

# MORTALITY PREDICTION IN COVID-19 CASES

EPICS Phase 2 - Progress Review II  
Group No - 290

## **SUPERVISED BY**

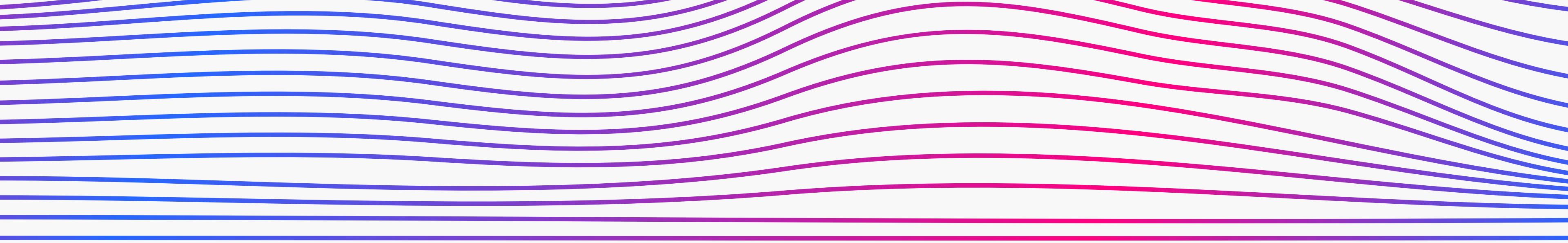
Dr. Amit Singh

## **PRESENTED TO**

Dr. Ravi Verma  
Dr. Mohammad Sultan Alam



# Content

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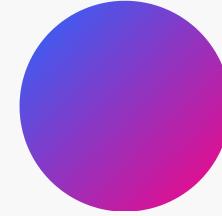
# Team Members



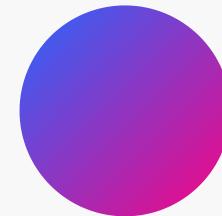
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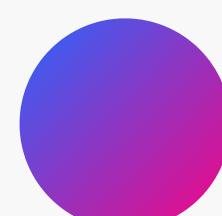
**Shefali Jain**



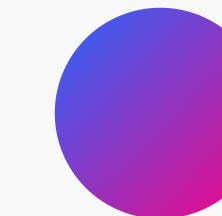
**Swati**



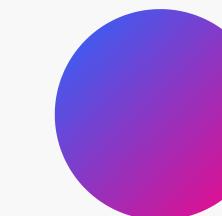
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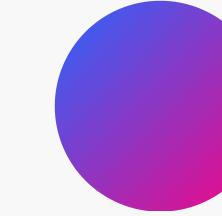
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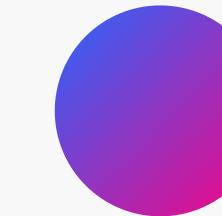
**Shrey Patel**



