1 Data Description

Hypertension induced heart failure (HF) is a major cause of hospitalization of senior Americans. There are over 5.8 million people in the US are suffering with HF with more than 670000 new cases joining this group. Existing treatments for hypertension that have been studied include thiazide-type diuretic and angiotensin converting enzyme inhibitors (ACEIs), both of which have been shown to be effective to reduce the incidence of HF by treating hypertension.

As new treatment agents are developed, The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) was the biggest clinical trial that was ever conducted, aiming to compare the effects of different treatment methods on fatal coronary heart disease (CHD) or non-fatal myocardial infarction (MI) among high-risk hypertensive patients. Four treatment methods under comparison are thiazide-type diuretic (chlorthalidone), ACEI (lisinopril), calcium channel-blocker (CCB; amlodipine), and α-blocker (doxazosin), in which the later three are the newer antihypertensive agents whose effects are not studied before . Under the multi-center, randomized, double-blind, active-controlled design mechanism, in the ALLHAT study a total of 42448 participants were randomized from 625 sites in the United States, Canada, Puerto Rico, and the US Virgin Islands (Grimm et al., 2001). The study included a large cohort of African American (36% of total study population) and a relatively large proportion of Hispanic patients (19%). Other major baseline characteristics of the study cohort include almost equal proportion of each gender (46.8% women), average age of 67 years (with 35% aged $\geq$70 years), high proportion of patients with diabetes (36%), 47% of the cohort with existing cardiovascular disease and 22% are smokers, etc. More detailed baseline characteristics of participants in the ALLHAT study can be found in Grimm et al. (2001).

The full-scale ALLHAT study was started in 1994 fall and the participants were then followed actively until March 31, 2002. After that the participants were followed using the national databased through 2006, which is called the extended follow-up in the study (Piller et al., 2011). As a result, the average of total follow-up time is 8.9 years: 4.9 years (3.2 years in the doxazaosin v.s. chlorthalidone comparison part) active follow-up time plus 4 years of extended follow-up. In the study, primary outcome was chosen as cardiovascular mortality and secondary outcomes were mortality, stroke, CHD, HF, cardiovascular disease, and end-stage renal disease. Cushman et al. (2012) has presented the mortality and morbidity results during and after the trail. During the active follow-up stage, outcomes as well as other clinical information like blood pressure are all available to use, however, during the post-trail follow-up no information are available for medications or blood pressure.

References

William C Cushman, Barry R Davis, Sara L Pressel, Jeffrey A Cutler, Paula T Einhorn, Charles E Ford, Suzanne Oparil, Jeffrey L Probstfield, Paul K Whelton, Jackson T Wright, et al. Mortality and morbidity during and after the antihypertensive and lipid-lowering treatment to prevent heart attack trial. *The Journal of Clinical Hypertension*, 14(1):20–31, 2012.

Richard H Grimm, Karen L Margolis, Vasilios Papademetriou, William C Cushman, Charles E Ford, Judy Bettencourt, Michael H Alderman, Jan N Basile, Henry R Black, Vincent DeQuattro, et al. Baseline characteristics of participants in the antihypertensive and lipid lowering treatment to prevent heart attack trial (allhat). *Hypertension*, 37(1):19–27, 2001.

Linda B Piller, Sarah Baraniuk, Lara M Simpson, William C Cushman, Barry M Massie, Paula T Einhorn, Suzanne Oparil, Charles E Ford, James F Graumlich, Richard A Dart, et al. Long-term follow-up of participants with heart failure in the antihypertensive and lipid-lowering treatment to prevent heart attack trial (allhat). *Circulation*, 124(17):1811–1818, 2011.