HIV Sentinel Surveillance (HSS) 2003: Results, Trends, and Estimates

Surveillance Unit
National Center for HIV/AIDS, Dermatology and STDS (NCHADS)

Sun Way Hotel
December 03, 2004
Outline

1. Objectives
2. Methodology
3. Results
4. Conclusions
5. Program implications
6. Recommendations
Objectives

1. To estimate the prevalence of HIV infection in selected sentinel population groups, by province in 2003;
2. To estimate the number of persons living with HIV, AIDS cases, and AIDS deaths over time;
3. To monitor trends in Cambodia’s HIV/AIDS epidemic; and
4. To inform prevention planning and care efforts, and to provide data needed to evaluate their impact.
Methods
## Provinces and Sentinel Populations Covered by Survey Year

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. of Provinces</strong></td>
<td>9</td>
<td>18</td>
<td>22</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td><strong>DSWs</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>IDSWs</strong></td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>POLICE</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>ANC</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
National Surveillance Implementation

- National Center for HIV/AIDS, Dermatology and STDs (NCHADS)
- Provincial AIDS Programs
- National Institute of Public Health (NIPH)
- Collaborating partners:
  - US CDC Global AIDS Program
  - Family Health International / USAID
  - World Health Organization
  - University of California at Los Angeles (UCLA)
  - University of New South Wales (UNSW)
Sentinel Sites (22 of 24 Provinces)
HIV Sentinel Groups 2003

1. Direct female sex workers (DFSW)
2. Indirect female sex workers (IDFSW)
3. Male police
4. Pregnant women attending ANC clinics (ANC)
HSS 2003 Sampling Scheme (1)

• DFSW and IDFSW
  • In provinces with less than the required sample size (i.e., ≤150), sampling was “take-all”
  • In provinces with sufficient numbers (>150):
    • DFSW samples were randomly selected from brothels
    • IDFSW samples were randomly selected from beer companies or karaoke establishments
• Police were randomly selected from units, offices, and departments
HSS 2003 Sampling Scheme (2)

- ANC
  - Separate samples of 300 women were selected from provincial capitals (PC) and remaining districts (RD)
  - Pregnant women were selected consecutively from the ANC clinics or health centers until the required sample size was reached
  - Duration of data collection was limited to three months
Comparison of Samples Collected in HSS 2000, 2002 and 2003

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2002</th>
<th>2003*</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFSW</td>
<td>2,180</td>
<td>2,110</td>
<td>2,411</td>
</tr>
<tr>
<td>IDFSW</td>
<td>1,799</td>
<td>1,232</td>
<td>1,633</td>
</tr>
<tr>
<td>Police</td>
<td>4,711</td>
<td>4,379</td>
<td>5,796</td>
</tr>
<tr>
<td>ANC</td>
<td>6,562</td>
<td>9,168</td>
<td>10,867</td>
</tr>
<tr>
<td>Total</td>
<td>17,991</td>
<td>19,247</td>
<td>20,707</td>
</tr>
</tbody>
</table>

*Data collected from August through November 2003*
Modifications for 2003

• Used two HIV rapid tests
• Decentralized HIV testing to the provincial level
• Conducted quality assurance testing
• Added Odor Meanchey province
• Dropped TB patients
HIV Testing Procedure

- Obtained oral informed consent
- Collected 5 ml whole blood
- Conducted voluntary anonymous testing
- Performed testing at the provincial level
- Followed WHO testing strategies I and II for HIV sentinel surveillance
- Prepared dried blood spots (DBS) for quality assurance testing
HIV Testing Algorithm*

$\geq 10\%$ HIV prevalence

Direct and indirect female sex workers

Determine

$+$  Positive

$-$  Negative

Se=100.0%  Sp=99.8%

$< 10\%$ HIV prevalence

Policemen and ANC women

Determine

$+$  Positive

$-$  Negative

Stat-Pak

$+$  Positive

$-$  Negative

Se=99.5%  Sp=100.0%

*Based on UNAIDS/WHO HIV testing strategy for sentinel surveillance
Quality Assurance Sampling Strategy