**Vinamra Rawat**



**Dhruv Sharma**

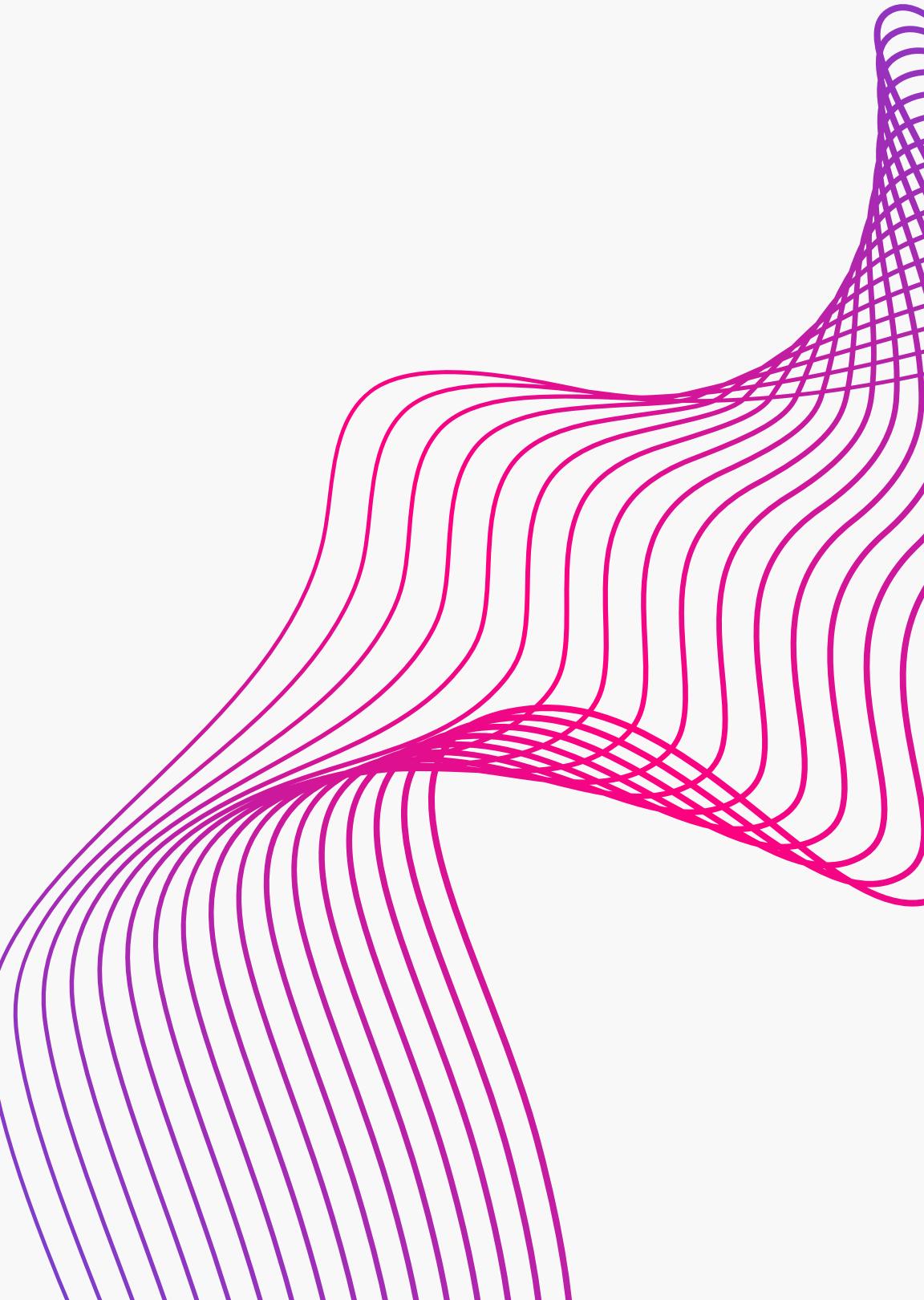


**Mihir Chaudhary**

# INTRODUCTION

In the face of the unprecedented challenges posed by the global pandemic, understanding mortality trends has become paramount for healthcare professionals, policymakers, and communities worldwide. Our project endeavors to harness the power of data analytics to predict mortality rates, providing invaluable insights to guide strategic responses.

In the following slides, we will delve into the methodology, data sources, predictive modeling techniques, expected outcomes, and implications of our analysis.



# BACKGROUND

The COVID-19 pandemic, emerging in late 2019, prompted an urgent need for predictive models to forecast its spread and inform response strategies. With its dynamic nature and impact on healthcare systems worldwide, accurate predictions are essential for optimizing resource allocation and guiding public health interventions.

# OBJECTIVE

Develop Predictive Models: Leveraging machine learning algorithms and statistical techniques, we seek to develop robust predictive models

Analyze COVID-19 Data: We aim to comprehensively analyze COVID-19 datasets to uncover patterns, correlations, and factors influencing mortality rates. By conducting thorough exploratory data analysis (EDA), we strive to gain insights into the complex dynamics of the pandemic.

# METHODOLOGY

## DATA COLLECTION

- Sources of Data: Public health databases, government reports, research papers
- Types of Data: Demographics, casualties , hospitalizations, interventions, etc.
- Data Preprocessing: Cleaning, normalization, feature engineering using onehotencoder library

