



HEALTH AND LIFE INSURANCE

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HEALTH AND LIFE INSURANCE



Reasons for Topic:

- Health insurance is well-known
- Curious about life insurance
- Life insurance contains financial interest

Initial Focus:

- Compare life insurance to health insurance
- Population of life and health insurance users in the U.S.
- Reasons for purchasing or not
- The cost and factors that affect price

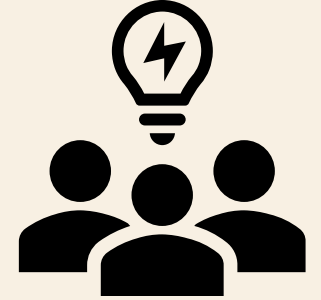
EXPLORATORY QUESTIONS



Dashboard

- What are the main reasons for purchasing life insurance?
- What categories do companies generally payout to?
- Can life insurance rates differ by demographic?
- What are the costs to have life insurance?
- How does coverage of life and health insurance differ?
- What is life expectancy of each state?

EXPLORATORY QUESTIONS



Machine Learning Model

- How well are we able to predict life expectancy based on demographic factors?
- What factors, if any, influence life expectancy?

After Research and Implementation

- Did we find a factor that was not accounted for?
- Does it show importance to the data?

DIFFERENCE

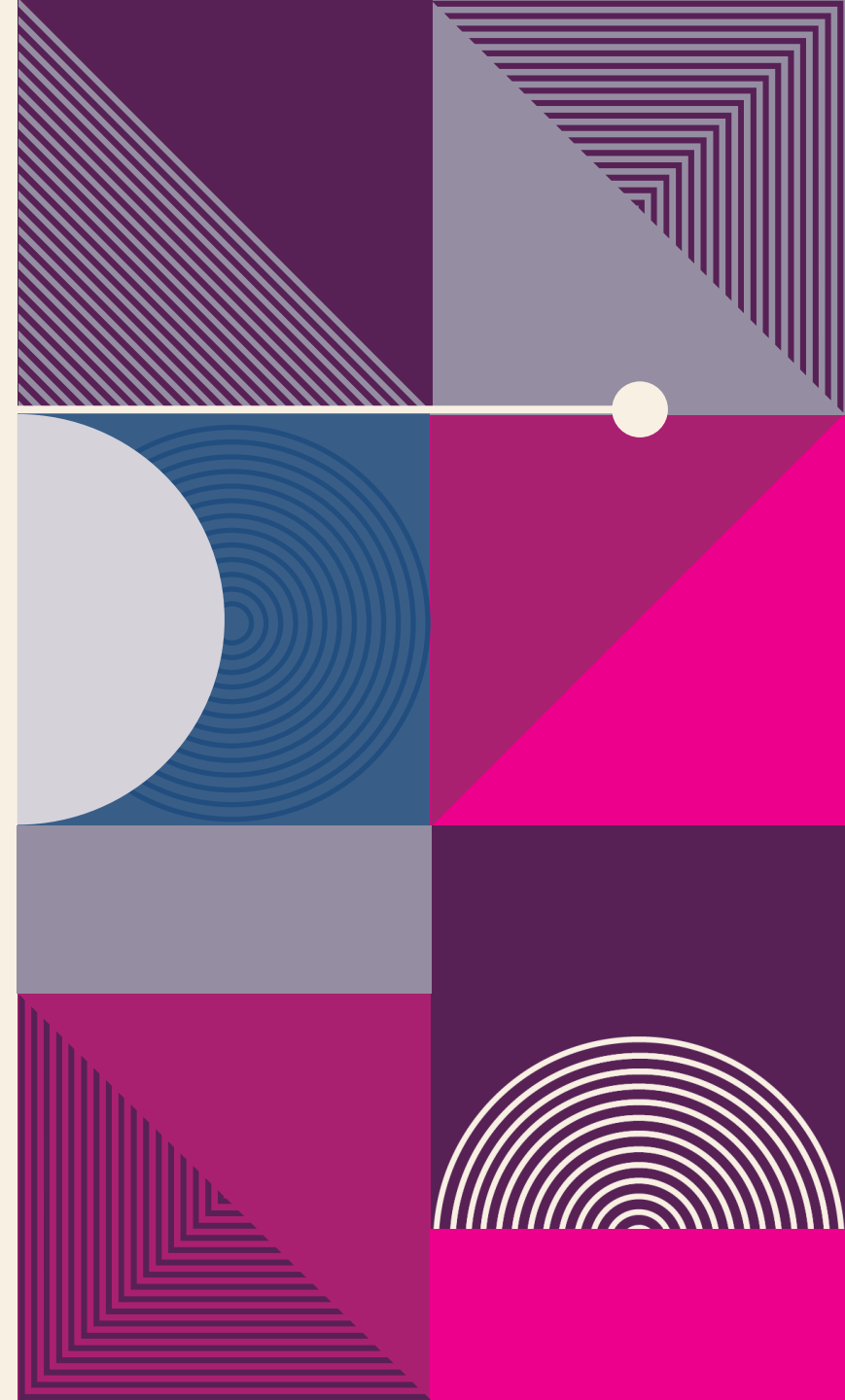


Life Insurance

- Legally binding contract that pays out a benefit after the insured individual has passed.
- The benefits will be received by the named beneficiaries of the insured.
- Optional.

