HIV Infection in hemophiliacs

The data for this lab are from the Multicenter Hemophilia Cohort Study, which is sponsored by the U.S. National Cancer Institute (NCI). The study followed over 1600 hemophilia patients at 16 treatment centers (12 in the U.S. and 4 in western Europe) during the period from January 1, 1978 to December 31, 1995. The MHCS is one of the two large U.S. epidemiological studies of hemophiliacs, the other being the Transfusion Safety Study Group of the University of Southern California.

Patients in the MHCS are classified according to age, HIV status, and severity of hemophilia. To determine severity of hemophilia, on each annual questionnaire patients indicate the amount of clotting-factor concentrate they have received in that year. The severity of hemophilia reported here is calculated from the average annual clotting-factor concentrate received in the 1978–84 period.

Each record in the data set corresponds to one stratum of hemophiliacs in one calendar year of the study. For example, one row in the data provides information on all severe hemophiliacs in 1983 who were HIV-negative and between the ages of 10 and 14 inclusive. In this group in 1983, the patients contributed 6.84 person years to the study, and none of them died. In general, a subject's person years are calculated from the beginning of the study, or their birth date if they were born after January 1, 1978, until the time of last contact or the end of the study, whichever is earlier. When a subject dies or drops out before the end of the study, then the last contact occurs at the time of death or withdrawal.

Variable	Description
Year	Calendar year: 78; ... ;95.
HIV	HIV status: 1=negative; 2=positive.
Severity	Average annual dose of clotting-factor concentrate:
	1= over 50,000 units; 2= 20,001–50,000 units;
	3= 1–20,000 units; 4=unknown; 5=none.
Age	Age in 5-year intervals:
	1= under 5; 2= 5 to 9;... ; 14= 65 and over.
Person years	Total amount of time during the calendar year that the people in the stratum were alive and part of the study.
Deaths	Number of deaths in the calendar year for the stratum.

- Begin by comparing the age distribution of person years for the HIV-

negative and HIV-positive groups. Is the HIV-negative population younger or older than the HIV-positive population?

- From 1980 to 1985, the clotting-factor concentrates were contaminated with HIV, and it was during this time period that the hemophiliacs who received contaminated transfusions were infected. By 1985, methods were available for screening blood supplies, and HIV was virtually eliminated from blood products. How might this window of exposure affect the age distribution of the HIV-infected hemophiliacs over time? Is calendar year a potential confounder?

- According to Duesberg, it is not HIV that has caused AIDS among hemophiliacs, but the "other junk" in the transfusions the patient receives. Duesberg claims that these other contaminants are the real cause of AIDS, and that it is critical to take into account the quantities of clotting-factor concentrate that people with hemophilia receive in their lifetime for a fair comparison of mortality rates of seropositive and seronegative patients. Do you find evidence in the MHCS study to support Duesberg's claim?

- Combine the HIV-positive mortality rates for each age group using a weighted average, where the weights reflect the relative size of each age group in some standard population. Use the same age adjustment for the HIV-negative rates.

- Use a simulation method to create confidence intervals for the difference in mortality rates between HIV-positive and HIV-negative hemophiliacs according to severity of hemophilia and calendar year. Present your results graphically.