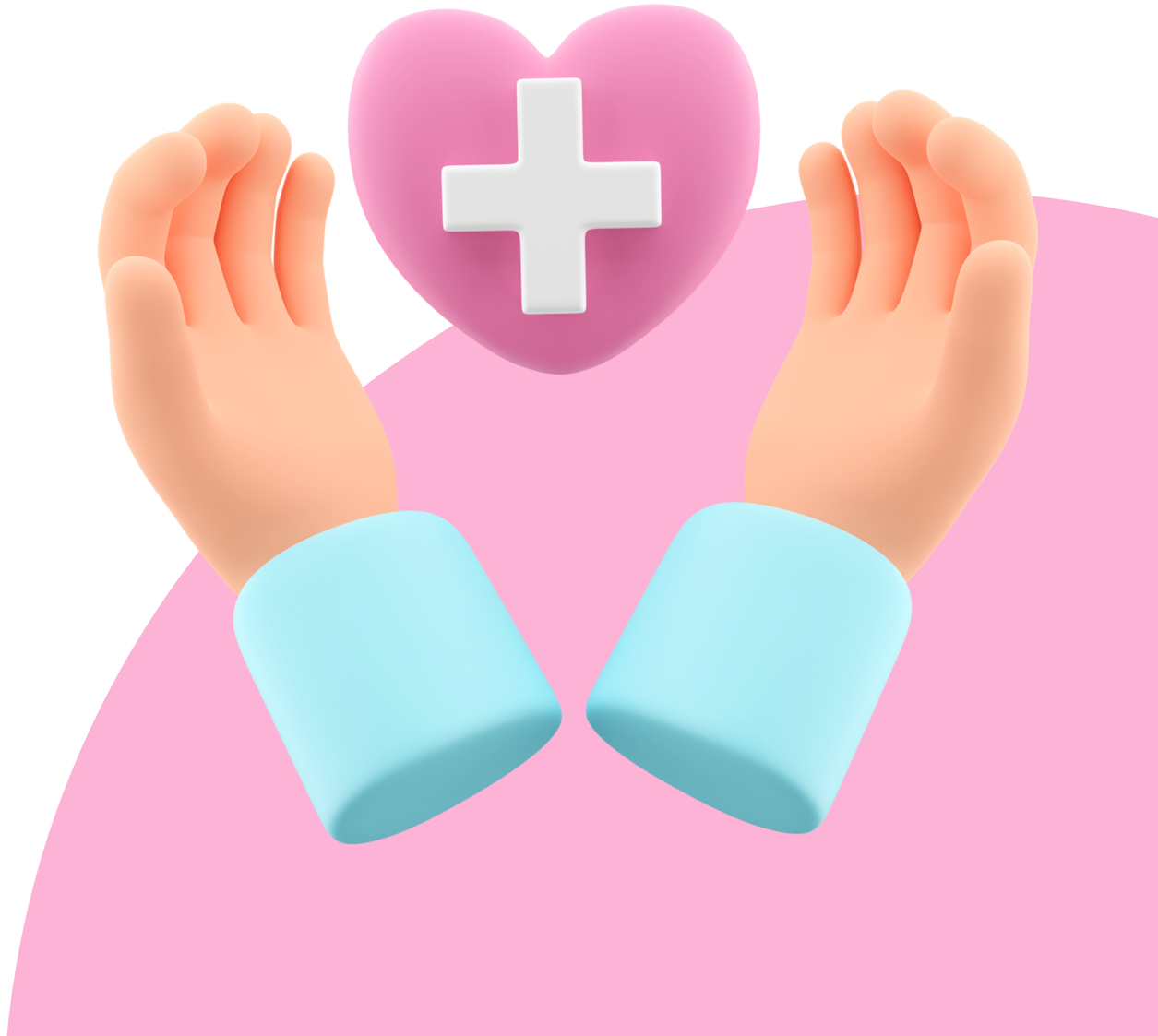
HEART CLINICAL TRIALS

INTRODUCTION

In this age of advanced technology, one fundamental aspect of life remains beyond human control: Death, influenced primarily by diseases.

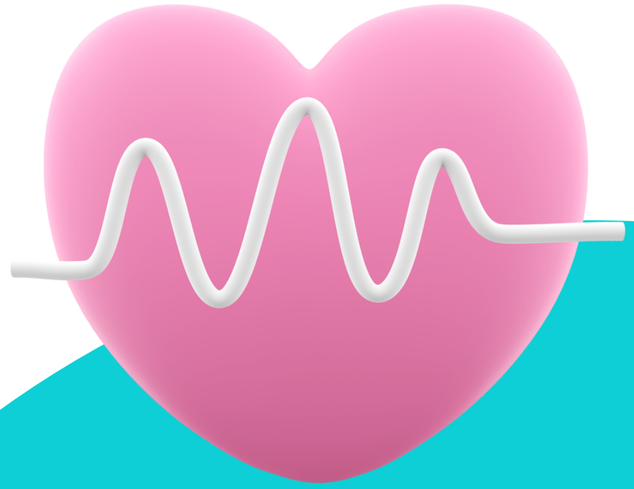
While we cannot completely conquer death, the ability to research and develop drugs that can cure, prevent, or mitigate the effects of diseases is crucial.

