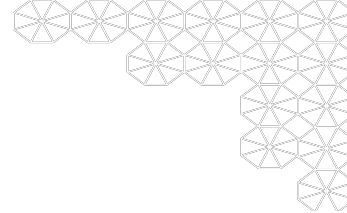# Analyzing SNAP Income

A Descriptive Regression Approach using CPS Census Data

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Research Question

How does the distribution of SNAP income vary across ages?

- What individual demographics impact the distribution of SNAP across ages? What household/family demographics?

Data Understanding

- Annual Social and Economic Supplement (ASEC)
- March 2023 Data from the Current Population Survey (CPS)
- Sample: 6,048 Individual Head of SPM's
- Response Variable: SNAP income (SPM_SNAPSUB)
- Feature Extraction: Age, Demographic features, Household features

	vars	n	mean	sd	median	trimmed	mad	min	max	range	skew
SPM_SNAPSUB	1	6048	3300.01	3074.48	2400	2803.30	2223.90	10	30000	29990	1.90
A_AGE	2	6048	49.05	15.83	49	49.01	19.27	15	79	64	0.02
SPM_NUMKIDS	3	6048	1.01	1.35	0	0.78	0.00	0	10	10	1.38
SPM_NUMADULTS	4	6048	1.81	0.96	2	1.65	1.48	1	11	10	1.58
RENTER*	5	6048	1.59	0.49	2	1.62	0.00	1	2	1	-0.38
NOT_IN_LABOR_FORCE*	6	6048	1.54	0.50	2	1.55	0.00	1	2	1	-0.18
SPM_WCOHABIT*	7	6048	1.10	0.30	1	1.00	0.00	1	2	1	2.65
RACE*	8	6048	5.25	1.81	5	5.41	2.97	1	7	6	-0.51
MALE*	9	6048	1.35	0.48	1	1.31	0.00	1	2	1	0.63
DEGREE*	10	6048	1.23	0.42	1	1.16	0.00	1	2	1	1.30
NOT_RECEIVE_SS_INCOME*	11	6048	1.71	0.46	2	1.76	0.00	1	2	1	-0.91

Basic Model

Relationship between Age and SNAP Subsidy
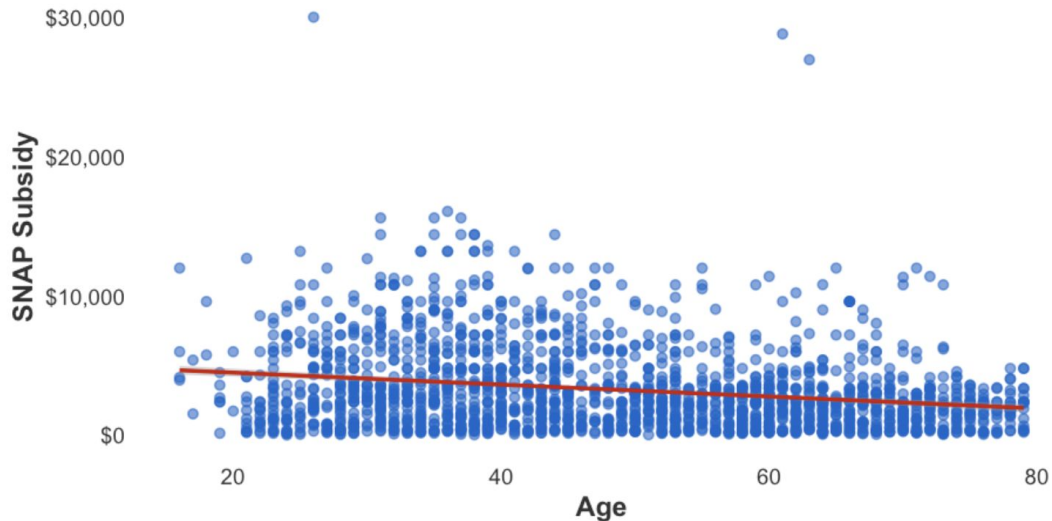
Exploration Set: 2023 Persons Dataset from ANES

$$SPM\_SNAPSUB = \beta_0 + \beta_1 \times A\_AGE + \epsilon$$

```
Call:
lm(formula = SPM_SNAPSUB ~ A_AGE, data = persons_snap_df)

Residuals:
    Min      1Q  Median      3Q     Max
-4493.5 -2060.5  -623.1  1006.3 25820.5

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 5422.469    150.015   36.15   <2e-16 ***
A_AGE        -42.862      2.904  -14.76   <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2993 on 4232 degrees of freedom
Multiple R-squared:  0.04895,   Adjusted R-squared:  0.04872
F-statistic: 217.8 on 1 and 4232 DF,  p-value: < 2.2e-16
```

SNAP Benefit: Individual Socioeconomic/Demographic Determinants

	(1)
(Intercept)	5211.483*** (256.504)
Age	−42.888*** (3.975)
Male	−2064.508*** (318.960)
American Indian/Alaskan Native only	1056.510** (401.590)
Asian only	−505.461* (216.369)
Black only	−163.177 (112.590)
Hawaiian/Pacific Islander only	2383.366 (1426.413)
Hispanic only	196.892 (118.220)
Mixed race	304.991 (296.295)
Degree	−345.408** (109.022)
R2 Adj.	0.073
F	32.521

$$
\begin{aligned}
SPM\_SNAPSUB = {} & \beta_0 + \beta_1 \times A\_AGE + \beta_2 \times MALE1 + \beta_3 \times A\_AGE : MALE1 + \beta_4 \times DEGREE1 \\
& + \beta_5 \times RACE\_AmericanIndianAlaskanNative + \beta_6 \times RACE\_Asian + \beta_7 \times RACE\_Black \\
& + \beta_8 \times RACE\_HawaiianPacificIslander + \beta_9 \times RACE\_Hispanic + \beta_{10} \times RACE\_Mixed \\
& + \beta_{11} \times RECEIVE\_SS\_INCOME1 + \epsilon
\end{aligned}
$$

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SNAP Benefit: Household Detail Determinants

- Family descriptors: number of adults, number of children
- Household economic characteristics: renters, unit head in labor force

	(1)	(2)	(3)
(Intercept)	2671.413*** (210.847)	3260.948*** (364.247)	1446.332*** (210.008)
Age	−7.968* (3.565)	−22.801*** (6.763)	−9.134** (3.080)
Male	−800.251** (292.510)		
Num. Kids	1093.118*** (51.660)		1112.194*** (50.749)
Age:Male	13.339* (5.177)		
Not in Labor Force		1474.193*** (352.856)	674.348*** (99.114)
Num. Adults		504.854*** (60.677)	341.575*** (53.533)
Renter		867.926* (344.243)	390.732*** (88.293)
Age:Not in Labor Force		−23.137*** (6.726)	
Age:Renter		−12.617* (5.969)	
R2 Adj.	0.234	0.077	0.251
F	172.975	59.650	150.724

Takeaways

- Older SNAP recipients receiving less for each year of age
- Decline in benefits can't be explained by natural socioeconomic accrued over life (house, child expenses)
- Decline in benefits true across demographics like race

Kernel Density Estimate of Metric SNAP Benefits by Age Group

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