



Chapter 4.

# Control of Communicable Diseases



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Having gone through bio-terror attacks such as the September 11 incident of the US, and threats of emerging communicable diseases such as SARS and the avian influenza, the prevention and control of communicable diseases has become more and more important. In the control of diseases, in addition to continuing efforts in epidemic monitoring and investigations, quarantine at ports of entry and disease control, preparedness for disease infections, nosocomial infection control, laboratory testing and research, and development of vaccines and immunization, more should be done to the amendment of laws and regulations to coordinate with world trend, and to the establishment of a national health commanding center to integrate disease control commanding systems. It is hoped that through excellent soft and hardware equipment and facilities, the goal of early detection and early prevention can be attained to protect the health of the people and to elevate quality of life. Major activities are illustrated as follows:

### Section 1. Notifiable Diseases

Comprehensive disease control laws and regulations not only can adequately regulate the rights and responsibilities of personnel in diseases control, they are bases for workers concerned in executing their disease control duties. Laws and regulations, therefore, are the most important cornerstone for the promotion of disease control. Therefore, the two basic laws of disease control, the Communicable Disease Control Act and the AIDS Control Act, have been, in coordination with the needs of disease control and changes in trends, supplemented and amended from time to time.

#### 1. Laws and Regulations on Communicable Disease Control

The Communicable Disease Control Act and the AIDS Control Act are two important laws in the prevention and control of communicable diseases. The Communicable Disease Control Act was amended and

announced on January 20, 2004 in 75 articles in seven chapters. In coordination with the implementation of the said Act, 20 relevant regulations have been amended and supplemented. In coordination with the announcement of the International Health Regulations, smallpox, Lassa fever, valley fever, Marburg virus hemorrhagic fever and West Nile fever have been made notifiable diseases (see Table 4-1).

The AIDS Control Act was amended partially and announced on February 5, 2005, to strengthen the control of AIDS. In coordination, the Implementation Regulations of the AIDS Control Act, and the Regulations Governing Lectures on AIDS and other Sexually Transmitted Diseases have been amended.

The World Health Organization, at its 58th World Health Assembly in 2005, amended and passed the International Health Regulations for implementation officially on June 15, 2007. The Regulations focus on the upgrading of international quarantine specifications and to strengthen the public health emergency-meeting capacities of all countries. Taiwan though is not a member state of the WHO, as a member of the global community, Taiwan has made considerable efforts, in coordination with the implementation of the IHR, to amend relevant laws and regulations such as the Communicable Disease Control Act, the Regulations Governing Quarantine at Ports, and the Regulations Governing Awards for Communicable Disease Control.

#### 2. The National Health Command Center

When SARS epidemics devastated Taiwan in 2003, for the lack of a combat commanding center for direct liaison between the central and the local governments, the overall risk-management of the government in disease control was jeopardized. For this, Dr Chen Chien-jen, the then Minister of Health, instructed the Center for Disease Control to establish a National Health Commanding Center (NHCC). Officials were dispatched to study the operation of the US health commanding center. After a year of preparation, the Center was officially inaugurated for operation on January 18, 2005.

Table 4-1 Notifiable Diseases, Taiwan

Law	Category	Diseases	Report Within	Mandatory Isolation	
Communicable Disease Control Act	I	Cholera, Plague, Yellow fever, Rabies, Ebola hemorrhagic fever, Anthrax, SARS	Within 24 hours	Yes	
	II	Typhus Fever, Diphtheria, Meningococcal Meningitis, Typhoid, Paratyphoid, Poliomyelitis, Bacillary Dysentery, Amebic Dysentery, Dengue Fever (Dengue Hemorrhagic Fever/Dengue Shock Syndrome), Malaria, Measles, Acute Viral Hepatitis A, EHEC (Enterohemorrhagic E coli), Enterovirus complicated severe cases, Hanta Virus Syndrome (Hanta Virus Hemorrhagic Fever, Hanta Pulmonary Syndrome)	Within 24 hours	When necessary	
	III	Tuberculosis, Japanese Encephalitis, Leprosy, Rubella, Congenital Rubella syndrome, Pertussis, Scarlet Fever, Tetanus, Scrub Typhus, Acute Viral Hepatitis (except A), Mumps, Chickenpox, Legionella, Invasive Hemophilus Infection type B, Syphilis, Gonorrhea, Influenza complicated severe cases	Within one week	When necessary	
	Designated communicable diseases		Novel influenza	Within 24 hours	Isolation treatment
			Smallpox, Lassa Fever, Rift Valley Fever, Marburg Virus Hemorrhagic Fever	Within 24 hours	Yes
			West Nile Fever	Within 24 hours	When necessary
AIDS Control Act		HIV infection, AIDS	Within 24 hours	When necessary	

The commanding system of the NHCC is built following the commanding frameworks commonly used by the US emergency management systems to incorporate with locally developed standard commanding operational procedures for epidemics management to set up a coordination center, a situation room, an administration office, conference rooms and a media watch room, hoping to rapidly transmit epidemic information and information needed for policy-making. In addition to the central commanding center, a regional commanding center each is set up in the north region (Nankang), central (Taichung), south (Tainan), east (Hualien) and Kaoping (Kaohsiung), to construct a comprehensive disaster control mechanism. The NHCC is used as a platform for cross-ministerial information exchange to pull together relevant information supplied by various ministries and departments, local governments and even private sector organizations, to transfer it into real-time information needed for the overall commanding on disaster combating, and to provide the commanding officer with information needed for making decisions to meet epidemics, bio-pathogenic disasters, anti-terrorism and emergency medical care.

At the time of the tsunami disaster in South Asia in 2004, the disease control teams dispatched for rescue by the Center for Disease Control made a direct online contact with the NHCC through tele-conference for effective allocation of manpower and materials and also to monitor the progress of the international aid program. This was the first time the NHCC commanded overseas missions; it was also a milestone for Taiwan in participating in international rescue actions. To face the possible pandemic of a novel influenza likely to be brought about by H5N1 virus, the Center for Disease Control also uses the advanced soft and hardware facilities of the NHCC for tabletop exercises to practice various standard operational procedures and coordination and liaison between departments.

## Section 2. Control of Major Communicable Diseases

Control of communicable diseases has made substantial progress along with the improvement in environmental sanitation, the universal application of vaccines, advancement in living conditions and effective disease control measures. In the recent years, smallpox,

rabies, malaria and poliomyelitis have been eradicated. However, the increasingly frequent international interaction has brought about threats of emerging and re-emerging diseases, and the control of communicable diseases faces once again serious challenges. In the next paragraphs, the control of some major communicable diseases by the disease control systems is illustrated.

### 1. Surveillance and Investigation of Epidemic Conditions

To strengthen the monitoring of epidemic conditions, a pluralistic surveillance system has been established, and simple and rapid networks are used for case reporting to enable the rapid examination and analysis of information. The distribution of notifiable diseases in the Taiwan area in 2005 is shown in Table 4-2. The novel influenza was announced a designated communicable disease on December 30, 2004. The notifiable disease surveillance system, symptoms surveillance system and laboratory surveillance system have been established and information integrated. When the systems receive reporting of suspected influenza cases, mobile phones are used to alert disease control workers for immediate control actions.

