ByteKarma

TEAM MEMBERS
Jaiditya Abhineet Kapoor
Guransh Chugh

Algorithm used and Accuracy

Target Variable
Data_Value = Mortality Rate
Ideally Mortality Rate should be low

XGBoost

```
model = xb.XGBRegressor(n_estimators=100, learning_rate=0.1, random_state=42)
model.fit(X_train, y_train, eval_set=[(X_val, y_val)], early_stopping_rounds=10, verbose=True)
y_pred = model.predict(X_test)

rmse = mean_squared_error(y_test, y_pred, squared=False)
r2 = r2_score(y_test, y_pred)

print(f"Root Mean Squared Error (RMSE): {rmse}")
print(f"R²: {r2}")
```

```
Root Mean Squared Error (RMSE): 0.014986415146008 49
R²: 0.9997763903871116
```

Linear Regression

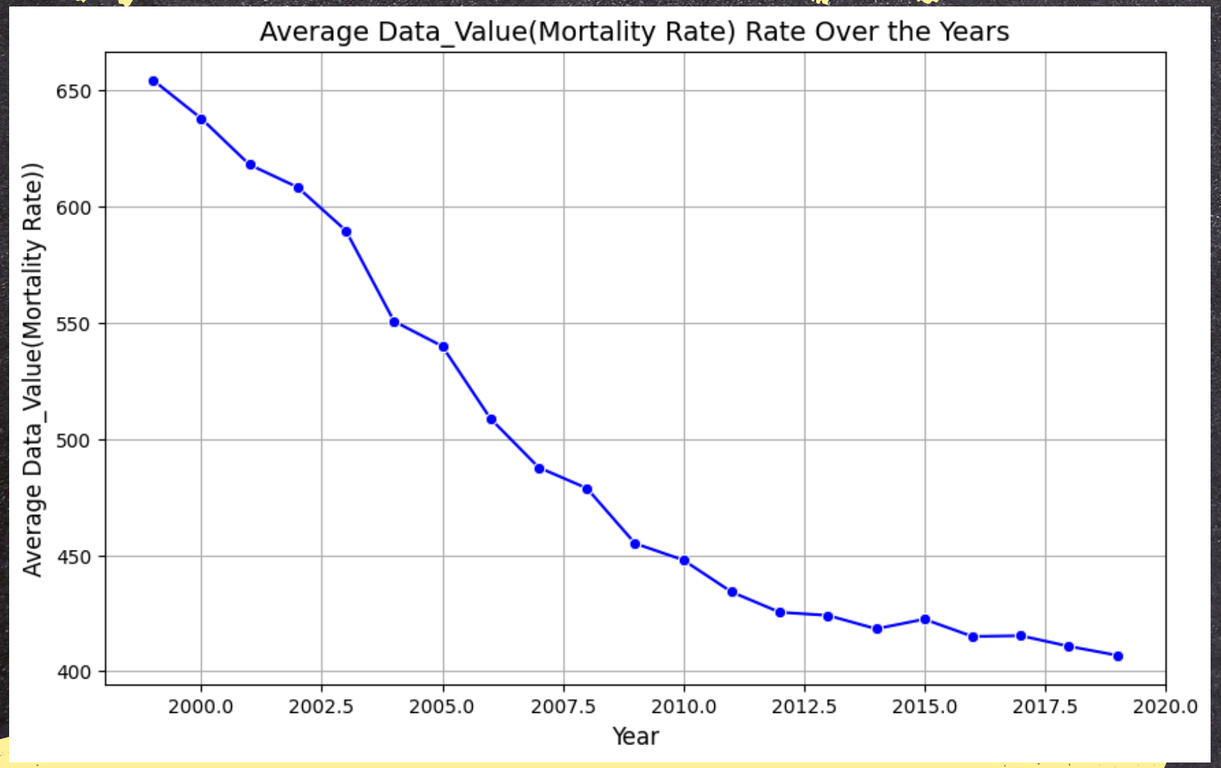
```
lr = LinearRegression()
lr.fit(X_train,y_train)
y_pred = lr.predict(X_test)
rmse = mean_squared_error(y_test, y_pred, squared=False)
r2 = r2_score(y_test, y_pred)

print(f"Root Mean Squared Error (RMSE): {rmse}")
print(f"R²: {r2}")
```

```
Root Mean Squared Error (RMSE): 0.014832329052385896
R²: 0.9997809649304483
```

