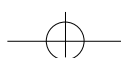


SARS and Flu Prevention **Taiwan Experience**

Edited by Center for Disease Control
Department of Health
Executive Yuan



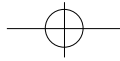
Center for Disease Control, Department of Health, Executive Yuan
April 2004



SARS & Flu Prevention
Taiwan Experience

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Introduction

Severe acute respiratory syndrome (SARS) took a devastating toll on Asia-Pacific nations in 2003, due to lack of knowledge about the disease and its origin, transmission, symptoms, survival rate and treatment. SARS-affected countries implemented quarantine measures under the guidance of the World Health Organization (WHO), including issuing travel advisories, establishing monitoring stations at harbors and airports, and quarantining suspected patients. However, they did not stop the epidemic from spreading to

various parts of the world.

Despite the difficulties, Taiwan has made important progress in combating the terrifying and lethal disease. Besides the quarantine measures, other measures put forward by health authorities were also based on scientific evidence and professional advice, and they included strict control policies adopted by hospitals, such as the establishment of fever screening centers for those coming down with

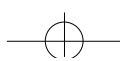
Health Minister Chen Chien-jen, left, and Director General of the Center for Disease Control Su Ih-jen, right, talk to the public to help them solve SARS prevention problems.



Dr. Gro Harlem Brundtland, the World Health Organization's former director-general, announced in Geneva that SARS is no longer spreading in Taiwan. Saying "today is a milestone," she also cautioned that the mysterious illness could make a comeback. Dr. David Heymann, right, the WHO's former executive director of communicable diseases, said that the WHO believes the virus has been contained but warned against becoming complacent.



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President Chen Shui-bian speaks to the audience during a drill on how to transfer SARS patients to the hospitals on Taiwan from offshore islands.

a fever, better design of quarantine facilities, and development of routes taking patients to related medical facilities. These measures, coupled with calls to have the public change their sanitation habits, cut down on hospital visits and refrain from going to work or school if they had a fever, resulted in a strong SARS-prevention network that had the disease under control in the shortest possible time. Health statistics suggested that, before May 2003, a third of SARS cases were hospital workers taking care of patients. Yet after mid-May, no health workers were infected. Control measures by some 500 hospitals received positive evaluations from health authorities.

The SARS contingency plan was developed shortly after the first SARS epidemic.

In the flu season in 2003-2004, SARS prevention has been facing several problems:

- insufficiency of vaccines
- new influenza strains
- care of fever patients

--reporting of mass fever outbreaks

--availability of negative pressure isolation wards

--storage, control and flow of disease control supplies

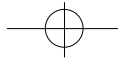
--quarantine and isolation

--handling of mass gatherings and activities.

During the flu season, the effectiveness of SARS and flu prevention measures were put to the test -- resulting in only one laboratory-acquired SARS case. Bio-safety at research laboratories has since been improved to ensure that Taiwan's SARS-prevention network covers all bases.

A total of 92.1% of medical professionals and 69.2% of those over the age of 65 received flu vaccinations, resulting in fewer flu patients this flu season than in previous years. Taiwan's fight against the flu this year will stand it in good stead as the island prepares for more major flu attacks in the future.

In combating the flu, the Department of Health has also been offering free flu vaccines to frontline medical workers and the elderly



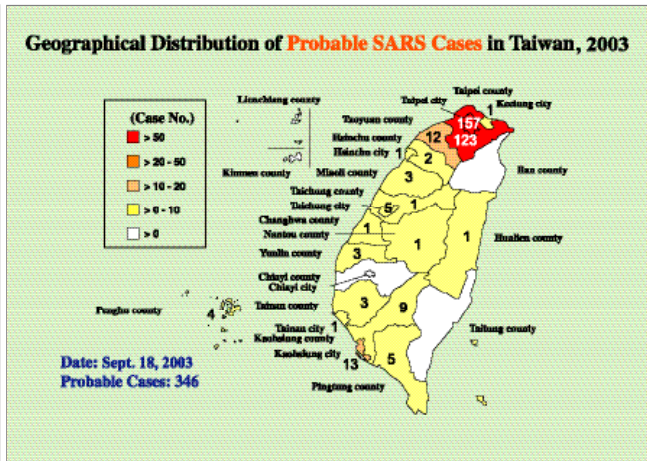
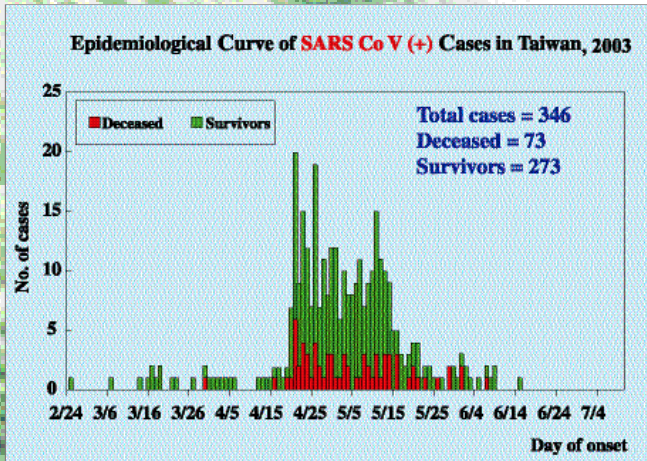
SARS Outbreak in Taiwan

