Background

- Strong evidence suggests antiretroviral therapy (ART) prevents HIV transmission; few studies conducted on the preventive effect of ART in the Asian epidemics.
- Viet Nam has a concentrated epidemic with highest HIV prevalence observed in people who inject drugs (PWID).

Objective

- To identify optimal strategies and targets for HIV control in Viet Nam’s epidemic, that include early ART for prevention in Viet Nam’s epidemic.

Methods

- A deterministic mathematical model with seven subpopulations (Fig 1), using HIV prevalence trends and sub-population size of Can Tho province, Vietnam.
- Studied intervention scenarios
  - Periodic testing and immediate treatment (PTIT)
    - ART: 96% reduction of needle-sharing transmission (sensitivity analysis 70-96%, Fig 5)
    - Delivered in various scenarios
    - Offered to all adults, or targeted to a specific sub-population
    - Combined with other prevention interventions
      - Current level or scale-up of methadone maintenance and condom

- Assumptions for ART effect on HIV transmission
  - 96% reduction of sexual transmission
  - 96% reduction of needle-sharing transmission (sensitivity analysis 70-96%, Fig 5)

- Costs
  - ART: USD 415 / person-year
  - HIV test: USD 3.5 / test

Figure 1. Seven sub-populations in the model

Results

- From 2011 to 2050, maintaining current interventions will incur an estimated 18,115 new infections, and will cost USD 22.1 million. (Fig 2)
- Annual HTC and immediate treatment, if offered to all PWID, will reduce new infections by 14,513 (80%), and will cost USD 76.9 million. (Fig 2)
- Annual HTC and immediate treatment offered only to PWID, will reduce new infections by 14,000 (77%) with similar costs USD 22.7 million. (Fig 2)
- This combination prevention scenario will reduce the incidence to less than 1 per 100,000 in 14 years; will result in a relative cost saving after 19 years. (Fig 3)

Summary

- Periodic HTC + early ART: Likely substantial impact on Viet Nam’s epidemic
- Targeting critical: Prioritizing PWID and other key populations likely enhance cost-effectiveness (Fig 4)
- Combination prevention: Combination with other prevention interventions accelerate the impact (Fig 3)
- Cost-saving: Upfront investment needed but will cost-saving beyond 20 years (Fig 3)

Figure 2. PTIT offered to all groups or a single group

Figure 3. Combination prevention with/without PTIT

Figure 4. PTIT: cost effectiveness

Figure 5. Sensitivity analysis on ART preventive efficacy on needle-borne transmission

Reference


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THE POTENTIAL IMPACT OF EXPANDING ANTIRETROVIRAL THERAPY AND COMBINATION PREVENTION IN VIETNAM: TOWARDS ELIMINATION OF HIV TRANSMISSION

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