

An Analysis of Affordable and Sustainable Housing

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Why is housing important?

- ◆ Physiological need (Maslow's hierarchy)
- ◆ Community and belonging
- ◆ Family
- ◆ Opportunities for education and jobs

Project Goals

- ◆ How have the household characteristics of HUD programs changed from 2009 to 2018?
- ◆ Can we predict program type based on demographics and external variables?
- ◆ How is housing important to sustainability?
- ◆ What can HUD do to improve these programs?

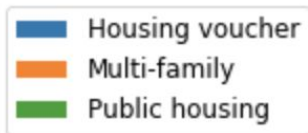
Exploratory Analysis



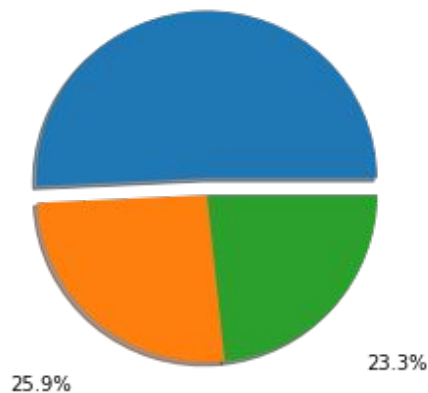


4.6 million

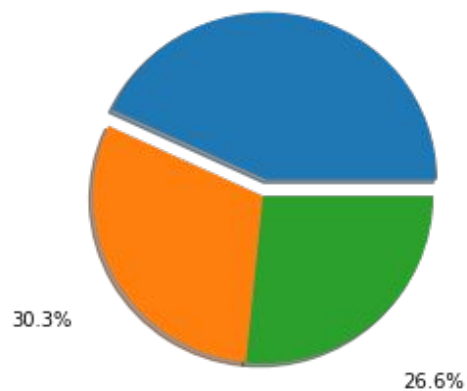
Number of households that HUD provides rental subsidies to annually



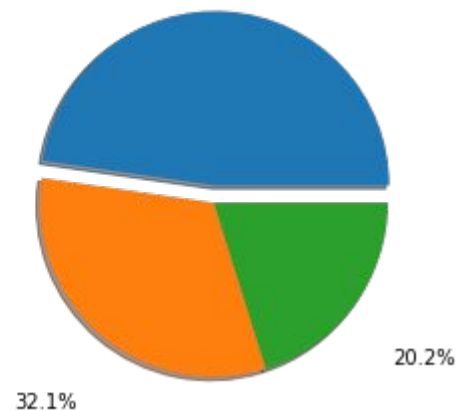
50.8%
Breakdown by Program - 2009



43.1%
Breakdown by Program - 2014

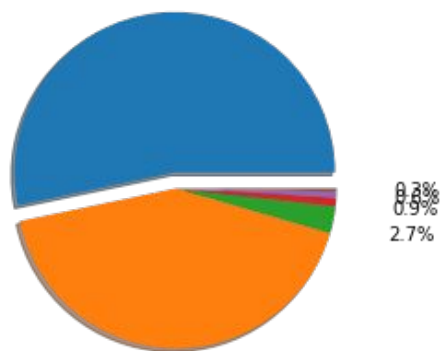


47.7%
Breakdown by Program - 2018

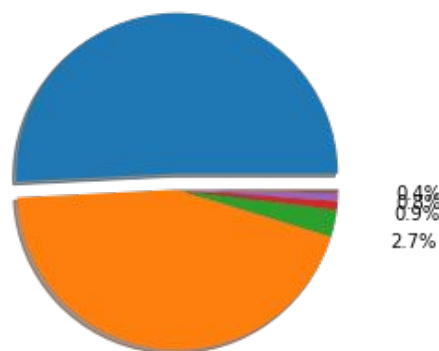




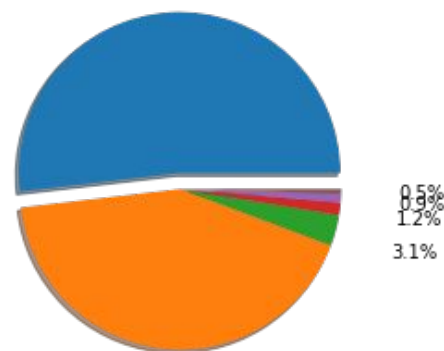
53.3%
Breakdown by Race - 2009



50.8%
Breakdown by Race - 2014



51.8%
Breakdown by Race - 2018



Trends

	Minority	Poverty
2009	45.4 %	18.9 %
2014	53.5 %	15.2 %
2018	53.6 %	24.0 %

Models



Logistic Regression

Goals

- ◆ Classify households into program type based on their characteristics
- ◆ Indicate significant predictors of the different program types

Logistic Regression

- ◆ Overall significant predictors
 - ◇ Elderly head of household, race of head household
- ◆ Program-specific predictors
 - ◇ Gender (housing choice voucher)
 - 78.4% female
 - ◇ City type, Hispanic percentage (multi-family)

