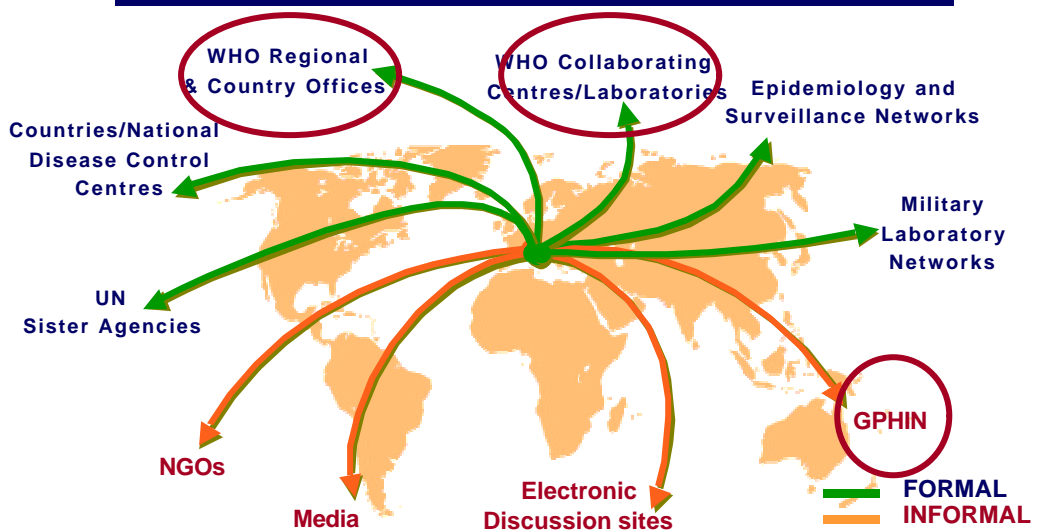


Severe Acute Respiratory Syndrome (SARS): Global Alert, Global Response

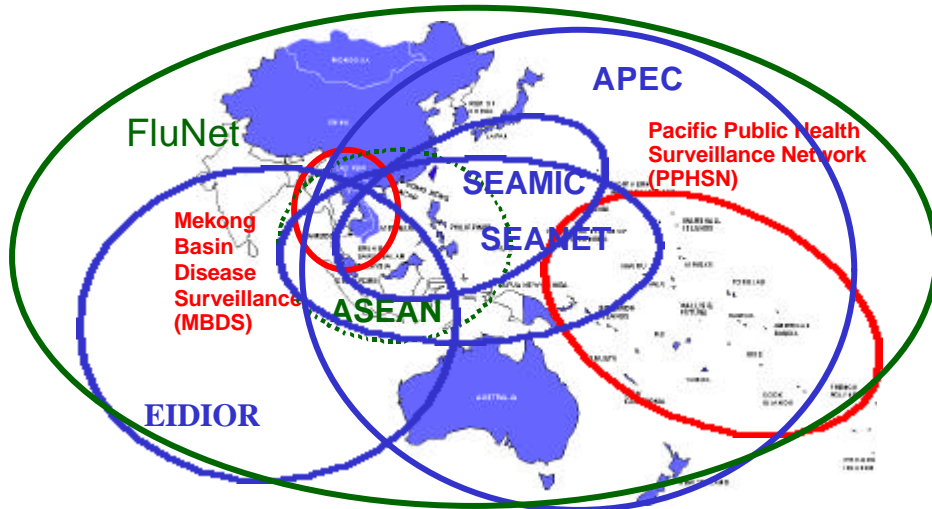


World Health Organization, 15 June 2003

Partnership for global alert and response to infectious diseases: network of networks



