

# Modeling Food and Housing Insecurity at UTEP - Phase 1

## Data Exploration

George E. Quaye

John Koomson

William O. Agyapong

University of Texas, El Paso (UTEP)

Department of Mathematical Sciences

## Contents

<code>\end{center}</code> . . . . .	1
<b>Exploratory Data Analysis</b>	<b>1</b>
Summary Statistics . . . . .	1
Visualizing Missing Data . . . . .	5
Distribution of Housing Insecurity Responses . . . . .	7
Distribution of Food Insecurity Responses . . . . .	9
Association between predictors and responses. . . . .	9

`\end{center}`

## Exploratory Data Analysis

### Summary Statistics

Table 1: A summary of variables of interest

Variable	Levels	Obervations	Percentage
enrollment	Full Time	4325	83.57%
	Part Time	850	16.43%
employment	Full Time	968	18.71%

Table 1: A summary of variables of interest (*continued*)

Variable	Levels	Observations	Percentage
employment_type	Part Time	2006	38.76%
	No	2201	42.53%
	On-Campus	491	16.51%
	Off-Campus	2483	83.49%
weekly_work_hrs	19 hours or less	1337	44.96%
	More than 19 hours	1637	55.04%
ethnicity	Hispanic	4462	86.22%
	Asian	115	2.22%
	Black/African American	135	2.61%
	White/Caucasian	291	5.62%
	Other	172	3.32%
gender	Female	3508	67.79%
	Male	1583	30.59%
	Non-binary/Non-conforming	62	1.20%
	NA	22	0.43%
total_income	< 10,000	851	16.44%
	10,000-19,999	862	16.66%
	20,000-29,999	806	15.57%
	30,000-39,000	649	12.54%
	40,000-49,999	538	10.40%
	50,000-69,999	651	12.58%
	70,000-99,999	494	9.55%
	>=100,000	324	6.26%
academic_level	Freshman	709	13.70%
	Sophomore	739	14.28%
	Junior	1275	24.64%
	Senior	1628	31.46%
	Masters	559	10.80%
	Doctoral/Professional	265	5.12%
college/school	Business	573	11.07%
	Education	484	9.35%
	Engineering	838	16.19%
	Health Sciences	577	11.15%
	Liberal Arts	1274	24.62%

Table 1: A summary of variables of interest (*continued*)

Variable	Levels	Observations	Percentage
	Science	822	15.88%
	Nursing	423	8.17%
	Pharmacy	41	0.79%
	Other	55	1.06%
	More than one	88	1.70%
mode_transport	Car (alone)	3359	64.91%
	Car (someone drives) & Carpool	805	15.56%
	Bus/Public transport	398	7.69%
	Bike, Trolley, or Walk	179	3.46%
	Other	125	2.42%
	Not applicable	309	5.97%
transport_reliability	Not reliable at all	92	1.89%
	Somewhat reliable	429	8.82%
	Fairly reliable	1628	33.46%
	Very reliable	2717	55.84%
living_alone	Yes	441	8.52%
	No	4734	91.48%
dependents	0	3802	73.47%
	1	367	7.09%
	2 - 3	448	8.66%
	4 or more	98	1.89%
	NA	460	8.89%
household_head	Yes	1155	22.32%
	No	3964	76.60%
	NA	56	1.08%
residence	On-Campus	133	2.57%
	Off-Campus with family	4093	79.09%
	Off-Campus not with family	821	15.86%
	Other	48	0.93%
	NA	80	1.55%
permanent_address	Yes	4830	93.33%
	No	265	5.12%
	NA	80	1.55%
spent_night_elsewhere	Rarely	138	52.08%

