



# **Adult Obesity & Fast Food Density**

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# Research Question

**Is there a correlation between adult obesity and the number of fast-food restaurants across states?**



## Data Link

# Dataset Overview Pt.1

Kaggle dataset (Excel CSV file) with data on the address, city, province, latitude/longitude, and website of over 8000 different fast food restaurants across America.



A screenshot of Microsoft Excel showing a dataset titled "FastFoodRestaur...". The table has 22 rows and 11 columns. The columns are labeled: address, city, country, keys, latitude, longitude, name, postalCode, province, and websites. The data includes various restaurant locations such as McDonald's, Wendy's, and Domino's across the US. The "websites" column contains URLs for each establishment.

	address	city	country	keys	latitude	longitude	name	postalCode	province	websites
2	324 Main St Massena	US	us/ny/mas	44.9213	-74.8902	McDonald'	13662 NY			http://mcdonalds.com,http://www.mcdonalds.com/?cid=RF:YXT_FM:TP::Text:Referral
3	530 Clinton Washington	US	us/oh/was	39.53255	-83.4453	Wendy's	43160 OH			http://www.wendys.com
4	408 Marke Maysville	US	us/ky/may	38.62736	-83.7914	Frisch's Bi	41056 KY			http://www.frischs.com,https://www.frischs.com/location/maysville-ky/
5	6098 State Massena	US	us/ny/mas	44.95008	-74.8455	McDonald'	13662 NY			http://mcdonalds.com,http://www.mcdonalds.com/?cid=RF:YXT_FM:TP::Text:Referral
6	139 Colum Athens	US	us/oh/athen	39.35155	-82.0973	OMG! Roti	45701 OH			http://www.omgrotisserie.com,http://omgrotisserie.com
7	4182 Tony Hamilton	US	us/oh/ham	39.4176	-84.4764	Domino's F	45011 OH			https://www.dominos.com/en/?redirect=homepageandutm
8	590 S Mair Englewood	US	us/oh/engl	39.86969	-84.2936	Domino's F	45322 OH			https://www.dominos.com/en/?redirect=homepageandutm_source=locallistingsandutm_medium=localstandut
9	401 N Jenr Saluda	US	us/sc/salu	34.00598	-81.7704	McDonald'	29138 SC			http://www.mcdonalds.com
10	205 W Ch Batesburg	US	us/sc/bate	33.91335	-81.5333	Wendy's	29006 SC			http://www.wendys.com
11	2711 W. Ki Paragould	US	us/ar/para	36.06107	-90.5233	Pizza Hut	72450 AR			http://www.pizzahut.com
12	613 W Cer Sheridan	US	us/ar/sher	34.30687	-92.4078	SONIC Driv	72150 AR			https://locations.sonicdrivein.com/ar/sheridan/613-w--center-street.html
13	512 Highw Monticello	US	us/ar/mon	33.61937	-91.8023	Domino's F	71655 AR			https://www.dominos.com/en/?redirect=homepageandutm
14	1535 NW E Oklahoma	US	us/ok/okla	35.52234	-97.5382	McDonald'	73118 OK			http://mcdonalds.com,http://www.mcdonalds.com/?cid=RF:YXT_FM:TP::Text:Referral
15	125 Towne Lexington	US	us/ky/lexir	38.06753	-84.5304	Domino's F	40511 KY			https://www.dominos.com/en/?redirect=homepageandutm_source=locallistingsandutm_medium=localstandut
16	66 14th St. Tell City	US	us/in/telci	37.94103	-86.7621	Long John	47586 IN			http://www.ljsilvers.com
17	301 Univer Louisville	US	us/ky/louis	38.21999	-85.7648	McDonald'	40208 KY			http://mcdonalds.com,http://www.mcdonalds.com/?cid=RF:YXT_FM:TP::Text:Referral
18	5812 NW E Oklahoma	US	us/ok/okla	35.54815	-97.6172	McDonald'	73132 OK			http://mcdonalds.com,http://www.mcdonalds.com/?cid=RF:YXT_FM:TP::Text:Referral
19	101 Thom Leland	US	us/nc/letai	34.23389	-77.9954	Taco Bell	28451 NC			http://www.tacobell.com,https://locations.tacobell.com/nc/leland/101-thomas-garst-lane.html?utm_source=y
20	1111 New Leland	US	us/nc/letai	34.21188	-78.0245	McDonald'	28451 NC			http://mcdonalds.com,http://www.mcdonalds.com/?cid=RF:YXT_FM:TP::Text:Referral
21	782 Old Hi Brentwood	US	us/tr/bren	36.04222	-86.78	Qdoba Me	37027 TN			http://www.qdoba.com,https://locations.qdoba.com/us/tn/brentwood/782-old-hickory-blvd.html
22	108 Village Leland	US	us/nc/letai	34.23448	-78.0006	McDonald'	28451 NC			http://mcdonalds.com,http://www.mcdonalds.com/?cid=RF:YXT_FM:TP::Text:Referral

# Data Link

# Dataset Overview Pt.2

Data.gov dataset with information from the 2015 CDC BRFSS Survey, highlighting each state's obesity rate.