Surveillance network partners in Asia



WHO COMMUNICABLE DISEASES • SARS, 15 June 2003

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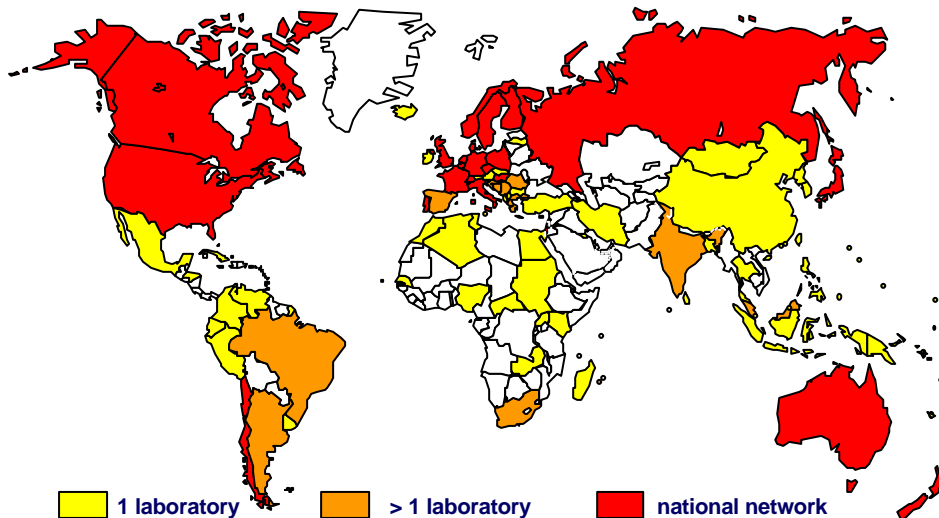
Global Public Health Intelligence Network, Canada



WHO COMMUNICABLE DISEASES • SARS, 15 June 2003

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FluNet: Global surveillance of human influenza: Participating laboratories, 2003



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Reports of respiratory infection, WHO global surveillance networks, 2002–2003

- **27 November**
 - **Guangdong Province, China:** Non-official report of outbreak of respiratory illness with government recommending isolation of anyone with symptoms (GPHIN)
- **11 February**
 - **Guangdong Province, China:** report to WHO office Beijing of outbreak of atypical pneumonia (WHO)
- **14 February**
 - **Guangdong Province, China:** Official confirmation of an outbreak of atypical pneumonia with 305 cases and 5 deaths (China)
- **19 February**
 - **Hong Kong, SAR China:** Official report of 33-year male and 9 year old son in Hong Kong with Avian influenza (H5N1), source linked to Fujian

WHO COMMUNICABLE DISEASES • SARS, 15 June 2003

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Intensified surveillance for pulmonary infections, WHO 2003

- **26 February**

- **Hanoi, Viet Nam:** Official report of 48-year-old business man with high fever ($> 38^{\circ}\text{C}$), atypical pneumonia and respiratory failure with history of previous travel to China and Hong Kong

- **5 March**

- **Hanoi, Viet Nam:** Official report of 7 medical staff from French Hospital reported with atypical pneumonia

- **Early March**

- **Hong Kong, SAR China** Official report of 77 medical staff from Hospital reported with atypical pneumonia, WHO teams arrive Hong Kong and Hanoi, and with governments advise on investigation and containment activities

Global Alert: Severe Acute Respiratory Syndrome (SARS)

- **12 March: First global alert**

- describing atypical pneumonia in Viet Nam and Hong Kong

- **14 March**

- Four persons Ontario, three persons in Singapore, with severe atypical pneumonia fitting description of 12 March alert reported to WHO

- **15 March**

- Medical doctor with atypical pneumonia fitting description of 12 March reported by Ministry of Health, Singapore on return flight from New York

Global Alert, 15 March 2003

- 1) Atypical pneumonia with rapid progression to respiratory failure
- 2) Health workers appeared to be at greatest risk
- 3) Unidentified cause, presumed to be an infectious agent
- 4) Antibiotics and antivirals did not appear effective
- 5) Spreading internationally within Asia and to Europe

Global Alert: Severe Acute Respiratory Syndrome (SARS)

- **15 March: Second global alert**
 - Case definition provided
 - Name (SARS) announced
 - Advice given to international travellers to raise awareness
- **26 March**

Evidence accumulating that persons with SARS continued to travel from areas with local transmission, and that adjacent passengers were at small, but non-quantified risk
- **27 March**

Guidance provided to airlines and areas with local transmission to screen passengers leaving in order to decrease risk of international travel by persons with SARS

Global Alert: Severe Acute Respiratory Syndrome (SARS)

- **1 April:**

Evidence accumulating from exported cases that three criteria were potentially increasing international spread:

- magnitude of outbreak and number of new cases each day
- pattern of local transmission
- exportation of probable cases