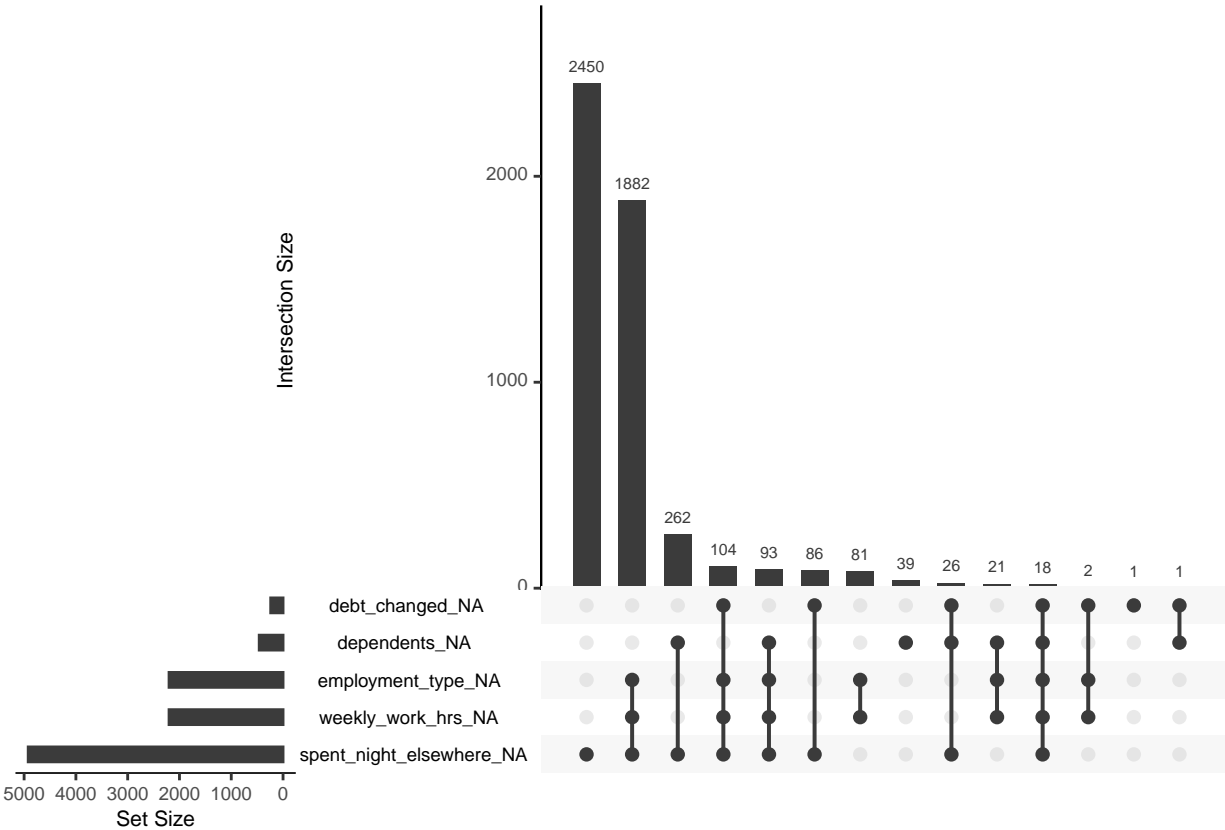
Table 1: A summary of variables of interest (*continued*)

Variable	Levels	Observations	Percentage
	Sometimes	83	31.32%
	Often	33	12.45%
	NA	11	4.15%
know_homeless_student	Yes	965	18.65%
	No	4095	79.13%
	NA	115	2.22%
federal_student_aid	Grants	1293	24.99%
	Work Study	256	4.95%
	Loans	581	11.23%
	Scholarship	237	4.58%
	Multiple Aids	1652	31.92%
	Other	992	19.17%
	None	49	0.95%
FI_q26	NA	115	2.22%
	Never true	2886	55.77%
	Sometimes true	1705	32.95%
	Often true	427	8.25%
FI_q27	NA	157	3.03%
	Never true	2579	49.84%
	Sometimes true	1744	33.70%
	Often true	695	13.43%
FI_q28	NA	157	3.03%
	Yes	1684	32.54%
	No	3334	64.43%
FI_q30	NA	157	3.03%
	Yes	1676	32.39%
	No	3322	64.19%
FI_q31	NA	177	3.42%
	Yes	1268	24.50%
	No	3730	72.08%
expenditures_changed	NA	177	3.42%
	Decreased	1323	25.57%
	About the same	2201	42.53%
	Increased	1413	27.30%