Clinical trials play a pivotal role in making this possible.



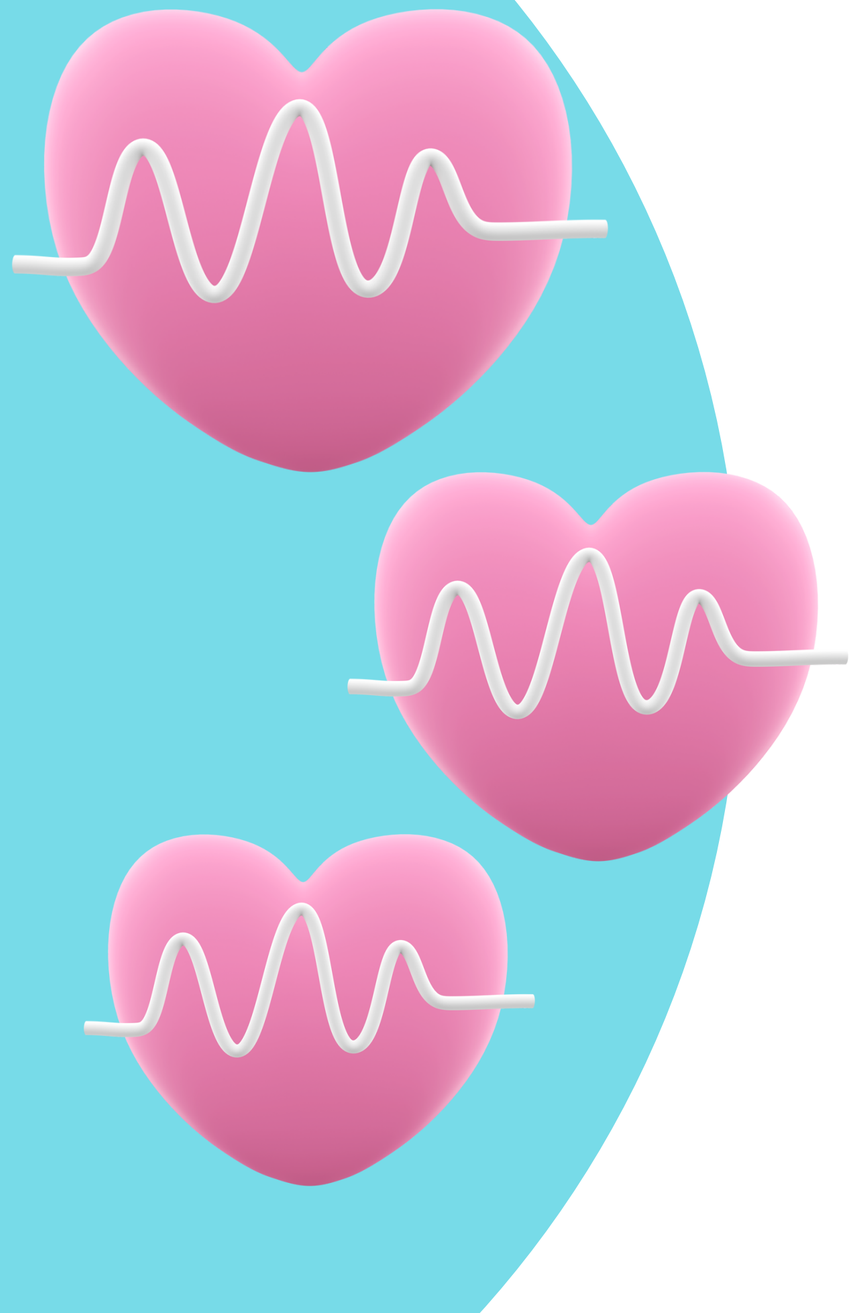
PROJECT OVERVIEW

Clinical trial sponsors are instrumental in shaping the success of medical research. They influence study design, secure funding, and establish critical procedures. This project focuses on optimizing the selection of sponsors for clinical trials, with a primary emphasis on heart-related studies.



PROJECT WORKFLOW

1. Business Understanding
2. Data Understanding
3. Data Preparation
4. Exploratory Data Analysis
    - Univariate Data Analysis
    - Bivariate Data Analysis
    - Text Analytics



DATA UNDERSTANDING

DATA

The analysis is based on the "Heart Conditions" dataset, collected from ClinicalTrials.gov.

SOURCE

The dataset was sourced from ClinicalTrials.gov, a comprehensive online database of clinical research studies and their outcomes.

SHAPE

This dataset encompasses data from 32,176 clinical studies and includes information on 30 distinct variables.

DATA PREPARATION

01

Feature Selection: We refined the dataset by excluding irrelevant columns and removing those with over 40% missing values.

