

Health Insurance Marketplace

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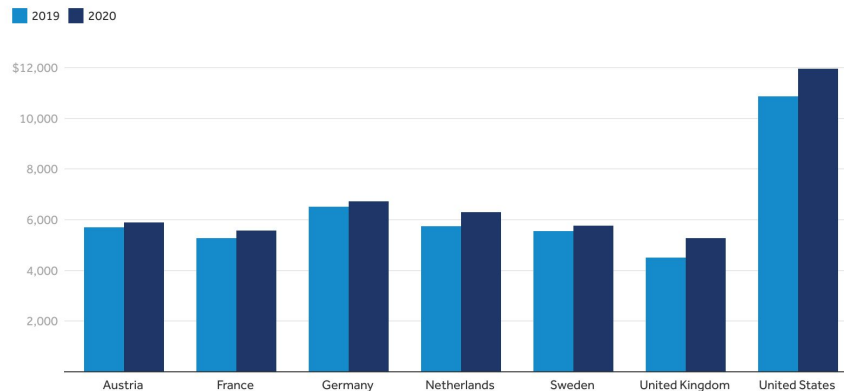




The Problem

- People in the United States spend more on healthcare than citizens of other high income countries (Wager, Ortaliza, & Cox, 2022)
- Within the United States health insurance plays a large role in determining an individual's health care spending (Montero, et. al. 2022)
- The quality of benefits of one's health insurance also contributes to America's overall health (American Hospital Association, n.d.)

Per capita health consumption expenditures, U.S. dollars, PPP adjusted, 2019 and 2020



Note: 2020 France data is estimated. 2020 data for all other countries but the United States are provisional.

Source: KFF analysis of OECD and National Health Expenditure (NHE) data



Being A Part Of The Solution

- Using the Health Insurance Marketplace Dataset, available on Kaggle, we aim to answer the question of where in the United States patients can get access to healthcare with the best cost and the most benefits
- The dataset has the following tables:
 - Benefits Cost Sharing
 - Business Rules
 - Networks
 - Plan Attributes
 - Rates
 - Service Areas



Understanding Health Insurance Marketplace

- The Health Insurance Marketplace helps you find health coverage that fits your needs and budget. Every health plan in the Marketplace offers the same set of essential health benefits, including doctor visits, preventive care, hospitalization, prescriptions, and more. You can compare plans based on price, benefits, quality, and other features important to you before you make a choice.
- Every person in the U.S. must have minimum health coverage or pay a fee.



The Data

- The data comes from the Centers for Medicare & Medicaid Services (CMS) Center for Consumer Information and Insurance oversight which publishes data with the intention of increasing transparency in the Health Insurance Exchange.
- The data comes out every year and is available from 2014 to 2023
 - This project uses examples of data from CMS from 2014 to 2016

BenefitsCostSharing

Column	Type	notnull	pk
BenefitName	Text	0	0
BusinessYear	Integer	0	0
CoinsInnTier1	Text	0	0
CoinsInnTier2	Text	0	0
CoinsOutofNet	Text	0	0
CopayInnTier1	Text	0	0
CopayInnTier2	Text	0	0
CopayOutofNet	Text	0	0
EHBVarReason	Text	0	0
Exclusions	Text	0	0
Explanation	Text	0	0
ImportDate	Text	0	0
IsCovered	Text	0	0
IsEHB	Text	0	0
IsExclFromInnMOOP	Text	0	0
IsExclFromOonMoop	Text	0	0
IsStateMandate	Text	0	0
IsSubjToDedTier1	Text	0	0
IsSubjToDedTier2	Text	0	0
IssuerId	Integer	0	0
IssuerId2	Integer	0	0
LimitQty	Numeric	0	0
LimitUnit	Text	0	0
MinimumStay	Numeric	0	0
PlanId	Text	0	0
QuantLimitOnSvc	Text	0	0
Row Number	Integer	0	0
SourceName	Text	0	0
StandardComponentID	Text	0	0
StateCode	Text	0	0
StateCode2	Text	0	0
VersionNum	Integer	0	0

