1023-92-1167   **J. Mac Hyman*** (`hyman@lanl.gov`), Mail Stop B284, Los Alamos National Laboratory, Los Alamos, NM 87545, and **Gerardo Chowell** (`chowell@lanl.gov`), Mail Stop B284, Group T-7, Los Alamos National Labortory, Los Alamos, NM 87545. *Mathematical Models for Estimating the Number of People Infected with HIV.*

The number of people infected with HIV in the US can be estimated by a Volterra integral equation of the first kind based on the relationship between HIV infection and the incidence of AIDS cases. Even though the resulting integral equation is ill-posed, this approach generates one of the best available estimates for the upper and lower bounds on the incidence of HIV infection. The kernel in the integral equation accounts for the long delay from the initial HIV infection to the onset of AIDS. Because of uncertainties in the AIDS case data and in the probability distribution of the time from HIV infection to AIDS, the sensitivity of the model must be carefully analyzed. We used the Centers for Disease Control AIDS case data to estimate the unknown parameters and solved the integral equation to provide insight into the past and future course of the HIV epidemic. (Received September 25, 2006)