
JEFF MUSGRAVE, UNB – Fredericton

An evaluation of control strategies for the HIV epidemic

Since the discovery of HIV/AIDS there have been numerous mathematical models proposed to explain the epidemic of the disease and to evaluate possible control measures. In particular, several recent studies have looked at the potential impact of condom usage on the epidemic (Greenhalgh 2001, Gumel 2005, Hethcote 2000, Hyman 1999). We propose a model of the effect of condom use and withdrawal on the spread of the virus, similar to that of Gumel et al. (2005), and show that a simple rescaling can be used to broaden the results of a sensitivity and uncertainty analysis. Based on available estimates, we predict a condom preventability of approximately 95% is necessary to ensure control of the epidemic. A further simplification of the model, replacing the standard incidence with a bilinear infection term and assuming the demographic timescale is much slower than the disease timescale, allows an estimate of the peak size of the epidemic.