



S16 – Modelling the Impacts of PrEP Intervention on the HIV Epidemic in MSM in Hong Kong

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Introduction and Project Objectives: Pre-exposure prophylaxis (PrEP) is a biomedical preventive measure which could reduce sexual transmission risk by as high as 86%. WHO has recommended PrEP as an intervention for controlling the HIV epidemic. In Asia, PrEP modelling studies have been conducted in India and South Korea, where transmission among heterosexuals played an important role. With men who have sex with men (MSM) accounting for a significant proportion of HIV infections in Hong Kong, we aimed to simulate the impact of PrEP intervention through mathematical modelling.

Methods: A deterministic compartmental model with a number of sub-models was developed. The model was structured by cascade of HIV care, natural history of HIV infection and PrEP usage. Empirical clinical data were collected from three major HIV specialist clinics in Hong Kong for model parameterization. HIV sequences were collected for population delineation by phylogenetic analysis (neighbour-joining tree). Annual surveillance data was retrieved from annual reports for model fitting.

Results: We divided HIV-infected MSM into 19 subgroups, each in one sub-model. Our simulation of the HIV epidemic curve without PrEP from 1981 to 2011 (basecase scenario) was close to the annual reported number of new diagnoses of MSM. In basecase scenario, HIV prevalence would increase from 0.07 in 2011 to 0.16 in 2021, and annual local new infections would increase from 317 to 443. If PrEP is implemented from 2017, 14-67% of new infections would be averted in 2021, depending on the coverage and distribution of high/low adherence of PrEP usage.

Discussion: Our modelling results showed that the HIV epidemic in MSM in Hong Kong is expected to grow. Implementation of PrEP in the community would avert new infections and control the epidemic. The impact of PrEP is positive even though the extent would vary by population coverage, adherence, affordability, public awareness and acceptance. The need of PrEP targeting high risk MSM in low HIV incidence city like Hong Kong would need further investigation.

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