Rate

Column	Type	notnull	pk
BusinessYear	Integer	0	0
StateCode	Text	0	0
IssuerId	Integer	0	0
SourceName	Text	0	0
VersionNum	Text	0	0
ImportDate	Text	0	0
IssuerId2	Text	0	0
FederalTIN	Text	0	0
RateEffectiveDate	Text	0	0
RateExpirationDate	Text	0	0
PlanId	Text	0	0
RatingAreaId	Text	0	0
Tobacco	Text	0	0
Age	Text	0	0
IndividualRate	Numeric	0	0
IndividualTobaccoRate	Numeric	0	0
Couple	Numeric	0	0
PrimarySubscriberAndO	Numeric	0	0
PrimarySubscriberAndTi	Numeric	0	0
PrimarySubscriberAndTr	Numeric	0	0
CoupleAndOneDepende	Numeric	0	0
CoupleAndTwoDepende	Numeric	0	0
CoupleAndThreeOrMore	Numeric	0	0
RowNumber	Integer	0	0



Tools used for the project

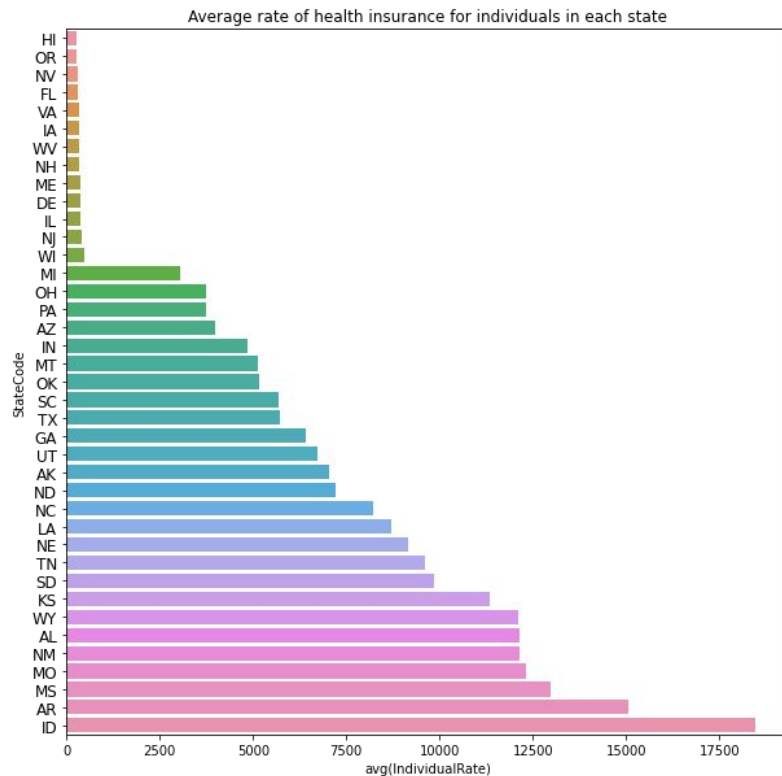
- SQLite3
- Python - Pandas, Matplotlib, Seaborn
- Anaconda
- Tableau



Question: What State has the best average cost for individual health insurance?

SQL Query:

```
SELECT StateCode, avg(IndividualRate)
FROM Rate
Group by StateCode
Order by avg(IndividualRate)
```

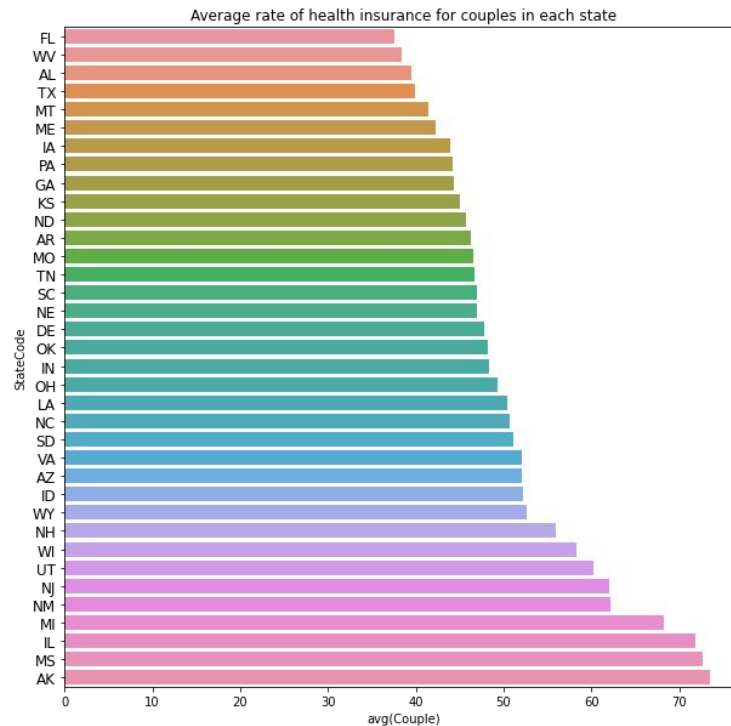




Question: What State has the best average cost for couples health insurance?

