

## HIV Incidence among Men Who Have Sex with Men Measured by Pooling Polymerase Chain Reaction, and Its Comparison with HIV Incidence Estimated by BED-Capture Enzyme-Linked Immunosorbent Assay and Observed in a Prospective Cohort

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**Abstract :** To compare the HIV incidence estimated using BED capture enzyme linked immunosorbent assay (BED-CEIA) and observed in a cohort against the HIV incidence among men who have sex with men (MSM) measured by pooling polymerase chain reaction (pooling-PCR). A total of 617 MSM subjects were included in a respondent driven sampling survey in Chongqing in 2008. Among the 129 that were tested HIV antibody positive, 102 were defined with long-term infection, 27 were assessed for recent HIV infection (RHI) using BED-CEIA. The remaining 488 HIV negative subjects were enrolled to the prospective cohort and followed-up every 6 months to monitor HIV seroconversion. All of the 488 HIV negative specimens were assessed for acute HIV infection (AHI) using pooling-PCR. Among the 488 negative subjects in the open cohort, 214 (43.9%) were followed-up for six months, with 107 person-years of observation and 14 subjects seroconverted. The observed HIV incidence was 12.5 per 100 person-years (95% CI=9.1-15.7). Among the 488 HIV negative specimens, 5 were identified with acute HIV infection using pooling-PCR at an annual rate of 14.02% (95% CI=1.73-26.30). The estimated HIV-1 incidence was 12.02% (95% CI=7.49-16.56) based on BED-CEIA. The HIV incidence estimated with three different approaches was different among subgroups. In the highly HIV prevalent MSM, it costs US\$ 1724 to detect one AHI case, while detection of one case of RHI with BED assay costs only US\$ 42. Three approaches generated comparable and high HIV incidences, pooling PCR and prospective cohort are more close to the true level of incidence, while BED-CEIA seemed to be the most convenient and economical approach for at-risk population's HIV incidence evaluation at the beginning of HIV pandemic. HIV-1 incidences were alarmingly high among MSM population in Chongqing, particularly within the subgroup under 25 years of age and those migrants aged between 25 to 34 years.

**Keywords :** BED-CEIA, HIV, incidence, pooled PCR, prospective cohort

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