# Data Cleaning Steps Pt.1

```
[14]: #Cleaning fast food dataset  
ff = fastfood[['province', 'latitude', 'longitude']].copy()  
  
ff = ff.dropna(subset=['province'])  
  
ff['province'] = ff['province'].str.upper().str.strip()  
  
ff.head()
```

```
[14]:  
      province    latitude   longitude  
0       NY  44.92130 -74.89021  
1       OH  39.53255 -83.44526  
2       KY  38.62736 -83.79141  
3       NY  44.95008 -74.84553  
4       OH  39.35155 -82.09728
```

```
obesity_clean = obesity[['NAME', 'Obesity']].copy()  
  
obesity_clean = obesity_clean.rename(columns={  
    'NAME': 'state_name',  
    'Obesity': 'obesity_rate'  
})  
  
obesity_clean['state_name'] = obesity_clean['state_name'].str.strip()  
  
obesity_clean['obesity_rate'] = pd.to_numeric(  
    obesity_clean['obesity_rate'],  
    errors='coerce'  
)  
  
obesity_clean = obesity_clean.dropna(subset=['obesity_rate'])  
  
obesity_clean.head()
```

```
[17]:  
      state_name  obesity_rate  
0       Texas        32.4  
1  California        24.2  
2     Kentucky        34.6
```

# Data Cleaning Steps Pt.2

```
•[15]: # of Fast Food Restaurants per State
restaurants_per_state = (
    ff.groupby('province')
    .size()
    .reset_index(name='restaurant_count')
)
restaurants_per_state.head()
```

```
[15]:   province  restaurant_count
      0       AK              14
      1       AL             236
      2       AR             151
      3       AZ             208
      4       CA             676
```

```
•[25]: #Merge fast food and obesity datasets
merged = restaurants_per_state.merge(
    obesity_clean,
    on='state_name',
    how='inner'
)
merged.head()
```

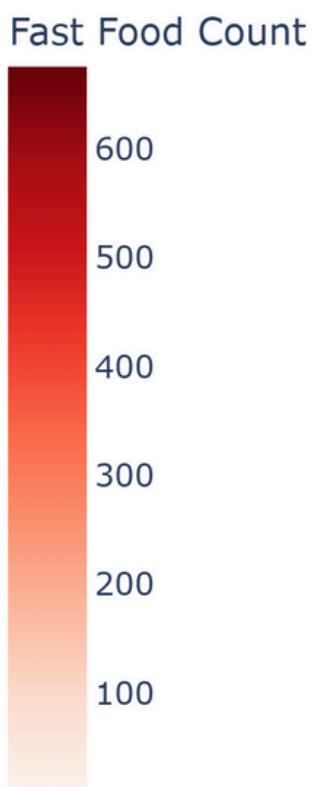
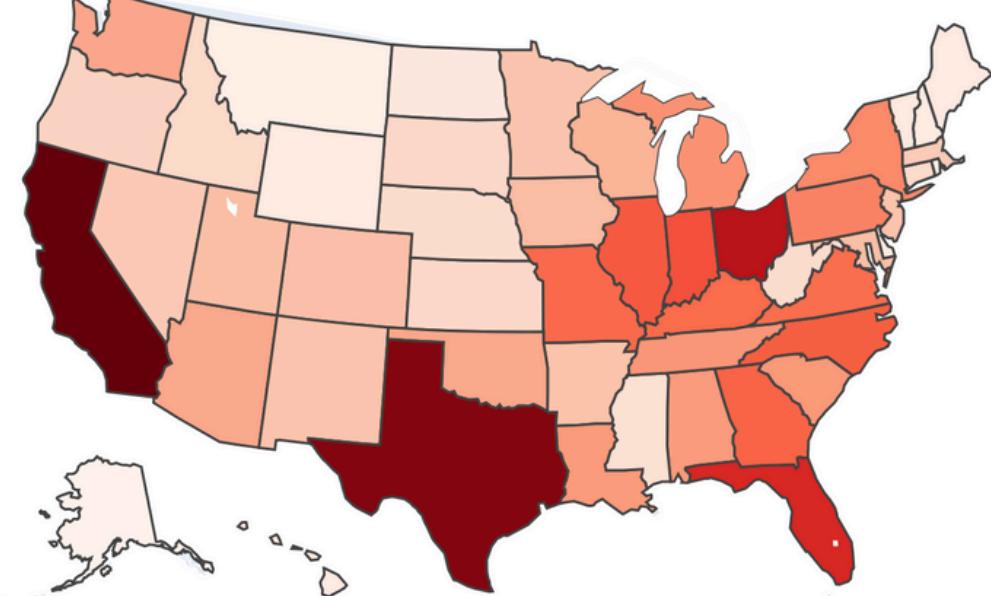
```
[25]:   province  restaurant_count  state_name  obesity_rate
      0       AK              14        Alaska      29.8
      1       AL             236       Alabama      35.6
      2       AR             151       Arkansas     34.5
      3       AZ             208       Arizona      28.4
      4       CA             676      California     24.2
```