A comprehensive national disease information network containing systems for the monitoring of communicable diseases including novel infectious diseases, emerging infectious disease hospitalization and management, geographic information for the management of epidemic conditions, e-electronic bulletin on epidemic conditions, case-reporting of communicable diseases, reporting by sentinel physicians, monitoring of communicable diseases in densely populated institutions, and reporting of monitoring in schools, has been established to integrate databanks on communicable diseases, sentinel physicians and tuberculosis, and the GIS databank to collect information through various channels and to monitor epidemic conditions immediately. To detect emerging communicable diseases, biological attacks and pathogens likely to cause cluster infection in community, the Center for Disease Control established in 2000 an "Investigation Taskforce for Diseases of Unknown Causes" by combining disease control and academics to strengthen mobility and sensitivity to focus on deaths due to unknown causes of communicable diseases and sudden deaths for investigation and analysis. In 2005 in

the north, central, south and east regions, there had been 42 deaths from unknown causes (see Table 4-3); for them, pathological autopsy was performed to clear the causes of death for taking disease control measures early and to interrupt the transmission of infections. In addition, 10 outbreaks of herd infection of unknown causes had been investigated (see Table 4-4)

To improve disease investigation capability, the 20th class of the Field Epidemiology Training Program (FETP) was held. In addition, 478 persons in 14 classes from different health agencies completed middle or elementary level training of field epidemiology courses.

### 2. Communicable Diseases of the Respiratory Tract

#### 1) Tuberculosis

In 2005, tuberculosis was the 13th cause of death. In 2005, 22,665 cases had been reported, and 15,097 cases were placed under management. Major activities are:

- (1) Payments for the medical care of tuberculosis have been improved; and case managers are created in hospitals to assist in the case management and to improve care rate of patients. In 2005, 255 hospitals had joined the project, and the care rate for tuberculosis cases had reached 68.8%. 659 medical care institutions (369 health stations and 290 medical care institutions) had waived the co-payment for the medical care of tuberculosis. 291 person-times of cases had been subsidized for medical care; and 922 persons had been subsidized for sputum test, to provide them with more access and thus to reduce barriers to medical care. 441 person-times of chronic open cases and patients of mountain areas had been subsidized for care in hospitals.
- (2) To realize the follow-up management of tuberculosis cases, tuberculosis control manpower has been strengthened. Counties and cities have been supplied with 3,144 person-months of manpower to visit 204,754 person-times of tuberculosis cases, and the branch bureaus are instructed to supervise them periodically. The 12-month lost-to-contact rate had dropped from 15.74% in the previous year to 10.35%; and the 18-month lost-to-contact

Table 4-2 Distribution of Cases of Notifiable Diseases, R.O.C(Taiwan), 2005

Category	Disease	Reported	Confirmed	Category	Disease	Reported	Confirmed	
I	□ Cholera	2	2	III	Tuberculosis	22,665	15,866	
	□ Plague	-	-		Japanese Encephalitis	306	35	
	□ Yellow Fever	-	-		□ Leprosy	9	9	
	□ Rabies	-	-		Rubella	43	6	
	□ Ebola Hemorrhagic Fever	-	-		□ Congenital Rubella Syndrome	-	-	
	□ Anthrax	-	-		Pertussis	184	38	
	□ SARS	-	-		Scarlet Fever	1,713	1,132	
II	□ Typhus Fever	-	-		Scrub Typhus	2,176	462	
	□ Diphtheria	-	-		Acute Viral Hepatitis B	323	321	
	Meningococcal Meningitis	39	20		Typhoid	76	35	
	Tetanus	16	-		Acute Viral Hepatitis C	194	172	
	Paratyphoid	40	13		Acute Viral Hepatitis D	14	4	
	□ Poliomyelitis	-	-		Acute Viral Hepatitis E	71	21	
	Bacillary Dysentery	214	174		Acute Viral Unspecified Hepatitis	16	10	
	Amebic Dysentery	283	120		Mumps	1,158	-	
	Dengue Fever	1,083	306		Chickenpox	13,599	-	
	□ Malaria	26	26		Legionella	943	38	
	Measles	39	7		Invasive Hemophilus Infection type B	38	12	
	Acute Viral Hepatitis A	264	257		□ Syphilis	5,291	5,291	
	EHEC	6	-		□ Gonorrhoea	1,498	1,498	
	Enterovirus complicated severe cases	275	142		Influenza complicated severe cases	91	33	
	□ Hantavirus syndrome	-	-		Designated communicable diseases	□ Novel Influenza	-	-
					Others	□ AIDS	504	504
					□ HIV Infection	3,404	3,404	

Notes: 1. Data includes all cases onset in the period January 1 to December 31, 2005. Cases of AIDS and HIV infections do not include foreigners, and are based on the day of diagnosis.

2. □ includes only confirmed cases; □ stands for □.

3. Cases of leprosy include foreigners.

4. Of all confirmed dengue fever case, 202 are indigenous cases; and 104 imported. All 26 malaria cases are imported.

rate had dropped from 4.48% in the previous year to 2.66%. Management of tuberculosis cases of medical personnel and indigenous peoples has been strengthened. Once a case is reported, the system will immediately dispatch message to the disease control workers for action.

- (3) The tuberculosis reporting enquiry system has been strengthened to improve the efficiency of reporting via the medical care institution websites. The average time required for reporting has been shortened to two days; and the abnormality of reporting time is lower than 2%.
- (4) The public health system of tuberculosis has been improved. Chest x-ray screening is

conducted for high-risk groups and residents of high-prevalence areas to actively detect patients. Thus far, 253,061 person-times have accepted the screening. Training of professional workers including 281 physicians, 1,657 nursing personnel, 932 health workers and 495 case managers has been organized.

- (5) A diagnosis and treatment system for tuberculosis has been established following the framework of the Infectious Diseases Prevention Network of the Department. In the north, central, south and east regions, eight tuberculosis referral and training centers have been set up to focus on drug-resistant cases, difficult cases and to train professional workers. In each of the north, central, south and

**Table 4-3 Deaths of Unknown Causes by Region, 2005**

Region	North	Central	South	East	Total
94	16(8)	11(5)	9(1)	6(2)	42(16)

Note: Figures in parentheses are the number of cases that have been performed pathological autopsy.

**Table 4-4 No. of Incidents of Herd Infection Outbreaks and from Unknown Causes Investigated, 2005**

Classification	No. of Incidents
Vomiting, diarrhea	5
Bacillary dysentery	2
Food poisoning	2
Encephalitis	1
Total	10

eastregions, a tuberculosis diagnosis and treatment advisory team has been set up to assist in the correct diagnosis of tuberculosis, to review second-line medication, and to offer recommendations on treatment, thus to improve the standard of tuberculosis care. In total, 123 meetings of the advisory teams have been held to discuss 2,061 cases, home-visit 130 cases, and investigate 19 outbreaks or unusual epidemic conditions.

- (6) A tuberculin laboratory testing system has been established using the rapid and convenient delivery systems and nine contracted laboratories throughout the country for sputum test. In total, 137,410 sputum specimens have been tested, and the sputum-testing rate of cases has been brought up to 95%.

## 2) Meningococcal meningitis

In 2005, 39 cases of meningococcal meningitis had been reported; of them, 20 had been confirmed, and one died, giving a fatality rate of 5%. Both the number of confirmed cases and the fatality rate were lower than the previous year. Of the confirmed cases, most were of the B-type serum; 10% were Y-type, and 10% were of the uncertain type (see Table 4-5).