- **2 April to present:**

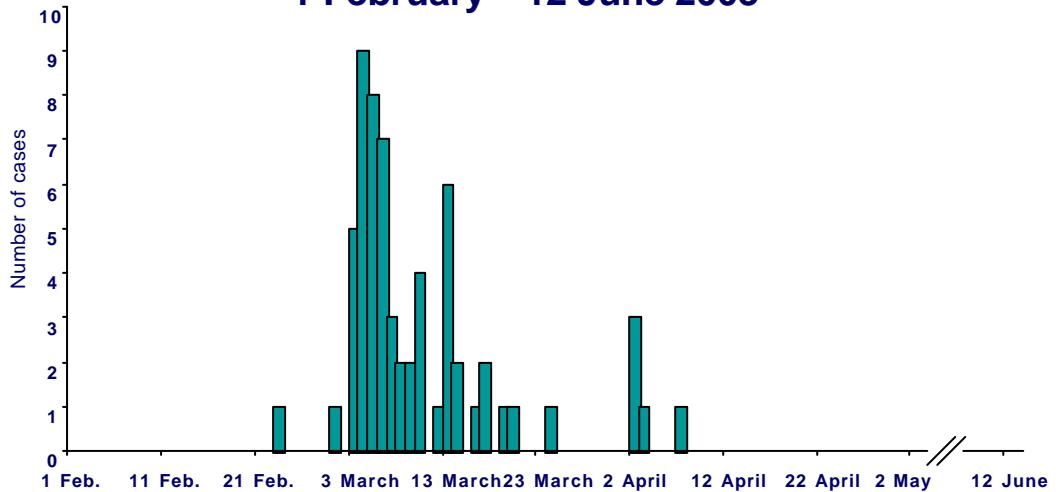
Guidance provided to general public to postpone non-essential travel to areas with local transmission that met above criteria

SARS: cumulative number of probable cases worldwide as of 12 June 2003 – Total: 8 445 cases, 790 deaths



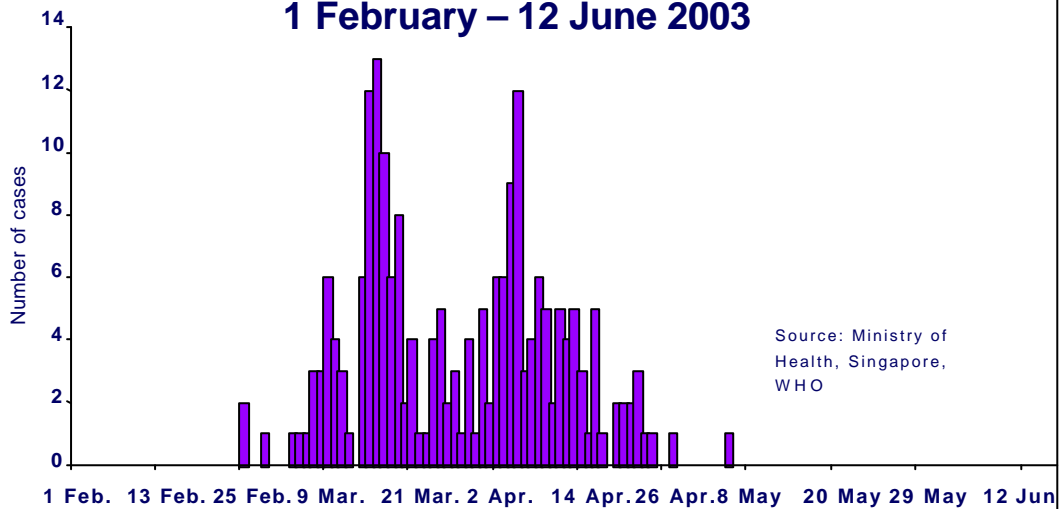
Probable cases of SARS by date of onset,
Hanoi: n = 62

