BIOS 6624: Project 1
Fall 2024
Interim Presentation Monday 9/23

Data Overview: This project is a secondary data analysis of the Multicenter AIDS Cohort Study, an ongoing prospective cohort study of the natural and treated histories of HIV-1 infection in homosexual and bisexual men in 4 major cities in the United States.

Highly active antiretroviral treatment (HAART) is the standard treatment for HIV infected patients. Our dataset includes up to 8 years of longitudinal laboratory and quality of life measures, as well as demographic and other health information, on HIV infected men after beginning HAART. The subjects were seen annually. Year 0 data are from the subjects' last untreated visit, just before beginning HAART. All other visits (year 1 up to 8) are on treatment.

Question of Interest: We are interested in understanding how treatment response 2 years after initiating HAART differs between subjects who report using hard drugs, such as heroin and cocaine, at baseline and other subjects, who did not report hard drug use at baseline.

Biologic Motivation: There is limited evidence from laboratory in vitro and animal studies that the use of hard drugs inhibits the immune system and increases HIV replication; however, results have not been clear in human studies. If drug users have poor treatment response compared to others, we may need to consider more aggressive treatment strategies or more actively encourage patients to enroll in drug rehabilitation programs.

Information about variables: We have 4 measures of treatment response. The first two are laboratory measures, viral load (VLOAD), which is the number of HIV copies in a mL of blood, and the second is CD4+ T cell count (LEU3N), a measure of immunologic health. In untreated HIV infection, viral load increases over time and CD4+ T cell counts decline as the immune system is attacked by the virus. Once treatment is initiated, we expect viral load to decrease rapidly and CD4 counts to recover. Our last two measures are quality of life measures from the SF-36. The first is the aggregate physical quality of life score (AGG_PHYS) and the second is the aggregate mental quality of life score (AGG_MENT). These scores range from 0 to 100,

with higher scores indicating better quality of life. We are not sure what happens to quality of life after initiating treatment - while in theory subjects' improving health should result in increased quality of life, the side effects of these treatments are significant. If subjects experience declines in quality of life after initiating treatment we would be concerned that they would stop treatment.

Some of our colleague's statistical team has been doing their analysis Bayesian. We are requesting that the analysis be done in both a Bayesian and non-Bayesian framework and compared.

The data are on CANVAS under the Project 1 directory. A data dictionary can also be found in the Project 1 directory.