

RESULTS

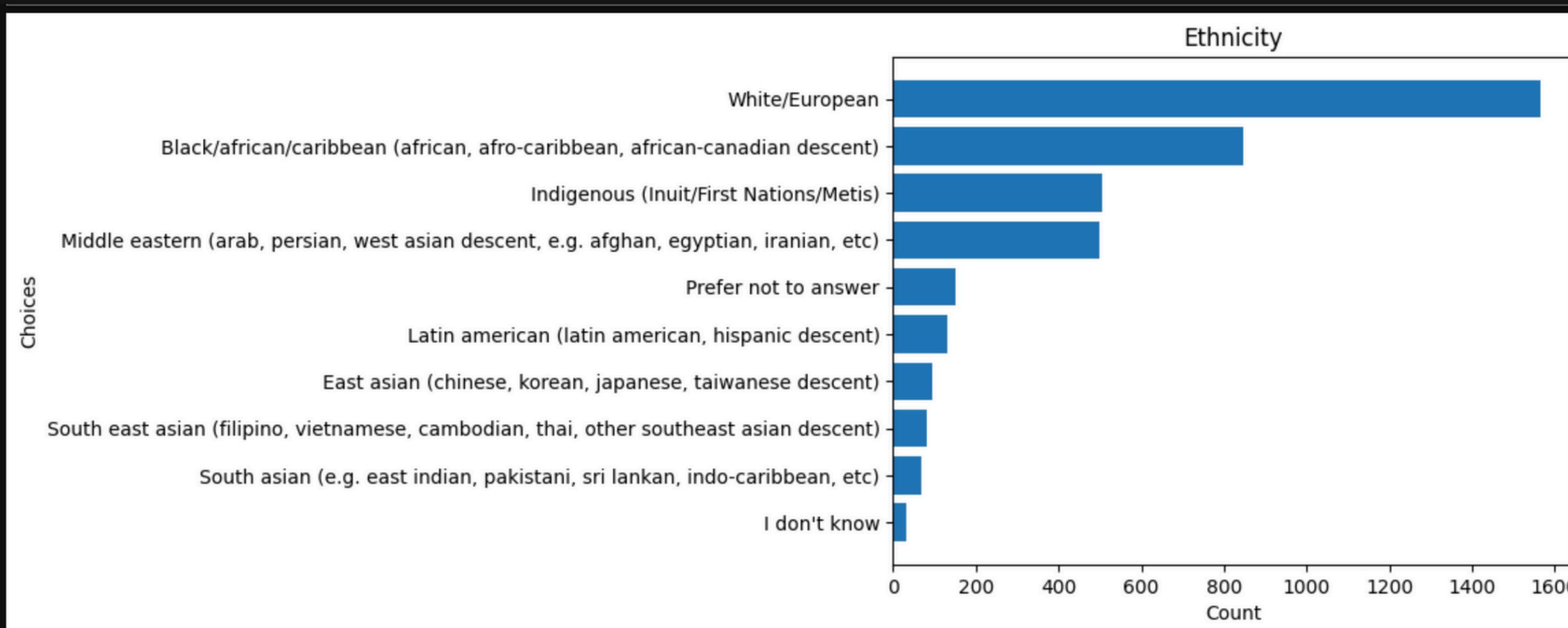
2024 Data for Good – Ottawa Relaunch
Ottawa Food Bank
Presentation
Mohamed Zidan

CHAPTER 1 : General Info

Demographics and food banks

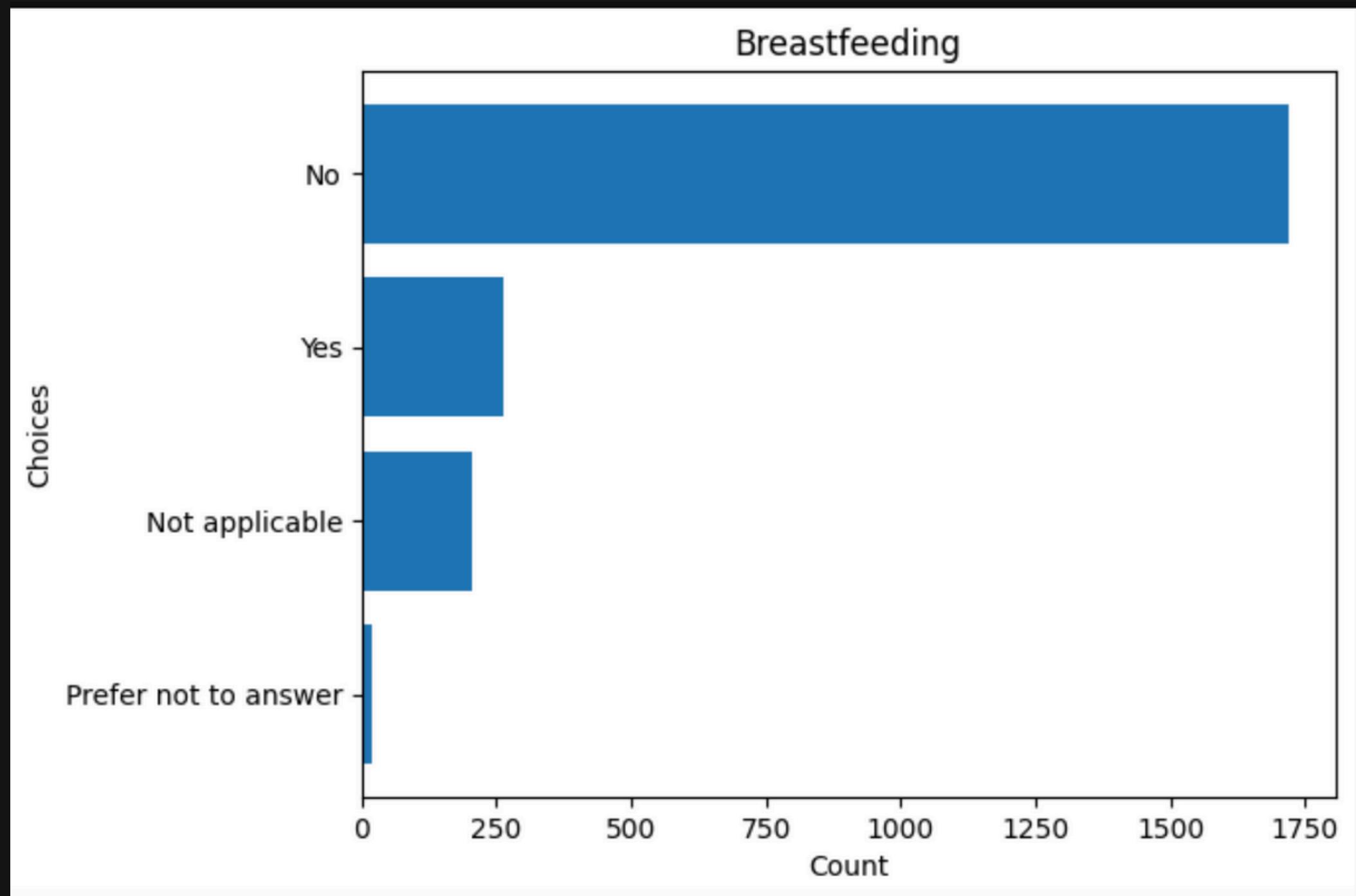
General Info

Demographics I - Ethnicity



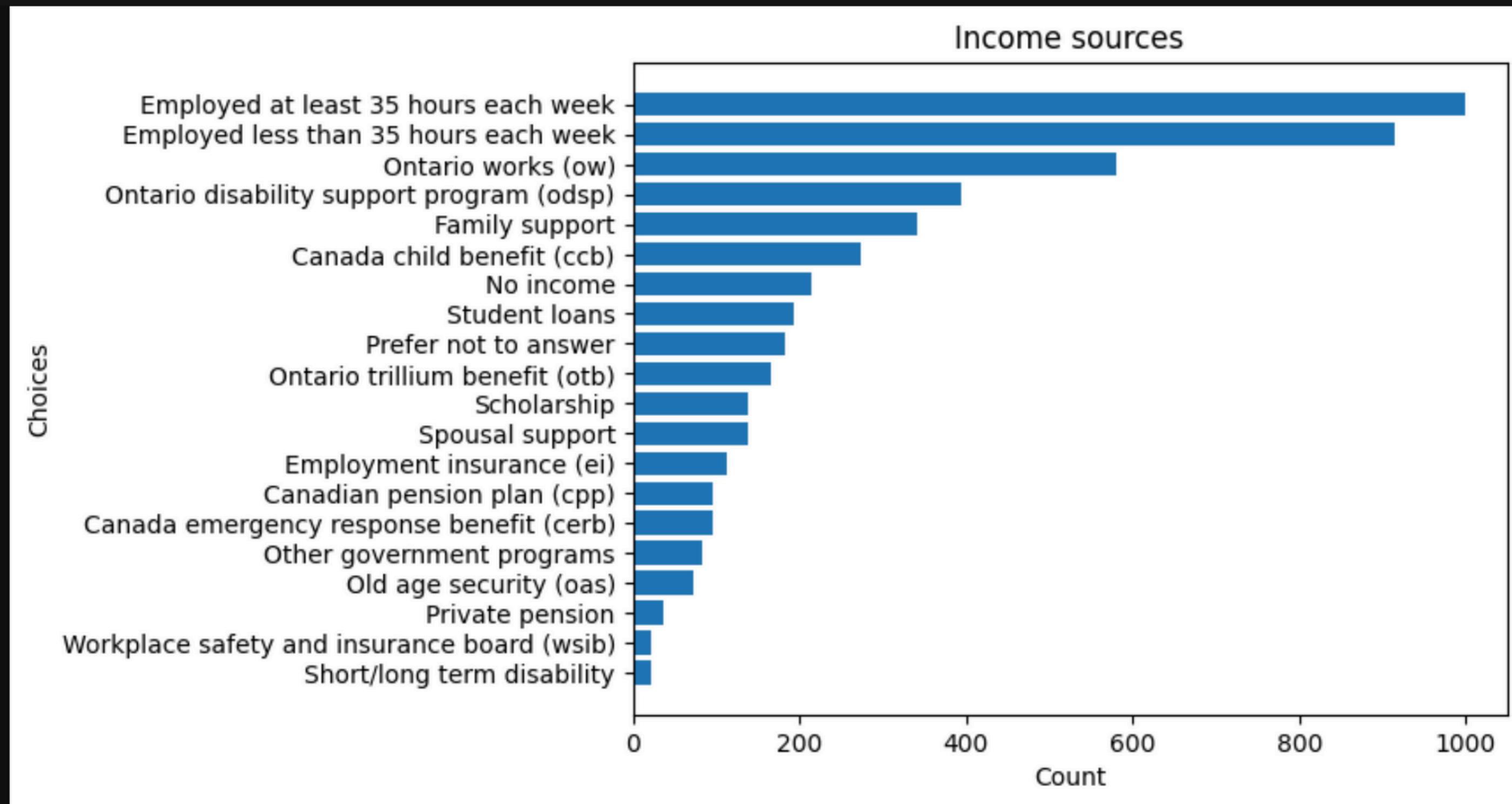
General Info

Demographics II - BreastFeeding



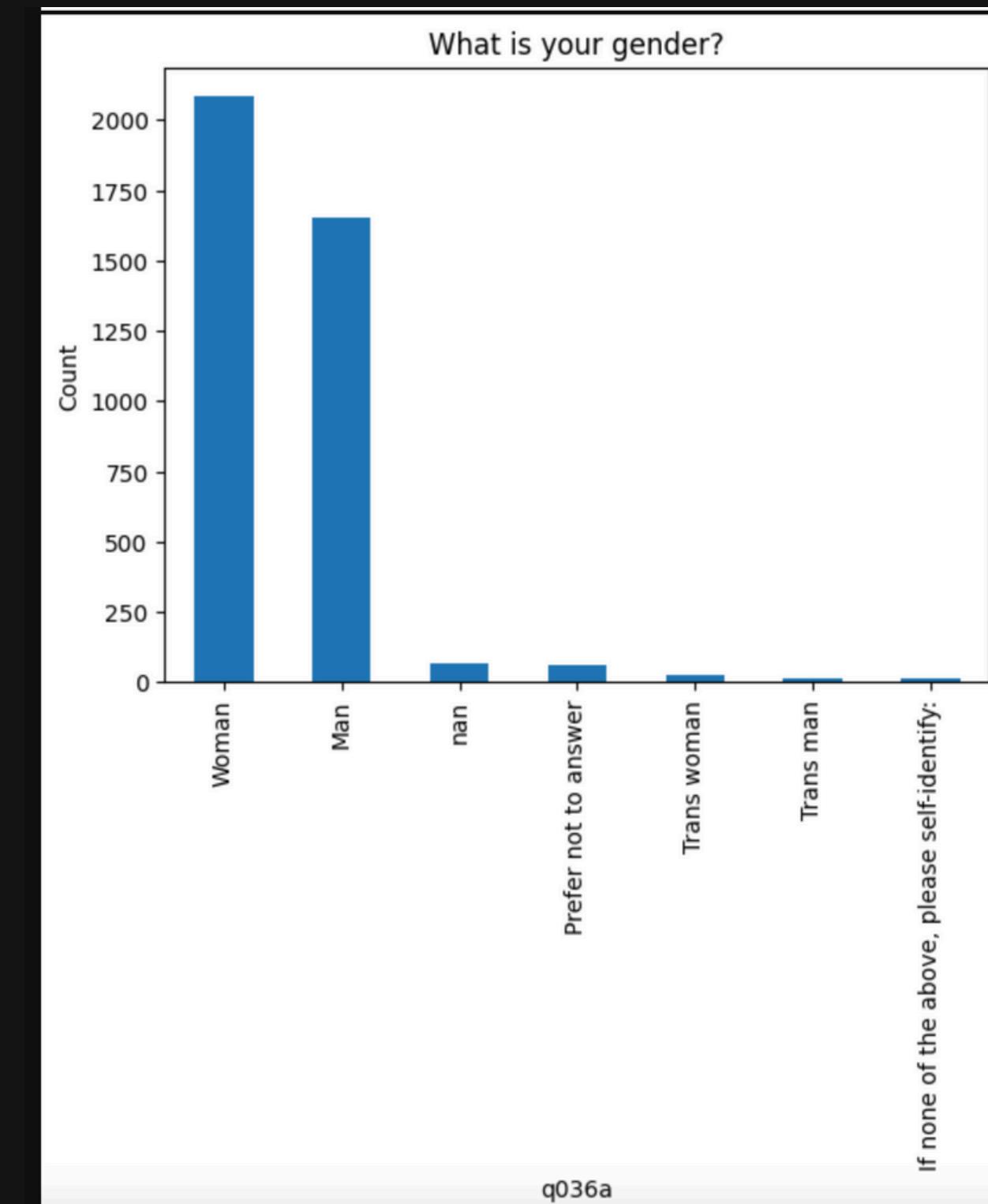
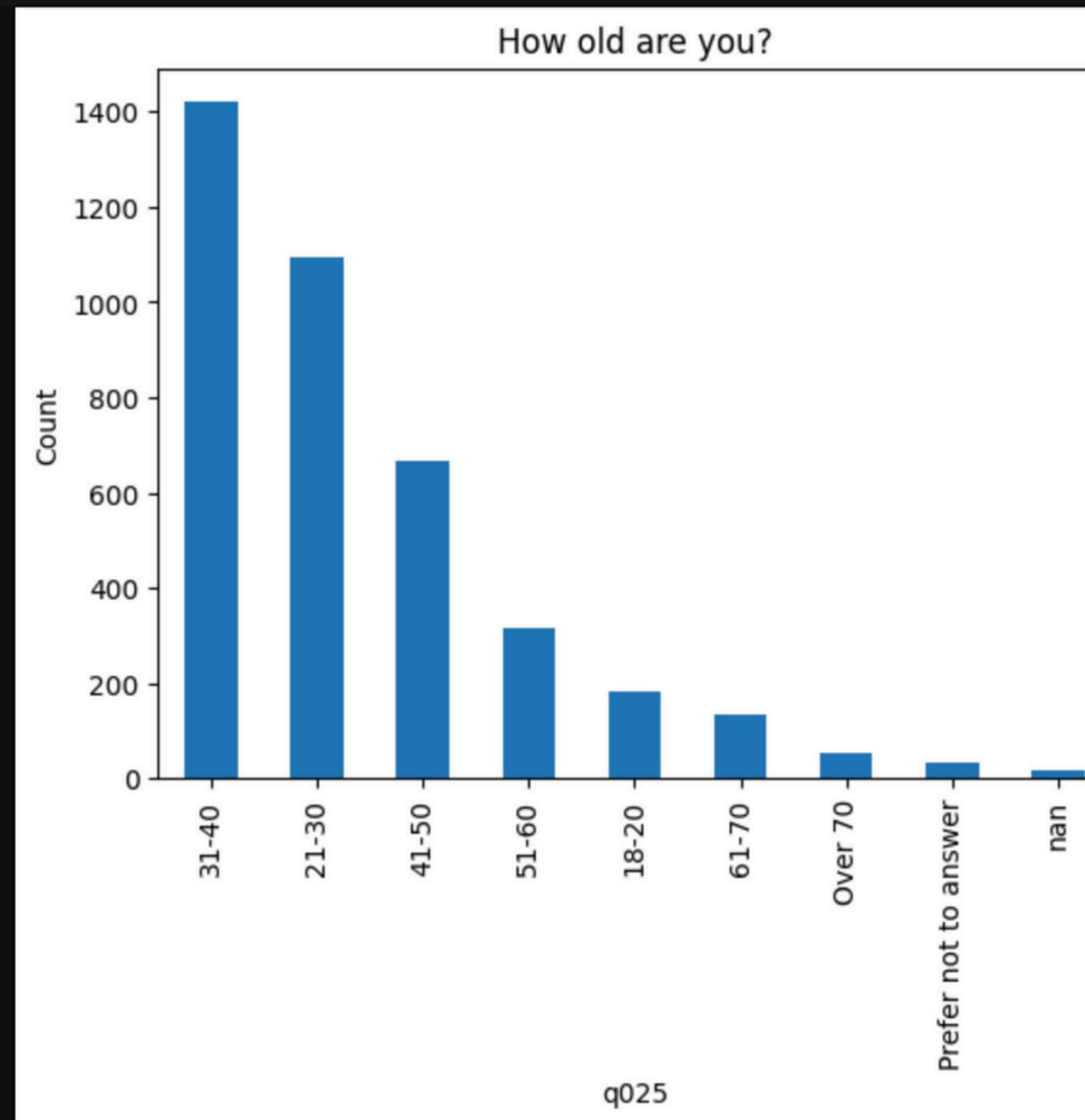
General Info

Demographics III - Income sources



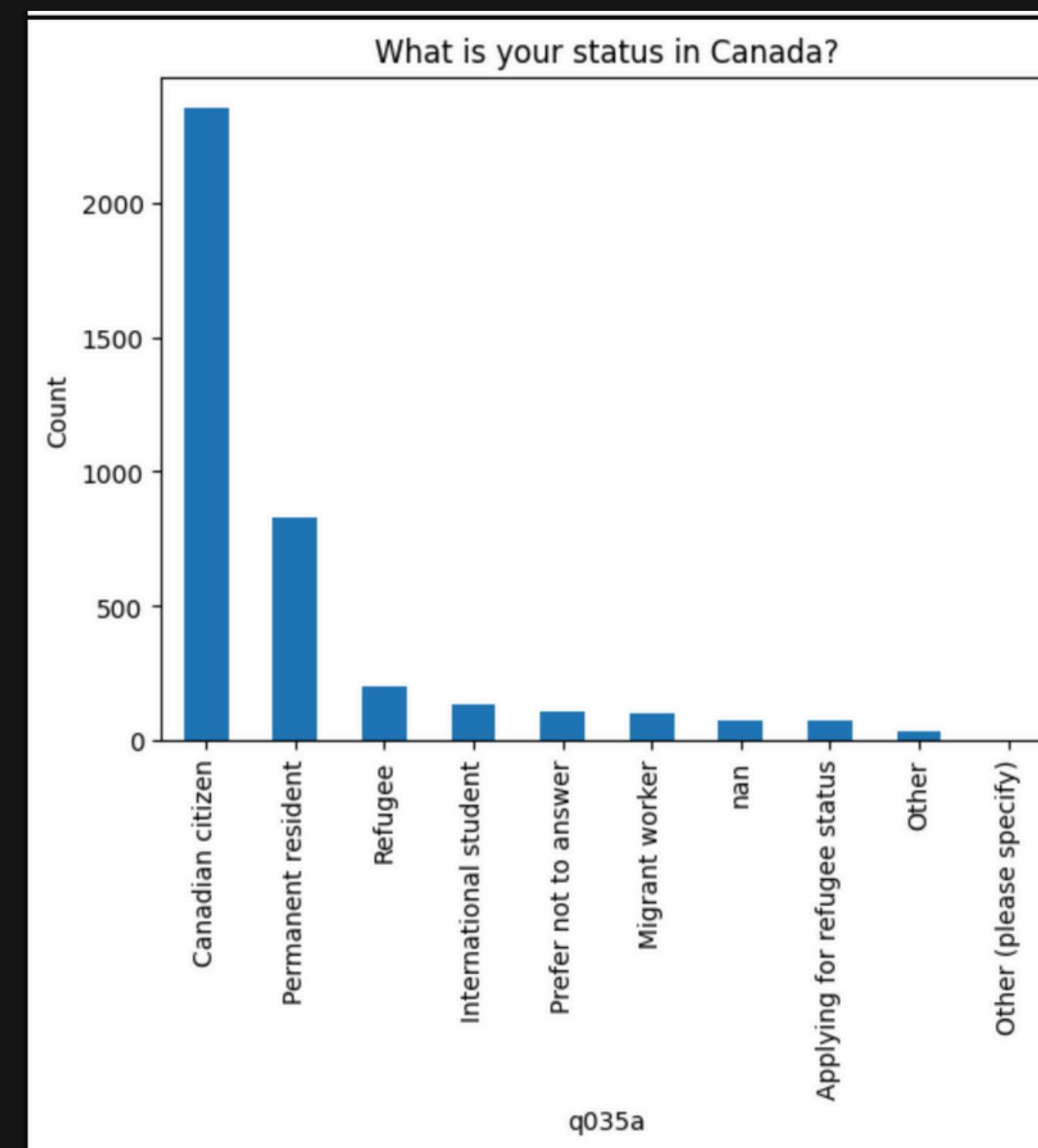
General Info

Demographics IV - Age | Gender



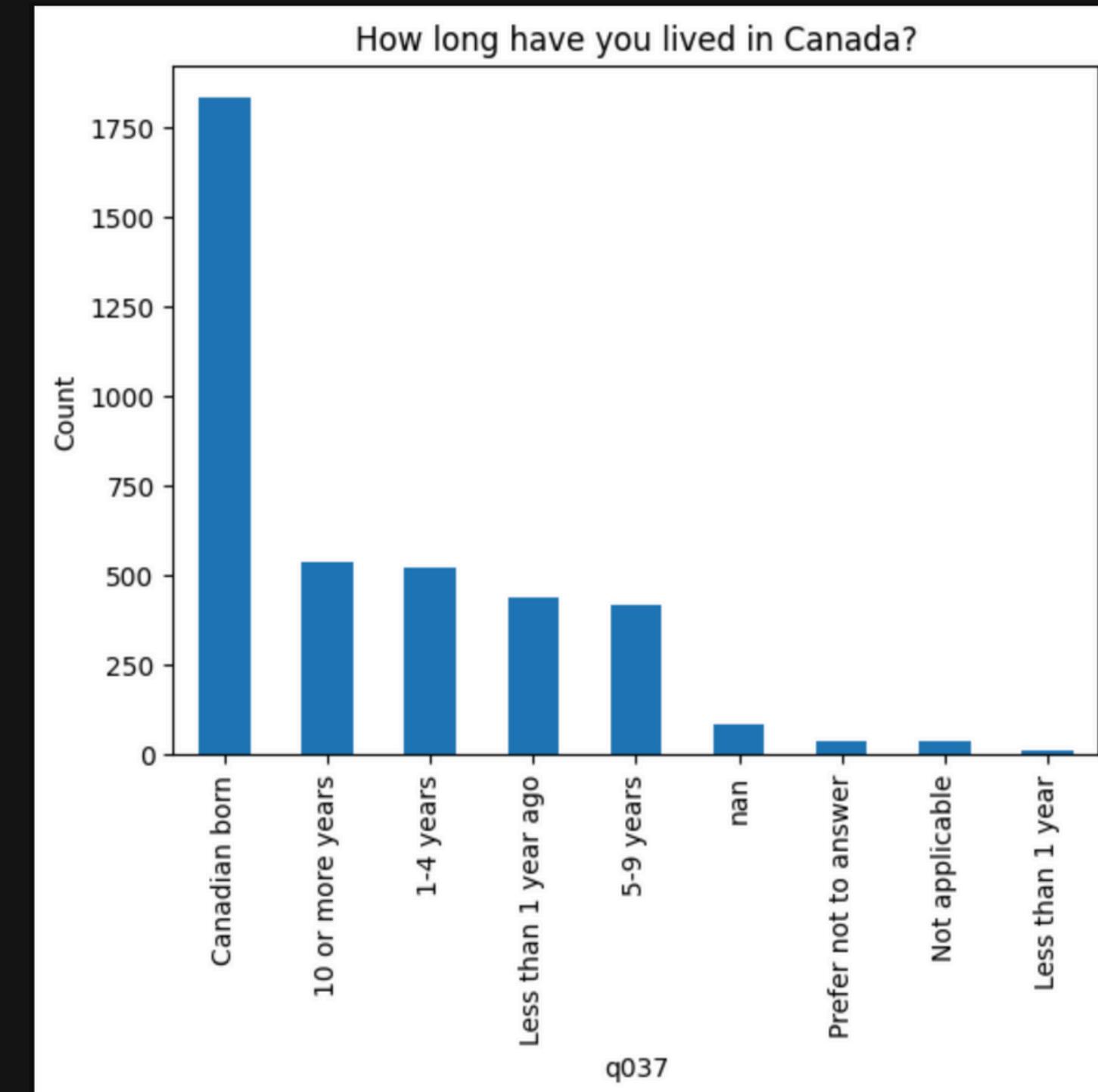
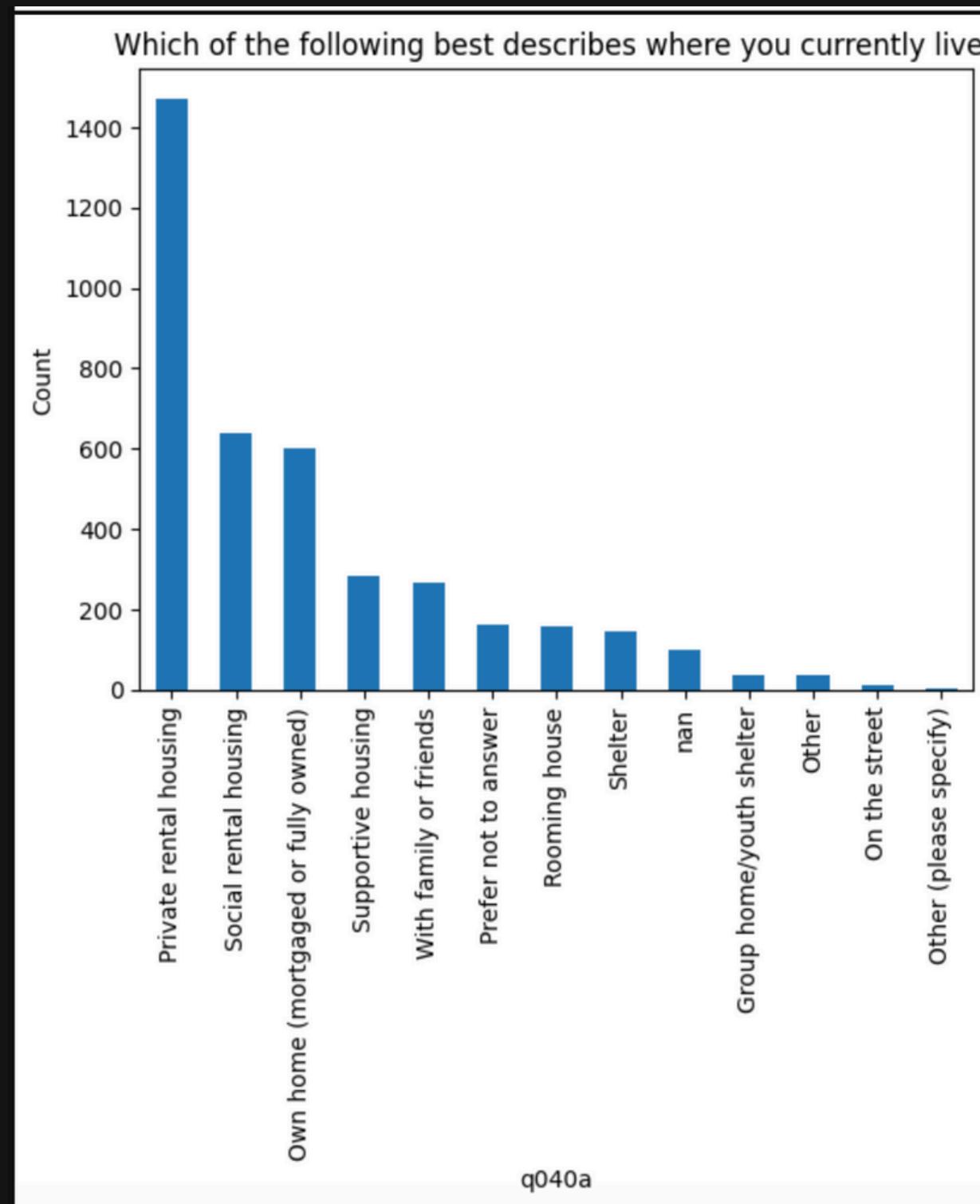
General Info