Algorithm for DBS Preparation

Direct and indirect female sex workers

Prepare DBS from *EVERY TENTH* specimen

Policemen and ANC women

Determine **POSITIVE**

Prepare DBS on *ALL POSITIVE* specimens

Determine **NEGATIVE**

Prepare DBS from *EVERY TENTH NEGATIVE* specimen
Quality Control

- QC was performed on the samples from 1999-2003
- False positive and false negative were identified among each sentinel group
- Prevalence was adjusted accordingly
Data analysis

• QA-adjusted province- and group-specific HIV prevalence
• Weighted police and ANC data by population size.
• Self-weighted DFSW and IDFSW
• Smoothed police and ANC data by using EPP to remove sampling variation
• QA-adjusted group-specific HIV prevalence for 1997-2002 based on HIV incidence study retesting
• Constructed HIV prevalence trends for each group
• Estimated national HIV prevalence percent and number of persons living with HIV in 2003
• Estimated number of new HIV infections, HIV infected pregnant women, AIDS cases and AIDS deaths, by year.
Results
### Percent refusal by HSS sentinel group and year

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>National aggregate (range across provinces)</td>
<td>National aggregate (range across provinces)</td>
<td>National aggregate (range across provinces)</td>
</tr>
<tr>
<td>DFSW</td>
<td>4.9 (0-18.0)</td>
<td>4.8 (0-16.2)</td>
<td>3.4 (0-22)</td>
</tr>
<tr>
<td>IDFSW</td>
<td>11.9 (0-32.3)</td>
<td>11.6 (0-37.7)</td>
<td>7.6 (0-40*)</td>
</tr>
<tr>
<td>Police</td>
<td>8.6 (0-58.0)</td>
<td>14.6 (0-57.8)</td>
<td>4.5 (0-27.1)</td>
</tr>
<tr>
<td>ANC</td>
<td>N/A</td>
<td>1.9 (0-18.5)</td>
<td>1.9 (0-17.3)</td>
</tr>
</tbody>
</table>

* Stung Treng: 4 out of 10 IDFSW refuse
Adjusted HIV prevalence* among sentinel groups in 2003

<table>
<thead>
<tr>
<th>Sentinel Group</th>
<th>Percent (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFSW</td>
<td>20.8 (18.7-23.0)</td>
</tr>
<tr>
<td>IDFSW</td>
<td>11.7 (9.4-14.4)</td>
</tr>
<tr>
<td>Police**</td>
<td>2.5 (1.6-3.9)</td>
</tr>
<tr>
<td>ANC**</td>
<td>2.2 (1.6-2.8)</td>
</tr>
</tbody>
</table>

*Adjusted for results of QA testing; values shown are point estimates and 95% confidence intervals

**ANC and police groups weighted by population size
Adjusted HIV prevalence* among DFSW, by year, 1996-2003

*Adjusted for results of quality assurance testing
Adjusted HIV prevalence* among DFSW, by age group and year, 1998-2003

*Adjusted for results of quality assurance testing
HIV Prevalence among DFSW by duration of sex work, 2002-2003

- Percent distribution by duration of sex work:
  - < 1 Year: 18.6% (2002), 18.6% (2003)
  - 1-2 Years: 26.9% (2002), 30.8% (2003)
  - > 2 Years: 34.6% (2002), 37.3% (2003)
Estimate of the prevalence of HIV among DFSW in Cambodia in 2003

HIV prevalence
- 14 - 22.%
- 20 - 25 %
- 27 - 30 %
- 31 - 54 %
- Non available
- Tonle sap lake
Estimated number of brothel based sex workers currently working and living with HIV in 2003
Adjusted HIV prevalence* among IDFSW, by year, 1998-2003

*Adjusted for results of quality assurance testing
Adjusted HIV prevalence* among IDFSW, by age category and year, 1998-2003

*Adjusted for results of quality assurance testing
Adjusted HIV prevalence* among police, by year, 1996-2003

Year


Percent

4.3 4.5 4.4 4.2 3.8 3.5 3.1 2.7

Adjusted, weighted data

Adjusted, weighted data smoothed with EPP
HIV prevalence among police in 2003

HIV prevalence among police

1 - 1.9%
2 - 2.8%
3.7 - 4.3%
5 - 12%
Non available
Tonle sap lake
Adjusted HIV prevalence* among ANC women, by year, 1996-2003

