2007

Taiwan Public Health Report

Taiwan Public Health Re

Department of Health, R.O.C. (Taiwan)

Foreword

In recent years, many countries have made the health of their citizens an indicator of national wealth. The International Herald Tribune proposes the concept of Gross National Happiness (GNH) by saying that national productivity can only be activated when people possess healthy body and mind as well as living in a comfortable, stable, peaceful and hopeful environment. Health has suddenly become a major area of study in this century; and national health has been given more attention by many countries in the world, because health is highly associated with the quality of population and the development potential of a nation.

The current societal need lies in holistic medical care and holistic health. In taking care of the people, the Department of Health will not only have to make all efforts to free them from physilngical pains, illnesses and psychological for stresses, but also to maintain the social health mechanism, for a healthy and vibrant Taiwan. As a guardian of national health, the Department would bear the responsibility of health education to approach the public through the most direct and powerful manner, and continue to provide the people with an all-directional arrangement of health.

We wish our people to lead longer, healthier and more comfortable lives. It is under this ideal that we whole-heartedly promote the Department to become "a facilitator of health for all, an educator of healthy life, a promoter of health industries, and a participator in international health". This promotion has gradually yielded positive results. For instance, the prevention and control of dengue fever has broken the magic curse of one epidemic every four years; the "reducing tuberculosis by half in ten years" project has brought about success in improving the medication conformity of patients and cure rate; the "reducing hazards of AIDS" project saw decline for the first time decline in the number of HIV infections, and in the 2006 competitiveness

assessment of the World Economics Forum (WEF), the low incidence of AIDS in Taiwan was rated the first together with 24 other countries.

This volume of the Taiwan Public Health Report 2007 documents the health status of Taiwan in 2006, the program implementation, and results. It also covers the health strategies and measures taken in the period from January to December 2006. To maintain the physical and mental health of the population, the health teams are progressing toward the blue ocean of health for all, hoping that by building a health support environment, promoting healthy lifestyles, and upgrading the quality of healthcare to attain the ultimate goals of making out people live longer, healthier and more comfortably.

Building a health-supportive environment: the plan is to build safe communities, establish healthy cities, promote health promoting schools, extend tobacco-free worksites, develop community healthcare and medical care groups, strengthen the functions of community pharmacies, and construct long-term care systems.

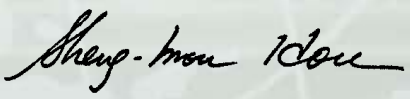
Promoting healthy lifestyles: This is to advocate new concepts of health, that is, to live by exercising, healthy diet, healthy mind, and walking ten-thousand steps a day.

Upgrading quality of healthcare: This includes health promotion, disease management, medical care and relevant measures concerning the National Health Insurance, equality in health for all, transparency in information, service in the locality, and thus to upgrade the quality of care.

Our health administration is an outstanding team. In the process of program implementation, there will be inevitably obstacles and stress to overcome. However, health and medical policies involve many issues, and constant thinking and innovation are necessary to construct systems that most suit local conditions. We would uphold the principle of KISS (Keep It Simple and Stupid) should be observed. A simple and clear policy is ultimately the best policy.

"Healthy Taiwan – Promise the People a Healthy and Safe Life" is the vision of the Department; and "Returning Health Information to the People" is my personal expectation and my promise to the people as well. The administrative teams of the Department will, on the existing infrastructure, do our best and spare no effort to safeguard the health of all.

Sheng-Mou Hou, MD, PhD, MPH



Minister of Health

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Health Policies

Chapter 1. Health Policies

The formation of health policies requires a macroscopic field of vision, long-term planning and concrete conceptions. The best decisions are made on the basis of forward-looking trends of health issues and wisdom of scholars and experts consolidated. The various health policies implemented by the Department, therefore, focus as its goals on the health and welfare of the people.

Work under the responsibilities of the Department, medical affairs, disease control, health promotion, management of pharmaceuticals and foods, nursing industries, biotechnology and health industry information, National Health Insurance, and international health affairs, is highly related to every one. The major issues at present are how to utilize the available resources and organization to provide the people with healthcare of all directions and to safeguard their health.

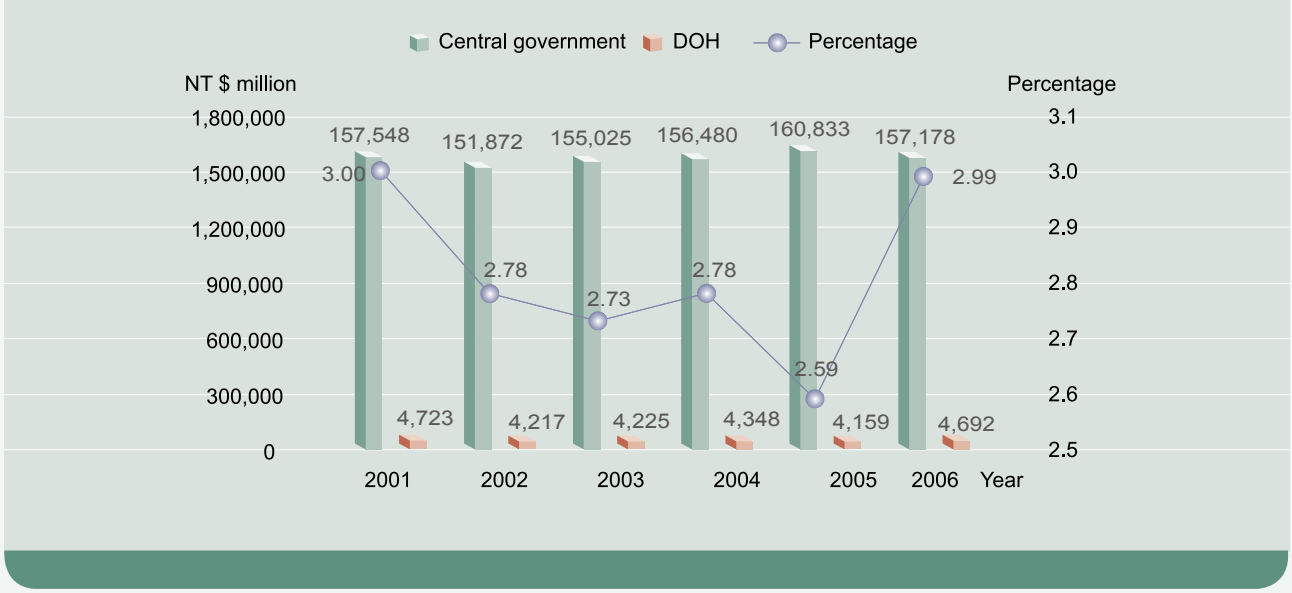
The health budget, however, accounts for 2.99% of the total central government budget (see Figure 1-1). The budget of the Department, though, has not grown steadily following the aging of population and increasing needs of the public, the health teams have continued all the way by their consistent enthusiasm and consideration to strive to promise the people a healthy and safe life. In 2006, the approval rate of the health policies, as shown by public polls, was around 60%.

Section 1. Health Organization

1. Health Organization

Health organization in Taiwan comes at two levels of the central and the local. At the central level, the Department of Health of the Executive Yuan is the highest health authority. There are, under the Department, bureaus of Medical Affairs, Pharmaceutical Affairs, Food Safety, Nursing and Health Care, International Cooperation, and Planning, and several task-oriented units such as the National Health Insurance Task Force, Information Management Center, Science and Technology Unit, and Hospital Management Committee. Subordinate organizations include the Bureau of National Health Insurance, Center for Disease Control, Bureau of Health Promotion, Bureau of Food and Drug Analysis, Bureau of Controlled Drugs, Committee on Chinese Medicine and Pharmacy, NHI Supervisory Committee, NHI Dispute Mediation Committee, NHI Medical Expenditure Negotiation Committee, 21 DOH hospitals and branches, six sanatoriums and one chest hospital. In addition, there are the financially supported Corporate National Health Research Institutes, Corporate Center for Drug Inspection and Examination, Taiwan Joint Commission on Hospital Accreditation, Corporate Foundation for Compensation for Drug Hazards, and Taiwan Organ Registry and Sharing Center (Figure 1-2).

Figure 1-1 DOH Budget as Percent of Central Government Budget, 2001-2006



At the local level, there are municipality health departments and county/city health bureaus, 25 in total. In each township, there is one health station totaling 372.

2. Reconstruction of the Central Health Organization

To elevate national competitiveness, many countries have been, since 1980, one by one drastically devoted to the reconstruction of their governmental organizations. Government reconstruction in Taiwan began in 1993. In 1998, after the Executive Yuan promulgated the "Outlines of Government Reconstruction" as the highest guiding principles, reconstruction of administrative organizations speeded up. In July 1999, the operation of the downsizing of the Taiwan Provincial Government was completed to reduce Taiwan's administrative levels from the original four of the central, provincial, county/city and township to three. In March 2005, the Ministry of the Interior and the Department of Health joined together to draft a preliminary plan for a Ministry of Health and Social Security. Soon after the Executive Yuan Organization Act is amended, follow-up operations will take place.

To activate the organization of the Department, since 1999, action has been taken, on the principles of "simplifying organization, improving administrative efficiency, constructing a vital government", to adjust the internal organization. Major work done in recent years are: 1) integration of three disease control systems to create a Center for Disease Control in July 1999; 2) reorganizing the Bureau of Narcotics to the Bureau of Controlled Drugs in July 1999 to intensify the management of drugs and to prevent drug abuse; 3) in coordination with the downsizing of the Taiwan Provincial Government, the original Taiwan Provincial Health Department was made the DOH Central Region Office, and the provincial hospitals and sanatoriums made DOH-affiliated hospitals; 4) in July 1999, the Bureau of Health Promotion was created by merging the Bureau of Health Promotion and Protection and three health promotion-related institutions; 5) the tuberculosis prevention system was reconstructed; the original Bureau of Chronic Diseases was reformed to become the Chest Hospital to care for patients; 6) in June 2004, the Bureau of International Cooperation was established in the Department to develop international health affairs; the Bureau of Nursing and Health Care was also established at the same time to promote special medical care services; the Central Region Office of the Department was converted to the Hospital Management Committee to be responsible for the supervision and management of the 28 DOH-hospitals.

Section 2. Framework of Administration

Based upon the vision of the Department, "promising the citizens a healthy and safe life", and focusing on the goal of "all-directional health care to safeguard the health of all", the Department has formulated mid-term and annual plans for the period 2005 through 2008.

1. Mid-term Plans

Available manpower and financial resources of the Department will be consolidated to focus, with priority, on cross-fiscal year programs and programs of importance and innovation. Assessment of the internal and external environments and issues of priority development will be made. To meet the need of the overall national long-term plans and the forward-looking development, and in coordination with the assessment of the program achievements in the past years, goals of the mid-term plan have thus been selected, and strategic objectives and assessment indexes decided. In coordination with the national mid-term financial goals and available resources, mid-term plans have been formulated as guidelines for the next four years.

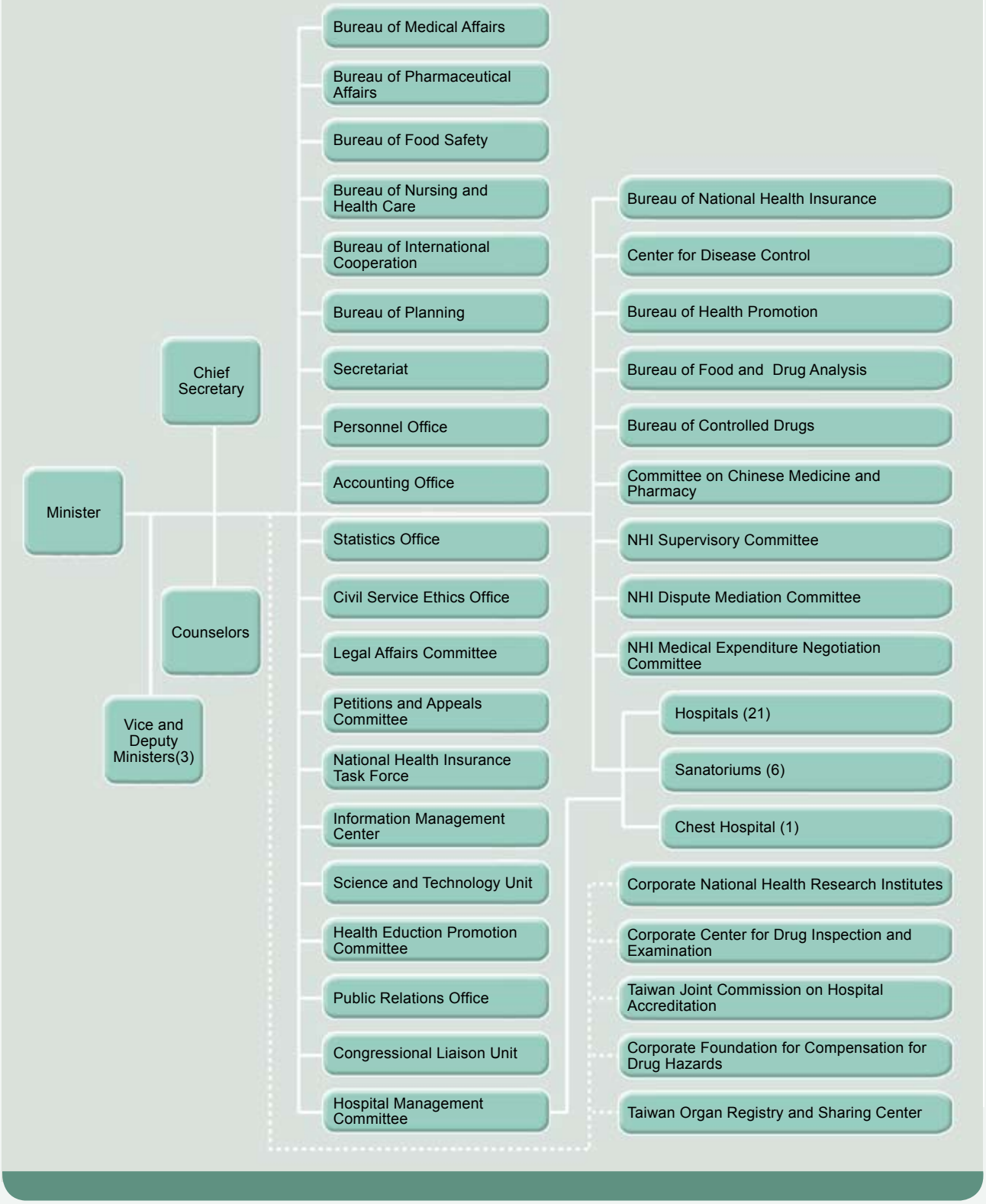
The six major goals of the mid-term plans are "to reform the healthcare system and upgrade quality of nursing care", "to build healthy life and promote self-management of health", "to strengthen disease control systems to free people from the threat of diseases", "to strengthen the control of pharmaceuticals and foods to protect the safety of the public", "to develop medical and pharmaceutical science and technology and promote biotechnology and health information industries", and "to promote international health affairs and join the World Health Organization" (Figure 1-3).

2. Annual work plans

In coordination with the mid-term plans and to realize the goal of "Healthy Taiwan", work will be done: to continue to promote the decision-making mechanism of the National Health Insurance for the allocation of medical care resources, and to ensure the sustained development of the National Health Insurance; to promote community-based healthy living, and encourage the public to build up healthy lifestyles; to strengthen emergency rescue systems and intensify primary care services; to develop professional and diversified long-term care industries and realize the policy of holistic healthcare; to promote professional and information-based disease control systems and improve quality of

quarantine and laboratory testing; to promote the science and technology development of medicine, pharmacy and healthcare and construct an excellent environment for medical/pharmaceutical and health industries; to promote cooperation in international health and strive to join the World Health Organization.

Figure 1-2 Organization of the Department of Health, the Executive Yuan



3. The Great Warmth Plan

The Executive Yuan, acting on the resolutions of the Forum on Taiwan's Sustained Economic Development, and the urgent needs of the public at the moment, and the trend of social-economic development, consolidated the resolutions of the Forum and drafted the great investment and great warmth plans for the year 2015 for the economic development of the nation. The three-year sprint programs at the first stage include five sets of work plans of industrial development, manpower resources, financial markets, public constructions and social welfare.

The Great Warmth Plan is the above-mentioned set of social welfare work plan. The Plan covers four major issues of reducing gaps between urban and rural areas and the rich and the poor, strengthening care of the elderly, facing the impact of fewer children, and promoting health for all. There are 12 major projects in this Plan.

The Department is involved in:

1) Project to build a holistic care system to realize the concept of healthcare for all, ensure the safety of patients, prevent suicides, interrupt the transmission of diseases, control hazards of drug abuse, and provide the public with high-quality, adequate, accessible and continuing medical care services.
2) Project to reform the National Health Insurance to expand bases for premium contributions, make information public, realize equality in premium contributions, strengthen the health insurance system, and reform the system toward the direction of upgrading quality of medical care.
3) Project to construct a long-term care system to build a support system for caregivers at home, stabilize the financial systems for long-term care, and to consolidate private sector resources to provide long-term care services.

Figure 1-3 Framework of Mid-Term Plans, 2005-2008

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Health Indicators

Chapter 2. Health Indicators

Along with increase in national incomes, improvement in living environment and nutrition, advancement in health and medical sciences and enhancement of healthcare standards, the average life expectancy of the people has been prolonged year by year. To meet the changes of social environment and to compare the progress and achievements in health and medical care in Taiwan before and after the implementation of the National Health Insurance, some major statistic indicators are presented herewith. These indicators include population indicators, vital indicators, national health expenditures, and they are, at the end compared internationally with other countries.

Section 1. Population Indicators

At the end of 2006, the total registered population in Taiwan was 22.88 million; of them, 11.59 million were males, and 11.28 million were females. The sex ratio (male population/female population x 100) was 103; and the annual growth rate of population was 4.66 ‰.

At the end of 2006, the population density in Taiwan was 632 persons per square kilometer of land area. By county and city, Kaohsiung City had the highest density of 9,862 persons; Taipei City the next, at 9,684 persons. Population density on the east coast was low, 75 persons for Hualien County and 67 persons for Taitung County.

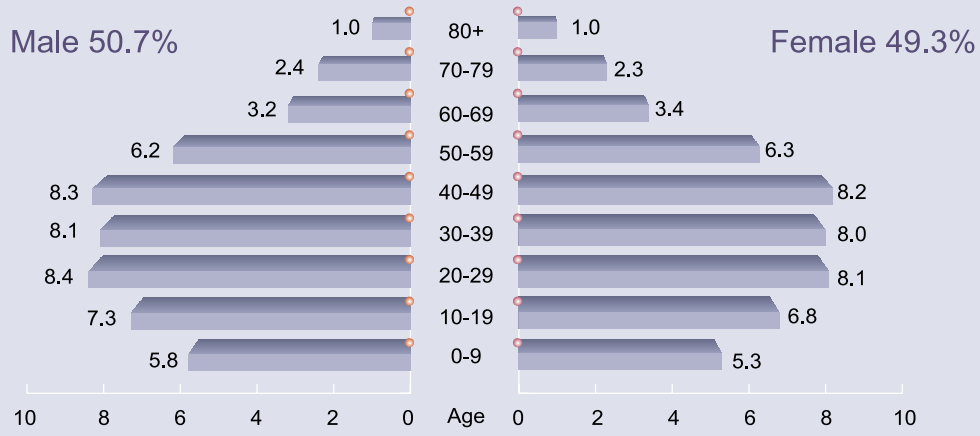
1. Age Structure of Population

The population of Taiwan reached 20 million at the end of 1989. Upon the impact of the declining birth rate, the age structure of population in 2006 presented a static pyramid pattern of low birth rate and low death rate (Figure 2-1).

By the age structure of population, the proportion of the aged population to the total population reached 7% in 1993, making Taiwan an aged society. The proportion of the 0-14 age groups had declined from 34.7% in 1976 to 18.1% in 2006, by 16.6 percentage points. In the same period, the proportion of the 65 and above elderly population had increased from 3.6% to 10.0%; the aging of population is increasingly significant (Table 2-1).

The dependency ratio (0-14 population + 65 and above population/15-64 population x 100) had declined from 62.1% in 1976 to 39.1% in 2006, primarily due to the rapid decline of the young dependency ratio (0-14 population/15-64 population x 100) and the steady

Figure 2-1 Age Structure of Population, 2006



increase of the elderly dependency ratio (65 and above population/15-64 population x 100) (Figure 2-2).

2. Births and Deaths

Along with changes of the society and value concepts, fertility in Taiwan has declined year by year. The crude birth rate (number of births in the year/mid-year population x 1,000) had declined from 15.2‰ in 1996 to 9.0‰ in 2006, a historically low level. The crude death rate (number of deaths in the year/mid-year population x 1,000) had increased slightly from 5.7‰ in 1996 to 6.0‰ in 2006, resulting in the decline of the natural increase rate of population (crude birth rate less crude death rate) to 3.01‰. (Figure 2-3)

3. Life Expectancy

The overall changes in life expectancy in the last ten years (1996 to 2006) had been that the life expectancy at birth for both sexes had increased by 2.5 years from 75.0 years to 77.5. For males, it had increased by 2.2 years from 72.4 to 74.6 years; for females, by 2.7 years from 78.1 to 80.8 years. The life expectancy at birth of the females is higher than that of the males, as shown in Figure 2-4.

Section 2. Vital Indicators

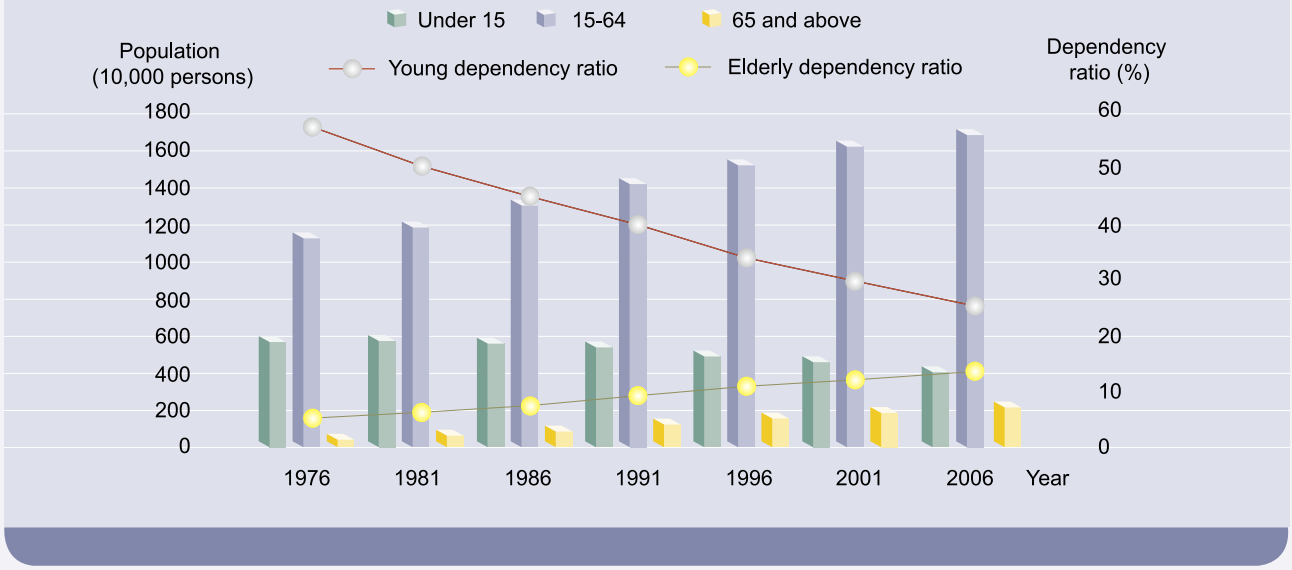
1. Ten Leading Causes of Death

Along with changes in the socio-economic structures, elevation in living standards, and improvement in health and medical care, the major causes of death have shifted from primarily acute communicable diseases in 1952 to chronic diseases such as malignant neoplasm and cardiovascular diseases, and accidents and injuries.

Table 2-1 Age Structure of Population by Year

	Total Population (1000)	Age Structure			Dependency Ratio	
		Under 15	15-64	65 and above	Young	Elderly
		%	%	%	%	%
1976	16,508	34.67	61.70	3.63	56.18	5.89
1986	19,455	28.99	65.73	5.28	44.10	8.03
1996	21,525	23.15	68.99	7.86	33.55	11.39
2006	22,877	18.12	71.88	10.00	25.21	13.91

Figure 2-2 Age Structure of Population by Year



The number of deaths in 2006 was 135,071, at a death rate of 591.8 persons per 100,000 population, an increase of 23.4% over 1981. The ten leading causes of death in 2006 were: 1) malignant neoplasm, 2) cerebrovascular diseases, 3) heart diseases, 4) diabetes, 5) accidents and adverse effects, 6) pneumonia, 7) chronic liver diseases and cirrhosis, 8) nephritis, nephrotic syndromes and nephrosis, 9) suicide, and 10) hypertensive diseases. As compared to those of 1981, tuberculosis was no longer on the list; malignant neoplasm had been the first leading cause since 1982, and the mortality rate had been increasing, and was the largest increase in all causes of death. Accidents and injuries, for the effective prevention and control, showed the largest decline of all causes (Figure 2-5).

2. Ten Leading Causes of Cancer Death

The number of deaths due to cancer in 2006 was

Figure 2-3 Crude Birth Rate, Crude Death Rate and Natural Increase Rate of Population by Year

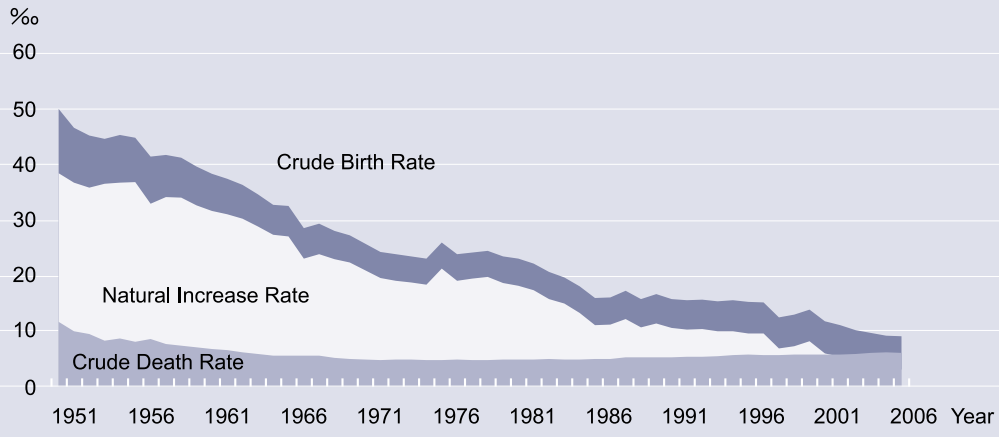
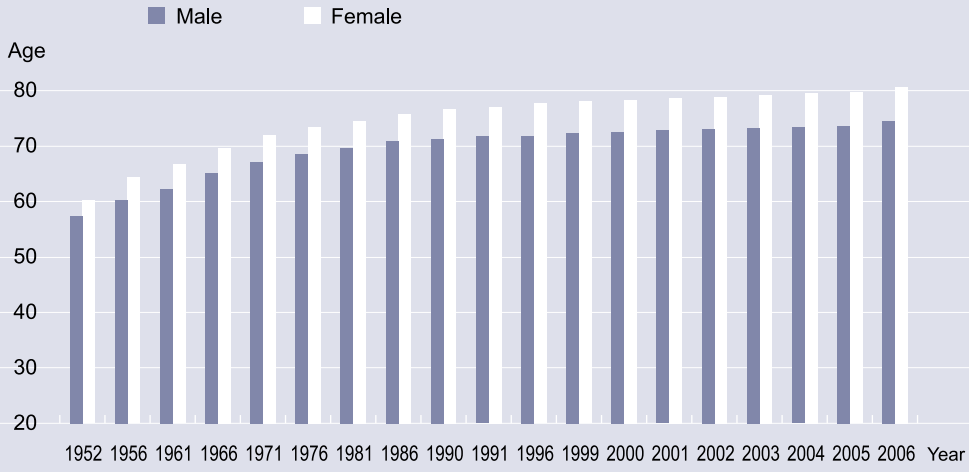


Figure 2-4 Life Expectancy at Birth



37,998, at a death rate of 166.5 persons per 100,000 population, an increase of 117.4% over 1981. The ten leading causes of cancer death in 2006 were: 1) lung cancer, 2) liver cancer, 3) colon-rectum cancer, 4) female breast cancer, 5) stomach cancer, 6) oral cavity cancer (including oropharynx and hypopharynx), 7) prostate cancer, 8) cervical cancer, 9) oesophagus cancer, and 10) pancreas cancer. As compared to those of 1981, nasopharynx cancer and leukemia were no longer on the list; whereas female breast cancer, oral cavity cancer, prostate cancer had become major causes of cancer death. For the effective screening, the number of deaths due to cervical cancer had declined, the only one of all (Figure 2-6).

Figure 2-5 Changes in Ten Leading Causes of Death

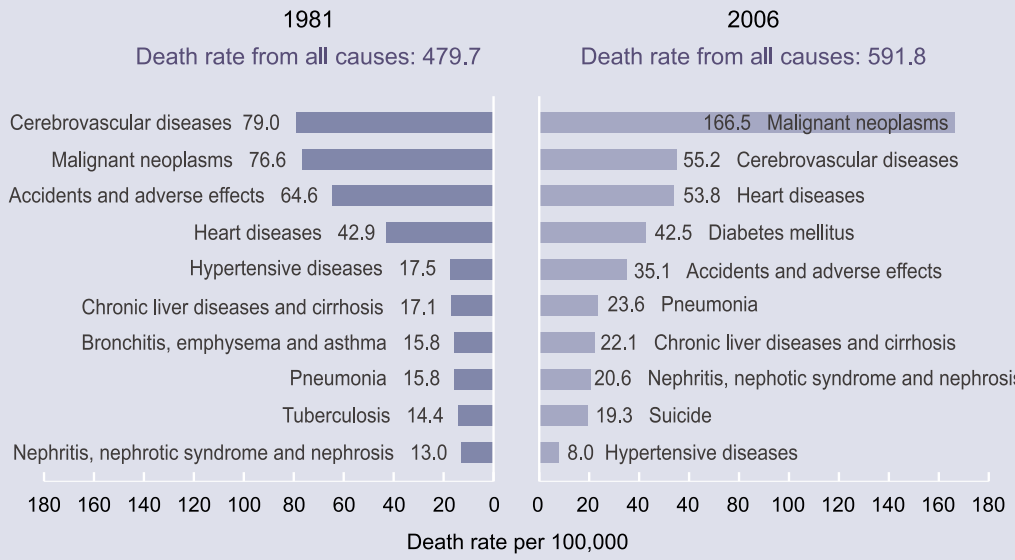
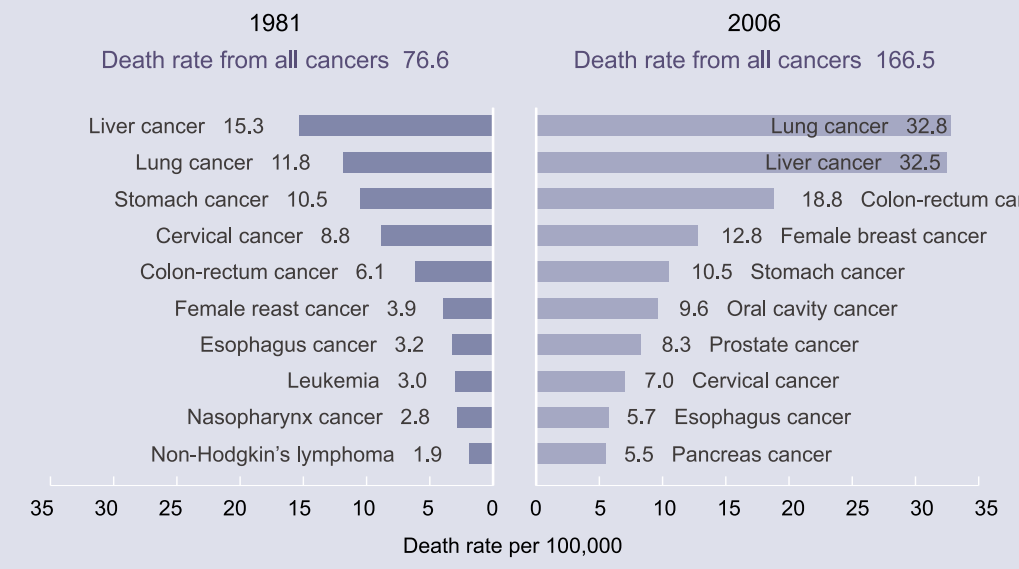


Figure 2-6 Changes in Ten Leading Causes of Cancer Death



3. Neonatal, Infant and Maternal Mortality Rates

With the advancement in public health, infant mortality rate (deaths of infants under one year of age/ number of live births x 1,000) and neonatal mortality rate (deaths of infants under four weeks of age/number of live births x 1,000) had in general, except a slight increase in 1995 due to the new practice of birth reporting, declined. In 2006, the neonatal mortality had declined to 2.7‰, which was about 44% of that of 1971 (6.2‰). In the same period, infant mortality rate had dropped from 15.5 to 4.6‰. Maternal mortality rate had also declined from 39.7 per 100,000 live births in 1971 to only 7.3 in 2006 (Figure 2-7).

Section 3. National Health Expenditures

Access to adequate medical care is one of the basic needs of the people in a modern society; it is also an important indicator of the level of development of a nation. In the year the National Health Insurance began in March 1995, the annual increase of the national health expenditures had reached 18.1%, and the increase was even higher than the GDP of that year. Ever since, the proportion of the national health expenditures to GDP has increased significantly. The total national health expenditures for the year 2006 were NT$ 722.6 billion.

The per capita health expenditures have shown steady increase since 1991. After the implementation of the National Health Insurance in 1995, the national health expenditures as percent of GDP had increased from 5.1% in 1994 to 5.3% in 1995, and to 6.1% in 2006. In the last ten years, the per capita health expenditures have increased year by year, from NT$ 10,828 in 1991 to NT$ 30,230 in 2005, an increase of 180.6% (Figure 2-8).

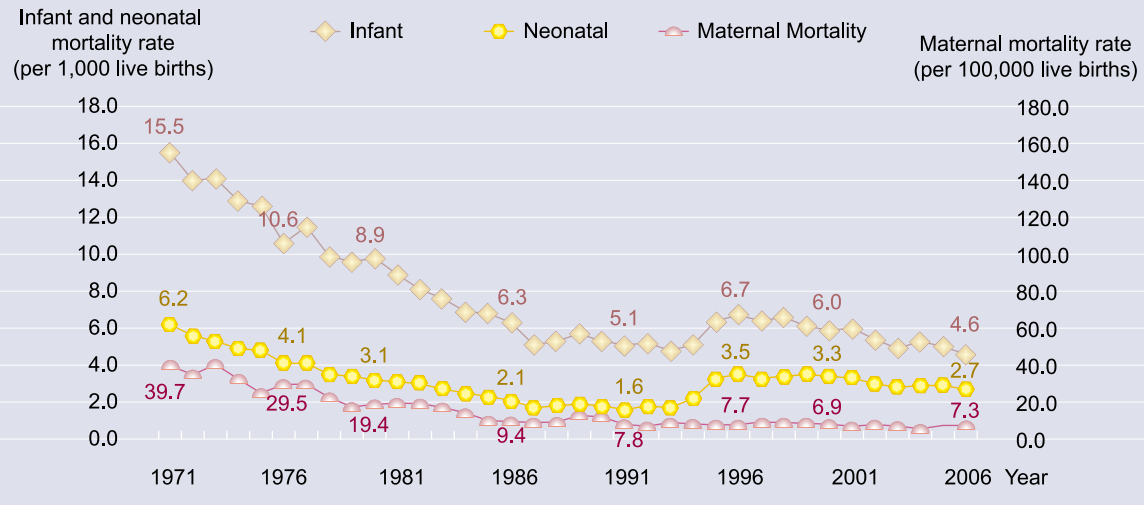
Section 4. International Comparison

1. Natural Increase of Population

The world population in 2006, according to the 2006 World Population Data Sheet, was 6.555 billion; and estimates are that, by the year 2050, it would reach 9.243 billion, at an increase rate of 41%. The world population in general though is increasing, in some countries there has been negative growth, and their population continues to decrease by size (Table 2-2).

The total fertility rate (number of live births per woman in life time) for the world as a whole in 2006 was

Figure 2-7 Neonatal, Infant and Maternal Mortality Rates by Year



2.7. Most of the Asian countries in the Table are not even a half of the world average, indicating that Asia is a low-fertility area. The birth rate of the world as a whole is 21‰ and death rate, 9‰. Germany has a birth rate lower than the death rate. Looking at the year as a whole, all developed countries in the world show a pattern of low birth and low death rate population structure.

2. Life Expectancy

In 2003, the life expectancy at birth for males in the major countries of the world was more than 73 years. Japan, at 78.4 years, was the highest of all; Australia came next at 77.8 years; and Taiwan had 74.8 years, about the level of Japan in 1985. Differences in life expectancy in the period 1960-2000 are that, Japanese males ranked the first to have an increase of 12.4 years in 40 years; and Taiwan had an increase of 10.4 years in the same period. The life expectancy for females was around 80 years. Japan again was the highest at 85.3 years; France came next at 82.7 years; and Taiwan had 80.3 years, about the level of Japan in 1985. Differences in the period 1960-2000 are that, Japanese females ranked the first to have an increase of 14.4 years in 40 years; and Taiwan had an increase of 12.0 years in the same period (Table 2-3).

3. Leading Causes of Death

When death rates of selected developed countries are adjusted against the 2000 standardized world population and compared with that of Taiwan, it is noted that in many countries, malignant neoplasm comes as the first cause of death. Death rates of heart diseases are higher in European countries and the US; Japan shows a high death rate of suicide and Korea comes next. Korea and Taiwan have higher death rates of diabetes, accidents and adverse effects, and chronic liver diseases and cirrhosis (Table 2-4).

4. National Health Expenditures

The per capita national health expenditures of Taiwan in 2003 were US$ 824, lower than the medium of US$ 2,139; the per capita GDP was US$ 13,327, again lower than the medium of US$ 26,311. Both of them were ranked the 24th in the OECD member states; higher only than those of Korea, Czechoslovakia, Hungary (2002), Mexico, Slovakia, Poland and Turkey. In general, countries with higher per capita GDP tend to have higher per capita national health expenditures. In 2003, the proportion of national health expenditures to GDP in Taiwan was 6.2%, lower than the medium by 1.9 percentage points, and was the lowest among the OECD member states, indicating that Taiwan was relatively low in these aspects (Table 2-5).

Figure 2-8 NHE/GDP Ratios and Average Per Capita NHE by Year

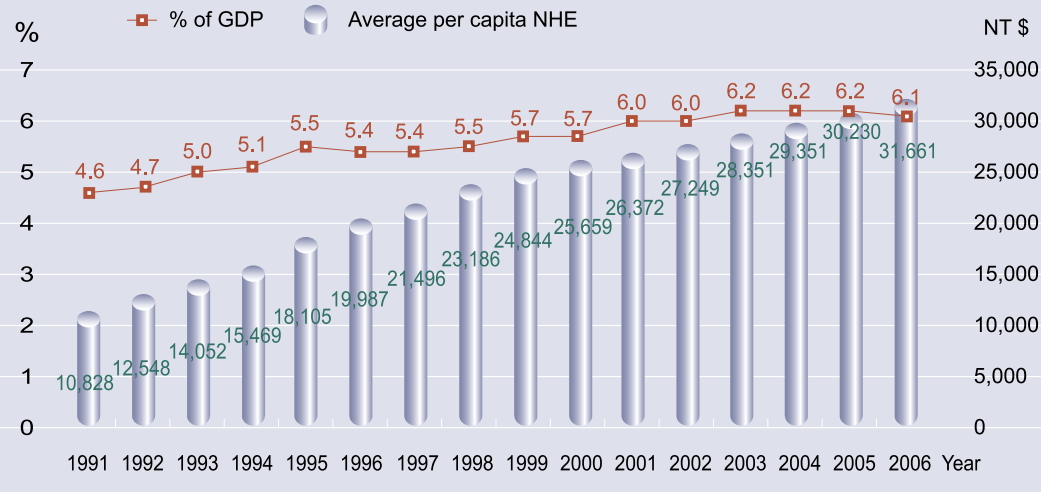


Table 2-2 Population of Selected Countries

	Mid-year Population (million persons)	Population Projection (million persons)		Difference: 2005-2050 %	Crude Birth Rate ‰	Crude Death Rate ‰	Total Fertility	Natural Increase Rate(%)
	2006	2025	2050					
World	6555.0	7940.0	9243.0	41	21	9	2.7	1.2
Taiwan	22.8	23.6	19.8	-13	9	6	1.1	0.3
Singapore	4.5	5.2	5.3	19	10	4	1.2	0.7
Japan	127.8	121.1	100.6	-21	9	8	1.3	0.0
South Korea	48.5	49.8	42.3	-13	9	5	1.1	0.4
Canada	32.6	37.6	41.9	29	11	7	1.5	0.3
USA	299.1	349.4	419.9	40	14	8	2.0	0.6
UK	60.5	65.8	69.2	14	12	10	1.8	0.2
France	61.2	63.4	64.0	5	13	9	1.9	0.4
Germany	82.4	82.0	75.1	-9	8	10	1.3	-0.2

Source: 2006 World Population Data Sheet, Population Reference Bureau

Table 2-3 Life Expectancy at Birth, Selected Countries

Unit: years

	1960	1970	1980	1990	2000	2005
Male						
Taiwan	62.3	66.7	69.6	71.3	73.8	74.5
UK	67.9	68.7	70.2	72.9	75.5	76.9
USA	66.6	67.1	70.0	71.8	74.1	…
France	67.0	68.4	70.2	72.8	75.3	76.7
Germany	66.9	67.2	69.6	72.0	75.0	76.2
Canada	68.4	67.4	71.7	74.4	76.7	…
Norway	71.3	71.0	72.3	73.4	76.0	77.7
The Netherlands	71.5	70.8	72.5	73.8	75.5	77.2
Australia	67.9	67.4	71.0	73.9	76.6	78.5
New Zealand	68.7	68.3	70.0	72.4	76.3	77.5
Japan	65.3	69.3	73.4	75.9	77.7	78.6
Female						
Taiwan	66.4	71.6	74.6	76.8	79.6	80.8
UK	73.7	75.0	76.2	78.5	80.2	81.1
USA	73.1	74.7	77.4	78.8	79.5	…
France	73.6	75.9	78.4	80.9	82.7	83.8
Germany	72.4	73.6	76.1	78.4	81.0	81.8
Canada	74.2	76.4	78.9	80.8	81.9	…
Norway	75.8	77.3	79.2	79.8	81.4	82.5
The Netherlands	75.4	76.5	79.2	80.9	80.5	81.6
Australia	73.9	74.2	78.1	80.1	82.0	83.3
New Zealand	73.9	74.6	76.3	78.3	81.1	81.7
Japan	70.2	74.7	78.8	81.9	84.6	85.5

Notes: 1. The average life expectancy at birth for Taiwan in 2006 is 74.9 years for males and 81.4 years for females.
2. Source: 2007 OECD Health Data

Table 2-4 Standardized Mortality Rates of Leading Causes, International Comparison -Calculated on the 2000 WHO world Standardized Population-

Unit: per 100,000

1975 ICD Code	Cause of Death	Taiwan (2006)		Japan (2002)	USA (2000)	Germany (2001)	UK (2002)	Singapore (2001)	South Korea (2002)
		Mortality Rate	Standardized Mortality Rate						
	All causes	591.8	495.4	375.8	576.3	520.0	534.0	467.8	556.6
08-14	Malignant neoplasms	166.5	139.3	119.3	139.2	137.1	146.8	130.7	136.6
29	Cerebrovascular diseases	55.2	44.7	45.4	35.6	43.7	51.9	45.5	85.3
250,251,27,28*	Heart diseases	53.8	43.8	55.4	152.1	151.8	122.9	114.5#	41.1
181	Diabetes mellitus	42.5	34.9	4.8	16.7	12.6	6.1	16.0	27.1
E47-E53	Accidents and adverse effects	35.1	31.9	19.5	31.3	17.9	14.9	10.3	37.7
321	Pneumonia	23.6	18.9	28.3	13.2	9.8	26.7	50.5	6.5
347	Chronic liver diseases and cirrhosis	22.1	18.6	6.2	8.5	13.8	9.4	3.1	20.3
350	Nephritis, nephrotic syndrome and nephrosis	20.6	16.8	6.6	8.4	4.7	3.4	8.1	6.2
E54	Suicide	19.3	16.8	18.0	9.5	10.5	6.3	8.9	17.1
26	Hypertensive diseases	8.0	6.4	1.8	10.1	11.4	3.2	11.9	12.3

Source: Calculated from Table 1. Mortality Database, of the WHO website (HYPERLINK "http://www.who.int")

Notes: 1. For Japan, USA, Germany, UK and South Korea, the ICD-10 is used.

2. * indicates that the disease is only part of the disease under the code; 28* includes ICD Detailed Codes 420-429

3. The ICD-9 Basic Code used for heart diseases (#) includes 250, 251, 270 and 28 (used by Singapore)

Table 2-5 National Health Expenditures, Selected OECD Countries and Taiwan, 2003

Unit: US$

Rank	Country (by order of per capita NHE)	Average per Capita NHE	Average per Capita GDP	NHE/GDP	Rank	Country (by order of per capita NHE)	Average per Capita NHE	Average per Capita GDP	NHE/GDP
	Medium	2,139	26,311	8.1	16	Italy	2,139	25,375	8.4
1	USA	5,635	37,658	15.0	17	UK	2.031	26,311	7.7
2	Switzerland	5,041	43,741	11.5	18	Austria[2002]	1,961	25,793	7.6
3	Norway	4,976	48,383	10.3	19	Australia[2002]	1.960	20,978	9.3
4	Iceland	3,827	36,510	10.5	20	New Zealand	1,611	19,982	8.1
5	Denmark	3,534	39,315	9.0	21	Greece	1,549	15,624	9.9
6	Germany	3,204	28,973	11.1	22	Spain	1,535	19,984	7.7
7	The Netherlands	3,088	31,458	9.8	23	Portugal	1,348	14,045	9.6
8	France	2,967	29,275	10.1	24	Taiwan	824	13,587	6.1
9	Luxemburg[2002]	2,950	48,219	6.1	25	South Korea	705	12,651	5.6
10	Belgium	2,796	29,188	9.6	26	Czechoslovakia	668	8,858	7.5
11	Canada	2,670	27,075	9.9	27	Hungary[2002]	496	6,390	7.8
12	Sweden[2002]	2,494	27,067	9.2	28	Mexico	372	6,031	6.2
13	Japan[2002]	2,450	31,181	7.9	29	Slovakia	360	3,073	5.9
14	Finland	2,297	30,855	7.4	30	Poland[2002]	303	5,008	6.0
15	Ireland[2002]	2,255	30,711	7.3	31	Turkey[2002]	194	2,933	6.6

Notes: 1. Source: OECD Health Data, 2005

2. Ranks arranged by average per person health expenditures

3

Health Promotion

Chapter 3. Health Promotion

A healthy population is part of the national competitiveness; it is also an important promoting power for the sustainable development of a nation. Along with the drastic changes in lifestyles and population structure in Taiwan, the elderly population is growing sharply, and health problems of the population have shifted from acute communicable diseases to chronic diseases. Like the European countries and the US, the leading causes of death in Taiwan in recent years have been malignant neoplasm, chronic diseases and accidents and injuries. The underlying pathogenic causes though are partially attributable to the genetically induced biological factors, they are primarily associated with personal lifestyles such as smoking, exercise, food habits, and receiving regular screening for diseases.

