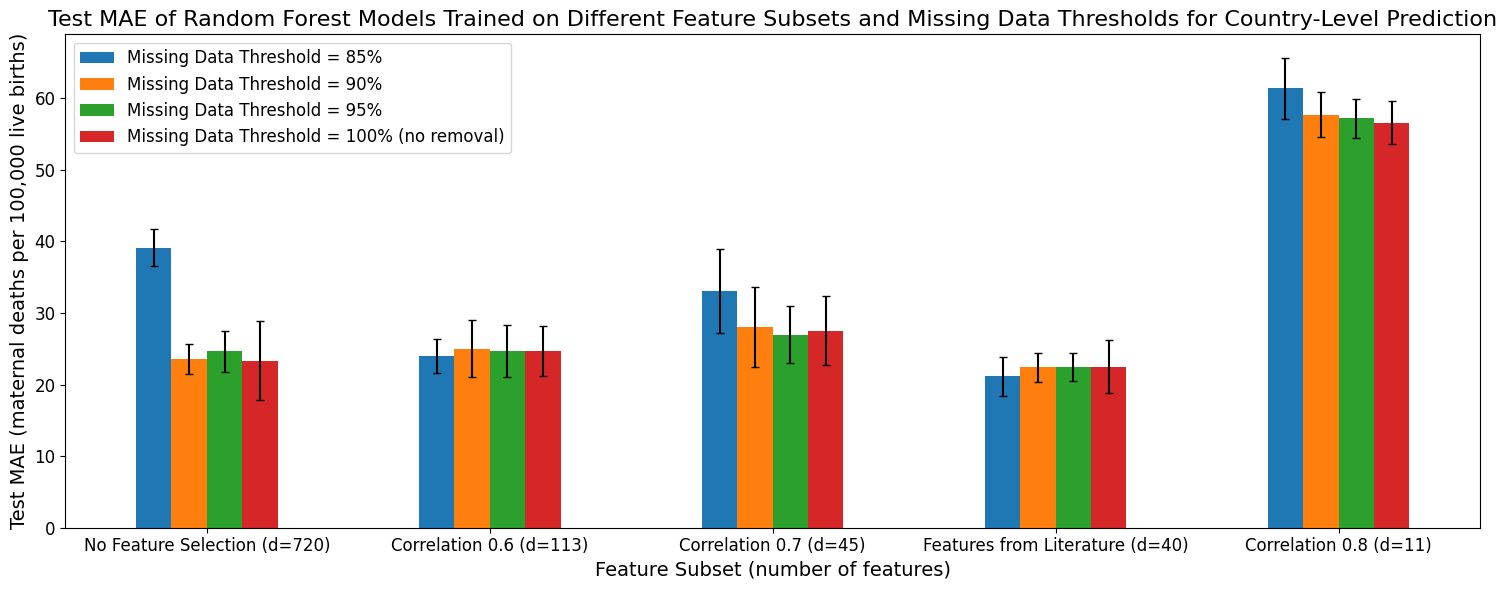
## 9. Appendix

### 9.1 Additional Performance Metrics to Quantify Base Estimator Predictive Error on Different Feature Subsets and Missing Data Removal Thresholds

#### 9.11 Country-Level Prediction

##### 9.111 Random Forest

a)



b)

A graph of different colored bars

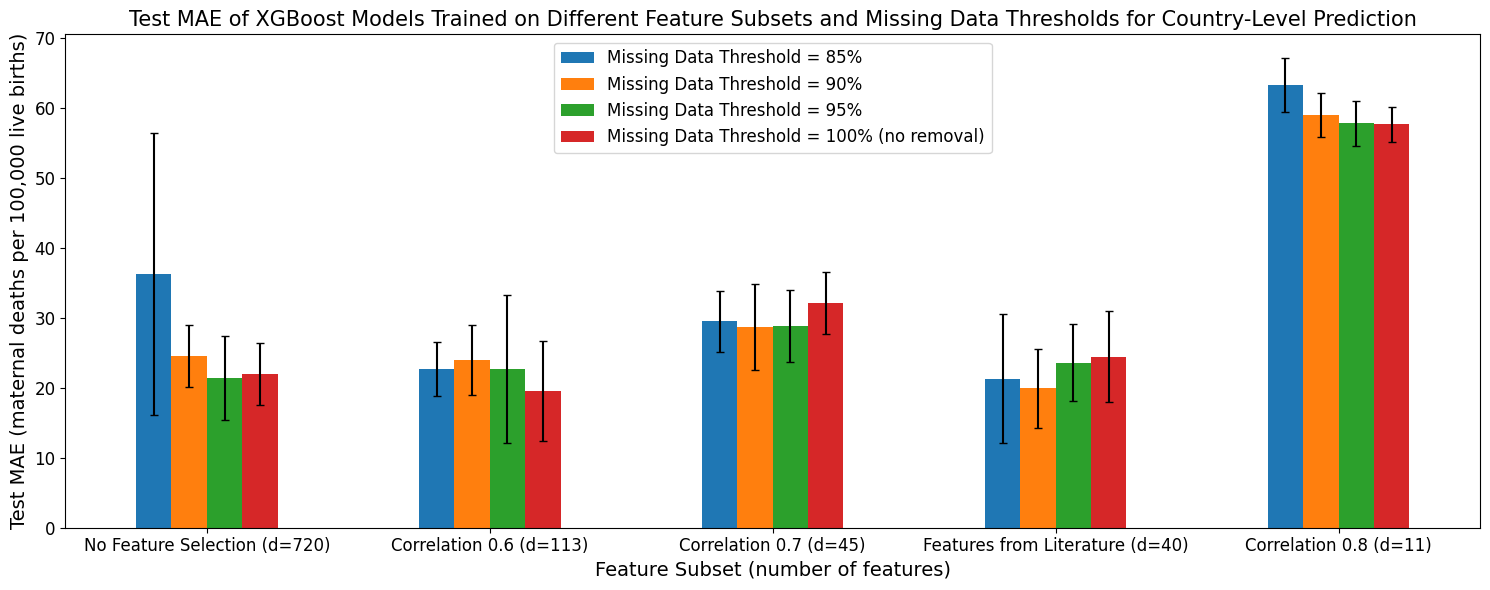
AI-generated content may be incorrect.

c)

A screenshot of a graph

AI-generated content may be incorrect.

##### 9.112 XGBoost



a)

b)

A graph of different colored bars

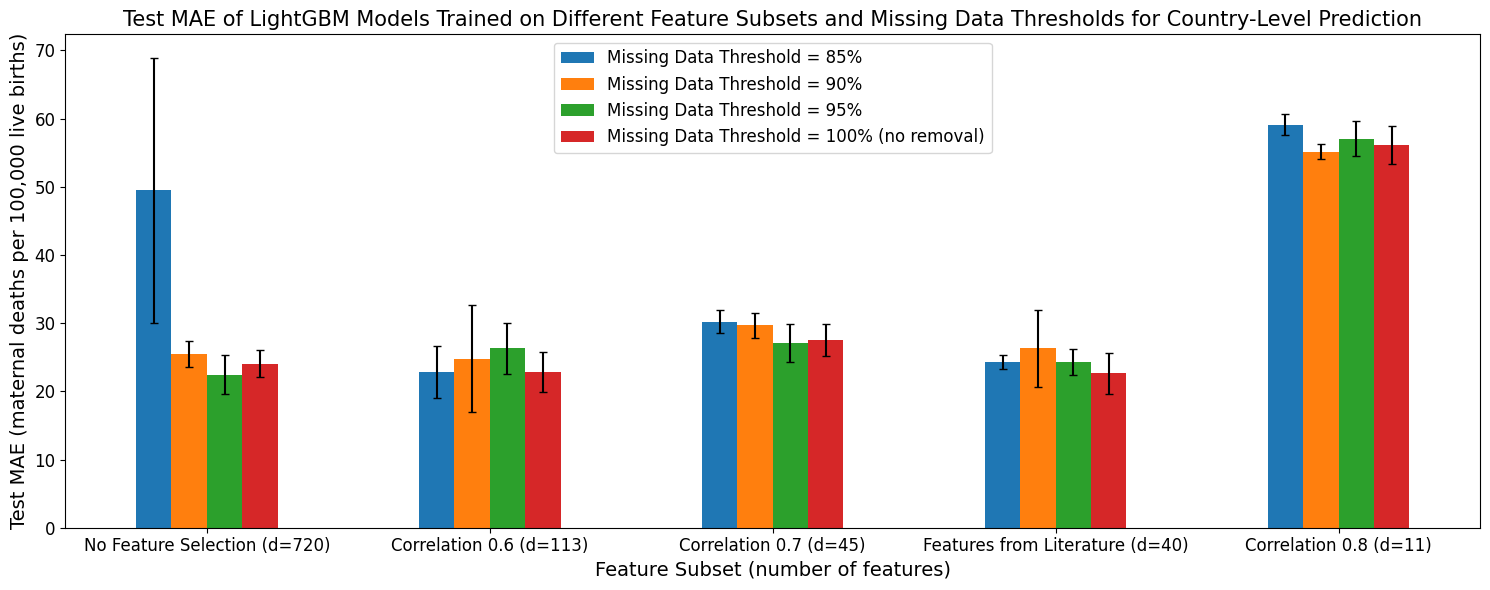
AI-generated content may be incorrect.