1 February – 12 June 2003



Probable cases of SARS by date of onset,
Singapore: n = 206

1 February – 12 June 2003

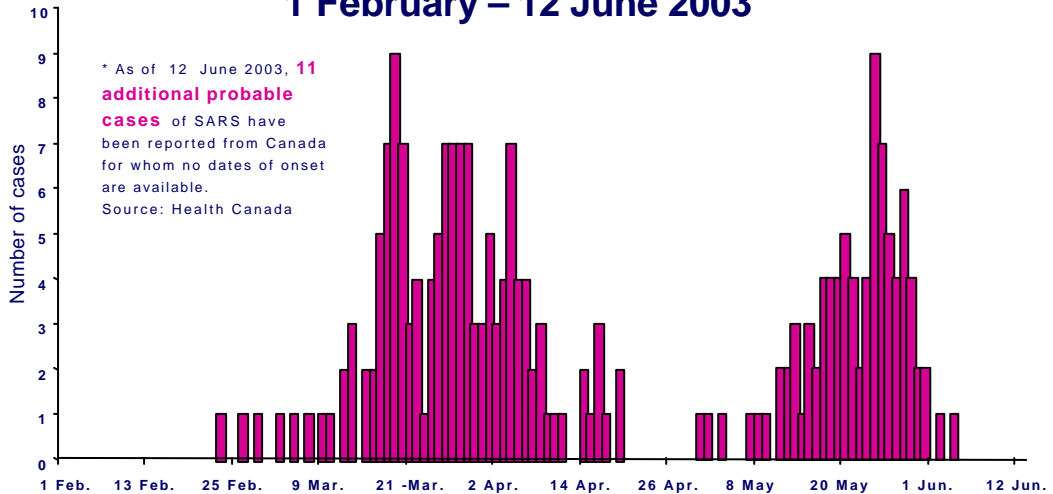


Source: Ministry of Health, Singapore, WHO

Probable cases of SARS by date of onset,

Canada: n = 227*

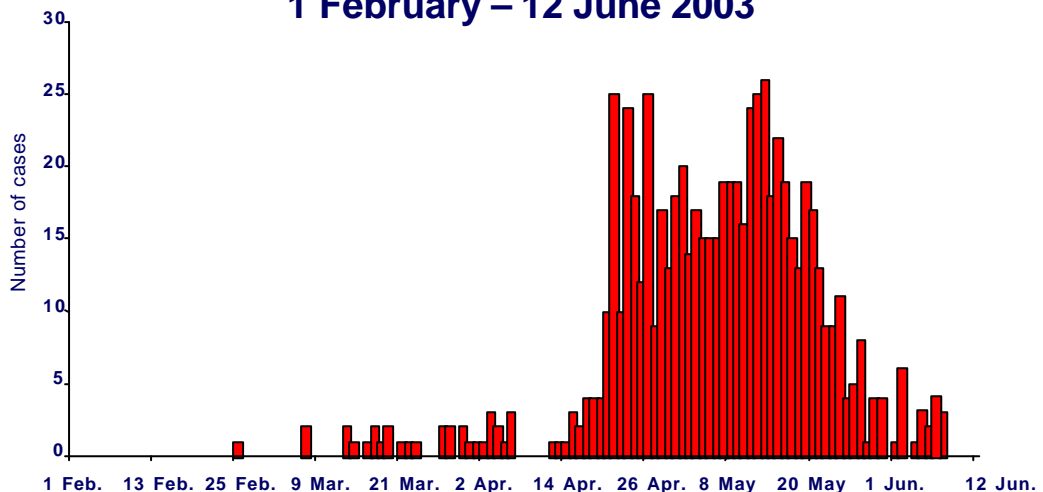
1 February – 12 June 2003



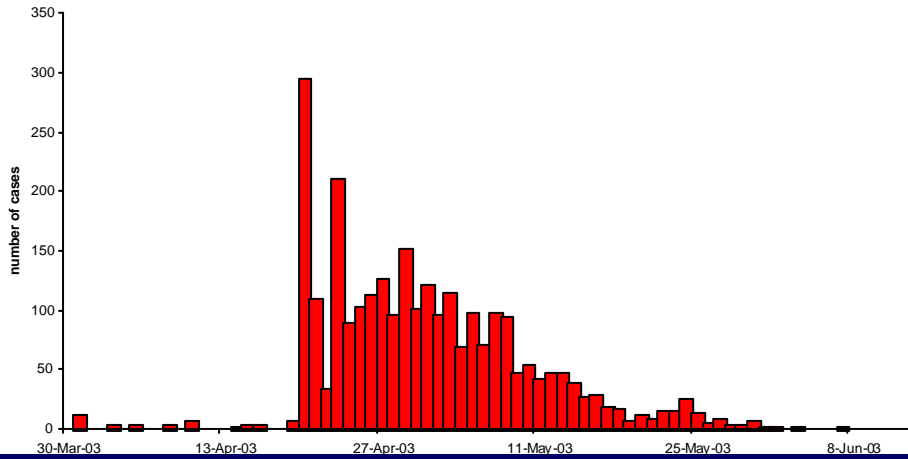
Probable cases of SARS by date of onset,