The World Health Organization advocates that health is not merely the absence of illness; it should be the development of the overall health. The main focuses of the Department, thus, have been to build healthy life, improve self-management of health, construct healthy lifestyles, and in coordination with the practice of early screening, to reduce the occurrence of chronic diseases and their complications, and minimize rates of sickness, disability and death, and thus to attain the goal of health for all and high quality of life.

Section 1. Community Health

The Alma-Ata Declaration of the World Health Organization in 1978 stresses the importance of health promotion through emphasized health care to attain the goal of "Health for All". The Department began in 1999 to promote "Community Health Building Programs" with a view to help the public, through community participation, identify health problems of the community, reach consensus, and establish an autonomous community health-building mechanism to resolve community health problems together.

1. Upgrading the Service Quality of Health Stations

Health stations are the primary operational points in Taiwan's healthcare service systems. At the end of 2006, there were 372 township health stations (including 12 health service centers of Taipei City) to provide the community people with continuous, overall and comprehensive health and medical care services. The Department has taken to upgrade the service quality of health stations, to set up excellent operational procedures, to improve the professional capabilities of the health station staff, and to strengthen the hardware facilities are as follows:

1) to subsidize and supervise 11 county/city health bureaus to reconstruct or expand buildings of 20 health stations, and to year by year improve building of the primary care health stations with a view to provide the public with a clean and safe space of community health care services;

2) to conduct a study on the need assessment for the capability development of health inspectors and training models; to survey the professional capabilities of health inspectors and compile a work manual for them; and to improve the professional legal knowledge of health inspectors and improve their service quality.

2. Health Fitness and Healthy Body

Due to changes in lifestyles, chronic diseases have become more prevalent. For effective prevention, physical activities are promoted to, together with balanced diet, maintain healthy body and establish healthy lifestyles. The key points are:

1) Since 2006, November 11th is made the "all walk day" to encourage the public to walk for health.

2) A series of physical activities have been organized to encourage the public to walk for health. Leaflets are produced, and TV and press channels are used to advocate the concept of "ten-thousand steps a day for good health"; information on the health fitness website is renewed to include maps of walking paths in the community, and thus to encourage the public to make walking part of their daily life.

3) A symposium on health fitness has been held to present research findings, survey reports, and thus to upgrade relevant knowledge, and also for the application of academic institutions and staffs of health bureaus and health stations.

4) To promote the self-necognition of health and body image of general public, a body-weight registration activity is organized. A five-year plan, "Adult Healthy Body – Challenging 1824", is promoted to advocate correct ways of body-weight control, and to maintain the BMI (Body Mass Index) between 18.5-24 (Table 3-1), and thus to minimize the detriment of chronic diseases induced by overweight or obesity to attain the goal of "marching toward health with BMI". A simple way to self-measure waistline is developed to help people maintain the waistline within a desirable range.

5) Policies such as "food sanitation in school", "knowing about foods", "body-weight control class", "diet for cancer prevention", and "five a day-five servings of vegetables and fruit a day" have been advocated to improve the public's knowledge on food safety and nutrition, and thus to develop correct knowledge on healthy body and diet.

3. Promoting a Community-Based Healthy Life Plan

The "Community-Based Healthy Life plan" aims at changing the public's conventional way of passively receiving healthcare service, and by way of community organizations to encourage the active participation of the public and to care about the health problems of their communities. Resources of communities are consolidated to resolve problems, to encourage the public to practice healthy life, and thus to attain the goal of health for all. Key issues are:

1) to construct a community health promoting network: 199 community health-building projects have been subsidized; private sector groups and community medical resources join together to promote community health. 747 blood pressure measurement stations, 305 healthy diet restaurants, and 733 smoke-free restaurants have been set up to build a health-supporting environment. 6,732 workshops have been held; 12,162 community health-building volunteers have been recruited; 983 training courses for volunteers have been organized; work has been promoted in collaboration with 3,031 community organizations; 706 campaigns have been held for 266,049 person-times of participants. Funds raised by communities account for 42.16% of the budget.

2) To promote the healthy city alliance: in 2005, the Tainan Healthy City Promotion Committee became a member of the WHO Western Pacific Region Healthy City Alliance; in 2006, a "Taiwan Healthy City Alliance Project" was promoted to hold a symposium on Taiwan healthy city alliance, and 23 county/city heads or representatives joined together to endorse the healthy city declaration. Workshops on healthy city have been organized to share experience in the promotion of healthy cities.

4. Health Promotion and Health Risks at Workplace

With the globalization of enterprises and diversities of employment, the promotion dimensions of health at workplace should also be adjusted accordingly, from reducing occupational disease passively to health promotion of workers actively.

1) Since 2006, by consolidating workplace health promotion and tobacco-hazards control projects, Center for Workplace Health Promotion and Tobacco Control has been set up each in the northern, central and southern regions. Service networks have been set up to offer counseling, health education and training in order to establish healthy workplace environments. Assessment of and award to outstanding tobacco-free workplace has been made to commend 113 outstanding tobacco-free workplace, and to establish

Table 3-1 Body Mass Index (BMI)

Physical Status	BMI=Body Weight(kg)/Height (m^2)	Waistline
Light	BMI＜18.5	
Normal	18.5≦BMI＜24	
Abnormal	Obese: 24≦BMI＜27 Slightly obese: 27≦BMI＜30 Moderately obese: 30≦BMI＜35 Extremely obese: BMI≧35	Male：≧90 cm (about 35.5 in) Female: ≧80 cm (about 31.5 in)

successful promotion models. A national survey on tobacco hazards at workplace has been conducted. In 2006, the smoking rate of employees was 22.8%, a decline of 2.2% over the year 2003.

2) To understand the situation of occupational diseases and injuries in employees, a reporting system for occupational diseases has been set up. Physicians are encouraged to early detect occupational diseases and injuries and thus to help early identify new types of occupational diseases and injuries. Each year, in collaboration with the Council of Labor Affairs, training programs for physicians and nursing personnel on occupational health promotion are held to develop professional manpower on occupational health.

3) The Department is the organizer of the Health Risk Group of the Executive Yuan's National Sustained Development Committee to implement cross-ministerial coordination and health risk assessment on matters concerning health hazards induced by environmental contamination. In 2006, meetings of the Group to share responsibilities and on policies for the assessment of health risks were held; measures to face the emerging health risks (such as electromagnetic wave and climate change) were also discussed.

Section 2. Maternal and Child Health, Genetic Health and Prevention of Genetic Disorders

The purposes are to construct a comprehensive maternal and child health and genetic health service system; to care for patients of rare diseases; to help pregnant women maintain good health; to ensure the healthy development of infants after birth; to respect the values and dignity of women; to provide women with friendly medical care environment; and thus to upgrade healthcare of mothers and children and to improve the health of mothers and children.

1. Health Promotion for Pregnant Women, Infants and Young Children

1) Health Promotion for Pregnant Women

(1) To upgrade the quality of healthcare for pregnant women, a health management model has been tried out; pre-natal care is also offered to pregnant women.

(2) Action has been taken to construct delivery-friendly environments for women. In 2006, acting on the operational specifications of the delivery-friendly project, five hospitals were selected for the pilot project. A model to investigate and operate the counseling mechanism for induced abortion has been worked out to provide women with sufficient information.

(3) Breastfeeding-friendly environments have been universally set up. Work on the certification of baby-friendly medical care institutions continues. In 2006, 82 medical care institutions passed the certification. Community support network models are promoted in counties and cities to help communities develop volunteers on breastfeeding and to set up supporting groups. Toll-free counseling lines have been set up. About 25 calls are received each day. Websites on breastfeeding are set up and a quarterly is published. About 20,000 visits are received each month. Private sector groups and organizations are encouraged to set up breastfeeding (collection) rooms.

(4) To help wives of foreign origins on reproductive health, health-cards have been set up for them for management and guidance on reproductive health. In 2006, health-cards for almost 95% of wives of foreign origins had been set up. Through the Fund for the Care and Supervision of Alien Wives of the Ministry of the Interior, foreign spouses are subsidized, before they are officially registered as citizens, for prenatal health examination and birth regulation. In total, 3,864 person-times of these wives for prenatal health examination and 710 persons for birth regulation have been subsidized. In counties and cities with more foreign spouses, a three-year project for the development of translators for foreign spouses on reproductive health is implemented. In 2006, 14 counties and cities and 119 health stations participated in this project. A manual on vocabularies of reproductive health for foreign spouses has been compiled to help medical and nursing personnel provide correct information on healthcare.

2) Health Promotion for Infants and Young Children

(1) To strengthen healthcare for infants and young children, nine health examinations are offered

free to children under seven years of age. A Child Health Handbook is issued to parents to improve their knowledge on preventive health. A health management model for infants and young children at primary care units has been tried out.

(2) To improve the quality of care for premature babies, a national databank of information on premature babies of very low body weight and a referral care service after hospital discharge network have been set up. To early detect cases of bile tract obstruction, in 2006, in collaboration with the immunization information management system, colors of stools were registered; and the use of infant stools color cards was promoted. Taiwan is the first country in the world to use infant stool card for early detection and screening of bile tract obstruction.

(3) To improve the screening of children of retarded development, a manual on the use of the screening tools for development and a DVD have been developed for the use of hospitals, health bureaus and health stations. A project for the analysis of the reliability and validity of the screening tools for child development has been conducted to improve the quality of screening. A project for the follow-up management of children 0-6 years detected abnormal in development screening has been conducted. In 2006, a total of 251,236 children had been screened to find 2,056 suspected cases, and reported and referred 895 cases. In collaboration with the Children's Bureau of the Ministry of the Interior, a press conference is held in April during the Child Development Screening Month to urge the public to pay more attention to the screening for child development. A pilot project on the screening of retarded development in 3-4 year old children of kindergartens and nurseries comprehensive healthcare model, and a project on the intervention in health fitness for young children of retarded development have been tried out to extend program activities further into kindergartens and nurseries.

2. Genetic Health

It has been 20 some years since the implementation of the Genetic Health Act in 1985. To attain the goals of the Act to protect the health of mothers and children, and to enhance welfare of families, and with reference to experience of some advanced countries, action has been taken to plan and promote national genetic health programs, and screening and services for various genetic disorders, including premarital health examination, prenatal genetic diagnosis, newborn screening for congenital for metabolic disorders, and genetic counseling, and thus to minimize the threats of congenital anomalies to the next generations.

The rate of newborn screening for congenital metabolic disorders has reached more than 99.9% (Figure 3-1) to detect 3,751 abnormal cases. 22,378 women have accepted prenatal genetic diagnosis. Nationally, more than 88.8% of women above the age of 34 years (Table 3-2) have gone through amniocentesis examination. 10,998 cases suspected of genetic diseases in them or in family members have undergone further genetic examination. These cases are waived of or subsidized fees in accordance with the Regulation for Reduction, Exemption or Subsidization on Fees for Genetic Health Measures; abnormal cases are followed-up and given health education.

To integrate the genetic diagnosis service network and to strengthen service quality, a certification program of genetic health counseling centers has been conducted to certify ten such centers. Follow-up assessment of 12 laboratory of genetic diseases has been made. Monthly screening of the newborns, G6PD deficiency confirmation testing for 20 times, and on-site inspections of 22 firms has been conducted.

3. Prevention and Control of Rare Diseases

The Rare Disease Control and Orphan Drug Act was implemented in August 2000. Taiwan is the 5th country in the world to legislate rare disease-related laws after the US, Japan, Australia and the European Union. The purposes are to prevent and control rare diseases, to early diagnose rare diseases, to strengthen the care of patients of rare diseases, to help patients obtain drugs for rare disease and special nutrient foods essential to life maintenance, and to encourage and guarantee the supply, manufacturing, research and development of these drugs and foods.

In recent years, to offer comprehensive care to patients of rare diseases, the government has, in addition to including rare diseases in the categories of severe and cortical illnesses and injuries and physical and mental impairments under the National Health Insurance,

Figure 3-1 Newborn Screening for Congenital Metabolic Disorders

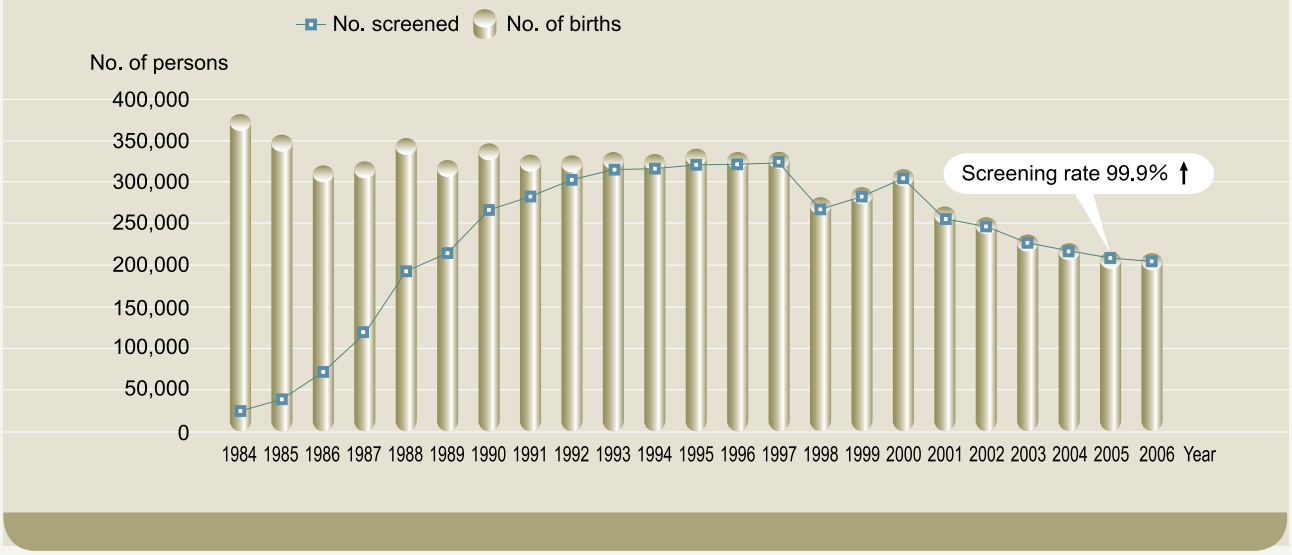


Table 3-2 No. of Women Aged 34 and Above Accepting Amniocentesis Examination

Year	No. of Babies Born to Women Aged 35+	No. of Women Aged 34+ Accepting Examination	Examination Rate (%)	Year	No. of Babies Born to Women Aged 35+	No. of Women Aged 34+ Accepting Examination	Examination Rate (%)
1987	8,752	672	7.7	1997	22,692	13,491	59.5
1988	10,577	1,163	11.0	1998	22,082	12,057	54.6
1989	11,695	1,828	15.6	1999	22,252	15,343	69.0
1990	12,927	2,214	17.1	2000	25,602	19,337	75.5
1991	14,315	2,551	17.8	2001	23,046	16,231	70.5
1992	15,366	3,048	19.8	2002	21,851	16,940	77.8
1993	16,831	4,250	25.3	2003	21,468	16,343	76.1
1994	18,042	6,318	35.0	2004	21,472	17,885	83.3
1995	19,305	8,252	42.7	2005	22,498	18,777	83.5
1996	21,399	10,134	47.4	2006	23,920	21,296	89.0

formulated a set of Regulations Governing Subsidies for Medical Care of Rare Diseases in accordance with regulations of the Rare Disease Control and Orphan Drug Act to subsidize some medical costs of diagnosis, treatment, drugs and special nutrient foods not reimbursable by the National Health Insurance; a total of NT$ 26.58 million in subsidies was made in 2005. A supply center of special nutrient foods and drugs for rare diseases has been set up to benefit 283 cases. 36 cases of rare diseases have been subsidized for laboratory testing under the international collaboration scheme. By the end of 2006, 156 rare diseases in 143 categories had been recognized and announced; 40 items of special nutrient foods for rare diseases and 80 items of rare disease drugs had been announced; 2,715 cases of rare diseases had been reported by medical care institutions (Table 3-3); and educational programs on the prevention and control of rare diseases had been held.

4. Technical Development of Artificial Reproduction

To facilitate legislation of the Artificial Reproduction

Act, the contentious issue of surrogate mothers is removed for separated treatment from the draft act, and a new version of the Assisted Reproduction Act was formulated and submitted to the Legislative Yuan for review on May 20, 2005. On March 21, 2007, Artificial Reproduction Act were published. Then, four Regulations related to the law were published as following: "Regulations on the Relative Verification for Artificial Reproduction Children" was published on June 23, 2007; "Regulations on the License for Artificial Reproduction Organization" was published on July 26, 2007; "Regulations on the Relative Verification Between Sperm/Ovum Donors and Receptors" was published on July 30, 2007and "Regulations on the Reporting and Management for Artificial Reproduction Information" was published on August 8, 2007.

To upgrade the quality of service and for the reference of infertility couples in seeking medical care, an assessment of medical care institutions providing artificial reproduction technology has been conducted; and 70 institutions have passed in 2007. A databank on artificial reproduction has been set up and maintained; information is regularly analyzed. In 2006, 7,273 cycles of treatment had been completed.

Figure 3-2 Mortality Rate of Accidents and Injuries by Year

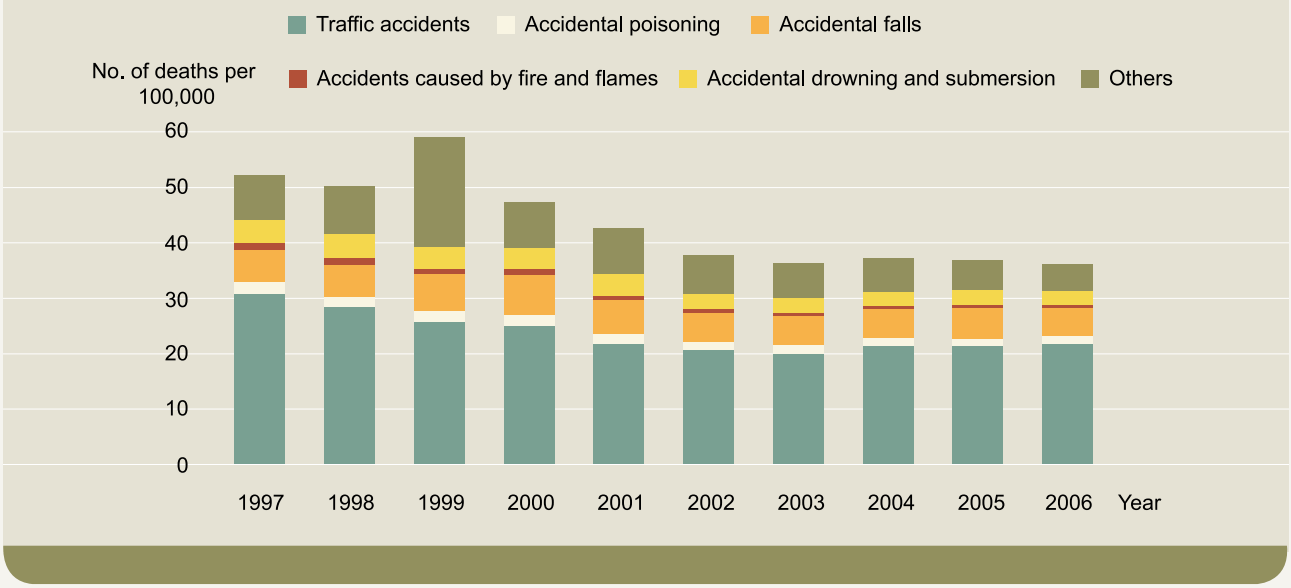


Table 3-3 Ten Leading Rare Diseases Reported

Rank	Disease	No. Reported
1	Phenylketonuria (PKU)	157
2	Amyotrophic lateralsclerosis (ALS)	147
3	Multiple sclerosis	143
4	Achondroplasia	133
5	Prader-Willi syndrome	116
6	Osteogenesis imperfecta	114
7	Mucopolysaccharidoses	94
8	Spinal muscular atrophy	85
9	Glycogen storage disease	71
10	Mitochondrial defect	62

Section 3. Health Promotion for Children and Adolescents

Investment in the health of children and adolescents is an investment on the future of a nation. Action has thus been taken to strengthen community safety, health of oral cavity, hearing and visual health, sexuality education, and promote of health promoting schools, hoping that each child and adolescent will have a normal and healthy life and physical and mental development.

1. Prevention of Accidents and Injuries and Safety Promotion

Mortality rate of accidents and adverse effects has gradually declined since 1989. With the slight increase in 1999 due to the devastating earthquake on September 21, a mortality rate has also declined in recent years. It went up again in 2004, and declined slightly in 2005. In general, the decline of the mortality rate of accidents and adverse effects in the last few years has been relatively steady; it stayed around 36.8 per 100,000 in 2005 (Figure 3-2).

To construct a safe home environment, through 25 county/city health bureaus, health stations and community health building centers, 18,075 households with young children in the districts have been inspected for home safety and environmental improvement.

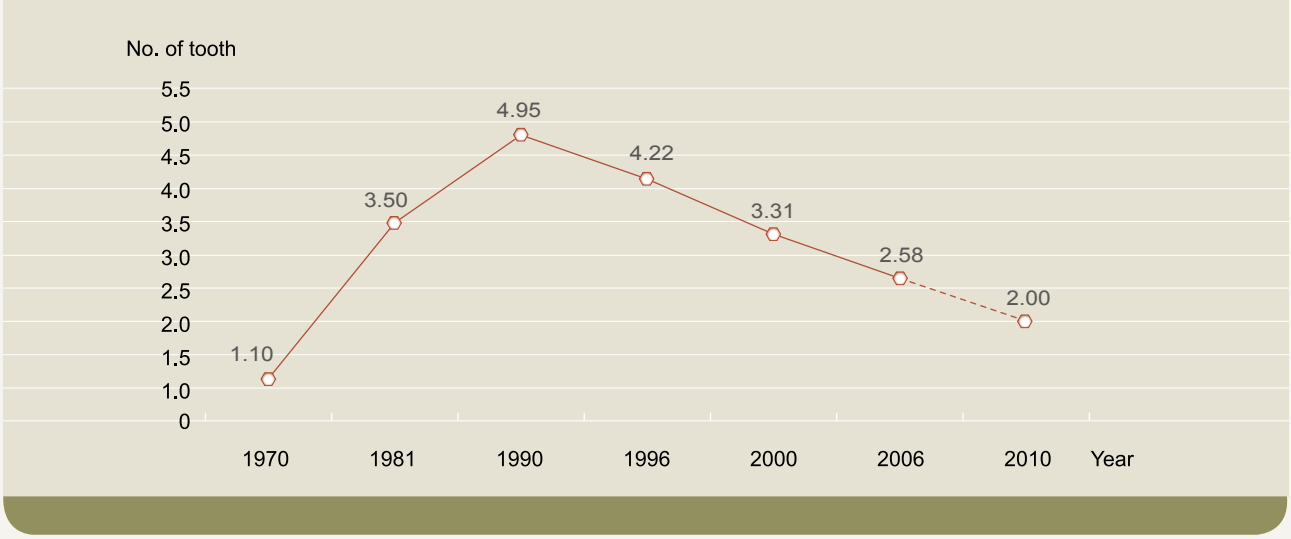
In collaboration with community resources such as private medical care institutions and lifesaving groups, a seminar on safe waters had been organized for 200 participants. To prevent accidents and injuries form children of alien and mainland China spouses, both rural and urban models have been established, and the work will be extended to six counties and cities for implementation. Since 2006, a plan has been implemented to set up safe communities supporting centers in the northern, central, southern and eastern parts of the Island; and nine newly developed communities have been supervised to promote various safety activities. In accordance with the international criteria for the certification of safe schools of the World Health Organization, a pilot demonstration project was tried out in four schools to establish step by step indigenous promotion models.

To build up national epidemiological information on accidents and injuries, a plan for the establishment and promotion of an electronic system on the mechanism of accidents and injuries, and registration and databank of wounds focusing on severe hospitalized patients of accidents has been tried out in 33 regional hospitals and medical center. In 2006, some 3,300 cases had been registered, and their epidemiological data were analyzed for reference in the formulation of injury preventive .

2. Oral, Visual and Hearing Health Promotion

1) Oral health promotion: Findings of national surveys show that the DMFT index of children at 12 years of

Figure 3-3 Dental Caries Index in 12-Year Old Children



age had declined from 4.95 teeth in 1990 to 4.22 in 1996, and further to 3.31 in 2000 and 2.58 in 2006 (Figure 3-3). Generally speaking, the decline in the DMFT index is due primarily to the decrease in the number of decayed and missing teeth and the increase in the filling rate.

(1) Free topical fluoridation of teeth twice a year, oral examination and health education are offered to children under five years of age; preventive dental care services for children are also offered to reduce the dental caries rate of pre-school children.

(2) A "mouth-rinsing with fluoridated water for the prevention of dental caries" project has been carried out all-around for 1.83 million schoolchildren in 2,655 primary schools in 25 counties and cities, at a participation rate of 98.5%, with a view to reduce the dental caries rate of schoolchildren and to build up good oral health habit to reach the WHO goal of DMFT index under two teeth for 12-year old children by the year 2010.

(3) Oral preventive healthcare service for the disabled: 460 seed teachers for the promotion of oral preventive healthcare service for the disabled have been trained to provide 40 sessions of services to 25 institutions of the disabled to upgrade the knowledge of oral health of caregivers and teachers. A project to prevent dental caries in the disabled children through the use of fluoride tablets is conducted to set up a safe model for the administration of fluoride tablets on the disable to reduce their dental caries rate.

Two international symposiums on the oral health of the disabled have been held to invite scholars and experts from the US, Japan, Korea, Thailand, Singapore and Hong Kong for the exchange and sharing of practical experience with experts of Taiwan. Some 500 participated in these symposiums.

2) Visual health: Comparing the findings of the 2006 national survey with those of the four preceding surveys, it was found that the previously increased prevalence of myopia for primary school children has slowed down. However, the mean refractive status becomes myopic at the age of 8, suggesting that prevention should start earlier at the pre-school stage. With the prevalence of diabetes, vision problems and eye diseases of adults and the elderly (such as cataract, retina disorders, complications of high myopia) are happening and increasing in number along with the aging of the society. To minimize the impact of vision problems on quality of life, the promotion of vision health and prevention of blindness are extremely important.

(1) A visual health advisory committee is set up to provide recommendations and counseling. A child visual health promotion group and a visual health for adults and the elderly group are set up to study relevant issues.

(2) Three community visual health centers and 11 community visual health service networks have been set up to provide vision screening services for people in remote and mountainous areas, and also screening of preschool children for strabismus and amblyopia and re-examination and counseling of abnormal cases. Community resources are allocated to promote visual health and care models to protect the visual health of children and the public.

(3) A national project on the screening of preschool children for strabismus and amblyopia and for visual health has been conducted to screen 265,699 children. 99% of the abnormal cases have been referred for correction (Table 3-4).

3) Hearing health: Both domestic and international studies show that about 3 per 1,000 newborns suffer from congenital hearing impairment of both ears. It is estimated that in Taiwan there are around 600 hearing impaired babies each year. If these babies are early detected and given hearing rehabilitation intervention within six months after birth, by the age of three years, their average language development is almost similar to normal level. Furthermore, the incidence of hearing impairment (including impairment due to otitis media) of young children is about 2%. For the early detection and early correction, the following measures are taken:

(1) A project for the establishment of a hearing screening website for the newborns and a hearing screening databank system is commissioned out to conduct follow-up studies on cases of hearing impairment. 12 medical centers and regional hospitals participate in this project to screen 8,834 cases. They are all registered in the databank and follow-up management is given. A website for

Taiwan hearing screening for infants and young children has been set up to provide relevant information.

(2) A hearing screening project is implemented. In 2006, 154,214 children aged 3-4 years had been screened. Those children who failed in the initial screening were referred to hospitals for re-examination. The 918 children confirmed abnormal by diagnosis have been given follow-up and correction management. 32 parent development groups meetings and parent-teacher meetings have been held; 251 person-times of volunteers have been trained; toll-free counseling hotlines have been set up in the northern and southern regions to receive 13,178 person-times of calls for counseling.

(3) Pilot projects on hearing health resource centers in the northern and southern parts are promoted. Primary care obstetrics and gynecology physicians are assisted to take part in the hearing screening of the newborns. In total, 40 medical care institutions participate in for a screening rate of 67.7%.

(4) In the project, to establish an operational and evaluation model for hearing and language impairment screening for preschool children, 1,167 children in 30 kindergartens took part. A manual on hearing and speech health of young children and related health education materials have been produced.

3. Health Services for Adolescents

Children in puberty develop delicate changes physiologically and mentally. Thus, to provide sexuality education and health services to adolescents at clinics by professional workers to concern about their health and development are most important.

1) A diversified, lively and vivid e-learning yard, website service for adolescents, has been developed to provide online counseling. Mailboxes are available for adolescents, parents and teachers. In 2006, 3,270 person-times of replies had been help adolescents that face common problems of the puberty stage.

2) Sexuality education and reproductive health service for adolescents

(1) 46 hospitals have been subsidized to operate health clinics for adolescents to provide them with diagnosis, treatment, referral and counseling on sex, physiology, reproduction and other physical and mental health problems. A total of 37,526 person-times of adolescents have benefited from this operation.

(2) An adolescent-friendly clinic on reproductive health project has been implemented. Four medical care institutions have collaborated in setting up a teen's clinic to develop friendly, respectful, and privacy-protected clinics, and to provide adolescents with counseling and medical care on reproductive health. A workship improved skills of parents when they talked about sex issues such as communication on sex and reproductive health.

3) A sexuality education campaign on the Internet was held, and some 3,000 person-times participated in the activity. Advertisements also appear on Yahoo/health-related pages. A total of 3,286 sexuality education campaigns have been held by county/city health bureaus for 560,114 participants.

Table 3-4 Screening of Preschool Children for Amblyopia and Vision

Year	No. Screened	No. of Abnormal Cases in Initial Screening (%)	Referral rate of Abnormal Cases (%)
2000	310,078	15.00	94.50
2001	314,308	12.30	96.30
2002	306,478	12.30	96.31
2003	306,395	12.03	98.00
2004	281,131	13.12	98.00
2005	308,089	12.95	98.00
2006	265,699	11.85	99.00

4) A sexuality education video has been produced for teachers of junior and senior high schools in their teaching. Teaching aids such as penis model and discs have been 67 health promoting schools and used by 25 health bureaus in promoting sex-related issues. A workshop has been held for 44 health bureau workers in sex education.

4. Health Promoting School

The Department of Health continues to work with the Ministry of Education in promoting health promoting school plans. Thus far, 516 schools have participated in the plans; of which, 367 are elementary schools, 123 junior high schools, and 26 senior high schools and vocational schools. Anti-smoking and betel nut hazards prevention are mandatory issue of these schools at various levels; the other issues include sexuality education (include AIDS prevention), safety education and first aid, safe use of drugs and abuse prevention, healthy body (including healthy eating and physical fitness), vision health, oral health, mental health promotion, communicable diseases control, and consumers health. To allow the sustained promotion of the plans, relevant supporting systems are strengthened and expanded.

1) Action plans for ten health issues, and health promoting schools teaching guidelines, have been completed. International program on health promoting schools translate finished and are shown on the health promoting school website.

2) A professional supervisory group of 53 scholars and experts to supervised 18 counties and cities to set up supervisory supporting systems, organized symposiums to present outcomes of some demonstration schools, counselling camps and skill enhancement workshops, education and health meeting of resources in counties and cities, and print chapters on supervisors, issues and actions of the supervision manual.

3) Training of school principals, teachers, school nurses and health workers in health promoting schools has been conducted. About 3,500 staff participated in the training of program promotion and 700 teachers participated in the training on life skills.

4) Health promoting school network platform has been set up. This project aim is to develop a network platform of health promoting school and to provides for services about teaching materials, information and communication. The conterts of the project include the profile of health promoting school in Taiwan, The policy and Act of school health, members of health promotion schools, all kinds of project's instruction, resources learning game, experts, periodicals and useful links to the WHO and international health promoting school websites.

5) The first Asia-Pacific International Conference on Health Promoting Schools was held to invite about 10 scholars, experts and practitioners from Japan, Thailand, Singapore, Hong Kong, Australia and the US, and experts and practitioners from Taiwan for exchange and sharing of experience. A commitment for sustained cooperation was signed.

6) Analysis of the resources invested by the central and local education and health authorities has been made; achievements assessed of each supporting system, set up demand and satisfaction. Data of imput and supporting systems of school toward government, status analysis of health promoting school. Achievement analysis is according to all of the data in the future.

Section 4. Prevention and Control of Lifestyle-Associated Chronic Diseases

In recent years, lifestyles of the population have, along with the global trends, moved toward less labor and westernized diets. The aging of population has also made disease patterns to shift from communicable diseases to chronic diseases. Diabetes, cardiovascular diseases, cerebral stroke, chronic respiratory tract diseases, and kidney diseases are some leading chronic diseases of the population. To reduce the occurrence of chronic diseases and minimize their mortality rates, strengthening of education, health promotion for high-risk groups, early detection, early treatment, and construction of a comprehensive care network are keys to the prevention and control of chronic diseases. To help people establish at early stage healthy lifestyles, to minimize the threats of chronic diseases, the prevention and control of chronic diseases is promoted following the three-stage five-step principles of public health. Some major achievements are illustrated as follows.

1. Health Promotion for High-Risk Groups

1) Metabolic syndromes

(1) The criteria for the diagnosis of metabolic syndromes have been revised and announced.

(2) An intervention study, Health Promotion for Metabolic Syndromes in Community, was conducted to involve 453 high-risk people (276 in the experiment group and 177 in the control group). Through diversified community intervention plans (including training of volunteers, counseling by professional medical personnel and telephone, and community activities, health promoting behaviors were improved such as exercise, diet habit, interpersonal support, stress management and health responsibility etc.

2) High-risk groups of diabetes

(1) Health promotion activities on diet, exercise and body weight control have been organized in 181 communities and 89 medical care institutions in 25 counties and cities for the high-risk groups of diabetes. A total of 26,122 individuals with family history of diabetes or having had gestational diabetes mellitus were involved. Of the 8,994 persons admitted to the 89 medical care institutions, 44.9% had shown decline in fasting blood glucose; and 49.9% and 43.6% had shown improvement respectively in blood pressure and cholesterol.

(2) In response to the concept of health promoting hospitals advocated by the World Health Organization, and to enhance health promotion for the high-risk groups, 116 diabetes healthcare institutions have been transformed into diabetes health promotion institutions.

3) High-risk groups of cardiovascular diseases

Cities and counties are encouraged and assisted to offer intervention activities such as group or individual health education to individuals of high-risk groups of cardiovascular diseases who have been detected high in the three-in-one screening (high blood pressure, high blood lipid, high blood sugar and obesity); in 2006, 2,153 cases accepted the service.

4) High-risk groups of kidney diseases

A case management project at primary care level for kidney disease patients is tried out in the Kaohsiung City Health Department by using integrated preventive healthcare service as a platform to establish a community-based management and follow-up system for kidney disease patients. 28,433 cases have thus far been screened in community; of them, 5,028 are identified as cases of second-stage chronic kidney diseases; 1,596 of them have complications of diabetes, high blood pressure, high blood lipid and urine abnormality. 1,324 cases are placed under management. The follow-up and referral rate is 83% (the goal is 80%).

5) Early screening and early detection

(1) The 25 counties and cities have been actively supervised to promote the community-based three-in-one (blood pressure, blood sugar and blood cholesterol) screening. In 2006, some 550 thousand people had accepted the screening, an increase of 140 thousand over the 410 thousand of 2005. In the follow-up of cases detected abnormal by screening, as high as 90% of abnormal blood pressure, blood sugar and blood cholesterol cases have completed referral and medication.

(2) To establish effective screening models, since 2002, local health bureaus have been encouraged to integrate available health and medical care resources in their jurisdiction, the preventive health service for adults available under the National Health Insurance, and the existing screening for cancer, to promote integrated screening services. The screening items, resources, funds, case referral and information systems are thus integrated. In 2006, 20 local health bureaus had been involved in the implementation of such services. In the period between 2003 and 2006, some 980 thousand people had accepted the integrated services, and the rate was high.

6) Prevention of falls of the elderly:

A project to prevent falls of the elderly is implemented. A symposium on the prevention of falls of the elderly was held jointly with the long-term care and other related institutions for 200 participants.

2. Upgrading of Care

1) Shared care network for diabetes

(1) Counties and cities have been supervised to promote the shared care network for diabetes. In total, 352 townships have participated in the promotion, giving a coverage rate of 95%.

(2) A set of standards for the certification of medical personnel in the shared care network for diabetes has been amended and announced. In total, 6,988 practitioners and 3,026 teachers have been certified.

(3) Work continues to upgrade the care of diabetes at the 116 diabetes health promotion institutions to serve 403,292 person-times of diabetes patients. Of them, 65% have accepted group care; 107,279 cases have joined the medical payment improvement plan for diabetes of the National Health Insurance; 5,241 have accepted counseling on smoking-cessation; and 583 case conferences have been held.

(4) Diabetes supporting systems have been gradually set up. 450 diabetes patient self-care groups have been set up to help diabetics improve their life skills. 2,492 cases self-monitor their blood glucose at least once a week; and 1,037 obese patients have reduced their body weight by at least two kilograms.

(5) A survey of the care effects of 1,160,979 diabetes patients that are taken from the national diabetes data for 2001-2003 of the National Health Insurance (by the prevalence rate of high blood pressure, high blood sugar and high blood cholesterol in 2002, the number of diabetes patients for the country as a whole was 1.35 million, and the medication rate was 86%), shows that after a year of care, the saccharified hemoglobin level of diabetes patients could go down by 0.3%; and about 5% of patients at saccharified hemoglobin level $\geqq$9% showed improvement. Their hospital care rate and costs are thus reduced.

(6) A primary care case management model for diabetes patients is tried out in Changhua County for 23,577 patients. Screening rates for complications are, 38% for nephropathy, 53% for retinopathy, 86% for feet and 86% for blood lipid. Outcomes of care are, 32% for Alc$<$7.0%, 25% for Alc$>$9.0%, and 67% with well-controlled blood lipid composition.

2) Care of stroke patients

(1) Continuing and comprehensive management is given to post-hospital stroke patients in the community to reduce recurrence of stroke. A community-based health management project for stroke patients is implemented to link with the discharge preparation service to plan the care of stroke patients upon their return to the community.

(2) A model for case management of stroke patients by leveh of severity in community has been set up. Through telephone interviews, home visits or community activities (including nursing, rehabilitation, nutrition, drug counseling and health education) case management services are offered to stroke patients In 2006, five counties and cities participated in this project to offer case management services to 3,317 persons. The blood pressure levels and compliance to medication have been improved.

3) Care of kidney disease patients

To slow down the development of chronic kidney diseases, and to help patients accept dialysis, a cross-department, cross-discipline care model has been established to set up 17 health promotion institutions for kidney and 27 kidney health promotion institutions. Some 7,000 cases have been accepted for management; 1,064 cases at critical stage of kidney diseases have accepted hemodialysis, peritodialysis, and kidney transplantation, an increase of 182 cases over 2005. Of them, 26.8% have accepted peritodialysis, an increase of 6.5% over 2005.

4) Care of patients of chronic obstruction pulmonary disease

A pilot project for the health promotion of chronic obstruction pulmonary disease (COPD) patients was tried out in five hospitals in the northern, central and southern regions. Through detailed assessment and case management, the self-care skills of patients and care capabilities of medical and nursing personnel have been improved.

Section 5. Prevention and Control of Cancer

The Cancer Control Act was implemented in 2003. Regular meetings at the central level on cancer control and meetings of the cancer control strategies committee are held for vertical and horizontal coordination and communication. A five-year national plan for the control of cancer has been formulated as guidelines for cancer control for the period 2005-2009. Cancer control is conducted in accordance with the principles and specifications of the Cancer Control Act for the management of the overall cancer control plans, collection and establishment of relevant cancer control information, and to draft preventive measures by the three-stage five-step principles, and thus to improve the quality of life of cancer patients, and with a view to reduce cancer incidence and mortality. The standardized mortality rate of cancer in the past ten years has declined from 143.5 to 141.2 per 100,000.

1. Current Status of Cancer

In the early stage of cancer control, the Department of Health in 1979 made hospitals of 50 beds and more to set up a cancer registration system, and to report epidemiological information and summary of diagnosis and treatment of newly detected cancer patients, and thus to set up a national cancer patient databank. The databank provides health organizations with information for reference in the formation of cancer control policies; it also serves as an important source of information for academic institutions in the descriptive epidemiological studies of cancer, and also in the investigation of risk factors of cancer and assessment of the survival rates of cancer patients.

In 2003, 212 hospitals of 50 beds and more reported newly detected cases of cancer. The number of new cases of cancer in the country as a whole (not including carcinoma in situ) was 62,542 (36,285 males and 26,257 females); the crude incidence of all cancers was 276.68 per 100,000; and that for males and females was respectively 315.11 and 236.77 per 100,000. If adjustment was made by the 2000 WHO world population structure, the standardized incidence of all cancers in Taiwan was 250.77 per 100,000; and that for males and females respectively was 288.98 and 212.02 per 100,000. The ten leading cancers for males and females are shown in Tables 3-5 and 3-6.

The age standardized incidence of cancer by sex in the last five years (1999-2003) shows that the incidence of all cancers for females had declined by 2.8%; of them, the decline was the most for cervical invasive cancer by 37%, suggesting that the early screening by Pap smear testing (Figure 3-4) had made significant contributions. The age standardized incidence of all cancers for males had increased by 2.6%; of them, the increase was the most significant for esophagus cancer and oral cavity cancer by more than 20%, indicating a strong association with risk factors of males such as smoking and betel nut chewing (Figure 3-5).

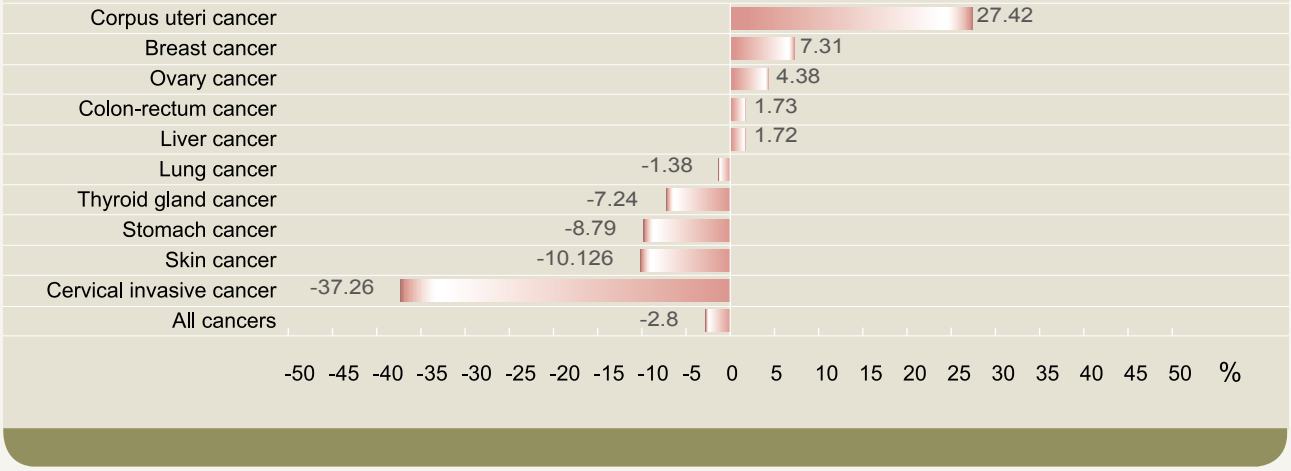
Table 3-5 Incidence of 10 Leading Cancers for Males in 2003 (not including carcinoma in situ)

Site	No. of Cases	Crude Incidence (per 100,000)	Aged-Standardized Incidence (per 100,000)
Liver and intrahepatic bile ducts	6,753	58.64	54.88
Trachea, bronchus and lung	5,025	43.64	39.39
Colon-rectum	4,677	40.62	37.29
Oral cavity, orophanynx and hypopharynx	4,040	35.08	31.81
Stomach	2,308	20.04	17.98
Prostate gland	2,237	19.43	17.22
Urinary bladder	1,318	11.45	10.48
Esophagus	1,258	10.92	10.04
Nasopharynx	1,157	10.05	9.01
Skin	960	8.34	7.62
Others	6,552	-	-
Total	36,285	315.11	288.98

Table 3-6 Incidence of 10 Leading Cancers for Females in 2003 (not including carcinoma in situ)

Site	No. of Cases	Crude Incidence (per 100,000)	Age-Standardized Incidence (per 100,000)
breast	5,325	48.02	42.01
Colon-rectum	3,561	32.11	28.81
Liver and intraphpetic bile ducts	2,651	23.91	21.87
Trachea, bronchus and lung	2,390	21.55	19.35
Cervix uteri	2,061	18.59	16.37
Stomach	1,226	11.06	9.86
Thyroid gland	975	8.79	7.82
Ovary, Fallopian tube and broad ligament	833	7.51	6.67
Corpus uteri	793	7.15	6.32
Skin	783	7.06	6.29
Others	5,659	-	-
Total	26,257	236.77	212.02

Figure 3-4 Five-Year Changes of Age-Standardized Incidence of 10 Leading Cancers in Women, 1999-2003



2. Reducing Risks to Cancer

The National Cancer Control Program 2002 of the World Health Organization stipulates that early prevention of cancer can reduce at least 30% of cancer cases. Therefore, effective control of tobacco and betel quid hazards, reduction of over-weight population, and promotion of immunization against hepatitis B, are some of the important links in any national cancer control program.

Of some major cancers in Taiwan, changes in the last five years of oral cavity cancer and esophagus cancer of males exceeded 20%; they were the cancers that had the most increase in number. Their standardized incidence and mortality have gone up steadily (Figure 3-6) for long time. The control of betel quid hazards is one of the major strategies in the prevention of cancer.

To control the hazards brought about by betel quid, ten years ago, nine ministries and departments of the Executive Yuan joined together to implement a "plan for the management of betel quid issues"; and as a result, the visibility of betel quid issues was greatly publicized and the understanding of the public on the hazards of betel quid to health was improved. In the past ten years, relevant activities have made way to schools, armies, workplaces and communities. At present, about 500 health promoting schools have integrated in their

teaching life skills on not chewing betel quid; and a betel quid-free supporting environment has been built across the armies.

