



Analysing premiums in the American Health Insurance Marketplace

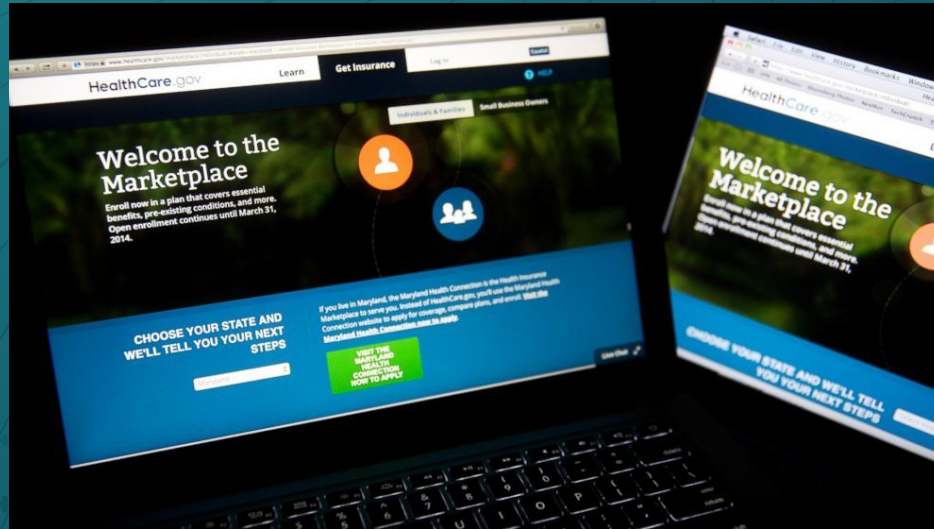
DSIA - Data Science Course

Mini Project 1

By Luiz Augusto Carneiro

8 February 2020

Introduction



The Health Insurance Marketplace

The Health Insurance Marketplace, or Exchange, is an online shopping center based at HealthCare.gov, for American citizens living in the USA.

People who use the Health Insurance Marketplace are those who don't have health insurance coverage through their jobs, or who are self-employed or unemployed.

Therefore, affordability is an important issue in the context of the Health Insurance Marketplace.

Objective and data used:

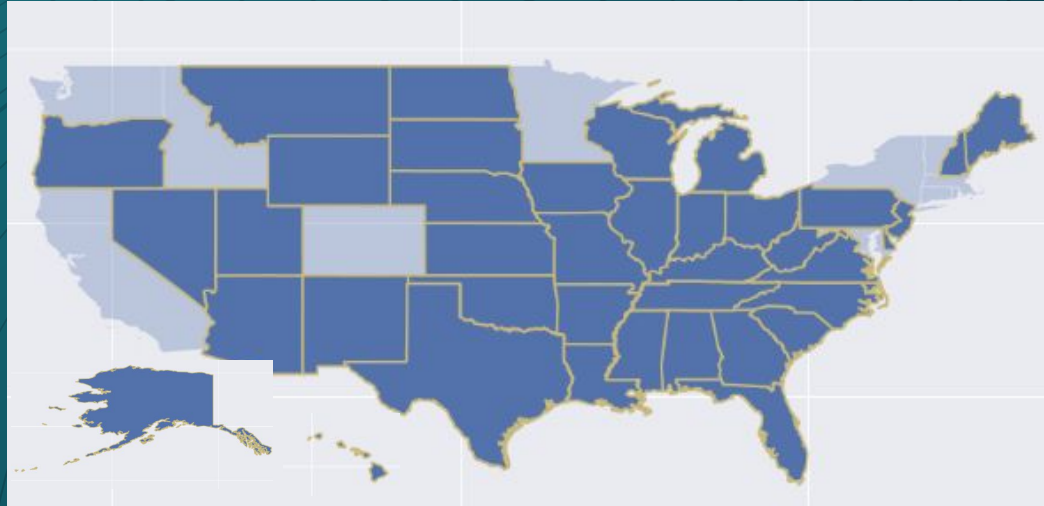
- This mini project aims to analyse affordability in the American Health Insurance Marketplace (in which states health insurance is less/more affordable?)
- The primary dataset is the **2019 Qualified Health Plan (QHP) landscape data**, obtained from **Healthcare.gov**.
- Additionally, the analysis used **real personal income per capita by state**, obtained from the **Bureau of Economic Analysis**.

Summary of results:

- Health insurance prices vary a lot across states in the USA
- At first sight, ranking the states by premium, it seems that the most expensive states are Wyoming and Nebraska
- However, after accounting for **real personal income per capita by state**, the least affordable state is West Virginia.
- Also, analysis shows a negative relationship between average premiums and the number of insurers per state.

Geographical coverage

- The Marketplace covers most states, including Alaska and Hawaii.