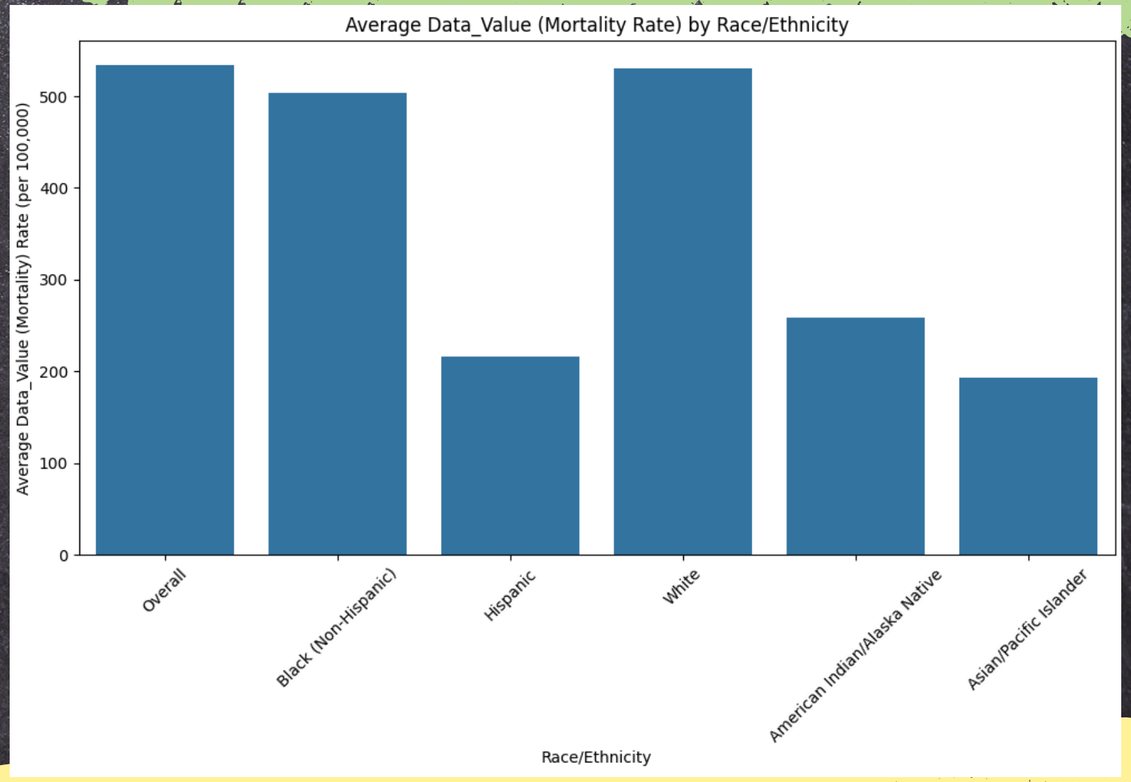
DATA VISUALIZATION AND INSIGHTS

Average Data_Value over years



The drop in average mortality rates over the years shows that public health efforts are working. However, ongoing efforts are needed to keep up and speed up this progress.