Demographics V - Status in Canada



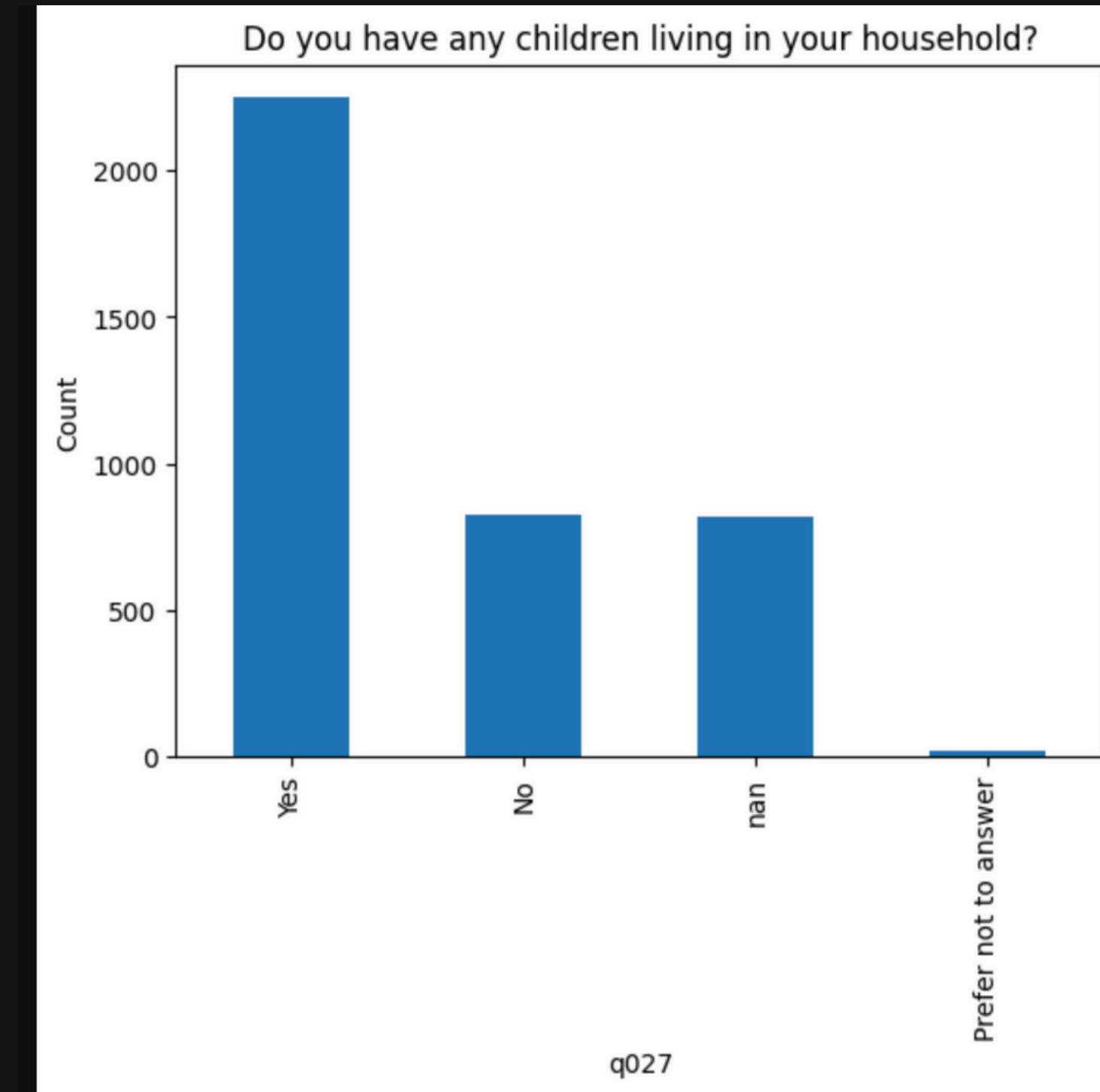
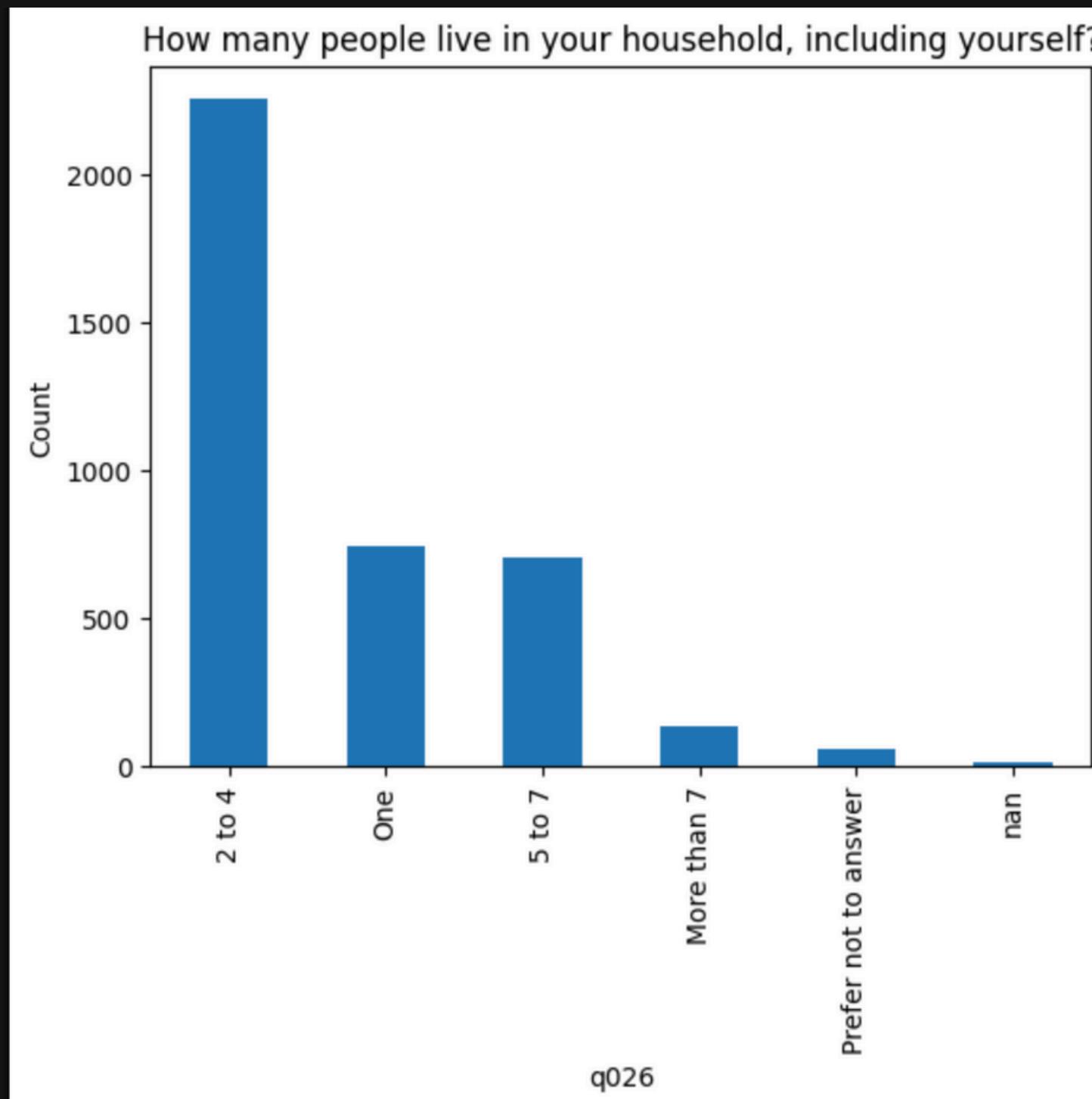
General Info

Demographics VI - Living



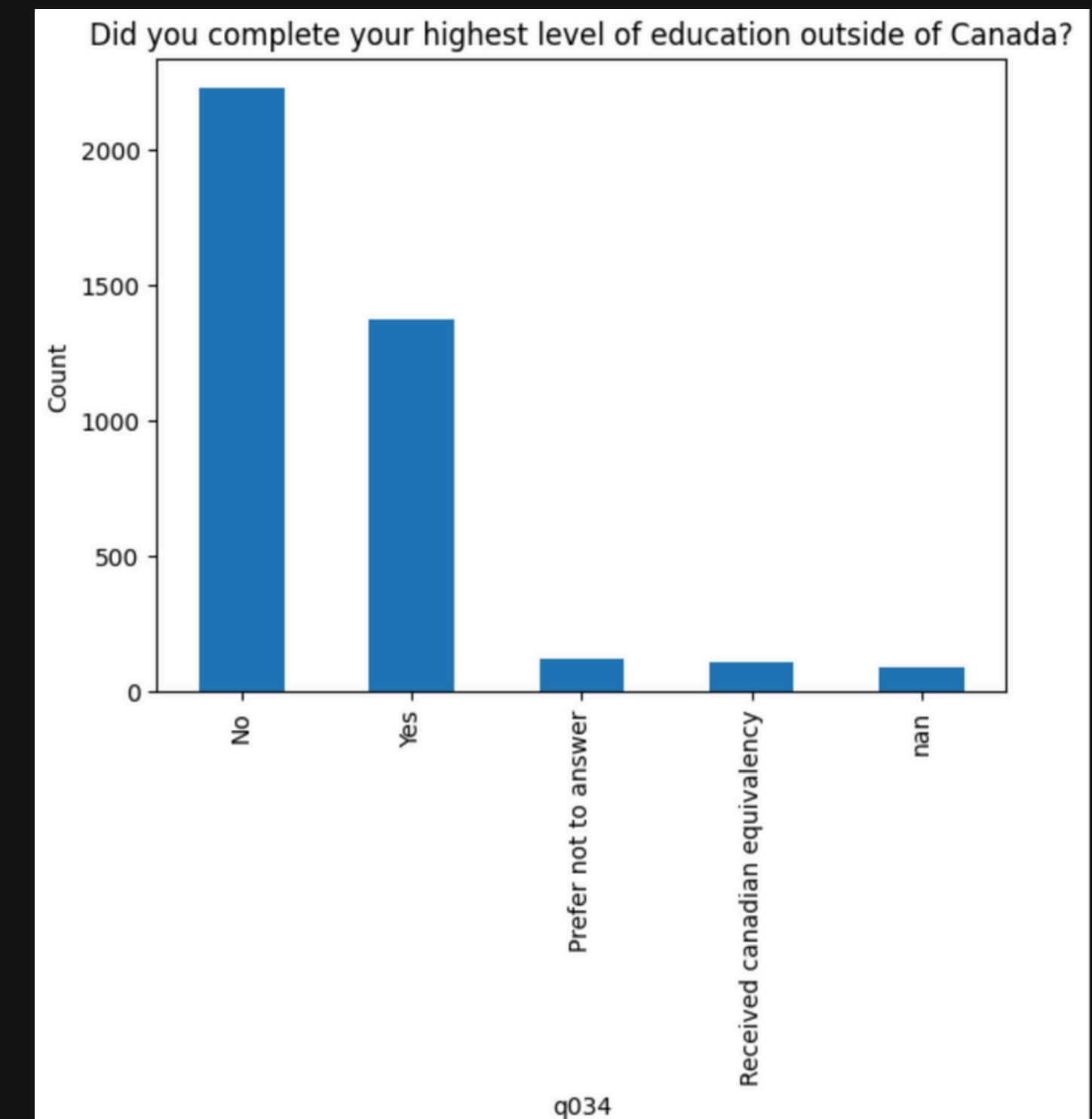
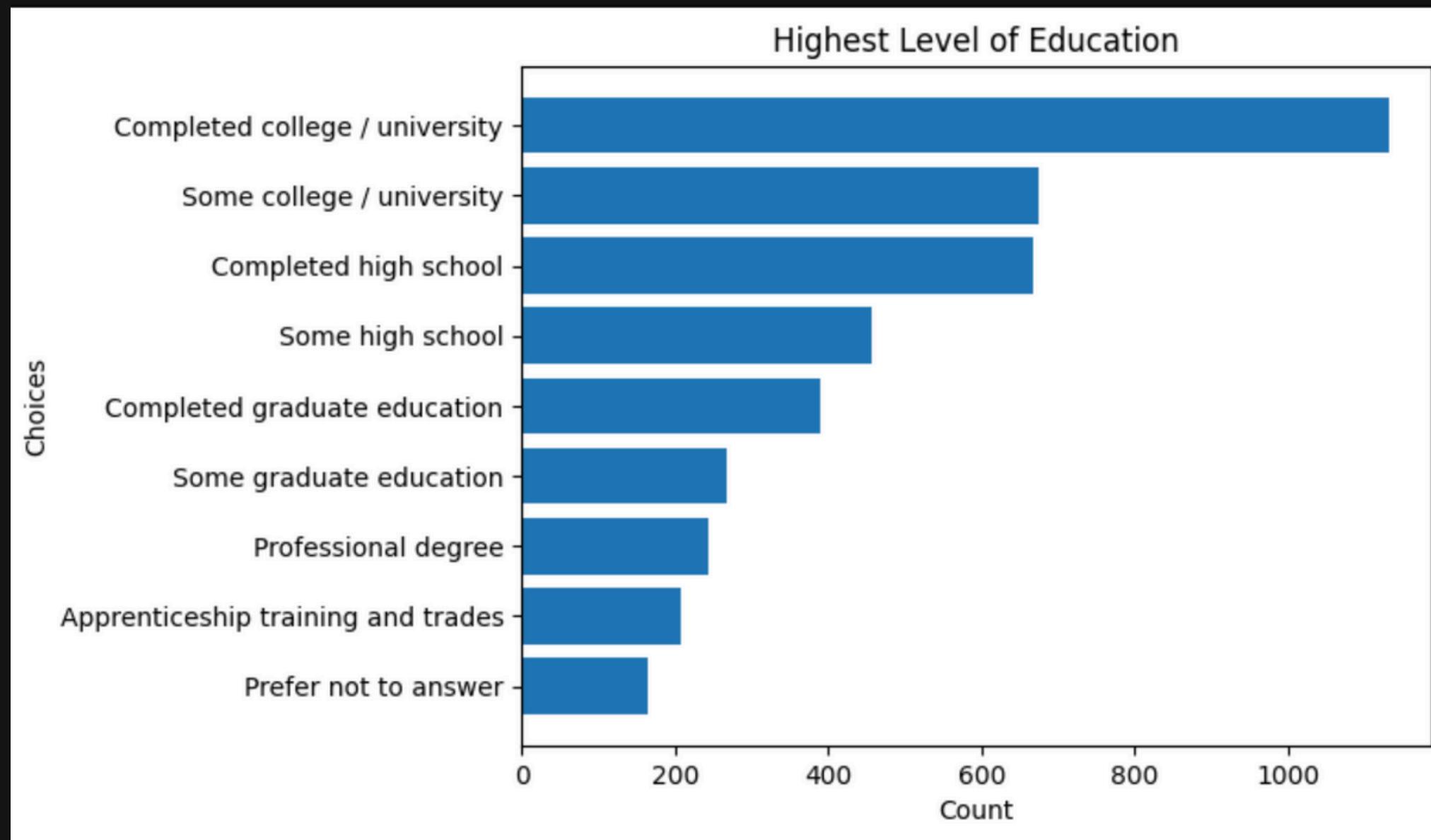
General Info

Demographics VII - Household



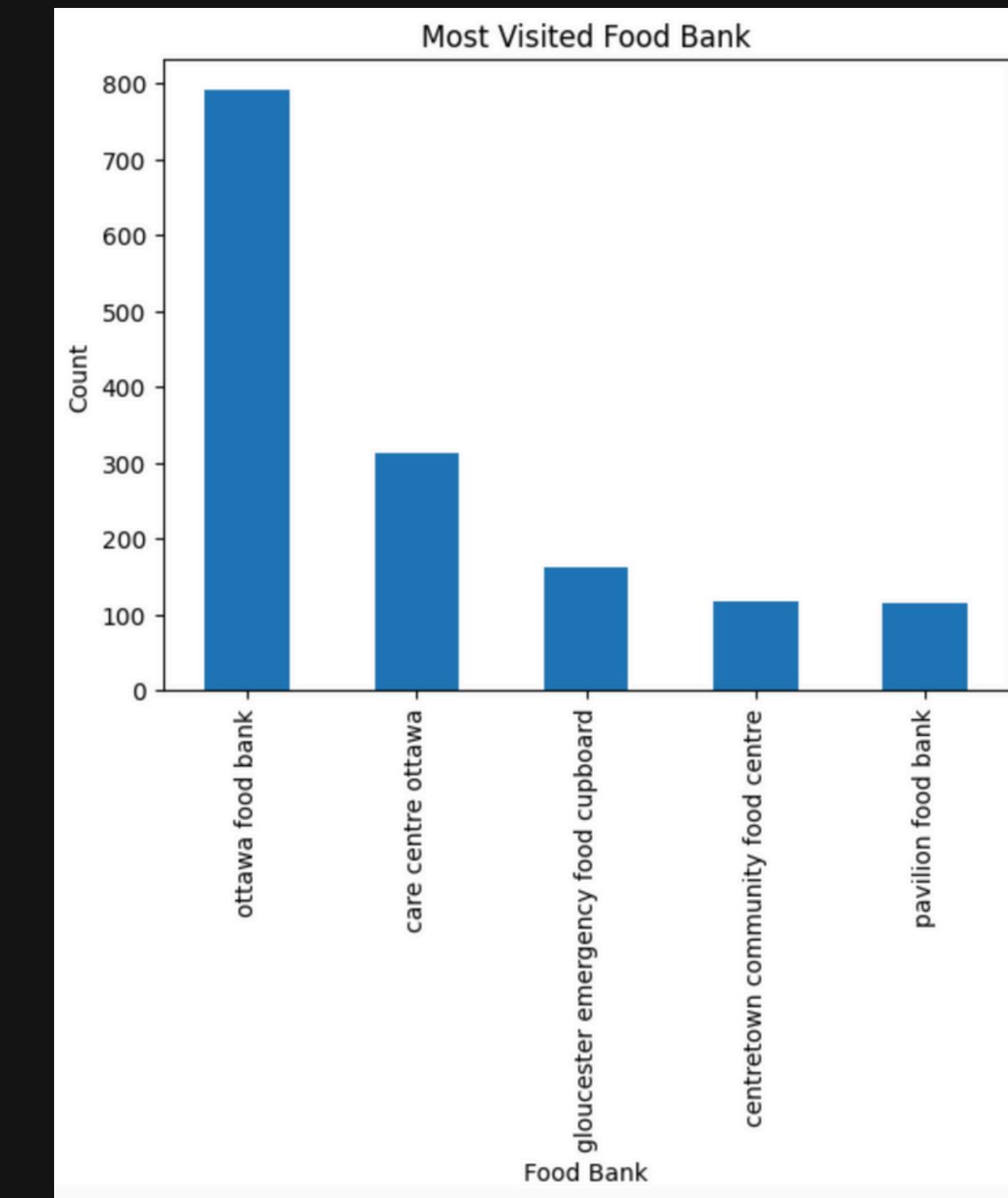
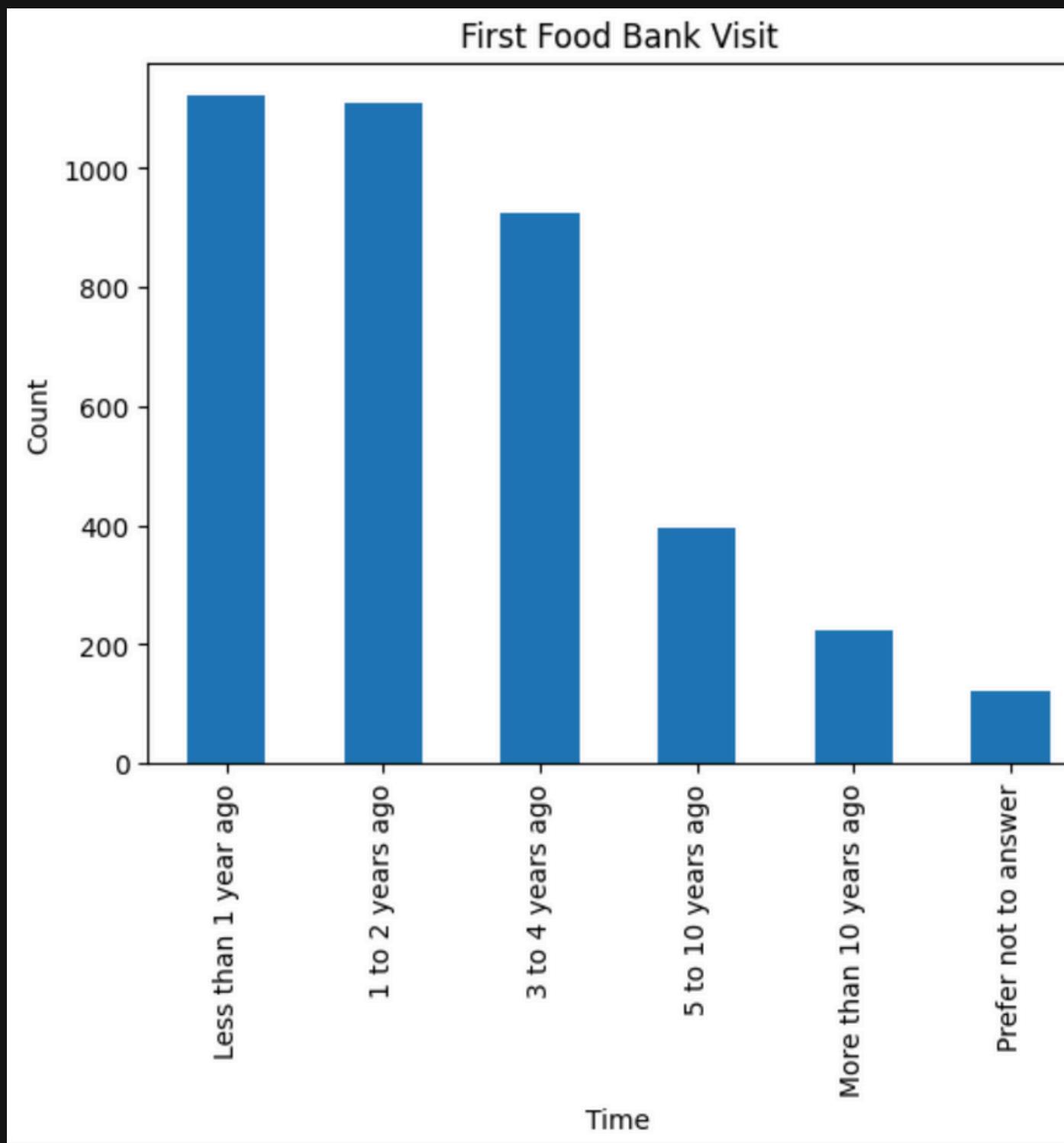
General Info

