Modeling the renal disease epidemic among HIV-infected individuals

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The number of HIV+ individuals who develop end stage renal disease (ESRD) and require life-long dialysis treatment has been continually rising in some regions around the world. A differential equation-based mathematical model was developed to assess the impact of antiretroviral therapy on the progression to disease and to project the future prevalence of HIV+ ESRD. The goals of this study are to parameterize the model with new data on the populations of individuals with HIV/AIDS and those with HIV+ ESRD, and to extend the model to take into account greater complexity in the population dynamics. We also expand the model's analysis to predict treatment recommendations for the population of HIV+ individuals at risk for developing renal disease. Further studies will estimate how much the development of renal disease and treatment levels have changed over time, predict the treatment levels needed to slow the increase of this epidemic, and use a two-sex model to better understand differences in HIV+ ESRD among women and men.

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