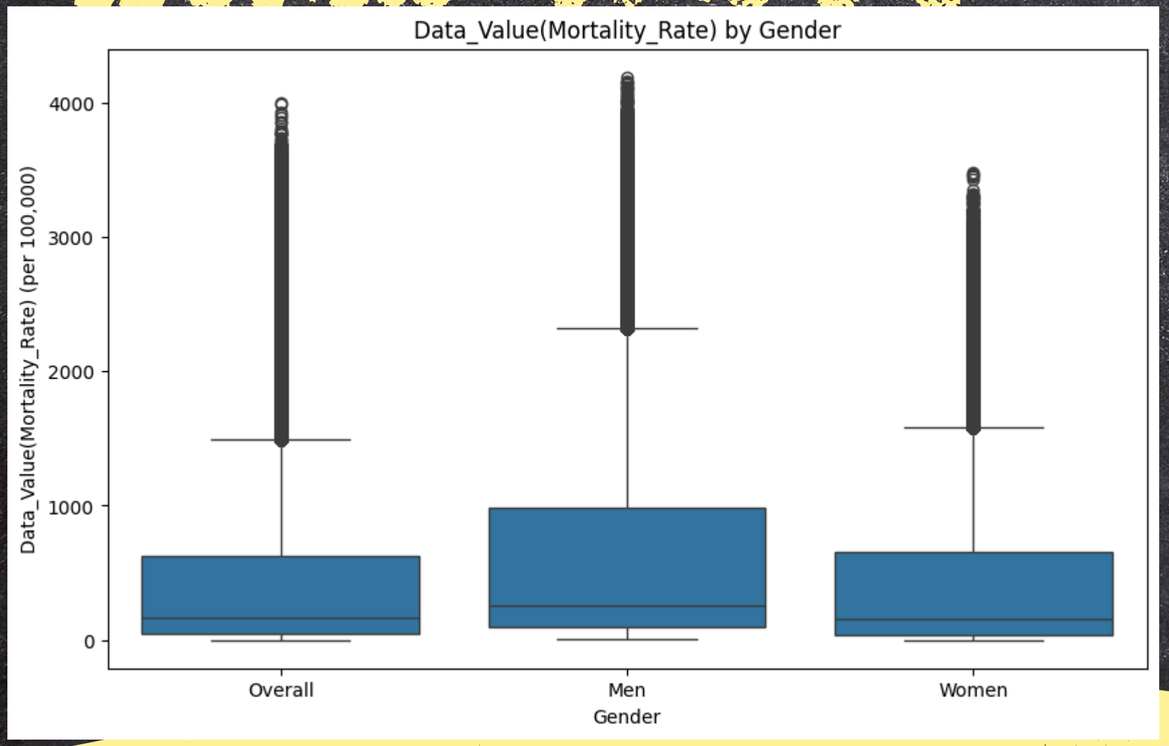
Average Data_Value by Ethnicity



The differences in mortality rates between ethnic groups highlight the need for focused health programs and policies to improve health outcomes, especially for communities with higher rates