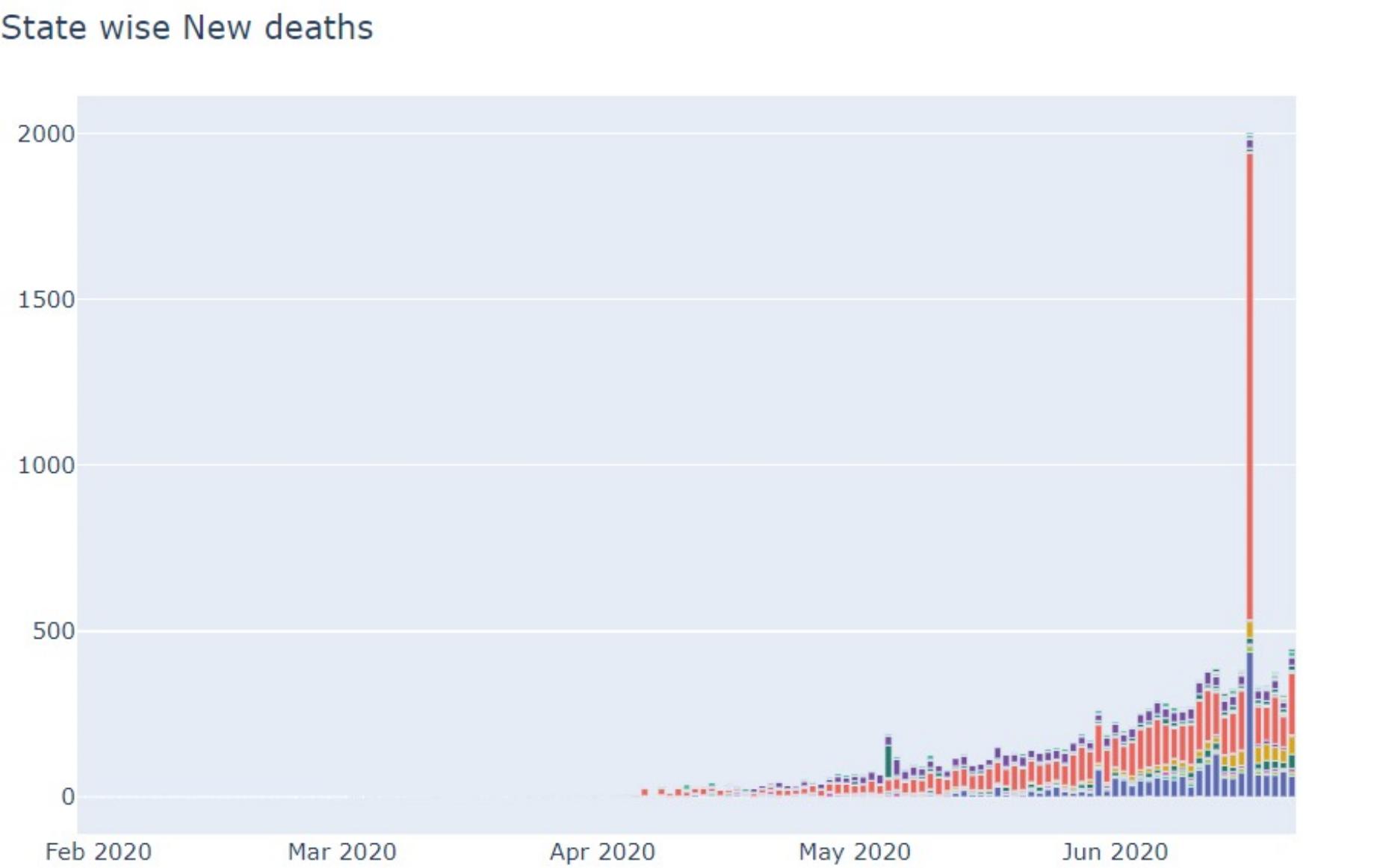
## Model Training and Validation

- Splitting data into training, validation, and test sets
- Training the chosen models with selected features
- Evaluating model performance using validation set

