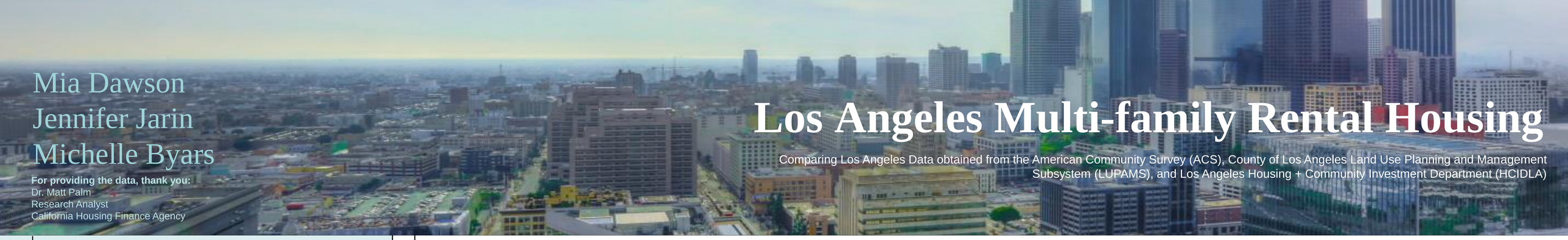

Los Angeles Multi-family Rental Housing

Comparing Los Angeles Data obtained from the American Community Survey (ACS), County of Los Angeles Land Use Planning and Management Subsystem (LUPAMS), and Los Angeles Housing + Community Investment Department (HCIDLA)

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For providing the data, thank you:
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ABSTRACT

TITLE:
Los Angeles Multi-Family Rental Housing Analysis

BACKGROUND:

Three agencies, the American Community Survey (ACS), County of Los Angeles, Los Angeles Housing + Community Investment Department (HCIDLA), and Land Use Planning and Management Subsystem (LUPAMS) gather data about multi-family rental units in the City of Los Angeles, but, at differing intervals. The question is whether this difference can be used to predict neighborhood changes. All data sets and other demographic data were provided at the census tract level. To compare demographic data in areas identified with variance, we used the Regional Opportunity Index (ROI) data.

Matt Palm, Research Analyst for California Housing Finance Agency (Cal HFA), obtained the data for this analysis and we used the indicators as shown below:

Source	Information	Label
ACS	Multi-family rental units	ACS_MFRENTALS
HCIDLA	Multi-family rental units	HCIDLA
LUPAMS	Multi-family rental units	LUPAMS
ROI	Demographic, Jobs-Housing Fit	ROI_12.15.14, JHFIT-places

OBJECTIVE:

Compare the Los Angeles rental data (required by the City when a landlord rents a unit in a multi-family unit) to that reported in the ACS. If the data sources are markedly different, are there any factors in which data vary along?

METHODS:

We used statistical, graphing, and mapping capabilities in R to analyze the data provided. Key results are shown at the right.

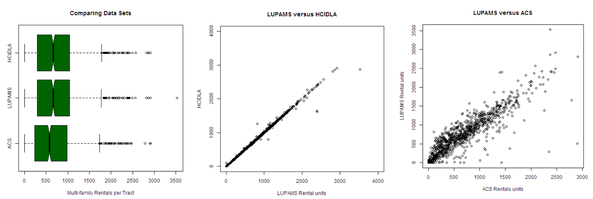
CONCLUSIONS:
The data shows that HCIDLA and LUPAMS are statistically the same, and that both differ from ACS. However, they differ on tracts that have entries of zero. It is possible, but improbable, that any tracts in Los Angeles would have a value of zero, showing no multi-family units. We are unable to determine the reason for this anomaly, but one possibility is that the data for these tracts was either not collected or not entered by one or more of these agencies. We recommend a deeper analysis of the data for the unmatched zones identified in this project.

ANALYSIS

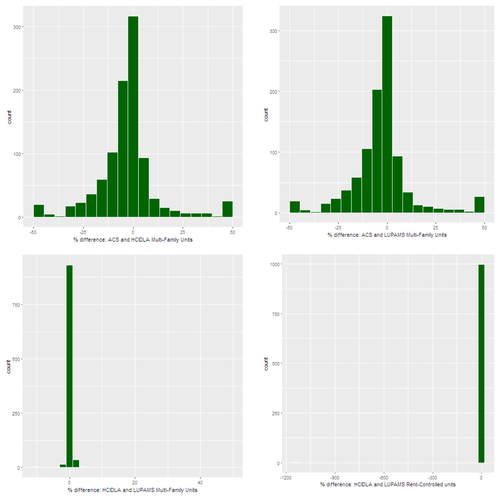
DATA SIGNIFICANCE:
We compared ACS, HCIDLA, and LUPAMS with the statistical methods shown below. We conclude that the HCIDLA and LUPAMS data are statistically similar, and each of those is statistically different from ACS.

Along with paired t-tests, we used scatterplots, box plots, and histograms to assess data differences. We determined that the LUPAMS and HCIDLA data are statistically similar. The box plots, scatterplots, and t-test results are shown below.

A t value less than 2 causes us to reject the alternate hypothesis and accept the null hypothesis and we therefore, consider LUPAMs and HCIDLA as statistically similar, however, with similar reasoning, both are statistically different from the multi-family ACS data.