In communities, education against betel quid chewing has been promoted jointly with private sector organizations; and contests and campaigns have been held to urge people to quit betel quid chewing. In the last three years, education programs have been intensified in 20 some communities of high betel quid chewing.

With all these efforts, preliminary results show that the betel quid chewing rate of adults has declined from 10.9% to 8.5% (Table 3-7). In counties and cities of high betel quid chewing rates such as Taitung, Pingtung, and Chiayi counties, betel quid chewing rates have also declined.

Based on the experience of the last ten years, the Department has drafted a "five-year plan for the control of betel quid hazards and oral cavity cancer " as a guideline for the future control of betel quid hazards.

3. Early Detection of Cancer

Cervical cancer, breast cancer, colon-rectum cancer

Figure 3-5 Five-Year Changes of Age-Standardized Incidence of 10 Leading Cancers in Men, 1999-2003

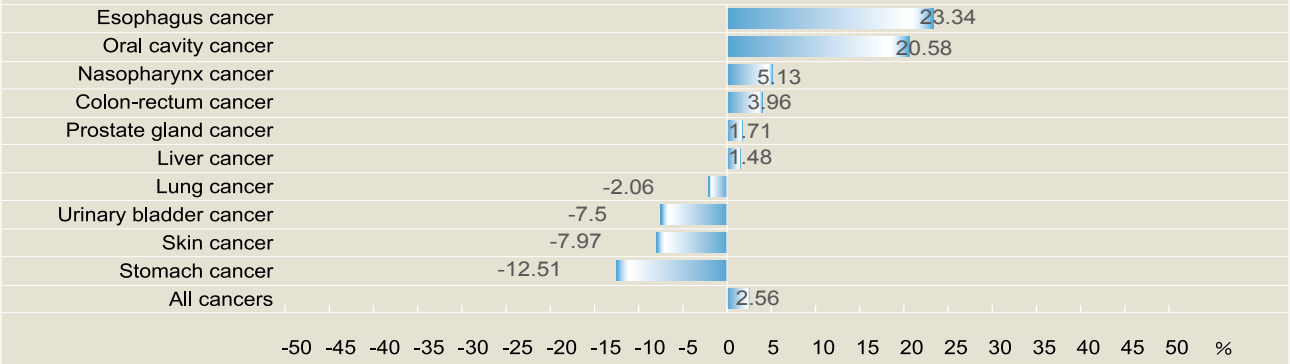
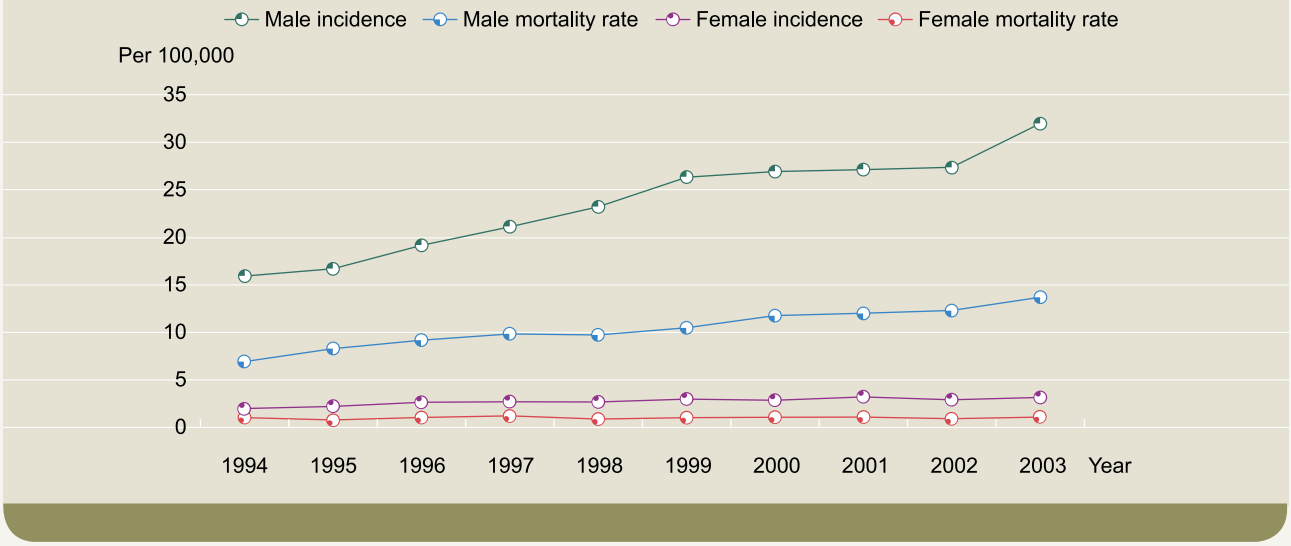


Figure 3-6 Standardized Mortality Rate and Long-Term Trend of Incidence of Oral Cavity Cancer, 1994-2003



and oral cavity cancer have high cure rate if detected early and treated early. Screening of these cancers for early detection and early treatment is a key to the improvement of survival rate.

1) Cervical cancer screening for women 30 years and above

   (1) To provide the people with accessible screening service, in addition to services provided by contracted medical care institutions, local health bureaus and health stations also set up on community occasions screening stations for service. In total, 27 hospitals have been subsidized to operate outpatient screening of Pap smear. Since July 1995, the National Health Insurance in its preventive care program has been paying for women 30 years and above one Pap smear test each year. By the end of 2006, around 3.55 million women aged 30 and above had had a Pap smear test in the last three years, at a screening rate of 53.9%.

   (2) Both incidence and mortality of cervical cancer have, due to the Pap smear screening, declined. The standardized incidence of cervical invasive cancer had declined from 23.7 per 100,000 in 1995 to 16.4 in 2003; the standardized mortality rate of cervical cancer had also declined from 10.86 per 100,000 in 1995 to 5.7 in 2006 (adjusted by the population structure of the 2000 standard world population) (Figure 3-7).

2) Breast cancer screening for women aged 50-69

   (1) The Bureau of Health Promotion conducted on pilot basis in July 2002 to June 2004 a two-step screening of breast cancer for women aged 50-69. The preventive health program of the National Health Insurance, since July 2004, has been paying for women aged 50-69 one mammography screening every two years.

   (2) By the end of 2006, some 170,000 women aged 50-69 had had one mammography screening in the last two years, at a screening rate of 7.8%.

3) Colon-rectum cancer screening for people aged 50-69: A program began in 2004 to encourage people of 50-69 years to accept one fecal occult blood test every one or two years. In 2006, some 220,000 people had accepted the test, at a screening rate of 5.2%.

4) Oral cavity cancer screening for smoking or betel quid-chewing high-risk groups: Since 1999, screening for oral cavity cancer for smoking or betel quid-chewing high-risk groups has been conducted. In 2006, some 280,000 smoking or betel quid-chewing people had accepted the screening for oral cavity cancer.

4. Upgrading the Quality of Cancer Diagnosis and Care

To upgrade the quality of cancer diagnosis and treatment, in accordance with Article 15 of the Cancer Control Act, a set of Guidelines on Measures to Assure the Quality of Cancer Diagnosis and Treatment was announced and implemented on March 2005. 25 hospitals have been subsidized to implement the "Plan for the Overall Upgrading of Quality of Cancer Diagnosis and Treatment". Scholars have been commissioned to develop core measurement indicators for cervical cancer, breast cancer, lung cancer, colon-rectum cancer, oral cavity cancer and liver cancer for the regular monitoring of hospitals and for comparison between hospitals.

To provide cancer patients and their families with relevant health education and assistance and thus to improve their quality of life and to continue to accept treatment, in collaboration with private sector groups,

Table 3-7 Betel Quid Chewing Rate among Adults

Unit:%

	1996	1999	2002	2005
Males	-	17.7	16.6	15.9
Females	-	1.0	1.2	1.0
Total	10.9	9.0	9.1	8.5

Sources: 1. Li Lan et al. Survey on the knowledge and practice of betel quid chewing in adolescents and adults in Taiwan, 1996.
2. Li Lan et al. 1999 survey on the betel quid chewing in adults in Taiwan, 1999.
3. Bureau of Health Promotion, 2002 National Health Survey, 2002
4. Bureau of Health Promotion, 2005 National Health Interview Survey, 2005

since 2004, a pilot project was tried out to provide supportive service and to make telephone calls of concern. In a year, some 70,000 person-times of patients have been so directly accessed for service. In addition, training has been given to professional workers and volunteers providing such services. In collaboration with private sector groups, the first Convention of World Chinese on Friends of Breast Cancer Associations was held in Taiwan. 31 local and overseas associations had participated in to publicize to the world the achievements of Taiwan in the supportive services.

To alleviate pains and malaise of cancer patients at terminal stage, and at the same time to attend to their emotional and spiritual needs, the Department began in 1995 to promote hospice palliative care for cancer patients. In 2000, the hospice care and home care became reimbursable by the National Health Insurance. Currently, 32 and 55 hospitals provide respectively hospital and home care services. In 2004, however, only 15.4% of cancer patients accepted within a year before their death the hospice care offered by the National Health Insurance. To improve the situation, hospitals have been subsidized to promote shared hospice care by sending teams from hospice wards to non-hospice wards to provide hospice palliative care to cancer patients at terminal stage. In total, 38 hospitals have been subsidized to serve about 8,000 patients a year. A system for the certification and follow-up assessment of hospice palliative care hospitals has been set up. A competition of the most outstanding hospice ward was held to commend hospitals of outstanding performance and serve as examples for other hospitals to learn from.

Section 6. Control of Tobacco Hazards

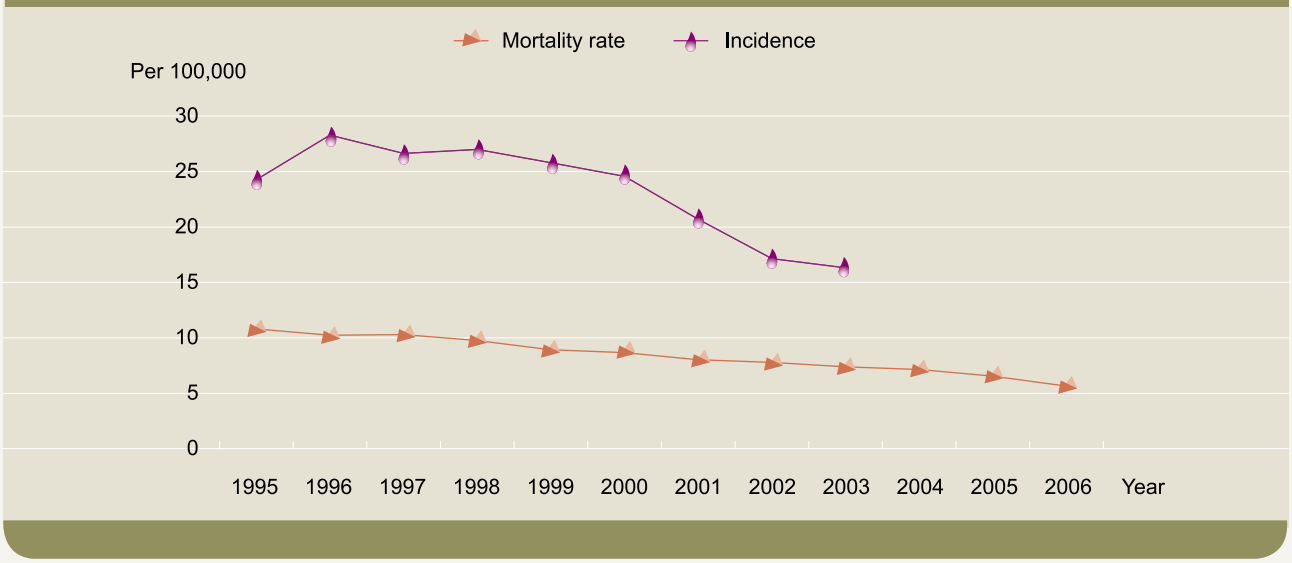
To control hazards of tobacco products, the Tobacco Hazards Prevention Act was promulgated in 1997. Out of the health and welfare surcharge levied on tobacco products since 2002, NT$ one billion is allocated specifically for the control of tobacco hazards. Telephone surveys in 2004 and 2006 on the smoking behavior of adults show that the smoking rates of males and females 18 years and above in 2004 were respectively 42.78% and 4.54%; they were 39.51% and 4.12% in 2006; the male smoking rate had declined. The key points of tobacco hazards control are to reduce the smoking rates of adults 18 years and above, and to minimize exposure to second-hand smoking in public spaces.

1. Smoke-Free Environment

To uphold the health rights of the people and protect them from hazards of second-hand smoking, a smoke-free environment is promoted and built in restaurants, campuses, workplaces and the armies.

1) Work continues to promote smoke-free environment in restaurants in counties and cities. Thus far, more than 10,000 restaurants in the 25 counties and cities

Figure 3-7 Trend of Age-Specific Standardized Incidence and Mortality Rate of Cervical Invasive Cancer



are smoke-free.

2) Work continues to promote together with the Ministry of Education, county/city health bureaus and education bureaus smoke-free campuses. Thus far, 516 senior high and vocational schools and under are health promoting schools (an increase of 62.3% over the 318 schools of 2004), and 38 universities and colleges have joined the smoke-free campus activities.

3) A worksite health promoting and tobacco hazards control supervision center is set up each in the northern, central and southern regions to help 189 worksites formulate smoke-free or smoke-restriction policies; and 66 worksites have been supervised to promote health promotion to build up a healthy worksite environment.

4) To reduce smoking rate in armies and improve the effects of smoking-cessation, various military services have actively formulated tobacco hazards control policies in the armies, to promote smoking-cessation, to conduct research on tobacco hazards control in armies, and to monitor activities related to tobacco hazards control.

5) Mass media (diversified channels such as wireless TVs, newspapers, radio broadcasting, networks, and outdoor media) are used to conduct various activities such as contests, anti-smoking support groups of working women, to advocate issues of smoking prevention, smoking cessation and refusal of smoking. In collaboration with the theme of the 2006 WHO World No Tobacco Day, 15 fighters were invited in a series of activities to urge all anti-smoking fighters to stand up (such as witness by smokers, keep children away from smoking). The public is urged to understand and place attention to the fact that "tobacco are deadly in any form or disguise".

6) A large-scale mobile exhibit for the youths has been organized together with the National Science and Arts Museums in Kaohsiung, Taipei and Taichung for an audience of 254,993.

2. Pluralistic Smoking-Cessation Services

Smoking-cessation can keep one away from sickness and prevent premature death. Doll et al. began in 1950 a series of long-term studies on the death rates of smokers. A cohort study over a half century shows that about a half of smokers would die from smoking; their death rate was three times that of non-smokers; and they were 20 years shorter in life expectancy. Smoking-cessation can certainly reduce risks of dying from smoking.

Article 18 of the Tobacco Hazards Prevention Act and Article 14 of the WHO Framework Convention on Tobacco Control (FCTC) stipulate that diagnosis of tobacco addition, treatment and counseling shall be made part of the national health plans. Services currently available to smokers in Taiwan are drug therapy at outpatient clinics, toll-free counseling lines, and behavioral therapy of the smoking-cessation classes in communities. Services are available via pluralistic channels.

1) Drug therapy at outpatient clinics: some 2,259 medical care institutions in 357 townships (97%) are currently providing such service. Since the inception through December 2006, 247,731 persons had accepted this service; and the six-month cessation rate was about 20%.

2) Smoking-cessation lines: To provide smoking-cessation counseling to the public, following the smoking-cessation telephone service of US California, a smoking-cessation counseling service plan, the first one in Asia, was implemented in 2003, by commissioning the Master Chang Foundation for the implementation. Using the special features of convenience and privacy-protecting of telephones, toll-free smoking-cessation counseling is provided by professionals. Thus far, 43,748 persons have called. Most of them are in the 31-50 age groups, males (56.5%). Their approval rate of the service is 85.4%.

3. Amendment and Enforcement of the Tobacco Hazards Prevention Act

The Tobacco Hazards Prevention Act has been amended following the principles of the WHO FCTC. The amendment was promulgated in June 2007. The amendment is more precise for the health protection of the population, and at the same time realizes the principles of the FCTC.

To enforce the Tobacco Hazards Prevention Act, a information and reporting system on the management of violations of the Tobacco Hazards Prevention Act have been set up to help counties and cities in their

inspection, and to provide the central and the local competent health authorities with real-time information on the processing of violations. In total throughout the country, 488,671 inspections have been made; of them, 7,163 cases are processed.

To provide the public with services on complaints of tobacco hazards and counseling on relevant laws and regulations, a project on the legal service of tobacco hazards control has been conducted. Thus far, some 400 cases of complaints on tobacco hazards have been received.

The Tobacco Products Testing and Research and Development Project continues to monitor the hazardous components of tobacco products. Thus far, 30 local and imported brands (180 cases) have been tested for their nicotine and tar levels. They all meet the current regulations. Through workshops, symposiums, training courses and compilation of operational manuals, the professional levels of the tobacco hazards control workers have been upgraded.

Section 7. National Nutrition

Unbalanced diet is strongly associated with chronic diseases such as cancer, stroke, cardiovascular diseases, diabetes and hypertension. According to the national nutrition surveys conducted by the Department indicate, the fat intake is excess and the fibers intake is insufficient in general population. To build a healthy diet concept in the population, to have a healthy lifestyle of dietary behavior, and to reduce the occurrence of chronic diseases are some of the major tasks of today that are to be actively promoted.

1. National Nutrition Surveys

To monitor the status of nutrition and the population on regular basis during 2004-2008, the Academia Sinica has been commissioned to conduct the Third Survey of Nutrition and Health transition. Questionnaire on diet and nutrition, the KAP of nutrition (knowledge, attitude and practice), nutrition-associated diseases, and physical examinations are conducted to investigate the nutrition problems of six subgroups (age of 0-3, 4-6, 19-30, 31-44, 45-64, and above 65). The nutrition policies will be established base on the survey. Household interview and physical examination began in July 2005.

Base on the second surveys of Nutrition and Health transition (survey groups: age of 65 and above in 1999-2000), a journal entitled "The Current Status of the Elder" was published and the information is accessible on the DOH homepage.

2. Nutrition Labeling of Packaged Food

In recent years, people have had more knowledge on nutrition and become more health-minded. For this, many developed countries have practiced the labeling of nutrition on prepackaged food. To meet the demands of consumers, to help consumers establish correct knowledge on the nutrition labeling of food, and to provide information for reference in selecting and buying food, a system on the nutrition labeling for prepackaged food on market has been prepackaged.

Since 1991, the Institute of Corporate Food Industry Research and Development Institute has been commissioned to conduct a six-year study to analyze the ingredients of foods in the Taiwan Area, and to gradually establish a databank of the nutrition ingredients of various food items in preparation for the nutrition labeling. In 2000, the said Institute was commissioned again to conduct a study on the nutrition values for labeling of packaged foods on market and to supervise industries to enforce the labeling system.

To encourage the voluntary labeling by industries and to promote the system gradually, a set of Regulations Governing Nutrition Labeling for Packaged Food was announced; and beginning in January 2002, all prepackaged food on market that make nutrition claims are required to carry nutrition labeling. Since January 2003, beverages and dairy products are required to practice the nutrition labeling; Furthermore, nutrition labeling is required for oil and ice-products in January 2004, bakery and cereals in Jannary 2005, and dehydrated and preserved food products in January 2007. To make the nutrition labeling system more perfect, action has been taken to supervise and educate industries of dehydrated and preserved food products to help them develop capabilities in building data for nutrition labeling.

Section 8. Health Education

To establish healthy lifestyles, the Department has promoted various health education activities by means of mass media such as TVs, radios, newspapers, magazines, public transportation and networks to systematically provide the public with correct health information in a clear, lively and vivid manner, hoping that

the public will in their daily life build up healthy behavior; and through the influence of families, schools and communities, to lay a sound foundation for good health and happiness. Major achievements are:

1. A health education theme each month important health issues such as safe use of drugs, prevention of drug abuse, control of AIDS and tuberculosis, control of tobacco and betel nut hazards, suicide prevention, and the National Health Insurance. Activities are promoted to help the public understand and accept the issues advocated, and to improve their self-care for health.
2. To promote the concept of "good doctors in the neighborhood; good hospitals in the community", a volume, Healthy People 125 – Self Care Manual, is published. The volume is intended to help people self-care themselves in advance at time of any warning symptoms by referring to the Manual, or to follow orders of doctors for self-care, with a view to change the conventional medical personnel-centered treatment model.
3. A cross-ministerial collaboration mechanism is established. Health promoting school plan is actively promoted with the Ministry of Education to collaborate in the development of teaching materials, training and supervision, establishment of a resource center, and promotion via media, and thus to build a resource platform for the health promoting schools.
4. Various health education channels have been established. Through diversified resources, and continuing promotion and integrated sales, action has been taken to improve the understanding of the public on health issues. At time of emergency, there are immediate and distinct responding channels to avert the doubts of the public.
5. On important occasions and following the themes of the World Health Organization, such as the women's day, mother's day, father's day, World Tuberculosis Day World Asthma Day the Kidney Health Month in June, the Cardiovascular Health Month in September, the World Osteoporosis Day the World Diabetes Day and the World AIDS Day a series of activities are held.
6. A health education resource website has been set up. There are on the website halls of dynamic life, tobacco hazards control, SARS control, sex education for adolescents, and cancer prevention. Over 2,000 educational materials have been collected for request or download of the public.
7. Various educational channels have been used to promote the concept of "pro-reproduction" to urge the public "to reshape the value of reproduction and family", "to share the burdens of marriage and reproduction by both sexes", and "to cherish life and respect the carry-on of family line".
8. An E-Q playhouse (E for epidemics) has been set up. In addition to routine exhibits, following the important issues of disease control of the year, special exhibits are held (including innovative health education materials, prevention and control of emerging communicable diseases, and prevention and control of influenza). Exhibits of interesting and interactive educational materials have attracted 3,269 visitors during the year.
9. In collaboration with the Taiwan Science Education Hall of the Ministry of Education, a special area on disease control is installed in the Hall to provide visitors and schoolchildren with information. A total of 609,857 persons have visited the exhibit during the year. Three camps on disease control have been held to train young "soldiers" in disease control. In collaboration with the Kaohsiung Science and Arts Museum of the Ministry, exhibits on avian flu have been held to build the concepts of disease control deeply in the minds of the public.
10. Booklets, manuals and leaflets on major issues such as cancer, diabetes, hypertension, high blood lipid, AIDS, enterovirus, safe use of drugs, food safety, nutrition labeling of food have been produced for the general public, and for medical personnel in conducting health education programs.
11. To assure the reliability and correctness of the health and medical care information on websites, the Department has, since 2002 for the last five years, conducted assessment of health education websites to help the public access to correct health information. In 2006, the relevant outstanding information thus collected was compiled as a databank of cases of outstanding health information websites and placed on the health information portal of the Department. Managers of health information websites are thus encouraged to strengthen the contents and quality of their websites.

4

Control of Communicable Diseases

Chapter 4. Control of Communicable Diseases

Having gone through bio-terrorist attacks such as the September 11 incident of the US, and the threats of emerging communicable diseases such as SARS and 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 plans for infectious disease threats, nosocomial infection control, laboratory testing and research, and development of vaccines, more should be done to the amendment of laws and regulations to comply with the world trend. Further, the National Health Command Center (NHCC) was established to integrate various disease control command systems. It is expected that through the utilization of superior soft and hardware equipment and facilities, the goal of early detection and early prevention can be achieved to protect the health of the people.

Section 1. Regulations and Framework for Communicable Disease Control

To arrest the occurrence, infection and transmission of communicable diseases, the Communicable Disease Control Act and the AIDS Prevention and Control Act were formulated to comprehensively and adequately outline the rights and obligations of the people in communicable disease control, and also to serve as a basis for related workers to follow in performing their duties of communicable disease control. In the promotion of communicable disease control, the central government is responsible for formulating disease control strategies and plans and supervising the implementation of the strategies and plans by local health agencies; the local governments are responsible for formulating action plans in accordance with the strategies and plans of the central government, and executing various programs of communicable disease control.

1. Laws and Regulations for Communicable Disease Control

The Communicable Disease Control Act and the AIDS Prevention and Control Act are the two important laws in the prevention and control of communicable diseases. The last amendment of the Communicable Disease Control Act was made on June 14, 2007, with a view to continue to steadily promote the national immunization policies, assure the effects of vaccines, and thus to prevent loopholes in disease control. The AIDS Prevention and Control Act was partially amended and announced on February 5, 2005, to strengthen the control of AIDS. In coordination with the amendment, two other regulations, namely the Implementation Regulations of the AIDS Prevention and Control Act, and the Regulations Governing Lectures on AIDS and Other Sexually Transmitted Diseases, were also amended; and two administrative orders, the Guidelines Concerning Review of Applications for Reentering the Country (Border) of HIV Infected Individuals and the Guidelines Concerning Subsidies on Costs of Laboratory Testing and Treatment of AIDS, were 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-response capacities of all countries. Taiwan though is not a member of the WHO, as a member of the global community, Taiwan has made a considerable amount of efforts, in coordination with the implementation of the IHR, to amend the 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. Framework for Communicable Disease Control

1) Framework of Disease Control

In accordance with regulations of the Communicable Disease Control Act, diseases are controlled at two levels, the central and the local. The Center for Disease Control of the Department of Health (CDC/Taiwan) is the highest disease control authority to be responsible for the formulation of communicable disease control strategies

and plans, and also for the direction, commanding, supervision and evaluation of local health agencies in the execution of various communicable disease control work. County/city health agencies formulate action plans in accordance with the strategies and plans of the central government, and execute various communicable disease control programs.

2) Framework of Laboratory Testing

The Research and Laboratory Testing Center of the CDC/Taiwan is responsible for the laboratory testing and research of various communicable diseases in country, including confirmation of pathogenic agents, research and development of new laboratory testing techniques and technology transfer, formation of laboratory testing standards, and verification of laboratory testing. To meet the demands for the laboratory testing of various communicable diseases, in collaboration with medical centers and teaching hospitals, 13 contract laboratories have been set up. To upgrade the overall capacity and quality of laboratory testing, a quality monitoring of laboratory testing is conducted every year of all medical care institutions and the contract laboratories. A quality assurance and verification system for bio-medical laboratories is also planned and implemented.

To assure the quality, timing and safety of specimens of communicable diseases sent by local health agencies for laboratory testing, acting on regulations of Article 4 of the Communicable Disease Control Act, a national plan for the quality management of sending specimens of communicable diseases for laboratory testing is formulated for the reference of county/city health bureaus in formulating their action plans. For the sending of specimens of communicable diseases for laboratory testing, 10 quality control indicators have been decided. More will be done to strengthen relevant administrative control measures to improve year by year the quality of specimens of communicable diseases sent for laboratory testing to upgrade the efficiency of laboratory testing.

3) Commanding Framework

When the SARS epidemic devastated Taiwan in 2003, for the lack of a combat command 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, a team was sent to study the operation of the US Health Command Center, and after a year of preparation, a National Health Command Center (NHCC) was set up and inaugurated on January 18, 2005.

The command system of the NHCC is built following the command framework commonly used by the US emergency management systems to incorporate with locally developed standard command operational procedures for epidemics management, to set up, in addition to the general command center, a regional command center each in the northern (Nankang), central (Taichung), southern (Tainan), eastern (Hualien), and Kaoping (Kaohsiung) regions, and the Taoyuan International Airport. The NHCC serves as a platform for cross-ministerial information exchange to pull together relevant information supplied by various ministries, departments, local governments, and even private sector organizations, to transfer it into real-time information needed for the overall commanding on disease combating, and to provide the commanding officer with information needed for making decision to meet emergencies.

In the summer of 2006 when counties and cities in the southern region met difficulties to effectively control dengue fever epidemics, upon approval of the Executive Yuan, a National Command Center for Dengue Fever was set up on October 2. At time of disease control, the Center was able to fully function in integrating, coordinating and commanding. The threat of dengue fever epidemics was removed on December 22.

Section 2. Control of Major Communicable Diseases

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

The purposes of disease surveillance are to timely

detect the abnormal situation of disease occurrence, to establish long-term trends of diseases, and thus to facilitate the formulation of communicable disease control policies. The distribution of cases of notifiable diseases in 2006 in the Taiwan Area is shown in Table 4-1 and Table 4-2. The following paragraphs illustrate more about the surveillance and investigations of epidemic conditions.

1) Pluralistic Communicable Disease Monitoring Systems

Sentinel monitoring networks including sentinel physicians, monitoring systems in schools and in densely populated institutions are set up to collect information on trend of epidemics that is often unavailable in passive reporting which focuses on information of individual cases.

(1) Monitoring by sentinel physicians: This system was established by the former National Quarantine Service in 1989 and began operation in 1990. Results of this surveillance can provide information on trends of influenza and their medical care rate, and serve as an important reference for the government in deciding on control measures, selection of vaccines and case management. There are currently about 650 physicians in 70-80% of all townships throughout the country volunteered for this practice. The number of population covered by each sentinel physician is slightly next to that of Japan (on average, one sentinel physician per 36,000 population). Diseases monitored include flu-like infections, enterovirus infections and diarrhea. Information on the sentinel monitoring networks is collected and compiled each week, analyzed for trends in the six regions and the country as a whole, and is periodically fed-back to the sentinel physicians through e-mail and networks.

(2) Disease monitoring systems in schools: This project was tried out in 2001. The project covers about 92% of all townships. By December 2006, 454 primary schools had participated in this project, accounting for 17% of all primary schools. Children in kindergartens and schoolchildren from grade one through grade six are covered in this project. Diseases currently monitored are flu-like infections, chickenpox, mumps, hand-mouth diseases, herpangina, diarrhea, fever, and notifiable diseases. Information of sick children is collected and compiled each week for the six regions and the country as a whole, and fed-back periodically by e-mail to participating schools, education and health authorities.

(3) Disease surveillance in densely populated institutions: This project began in December 2003 to primarily monitor cluster infections of respiratory tract and intestinal tract in densely populated institutions. Inmates and staff of institutions such as nursing care institutions, long-term care institutions, houses for senior citizens, welfare institutions for the disabled, placement and correction institutions for children, houses for retired servicemen, correction centers, nursing homes, and rehabilitation institutions are monitored. By the end of 2006, some 1,750 institutions had participated in this project for a population of 200,000. During the period, 150 institutions had reported 1,619 person-times of incidents; of them, 694 person-times were suspected of respiratory tract symptoms, 905 of intestinal tract symptoms, 20 cases of fever cluster, 25 cases of respiratory tract symptom cluster, and 59 cases of intestinal tract symptom cluster. A cluster incident alarming value is set for this system. When one institution reports in three days three or more cases of the same symptoms, the system will automatically send message to disease control personnel to take early precautions.

2) Integration of Disease Surveillance Systems

(1) To integrate disease surveillance systems and strengthen their functions, in 2006, the third stage project of the Notifiable Disease Surveillance System was established for online use to integrate the previous "automatic monitoring and reporting system" to a "syndromic surveillance system"; to integrate the previous "syndrome surveillance system" into the "notifiable disease surveillance system" to upgrade their functions. The entry of reporting is thus made into one, and the timeliness of disease reporting is upgraded.

(2) An integrated national disease control information network was set up. The network contains information systems such as the Syndromic Surveillance System, Emerging Communicable

Table 4-1 Cases of Acute Notifiable Diseases , 2006

Category	Disease	Total		Indigenous		Imported	
		Reported	Confirmed	Reported	Confirmed	Reported	Confirmed
I	※Cholera	1	1	1	1	-	-
	※Plague	-	-	-	-	-	-
	※Yellow fever	-	-	-	-	-	-
	※Rabies	-	-	-	-	-	-
	※Ebola hemorrhagic fever	-	-	-	-	-	-
	※Anthrax	-	-	-	-	-	-
	SARS	-	-	-	-	-	-
II	+Typhus fever	-	-	-	-	-	-
	※Diphtheria	-	-	-	-	-	-
	Meningococcal meningitis	25	13	24	12	1	1
	Typhoid	75	43	51	25	24	18
	Paratyphoid	56	10	48	3	8	7
	※Poliomyelitis	-	-	-	-	-	-
	Acute flaccid paralysis	74	66	73	65	1	1
	Bacillary dysentery	164	139	122	101	42	38
	Amebic dysentery	363	125	223	81	140	44
	Dengue fever	2,465	1,074	2,310	965	155	109
	※Malaria	26	26	-	-	26	26
	Measles	24	4	21	1	3	3
	Acute viral hepatitis A	193	189	178	174	15	15
	EHEC (Enterohemorrhagic E. coli)	6	-	6	-	-	-
	Enterovirus complicated severe cases	48	11	48	11	-	-
	※Hanta virus hemorrhagic fever	3	3	3	3	-	-
	※Hanta pulmonary syndrome	-	-	-	-	-	-
III	Japanese encephalitis	251	29	247	28	4	1
	Rubella	54	6	50	3	4	3
	※Congenital rubella syndrome	-	-	-	-	-	-
	Pertussis	135	14	135	14	-	-
	Scarlet fever	1,634	1,130	1,629	1,129	5	1
	Tetanus	14		14		-	
	※Neonatal tetanus	-	-	-	-	-	-
	Scrub typhus	2,353	384	2,316	383	37	1
	Acute viral hepatitis B	274	245	268	241	6	4
	Acute viral hepatitis C	759	154	758	154	1	-
	Acute viral hepatitis D	12	5	11	5	1	-
	Acute viral hepatitis E	72	11	67	10	5	1
	Acute viral hepatitis, unspecified	17	9	17	9	-	-
	Mumps	971	5	970	4	1	1
	Chickenpox	10,563		10,559		4	
	Legionnella	605	56	602	54	3	2
	Invasive hemophilus infection type b	41	16	41	16	-	-
	Influenza complicated severe cases	96	25	96	25	-	-
Designated communicable diseases	※Smallpox	-	-	-	-	-	-
	※Lassa fever	-	-	-	-	-	-
	※Marburg virus hemorrhagic fever	-	-	-	-	-	-
	※Rift valley fever	-	-	-	-	-	-
	※West Nile fever	-	-	-	-	-	-
	※Novel influenza	-	-	-	-	-	-

Notes 1：Data are for the period January 1 to December 31, 2006; year of occurrence is used for analysis
2：※Only confirmed cases are included; "-"stands for 0, 「」no data

Table 4-2 Cases of Chronic and Other Notifiable Diseases, Taiwan, 2006

Category	Disease	Reported	Confirmed
III	Open tuberculosis	6,566	5,542
	Other tuberculosis	13,841	9,836
	※Leprosy	11	11
	※Syphilis	5,808	5,808
	※Gonorrhea	1,437	1,437
Others	AIDS	579	579
	HIV infection	2,938	2,938

Note 1: Data are for the period January 1 to December 31, 2006; year of diagnosis is used for analysis
2: ※Only confirmed cases are included
3: In coordination with the Communicable Disease Control Act and to link with international indicators, tuberculosis is presented into two classifications, positive sputum smear and other tuberculosis.
4: Data analysis of AIDS and HIV infection is based on domestic cases

Disease Hospitalization and Management System, Geographic Information System on Communicable Diseases, Electronic Bulletin System (EBS), Notifiable Disease Surveillance System, sentinel physicians' reporting, reporting of communicable diseases in densely populated institutions, and reporting of school surveillance. The network integrates databases of communicable diseases, sentinel physicians, tuberculosis and GIS for collecting communicable diseases data through diversified channels for the timely monitoring and control of epidemic conditions.

3) Investigation of Epidemics

The communicable disease epidemics investigation information system of the CDC/Taiwan immediately perform epidemic investigation of notifiable diseases; it can at the same time, following the actual situation or by diseases, develop its own simulation questionnaires to assist in the daily routine collection, maintenance, and inquiry of various epidemic survey data. At the same time, for the convenience of disease control personnel in using standardized epidemic investigation questionnaires for the analysis of communicable diseases, some cross-sectional or vertical analyses such as analysis of epidemiological curves, demographic analysis, and odds-ratio analysis are made for their reference in understanding epidemic conditions or in formulating management measures.

In 2006, work was continued to implement the FETP (Field Epidemiology Training Program) to develop manpower in field epidemiology to assist the CDC/Taiwan to timely and promptly control outbreaks. Information collected through practical work is statistically analyzed, and findings are submitted to the administration for reference in making health policies. In 2006, the FETP had conducted eight epidemiological investigations of outbreaks and cluster infections of unknown causes, including three cases of norovirus, three cases of food poisoning, one case of tuberculosis, and one case of skin rash of unknown causes.

To detect the emerging and re-emerging communicable diseases, the Investigation Task Force for Diseases of Unknown Causes (ITDUC) of the CDC/Taiwan, in collaboration with resources of the health administration systems, medical care systems and academic research systems, has invited scholars and experts in infectious diseases, epidemiology, pathological anatomy and toxicology to investigate and analyze sudden death cases of unknown causes of suspected communicable diseases. Pathological anatomy of communicable diseases is actively promoted to clarify pathogenic causes for the early adoption of disease control measures to interrupt possible routes of transmission. Through this process, it is hoped that more understanding of certain specific pathogenic agents can be gained and prevented for the effective and timely

control of epidemics, and thus to minimize fears and panics of the public and to avoid aftermath of hazards. In 2006, there had been 30 deaths of unknown causes reported (8 were dissected). Of them, 14 cases were in the northern region (four dissected); five in the central region; eight in the southern region (three dissected); and three in the eastern region (one dissected).

By the end of 2006, 54 cases of rubella (six confirmed), 24 cases of measles (four confirmed), and 74 cases of acute flaccid paralysis (66 confirmed) had been reported. No cases of congenital rubella syndrome and neonatal tetanus had been confirmed. Adequate preventive measures had been taken accordingly.

2. Communicable Diseases of the Respiratory Tract

1) Tuberculosis

Each year throughout the world, some nine million people are infected with tuberculosis and some two million die. In the period between 2004 and 2006 in Taiwan, the confirmed cases of tuberculosis were 16,784, 16,472 and 15,378 respectively. In consideration of the current status of tuberculosis and the effectiveness of control efforts in the past, the CDC/Taiwan, with reference to the Global Plan to Stop TB 2006-2015 of the WHO, has formulated a Mobilization Plan to Reduce Tuberculosis by Half in Ten Years, with a view to reduce by the year 2015 the case incidence to 34 per 100,000. The Plan includes three networks of public health, medical care and laboratory testing to realize strategies such as follow-up of contacts, and screening for the high-risk groups to early detect tuberculosis cases (Find TB); a referral network for medical care for multiple drug-resistant tuberculosis will be established; quality of medical care and laboratory testing will be upgraded; and the DOTS plan will be intensified to give patients comprehensive care (Cure TB). In addition, international cooperation, academic exchange, and research and development will be promoted; and private sector organizations and other government organizations concerned will be encouraged to join in the fight against tuberculosis. Achievements made in 2006 are summarized as follows.

(1) More medical care institutions waive the co-payment for medical care of tuberculosis; subsidies are made to individuals not covered by the National Health Insurance and also to chronic open tuberculosis cases and hospital care of patients of mountain areas for their medical costs. Medial care is made more convenient and obstacles are removed. 801 person-times of individuals not covered by the NHI have been subsidized for medical care.

(2) A plan to improve payment for the medical care of tuberculosis patients has been implemented, and thus far, 307 medical care institutions have participated in the plan. In total, 12,179 cases have been reported, confirmed and placed under management. Hospitals will set up case-managers to assist in case management and to urge cases for re-visits to improve care rate.

(3) The DOTS plan is promoted in counties and cities with 368 additional workers employed as care-givers to assist the promotion. They supervise the regular medication of patients. The 90 persons employed under the expanded employment plan for public service help in case management and home visiting. In total, 120,377 person-times of cases have been thus served.

(4) Work continues to promote the tuberculin laboratory testing network plan. In total, 133,273 sputum specimens have been tested; and nationally, 70% of the sputum smear-positive cases have been included in the DOTS plan.

2) Meningococcal meningitis

In 2006, 25 cases of meningococcal meningitis had been reported; of them, 13 were confirmed, and two died, giving a fatality rate of 15%. The number of confirmed cases was fewer than that of the year before. Of the confirmed cases, serogroup B accounted for 77%; serogroup Y for 15%; and serogroup C for 8%. For details, please refer to Table 4-3.

3. Communicable Diseases of the Intestinal Tract

1) Enterovirus

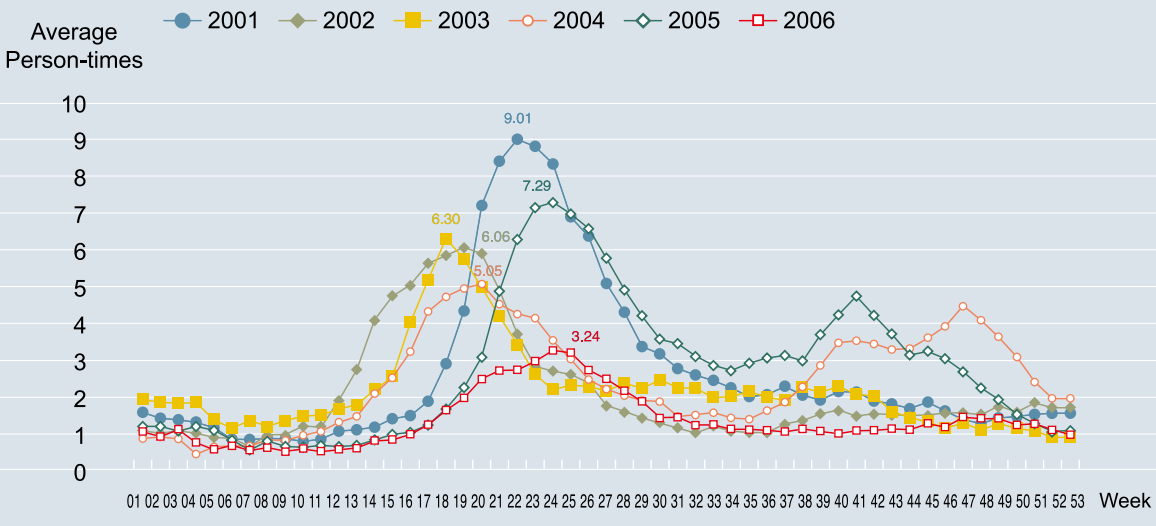
Enterovirus infections are strictly monitored through the communicable disease reporting and management system, sentinel physician system, and the system of laboratories contracted for the monitoring of viral infections. In 2006, 11 enterovirus complicated severe cases were confirmed with no death. The average

Table 4-3 Monthly Distribution of Meningococcal meningitis, 2006

Month	No. of Cases				Serotypes					
	Reported	Confirmed	Deaths	Fatality Rate	A	B	C	W135	Y	Unspecified
January	1	1	0		0	1	0	0	0	0
February	0	0	0		0	0	0	0	0	0
March	2	0	0		0	0	0	0	0	0
April	1	0	0		0	0	0	0	0	0
May	0	0	0		0	0	0	0	0	0
June	3	2	1		0	2	0	0	0	0
July	3	1	0	15%	0	0	1	0	0	0
August	4	3	0		0	2	0	0	1	0
September	3	3	0		0	2	0	0	1	0
October	3	0	0		0	0	0	0	0	0
November	2	1	0		0	1	0	0	0	0
December	3	2	1		0	2	0	0	0	0
Total	25	13	2		0	10	1	0	2	0

Notes : 1. In 2005, there were 20 confirmed cases of Meningococcal meningitis with one death, giving a fatality rate of 5%.
2. In 2006, there were 13 confirmed cases of Meningococcal meningitis with two deaths, giving a fatality rate of 15%.

Figure 4-1 Comparison of Enterovirus Case Number Reported from Sentinel Physicians by Year



number of entrovirus cases reported by sentinel physicians by 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. Recent epidemic conditions of enterovirus infections and

the distribution by township of enterovirus 71-type and enterovirus severe cases are announced periodically for the reference of counties and cities in the prevention and control of enterovirus infections and in deciding whether schools should be closed.

To improve knowledge in disease prevention and control, health education materials such as the Enterovirus-prone Group Control Handbook, Entrovirus Control Plan, Enterovirus Control Handbook for Child Care Workers in Nurseries, Kindergartens and Primary Schools have been revised and published.

Since 2006, county/city health bureaus have been commissioned to conduct a plan to intensify education and training to enhance the quality of medical care for enterovirus infections and to strengthen health education in communities. Through this plan, the knowledge and skills of medical and nursing personnel has been improved; and local seed workers in health education have been developed to reduce chances of being infected with enterovirus and thus to prevent the occurrence of adverse sequelaes and deaths.

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 formulation of policies, and thus to reduce the fatality of severe cases. A list of recommended hospitals for referral is provided for the reference of medical care institutions in referring their patients, and thus to allow severe cases access to timely and adequate medical care to reduce fatality and the occurrence of adverse sequelaes.

2) Bacillary Dysentery in Mountain Areas

The plan to strengthen prevention and control of bacillary dysentery in mountain townships has been continued. In 2006, only 15 cases of bacillary dysentery had been reported from the mountain townships, a sharp decline of 93% over the average of 206 cases per year of the previous five years. Not even a case had been reported from Tatung, Chienshih, Wefung, Hsinyi, Yenping, Haituan, Tajen, Chinfeng and Lanyu townships. The incidence of bacillary dysentery in mountain townships had declined from 31.3 per 100,000 in 1997 to only 6.0 in 2006, suggesting that the infection has been brought under effective control.