## 3. Communicable Diseases of the Intestinal Tract

### 1) Enterovirus

Enterovirus infections are strictly monitored through

the communicable disease reporting and management system on the monitoring of enterovirus complicated severe cases, and the sentinel surveillance system on the monitoring of hand-foot-mouth disease and herpangina. The average number of enterovirus cases reported by sentinel physicians each year is shown in Figure 4-1.

Definition for the reporting of enterovirus complicated severe cases has been revised to include contents applicable to severe cases of the newborns to more adequately meet the actual needs of prevention and control, and to avoid missing of suspected severe cases. Health education materials such as Enterovirus-prone Group Control Booklet, Enterovirus Control Plan, Enterovirus Control Handbook for Child Care Workers, and notes on the clinical care of enterovirus complicated severe cases have been revised. Recent epidemic conditions of enterovirus and the distribution by township of enterovirus 71-type and enterovirus severe cases in the Taiwan area are announced periodically for the reference of counties and cities in the prevention and control of enterovirus infection and in deciding whether classes should be suspended.

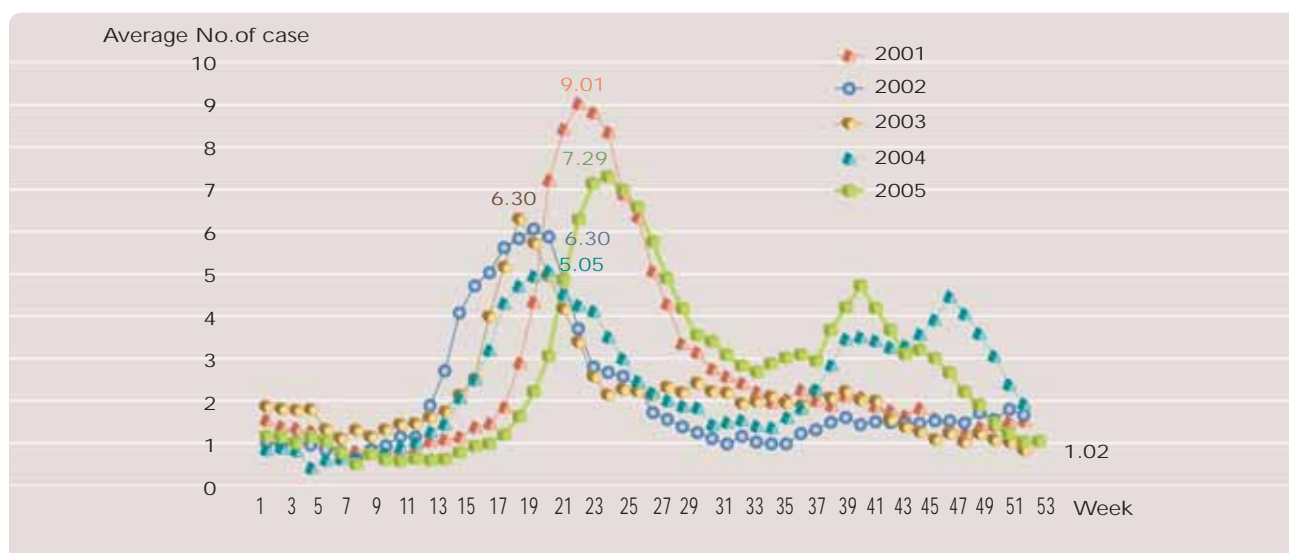
Experts are invited to serve as advisors on clinical care to assist in the review of suspected severe cases, to establish principles for medical treatment, to provide recommendations for medical care and also for the formulation of policies, and thus to reduce the fatality of severe cases. The list of recommended hospitals for referral is renewed from time to time for the reference of medical care institutions in referring their patients, and

Table 4-5 No. of Cases of Meningococcal meningitis by Month, 2005

Month	No. of Cases				Serotype					
	Reported Cases	Confirmed Cases	Deaths	Fatality Rate (%)	A	B	C	W135	Y	Undecided
January	4	3	0	0%	0	1	0	0	0	2
February	6	2	0	0%	0	2	0	0	0	0
March	4	3	0	0%	0	3	0	0	0	0
April	6	4	0	0%	0	2	0	0	2	0
May	2	1	0	0%	0	1	0	0	0	0
June	3	0	0	0%	0	0	0	0	0	0
July	4	3	0	0%	0	3	0	0	0	0
August	4	2	0	0%	0	2	0	0	0	0
September	4	1	1	100%	0	1	0	0	0	0
October	2	1	0	0%	0	1	0	0	0	0
November	0	0	0	0%	0	0	0	0	0	0
December	0	0	0	0%	0	0	0	0	0	0
Total	39	20	1	5%	0	16	0	0	2	2

Note: In 2004, the number of confirmed cases of Meningococcal meningitis was 24 with 3 deaths, giving a fatality rate of 12.5%

Figure 4-1 Average No. of Enterovirus Cases Reported by Sentinel Physicians



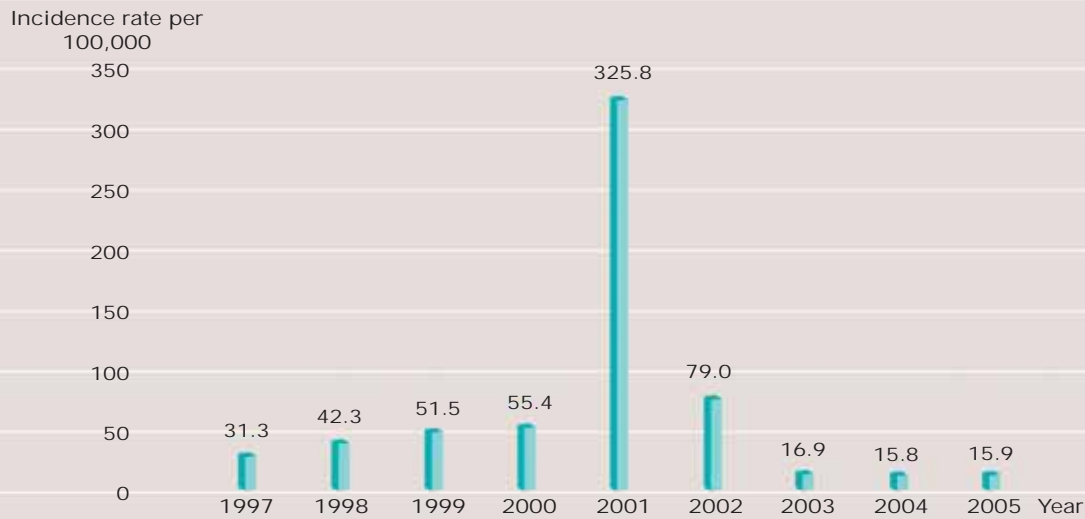
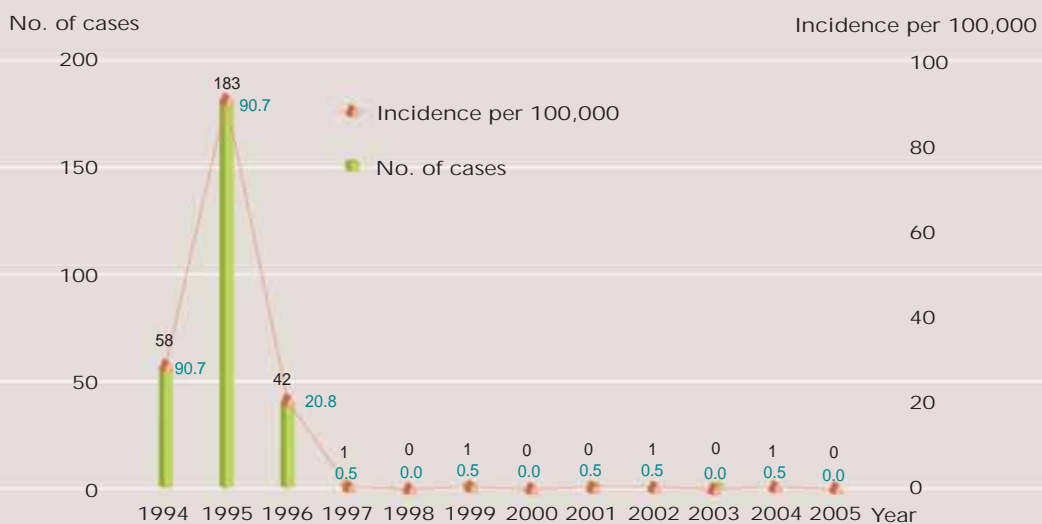
thus to allow enterovirus complicated severe cases access to timely and adequate medical care, to reduce fatality and the occurrence of sequelae. Training on the clinical diagnosis of enterovirus infection and management of complicated severe cases has been organized five times to improve the medical care quality for enterovirus complicated severe cases.

