• Successful HIV prevention depends on changing risk behaviors
• Based on Behavioral Surveillance Survey (BSS) format developed by FHI (Family Health International) and IMPACT (Implementing AIDS Prevention and Care Project)
• Early warning system that measures behavior and risk factors and identifies sub-groups most at risk
• 2006msmsurvey.com
• Online survey conducted from 01 to 30 April 2006
• Invitation was sent to 55,000 people
Questions

- Background characteristics
- Sexual history
- Condoms and lubricants
- STDs
- Knowledge/attitudes towards HIV/AIDS
- Exposure to interventions
Results

- Total respondents
  - 3272
- Singapore respondents
  - 1479 (45%)
Basic demographics

• Same ethnic makeup of Singaporeans
  – e.g. 80% Chinese, 7% Malay, 3% Indian
• Well educated
  – 47% with university/post grad degree
• 81% had sex in the last 3 months
Age of respondents

Below 20 20 to 29 30 to 39 40 to 49 50 and above

2004 2006

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Ethnicity of respondents

- Caucasian
- Eurasian
- South Asian
- Malay
- Chinese

2003: 76.2%
2004: 83.1%
2006: 79.72%

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Sexual Orientation

- Gay
- Heterosexual
- Others

2003 2004 2006
Awareness of Anon Testing Service

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>37</td>
<td>56.9</td>
<td>90.2</td>
</tr>
<tr>
<td>No</td>
<td>8.4</td>
<td>12.2</td>
<td>2.5</td>
</tr>
<tr>
<td>Don't know</td>
<td>54.5</td>
<td>30.9</td>
<td>6.25</td>
</tr>
</tbody>
</table>
HIV Testing History

- 2003: 40.4% Never, 59.6% Yes
- 2004: 49.9% Never, 50.1% Yes
- 2006: 18.75% Never, 81.25% Yes
HIV Testing History
(2006 Data)

<table>
<thead>
<tr>
<th>Duration</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>18.75</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>46.85</td>
</tr>
<tr>
<td>1 to 2 years</td>
<td>18.36</td>
</tr>
<tr>
<td>2 to 4 years</td>
<td>9.7</td>
</tr>
<tr>
<td>More than 4 years</td>
<td>5.9</td>
</tr>
</tbody>
</table>
Testing vs Condom Use

<table>
<thead>
<tr>
<th></th>
<th>Never had test</th>
<th>Had HIV Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Condom Use</td>
<td>17.46%, 19.05%</td>
<td>83.33%, 80.95%</td>
</tr>
</tbody>
</table>

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HIV prevalence in survey respondents

HIV Prevalence

2003 2004 2006

1.6 3.34 7.4

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Ethnicity of HIV+

- 2004 HIV+
  - Caucasian
  - Eurasian
  - South Asian
  - Malay
  - Chinese
  - Total: 70%

- 2006 HIV+
  - Caucasian
  - Eurasian
  - South Asian
  - Malay
  - Chinese
  - Total: 77.78%
Sexually Transmitted Infections 2003-2006

- Gonorrhoea
- Genital/Anal Warts
- Syphilis
- NGU
- Herpes
- Hep B
- Chlamydia
- Pubic Lice
- Molluscum

2003
2004
2006

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Condom use & HIV

- Consistent Condom Use
- Inconsistent condom use

HIV+
Condom use vs Number of Partners

- 1
- 2 to 5
- 6 to 10
- >10

Graph showing condom use percentages for different numbers of partners.
Number of Partners in last 3 months

- None
- 1
- 2 to 5
- 6 to 10
- >10

All
HIV+
Ways of Meeting Male Sexual Partners

Previously Known | Internet | Sauna | Work/Camp/School | Cruising Area | Friends/Parties | Gay clubs/events

2003 | 2004 | 2006

2006 copyright Fridae.com & Action for AIDS
Condom use with regular partners

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>HIV+</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>38.54</td>
<td>66.67</td>
</tr>
<tr>
<td>&lt;100%</td>
<td>40.2</td>
<td>7.41</td>
</tr>
<tr>
<td>No anal sex</td>
<td>19</td>
<td>18.52</td>
</tr>
</tbody>
</table>

2006 copyright Fridae.com & Action for AIDS
Condom use with casual partners

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>HIV+</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>45.85%</td>
<td>62.96%</td>
</tr>
<tr>
<td>&lt;100%</td>
<td>22.34%</td>
<td>22.22%</td>
</tr>
<tr>
<td>No anal sex</td>
<td>0%</td>
<td>7.41%</td>
</tr>
</tbody>
</table>

2006 copyright Fridae.com & Action for AIDS
Protected Anal Sex

Boyfriend only
Casual only
Both

HIV+ HIV+
Reasons for not using a condom

- Boyfriend
- Had Sex Before
- Condom not Available
- Looked Healthy
- Had HIV Test
- Feels Better Without Condom
- Too Drunk/High
- Impulse
Conclusions

• Singaporeans have high awareness of HIV and how it is transmitted
• Level of recent testing is high (and does not correlate with consistent condom usage)
• Some interventions appear to be working and condom usage is increasing, though still inconsistent
• Inconsistent condom usage is strongly correlated with being HIV+
Conclusions

- Most common reasons for not using condoms
  - Familiar partner (boyfriend or regular partner)
  - Feels better without (ie enjoy bareback sex)
  - Looks “healthy”
  - Impulse
- Risk behavior changes over time
Recommendations

• Prevention messages need to target specific risk taking behaviors and challenge the beliefs that lead to them
• “Positive prevention” is essential to the overall prevention strategy
• Primary goal is to increase consistent condom use
• Interventions require monitoring for efficacy
Caveats & Limitations

- Small sample of HIV positives
- Self-reporting (may be inaccurate)
- Demographic sample not representative of general population
- No full multi-variate logistic regression analysis
- Cause or effect not determined from the study
Acknowledgements

• Dr George Bishop (NUS)
• Phillipe Girault (FHI)
• Frits van Griensven (CDC-Atlanta)
• Dr Roy Chan