c)

A graph of a graph

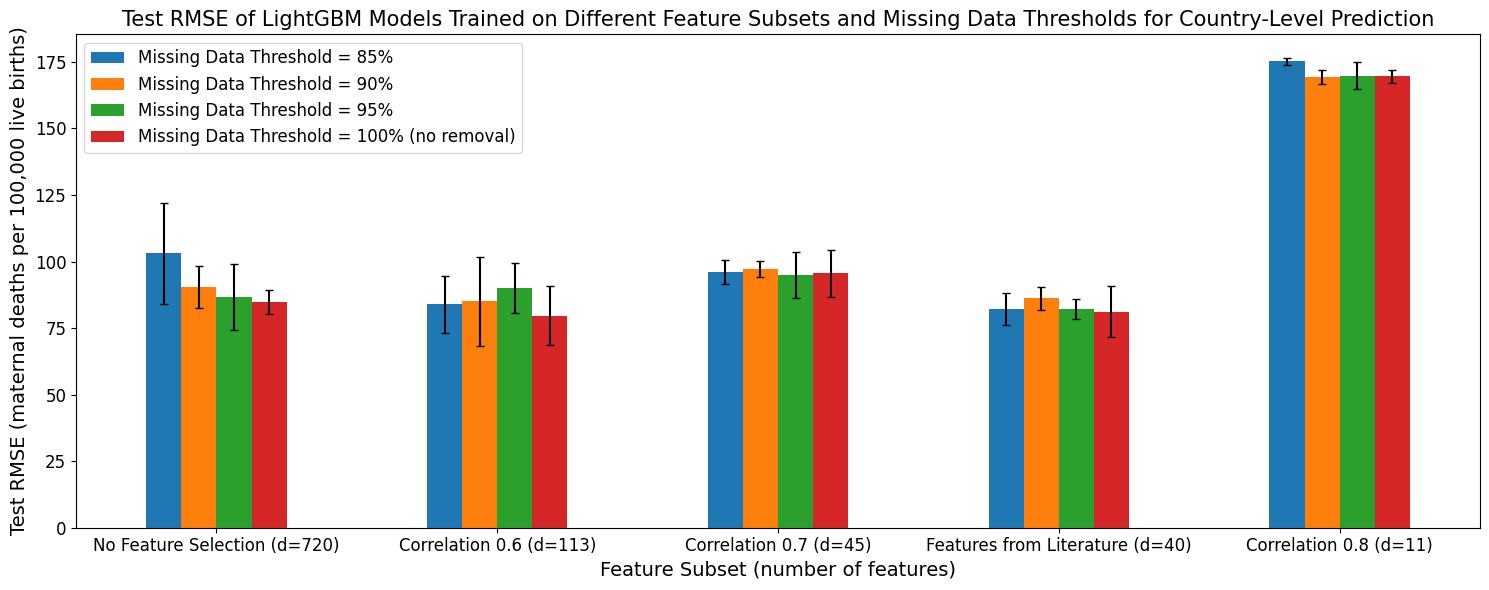
AI-generated content may be incorrect.

##### 9.113 LightGBM

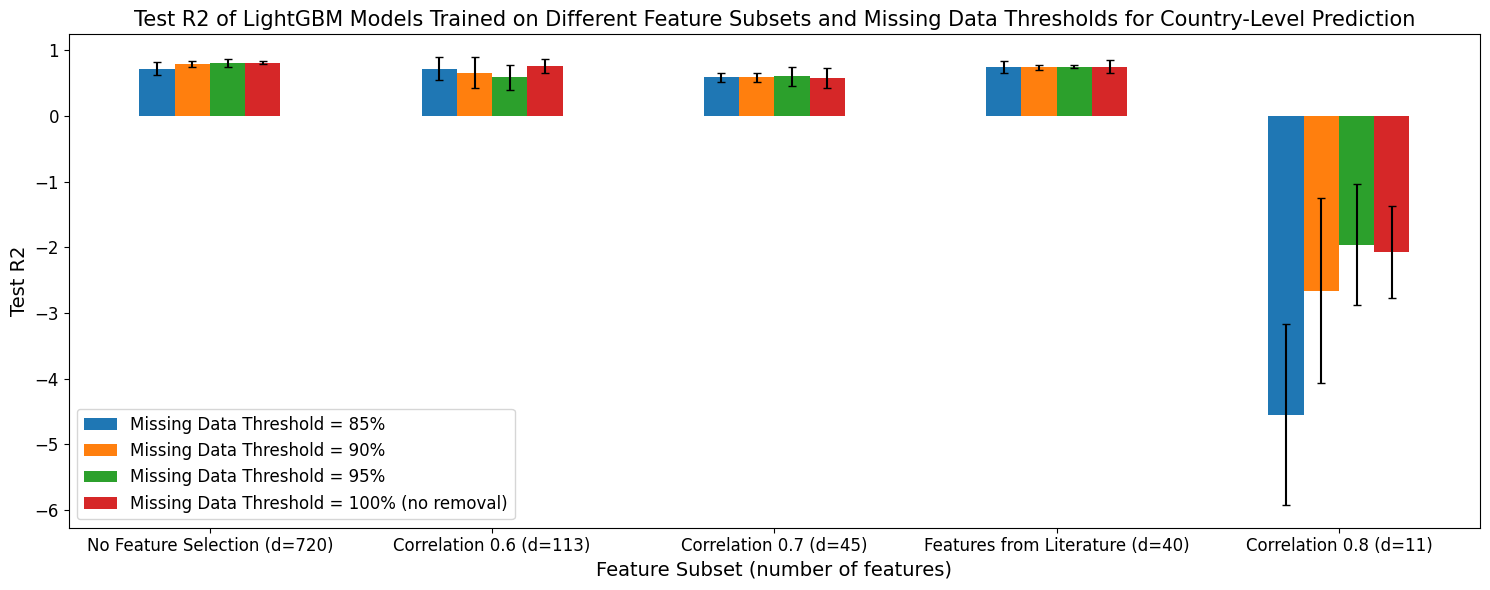


a)

b)



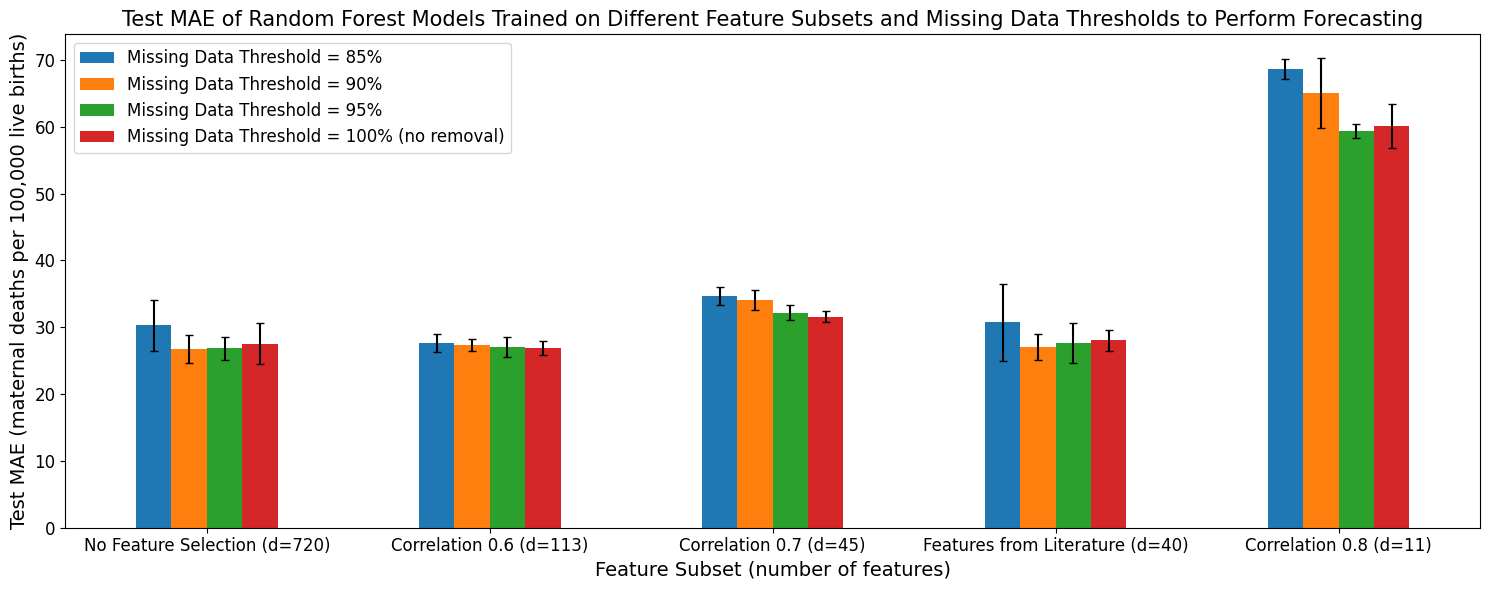
c)