A dedicated effort by the government and the people of Taiwan had the SARS outbreak under control by July 5, 2003. A total of 346 cases were recorded as confirmed SARS cases. Of them, 21 (6.1%) came from other countries, 38 (11%) got the disease from infected family members, 105 (30.3%) were hospital workers, and 142 (41%) got the disease after staying in hospital. Of the SARS patients, 73 died, of which 37 died directly from SARS,

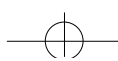
translating into a fatality rate of 10.7%.

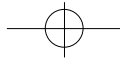
The WHO's travel advisories against Taipei City and Taiwan lasted 41 days and 28 days, respectively, compared with 63 days for Beijing, 52 days for Guangdong Province and 52 days for Hong Kong.

Since the initial SARS outbreak, there has only been one recurrence. On December 17, 2003, a lab researcher developed SARS symptoms while conducting

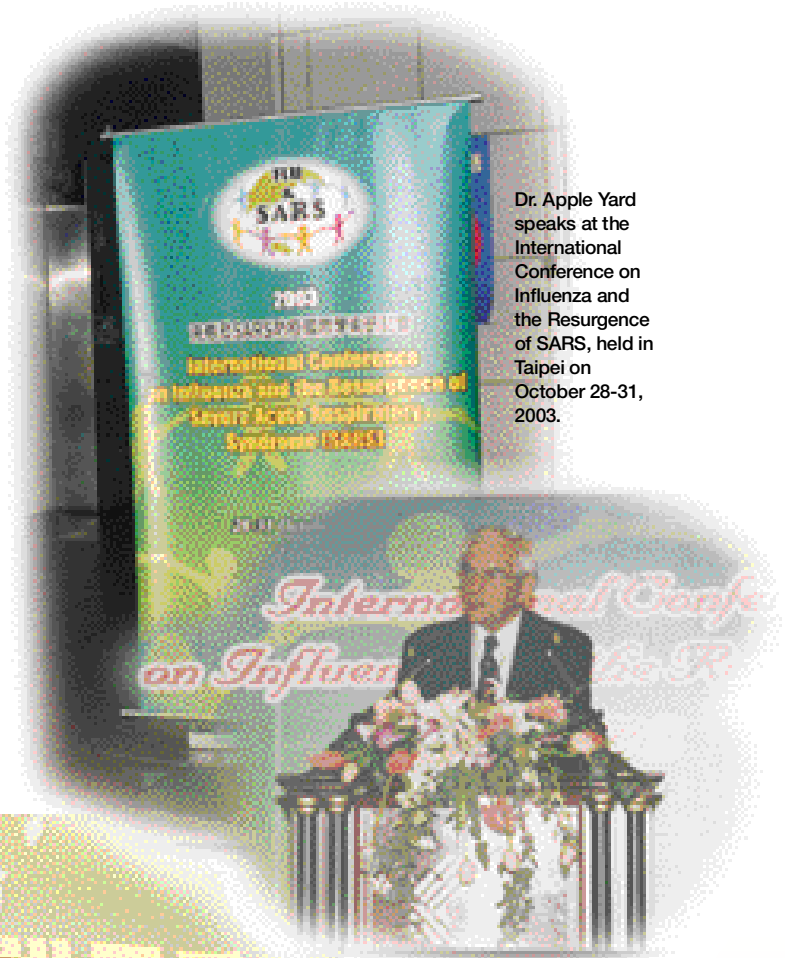


Collaboration with international health organizations ensured the monitoring of overseas individuals who may have had contact with the lab researcher





research at a SARS-related research facility. Within seven hours the situation was brought under control. The case was reported to the WHO and other countries, and within two days individuals who had been in close contact with the lab researcher were banned from leaving the country and were asked to monitor themselves. Collaboration with international health organizations ensured the monitoring of overseas individuals who may have had contact with the lab researcher.