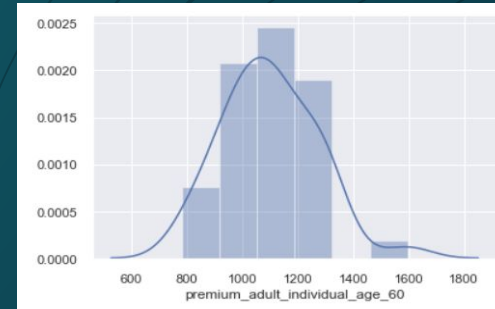
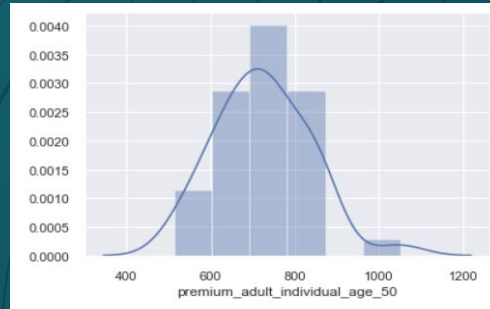
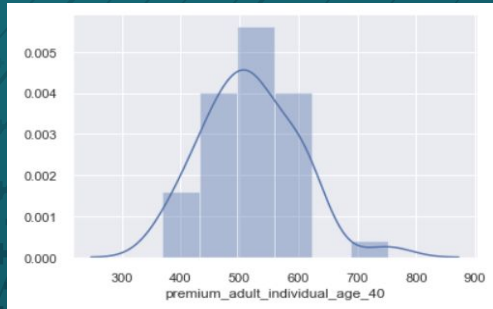
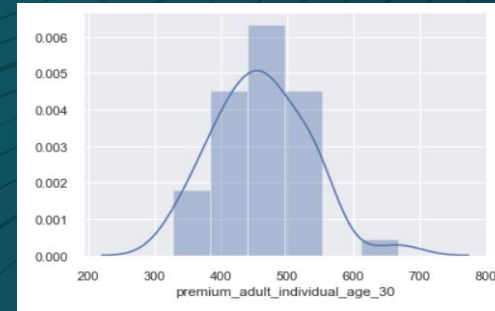
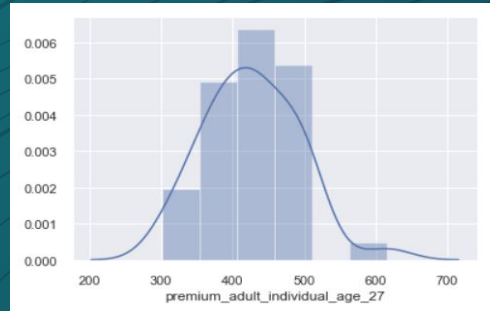
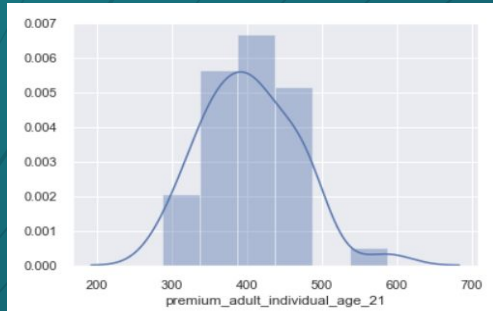
More on the data:

The 2019 plan data show premiums for the following rating scenarios:

- Child age 0-14, and 18
- Adult individual age 21, 27, 30, 40, 50, and 60
- Couple age 21, 30, 40, 50, and 60, no children
- Couple age 21, 30, 40, and 50, plus 1 child age 0-14
- Couple age 21, 30, 40, and 50, plus 2 children ages 0-14
- Couple age 21, 30, 40, and 50, plus 3 or more children ages 0-14
- Single parent age 21, 30, 40, and 50, plus 1 child age 0-14
- Single parent age 21, 30, 40, and 50, plus 2 children ages 0-14
- Single parent age 21, 30, 40, and 50, plus 3 or more children ages 0-14

Looking at the distribution of average premium per state for ages 21, 27, 30, 40, 50 and 60.

- In a few states health insurance is much more expensive than in other state.