Taiwan: n = 688

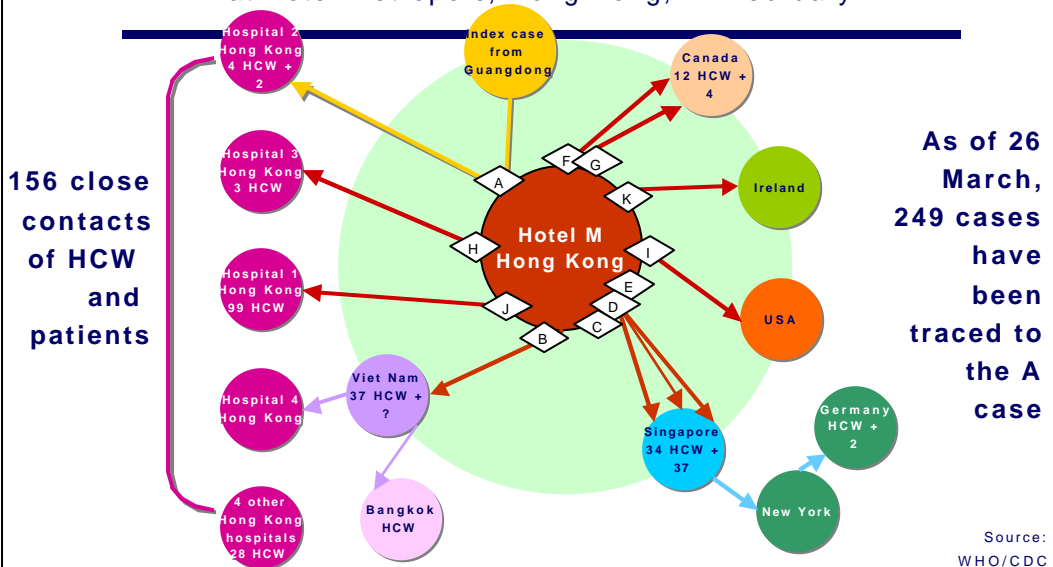
1 February – 12 June 2003



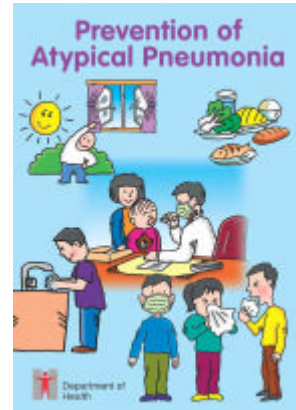
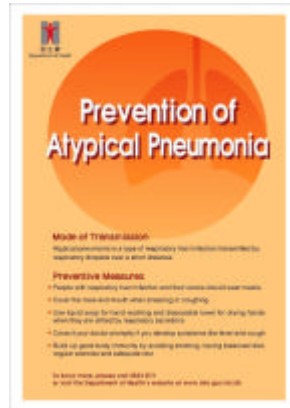
Probable cases of SARS by date of onset,
Beijing: n = 2,522



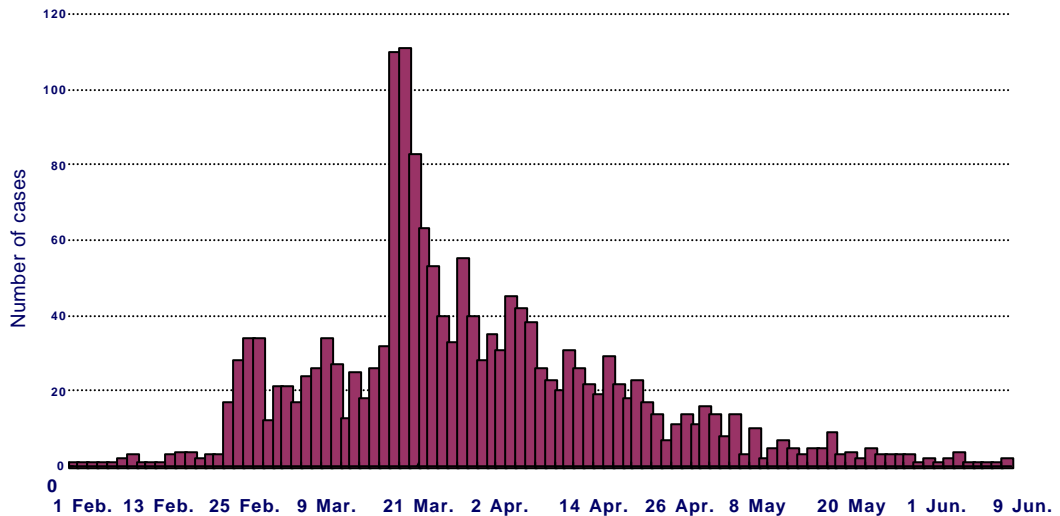
SARS: chain of transmission among guests
 at Hotel Metropole, Hong Kong, 21 February