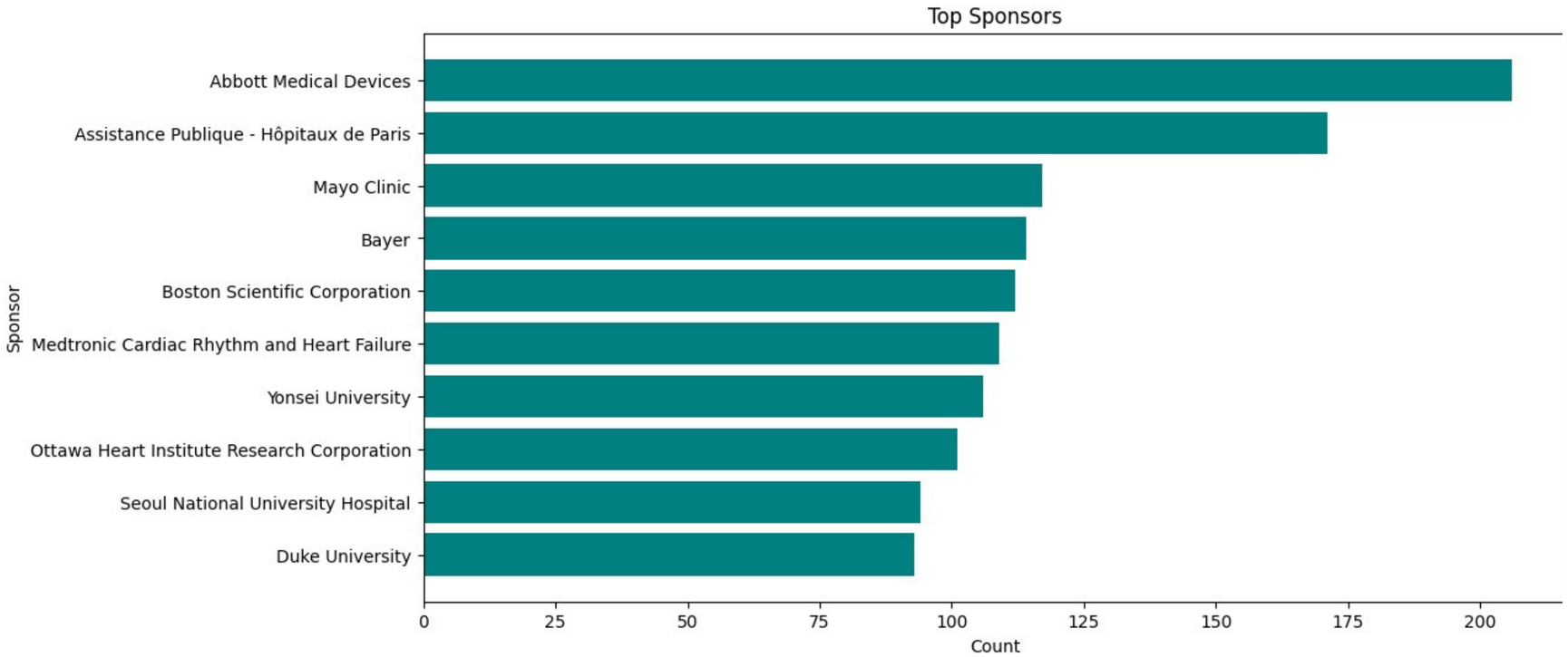
02

Data Completeness: In pursuit of data quality, we pruned missing values to maintain data integrity.