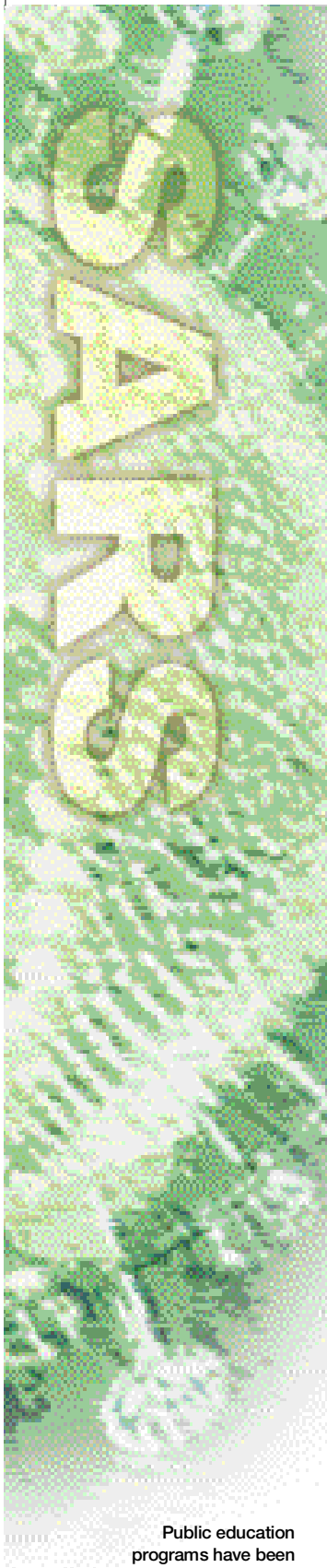
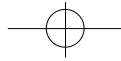
Dr. Apple Yard speaks at the International Conference on Influenza and the Resurgence of SARS, held in Taipei on October 28-31, 2003.



Premier Yu Shi-kun, right, shakes hands with Chen Chien-jen, minister of the Department of Health, to congratulate each other on the removal of Taiwan from the list of SARS transmission areas. Standing at the center smiling is Lee Ming-liang, head of the Cabinet's SARS prevention committee. Yu says it's time to start rebuilding the nation from the damage caused by SARS.

SARS & Flu Prevention
Taiwan Experience





SARS Prevention Measures

Several measures were adopted to prevent SARS from recurring during the post epidemic and flu season. These measures proved effective in preventing SARS from spreading. One of the most important measures was to monitor incoming and outgoing travelers. If symptoms were detected, outgoing travelers were required to stay in the country and were sent to medical facilities. Incoming travelers from SARS-affected areas were asked to keep track of themselves.

Schools and other organizations asked students and staff to have their temperatures taken upon entering facilities. Those with a

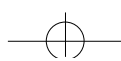
fever were required to stay at home. Hospitals also set up en-masse temperature-taking areas to prevent diseases from spreading. Various monitoring systems were set up for different types of cases.

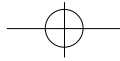
Health authorities also set up negative pressure chambers in medical facilities throughout the island and five command centers around Taiwan.

Meanwhile, flu vaccines were given to senior

Public education programs have been launched to teach children how to prevent the spread of SARS.

5





During the SARS outbreak, airline passengers were warned to take precautions against the disease.

citizens over 65 years of age, medical workers and poultry farmers. Free antiviral drugs were issued to senior citizens over 65 years of age and other high-risk groups.

Quarantine

The monitoring has been conducted continuously.

Between July 1, 2003 and March 25, 2004, a total of 2,250,835 incoming travelers filled out SARS forms and underwent temperature checks, while 2,585,983 outgoing travelers underwent temperature checks. Health workers tracked via telephone 29,815 individuals from Guangdong Province, and 105,755

individuals from mainland China, Hong Kong and Macau checked into hospitals for examinations, with 3,359 of them further monitored by health authorities.