Demographics VIII - Education



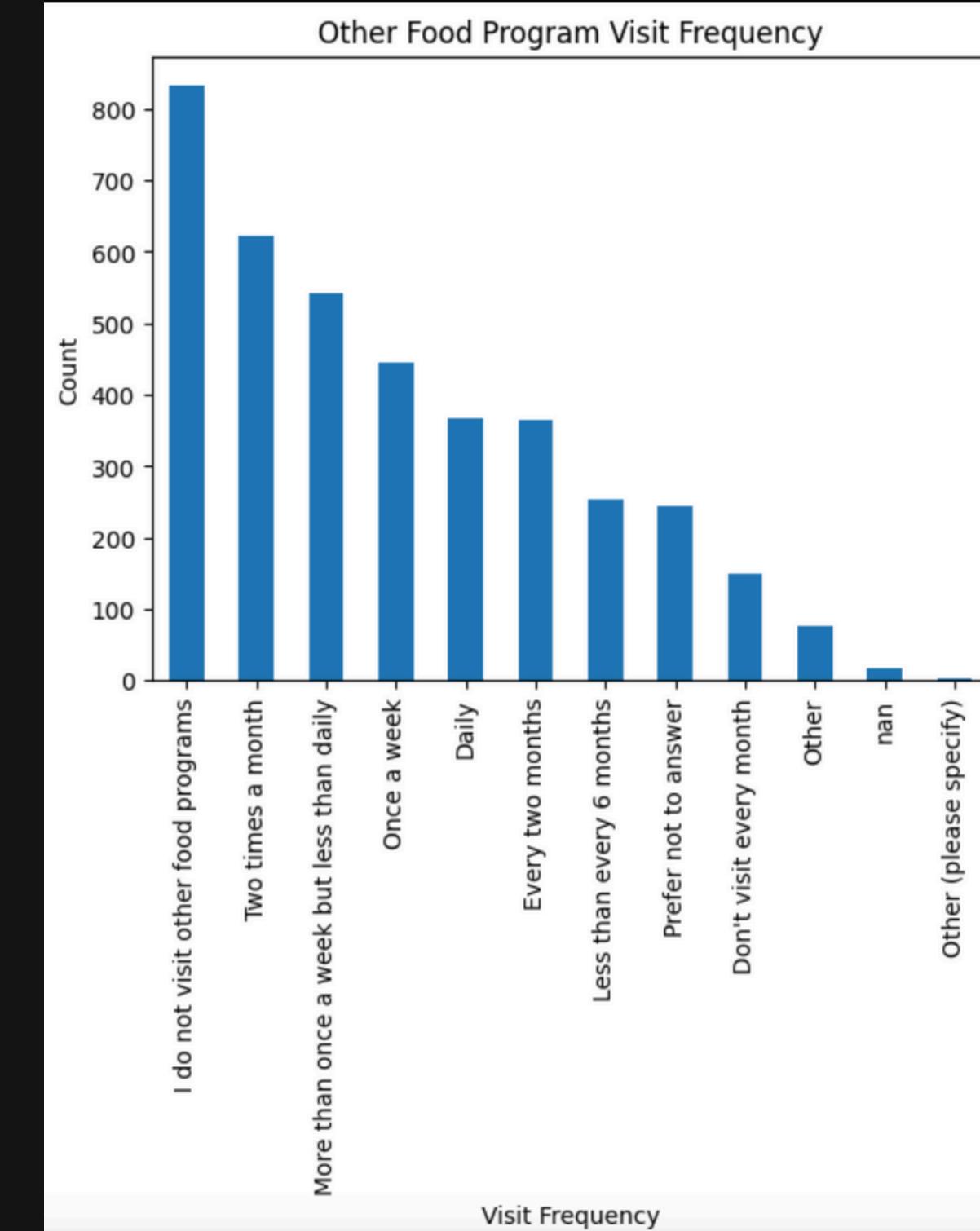
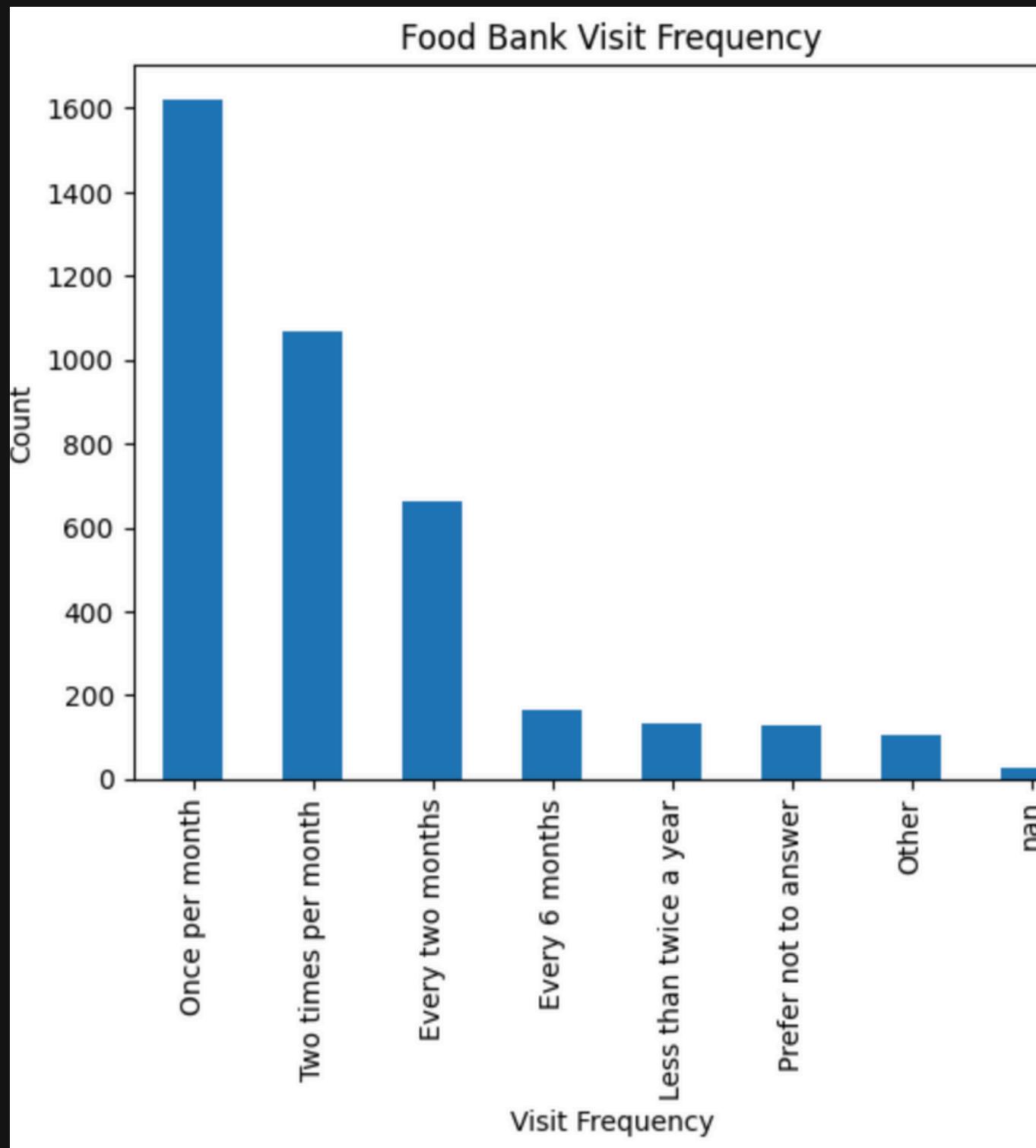
General Info

Food program Info - I

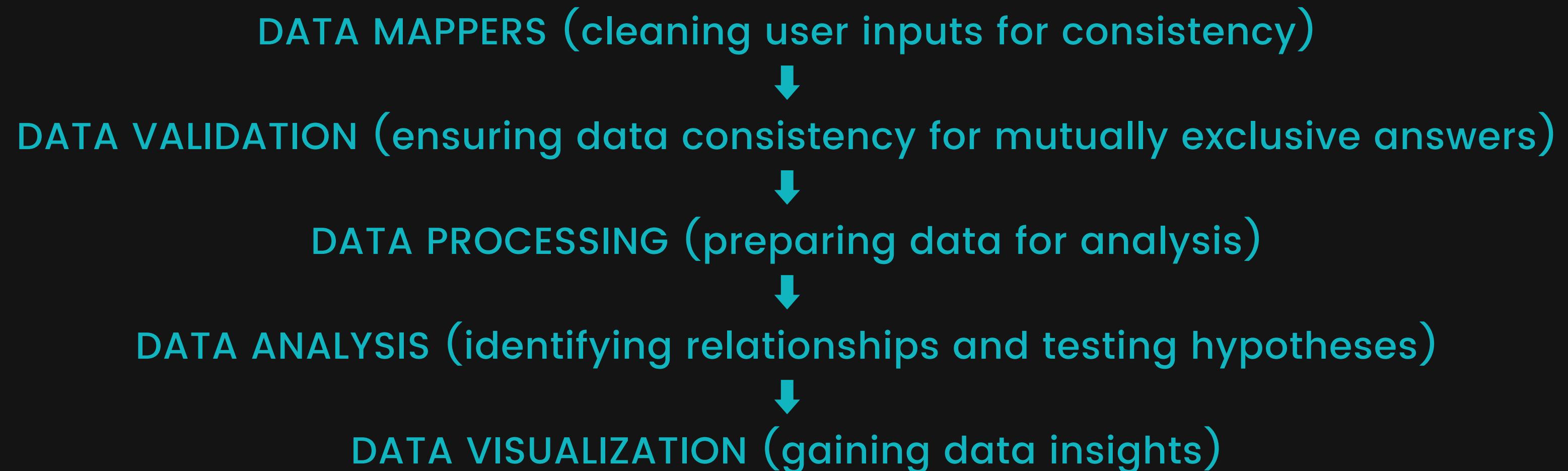


General Info

Food program Info - II



CHAPTER 2 : Analysis Methodology



DATA MAPPERS (cleaning user inputs for consistency)

FUNCTIONALITY

- The 'dataset_mappers.py' code defines various dictionaries (text_to_number, text_to_gender_number, etc.) to map and standardize user inputs.
- These mappers clean the raw text inputs by transforming them into consistent, analyzable formats.

FUNCTIONALITY

- The DatasetValidator class contains methods like validate_income_sources, validate_health_conditions, and others that check for and correct logical inconsistencies in the dataset, ensuring that the data is valid and reliable for analysis.
 - For example, ensuring mutually exclusive answers are respected or that contradictory responses are corrected.
- This functionality found out and removed
 - 20 rows with missing answers.
 - All 20 respondents skipped the questions and submitted their answers because there was no mechanism in place to prevent them from submitting without completing the questions.
 - 45 duplicated rows
 - Occurred due to the absence of a redundancy-check system.
 - 64 rows using validate_income_sources
 - 1 row using validate_health_condition
 - 13 rows using validate_ethnicity
 - 3 rows using validate_education
 - 10 rows using validate_breastfeeding
 - 2 rows using validate_unique_food_needs

DATA VALIDATION
(ensuring data consistency for mutually exclusive answers)

DATA PROCESSING (preparing data for analysis)

FUNCTIONALITY

- The DatasetProcessor class is responsible for processing the data using the provided **mappers** and adding new columns, such as food security status.
- The DatasetProcessor class standardizes the data, making it ready for further analysis by cleaning, mapping, and adding relevant columns (`food_security_score`, `food_security_status` etc)

DATA ANALYSIS
identifying relationships and testing hypotheses)

FUNCTIONALITY

- The DatasetAnalyzer class performs the statistical chi-square tests, to identify significant relationships between variables (e.g., demographics and food security status).
- The DatasetAnalyzer class includes functions for analyzing these relationships and generating visualizations to help in interpretation.

DATA VISUALIZATION (gaining data insights)

FUNCTIONALITY

- The DatasetVisualizer class provides various methods to visualize the data, such as bar plots, heatmaps, and proportional stacked bar plots.
- These visualizations help in understanding and extracting insights from the data, such as the distribution of food security status across different age groups.

CHAPTER 3 : Analyzing Relationships Between Variables and Food Security Status

**Using Chi-Square Test to Examine Categorical Relationships
In The Dataset**

14 Related variables

Chi-Square Test Results

Chi-square test for q025 vs. Food Security Status:
Chi-square statistic: 201.32847596175742
P-value: 1.984362169634502e-31
Significant: True

Chi-square test for q026 vs. Food Security Status:
Chi-square statistic: 184.81617197579484
P-value: 4.374492394061649e-33
Significant: True

Chi-square test for q030 vs. Food Security Status:
Chi-square statistic: 43.844127952603884
P-value: 0.00011631513202617968
Significant: True

Chi-square test for q034 vs. Food Security Status:
Chi-square statistic: 391.94762329833566
P-value: 7.153023969874901e-79
Significant: True

Chi-square test for q035a vs. Food Security Status:
Chi-square statistic: 208.91701984946013
P-value: 1.9465380265642412e-31
Significant: True

Chi-square test for q036a vs. Food Security Status:
Chi-square statistic: 73.84614876319294
P-value: 9.142933936332903e-10
Significant: True

Chi-square test for q036b vs. Food Security Status:
Chi-square statistic: 14.00000000000002
P-value: 0.02963616388052175
Significant: True

Chi-square test for q037 vs. Food Security Status:
Chi-square statistic: 380.49080460756767
P-value: 9.971067624190824e-68
Significant: True

Chi-square test for q040a vs. Food Security Status:
Chi-square statistic: 234.53523203223142
P-value: 3.0856588491551847e-32
Significant: True

Chi-square test for q040b vs. Food Security Status:
Chi-square statistic: 21.102774784482758
P-value: 0.04889557814738302
Significant: True

Chi-square test for q019 vs. Food Security Status:
Chi-square statistic: 123.58743029767251
P-value: 2.872387207021154e-24
Significant: True

Chi-square test for q020 vs. Food Security Status:
Chi-square statistic: 149.34728875726074
P-value: 3.2513646728718995e-24
Significant: True

Chi-square test for q022 vs. Food Security Status:
Chi-square statistic: 118.67895591737062
P-value: 2.489909726044451e-21
Significant: True

Chi-square test for q002 vs. Food Security Status:
Chi-square statistic: 572.427876454181
P-value: 2.0618272595415918e-120
Significant: True

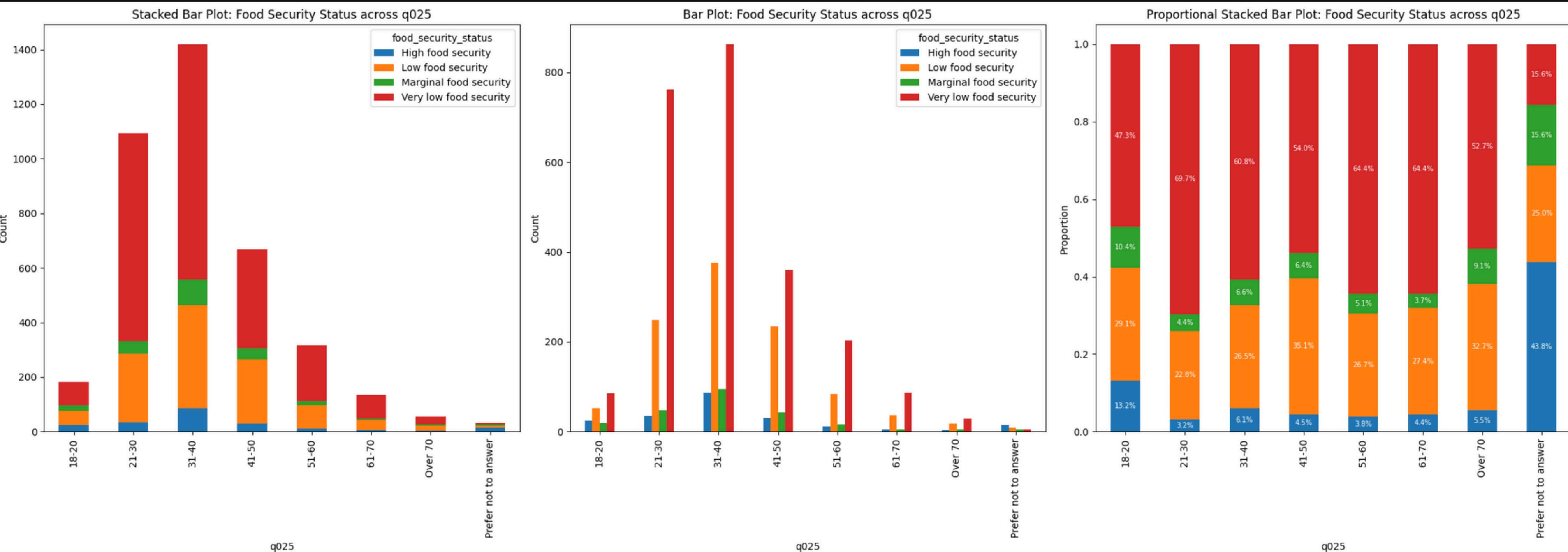
OBSERVATIONS:

- q025: Age
- q026: Household size
- q030: Number of children aged 3–5 in the household
- q034: Education level
- q035a: Status in Canada (e.g., citizen, permanent resident)
- q036a: Gender
- q036b: Gender (Other)
- q037: Time in Canada
- q040a: Housing situation
- q040b: Housing situation (Other)
- q019: Exercise habits
- q020: Frequency of exercise
- q022: Pregnancy status
- q002: Income level

Food Security Status vs Age Groups

OBSERVATIONS:

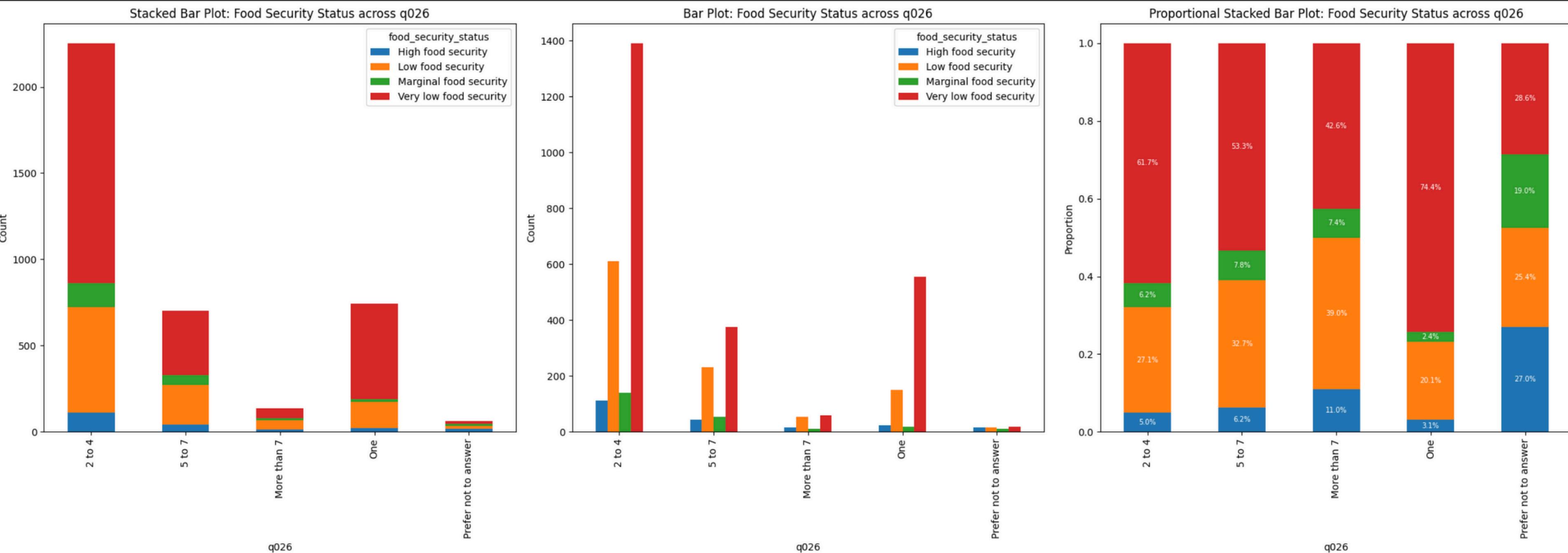
- [COUNTS PLOTS - Overall Impact]: Younger adults (21-40) are most affected in terms of the total number of food-insecure individuals.
- [PROPORTION PLOT Severity/Intensity]: Age groups 21-30, followed by 51-60, and 61-70 experience the highest severity of food insecurity within their groups.



Food Security Status vs Household size

OBSERVATIONS:

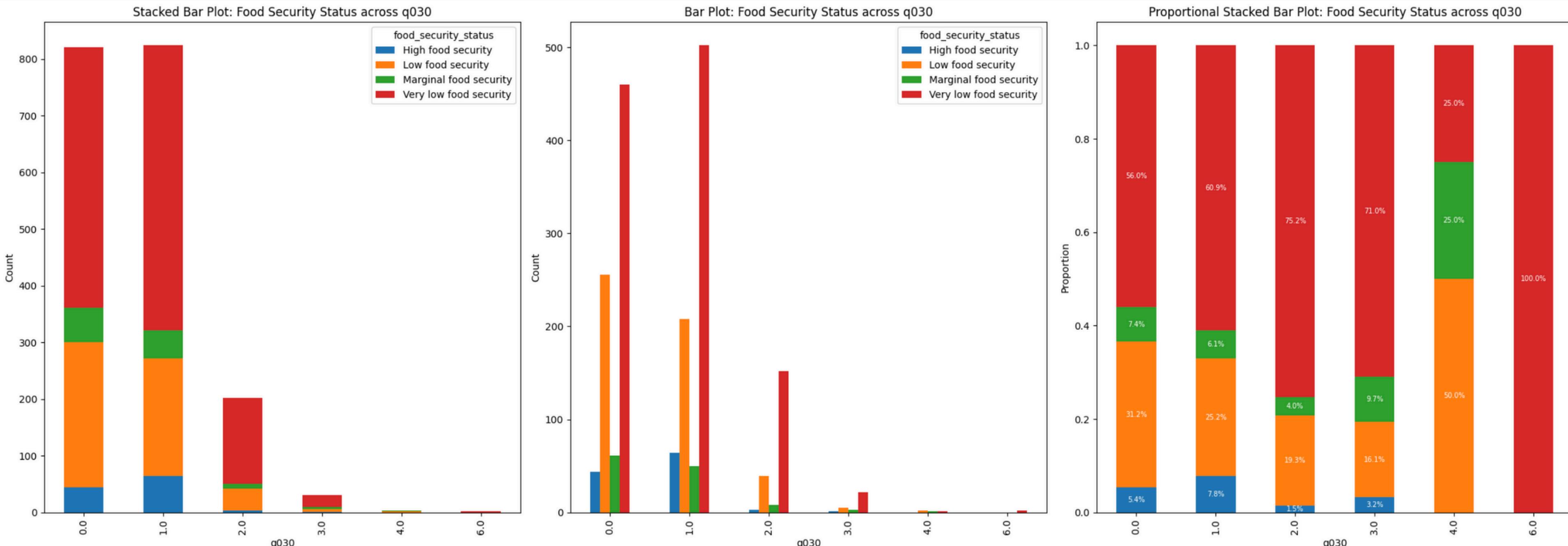
- While larger households (2 to 4 members) have the most individuals affected overall, single-member households experience the most acute levels of food insecurity, with a significant majority falling into the 'Very low food security' category.



Food Security Status vs Kids Aged 3-5

OBSERVATIONS:

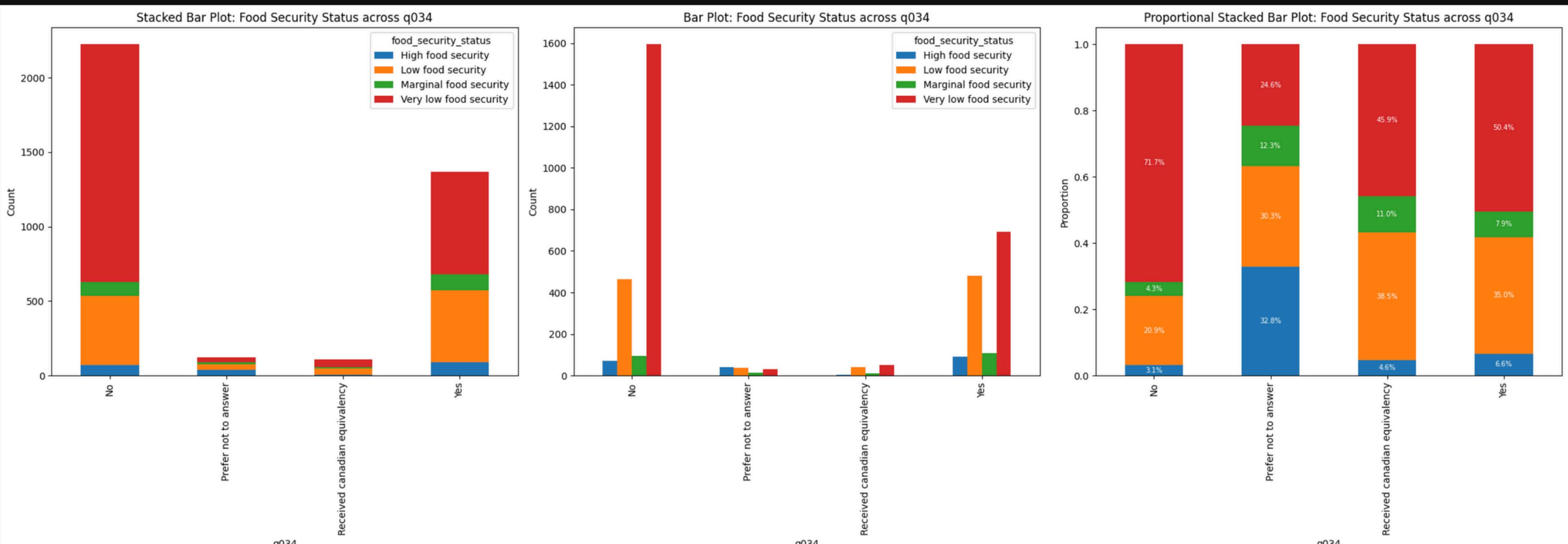
- [COUNTS PLOTS - Overall Impact]: Households with 0 or 1 child aged 3-5 have the highest number of food-insecure individuals overall.
- [PROPORTION PLOT Severity/Intensity]:
 - Households with fewer children (0, 1, or 2) represent the majority of the data and clearly show a severe level of food insecurity, especially those with 2 children.
 - While households with more children (3 or more) also display severe food insecurity, the small sample size in these categories suggests that these results should be interpreted with caution. The most reliable insights are drawn from the larger groups (0, 1, or 2 children), where the data is more abundant.



