1. **Adverse Drug Reaction (ADR) Prediction and Analysis**

* **Objective**: Use machine learning to predict adverse drug reactions by analyzing drug usage patterns, patient demographics, and previous ADR data.

**Dataset**:

* **FDA Adverse Event Reporting System (FAERS)**: Collection of data on adverse events and medication error reports.
* **OpenFDA**: Provides access to the FDA's adverse event data, drug interactions, and recalls.

1. **Predictive Models for Personalized Medicine**

* **Objective**: Develop models that predict how patients will respond to different treatments based on genomic data and patient health profiles.
* **Dataset**:
  + **1000 Genomes Project**: Genome data of individuals from various populations.
  + **The Cancer Genome Atlas (TCGA)**: Clinical and molecular data on various types of cancer, often used for analyzing response to therapies.

1. **Drug Repurposing Using AI and Big Data**

* **Objective**: Analyze existing drugs and patient data to identify potential new uses for existing medications, especially for rare diseases.
* **Dataset**:
  + **DrugBank**: Comprehensive data on drugs, their interactions, and mechanisms.
  + **Human Phenotype Ontology (HPO)**: Data linking genetic disorders to phenotypic abnormalities, useful for drug repurposing in genetic diseases.

1. **Prediction of Disease Outbreaks and Epidemics**

* **Objective**: Use big data to predict disease outbreaks and epidemics based on drug prescription rates, hospitalization data, and social determinants.
* **Dataset**:
  + **CDC WONDER**: Database with public health data on disease statistics, morbidity, and prescription patterns.
  + **HealthMap**: Aggregates online news and public health alerts for tracking and predicting disease outbreaks.