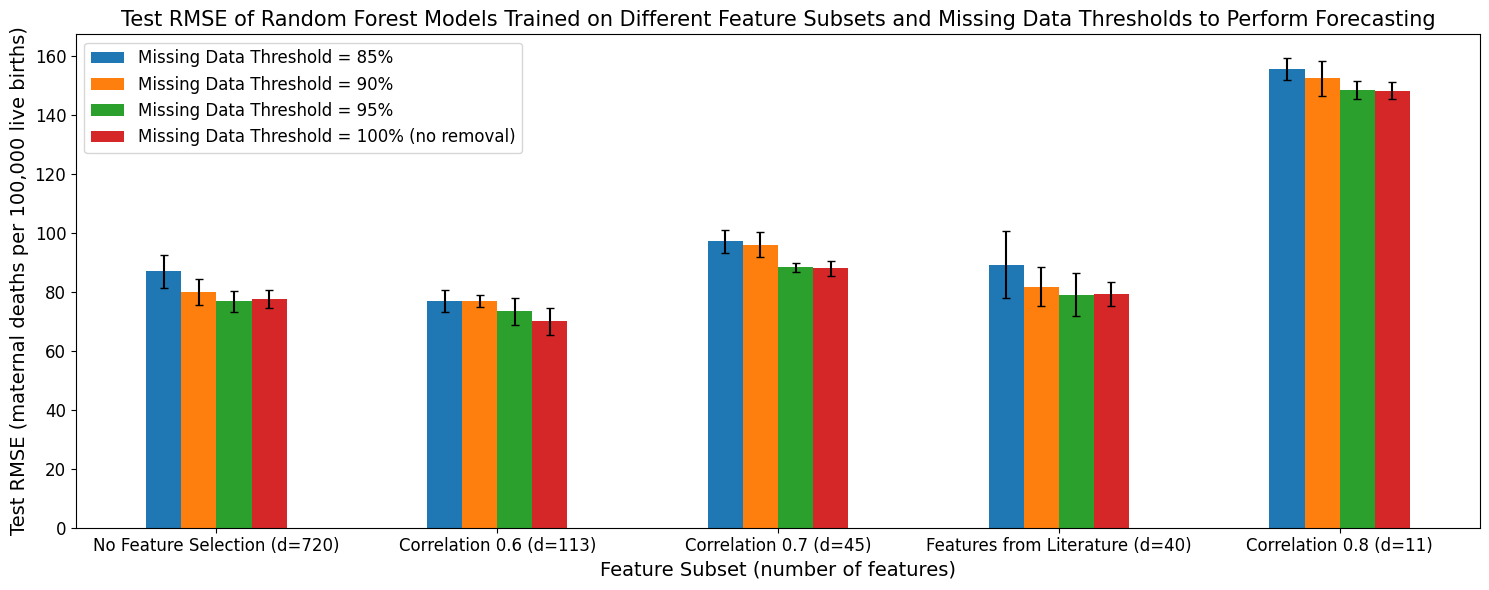
#### 9.12 Forecasting

##### 9.121 Random Forest

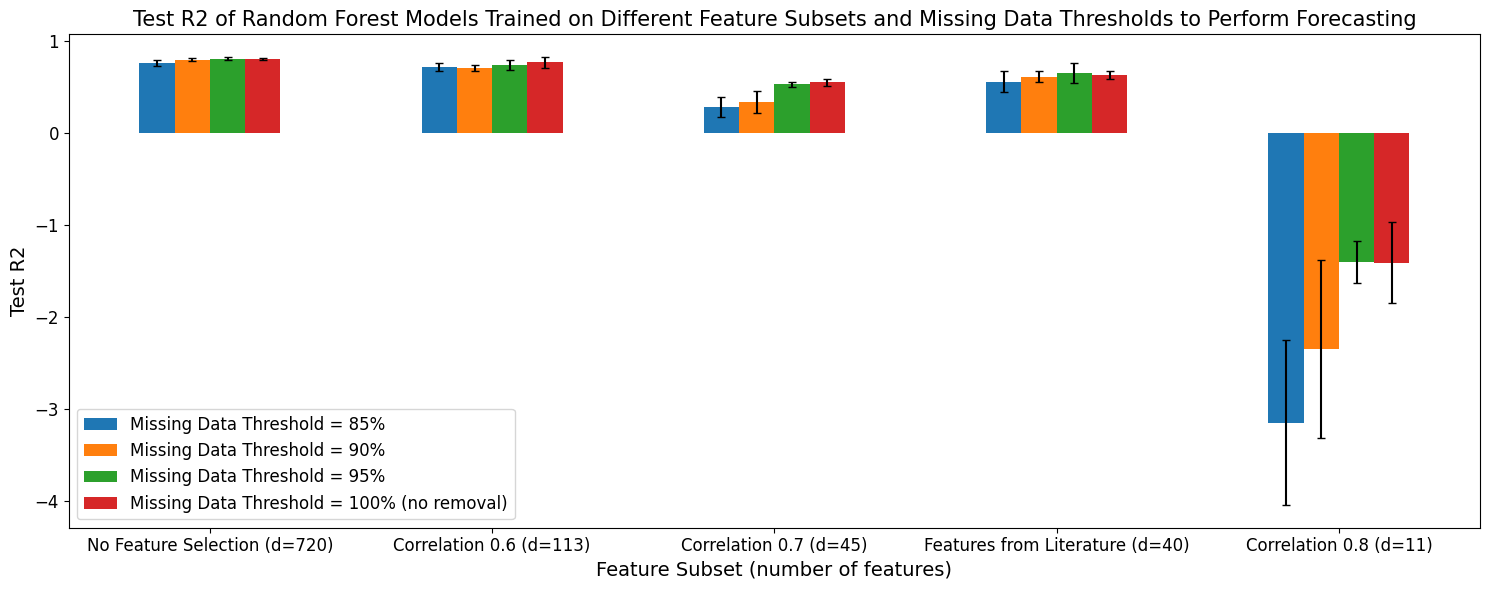
a)



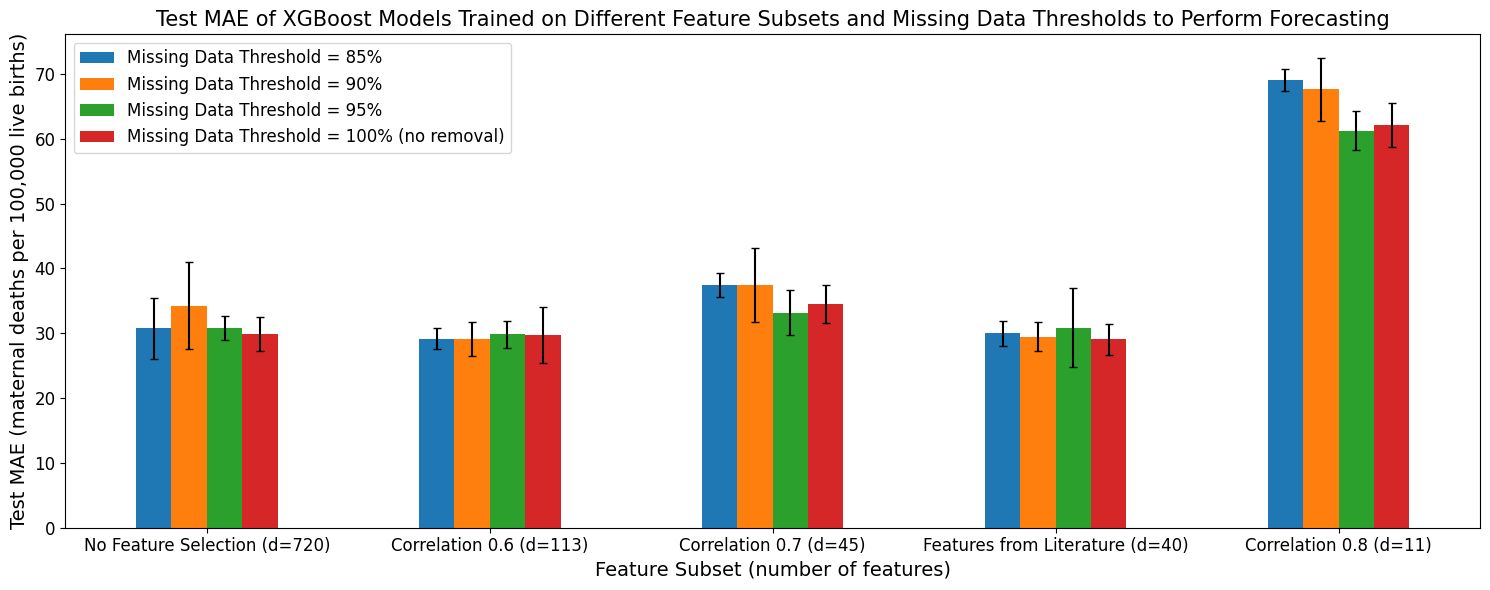
b)



c)