Health Insurance

- Covers medical and surgical expenses for the insured.
- Allows for preventative check-ups.
- Generally, it is recommended to have a health insurance plan.



WHY IS LIFE INSURANCE IMPORTANT?

Cost

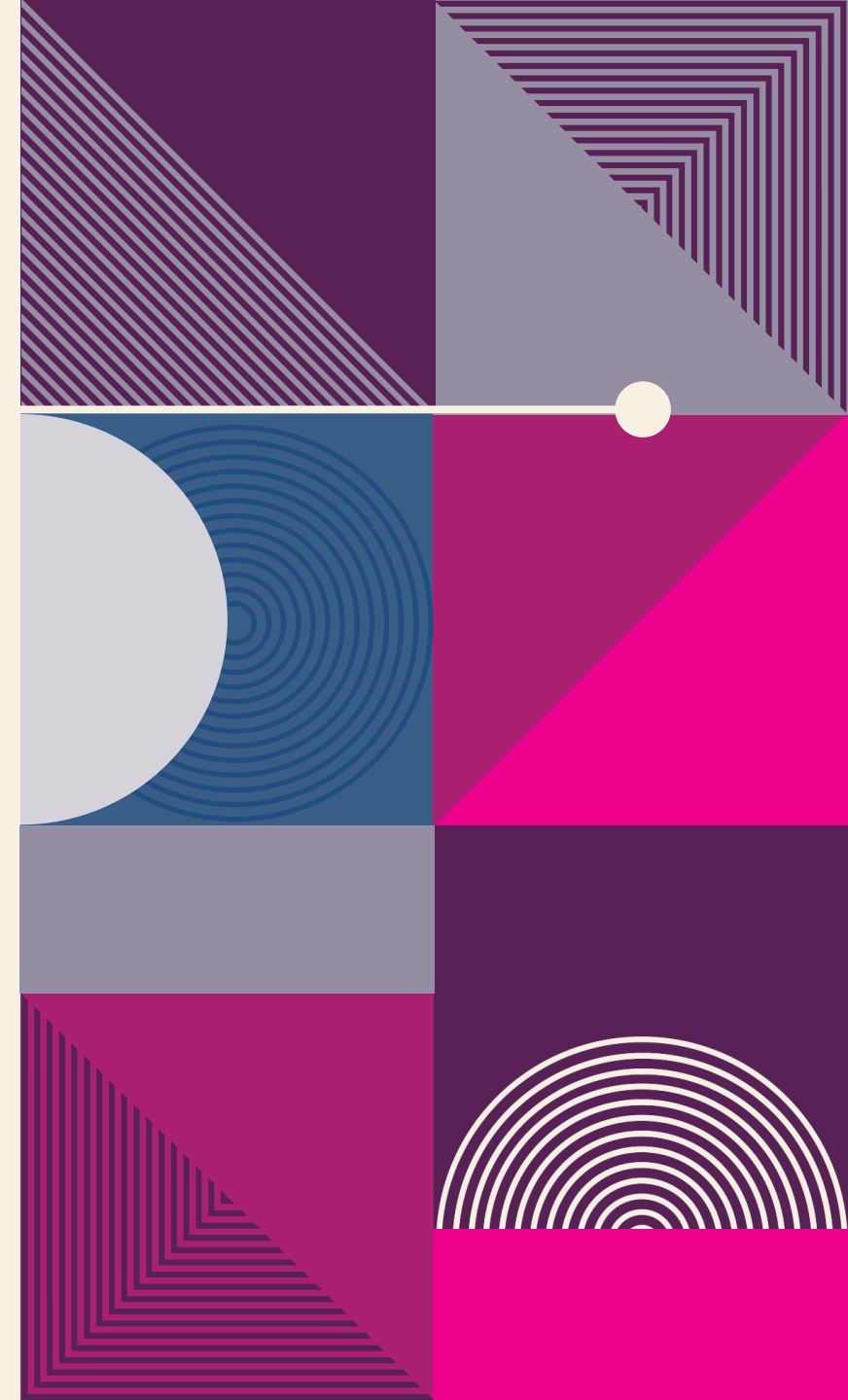
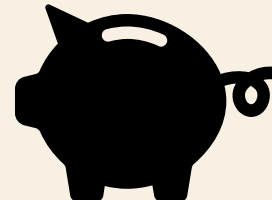
- Funerals upwards of \$10,000
- Other expenses \$20,000

Taking care of loved ones

- Children
- Spouse
- Relatives

Reliability

- Assets
- Others



WHY DO PEOPLE BUY LIFE INSURANCE?