Logistic Regression

- ◆ Accuracy: 53.9%
- ◆ Recall: 14.7%

	y_pred		
y_true	1	2	3
1	368	1401	737
2	222	4771	1212
3	236	1949	1829

Classification Tree

- ◆ Accuracy: 57.6%
- ◆ Recall: 22.5%

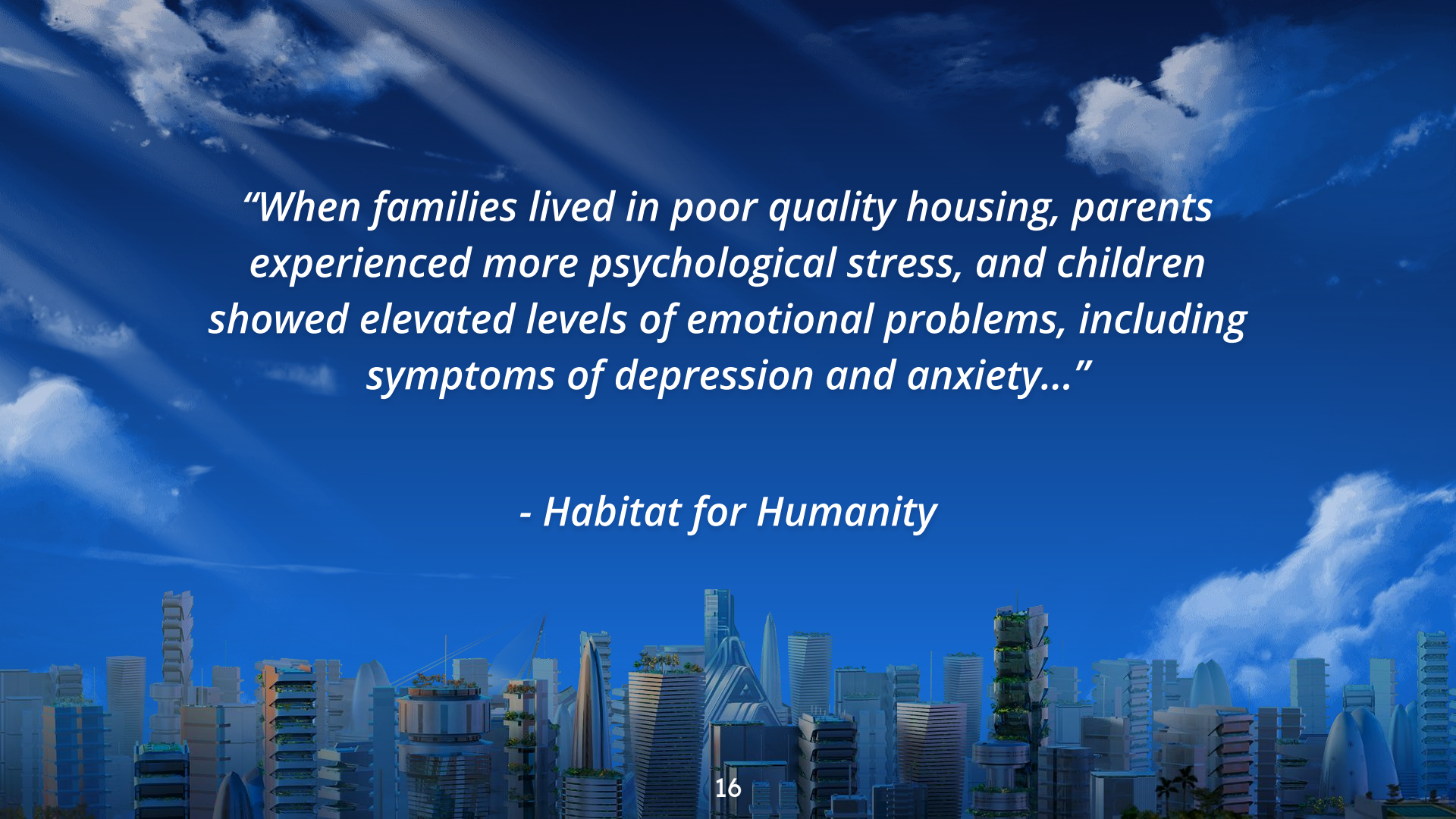
	y_pred		
y_true	1	2	3
1	564	1254	688
2	314	4685	1206
3	252	1681	2081

Conclusions



Inferences and Conclusions

- ◆ Public housing decreasing, multi-family (private) housing increasing
- ◆ Poverty levels in HUD areas increasing
- ◆ Demographics of head of household most significant for predicting program type



“When families lived in poor quality housing, parents experienced more psychological stress, and children showed elevated levels of emotional problems, including symptoms of depression and anxiety...”