Food Security Status vs Education Outside Canada

OBSERVATIONS:

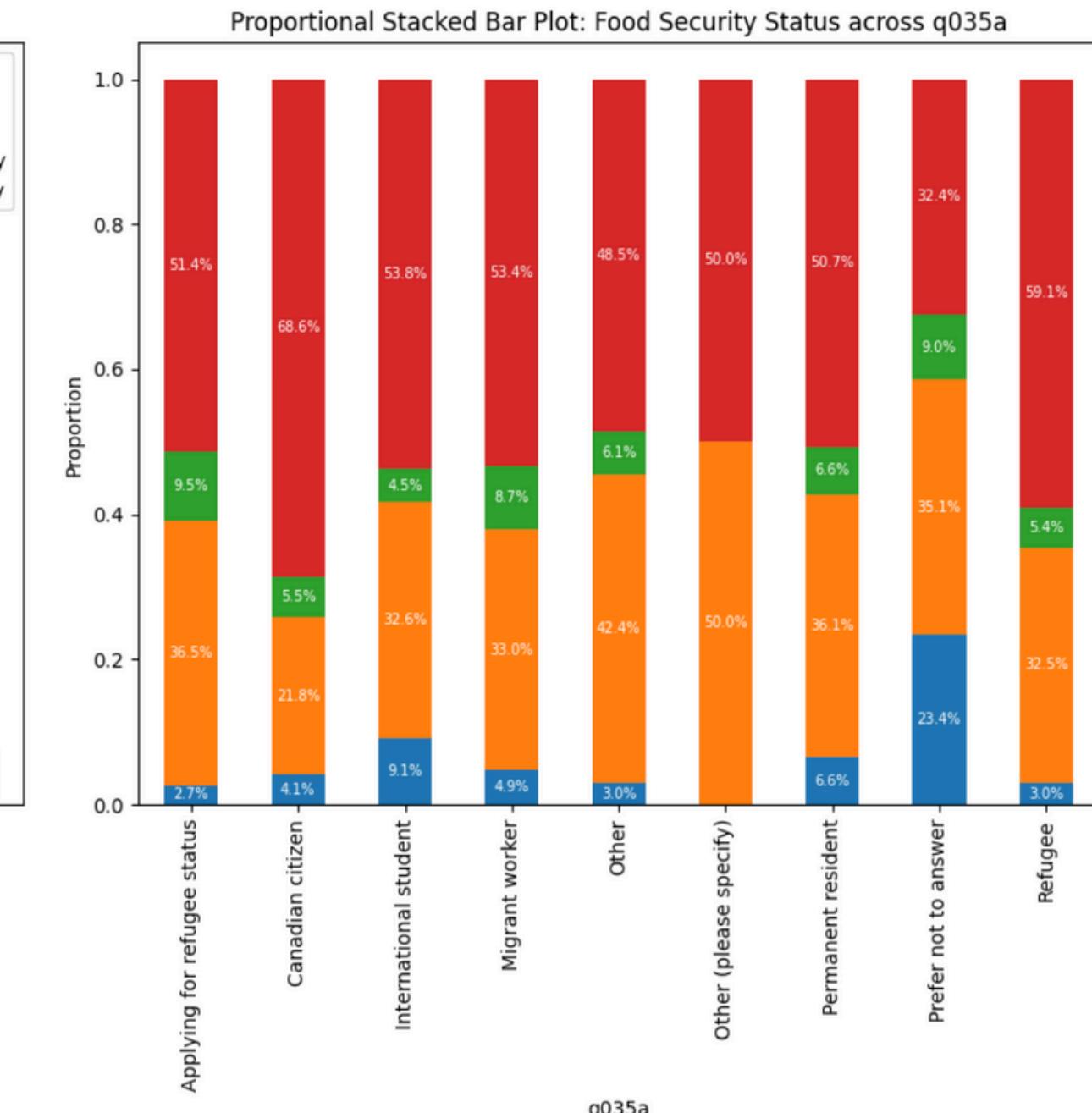
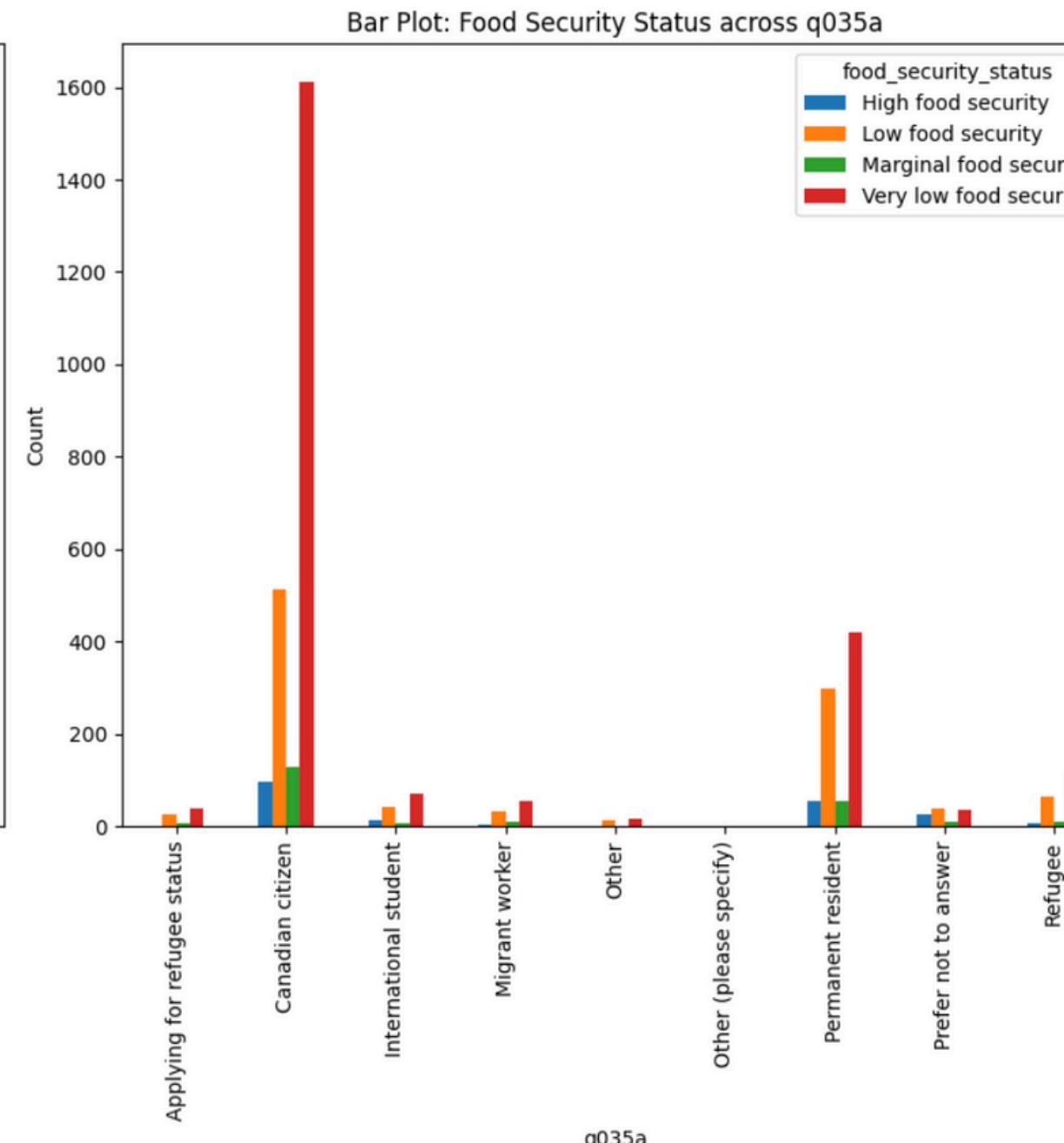
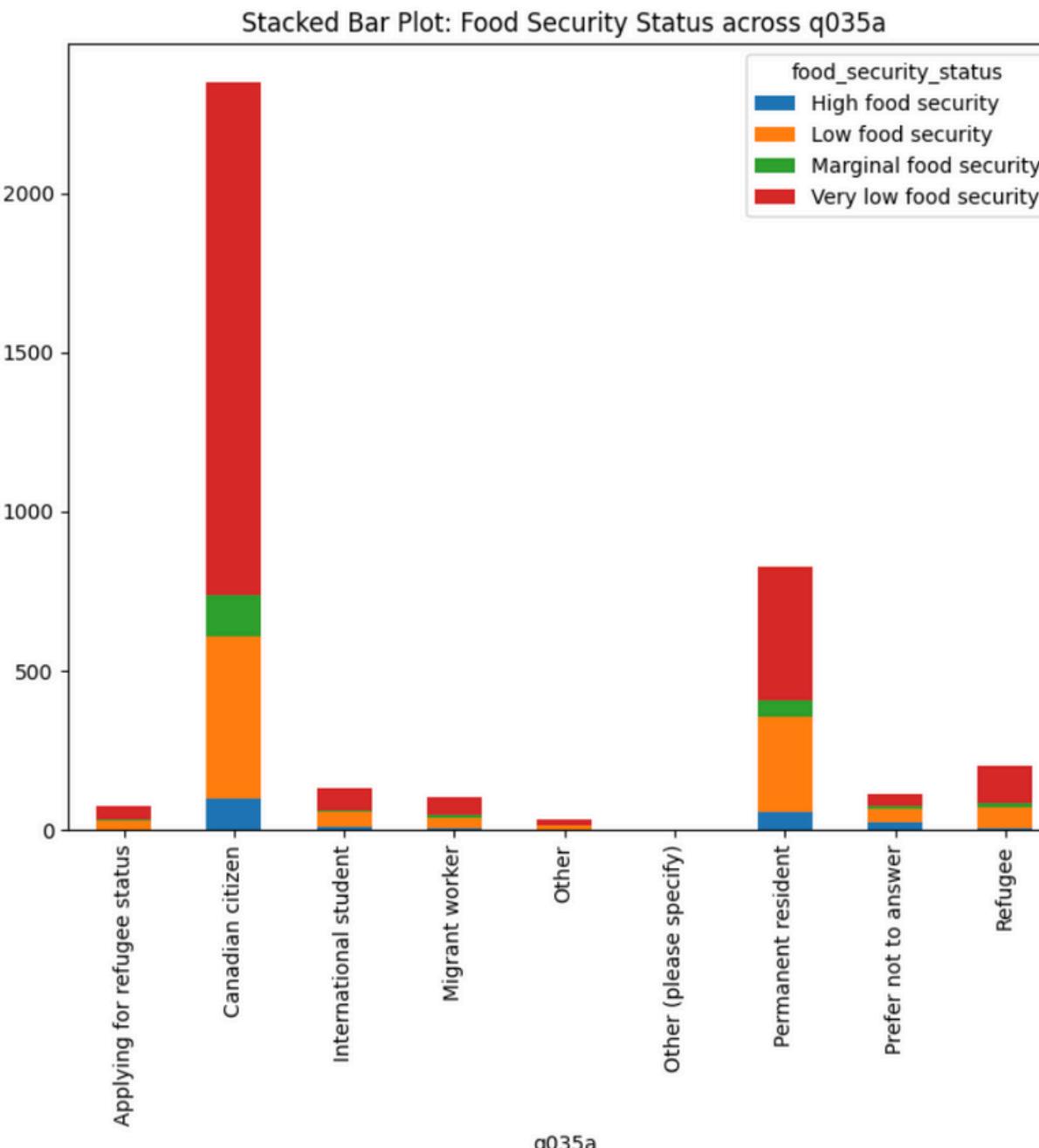
- The "No" group (those who did not complete their highest education outside Canada) overwhelmingly dominates the data in terms of both the total number affected and the severity of food insecurity.
- The "Yes" group (those who completed their highest education outside Canada) also experiences food insecurity, but the data for this group is more varied compared to the "No" group.



Food Security Status vs Status in Canada

OBSERVATIONS:

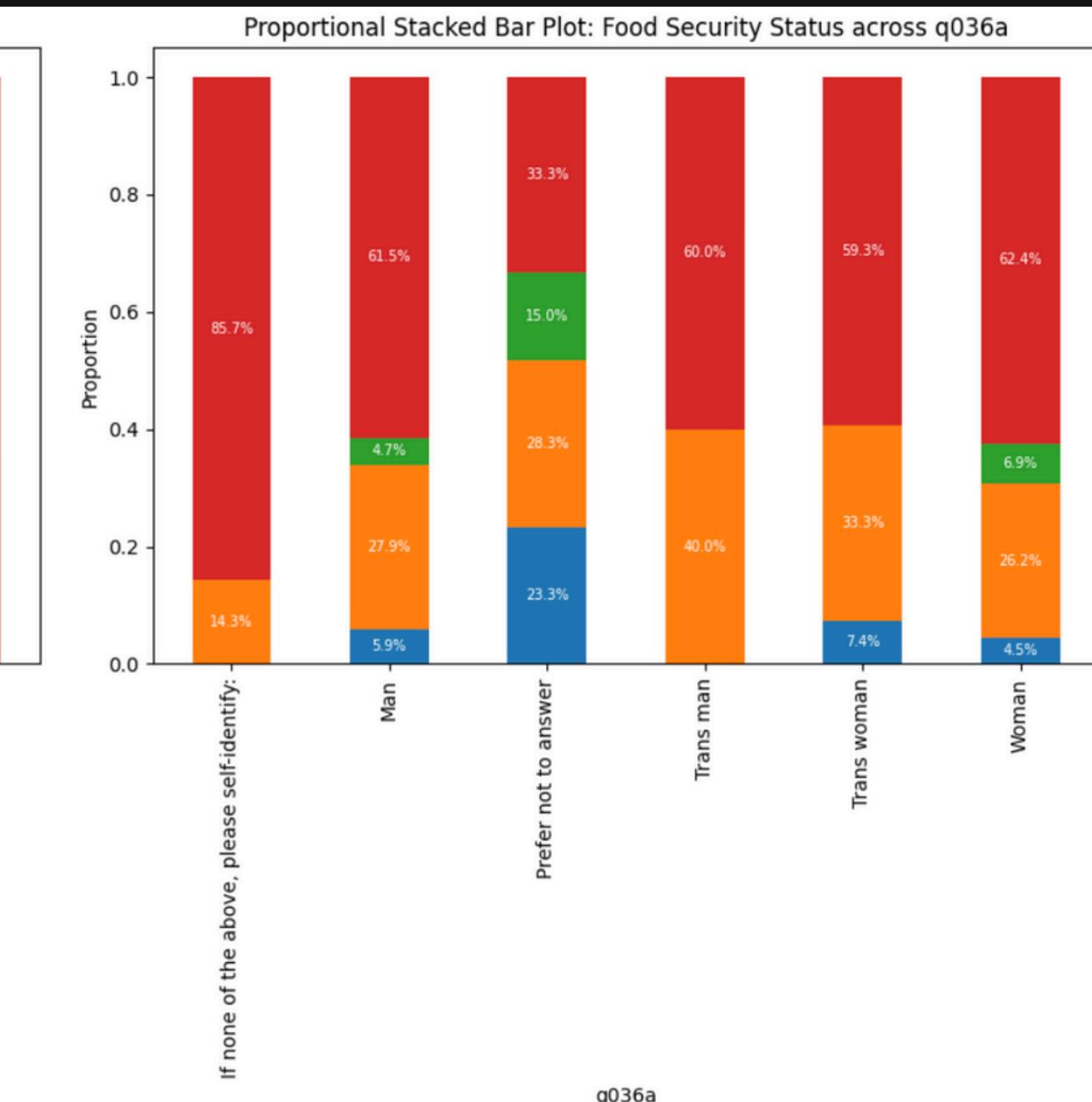
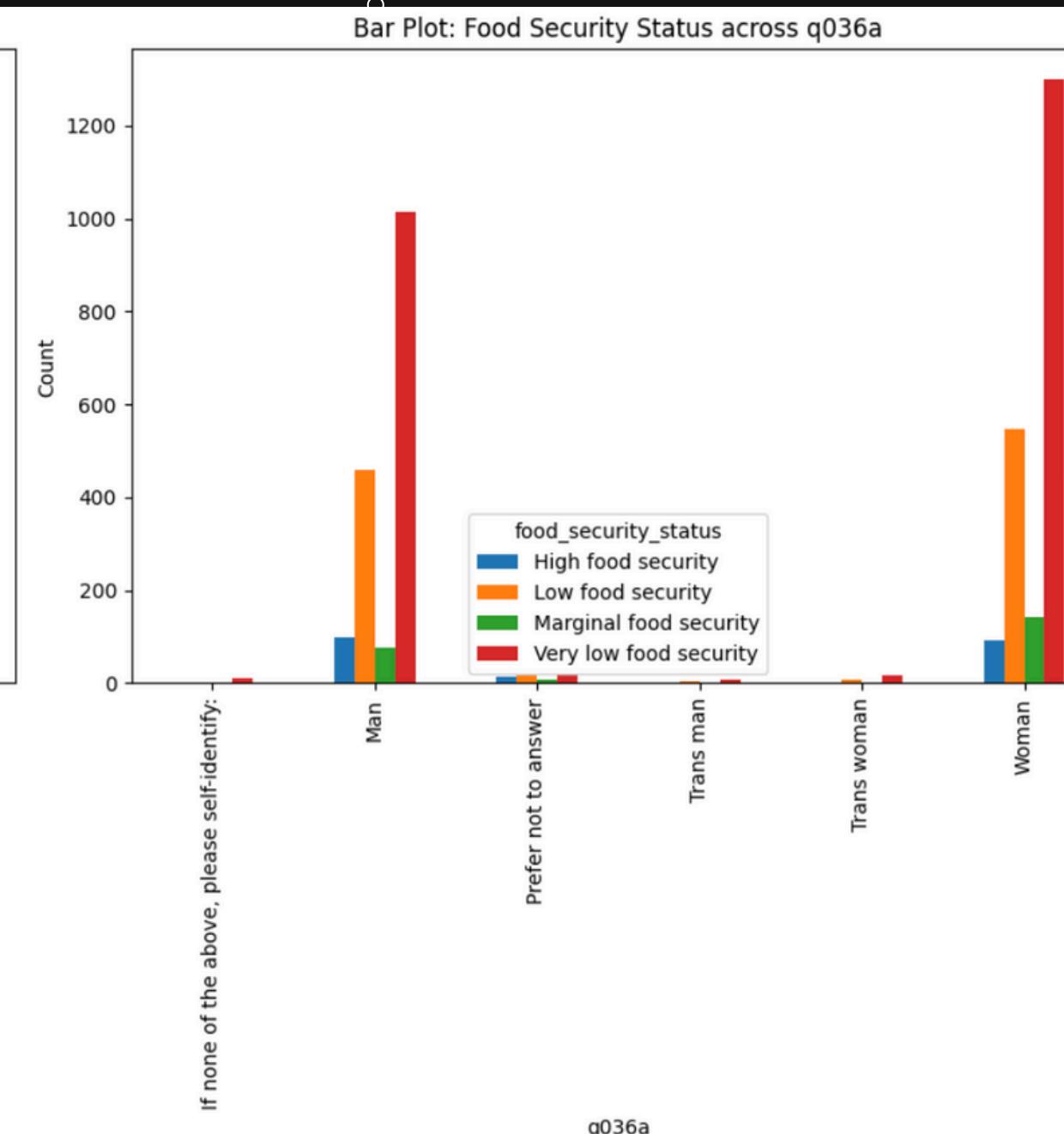
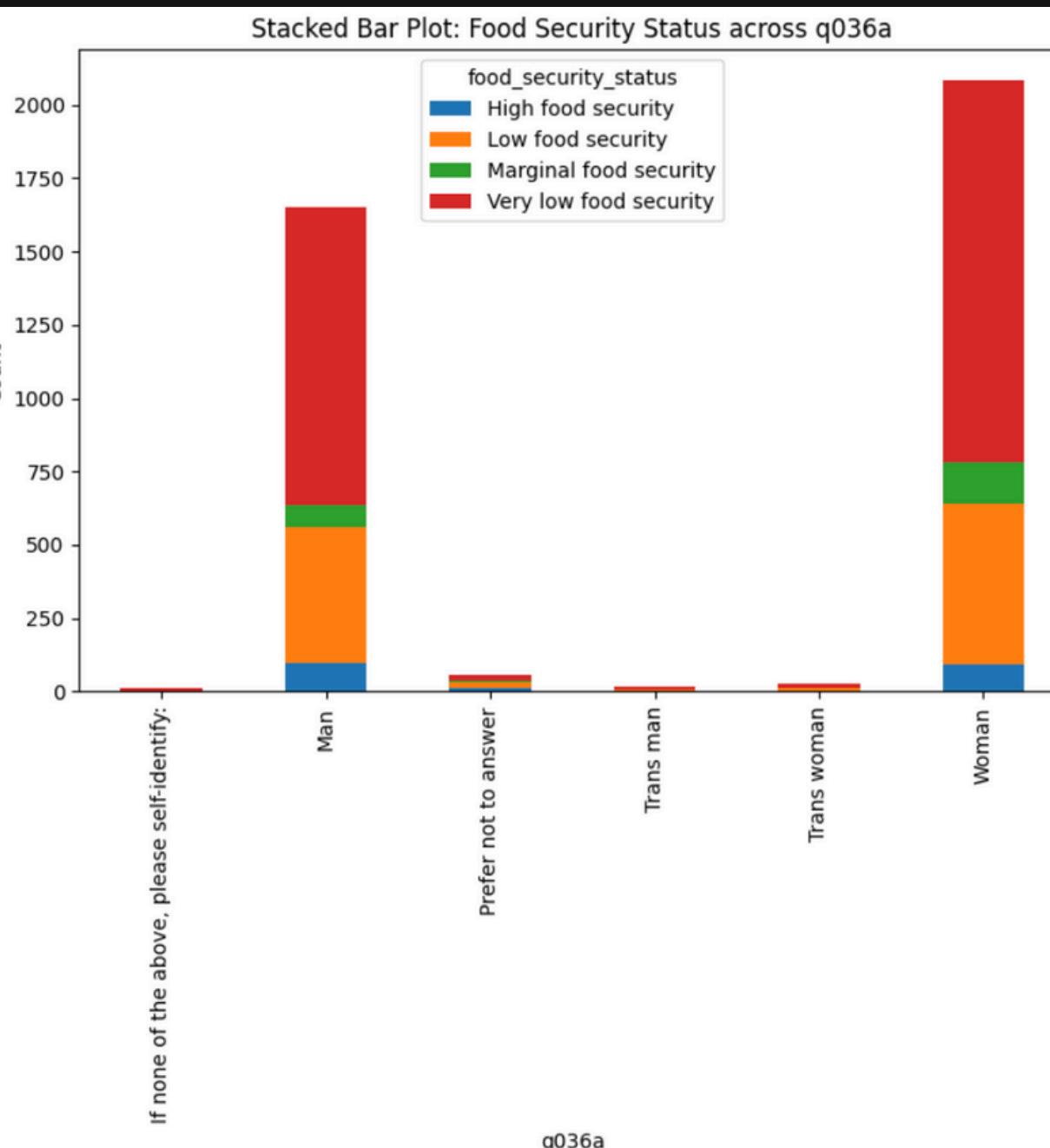
- [COUNTS PLOTS - Overall Impact]: "Very low food security" is most prevalent among Canadian citizens and permanent residents, while other statuses show lower counts.
- [PROPORTION PLOT Severity/Intensity]:
 - Canadian citizens experience the highest proportion of "Very low food security" at 68.6%, followed by refugees at 59.1%.
 - Applicants for refugee status and international students also face significant levels of "Very low food security" at 51.4%, and 53.8% respectively.



Food Security Status vs Gender

OBSERVATIONS:

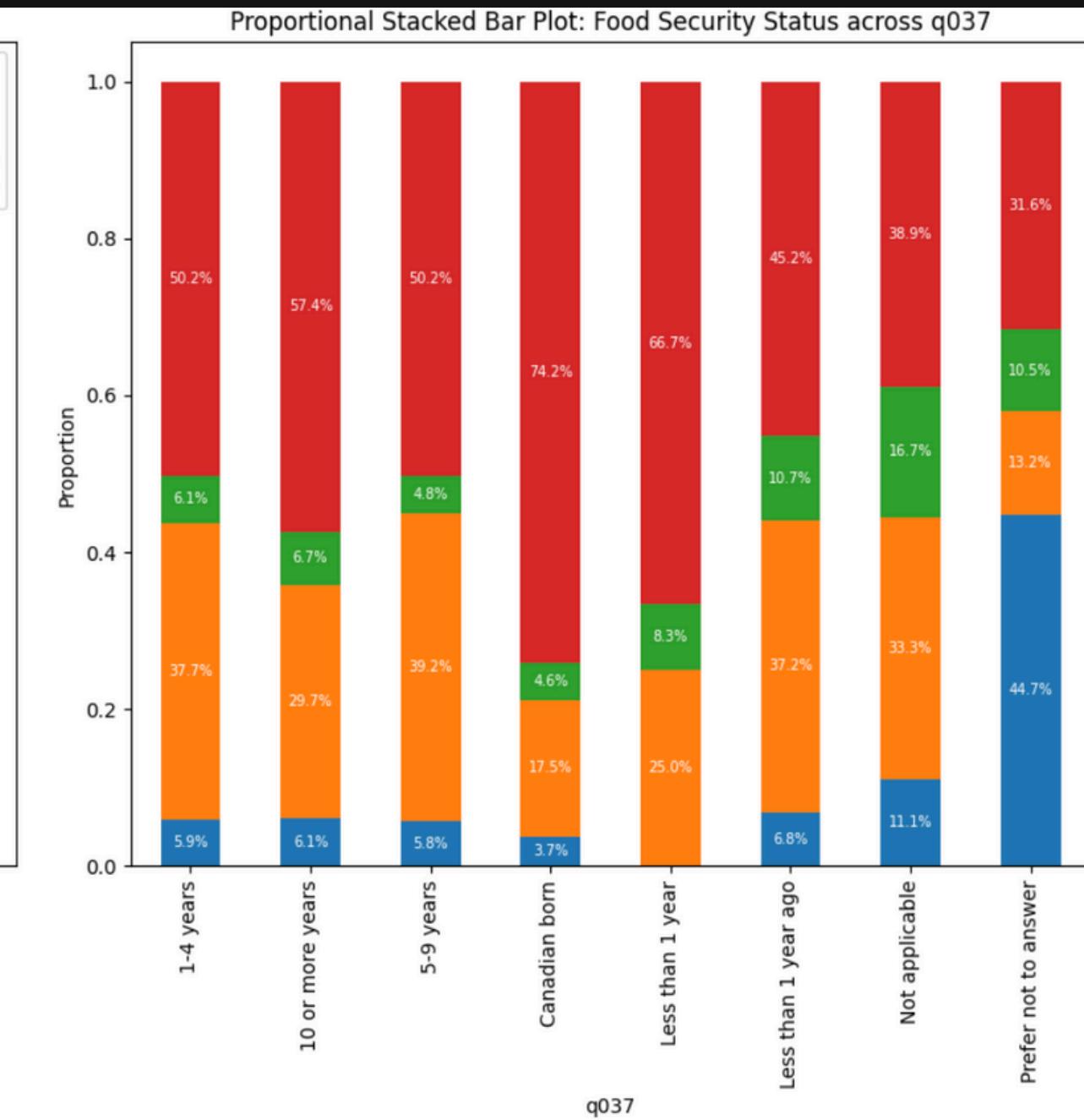
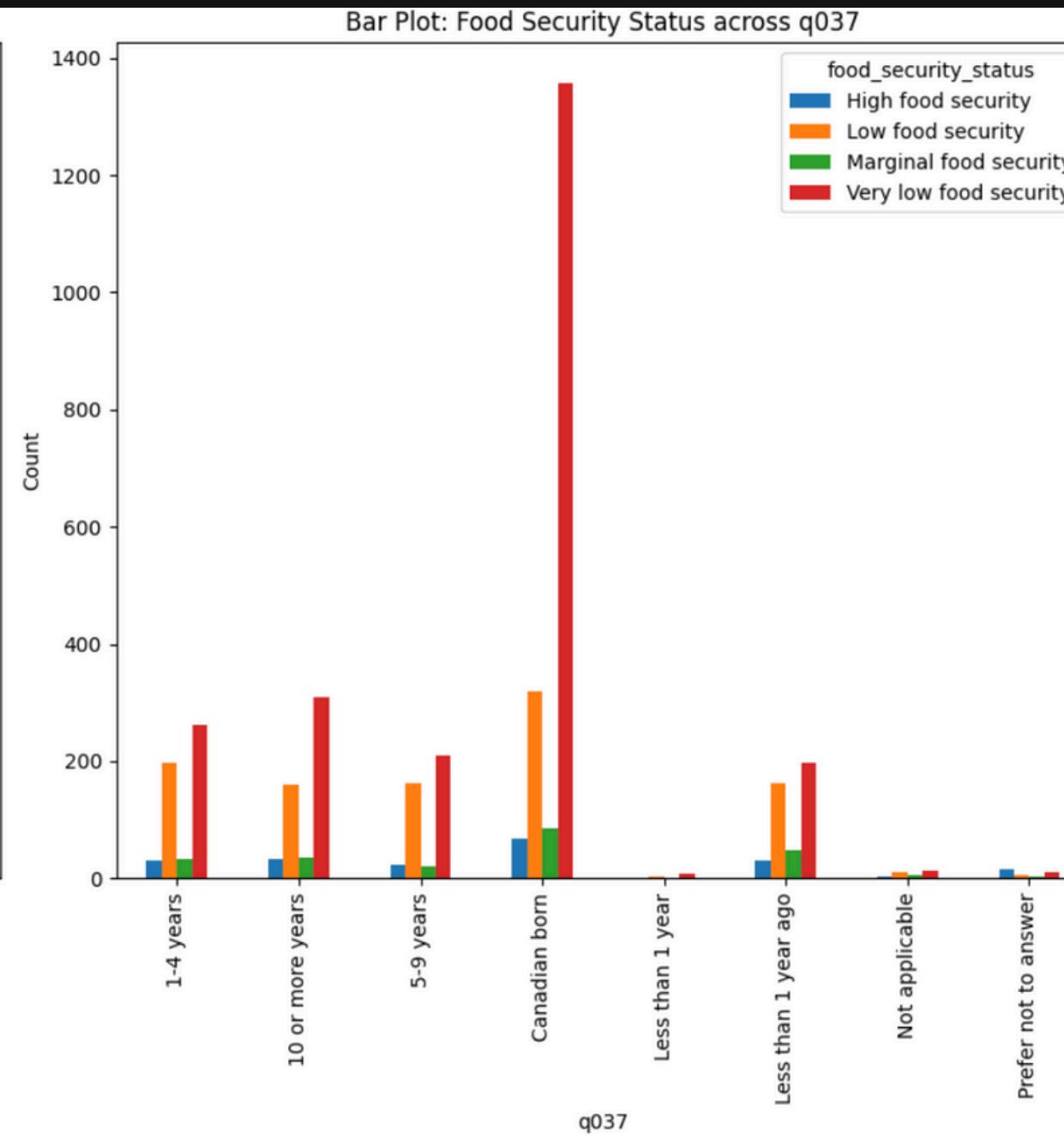
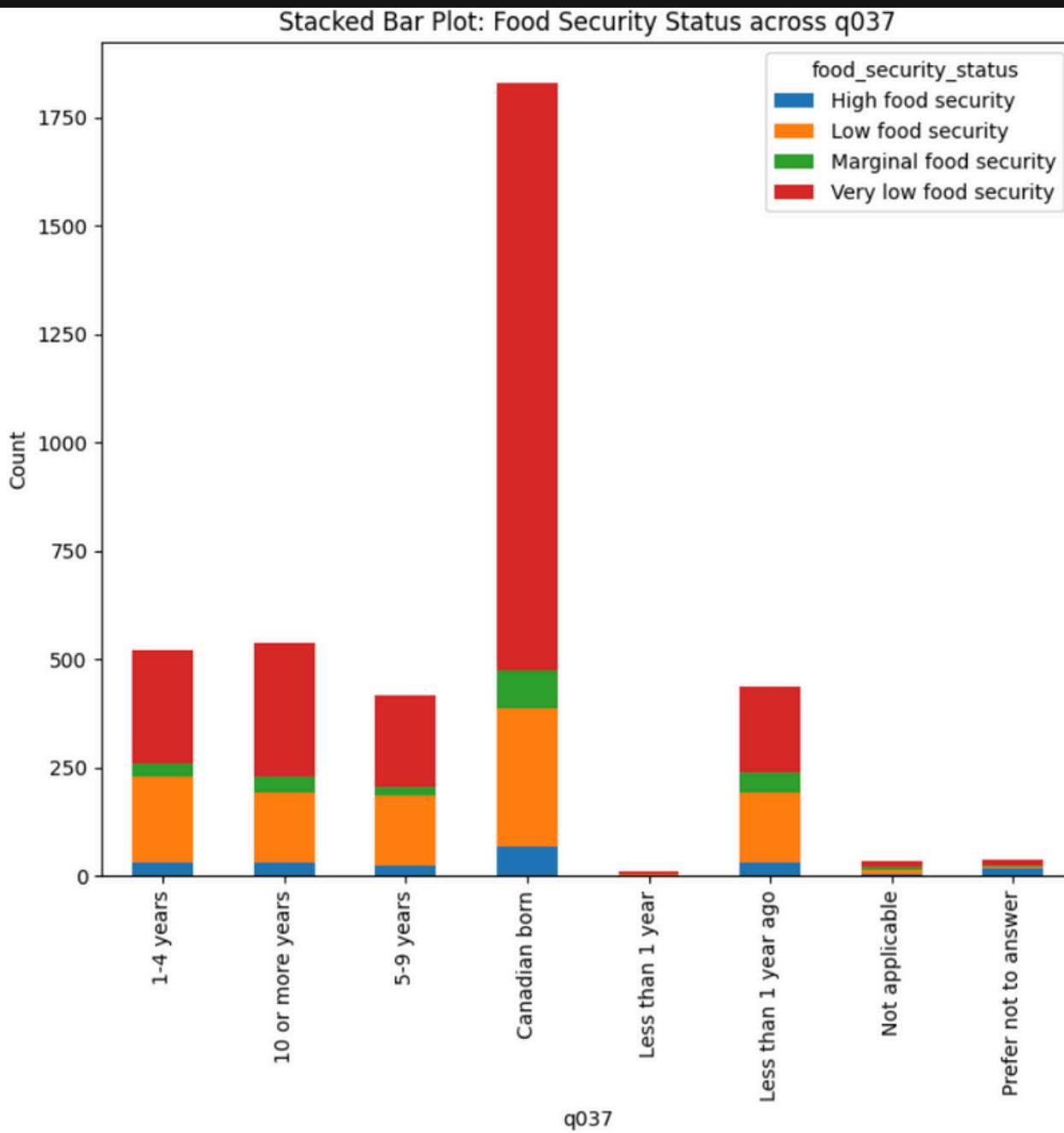
- [COUNTS PLOTS - Overall Impact]: "Very low food security" is most prevalent among women, followed by men, with lower representation for other gender identities.
- [PROPORTION PLOT Severity/Intensity]:
 - Women experience the highest proportion of "Very low food security" at 62.4%, followed closely by men at 61.5%.
 - Trans men also face significant levels of "Very low food security" at 60%, while trans women have a slightly lower proportion at 59.3%.
 - This indicates that severe food insecurity is widespread across all these gender identities.



Food Security Status vs Time in Canada

OBSERVATIONS:

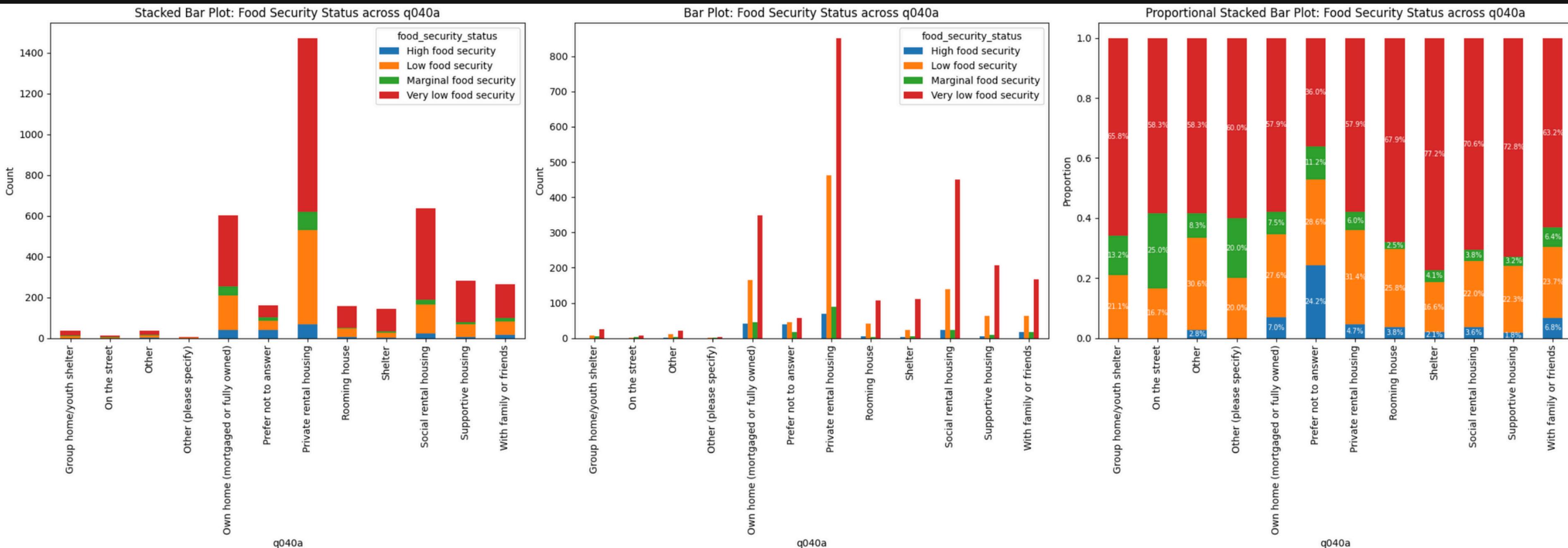
- [COUNTS PLOTS - Overall Impact]: ‘Very low food security’ is most prevalent among those born in Canada, followed by those who have been in Canada for 10 or more years , and those who arrived one year ago.
- [PROPORTION PLOT Severity/Intensity]: Canadian-born individuals experience the highest proportion of “Very low food security” at 74.2%, followed by those who arrived less than a year ago at 66.7% , and those who have been in Canada for 10 or more years at 57.4%.
- This indicates that both long-term residents and recent immigrants face significant challenges related to food security, with Canadian-born individuals being the most affected.



Food Security Status vs Housing

OBSERVATIONS:

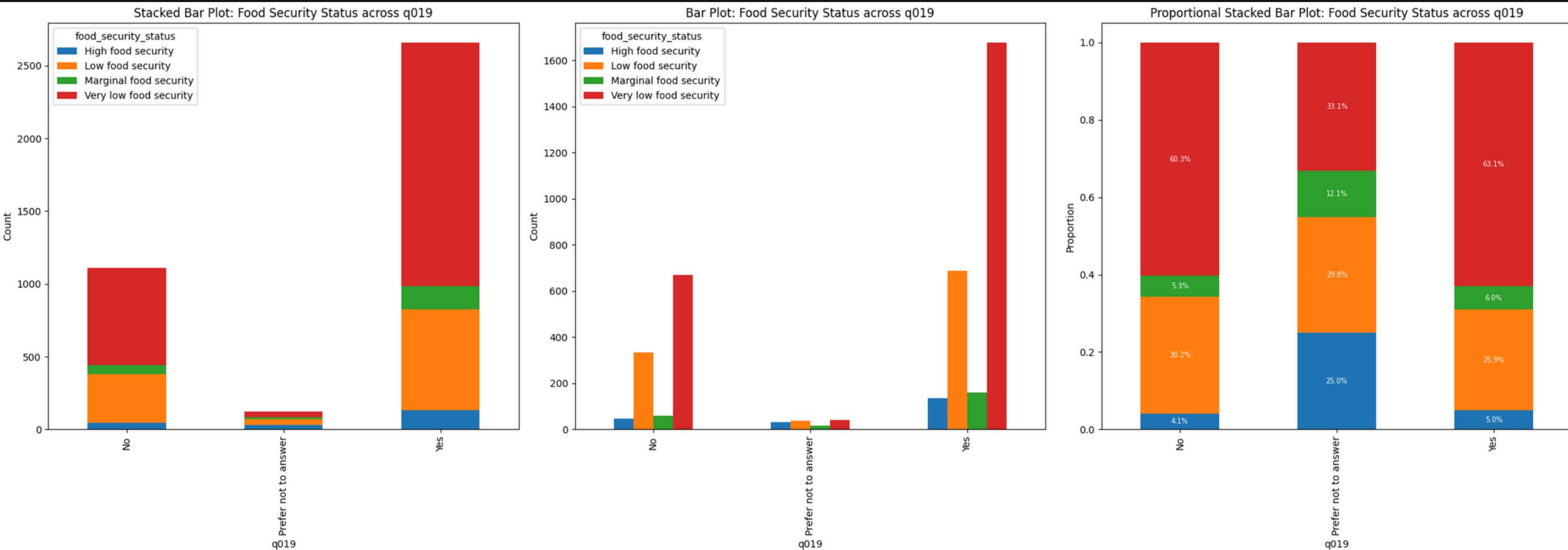
- [COUNTS PLOTS - Overall Impact]: The counts highlight where the problem is most numerically significant (in terms of absolute numbers, The problem is in private rental housing),
- [PROPORTION PLOT Severity/Intensity]: The relative percentages highlight where the problem is most intense relative (to the proportion of food-insecure individuals within each housing type, The problem is in shelters, social rental housing, and rooming houses).
- More details in Chapter 5 !



Food Security Status vs Exercise

OBSERVATIONS:

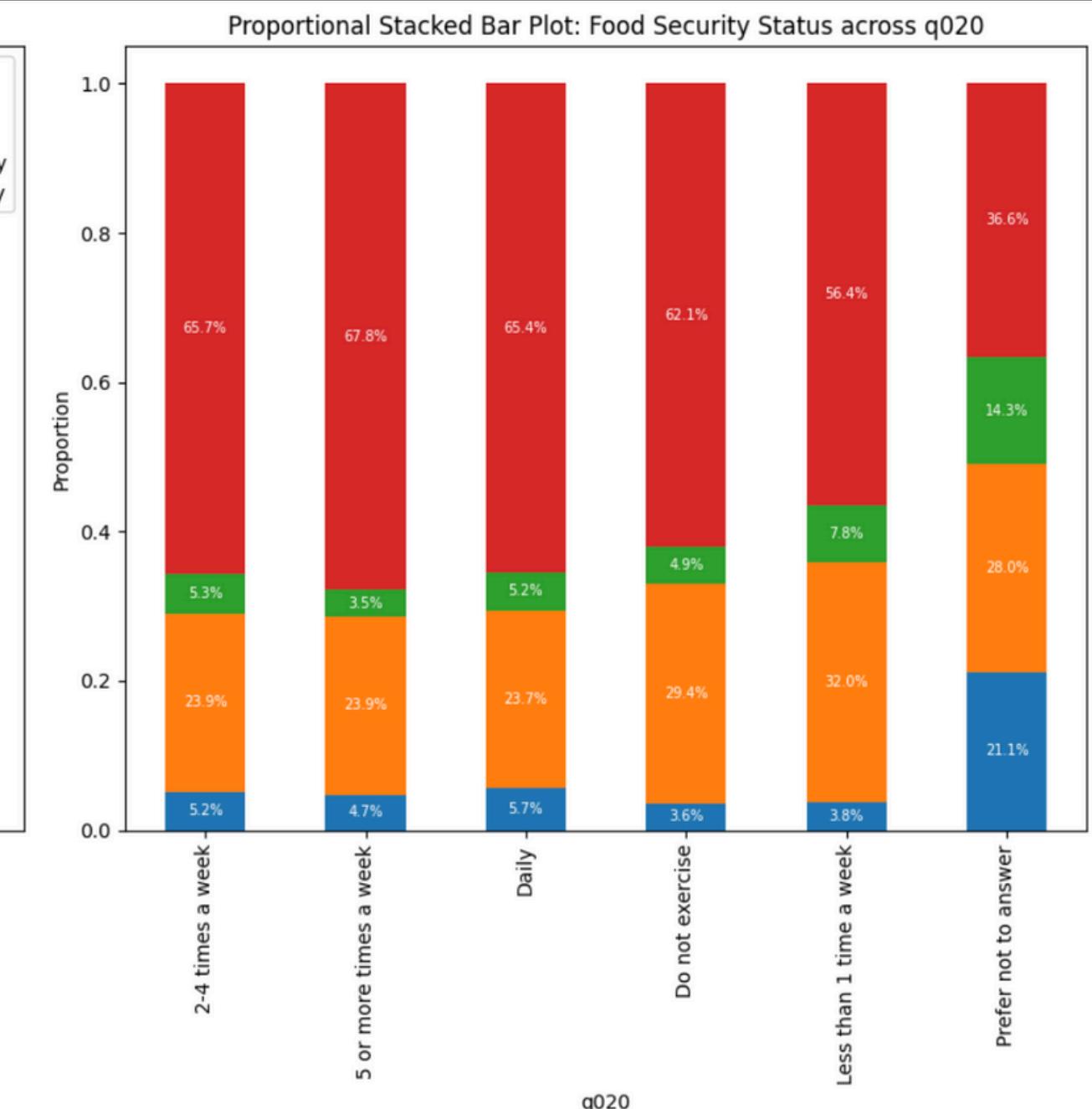
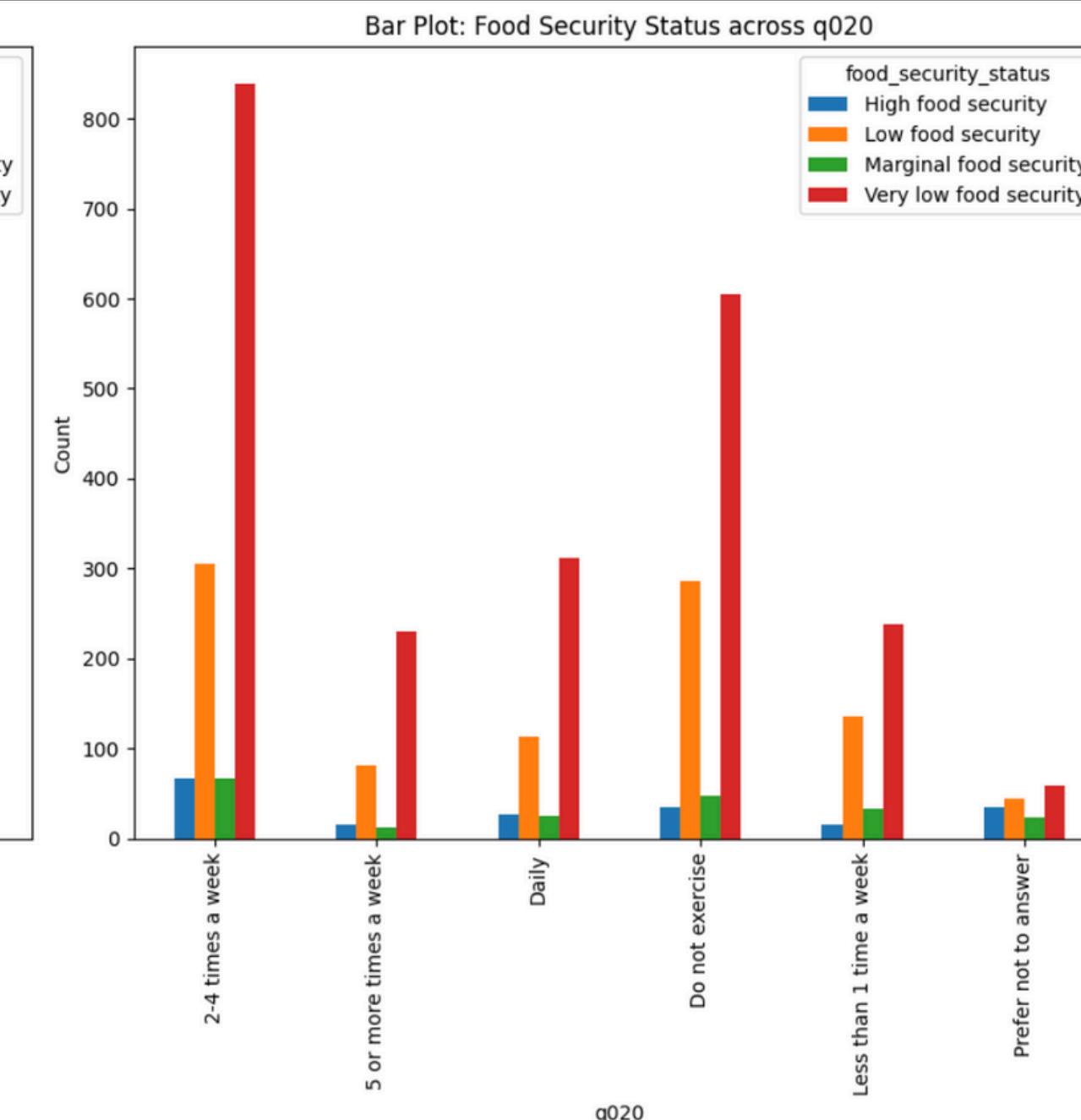
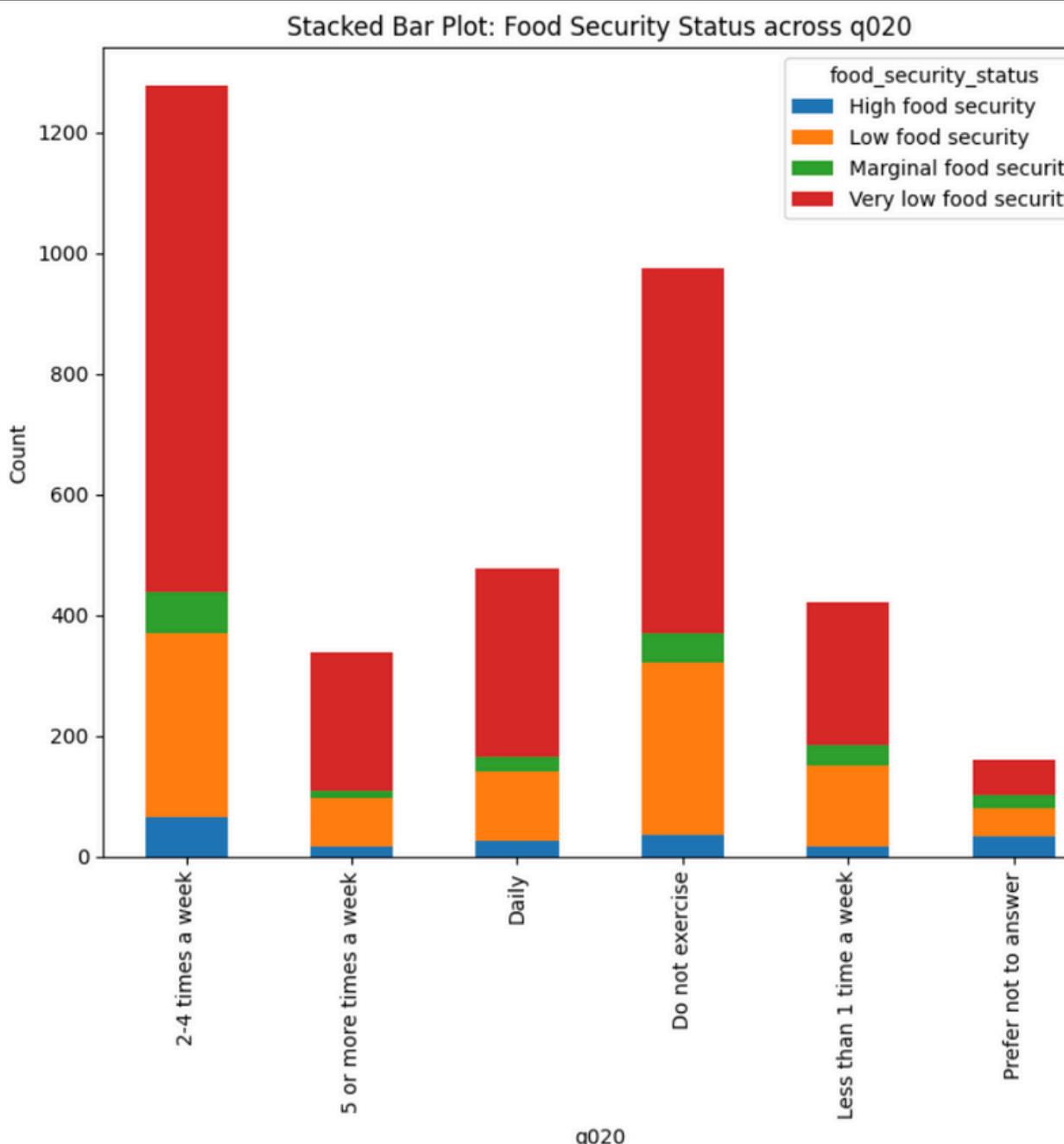
- Individuals who do exercise ("Yes" category) are the most represented in the data and have the highest proportion of "Very low food security" at 63.1%.
- Those who do not exercise ("No" category) also experience "Very low food security," but at a slightly lower rate of 60.3%.



Food Security Status vs Frequency of exercise

OBSERVATIONS:

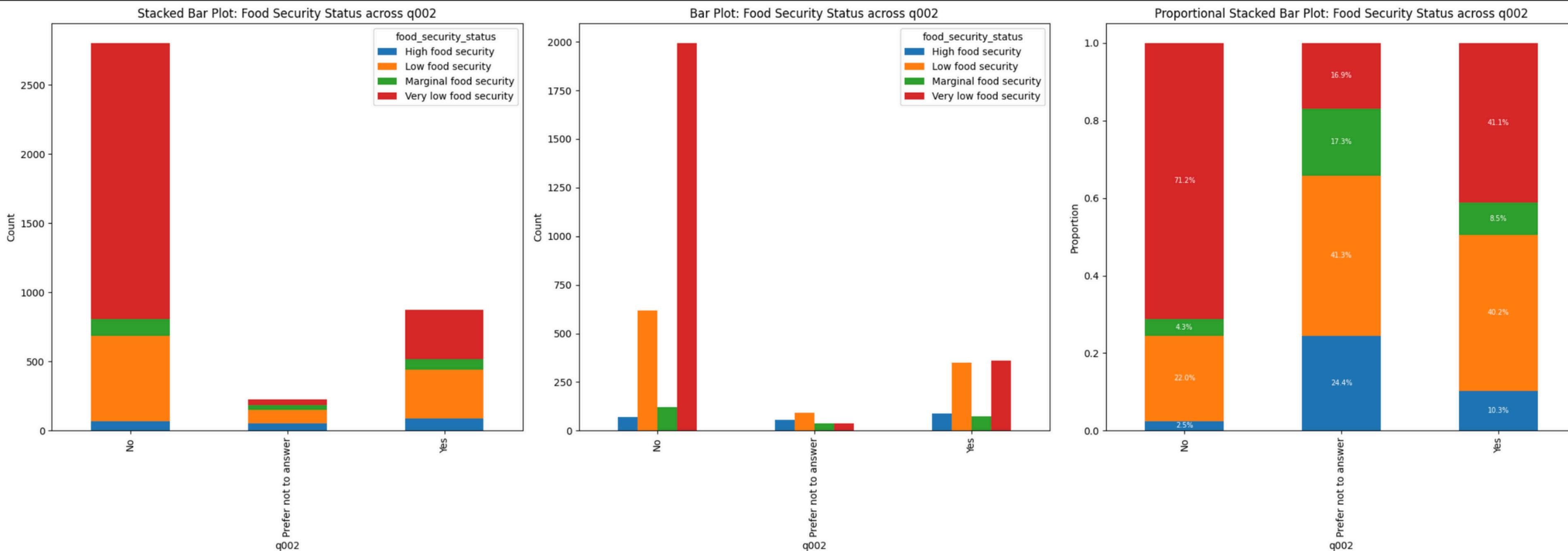
- Individuals who exercise 2-4 times a week are the most represented in the data and show the highest counts of "Very low food security."
- However, the most severe levels of food insecurity are seen in those who exercise 5 or more times a week, with 67.8% experiencing "Very low food security."
- Those who do not exercise also show significant levels of severity, with 62.1% in "Very low food security."
- This suggests a trend where both regular and frequent exercisers, as well as non-exercisers, face substantial food insecurity challenges.



