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## WHO: At the Forefront of Combating SARS

The world's obsession with figures reached a peak in recent months — no thanks to the outbreak of severe acute respiratory syndrome (SARS).

Apart from monitoring share prices, many in the SARS-affected areas have added another item to their daily routine — monitoring the SARS epidemic curve on the WHO website which shows the development of the mysterious disease in various countries.

They check that the number of “active” cases in the hospitals of their countries is below 60; that new SARS cases over a three-day period are kept to fewer than five; that 20 days (or double the longest incubation period) have passed since the last locally acquired case was isolated or died; that there is no community spread of the disease in the country; and that there has not been any exported case. For a SARS-affected area has to meet these requirements to be declared free of the disease by the World Health Organization (WHO). These areas have to prove that their surveillance is reliable too.



Vietnam was the first country to be announced SARS-free by WHO. It was removed from the organization's list of countries with local transmission of SARS on 28 April.

WHO maintained that the status change for Vietnam was especially significant as it was one of four countries WHO initially identified on March 15 as having local transmission of SARS. Vietnam reported a total of 63 SARS cases and five deaths prior to 8 April.

The Southeast Asian country has proven to have conscientiously implemented detection and protection measures including:

- prompt identification of persons with SARS, their movements and contacts;
- effective isolation of SARS patients in hospitals;
- appropriate protection of medical staff treating these patients;
- comprehensive identification and isolation of suspected SARS cases;
- exit screening of international travelers;
- timely and accurate reporting and sharing of information with other authorities and/or governments.

WHO on Vietnam:

“Since SARS was first detected in Vietnam on 26 February, WHO has collaborated closely with Vietnamese officials to bring the outbreak under control. Key actions have included early recognition of the outbreak, the consolidation of SARS patients in a single hospital, strict infection control, diligent contact tracing, and thorough investigation of all rumoured cases.”

*Source: WHO website, 28 April 2003*

On 12 May, however, WHO began to post on its website a new table indicating those areas with recent local transmission outside a confined setting, such as the healthcare environment. If no new locally acquired cases are identified 20 days after the last reported locally acquired probable case died or was appropriately isolated, the area will be removed from this list. Four patterns of transmission have been identified in this list:



#### Pattern A

- Imported probable SARS case(s) have produced only one generation of local probable cases, all of whom are direct personal contacts of the imported case(s).

#### Pattern B

- More than one generation of local probable SARS cases, but only among persons that have been previously identified and followed up as known contacts of probable SARS cases.

#### Pattern C

- Local probable cases occurring among persons who have not been previously identified as known contacts of probable SARS cases.

#### Pattern Uncertain

- Insufficient information available to specify the areas or extent of local transmission.

Two recommended measures are specified in the table, which is updated daily: exit screening for international travelers departing the area, and postponing all but essential travel to the area.

Canada's capital Toronto, whose transmission was formerly identified to have followed Pattern B, was removed from the list of areas with recent local transmission on 14 May 2003. Its last locally acquired case was isolated on 20 April.

However, health authorities in Canada informed WHO on 22 May about a cluster of five cases of respiratory illness associated with a single hospital in Toronto. More cases of transmission surfaced. As of 26 June, Toronto continued to experience local transmission of SARS.

The Philippines, which saw 12 probable SARS cases, was next to be removed from the list on 20 May. But another Southeast Asian country, Singapore, was less fortunate. A new SARS case on the 19<sup>th</sup> day with no infection (which was discovered on 18 May) dashed its hope of following in Vietnam's footsteps. Singapore's health officials notified WHO accordingly and the country's countdown to removal from its list of SARS-affected countries had to start from 11 May, the day the newest SARS patient was hospitalized.



Barely a week before the new SARS case, 30 patients and staff at Singapore's main mental hospital had come down with fever. It was a false alarm then – the patients and staff were diagnosed to have the flu. Undaunted, continued vigilance led the Lion City to be removed from the list of areas with recent local transmission of SARS with effect from 31 May. WHO ceased recommending exit screening of international travelers departing Singapore from that date.

WHO on Singapore:

‘From the start, Singapore’s handling of its SARS outbreak has been exemplary.... This is an inspiring victory that should make all of us optimistic that SARS can be contained everywhere.’