03

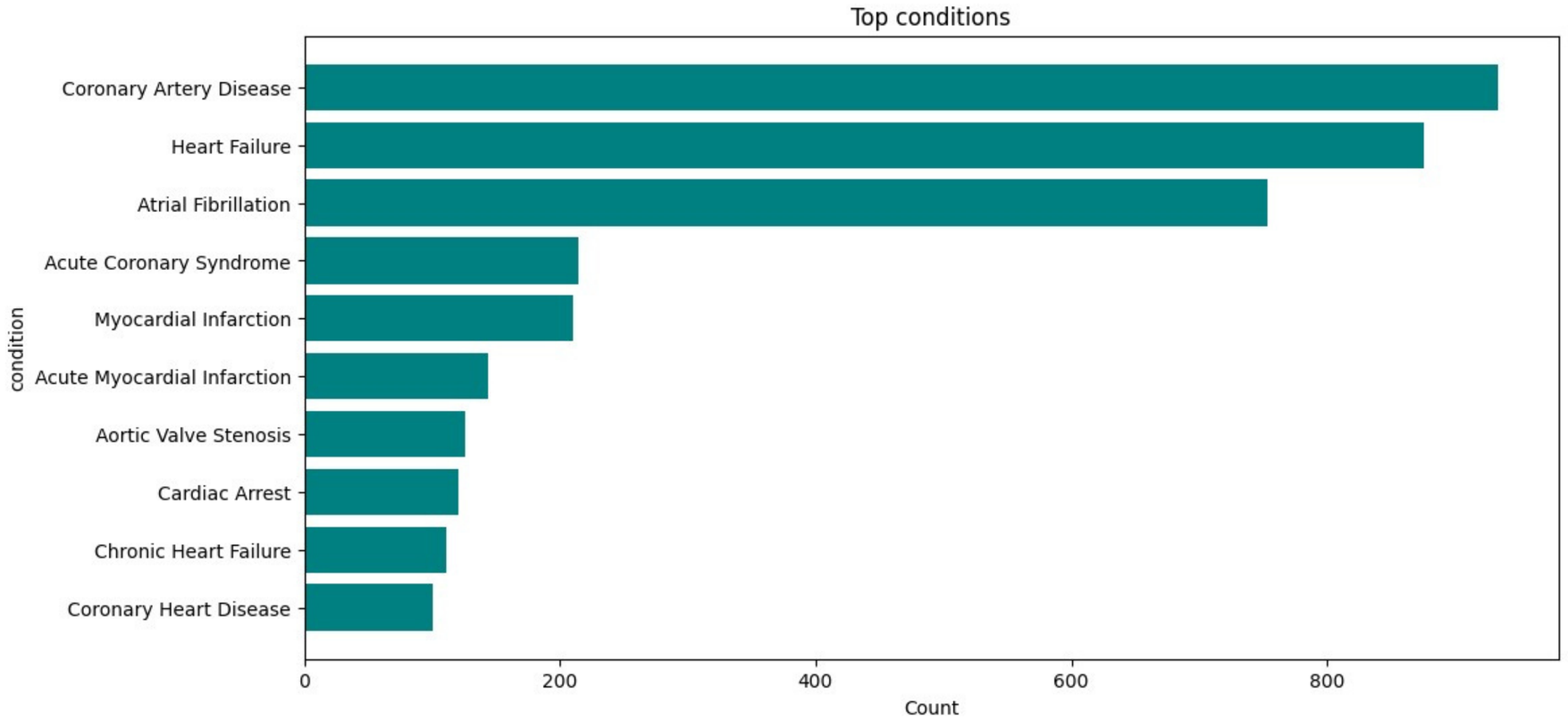
Feature Engineering: To extract deeper insights, we engineered new features through transformations of existing variables.

UNIVARIATE ANALYSIS



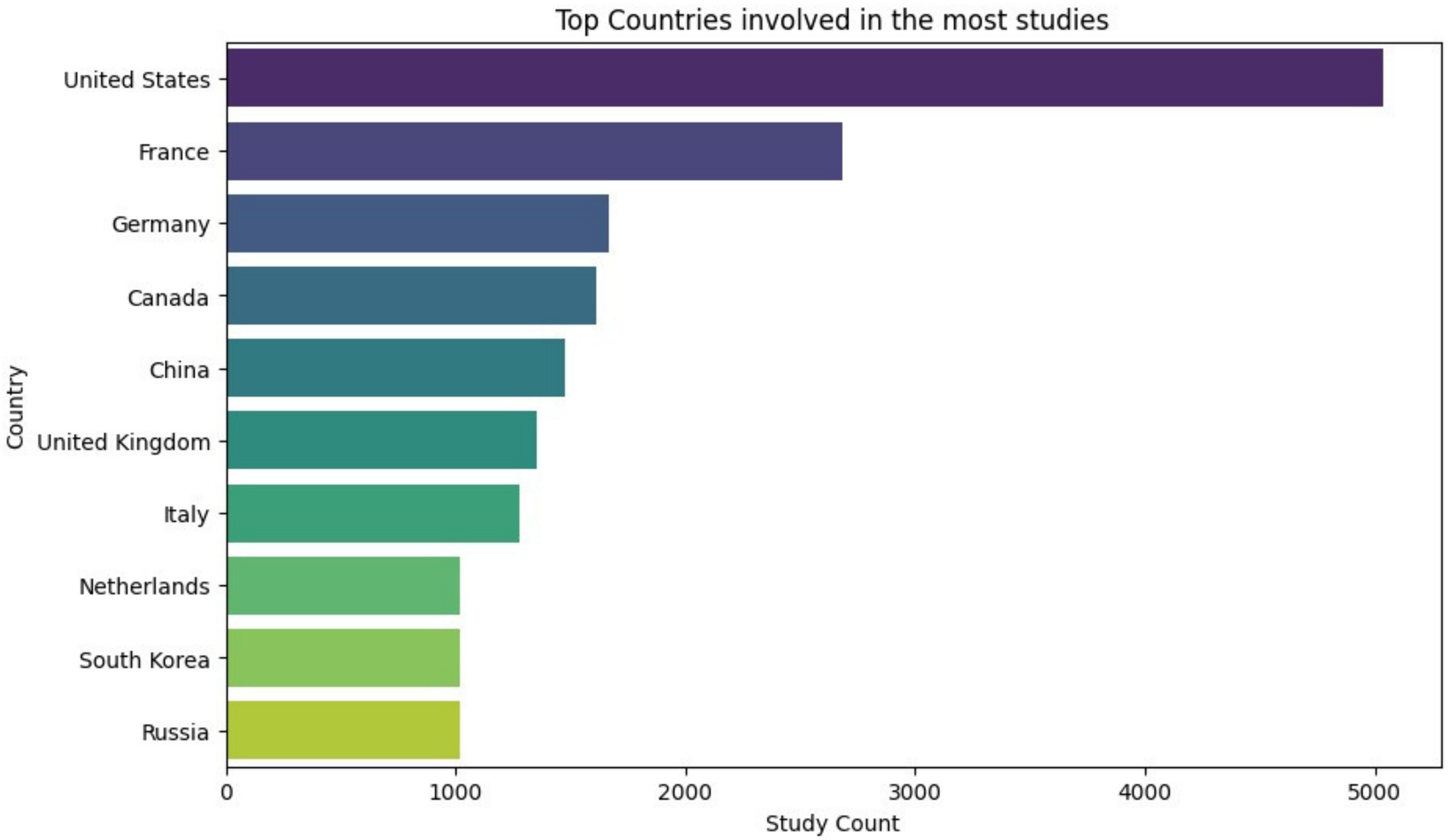
Abbott Medical Devices has sponsored most of the studies