Food Security Status vs Income level

OBSERVATIONS:

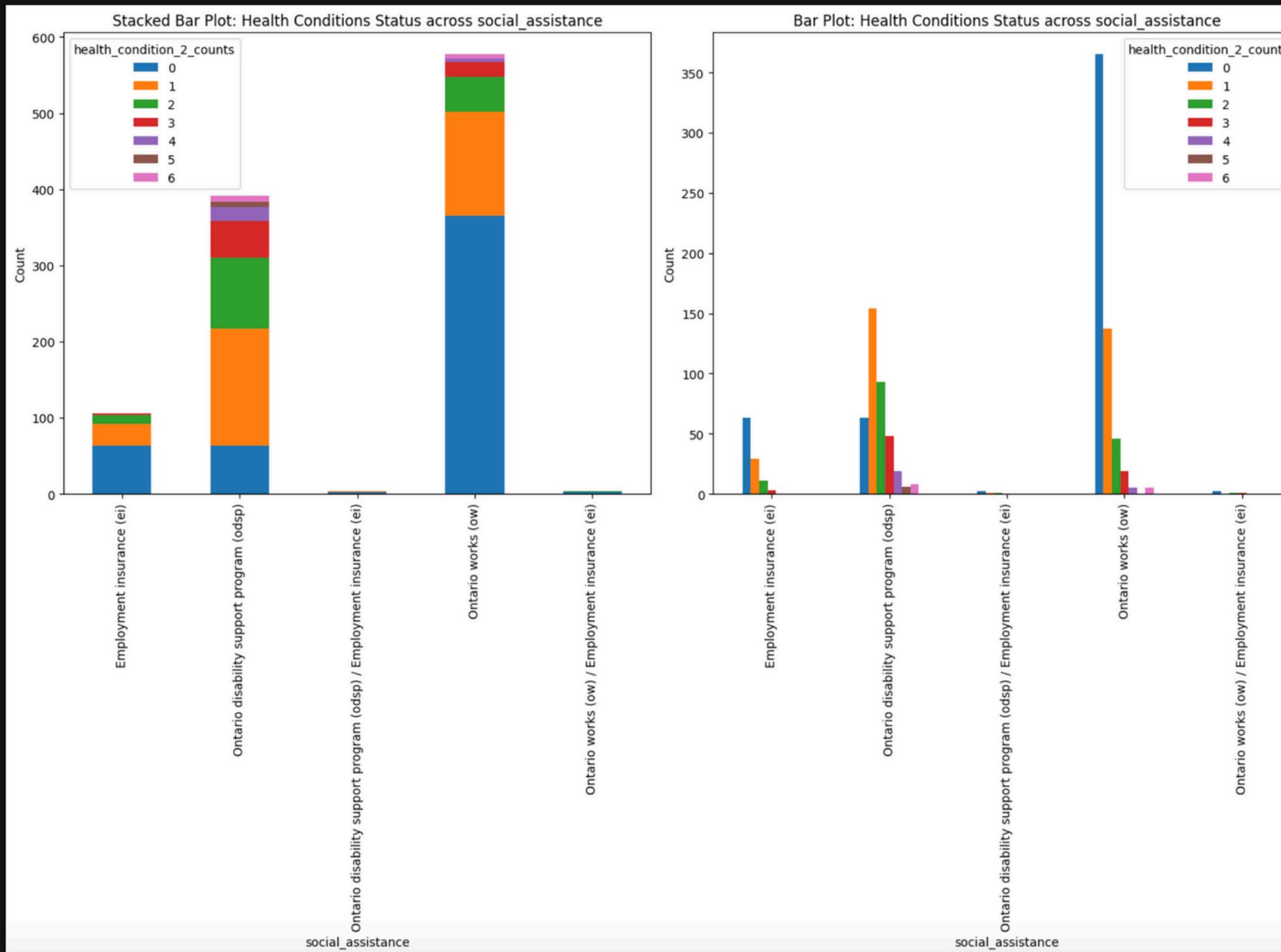
- Individuals who report having insufficient income are the most represented in the data and experience the highest counts of "Very low food security."
- Specifically, 71.2% of those with insufficient income fall into the "Very low food security" category.
- In contrast, those who report having a sufficient income show a more balanced distribution across food security categories, with only 41.1% experiencing "Very low food security."
- This indicates that insufficient income is strongly associated with severe food insecurity.



CHAPTER 4 : Health Conditions by Social Assitance Groups

Counts

Health Conditions (Q39a-i) Status Across Social Assistance Groups

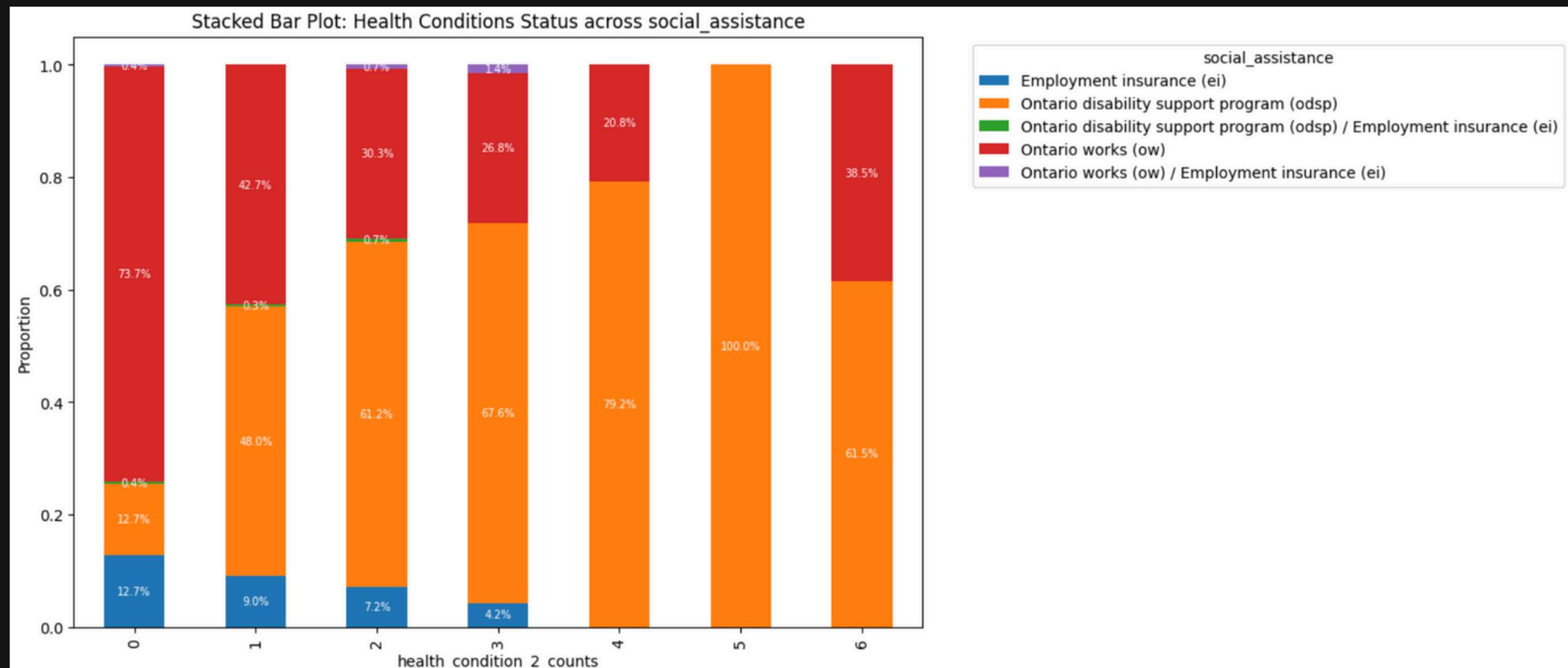


OBSERVATIONS:

- Ontario Works (OW):
 - Supports individuals with fewer health conditions.
- Ontario Disability Support Program (ODSP):
 - Serves individuals with multiple health needs.
- Employment Insurance (EI):
 - Has a varied distribution but fewer respondents with multiple health conditions.

Percentage

Health Conditions (Q39a-i) Status across Social Assistance Groups

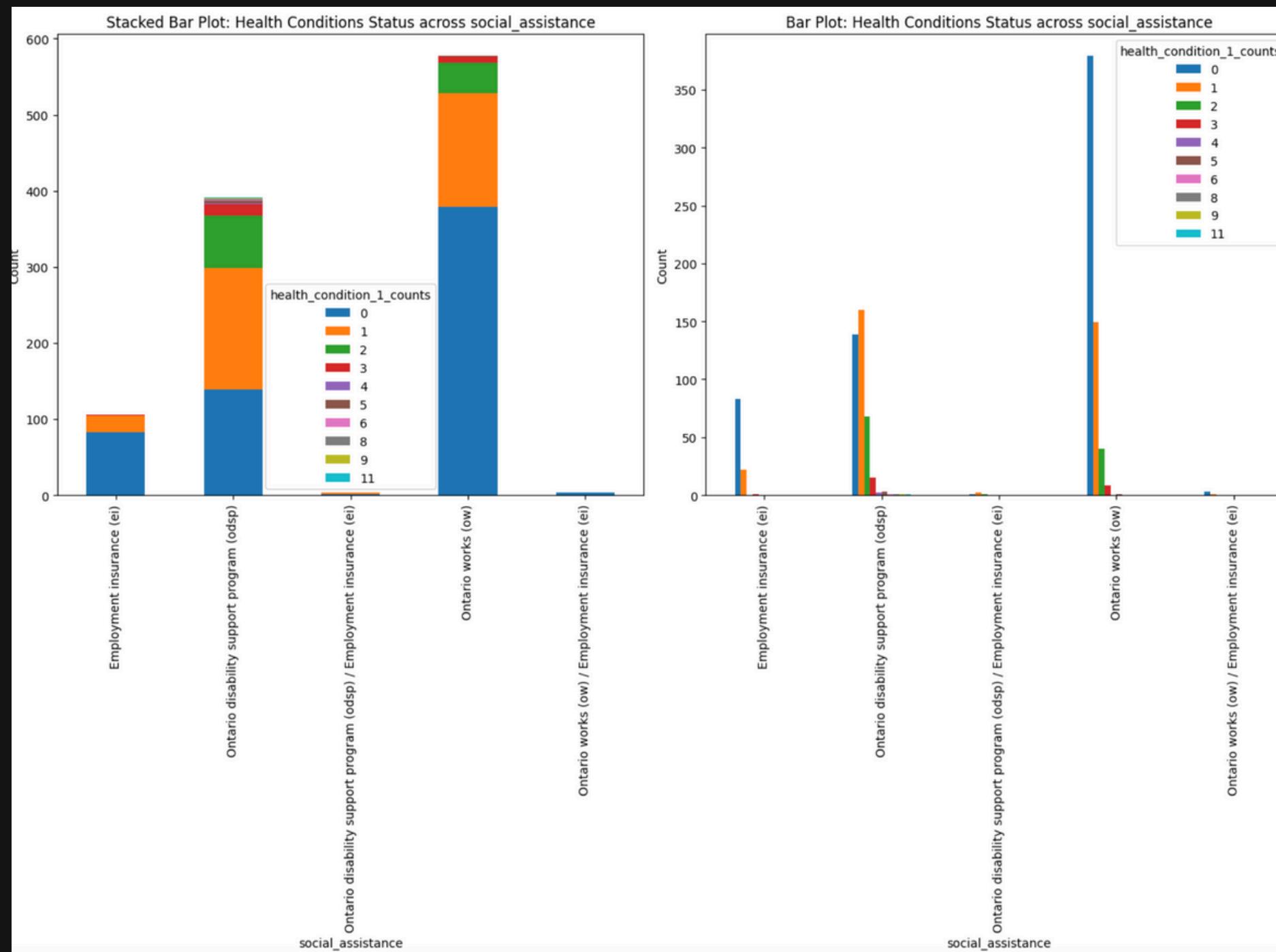


OBSERVATIONS:

- Ontario Works (OW):
 - Primarily serves respondents with no or one health condition.
- Ontario Disability Support Program (ODSP):
 - Serves respondents with more significant health needs, as indicated by the higher proportion of individuals with multiple health conditions.
- Employment Insurance (EI):
 - Has a more balanced distribution but with fewer respondents reporting multiple health conditions.

COUNTS

Health Conditions (Q21a-f) Status across Social Assistance Groups

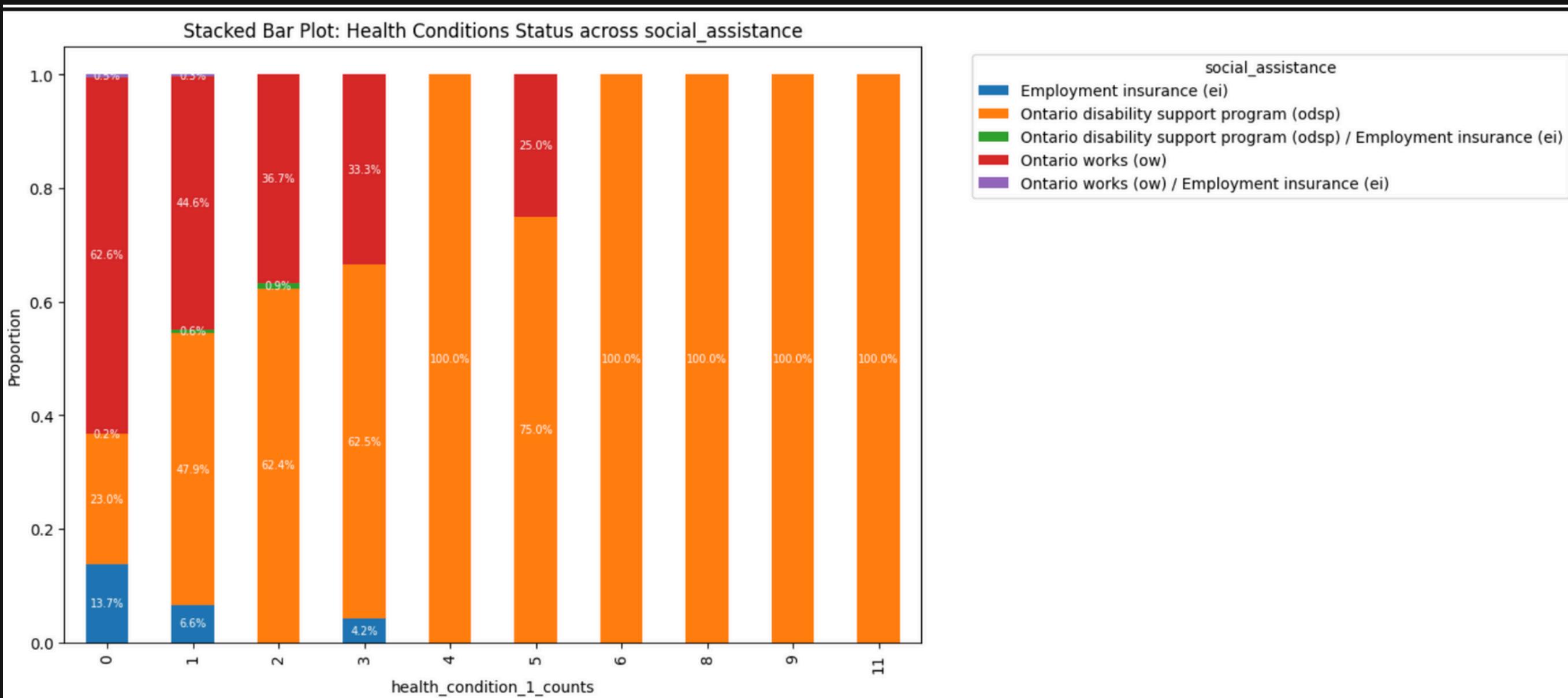


OBSERVATIONS:

- Similar observation as the Counts graph in the previous slide.

Percentage

Health Conditions (Q21a-f) Status across Social Assistance Groups



OBSERVATIONS:

- Similar observation as the Counts graph in the previous slide.

SUMMARY

- The graphs illustrate that the different types of social assistance programs are targeted at different segments of the population based on their health condition complexity.

SUMMARY

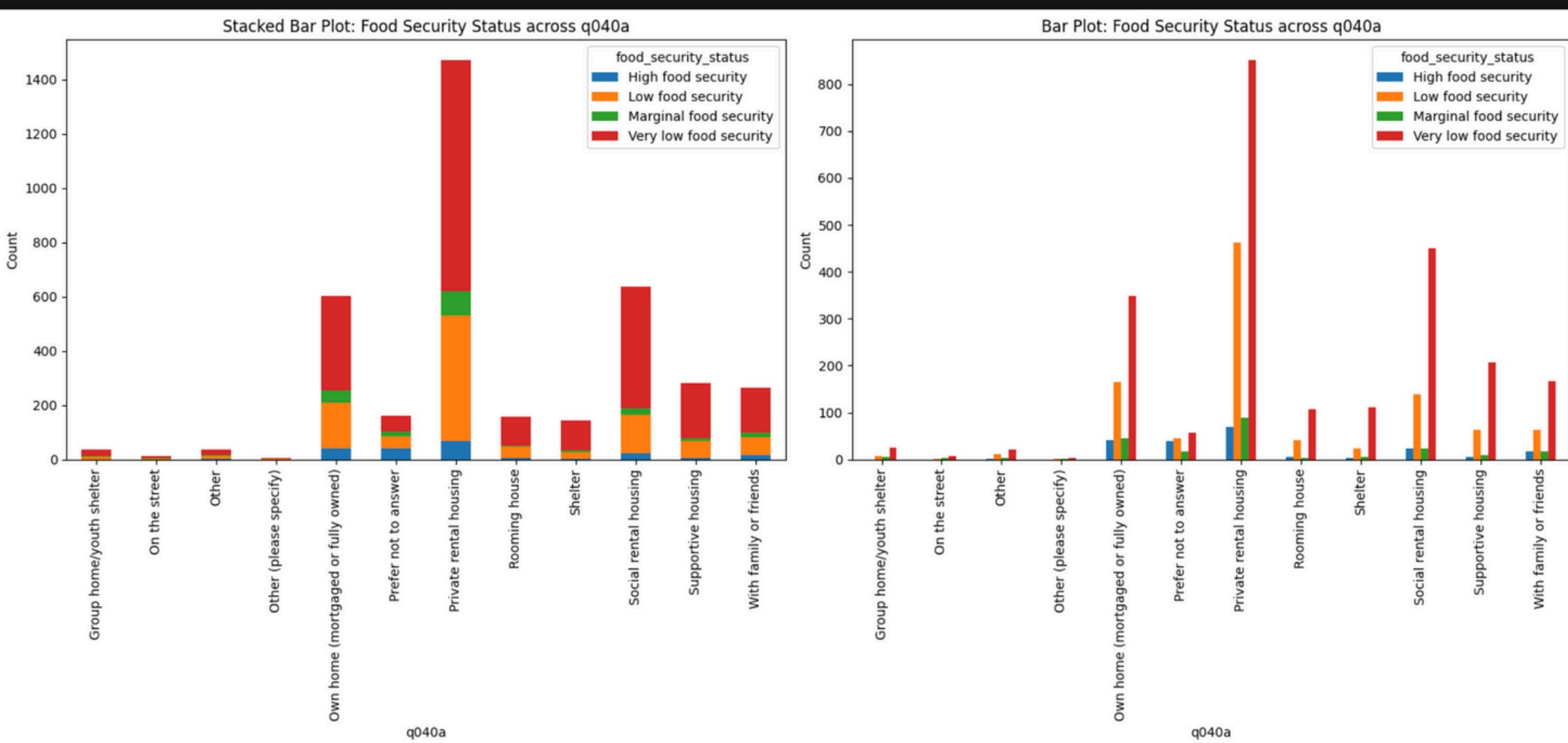
CHAPTER 5 : Food Security Status and Housing

COUNTS

Food Security Status vs Housing Situation

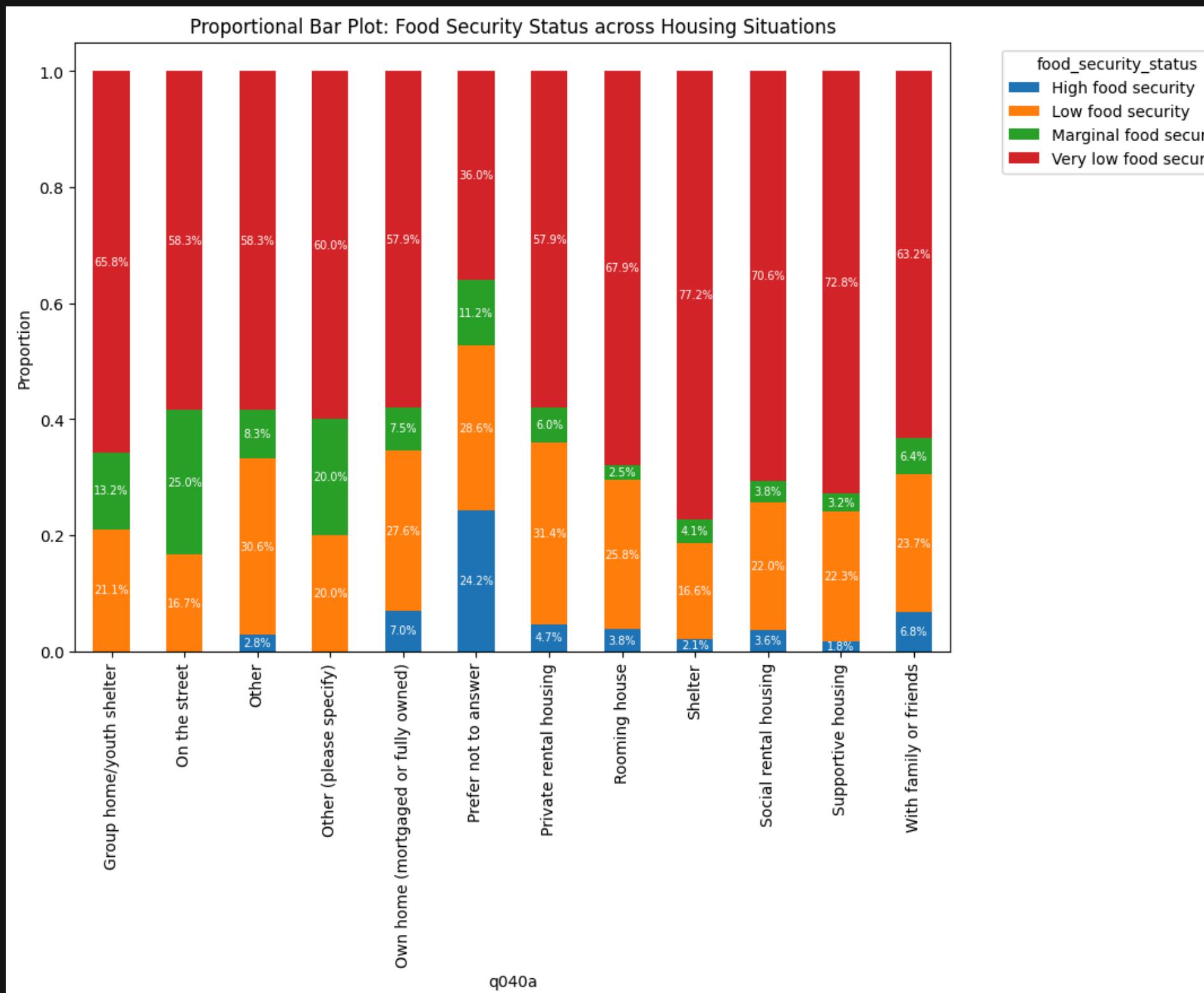
OBSERVATIONS:

- The two count-based bar plots show that the absolute number of individuals with food insecurity is highest in private rental housing.
- This indicates a significant burden of food insecurity within the private rental housing type.
- In other words, the two plots identify that those living in private rental housing had a higher likelihood of being food insecure (including severely, moderately, marginally food insecure) relative to those living in other housing arrangements.
- Statistical validation:** The extremely low p-value [3.0857e-32 (very close to zero)] indicates a strong association between q040a (housing type) and food security status. This means that the differences in food security status across different housing types are statistically significant, which aligns with the two graphs showing higher food insecurity in certain housing categories, particularly in private rental housing.



Percentage

Food Security Status vs Housing Situation



OBSERVATIONS:

- The relative proportions of severely, moderately, and marginally food-insecure individuals seem relatively constant across most groups.
- While private rental housing has the highest number of food-insecure individuals (including severely, moderately, and marginally food insecure), the proportional severity of very low food insecurity is higher in shelters, social rental housing, and rooming houses.
- Therefore, the Chi-square analysis and the proportional bar plot suggest that the **likelihood of being severely food insecure** is greater in these other housing types compared to private rental housing.

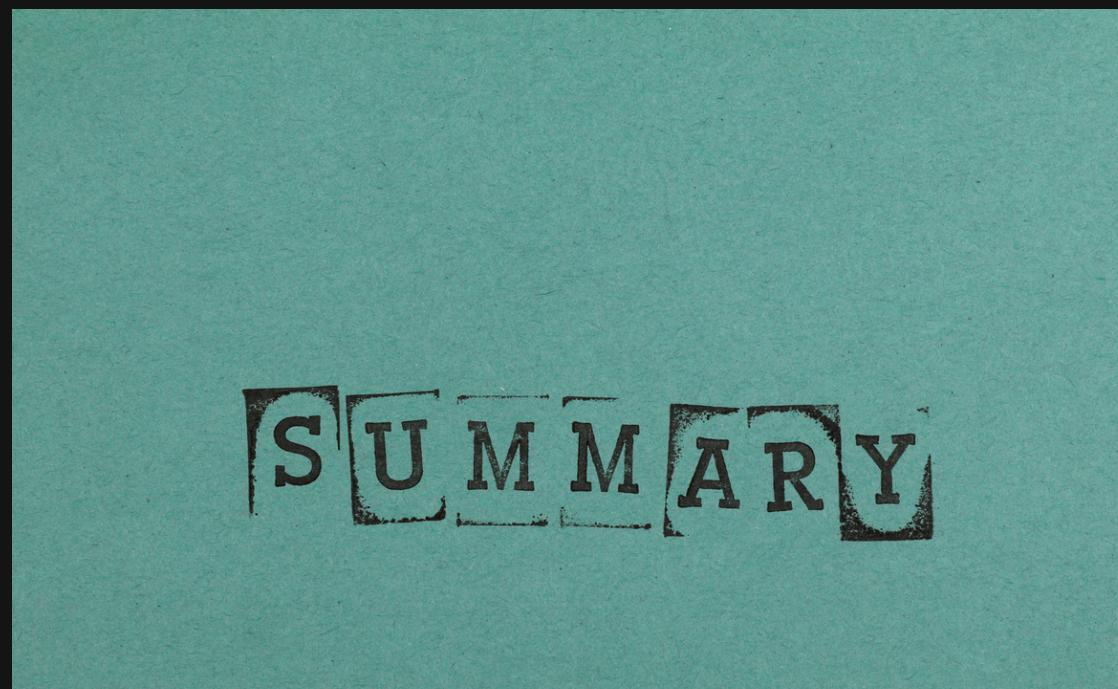
Not Possible !

