Patient safety and Infection Control

- the needs and challenges of regional networking

World Alliance for Patient Safety

WHO
Welcome...
First Avian Flu case in Hong Kong, 2005
A single act that can make a difference

Hand Hygiene
May/2002, World Health Assembly passed resolution WHA55.18, urged countries to pay the greatest possible attention to patient safety and requested the Director-General of WHO to carry out a series of actions to promote patient safety, including:

- development of global norms and standards;
- promotion of evidenced-based policies;
- promotion of mechanisms to recognize excellence in patient safety;
- encouragement of research;
- provision of assistance to countries in several key areas.
In November 2003, at a WHO meeting of international experts......

Sir Liam Donaldson proposed the establishment of a world alliance to develop patient safety policy.

The proposal was unanimously supported

World Alliance for Patient Safety
World Alliance for Patient Safety
World Alliance for Patient Safety

Improving the safety of global health care

**Six action areas:**
- A Global Patient Safety Challenge
- Patients advancing patient safety
- Developing an international taxonomy
- Promoting and coordinating research
- Developing solutions
- Reporting and learning

*Primum non nocere  "First do no harm..." Attributed to Hippocrates circa 470-360 BC*

Clean Care is Safer Care
Health Care-associated Infections.

- Affect millions worldwide every year
- Increase severity of illness with excess deaths
- Prolong hospital stay
- Long-term disability
- Endanger health care workers
- Massive additional financial burden
- High costs on patients and their families
- Increase antibiotics resistance
1.4 million hospital patients worldwide acquire HAI (at any given time)
Health care-associated infections

US$17 to US$29 billion / year

In UK, nosocomial infections may be responsible for > 5’000 deaths/year

at least £1 billion / year
World Alliance for Patient Safety

Clean Care is Safer Care

To develop solutions to improve safety and reduce risk by focusing on 5 action areas:

- Clean hands
- Clean practices
- Clean products
- Clean environment
- Clean equipment

WHO material, procedures, guidelines, and experience available
Blood safety
Injection practices & Immunization
Water, sanitation and waste management
Safe surgical and clinical procedures
Products
Practices
Environment
Equipments
Clean Care is Safer Care

To develop solutions to improve safety and reduce risk by focusing on 5 action areas:

- Clean hands
- Clean practices
- Clean products
- Clean environment
- Clean equipment

Develop WHO general guidelines for hand hygiene in healthcare settings
Hand Hygiene

- Single most important practice to prevent the transmission of infection
- Single most effective way to prevent Healthcare Associated Infections (HAI)
Results

COMPLIANCE WITH HAND HYGIENE (%)

Alcohol-based handrubbing

Handwashing (soap + water)

www.hopisafe.ch

Hospital-wide nosocomial infections; trends 1994-1998

www.hopisafe.ch
Impact of hand hygiene education in the community in a developing country


- Cluster-randomized study (villages)
- Rural community in Pakistan
- Intervention: education with focus on hand hygiene and distribution of soap
Impact of hand hygiene education in the community in a developing country


• Results
  - ↓ diarrhoea
  - ↓ skin infections
  - ↓ respiratory infections
  - ↓ mortality among children
Introduction

Part 1: Review of scientific data

Part 2: Consensus recommendations

Part 3: Outcome measurements

Part 4: Promoting hand hygiene on a large scale

Part 5: Information to the public

751 references
Health-care workers’ compliance with hand hygiene practices is less than 40% on average.
Time constraint = major obstacle for hand hygiene

- **Handwashing**: soap + water
  - 1 to 1.5 min

- **Alcohol-based hand rub**: 15 to 20 sec
Relation between workload and compliance with handwashing vs. handrubbing in ICUs

Handwashing ...
an action of the past
(except when hands are visibly soiled)

Alcohol-based hand rub is standard of care
• Handwashing with soap and water when hands are visibly dirty

• Adoption of alcohol-based hand rub is the gold standard in all other clinical situations, whenever possible
Hand hygiene agents

Durban, South-Africa, January 2005
How much do you pay for it?