3) Hepatitis A

A proram to immunize against hepatitis A children two years of age through primary school 6th grade in 30 mountain townships in remote areas and preschool children in nine nearby plane 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 1.0 in 2006, indicating the success of the

Figure 4-2 Incidence of Bacillary Dysentery in Mountain Areas, 1997-2006

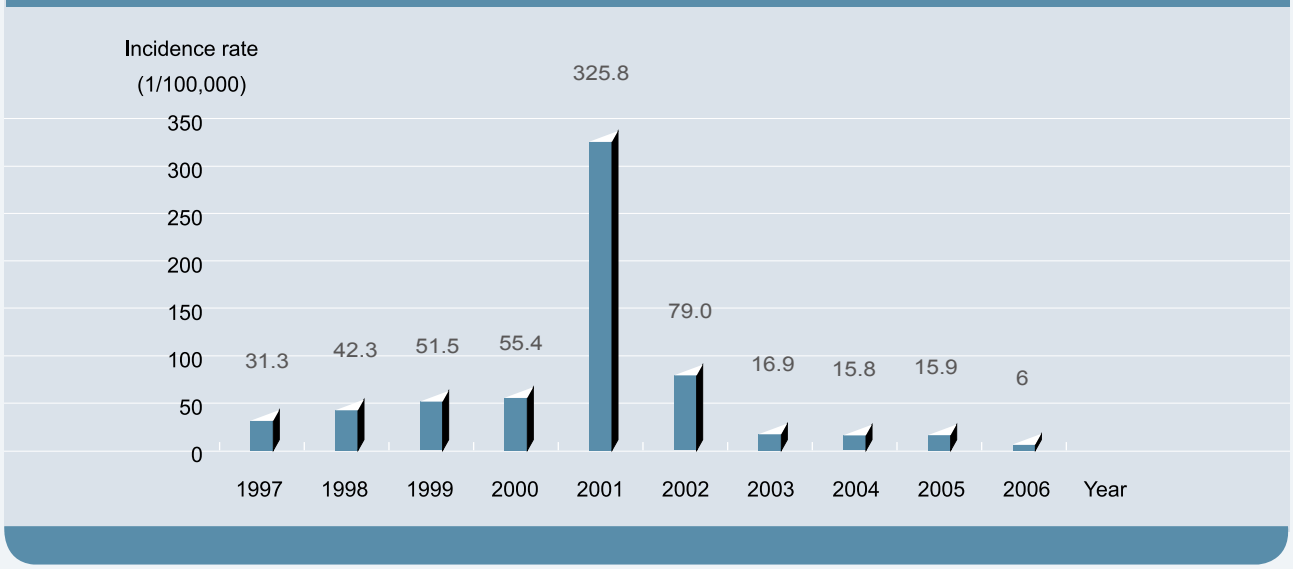


Figure 4-3 Distribution of Confirmed Indigenous Dengue Fever Cases, 2006

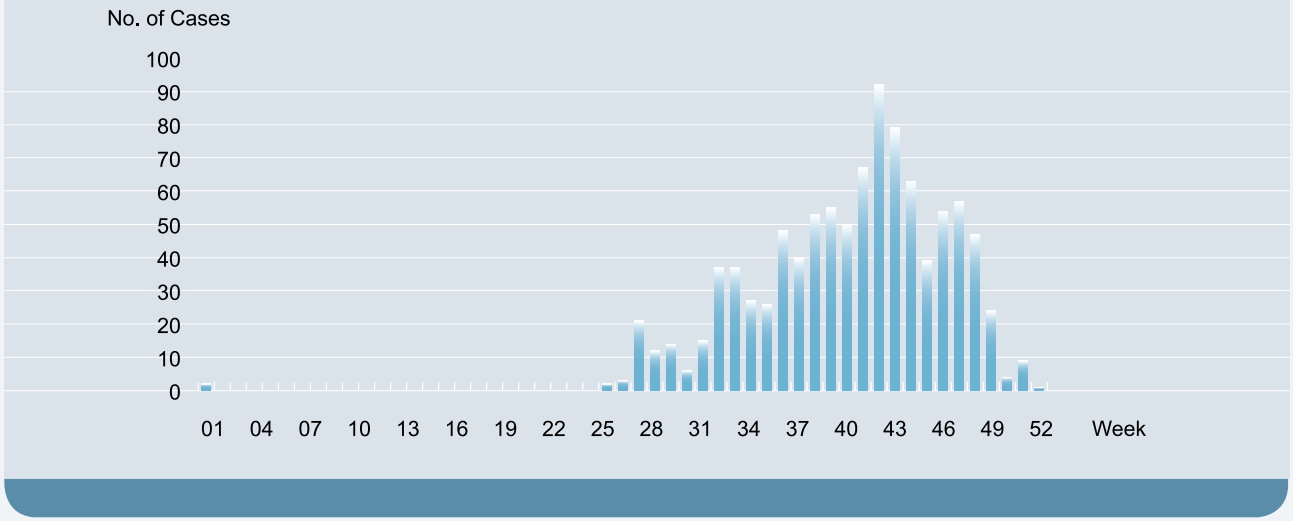


Table 4-4 Serotypes and Origins of Imported Dengue Fever Cases , 2006

Country of Origin	No. of Cases	Serotypes				
		DN-1	DN-2	DN-3	DN-4	Unspecified
Indonesia	20	5	4	3	1	7
Myanmar	2			1		1
Vietnam	36	7	10	3	1	15
Philippines	16	1	5	5		5
Thailand	12	3	4		3	2
Cambodia	9			4		5
Salvador	1	1				
Malaysia	5	3		1		1
India	3	1	1			1
Bangladesh	4			2		2
Madagascar	1	1				
Taiwan	965	1	34	370		560
Total	1074	23	58	389	5	599

control program.

4. Vector-Borne Communicable Diseases

1) Dengue Fever

In 2006, there were 1,074 confirmed cases of dengue fever, with four deaths; of them, 109 were imported, and 965 were confirmed indigenous cases (19 dengue hemorrhagic fever cases) (Figure 4-3 and Table 4-4).

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

(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 control centers; and private sector organizations in the dengue fever high-risk areas are subsidized to conduct community building for the elimination of breeding sources of vector mosquitoes. Health education is intensified and educational materials are produced to improve the knowledge of the public on the control of dengue fever.

(2) The work manual on the control of dengue fever has been revised; training of disease control and medical personnel in dengue fever control, vector mosquito surveys and emergency spray of pesticides has been strengthened.

(3) The monitoring mechanism has been strengthened. Monitoring mechanisms on breeding sources, larva and vector mosquitoes have been set up. 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 spray of pesticides, elimination of breeding sources, and health education of the public. Monitoring of inbound passengers from Southeast Asia is strengthened, and arriving passengers with abnormal body temperature is screened for dengue fever.

(4) By using the dengue fever epidemics projection data, a national dengue fever epidemics command center was set up on October 2, 2006, and a frontline command post was set up in Kaohsiung at the same time to effectively integrate central and local disease control resources to unify, coordinate and supervise matters concerning the control of dengue fever. With rather insufficient funds for operation, the epidemics had shown a declining trend soon after three months of the operation of the command center, and epidemic conditions in some major areas had been brought under control. The outbreaks of 2002 were avoided; and the approval rate of the public of the government in the control of dengue fever had improved from 57% in September 2006 to 70% in November.

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 to 400 cases are reported, though only ten to 30 are confirmed. In 2006, there were 251 reported cases and 29 were confirmed. By age, the eldest patient was 74 years old, and the youngest was 11 years old, with an average age of 46.8 years.

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 2006, 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 December 2006, there had been a cumulative total of 13,702 reported cases of HIV infection (including 599 foreigners). Of the indigenous cases, 2,981 had developed into full-blown AIDS; of them, 1,570 had died.

The Harm Reduction Program promoted since 2006 is an all-directional integrated program. The purpose is to reduce hazards of drugs to individuals, families and the society. Measures include: 1) Screening and monitoring of injecting drug users (IDUs) for HIV is expanded to early detect cases for timely treatment to prevent their transmission to others. 2) Needle-syringe program (NSP) is implemented to provide drug addicts with supervision, follow-up and counseling on drug cessation to prevent them from being infected with hepatitis B, C and HIV. 3) Substitute treatment is offered to IDUs who are unable to quit drug use to allow them taking orally substitutes of lower hazards in place of intravenous injection of high danger; they are followed-up, supervised, educated and referred for drug cessation.

As the number of IDUs infected with HIV is increasing, a pilot project, Harm Reduction of IDUs from being infected with HIV, was tried out in December 2005 to supply drug users with clean needles and substitute treatment. After a half year of trial, the project was considered effective and was implemented on an extended basis in July 2006. By December 2006, 19

medical care institutions throughout the country were providing substitute treatment services to treat a total of 1,066 cases and 89,650 person-days of medication. 730 clean needle-syringe supply and counseling stations have been set up; and over 450,000 needles have been distributed to more than 74,000 person-times of IDUs. The number of new HIV infections had declined from 3,399 in 2005 to 2,942 in 2006, a decline of 457 cases. This was the first decline in the number of infections since the first HIV infection was detected in Taiwan in 1981. The 2006 Global Competitiveness Assessment of the World Economics Forum (WEF), in its accreditation of health-related indicators, noticing that Taiwan has succeeded in controlling the HIV prevalence of adults 15 to 49 years under 0.1%, listed Taiwan, among 125 countries assessed, as number one together with 24 other countries.

To strengthen AIDS control, an AIDS Control Program was initiated in 1994. The Program is in its fourth five-years. There are at present 32 designated HIV/AIDS hospitals and four designated HIV/AIDS hospitals for IDUs providing free medical care and HAART (Highly Active Anti-Retroviral Therapy) treatment. Nine designated hospitals including the National Chengkung University Hospital have been commissioned to conduct free anonymous screening to strengthen screening of the high-risk and specific groups. In 2006, 6,088 persons had accepted the screening.

To prevent the vertical transmission of HIV from mothers to children, since 2005, all pregnant women are screened against HIV. By the end of 2006, 58 positive cases had been detected; of them, 45 were indigenous and 13 were foreigners.

For the care of HIV infected patients, the Garden of Mercy Foundation and the Harmony Home Association have been commissioned to provide cases with care and counseling. The Lourdes Association has been subsidized to promote community care in Taipei and Taichung to provide life care for patients, for 1,186 person-times.

2) Sexually Transmitted Diseases

To collect epidemiological information on sexually transmitted diseases, the Department, in collaboration with physicians of obstetrics and gynecology, dermatology, family medicine, urology and infectious diseases, began in November 2003 to conduct a project on the monitoring and reporting of STDs by sentinel physicians and HIV testing of STD patients. In 2006, a total of 256 medical care institutions involving 466 sentinel physicians participated in this project. The project is intended to realize the reporting of STD symptoms and the 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 standards of diagnosis and treatment.

3) Hepatitis B and C

There are estimated to be around 2.5 to 3 million hepatitis B carriers in adults in Taiwan; and the number of hepatitis C infection is about 700,000 to 800,000. To provide treatment to those already infected, a pilot project, Strengthening of Treatment for Chronic Hepatitis B and C Patients under the National Health Insurance, began on October 1, 2003, hoping to significantly reduce incidence of liver cirrhosis and hepatoma. In the period between October 2003 and end of December 2006, 33,017 person-times of cases had been registered; 21,074 person-times for hepatitis B (including 740 cases with drug-resistant strains), and 11,943 person-times of hepatitis C.

Prenatal examination of pregnant women for hepatitis B and immunization of the newborns against hepatitis B are continued. The carrier rate of children at age six had declined from 10.5% before the immunization program to 0.84%. Make-up immunization of preschool children and schoolchildren upon enrollment against hepatitis B is also conducted. The hepatitis B immunization coverage rates for the second and third doses for the cohort born in 2005 are 97.6% and 95.4% respectively.

6. Quarantine, Health on Traveling, and Health of Alien Laborers

1) Quarantine

To prevent the entry of communicable diseases, necessary quarantine measures are taken against vessels, aircraft, crew and passengers. Immunization is carried out against some major communicable diseases such as cholera, yellow fever, and meningococcal meningitis. For the sanitation of ports, a sanitation and security team is organized jointly by the CDC/Taiwan, the harbor (airport) authorities, the police departments and customs authorities to plan, coordinate and execute matters concerning sanitary control in the port areas, to maintain the sanitation of ports, and to prevent the entry

and export of communicable diseases. Achievements in the quarantine of inbound transportation means is shown in Table 4-5.

2) Communicable Diseases Control on Traveling

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 Control Survey Form. Health education materials such as a leaflet, Health Advice for Travelers, are produced for distribution at international ports and ports of Kinmen and Matsu, the terminals of the "Mini-Three-Links" with China. Health education is also given to outbound passengers and groups. Educational materials such as light-boxes and posters are placed at international ports. Airlines and vessels of the three small-links are requested to show disease control videos on board. Core educational materials have been developed and produced for travel agents; and training is conducted jointly with travel associations for tour guides.

3) Health Management of Alien Laborers

There were some 330,000 legal alien laborers in Taiwan in 2006. To prevent the entry of communicable diseases, all legally brought in alien laborers are required of health examinations for application of entry visa; they are required for further health examinations after entry.

To strengthen the health management of alien laborers, the Department, under the authorization of the Employment and Service Act, formulated and announced in 2004 a set of Regulations Governing Management of the Health Examination of Employed Aliens, and another set of Regulations Governing the Designation and Management of Hospitals for the Health Examination of Employed Aliens after Entry. Alien laborers are requested to undergo health examination at designated hospitals prior to entry, three days after entry, and 30 days before or 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, stool examination for intestinal parasites, pregnancy test, general physical examination (including mental status), and leprosy examination. Pregnancy test and hepatitis B surface antigen testing are waived for the health examinations at six months, 18 months and 30 months of employment. Alien laborers failing any one item of the examination are not permitted for entry; and those who have already entered, except intestinal parasites (except *Entamoeba histolytica*) that are given 30 days for treatment and re-examination, are deported.

To upgrade the quality of health examination for alien laborers, and to execute the relevant regulations of the Regulations Governing the Designation and Management of Hospitals for the Health Examination of Employed

Table 4-5 Quarantine at International Ports, 2006

Quarantine Authority	Inbound Ships (No)	Vessel Passengers (No)	Passenger Aircraft (No)	Air Passengers (No)	Cargo Planes (No)	Tonnage of Air Cargo
1st Branch Office (Keelung Harbor)	7,451	18,054				
1st Branch Office (Suao Harbor)	657	0				
1st Branch Office (Shuitou Harbor of Kinmen)	3,479	620,454				
1st Branch Office (Fuwuo Harbor of Matsu))	918	45,780				
2nd Branch Office (Taoyuan Airport)			63,879	9,294,915	14,936	4,474,413
3rd Branch Office (Taichung Harbor)	5,710	2,924	296	20,127		
3rd Branch Office (Mailiao Harbor)	2,510	2				
5th Branch Office (Kaohsiung Harbor)	17,323	44,169				
5th Branch Office (Xiaogang Airport)			14,542	1,673,963	637	208,536
6th Branch Office (Hualien Harbor)	1,306	257	26	2,309		
Total	39,354	731,640	78,743	10,991,314	15,573	4,682,949

Aliens after Entry, the validity of the original 72 designated hospitals for the health examination of alien laborers was terminated on July 15, 2006. Hospitals (except those on offshore islands) newly applying for health examination of alien laborers must be either regional and above teaching hospitals or teaching hospitals accredited and qualified by the new hospital accreditation system. Their laboratories should also be accredited. By the end of December 2006, 51 hospitals had been newly designated; of them, four are on offshore islands. 47 laboratories of these hospitals had been accredited.

In 2006, 325,060 person-times of alien laborers had gone through regular health examinations (except the one three days after entry); and the failure rate was 6.03%. Failure rate of parasites at 5.89% was the highest; and tuberculosis at 0.12% came the next. The HIV antibody positive rate was 0.01%. In the years 2004, 2005 and 2006, the failure rates in intestinal parasites of the regular health examinations of alien laborers were 2.61%, 3.53% and 5.89% respectively; the chest x-ray failure rates were 0.05%, 0.08% and 0.12% respectively. The failure rates increased slightly in the years 2005 and 2006; due perhaps to the improvement in the quality of health examination as a result of the promotion in the recent two years of measures such as laboratory certification, and on-site spot-checking of chest x-ray and parasite specimens.

Section 3. Prevention and Control of Emerging Communicable Diseases

The September 11 terrorist attack on the US in 2001, the threats of anthrax biological terrors, the SARS outbreaks in 2003, and the pandemics of 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 emerging communicable diseases and their control measures.

1. Influenza Pandemics

The likelihood of pandemics of influenza comes from the spread of epidemics among poultry and human cases caused by H5N1 avian flu virus. Since 2004, the World Health Organization has released reports on human cases of H5N1 influenza. International data also show that the risk of influenza pandemics is approaching. The pandemics, if occurs, will have serious impact on the health and lives of human beings, will also bring about risks of socio-economic stresses and disorder. The CDC/Taiwan thus formulated in 2005 a Preparedness Plan against Influenza Pandemics to serve as the highest policy guidelines. The levels of alertness to influenza epidemics are shown in Table 4-6.

To face the challenges of the next influenza pandemics, the CDC/Taiwan has set up four strategies of early detection, interruption of transmission, antiviral medicines, and flu vaccines, and five defense lines of containment abroad, quarantine at border, health management in community, maintaining normal functions of medical care systems, and individuals and family protection. Achievements in 2006 are as follows.

1) The stockpile quantity of antiviral agents has reached it's goal. By 2006, some 2.38 million doses of antiviral

Table 4-6 Levels of Alertness to Influenza Epidemics

Level	Time to Activate
Phase O	Foreign condition: Human infection(s) with a new influenza virus subtype, but no human-to-human spread. Domestic condition: No new influenza virus subtypes have been detected in humans.
Phase A1	Foreign condition: Human-to-human spread cluster(s) with a new subtype Domestic condition: No new influenza virus subtypes have been detected in humans
Phase A2	Domestic condition: New subtype has been detected in humans, no matter the human case is imported or domestic, and no matter the case is infected from other human case, infected animal or laboratory specimen.
Phase B	Domestic condition: Human-to-human spread cluster(s) with a new subtype.
Phase C	Domestic condition: Sustained transmission with a new subtype. in general population.

drugs had been stockpiled, reaching the goal of covering 10% of the whole population. Along with the principle of diversified stockpile, the Material Management Information System (MIS) has been renewed; training has been conducted; and targets for administration during different pandemic alert phases have been planned.

2) Planning for the stockpile and use of a candidate pandemic vaccine has been completed. Some 190,000 doses of H5N1 vaccines are stockpiled as short-term supplies for preparedness and to meet the needs of the maintenance of medical care services and major social functions. Priority targets for the use of H5N1 influenza vaccines are planned to maintain the minimal manpower requirement for disease control, medical care services and major social functions.

3) A PPE (personal protection equipment) management system has been established. Protective devices such as P100 masks have been purchased for the protection of medical and nursing personnel at time of pandemics. The safety reserve of PPE is stipulated to set up storage at three levels of the central government, local governments, and hospitals, and an inspection by level and allocation is carried out regularly.

4) Flu pandemic surveillance systems are established. To enhance the effectiveness and efficiency of system surveillance, in 2006, more laboratory testing reagents such as PCR and RT-PCR had been purchased. Related information systems have been set up; and epidemiological investigation procedures and forms have been developed.

5) Knowledge and skills of personnel at various levels have been upgraded. A series of drills on flu pandemics have been held. The drills focus on management of inbound passengers at airport, deployment of medical teams on offshore islands, emergency allocation of PPE, operation of the Central Epidemic Command Center, and responses of local authorities.

2. Control Measures Against Emerging Communicable Diseases

1) Smallpox, Lassa fever, Marburg hemorrhagic fever, Rift Valley fever and West Nile fever are announced designated communicable diseases.

Regulations of Article 6 of the recently amended International Health Regulations (IHR) concerning reporting specifically stipulate that 14 communicable diseases of smallpox, poliomyelitis due to wild type poliovirus, human influenza caused by a new subtype, SARS, cholera, pneumonic plague, yellow fever, Ebola hemorrhagic fever, Lassa fever, Marburg hemorrhagic fever, West Nile fever, dengue fever, Rift Valley fever and meningococcal meningitis should be placed under surveillance. Member states of the WHO should, in accordance with the stipulations of the Regulations, "assess and notify events that may constitute a public health emergency of international concern", and assess whether it is necessary to report the domestic public health event to the WHO. At that time, in the Communicable Disease Control Act, with the exception of Smallpox, Lassa fever, Marburg hemorrhagic fever, West Nile fever and Rift Valley fever, the rest were already listed as notifiable diseases to be reported.

To allow the disease control system to effectively monitor and control the five diseases mentioned above, and by regulations of the newly amended IHR to link with the global disease control trend, on February 9, 2006, in accordance with regulations of Article 3 and Article 43 of the Communicable Disease Control Act, the five diseases were announced designated communicable diseases. Of them, Smallpox, Lassa fever, Marburg hemorrhagic fever and Rift Valley fever are handled as Category 1 Notifiable Diseases; and West Nile fever is handled as Category 2 Notibiable Disease. For the effective control of these five diseases, management procedures for suspected hemorrhagic patients are formulated, and a work manual is produced. An online real-time reporting channel and a disease investigation system have been set up, and unified teaching materials for them have been developed to allow public health and medical personnel to understand better about the control of these newly announced diseases and to comply with.

2) Compilation of a Clinical Guide on Zoonosis

To strengthen the understanding of clinical health workers on zoonosis and as a guide for their practice, the Chinese Society of Comparative Pathology, the Infectious Diseases Society of Taiwan, and the Nosocomial Infection Control Society of Taiwan, ROC, have been commissioned to compile a guide. The Guide contains information on 78 major zoonoses, their reporting systems, bio-safety in laboratories, and isolation guidelines for medical care institutions for the reference

of clinical medical personnel.

3) Establishment of an Information Website on Zoonosis

A website is established to integrate currently available information on zoonosis to serve as a platform for the academics, health and medical care personnel, and people in contact with animals. Knowledge on zoonosis is also disseminated through this website to improve the overall disease control capacity. Contents of the website include downloaded files of the Clinical Guide on Zoonoses, health education on disease control, news about activities, epidemic information, and the government actions in the prevention and control of zoonosis.

Section 4. Disease Control Preparedness and Infection Control

The SARS outbreaks in 2003, the September 11 terrorist attack on the US, and the anthrax bio-terrorist attack, all indicate the importance of the management of disease control supplies, control of infectious diseases, nosocomial infection control, and anti bio-terrorism. To upgrade the overall national disease control capacity against major diseases, work has been strengthened as follows.

1. Management of Disease Control Supplies

During the SARS outbreaks in 2003, demands for disease control supplies had suddenly increased; information was confusing, and the balance between demand and supply collapsed, to result in social panic and complaints from the public. To meet the demands of disease control in the future, the CDC/Taiwan started a series of action to manage disease control supplies, to sign contracts for the procurement of disease control supplies such as N95 respirators and surgical masks, and to assess and adjust from time to time based on epidemic conditions items of disease control supplies to be included in the contracts for procurement. In addition to stockpiling (Table 4-7), the CDC/Taiwan also tried to get the real-time information on manufacturing, sales and inventory by managing PPE supply chains and establishing information systems. In 2006, through table exercises, the familiarity of the primary health care units on the MIS system was assessed. They were also supervised to store sufficiently, and use promptly and correctly.

To effectively manage disease control supplies, in the safety stockpile, a system to store disease control supplies at three levels of the central, local and hospitals has been set up. The disease control supplies stored at the central level are primarily for emergency allocation; the stocks at the local level are for local mobilization and control of communicable diseases; and stocks in hospitals are for nosocomial infection control resulted from patient admission. They should all store sufficient amount of disease control supplies.

For the combat mobilization and preparedness plan against outbreaks of influenza, the Animal and Plant Quarantine Bureau of the Council of Agriculture, the Coast Guard Administration of the Executive Yuan, the National Police Administration of the Ministry of the Interior, the Air Police Squad, the National Fire Department of the Ministry of the Interior, and the Environmental Protection Administration have been supported with personal protective devices such as 366,000 pieces of N95 masks, 1,844,000 pieces of surgical masks (including procedure masks), 289,000 pieces of protective clothes, 227,000 pieces of isolation gowns, and 185,500 pairs of gloves.

2. Infection Control

1) Communicable Disease Prevention Network

Organizational framework of the communicable

Table 4-7 Stockpiles of Disease Control Supplies

Unit: 10,000 pieces

Item \ Level	Hospitals	Local Government	Central Government	Others	Total
N95 respirators	139.3	97.9	53.1	2.7	293.0
Protection clothes	75.3	45.4	250.3	86.6	457.6
Surgical mask	526.3	434.7	62.8	20.0	1,043.9
Regular mask	107.9	85.1	718.8	61.7	973.5

disease prevention and control network has integrated the medical and public health systems to provide safer and more effective treatment of patients of communicable diseases and protocols for health care workers. The framework includes six command centers, 23 communicable disease control hospitals, consulting committees, supporting hospitals and other departments concerned. Regular meetings are held and drills and other training are conducted to familiarize organizations and personnel concerned with Network, and to allow the Network to function in full. To meet 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 reference of organizations concerned in planning relevant programs to provide patients with adequate care.

2) Nosocomial Infection Control

To effectively reduce nosocomial infections in medical care (medical) institutions, and to realize nosocomial infection control, several policies have been formulated. Some important achievements are illustrated as follows.

(1) Inspection on nosocomial infection control: To improve the nosocomial infection control capacities of medical care (medical) institutions, standards of inspection have been formulated and inspections have been promoted. In the post-SARS period of 2004, major focus was placed on the spot-inspection of 60% of district and above hospitals; in 2006, local health bureaus conducted a census of 521 hospitals, and the CDC/Taiwan spot-checked 127 of them. Through the supervision by region plan, priority hospitals and hospitals that have not met requirements are supervised. In 2006, the total passing rate of the inspections was 98.66%, exceeding the originally set goal of 92%. The number of hospitals at various levels that failed the inspections had declined from 69 to only 7 (Table 4-8).

(2) Strengthening the implementation of the infection control plan: To encourage medical care (medical) institutions to participate in nosocomial infection control, a plan to strengthen infection control has been promoted. Since 2005, the quality of infection control and communicable disease control of hospitals, the quality of specimen collection and laboratory testing, and the quality of disease reporting and management, and their coordination in the control of communicable diseases have made significant progress.

(3) Supervision of nosocomial infection control by region: To supervise hospitals to set up nosocomial infection control systems, a pilot project was tried out the first time in 2002 to supervise nosocomial infection control of hospitals by region. A bi-monthly publication of nosocomial infection control is published each year; competent health authorities at various levels are assisted by infection control experts to conduct epidemiological investigations of communicable diseases in their jurisdiction; training for manpower development and improvement of professional knowledge is organized; and visits are made to priority management institutions (Table 4-9).

(4) Recommendations and guidelines on infection control are established: To develop recommendations and guidelines on infection

Table 4-8 Inspections of Nosocomial Infection Control, 2004-2006

Year	Year-end No. of hospitals (No)	Inspected (No)	Inspected/ Supervised by Competent Authorities (No)	Average Score (No)	Failed (No)	Qualified (%)
2004	553	339	509	79.3	69	79.6%
2005	535	535	862	85.2	39	92.7%
2006	521	521	950	90.3	7	98.7%

Note: A qualified hospital refers to the percentage of the inspection criteria that the hospital passes; more than 80% for medical centers, 70% for regional hospitals, 60% for district hospitals. These are the qualified hospitals of the year.

Table 4-9 Supervision of Hospitals by Region, 2004-2006

Year	Newsletter Issued (Bimonthly)	Training		Key-point Inspection	
		Target	Completed (% Completed)	Target	No. Actually Inspected (% Completed)
2004	6 issues	30	33 (110%)	170	192 (113%)
2005	6 issues	36	41 (114%)	205	212 (103%)
2006	6 issues	55	66 (120%)	230	296 (129%)

control that meet local needs for medical care institutions at various levels to comply with, in the period between 2004 and 2006, more than 20 relevant guidelines for the prevention of healthcare-associated infections had been completed. Through the development of information platform and testing systems, organizations at various levels are provided with a mechanism for self-training and evaluation of achievements.

(5) Other management measures: Since 2006, the multiple management measures on infection control and monitoring and reporting of antimicrobial resistance have been renewed for the early detection, real-time reporting of suspected cluster infections, and to reduce hazards of cluster infection in medical care (medical) institutions, and to help them adopt more effective control measures to protect the safety of patients.

3. Counter Bio-Terrorism

To strengthen capacity in counter bio-terrorism and response, in 2005, in collaboration with the Medical Affairs Bureau Ministry of National Defense, a bio-terrorism contingency cooperation training program was held from 2005. In the program, bio-protective facilities had been established, and 232 bio-protection response personnel were trained in the northern, central, southern and eastern regions. To assess the responding capacity of the bio-protection response personnel, two drills were held by region in 2006. The first drill was held on November 23 at the HSR Taipei Station. Advance warning was given; and the situation was set as "spread of suspected bio-warfare agent at station". The second drill was held on November 28 at the Taichung Harbor, without advance warning. The situation was set as "commercial vessels being contaminated by bio-warfare agents". The command systems, reporting mechanisms and response capacity are thus verified for the future reference of policies.

To promote knowledge on counter bio-terrorism and biological protection, the Department, in collaboration with the National Health Research Institutes, developed an counter bio-terrorism digital e-learning net. The learning is supplemented with conventional learning and practical exercise, to develop bio-defense personnel. Thus far, 362 professionals have been triained throughout the country.

4. Research and Laboratory Testing

1) Research and Laboratory Testing

(1) In 2006, 154,217 specimens of various notifiable communicable diseases were laboratory tested and diagnosed; a biological material and laboratory bio-safety management information system and a database of electro-microscope images of pathogens were set up, and 200 pictures of 26 bacteria, 90 of 12 kinds of viruses, 26 of three fungi, and 7 images of one parasite were taken. Files for all BSL-3 laboratories in Taiwan were built and two inspection visits were made.

(2) Reference laboratories for six major pathogenic agents of communicable diseases, yellow virus, tuberculosis bacilli, other bacteria, fungi, viruses and parasites have been planned, and will be built in 2008 to upgrade the skills and the overall capacity of laboratory testing.

(3) In coordination with the recommendations of the WHO, a project for the surveillance, reporting and laboratory testing of specimens for emerging infectious disease syndromes has been conducted; rapid molecular testing and epidemiological classification methods have been brought in and developed to upgrade skills in the

laboratory testing of emerging infectious diseases.

(4) A PulseNet, Taiwan is set up to provide quick diagnosis and confirmation process for cluster food-borne communicable diseases to prevent the spread of diseases, and also to serve as a platform for exchange with international surveillance systems and academic institutions.

(5) A National Influenza Center (NIC) has been set up to integrate domestic and international surveillance, to track down and report the trends of change of influenza viruses, and to serve as a platform for exchanges of local and international epidemiological laboratories.

(6) Work continues to collaborate with laboratories of the US Centers for Disease Control and Prevention (CDC) and the National Institute of Infectious Disease (NIID) of Japan. In collaboration with the NIID, projects to construct a molecular epidemiology laboratory network for diseases prevalent in Asia such as Dengue fever and other vector-borne diseases, and development of technology on MLVA of intestinal bacteria are in progress. A collaborative relationship has been built with the Aberdeen University of the UK and the Chiba University of Japan to set up a platform for the exchange of information on bacterial strains and typing. In collaboration with the National Institute of Public Health and Environmental Protection of the Netherlands, a global surveillance project on the Beijing strain of tuberculosis is ongoing.

(7) Pathogen Gene Project

i) This project is an ongoing year by year plan to construct databanks for various priority pathogen genes. Information of relevant genes is used to project the likely sources of infections for the surveillance of imported or emerging pathogens, and to timely provide molecular epidemiological information for advance warning against communicable diseases in time and to serve as an important reference in the formulation of disease control policies.

ii) Through sequencing of pathogen genes and analysis of the epidemiological information of cases, the sources of infection and routes of transmissions are clarified. The recent outbreaks of enterovirus subtype 71 and dengue fever in the southern part of Taiwan, the sudden increase of HIV cases among drug addicts, and surveillance of influenza viruses can be projected of their magnitudes and likely sources of infection to provide reference for the formulation of disease control strategies to be prepared in advance for outbreaks. Relevant gene sequences can also serve as an important reference in the future development of vaccines and diagnostic reagents.

iii) Construction of a pathogen gene information databank system continues.

(a) Soft and hardware were built for the new version of gene information databank to integrate information on viruses, bacteria, fungi under the gene typing information of the CDC/Taiwan and the integrated epidemiological information, and to offer more functions in analysis. The system has been online in January 2007.

(b) The qualitative analysis automation process and the laboratory information management system are integrated to link the case admission procedures of the qualitative analysis laboratory, PCR qualitative analysis process, and procedures of sequence matching and result analysis to construct a laboratory information system. The system is linked with the new gene information databank to provide online qualitative analysis service and to complete the construction of a management website.

2) Bio-Safety in Laboratory

At the end of 2003, there was an incident of laboratory infection of SARS. The concern over the bio-safety of laboratories was aroused. For this, local and international experts were invited to amend and formulate a set of Regulations Governing Management of Infectious Bio-materials and Collection of Specimens from Cases of Communicable Diseases. The set of Regulations was implemented on March 26, 2006. By the principles of management by level, all bio-safety level 3 and above laboratories should be inspected regularly each year to guarantee their safety. As for bio-safety level 2 (inclusive) and below laboratories, they are supervised and managed

by the bio-safety committee or person-in-charge of the agency concerned to conduct at least one internal inspection a year. The bio-safety levels of laboratories are decided by such factors as the specific natures of the infectious bio-materials that the laboratories are handling, their facilities and safety conditions, personnel and protection facilities, to make reasonable risk assessment, and to decide on the safety management rules suitable to the agencies concerned. It is only under comfortable operation and safety protection that the bio-safety of laboratories can be assured.

3) Surveillance Systems for Emerging and Re-emerging Communicable Diseases

To construct background information on host animals of communicable diseases common to humans and animals, and to build laboratories, laboratory testing methods and capacity for specific communicable diseases common to humans and animals, since 2005, academic institutions have been commissioned to conduct epidemiological studies of Hanta virus and leptospira in rodents, West Nile virus in avian and horse, and Q fever pathogen in sheep, and to set up laboratory testing methods for indigenous typhus fever. Achievements in 2006 are as follows.

(1) By the microscopic agglutination test (MAT), the leptospirosis antibodies in rodents were spot-tested; and the antibody positive rate was 11%.

(2) By the RT-PCR method, the Hanta virus carrier rate in rodents was tested; and the positive rate was 32%.

(3) Testing of the sheep Q fever in the southern part of Taiwan showed a positive rate of 28%.

By the implementation of projects concerned, a preliminary understanding of the infections of relevant host animals of leptospirosis, Hanta virus, West Nile fever, Q fever has been gained. Reference laboratory testing methods were thus set up and supporting laboratories were built. They should be helpful in the promotion of disease control and surveillance in the future.

Section 5. Immunization

Development of vaccines and immunization can effectively prevent and control communicable diseases that are vaccine-preventable. This Section illustrates the immunization status in 2006 and the development of vaccines.

1. Current Status and Trend of Immunization

The routine immunizations currently given are: BCG, hepatitis B vaccine, diphtheria and tetanus toxoid with whole cell pertussis vaccine (DPT), oral polio vaccine, varicella vaccine, measles, mumps and rubella combined vaccine (MMR), Japanese encephalitis vaccine, tetanus and reduced diphtheria toxoid (Td), influenza vaccine, and hepatitis A vaccine (in mountain areas of high-risks). Three of these vaccines, BCG, Japanese encephalitis and Td, are domestically manufactured, accounting for 30% of all vaccines.

The free routine immunizations offered by the government to infants and young children and their schedules are shown in Table 4-10. The coverage rates of various immunizations in 2006 are shown in Figure 4-4. To offer convenient immunization services and to improve coverage rates, county and city governments actively encourage hospitals and clinics to assist in immunization (currently, around 1,600 contracted hospitals and clinics offer immunization to young children). Districts that fail behind the expected coverage rates are encouraged and followed-up to make up the deficiency. Immunization records of schoolchildren upon enrollment are checked and the immunization coverage rates of the first-grade schoolchildren are more than 97%. Children not immunized are given make-up immunization to protect them from being infected with communicable diseases.

By the end of 2006, the coverage rates of immunization against influenza by target groups were: 88.3% for medical and disease control personnel, 52.3% for the elderly 65 years and above, 52.9% for poultry farmers and workers of relevant occupations, and for the first-time immunization of children under two years (required two doses), the coverage rates for the first and the second doses were 49.5% and 31.6% respectively.

A system for the application for and review of relief for victims of immunization is also set up by the government. Victims of immunization are, by law, given adequate relief.

The four major global trends in the development of vaccines are to make existing vaccines safer and more effective, to develop vaccines against other major pathogens, to develop more-in-one vaccines to reduce the frequency of injection, and to develop vaccines for

Table 4-10 Current Immunization Schedule in Taiwan

Vaccine / Age	BCG	Hepatitis B	Diphtheria, Tetanus, Pertussis	Polio	Varicella*	Measles, Mumps, Rubella¤	Japanese Encephalitis**	Influenza	Hepatitis A#
≥24 hr	BCG								
2-5 days		HepB1							
1 month		HepB2							
2 months			DTP1	OPV1					
4 months			DTP2	OPV2					
6 months		HepB3	DTP3	OPV3				Influenza (yearly)	
9 months									
12 months					Var	MMER1			
15 months							JE1, JE2		
18 months			DTP4	OPV4					
24 months									HepA1
27 months							JE3		
30 months									HepA2
6 years			Td	OPV5		MMR2	JE4		
≥65years								Flu(yearly)	

* Varicella vaccine is given to children born after January 2003 and aged 12 months or older.
** Two weeks interval between dose1 to dose2.
# In selected aboriginal areas.
¤ From 2006 onward, Measles vaccine is removed from the immunization program and the age for receiving the first dose of MMR has been revised to be between 12-15 months.

the prevention of cancer, such as human papilloma virus and smoke-cessation vaccine. The WHO is also strongly recommending immunization against B-type hemophilus and *Streptococcus pneumoniae.*

In the future, new vaccines will be included in the routine immunization. Priorities will be carefully decided on the severity of diseases, safety, efficacy and staple supplies of vaccines, medical costs in terms of public health and others to offer immunization through diversified channels and thus to gain the maximum benefits of immunization and the overall effects of disease control.

2. Manufacturing of Serum Vaccines

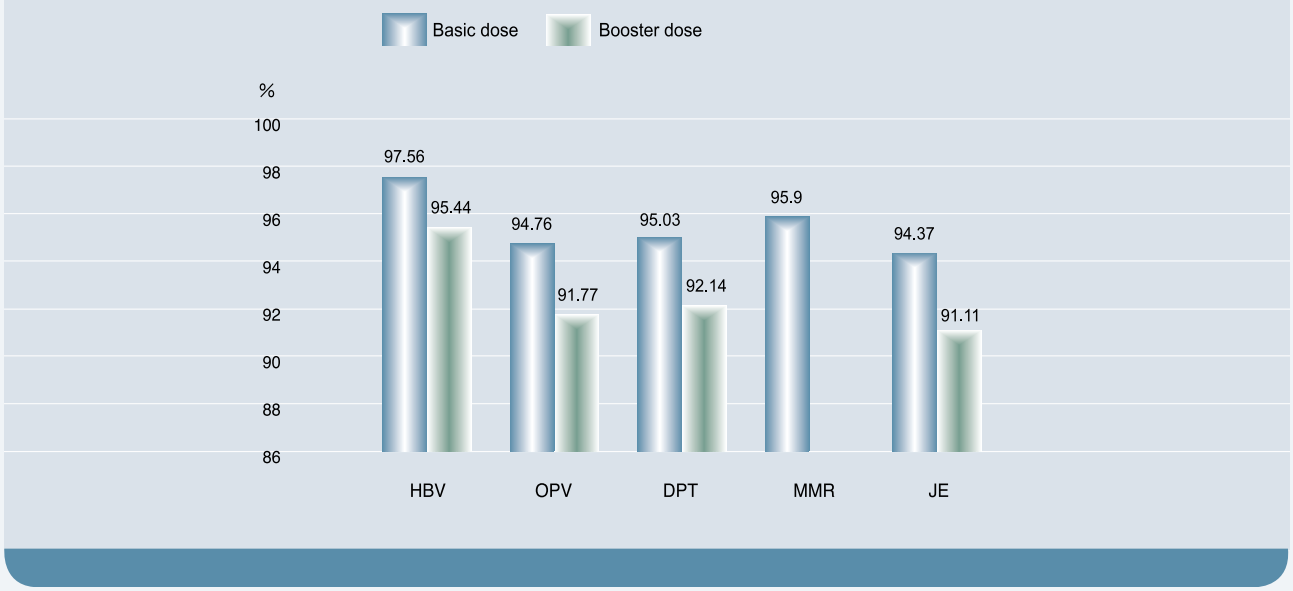
1) Manufacturing, Testing and Development of Biological Products

(1) 604,290 doses of Freeze-Dried BCG Vaccine, 108,368 doses of Cholera Vaccine, 533,594 doses of Absorbed Tetanus and Diphtheria Toxoid for adults (Td), 36,630 doses of Absorbed Diphtheria and Tetanus Toxoid (DT), 8,986 doses of Alum-precipitated Tetanus Toxoid, 2,285 doses of lyophized bivalent antivenin of Tr. Mucrosquamatus and Tr. gramineus (Lyophilized), and 1,069 doses of antivenin A. acutus (Lyophilized) have been manufactured.

(2) Testing for 17 batches of biological final products, 45 batches of bulks, 103 batches of raw materials, and 28 batches of materials has been completed.

(3) Four cases have participated in the clinical trials of the antivenin of *Druseilli* this year.

Figure 4-4 Immunization Coverage in the Taiwan



Source: The values were calculated in January 2007 on the basis of the immunization data registered under National Immunization Information System.
Primary dose for the infants born in 2005.
Booster dose for the infants born in 2004.

2) International Cooperation in the Manufacturing Techniques of Biological Products

(1) A Research and Evaluation and Material Transfer Agreement of Vaccines is signed by the National Health Research Institutes and the Korea International Vaccine Institute.

(2) A Research and Evaluation and Material Transfer Agreement for Influenza Vaccine is signed by the National Health Research Institutes and the US IOMAI.

3) Research and Development on Biological Products

(1) Research and development on influenza

i) A basic model for the projection of influenza transmission in the Taiwan Area and a marten immunity model have been established.

ii) Integration of the Influenza Virus Resource of the US NCBI, the Influenza Sequence Database (ISD) of LANL, and the influenza sequence database of the CDC/Taiwan has been completed.

iii) The complete genomes of the novel influenza virus have been appraised and analyzed; influenza virus strains are produced by the reverse transcript genetics method.

iv) Production lines and manufacturing techniques have been set up to produce at least 60 liters of semi-products of raw fluid, equivalent to 7,500 doses of vaccine (based on 15 μg of effective antigens per dose). Currently, the raw fluid of H5N1 can produce about 28,227 doses of vaccines (based on 15 μg of HA protein per dose).

v) Using the high reservation DNA sequence of H5 genes, five types of recombinant H5 DNA of H5N1 influenza virus have been constructed. Through medication with H5 DNA vaccines, mice are protected, and their changes in body weight and survival rates are not affected by the infection of the NIBRG-14 strain.

vi) A draft of Guidelines on the Review of Registration and Market Approval of Pandemic Influenza Vaccine is proposed, and action is

currently taken to work with the Bureau of Pharmaceutical Affairs of the Department for the legislation of the draft.

(2) Research and development of enterovirus 71 vaccine

i) A candidate vaccine strain, E36 of genotype C4 is screened (its neutralization antibody titer is higher than the prototype vaccine strain E59 previously screened).

ii) Virus harvest, mass production, concentration and purification, and analysis by ELISA, SDS-PAGE and Western blot of 20 batches of enterovirus 71 prototype vaccine have been completed. All production processes are reproducible.

iii) Testing of mice immunity with enterovirus 71 prototype vaccine is conducted; 5 μg of antigen protein can produce 1:40 neutralization .antibody titer.

iv) Two testing of the prototype vaccine for the abnormal toxicity safety of mice has been completed.

(3) Production of anti-cobra IgY antibody by eggs

i) Using Ouchterlony double diffusion and Western blotting assay, the antibody of IgY purified by ammonium sulfate precipitation is shown to be specifically recognized against the snake venom.

ii) If different IgY antibody can be produced from duck eggs instead of horse by using the immunization of snake venom separately, it can reduce the budget up to 85%.

4) Research and Development System for Vaccines

(1) To realize the government policies on the development of vaccine industries, infrastructures for research and development of vaccines have been strengthened to face emerging communicable diseases and sudden outbreaks. In 2006, a five-year plan for the research and development of vaccines for use of Taiwanese (including mass production techniques) was proposed. The plan intends primarily to integrate the limited resources and manpower in the country, establish national vaccine R&D teams, and to invest in the development of four major vaccines against influenza, enterovirus 71, cellular Japanese encephalitis and group B meningococcal. At the same time, infrastructures for disease control and capacity of domestic manufacturing of vaccines will be strengthened, and thus to establish Taiwan's capacity in facing global pandemics and indigenous communicable diseases.

(2) An emergency production line for influenza has been established; and cell culturing production techniques and optimum mass production conditions and relevant documents have been set up. In June 2006, work began to produce vaccines in small amount; trial manufacturing at 60 liters per batch began in the fourth quarter for the pre-clinical trial in the first quarter of 2007.

5

Management of Pharmaceuticals and Foods

Chapter 5. Management of Pharmaceuticals and Foods

As Taiwan is a member of the World Trade Organization (WTO) and APEC, and the international trade of foods and drugs is increasing in volume day by day, to face the impact of the opening of market, and the rampage of illegal foods and drugs on market, issues such as the safety management of foods and drugs, education of the public on the safe use of drugs, control of drug abuse, establishment of an international mutual recognition system, and the upgrading of the quality of domestic products have become more important. It is the responsibility of the Department to protect the rights of knowing of the people, and to protect their health as well. At the same time, it is hoped that when choosing and buying drugs and foods, people should also know how to protect their health.

Section 1. Safety Management of Pharmaceuticals and Foods

The quality of food and drug products, the flow of products, and the services offered by professionals are closely linked to the health of the people. The amount of drugs used by people in Taiwan is 6.5 times more than that of the US. To protect the safe use of drugs of the public, the following programs have been promoted.

1. Management of Pharmaceuticals Safety

1) To help the public identify counterfeit and prohibited drugs, a drug information website was inaugurated in December 2006 to provide material appearance information of some 5,200 items of drugs, and photo files for the identification of 18 commonly faked drugs for inquiries of medical and nursing personnel and the public. A database of authorized dealers of pharmaceutical factories is also set up, and in the first stage, information of the authorized dealers of 41 pharmaceutical factories (including 18 pharmaceutical factories of easily faked drugs) is announced for the benefit of medical care institutions in the procurement of pharmaceuticals, for the inquiries of the public, and also for reference of the inspection authorities.

2) Since the practice of the separation of dispensing from prescribing in March 1997, at the current ratio of 3:1 of the National Health Insurance (NHI) contracted western medicine clinics to NHI contracted pharmacies, the goal of "physicians responsible for diagnosis and treatment" and "pharmaceutical personnel responsible for dispensing" has been preliminarily attained. In August 2002, the regulation that the separation of dispensing from prescribing be practiced where there is an NHI contracted pharmacy within a distance of 1.8 kilometer in the neighborhood of a western medicine clinic was announced and officially implemented in January 2003. The number of prescriptions (including prescriptions for chronic diseases) released had sharply increased from 10.02 million in 1999 to 64.14 million in 2006 (Figure 5-1).

3) Lectures on the safe use of drugs have been organized in community colleges; workshops have been held in relevant community groups (for the elderly, for instance); and radios have been used to disseminate correct information on the safe use of drugs and to promote the knowledge of the public on drug use.

4) To strengthen management of the safe use of Chinese medicines, the promotion of the five-year plan for the construction of an environment for the safe use of Chinese medicines is continued.

   (1) Quality control of Chinese medicine preparations (materials) has been realized. A draft framework on the control of the flow of imported materials has been completed; a system to label ingredients on the packing of Chinese medicine materials has been practiced for 81 items; and the supply of inferior-quality materials has been interrupted to control the supply of high-quality materials.