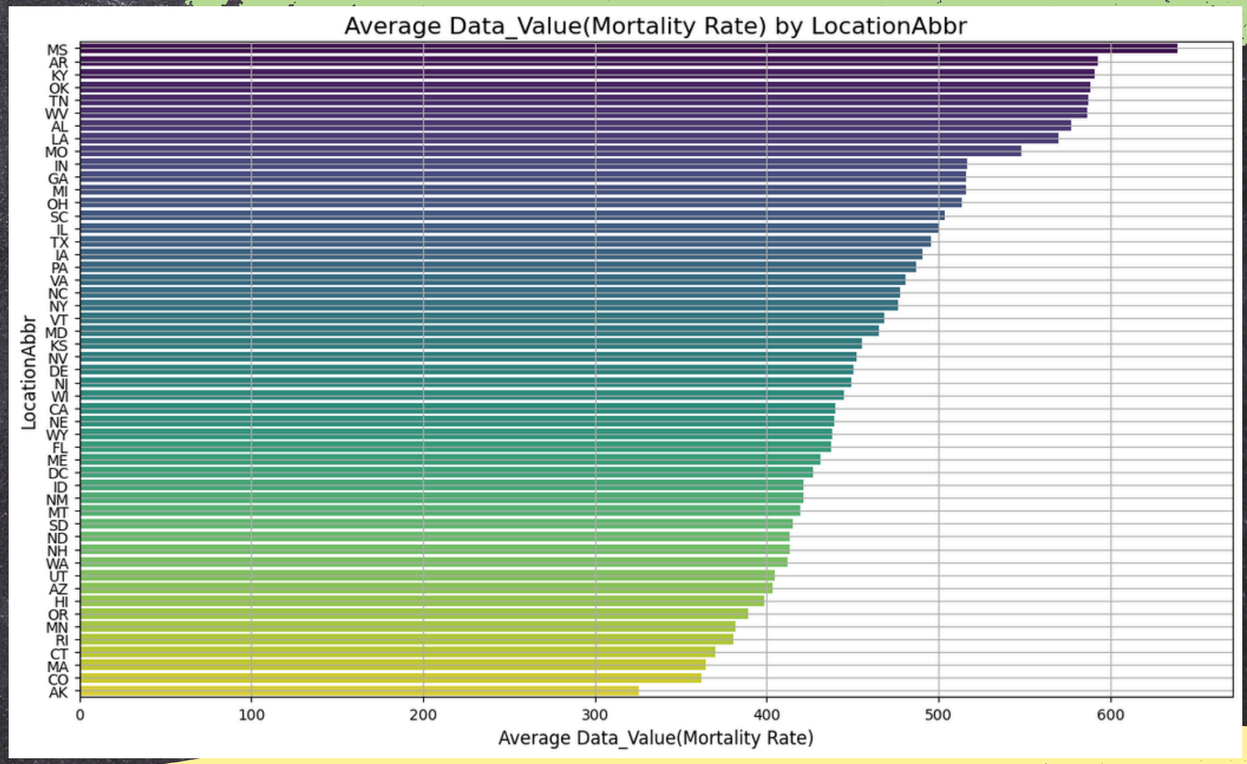
DATA VISUALIZATION AND INSIGHTS

Mortality Rate by Gender



Mortality rates show a higher prevalence in males compared to females. This gender disparity suggests potential biological, lifestyle, or healthcare access factors influencing heart disease outcomes across different genders.