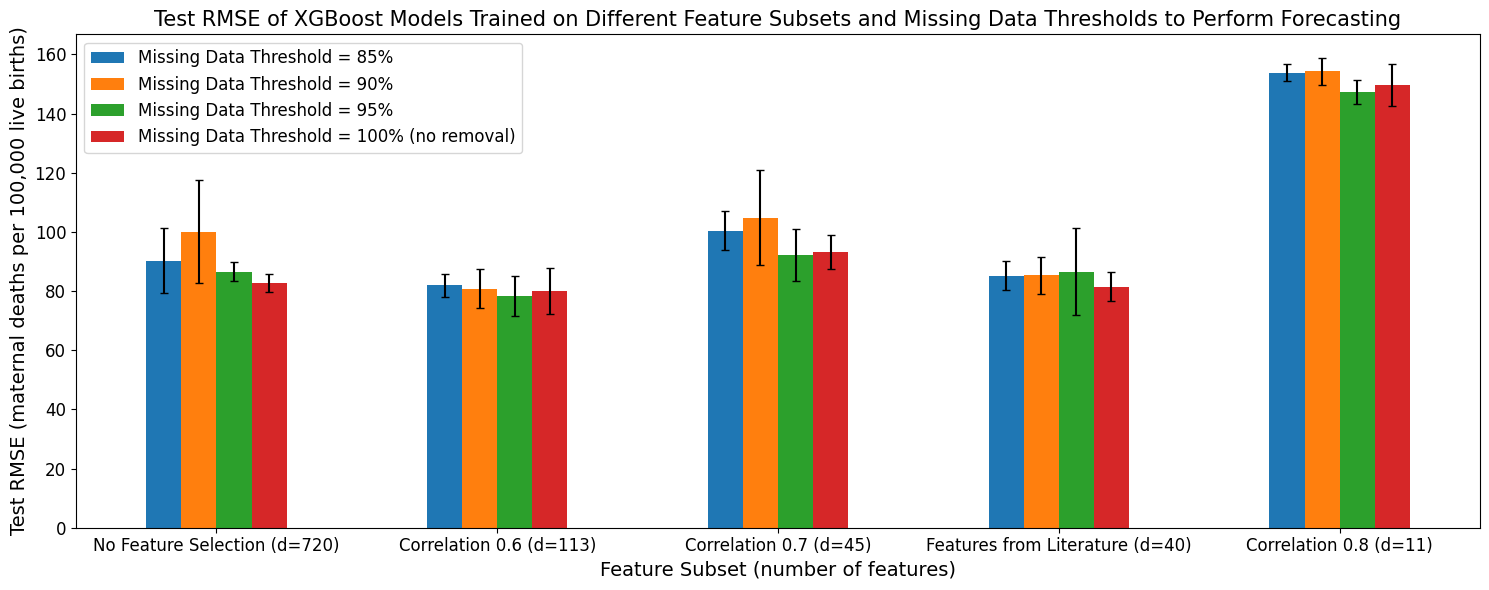


##### 9.122 XGBoost

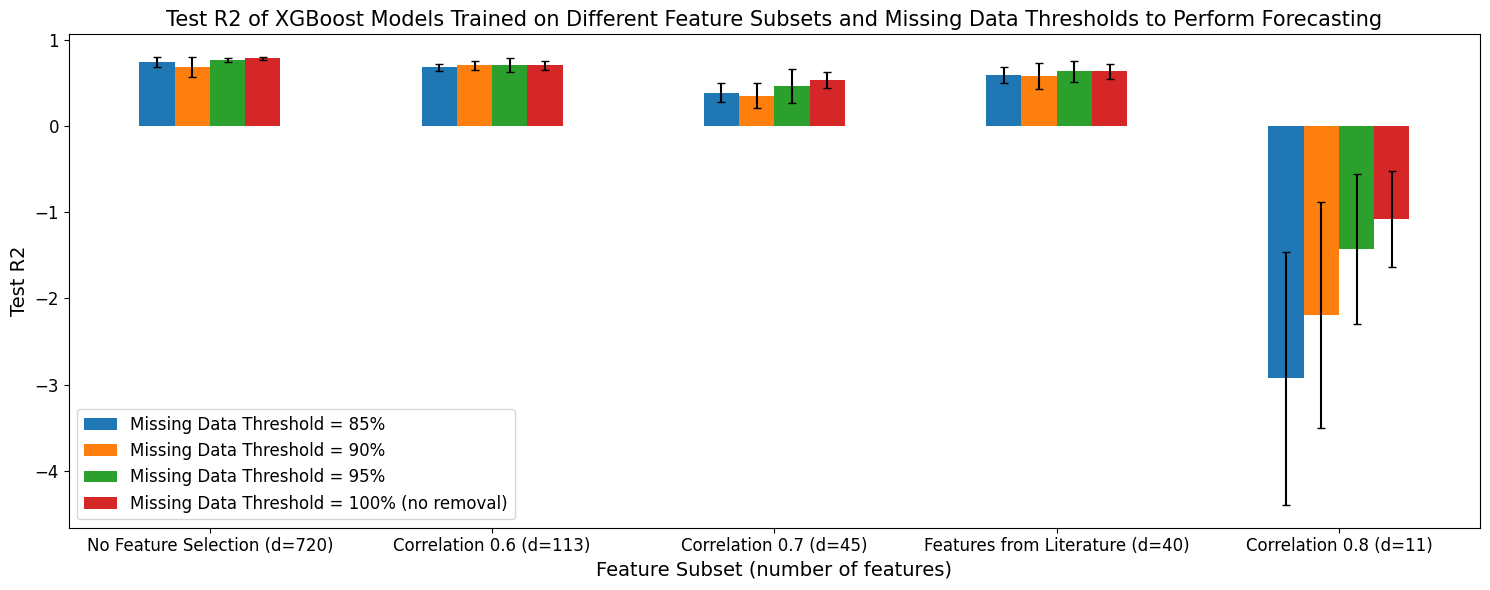


a)

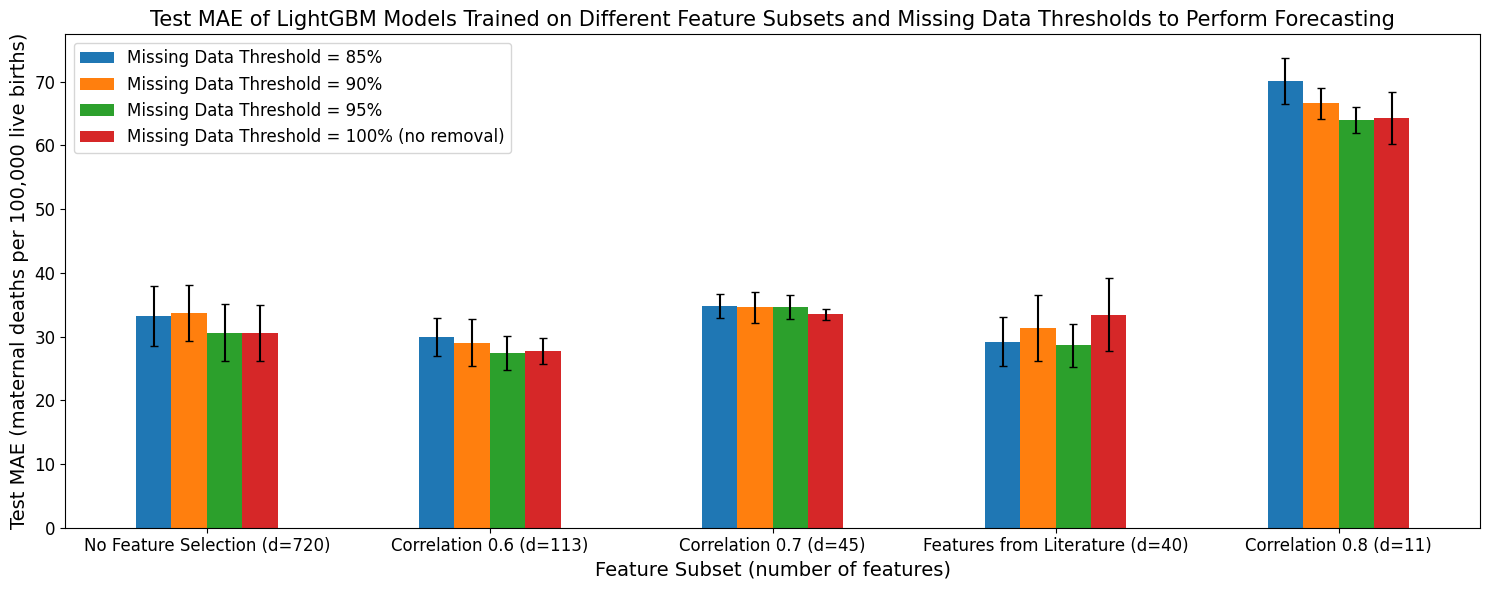
b)



c)