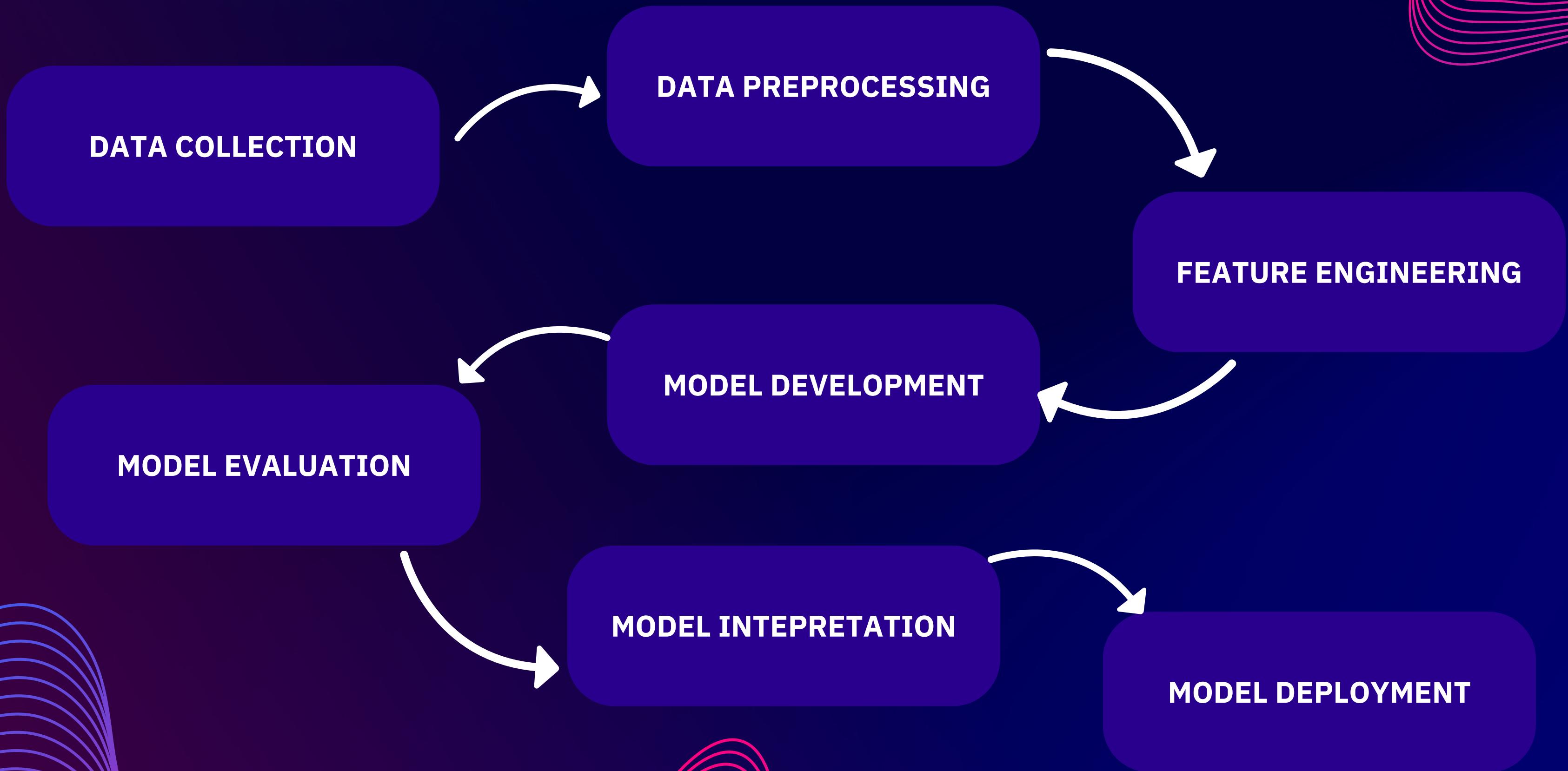
# METHODOLOGY

## MODEL SELECTION

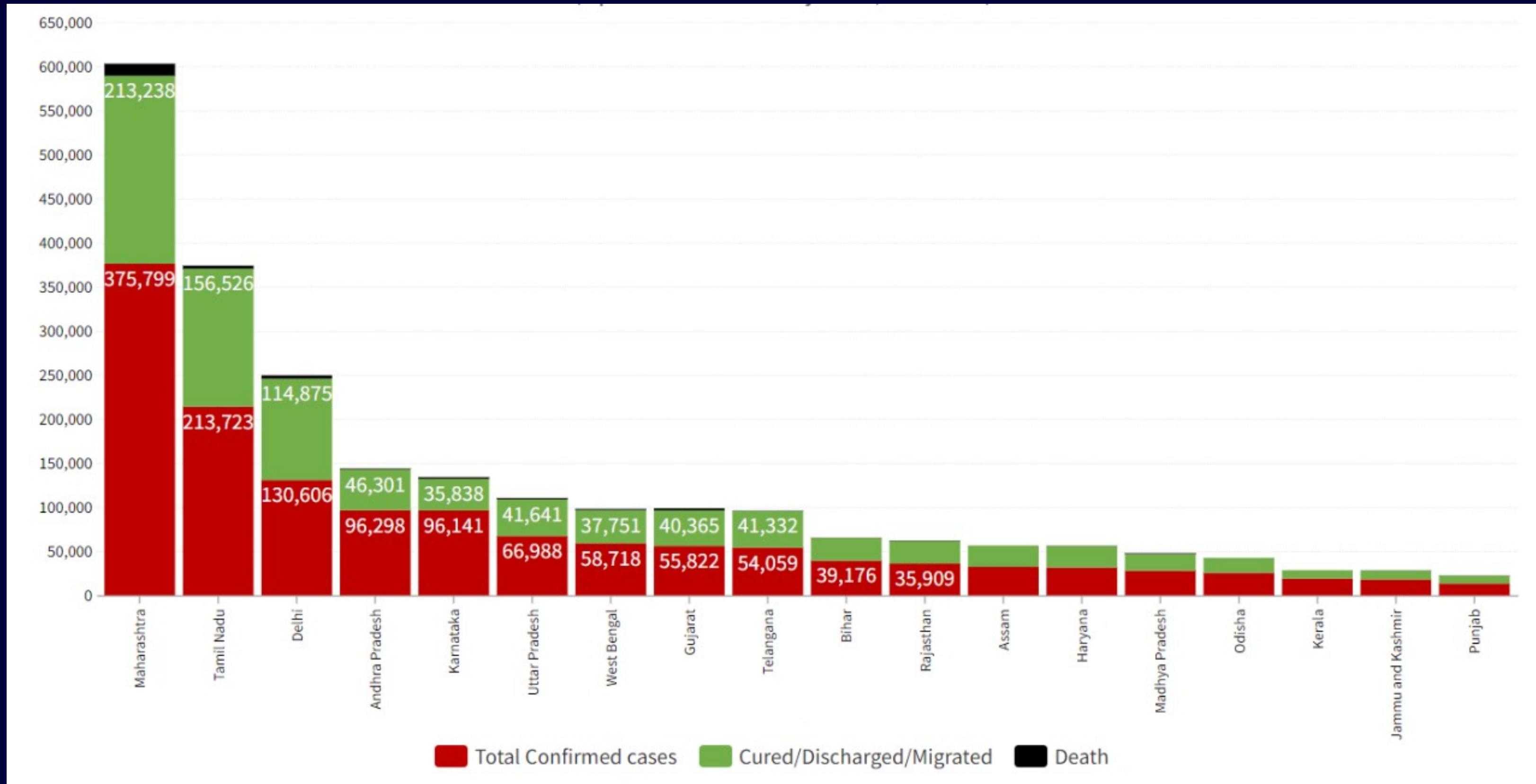
- Overview of models: Logistic Regression, k-nearest neighbour, Random Forest, SVM, gradient boosting, , etc.
- Model Selection: Cross-validation, hyperparameter tuning
- Evaluation Metrics: Accuracy, precision, recall, F1-score, ROC-AUC