UNIVARIATE ANALYSIS



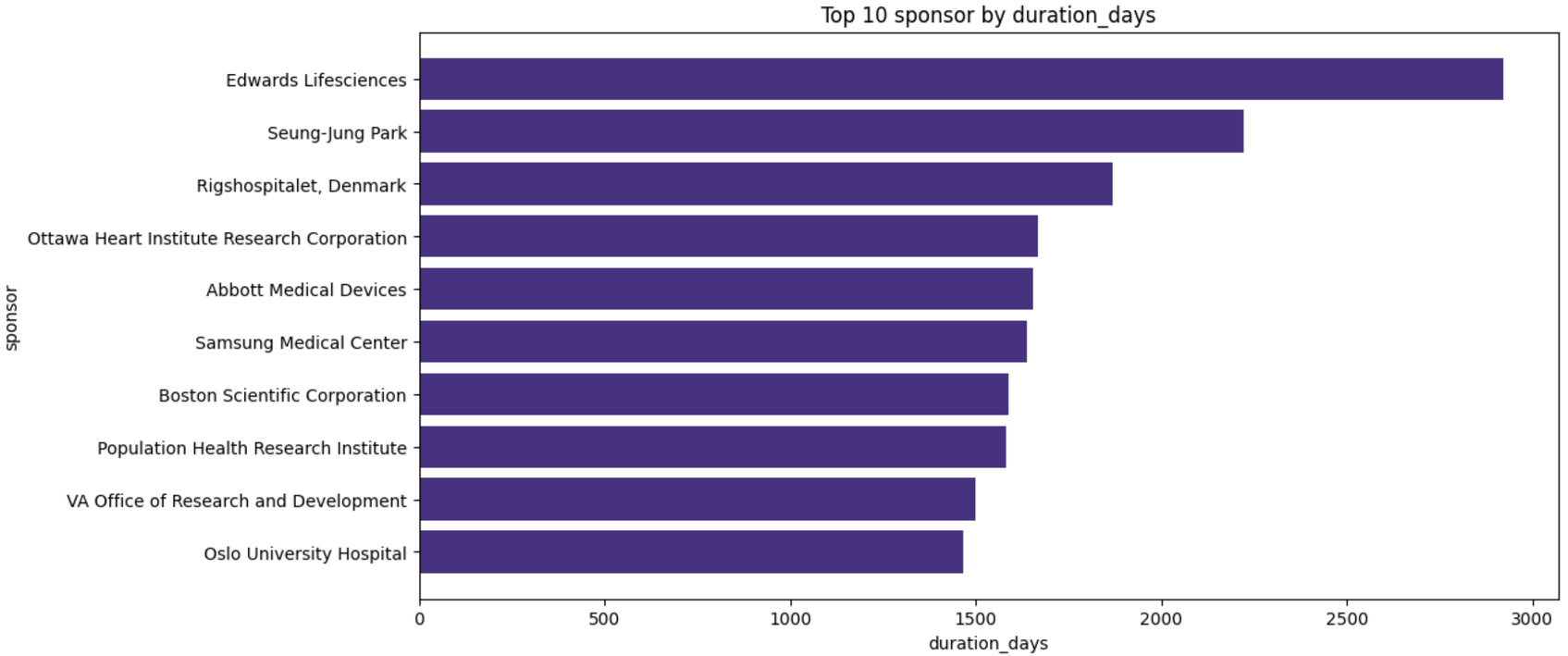
The most common conditions include Coronary Artery Disease, Heart Failure and Atrial Fibrillation.