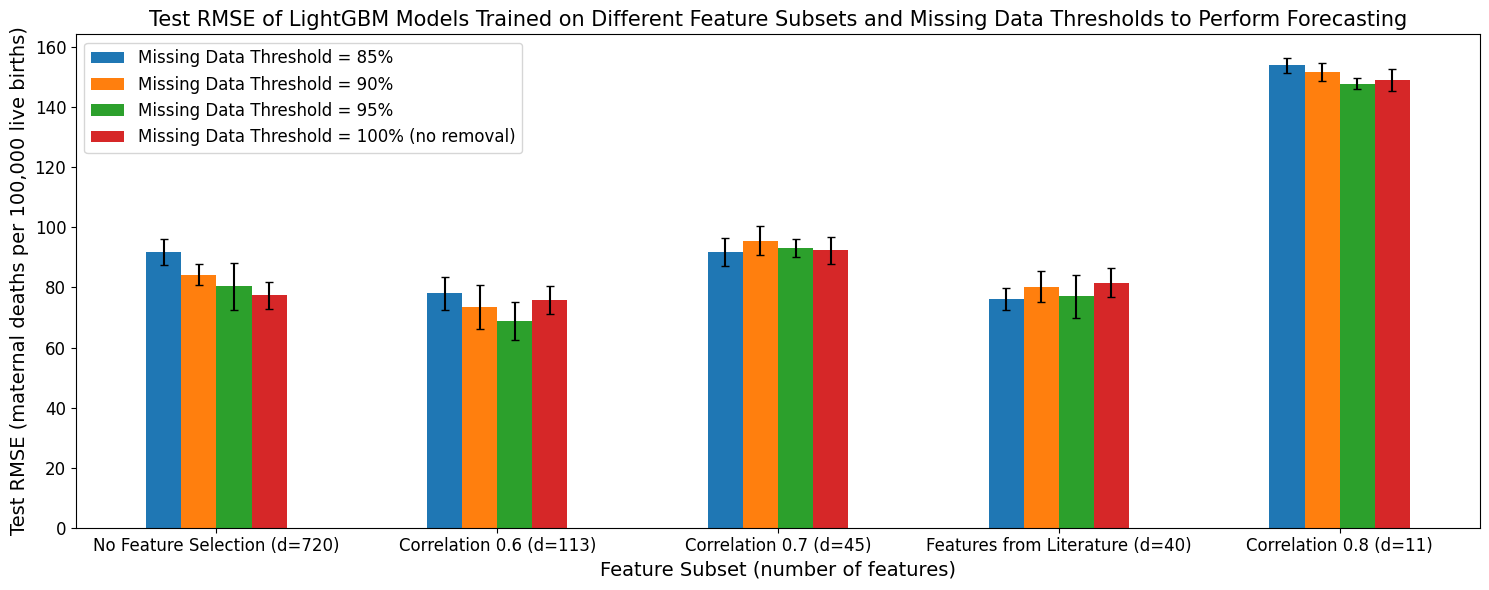


##### 9.123 LightGBM



a)v

b)



c)

A screenshot of a graph

AI-generated content may be incorrect.

### 9.2 Additional Performance Metrics to Compare Predictive Performance of Different Types of Base Estimators Trained Different Feature Subsets and Missing Data Removal Thresholds

#### 9.21: Country-Level Prediction

A screenshot of a graph

AI-generated content may be incorrect.

a)

A graph of different colored lines

AI-generated content may be incorrect.

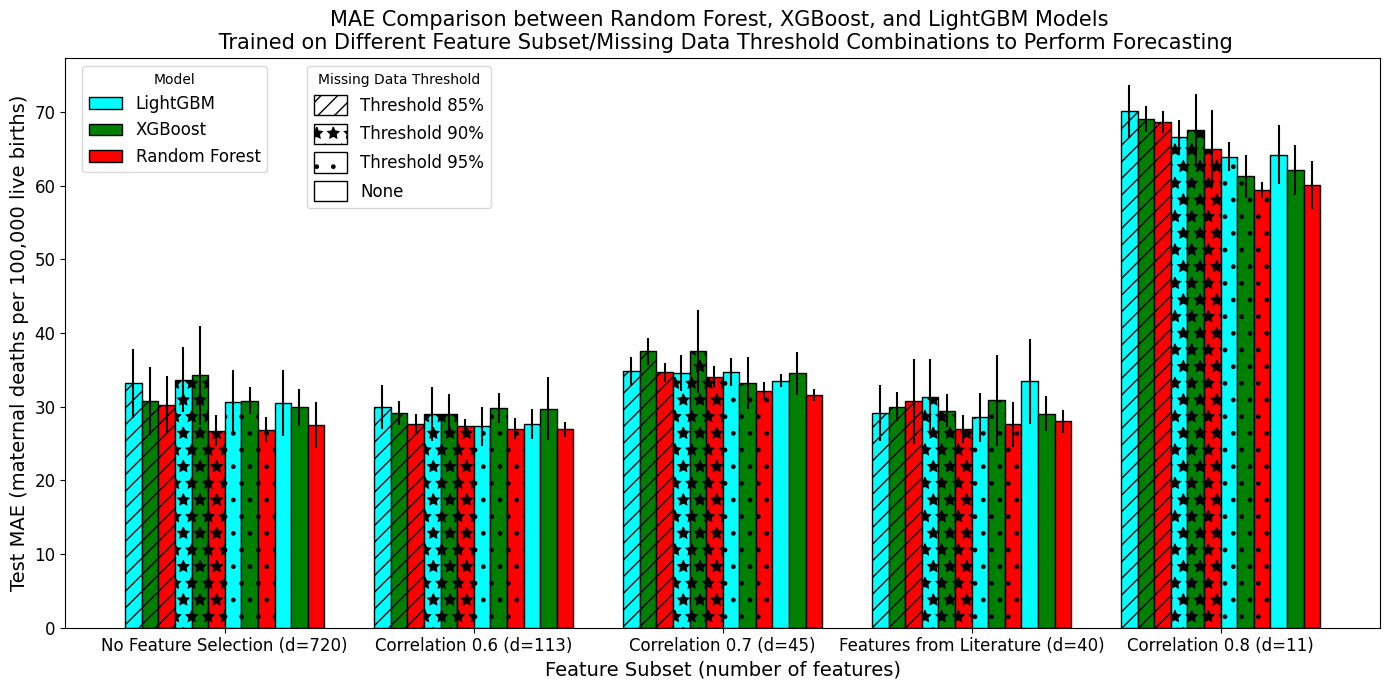
b)

A screenshot of a computer

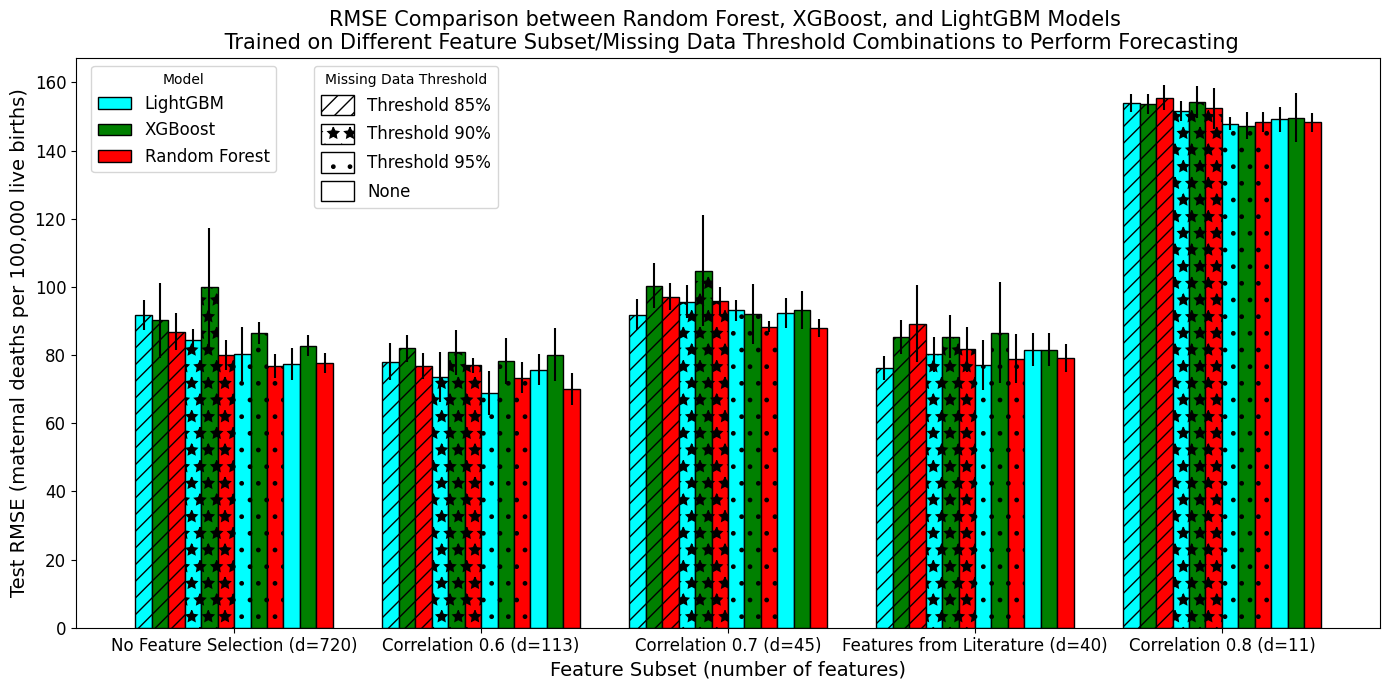
AI-generated content may be incorrect.