Airport screening and health information, Hong Kong, SARS, 2003



Probable cases of SARS by date of onset, Hong Kong: n = 1 753, as of 9 June 2003



SARS and the economy: impact on global travel, Hong Kong



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SARS and the economy: impact on global travel, Singapore

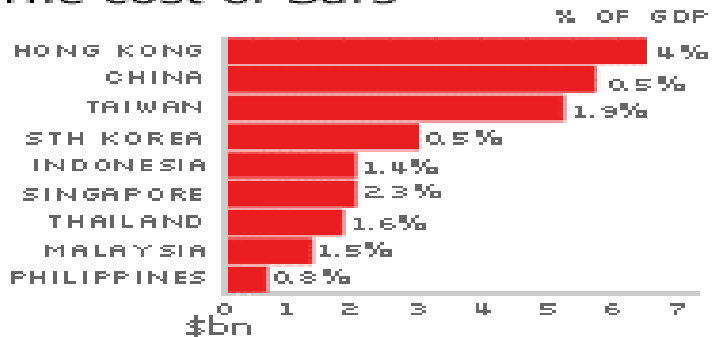
Time Flight	Destination	Gate	Status
17:00 6A 069	Singapore	18	En route
17:20 8A 900	Shanghai/Pudong		Cancelled
17:45 6A 804	Shanghai/Pudong		Cancelled
17:50 6A 400	Kaohsiung		Cancelled
17:50 6A 606	Klanian		Cancelled
17:50 6A 806	Beijing		Cancelled
17:55 6A 700	Guilin		Cancelled
17:59 8A2 6020	Hongkong	18	Now Boarding
18:00 6A 200	Chengdeping	04	
18:00 8A 204	Xi'an	23	Boarding Done
18:00 8A 202	Nanchang	24	
18:05 8A 316	Nanchang	23	Boarding Done
18:05 6A 680	Taipei		Cancelled
18:25 6A 400	Taipei	07	
18:25 6A 610	Shanghai/Pudong	10	
18:30 8A 806	Singapore	20	Boarding Done
18:35 6A 622	Hongzhou		Cancelled
18:40 6A 906	Nanchang		Cancelled
18:45 6A 018	Taipei	28	
18:45 8A 803	Bangkok	42	
18:45 6A 812	Hongkong		Cancelled
18:50 6A 111	Sydney	47	
19:10 6A 126	Melbourne		Cancelled
19:10 6A 088	Melbourne	18	
19:15 8A 500	Shanghai/Pudong	15	
19:16 6A 015	Auckland	26	
19:16 6A 015	Auckland	26	
19:20 6A 908	Beijing		Cancelled
19:20 6A 900	Singapore		Cancelled
19:25 6A 812	Taipei		Cancelled
19:25 6A 060	Haikou	30	
19:40 6A 118	Manila	21	
19:40 6A 118	Beijing		Cancelled
19:40 6A 068	Taipei		Cancelled
19:40 6A 013	Manila		Cancelled
19:45 6A 812	Taipei	26	
19:45 8A 7000	Taipei		Cancelled
20:00 6A 715	Singapore		Cancelled
20:00 6A 610	Singapore		Cancelled
20:05 6A 068	Hongzhou	26	
20:10 6A 068	Hongzhou	30	
20:10 6A 068	Hongzhou		Cancelled
20:15 6A 068	Sydney		Cancelled
20:15 6A 068	Shanghai/Pudong	10	
20:15 7A 830	Taipei		Cancelled
20:20 6A 107	Auckland	1	
20:20 6A 450			
20:25 6A 436	Kaohsiung		Cancelled
20:45 6A 488	Taipei		Cancelled
20:45 7A 807	Bangkok	42	
20:45 6A 618	Taipei		Cancelled
20:45 6A 302	Dallas	33	
21:00 8A 808	Taipei	26	
21:05 6A 311	Honolulu		
21:10 6A 138	Sydney	10	
21:45 6A 434	Kaohsiung	27	
21:45 6A 488	Taipei		Cancelled
21:50 6A 408	Taipei	4	
21:55 6A 006	Honolulu	11	
21:55 6A 873	Kaohsiung		
21:55 6A 002	San Francisco		
22:00 6A 703	Ho Chi Minh		
22:05 6A 660	Taipei		Cancelled
22:05 6A 703	Bangkok		Cancelled
22:25 6A 363	Bangkok	62	
22:25 6A 363	Dubai		
22:45 6A 462	Taipei		Cancelled
23:10 6A 701	Honolulu		Cancelled
23:10 6A 481			
23:20 6A 520	China		
23:20 6A 520	Melbourne		