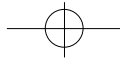
All of the individuals mentioned above did not show signs of SARS. Those with a fever were later determined to have contracted: Dengue fever (27 cases), malaria (1), bacillary dysentery (39) and the flu (22).

Nosocomial Infection Control

In-patient and fever monitoring systems were put in place to track the latest conditions of patients staying in hospitals.

One of the most important measures was to monitor incoming and outgoing travelers





A total of 330,000 individuals across 554 hospitals were examined. All patients tested negative for SARS, while seven tested positive for the flu.

From November 5, 2003 to March 18, 2004, 975 suspected pneumonia cases were reported, and one was infected with SARS – the lab researcher. Meanwhile, 83 of the cases tested positive for influenza, with the infection rate being 8.5%.

Meanwhile, several reporting mechanisms were integrated to ensure a faster and easier reporting process. By integrating these systems, health workers were able to track undiagnosed pneumonia cases, watch for the latest

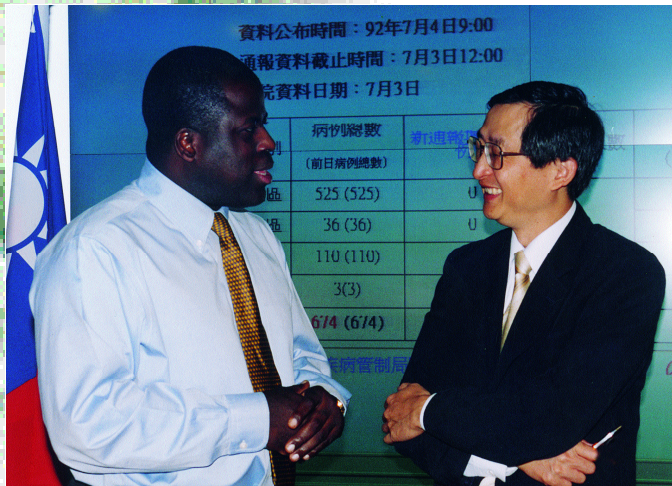
Internet.

Community Surveillance

In order to prevent the possibility of a contagious outbreak within mass-populated community institutions and to implement control measures as early as possible, monitoring operations began in these institutions in May 2003.

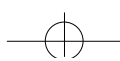
Community monitoring includes screening of orphanages, nursing homes, jails, detention centers, halfway houses, drug rehabilitation centers, veteran's homes, long-term care centers, psychiatric institutions and other facilities with a mass-population of confined inhabitants. As of April 30, 2004, a total of 1,506 facilities were participating in the monitoring program, and since the SARS infection of a laboratory researcher, all facilities have been assisted by various city and county health and social affairs bureaus to provide immediate reports on any inhabitants suffering from undiagnosed fevers.

As of April 30, 2004, only 14 inhabitants of these institutions were treated for influenza, much less than the expected number. Based on the normal infection rate of 10% for influenza and accounting for various adjustments, over 560 elderly inhabitants alone were expected to be treated for influenza. Therefore, in comparing these two numbers, we can see that



Chang Hong-jen, right, CEO of the Bureau of National Health Insurance, shares SARS prevention experience with a foreign expert.

conditions of patients, analyze data of SARS patients and read information submitted via the





SARS suspects in a stable condition board a special shuttle van for Sungshan Military Hospital. Over 40 patients left Ho Ping Municipal Hospital to stay at the service medical institution near Sungshan Airport.

the government's policies in providing flu vaccinations, anti-virus medication and fever monitoring have been effective in significantly reducing the number of influenza patients.

Infection Prevention Network

The CDC has coordinated with its northern, central, southern and eastern branch offices to form infection command centers throughout the island. Each center is led by a commander and a deputy commander, who monitor the operations of the center during an outbreak.

Meanwhile, emergency medical units and an infection prevention center have been established at the Tainan Military Hospital to take charge of transporting patients from remote areas. The Tainan Military Hospital holds regular meetings to discuss the status of its operations.