Food Security Status vs Private Housing Situtations



OBSERVATIONS:

- Not possible !
 - Not possible to see if there is a difference between those living in properties owned by large companies versus individual landlords.
 - Reason:
 - The data available for questions 'q040a' and 'q040b', is insufficient to determine whether private rental housing is owned by large companies or individual landlords.
 - To create an 'ownership_type' column, we would need additional information, as the current dataset is insufficient for this purpose.



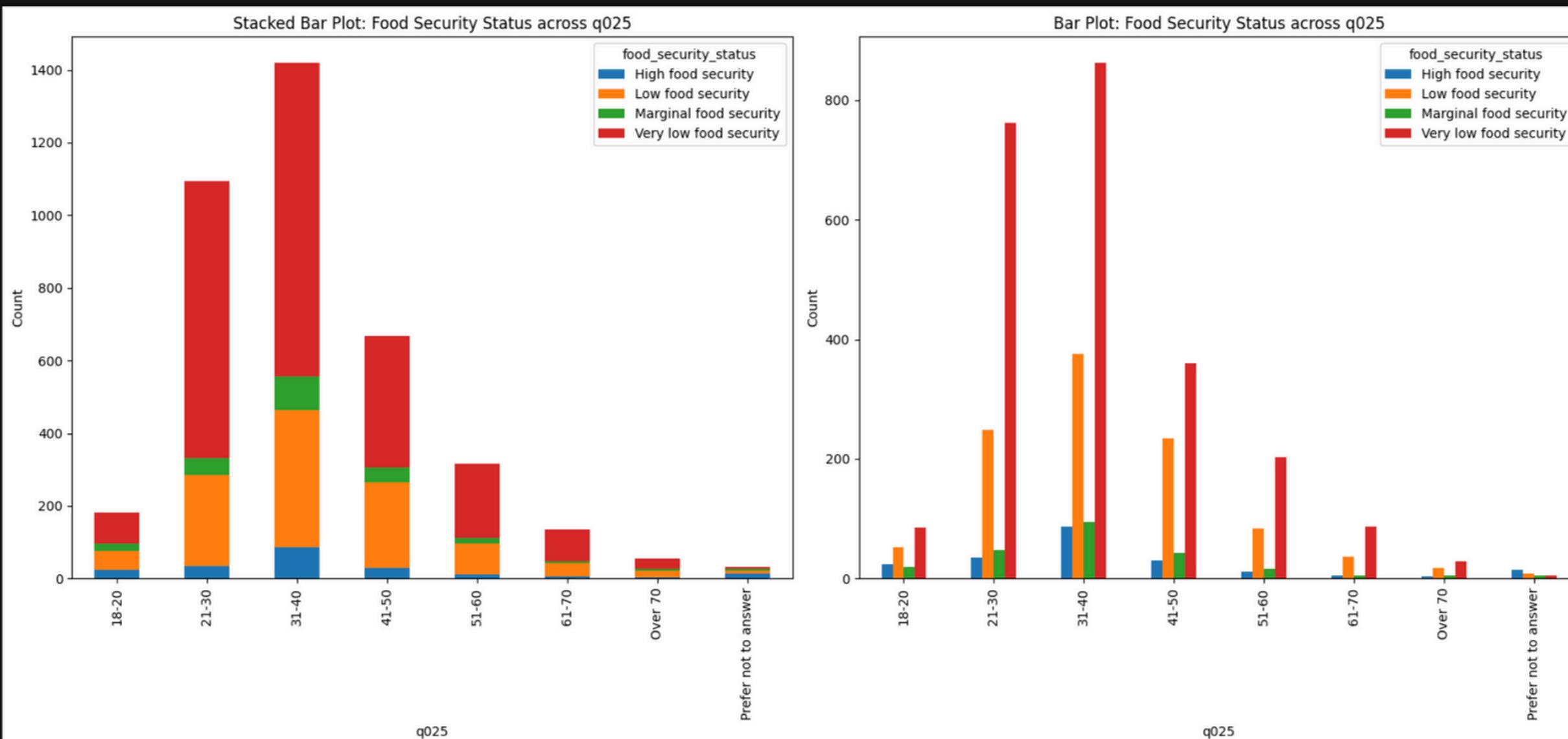
SUMMARY

- Using both counts (bar plots) and relative percentages (proportional bar plots) helps us to understand the data comprehensively.
- The counts highlight where the problem is most numerically significant (in terms of absolute numbers, like in private rental housing),
- The relative percentages highlight where the problem is most intense relative (to the proportion of food-insecure individuals within each housing type, like in shelters, social rental housing, and rooming houses).

CHAPTER 6 : Generational Differences Among Food Bank Visitors

COUNTS

Food Security Status vs Age Groups

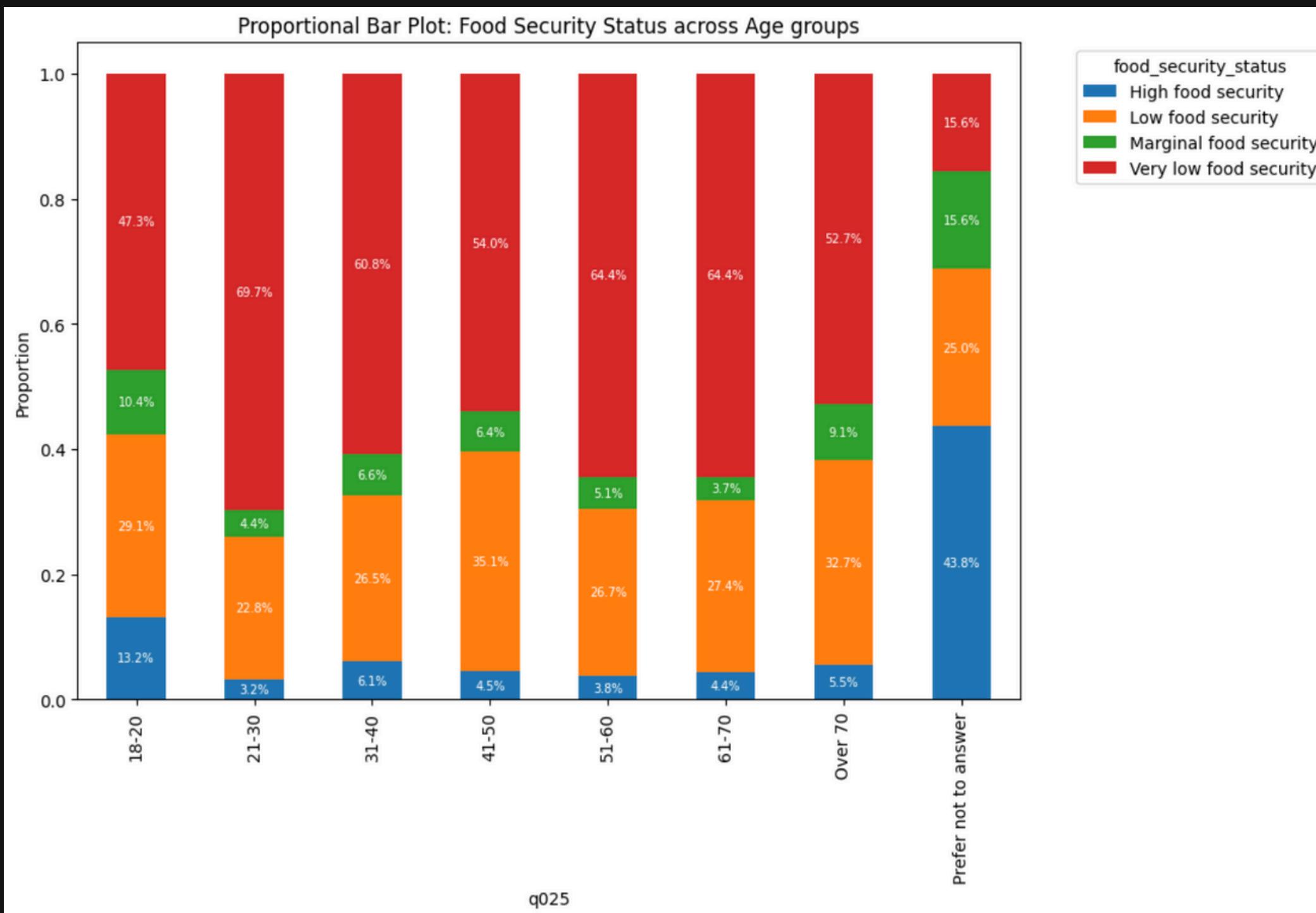


OBSERVATIONS:

- Overall Impact: Younger adults (21-40) are most affected in terms of the total number of food-insecure individuals.

Percentage

Food Security Status vs Age Groups

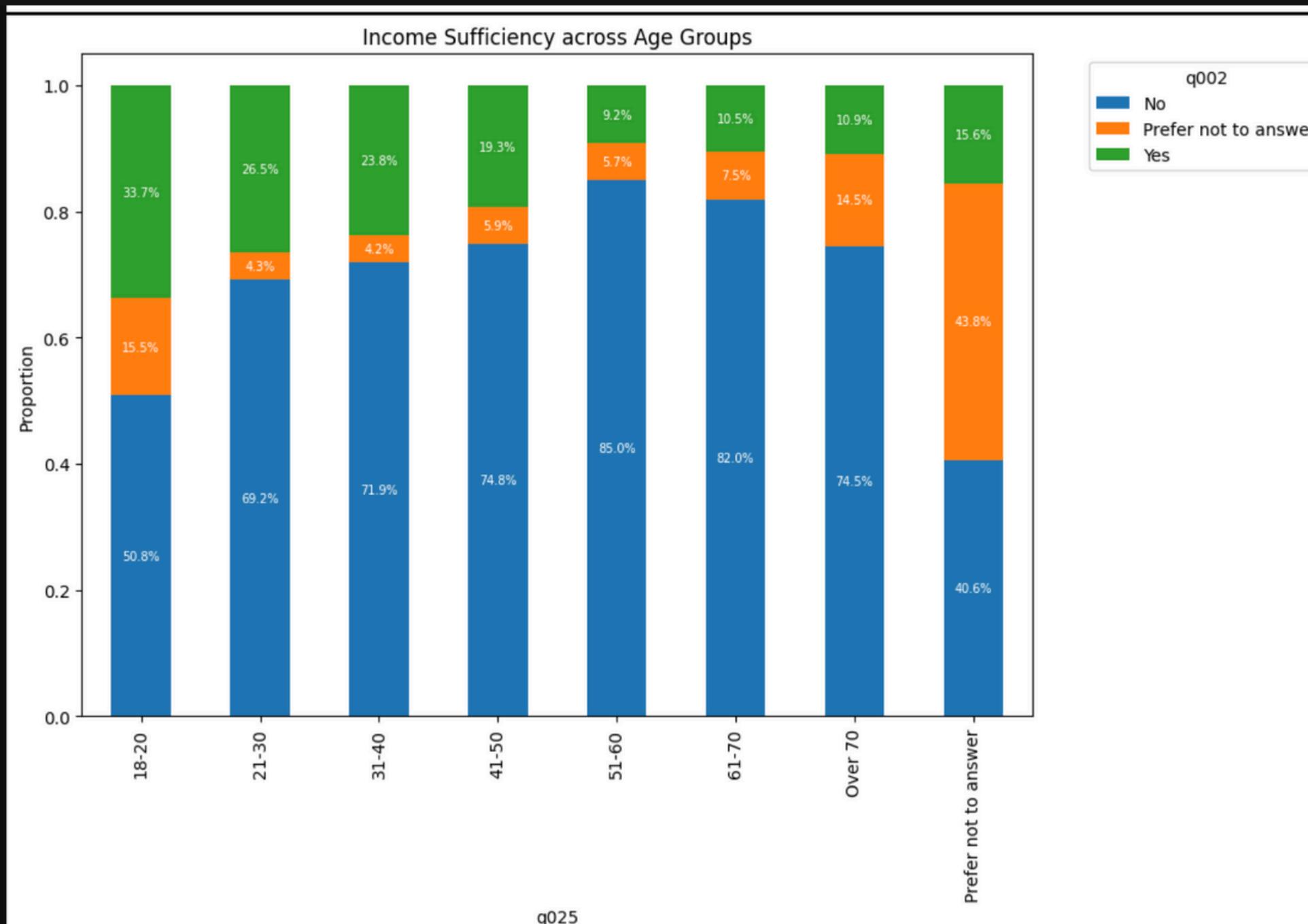


OBSERVATIONS:

- Severity/Intensity: Age groups 21-30, followed by 51-60, and 61-70 experience the highest severity of food insecurity within their groups.

Percentage

Income Sufficiency vs Age Groups

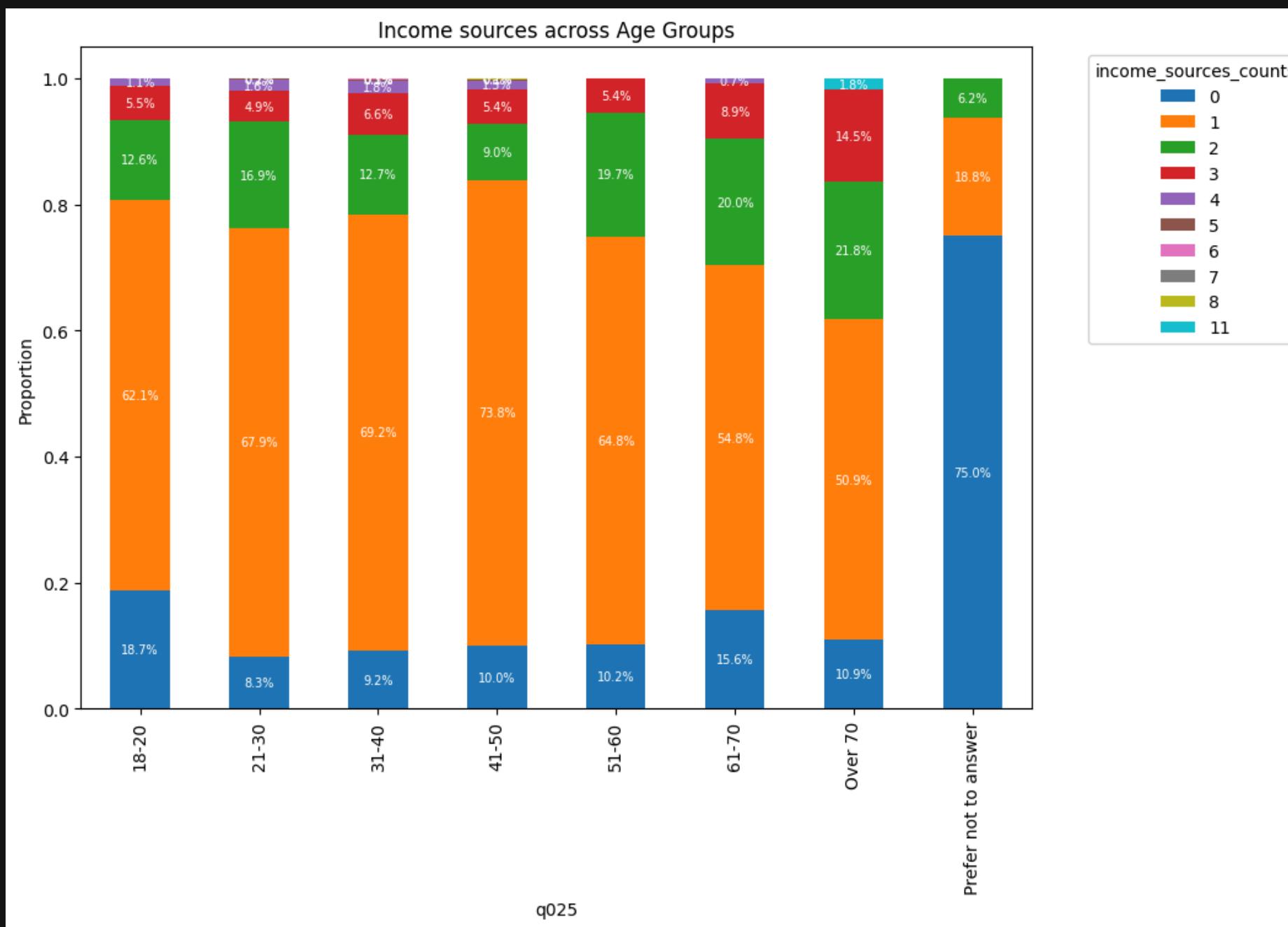


OBSERVATIONS:

- The 51-60 age group is particularly notable, with the highest proportion of individuals reporting insufficient income.
- Age groups 18-40 have a relatively higher proportion of individuals with sufficient income compared to other age groups.
- The "No" responses (blue bars) follow a bell curve pattern across the age groups. This bell curve shape indicates that middle-aged adults (particularly those in the 51-60 age group) report insufficient income more frequently, while both younger and older adults report insufficient income less frequently, relative to the middle-aged groups.
 - This pattern shows that income sufficiency issues peak in middle age and decline in both younger and older age groups.

Percentage

Income Sources vs Age Groups

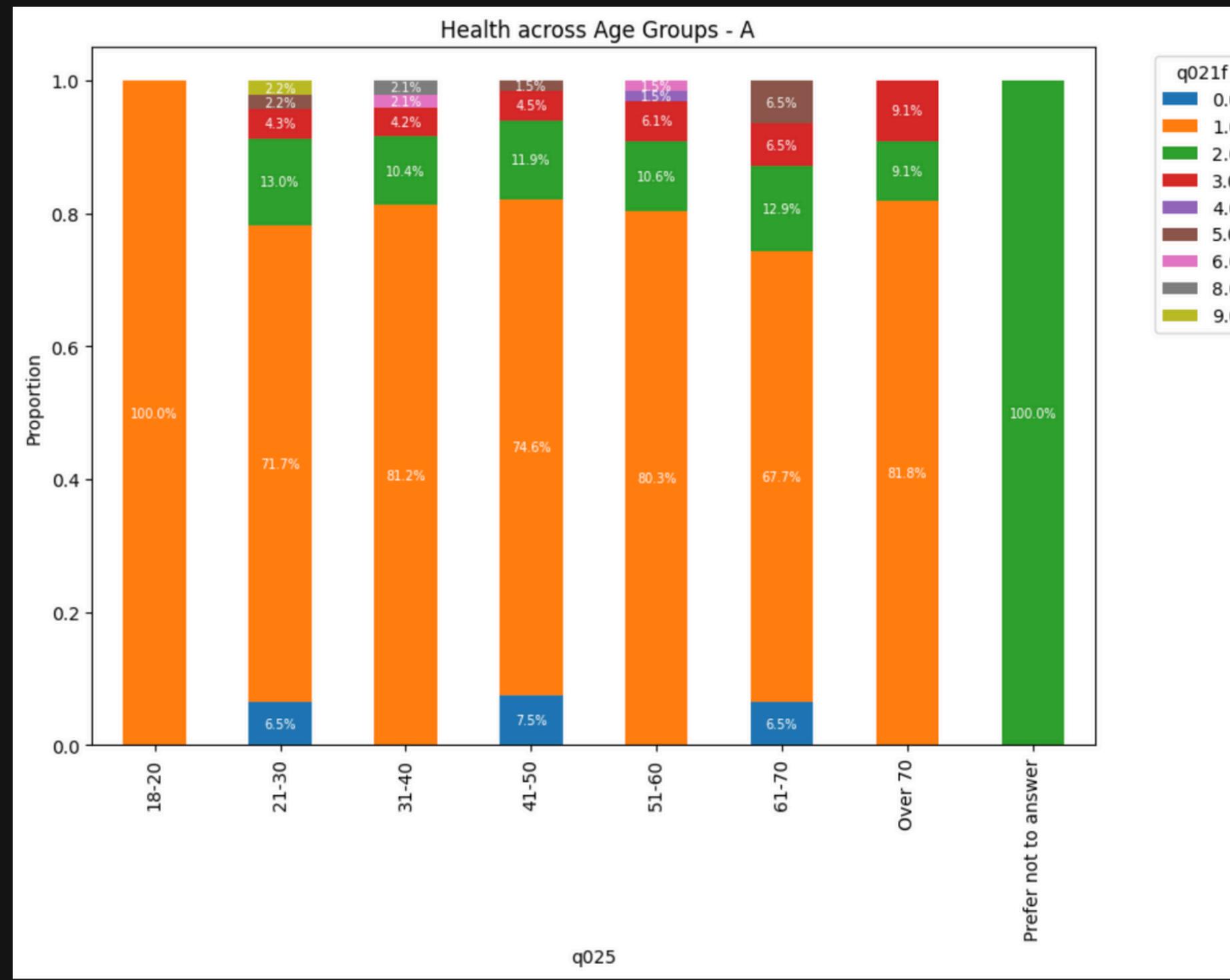


OBSERVATIONS:

- Across all age groups, the majority of individuals rely on a single income source.
- The age group 31-40 has the highest proportion of individuals relying on a single income source (69.2%)
- The age group Over 70 has a higher proportion of individuals with multiple income sources, which could indicate a combination of pensions, social security, and other benefits.

Percentage

Health Conditions (Q21a-f) Status vs Age Groupss

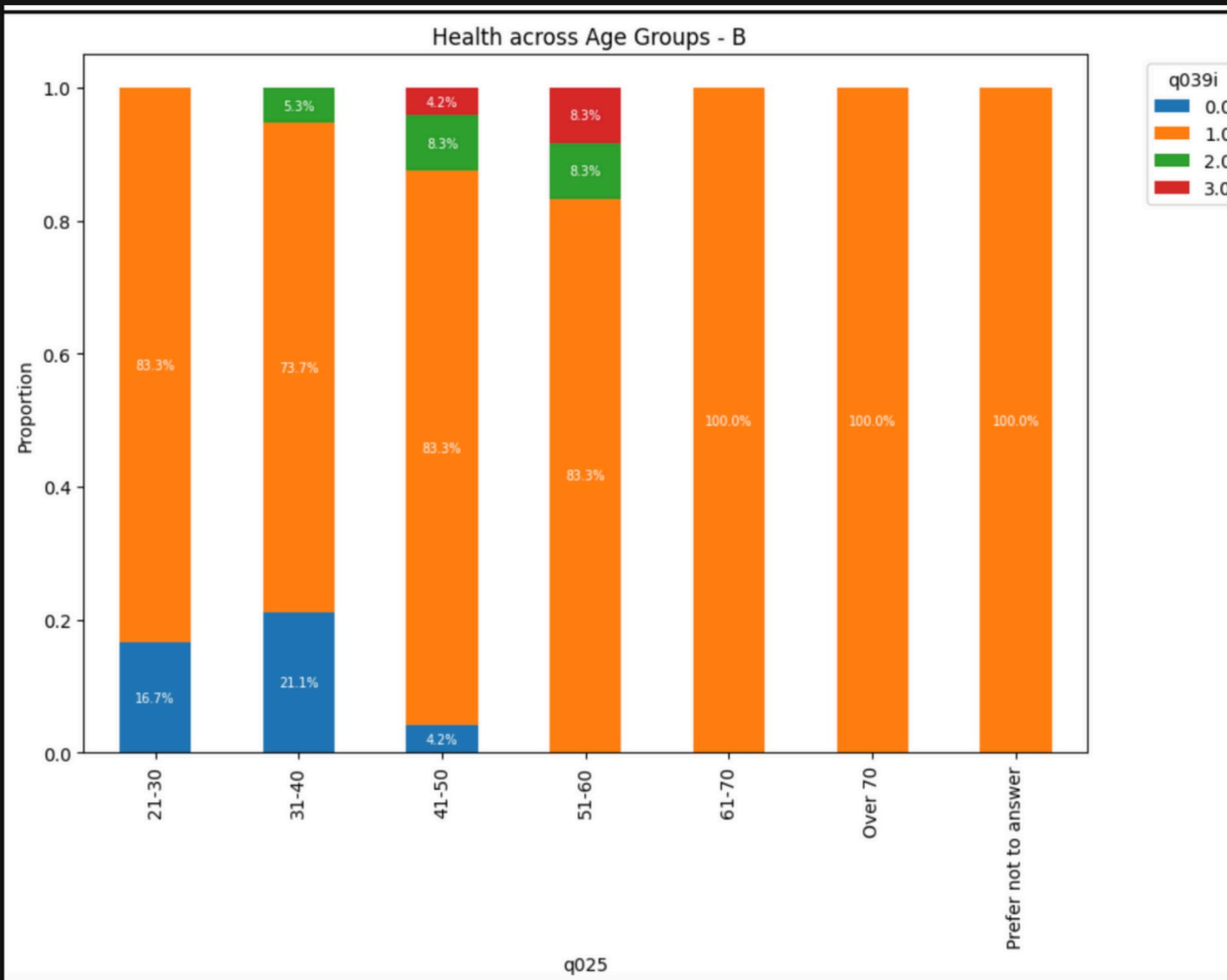


OBSERVATIONS:

- The older age 61-70 show the highest proportion of individuals with more than one health condition.
- The pattern of health conditions across age groups does not follow a simple gradual increase:
 - Younger (18-20) and older adults (over 70) tend to report fewer health conditions, with most reporting only one.
 - (21-70) groups show more variability, with age (61-70) group show the highest proportion of individuals with more than one health condition.