UNIVARIATE ANALYSIS



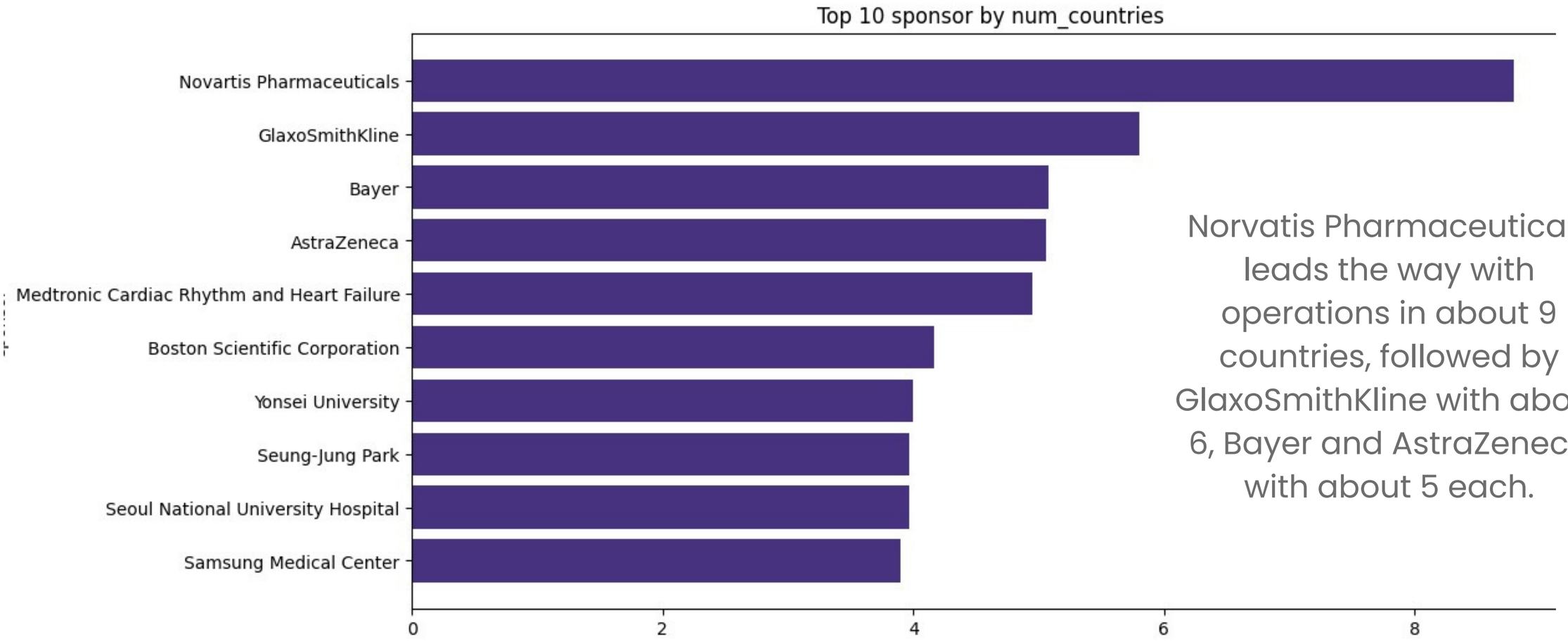
The countries that lead in terms of the clinical trials that they participate in include USA, France, Canada, Germany, China and the United Kingdom.

BIVARIATE ANALYSIS



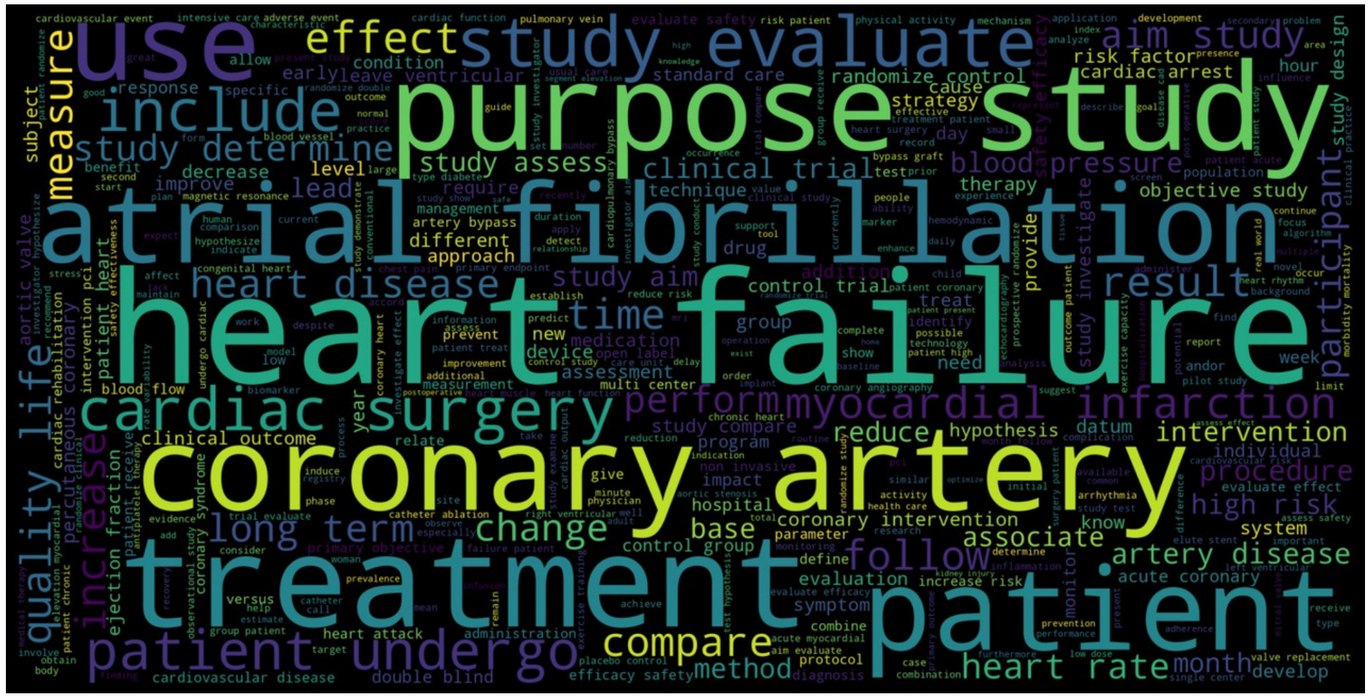
Edwards Lifesciences takes the longest time with about 9 years on average. It is followed by Seung-Jung Park at around 7 and Rigshopitalet, Denmark at just under 6.

