“I hereby declare that the work represented in this report represents my individual effort. I

understand that I am encouraged to seek advice and guidance on any course material from my

professor, teaching assistants and fellow classmates, however, I am responsible, solely, for this

written document and my oral presentation of components of this report.”

\_\_\_\_\_\_\_\_\_Sean Vieau\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_10/06/2024\_\_\_\_\_\_\_

(name) (date)

**Project 2**

**Introduction**

The aim of the current study is to assess how treatment response differs for HIV+ patients 2 years after initiating Highly Active Antiretroviral Therapy (HAART) based on hard drug usage (such as heroin or cocaine). This is a secondary data analysis of the Multicenter AIDS Cohort Study, an ongoing prospective cohort study investigating the natural and treated disease progression of HIV-1 in bisexual men in 4 major cities in the U.S. This study is of particular scientific interest because it is unclear whether the use of hard drugs inhibits the immune system in humans; treatment strategies may differ based on these results. Data was received as a longform .csv file containing 33 columns over 8 years of research and a data dictionary; however the current analysis is only concerned with treatment outcomes after 2 years of HAART. The researchers are interested in comparing subjects who never used hard drugs to current hard drug users (those that use hard drugs at year 2) or previous hard drug users (those who used drugs at year 0 or 1). Outcomes of interest are: viral load (HIV copies in a mL of blood), CD4+ T cell count (a measure of immunologic health), and aggregate physical and quality of life scores from the SF-36.

The clinical hypothesis is that, if hard drugs inhibit the immune system in humans, subjects who currently or previously used hard drugs will have higher viral load and lower CD4+ T cell counts than those who never used hard drugs. Additionally, the researchers are interested in knowing if potential differences between the drug use groups can be explained by differences in adherence to the treatment regimen. The researchers are agnostic on how quality of life changes after treatment, since side effects of the treatment are significant.

**Method**