   (2) An Asia-Pacific Center for the Supply of Chinese Medicine Standards has been set up to complete 74 standards for Chinese medicines. The supply, sales and intellectual property rights protection have been studied for reference of the future implementation of policies.

(3) Laws and regulations on Chinese medicines have been amended and public education intensified. Draft regulations related to the practice of GMP in Chinese medicine factories have been reviewed. Practice of GMP in the factories for the concoction of Chinese medicine drinks and tablets is implemented.

(4) Programs to develop the science and technology manpower of Chinese medicine industries are strengthened. Five courses on Chinese medicine materials and their experiment, concoction of Chinese medicines and their experiment, and technology in Chinese herbal medicine industries have been started for 123 person-times of the public and participants of the industries.

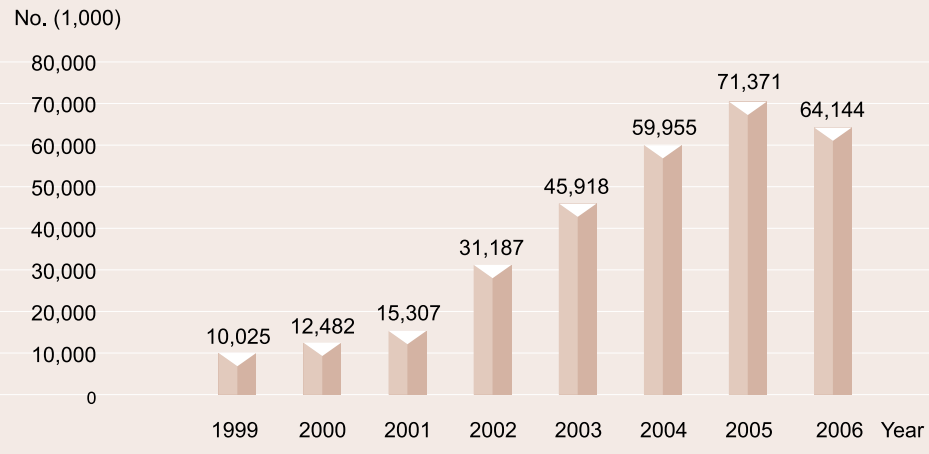
(5) The safe manufacturing process of Chinese medicine preparations is strengthened, and a platform for research and development is also established. Analysis and studies on the concoction of dried tangerine, Chinese mango-liavine and multiflower knot weed are established; factories for the concoction of Chinese medicine drinks and tablets are promoted to practice GMP; and a plan to set up a mechanism for the development of four items of Chinese medicines is ongoing.

5) A plan to establish a concoction base for Chinese medicine is promoted. Through the formulation of specifications for the concoction of Chinese medicines, the management of Chinese medicine materials (raw materials) will be placed under the Pharmaceutical Affairs Act, and thus to guarantee the public the safe use of Chinese medicines. Studies on the safety of Chinese medicines for liver and kidney diseases and the alcoholic preparations have been conducted for reference in their quality control.

6) In October 2006, a set of Regulations Governing the Amount Standards of Hazardous Substances in Chinese Medicine Preparations and their Scope of Application, and in November, an Order on the Amount of Contaminating Substances in Chinese Medicine Materials were announced to control the amount of various contaminating substances in medicines, and thus to strengthen the quality control of Chinese medicines and to improve their management.

7) For the relief of victims of drug incidents, the

Figure 5-1 **No. of Prescriptions Released to Contracted Pharmacies**



Department announced in October 1998 a set of Guidelines on the Relief for Victims of Drug Incidents and implemented in January 1999. To make the relief system more comprehensive, and to offer timely relief to victims of drug incidents who are proper users of legal drugs, the Drug Incidents Relief Act was promulgated in May 2000. Thus far, 797 appeals have been accepted for processing; of them, 316 cases have been decided applicable to relief for drug incidents and are compensated, giving a compensation rate of 47.07%. The total amount paid is NT$ 12,631,199. In 2006, the review criteria were relaxed and the payment raised to include those whose causes of death and their relationship with the use of drugs cannot be eliminated, and those whose physical disabilities cannot be reasonably decided due to other reasons. Payments are raised for serious patients in intensive care units or burn units due to drug hazards. Through these amendments, it is hoped that the drug hazards relief system can be more comprehensive.

2. Good Manufacturing of Pharmaceuticals and International Mutual Recognition

To strengthen the drug review system, to upgrade the quality of domestic pharmaceutical products and to improve their international competitiveness, action has been taken to actively promote good manufacturing practice and international mutual recognition.

1) Effort has been made to continue to promote the pharmaceutical good manufacturing practice (GMP). Thus far, 168 domestic pharmaceutical factories have completed the first-stage cGMP validation; of them, 162 have completed the second-stage cGMP validation, and 161 have completed the third-stage cGMP validation. In addition, 738 importing pharmaceutical factories have applied for the third-stage validation; of them, 622 have passed the review. 78 importing pharmaceutical factories have applied for field inspection; of them, 60 have passed the review.

2) Conventional Chinese medicine manufacturers have been promoted and supervised to universally implement GMP. Since September 2005, all of them are required to practice GMP. There are currently 112 Chinese medicine GMP factories.

3) Assessment of the GMP of medical devices is continued. Thus far, 409 domestic medical device manufacturers have been registered; and the QSD registration for imported medical devices has been made for 2,026 factories. In coordination with the exchange of letter on medical devices signed with the EU, technical cooperation programs have been signed with 12 EU medical device notified bodies to facilitate international harmonization and mutual recognition in the management of medical devices.

3. Management of Food Safety

To prevent people from buying the so-called "black-hearted foods", that is, the illegally marketed unsafe foods, and to rid them of the worries of black-hearted foods, and thus to protect their health, a food consumption warning system and a food traceability system have been established.

1) To strengthen the current system of food safety management, to comply with international regulations, to reinforce the self-control system of food industries, and to boost their responsibility for products, food safety-related regulations have been reviewed for amendment. On May 17, 2006, the amended Health Food Control Act was promulgated. Action has also been taken to complete the maximum residue limits for 33 pesticides, to decide on the criteria of use scope, application and specification standards for 42 food additives, and to supplement and revise sanitation standards for five food items. They are published on the website of the Department for public information to make food management more transparent.

2) Establishment of a food safety light mechanism: When food safety is in suspicion, professional scientific basis and risk assessment analysis are used as a communication platform, and through the professional assessment of the advisory group, the results are announced in the form of a safety lights system. Red light stands for foods unfit for human consumption; yellow light is for food without immediate risk but their safety is uncertain; and green light is for foods with negligible risk. The system helps the public in correctly recognizing food

safety (Table 5-1). In 2006, lights were lit for 30 times: twice for red, nine times for yellow, five times for yellow-green, and 14 times for green.

3) Establishment of a risk assessment and management system for food contaminants: Since August 2005, a mechanism has been set up to hold regular meetings with vice chairpersons of the Council of Agriculture and the Environmental Protection Administration, both of the Executive Yuan, to integrate cross-ministerial resources, and to revolve issues concerned in time. Focusing on the management of environmental pollution and food safety at the sources of production, a set of management procedures for the reporting and response to environmental protection and food safety has been formulated. A special agent mechanism for food has also been set up. In the year, three general meetings, 11 coordination meetings and two national symposiums had been held; and special agents had been dispatched for duty for 38 times.

4) Management of the "black-hearted foods": For the control of black-hearted foods, in addition to classification, inspection and seizure, a special line has been set up for consumers to report. A special project for the cross-county inspection of food safety has been promoted. Publicity is intensified to educate the public on how to distinguish black-hearted foods. The Food Act Govering Sanitation is amended.

5) HACCP System

(1) The system is designed to identify, evaluate and control potential food safety hazards by applying the principles of hazard analysis throughout the whole process of raw material production, processing, manufacturing, storage and transportation.

(2) A multidisciplinary HACCP team is required to be assembled conduct, establish and implement the hazard analysis as well as to consider any measures for the control of identified hazards. They are also responsible for managing the resources needed for the food safety control system.

(3) Hazards analysis

i) All potential hazards should be identified and evaluated so as to develop preventive measures.

Table 5-1 Food Safety Lights

Light	Denotation
Red	a. Hazardous to human health or not, should not be used for human consumption b. Immediate hazards to human c. Validity date exceeded d. Not safe and may be hazardous to human health e. In violation of the permissible amount standards for food safety and also hazardous to human health f. Food adulterated with drugs g. Assessment of health risks indicates high possibility of hazardous to human health.
Yellow	a. No immediate hazards to human health; hazards are suspected, and in-depth investigations or improvement are needed b. Food suspected of not safe c. In violation of the permissible amount standards for food safety, though not hazardous to human health, however the impact is large d. Assessment of health risk indicates suspicions of hazardous to human health
Green	a. Incomplete labeling b. Though may be hazardous, risk factors have been controlled c. All rumors; products are safe d. Assessment of health risk indicates very low possibility of hazardous to human health

ii) Hazard analysis should base on the verified product description, the proposed use of the products, and the processing flow chart.

iii) Potential hazards include microbiological (microbes, natural toxins, diseases of animals), chemical (chemicals, pesticides, drug residues, decomposed or inferior substances, parasites and food additives), physical hazards and any other hazards associated with food safety. Identifying the frequency and severity of these potential hazards should be taken into consideration in hazard analysis.

(4) The approach to establish HACCP system in various food industries has been planned. Fish and fishery product industry was the first to mandate HACCP system. The conformity to the HACCP is inspected and audited regularly. Relevant training programs are organized annually.

(5) The HACCP system is applied to other industries such as meat and meat products, restaurants, and dairy products are in placed.

6) Sanitary and safety control in food industries: In an attempt to achieve the goal of managing food production at source, a "Good Hygiene Practice" was announced to promote comprehensively the self-governing capacity in the food industry through improving the professional knowledge of the managerial personnel in government health agencies, and supervising food manufacturers to build up their self-governing systems. Additionally, a non-mandatory GMP and CAS certification system was promoted to encourage the establishment of self-governing system.

7) The promotion program of food retail industry management is to assure the safety and quality of food in the entire process from production, manufacturing, transportation and distribution to the consumers. The Chinese CAS Good Development Association was commissioned to conduct the sanitary assessment for food retail industry, focusing primarily on the assessment of food warehouses, supermarkets and fresh food industry. 120 out of 122 food retailers were passed the sanitary assessment, which accounts for 98% of total participants. The information related to this assessment was published and updated at the DOH website.

8) Management of genetically modified food products: A management system for the voluntary and mandatory labeling of genetically modified ingredients in food is practiced. Thus far, 14 cases of genetically modified soybeans and corns have been reviewed and approved.

9) Monitoring mechanism for food poisoning incidents: In 2006, there had been 265 food poisoning incidents, affecting 4,401 victims, with no death. The number of incidents had increased by 18 as compared with the 247 incidents in 2005; the number of victims had also increased by 871 cases (24.7%) over the 3,530 of 2005. By pathogenic agents, 98 incidents had been identified of their pathogenic agents, giving an identification rate of 36.6% (Figure 5-2). By the site of food intake, 117 incidents, 44% of all, occurred at food supply business sites; 47 (18%) occurred in schools; and 41 and 24 (15% and 9%) occurred at home or offices respectively (Figure 5-3).

10) Strengthening the sanitary management of public eating places: By the end of 2006, 13,356 food handlers had been placed under management. They are required of cook licenses. In total, 24,432 persons have cook licenses, reaching a 100% complete rate. 5,670 food service establishments had been placed in files for safety management; and 2,819 had met the requirements of self-control of sanitation.

11) Management of special dietary foods: Special dietary foods refer to infant formulas, formula-assisted foods for infants, and foods adjusted for their nutrition components used for patients, including foods adjusted for protein, amino acid, fat or minerals, low allergic food, body-weight control substitutes, and foods for tube-feeding. These patients have special nutritional needs, and special dietary foods can provide them with comprehensive nutrition or reinforced special nutrition needed at certain stage, they should be strictly controlled. Foods that are within the scope of special dietary foods should be sent to the Department for review

Figure 5-2 Food-borne Disease Outbreaks by Bacterial Origin

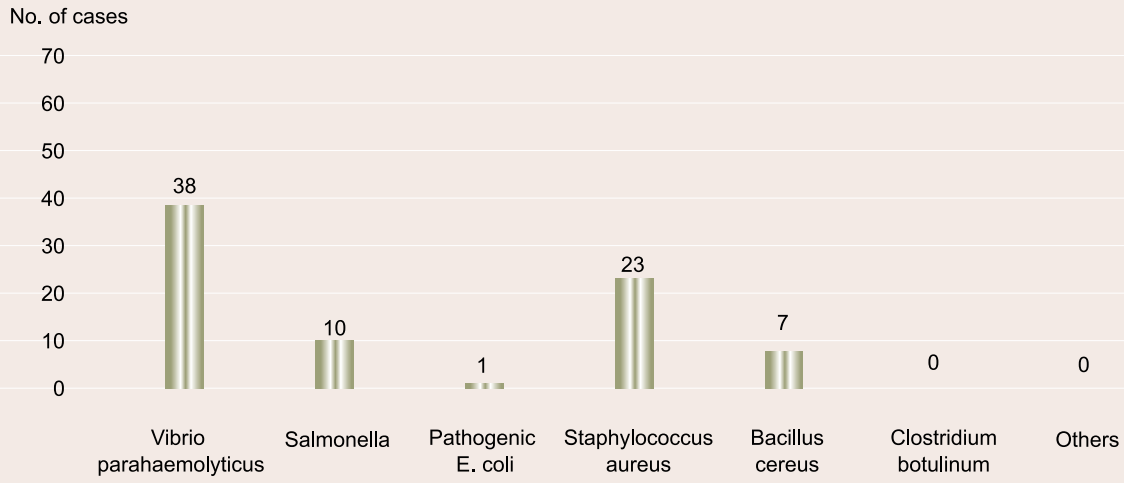
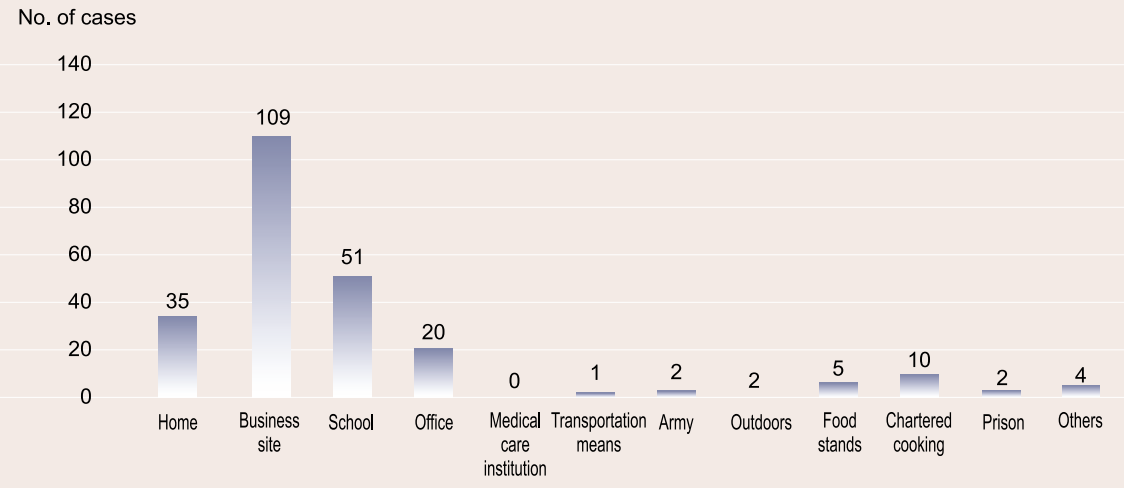


Figure 5-3 Food-borne Disease Outbreaks by Eating Places



and approval. Thus far, 155 infant formulas, 109 formula-assisted foods for infants, and 160 items of foods for patients have been approved. Names of these food items can be found on the website.

4. Safety Monitoring Mechanism

To safeguard the safety of drug use and buying and consumption of foods, and to function as a gatekeeper for the public, the Department has made all efforts in the inspection and seizure of illegal foods and drugs, set

up mail-box and toll-free telephone lines for reporting, and established a safety monitoring system to arrest the rampage and hazards of illegal foods and drugs.

1) The safety monitoring system for new drugs is continued. In September 2004, a set of Regulations Governing Management of Pharmacovigilance Monitoring was announced to adjust the period of safety monitoring of new drugs from the original seven years to five. Some designated medical devices are placed under monitoring, for a period of three years. During the period of monitoring, drug companies concerned are required to submit periodic safety update reports (PSUR) for the Department to assess the safety of their clinical use, and thus to establish a comprehensive drug risk management mechanism, and to safeguard the safe use of drugs of the public. Thus far, 762 items of drugs are under the safety monitoring for new drugs. They are posted on both the website of the Department and the National Adverse Drug Reaction Reporting Center.

2) To timely detect adverse reactions that are not found in clinical trials, the Department encourages the public and medical professionals to actively report information concerning adverse drug reactions, a set of Regulations Governing Reporting of Serious Adverse Drug Reactions was announced in August 2004; and a website for the monitoring of drug safety was set up to recall unsafe drugs and to strengthen the monitoring of the safety of drugs on market. A National Adverse Drug Reaction Reporting Center is set up to collect information on the adverse drug reactions. The reported adverse drug reactions will be evaluated by clinical specialists and certain intervention measures will soon be disseminated to the medical community and the general public via the Department's website. By the end of December 2006, 17,264 reports on the adverse reactions of drugs on market, and 18,666 reports on the adverse reactions of drugs under clinical trials had been received. A quarterly Drug Safety newsletter is issued.

3) Registration and market approval

(1) Registration and market approval for foods

i) The management of food safety is not done primarily by pre-marketing approval and licensing. However, a system of pre-marketing approval management is necessary for some foods of relatively high safety concerns. In accordance with regulations of Article 14 of the Food Sanitation Management Act, announcement has been made to the effect that food additives for single ingredient item, and imported foods in tablet and capsule forms may not be manufactured, processed, prepared, repacked, imported or exported without being inspected, registered and permit licenses issued. Thus far, 920 applications for registration and market approval of food additives, 3,063 applications for foods in tablet and capsule forms have been processed.

ii) In accordance with regulations of the Health Food Management Act, health foods should not be manufactured, imported, or labeled or advertised as health foods, or emphasized of having health promotion effects, unless they are inspected, registered and approved. In 2006, 13 items had been approved as health foods.

(2) A set of review guidelines on the clinical trials of new Chinese medicines and their registration and market approval is announced to establish a comprehensive and obstacle-free legal environment and to promote the development of new medicines.

4) Joint inspections

(1) To strengthen supervision of local health agencies to strictly manage cases of illegal drugs, since May 2006, the frequencies of inspection have been increased. Inspections are now conducted monthly. Dealers that have law-violation records of selling counterfeit or prohibited drugs in the past three years are black-listed for intensified inspections to protect the safe use of drugs of the public. Mail-boxes and toll-free lines have been set up for reporting by the public. Cases so reported are referred to local health bureaus for inspection and punishment.

(2) A cross-ministerial special project meeting to crack down illegal drugs meets once every six

months to study and set up operational flows for the inspection and seizure of illegal drugs and to strengthen collaboration of organizations concerned, and thus to arrest the flow of illegal drugs. County/city health bureaus are supervised to implement a special project on the inspection of illegal drugs, cosmetics and foods. Operational procedures for the inspection and punishment of drug vendors and illegal sales of drugs on network have been formulated to improve the efficiency and effects of inspection and seizure.

(3) A project to supervise illegal advertisement on newspapers and magazines is practiced. In total, 2,329 cases of illegal advertisements were referred to county/city health bureau for processing. Of them, 1,237 cases were found violating regulations, and the fines totaled NT$ 15.892 million. This project is in its 6th year, and the number of cases processed is increasing year by year (Table 5-2). The Department is highly concerned about the negative impact brought about by illegal medical advertisements, and therefore on May 30, 2006, amended the Pharmaceutical Affairs Act to raise the fines stipulated in Paragraphs 1 and 2 of Article 66 of the said Act from NT$ 30,000 up to NT$ 150,000 to NT$ 200,000 up to NT$ 5 million; fines stipulated in Paragraph 3 of Article 66 of the said Act was also raised from NT$ 10,000 up to NT$ 50,000 to NT$ 200,000 up to NT$ 5 million. Advertisements that continue to appear after having been notified by health authorities to discontinue will be fined NT$ 600,000 up to NT$ 25 million, and be fined consecutively for each violation until the advertisements are discontinued. It is hoped that the final goal of zero illegal medical advertisement can be reached through more comprehensive legislation.

(4) Local health agencies are supervised to spot-check medicines on market claiming to improve sexual power or reduce weight to see if they are adulterated with western medicines. The number of counterfeit and prohibited drugs inspected and seized by local health agencies and sent to local prosecution offices has thus increased sharply. In the period 2002 to 2006, the number sent for prosecution had increased from 48 to 149.

Table 5-2 Illegal Advertisements on Newspapers and Magazines, 2002-2006

Unit:No.

Year / Nature	2002	2003	2004	2005	2006	Subtotal
Chinese pharmacy	53	12	44	133	73	315
Western pharmacy	2	1	9	77	28	117
Chinese medicine	82	33	26	44	13	198
Western medicine	33	36	73	77	79	298
Foods	143	213	284	703	916	2,259
Cosmetics	31	74	125	376	496	1,102
Medical device	3	30	9	26	7	75
Beauty and weight-control	5	14	6	21	3	49
Unknown	6	20	5	3	0	34
Others	5	25	29	44	25	128
Total	363	458	610	1,504	1,640	4,575

Section 2. Management of Controlled Drugs

Statistics of the United Nations UNODCCP on 2005 World Drug Report shows that the current population world-wide of drug abusers is as many as 200 million, accounting for about 5% of the population aged 15 through 64. Marijuana is the most abused drug internationally by some 160 million people, accounting for 4% of the population aged 15 to 64. The amphetamines are the next, including primarily methamphetamine and MDMA, used by some 26 million and 8 million people respectively. Cocaine, heroin and opium are the 3rd, 4th and 5th abused drugs. Drug abuse has thus become an international problem. In recent years, emerging drugs (or the so-called club-drugs) have run rampant, suggesting the importance of the management and control of controlled drugs.

1. Management System of Controlled Drugs

The aims of the control of controlled drugs are to understand the flow of controlled drugs in country, to establish a management by level system for controlled drugs, and to license for management and inspection.

1) Management of controlled drugs by level:

In August 2006, amendments and additions of the following controlled drugs by level were announced:

(1) PMMA (Para-methoxymethamphetamine) is added as a schedule II controlled drug.

(2) Low content test reagents for external use of controlled drugs (one milligram per milliliter; specifications for per unit packing are that contents of each controlled drug ingredient are under two milligram) are not applicable to the items and scope stipulated in the Controlled Drug Management Act.

(3) Clobenzorex is added as a schedule IV controlled drug.

(4) Schedule IV controlled drug, Nimetazepam, is amended to be a schedule III controlled drug.

2) Establishing a management system for the flow of controlled drugs:

The licensing management system is practiced. Businesses or institutions concerned must apply for registration licenses of controlled drugs before the drugs can be imported, exported, manufactured, sold and purchased. Thus far, 12,308 registration licenses, 1,966 permits for import/export, production or research, and 36,147 prescription licenses for controlled drugs have been issued.

3) Audit and inspection of controlled drugs

(1) Routine inspection: According to the annual plans of the DOH, local health bureaus make their own arrangements for routine inspection.

(2) Priority inspection: Inspection is conducted jointly with local health bureaus according to the degree of abuse, unusual amount of consumption, or report of illegal use.

(3) Judicial inspection: Inspection is conducted to assist the prosecution, police and investigation authorities in their inspections.

(4) Joint inspection: Inspection is conducted jointly with local health bureaus following the Special Project on the Joint Auditing of Illegal Drugs, Cosmetics and Foods of the Department.

(5) The Internet inspection: Advertisements on the Internet selling controlled drugs or toxic substances are inspected. Violations are referred to the police authorities for investigation and action.

(6) Report and audit of the flow of controlled drugs: The Internet is used for the report of the balance of controlled drugs. Thus 49% of institutions and 93% of dealers use the media for reporting in 20%. Data of report by documents are filed in computers to check the flow of controlled drugs. Inspections are strengthened against unusual flows. 16,629 firm-times totally have been inspected and we find 306 violations. The rate of violation is 1.84%. They have been processed accordingly to prevent and arrest the illegal use or abuse of controlled drugs.

2. Prevention and Control of Drug Abuse

The link of the Internet to the daily life of everyone

has become closer, and now information is available easily without distinction of national borders. Through the convenience of the Internet, information of all kinds can be easily obtained. Drug abusers can thus gain information on international drug abuse; can even proceed with drug trade on it. Drug abuse has thus become more diversified. In addition to the commonly used drugs such as heroin and amphetamine, emerging drugs such as MDMA, Ketamine, marijuana and Erimin are frequently found in pubs and KTVs. For the prevention and control, various preventive measures have been taken and strengthened; a reporting system on drug abuse has been established; and more diversified educational programs have been intensified to improve the public's knowledge on the hazards of drug abuse and thus to refuse drugs and toxic substances.

1) To enforce the prevention and control of the abuse of emerging drugs, the promotion of the four-year plan to intensify the prevention and control of the demands for emerging abuse drugs is continued. The first national survey in country on drug abuse focusing on the general population has been completed to find that the prevalence rate of drug abuse in the Taiwan Area is 1.2%; and the most commonly abused drugs are, in that order, amphetamine, MDMA, Ketamine and marijuana. The age that drug abuse is initiated is 20.6 years. Reasons for abuse are out of curiosity and being fashionable. A cross-national multi-city epidemiological survey on emerging drugs is conducted.

2) A system on the reporting of drug abuse has been established. Currently, 131 medical care institutions have joined in the reporting to report 11,967 cases. On December 15, 2006, a set of Regulations Governing Reporting and Award on Controlled Drugs was amended and announced to encourage medical care institutions to report cases. More comprehensive epidemiological information has been established to timely monitor the trend of drug abuse.

3) Since July 2006, county/city governments have been supervised to set up each a drug hazards control center. The center has four sections, education, protection and support, referral, and planning. Education of the public is intensified on the principle of "prevention surpasses treatment"; and professional workers in social work, medical care, psychology and other related disciplines are called together to help, upon the concept of "holistic service", cases quit the habit.

4) Since 2996, through proposals of communities, community resources are organized to focus on the likely drug abuse behavior and problems in the community, and by way of self-management of community, to conduct education and promotion on drug abuse to enhance the knowledge of the community people on the hazards of drug abuse.

5) In collaboration with the Ministry of Justice, a project on drug cessation and rehabilitation in community is conducted. The project is operated by the DOH Pali and Taoyuan sanatoriums in collaboration with the Hsintien Drug-Cessation Center to help, in the



period between May and December 2006, 3,244 addicts to quit the habit; another project conducted by the Tsaotun Sanatorium in collaboration with the Taichung Drug-Cessation Center had helped, in the year 2006, 5,931 addicts to quit.

6) A harm-reduction project through substitute methods for drug addicts and HIV positives is operated by the DOH Pali, Taoyuan, Tsaotun and Chianan sanatoriums to accept 1,080 cases for 52,507 person-times of medication.

7) The DOH Chianan Sanatorium, in collaboration with the Ministry of Justice, since September 1, 2006, has implemented a harm-reduction project for drug addicts under probation. By December, 200 heroin addicts had been accepted for treatment.

8) The DOH Tsaotun Sanatorium, in collaboration with the Ministry of Justice, has renovated the old portion of the Taichung Prison building into a community cessation and rehabilitation site, the Chiehlao Hill. The Hill was inaugurated in December 2006.

9) An online museum of anti-drug resources is set up. On average, about 2,000 person-times visit the website each day. Seed teachers for the control of drug abuse are trained. Counseling concerning drug abuse is provided to the community people through the 293 community-based counseling stations. In collaboration with the Local Administration Training Center of the Central Personnel Administration, the Executive Yuan, an online learning program on hazards of some commonly abused drugs and their control is organized to improve the effects of drug control.

Section 3. Laboratory Testing for Drugs, Foods and Cosmetics

Testing of health-related products is conducted at both the national and the local levels. The Department is responsible for the national laboratory services with more emphasis on products required for permit licensing, batch certification of biologics such as vaccines and botulism toxins, and certain incidents of public concerns. In addition, the Department is also dedicated to developing testing methods, implementing national monitoring programs for gathering background data, promoting the good laboratory practice (GLP) management systems and providing technical supportive services to local health laboratories.

To effectively utilize the private sector laboratory testing resources, the Department has launched a laboratory accreditation project based on international standards. The operation of the accredited laboratories and the quality of their laboratory testing are regularly audited. Lists of the accredited laboratories and their accredited testing items are supplied to companies, the public, consumers' associations and competent health authorities at various levels. The use of accredited private laboratories will help health product providers strengthen their self-management practice and be also in coordination with the out-sourcing policy of the government.

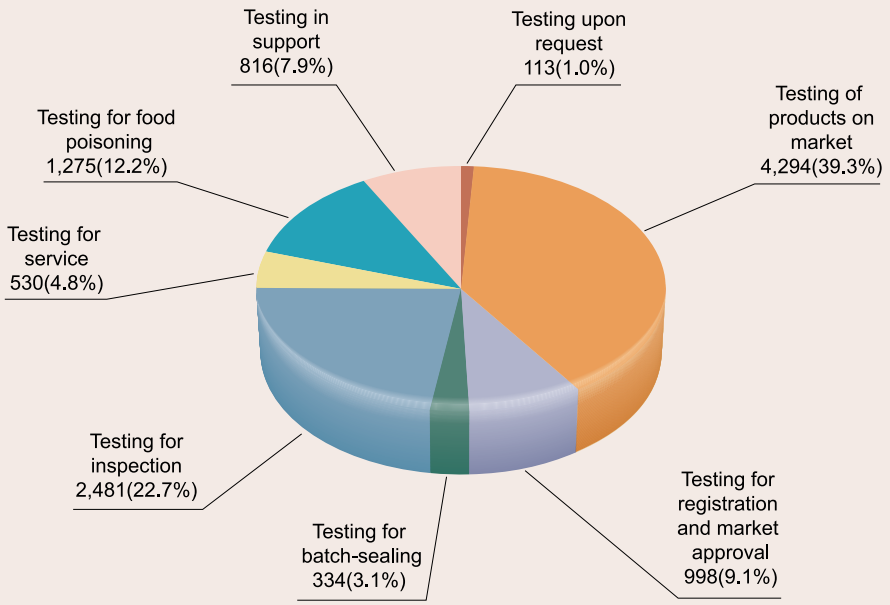
1. Laboratory Testing

Laboratory testing of foods and drugs conducted by the Department includes items necessary for policy-making, routine testing in support of county/city health bureaus and other organizations, and testing for monitoring the quality and safety of products on market. Pharmaceutical products, medical devices, medicated cosmetics, drugs of unknown ingredients and counterfeit drugs referred by the police and judicial authorities, antibiotics, vaccines, blood products, radiological drugs for medical use, Chinese medicines, their raw materials and preparations, residues of pesticides and veterinary drugs in foods, chemical contaminants, microbes and their toxins, allergens, adulterated medicines, and genetically modified food products are laboratory-tested by the Department.

1) Administrative testing: testing is conducted for product registration and market approval, and permit licenses; batch-testing for sealing for vaccines, blood products, and botulism toxins; testing is also conducted for emergency incidents such as *Salmonella*-contamination of infant formulas, malachite green residue in fish, and imported vegetables suspected of being contaminated by *E. coli* 0157.

2) Supervisory testing: testing conducted for inspection; consumers' service; and testing of food-borne outbreaks.

Figure 5-4 Types of Laboratory Testing for Drugs, Foods and Cosmetics



3) Supportive testing: testing conducted upon request by other government authorities, such as the customs authorities to levy tax on imported goods; manufacturers for product certificates for export; assistance to judicial courts, prosecution, police and customs authorities for the testing of confiscated drugs or foods.

4) In the year, 998 cases had been tested for product registration and market approval; 334 cases tested for batch-release; in support of local health bureaus, 2,481 cases had been tested for inspection sampling; 530 cases tested for consumer service; 1,275 cases tested for food poisoning incidents; 816 cases tested in support of other organizations; and 113 cases tested upon request (Figure 5-4). 28 surrey programs products on market such as monitoring of pesticide residues in vegetables and fruits from packers had been conducted, and 4,294 samples had been tested. Findings of nine survey programs were made public to the media and at the same time posted on the website of the Department to alert producers, distributors and manufacturers to strengthen their responsibility for products, and also for the reference of consumers, and thus to protect their rights

2. Quality of Laboratory Testing

The Department actively and continually implements the GLP (Good Laboratory Practice) system to ensure the quality, accuracy and efficiency of laboratory testing. The food and drug laboratory has been accredited by the Taiwan Accreditation Foundation (TAF). The Department also develops new testing methods, promotes laboratory accreditation, and helps county/city health bureaus upgrade their testing capacities. The achievements are as follows:

1) Forty-three testing methods have been developed. In addition, review standards for 20 items of medical devices have been drafted; seven official testing methods for foods and three items on minimum requirements for biological products have been announced. Research projects on systematical study

of drug impurities, preparation and collaborative titration for national sensitivity panel of HBsAg, identification of Chinese medicine raw materials in preparations by Nested PCR and DNA sequencing methods, monitoring of the background contents of dioxin in foods and human blood in Taiwan, and study on the detection method and monitoring of genetically modified foods have been conducted.

2) Accreditation of private food testing laboratories was initiated in 2004. Laboratories are assessed for their capacity in an impartial, objective and independent manner based on international accreditation standards to assure the accuracy and quality of testing. Thus far, 13 laboratories have been accredited, and the items accredited include pesticide residues, veterinary drugs residues, heavy metals, food additives, food components, dioxin and microbes.

3) Laboratories of county/city health bureaus are supervised to set up the GLP system and advised to apply for accreditation. All 25 local health bureaus have been accredited by the TAF.

4) A regional laboratory integration network for local health bureaus in central Taiwan has been established to coordinate the laboratories of five county/city health bureaus. Each laboratory takes charge in its specialized test items. By sharing resources and expertise, health bureaus in the region could conduct fundamental tests while saving facility expenditures and enhancing program effectiveness.

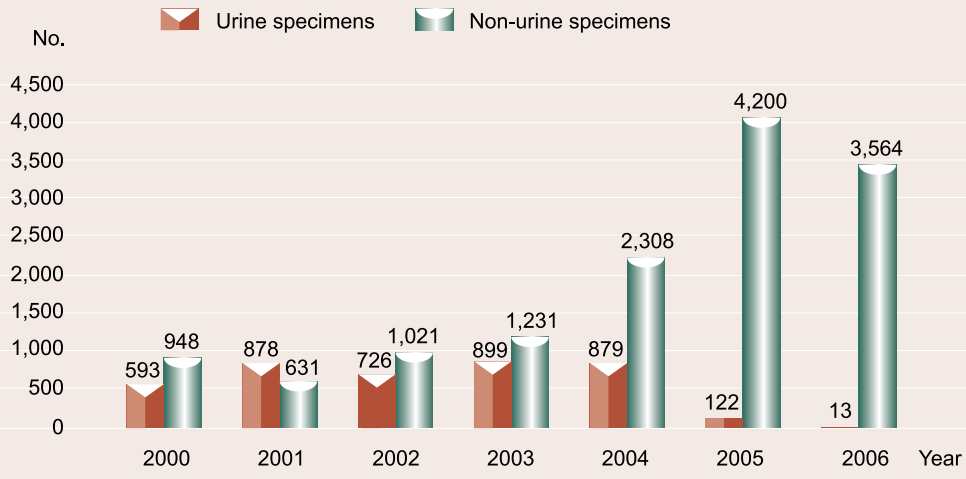
5) To improve the laboratory testing competency and capacity of health bureau personnel, related training, workshops, symposiums, online learning, proficiency tests and training of inspection have been held.

3. Laboratory Testing for Drug of Abuse

To improve quality of laboratory testing for drug of abuse and to speed up testing, laws and regulations are timely amended, and management of the testing laboratory system is strengthened. Major activities in 2006 are:

1) 3,577 non-urine specimens referred by the judicial, prosecution, police and health authorities, and urine specimens requiring re-testing were conducted.

Figure 5-5 The Amount of Urine and Non-urine Specimens Tested by Year

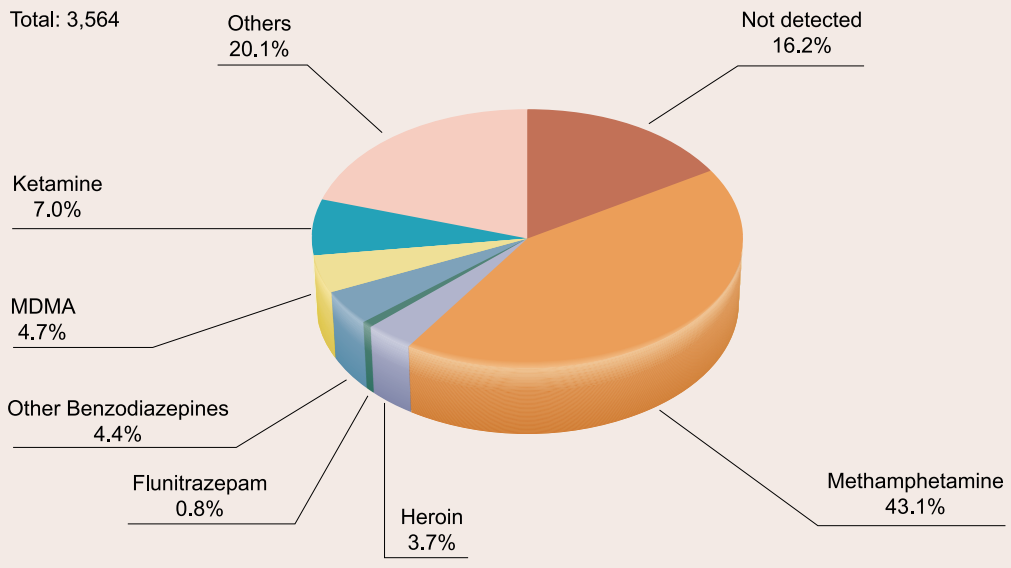


The number tested in 2006 was 745 fewer than the 4,322 of 2005; the decrease of non-urine and urine specimens were 1.48% and 89.3%, respectively. The amount tested by year is shown in Figure 5-5. In urine specimens, morphine and methamphetamine were the major drugs detected; codeine and amphetamine came next. In non-urine specimens, methamphetamine was detected the most; followed by Ketamine and MDMA. Distribution of the drugs detected is shown in Figure 5-6.

2) On November 17, Articles 22, 41 and 51 of the Regulations Governing Accreditation and Management of Drug Abuse Urine Testing and Medical Institutions were amended: After the cause for suspension of accreditation is eliminated, the testing institution may apply for inspection upon the expiry of suspension period, the accreditation may be recovered if the institution passes the inspection. However, the testing operations of the testing institution shall be on hold till the accreditation is recovered. A symposium on laboratory testing techniques of urine for drug abuse was held, another symposium on the drug testing of hair and harm-reduction had been organized to upgrade laboratory testing techniques relevant to drug of abuse.

3) Accreditation and management of drug of abuse urine testing institutions were conducted. There are a total of 14 accredited urine testing institutions, including one newly accredited, one was newly accredited for urine testing of marijuana. Accredited items of urine testing include methamphetamine, amphetamine, MDMA, MDA, morphine, codeine and marijuana. To maintain testing quality of accredited institutions, 57 lin total performance testings had been given routinely; and 32 onsite inspections were carried out. Furthermore, 8 special inspections were conducted. A total of 181,816 urine specimens had been tested by the 14 accredited institutions in 2006, giving a coverage rate of 98.5% (coverage rate=number of specimens tested by accredited institutions total number of specimens tested in the Taiwan Area x 100%), an increase of 7.4% over 2005 (Figures 5-7 and 5-8). Four public medical institutions in

Figure 5-6 Distribution of the Drugs Detected in Non-Urine Specimens, 2006



the northern, central, and southern regions were coordinated to assist conducting qualitative analysis of abused substances specimens under 1 gram, due to overloading of judicial and police laboratories.

Figure 5-7 Accreditation and Management of Drag of Abuse Urine Testing Institations

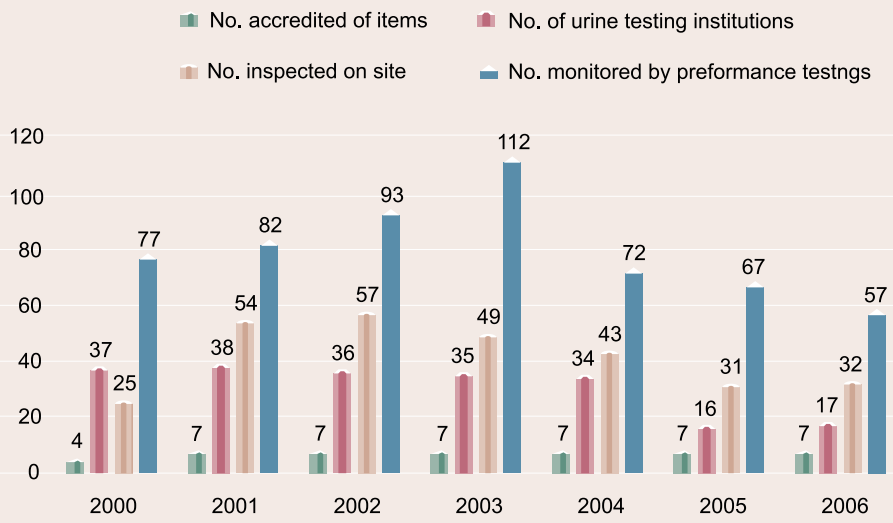
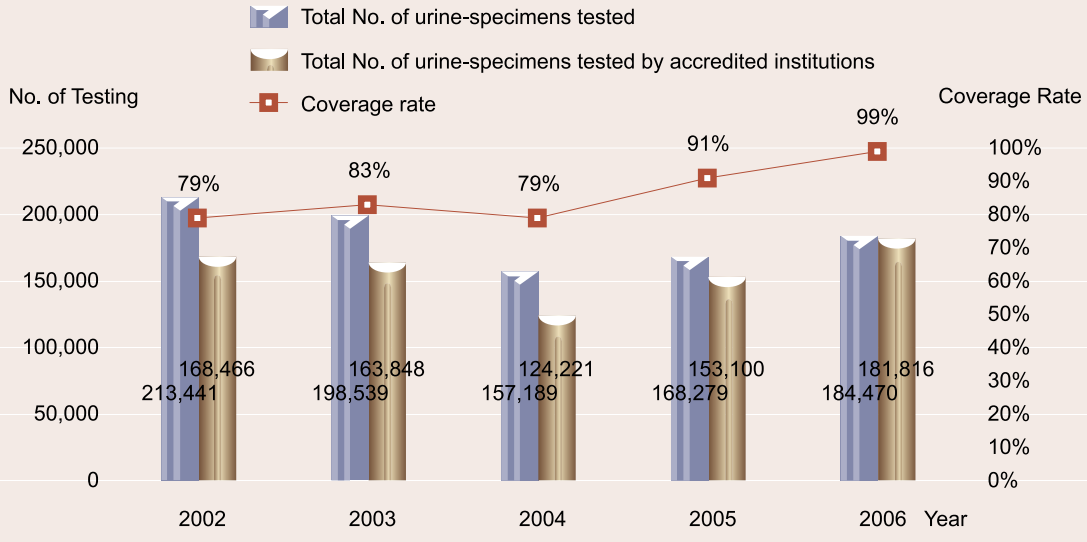


Figure 5-8 No. and Coverage of Urine Testing by Accredited Testing Institutions by Year



6

Medical Care

Chapter 6. Medical Care

Along with the rapid changes in health and medical care and the social-economic environment, services provided to the people are no longer care of diseases; they are also concerned with the challenges of how the medical care systems and medical care teams can best assure the public of safety of medical care. How to construct a care system to provide the people with holistic health and medical care, how to avoid excessive division of labor, to improve physician-patient relationship, to realize community medical care and preventive medicine, and thus to upgrade the health and quality of life of the people, are some of the priority tasks of present.

Section 1. Medical Care System

In 1995, in coordination with the formulation of the Medical Care Act, a medical care network plan was implemented. With reference to the life circles developed by the Council for Economic Planning and Development of the Executive Yuan, the Taiwan Area was divided into 17 medical care regions to plan for the medical manpower and facilities of each region. The primary goals are to balance the distribution of medical care resources, to shorten regional differences, to avoid repeated investment of medical care resources, and to upgrade regional medical care standards.

The plan has been implemented in four phases in 19 years. The number of hospital beds has now become sufficient; and the quality of medical care has been upgraded. Medical care resources in the mountain areas and offshore islands, however, require further improvement; and the quality of primary care has rooms for strengthening. The fourth phase of the medical care network plan was completed at the end of 2004. To face the impact on the environment of the Taiwan Area brought about by the aging of population and the emerging communicable diseases, and at the same time, to promote holistic health care, to assure the safety of patients, and to construct a patient-centered medical care environment, in the period between January 2005 and December 2008, a holistic health care plan is implemented. The key issues of the plan include improving the regional medical care systems, upgrading the service quality of primary care, planning for medical manpower and improving their professional quality, improving quality of medical care, improving the external supervision mechanism for medical care quality, and implementing medical care for special groups, with a view to provide the people with adequate, accessible, comprehensive and continuing holistic medical care services.

1. Medical Care Resources

To balance the distribution of medical care resources, in accordance with the Medical Care Act and the medical care network plan, a regional medical care system has been established. Through regional supervision and organization, health needs of the local residents are assessed, and plans to improve various regional medical care resources and standards of regional medical care have been implemented. Achievements thus far are as follows:

1) Current status of medical care institutions: The number of both public and private medical care institutions has been increasing year by year. At the end of 2006, there were 547 hospitals, and 19,135 clinics (Figure 6-1). The number of hospitals is declining year by year; while the number of clinics is increasing. The number of patients served by each medical care institution per year is declining year by year to only 844 per institution. The number of institutions per 10,000 population has increased year by year from 6 in 1989 to 8.4.
2) Current status of hospital beds: Since the implementation of the National Health Insurance, though, for management efficiency and competition, the number of hospitals has declined, the number of hospital beds, however, has increased sharply. There are currently 148,962 hospital beds (including general beds and special beds); of them, general beds account for 65.4% of all. Beds of the DOH-affiliated hospitals and county/city hospitals account for 16.7%; those of other public hospitals account for 19.6%; and those of corporate and private hospitals affiliated to medical schools account for 34.5%; and those of other private hospitals account for 29.2%. Beds of private hospitals are 1.7 times more than beds of public hospitals. There are altogether 96,595 general beds in all medical care institutions (including 72,932 acute general beds, 4,188 chronic general beds, 6,073 acute psychiatric beds, and 13,054 chronic psychiatric

beds), averaging 65.12 beds per 10,000 population. The goal of the medical care network has been attained. The number of beds per 10,000 population by year is shown in Figure 6-2.

