National Response to SARS: Singapore

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National Response to SARS: Singapore

• SARS transmission pattern
• 3 key lessons learnt & our response
• What we think has worked
  Containment of community transmission:
  Surveillance, contact tracing, quarantine
SARS Transmission pattern - Singapore

- **Patient Zero**
  - TTS Hospital Cluster: 109 cases
  - Orange Valley NH: 7 cases
  - Social group Cluster: 7 cases
  - PP Market Cluster: 13 cases
  - NU Hospital Cluster: 11 cases

- 6 imported cases
Key elements of national response

• Strong, coordinated national effort involving government, multiple agencies & public

• Prevention of import & export of cases

• Detect, isolate & contain strategy

• International info exchange & coordination
3 KEY LESSONS LEARNT

• Intrahospital transmission is the most important amplifier of SARS infection
Amplification of SARS infection through hospital transmission

1. SARS introduced into hospital
2. Amplified through intrahospital transmission
3. Spreads to other healthcare facilities
4. Spills out into community usually through HCWs, visitors
3 KEY LESSONS LEARNT

• Intrahospital transmission is the most important amplifier of SARS infection

• “Superspreaders” are unforgiving
Superspreaders are unforgiving

In Singapore

5 patients accounted for
103 of the 205 probable SARS cases
3 KEY LESSONS LEARNT

• Intrahospital transmission is the most important amplifier of SARS infection

• “Superspreaders” are unforgiving

• Atypical SARS patients pose the greatest risk
Our first “atypical” SARS case - 10 March 03

- Diabetes, hypertension, bad heart disease
- Admitted 10 March 03 with fever & pneumonia
- Blood cultures grew gram negative bacteria
- Deteriorated 12 March
- Diagnosis- worsening community acquired pneumonia & heart failure
- Treated in CCU

- Infected 23 (18 HCWs, 5 family members & visitors)
- Unrecognised exposure to another SARS patient
Atypical SARS cases are very difficult to detect early
<table>
<thead>
<tr>
<th>Public health implications</th>
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<tbody>
<tr>
<td>Intrahospital transmission is a major disease amplifier</td>
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<tr>
<td>Early detection and rapid containment</td>
</tr>
<tr>
<td>Superspreaders Atypical SARS cases</td>
</tr>
<tr>
<td>Very “Wide-net” surveillance &amp; quarantine policy</td>
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What has worked for us

Containment of hospital infection clusters

• Designating 1 hospital as the SARS hospital

• Stringent temperature surveillance of all staff & patients
  - isolation of staff, monitoring for fever clusters

• Enforced use of personal protective gear, fit-tested N95 masks, in all healthcare facilities
What we think has worked

Control of community transmission

• Broad-based & sensitive surveillance system
• Rapid, effective contact-tracing
• Low threshold for enforced quarantine during outbreak
Surveillance system: Sources

• Mandatory notification of suspected cases by email/fax within 24 hours by all doctors

• All suspicious cases sent to TTSH (SARS hospital) GPs, TCM, other hospitals, nursing homes, walk-in

• System for daily monitoring for fever clusters in all hospitals, nursing homes

• Temperature screening at points of entry and in community eg markets, schools
Epi team in TTSH to interview all patients (prob/suspect/obs)

11am review & classification of all cases by senior drs

TTS Hospital

All suspicious cases

DAILY EPI MEETING AT MOH
All suspicious cases → Epi team in TTSH to interview all patients (prob/suspect/obs)

Notifications by drs ↓

DAILY EPI MEETING AT MOH ↓

MOH Contact Tracing Centre ← FRT

HQO Phone surveillance

Trace in 24 hours

HQO same day

FRT

Fever clusters in hospitals, nursing homes

Contact tracing team in hospitals/schools/army camps/etc
Triggers for quarantine

Mandatory Home quarantine x 10 days

• Contacts of all probable and suspect cases

• Contacts of atypical or suspicious pneumonia patients without travel or contact history (or phone surveillance)

Hospital quarantine or other measures

• Clusters of febrile healthcare workers or patients in a work area
Weekly average time from onset of symptoms to isolation of SARS cases
<table>
<thead>
<tr>
<th>Period</th>
<th>No. of cases</th>
<th>Previously suspects (%)</th>
<th>Onset to isolation (days)</th>
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</thead>
<tbody>
<tr>
<td>3/3 - 9/3</td>
<td>15</td>
<td>0%</td>
<td>6.8 (5-9)</td>
</tr>
<tr>
<td>10/3 - 16/3</td>
<td>39</td>
<td>41%</td>
<td>4.5 (0-11)</td>
</tr>
<tr>
<td>17/3 - 23/3</td>
<td>33</td>
<td>48.5%</td>
<td>3.5 (0-8)</td>
</tr>
<tr>
<td>31/3 - 6/4</td>
<td>44</td>
<td>63.6%</td>
<td>2.9 (0-10)</td>
</tr>
<tr>
<td>21/4 - 27/4</td>
<td>8</td>
<td>87.5%</td>
<td>1.3 (0-4)</td>
</tr>
</tbody>
</table>

Early isolation of Probable SARS cases
Conclusion

In an outbreak situation

- Rapid containment of hospital clusters critical
- Intensive “wide-net” surveillance with low threshold for mandatory quarantine & phone surveillance
- Surveillance needs to be intensified when chain of transmission appears to have been broken