Year | Percent
--- | ---
1996 | 1.9
1997 | 2.3
1998 | 2.5
1999 | 2.5
2000 | 2.5
2001 | 2.4
2002 | 2.3
2003 | 2.1
HIV prevalence among women at ANC in Cambodia in 2003

The map illustrates the distribution of HIV prevalence in Antenatal Care (ANC) in various regions of Cambodia. The prevalence ranges from 0.6% to 3.5%. The map uses different colors to represent different prevalence rates. The legend includes:

- **Yellow**: 0.6% - 1.4%
- **Orange**: 1.5% - 1.9%
- **Red**: 2% - 2.7%
- **Violet**: 2.8% - 3.5%
- **White**: Non available
- **Light blue**: Tonle sap lake

The map shows the prevalence across the provinces, with some areas having data unavailable.
HIV infected pregnant women who will deliver in 2004 in Cambodia

Number of HIV pregnant women
- 0 - 75
- 160 - 250
- 350 - 550
- 650 - 770
- 970 - 1230
- Non Available

Tonle sap lake.shp
Estimated number of men aged 15-49 living with HIV, newly infected with HIV, and who died from AIDS, by year, Cambodia

Living with HIV (Prevalence)  Deaths (Mortality)  New HIV Infections (Incidence)
Estimated number of women aged 15-49 living with HIV, newly infected with HIV, and who died from AIDS, by year, Cambodia

- Living with HIV (Prevalence)
- Deaths (Mortality)
- New HIV infections (Incidence)
Estimated number of people aged 15-49 living with HIV/AIDS, 1990-2003, Cambodia
Gender distribution of people currently living with HIV/AIDS, 1997-2003
Estimated number of AIDS cases by year, Cambodia

- **Women**
- **Men**
- **Total**

<table>
<thead>
<tr>
<th>Year</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1991</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1992</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1993</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1994</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1995</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1996</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1997</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1998</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1999</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2000</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2001</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2002</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2003</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2004</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Number of women living with HIV in Cambodia in 2003

- **Tonle Sap Lake**
  - Number of women living with HIV
    - Non available
    - 150 - 500
    - 1000 - 2500
    - 4000 - 5000
    - 5000 - 6000
    - 8300

---

**Number of women living with HIV**

- 150 - 500
- 1000 - 2500
- 4000 - 5000
- 5000 - 6000
- 8300

**Legend**

- Non available
- Tonle sap lake

* From the modeled numbers of PLHA
Conclusions

• HIV prevalence has declined among sex workers and police but appears to be stable among pregnant women attending ANC

• Larger decline among young female sex workers compared with those older than 20 years suggests declining incidence in this group

• Estimated national prevalence of HIV among persons aged 15-49 has declined from 2.1% in 2002 to 1.9% in 2003

• Declining HIV prevalence not explained by increasing number of deaths alone, thus incidence (number of new HIV infections) must be declining

• Women make up an increasing proportion of persons living with HIV
Programmatic Implications

• HSS 2003 data provide data needed for evidence-based program planning
• ANC data may be used by PMTCT program planners for estimating need and for monitoring and evaluation
• Although prevalence is declining, an unacceptably large number of Cambodians living with HIV are in need of care and treatment
• Strategic planning is urgently needed if successes are to be sustained and additional epidemic waves prevented
• Current intervention efforts on high risk groups need to be sustained
• Effective family intervention (husbands and wives) must be implemented given that the HIV incidence among women is not declining
Recommendations for future rounds of HSS (1)

- Continue adherence to quality assurance:
  - Data collection, entry, analysis, interpretation
  - Laboratory testing
- Consider new strategies for HIV/AIDS surveillance
  - Integrate testing for determination of recent infection (incidence) into the HSS protocol
- Continue capacity building for surveillance at the provincial level
Recommendations for future rounds of HSS (2)

• Consider the need for data on HIV prevalence among drug users, men-who-have-sex-with-men, and migrant populations
  • Conduct pilot surveys among these groups before next HSS round
• Collect additional data to characterize the indirect sex worker group
  • Who they are and the size of the population at risk
Thank You!