BIVARIATE ANALYSIS

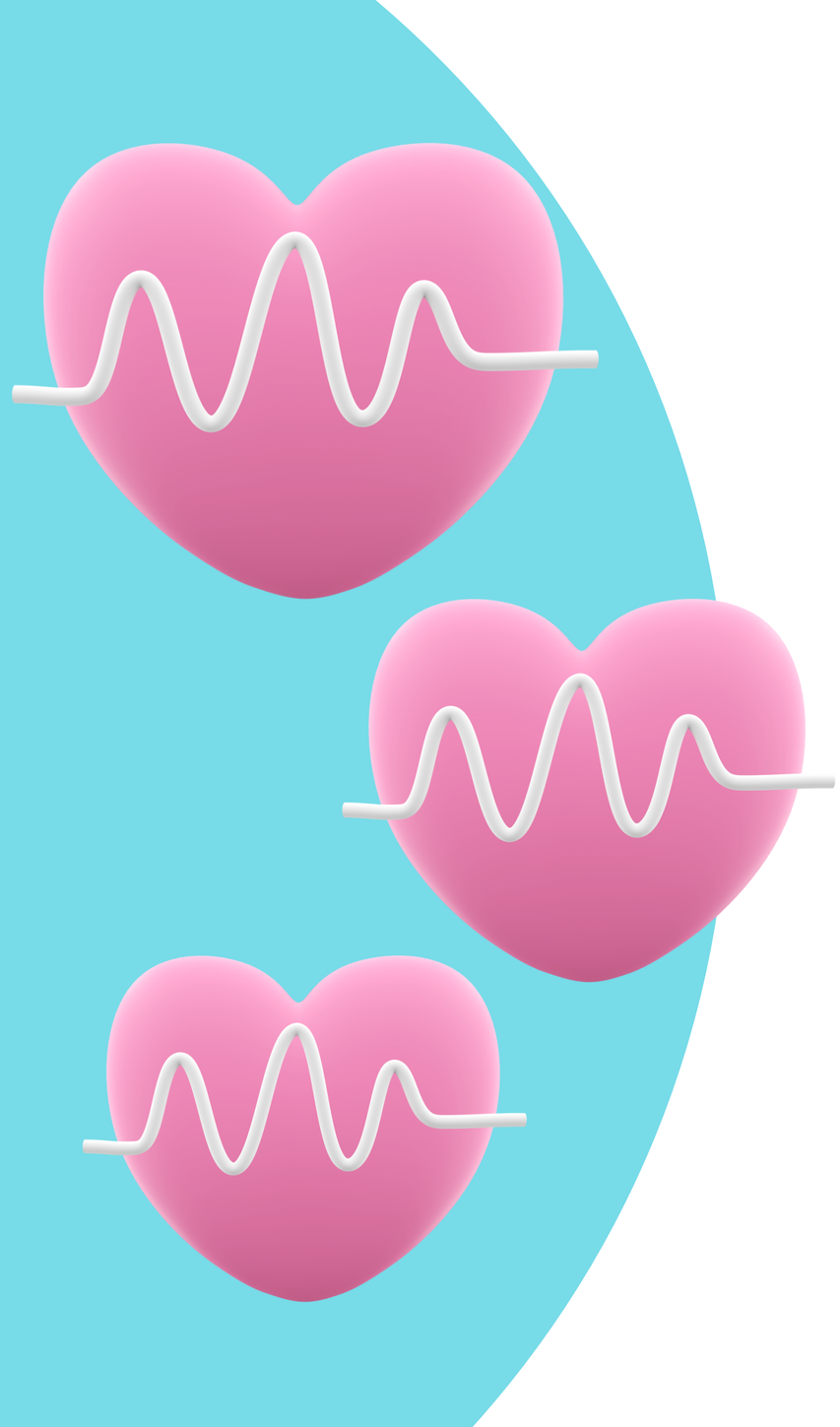


Norvatis Pharmaceuticals leads the way with operations in about 9 countries, followed by GlaxoSmithKline with about 6, Bayer and AstraZeneca with about 5 each.

TEXT ANALYTICS



The clinical trials revolved around key aspects including the study's purpose, heart failure, coronary artery, atrial fibrillation, treatments, and patient-centric considerations.



