HIV Sentinel Surveillance 2006

Surveillance Unit
National Center for HIV/AIDS Dermatology and STD

15 August 2008
Outline

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- Results
- Conclusion
- Recommendation
Objectives

- To estimate the prevalence of HIV infection in two key female sentinel groups in 2006
- To estimate HIV incidence in these groups
- To estimate HIV prevalence in the general population
- To obtain data for monitoring trends in HIV prevalence
- To provide information on HIV prevalence for prevention planning and care efforts
Methods

- Study design: Cross sectional study (October 2006-February 2007)
- Sentinel groups:
  - Brothel based female sex workers (FSW)
  - Pregnant women attending antenatal clinics (ANC)
- Sentinel sites: 22 cities/provinces
- Sample size:
  - FSW: 150 per province
  - ANC: 600 per province (300 from provincial capital/urban area and 300 from remaining districts/rural area)
- Specimen collected: 5 ml of whole blood
Methods: 22 sentinel provinces
Methods: Sampling

- **FSW**
  - In provinces with less than the required sample size of 150, sampling was “take-all”
  - In provinces with at least 150 FSWs, sampling was “take-all” from randomly selected brothels

- **ANC**
  - Separate samples of 300 women were selected from provincial capitals (PC) and 300 from remaining districts (RD)
  - Pregnant women were selected consecutively from designated ANC clinics at health centers until the required sample size was reached
  - Duration of data collection was limited to three months
Methods: sample size by survey year

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<tbody>
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<td></td>
<td>(21)</td>
<td>(20)</td>
<td>(22)</td>
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<td>(Provinces)</td>
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<tr>
<td>DFSW</td>
<td>2,180</td>
<td>2,110</td>
<td>2,411</td>
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<td>IDFSW</td>
<td>1,799</td>
<td>1,232</td>
<td>1,633</td>
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<td>Police</td>
<td>4,711</td>
<td>4,379</td>
<td>5,796</td>
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<tr>
<td>ANC</td>
<td>6,562</td>
<td>9,168</td>
<td>10,867</td>
<td>12,464</td>
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<tr>
<td>Total</td>
<td>17,991</td>
<td>19,247</td>
<td>20,707</td>
<td>14,730</td>
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Methods: HIV testing

- Tests performed at the provincial level
  - Two rapid tests were used (Determine & Stat-Pak)
  - A serial two-test algorithm was used for FSW and a parallel two-test algorithm was used for ANC
  - Dried blood spot (DBS) specimens were prepared for quality control

- Quality control testing performed by NIPH lab
  - FSW:
    - Phase 1: 10% of all specimens were tested
    - Phase 2: All reactive specimens not tested in phase 1 were tested
  - ANC:
    - All reactive specimen and 10% of all non-reactive specimens were tested
  - Two enzyme immunoassays were used for quality control testing (Vironostika & Murex)
Methods: HIV prevalence testing algorithm

**Female sex workers**

Determine

- **Positive**
  - Stat-Pak
    - Positive
    - Negative

- **Negative**

**ANC women**

Determine

- **Positive**
  - Stat-Pak
    - Positive
    - Negative?
      - Repeat both tests
      - Negative

- **Negative**
  - Stat-Pak
    - Positive
    - Negative

Sensitivity (Se) and specificity (Sp) data from phase 1 validation of 5 rapid HIV tests conducted in Cambodia in 2004. The combined algorithm was found to be 99.5% sensitive and 100% specific.
Methods: Quality control testing algorithm

DBS specimens selected for QC testing

Vironostika

Positive

Murex

Positive

Negative

Negative
**Methods: HIV incidence estimation**

- **Testing for recent infection**
  - All DBS specimens identified as HIV positive were tested for recent infection
  - Calypte HIV-1 Incidence BED EIA was used
  - Specimens with normalized optic density (OD_n) values ≤0.8 on confirmatory testing were considered to be from persons with recent HIV infection

- **Calculating HIV incidence**
  - Overall window period used was 155 days
  - HIV incidence was annualized using the formula

\[
I = \frac{\{{(365/155)N_{inc}}\}}{{N_{neg} + [(365/155)N_{inc}]/2}} \times 100
\]

where:
- \(N_{inc}\): number of recent infections
- \(N_{neg}\): number of HIV seronegatives
**Results:** HIV prevalence* in 2006, by sentinel group

*Adjusted for results of quality control

**Weighted for provincial population size
Results: HIV prevalence among female sex workers, by survey year
Results: HIV prevalence* among female sex workers, by age group

*Adjusted for results of quality control
Results: HIV prevalence* among female sex workers, by survey year and duration of sex work

*Adjusted for results of quality control
**Results:** HIV prevalence* among female sex workers, by age and duration of sex work

*Adjusted for results of quality control
Results: HIV prevalence* among FSWs, by province

*Adjusted for results of quality control
Results: HIV prevalence among ANC, by survey year

QC-adjusted, weighted
QC-adjusted, weighted, and EPP smoothed
Results: Trends in estimated HIV prevalence* among ANC women, by ANC location

* QC-adjusted, weighted, and smoothed with EPP
Result: Estimated HIV prevalence* among general population aged 15-49 years old

*Qc adjusted, weighted and EPP smoothed
Results: HIV prevalence* among ANC, by province

*Adjusted for results of quality control
Estimating HIV incidence

Annualized period (365 days)

Assumed window period (155 days)

In HSS 2006:
All new infection was assumed to occur within 155 day of the cohort if all participants were followed up

\[ I = \frac{(365/155)N_{inc}}{N_{neg} + [(365/155)N_{inc}]/2} \times 100 \]

Annualized HIV incidence
(HIV incidence among 100 person per year)

Adjusted annualized incidence
Results: HIV incidence* among FSWs in 2006

* With 95% confidence interval
Results: HIV incidence* among FSWs, by survey year

*Uncorrected incidence
Results:  HIV incidence* among ANC women in 2006, by adjustment method

* With 95% confidence interval
Results: HIV incidence* among ANC women, by survey year

* Unadjusted incidence
Results: Projected new HIV infection among adult population aged 15+
Conclusions

- HIV prevalence has declined among both sentinel groups of female sex workers and pregnant women attending antenatal clinics.
- Data* suggest that some female sex workers may already be infected with HIV when they start sex work or become infected almost immediately after starting.
- HIV prevalence among pregnant women who attend provincial capital/urban ANCs has been consistently higher than among those who attend remaining district/rural ANCs.
- HIV incidence has declined among both sentinel groups and it is estimated that among 100,000 pregnant women, 70 were newly infected in 2006.
- Although unadjusted HIV incidence among FSWs and ANCs is probably an over-estimate of true incidence, the declining trend and magnitude of the decline is consistent with prevalence data.

*9% HIV prevalence among FSWs who had reported working for less than one year.
Recommendations

- Integrate testing for recent infection into all future rounds of HSS
  - Maintain or improve adherence to quality assurance and capacity building for surveillance at provincial level
  - Continue to use dried blood spot specimens in future HSS rounds because of simplicity in preparing, processing and storing
  - Maintain current interventions among most at risk populations—despite declining prevalence and incidence among both sentinel groups, this step will be crucial in preventing further spread of HIV and another wave of the epidemic
Acknowledgements

- National Center for HIV/AIDS, Dermatology and STDs (NCHADS)
- Provincial Health Department and Provincial AIDS Programs
- National Institute of Public Health (NIPH)
- Collaborating partners:
  - US CDC Global AIDS Program
  - USAID/PRASIT
  - World Health Organization
Thank You