3) The Medical Care Development Fund: In the period between 1992 and 2006, 214 hospitals and 105 clinics had been subsidized by this Fund. In 20 districts, subsidies have been made available to improve districts of relatively poor resources in emergency medical care. To upgrade the care service quality of small-scale hospitals, five hospitals have been subsidized to set up a joint practice model with clinics. For providing integrated medical care services to the elderly, 16 hospitals have been subsidized.

4) Regular check on resources to promote the effective utilization of beds: A set of Principles on

Figure 6-1 No. of Hospitals and Clinics in Taiwan by Year

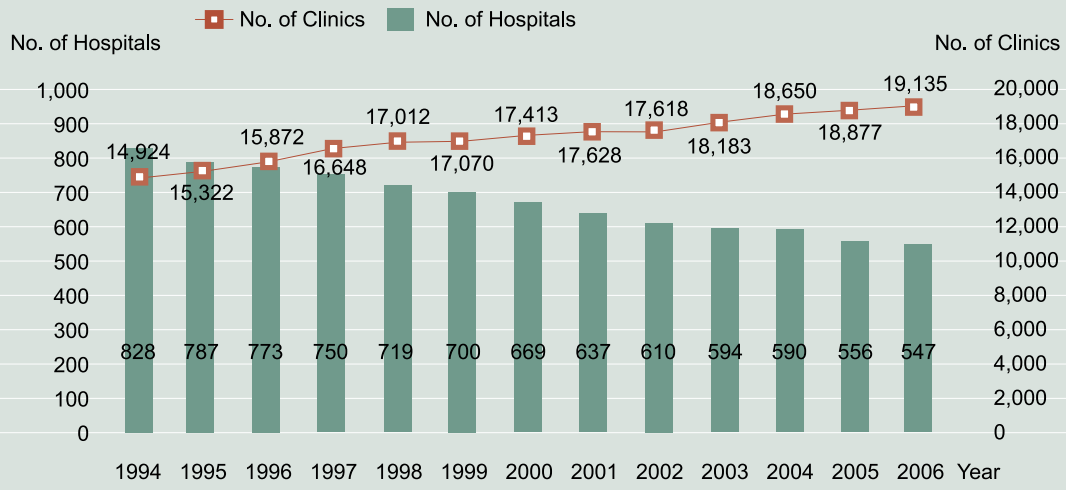
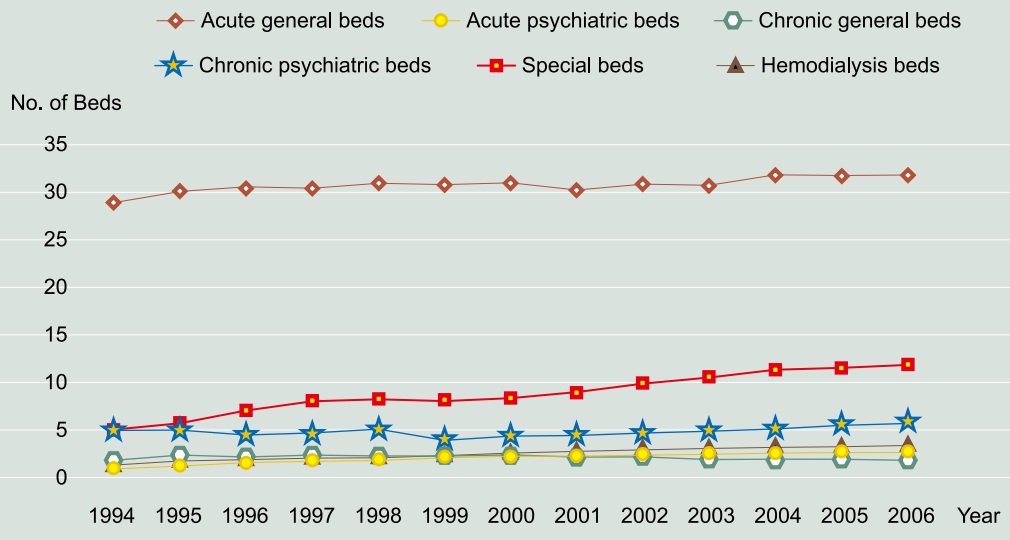


Figure 6-2 No. of Hospital Beds per 10,000 by Year

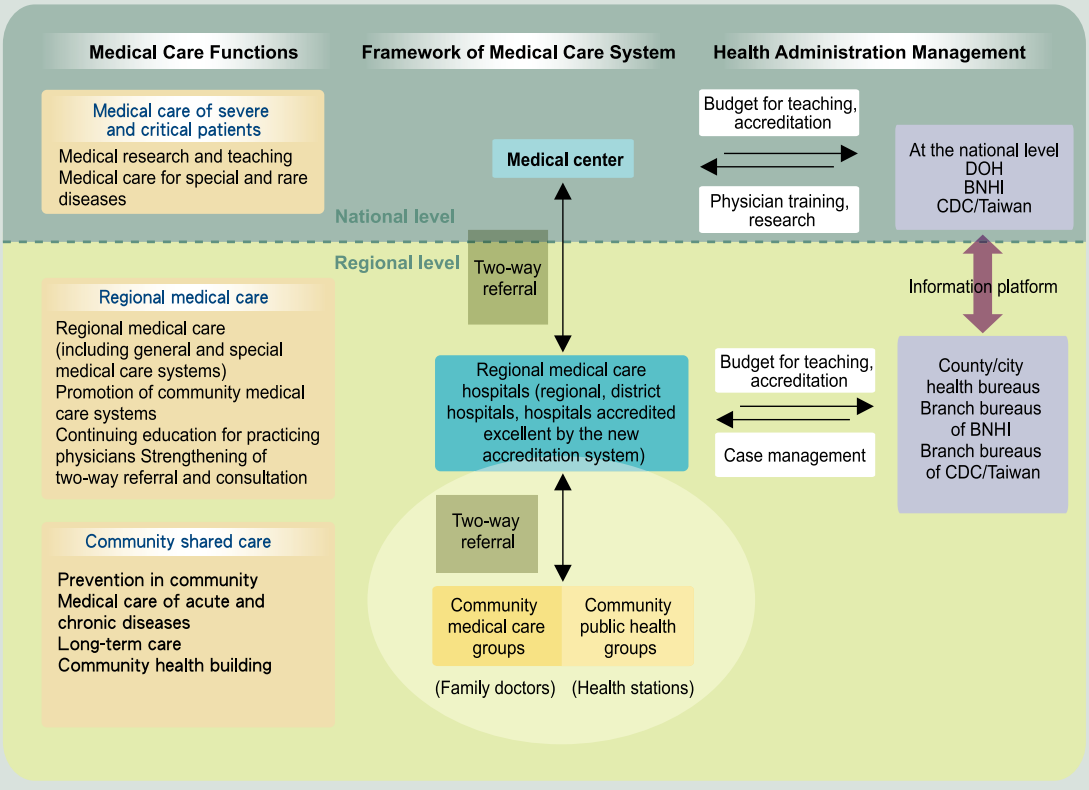


the Management of Unoccupied Acute General Beds in Hospitals, and another set of Principles on the Management of Unoccupied Psychiatric Beds in Hospitals have been formulated to generally check on the occupancy of beds in hospitals to avoid beds being occupied for long time and thus to protect the rights of the public to medical care. By the end of 2006, 7,513 acute general beds and 2,355 psychiatric beds had been terminated (including nullified) their use.

2. Community Health Care System

To meet the post-SARS needs for the reform of medical care system, since 2004, a pilot project on the establishment of community public health (disease control) groups has been tried out. The functions of the groups are to promote prevention and health promotion in community, to integrate resources of disease control and medical care, and resources of public and private sectors. Through the establishment of community public health (disease control) groups and strengthening of their functions, interaction of health bureaus, health stations and community medical care groups (consisting of clinics and their collaborating hospitals) is promoted to integrate health and medical care of communities to jointly promote health, medical care and disease control, to identify and resolve health problems of the residents, and to realize community healthcare model and the establishment of disease and medical care network. Since 2005, action has been taken to actively promote a pilot project on integrated services by community public health (disease control) groups. Household records are set up jointly by community hospitals, clinics and health stations to review medical care needs of the residents, to offer them adequate services and referral, to fully practice the functions of family medicine systems, and to form together with community hospitals a community medical care network to provide comprehensive holistic medical care. By 2006, 303 community medical care groups and 20 public health (disease control) groups had been set up. At the same time, community medical care group demonstration spots had been set up; and an evaluation system of the quality of community medical care had

Figure 6-3 Community Medical Care System



been established. The framework of the community health and medical care system is shown in Figure 6-3.

To strengthen the community health and medical care systems, and to establish shared care networks and medical care information platforms, subsidies of the Medical Care Development Fund are used to supervise district hospitals to provide integrated medical care services to the elderly, or to collaborate with clinic physicians in their practice. In 2006, Changhua County was made the demonstration spot to try out a regional shared care project, and to promote medical care by level and two-way referral of patients. Disease management and case management, and modern information technology are used to provide information of the two-way referral of patients to primary care physicians and collaborating hospitals, and to help the public develop correct medical care behavior, and thus to reduce wastes of medical care resources due to repeated medical care. The confidence of the public on primary care physicians is regained, and a sound physician-patient relationship is built.

3. Management of Public Hospitals

In the past, public hospitals had always been subsidized by government budgets for long time; their management, however, was rather ineffective. To improve the management flexibility of public hospitals and upgrade their operation efficiency, reform of public hospitals has been ongoing to direct them toward more pluralistic and corporative-type management.

1) To improve management flexibility of public hospitals and to upgrade their operation efficiency, downsizing and merging of institutions have been practiced and a strategic alliance is formed.
2) Functions of the DOH hospital regional alliance are integrated for personnel exchange, sharing of resources, and joint promotion and marketing; operation costs are reduced and efficiency improved.
3) Plans have been promoted to transform public hospitals into administrative corporations, to restructure the organization of the DOH hospitals, and to promote participation of the private sectors. A plan to promote participation of the private sectors in public works is implemented. A total of NT$ 320 million private sector investments have been made.
4) Safe operational environment is created in hospitals to provide high-quality medical care services and community concerns.

Section 2. Quality of Medical Care

The several medical care incidents in the recent years in Taiwan, and the SARS outbreaks in April 2003, all indicate problems in nosocomial infection control, safety of patients, and inadequacy of training for medical personnel. In this connection, the strengthening of the safety of patients, upgrading the quality of medical personnel, strengthening the quality of hospital management, effective and continuing external monitoring of hospital quality, establishment of national hemodialysis medical care resources and a system for the control of blood quality to maintain high quality, and the provision of all-directional and safe medical care services are some of the priority tasks of present.

1. Quality of Medical Care Services

The objectives are to strengthen quality of medical care services, to establish a patient safety-centered medical care environment, to plan for a new hospital accreditation system, to improve the care of patients by family members in hospital, to develop a monitoring system for patient safety, and to set up a mechanism for the reporting of safety incidents. Major achievements are as follows:

1) Patient Safety

Patient safety is the most highly-regarded issue of the World Health Organization, the US and the European countries in the recent years. To protect the safety of patients and to upgrade medical care quality, the Department has, in addition to strengthening the functions of the medical care quality committee and the patient safety committee, promoted several priority measures.

(1) With reference to the national patient and implementation strategies of medical care institutions developed by The Joint Commission the 2006-2007 annual work objectives of hospitals in Taiwan have been formulated. The objectives include upgrading the safe use of drugs, realizing nosocomial infection control in medical care institutions, improving accuracy of surgical operations, improving accuracy of patient identification, preventing patients from falls, encouraging reporting of sentinal events improving

communication and safety in transferring patients, and encouraging the public to participate in the promotion of patient safety. In January 2006, these objectives and implementation strategies were announced to require health bureaus to supervise hospitals under their jurisdiction. These objectives are also made items of assessment of hospitals; and regular and un-scheduled assessments are made.

(2) A Taiwan Patient-safety Reporting System (TPR) is set up to realize patient-centered medical care, to build up step by step patient safety culture, to set up a non-punitive learning environment, and to avoid repeating of errors, and thus to promote the safety of patients. Thus far, 301 hospitals have participated in this system. An unscheduled newsletter on the TPR is published for the reference of medical care institutions.

(3) With reference to the experience of the US National Patient Safety Foundation (NPSF) on patient safety week activities, since 2004 on a three-year basis, patient safety week activities are carried in the fourth week of October to promote correct concept of medical care. The program is promoted through the six medical care network regions of the National Health Insurance to the entire country to enhance the understanding and attention of family members, the public and medical personnel on the safety of patients, and thus to promote good physician-patient relationship. In 2006, activities were organized under the theme of "participation of all in patient safety" to promote "safe use of drugs" and "checking of medicines used at home", to remind the public to prepare records for medicines of long-term use and allergic reactions to medicines, and thus to improve their safe use of drugs. Through the patient-safety week activities, the knowledge of the public on health is improved; and they are also encouraged to participate in the decision-making process for medical care. In this way, it is hoped that the patient safety culture will be deeply rooted.

(4) To improve accuracy of surgical operations, the marking of operation site prior to operation is strengthened. The five priority operation items for operation site marking are total knee replacement, spinal fusion, total hip replacement, amputation, and peripheral vascular operations. The Taiwain Orthopedics Association is commissioned to develop a working manual; and the Bureau of National Health Insurance conducts on-site inspections.

(5) A patient safety website is set up to provide patients with new information on safety and to serve as a platform for exchange. Exchanges with international organizations of patient safety for mutual learning are activated. Research and development in patient safety is encouraged; and information is transmitted and shared timely.

2) The Hospital Accreditation System

Reform of the accreditation of hospitals and teaching hospitals is made on the directions of "patient-centered" and "priority on patient safety".

(1) Priority of the new accreditation system has moved gradually from accreditation of structures to accreditation of process and outcomes, focusing on the review and adjustment of the functions of hospitals at all levels. Through this process, it is hoped that the myth of "the bigger the hospital, the better; the more departments there are, the better" will be broken down. Hospitals are encouraged to develop different types of specialties based on the health needs of the community people. In the reform of teaching hospital accreditation, the focus is on teaching and training programs, and their teaching and training processes and outcomes, to improve the quality of physicians and medical personnel, and to upgrade the overall quality of medical care.

(2) A "scheduled but not on fixed time" system for follow-up supervision and inspection has been practiced to supervise hospitals to make corrections on the defects identified in the accreditation. A "patient-centered" safe care environment has been set up to upgrade the quality of medical care. Thus far, 491 hospitals have passed the accreditation, accounting for about 90% of all hospitals. 70 hospitals have been followed-up and inspected.

(3) Accreditation of psychiatric hospitals and psychiatric rehabilitation institutions has been made. Three psychiatric hospitals (including teaching hospitals) and 75 psychiatric rehabilitation institutions have been accredited to assure the quality of medical care and community rehabilitation service of psychiatric patients.

(4) To upgrade the service quality of Chinese medicine care, and to provide a safe environment for Chinese medicine care, accreditation of Chinese medicine hospitals and Chinese medicine departments affiliated to hospitals has been conducted for the first time. In June 2006, a set of 2006 Operational Procedures on Accreditation of Chinese Medicine Hospitals and Chinese Medicine Departments Affiliated to Hospitals, and another set of Standards for the Accreditation of Chinese Medicine Hospitals and Chinese Medicine Departments Affiliated to Hospitals were announced. 36 medical institutions have thus far been accredited. At the same time, the two-year qualification by training of physicians-in-charge of Chinese medicine institutions is assessed. Thus far, 12 hospitals are rated outstanding, and 21 are qualified.

3) Planning on the establishment of a third-party impartial institution, the health care promotion center, is ongoing. The center will be an organization to supply and monitor information concerning medical care quality. The framework for the national medical care quality assessment has been set up; and core indexes of some major diseases have been developed.

4) Quality management and clinical indicators have been established step by step. Practical review criteria of medical care quality are studied to eventually set up a quality-associated National Health Insurance payment system.

5) A project to upgrade medical care quality has been promoted; and indicators for the achievements of the quality of core medical care for diseases have been developed. Monitoring and improvement of quality have been strengthened. 40 items are promoted to improve quality.

6) A pilot project on full-time nursing care model, and another pilot project on compound nursing care have been commissioned out to establish a collaborative model between full-time nursing personnel and assistant nurses, and thus to reduce the burdens of nursing personnel. Seven more pilot projects on measures to retain nursing personnel have also been commissioned out to alleviate the current awkward situation of nursing manpower shortage.

7) A plan for the rehabilitation and care of medical care or disease control personnel injured by SARS is implemented for 84 persons.

8) Through public health nursing and community nursing networks of public hospitals, a platform for communication on national and local nursing policies has been set up. A nursing partnership network project and on-job training of public sectors have been promoted for 28 public hospitals and 7 county/city health bureaus.

9) A professional registered nurses advisory committee was set up in 2005 to promote the professional registered nurses system. The scope of practice, relevant laws and regulations and their accompanying measures for professional registered nurses have been actively planned.

10) To strengthen the use and application quality of certain medical care techniques, and devices for examinations and laboratory testing, in accordance with the Regulations Governing Management of the Use and Application of Specific Medical Care Techniques, and Devices for Examination and Laboratory Testing, medical institutions, when using or applying specific examinations or items of laboratory testing shall, by regulations, apply to the local municipality or county/city competent health authorities for registration before such use or application can be made. By the end of 2006, 24 items of such medical care techniques and medical devices had been announced. In accordance with regulations governing review and assessment on the procurement and use by medical care institutions of expensive or dangerous medical care instruments, announcement has been made to place PET and Cyclotron under control.

2. Quality of Environmental Protection in Hospitals

Medical wastes can be classified into general and hazardous wastes; and the hazardous wastes produced by medical care institutions are primarily bio-medical wastes. In accordance with regulations of the Waste Disposal Act, bio-medical wastes must first go through the intermediate processing of heat treatment, chemical treatment or sterilization before they can be eventually treated by landfill. Since 1989, the Department has set up by medical care region a joint disposal system for medical wastes.

On December 28, 2001, the Department and the Environmental Protection Administration jointly

announced a set of regulations governing management of institutions in the joint disposal of medical wastes. Currently, the total capacity of the existing public and private disposal institutions for medical wastes and institutions for the joint disposal of medical wastes is more than 167 tons a day, sufficient to handle the 60 tons of infectious medical wastes produced each day. There are at present six institutions set up under the supervision of the Department for joint disposal; of them, two apply the sterilization method for disposal, and the rest have incinerators to dispose wastes by incineration. One joint disposal institution has been approved to electrolyze the recalled fixation fluids produced by medical care institutions to solve the problems of disposing these fluids of medical care institutions.

To reduce the amount of wastes, to promote the recall and recycling of substances, to reduce burdens on the environment, and thus to promote the sustained use of resources, since 2000, the Department has, through demonstration projects on waste reduction and resource recalling, supervised medical institutions to take initiative to properly handle and manage wastes. One company for the recycling of wastes has been approved for operation.

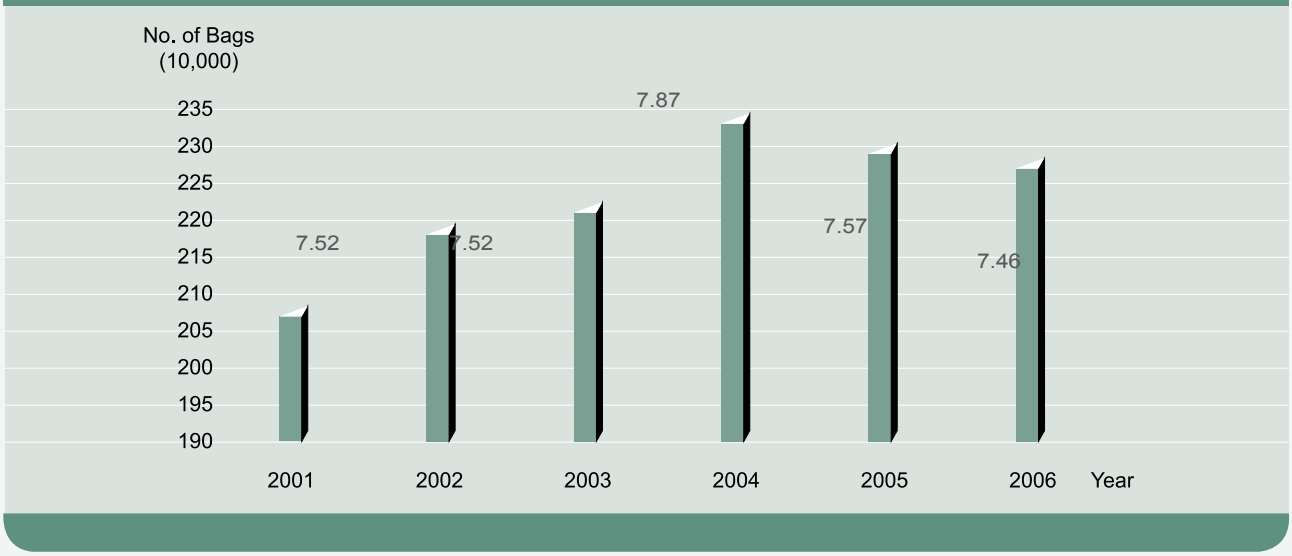
3. Improving the Quality of Blood Supply and Transfusion

In the 32 years that the blood services are promoted in Taiwan, by the enthusiastic participation and warm responses of the population, the blood donation rate in Taiwan has reached the level of the developed countries. They have made considerable contributions to the upgrading of medical care quality and to the promotion of national health. Since the implementation of the first phase intensified hepatitis B control plan in 1981, the Department has consistently promoted the upgrading of the quality of blood supply and transfusion; intensified blood donation and supply enterprises to improve blood supply and transfusion facilities, processes and service quality. To promote bio-technology standards, and to develop self-sufficient blood services, and thus to meet the WHO policy of "self-sufficiency", the Blood Products Act and their Implementation Regulations were promulgated in January 2006. With this, the national blood services can be further strengthened; the quality of blood for medical use can be upgraded; and the safety of blood transfusion can be further guaranteed.

1) High-risk groups are discouraged from blood donation. The presently available laboratory testing techniques can not detect blood infected by AIDS during its window period. This blind spot of laboratory testing increases the risk of blood transfusion. To minimize risk of being infected by AIDS through blood transfusion, the public is actively educated of the correct concept of blood donation; and the high-risk groups are discouraged from using blood donation as a means to test for AIDS infection.

2) New sources of blood are developed to improve the

Figure 6-4 **Blood Donation Rate by Year, 2003-2006**



first-time donation rate. The blood services in Taiwan have been in operation for more than 30 years, and the concept of blood donation is now deeply rooted in the minds of the public. At present, the blood donation population is more than six million, and the blood donation rate is 7.46% (Figure 6-4). In the last six years, the average amount of blood donated per year is 2,225,251 bags (Figure 6-5).

3) Automation of laboratory testing is strengthened to upgrade the quality of blood services. Automation of laboratory testing for blood is upgraded to reduce re-examination rate and to avoid human errors, and thus to improve the quality of blood service, and to protect the safety of the blood recipients.

4) Training on the nucleic acid testing (NAT) of blood is conducted. NAT can directly detect nucleic acid of viruses, their sensitivity is higher than the conventional EIA method; they can also shorten the window period of laboratory testing. To prepare for NAT in the coming future, training of technical personnel is conducted to allow them to become familiar, through training courses, with NAT, and to learn about the techniques.

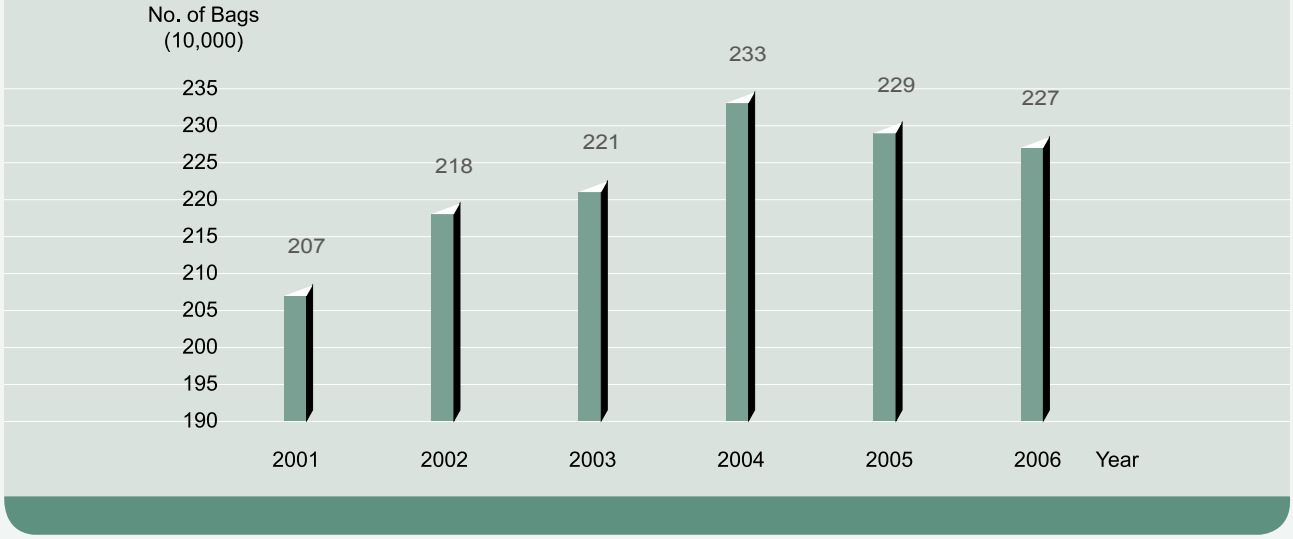
5) Database of rare blood types is established. The frequency of irregular antibodies in red blood cells in the population is 0.73%. Due to the irregular antibodies in red blood cells, hemolysis after blood transfusion is often seen in medical care institutions. For this reason, screening of blood donors for antigens in red blood cells is made to effectively increase the number of files of antigens in red blood cells, to improve the chances of patients of rare blood types locating adequate blood for transfusion, and thus to improve the safety of blood transfusion.

6) Quality of blood services on offshore islands and remote areas is improved. Relevant professional training on the safety of blood transfusion is conducted in medical care institutions of offshore islands of Kingmen and Penghu, and in Hualien and Taitung counties, to improve their medical care quality, and to shorten differences in medical care resources between the offshore islands and the Taiwan Island proper.

Section 3. Psychiatric Care and Mental Health

As a result of social transformation, human relations have become isolated and social support systems are weakened. Consequently, social and psychological problems have increased day by day, and the prevention of psychiatric disorders and the enhancement of mental health have become important issues of concern. For this, the Department has spared no efforts in promoting medical care for psychiatric patients, in planning for mental health services, promoting health education of physical and mental health, and providing counseling

Figure 6-5 Amount of Blood Donated, 2001-2006



to the public on mental health, in order to prevent the occurrence of post-trauma stress syndromes and other related psychiatric disorders.

1. Psychiatric Care Services

To provide comprehensive medical care to serious psychiatric patients, the care network has been improved. To help mild psychiatric patients return to the community, community rehabilitation services are actively promoted. To provide adequate care to victims of sexual assaults, action has been taken to implement the prevention of family violence and sexual assaults. Major activities are as follows:

1) To improve medical care services for psychiatric patients, governments at various levels and private sector institutions are subsidized each year to start or intensify their facilities for psychiatric care, rehabilitation, and psychiatric nursing care to make psychiatric care more accessible to patients. Thus far, one psychiatric care institution, ten psychiatric rehabilitation institutions (including nine community rehabilitation centers and one house of restoration), and four psychiatric nursing homes have been subsidized.

2) To encourage psychiatric patients of stable conditions, patients with deterioration of local functions, and patients likely to be rehabilitated and yet are in long-term stay in medical institutions, to return to the community, community rehabilitation facilities have been substantiated to strengthen community rehabilitation services. By the end of 2006, services had been provided to 2,539 patients by community rehabilitation centers; and 3,365 beds were available at houses of restoration.

3) To understand the care of patients in community, work has been done to conduct registration of the community follow-up care systems for psychiatric patients in 25 counties and cities. At present, 76,105 patients are under case management; they are given follow-up visits in accordance with the guidelines on visits for the follow-up care in communities of the Department. Home visits are made by 60 community care workers to provide continuing and regular care after the discharge of patients from hospitals. By their actual needs, referral is also made to adequately plan for their medical care, rehabilitation and follow-up treatment. For high-risk groups, family members are taught of ways to handle risks.

4) Municipality and county/city governments are subsidized to set up community mental health centers to provide community residents with mental health care and counseling, and to promote education on mental health. Thus far, 25 such centers have been set up throughout the country, and the goal of one center for each county/city has been attained.

5) To manage the injuring parties of family violence, the county/city family violence centers have commissioned 105 institutions to provide the injuring parties with treatment in drug cessation, and with mental therapy, psychological guidance, and cognitive education for treatment. Since June 1999 till present, the accumulated number of persons so treated is 3,361 person-times. For injury examination and collection of evidence of victims of sexual assaults and their emergency medical care, there are 160 responsibility hospitals for the prevention and control of sexual assaults in all counties and cities. To strengthen the understanding of medical personnel on their responsibility in case reporting, a set of operational regulations governing the responsibility of medical personnel in reporting and their award and punishment has been amended and formulated. Thus far, 18 counties and cities have formulated such regulations.

6) In 2006, there were 134 drug cessation institutions designated by the Department. A pilot project on integrated medical care for drug cessation is tried out in collaboration with the judicial authorities. By the end of December, 1,123 persons had been assessed at the institutions; of them, 840 persons were treated, and 1,135 person-times of individual counseling and 6,917 person-times of group therapy were given. In total, 9,175 person-times of treatment were offered. On December 26, 2006, a community rehabilitation project was initiated at the Tsaotun branch jail. The project will accept 30 substance-abusers for treatment. Relevant organizations and groups are encouraged to hold 41 lectures, continuing education and development courses.

7) A set of Operational Standards for the Substitute Therapy of Opium-like Substances is amended and formulated. In coordination with the harm-reduction project for AIDS, the substitute therapy is extensively promoted.

2. Prevention of Suicide

Estimates of the World Health Organization are that by the year 2020, of the ten leading causes of death world-wide, suicide will become the ninth (the eighth in developed countries). The suicide rate in Taiwan had increased from 6.2 per 100,000 population in 1993 to 19.3 in 2006 (Figure 6-6), and had been on the list of the ten leading causes of death for nine consecutive years. To improve the mental health of the population, and to reduce the number of unnecessary deaths, suicide prevention is one of the major public health tasks of present.

Suicide poses a considerable impact on the society; their relevant factors, however, are multi-faceted and interlocked, and the suicide groups are heterogeneous in nature. In recent years, the September 21 earthquake, the global economic recess, and the SARS outbreaks have induced people to face many health, and social and economic shocks, resulting in direct and indirect social and economic losses, and thus created an environment unfavorable to the prevention and control of suicide. Unemployment of individuals or their suspensions of incomes, and economic problems in general have put individuals and families in difficult positions. For this, the Department has made suicide prevention a priority public health task to promote several preventive measures.

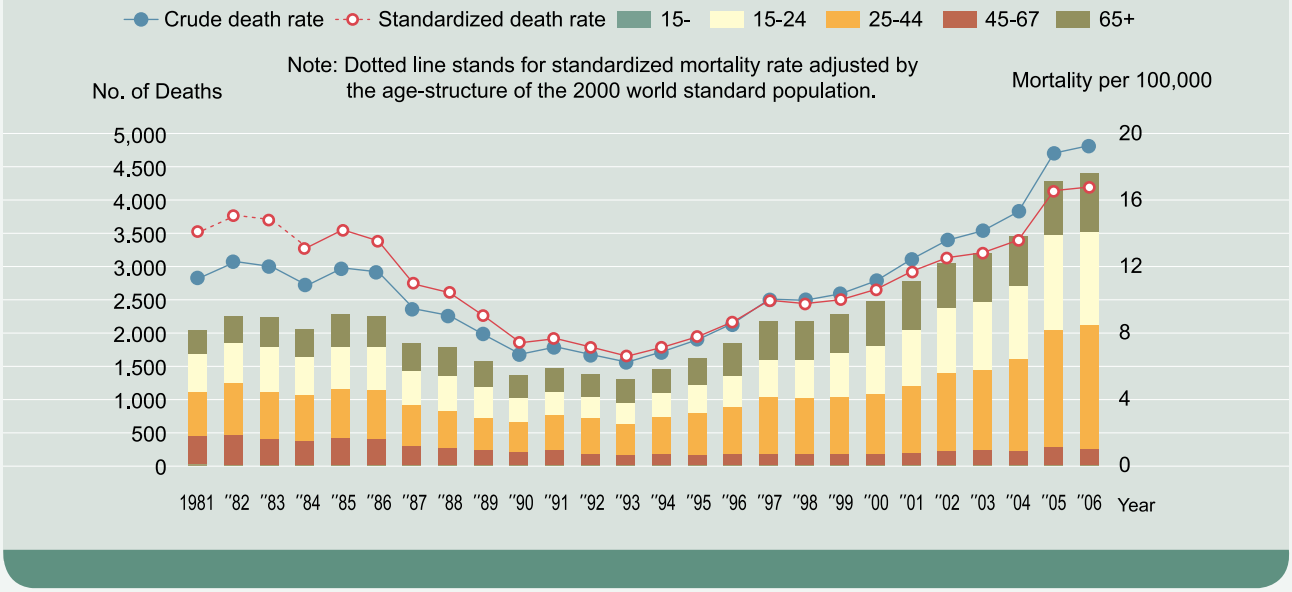
1) A national action plan on strategies for the prevention of suicide was approved by the Executive Yuan in May 2005. The plan is formulated on the concept of prevention in three stages and by five levels on an overall planning basis to draft short, mid and long-term prevention goals from three dimensions, the all-directional, selective and indicative.

2) In November 2005, a suicide prevention reporting and concern system was activated. Reporting units are asked to fill out detailed and analytical reports on the interviews with suicide cases and their referral, and sent them to health bureaus and the Department. In 2006, 19,192 person-times of cases had been reported.

3) In December 2005, a suicide prevention center was set up (commissioned to the Taiwan Association Against Depression); and a 24-hour hotline, 0800-788995, was set up to provide the public with professional counseling services. In 2006, 27,517 calls had been made.

4) In collaboration with community mental health centers, community supporting networks are activated. The shared care network for depression has been expanded to provide professional personnel with training and certification. Workshops have been held to improve reporting of suicide attempts and their follow-up visits.

Figure 6-6 No. of Suicide Cases and Mortality Rate by Year



Section 4. Long-Term Care Service Systems

Acting on the policy of "aging in community", through governments at various levels, plans for vertical and horizontal integration have been implemented to closely link health professions and community support services to set up community long-term care systems. Disabled individuals in community will then be able to maintain independent, autonomous, safe and dignified life capacity. Special care models have also been developed to provide the mentally and physically impaired with comprehensive care services.

1. Community-Based Long-Term Care

In 2006, the population above 65 years in Taiwan accounted for more than 10% of the total population (Figure 6-7). Projections of the Council for Economic Planning and Development of the Executive Yuan are that by the year 2018, the elderly population in Taiwan will be 14% of the total. Along with the aging of population, prolongation of life expectancy, changes in disease patterns, and the sharp increase in the number of disabled persons, the needs for long-term care have increased sharply. How to provide adequate long-term care will be an important policy concern of the government. The Department, to meet the demands, has rendered considerable efforts in promoting long-term care systems to assure the public with integrated, accessible and continuous care services.

1) A pluralistic long-term care service network is developed to strengthen care resources in community, to realize the ideal of aging at home and aging in community. The priority of the plan is on community care supported by institutional care. Hospitals and nursing homes are encouraged to provide home care services. There are at present 311 nursing homes, 468 home care institutions and 22 day care centers.

2) A long-term care system is established to link acute medical care with follow-up care, to implement plans to prepare for discharge from hospitals, and thus to provide continuing care services.

3) A single-window management mechanism for long-term care has been set up. 25 counties and cities have been supervised to set up long-term care management centers. Criteria for the assessment of the long-term care management centers have been established. On-job training for long-term care professionals has been organized to promote their professional skills and knowledge.

4) A long-term care information network has been set up. Information systems for the county/city long-term care management centers, for case management of nursing homes, and for the management of hospital discharges have been completed to key-in information of long-term care management centers, nursing homes and hospital discharge services and program promotion, to monitor quality, and to upgrade service

Figure 6-7 Elderly Population as Percent of Total Population in the Taiwan-Fukien Area (Exceeded 10.0% at end of 2006)

efficiency.

5) In collaboration with the application procedures for alien caregivers of the Council of Labor of the Executive Yuan, various necessary measures have been taken to link the procedures with the long-term care management centers to promote the development of care services.

6) Respite care service plans have been implemented to provide family members with respite services. Caregiver-support groups have been organized. Training for caregivers has been held to relieve caregivers of emotional and physical stresses, and to improve their care skills. In total, 7,792 person-days of caregivers have accepted this service.

2. Services for the Mentally and Physically Impaired

Medical care and rehabilitation services are actively provided to the mentally and physically impaired to intensify medical care for the less privileged groups.

1) 18 district and above teaching hospitals have been subsidized to implement a plan to set up auxiliary aid centers for medical care and rehabilitation. Auxiliary aids are displayed, assessed professionally, and counseling is given. They can be individually designed. Training is also given, and services for home care aids are offered.

2) 24 regional and above hospitals have been subsidized to conduct a plan for the establishment of a joint assessment center on child development, to set up an easily accessible service network for assessment, diagnosis and care, and to provide children with occupational, physical and language therapy and follow-up at clinics.

3) A care model for the mentally retarded is established. The DOH Hualien, Putze and Pingtung hospitals are made demonstration hospitals for the care of the mentally retarded. Since 2006, a project to encourage setting up of community-based day care centers and improvement of the functions of nursing homes has been implemented. Four hospitals have been subsidized to strengthen their facilities for the care of the mentally retarded to provide adequate institutional care services, and to alleviate the burdens of the families, and thus to improve their quality of life.

Section 5. Emergency Medical Care

To strengthen the national emergency care and rescue system, upgrade the quality of emergency medical care and rescue, and assure the life and health of the injured patients in emergency, the Department announced in August 1995 the Emergency Medical Care Act, and ever since, actively promoted the emergency medical care response mechanism.

1. The National Taiwan University and the National Chengkung University have been subsidized to set up National Disaster Medical Assistant Teams (DMAT) to meet demands for emergency medical care at time of major disasters. The establishment and operation of the regional emergency operation centers (REOC) in six regions in Taipei, the northern, central, southern, and eastern regions and the Kaoping area have been completed.

2. Preparation for civil defense has been completed. In coordination with disaster prevention and protection laws and relevant regulations, disaster control and mass casualty emergency care are intensified. Seven drills on the emergency care of mass casualties have been conducted. An Incident Command System (ICS) for mass casualties has been set up.

3. A referral system for the emergency care in perinatal period has been established. There are currently 92 emergency care responsibility hospitals for the newborns, and 85 emergency care responsibility hospitals for high-risk pregnancies. Functional adjustment and development of new functions have been made to provide more convenience to hospitals for use and also for inquiries of the public.

4. A reporting system of ICU beds for critically and severely ill patients has been established to prevent the severely ill patients from overstaying in emergency units. The normal operation of the flow of information on unoccupied beds in emergency responsibility hospitals is maintained to provide fire departments with real-time information on unoccupied beds. At present, 206 hospitals transmit automatically through this system information on unoccupied beds.

5. Local emergency mendical service system to respond to chemical hazards, nuclear hazards and poisons and their emergency care systems have been improved.

1) Medical care for chemical hazards and radiation

hazards has been integrated. Six coordination centers have been set up in Taipei, the northern, central, southern, and eastern regions and the Kaoping area to improve response ability in the care of mass casualties of chemical hazards and radiation hazards.

2) The Taipei Veterans' General Hospital is made responsible for clinical foxicplogy consulting and laboratory test. In Taiwain the central, southern and eastern branches also provide the same counsulting services.

3) The Taipei Veterans' General Hospital is made responsible for the establishment of a emergent specific antidote control center to store specific antidotes for urgent care. Antidotes are properly allocated to 53 hospitals throughout the country.

6. Training in CPR is promoted nation-wide. Training in CPR for employees of the central government has been conducted for some 1,000 participants each year. County/city health bureaus and private sector groups have also been subsidized to organize CPR training for the public.

7. Quality of ambulance services is assessed. In collaboration with the National Fire Agency of the Ministry of the Interior, Medical Affairs Bureau of the Ministry of National Defense, and county/city health bureaus and health stations, a joint inspection team is formed. The team conducted in April and August, 2006, spot-inspection of ambulance services. The inspections are beneficial to the realization of the management of ambulances, upgrading their service quality, and protecting the rights of patients and their families.

8. To fulfill the establishment of the emergency disaster responding procedures in hospital, the Investigation Regulations and Responding Procedures for Emergency Disaster in Hospital was amended and announced in December 2004. The supervision of hospital emergency disaster response is also included in the items to evaluate the performances of local health bureaus.

Section 6. Health and Medical Care in Mountain Areas and Offshore Islands

Residents of mountain areas and offshore islands, as compared to residents of other areas, for insufficiency in medical care resources and manpower, and restrictions by geographic conditions and others, their lives and access to medical care are greatly affected. To narrow down the discrepancy in health and medical care between urban and rural areas, the Department has implemented various health and medical care measures and projects of health building in communities of indigenous peoples and on offshore islands to upgrade the quality of health and medical care, and to create healthy communities.

1. Strengthening of medical care resources and facilities: Health and medical care facilities have been improved. Six health rooms in mountain areas and on offshore islands have been subsidized for reconstruction: Sanmin Health Room of Kaohsiung County for reconstruction, Maolin Health Station for space-renovation and reconstruction to integrate Wanshan Health Room, reconstruction of four health rooms in Hualien County, and space-renovation of the First Health Station of Penghu County Makong City. 11 health rooms have been subsidized to renovate buildings and to prolong their use. Health stations have been subsidized to procure 125 items of medical equipment and facilities and 225 items of information facilities to improve their standards of health and medical care. 17 ambulances and mobile clinic vans and 218 motorcycles for mobile medical care in health stations of the mountain areas and offshore islands have been replaced to improve their mobility in medical care and rescue services.

2. Protecting the rights to health and medical care of residents of mountain areas and offshore islands:

1) The Council of Indigenous Peoples of the Executive Yuan is coordinated to subsidize the health insurance premiums of indigenous peoples to reduce their medical care burdens, and thus to make available to all the various services of the National Health Insurance.

2) Local primary care resources and medical care resources of hospitals are integrated and efforts of the academic and private sectors are coordinated to strengthen the medical support programs. In addition to support of public and military hospitals, since November 1999, a National Health Insurance Integrated Delivery System (IDS) for medical care in mountain areas and offshore islands has been promoted in the forms of support to specialty care,

fixed-spot clinics on holidays, mobile clinics, and commissioned medical care to attain the goal of "medical care in every township; support in every village". In total, 48 townships in mountain areas and offshore islands have been involved in this project.

3) A project of the Department, Review Center for the Air Referral of Patients, is implemented to provide local emergency and seriously ill patients with adequate medical care, and at the same time, to upgrade the quality of air-rescue. In 2006, 255 applications for air-referral had been received; 214 of them were approved, at an approval rate of 83.92%. In addition, the helicopter parking areas in three mountain areas and offshore islands (Fuhsing Township of Taoyuan County, Wanan Township of Penghu County, and Wuchiu of Kinmen County) have been repaired to improve air safety.

4) In accordance with the guidelines governing transportation subsidies for medical care to severely ill or emergency patients of mountain areas and offshore islands, since 1998, subsidies have been made to Penghu, Kinmen, Lienchiang, Pingtung and Taitung health bureaus for transportation costs for the air-referral of patients. By the end of 2006, 317 patients had been air-transferred; and subsidies on transportation costs had been made to 20,803 severely ill patients for referral to the Taiwan proper for medical care.

3. Tele-Medical Care

1) A tele-medical consultation system has been set up in Penghu, Kinmen, Lienchiang and Taitung health bureaus to provide medical consultation. There are at present 25 link points.

2) A pilot project, mobile clinic, is tried out in Taian Township of Miaoli County. Real-time radio communication is used to replace paper medical records. A vocal registration system in Tayal language, the first one in country, is set up. The system takes all languages of the indigenous peoples.

3) A pilot project to set up the PACS system on offshore islands is tried out in Lienchiang County. The cross-regional real-time x-ray diagnosis shortens the distance between offshore islands and the Taiwan proper. A virtual real-time medical care platform is linked to provide second consultation and referral, and thus to upgrade the quality of medical care in mountain areas and offshore islands.

4. To encourage medical personnel to practice in mountain areas and offshore islands, a set of regulations governing incentives and supervision of medical institutions practicing on offshore islands has been formulated; thus far, three medical institutions (clinics) have been supervised for practice. A set of guidelines to subsidize medical personnel for practice in mountain rural areas is also formulated; and thus far, one medical institution (clinic) has been so supervised.

5. The community health building project is promoted from three dimensions, indigenous, formulating health issues, and establishing mechanisms to strengthen organization, consolidate local resources and activate community health strategies, and thus to encourage participation of community people to jointly build a healthy life and a healthy community. In 2006, 61 projects had been promoted together with 1,425 community organizations; 3,835 health volunteers had also been recruited.

6. Integration of medical care resources in remote areas, and Penghu and Kinmen

1) The Kinmen County Hospital was made a DOH-affiliated hospital in October 2005. The various medical affairs of the Hospital are supported by the DOH-hospitals of the Taipei Region Alliance.

2) The Matsu Military Hospital was dissolved in July 2005. For no interruption to medical care, medical care services are supported by the Taipei Municipal Joint Hospitals, and by the DOH-hospitals of the Central Region Alliance for surgery and psychiatry to meet actual demands for medical care.

3) The Penghu Medical Building is managed by the Tri-Service General Hospital Penghu Branch. Medical care resources in the Penghu area are consolidated; the consolidation is expected to complete in July 2008.

4) The Lienchiang County Hospital is subsidized for building a new hospital building; the Kinmen Hospital is subsidized to renovate wards. The quality of health and medical care in Kinmen and Matsu areas will thus be upgraded. Subsidies are made to install a set of MRI in the Penghu Medical Building. The equipment was inaugurated for use on January 26, 2007. Medical care standards in these areas will thus be effectively promoted.

5) To improve medical care for indigenous peoples, the

Fengping Branch of the DOH Hualien Hospital was named, on August 1, 2006, the Fengping Indigenous Peoples Branch Hospital of the Hualien Hospital to strengthen medical care for indigenous peoples.

6) In November 2006, the Hengchun Branch Hospital successfully integrated three local hospitals to develop services of tourism-cum-medical care, and to provide local residents with 24-hour emergency care services.