CONCLUSIONS

80% of the trials are interventional with the remaining 20% being observational.

12.4 % of the study results had been posted, 87.6 % of the trials did not post the study results.

Industry funders fund trials in more countries than other funder types.

The most common sponsors according to the number of appearances include Abbott Medical Devices, Assistance Publique - Hôpitaux de Paris, Mayo Clinic and Bayer

The most common conditions include Coronary Artery Disease, Heart Failure and Atrial Fibrillation.

RECOMMENDATIONS

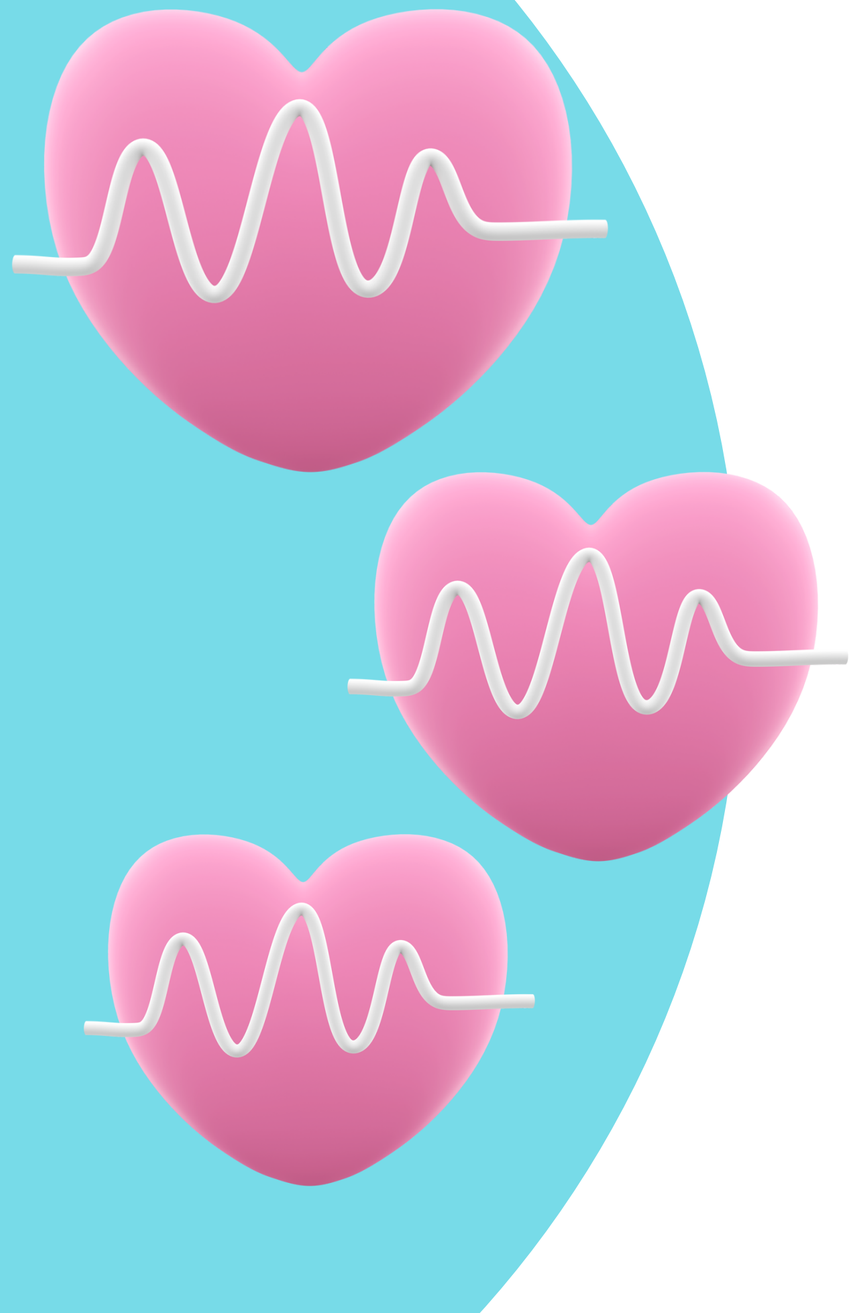
1. Balance the trade-offs between observational and interventional trial designs for efficiency and scientific rigor.

2. Prioritize research and treatments for common conditions like Coronary Artery Disease, Heart Failure, and Atrial Fibrillation.

3. Encourage sponsors to post clinical trial results for increased transparency, enhancing research quality.

4. The study has found that some of the best sponsors in reasearching heart diseases include:

- Norvatis Pharmaceuticals
- Bayer
- Yonsei University
- Abbott Medical Devices
- AstraZeneca
- Mayo Clinic and GlaxoSmithKline



FUTURE WORKS

FINANCES

Include financial data to assess budget and potential revenue/lives saved from study approaches.

EXPLORATION

Explore variables like the number of countries, conditions, outcome variables, days, and enrollment for tradeoff analysis.

EVALUATION

Evaluate study success to inform future research directions.

THANK YOU.

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