## 2) Prevention and Control of Bacillary Dysentery in Mountain Townships

The plan to strengthen prevention and control of

bacillary dysentery in mountain townships has been continued. In 2005 in the nine priority counties and cities for prevention and control, 39 cases of bacillary dysentery had been detected. This was 83% less than the average 222 cases per year of the last five years. Of all townships, no cases were reported in Taoyuan, Heping, Fushing, Yenping, Chinfeng, Tajen, Lanyu, Chienshi and Nanao. All in all, the annual cumulated incidence rates per 100,000 population for the years 2001 through 2005 in the mountain townships are 325.8, 79.0, 16.9, 15.8, and 15.9, suggesting that



**Figure 4-2** Incidence of Bacillary Dysentery in Mountain Areas, 1997-2005**Figure 4-3** Incidence of Acute Viral Hepatitis A in Mountain Areas, 1994-2005

Source: Communicable disease reporting management system

bacillary dysentery in the mountain townships has been brought under control (see Figure 4-2).

### 3) Hepatitis A

A project to immunize against hepatitis A children two years of age through primary school 6th grade in 30 mountain townships in the remote areas of 12 counties and cities and preschool age children in the plane townships close to the mountain townships has been continued. The incidence of hepatitis A in the mountain

townships had drastically dropped from 90.7 per 100,000 in 1995 to 0 in 2005, indicating the success of the control program (see Figure 4-3).

Hepatitis A is likely to be imported and to pose threats to the health of children as a result of the frequent contacts of people and trade of goods after the three small-links with China. Since February 2002, hepatitis A immunization for children two years of age through 12 years in Kinmen and Lienchiang counties has been made a free routine immunization.



Hemophilia patients could be infected with hepatitis A at time of blood transfusion. Since December 15, 2004, free immunization against hepatitis A has been offered to hemophilia patients showing no antibodies to hepatitis A. The ROC Hemophilia Association and the 18 hospitals frequently visited by patients for care are commissioned to conduct investigations and also matters concerning immunization.

4. Vector-Borne Communicable Diseases

1) Dengue Fever

In 2005, there were 306 confirmed cases of dengue fever with no death. Of them, 104 were imported (2 dengue hemorrhagic fever cases), and 202 were indigenous (3 dengue hemorrhagic fever cases) (see Figure 4-4 and Table 4-6).

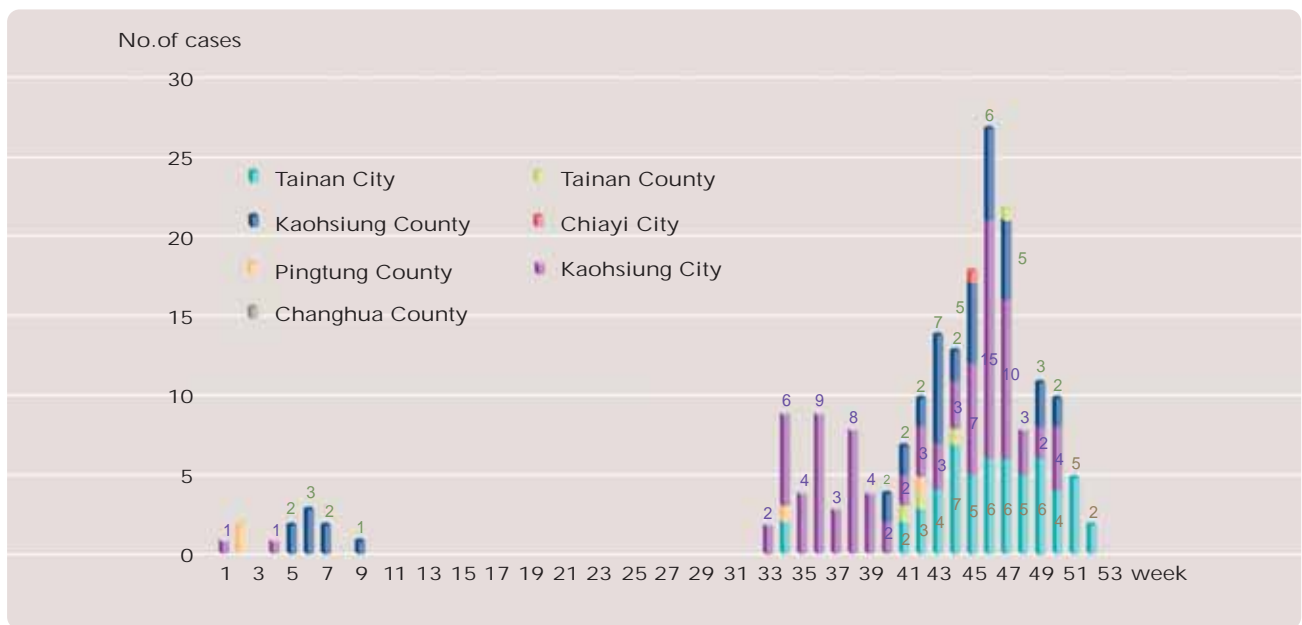
Work has been carried out in accordance with the Four-Year Plan to Eliminate Breeding Sources of Vector Mosquitoes and Interrupt the Transmission of Dengue Fever to prevent and control the infection.

- (1) A mobilization mechanism has been set up; coordination meetings between health and environmental protection authorities have been held; county/city governments are asked to set up local dengue fever prevention and control centers; private sector organizations in the dengue fever high-risk areas are subsidized to

conduct elimination of breeding sources of vector mosquitoes; health education is intensified to improve knowledge of the public on dengue fever control; and educational materials have been produced for distribution through various media to the general public.