Answer: 1.5 x the price in Boston

Nairobi, Kenya, Africa, January 2005
**WHO formulation**

**Formulation I**
To produce final concentrations of ethanol 80% (V/V), glycerol 1.45%, hydrogen peroxide 0.125%:
Pour in a 1000 ml + 1.0 ml graduated flask:
- Ethanol 95% V/V 842.0 ml
- Humectant-like substance: glycerol 14.5 ml
- Hydrogen peroxide 3% 41.7 ml
Top up to 1000.0 ml with distilled or boiled water.

**Formulation II**
To produce final concentrations of isopropyl alcohol 75% (V/V), glycerol 1.45%, hydrogen peroxide 0.125%:
Pour in a 1000 ml + 1.0 ml graduated flask:
- Isopropyl alcohol (with a purity of 99.8%) 751.5 ml
- Humectant-like substance: glycerol 14.5 ml
- Hydrogen peroxide 3% 41.7 ml
Top up to 1000.0 ml with distilled or boiled water.
Jan-Sept. 2005...
More than 200 hospitals with alcohol-based handrub at the bedside

Kingdom of Saudi Arabia
June, 2005

Lancet 2006; 367:1025
Clean Care is Safer Care

Launch
October 13, 2005
Launched by the World Health Organization
GLOBAL PATIENT SAFETY CHALLENGE:
Clean Care is Safer Care

The Government of the Hong Kong Special Administrative Region
of the People’s Republic of China

Hong Kong connected with Geneva
Hong Kong
linked to WHO Headquarter, Geneva
National commitment worldwide: No. of countries

COUNTRIES PLEDGING TO ADDRESS HEALTH CARE–ASSOCIATED INFECTION

March 2006
Countries having signed a statement in 2005-2006 committing to address HAI

Countries showing interest or planning to sign statements in 2006 committing to address HAI
The Hong Kong Experience
Hong Kong, April 2006 - Government Panel
1. Hong Kong Healthcare workers
   >9000 doctors and 30,000 nurses
   >8000 Chinese medicine practitioners.

2. Public sector is managed by Department of Health (DH) and Hospital Authority (HA) with
   >41 public hospitals (28,000 hospital beds)
   >70 government clinics
   120 general and specialist out-patient clinics.

3. Private sector: 12 hospitals with a total of 2,794 beds
Essential issues in Hong Kong for programme implementation

1. Broad provision of WHO alcohol hand rub formula
2. Changing practice from hand wash to hand rub as standard practice
3. Proper practice to minimize harm to the skin
   - No mixing of hand wash and hand rub at the same time
   - No mixing of disinfectant detergent with hand rub
4. Proper use of gloves with hand hygiene
5. The proper use of WHO evaluation tools
6. Planning the optimal multifaceted behavioral change programme
Key Changes Needed in Hong Kong

1. Using Alcohol rub most of the time
2. Broad Provision of WHO formula
3. Proper use of gloves for soil procedures
4. No mixing of hand washing and alcohol rub
5. Discontinuation of disinfectant detergent
6. Implement guideline using WHO tools
Summary of Hong Kong’s implementation programme

1. Signing of pledge and formation of task force – Oct 05
2. Defining local issues and formulation of plans – Nov 05 to Mar 06
3. Meeting and review of plans with Prof Pettit – Apr 06
4. Finalization of WHO measurement tools – Apr 06
5. Pilot testing in 4 hospitals initiated in May 06
6. Pilot testing in Chest Clinic initiated in May 06
7. Planning of launching programme for 41 public hospitals - Oct 06
   will need 18,150 gallons of alcohol rub per month
   which is >5 million 100ml bottles annually.
8. Tendering in progress to make alcohol rubs available by Jan 07
9. Major programme planned for city wide launch in 1Q 07
10. Prevalence survey for Hospital Acquired Infection in 2Q 07
About $4 HK a bottle
<40 cents US
Initial pilot results for Hand hygiene with patient contact:

Outpatient Chest Clinic: $\uparrow$ 24% to 55%

Hospital – Test Wards: $\uparrow$ 26% to 43%
Control Wards: $\downarrow$ 30% to 19%

Acceptability of WHO formula: 63%
Rub hands for at least 20 seconds.