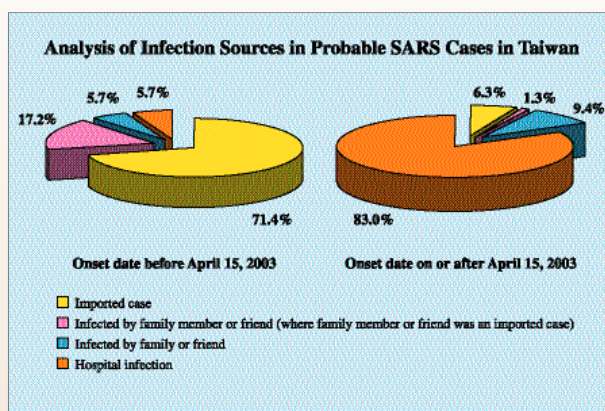
The government has also been working with local authorities to designate county and municipality-level hospitals for infected patients,

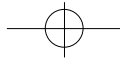
with different levels of quarantine facilities put in place to suit the various types of cases.

Hospital Assessment

Health authorities visited several medical facilities above the municipality level from September to October 2003, evaluating them on 10 major criteria:

1. Implementation of previous recommendations
2. Establishment of an Infection Control Committee
3. Reporting of suspected SARS and pneumonia cases in accordance with DOH regulations





- 4. Fever screening and processing
- 5. Diagnosis of suspected SARS and undiagnosed fever patients
- 6. Health and temperature monitoring of all hospital personnel
- 7. Availability of Personal Protective Equipment (PPE)
- 8. Existence of isolation rooms, observation rooms and hand-washing facilities
- 9. Completion of SARS training for all hospital personnel
- 10. Crisis management processes

Meanwhile, health authorities published a "personal guide to SARS prevention" handbook and completed "guidelines on the control of the bird flu."

Bio-safety in Laboratories

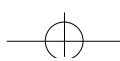
Evaluations and assessments of island-wide BSL-3 laboratories have been conducted to ensure quality control of Biological Class-3 research facilities, in response to a SARS case reported at a research facility.

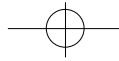
The evaluations were based on Article 32 of the Communicable Disease Control Act, which authorizes the Center for Disease Control to carry out measures ensuring the safety of lab researchers, the containment of infectious microbes in related studies, and provide guidelines for conducting tests on certain types of organisms.

Improved bio-safety controls at BSL- 3 laboratories have enabled staff, equipped with protective clothing and oxygen tanks, to work on unraveling the secrets of mysterious new epidemics.



Health authorities published a "personal guide to SARS prevention" handbook and completed "guidelines on the control of the bird flu"