- (2) The work manual on the prevention and control of dengue fever has been revised; training of disease control workers and medical personnel in dengue fever control, vector mosquito surveys, emergency spraying of pesticides, and medical care of dengue hemorrhagic fever patients has been strengthened; and staff members have been sent abroad via the international cooperation channels to study experience in disease control and medical care.
- (3) The monitoring mechanism has been strengthened. Monitoring mechanisms on breeding sources, larva and vector mosquitoes have been established. Studies on the monitoring of virus in vector mosquitoes and the drug-resistance of vector mosquitoes have been conducted. Local governments are supervised to conduct epidemiological investigations of suspected cases, emergency spraying of pesticides, elimination of breeding sources, and health education of the public.

Figure 4-4 No. of Confirmed Indigenous Dengue Fever Cases by County/City, by Week, 2005



Monitoring of inbound passengers from Southeast Asia is strengthened, and arriving passengers with abnormal body temperature is screened for dengue fever.

## 2) Japanese Encephalitis

Japanese encephalitis continues to be an indigenous disease of Taiwan, prevailing between May and October of the year with peaks in June and July. Each year, some 300 and 400 cases are reported, though only ten to 30 are confirmed. In 2005, there were 306 reported cases and 35 were confirmed. By age, the eldest patient was 83 years, and the youngest was 12 years, with an average age of 43.9 years. Onset of the confirmed cases concentrates in the period May to August.

## 3) Malaria

To maintain the 40-year achievement in malaria eradication, monitoring of malaria is continued, and control of imported cases is strengthened to prevent the outbreaks of the disease. Health education is intensified to alert overseas travelers to avoid being bitten by mosquitoes. In 2005, there were 26 confirmed cases, all imported. One case of them was detected through screening of abnormal body temperature at the international airport.

## 5. Blood-Transmitted Communicable Diseases

### 1) AIDS

By the end of 2005, there had been a cumulated total of 10,709 reported cases of HIV infection (including 551 foreigners). Of the indigenous cases, 2,398 had developed into full-blown AIDS; of them, 1,333 had died.

To strengthen the control, a plan for AIDS Prevention and Control began in 1994. The plan is now in the third five-year stage. Focuses of the plan include the strengthening of medical care, extension of control systems, improvement of disease monitoring systems, upgrading of the quality of laboratory testing, improvement of blood transfusion safety, strengthening of health education, strengthening of the prevention and control of sexually transmitted diseases, training and development of professional manpower, and science and technology development.

Currently, there are throughout the country 28 designated AIDS hospitals and three designated hospitals for drug-addicted AIDS patients providing free medical care and HAART (Highly Active Anti-Retroviral Therapy) treatment. To strengthen the screening of high-risk groups and specific groups, ten designated hospitals including the National Taiwan University Hospital have been commissioned to conduct free anonymous screening for HIV infection. By the end of 2005, 5,350 persons had accepted this screening service.

To prevent the vertical infection of AIDS virus from mothers to children, since 2005, counseling on AIDS control, and screening and follow-up care of positive cases have been provided to pregnant women. A total of some 230,000 pregnant women have thus far been screened to find 28 positive cases (of them, 21 are nationals and seven foreigners). Of them, 22 have delivered. They are referred to the AIDS designated hospitals for the care of mothers and follow-up care of the newborns.

The number of drug-addicts infected with AIDS is

**Table 4-6 Serotypes and Origins of Imported Dengue Fever Case,2005**

Country of Origin	Serotype					Total
	1	2	3	4	Unspecified	
Indonesia	9	5	7	2	14	37
Vietnam	1	11	3		7	22
Philippines	1	2	1	3	3	10
Thailand				8	1	9
Myanmar			5		2	7
Cambodia				1	5	6
Malaysia	1				4	5
Singapore	1		1		3	5
India					1	1
Belize					1	1
Bangladesh		1				1
Total	13	19	17	14	41	104

increasing. A pilot project to prevent drug-addicts from being infected with AIDS began on December 6, 2005, to provide them with free and safe needles and syringes and with alternate treatment. In the initial stage, the project has been tried out in Taipei City, Taipei County, Taoyuan County and Tainan County. 76 safe needle supply depots have been set up in 34 pharmacies, 31 health stations and 11 hospitals. Each month, about 1,000 to 2,000 needles and syringes are distributed. The alternate treatment is provided on trial basis by four hospitals to serve 260 patients in the initial stage.

For the life care of AIDS patients, hospice care of cases at the terminal stage, respite services for family members, and temporary settlement of patients after discharge from hospitals, AIDS control-related private sector organizations have been commissioned. In 2005, services had been provided to 240 AIDS patients for 720 person-times.

## 2) Sexually Transmitted Diseases

To collect epidemiological data on sexually transmitted diseases, the Department, in collaboration with physicians of obstetrics and gynecology, dermatology, family medicine, urology and infectious diseases, conducted in November 2003 a pilot project on the monitoring and reporting of STDs by sentinel physicians and HIV testing for STD patients. A total of 309 medical care institutions involving 428 sentinel physicians have participated in this project. Monitoring focuses on STD out-patients with a view to establish an STD symptoms reporting and HIV specimen delivery system. A manual on the diagnosis and treatment of STDs has been produced, and training courses have been organized to upgrade the standard of diagnosis and treatment.

## 3) Hepatitis B and C

There are estimated to be around 2.5 million hepatitis B carriers and 300,000 hepatitis C carriers throughout the country. To provide treatment to those already infected, a pilot project to strengthen treatment for chronic hepatitis B and C under the National Health Insurance began on October 1, 2003, hoping to significantly reduce incidence of liver cirrhosis and liver cancer. In the period October 2003 through the end of December 2005, 23,596 cases had been registered; of them, 14,801 were hepatitis B and 8,795 were hepatitis C cases. Of them, 9,321 cases (39.5%) are still under

treatment; 2,485 (10.5%) have suspended treatment; 1,227 (5.2%) have died; 10,518 (44.6%) have terminated treatment; and 45 cases (0.2%) have been referred for treatment. Prenatal examination of pregnant women for hepatitis B and immunization of the newborns against hepatitis B are continued. Make-up immunization of preschool age children and primary school children upon enrollment against hepatitis B is also conducted. The hepatitis B second and third doses immunization coverage rates for the cohort born in 2004 are 97% and 94.5% respectively.

To improve the quality of laboratory testing for hepatitis, hospitals participating in the pilot project to strengthen treatment for chronic hepatitis B and C under the National Health Insurance have been validated for their laboratory testing quality. Re-validation is given to hospitals that failed the initial test. Re-validation shows that the accuracy of testing is 100%.

## 6. Quarantine

To prevent the entry of communicable diseases, quarantine measures are mandatory for vessels, aircraft, crew and passengers. Immunization against major communicable diseases is carried out for cholera, yellow fever, meningococcal meningitis, adult-type tetanus, and reduced diphtheria toxoid. In addition, for the sanitation of ports, a joint supervisory team on the control of communicable diseases at international ports has been organized by the Center for Disease Control, the harbor and airport authorities, police departments and customs authorities to regularly inspect and eliminate breeding sources of vectors for the control of vectors. Achievements of the quarantine of in-bound transportation means are shown in Table 4-7.