WHO Recommended Formulation

世界衛生組織建議成份

Isopropyl alcohol 75% v/v
Glycerol 1.45%
Hydrogen peroxide 0.125%

手掌

手背

指縫

指背

Back of Hand

Palm
Let us Introduce it to the world
Even making it in style

Bond….James Bond
A single act that can make a difference

Hand Hygiene

Even for Pandemic Preparation
For Pandemic Preparation

We must and can do more
The pandemic strain requires very complex mutation expressing retro genes... all eight genes makes an exceptionally virulent viruses

"125 and 39,000 times..."

Complexity indicates that it is a rare event

Comparison of the 1918 virus with recombinant viruses expressing 1918 genes...all eight genes makes an exceptionally virulent viruses...
HPAI has been around for a Long period ....
Table 3. Summary of Influenza A Viruses Isolated From Domestic Poultry Originating From Hong Kong and Southern China Over 5 Years’ Continuous Surveillance at a Hong Kong Poultry Dressing Plant, November 1975 to October 1980

<table>
<thead>
<tr>
<th>Virus Subtype Combinations</th>
<th>No. of Isolates</th>
<th>Virus Subtype Combinations</th>
<th>No. of Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duck</td>
<td></td>
<td>Duck (con’td)</td>
<td></td>
</tr>
<tr>
<td>H1N1</td>
<td>1</td>
<td>H10N1</td>
<td>4</td>
</tr>
<tr>
<td>H1N2</td>
<td>2</td>
<td>H10N2</td>
<td>4</td>
</tr>
<tr>
<td>H1N3</td>
<td>1</td>
<td>H10N3</td>
<td>23</td>
</tr>
<tr>
<td>H2N2</td>
<td>5</td>
<td>H10N4</td>
<td>4</td>
</tr>
<tr>
<td>H2N3</td>
<td>1</td>
<td>H10N5</td>
<td>26</td>
</tr>
<tr>
<td>H2N9</td>
<td>1</td>
<td>H10N8</td>
<td>2</td>
</tr>
<tr>
<td>H3N1</td>
<td>1</td>
<td>H10N9</td>
<td>4</td>
</tr>
<tr>
<td>H3N2</td>
<td>23</td>
<td>H11N2</td>
<td>3</td>
</tr>
<tr>
<td>H3N3</td>
<td>3</td>
<td>H11N3</td>
<td>2</td>
</tr>
<tr>
<td>H3N4</td>
<td>9</td>
<td>H11N9</td>
<td>8</td>
</tr>
<tr>
<td>H3N6</td>
<td>26</td>
<td>H12N5</td>
<td>2</td>
</tr>
<tr>
<td>H3N8</td>
<td>81</td>
<td>(total = 564)</td>
<td></td>
</tr>
<tr>
<td>H4N1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4N2</td>
<td>20</td>
<td>Goose</td>
<td></td>
</tr>
<tr>
<td>H4N3</td>
<td>1</td>
<td>H1N1</td>
<td>1</td>
</tr>
<tr>
<td>H4N4</td>
<td>4</td>
<td>H3N2</td>
<td>1</td>
</tr>
<tr>
<td>H4N5</td>
<td>4</td>
<td>H3N8</td>
<td>1</td>
</tr>
<tr>
<td>H4N6</td>
<td>119</td>
<td>H4N2</td>
<td>1</td>
</tr>
<tr>
<td>H4N7</td>
<td>1</td>
<td>H4N5</td>
<td>1</td>
</tr>
<tr>
<td>H4N8</td>
<td>9</td>
<td>H4N6</td>
<td>2</td>
</tr>
<tr>
<td>H4N9</td>
<td>2</td>
<td>H5N3</td>
<td>1</td>
</tr>
<tr>
<td>H5N2</td>
<td>1</td>
<td>H6N1</td>
<td>2</td>
</tr>
<tr>
<td>H5N3</td>
<td>21</td>
<td>H6N2</td>
<td>3</td>
</tr>
<tr>
<td>H6N1</td>
<td>34</td>
<td>H6N4</td>
<td>1</td>
</tr>
<tr>
<td>H6N2</td>
<td>39</td>
<td>H6N9</td>
<td>1</td>
</tr>
<tr>
<td>H6N3</td>
<td>8</td>
<td>(total = 15)</td>
<td></td>
</tr>
<tr>
<td>H6N4</td>
<td>6</td>
<td>H6N5</td>
<td>1</td>
</tr>
<tr>
<td>H6N5</td>
<td>10</td>
<td>H1N1</td>
<td>1</td>
</tr>
<tr>
<td>H6N6</td>
<td>4</td>
<td>H3N2</td>
<td>3</td>
</tr>
<tr>
<td>H6N9</td>
<td>4</td>
<td>H3N6</td>
<td>1</td>
</tr>
<tr>
<td>H7N2*</td>
<td>1</td>
<td>H3N9</td>
<td>1</td>
</tr>
<tr>
<td>H9N2*</td>
<td>16</td>
<td>H6N4</td>
<td>1</td>
</tr>
<tr>
<td>H9N6</td>
<td>1</td>
<td>(total = 7)</td>
<td></td>
</tr>
</tbody>
</table>
### Table 7. Serological Evidence for Human Exposure to Avian Influenza Viruses in the Hypothetical Influenza Epicenter and Occurrence of these Viruses in Domestic Ducks There