Flu Prevention

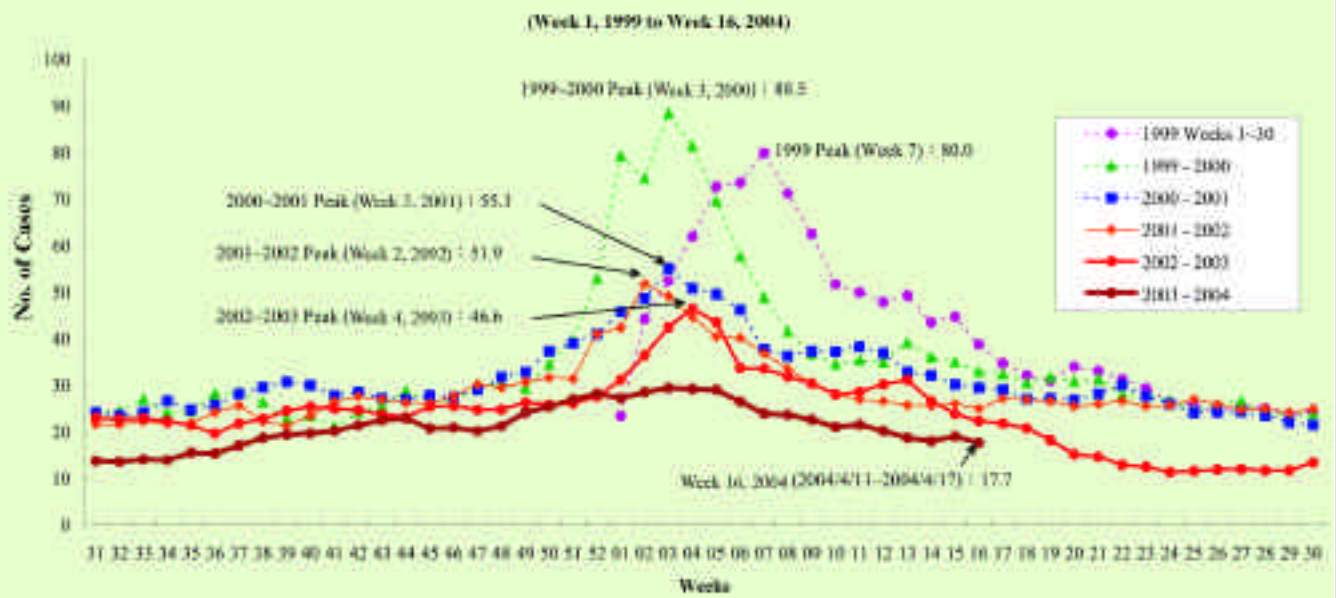
Surveillance

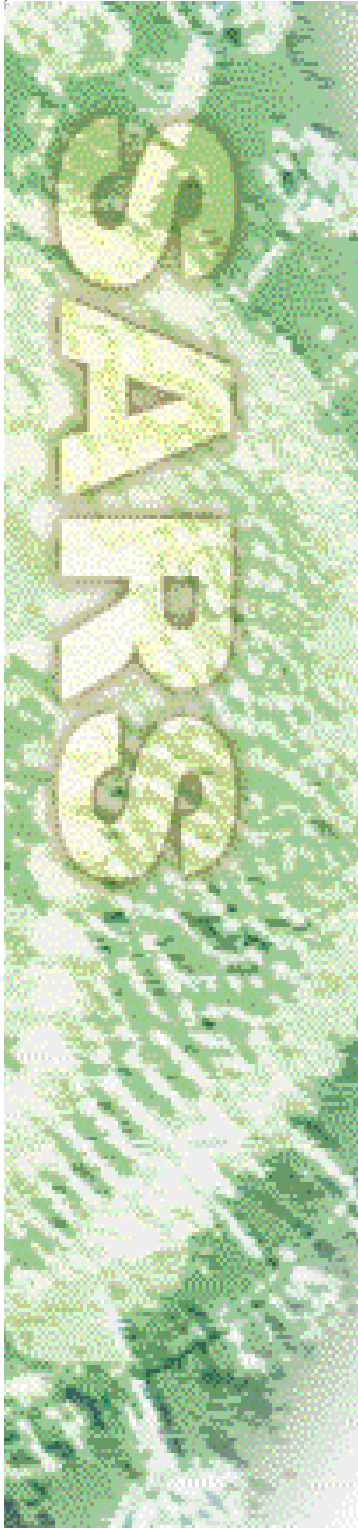
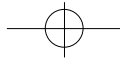
The Center for Disease Control has operated a national influenza surveillance system since 1999 to monitor and report influenza activities across Taiwan. There are three main sources of information: 1) influenza-like illnesses reported by sentinel physicians on a weekly basis across the island, 2) reports of positive influenza tests by 12

contract laboratories, and 3) sub-typing and antigenic characterization of influenza isolates by the CDC's virology laboratory.

The current flu season began in December 2003 and reached a peak during the third week of 2004 (January 11, 2004 to January 17, 2004). During this time, an average of 29.6 patients were reported by each sentinel physician. After the period, the number of patients

Average No. of Influenza-like Cases Reported per Sentinel Physician per Week in Taiwan





The CDC, working in conjunction with hospitals and other medical facilities, has been providing flu vaccinations to frontline health workers

reported began to drop. Of note, there were fewer flu patients in this season than there were in previous seasons, and the peak of this season was less noticeable.

The predominant virus circulating in Taiwan during this season is influenza A(H3N2). The CDC's virology laboratory has antigenically characterized 468 influenza viruses to date; 438 are influenza A viruses, including A/Wyoming/3/2003(H3N2)-like, 45 A/Panama/2007/99(H3N2)-like, 4 A/New Caledonia/20/99(H1N1)-like, and 30 are influenza B viruses,

including 17 B/Sichuan/379/99-like, 12 B/Shanghai/361/2002-like, and one B/HongKong/330/2001-like.

A total of five cases were reported among poultry farmers, with three confirmed to have contracted the influenza A(H3N2) virus. As for the other two, one contracted influenza A (untypable), and the other tested negative for the disease.

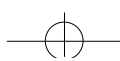
Prevention Measures

The Department of Health has been providing flu vaccines for senior citizens over 65 years of age

The Department of Health has been providing flu vaccines to senior citizens over 65 years of age, including former Health Minister Lee Ming-liang, as part of its flu-prevention program for the elderly.