David Heymann, Executive Director  
Communicable Disease, WHO

*Source: WHO website, 30 May 2003*

Besides tracing the development of the disease in SARS-affected areas, WHO issued advisories as early as 15 March, advising that people consider postponing all but essential travel to certain SARS-affected areas.

China, the worst SARS-hit country, was one of the countries which desperately sought affirmation from WHO that it was on the right track towards eradicating the disease. Without such affirmation, countries avoided contacts with it. At one time, more than 100 countries imposed travel restrictions to the mainland.

To help the world’s most populous country to battle the infectious disease, a WHO team arrived in China’s capital as early as March 23. The investigation team traveled to Guangdong, which was believed to be the first Chinese city to have witnessed SARS (as early as November 2002), in early April. It presented its interim report on the SARS outbreak in Guangdong province on 9 April to the Chinese Minister of Health and Vice-Premier, Wu Yi, in Beijing. It concluded that with “a health system in every hospital at every level”, virtually all probable cases of SARS presenting at a hospital in Guangdong province would be detected and rapidly reported.



However, an increase in sporadic cases, which could not be linked to a particular transmission chain, was of particular concern. In Beijing, for example, the authorities indicated inability to trace the origins of many cases. This was especially so as military hospitals are not obliged by Chinese law to report cases to health authorities. Still, a WHO team began visits to Beijing's military hospitals on 16 April. This was followed by an urgent meeting of China's highest ruling body presided over by President Hu Jintao, at which Beijing was explicitly warned against the covering up of SARS cases and instead to ensure "accurate, timely and honest reporting of the SARS situation".

The visits prompted the WHO Beijing team to estimate that the Chinese capital might have as many as 200 cases of SARS, instead of 37 as officially reported. The team recommended that Beijing improve its reporting system, possibly using as a model, procedures followed in Guangdong province, where the daily SARS reports were considered reliable and transparent.

The findings invited much criticism from the international community. The Chinese leadership then decided to view with seriousness, the need for transparency in SARS reporting, and as a consequence, two heads rolled. Beijing's mayor Meng Xuenong, and China's health minister, Zhang Wenkang, were dismissed from key Communist Party posts. Beijing implemented tough measures to contain the disease thereafter, such as imposing quarantines, closing schools and entertainment spots, and even shortening the traditional week-long May Day holiday to a single day. However, records on SARS cases were said to be still flawed.

**WHO on Beijing:**

"Right now, the situation is that we have a whole load of people (in Beijing) and we don't know where they got the disease.... The problem with the data is that there are holes in it. That means you don't understand what's going on. The epidemic might be flying off in one direction, and you might not know about it."

Mangai Balasegaram  
WHO spokeswoman

*Source: Associated Press, 10 May 2003*



As of 16 May, Beijing has reported less than 50 probable SARS cases for six consecutive days, a far cry from the daily average of more than 100 probable cases from the previous week of April through 3 May. The daily number of new deaths has also declined from a peak of 15 to an average of four.

In mid-May, although the number of new cases in Beijing had dropped from more than 100 in early May to 12 on 19 May, WHO experts cautioned against concluding that the city's SARS cases were on a downward trend. They warned that misdiagnosis of cases could have contributed to the lower number of probable cases. They feared that patients with milder symptoms of SARS or who had no known contact with an infected person were excluded as probable cases.

The number of wrongly diagnosed patients was not known, but WHO experts feared that this could be happening after visits to Beijing hospitals. They were also apprehensive that annual floods in summer might overwhelm the country's sewage system and allow the virus to return with a vengeance. Although the virus did not appear to have spread through water, it could stay in feces for days and that the virus could then be transmitted by overflowing water.

A six-member WHO team of experts was also invited to Shanghai to assess the SARS situation. Among its activities, the team examined the SARS surveillance and reporting system, investigated rumors that the case burden might be higher than officially reported, and visited ten health facilities, three district Centers for Disease Control, and the municipal Center for Disease Control. The team was given free access to all requested data, patient registries, and facilities, which were visited on very short notice.

In its preliminary report of findings in Shanghai, the team found no evidence of systematic underreporting of cases, and concluded that the level of preparedness and response was good. Reporting of cases appeared to be open, frank, and accurate. Over the previous 3–4 weeks, authorities had designated two hospitals as dedicated to the treatment of SARS patients and set up cough and fever clinics. The team also found a very high level of government commitment in tackling the SARS problem.