WHO COMMUNICABLE DISEASES • SARS, 15 June 2003

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The cost of SARS: Initial estimates, Asian Development Bank

The cost of Sars*



* IF OUTBREAK LASTS SIX MONTHS.
SOURCE: ADB.

SARS: what more we know 3 months later

1) Atypical pneumonia with rapid progression to respiratory failure:

- Case fatality rate by age group

< 1%	≤ 24 years old
6%	25–44 years old
15%	45–64 years old
> 50%	≥ 65 years old
- 85% full recovery
- Incubation period: 3–10 days

2) Health workers appeared to be at greatest risk

- Health workers remain primary risk group in second generation
- Others at risk include family members of index cases and health workers, and their contacts
- Majority of transmission has been close personal contact; in Hong Kong environmental factors caused localized transmission

SARS: what more we know

3 months later

3) Unidentified cause, presumed to be an infectious agents

- Aetiological agent: Coronavirus, hypothesized to be of animal origin
- PCR and various antibody tests developed and being used in epidemiological studies, but PCR lacks sufficient sensitivity as diagnostic tool

4) Antibiotics and antivirals did not appear effective

- Studies under way to definitively provide information on effectiveness of antivirals alone or in combination with steroids, and on use of hyperimmune serum in persons with severe disease
- Case detection, isolation, infection control and contact tracing are effective means of containing outbreaks
- Meeting 30 April at NIH to examine priorities in drugs and vaccine

SARS: what more we know

3 months later

5) Spreading internationally within Asia and to Europe and North America

- Only 1 major outbreak occurred after 15 March despite initial exported cases to a total of 32 countries
- Symptomatic persons with SARS no longer travelling internationally
- International spread occurring the in small number of persons who are in incubation period
- Since 15 March, 27 persons on 4 of 32 international flights carrying symptomatic persons with SARS appear to have been infected (1 flight alone on 15 March has accounted for 22 of these 27 cases), and these occurred before 23 March

SARS: what we are learning

- In the world today an infectious disease in one country is a threat to all: infectious diseases do not respect international borders
- Information and travel guidance can contain the international spread of an infectious disease
- Experts in laboratory, epidemiology and patient care can work together for the public health good despite heavy pressure to publish academically
- Emerging infectious disease outbreaks often have an unnecessary negative economic impact on tourism, travel and trade
- Infectious disease outbreaks reveal weaknesses in public health infrastructure
- Emerging infections can be contained with high level government commitment and international collaboration if necessary

SARS: what Hong Kong has contributed to the global effort

- **Reporting:** open and transparent reporting of H5N1 on 19 February that led to intensified global surveillance for respiratory disease
- **Reporting:** open and transparent reporting in early March of health worker infection, leading to global alert on 12 March
- **Information:** new cases and deaths reported regularly to WHO
- **Science:** coronavirus first isolated and identified, early PCR and antibody tests developed, environmental factors involved in transmission identified, studies on animal reservoir in collaboration with Guangdong scientists conducted
- **Outbreak Control:** prompt reaction once outbreak had been identified, with effective case identification, contact tracing, isolation/infection control, surveillance and quarantine despite environmental transmission at Amoy Gardens

SARS: what Hong Kong will contribute to the global effort over coming months

- **Continued case identification through surveillance:**
 - necessary to determine whether infection is endemic and seasonal, or whether it has disappeared from human populations
- **Continued collaboration with China, particularly Guangdong Province in studies to identify animal reservoir and risk factors for transmission to humans**
 - necessary to manage the risk and prevent future outbreaks
- **Continued participation in major WHO networks of global surveillance for influenza and other infectious diseases**
 - identify next major emergence of new influenza strain or