# Insights - Charts

## Choropleth Map - Fast Food Restaurants per State Data

High-population states have a higher density of fast food restaurants

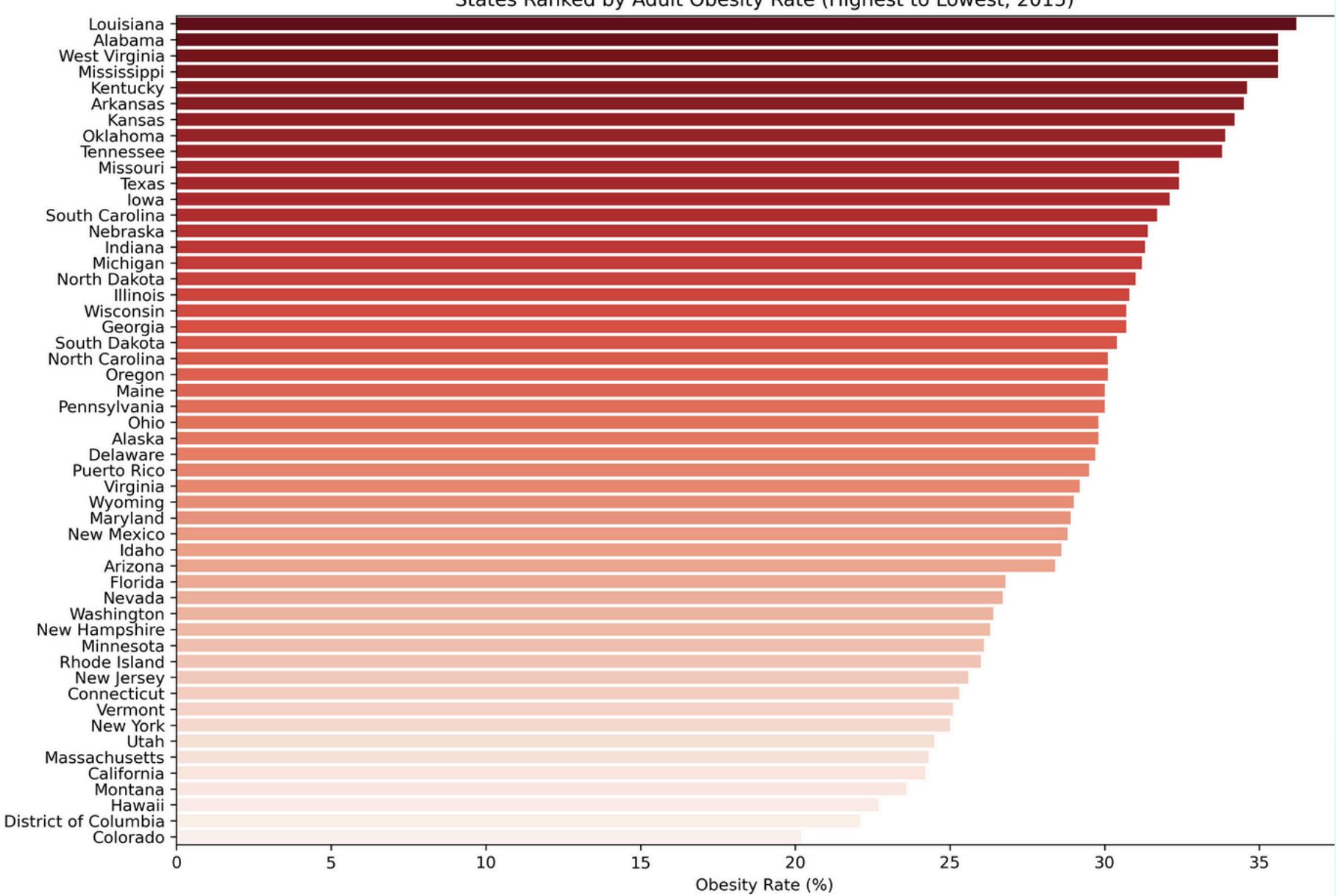
Number of Fast Food Restaurants per State