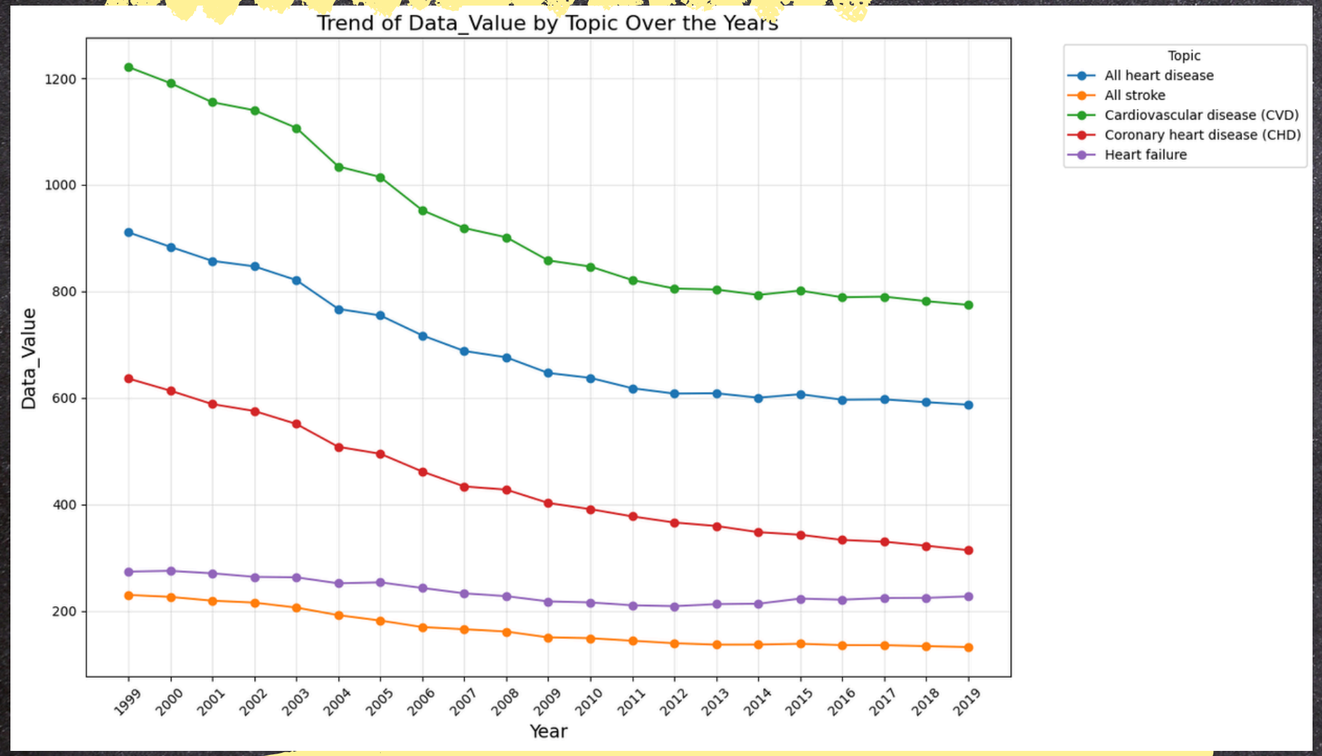
Mortality Rate by LocationAbbr



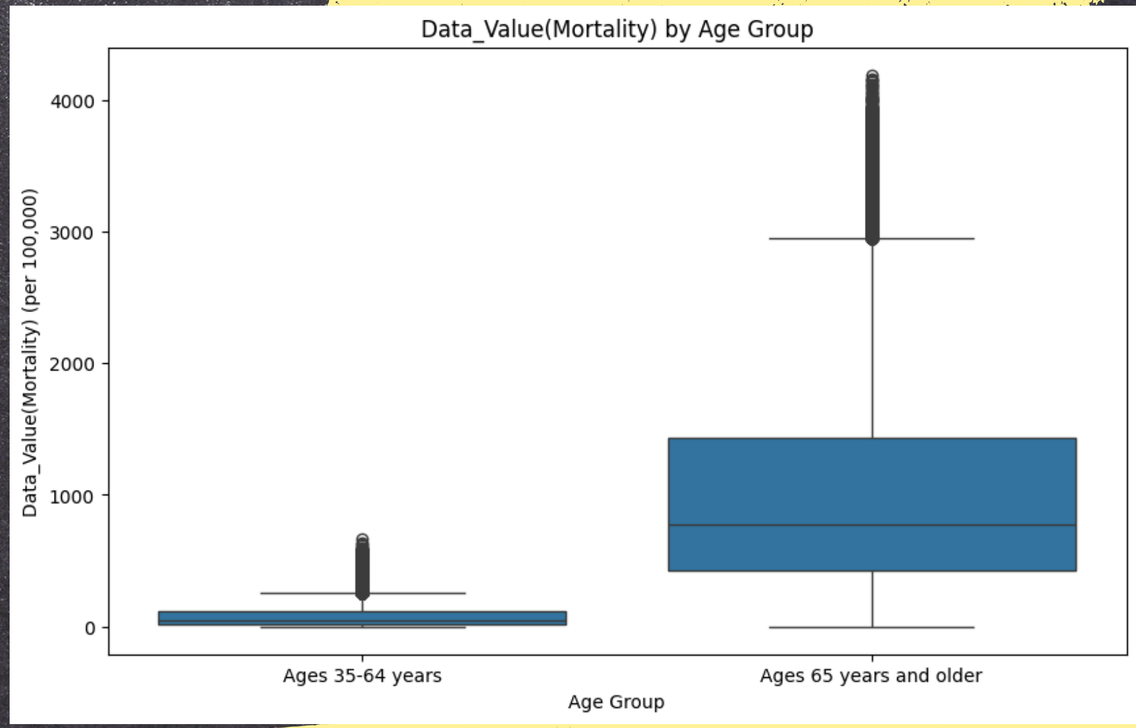
Identify the city with the highest mortality rate to prioritize healthcare resource allocation, targeted intervention programs, health education campaigns, improved medical facilities, and preventive care measures for effective mortality reduction.

DATA VISUALIZATION AND INSIGHTS

Data_Value Rate trend

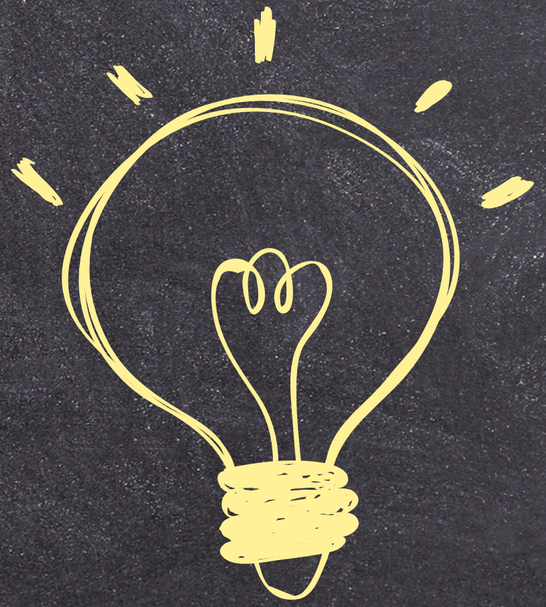


Data_Value vs Age Group



Identifying topics with increasing trends over the years can help guide research focus, ensuring that resources are directed toward emerging public health concerns that require urgent attention and intervention

Since the data indicates that individuals above **65** years are most affected, targeted health campaigns, preventive care programs, and specific resource allocations could significantly reduce mortality risks in this age group



THANK YOU