To early detect and effectively control communicable diseases, infrared ray body temperature screeners have been installed at international ports to screen inbound passengers. Inbound passengers with symptoms are asked to fill out the Communicable Disease Survey Form. A leaflet, Health Advice for Travelers, is published in both Chinese and English for distribution to passengers at international ports and ports of the Kinmen and Matsu three small-links. Health education is provided to outbound passengers and groups. Educational materials such as light-boxes and posters are placed at international ports. Airline companies are requested to show disease control videos on board. A special zone on the website of the Center for Disease

Table 4-7 Quarantine at International Ports, 2005

Quarantine Authority	No. of Inbound Ships	No. of Vessel Passengers	No. of Passenger Aircrafts	No. of Air Passengers	No. of Cargo planes	Tonnages of Air Cargo
1 <sup>st</sup> Branch Office (Keelung Harbor)	7,167	53,761				
1 <sup>st</sup> Branch Office(Suao Harbor)	651	0				
1 <sup>st</sup> Branch Office (Shuitou Harbor of Kinmen)	2,553	242,073				
1 <sup>st</sup> Branch Office (Fuwoo Harbor of Matsu)	1,545	36,628				
2 <sup>nd</sup> Branch Office (CKS Airport)			61,225	8,674,133	15,069	4,548,402
3 <sup>rd</sup> Branch Office (Taichung Harbor)	5,771	3,747				
3 <sup>rd</sup> Branch Office (CCK Airport)			46	3,103		
3 <sup>rd</sup> Branch Office (Mailiao Harbor)	2,556	9				
5 <sup>th</sup> BranchOffice (Kaohsiung Harbor)	17,318	134,977				
5 <sup>th</sup> Branch Office (Xiaogang Airport)			14,161	1,336,099	626	219,296
6 <sup>th</sup> Branch Office (Hualien Harbor)	3,760	1,009	33	1,649		
Total	41,316	472,204	75,465	10,014,984	15,695	4,767,698

Control is allocated for travel-associated disease prevention to provide the public with information related to travel-associated communicable diseases.

To strengthen the health management of alien laborers, they are required of health examinations prior to entry, within three days after entry, and within 30 days before and after six months, 18 months and 30 months of employment. Items for health examination are: chest x-ray examination, HIV antibody testing, serological testing for syphilis, hepatitis B surface antigen testing, fecal examination for intestinal parasites, pregnancy test, general physical examination (including mental conditions), and leprosy examination. Pregnancy test and hepatitis B surface antigen testing are waived for the health examinations six months, 18 months and 30 months after employment. Alien laborers failing any one item of the examination are not permitted for entry. Those who have already entered, except intestinal parasites (except amebic dysentery) that are given 30 days for treatment and re-examination, are deported. Failure rate of health examination is the highest for parasites.

### Section 3. Prevention and Control of Emerging Communicable Diseases

The September 11 terrorist attack in the US in 2001, the threats of anthrax biological terrors, the SARS outbreaks in 2003, the swine streptococcus infections in China in 2004, and the threats of pandemics of avian flu/novel influenza now facing the world, all indicate the importance of the prevention and control of emerging

communicable diseases. This section illustrates in detail the threats of the novel influenza and swine streptococcus infections and their control measures.

#### 1. Novel Influenza

In view of the prevalence of the H5N1 and H7N7 avian flu, the World Health Organization has warned countries throughout the world to be prepared for the prevention and control of possible global outbreaks of influenza. To be prepared in advance, the Center for Disease Control of the Department announced on December 29, 2004, the novel influenza as a notifiable disease, and defined that "type-A influenza virus but not of subtypes H1 or H3, or though of subtypes H1 or H3 but the currently available influenza vaccines are unable to provide protection, shall be determined based on the findings of virus isolation by the Center for Disease Control". At the same time, criteria for specimen collection were also announced. Physicians detecting in their clinical practice any cases meeting the announced criteria for specimen collection shall report immediately. 485 clinics and hospitals are contracted as sampling sentinels (including most district and above hospitals and some clinics), and when necessary, anti-virus medicines will be offered.

For the prevention and control of the novel influenza, four strategies and five lines of defense have been formulated. The four strategies are early detection, flu vaccine strategy, antiviral strategy and public health intervention. The five lines of defense are containment abroad, border quarantine, health management in community, sound health system and personal and family prevention. Various important activities have been conducted.

In March 2005, a plan for mobilization and preparation for combat against outbreaks of influenza was completed for reference of disease control workers in carrying out their duties. On May 24, the Executive Yuan approved the National Influenza Preparedness Plan. This plan became the core plan for the prevention and control of influenza outbreaks. Action was then taken to communicate on policy matters with ministries and departments concerned, to conduct relevant cross-ministerial drills to strengthen interaction, to understand the mobilization systems at time of combat, and to supervise county/city governments to draft local plans and to practice various kinds of drills.

Since 2003, the antiviral agent, Tamiflu, has been stockpiled. In 2005, mandatory authorization on conditions for the use of Tamiflu was obtained. Manufacturers have been invited to build an influenza vaccine factory of 16 million dose capacity.

On a task-oriented research basis, an influenza research special project was formed in June 2005 to consolidate professional manpower of experts and specialists for the in-depth research on H5N1 avian flu to develop methods to supply prompt and accurate laboratory testing diagnosis of viruses, to understand the manufacturing process of Tamiflu, to assist in the development of a set of guidelines on the clinical care of H5N1 patients, to develop influenza vaccines, hoping to, through the overall process of diagnosis, treatment and prevention, minimize the impact of avian flu, and thus to construct a novel influenza control network.

To improve the transparency and convenience of information, information systems for monitoring, reporting, epidemiological investigation and self-management of health and an influenza control website, <http://flu.cdc.gov.tw>, have been set up to provide channels for smooth health education and communication. Communication on risks with specific groups has continued. Since October 2005, inbound passengers from avian flu epidemic areas such as Vietnam, Thailand, Indonesia, Cambodia and China are asked to conduct self-management of health for ten days. The levels of outbreaks of influenza announced by the Department are shown in Table 4-8. At present, Taiwan is at level 0. Though there have been human cases reported, the World Health Organization has not yet confirmed any cases of man-to-man transmission.

## 2. Swine Streptococcus Infection

At the end of June 2005, an acute infection of unknown causes was reported in Tsiyang City, Sichuan Province of China. In early July, the infection was primarily considered to be swine streptococcus infection. In mid-August, the World Health Organization announced that there had been 215 cases; of them, 39 had died. To prevent this communicable disease of unknown causes, Taiwan has immediately taken relevant control measures.

- 1) Disease control meetings are called to invite experts and representatives of organizations concerned to formulate plans for action, to decide on some important measures such as disease reporting, specimen collection, nosocomial infection control and quarantine measures. The information is made public soon.
- 2) News is soon released. Posters are placed at ports (the three small-links) to disseminate information on the prevention of swine streptococcus infection to passengers visiting China, and to remind them not to visit epidemic areas. If such visits have to be made, they should take personal preventive measures.
- 3) Fever-screening and disease-monitoring of inbound passengers from China are strengthened. The Council of Agriculture of the Executive Yuan is asked to strictly control smuggling of animals and their products to avoid disease being imported. Disease information on China is collected through various international channels to make immediate and correct information known to the public and also for the analysis of epidemic conditions for the adjustment of various control measures in time.