<table>
<thead>
<tr>
<th>HA Subtype</th>
<th>Pearl River Delta (n = 400)*</th>
<th>Jiangsu Province (n = 300)</th>
<th>Taichung Taiwan (n = 150)</th>
<th>Urban Hong Kong (n = 100)</th>
<th>Percent Isolation Rate From Domestic Ducks</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>NT</td>
<td>19</td>
<td>NT</td>
<td>NT</td>
<td>&lt;1</td>
</tr>
<tr>
<td>H2</td>
<td>NT</td>
<td>58</td>
<td>NT</td>
<td>NT</td>
<td>1</td>
</tr>
<tr>
<td>H3</td>
<td>47</td>
<td>46</td>
<td>48</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>H4</td>
<td>11</td>
<td>4</td>
<td>10</td>
<td>2</td>
<td>29</td>
</tr>
<tr>
<td>H5</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>H6</td>
<td>12</td>
<td>1</td>
<td>13</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>H7</td>
<td>5</td>
<td>38</td>
<td>4</td>
<td>0</td>
<td>&lt;1</td>
</tr>
<tr>
<td>H8</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>0†</td>
</tr>
<tr>
<td>H9</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>H10</td>
<td>6</td>
<td>17</td>
<td>4</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>H11</td>
<td>15</td>
<td>15</td>
<td>4</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>H12</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>H13</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
H5N1

Be Prepared and Vigilant

We may have to wait for many years......

and we can get tired
The crude mortality of pandemics in Singapore

Death per 1000


- Asian Flu
- HK Flu
The crude mortality of pandemics in Hong Kong

- Spanish Flu
- Asian Flu
- HK Flu

Death per 1000
1. Give priority to building strong Infection Control Infrastructure
SHEA Position Paper

Requirements for Infrastructure and Essential Activities of Infection Control and Epidemiology in Hospitals: A Consensus Panel Report

William E. Scheickler, MD; Dennis Brimhall, MD; Alfred S. Bock, MD; Barry M. Farr, MD; Candace Friedman, MPH, CIC; Richard A. Gerbaldi, MD; Peter A. Gross, MD; Jo Ann Harris, MD; Walter J. Herrholzer, Jr., MD; William J. Martone, MD; Linda L. McDonald, RN, MS, CIC; Steven L. Solomon, MD

ABSTRACT

The scientific basis for claims of efficacy of nosocomial infection surveillance and control programs was established by the Study on the Efficacy of Nosocomial Infection Control project. Subsequent analyses have demonstrated nosocomial infection prevention and control programs to be not only clinically effective but also cost-effective. Although governmental and professional organizations have developed a wide variety of useful recommendations and guidelines for infection control, and apart from general guidance provided by the Joint Commission on Accreditation of Healthcare Organizations, there are surprisingly few recommendations on infrastructure and essential activities for infection control and epidemiology programs. In April 1996, the Society for Healthcare Epidemiology of America established a consensus panel to develop recommendations for optimal infrastructure and essential activities of infection control and epidemiology programs in hospitals. The following report represents the consensus panel’s best assessment of needs for a healthy and effective hospital-based infection control and epidemiology program. The recommendations fall into eight categories: managing critical data and information; setting and recommending policies and procedures; compliance with regulations, guidelines, and accreditation requirements; employee health; direct intervention to prevent transmission of infectious diseases; education and training of healthcare workers; personnel resources; and nonpersonnel resources. The consensus panel used an evidence-based approach and categorized recommendations according to modifications of the scheme developed by the Clinical Affairs Committee of the Infectious Diseases Society of America and the Centers for Disease Control and Prevention’s Hospital Infection Control Practices Advisory Committee (Infect Control Hosp Epidemiol 1998;19:114-124).