Top Reasons:

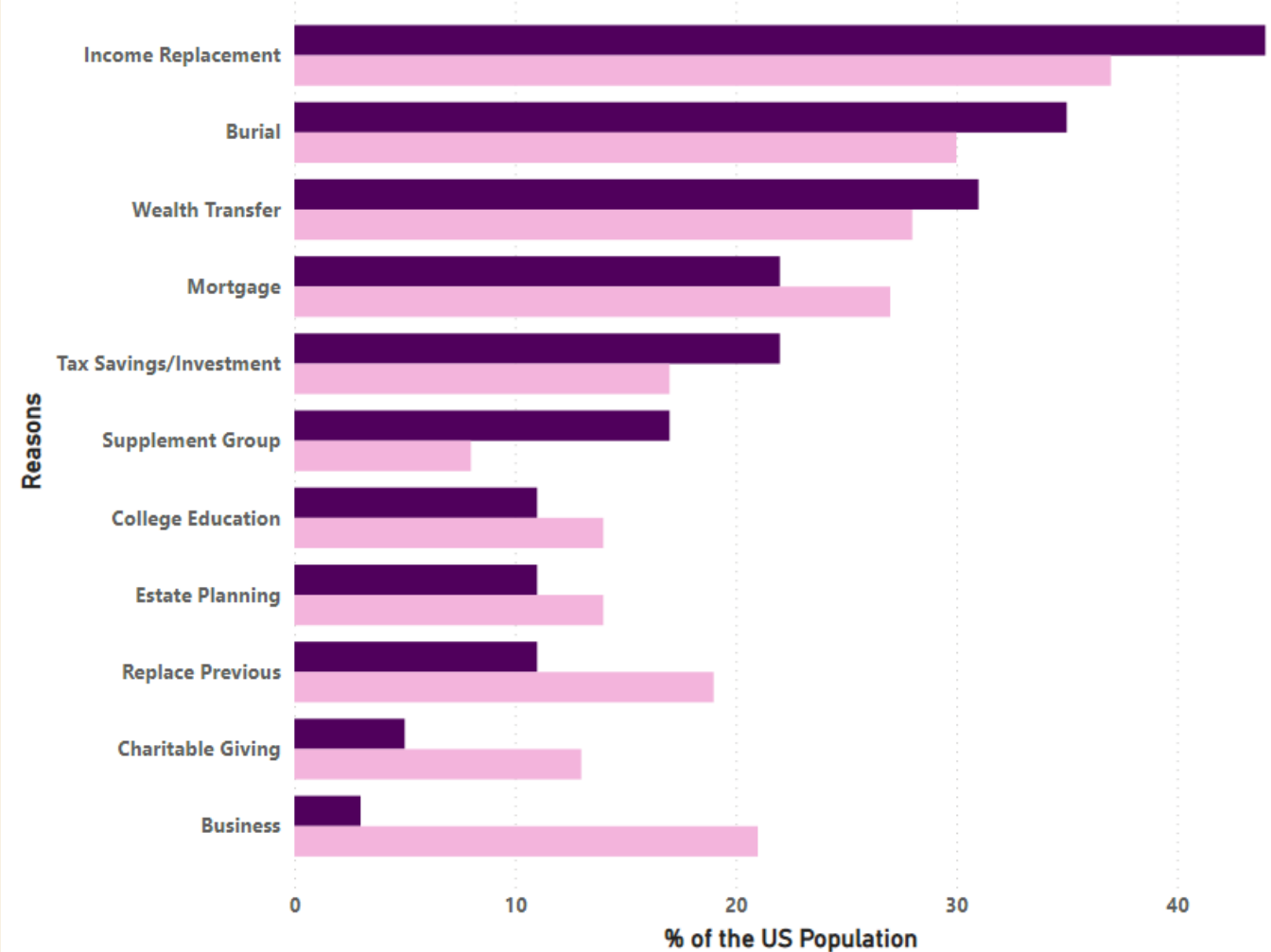
- Income Replacement
- Burial
- Wealth Transfer