SQL Query:

```
SELECT StateCode, avg(Couple)
FROM Rate
WHERE Age='Family Option'
Group by StateCode
Order by avg(Couple)
```

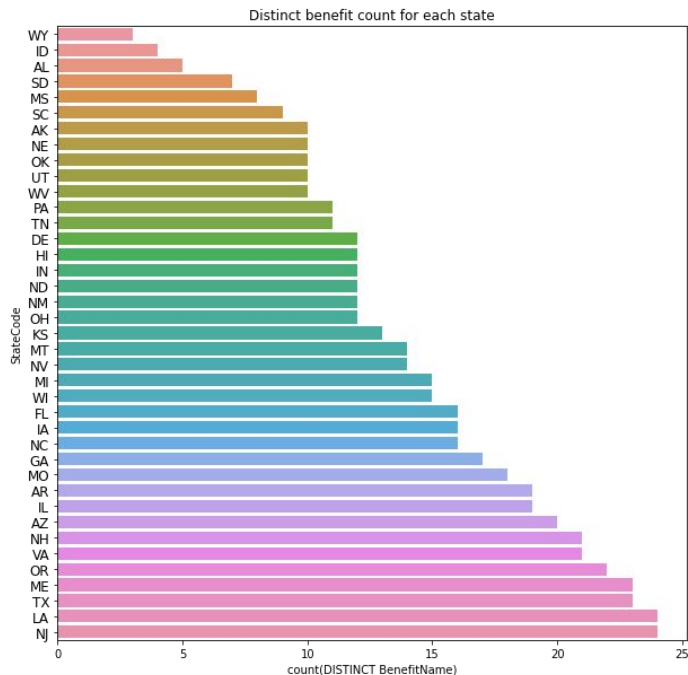




Question: What state has the most required benefits?

SQL Query:

```
SELECT StateCode, IsStateMandate,  
count(DISTINCT BenefitName)  
FROM BenefitsCostSharing  
WHERE IsStateMandate = 'Yes'  
GROUP BY StateCode  
ORDER BY count(DISTINCT BenefitName)
```