Over the past 30 years, nosocomial infection surveillance, prevention, and control programs have been integrated into hospitals and other healthcare institutions to ensure the well being of patients, staff, visitors, and others in the healthcare environment. In 1986, responding to nationwide epidemics of nosocomial Staphylococcus aureus infections and recognizing the need for hospitals to identify problems in a timely fashion, the American Hospital Association’s Advisory Committee on Infections Within Hospitals recommended that nosocomial infection surveillance become a regular hospital routine. In 1970, the Centers for Disease Control and Prevention recommended that hospitals estab...
4. Personnel Resources

- Hospital Epidemiologist
  - doctor with special training

  “formal training is helpful .. and increasing(ly) essential”

- Infection Control Nurse - 1/250 beds
  - special certification

  “encouraged to obtain Certification in IC”
Does Infection Control works?

To answer this question:-

**SENIC STUDY**: Study on the Efficacy of Nosocomial Infection Control

Involving > 6500 hospitals
> 12000 interviews

Started in 1975
Major findings:-

1) Prevent 50% more with an effective programme.

2) Cost effective - reduction of infection by 6% would offset the cost.

3) One ICN per 250 beds was important component.

4) An ICO has substantial contribution.
HK Acute Hospitals: beds per 1 FTE ICN – 2001 Audit.

- NHS mean: 535
- HK mean: 535
### Prevalence Survey in QMH

<table>
<thead>
<tr>
<th>Year</th>
<th>n</th>
<th>% infected</th>
<th>CAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>1075</td>
<td>11.4</td>
<td>15.3 (85–87)</td>
</tr>
<tr>
<td>86</td>
<td>996</td>
<td>14.2</td>
<td></td>
</tr>
<tr>
<td>87</td>
<td>1046</td>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>90/91</td>
<td>898</td>
<td>8.0</td>
<td>11.9</td>
</tr>
<tr>
<td>94</td>
<td>1052</td>
<td>7.7</td>
<td>16</td>
</tr>
<tr>
<td>97</td>
<td>1079</td>
<td>7.4</td>
<td>15.7</td>
</tr>
<tr>
<td>00</td>
<td>1087</td>
<td>6.2</td>
<td>14.3</td>
</tr>
<tr>
<td>04</td>
<td>1085</td>
<td>5.1</td>
<td>14.6</td>
</tr>
</tbody>
</table>

\[ p<0.00001; X^2 = 41 \]

\[ p=0.08 \]
## Infection rates with UTI, LRTI and Bacteremia

<table>
<thead>
<tr>
<th>Year:</th>
<th>85-87</th>
<th>90/91</th>
<th>94</th>
<th>97</th>
<th>00</th>
<th>04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infections(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UTI:</td>
<td>3.5</td>
<td>1.5</td>
<td>1.2</td>
<td>1.9</td>
<td>1.2</td>
<td>0.9</td>
</tr>
<tr>
<td>LRTI:</td>
<td>3.9</td>
<td>3.4</td>
<td>4.4</td>
<td>2.2</td>
<td>2.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Bact:</td>
<td>0.9</td>
<td>1.0</td>
<td>0.4</td>
<td>0.8</td>
<td>0.6</td>
<td>0.7</td>
</tr>
</tbody>
</table>

### Guidelines

<table>
<thead>
<tr>
<th></th>
<th>UTI</th>
<th>IV</th>
<th>LRTI</th>
<th>ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>89</td>
<td>91</td>
<td>93</td>
<td>00</td>
<td></td>
</tr>
</tbody>
</table>
HK contingency plan for Avian Influenza Pandemic