Shift between 2017-2019

- Business especially

Reasons to Hold Life Insurance

● 2017 ● 2019

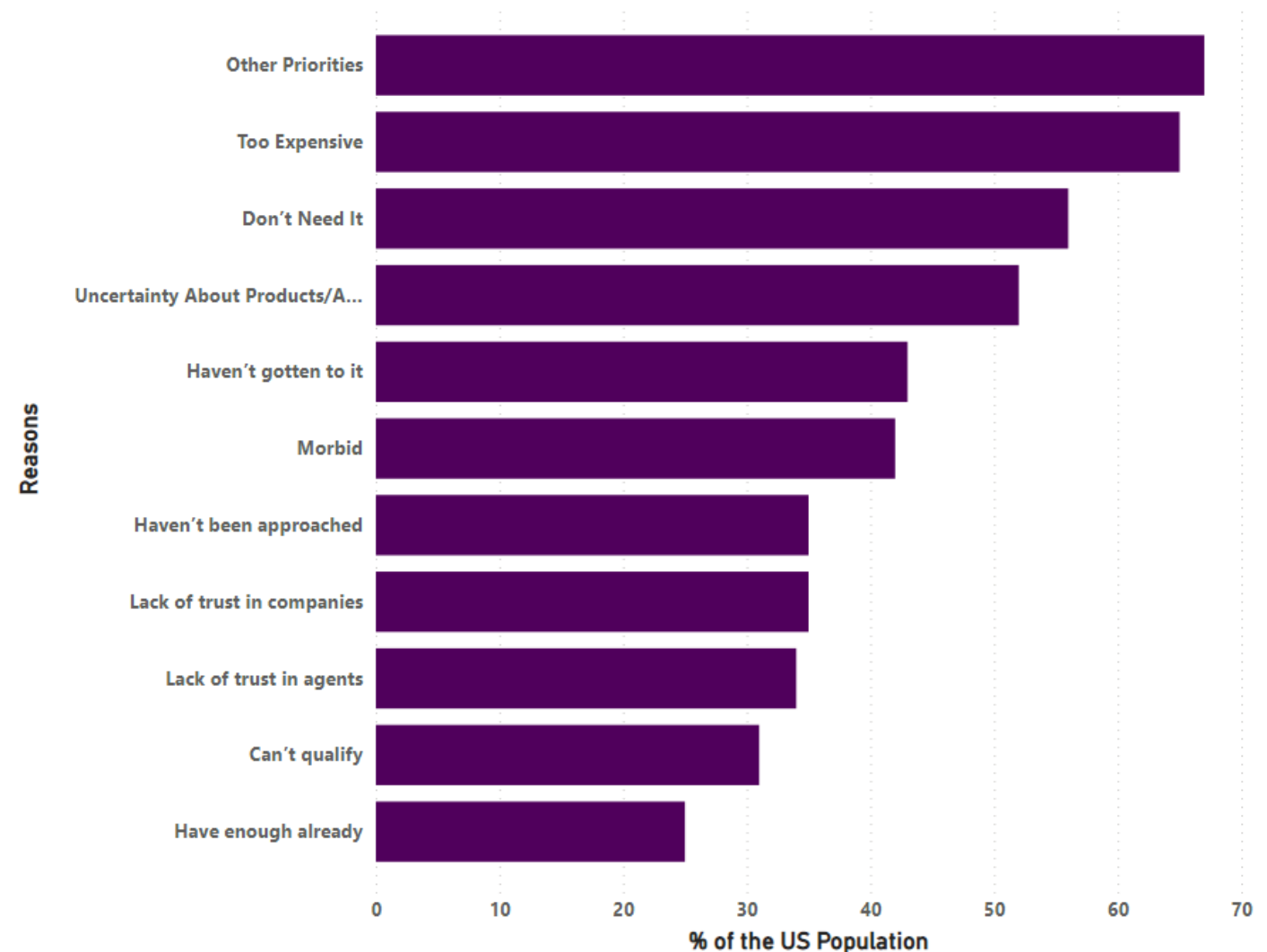


WHY DO PEOPLE NOT BUY LIFE INSURANCE?