7) With the commanding and support of the DOH Central Region Alliance for the allocation of physicians and nurses in the DOH Taitung Hospital Chengkung Branch, 24-hour emergency care services are now provided. The Taoyuan Health Bureau has successfully integrated resources of the DOH Taoyuan Hospital, the Hsinwu Branch, the Taipei, Hsinchu and Miaoli hospitals to provide in these areas 24-hour emergency services.

7. Continuing education for physicians of health stations in mountain areas is conducted. The training includes care of critically and severely ill patients and alcohol-cessation. The training is conducted jointly by the Antai Hospital and the DOH Ilan Hospital for 23 physicians.

8. Medical and rescue teams in mountain areas have been established. 90 members are employed to provide education and training in emergency care, to assist in the promotion of the public health programs of health stations in mountain areas, to upgrade the quality of medical care in mountain areas, and to help solve unemployment problems of the indigenous peoples.

9. Hepatitis control for indigenous peoples in Miaoli County and screening for hepatitis in Kinmen and Green Island areas have been conducted. Residents above the age of 20 years who have not yet been screened are screened and examined with ultrasound. In the Kinmen and Green Island areas, 1,739 persons have been screened and eight of them are confirmed diagnosis. In the Miaoli area, 970 persons have been screened, and five of them are confirmed diagnosis.

10. Indigenous peoples and residents of offshore islands are recruited for training to be medical personnel on government scholarship. Upon completion of training, they are sent back to their villages for service. By the end of December 2006, 266 such medical personnel had been trained. After completion of their obligatory services in hometowns, more than 70% have remained at the locality for service.

Section 7. Health Information

Along with the changes of information technologies with each passing day, information systems have been playing a more important role in the quality of medical care. Following the plan for the promotion of the Internet health services (plan period from 2002 to 2005) and the plan for the Internet public services of health bureaus and health stations (plan period from 2003 to 2006), the Department continues, expands and promotes the National Health Informatics Project (NHIP) to realize the policy goal of "returning health information to the public", to construct a sound environment for the development of health information, to develop manpower in health information, to create new service models of medical information industries, and thus to upgrade the quality of medical care.

1. Health Information Network

1) National Health Information Network Infrastructures

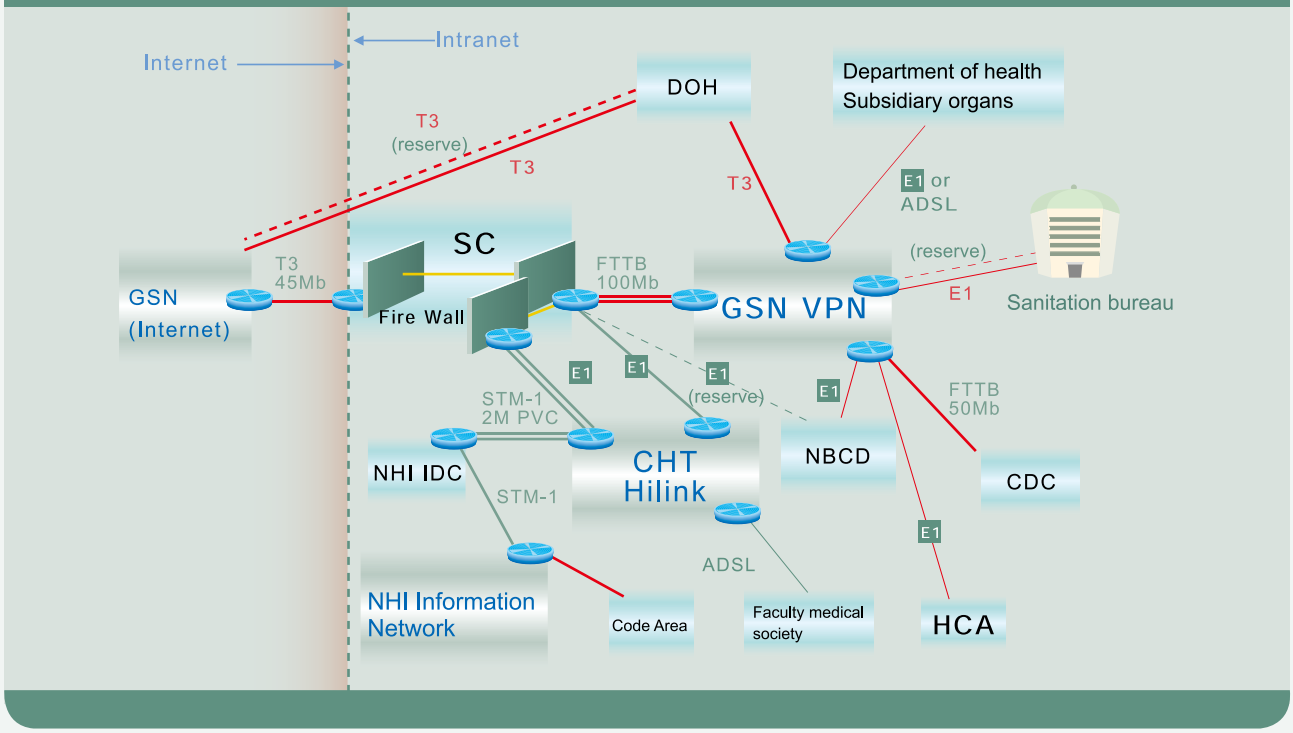
To meet the needs for exchange and sharing of medical care information, the construction of regional centers (RCs) in Taipei, Taichung and Kaohsiung under the National Health Information Network (HIN) was completed in 1995. In 2001, the RCs were merged into one service center (SC) to serve as a national hub for the exchange of health information (Figure 6-8).

The SC continues to be responsible for the operation and management of the maintenance performance and backup etc. of various public information systems, and the counseling services to the linking institutions of HIN. The SC is also responsible for the monitoring, maintenance, and operation of the networks, and information security management, and to provide health bureaus/health stations with on-site visits and supervision on the status of information environment, to provide the linking health and medical institutions a high-quality, high-stability data processing service, and also channels for information transmission and exchange, to promote the efficiency and quality of information management in the primary health units, and to narrow down the digital discrepancy between the urban and the rural areas.

2) Medical Affairs Management System

The primary functions of the medical affairs

Figure 6-8 Framework of HIN Network



management system are to assist the Department and local health bureaus in the management of medical affairs, pharmaceutical affairs, management of the psychiatric rehabilitation institutions, and management of medical personnel and their administrative sanction, management of specific instruments and credit points for the continuing education for medical personnel. The system is linked to other relevant systems of the DOH-affiliated organizations for information exchange to reach the goal of information sharing. Functions are added and amended constantly to improve the efficiency of the system.

3) Health Bureau/Health Station Internet Public Services Plan

In coordination with the "Challenging 2008 Key National Development Projects – Plan for Digital Taiwan", a health bureau/health station Internet public service plan is proposed. Work will be done by the central government to plan for and develop health promotion public service networks and related information reporting service systems, and to urge health bureaus and health stations to use at an early date the Internet technologies to provide the public with services in health promotion. Major achievements in 2006 are as follows:

(1) Extension of the functions of the reporting of psychiatric care, reporting of suicide prevention, and assessment of the physical and mental impairments systems has been completed. Cases reported by each system are respectively 9,867, 20,563 and 41,563.

(2) The functions of the online application system for medical personnel reporting for support services are expanded and promoted in 25 health bureaus and hospitals under their jurisdiction. In total, 28,631 applications have been received from 267 hospitals. The processing time required for hospitals to report for support has been effectively shortened from three days to one day.

(3) Integration of the single entry systems of health bureaus: Health bureaus are supervised to use online their own information networks, and online account applications and information management systems. The existing systems of health bureaus are integrated for single entry with systems of the Bureau of Controlled Drugs and the Committee on Chinese Medicine and Pharmacy.

(4) The health promotion public service websites of the 354 health stations are operated as a whole to

provide the public with online searching for health information and other related services. In total, 21,769,655 person-times of individuals have visited these websites (Figure 6-9).

(5) The food safety management information system was officially put into operation online in January 2006. The functions of food inspection and management are strengthened; the food safety of the public is safeguarded; and the administrative efficiency is improved. Some 78,000 cases of inspection have thus far been filed.

4) Establishing a Long-Term Care Information Network

In 2006, in coordination with the reporting process and management indicators formed by the central government, functions of the reporting systems of care institutions were expanded. Training and promotion were conducted at the same time. The long-term care management centers of counties and cities, 31 nursing homes and 14 hospitals using the said system are supervised. Information is exchanged with the care service management information systems of the Ministry of the Interior. Through the strengthening and promotion of the long-term care information network systems, the goal of information in support of long-term care is reached.

2. Internet Health Services

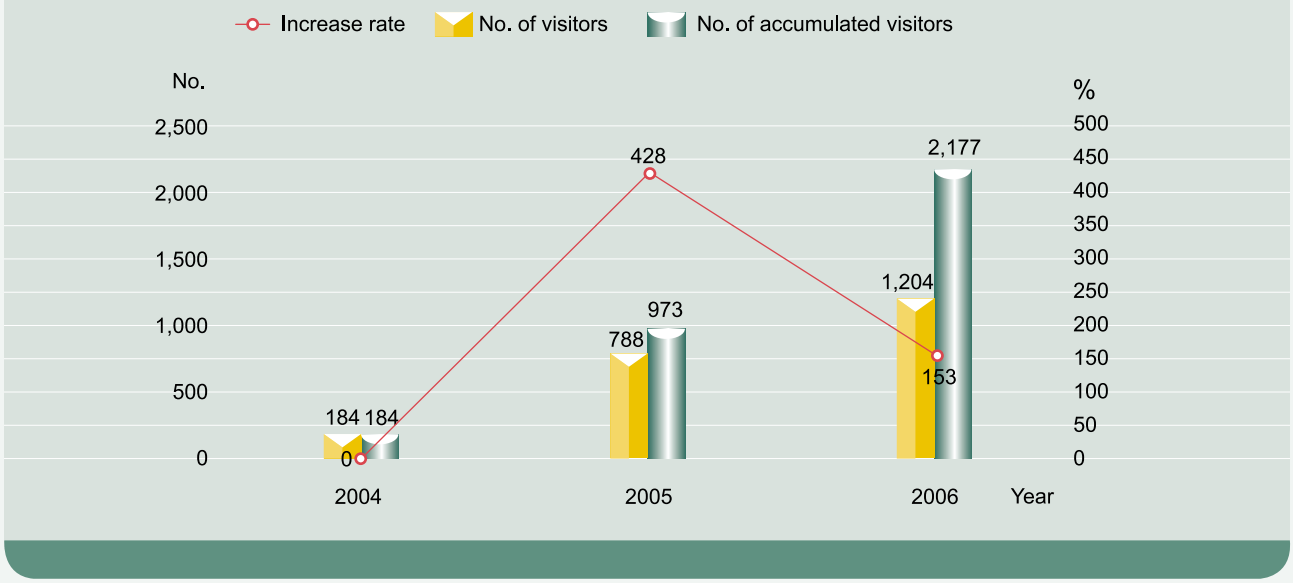
1) Promotion of Electronic Medical Records

To protect the security of medical records and privacy of patients, a set of Regulations Governing Preparation and Management of Electronic Medical Records by Medical Institutions was formulated and announced for implementation in November 2005. Medical institutions meeting requirements of the said Regulations may be waived from preparing medical records in paper form, and thus to improve efficiency of medical care services, to upgrade quality of medical care, and to reduce management costs of medical institutions.

(1) Promotion of Electronic Medical Records in Medical Care Institutions: The use of electronic medical records in medical care institutions is relatively popular; about 50% (244) of hospitals are in the second stage (computerized medical records), and 40% (202) are in the third stage (electronic medical record) and above. This suggests that medical industries are well developed in infrastructures; and that the development of electronic medical records has reached the stage of integration within hospitals and is moving toward sharing and exchange between hospitals (Figure 6-10).

(2) Operation of the Healthcare Certification Authority:

Figure 6-9 No. of Visitors to Health Station Websites by Year



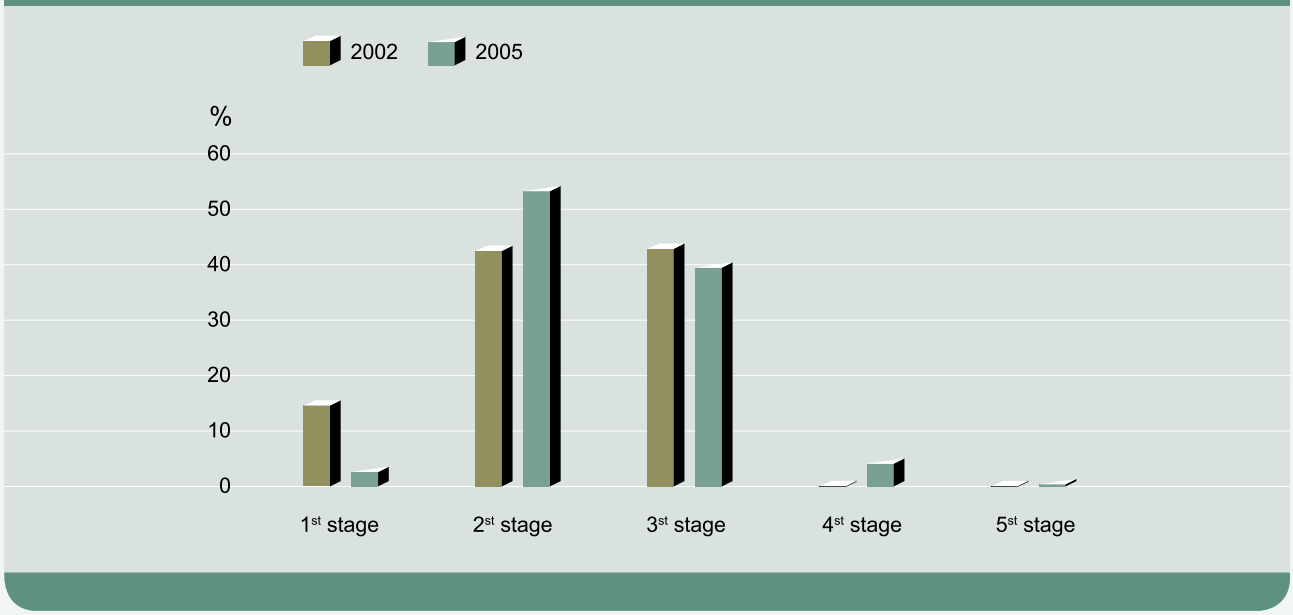
The Healthcare Certification Authority (HCA) officially began operation on June 13, 2003 to provide services in electronic certificates. Thus far, 5,832 Healthcare Certification IC cards have been produced and issued, totaling 146,272 cards. The cards are used for the promotion of electronic medical records, for use in the health bureau/health station public service networks, online reporting of births, signing of testing and examination reports, exchange of electronic documents between medical care institutions, and reading of information on the columns of the National Health Insurance card about the critically and severely ill patients, allergic medicines, prescriptions, and consent to organ donation.

(3) Promotion of Medical Care Information Standards: To realize the exchange and flow of medical care information between medical care institutions, work has continued to promote the medical care information HL7 and the Digital Imaging and Communications in Medicine (DICOM) standards. Thus far, 13 sets of draft HL7 standards have been formulated. A message verification mapping for medical care information standards HL7 and a system for the comparing of the international LOINC and the NHI codes have been set up to provide medical care institutions with standards for the verification of information in the process of exchange of medical care information.

2) Databank on Drug Interaction: The system began operation in 2004. Basic information on drugs and their relevant interactions, together with codes of the NHI-covered drugs, and ingredients and generic names of domestically used drugs are integrated to a comprehensive drug interaction-related databank. Hospitals, clinics and pharmacies are provided for free use to timely check whether the drugs on the prescriptions are interactive, and thus to improve the safety of drug use and adequacy of prescriptions, and to reduce chances of repeated use of drugs and costs of the National Health Insurance, and to safeguard the safe use of drugs. Thus far, 1,787 medical care institutions are using this system, and 63,819 person-times have visited the website.

3) Emergency Care Management System: In 2001, by applying the Internet technologies, a revised edition of the emergency care management system was completed. At the same time, the automatic reporting by emergency responsibility hospitals via HIS system of available ICU and observation beds by department was also completed. In collaboration with the geographic information system of the medical care resource management systems, the system can display the number of unoccupied beds in the region and in the neighboring counties and cities and their geographic positions. The functions of the emergency

Figure 6-10 Hospitals in Different Stages of Electronic Medical Records



medical care and rescue reporting systems, and the management of emergency responsibility hospitals are amended and added to improve the friendliness of the system surface. A system operation monitoring mechanism is set up to provide timely emergency and rescue information at time of incidents. Users of this system include the Department, the National Fire Administration, emergency care responsibility hospitals, county/city health bureaus, disaster command centers of the fire departments of counties and cities, epidemic command centers, and six regional emergency and disaster response centers, 400 some in total.

4) Online Public Application Service System:In line with the policy on the promotion of e-government, in December 2003, online public application systems for medical affairs, pharmaceutical affairs and food safety were set up to use the Internet technologies for the downloading of various application forms, inquiries by applicants on the progress of processing, and notification for collecting the processed applications. In 2006, online application for the registration and market approval of Category I medical devices was added, and integrated with the management information system for pharmaceutical affairs and management system for medical affairs to shorten the time required for processing. The use of the Healthcare Certification (for personnel and institutions) IC cards issued by the Healthcare Certification Authority to enter the system is added to provide the public with more diversified mechanisms for entering, and thus to reach the goal of bringing more convenience to the people.

Section 8. Medical Manpower

The size and quality of medical manpower have certain impact on the quality of medical care and accessibility to medical care resources. For this, the Department has continued to conduct projects related to the distribution of medical manpower and their training to improve the sound operation of the medical care system.

1. Current Status of Medical Manpower

By the licensing systems of professional personnel, there are 11 laws and regulations governing the management of medical personnel, namely, the Physician's Act, Pharmacist's Act, Midwifery Personnel Act, Dietitian's Act, Nursing Personnel Act, Physical Therapist's Act, Occupational Therapist's Act, Medical Technologist's Act, Medical Radiology Technologist's Act, Psychology Counseling Personnel Act, and Respiratory Therapist's Act. In the future, more laws and regulations for the management of dental technologists, optometrists, hearing technologists and speech-language technologists will be developed and formulated.

By the end of 2006, there were 15.26 western medicine physicians, 2.07 Chinese medicine doctors, 4.55 dentists, 11.99 pharmaceutical personnel, and 47.90 nursing personnel per 10,000 population. By the goal of the holistic healthcare plan, the number of western medicine physicians per 10,000 has reached the goal of 14.7. The number of Chinese medicine doctors, dentists, medical technologists, medical radiology technologists, physical therapists, occupational therapists, pharmaceutical personnel, nursing personnel and dietitians also meets the estimated required number. Manpower of clinical psychologists, and hearing and language technologists, however, are still insufficient.

2. Development of Medical Manpower

To improve the quality of medical manpower, on-job training and plans for the development and cultivation of various kinds of medical manpower are conducted each year by the Department. Major achievements are as follows:

1) The development of various kinds of medical manpower is done on control basis. The ceiling for the development of western medicine physicians, for instance, is in principle 1,300 medical students per year. Manpower of other kinds of medical personnel is under special control. Applications should be made prior to the establishment of schools; and the applications are reviewed by the Ministry of Education for control purpose. Planning for physician manpower in the future will be based on the goal of balanced distribution of physician manpower resources. Periodic assessment mechanisms will also be set up. The number of medical personnel licensed and in practice is shown in Table 6-1.

2) To develop local personnel, a plan for the development of local medical and nursing personnel began in 1969. Indigenous peoples and residents of offshore islands are recruited for training as medical personnel

on government scholarship, and are sent back to their original localities for service upon completion of training. Since 2002, development plans of Kinmen and Lienchiang County have been integrated. Thus far, 256 physicians on government scholarship have been trained. Military draftees serving alternate duties with specialties in medical care are assigned with priority to mountain areas and offshore islands for service to strengthen local medical manpower and to upgrade their medical care quality. In the period between 2003 and end of 2006, 275 such draftees had been assigned.

3) Training of physicians on government scholarship began in 1975. They are assigned, upon graduation, to work in primary care units or to specialize in specialties of fewer applicants. The program was initially operated by the Ministry of Education, and since 1993, it was transferred to the Department for implementation. Thus far, 5,391 physicians have been trained. Currently, 1,327 are fulfilling their obligations; of them, 451 are in some special branches of medicine, and 195 are doing their second-stage obligations in mountain areas, offshore islands, health stations, and non-public teaching hospitals. To strengthen the social participation and support of medical care services in remote areas of the DOH hospitals, to stabilize the medical manpower resources in remote areas, since 2005, graduates on government scholarship are assigned to work in the DOH-affiliated hospitals for six years. They are routinely assigned to work in remote areas.

4) A set of Regulations Governing Classification, Screening and Review of Specialty Physicians was announced in June 1988. Professional medical societies are commissioned to conduct screening and review of specialty physicians, and to upgrade the quality of professional training. Since 2001, hospitals for the training of specialty physicians are accredited and certified again each year to maintain certain quality of specialist training and to balance the distribution of specialists. At present, 25 specialties have been announced; of them, two sub-specialties are sub-specialties of dentistry specialty. A total of 37,646 person-times of physicians have thus far been issued certificates of specialists after screening and review. Subsidies have been made each year for advanced training overseas to physicians in eight specialties of gerontology, genetic medicine, occupational medicine, nuclear medicine, anatomy and pathology, clinical pathology, radiological therapy, and forensic medicine, to improve manpower and quality in these specialties.

5) To strengthen in physicians the concepts and capacity of holistic care, to improve the quality of training of resident physicians, and to realize the idea of "patient-centered" holistic care, since 2003, a plan for the training of physicians in general medicine after graduation has been promoted. Physicians were initially required to go through training in general

Table 6-1 Medical Manpower, 2006

Category	No. Licensed	No. Practicing	No. Practicing /10,000
Physician	50,933	34,899	15.26
Chinese medicine doctor	10,893	4,743	2.07
Dentist	13,802	10,412	4.55
Pharmacist (assistant pharmacist)	45,943	27,413	11.99
Nursing personnel	373,034	109,538	47.90
Dietitian	4,529	1,138	0.50
Medical technologist (technician)	17,244	7,459	3.26
Physical therapist	4,261	2,395	1.05
Physical therapy technician	3,130	1,378	0.60
Occupational therapist	2,027	1,286	0.56
Occupational therapy technician	467	172	0.08
Medical radiology technologist (technician)	5,765	4,053	1.77
Clinical psychologist	649	413	0.18
Counseling psychologist	808	24	0.01
Respiratory therapy technologist	1,360	1,078	0.47

medicine for three months; the training was extended to one year in 2006. The purpose is to correct the organ-oriented, disease-oriented treatment models, and to provide more comprehensive medical care services. In total, 122 hospitals have participated in this plan.

6) A project to train additional dental residents is conducted. In 2006, 399 dentists had accepted two-year training in teaching hospitals.

7) In December 2006, a set of Regulations Governing Classification, Screening and Review of Specialty Professional Registered Nurses was partially amended and announced. Relevant administrative orders concerning specialty professional registered nurses were annulled at the same time. A project to train teachers of specialty professional registered nurses in internal medicine and surgery was conducted for 553 medical and nursing personnel (184 physicians and 369 professional registered nurses). A written examination was held in December for the screening and review of specialty professional registered nurses in internal medicine and surgery for the year 2006; 1,662 had taken the oral examination. To encourage nursing personnel to stay on job, and to improve their professional capacity, seven pilot projects on measures to encourage nursing personnel to remain on job have been commissioned out.

8) The training of Chinese medicine doctors comes in a seven-year program (extended to eight years in 1996) and a five-year post-baccalaureate program. To select among individuals who have considerable knowledge of Chinese medicine and pharmacy to practice Chinese medicine, the Ministry of Examination has held qualifying examination and special examination for them. To promote the normal development of education in Chinese medicine, and to improve the ratio of Chinese medicine doctors trained by regular education, the qualifying examination for Chinese medicine doctors will be discontinued in 2008; and the special examination will be discontinued in 2011.

9) Plans have been promoted to improve the clinical training of Chinese medicine doctors to enhance the teaching, research, training and practice environment of Chinese medicine.

   (1) To improve the clinical training of Chinese medicine doctors, in 2006, 14 hospitals had been subsidized to conduct 24 projects for the improvement of the clinical training of Chinese medicine doctors (including 13 training projects at out-patient clinics, 7 for consultation, one for hospital care, and three core hospitals for the clinical training of Chinese medicine doctors). In total, 612 Chinese medicine teaching clinics have been set up to train 2,508 person-times; and 574 teachings in consultation in Chinese medicine have been held for 1,733 person-times. In the training in hospital care, 54 teachings have been held for 81 person-times.

   (2) To provide Chinese medicine doctors with a platform for case discussion and experience sharing, one national and three regional case conferences totaling 12 were held in the northern, central, and southern regions for 2,109 person-times of Chinese medicine doctors. 84 of the instructors have contributed 113 papers for medical journals.

   (3) For each case, a medical record and abstract for teaching are prepared. A volume, cases for teaching at out-patient clinics, for consultation and in hospitals, will be compiled for use as clinical teaching materials.

10) Continuing education for Chinese medicine personnel is implemented to overall upgrade the care quality of Chinese medicine.

   (1) 15 academic symposiums for the continuing education of Chinese medicine doctors (including carrying-on of experience) have been held for 3,736 Chinese medicine doctors, accounting for 80.9% of all practicing Chinese medicine doctors at the end of 2005 (4,616).

   (2) Nine academic symposiums on western medicine and Chinese medicine have been held for 3,218 Chinese medicine doctors, accounting for 69.7% of the practicing Chinese medicine doctors at the end of 2005.

   (3) 24 training courses for Chinese medicine nursing personnel have been held for 762 nurses, accounting for 55.9% of all nursing personnel practicing in Chinese medicine hospitals at the end of 2005 (1,427). Thus far, 169 nursing personnel have completed the nine-credit courses in seven disciplines.

7

National Health Insurance

Chapter 7. National Health Insurance

The National Health Insurance (NHI) is one of the major social protections for the health of the people. Since the inception of the program on March 1, 1995, the financial barriers of the public to medical care have been greatly reduced; and the access to medical care has been significantly improved. The public satisfaction rate has always remained high at around 70 to 80%. This Chapter focuses on the current status of the National Health Insurance and its reform.

Section 1. Current Status of the National Health Insurance

The National Health Insurance was initiated on March 1, 1995. It is one of the most important social infrastructures for the people of Taiwain. For the sustained management of the program and protection of people's righ to medical care, a number of measures have been implemented.

1. Insurance Underwriting

The enrollment of National Health Insurance program is a mandatory. Not only all citizens in Taiwan are required to join the program, foreigners who have the resident permits and have resided in the Taiwan for more than four months shall also join the program by law. By the end of 2006, a total of 22,484,427 persons (not including armed forces) were covered, giving a coverage rate of more than 99%, In order to protect the medical right of the disadvantaged groups and to relieve their financial burden to healthcare various measures have been taken.

1) Permium subsides to individuals of disadvantaged groups: including the elderly aged over 70 and children under the age of 3 of Lower middle income household, the physically and mentally impaired, unemployed indigenous individuals and unemployed labors are subsidized of their insurance premiums. Each year, approximately NT$ 6.45 billion is subsidized for 1.373 million people.

2) Assistance to people with overdue premiums

(1) The National Health Insurance Relief Fund: Individuals who have financial difficulties to afford the insurance permiums, can apply to the National Health Insurance Relief Fund for interest-free laans In 2006, 1,827 applications had been approved.

(2) Referral to charity groups: the Branch of National Health Insurance will refer persons who are unable to pay for insurance premiums to charity groups to get premium support. In 2006, 574 cases had been successfully referred for a total of NT$ 4.71 million.

(3) Installment application for insurance premiums: Individuals who cannot pay for insurance premiums in full at one time, they can apply to pay their premium on installments. In 2006, 256,962 persons applied this arrangement.

3) Copayment waiver for catastrophic illness: For patients of cancer, psychiatric diseases, end-stage renal diseases, congenital disorders and rare disease, their co-payments for medical care are waived. There are about 650,000 cases so far. Although those patients account for a mere 2.9% of the total insured, they share about 26% of total medical coast, accounting NT$110.9 billion medical expenses.

2. Insurance Financing

When the National Health Insurance was initiated in 1995, the premium rate was set at 4.25%. Various revenue-increment and expenditure-saving measures, and a strict monitoring mechanism of financial status executed by the Bureau of National Health Insurance had prolonged the financial balance cycle originally set for five years. In September 2002, the premium rate was slightly adjusted from the original 4.25% to 4.55% to maintain the financial balance for the next two years.

In the period between March 1995 and end of 2006, the insurance revenue, calculated on accrual basis was NT$ 3,515.474 billion; whereas the insurance cost was NT$ 3,514.047 billion. In the year 2006 for instance, the insurance revenue was NT$ 382.121 billion; whereas the insurance cost was NT$ 382.21 billion, giving a deficit of NT$ 8.9 million. The cumulative reserve funds are NT$ 1.427 billion (Table 7-1); lower than the one-month total insurance payments (about NT$ 31.8 billion). By

regulations of Article 67 of the National Health Insurance Act, the premium rate shall be adjusted when the total amount of safety reserve is lower than the amount of one-month total insurance payments.

To make specific recommendations to resolve the financial problems of the National Health Insurance, the NHI Supervisory Committee set up a special group for it. At the provisional meeting of the Committee in December 2006, it was resolved that: 1) the safety reserve fund should not become zero; 2) expenditure-saving measures of the NHI should be specifically defined and should bear no negative impact on the quality of medical care; and 3) measures in the basic hypothetic conditions that are to be adjusted by law should be implemented immediately. The Bureau of National Health Insurance has, acting on the resolutions of the meeting, studied and drafted several items for financial adjustment.

3. Insurance Payment

1) Payment schedules for medical costs under the NHI are reviewed and amended to upgrade the quality of medical care, to reasonably reflect the comparative values of the payment points, and to promote the balanced development of various departments and hospitals at various levels. Major adjustments include:

   (1) The second edition of the medical payment schedules based on comparative values has been compiled to agree to include obstetrics and gynecology tables of comparative values in the payment schedules.

   (2) On the principle of "same work, same pay", amendment is made on the basis of one unified table. The items for relaxation for the second stage proposed by the western medicine primary care are also agreed, totaling seven items.

   (3) To reduce differences in per diems for hospice care at different levels, amendment is made to unify the per diem for hospice care for institutions at all levels. To protect the rights of the public to the use of medicines, claims at cost for drug for pain of bony metastasis, bisphosphonate, are added.

   (4) To upgrade the quality of primary care, plans for the improvement of hypertension and depression have been added and implemented.

   (5) To strengthen dental care services for the physically and mentally impaired, regulations are relaxed to make services available to the moderately and above impaired. County/city dental associations may form dental care teams to visit on fixed schedule social welfare institutions for the physically and mentally impaired designated by the Ministry of the Interior for dental care services.

   (6) To encourage physicians to perform normal child delivery in place of Caesarean section, payments for normal child delivery are adjusted to the same level of the case-payment for Caesarean section since May 2005.

2) To reasonably contain medical costs and to promote the balanced distribution of medical care resources, the global budget payment system has been universally practiced since July 2002. At the micro-level, the payment schedules and the claim review systems have been reformed. Measures taken include payments for quality of services rendered (such as a plan to improve payments for five major diseases, a pilot project on integrated medical care by family doctors), expansion of the case-payment system, and studies on the formulation of a table of payment schedules based on comparative values. The case-by-case review has been shifted toward the establishment of the medical care pattern review based on profile analysis.

3) In accordance with regulations of the National Health Insurance Act, the global budget for the year is proposed by the Department of Health before the start of a fiscal year. After approval by the Executive Yuan, the budget is referred to the NHI Medical Expenditure Negotiation Committee, which will then call meetings of payers and health care providers to reach an agreement on the total amount and ways of allocation. The results of negotiation in the past years are shown in Table 7-2.

4) To improved access of the insured to medical care services, the Bureau of National Health Insurance contracted more than 92% of medical institutions across the country. By the end of 2006, there were 23,207 institutions that had signed contract with the BNHI among them, 18,289 are medical care institutions 4,036 are pharmacies, 21 midwifery

Table 7-1 Revenues and Expenditures of National Health Insurance by Year (by Authority and Responsibility)

Unit: NT$ 100 million

Year	Revenues[1]		Costs[2]		Balance	Surplus of Safety Reserves
	Amount	Growth Rate (%)	Amount	Growth Rate (%)		
1995	1,939.91	-	1,568.47	-	371.44	371.44
1996	2,413.28	-	2,229.38	-	183.90	555.33
1997	2,436.38	0.96	2,376.14	6.58	60.26	615.59
1998	2,604.80	6.91	2,620.40	10.28	(15.59)	599.99
1999	2,648.95	1.69	2,858.98	9.10	(210.03)	389.96
2000	2,851.70	7.65[3]	2,842.06	(0.59)[4]	9.64	399.60
2001	2,861.46	0.34	3,017.88	6.19	(156.42)	243.18
2002	3,076.07	7.50[5]	3,232.62	7.12	(156.55)	86.63
2003	3,367.60	9.48[6]	3,371.44	4.29[7]	(3.83)	82.80
2004	3,522.44	4.60	3,526.74	4.61	(4.30)	78.50
2005	3,610.92	2.519	3,674.27	4.18[9]	(63.35)	15.16
2006	3,821.21	5.82[8]	3,822.10	4.02[9]	(0.89)	14.27
Total	35,154.740	-	35,140.477	-	14.27	14.27
Annual average 1997-2006	3,080.16	4.70	3,134.26	5.54	-	-

Explanations: 1. ( ) is for negative values.
2. Revenues and expenditures for 1995-2004 are audited balances.

Notes: 1. Insurance revenues= insurance premiums + fines for overdue payments + net income from capital use + share of public interests lottery + other net incomes – bad debts
2. Insurance costs= medical costs + other financial insurance costs (subsidies on medical care for the September 21 earthquake already deducted)
3. The sudden increase in insurance revenues in 2000 is due primarily to the strengthened collection of premiums from the interrupted insured.
4. The sudden decline in insurance costs in 2000 is due primarily to measures to increase incomes and reduce expenditures and monitoring of financial balance; if the NT$ 4.523 billion of government subsidies to medical costs of the September 21 earthquake is included, the insurance costs of the year should be NT$ 288.729 billion, at a growth rate of 0.99%.
5. The sharp increase in insurance revenues in 2002 is due to the practice of the Fair Share Plan of Insurance Premiums in August, and also adjustment of the premium rate to 4.55% in September.
6. The sharp increase in insurance revenues in 2003 is due to the practice of the Fair Share Plan of Insurance Premiums and adjustment of premium rate to 4.55% for five months and four months in 2002 and for the entire year of 2003.
7. The decline in insurance costs in 2003 is due to the practice of global budget payment for western medicine in July 2002, and payments are made generally by the global budget payment systems. Insurance costs are thus effectively contained at a reasonable growth rate.
8. The sharp increase in insurance revenues in 2006 is due to the increase of the tobacco product surcharge that was raised from NT$ 250 per 1,000 cigarettes (per kg) to NT$ 500; and the allocation to safety reserve funds was raised from 70% to 90%.
9. Declines in insurance costs in 2005 and 2006 are mainly due to the payments for preventive care and notifiable disease control from government budgets.

clinics, 132 community psychiatric rehabilitation institutions, 486 home care institutions, 213 medical laboratories, 22 physical therapy centers, and 8 medical radiology institutions. In 2006, the average number of out-patient visits per person per year was 13.82, a decline of almost one visit as compared to the 14.71 visits of 2005.

5) To improve the quality of drug use of the public, to provide more choices on drug uses, and to reduce their financial burdens, regulations on the payments of drugs have been adjusted one by one in recent years. In 2005, payment regulations were adjusted for the following items: drugs for osteoporosis, for recurrent malignant multiple sclerosis, moderate and severe-stage atopic dermatitis, oral drugs for stomach cancer patients, drugs for intrusive candidiasis, anti-platelet drugs, drugs for recurrent multiple sclerosis, and drugs for primary pulmonary hypertension.

4. Review of Medical Care and Publicizing Quality Information

1) Review of Medical Costs

(1) The review of medical claims comes in procedure review and professional review. The procedure review is made by administrative staff to check the accuracy of the information on the claims submitted by medical institutions, and to make sure that the claims meet the various payment

regulations of the payment schedules. In the process of the professional review, claims are either randomly or intentionally sampled through computers by the Bureau of National Health Insurance. Medical and pharmaceutical experts with experience in teaching, clinical care, or practical experience are then invited by the Bureau to form a medical care service review committee and regional medical care service review sub-committees to review these sampled claims. For disciplines practicing the global budget payment system, their professional review may be commissioned to relevant medical institutions or groups such as the National Union of Physician's Associations.

(2) To improve the consistency of review, in 2006, principles on the review of medical costs by global budget for hospitals, clinic, dental care, and traditional Chinese medicine were published for the review of costs for physicians.

(3) To assure the safety of medical care and to avoid any hazards to the health or life of patients caused by the inadequate use of drugs, examinations, operations or medical treatment by a few physicians, the Bureau of National Health Insurance has invited the medical professions to develop together a set of criteria to withhold payments for claims reviewed through profile analysis. A threshold value is set for each criterion. When the threshold is exceeded, deduction of the part exceeding the threshold is made through procedure review to the medical care institution or pharmacies to correct abnormal medical behavior, to assure the reasonable use of medical care resources, to guarantee the safety of medical care, and to upgrade the quality of medical care. In 2006, 21 reimbursement denial indicators; 3 indicators have been amended; and 1 indicator had been abolished.

(4) The review and administrative relief procedures of the National Health Insurance medical reimbursement come in initial review, reply, re-deliberation, dispute mediation, appeal and administrative litigation. The rates of deduction of medical costs by year are shown in Table 7-3. If the medical care providers are in disagreement with the results of the review on medical reimbursement, they can apply for appeal. Applications for dispute mediation can be made if they are not satisfied with the results of the appeal. Dispute mediation is made by the NHI Dispute Mediation Committee of the Department. The Committee, acting on the principles of assuring the quality of medical care, containment of the NHI financing, and respecting the professional autonomy of medical care and the rights of patients, will carefully review the cases under dispute on evidence-based medicine and through considerations of the ethical and legal aspects of the cases concerned.

Table 7-2 Growth of Medical Expenditures per Person by Year

Year		2002		2003	2004	2005	2006	2007
By section		1st Half Year	2nd Half Year					
Ranges approved by the Executive Yuan		1.67~4%		1.55~4.02%	0.51~4.00%	1.34~4.03%	2.34~5.10%	1.17~5.00%
Coordinated by the NHI Medical Expenditures Negotiation Committee	Total	2.342~3.707%	3.883%	3.899%	3.813%	3.605%	4.536%	4.501%
	Dental outpatient	2.50%		2.48%	2.64%	2.90%	2.93%	2.61%
	Chinese medicine outpatient	2.00%		2.07%	2.41%	2.51%	2.78%	2.48%
	Western medicine primary care	3.727%		2.898%	2.70%	3.228%	4.684%	4.18%
	Hospital	1.61~3.727% (Target)	4%	4.01%	4.10%	3.53%	4.90%	4.91%
	Others	-		Increase 1.3 billion	Increase 1 billion	Increase 1.141 billion	Increase 0.062 million	Increase 472 million

Note: Growth rate of medical expenditures per person for 2002-2005; growth rate of total medical expenditures since 2006.

2) Publicizing information on quality of medical care

Publicizing information on quality of medical care is a way to protect the medical rights of the public; it also a promotes overall quality of medical care. The Bureau of National Health Insurance publicizes quality indicators of medical care services of medical care institutions in the expectation that people will have direct access to the results of quality monitoring, they can then supervise in some way the upgrading of medical care quality.

(1) A special zone on medical care quality is created for public inquiries, including:

i) Reports on criteria of professional medical care quality: global budgets for hospitals, Chinese medicine care, and hemodialysis.

ii) Reports on quality of medical care services for specific diseases or treatment methods.

iii) Guidelines for evidence-medicine based clinical treatment.

iv) Evidence-based medicine case analyses.

v) Information on evidence-based medicine literature.

(2) Quality information by hospital and department, such as global budgets for hospitals, clinic, dental care, traditional Chinese medicine and hemodialysis, are publicized on the Internet for public inquiries.

5. NHI Insurance wIC Card

To meet the coming of the electronic age, the health insurance IC card was put in use throughout the country in January 2004. With the card, the insured can get simpler, safer and more convenient services. The name-card size health insurance IC card contains a small IC chip that provides enough memory for use and is divided into four information storing sectors for personal information, health insurance data, special medical care, and health administration special sector. The IC card has replaced and put together functions of the paper card of the past, children's health handbook, and health handbook for pregnant women. As the IC card can be used without renewal for five to seven years, it has saved time of the insured for card renewal, and at the same time, much of the insurers' administrative manpower. This is consistent with the goal of "all cards in one; and one card for all." The IC card can provide timely information on medical care; it also contributes to disease control to protect the health of the people. Some major achievements are as follows.

1) 99.9% of the NHI contracted medical care institutions have been verified for linking; medical institutions are now computerized and linked to bring about the development of the information industries and to provide platforms for communication among hospitals.

2) A special project to supervise the insured of abnormal use of medical care is implemented. Patients who visit clinics for more than 20 times a month (15,574 cases) are supervised. Preliminary results show that

Table 7-3 Reduction Rates after Review of Claims for NHI Medical Costs

Year	Total Reduction Rate after Initial Review	Total Reduction Rate after Second Review	Total Reduction Rate after Dispute Mediation
1997	3.28%	2.34%	2.21%
1998	2.73%	1.96%	1.81%
1999	3.48%	2.75%	2.53%
2000	3.97%	2.34%	2.15%
2001	2.45%	1.89%	1.69%
2002	2.21%	1.67%	1.54%
2003	1.27%	1.03%	1.01%
2004	2.38%	2.14%	2.12%
2005	3.02%	2.29%	2.13%

For 2005, the time point for calculation is December 31, 2006.

the frequency of clinic visits has declined by 30 to 60%.

3) On the health administration special area of the NHI IC card, organ donation is noted. Thus far, 14,145 persons have registered for organ donation. This would allow medical personnel to know at the first moment about the individual's willingness of organ donation.

4) On the health administration special area of the NHI IC card, the willingness for hospice and palliative care is noted. Thus far, 4,462 persons have so registered. The will of the patients at their terminal stage can thus be respected to provide them with hospice and palliative care; patients are then helped to pass away with dignity and in peace.

5) Since July 2005, on the health administration special area, registration and uploading of immunization is practiced. By January 29, 2007, uploading had been made by 1,757 hospitals and clinics for 3,079,285 cases.

6) Using the reported information of the NHI IC card, assistance has been given to the implementation of the 2006 dengue fever special plan. Some 1,238 indigenous cases are matched against all IC cards for medical care in June 2006. The information is referred to the CDC/Taiwan for necessary management. This practice is most efficent in the control of dengue fever in the Kaohsiung area.

Section 2. Reform of the National Health Insurance System

The National Health Insurance is the most important social construction since the start of the Republic. It is a public policy that has benefited most people. It is also an important link in the promotion of national development, maintenance of social security and protection of the rights of the people. However, for the rapid aging of population, and the escalating costs of high-tech medical care, medical expenditures have exceeded revenues from insurance premiums. Adjustment of premium rates, their contribution bases and medical care payments is not easy. On top of these, there are the threats of the emerging communicable diseases. These and other factors have made the National Health Insurance face financial risks. To meet the challenges, reform of the National Health Insurance System has been promoted vigorously to assure the sustained management of the National Health Insurance.

1. Reasons for Reform

The National Health Insurance is the pride of us all. The implementation of policies must, however, make progress constantly. For the sustained management of this program, and at a time the current system is facing many problems and dilemmas, the reform of the system is imperative under the circumstances. The difficulties now encountered are as follows:

1) The worsening financial situation: For factors such as the aging of population, advancement in medical technologies, and the increasing demands of the people, revenues of the National Health Insurance have been, for a long while, lagged by 2% behind the expenditures. The pluralistic micro-adjustment though can barely maintain the financial balance for a period of time, at a time the safety reserves are reaching the bottom, the issue of financial balance must with priority be dealt with.

2) Differences in premium contributions: The current system classifies in detail the insured into 14 items in six categories. Premium contribution rates are different for each item and each category to cause large differences in the sharing of premiums. For instance, the self-paid premiums of the unemployed without incomes are higher than those of union members with fixed incomes, the farmers, and the fishermen (categories 2 and 3). Families with more dependents pay more.

3) Insufficient linkage of revenues and expenditures: Under the current system, the revenues of the National Health Insurance are supervised by the NHI Supervisory Committee, and the expenditures are negotiated by the NHI Medical Expenditure Negotiation Committee. There is no such mechanism to link revenues and expenditures to result in the imbalance of the insurance financing.

4) Insufficient mechanisms for the allocation of

resources: The National Health Insurance is a merger of the original government employee's, laborer's and farmer's insurance schemes, and there is a lack of an assessment mechanism for the scopes of payments. When there is no coordination between revenues and expenditures under the circumstances where NHI resources are limited, the result is that medical care resources are wasted and reasonable adjustment of the contents of payments is difficult.

5) Medical care information not transparent enough: For the inequity in medical care information, the public is unable to judge the quality of the medical care services that they receive. People often rely highly on the advice and referral for medical care of their friends and relatives, the lack of medical care information or difficulties in their interpretation have become more serious.

6) Payment should focus on quality: Currently, payments are mostly made on quantity basis. Relatively little consideration is given to the quality of medical care. The payment mechanisms should give more consideration to the upgrading of quality.

2. Core Values of the Reform and Key Issues of Law Amendment

The NHI Second-Generation Task Force of the Executive Yuan has, after several years of planning, submitted a final report. The report contains policy recommendations in four aspects, strengthening the provision of information to enhance the quality of medical care, balancing the finances and improving service purchasing efficiency, expanding diversified social participation in NHI policies, and constructing a rights and responsibility accountable NHI organizational system. Amendment of laws for the second-generation NHI is actively planned.

1) Goals of reform: to assure the reliability of medical care.

2) Core values

(1) Quality: to make public information on medical care and medical care quality to give the people more choices; to strengthen mechanisms of upgrading the quality of medical care; payment systems will be reformed toward the direction of encouraging high-quality medical care.

(2) Equity: Insurance premiums will be collected on the total incomes of the household to expand the premium basis. People of low-income are guaranteed medical care following the current system. People of high income share more insurance premiums. Households of the same incomes share the same insurance premiums.

(3) Efficiency: Classification of the insured will be modified from the current 14 items in six categories to two categories. When individuals change jobs or have salary adjustments, they are no longer required to change their insurance status by moving-in or moving-out of the scheme. The two Committees will be merged to promote a mechanism to link revenues and expenditures.