Available on intranet and internet!
Hong Kong
Pandemic Plan 1995

HK Pandemic Plan 1995
<table>
<thead>
<tr>
<th>Country/Province</th>
<th>No of cases</th>
<th>No of deaths(%)</th>
<th>Number of HCW affected(%)</th>
<th>Date onset last case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hong Kong</td>
<td>1755</td>
<td>302 (17)</td>
<td>405 (23)</td>
<td>31 May 03</td>
</tr>
</tbody>
</table>

SARS : Cumulative Number of Reported Probable* Cases
Total number of cases: 3293 as of 16 Apr 2003, 12:00 GMT+2

Annals Int Med. 04;141 (9), 622
Daily No. of SARS Cases among Healthcare Workers analyzed by Date of First Admission

- 405 HCWs
- Only 2 in QMH
- 0 patients infected
Infected Staff per 1,000 FTE Staff Strength by Hospital*

* excluding KH
No. of infected staff (up to 18 April 2003)
FTE staff strength (as at end March 2003)
Preventing SARS

Back to the Basics in Infection Control

Seto Wing Hong, Hong Kong, China
Effectiveness of precautions against droplets and contact in prevention of nosocomial transmission of severe acute respiratory syndrome (SARS)

W H Seto, D Tsang, R W H Yung, T Y Ching, T K Ng, M Ho, L M Ho, J S M Peiris, and Advisors of Expert SARS group of Hospital Authority*

*Members listed at end of report

We did a case-control study in five Hong Kong hospitals, with 241 non-infected and 13 infected staff with documented exposures to 11 index patients with severe acute respiratory syndrome (SARS) during patient care. All participants were surveyed about use of mask, gloves, gowns, and hand-washing, as recommended under droplets and contact precautions when caring for index patients with SARS. 69 staff who reported use of all four measures were not infected, whereas all infected staff had omitted at least one measure (p=0.0224). Fewer staff who wore masks (p=0.0001), gowns (p=0.006), and washed their hands (p=0.047) became infected compared with those who didn’t, but stepwise logistic regression was significant only for masks (p=0.011). Practice of droplets precaution and contact precaution is adequate in significantly reducing the risk of infection after exposures to patients with SARS. The protective role of the mask suggests that in hospitals, infection is transmitted by droplets.

SARS 2–7 days after exposure, with no exposure to cases outside the hospital.

For this study, index patients were selected only when there was documented clustering, indicating recent spread of infection. We could identify infected staff because since early February, notification of staff with SARS was mandatory in hospital-authority hospitals. We tested sera taken from index patients and infected hospital staff during the acute phase of the infection and during convalescence for antibodies to the corona-like virus associated with SARS using an indirect immunofluorescence test.

We excluded one hospital that had a large nosocomial outbreak because a drug nebuliser was used on an index patient with SARS for longer than 10 days. Droplets precautions have never been recognised as an effective infection control measure for such aerosol-generating procedures and assessment of its effectiveness is inappropriate.
The virus that stole across the globe

HOW THE INFECTION CHECKED OUT OF THE METROPOLE

Hong Kong’s Patient Zero, Guangdong Professor Liu Jianjun, warned of the virulence of the disease he was carrying as soon as he was admitted to Kwong Wah Hospital on February 22. Between that time and March 10, when the outbreak was made public, it has been carried across Hong Kong and the globe.

KWONG WAH HOSPITAL, HONG KONG

PATIENT ZERO is admitted to hospital on February 22. Four staff are subsequently infected, plus family members who visit Patient Zero.

PRINCE OF WALES HOSPITAL, HONG KONG

PATIENT ONE, a local man who visited the Metropole on February 21 and 22, is admitted to the Prince of Wales on March 5. Seven hospital staff, eight of their children, 17 medical students and possibly Hospital Authority chief executive William Ho (below right) are infected as a result.

ST PAUL’S HOSPITAL, HONG KONG

PATIENT TWO, a tourist from Vancouver, falls ill and infects three hospital workers.

THE TOLL WORLDWIDE*

<table>
<thead>
<tr>
<th></th>
<th>18 deaths</th>
<th>516 infected</th>
<th>10 deaths</th>
<th>316 infected</th>
</tr>
</thead>
<tbody>
<tr>
<td>HONG KONG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*These figures include Hong Kong but not the mainland. Many secondary infections are not recorded on this graphic.