Percentage

Health Conditions (39a-i) Status vs Age Groupss

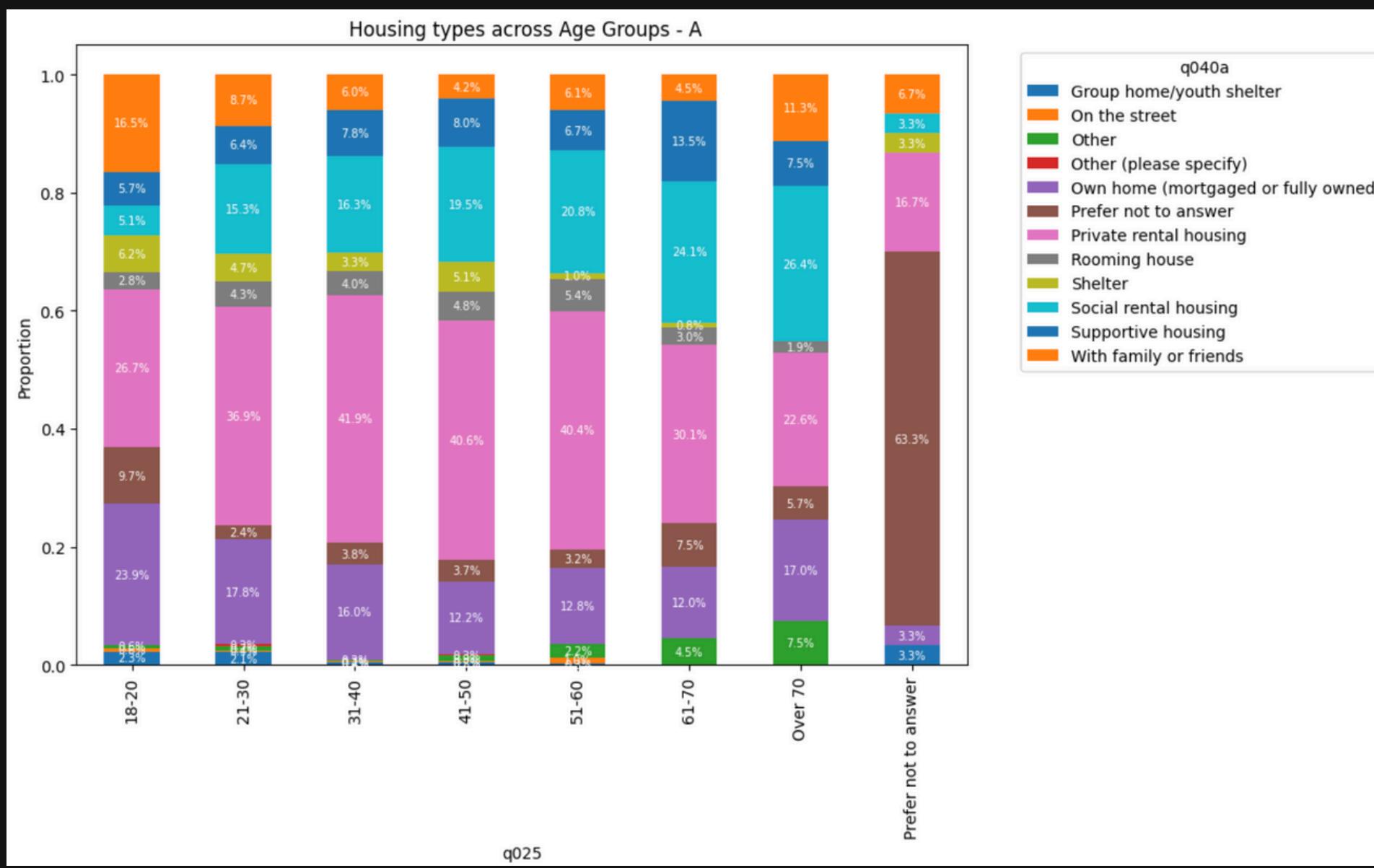


OBSERVATIONS:

- The data indicates a gradual increase in the number of reported health conditions up to the 41-50 age group, after which the number of health conditions **stabilizes**, with individuals reporting just one condition in the older age groups.

PERCETANGE

Housing Types & Stability (Q040a) vs Age Groups



OBSERVATIONS:

TYPES:

- Private Rental Housing Dominance: Across most age groups, private rental housing (pink bars) is the predominant housing type in the (21-60) age groups.
- Older Adults (Over 70): There is a noticeable presence of private rental housing and an increase in social rental housing, with a higher proportion in homeownership compared to the middle-aged groups (31-50).

STABILITY:

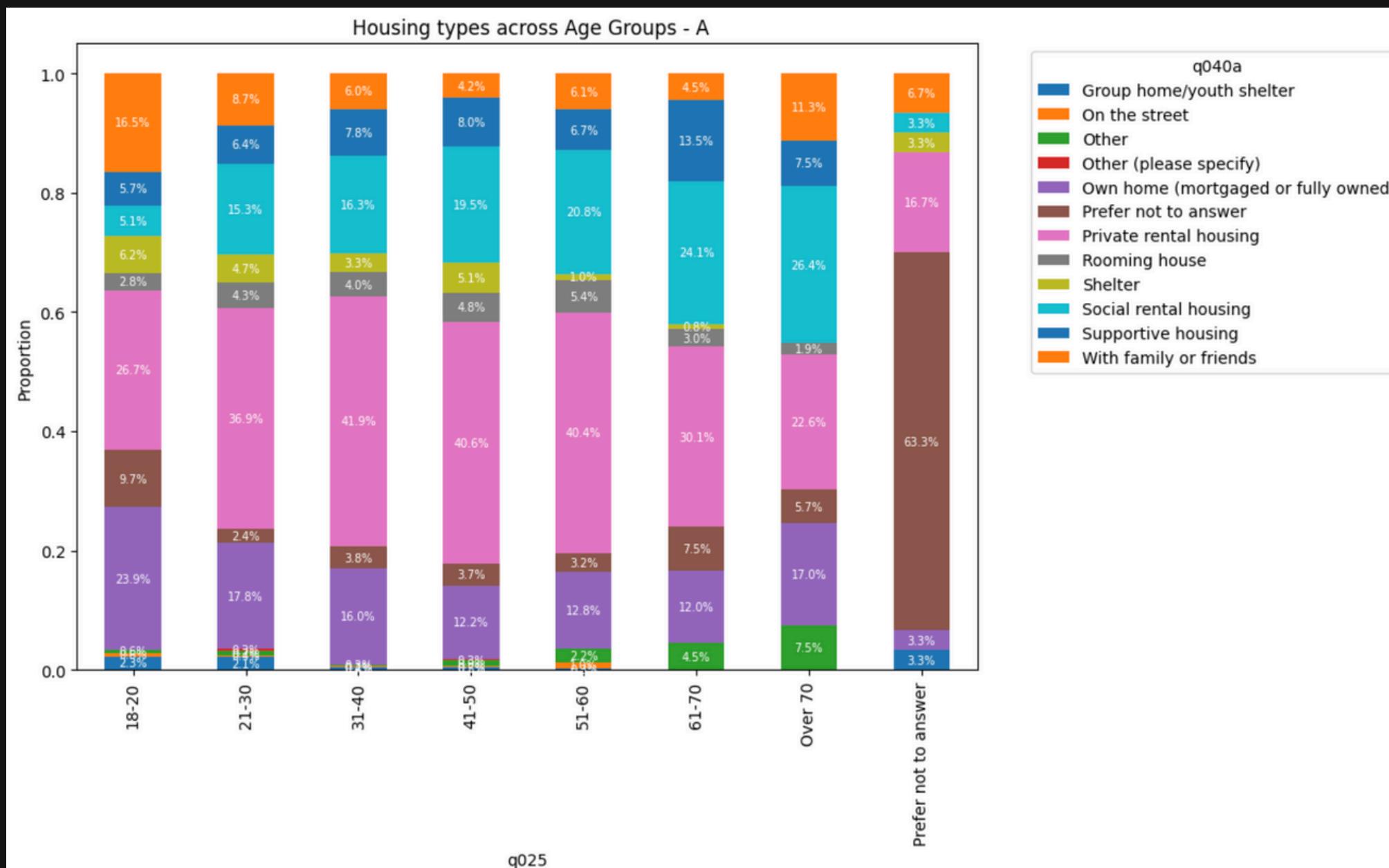
- Younger Adults (18-30): This age group shows moderate housing stability, with a notable portion in homeownership (23.9% for 18-20 and 17.8% for 21-30) but still a significant reliance on private rental housing (26.7% for 18-20 and 36.9% for 21-30) and living with family or friends (16.5% for 18-20 and 8.7% for 21-30).

PERCETANGE

Housing Types & Stability (Q040a) vs Age Groups (Continuing)

OBSERVATIONS:

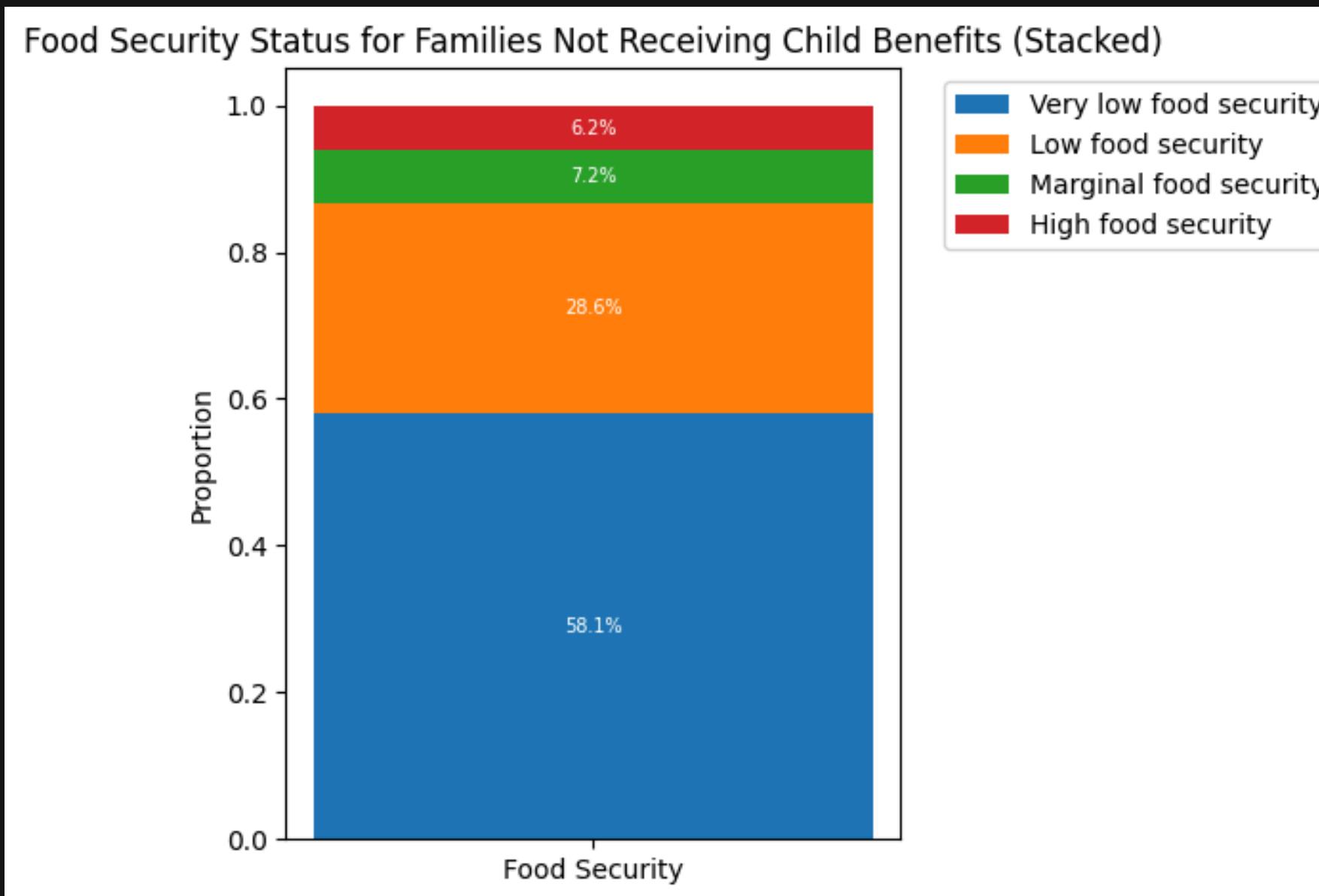
- Adults (31-60): This age group can be categorized as moderate housing stability.
 - There is some homeownership decline (16.0% for 31-40, 12.2% for 41-50, and 12.8% for 51-60) and an increased presence of government-supported housing (social rental housing at 16.3% for 31-40, 19.5% for 41-50, and 20.8% for 51-60).
 - However, the heavy reliance on private rentals (41.9% for 31-40, 40.6% for 41-50, and 40.4% for 51-60) and the decline in homeownership contribute to a less stable overall housing situation for this group.
- Older Adults (61-70 and Over 70): exhibit above-moderate housing stability.
 - Homeownership increases to 17.0% in the 61-70 age group,
 - Social rental housing becomes more prominent, with 24.1% in the 61-70 group and 26.4% in the Over 70 group, reflecting a shift towards more stable, government-supported options.
 - Meanwhile, reliance on private rental housing decreases significantly to 30.1% for the 61-70 group and 22.6% for the Over 70 group, indicating a move away from less stable housing types.



CHAPTER 7: Food Security Status and Children

Percentage

Food Security Status for Families Receiving NOT Child Benefits

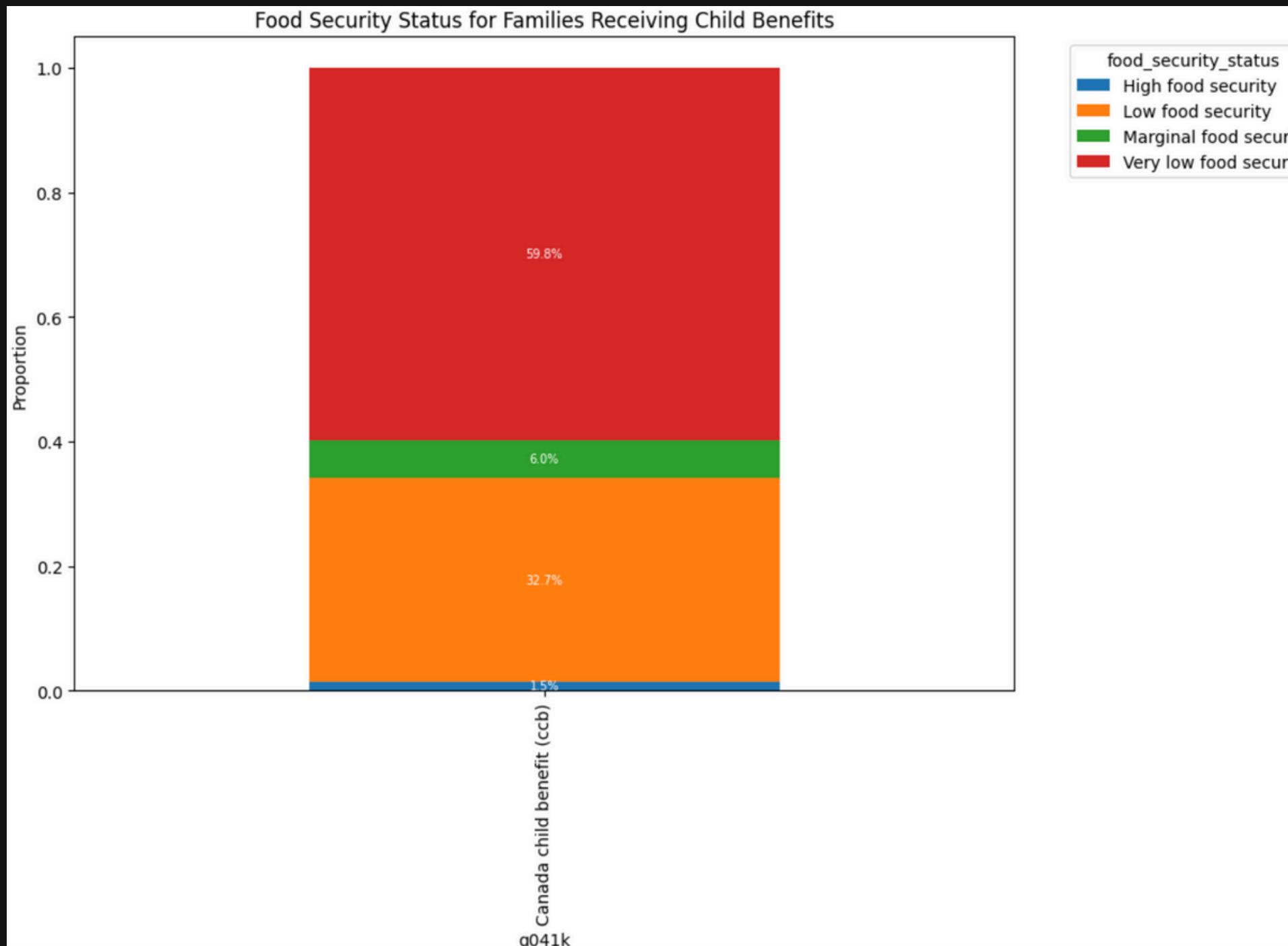


OBSERVATIONS:

- A significant portion (58.1%) of these families experience very low food security.
- Only 6.2% of these families have high food security.

Percentage

Food Security Status for Families Receiving Child Benefits

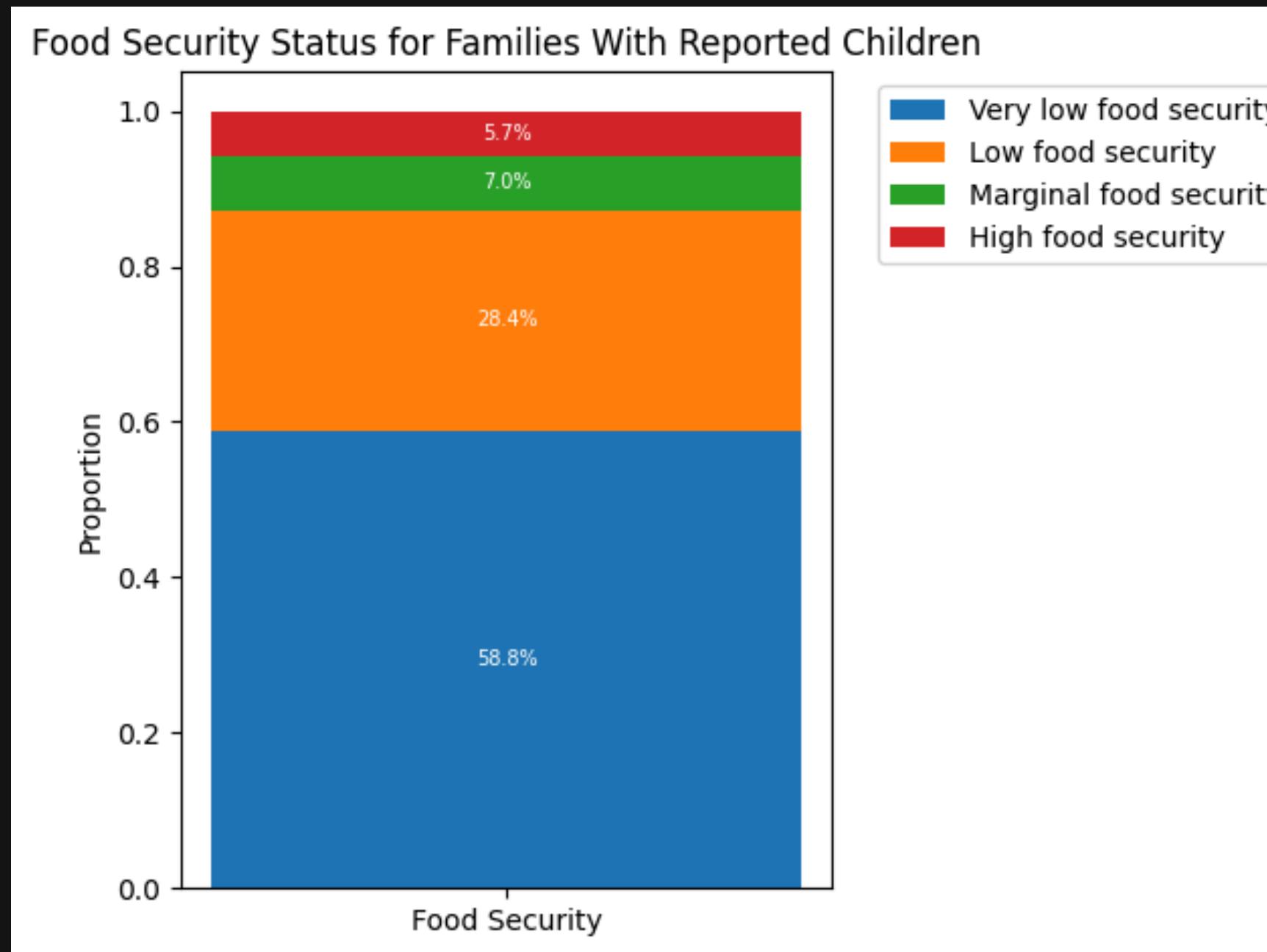


OBSERVATIONS:

- A slightly higher percentage (59.8%) of these families experience very low food security, suggesting that receiving child benefits does not necessarily improve food security.
- The proportion of families with high food security is even lower (1.5%) compared to those not receiving benefits.

Percentage

Food Security Status for Families with Reported Children

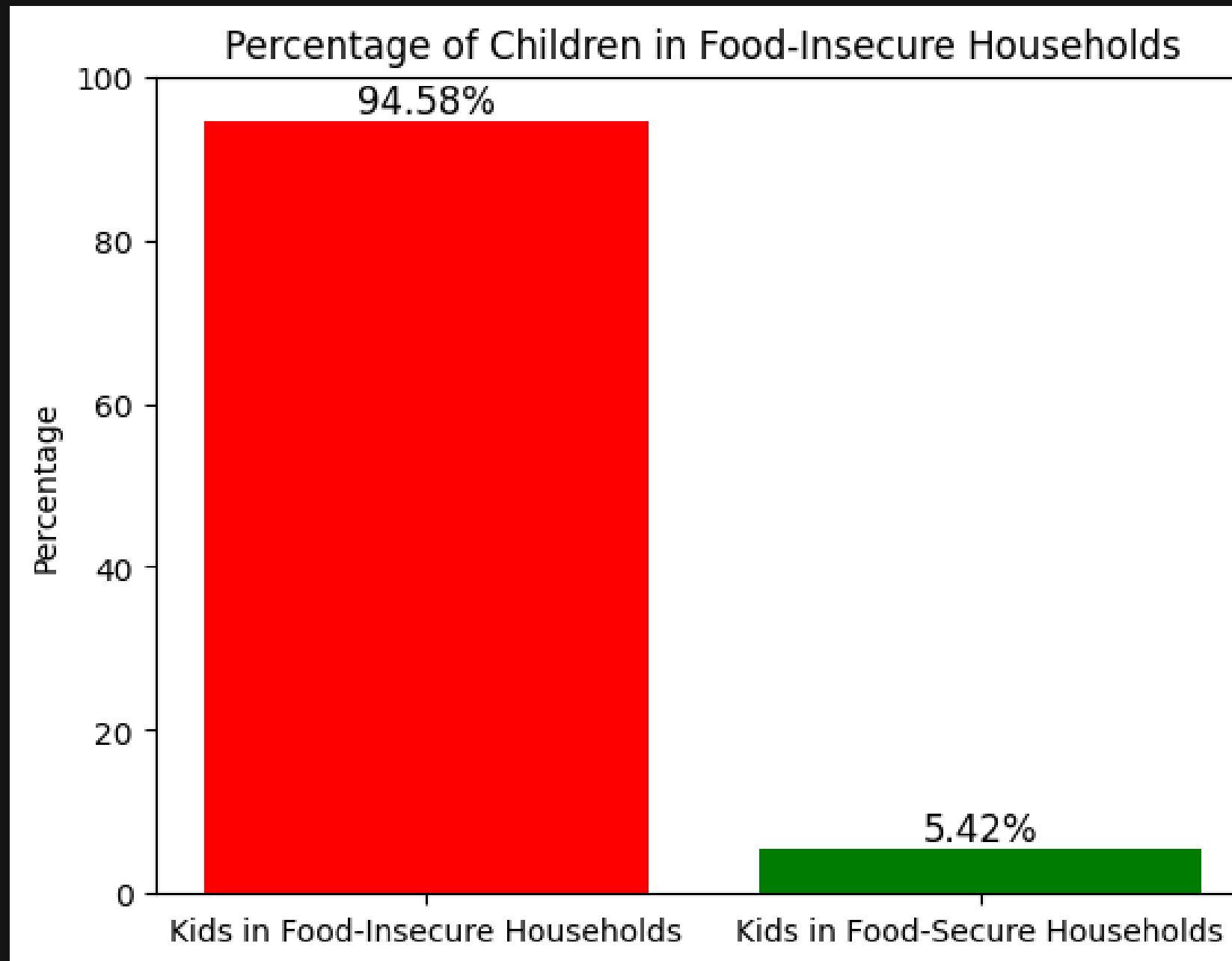


OBSERVATIONS:

- **High Insecurity:** The majority (over 58%) of these families are experiencing very low food security, indicating severe food access challenges.
- **Low Security Levels:** An additional 28.4% of families fall into the "Low food security" category, suggesting that nearly 87% of these families struggle to meet basic food needs.
- **Marginal to High Security:** Only a small proportion, about 12.7%, of families are in either "Marginal" or "High" food security, indicating relatively better access to food but still showing vulnerability.

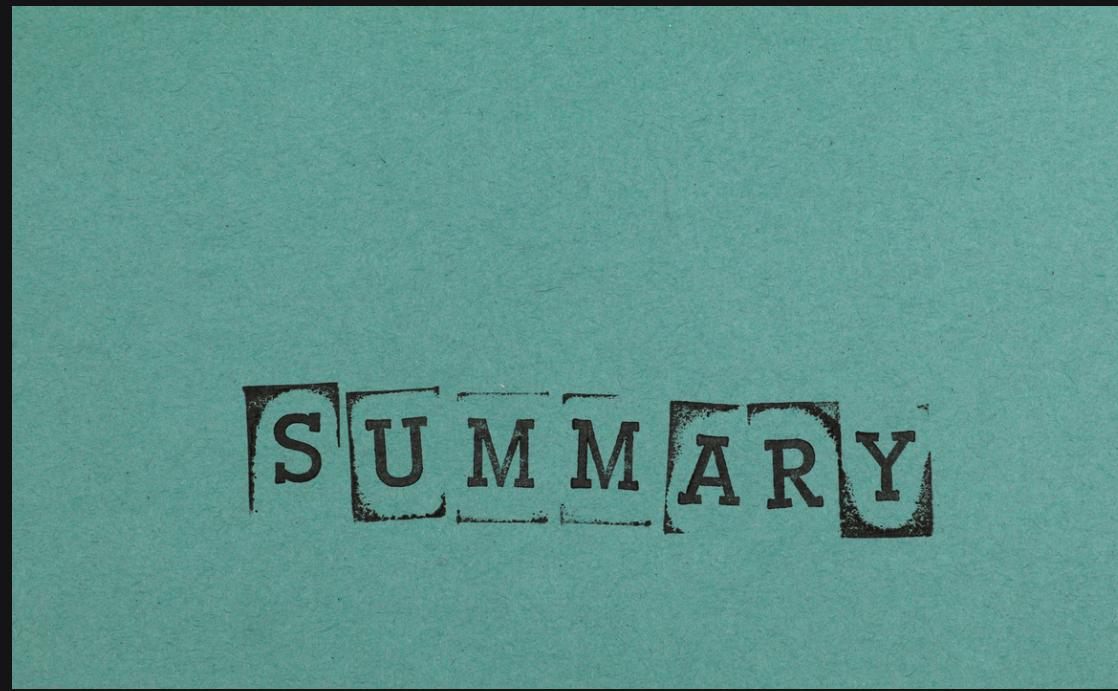
Percentage

Children in Food-Insecure Households



OBSERVATIONS:

- Significant majority (94.58%) of children in the surveyed population live in food-insecure households, while only a small fraction (5.42%) live in food-secure households.
- This indicates a serious issue with many children lacking reliable access to food.



SUMMARY

- receiving child tax credits or affordable childcare benefits does not seem to correlate strongly with improved food security status. In fact, families receiving these benefits still exhibit a high percentage of very low food security.
- Over 58% of families face severe food access challenges, with an additional 28.4% experiencing low food security. Nearly 87% struggle to meet basic needs, while only 12.7% have marginal or high food security.
- A significant majority (94.58%) of children live in households that are food-insecure, with just 5.42% in food-secure homes

FUTURE CHAPTER X : Food Security Status and Transportation

**Analysis of transportation concerns across different
catchment areas**

FUTURE CHAPTER X: Food Security Status and Ethnicity

Future CHAPTER X : Food Security Status and Newcomers

FUTURE CHAPTER X : Food Security Status and Seniors