c)

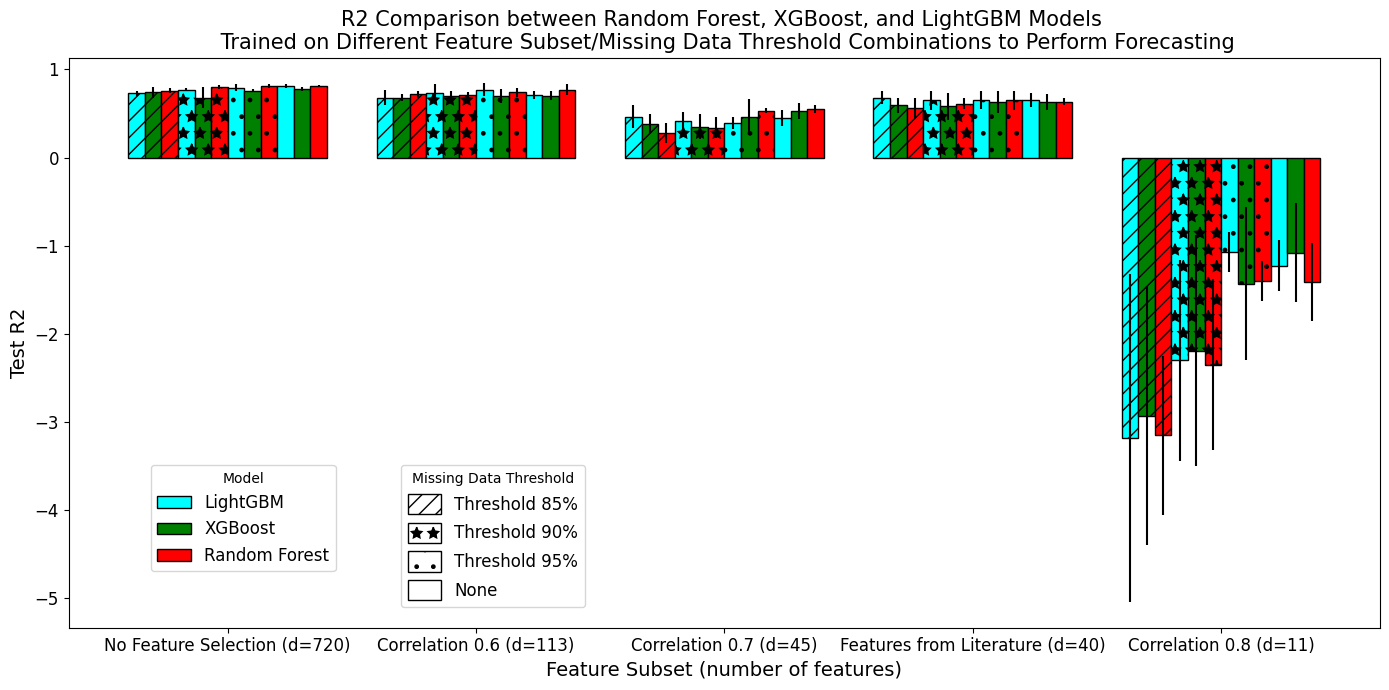
#### 9.22: Forecasting



a)



b)



c)

### 9.3 Additional Performance Metrics to Compare Stacking versus Voting Ensemble Models

#### 9.311: Country-Level Prediction: Additional Performance Measures Comparing Stacking versus Voting Ensemble

a)

A graph of blue squares

AI-generated content may be incorrect. A graph of blue squares

AI-generated content may be incorrect. A graph of blue rectangular objects

AI-generated content may be incorrect.

c)

b)

#### 9.312: Forecasting: Additional Performance Measures Comparing Stacking versus Voting Ensemble

A graph of blue rectangular objects

AI-generated content may be incorrect.

b)

a)

A graph of blue rectangular objects

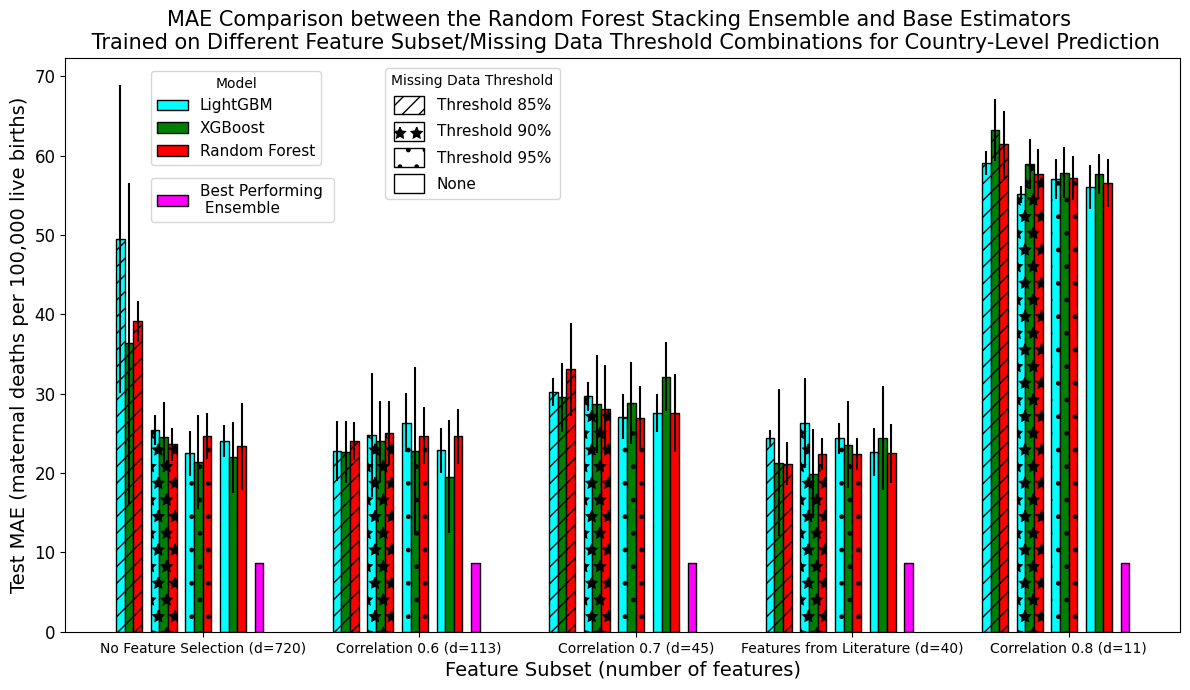
AI-generated content may be incorrect.