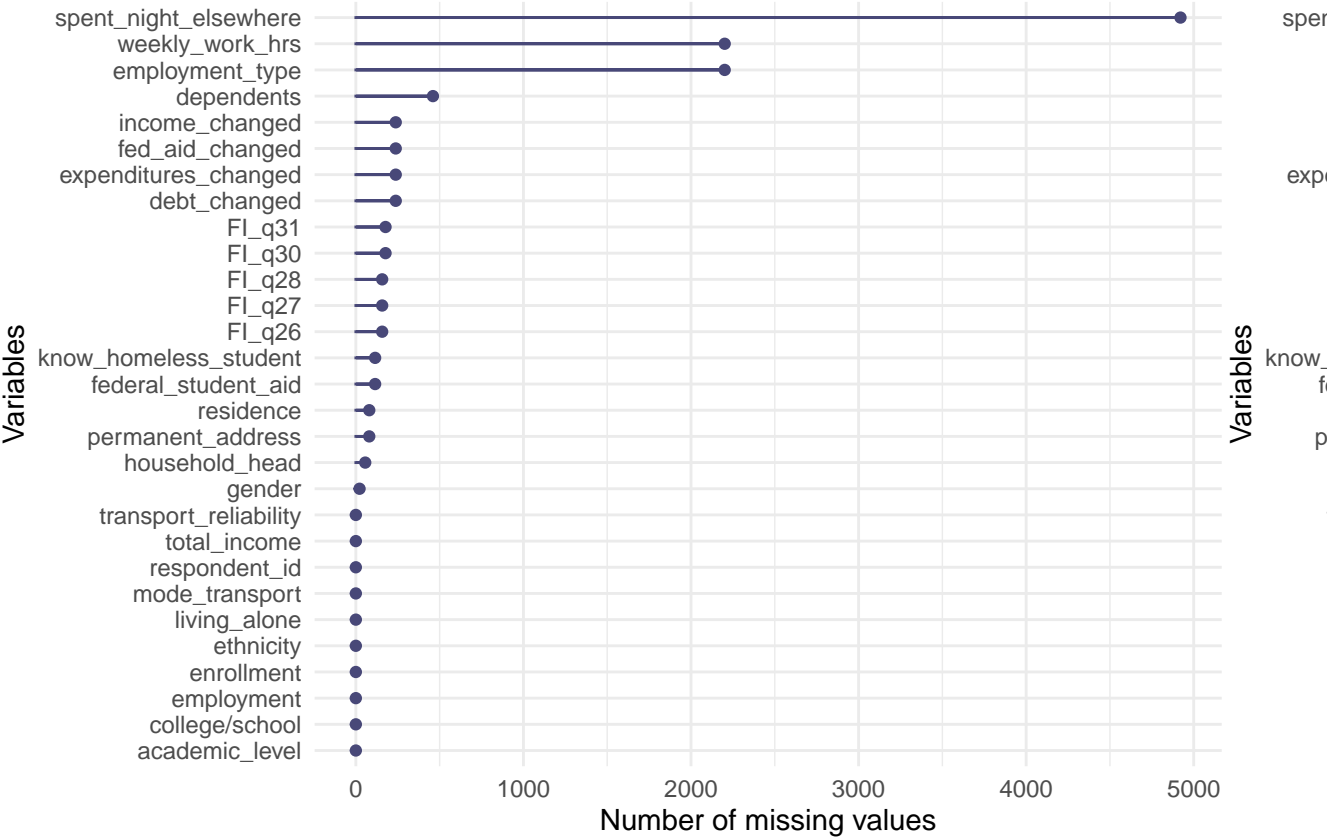
Table 1: A summary of variables of interest *(continued)*

Variable	Levels	Obervations	Percentage
income_changed	NA	238	4.60%
	Decreased	2702	52.21%
	About the same	2046	39.54%
	Increased	189	3.65%
	NA	238	4.60%
fed_aid_changed	Decreased	1175	22.71%
	About the same	3388	65.47%
	Increased	374	7.23%
	NA	238	4.60%
debt_changed	Decreased	289	5.58%
	About the same	2441	47.17%
	Increased	2207	42.65%
	NA	238	4.60%