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under a project initiated in October 1998 as part of its flu-prevention program for the elderly, who are more susceptible to the disease. Certain patients have died from complications after contracting the flu, prompting the government to improve its health policies to better look after the interests of the elderly. Since the program's implementation, the DOH has vaccinated about 180,000 senior citizens most susceptible to the disease.

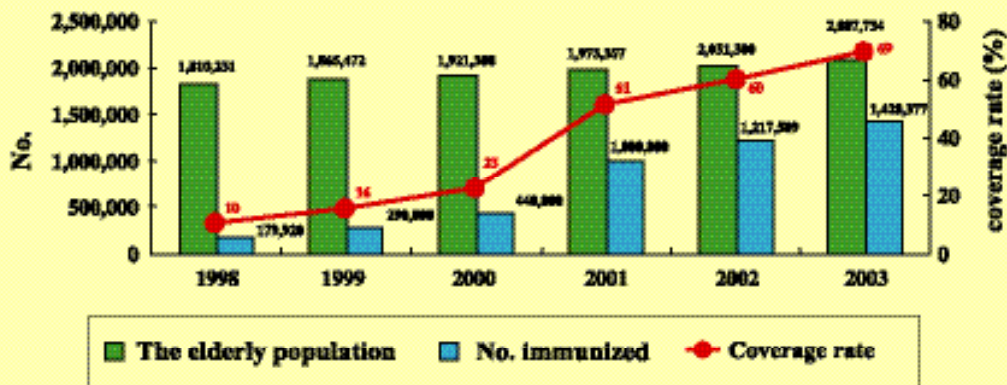
During the 2003 flu season, the department set a 80% vaccination rate for senior citizens over the age of 65 as a target in its effort to prevent a comeback of SARS, whose early symptoms are similar to those of the flu. The measure was also aimed at minimizing confusion should a change in the demand for

flu vaccines take place with an attack of SARS. By March 2004, the 80% vaccination rate had not yet been achieved, but the rate had increased significantly to 69.2% from 2002's 59.9%. Meanwhile, the vaccination rate for senior citizens at care facilities reached 91.1%.

The DOH will in the future continue to carry out policies to improve the health of senior citizens and prevent deaths and

To guard against the spread of avian flu, the government frequently inspects poultry farms.

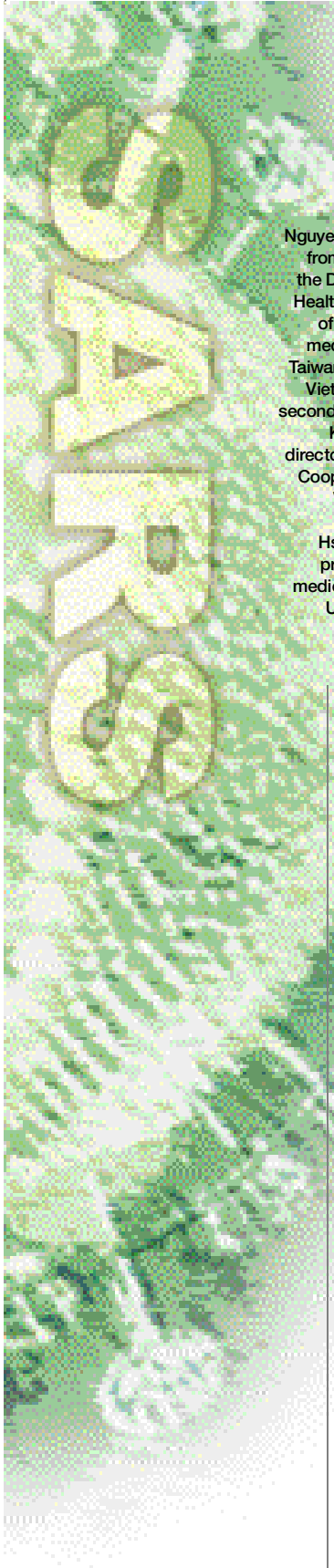
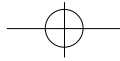
Immunization of the Elderly (65 and above) Against Influenza



Remarks:

1. All figures are based on the amount of vaccines purchased by the central government.
2. The 1998 figures do not include invalid vaccines.
3. Immunization of senior citizens in areas hit by the 9-21 earthquake is included in the 1999 figures.