A graph of blue rectangular objects

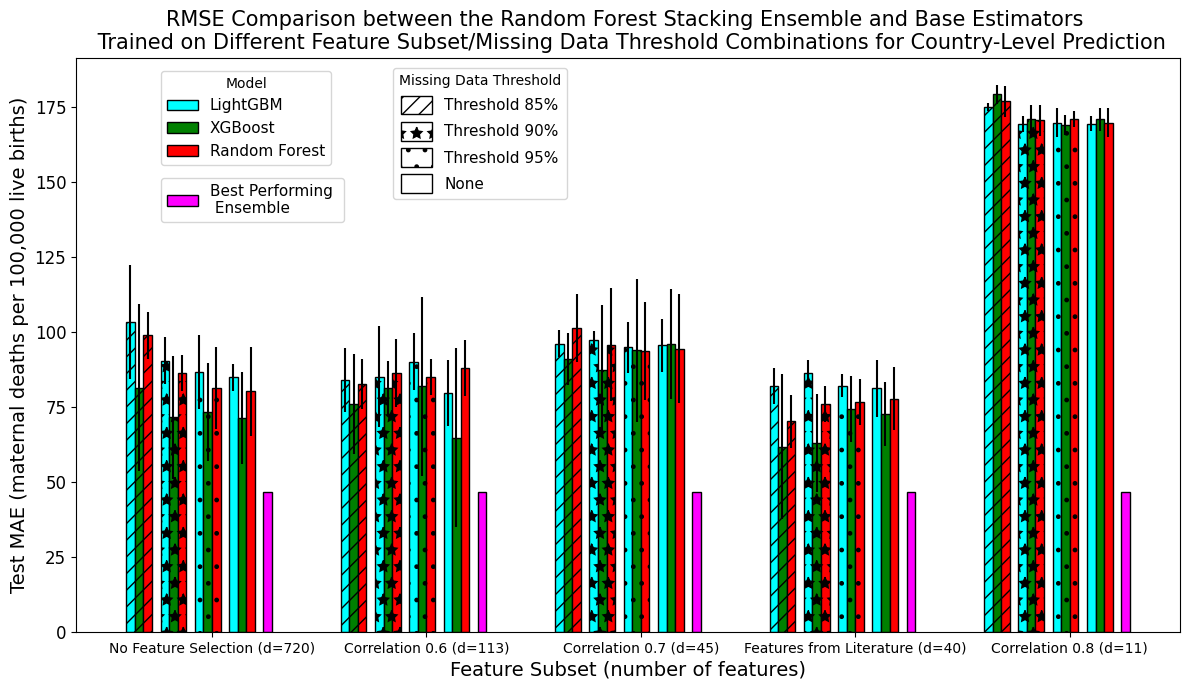
AI-generated content may be incorrect.

c)

#### 9.321: Country-Level Prediction: Additional Performance Metrics to Compare Stacking versus Voting Ensemble Models Trained on All Base Estimators



a)



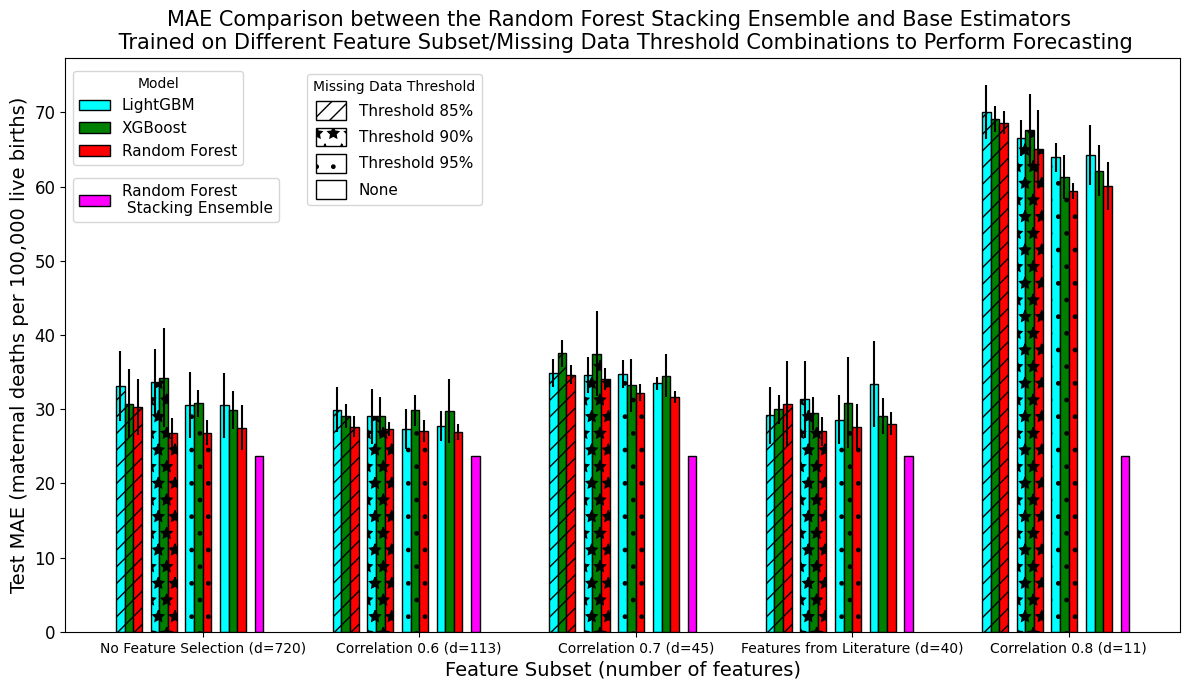
b)

A screenshot of a computer

AI-generated content may be incorrect.

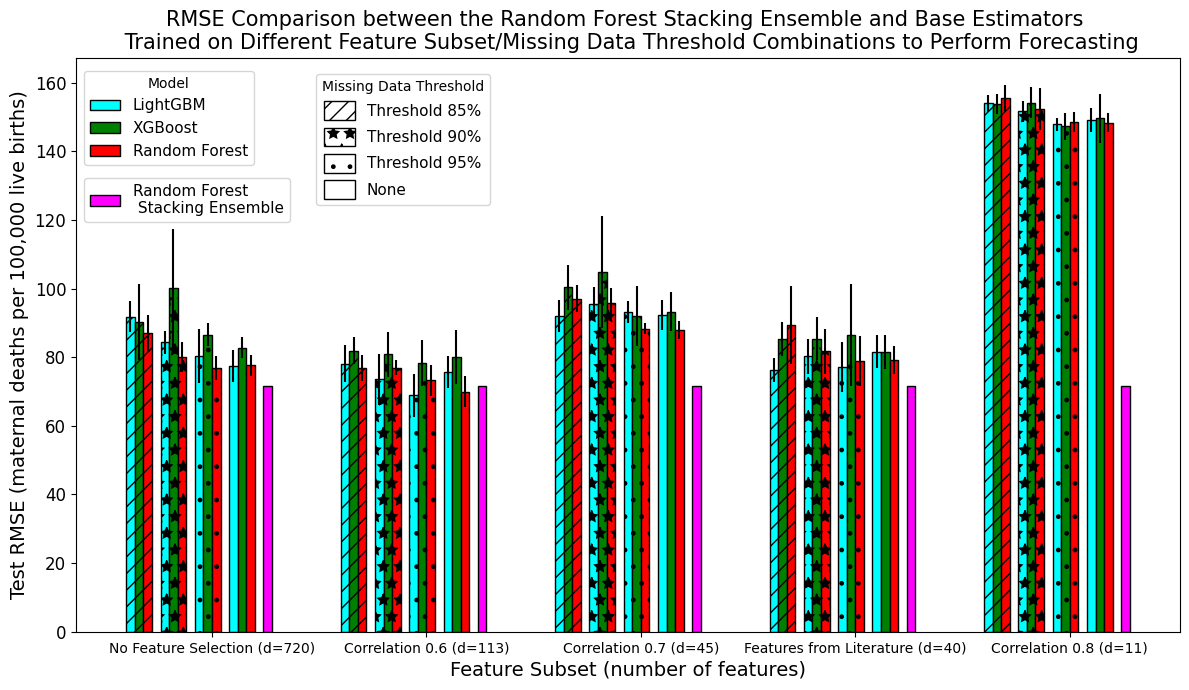
c)

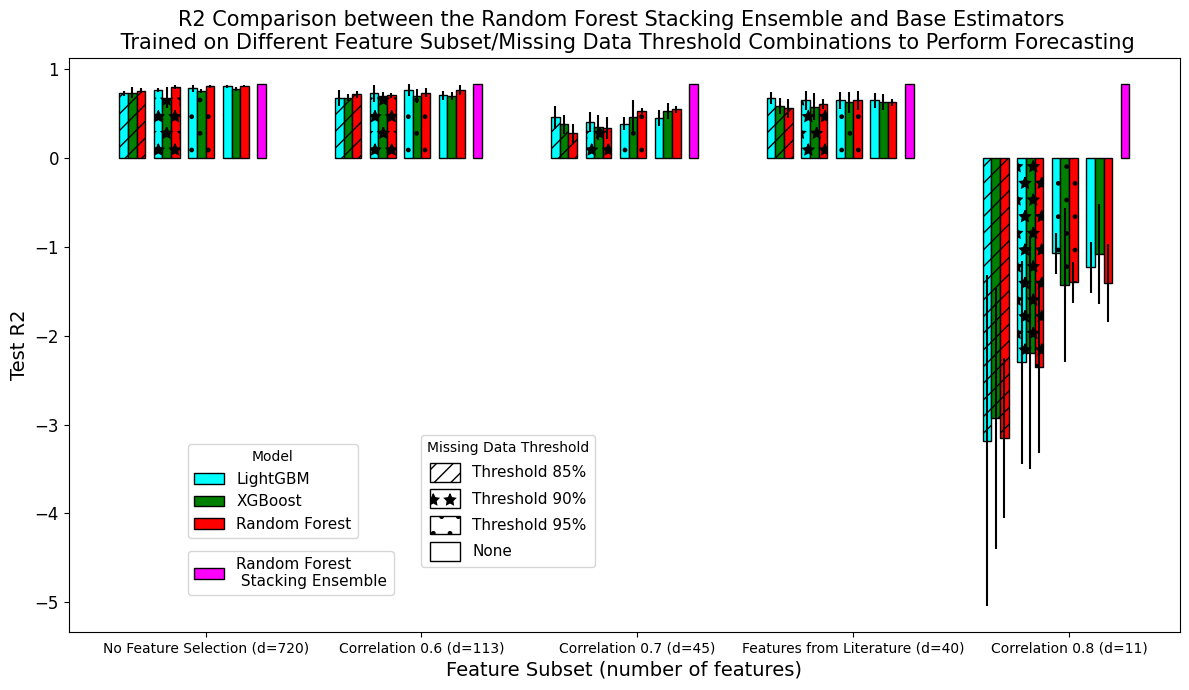
#### 9.322: Forecasting



b)

a)

