Abstract

MOPE0315 - The AVAHAN HIV-prevention intervention programme in India: preliminary modelling results on potentially achievable levels of effectiveness

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Background: The Bill and Melinda Gates Foundation-funded AVAHAN Initiative aims to reduce HIV prevalence in high-risk groups in six Indian states and limit HIV transmission in the general population. Mathematical modelling was used to rapidly assess the likely impact achievable by different components of the AVAHAN intervention.

Methods: A deterministic compartmental model simulated, at district level, the transmission dynamics of HIV and two sexually transmitted infections (STI) as cofactors for HIV transmission. This model represented key stages of HIV and STI infection for the sexually active population stratified into female sex workers (FSW), male clients, and high- and low-risk members of the general population. Interventions modelled included those leading to increased condom use, quality syndromic management of STIs (SMSTI) and presumptive prophylactic treatment (PPT) of bacterial STIs for FSW. Using context-specific behavioural data, model outputs were fitted to epidemiological data from two settings in Karnataka State. Univariate and Latin hypercube (LHS) multivariate sensitivity analyses were undertaken. The primary intervention impact measure investigated was proportion of incident HIV cases averted by the interventions.

Results: Baseline FSW and general population HIV prevalences were most sensitive to baseline patterns of FSW condom use, FSW client numbers and population distribution between sexual activity groups. Greatest intervention impact was achieved through increased condom use, and least through SMSTI; PPT impact, initially similar to SMSTI, gained in effectiveness over time, and by 15 years approached that of increased condom use.

Conclusions: Increased condom use by FSWs is likely to result in greatest and most rapid impact. LHS analysis suggested intervention effectiveness could vary over a relatively wide range, depending on baseline characteristics, but was most strongly and negatively associated with FSW HIV prevalence. So the effectiveness of interventions is likely to be largest in low prevalence settings, independently of population characteristics.