Analysing the average premium for age 21

Top 10 **least** affordable states

state_code	average_premium
WY	587.798174
NE	486.051098
WV	485.165961
AK	482.344828
MO	477.311163
IA	475.649683
DE	472.317500
OK	469.766362
FL	463.161025
TN	449.128145

Wyoming

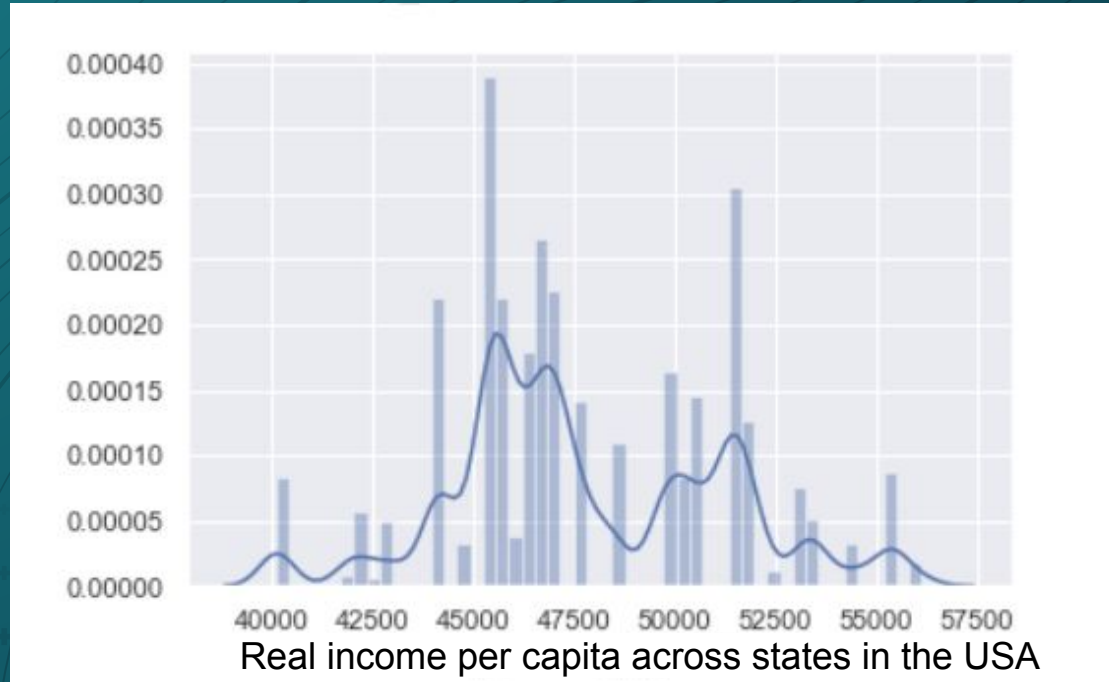
Top 10 **most** affordable states

state_code	average_premium
TX	359.386529
KY	346.852717
OR	345.501451
MI	345.483548
UT	344.269641
ND	341.907750
NH	314.032229
NM	310.390850
AR	306.049961
IN	288.351547

Indiana

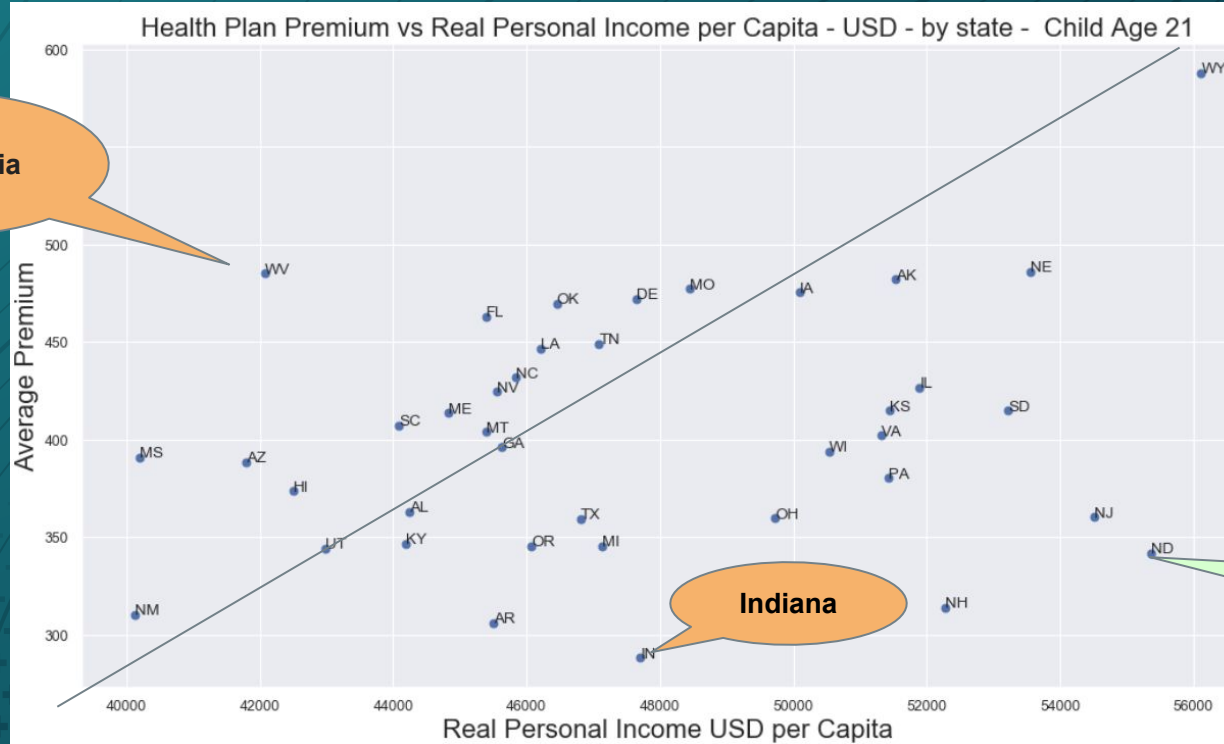
However, affordability also depends on personal income per capita