## Section 4. Disease Control Preparedness and Infection Control

The SARS outbreaks in 2003 had brought about devastating impact on the medical care and livelihood systems. Demands for N95 masks and protection gowns had suddenly increased, information was confusing, and the balance between demand and supply collapsed, to result in social panic and almost destruction. It also exposed the weakness of the national disease control

capabilities. To upgrade national disease control capabilities, action has been taken to strengthen important measures such as disease control preparedness, nosocomial infection control and defense against anti-bio terrorist attacks.

### 1. Management of Disease Control Supplies

The SARS outbreaks in 2003 had brought about devastating impact on the medical care and livelihood systems, demands for diseases control supplies had suddenly increased, information was confusing, and the balance between demand and supply collapsed, to result in social panic and almost destruction. To meet the demands of disease control in the future, the Center for Disease Control has started a series of action to manage disease control supplies, to sign contracts for the procurement of disease control supplies such as gauze masks and surgical masks, and to assess and adjust from time to time based on disease conditions items of disease control supplies to be included in the contracts for procurement. Basic stocks are build (see Table 4-9), and chains of supply for disease control materials and management systems have been established to effectively understand information concerning the manufacturing, sales and stock of disease control supplies.

Experts have been invited to lecture on supply management and disaster response, and also on preparing for disease control at ordinary times and emergency allocation, using the novel influenza as a

simulation to assess needs for supplies, and to discuss chains of demand and supply and flow of materials. Training on the operation of the supply management systems has been organized; and seven military units have been assisted to improve their supply stocking facilities.

For mobilization and preparedness against influenza outbreaks, some 256,000 N95 masks, 948,000 surgical masks (including gauze masks), 255,000 pieces of protection gowns, 193,000 pieces of isolation robes and 383,000 pairs of gloves for personal protection have been provided to the Bureau of Animal and Plant Quarantine of the Council of Agriculture, Coast Guard Administration of the Executive Yuan, National Police Administration of the Ministry of the Interior, Fire Department of the Ministry of the Interior, and the Environmental Protection Administration. In December 2005, a plan for the establishment of the flow of disease control supplies and estimates of demands for disease control supplies for all those concerned including health bureaus and medical care institutions for personal protection was completed to serve as a basis for the follow-up management of disease control supplies.

### 2. Prevention and Control of Infectious Diseases

In 2003, through nosocomial infection, SARS ran rampant quickly in hospitals to cause serious damages to the medical care and disease control systems. To prevent the recurrence of such incidents, medical care systems for infectious diseases have been set up to,

**Table 4-8 Levels of Alertness to Influenza Epidemics**

Level	Time to Activate
0	H5 or H7 avian influenza viruses detected in Taiwan; or human cases of highly pathogenic avian flu detected in other countries 1.Low-pathogenicity avian flu confirmed in poultry in Taiwan 2.High-pathogenicity avian flu confirmed in poultry in Taiwan
A1	Cases of human-to-human transmission of novel influenza have been confirmed in other countries
A2	Suspected cases of poultry-to-human transmission, imported or laboratory ifection of novel influenza detected in Taiwan
B	Human-to-human transmission of novel influenza confirmed in Taiwan
C	Large-scale human-to-human transmission of novel influenza occurr in Taiwan

**Table 4-9 Stockpiles of Personal Protective Equipment**

unit:10,000 pieces

Item	Level	Hospital	Health Bureau	Central	Total
N95		205.5	96.8	65.0	367.3
Protection Robe		166.8	44.3	254.0	465.1
Mask		1050.1	514.5	838.4	2403.0

Source: Information System for the Management of Disease Control Supplies



through strict disease control network, protect the health and life of the public.

- 1) Infectious disease medical care network: organizational framework of the infectious disease medical care network has been planned and established. The framework includes regional commanding centers, 23 infectious disease control hospitals, the infectious disease control group under the advisory committee, supporting hospitals and ministries and departments concerned. Regular meetings are held, and drills and training are conducted to familiarize organizations and personnel concerned with the infectious disease control systems, and to allow the infectious disease control medical care network to function in full. To meet the outbreaks of influenza, studies on the mobilization and preparation mechanisms, evacuation of hospitals, referral and transfer of patients, and guidelines on the requisition of hospitals and large areas to house patients and refugees have been made for the reference of organizations concerned in planning relevant programs to provide patients with adequate care.
- 2) Nosocomial infection control: the Communicable Disease Control Act amended in 2004 provides the competent health authorities with legal basis for the strengthening of nosocomial infection control and immunization measures. On November 2004, the Center for Disease Control completed the set of Regulations Governing Inspection of Medical Care Institutions for Nosocomial Infection Control and Immunization, and announced in early 2005 items and criteria for inspection. Inspections are carried out by county/city health bureaus and supervised by teams of the Center for Disease Control, regional infectious disease control physicians and nursing personnel. The rate of passing inspections for hospitals at various levels had increased from 79.6% in 2003 when SARS was rampant to 92% in 2005. Training for medical and nursing personnel of clinics, hospitals, medical groups and care institutions in communicable disease control and infection control has been intensified. Experts and specialists have been invited to develop and review guidelines on infection control and to

make recommendations for disease prevention. Various educational materials on infection control have been developed and distributed through websites for learning by all.

### 3. Counter Terrorism

A Biological Disaster Prevention and Response Plan was completed by the Center for Disease Control on August 31, 2005, to install and procure advanced facilities and equipment such as tractors, negative pressure decontamination shelter, multiple function shelter, biological detector, BSL4 protection suit, BSL3 protection suit, fluid specimens collectors and aerosol collectors to prepare for bio-terrorism attacks.

To strengthen the capabilities in responding to bio-terrorism attacks, drills and training have been held. In April 2005, a bio-terrorism attack for smallpox preparedness drill was held; a bio-terrorism contingency cooperation training program was held in collaboration with the Medical Bureau of the Ministry of National Defense for 77 participants; and four lectures on defense against bio-terrorism were held by region. Education of the public on anti-terrorism has been intensified, and 25 bio-defense sessions for officials of country/city health bureaus and the general public were organized for 1,519 participants. In December, counter-terrorism specialists from the US, the Netherlands, Japan, Poland and Singapore were invited to share experience with local experts concerned, and to establish a non-governmental channel of communication. Matters discussed would be used for the reference in formulating counter-terrorism policies. A conference, International Conference on Bio-Terrorism Defense, 2005, Taiwan, was held. Achievements of the training courses for professional workers were presented.

A Counter Bio-terrorism E-learning Project was set up in collaboration with the National Health Research Institutes. The advantage of digital learning is that learning can take place without restrictions of time and locations, and that the latest information can be easily obtained at anytime. Conventional learning methods and practice are used to train bio-defense personnel. A handbook on anthrax and another handbook on smallpox for health personnel have been produced; and bio-defense training courses for public health and control workers in the control of anthrax and smallpox have been organized in different regions.



## Section 5. Immunization

By the end of 2005, 15,951 suspected cases of communicable diseases had been reported throughout the country. Of them, there were 43 reported cases of rubella (6 confirmed), 39 cases of measles (7 confirmed; of them, one was imported), and 79 cases of acute flaccid paralysis (65 confirmed); and no cases of congenital rubella syndrome and neonatal tetanus were confirmed.

To prevent and control outbreaks of communicable diseases, routine immunizations are provided free to infants and young children on schedule by the government (see Table 4-10). To make immunization services more convenient and to improve coverage rate, some 1,600 hospitals and clinics in counties and cities are contracted to provide routine immunization services. To strengthen immunization of the elderly and young children against influenza, in 2005, some 4,000 hospitals and clinics had participated in the efforts. Areas where people move around frequently are followed-up and make-up immunization is given.

