., skipping meals, cutting size of meals, not eating when hungry)
  - $\circ$  Fruit and vegetable (F/V) Intake: Estimated using the validated Block Fruit/Vegetable/Fiber screener.
- **Statistical Analysis**: All statistical analyses were performed in SAS v9.4.



# Inadequate Fruit and Vegetable Intake and Nutrition-Related Chronic Conditions **Among SNAP Households**

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#### RESULTS

- Figure 5).







- Figure 4. The percentage of PROVIDE Study participants who reported a diagnosis of prediabetes or diabetes and hypertension (n = 594), 04/13/24-01/26/25.
- to those without these conditions (M=3.2 vs. M=3.6; p=0.0309) (Figure 6).
- without hypertension (M=3.0 vs. M=3.7; p=0.0002) (Figure 7).







Participants (n=594) were primarily female (80.6%) with a mean age of 39.9 years (range: 19-88 years). Most participants (78.1%) experienced food insecurity with 60.8% experiencing very low food security (Figure 3) and about one-third reported diagnoses of hypertension or diabetes/pre-diabetes (Figure 4). Fewer participants experiencing food insecurity reported eating F/Vs daily (68.1% vs 81.5%, p=0.0028;



**Figure 3.** Food security category at baseline of PROVIDE Study participants (n = 594), 04/13/24-01/26/25.



**Figure 5**. The percentage of PROVIDE Study participants with daily intake of fruits or vegetables by food security (n = 594), 04/13/24-01/26/25.

Participants with prediabetes or diabetes consumed fewer F/V servings on average compared







# DISCUSSION

# CONCLUSION

• These analyses highlight that lower F/V intake is associated with food insecurity and hypertension and diabetes among adults in SNAP households. • Future research is needed to determine whether improving F/V access could improve food security and hypertension and diabetes in this population.

# REFERENCES

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# HUMAN SUBJECTS RESEARCH APPROVAL

This study was approved by the Institutional Review Board (IRB) of the University of Oklahoma Health Sciences Center, OUHSC IRB #15189, and by the Oklahoma Department of Human Services IRB (Application #083042023).



- Despite receiving SNAP benefits, the majority (78%) of PROVIDE study participants experienced food insecurity at baseline, with 60.8% classified as having very low food security, highlighting a gap between food assistance and needs.
- While most (71.1%) reported consuming at least one serving of F/V daily, their average daily intake (3.5 servings) remained well below the
- recommended 5–9 servings for optimal health.<sup>7</sup> Food insecurity exacerbated these disparities, as participants who experienced food insecurity were significantly less likely to consume F/V daily compared to food secure participants (68.1% vs. vs. 81.5%; p=0.0028).
- Similar to previous studies showing adults with diabetes and hypertension consumed fewer F/Vs,<sup>8,9</sup> our findings show that adults receiving SNAP with these chronic diseases consumed fewer F/Vs. Given the importance of diet in disease prevention, improving F/V intake among SNAP recipients is essential for better health outcomes.<sup>10</sup>

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