Personal income per capita varies a lot across states:



Taking into account personal income per capita per state

After accounting for personal income per capita, West Virginia seems to be the least affordable state and the North Dakota the most affordable one.



West Virginia

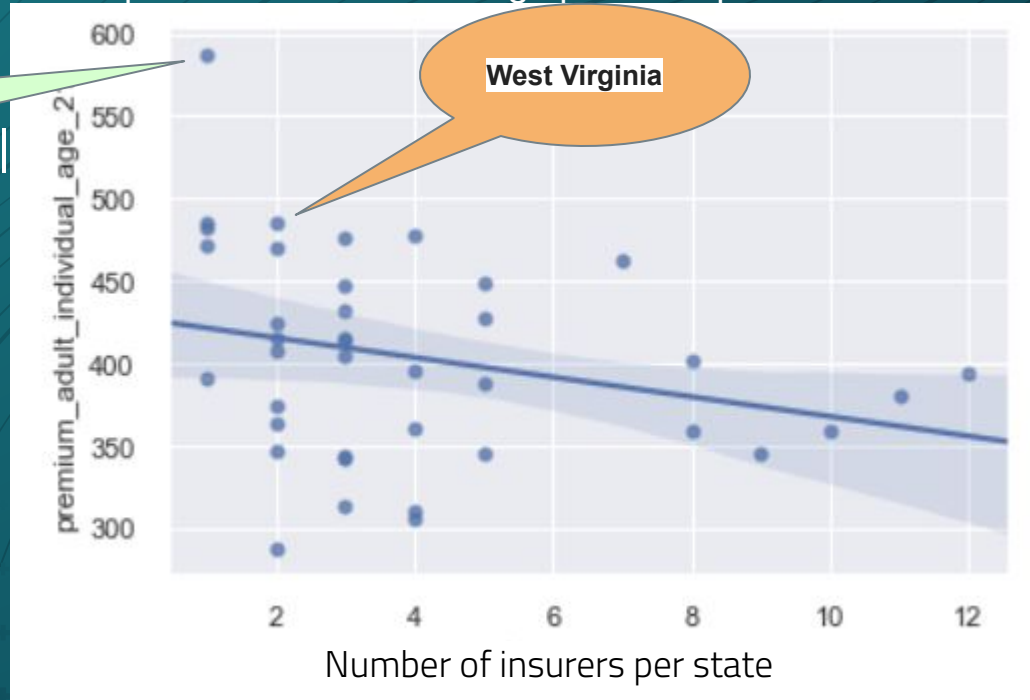
Wyoming

Indiana

North Dakota

Why is health insurance more expensive in some states than in other states? Maybe it is related to competition...

There seems to have a negative relationship between the number of insurers per state and the average premium per state.

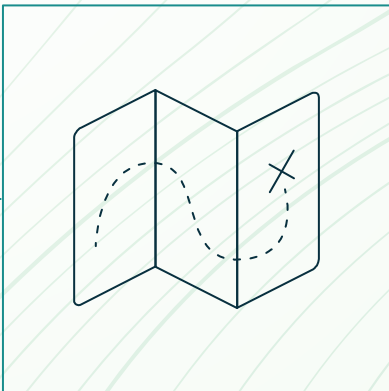


Conclusions:

- After performing EDA on the **2019 Qualified Health Plan (QHP) landscape data**, it was possible to see that:
 - The distribution of the average premium per state is very similar for policies of all age groups;
 - The average premium per age group varies a lot across states. For age 21, Wyoming has the highest premium (\$587.79) and Indiana the lowest (\$288.35).

Conclusions (cont.):

- After accounting for real personal income per capita, West Virginia has the least affordable health insurance and North Dakota has the most affordable one.
- Final analysis on the number of health insurers per state show a negative relationship between average premium and the number of health insurers in each state, indicating that having a competitive marketplace helps offering lower prices to consumers.



Thank you!

Any questions?

You can find me at carneiro_aus@yahoo.com.au