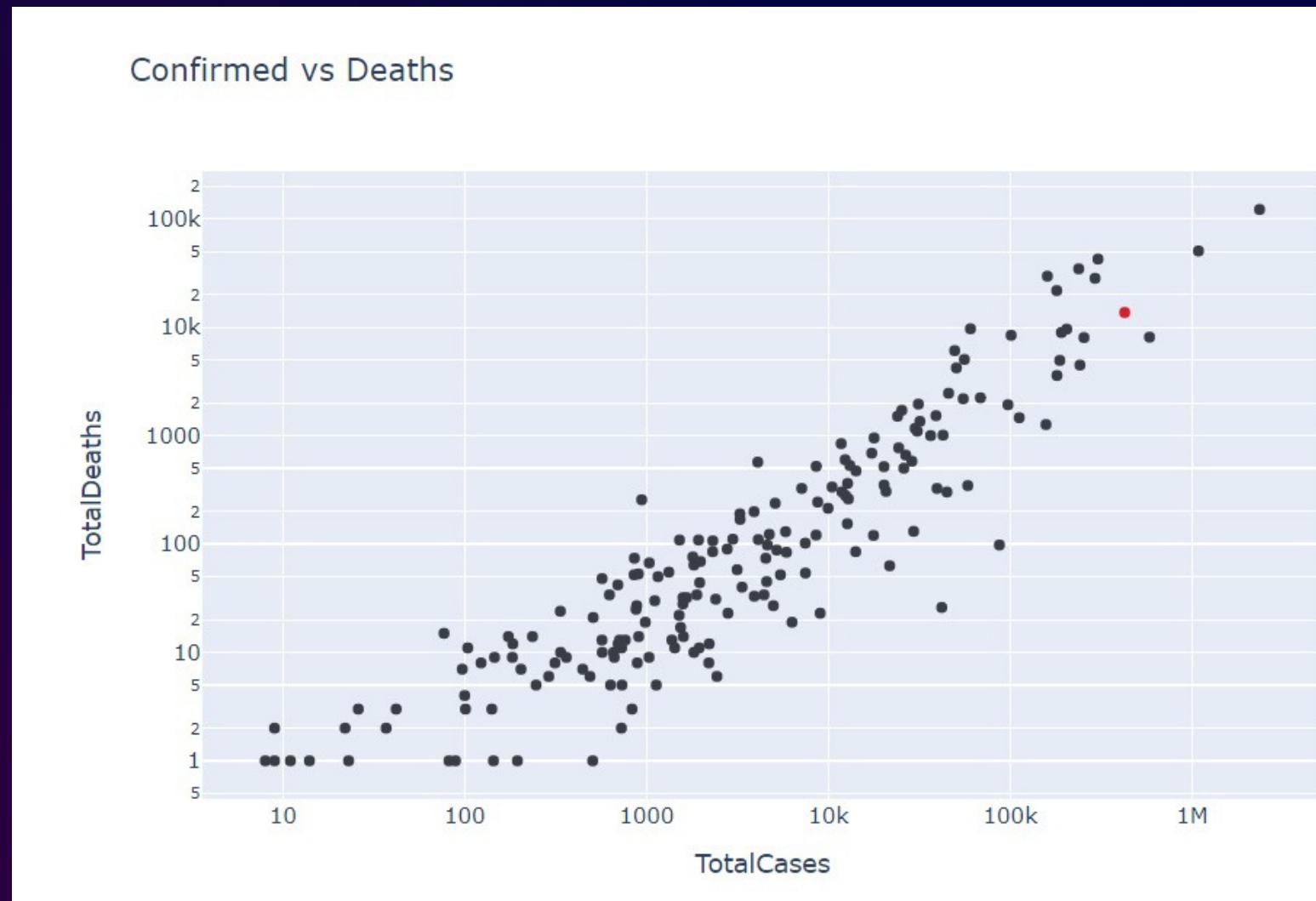


# WORKFLOW

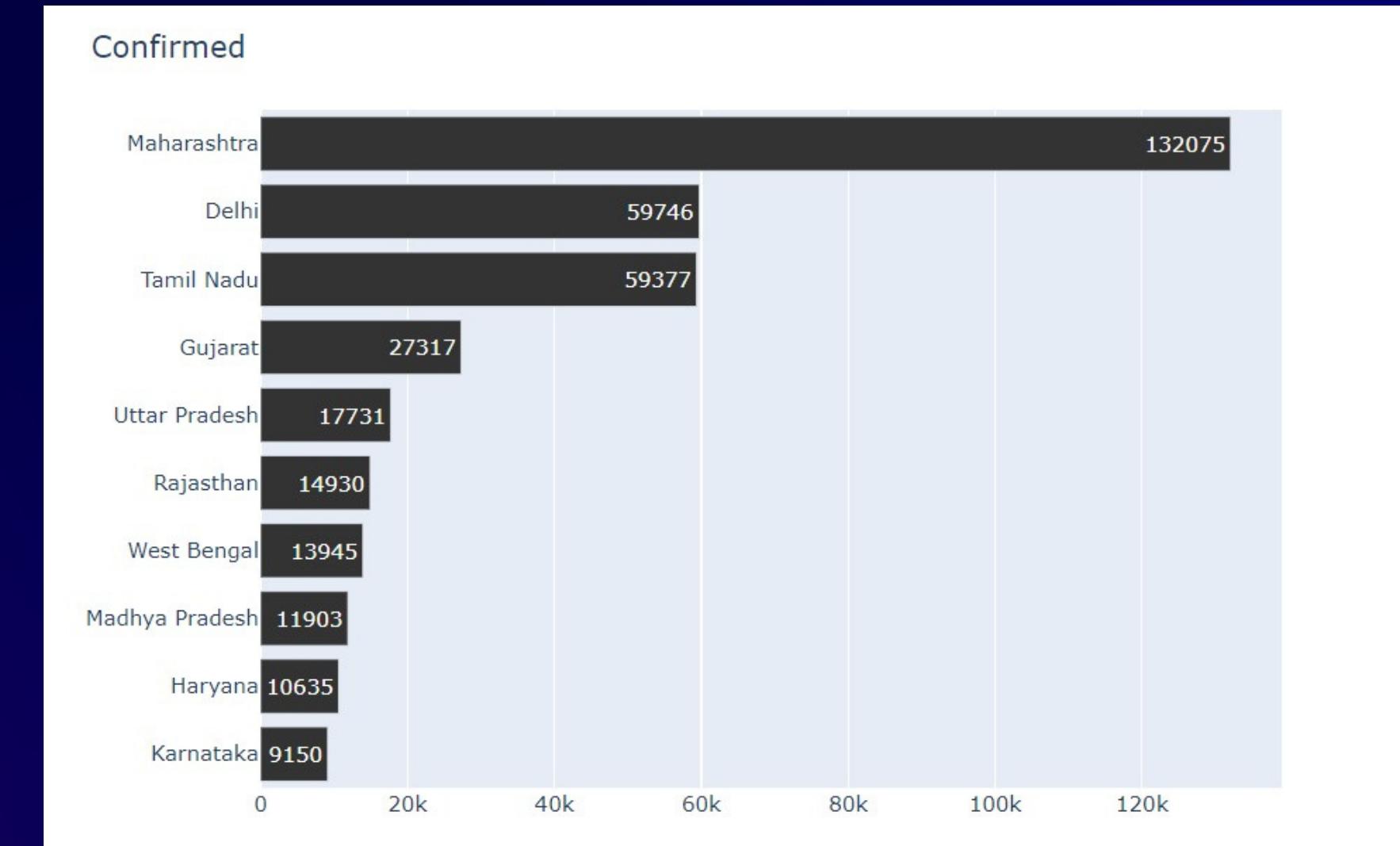


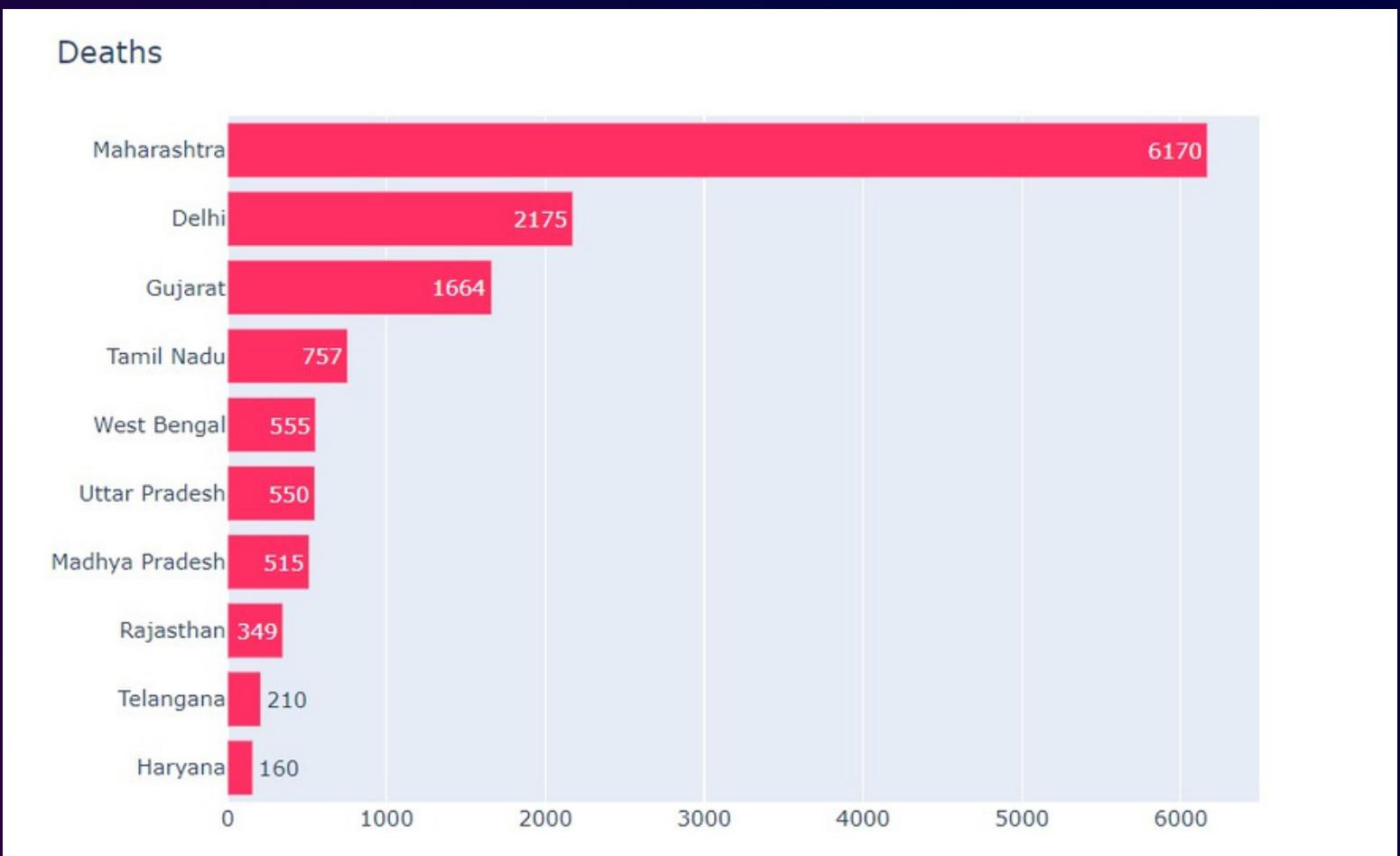
# VISUALIZATION OF AFFECTED STATE WISE



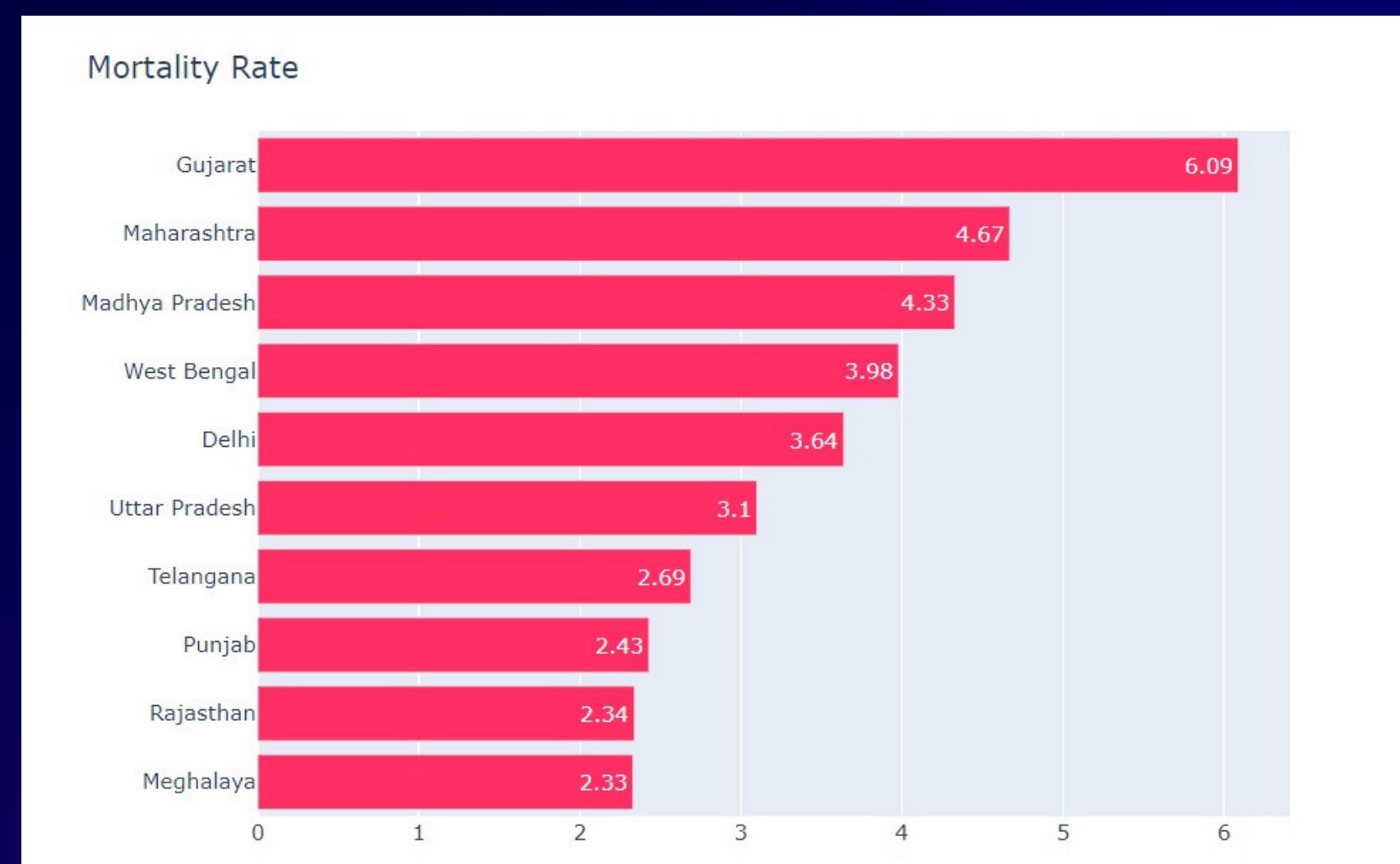


# RESULTS CHARTS





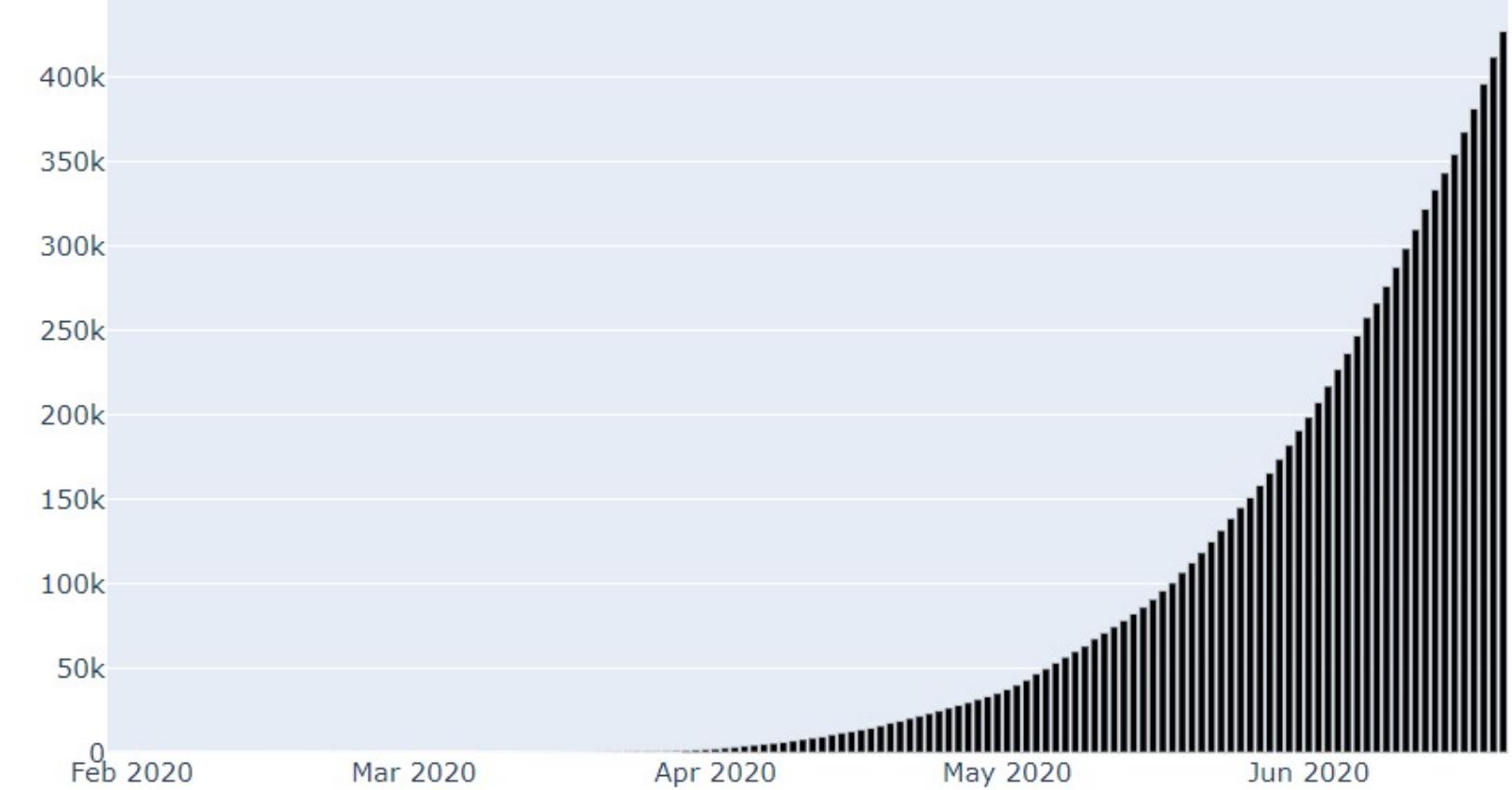
# INSIGHTS INTO KEY PREDICTORS OF MORTALITY RATE



# DATA COLLECTION

The dataset used is provided by the Indian Govt. which contains a total of 18,000 patients' information, including their