Visualizing Missing Data



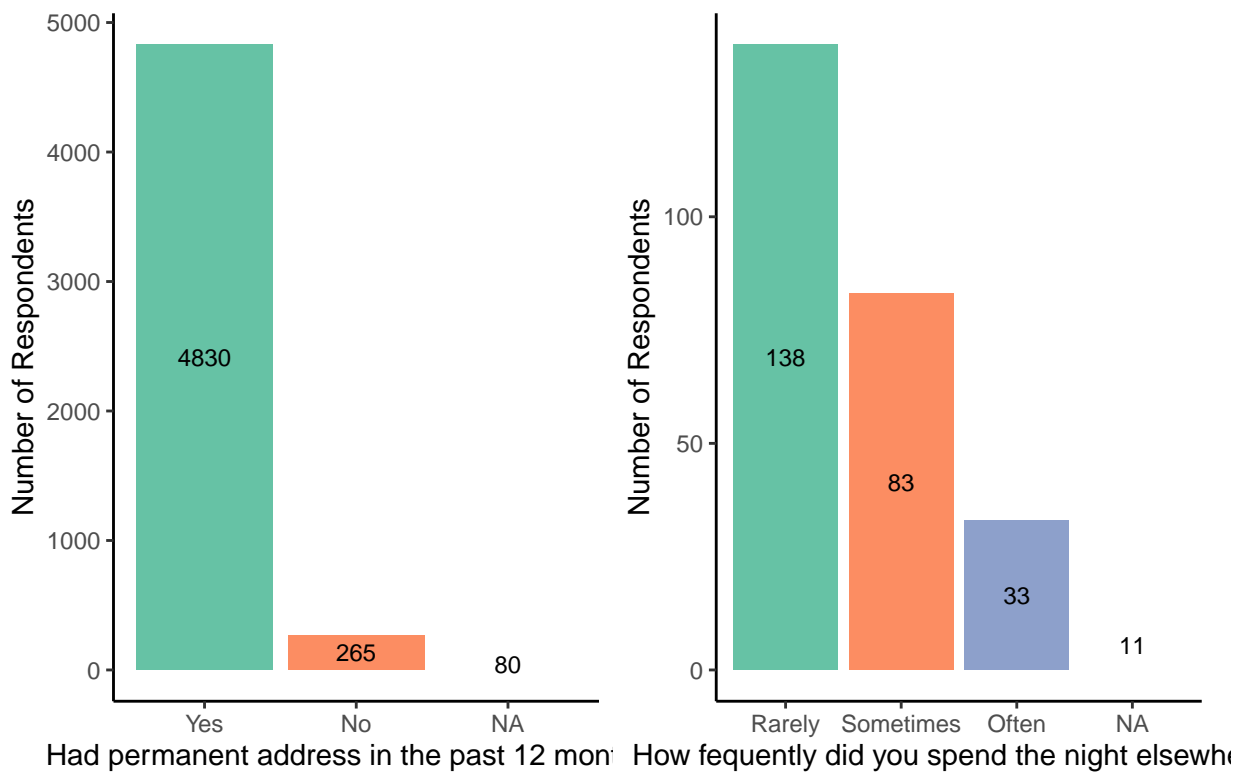
variable	n_miss	pct_miss
spent_night_elsewhere	4921	95.0917874
employment_type	2201	42.5314010
weekly_work_hrs	2201	42.5314010
dependents	460	8.8888889
expenditures_changed	238	4.5990338
income_changed	238	4.5990338
fed_aid_changed	238	4.5990338
debt_changed	238	4.5990338
FI_q30	177	3.4202899
FI_q31	177	3.4202899
FI_q26	157	3.0338164
FI_q27	157	3.0338164
FI_q28	157	3.0338164
know_homeless_student	115	2.2222222
federal_student_aid	115	2.2222222
residence	80	1.5458937
permanent_address	80	1.5458937
household_head	56	1.0821256
gender	22	0.4251208
respondent_id	0	0.0000000
enrollment	0	0.0000000
employment	0	0.0000000
ethnicity	0	0.0000000
total_income	0	0.0000000
academic_level	0	0.0000000
college/school	0	0.0000000
mode_transport	0	0.0000000
transport_reliability	0	0.0000000
living_alone	0	0.0000000