Comes down to value

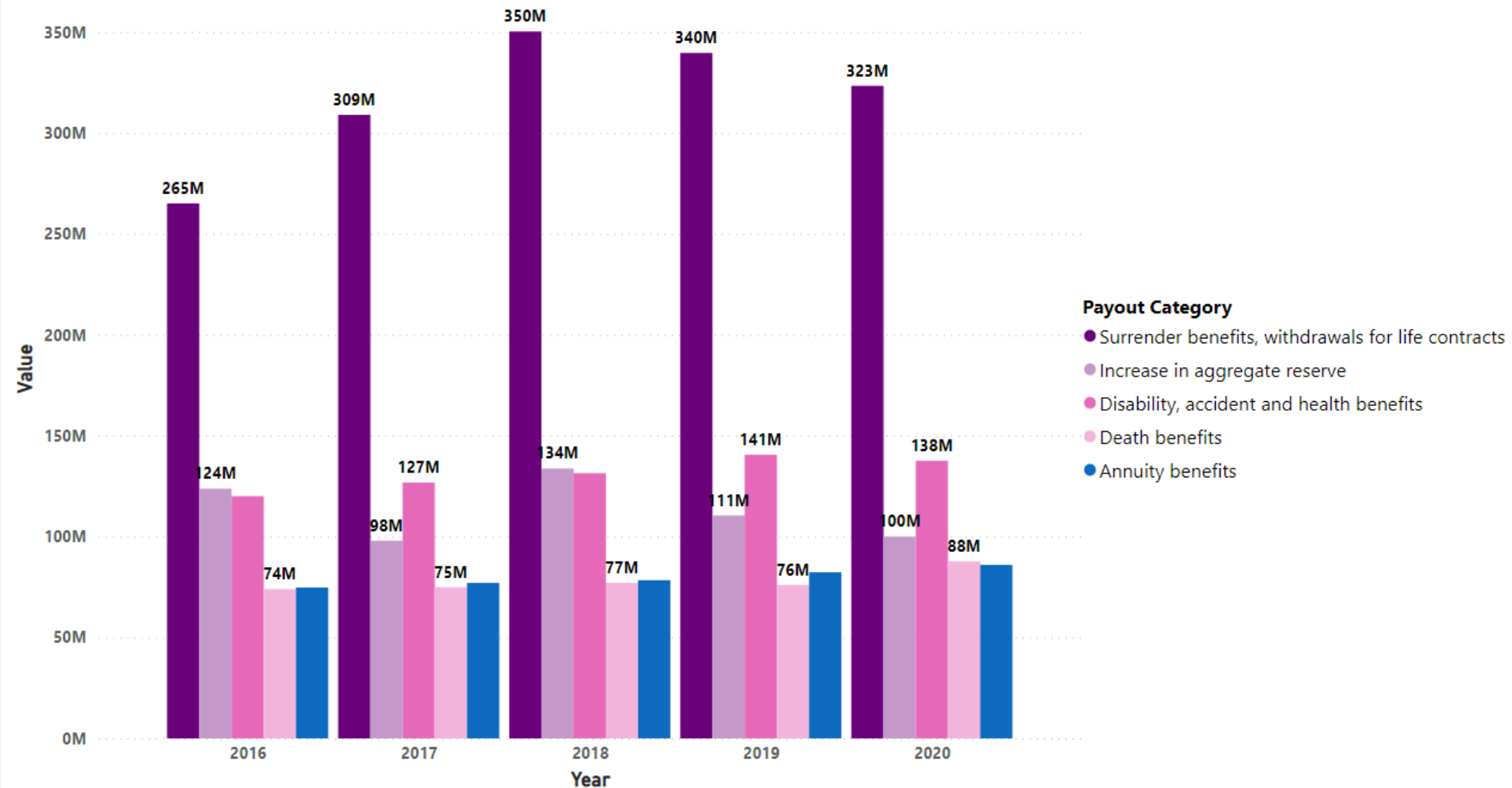
- Time
- Money

Reasons to Not Hold Life Insurance



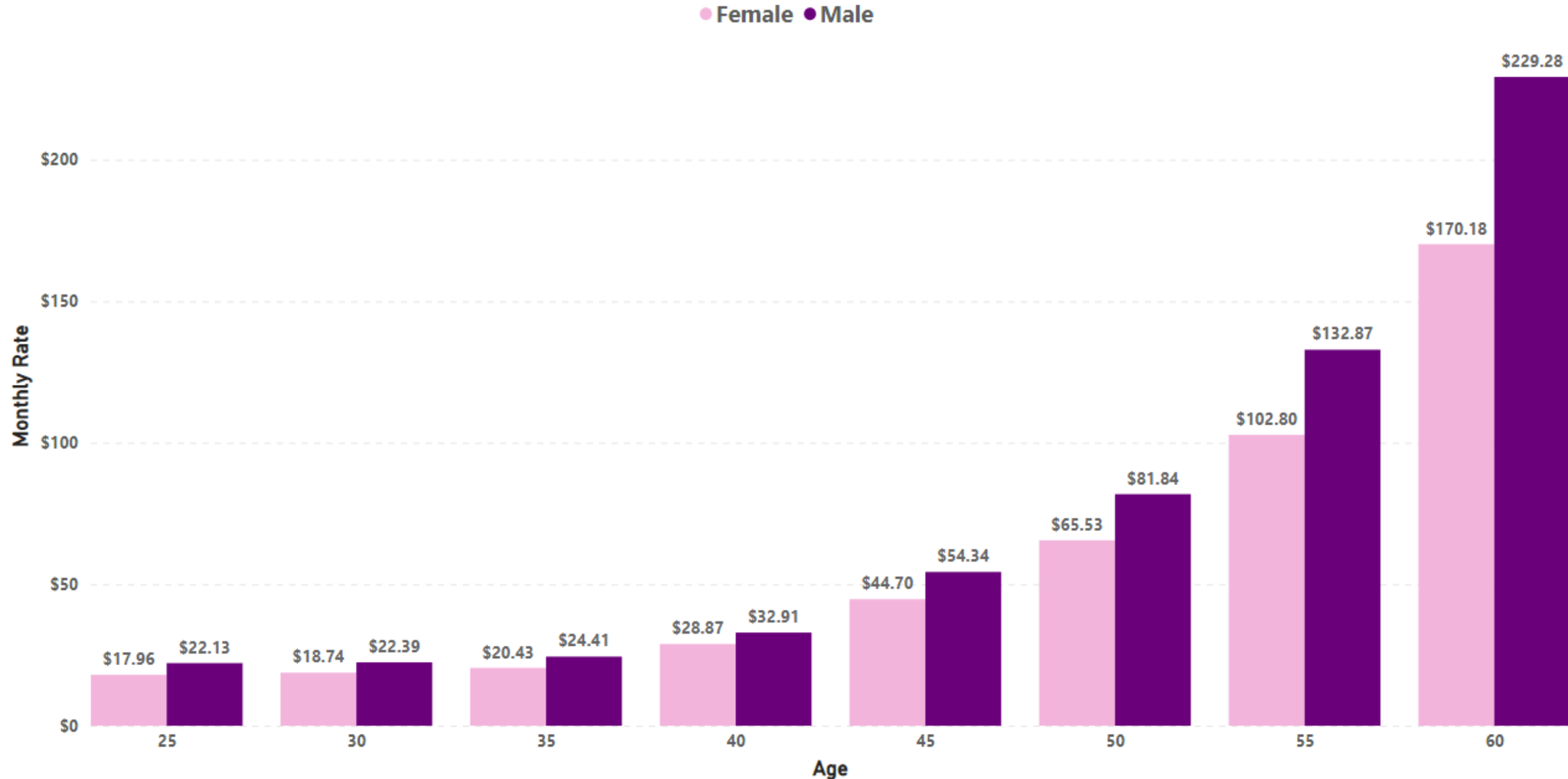
WHAT ARE THE MOST PAYOUTS BY CATEGORY?