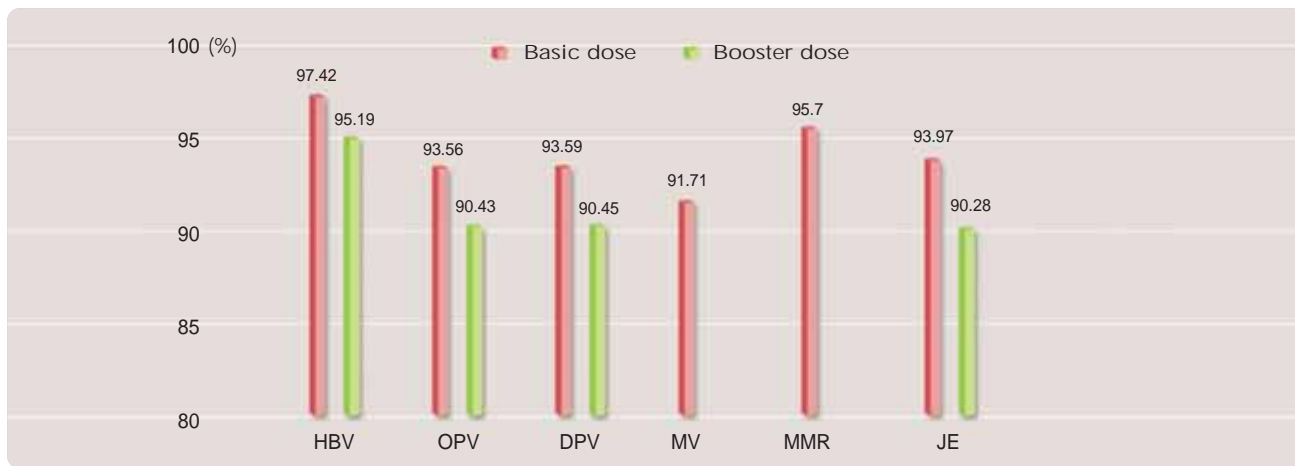
Immunization records of preschool age children and primary school children upon enrolment are inspected and make-up immunization given to improve coverage rate (Figures 4-5 and 4-6) to protect children from being infected.

For the control of influenza and for the consideration of overall disease control, immunization against influenza is now given to the elderly 65 years and above, inmates and caregivers of nursing and long-term care institutions, patients of rare diseases, young children between six months and two years of age, medical and nursing personnel of medical care institutions, disease control workers, and high-risk groups such as handlers of poultry (chickens, ducks, geese and pigs) farming and animal quarantine personnel. By the end of 2005, the immunization coverage rates were: 94.7% for medical and nursing personnel, 59.2% for the elderly 65 and above, 92.7% for poultry handlers, 63.4% for the first dose for children under two years, 43.5% for the second dose, and 72.2% for children under two years who had immunization the year before.

**Table 4-10 Routine Immunization Schedule**

Age of immunization	Type of Vaccine	No. of Dose
Within 24 hours of delivery	Hepatitis B immunoglobulin	Single dose
After 24 hours following delivery	BCG	Single dose
Three to five days after delivery	Hepatitis B vaccine	1 <sup>st</sup> dose
One month	Hepatitis B vaccine	2 <sup>nd</sup> dose
Two months	Diphtheria, Tetanus, Pertussis	1 <sup>st</sup> dose
	Oral polio vaccine	1 <sup>st</sup> dose
Four months	DPT vaccine	2 <sup>nd</sup> dose
	Oral polio vaccine	2 <sup>nd</sup> dose
Six months	Hepatitis B vaccine	3 <sup>rd</sup> dose
	DPT vaccine	3 <sup>rd</sup> dose
	Oral polio vaccine	3 <sup>rd</sup> dose
12 months	Measles vaccine	Single dose
12-15 months	Measles, Mumps, Rubella vaccine	1 <sup>st</sup> dose
15 months	Japanese encephalitis vaccine (March-May)	1 <sup>st</sup> dose
	Japanese encephalitis vaccine (March-May)	2 <sup>nd</sup> dose after two weeks
18 months	DPT vaccine	4 <sup>th</sup> dose
	Oral polio vaccine	4 <sup>th</sup> dose
Two years and three months	Japanese encephalitis vaccine (March-May)	3 <sup>rd</sup> dose
First year of primary school	Combined tetanus (and reduced diphtheria toxoid)	Single dose
	Oral polio vaccine	5 <sup>th</sup> dose
	Measles, Mumps, Rubella vaccine	2 <sup>nd</sup> dose
	Japanese encephalitis vaccine (March-May)	Booster
	BCG scar examination (those with no scars and tested negative will be vaccinated)	4 <sup>th</sup> dose

Figure 4-5 Immunization Coverage Rates for Infants



Source: National Immunization Information System by January 2006

Note: HBV hepatitis B vaccines

OPV oral polio vaccines

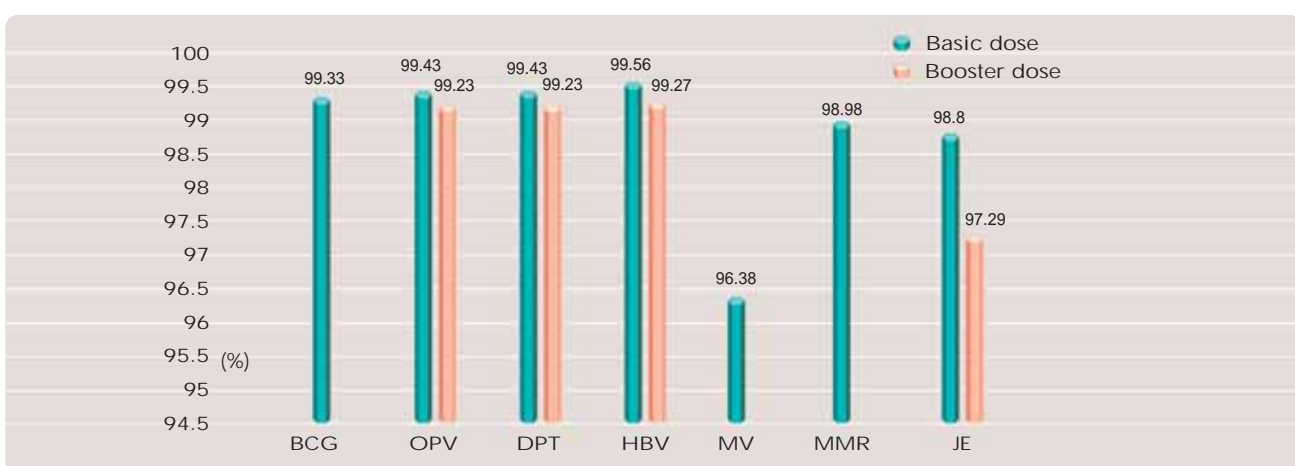
DPT diphtheria-tetanus-pertussis combined vaccines

MV measles vaccines

MMR measles mumps rubella vaccine

JE Japanese encephalitis vaccines

Figure 4-6 Immunization Coverage Rates of Primary School Enrollees



Source: Immunization records of new primary school enrollees checked in September 2005