In addition, a team of four WHO experts took its SARS probe into rural China, where most Chinese live, but where the healthcare system is in a shambles. There were earlier reports that many mainlanders had attacked quarantine sites for fear of the disease.



On 9 May, WHO's Director-General, Dr Jong-Wook Lee, arrived in Beijing to exchange views on the SARS situation and other health issues in China. A day before, a WHO team had traveled to Hebei province, which borders Beijing municipality, to assess the SARS situation. WHO had expressed concern that Hebei could be particularly vulnerable to the spread of SARS, as the province has a large population of migrant workers — part of Beijing's "floating population".

As at 15 May, the Chinese provinces of Hebei, Jilin, Hubei, Shaanxi and Jiangsu had been added to the list of affected areas. On the same day, China's Xinhua News Agency quoted Premier Wen Jiabao as saying at a Cabinet meeting, that "no individual or administration will be allowed to tamper with or delay the reporting of information". It added that over 300 Communist Party and government officials had been fired or given other punishments for delaying the release of figures and for other violations in the provinces of Hunan and Jiangsu.

State media also publicized a warning by China's Supreme Court that those who caused death or severe illness by knowingly spreading SARS could face a prison term or possible execution. Quarantine violators could be jailed for up to seven years. A new ruling also stated that information about local emergencies must be passed on from local to provincial to central authorities in just five hours.

WHO's David Heymann traveled to China on 10 June and conferred with health officials about the SARS outbreak and discussed future plans. Both the WHO and the Chinese Health Ministry regarded the emergency response to SARS as an excellent opportunity to strengthen countrywide systems for detecting and responding to all emerging and epidemic-prone infectious diseases. The improvements would strengthen China's capacity to respond to the next influenza pandemic.

WHO on 24 June said it had lifted its travel advisory on Beijing and removed it from the list of areas affected by SARS.

In Hong Kong, as new daily cases continued to fall, local health authorities had since 2 April pursued discussions with the WHO for the territory to be removed from the travel advisory. A mask-burning ceremony should be held to celebrate that, came a suggestion.

On 12 May, in a videoconference with Hong Kong's Secretary of Health, Welfare and Food, Dr Eng-kiong Yeoh, and Director of Health, Dr Margaret



Chan, WHO commended Hong Kong officials for their level of transparency in reporting on the SARS situation in the territory. Hong Kong was taken off the list of SARS-infected areas on 23 June. That certainly called for celebrations, with bars in the popular Lan Kwai Fong district serving free champagne. But the celebrations were largely muted, for the virus had claimed the lives of close to 300 people.

WHO on Hong Kong

“Hong Kong has introduced a rigorous contact tracing procedure. All close contacts of known SARS cases are quarantined at home. In addition, their Hong Kong identity card numbers are passed to the Immigration Department to ensure that these individuals cannot leave the territory.”

*Source: WHO website, 12 May 2003*

Taiwan, on the other hand, was able to quickly trace and isolate the infection sources at the early stages of the epidemic. However, SARS soon spread rapidly within the communities. The number of infected cases accelerated considerably from late April. Not leaving things to chances, Taiwan authorities sealed the Taipei Municipal Ho Ping Hospital after more than 25 suspected SARS cases were discovered, and about 1,100 doctors, nurses, patients and visitors stayed there for up to two weeks. Authorities also sealed off a housing complex where one resident had died of the disease, and one of the largest department stores in Taipei was closed while major a disinfection effort was carried out following the infection of a cashier.

A WHO team arrived on 3 May in Taipei to support the health authorities in combating the SARS outbreak. The two-person team, with expertise in epidemiology and virology, visited hospitals and consulted with local health authorities. On 8 May 2003, WHO issued a warning against nonessential travel to Taiwan’s capital.

A day later, when officials could not track down the infection source for a high number of people, WHO upgraded the Taiwanese capital to the category of “high” local transmission of SARS, alongside China’s Beijing, Guangdong, Shanxi and Hong Kong.



WHO's Dr Heymann said the seriousness of Taiwan's situation lay in the several sources of infection, be they Taiwanese businessmen who had traveled overseas, or healthcare workers who had not had enough knowledge about SARS, among others. To complicate matters, not all organizations and units had joined hands to combat SARS. On 18 May, WHO commented that Taiwan was the territory that had spread the virus most quickly.