Payout by Category



HOW MUCH WILL IT COST ME?

Average Monthly Rate for a 20 year Life Insurance Plan between \$250,000 - \$1,000,000



ML MODELS

PURPOSE

Build a Life Expectancy Predictor Model for a population given certain demographic information.

METHOD

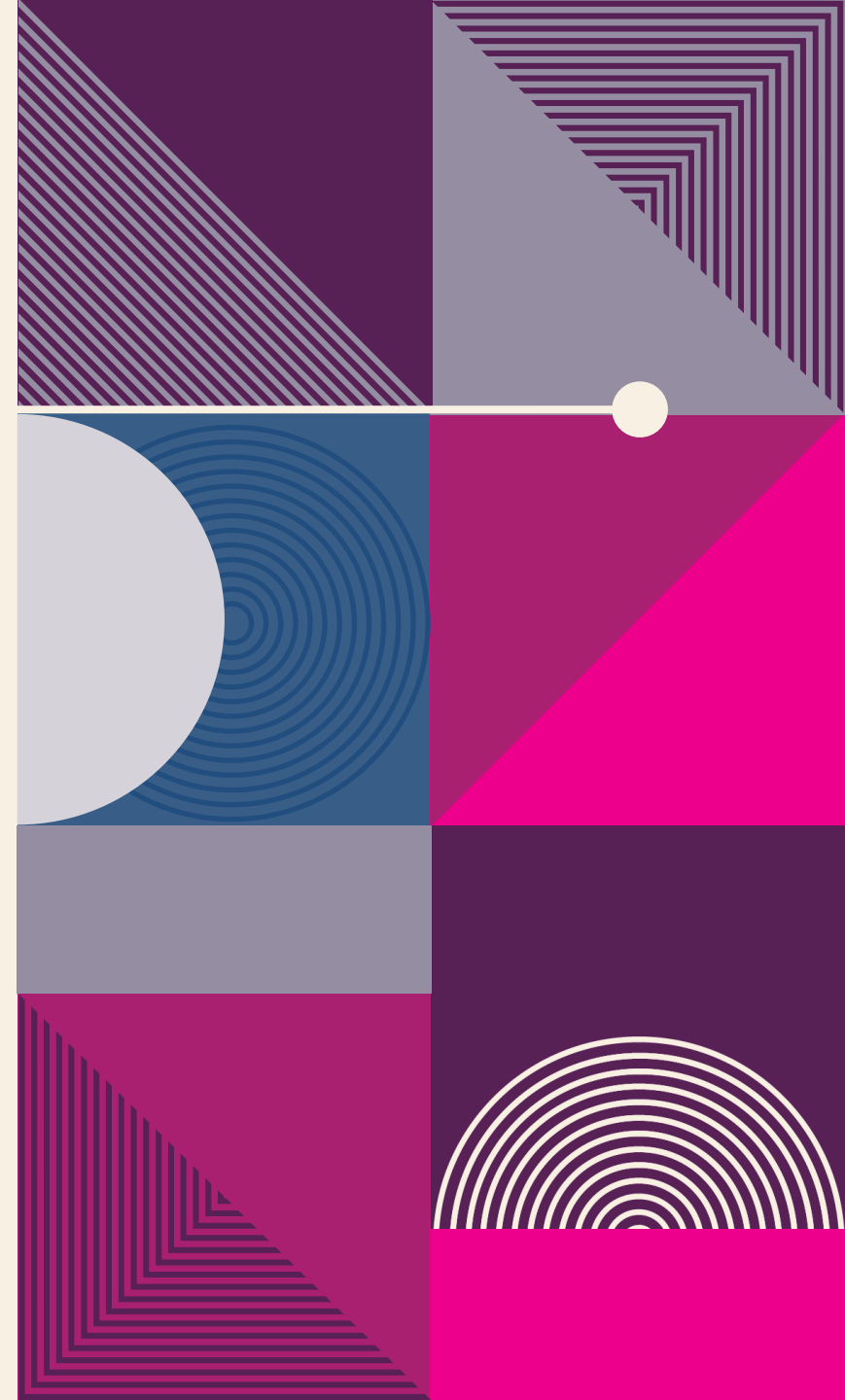
Using CDC Life Expectancy projections as goal, build our own replica model.

