Data Collection and Problem Statement

The Western Collaborative Group Study (WCGS) was established with the primary aim of investigating the theory that the Type A behavior pattern (TABP) – characterized by traits such as excessive drive, aggressiveness, and ambition, often associated with a heightened focus on competitive endeavors, work deadlines, and similar pressures – could be a contributing factor to Coronary Heart Disease (CHD). In 1960 and 1961, the study enrolled 3,524 employed men aged 39-59 from the San Francisco Bay and Los Angeles regions. They underwent a comprehensive initial assessment, including behavior patterns, medical histories, socioeconomic factors, lifestyle, and cardiovascular examinations. Annual re-examinations tracked cardiovascular health and ECG data. The study focused on identifying classical angina pectoris, symptomatic MI, and unrecognized MI cases. CHD incidence follow-up ended in 1969 , with separate investigators conducting mortality follow-up in 1982 and 1983.

This cohort study's strengths lie in its extended follow-up, annual examinations, and comprehensive data on potential risk factors, which collectively enhance its ability to track and understand CHD progression. Therefore, our research aims to achieve two primary objectives. Firstly, we will assess the individual contributions of various risk factors to the incidence of CHD, aiming to elucidate both the presence and magnitude of their associations with CHD development. This in-depth analysis will provide critical insights into the multifaceted nature of CHD risk. Secondly, leveraging advanced machine learning approaches, we endeavor to construct a clinical predictive model. This machine learning technique has advantages over traditional regression techniques including better efficiency and interpretability for exploring features in high-dimensional data with complex interrelationships. By doing so, this clinical decision-making tool could be a valuable approach to optimizing targeted interventions and ultimately contribute to the improvement of long-term cardiovascular health outcomes.