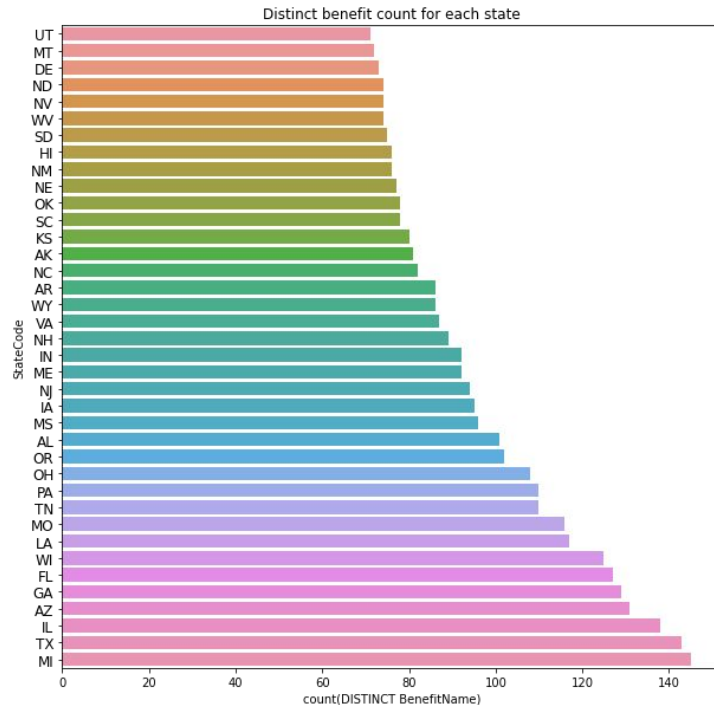




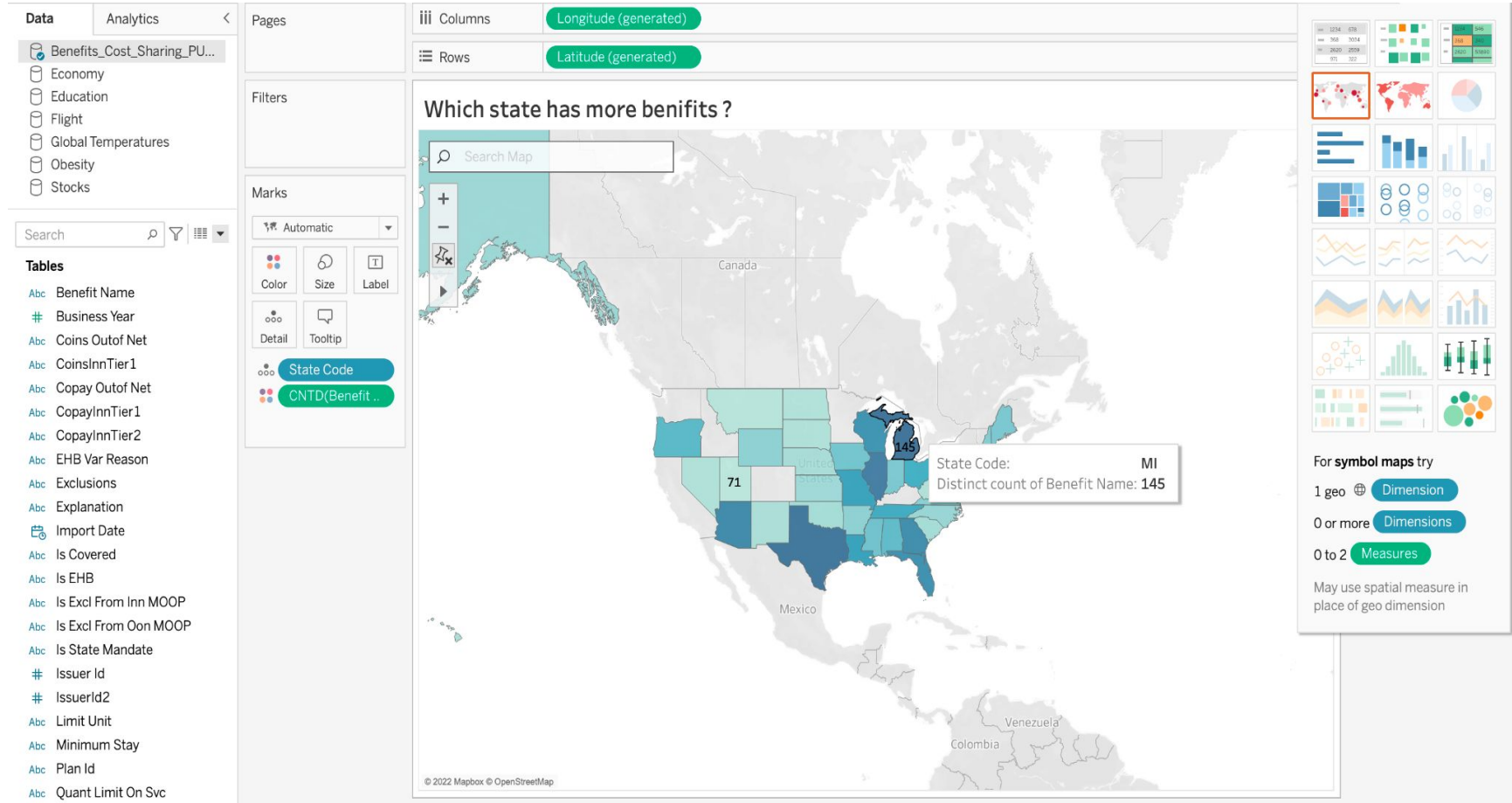
Question: What state has the most options for benefits (focus on 2016)?

SQL Query:

```
SELECT StateCode, count(DISTINCT BenefitName)
FROM BenefitsCostSharing
WHERE BusinessYear='2016'
Group by StateCode
Order by count(DISTINCT BenefitName)
```



Analysis of benefit count using Tableau



Analysis of benefit count using Tableau (cont.)

Data Analytics <

Columns Longitude (generated)

Rows Latitude (generated)

Filters

Marks

Automatic

Color Size Label

Detail Tooltip

State Code

CNTD(Benefit ...)

Tables

- Benefit Name
- Business Year
- Coins Outof Net
- CoinsInnTier1
- Copay Outof Net
- CopayInnTier1
- CopayInnTier2
- EHB Var Reason
- Exclusions
- Explanation
- Import Date
- Is Covered
- Is EHB
- Is Excl From Inn MOOP
- Is Excl From Oon MOOP
- Is State Mandate
- Issuer Id
- IssuerId2
- Limit Unit
- Minimum Stay
- Plan Id
- Quant Limit On Svc

Which state has least benifits ?