Distribution of Housing Insecurity Responses

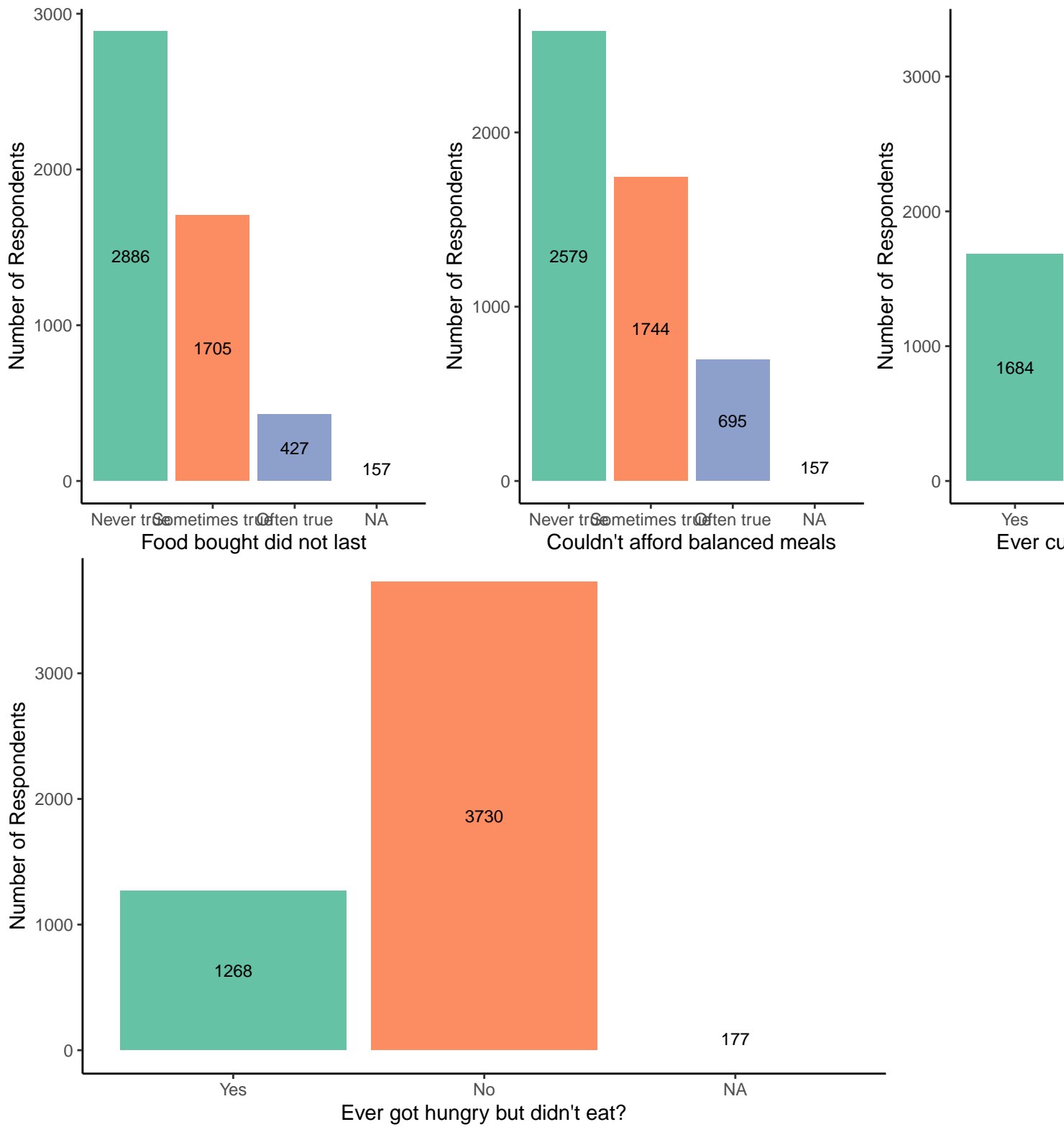
```
## Warning in if (!(class(data) %in% c("data.frame", "tbl", "tbl_df"))): data <-
## FIHI_sub3: the condition has length > 1 and only the first element will be used

## # A tibble: 4 x 4
##   spent_night_elsewhere      n    pct lbl
##   <chr>                <int> <dbl> <chr>
## 1 1                      138 0.521 52.1%
## 2 2                       83 0.313 31.3%
## 3 3                       33 0.125 12.5%
## 4 Missing                11 0.0415 4.2%
```





Distribution of Food Insecurity Responses



Association between predictors and responses.