Though SARS was an issue concerning public health, Taiwan, which was removed from WHO's list of travel advisory on 17 June, turned it into a viable political weapon. The territory with a longstanding discord with China used the situation to push for some form of representation in WHO.

On 20–21 April, Taiwan hosted a seminar on SARS for the international community. The event was attended by more than 500 health officials and researchers from several countries, and its objective was for information exchange pertaining to the disease. Taiwan's Health Minister, Mr Twu Shiing-ger, used his opening speech for the event to garner support for Taiwan's bid to become an observer in WHO. Taiwan had tenaciously tried to gain WHO observership during the past few years, but its efforts had repeatedly been thwarted by China's objections each year.

In another lobbying effort, Taiwan's representative to the United Kingdom, Mr Tien Hung-mao, argued for Taiwan's participation in WHO in front of the British parliament at a recent international seminar. Mr Tien addressed the House of Commons and expressed Taiwan's aspirations to rejoin WHO, and criticized the "moral unfairness of marginalizing Taiwan from WHO assistance for political reasons".

International indignation against China's earlier mishandling of the SARS outbreak, particularly the cover-up that caused the number of cases to balloon in many countries, turned into greater sympathy for the territory that broke away from the mainland in 1949. The United States, the European Union and Japan all expressed support for an observer status for Taipei at WHO's 56<sup>th</sup> Assembly held in Geneva from 19 May.

The status was denied, however, following China's strong objection. Only seven friends of Taiwan supported it; those which opposed numbered 27. A week before the meeting commenced in Geneva, both China and Taiwan wrestled for votes. While the former sent Wu Yi to visit WHO's former director-general Dr Brundtland to express gratitude for the organization's repeated visits to various parts of China affected by SARS, the latter had sent



one of its foreign affairs officials on a private visit. During her visit, Wu Yi highlighted the Chinese government's concern for the health of Taiwanese and was active in facilitating interaction between the two places. However, she lamented that Taiwan had politicized the health issue by expressing its willingness to be an observer at the Assembly. Only sovereign states could join WHO, she argued, and Taiwan's effort seemed to be pointing to the creation of a notion of "two Chinas".

Another cross-border meeting which was convened was less controversial. WHO had welcomed the unprecedented efforts made by the Association of Southeast Asian Nations (ASEAN) to coordinate and standardize their campaigns against SARS. Heads of the 10-member association, China and Hong Kong met in Bangkok, Thailand, on 29 April and endorsed a set of procedures to jointly combat the disease. They agreed to standardize the screening of travelers, isolate and treat identified SARS cases, as well as share accurate and timely information.

Addressing participants at the special summit, Dr Heymann reminded the heads of states that there were two simple strategies that could contain and eventually stop SARS — detecting all cases and protecting those at risk of infection from these cases.

"Meetings of this level and magnitude, to formulate a common strategy against a specific disease, show how serious countries are to become free of SARS," he said.

Based on data from Canada, China, Hong Kong, Singapore and Vietnam, WHO had also revised its 6–10% death rate to 15%.

On 26 June, WHO issued a statement to point out that the global public health emergency caused by the sudden appearance and rapid spread of SARS was coming to an end. It expressed optimism that should SARS resurface later this year, the global impact would be milder than experienced during the initial emergency. This is so as the world's public health systems have demonstrated their capacity to move quickly into a phase of high alert, with former SARS hotspots, including Hong Kong and Singapore, planning to maintain a high level of vigilance, supported by measures for screening and detection, until at least the end of the year.

Secondly, the world already has knowledge about what to do. Control measures such as quarantines, though centuries old, have demonstrated their capacity to completely halt the outbreak.



Thirdly, the intensive research effort which is underway, can be expected to improve scientific understanding of SARS and yield better control tools, most notably a rapid and reliable point-of-care diagnostic test.

At the same time, resolutions adopted during the May World Health Assembly allow WHO to move from a passive reliance on official government notifications to a proactive role in warning the world as soon as evidence indicates that an outbreak poses a threat to international public health.

Most important, said WHO, SARS had underscored the importance of immediately and fully disclosing cases of any disease with the potential for international spread. It appears unlikely that any country would choose to conceal cases should SARS resurface. In addition, SARS is simply too big a disease to hide for long.