

**JiaWei Yu**

## **The Impact of Time Lived in the United States on Adult Food Security**

**Background:** A household is food insecure when they are worried about or are unable to acquire enough food for all household members and in 2023, this described around 13.5% of all US households. To learn more about this prevalent issue, this study aims to determine how the length of time an individual has spent living in the United States may be related to their food security by answering the following research question: How does the length of time lived in the United States affect food security among adults 18-79 years of age?

**Methods:** This study is a retrospective cross sectional study using the NHANES 2015-2016 and 2017-March 2020 pre-pandemic data on individuals of 18-79 years of age. The exposure variable of time lived in the US was evaluated based on whether an individual has lived in the US for <5 or 15+ years and the outcome of food security was evaluated based on whether the individual has full food security or not (Full vs. marginal, low, or very low food security). Propensity scores were generated with the following covariates: sex, age, race, marital status, insurance coverage, education level, income level, employment status, general health condition, prescription medication, healthcare usage, and alcohol intake.

Covariate balancing for the exposure and control groups was performed using 1:1 greedy matching with a caliper range of  $\pm 0.2$ . A doubly robust approach using an ATT weighted sample on the inverse propensity score adjusted with the linear propensity score was also considered as an alternate method of covariate balancing. The balance between groups was assessed using Love Plots of the standardized mean differences and also Rubin's Rules 1 and 2. Finally, full food security among balanced samples was evaluated with binary logistic regression. The robustness of these results were tested with sensitivity analyses using caliper widths of 0.3 and 0.1 with 1:1 greedy matching without replacement.

**Results:** Among a total of 2500 individuals included in the study, 325 out of 402 of those who lived in the US for <5 years were matched with 325 individuals who lived for 15+ years in the US. This propensity matched sample produced balanced groups based on Rubin's Rules 1 and 2 and shown with small standardized mean differences. Analysis using matching was preferred over the double robust analysis since the balance from matching was slightly more equal compared to that of the ATT weighted sample; this suggests that the analysis using the matched samples was less biased than the double robust analysis despite the similar results. The logistic regression on matched samples

produced an odds ratio of 1.101 (95% CI: [0.812, 1.493], p-value: 0.535), implying that there is little to no evidence of a difference between individuals who've lived <5 vs. 15+ years in the US in terms of if they have full food security or not. The sensitivity analyses produced similar results.

**Conclusions:** The logistic regression performed produced no strong evidence that there is an association between the length of time an individual has lived in the United States and whether or not they are fully food secure. Repeat analyses using more specific or similar variables, such as assessing income prior to immigration along with time lived in the US, are recommended to confirm and build on these results.