DATA

- Demographic Data from US Census Bureau
- Life Expectancy Data from CDC

MODELS BUILT

- Linear Regression
 - Default SVR
 - Tuned SVR
- (for both the whole data set and a reduced subset)



FIRST LINEAR REGRESSION MODEL

MODEL COEFFICIENTS

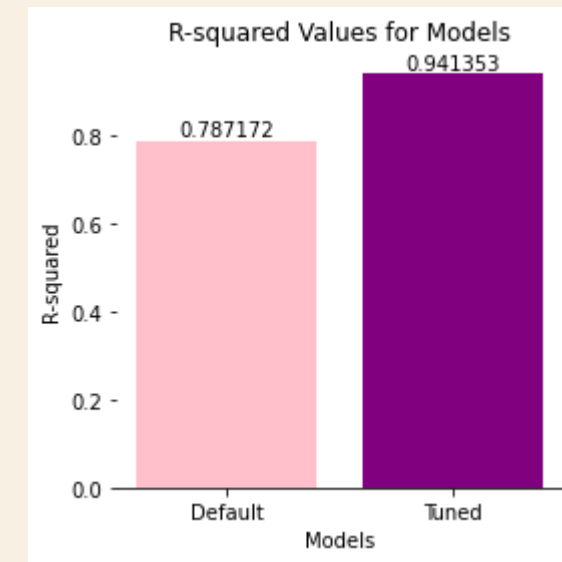
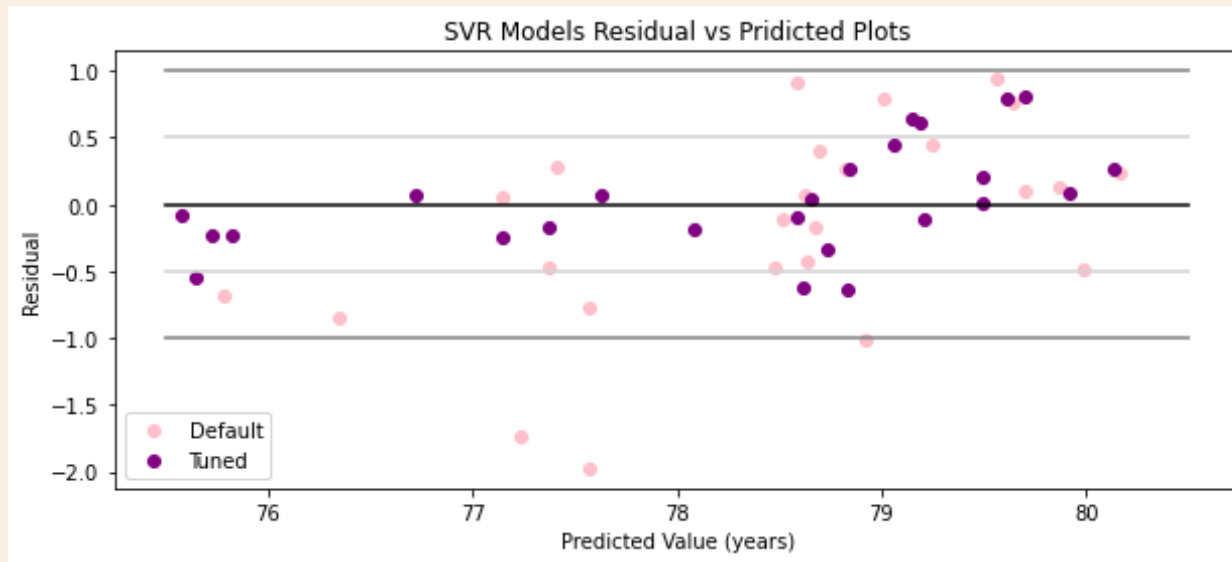
Variables	Coefficients
Male	0.1313349
White	0.1281162
Black or African American	-0.3636552
American Indian and Alaska Native	-0.1584682
Asian	0.7366583
Native Hawaiian and other Pacific Islander	-0.0274978
Other	-0.0529579
Multiracial	-0.5206292
Hispanic or Latino	0.3411264
Median Household Income	0.9106875
Percent Insured	0.1225619