- Habitat for Humanity



Next Steps

Plan for Action

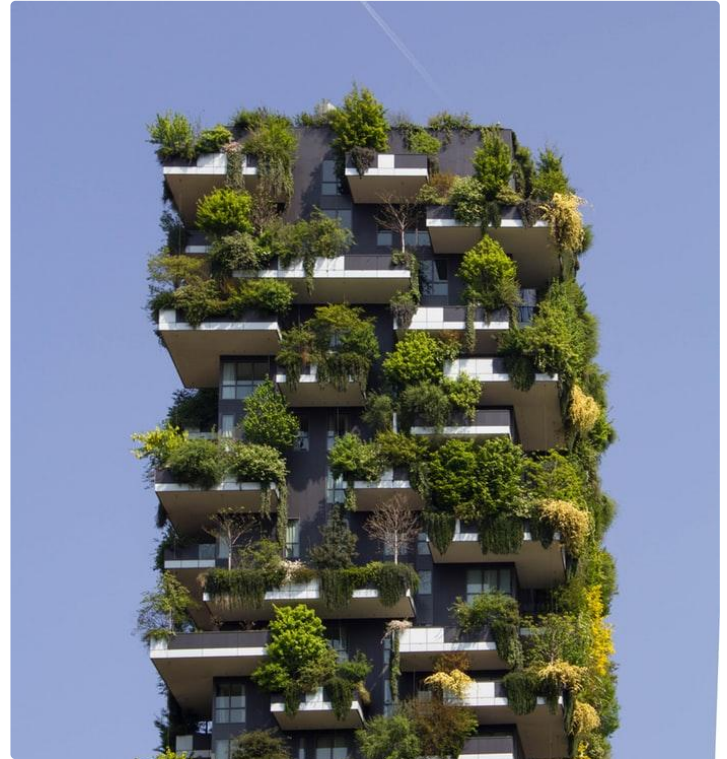
- ◆ Further understand groups at an individual level (e.g. interviews, focus groups, qualitative research)
- ◆ Develop more accurate classification methods
- ◆ Anticipate needs for each program type to better cater to individual households
- ◆ Long-term goal: Improve banking and lending procedures to create equal opportunities for credit

An aerial photograph of a modern architectural complex. The central feature is a large, circular courtyard filled with lush green trees and plants. Surrounding this courtyard are several buildings, including a prominent one with a green roof. The entire scene is framed by soft, white clouds, giving it a dreamlike or ethereal quality. The word "SUSTAINABILITY" is overlaid in large, white, bold letters across the center of the image.

SUSTAINABILITY

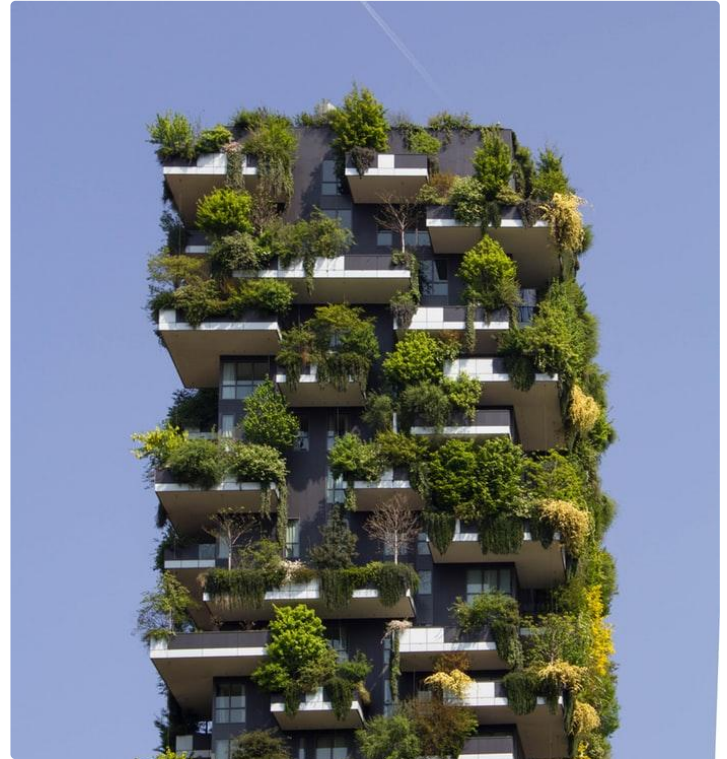
Environmental

- ★ Build higher quality housing
 - Decreases carbon footprint
 - Reduces energy usage in homes
- ★ Enforce housing codes
- ★ Living conditions



Economic

- ★ Access to jobs
- ★ Disposable income to stimulate local economy
- ★ Stability in case of economic downturns



Social

- ★ Build communities
- ★ Better school districts
- ★ Health
- ★ Crime/violence
- ★ Child development
- ★ Ending cycle of poverty



THANKS!
Any questions?