Search Map

Canada

United States

Mexico

Colombia

Venezuela

© 2022 Mapbox © OpenStreetMap

For symbol maps try

1 geo **Dimension**

0 or more **Dimensions**

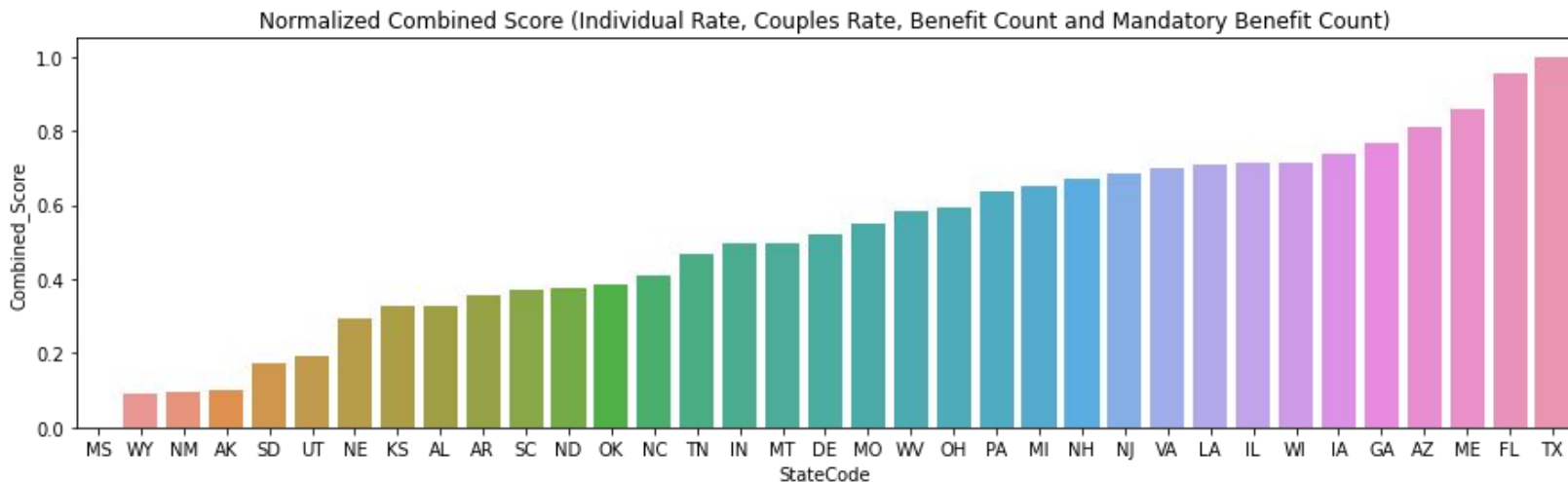
0 to 2 **Measures**

May use spatial measure in place of geo dimension



Conclusion

- To determine the “best” state to live in from an insurance point of view, we normalized the data from the categories discussed (individual rate, couple rate, benefits offered and mandatory benefits required) and determined which state had the overall best score using equal weight for all the mentioned categories
 - HI, OR, and NV did not have data for Couple Rates so they were removed before normalization





References

- Wager, E., Ortaliza, J., & Cox, C. (2022, January 21). How does Health spending in the U.S. compare to other countries? Peterson-KFF Health System Tracker. Retrieved from [https://www.healthsystemtracker.org/chart-collection/health-spending-u-s-compare-countries-2/#GDP%20per%20capita%20and%20health%20consumption%20spending%20per%20capita.%202020%20\(U.S.%20dollars.%20PPP%20adjusted\)](https://www.healthsystemtracker.org/chart-collection/health-spending-u-s-compare-countries-2/#GDP%20per%20capita%20and%20health%20consumption%20spending%20per%20capita.%202020%20(U.S.%20dollars.%20PPP%20adjusted))
- Montero, A., Kearney, A., Hamel, L., & Brodie, M. (2022, July 14). Americans' Challenges with Health Care Costs. Kaiser Family Foundation (KFF). Retrieved from <https://www.kff.org/health-costs/issue-brief/americans-challenges-with-health-care-costs/>
- American Hospital Association. (n.d.) Why is health insurance important? Retried from: <https://www.aha.org/guidesreports/report-importance-health-coverage>
- Health Insurance Exchange Public Use Files (Exchange PUFs). CMS. Retried from: <https://www.kaggle.com/code/veroanalytic/health-insurance-marketplace-analysis/comments>

Thank You !!