## Stacked Bar Chart - Obesity Rates per State (high to low)

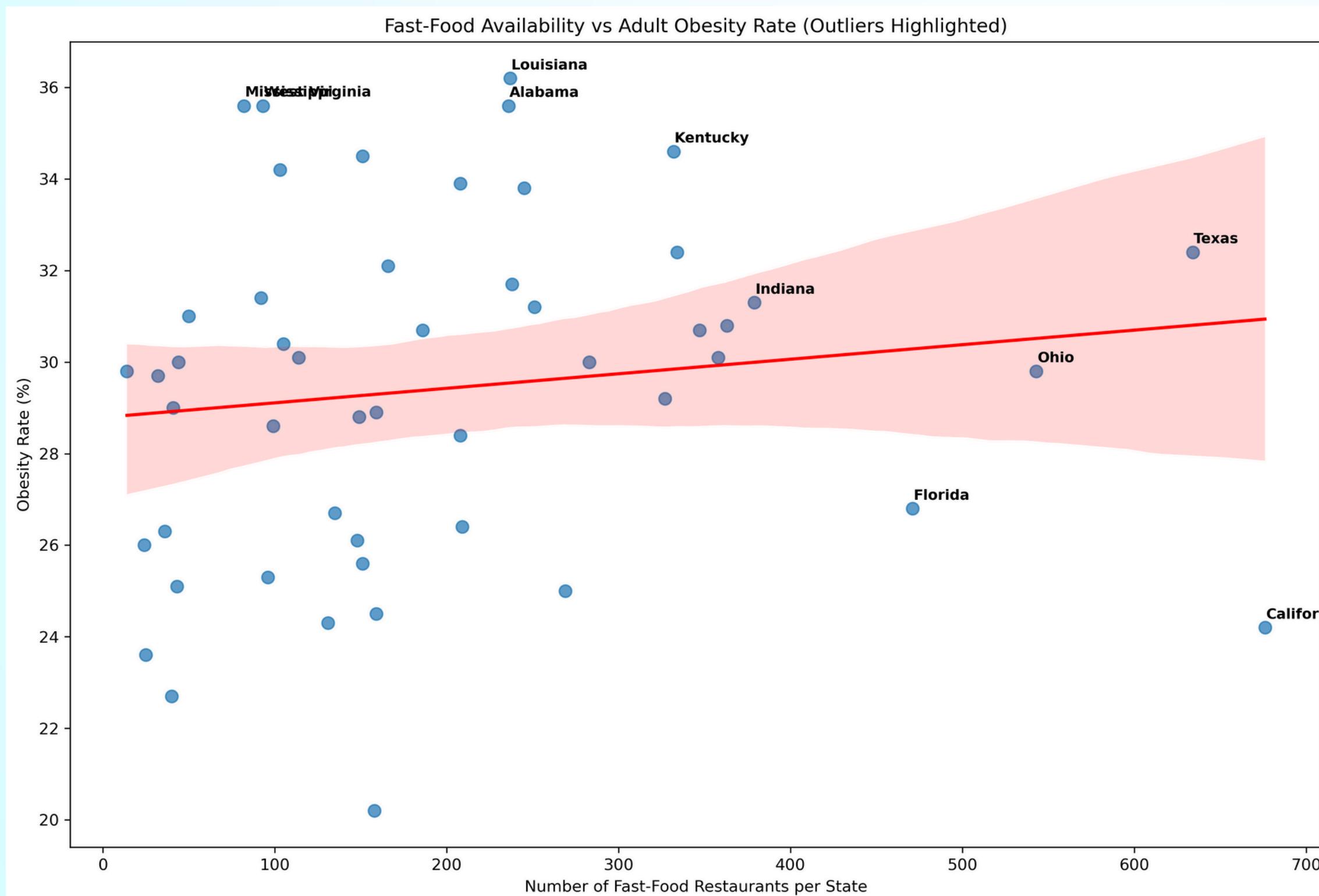
Regional Obesity Patterns-  
South & Midwest

States Ranked by Adult Obesity Rate (Highest to Lowest, 2015)



# Insights - Charts pt 2

Weak Positive Relationship between Obesity Rates & Fast Food Restaurant Density



**Correlation Coefficient: 0.13**

doesn't indicate causation only  
slight correlation between the  
two factors.

Scatter Plot with Regression Line

# Conclusion

- Obesity rates are highest in the **southern states**.
- Fast Food Density varies across states but closely follows **higher population states**.
- **Positive but weak correlation** between obesity rates & fast food density.
- Suggests other factors are in play and highlights the complexity of weight-related health issues.

# Limitations/Reflection

- datasets are from two different years: 2015 & 2018 (assuming fast food density hasn't changed as much).
- couldn't find per capita fast food restaurant density data ( helps with avoiding under- or overestimation).
- Overall, this project helped me visualize and plan the process of exploratory data analysis.

# Thank you