states, their nationality , number of cured patients, no. of patients died and Number of confirmed cases

Total Confirmed



# FUTURE DIRECTIONS

- To perform continuous model refinement with updated data
- Extension to other infectious diseases or healthcare domains to broaden the areas for providing decision support
- Collaborations with healthcare professionals and policymakers for optimum and reliable services



# CHALLENGES & LIMITATIONS

- Data quality and availability constraints
- Generalizability of models across different populations
- Ethical considerations in healthcare data access
- Creating relations between different datasets

# RESULT

- PERFORMANCE METRICS OF TRAINED MODELS
- COMPARATIVE ANALYSIS OF DIFFERENT ALGORITHMS
- INSIGHTS INTO KEY PREDICTORS OF MORTALITY RATE

# APPLICATION IN HEALTHCARE

Integrating the predictive model into healthcare systems

Real-time monitoring of mortality risk for COVID-19 patients

Supporting clinical decision-making and resource allocation.

# CONCLUSION

- Our project on COVID-19 mortality prediction has provided valuable insights for public health response.
- Accurate predictive models and data-driven recommendations aid in early intervention and resource allocation.
- We remain committed to refining our methods and contributing to the global effort in combating the pandemic.
- Together, let's leverage data analytics to save lives and build a healthier future.



Thank you