A MICROSCOPE IMAGE OF A CELL INFECTED WITH ONE OF THE VIRUSES FROM A TYPICAL PATIENT

CANADA

PATIENT THREE, a Metropole guest from Toronto returns home and infects five relatives. He dies on March 5. His son dies on March 13.

SINGAPORE

PATIENTS FOUR, FIVE AND SIX are Singaporean tourists. They infect 17 people when they return home.

HANOI

PATIENT SEVEN, a Chinese-American businessman, flies to Hanoi and dies on March 13. Fifty hospital workers at two hospitals are infected. Two die.

Heike Phillips

The date is Friday, February 21. A group of strangers gather in the lift lobby on the ninth floor of a Mongkok hotel, one of them coughing and sneezing. The elevator arrives and they share a brief journey to the ground floor before the doors slide open and they part company.

None could have expected this encounter would set in motion a chain of events that would claim the lives of three in their group and spread disease and fear among hundreds of people worldwide.

The man who squeezes is a 64-year-old who has arrived by bus from Guangdong a day ago to attend a wedding. Feeling too sick to attend, however, he is taken to hospital on February 22.

His name is Liu Jianjun, and on being admitted to Kwong Wah Hospital, he warns medical staff they should not touch him as he has contracted a “very virulent disease”.

He tells staff he is a professor in respiratory medicine at Zhongshan University in Guangzhou and has been treating patients with atypical pneumonia at the university’s no. 2 hospital. His colleagues in the intensive care unit have fallen ill one by one.

Health authorities in Hong Kong discover that the professor showed symptoms of the disease on February 15, at which point in time he would still have been on the mainland.

According to the World Health Organisation, the incubation period for the virus is between two and seven days.

As Liu moved to come into contact with others, a medical team from the hospital where he worked was dispatched to Hong Kong, where they collected virus samples.

Over the next two weeks, 70 medical staff at the hospital are struck down, as well as 17 medical students.

Hospital staff take the virus to laboratory technicians at the hospital. To medical treatment area

TALKBACK

Is Hong Kong handling the pneumonia outbreak properly?

Send your comments to talkback@scmp.com

Hong Kong 27th March 2003
3 SARS patients including Hotel M patient admitted to General Wards first week of SARS to QMH, No staff got infected

<table>
<thead>
<tr>
<th>RANK</th>
<th>Exposed</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>23</td>
<td>46</td>
</tr>
<tr>
<td>HCA/WA</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Doctor</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Precautions</th>
<th>n</th>
<th>(%)</th>
<th>Rank non-conform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mask (46 surgical, 4N95)</td>
<td>50</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Gown</td>
<td>13</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Glove</td>
<td>14</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>handwashing</td>
<td>45</td>
<td>92</td>
<td>2 RN + 2 HCA, 1 not sure</td>
</tr>
</tbody>
</table>
Good infrastructure for Infection Control do not exist in many countries in East Asia
Government policy cannot guarantee that Infection Control Infrastructure is in place.
A stated government policy is not enough......

**Example: Brazil**

**1976:** Ministry of Health recommended IC in all hospitals

**1980:** Survey of 3,225 hospitals - only 13 has a nurse involve in infection control

**1995:** Report that of 214 hospitals in Sao Paulo, only a few has IC team

Pannuti et al ICHE, 1995, 16:170
What you must please do .......

Deploy adequate Infection Control personnel
Personnel Resources

• Hospital Epidemiologist
  - doctor with special training
  “formal training is helpful .. and increasing(ly) essential”

• Infection Control Nurse - 1/250 beds
  - special certification
  “encouraged to obtain Certification in IC”
Where we can help…..

Develop self-sustaining educational programme for Infection Control personnel
What we can do as a regional network.....

Certification and continuing education
An appeal for us in WPRO……

1. Adequate Infection Control personnel
2. Self-sustaining educational programme for Infection Control personnel
3. Certification and continuing education
“Above all ….

Hospitals should do the patients no harm”

Florence Nightingale
Meeting the challenges ahead: seeing oneself accurately and improve