SARS & Flu Prevention
Taiwan Experience



Nguyen Van-thong, second from left, vice director of the Department of Animal Health, Vietnam's Ministry of Agriculture, receives medical equipment from Taiwan's Representative in Vietnam Huang Nan-hui, second from right, with Tran Kim-long, left, deputy director of the International Cooperation Department, Vietnam's Ministry of Agriculture, and Tsai Hsiang-jung, associate professor of Veterinary medicine, National Taiwan University, looking on.



complications resulting from communicable diseases.

Meanwhile the CDC, working in conjunction with hospitals and other medical facilities, has been providing flu vaccinations to frontline health workers. About 92.1% of these professionals have been vaccinated.

Free flu vaccines were also given to poultry farmers, slaughterhouses and retail and transportation services to prevent an outbreak of the flu among these individuals. As many as 25,000 people received the vaccines.

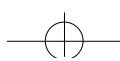
In addition to flu vaccines, the government has since December 15, 2003, given free antiviral drugs (Tamiflu®) to senior citizens over the age of 65, poultry farmers and servicemen. As of April 7, 2004, a total of 10,752 doses were given to

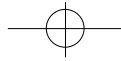
1,097 people for treatment, while 2,058 doses were given to 230 people in preventive action.

A reduction in flu cases in 2004 as compared to 2003 was a result of increased understanding of the disease by the public and better preventative measures. At the same time, the government gave flu vaccinations and medication to more people.

With the influenza A (H5N1) virus spreading to many nations at the beginning of the year, the WHO predicted in mid-March that there would be a major outbreak across the globe in the next couple of years. Taiwan's fight against the flu this year has indeed become valuable experience as the island prepares for a major flu attack in the near future.

The spread of the bird flu is a wake-up call, as the WHO has already warned of a major outbreak. Even though Taiwan is not a WHO member, it has been very active in supporting the global prevention network





Conclusion

Thanks to the government's effective prevention measures, SARS and flu outbreaks have been well controlled in Taiwan. The power of the viruses has been reduced significantly, and measures adopted by countries across the world have proven to be effective against SARS and other communicable diseases such as the flu.

Since December 2003, several Asian countries have reported cases of the high pathogenic avian influenza (H5N1) and human cases have been found in Vietnam and Thailand. The spread of the bird flu was a wake-up call for these countries, as the WHO had already warned of a major outbreak within the next few years. Prevention of an outbreak has become a big challenge for health workers.

It's important to keep in mind that the spread of these communicable diseases has been faster after changes in the environment, over-development of



land, indiscrete use of medication, closer contact with animals and easier travel around the globe. Taiwan believes that, as a member of the international community, it must do its part in the global fight against SARS, influenza, tuberculosis, AIDS and other diseases.

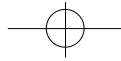
Although not a member of the WHO, Taiwan will continue to play an active role in the international health community to contribute to a healthier world not only for the 23 million people on the island but for all citizens of the Earth.

Health Minister Chen Chien-jen acknowledges that prevention of an outbreak has become a big challenge for health workers.

Taiwan's experience has proven to be effective against SARS and other communicable diseases such as the flu

SARS & Flu Prevention
Taiwan Experience





SARS and Flu Prevention Taiwan Experience

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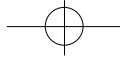
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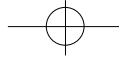
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SARS & Flu Prevention
Taiwan Experience





Diseases Controlled in Taiwan

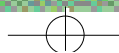
- 1948 - Bubonic plague eradicated.
- 1948 - Immunization program implemented to reduce communicable diseases.
- 1955 - Smallpox eradicated.
- 1959 - Rabies eradicated.
- 1965 - Malaria eradicated.
- 1984 - Hepatitis B vaccination program implemented to reduce infection among children.
- 1995 - Hepatitis A vaccination program implemented to eliminate the outbreak in mountainous areas.
- 1998 - Influenza vaccination program for the elderly implemented.
- 2000 - Polio eradicated.

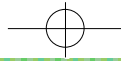


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SARS and Flu Prevention

Taiwan Experience



SARS is there to stay. It's only by working together that better things can be expected from the epidemic. Taiwan's experience has proved to be effective against SARS and other communicable diseases such as the flu.

Source: WHO, Disease Control, Department of Health, Executive Yuan, Taiwan, R.O.C.