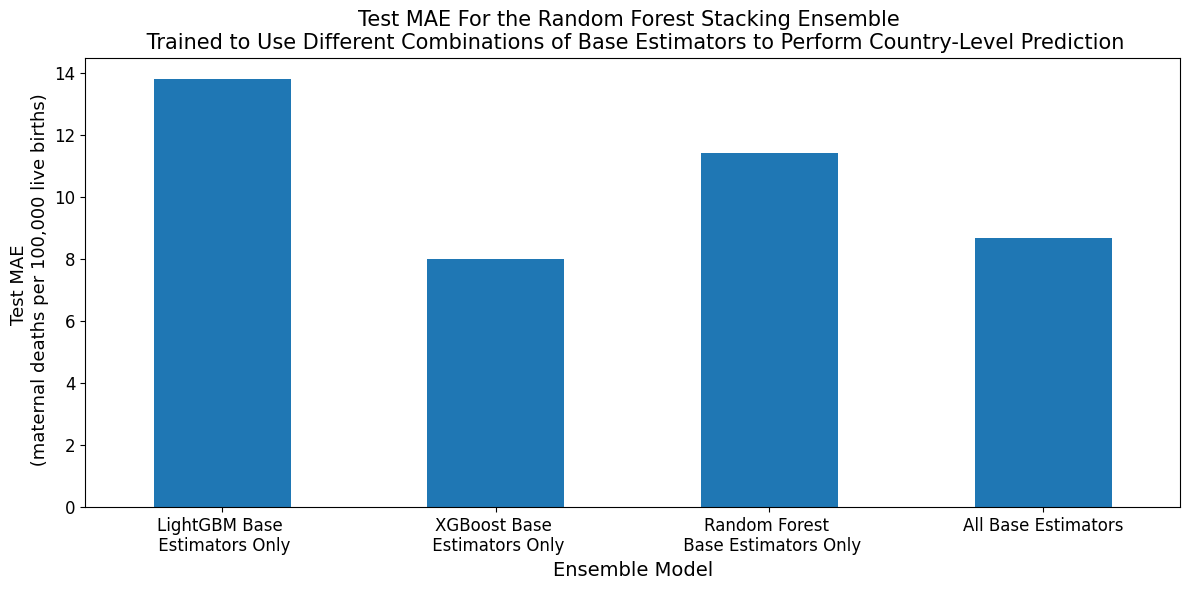




c)

### 9.4 Additional Performance Metrics to Compare Random Forest Stacking Ensemble with Base Estimators

#### 9.41: Country-Level Prediction



a)

A graph of blue rectangular bars

AI-generated content may be incorrect.

b)

A graph of blue rectangular objects

AI-generated content may be incorrect.

c)

#### 9.42: Forecasting

A graph of blue bars

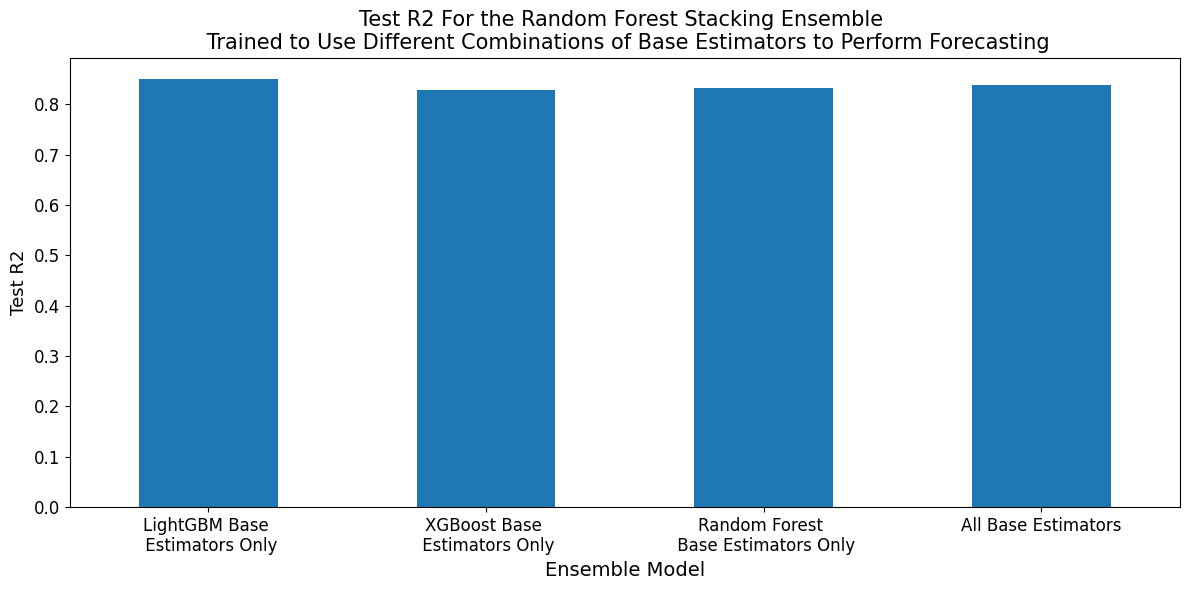
AI-generated content may be incorrect.

a)

A graph of blue bars

AI-generated content may be incorrect.

b)



c)

### 9.5 Additional Performance Metrics for Use of Different Combinations of Base Estimators

#### 9.51: Country-Level Prediction

#### 9.52: Forecasting

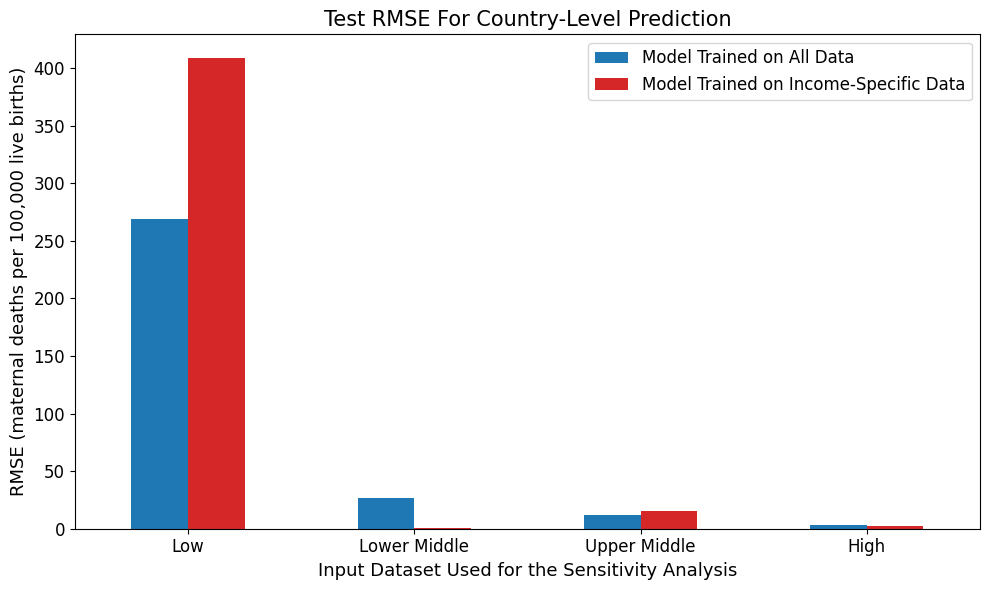
### 9.6 Additional Performance Metrics for Sensitivity Analysis

#### 9.61: Country-Level Prediction

A graph showing a red and blue bar

AI-generated content may be incorrect.

a)



b)

A graph of a test

AI-generated content may be incorrect.

c)

#### 9621: Forecasting

A graph of a bar chart

AI-generated content may be incorrect.

a)

A graph of a bar chart

AI-generated content may be incorrect.

b)

A graph of a graph showing the results of a forecasting test

AI-generated content may be incorrect.

c)