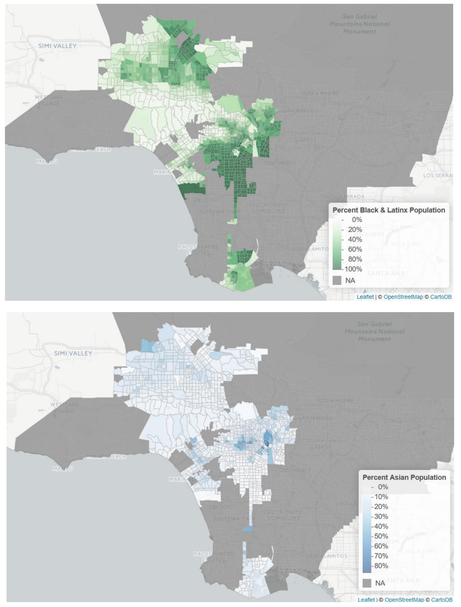
Comparison	t value	p value	95 % Confidence Interval		Mean of the Differences
LUPAMS and HCIDLA	-0.36212	0.7173	-3.405499	2.344438	-0.5305305
ACS and HCIDLA	-7.3148	5.29E-13	-70.23732	-40.52344	-55.38038
ACS and LUPAMS	-7.0344	3.71E-12	-70.15107	-39.54863	-54.84985



VISUALIZATION

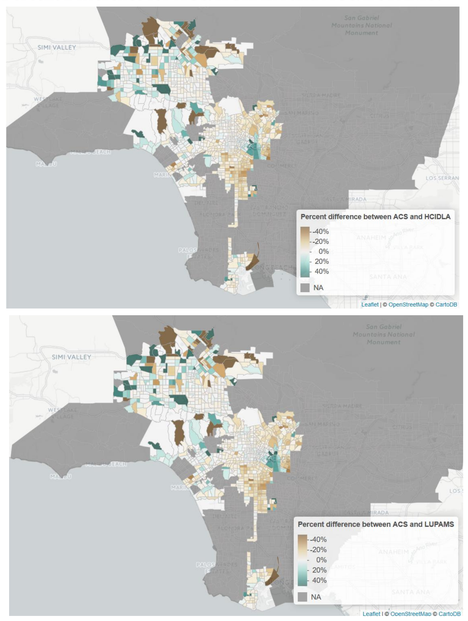
GEOGRAPHICAL ANALYSIS:
To explore the data visually, we merged it with a map of LA. We produced maps to show race distributions as indicated below. We also mapped percent differences between ACS and HCIDLA and ACS versus LUPAMS, the maps show graphically what we concluded with statistics (the data is almost identical). Lastly, we mapped the outlier data by census tract to show areas of mismatched data.

Race by Tract:



Note: Race did not correlate with unmatched zones.

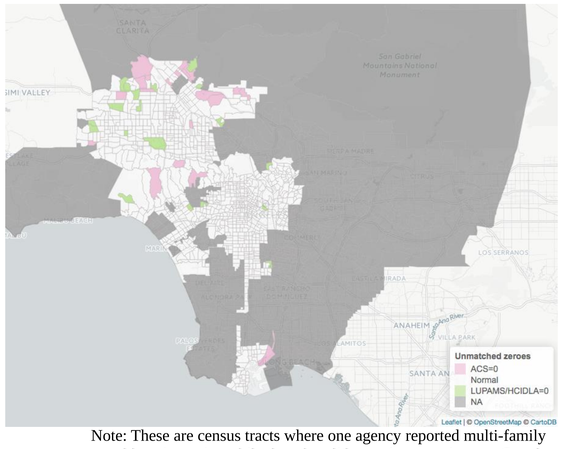
Percent Difference for ACS/HCIDLA and ACS/LUPAMS:



Note: The comparison is almost identical.

FUTURE INQUIRY

Unmatched Zones:



Note: These are census tracts where one agency reported multi-family rental housing units, while the other did not. A comparison on Google Earth revealed that HCIDLA/LUPAMS occasionally report units on golf courses, green spaces, and landfills.

Examples of unmatched zones:

Tract	ACS vs (HCIDLA or LUPAMS)	ACS units (number)	(HCIDLA or LUPAMS) units (number)
6037101122	Low % difference	0	44
6037102104	High % difference	65	0

Note: HCIDLA and LUPAMS have the same data and ACS data differs.

Unmatched Zones with a Significant Data Difference:

Census Tracts with Low Percent Difference:		Census Tracts with High Percent Difference:	
6037103101	6037111201	6037102104	6037134422
6037103300	6037113102	6037104103	6037134423
6037106020	6037121600	6037106111	6037207400
6037106112	6037137301	6037106646	6037262601
6037106113	6037141700	6037108102	6037267901
6037106403	6037261101	6037108201	6037302102
6037106603	6037262301	6037111206	6037535400
6037106641	6037980014	6037113303	6037700901
6037106643	6037980021	6037115103	6037980024
6037106649	6037101122	6037133000	

CONCLUSIONS

- HCIDLA and LUPAMS data are statistically the same.
- HCIDLA and LUPAMS vary from ACS Multi-family data, but are correlated.
- There are data anomalies (“0” entries) in all sets of data that prevent further conclusion.
- Cal HFA should further examine the data for the 39 census tracts identified in this analysis.