SPATIO-TEMPORAL MODELLING OF THE HIV EPIDEMIC IN JAPAN

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Although Japan has one of the lowest rates of HIV/AIDS cases among industrialized nations, the number of HIV/AIDS cases in the country has been increased steadily and rapidly. In the earlier phase of the HIV/AIDS epidemic (until around 1990), most cases were reported from Tokyo and its surrounding prefectures. However, as the epidemic progressed, the diffusion of the epidemic into other metropolitan areas and peripheral regions was noticeable. A simple multiregion epidemic model with SIR (Susceptible-Infective-Remover) compartments is employed in this study in order to provide the basic information on the current and future states of local HIV epidemics in Japan. Regarding the model as a stochastic space-time series model, we statistically calibrate the model by an estimation method allowing geographically varying-parameters. Using the estimated parameters, we conduct mid-term geographical projections of local epidemics by examining geographical variations in future epidemic growth and spatial relationships in HIV transmission. We assess the utility of the current surveillance system of HIV/AIDS in Japan for controlling regional epidemics from a geographical perspective. Further extensions including sensitivity analysis and disaggregation by risk groups will be also discussed.