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Abstract

TUPE0414 - Four cities modelling: #5 simulated effect of HSV-2 prophylactic vaccines on population-level HIV incidence in sub-Saharan Africa

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Background: HSV-2 may play an important role in HIV transmission in sub-Saharan Africa. This project explores the effect of a potential prophylactic HSV-2 vaccine on the HIV epidemic in model simulations.

Methods: Epidemiological, behavioural, and demographic data from a cross-sectional population based study in four cities (Cotonou, Benin; Yaounde, Cameroon; Kisumu, Kenya; and Ndola, Zambia) were used to inform model parameters. An individual-based stochastic microsimulation model simulated the HSV-2 and HIV epidemics in the four sites. A prophylactic HSV-2 vaccine was introduced into the model in 1997; HIV incidence ten years later was compared to default scenarios.

Results: Assuming continuous vaccination of 14y olds and an initial mass vaccination campaign among 14-30y olds, each with 80% coverage, and 15y average duration of immunity, simulated reductions in population-level HIV incidence in the four cities after ten years were 18-25% for a vaccine with 80% efficacy. This decreased to 10-16% and 6-10% for efficacies of 50% and 30% respectively. Without the initial mass vaccination campaign, the reduction in HIV incidence for 80% efficacy was only 8-9%, demonstrating the importance of a mass campaign for short-term impact on HIV.

Conclusions: HSV-2 vaccines of high or moderate efficacy could have a substantial impact on population-level HIV incidence if delivered with high coverage. Initial mass campaigns targeting a wide age-range will greatly hasten the impact of vaccination.