CORRELATIONS WITH LIFE EXPECTANCY

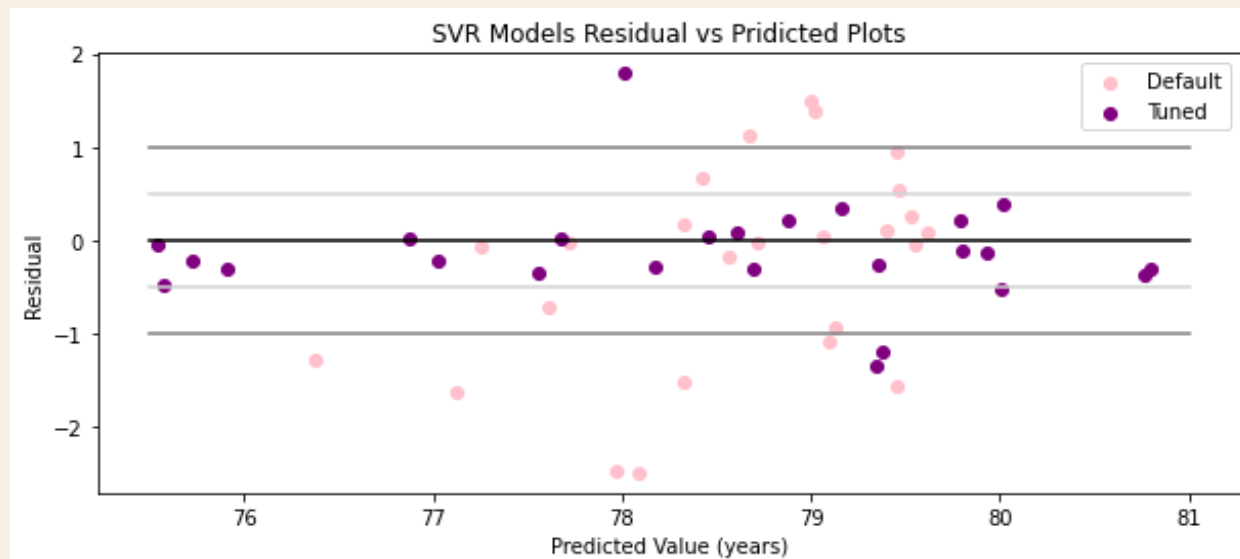
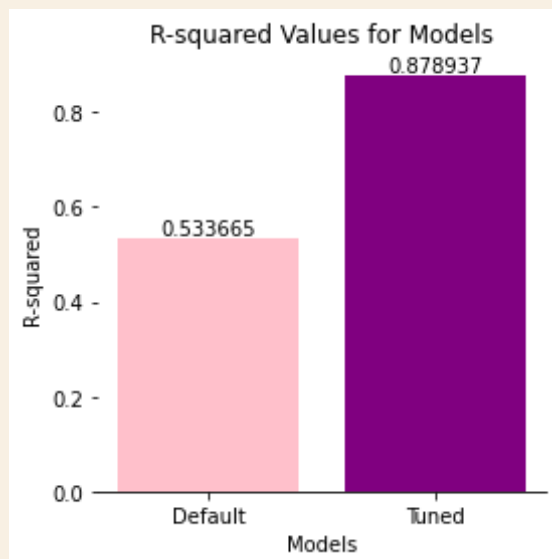
Variables	Correlation Coefficients
Male	0.300603
White	-0.024882
Black or African American	-0.464772
American Indian and Alaska Native	-0.075283
Asian	0.456682
Native Hawaiian and other Pacific Islander	0.248467
Other	0.379231
Multiracial	0.282104
Hispanic or Latino	0.310126
Median Household Income	0.76506
Percent Insured	0.405851

MODEL ANALYSIS VISUALS

ALL DATA



ONLY SEX, RACE, & ETHNICITY DATA





MODEL SHORTCOMINGS

SMALL SAMPLE SPACE

- Not built on a large sample space (only 100 total rows), quite possibly overfit.

PERSISTENT RESIDUAL TRENDS

- Positive correlation between Residuals and Predicted Values
- Could be an artifact of the small sample space, or something greater

TOO WEAK FOR APPLICATION

- 94% accuracy too low for real world application

[Dashboard Link](#)

CONCLUSION

- Successfully answered our initial questions
- Learned more about the industry
- Limited by lack of proprietary data
- Little/no data past 2020, many things may have changed



DATA SOURCES



- Funeral Costs
 - <https://www.policygenius.com/life-insurance/how-much-does-a-funeral-cost/>
- Life Insurance Data
 - <https://www.bestliferates.org/statistics>
 - <https://www.investopedia.com/articles/personal-finance/022615/how-age-affects-life-insurance-rates.asp>
 - <https://www.iii.org/table-archive/22403>
 - https://www.cdc.gov/nchs/pressroom/sosmap/life_expectancy/life_expectancy.htm
- Census Data
 - <https://data.census.gov/cedsci/>
 - <https://api.census.gov/data/2020/acs/acs5/subject/variables.html>
 - <https://www.census.gov/data/tables/time-series/demo/health-insurance/acs-hi.html>
- Abbreviation Table
 - <https://worldpopulationreview.com/states/state-abbreviations>



QUESTIONS
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