3) Key Issues of Law Amendment

(1) Organizational structure and social participation: The NHI Supervisory Committee and the NHI Medical Expenditure Negotiation Committee will be merged into a NHI Supervisory Commission. Authorities to manage insurance revenues and expenditures will be unified; and the linking mechanism of revenues and expenditures will be strengthened. Representatives of payers will jointly decide on the scopes of payments and the insurance premiums to be shared, and thus to calculate the premium contribution rates. The NHI Supervisory Commission, when reviewing or negotiating major issues related to insurance, should first organize related activities of civil participation.

(2) New insurance payment schemes: The total funds needed for the insurance will be shared by the government, employers and the insured. The share of the government will be calculated of its growth rate by a certain formula. Employees share the premium by a certain formula, and their share is linked to that of the insured. The insured share the premiums by the total incomes of the household.

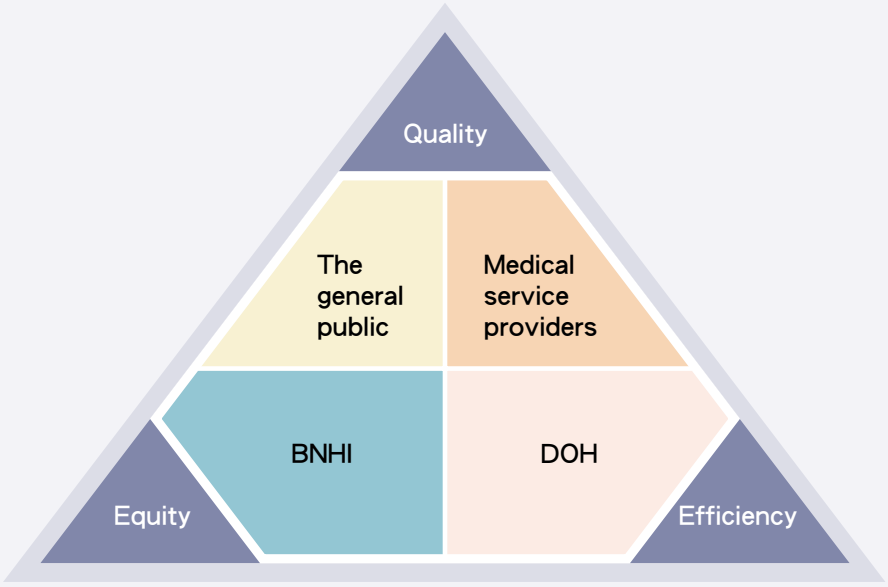
(3) Medical care quality and information disclosure: To assure the quality of medical care, it will be clearly stipulated that the insuring agents and

the insurance medical service institutions will periodically make public information of medical care quality related to the insurance. Payment by quality will be strengthened. Ways and procedures to formulate "items of payments and payment schedules for medical care services" and "items of payments and payment schedules for pharmaceuticals" will be established.

(4) Others: There should be a waiting period, upon their return to the country, for those who have stayed overseas for some long time and not paying by month the insurance premiums. To provide the people with more choices for medical care, payments for differences will be decided. That is, the insured may decide to use medicines the prices of which are higher or are exceeding the upper limit of the payment, and pay for the differences. Items and time of implementation will be reviewed by the NHI Supervisory Commission.

4) Progress in Law Amendment

The amendment of the National Health Insurance Act was submitted to the Executive Yuan for review on September 15, 2005. The amendment was further revised after seven meetings of the Executive Yuan and upon suggestions of various ministries and departments, and was referred to the Legislative Yuan for review in May 2006. The Legislative Yuan passed the first reading of the amendment of the National Health Insurance Act in October 2006, and the amendment has been referred to the Sanitation, Environment and Social Welfare Committee for review.



8

International Cooperation

Chapter 8.
International Cooperation in Health

Now that Taiwan is a developed country, the promotion of international cooperation in health and medical care is not only a matter of world trend, it is also a vital key to whether Taiwan can stand out conspicuously on the international stage. Therefore, matters such as international cooperation and exchange, planning of policies concerning international aid, collection of relevant information, participation in international organizations, enhancement of Taiwan's international image, recruitment of specialists, and manpower development for international health should be in coordination with the world trends. More innovative and pluralistic models for international health cooperation should be developed to allow Taiwan to fully execute in the global community her functions in aiding the distressed and supporting the tottering to attain the ultimate goal of feeding back and contributing to global health.

Section 1.
Join the World Health Organization

Efforts to join the World Health Organization (WHO) as a member began in 1997 without success yet due to the strong obstructions of China. However, by way of our ceaseless efforts, this issue has become a focus of international concern, and the world is made aware of the unfair treatment that Taiwan has encountered. To link with the world community in the areas of health and medical care, Taiwan will continue to strive to join the World Health Organization as a member.

1. The Republic of China was one of the founding nations of the WHO. In 1945 at the United Nations San Francisco Conference, representatives of the Republic of China and Brazil proposed to hold as early as possible the world health conference to realize the establishment of a world health organization. As the WHO confirms that "health" is a "basic human right" in its Constitution, it clearly states that "the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, political belief, economic or social condition".

2. In 1972, Taiwan was forced to withdraw from the WHO. Since then in the last decades, the government and the people of Taiwan have always adhered to the spirit of the WHO to promote the health standards of her people, and to fulfill her duties in health and medical care as a member of the international society.

3. To promote participation in the WHO, a cross-ministerial special Executive Yuan task group on participation in the WHO was established in April 2001 to effectively integrate and utilize various resources, and by using medical care, health care and humanity as main appeals, to actively seek for international sanctions to attain the ultimate goal of becoming again a member of the WHO. Since 1997, every year in May when the World Health Assembly (WHA) is in session, delegations are sent to Geneva of Switzerland where the WHO headquarters is located to win over support of all circles to Taiwan's appeal of becoming an observer of the WHA. Nations friendly to Taiwan are requested to motion to invite Taiwan to participate in the World Health Assembly as an observer. The motion is, each year, discussed intensively at the General Council meeting. For the strong objections of China, the motion has not yet been placed on the agenda of the Plenary Session of the WHA.

4. The efforts of Taiwan to join the WHO have lasted for ten years. During this period, there had been the enterovirus and SARS outbreaks, and the legitimacy of Taiwan's participation and international support has grown day by day. For the vicious pressure of China, Taiwan's wish may not come true yet. Taiwan has, however, participated actively in various international conferences and activities, and at the same time, fulfill with good intention her duties as a member of the global village to gain support and recognition of other countries.

5. Major achievements in 2006 are as follows:

1) Many countries spoke openly in public at the WHA meeting directly or indirectly in support of Taiwan. In 2004, the US and Japan voted openly at the WHA meeting to support Taiwan to become an observer of the WHA. In 2005, more countries such as Tuvalu,

Signing of Memorandum of Understanding on Avian Influenza with Burkjna Faso

the Marshall Islands, Burkina Faso, Honduras, Saint Vincent, Sao Tome and Principe, Kiribati, Dominican Republic, Mongolia, the US, Canada and Australia spoke on public occasions on issues such as health professions and health rights to support Taiwan directly or indirectly. They also urged the WHO to strengthen interactions with Taiwan.

2) The early practice of the IHR by Taiwan was recognized. In 2005, the WHO amended the International Health Regulations (IHR) to include the "principle of universal application" favoring Taiwan's participation in international affairs. In May 2006, Taiwan announced to implement the IHR in advance. This announcement was recognized universally and favorably by the international community, and should be helpful for Taiwan to integrate into the international disease control system. The CDC/Taiwan is the focal point of Taiwan's IHR to report major epidemic information to the WHO, its regional offices and other countries.

3) Taiwan has actively participated in communicable disease-associated conferences or activities, including six WHO technical meetings and ten APEC health-related meetings. Participants from Taiwan served as speakers at four APEC meetings. Taiwan also participated in the APEC regional simulation drills on influenza pandemics.

4) In the substantial interactions with the WHO, some progresses have been made:

(1) Participation in WHO meetings: The persistent efforts of the government and the private sectors of Taiwan had posed considerable pressure on the WHO and China to force China to make a concession to admit on conditions Taiwan's healthcare officials and experts to WHO technical meetings. Taiwan has thus far participated in several technical meetings. This is a substantial progress as compared to the time when Taiwan was totally rejected.

(2) Information exchange with the WHO: A direct channel of communication has been established between the CDC/Taiwan and the WHO window. The Outbreak Verification List compiled by the WHO is sent to Taiwan periodically. Taiwan can now participate in the relevant technical meetings or training organized by the WHO Headquarters or its regional offices. This helps Taiwan a great deal to collaborate with other countries in matters concerning disease control.

(3) Participation in the WHO disease control mechanisms: Though not yet a member of the GOARN, Taiwan can participate in some of the activities of GOARN and other disease control mechanisms.

(4) Access to the WHO emergency aid: The WHO has officially announced that the WHO will immediately dispatch experts for assistance should Taiwan face serious outbreaks. In other words, the delay in dispatching experts for assistance for as long as six weeks due to the obstructions of China at the time of SARS crisis in 2003 will not happen again.

After years of promotion, with the increasing support of the international community, Taiwan's wish to become a member of the WHO will come true soon. The international society has come to realize that it is most unfair and immoral to expel the 23 million people of Taiwan from the WHO. They are seriously thinking of ways to solve this problem. In the first eight years of promotion, major countries such as the US, Japan and the European countries were not earnestly in support. In the last two years, however, the US and Japan have publicly expressed support to Taiwan's observer status with the WHA. The European countries have also enthusiastically supported Taiwan's substantial participation. The WHO has also moved from refusing any contact with Taiwan initially to willing to engage in interactions with Taiwan's departments concerned on professional medical matters. Many countries have turned from opposition or indifference to Taiwan's issue in the early days to willing to support Taiwan's substantial participation. These are remarkable changes that ought to be recognized. This favorable development in

international atmosphere can be further strengthened upon the existing basis to create an all-directional basis for the future promotion of Taiwan's wish to be involved in international health affairs.

Section 2. International Exchange and Cooperation in Health

The purposes of international exchange and cooperation in health are to strengthen medical cooperation with countries friendly to Taiwan, to help them improve their standards of health and medical care, to fulfill Taiwan's duties as a member of the international society, and to win over the understanding and attention of the international community to Taiwan. International organizations such as APEC (in Asia), PAHO (Pan American Health Organization in the Americas), WAHO (Western Africa Health Organization in Africa), and EHFG (European Health Forum Gastein) and OECD (in Europe) are fully utilized to appeal to the international media Taiwan's humanitarian medical aid programs and substantial exchanges in medical care with other countries, and thus to improve Taiwan's international visibility. Activities of international exchange and cooperation in 2006 are as follows.

1. Signing of Memorandums and Agreement of Cooperation

1) In July, an Agreement on Cooperation in Health and Medical Care between Israel and Taiwan was signed to strengthen cooperation between Israel and Taiwan in the areas of health and medical care. Under this Agreement, two physicians from Taiwan are sent to Israel for a two-week training in trauma medicine. At the same time, senior health officials from Israel are invited to visit Taiwan. A bilateral health meeting between Israel and Taiwan was held at the end of the year to promote substantial exchange and cooperation between the two countries.

2) To strengthen cooperation with other countries in health matters and in exchange of information on disease control and control of avian influenza, and personnel training and research and development, action has been taken to actively sign either cooperation agreements or memorandums of understanding with several countries. Between the period 1994 and end of December 2006, agreements had been signed with 28 countries.

2. Participation in International Conferences and Symposiums

1) Participation in the EU-associated meetings

(1) In June, the Department participated in the 18th Taiwan-EU Consultation Meeting to propose a plan for the Construction of an Exchange Framework for the Contents of the Patient-Centered Electronic Medical Records and another plan of Joint Taiwan-EU for Health and Medical Aid to Africa. Action has been taken to actively promote collaborative relationship in health matters with the EU.

(2) In October, the Italy Association in Taiwan and the Milan Saint Rafael University were subsidized to hold an international symposium at Milan in commemoration of the 3rd anniversary of the death of Dr Obani.

(3) In October, in collaboration with the International Forum Gastein, the 9th European Health Forum Gastein was held. A parallel forum was held at the same time under the Forum. During the meeting, the Health Minister of Taiwan met with high officials of the EU and European countries for bilateral discussions.

(4) In October, an international symposium, "Health Care 21 – Current and Future Health Care", was held in Czechoslovakia. Health leaders of some East European countries were invited.

(5) In October, an inauguration meeting, APEC Health Task Force on Establishing Electronic Abstract of Health of Tourists in the Asia-Pacific Area, was held to invite members of the 12 APEC economics entities to discuss ways to promote electronic information facilities to minimize the cross-country transmission of communicable diseases.

2) Participation in meetings with Japan

(1) To promote collaboration in health between Taiwan and Japan, exchange meetings between Taiwan and Japan are planned, hoping that through regular meetings of the two countries, a long-term communication mechanism on health matters can be established. The proposal was presented at the 31st Sino-Japan Economic and Trade Conference for discussion.

(2) The 3rd bilateral symposium between Taiwan and Japan was held in Taipei in collaboration with the

Nippon Institute of Infectious Diseases (NIID). The theme of the symposium was AIDS. 12 experts from Japan came to the symposium. Two collaborative projects on bacillary dysentery and dengue fever continue.

3) Participation in APEC-associated meetings

(1) In May, the Department participated in the APEC 2006 Ministerial Meeting on Avian Influenza to discuss strategies for the control of avian influenza with ministers of health and agriculture of several countries and representatives of some major international organizations. A Preparation of the Action Plan on Prevention and Response to Avian and Influenza Pandemics was drafted.

(2) Delegates were sent to participate in symposiums and activities on the prevention and control of influenza pandemics organized separately by some APEC members such as the US, Japan, Australia and Canada to share Taiwan's experience in the control action. In total, 14 persons were sent for 11 such symposiums or activities.

4) Participation in other international conferences or training

(1) In March, an International Symposium on the Construction of Global Health Security was held. International experts of outstanding contributions to health were invited for keynote speeches, including Dr Delon Human, former President of the World Physician's Association, Dr Kgosi Letlape, current President of the World Physician's Association, and Prof Martin McKee of the London School of Tropical Medicine. Some 100 international and local scholars and experts participated in this meeting. The issue on how Taiwan could be involved in the global health security system to fill in the gap of this system was discussed in depth.

(2) In June, delegates were sent to participate in the international symposium on the prevention and control of avian influenza jointly organized by the ROC Pacific Democracy Alliance and Indonesia.

(3) To meet the international shortage of nursing personnel, on the basis of Taiwan's advantages in this aspect, assistance has been given to improve both the quantity and quality of medical personnel in countries friendly to Taiwan. In August, the 2006 Training Program for Nursing Personnel in Friendly Countries was held for 24 high-ranking nursing personnel from 12 countries of Southeast Asia and the South Pacific areas.

(4) In September and October, the 2006 CAM/TM Professional Training Program was held for 29 officials in charge of pharmaceutical affairs and experts from 22 countries.

(5) In November, an International Symposium on Internationalization and Modernization of Chinese Medicine was held to invite experts and specialists of industries, the government, academic and research institutions from the US, Hong Kong, the UK, Germany and Taiwan to review the world trend of the development of traditional medicine, their current status, and prospects for internationalization and modernization.

(6) In December, an international conference and related activities on Taiwan-Indonesia Health Security were held in Indonesia

(7) In December, the 2006 Global Forum for Health Leaders was held at the National Taiwan University Convention Center. International and local high-ranking health officials, renowned scholars and experts, and representatives of health and medical organizations were invited. The theme of the Forum was Sustainability of Global Health. In-depth discussions were held.

(8) An International Conference on the Digital Model of Communicable Diseases and the 8th International Symposium on AIDS were held. In collaboration with the Pasteur Institute of France, an International Symposium on Re-emerging Viral Infectious Diseases was held. 20 and 33 international and local specialists were invited as speakers for some 1,150 participants.

3. In July, the 1st Sino-US Health Meeting was held in Washington, DC. Bilateral meetings of deputy health ministers of both countries met for discussions on issues such as health insurance, disease control, and international cooperation in health, and also opportunities for further cooperation. On the issue of joint aid to third countries, the Marshall Islands, Malawi, Panama, Vietnam and Sao Tome and Principle were selected for aid with priority. Thus far, (1) the Taiwan-US-Malawi AIDS control program

Medical aid to Gambia

Medical aid to the Solomon Islands

is officially included in the US Country Operational Plan; and through this reciprocal cooperation program, Taiwan's international visibility in AIDS control can be improved; (2) on the issue of Taiwan-US-Marshall cooperation, Taiwan has sent delegates to the Marshall Islands to assess the opportunity of cooperation in diabetes prevention. These two cooperation programs will help Taiwan promote substantial participation in international health affairs; and it is hoped that this cooperation experience can be further extended to other countries.

4. Health institutions are encouraged to actively participate in cooperation and aid in health and medical care to help develop Taiwan's health cooperation matters. Thus far, the DOH Taipei Hospital, Taoyuan Hospital, Taichung Hospital, the Kaohsiung Medical University Hospital and the Chiayi Christian Hospital have been subsidized to develop sister-hospital or sister-school relationship with Mongolia, Belize, Ghana, the Solomon Islands and the Philippines. Some 28 private sector organizations have also been subsidized to participate in major international conferences or international exchange activities.

5. To meet the emergency care needs of Japanese living in Taiwan, lists of medical care institutions that can provide medical care services in Japanese language (including information on physicians, nursing personnel and volunteers that can provide medical care services in Japanese) have been provided to the Japanese. An Operational Flow for the Care and Reporting of Avian Influenza and Novel Influenza of Japanese in Taiwan has been drafted for reference. In August, staff members of the Exchange Association were invited to a drill on the dispensing of anti-viral drugs for them to understand further Taiwan's disease control systems and their operation.

6. The National Taiwan University Hospital was subsidized for the second year to conduct a medical cooperation program with Vietnam. The program aims at establishing a teaching-practice relationship with medical care institutions of Vietnam to help them upgrade their medical care services, and teaching and research standards; to improve the perspectives of local medical professionals on cross-country medical cooperation; to collect and understand information concerning emerging communicable diseases; to make Vietnamese medical care institutions realize more the medical care services, teaching and research and development of the medical care institutions of Taiwan; to increase more impact of Taiwan's medical professionals on the medical circles of Vietnam; to assess the feasibility and strategies of Taiwan developing medical care industries in Vietnam; and to explore the possible directions of medical cooperation between Taiwan and Vietnam.

7. The Department participates in the National AIDS Control Program of Malawi. Meetings are attended regularly. In October, Malawi was assisted to hold a symposium on AIDS. In November, a Surgery Society Meeting for East Africa was held.

8. Meetings were held with the US CDC to discuss matters concerning influenza, tuberculosis, EIS training, and the promotion of collaborative projects in third countries. The second Sino-US MRSA on public health and preventive medicine was implemented.

9. The President of the Vietnam National Health and Communicable Disease Research Institute was invited to make a keynote speech on "Vietnamese Experience in Epidemiology and Control of Human Avian Influenza". Opportunities for further cooperation were also discussed.

10. On June 29 through July 9, staff members of the Committee on Chinese Medicine and Pharmacy of the Department and the Traditional Medicine Research Institute of the Yangming Medical University visited the BfArM, MHRA, EMEA and Schwabe pharmaceutical factories in Germany and

the UK to study the advantages and disadvantages of the Chinese medicine science and technology management systems for internal resources in Taiwan and chances for external support in order to explore strategies most suitable for the development of the Chinese medicine science and technology management systems in Taiwan. At the same time, channels for exchange and communication with countries in Europe were established to improve the role of Taiwan in the global development of traditional medicine.

Section 3. International Medical Aid

Since the withdrawal from the WHO in 1972, Taiwan's close link with the international health society has been unhooked. Facing the trend of globalization, and the challenges of the new era that health sees no limit and diseases are without boundaries, Taiwan has made all efforts to promote international cooperation in health and international medical aid as a means to knock at the door of the world, and to facilitate the international society to know in depth about Taiwan, with a view to build up step by step Taiwan's health diplomacy. Major achievements in 2006 are as follows.

1. In March, to integrate governmental and private sector resources for humanitarian medical aid, the Department and the Ministry of Foreign Affairs jointly set up a cross-ministerial Taiwan International Health Action group (TaiwanIHA). Soon after the establishment, several humanitarian aid projects to aid the Philippine landslide incident, project to help Burkina Faso control outbreaks of avian influenza, emergency aid to Indonesia's earthquake in Jog Jakarta, and relief to refugees of floods in Kenya had been conducted.
2. In February, to deliver medicines and supplies to aid the Philippine landslide incident, the TaiwanIHA soon raised some NT$ 3 million worth of medicines and supplies. With the support of the Ministry of Foreign Affairs and the airlines, the supplies were immediately delivered to the disaster areas.
3. In April, outbreaks of avian influenza were reported in Burkina Faso. The TaiwanIHA soon integrated resources of foreign affairs, health and medical care, and agriculture and husbandry to send specialists in health and agriculture to assess the epidemic situations, and to teach local authorities the use of available disinfection facilities and laboratory testing techniques. The mission met the approval of the local media; they also helped in enhancing further the diplomatic relations between the two countries and in establishing a global avian influenza control network.
4. In May, three medical teams were sent to aid Indonesia in the earthquake relief. The teams brought with them NT$ three million worth of medical supplies. The special rescue team of the Fire Department of Taiwan also arrived at the disaster sites. In this case, various government organizations of Taiwan were involved; at the same time, many private sector institutions had also donated orthopedic instrument and supplies. Taiwan also participated for the first time in the local WHO-organized international coordination meetings.
5. In December, Kenya had serious floods. Taiwan sent immediately teams to assess the situation. The team brought with them NT$ 1.1 million worth of supplies. The team also worked together with the local government organizations and the US CDC to control the Rift Valley Fever epidemics.
6. In June, teams were sent to Chad to help control the avian influenza epidemics.
7. The GMISS of Taiwan has donated second-hand medical devices to Burkina Faso, Kiribati, Honduras, Nicaragua, Saint Vincent, Belize, Haiti, and Mongolia to meet their needs. Taiwan's health diplomacy policies are thus realized; and Taiwan's international visibility is enhanced.
8. The Taiwan AIDS Center in Malawi has been subsidized to procure facilities such as blood cell analyzers, spectrometers and microscopes.
9. To Ghana, protective robes, N95 masks, laboratory gloves and shoe covers for the prevention of avian influenza have been donated.
10. Gambia has been subsidized to purchase polio vaccines.

9

Science and Technology Research

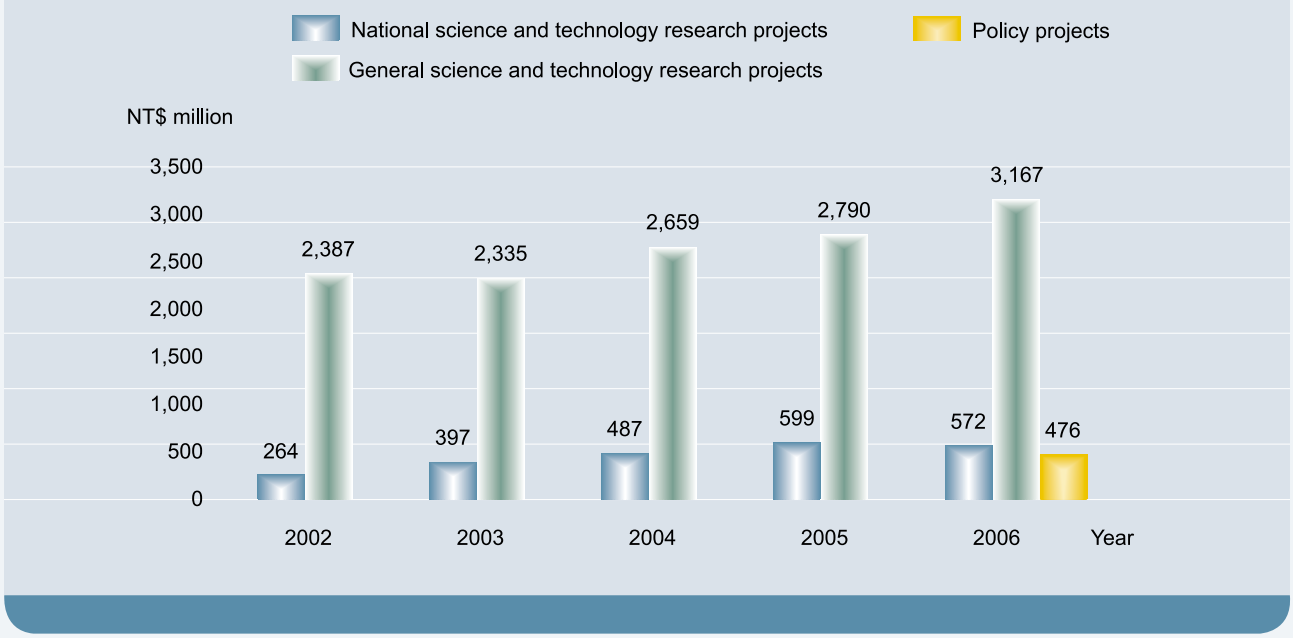
Chapter 9. Science and Technology Research

Bio-technologies are the key point of national development; it is also the current world trend. The Department has attached utmost importance and spared no efforts to the enhancement of medical bio-technologies and to improve national competitiveness by assuming the role and vision of promoter of bio-technology industries. Success and failure in studies in genetic sciences, science and technology research in nanometer, advancement of medical engineering, development of bio-information, establishment of clinical trial systems, and development of new pharmaceuticals are key factors as to whether Taiwan can have a foothold on the international stage of bio-technology.

The development strategies of science and technology of the Department are primarily in coordination with the health programs to plan for studies on bio-technology policies for health and medical care, to promote and integrate databases of health and medical care, to establish core resources for the development of industries and science and technology research, to construct infrastructures and international cooperation mechanisms for the science and technology development of bio-technology medicine and pharmacy, and to strengthen training, recruitment and utilization of manpower in health and medical care. In research utilization, strategies for the planning of mid-term science and technology research have been strengthened; 1,005 national research projects on health and medical care, pharmaceuticals, food, and bio-technology have been promoted; and some 7,884 person-times of manpower have been invested to provide evidence-base for the formulation of health policies and plans. Almost 98% of the research findings have been utilized.

In 2006, 1,681 research papers had been published; three national and five international patents were obtained; and eight items of technology exportation, 21 items of technology diffusion, 139 technical reports, 29 items of technical innovation, 614 items of technical services, one trade mark, and one item of teaching materials for quality certification had been made.

Figure 9-1 Funds for Science and Technology Research in Health



Section 1. Major Science and Technology Research Projects

Funds appropriated for science and technology research by the Department (including affiliated organizations and the National Health Research Institutes) in 2006 amounted to NT$ 4.215 billion. Of which, NT$ 572 million was for the national science and technology research projects, a decrease of 4.4% over the NT$ 2.79 billion of 2005; and NT$ 3.167 billion was for general science and technology research projects, an increase of 13.5% over the NT$ 2.790 billion of 2005. NT$ 476 million was allocated for the first time to policy projects (Figure 9-1).

1. Policy Projects

Policy projects focus primarily on issues related to the development of policies, to establishment of mechanisms, that promote cross-ministerial research and cooperation, and through cooperation between industries and the academics to improve the utilization rate of resources, and to create high value-added projects. Two projects in this respect, "Establishing health protection network for consumers and promoting health industries" and "Recearch and Development of influenza virus vaccine", have been proposed.

1) Establishing health protection network for consumers and promoting health industries: The goals of the project are to promote safety of the public in using medicines, foods and to plan a preparatory medical information system to attract investments of relevant industries. Thus far, Information network for consumers, Information network on pharmaceuticals, and Information network on food have been established, and the satisfaction rate of the public is as high as 99.7%. The laboratory testing systems of the central region have been integrated to elevate capacity. Basic formats of the Electronic Patient Records for 22 sheets in 6 categories have been developed. Ninety-one hospitals have implemented the Picture Archiving and Communication System (PACS) that have been reviewed in advance, totaling 4,057 cases.
2) Research and development of influenza virus vaccines: The CDC/Taiwan has integrated scholars and experts in the field of influenza to implement this project. The project consists of 3 separate groups, research on vaccine strains selection and vaccine-related policies, establishment of vaccine infrastructure techniques and promotion of the development of industries. After having set up ferret raising method and viral infection models, immunity of ferret against five viral strains have been boosted, and anti-virus sera have been collected. A basic model to predict influenza transmission in the Taiwan Area is established. Five recombinants H5 DNA strains from H5N1 avian flu virus have been produced. Mice immunized with H5 DNA are free from infection of HIBRG-14 avian flu virus. The procedures for 40-liter mass production of inactivated total viral vaccines by cell culture with Madin-Darby Canine Kidney (MDCK) cells have been established. The validity has been confirmed by that mice injected with vaccines successfully produce neutralization antibodies.

2. General Science and Technology Research Projects

General science and technology research projects include, Establishment of clinical trial and research system of excellence, Establishment of a Taiwan Biobank, Health and medical care, Pharmaceutical project, Food science project, and General purposes. Their key issues and achievements are as follows.

1) Establishment of clinical trial and research system of excellence: Items include a) establishing a national tumor, cancer and stroke specialties-related clinical trial and research center; b) establishing a national clinical trial collaboration network; and c) promoting the training of clinical trial professionals. The system established should be most helpful to the establishment of a sound domestic clinical trial environment and also to the development of medical personnel in clinical trial. The clinical trial and research system of excellence so established should also be useful to the upgrading of the local clinical trial standards. Projects ongoing include the third phase of a large-scale, multi-national, multi-center clinical trial on the effects of human-papillovirus vaccine in preventing cervical cancer; development of new drugs for the treatment of hepatoma and development of influenza vaccines;

development of new anti-hepatoma medicines; establishment of the stroke registration system and trauma registration system; and encouraging physicians, pharmacists and nursing personnel in 12 medical institutions to work either part-time or full-time in clinical trials.

2) Establishment of a Taiwan Biobank-Project for Preparatory Phase: The project consists of four separate groups: the Medical Genetics, ELSI (Ethical, Legal and Social Implications), Bio-information Technology, and Industry Development. The main objectives of the study are two-fold. Firstly, it attempts to construct an infrastructure of Taiwan biobank together with all essential requirements for establishing the Taiwan biobank such as regulations, guidelines and adequate protection of donors' privacy and data confidentiality etc. Secondly, it is expected that the future Taiwan biobank will be implemented accordingly with its great contributions for future biomedical research and development. At present, the framework and its operational models of the future Taiwan biobank, issues related to those derived from intellectural properties and commercialization have been completed. In addition, the Human Tissue Act and the Genetic Data Protection Act have been drafted together with an initiative for establishing the public communications and trust.

3) Health and medical care project: Research projects such as "utilization of medical ethics in medical institutions and medical care policies", "safety management models of alternative medicines", "investigation of patient safety culture and monitoring indicators, and epidemiological investigation of delinquent emergency care incidents", "establishment of laws and ethics on the management of genetic information safety", "special mental health problems – suicide, depression", "development of medical manpower", "evidence-based investigation of medical disputes and relief for medical hazards, and mandatory insurance system", "treatment models of substance abuse and their complications", "issues of women's health, and prevention of family violence and sexual assaults", "construction of protection networks for children and adolescent sexual assaults", "medical care and health promotion for the dementia", "promotion of community medical care group-supported long-term care", and "follow-up of the long-term care of the elderly and the disabled" have been conducted to establish models for the prevention, screening, treatment and rehabilitation of suicide and depression. A preliminary mechanism for the referral of home care cases has been set up to systematically organize home nursing care groups for the medium and severe cases. Individual case management models are used to provide multi-facet care and assessment for reference in the formation of care policies and to upgrade medical care quality and protect the safety of the people.

4) Pharmaceutical project: Genetic factor-related research projects on pharmaceuticals including "genetic study of the efficacy and side reactions of an anti-psychiatric medicine Aripiprazole", and "the pharmacogenetic response to leukotirene receptor antagonist in asthmatic children according to leukotriene C4 synthase gene polymorphisms" have been conducted. Research projects on the intellectual property rights of pharmaceuticals such as "review and recommendations on the integrated service and related mechanism of the intellectual property rights of pharmaceutical industries and health regulations" have been conducted. Research projects related to laws and policies of medical devices including "promotion of the certification mechanism for standards of medical devices and their use in industries", "databases for emerging or un-assessed medical devices and their classification", and "framework on the feasibility of GMP certification system for medical devices" have been conducted to promote evidence-based high-quality health policies. Studies have also been conducted on issues such as "prevention and control of drug abuse", "modernization and internationalization of Chinese medicine and pharmacy", and "laboratory testing and regulations for drugs and cosmetics" to produce concrete policy recommendations and to maintain and upgrade the health of the people.

5) In food sciences: Research projects such as "building a smart food composition analysis system", "development of the food composition database audit and the interactive multimedia

with systematic application", studies on setting up the specifications of functional compositions or active constituents in healthy foods as reference standards", "study on the safety and administration of the nanomized foods in Taiwan and other countries", "construction of safety assessment model for domestic genetically modified organisms (GMO)", "determination and exposure assessment of Nonylphenol and Nonylphnool Ethoxylates", "the contents of trans fatty acid in commercially hydrogenated oils and snack foods", and "evaluation of the safety and function of nanosized red mold rice" have been conducted. Interactive Multimedia software has been developed and used as a tool for nutrition education and to help the public calculate the nutrients they intake. Market survey data related to nanotechnology-foods, genetically modified foods, and trans fatty acids, and their safety and management specifications are used for reference in planning for a safety management system.

6) Management of science and technology development: This program aims at the strategic planning and implementation of health science and technology policies. Moreover, some budgets were allocated for supporting the holding of international symposiums in Taiwan, such as the 2006 International Hospital Federation Asia-Pacific Regional Conference, the 28th World Congress of Internal Medicine, the 39th Pacific Association of Pediatric Surgeons, the EPC/RFID International Forum 2006, the 6th Human Genome Organization Pacific Meeting and 7th Asia-Pacific Human Genetics Conference, and the International Conference on Avian Influenza. A research project conducted by the National Taiwan University had been funded to establish the mutual interaction with the University of Hong Kong regarding communicable disease control; a Taiwan-Hong Kong bilateral symposium on emerging infectious diseases had also been held in 2006.

3. National Science and Technology Research Projects

The National Science and Technology Research programs include Genomic Medicine, Biotechnology, Pharmaceuticals, Agricultural Biotechnology, e-Learning and Nanotechnology.

1) National Science and Technology Program for Hazards Mitigation: Research projects such as "an integrated study on disaster medical commanding mechanism and assessment model of medical response capacity", "establishment of medical response models for flood and landslide disaster", "establishment of practical disaster response command systems in hospitals", "development of standard operational procedures for electronic ambulances", "RFID technology development and use in rescue systems", and "cross-regional integration of medical group command systems" have been conducted. Assessment of the non-

structural earthquake-resistance of regional and above responsibility hospitals in the Kaoping region has been completed; earthquake-resistant engineering techniques have been developed; and databases of non-structural earthquake-resistance in the southern region have been established. A transmission and reporting management system for emergency care information has been planned. Information industries, 3G information services, radio communication and blue-tooth technology are used on helicopters and ambulances for telemedical care for their communication, medical counseling, and for the real-time transmission of imaging of patients, physiological functions and vital signs for the full functioning of the medical reporting systems.

2) National Research Program for Genomic Medicine: Programs on the genomic studies of Chinese medicine for female lung cancer have been conducted to explore the targets for disease diagnosis and prevention. A Pathogenic Micro-organism Genome Databases has been established to provide information for surveillance. Mechanisms for evaluating clinical trial protocols and the related products of genomic medicines have also been established to promote the development of bio-medical industries.

3) National Science and Technology Program for Biotechnology and Pharmaceuticals: In coordination with the research outcomes of the upper and middle-streams for further application in clinical assessment, more than 18 cases of clinical trials have been subsidized; 55 protocols of advance exploratory clinical trial plans have been reviewed; and 54 applications for counseling on pioneering clinical trials have been accepted. To assure the quality of clinical trials, 15 clinical trials have been monitored and eight have been inspected.

4) National Science and Technology Program for Agricultural Biotechnology: Guideline of Safety Assessment for Genetically Modified Foods (GM Foods) has been amended and an additional Guideline for Safety Assessment for stacked gene plants is under discussion. GM Foods Safety Assessment facilities such as GM safety consultation center and GLP laboratory guidelines have been set up by the government to provide GM foods safety assessment consultation and to ensure reliable GM food safety assessment data, respectively. In coordination with the Council of Agriculture, the Executive Yuan, the genetically modified plants that have either completed or have been approved for field experiment, food safety is assessed.

5) National Science and Technology Program for e-Learning: Curricula for e-learning in medical services and medical learning platform, the Formosan e-Medical School have been developed. Courses currently available for the public include the Pharmacy Garden developed by the international research-based Pharmaceutical Manufactures Association, continuing education courses organized by the Taiwan Association of Gynecologic Oncologists, the 2005 course on prevention and response to avian influenza prepared by the DOH Taipei Hospital, and course on mental care and day-care for the elderly prepared by the DOH Jianan Mental Hospital. By end of December 2006, some 750,000 person-times had visited the website for learning. A medical dictionary in Chinese is under compilation. Copyrights for 56 e-learning courses for chronic diseases have been obtained. Courseware for the general public has been certified AA for e-Learning Quality Certification by the Industrial Development Bureau of the Ministry of Economic Affairs. Medical counseling in 38 specialties such as internal medicine, obstetrics and gynecology, dermatology and rare diseases is provided by some 249 attending physicians, eight dietitians, 28 pharmacists and 11 professional registered nurses of 42 hospitals including the DOH hospitals, National Taiwan University Hospital, Veterans' General Hospital and Chang Gung Memorial Hospital for 980,000 person-times.

Section 2. Research Projects of the National Health Research Institutes

The 21st century has seen the rapid development of biotechnology industries. The NHRI, which is Taiwan's only health and medical research institution at the national level, is playing a role in this. In coordination with the development goals of biotechnology of the Executive Yuan, the NHRI is

working tirelessly to strengthen research related to medicine, pharmacy and biotechnology, assist in the development of biotechnology industries such as bio-products and medical engineering, organize academic activities and provide research resources, and make concrete recommendations on health policies. Major research projects for the year 2006 are summarized as follows.

1. Promotion of Research on Major Domestic Diseases

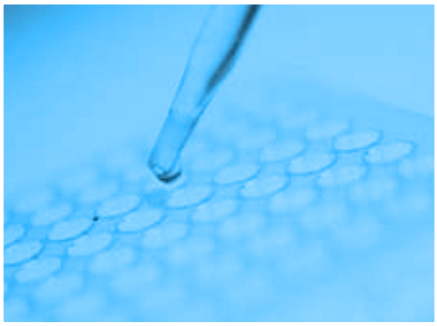
1) Cancer Research: The first National Cancer Clinical Trial Research Center has been established. The Center has cancer clinics and collaborative clinical research wards. Through the Taiwan Cancer Clinical Research Cooperation Organization, physicians from 24 hospitals and medical centers in Taiwan are brought together to develop guidelines for the clinical diagnosis and treatment of cancer, and thus to upgrade the medical care quality of cancer treatment.

(2) Clinical Trials: Clinical trials have been conducted in collaboration with medical centers. Thus far, a consensus has been reached on the diagnosis and treatment of some ten cancers such as cervical cancer, breast cancer, oral cavity cancer, lung cancer, colon-rectum cancer, stomach cancer, prostate cancer, nasopharyngeal cancer, radiological therapy and cranial tumor. Clinical guidelines for cervical cancer, endometrial cancer, ovarian cancer, colon-rectum cancer, breast cancer, prostate cancer, pancreatic cancer have been compiled to facilitate the upgrading of medical care.

3) Environmental Pollution and Occupation Medicine: A Taiwan-conducted study confirms that dioxin and PCB can be transmitted from mother's placenta to fetus; and that they can also be absorbed by the newborns from mother's milk rich in fat. The emerging issue of beef imported from the US was researched, with recommendations submitted to the Department for risk communication with the public. Meanwhile, a health risk assessment model is also being established.

4) Surveillance of Enterovirus and Influenza Virus: Measures have been taken to solve problems of indigenous infectious diseases through surveillance and basic research. The Taiwan Virology Laboratory has been set up to monitor the prevalence in southern Taiwan of enterovirus and influenza viruses. The Laboratory has found in recent years the major influenza strain in Taiwan, B/Hong Kong/1351/02-like strain (B reassortant), is different from the strain the WHO recommends for vaccine use: B/Hong Kong/330/01-like strain (Victoria lineage). This finding not only provides necessary reference for the development of influenza vaccines in Taiwan, but also of significance for the global surveillance of influenza viruses. Also, qnr particles that reduce susceptibility to FQ are found in the first strain in country of ***Klebsiella pneumoniae.*** These particles have also been found to contain both drug-resistant genes to other kinds of antibiotics (including ESBL) and also channels to transmit their multi drug-resistant genes to other bacteria. This finding will extend the scope of research on the drug-resistance mechanism of bacteria to FQ.

5) Studies in Geriatrics: Work has been done from the


basic research on aging to the clinical studies of geriatrics, including the establishment of a research network on geriatrics, and a multi-center research project on plant estrogen. Three medical centers, the National Taiwan University Hospital, National Chengkung University Hospital and the Changhua Christian Hospital are participating in this project. Currently, cases are collected and analyzed to understand the pathogenic mechanisms of aging and chronic diseases and health risk factors for the development of strategies for the early detection, early diagnosis and treatment of diseases.

6) Studies in Psychiatrics: Neuroscience and clinical studies are being applied to problems of psychiatric diseases and drug addiction. An epidemiological study of psychiatric disorders in children and adolescents in Taiwan is ongoing to provide reference for the formation of health policies, for assessment in control, and for the planning of health promotion programs.

2. Research in Medical Technology and Pharmaceuticals for the Development of New Products and Techniques

1) Development of New Pharmaceuticals: Research and development on anti-cancer drugs have already synthesized 60 different derivatives, five of which are active and of high solubility in water; pharmacokinetic studies have been conducted on these. Oral tests for efficacy conducted on some derivatives with high bio-availability have found that BPR0L002 and BPR0L164 have anti-cancer effects through oral intake. New4-(4-benzhydrylpiperazin-1-yl)-7H-pyrrolo[2,3-d]pyrimidine analogues (1-31) were designed and synthesized. Their anti-CVB3 activities were evaluated in a plague reduction assay. Bioactivity tests were conducted on enterovirus 71 and Coxsackievirus types B2 and B3 for the development of new drugs against enteroviruses.

2) Studies in Medical Engineering: Cooperative research between the NRHI and the Center for Applied Stochastic Research of the Florida Atlantic University brought about a new theoretical model for predicting cyclic failure of mechanical heart valves that saves time on the testing of cardiac valves, and thus improves clinical diagnosis and treatment methods. A spatial approach to endothelial and smooth muscle celll structure, gene expression and function on genomic analysis, and mechanotransduction in the focal origin of atherosclerosis has helped to identify novel marker genes responsible for the formation and progression of anterosclorosis. The result could serve as a theoretical basis for the further development of new treatment method for arteriosclerosis.

3) Studies in Genetics: Studies on the genetic factors of hypertension and insulin-resistance, and follow-up studies on the subsequent occurrence of cerebrovascular diseases have been conducted to detect genes that regulate insulin, thus helping the development of early diagnosis and treatment methods. Registration of families with genetic non-polyp colon-rectum cancer is performed to study related genetic factors and genetic testing methods to solve the problems of diseases induced by genetic factors.

4) Studies in Bio-Informatics: A genomic DNA array-CGH platform specifically for use in comparing genomic hybridization experiment has been set up; and statistical methods and calculations required for the genomic hybridization experiment have been developed. The specific platform so established is superior in analysis and sensitivity to the conventional methods of using chromosome or DNA as probes to analyze abnormality of chromosomes in various cells.

5) Application of Genomic Science and Technology: In microbial genomic research, the NHRI has completed the genome sequencing of *Klebsiella pneumoniae*, Deinococcus ficus, and Ganoderma lucidum. In studies of the positional cloning of genes, findings from studies of the positional cloning of inherited avascular necrosis of the femoral head show that mutation of type II collagen (COL2A1) will result in the necrosis of femoral head. The findings will serve as a reference for the further development of treatment models.

6) Studies on Stem Cells: Through research and development of adult and fetal brain stem cells as well as the bio-characteristics and immune reactions of human placenta stem cells, techniques in the isolation and purification of stem cells have been upgraded. Placenta-derived Multipotent Cells have been successfully differentiated into bones, fat

and neuro-cells. A large amount of stem cells are cultured *in vitro* to replace mature liver cells for the reshaping of liver. Findings will serve as a basis for the development of treatment for congenital metabolic disorders, and to promote the overall development of research techniques on stem cells.

3. Research on Health Policies and Health Promotion System

1) Bacterial Research: The fifth phase of the Taiwan Surveillance of Antibiotics Resistance (TSAR) project has been completed. This project led to the improvement of antibiotics usage in outpatient clinics in Taiwan in 2001-2005. Drug resistance for first-line antibiotics, such as erythromycin and ampicillin, showed a dramatic decrease in 2004. The government is urged to ban the unnecessary use of antibiotics, which would help save a great deal of money spent on the National Health Insurance. National policies prohibiting the addition of antibiotics in animal feeds have been drafted. The use of antibiotics such as tetracycline, bacitercin and neomycin is terminated; a major milestone in antibiotic use in Taiwan.

2) Viral Research: Plan has been made to establish a National Influenza Research Team to study the current status of H5N1 infection, and to promote international health cooperation programs.

3) Study on Diabetes Management through an Integrated Delivery System: A joint community care network for diabetes and their long-term monitoring has been established. Cohort data of indigenous diabetes has been established to provide information to authorities concerned with the formation of goals for the control of indigenous diabetes.

4) Building a platform for inter-ministerial health risk assessment: In coordination with the inter-ministerial health risk assessment center, assessment of possible health risks related to beef for human consumption imported from mad-cow disease regions and of the safety-associated exposures of laborers have been conducted to provide timely scientific assessment results to the Department and the Council of Labor Affairs to help with the formation of evidence-based policy.

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Appendix

Appendixes Population Statistics

Table1 Population Statistics

Year	Population	Poulation Composition			Dependency Ratio	Sex Ratio (per 100 women)	CBR	CDR	NIR	Life Expectancy			Population Density (Persons/ km²)
		Under 15	15-64	Above 65						Total	Male	Female	
	(1,000)	%	%	%	%		‰	‰	‰	Year	Year	Year	
1994	21,178	24.41	68.21	7.38	46.60	106	15.31	5.40	9.91	74.50	71.81	77.76	585
1995	21,357	23.77	68.60	7.64	45.78	106	15.50	5.60	9.90	74.53	71.85	77.74	590
1996	21,525	23.15	68.99	7.86	44.94	106	15.18	5.71	9.47	74.95	72.38	78.05	595
1997	21,743	22.60	69.34	8.06	44.22	106	15.07	5.59	9.48	75.54	72.97	78.61	601
1998	21,929	21.96	69.79	8.26	43.30	105	12.43	5.64	6.79	75.76	73.12	78.93	606
1999	22,092	21.43	70.13	8.44	42.60	105	12.89	5.73	7.16	75.90	73.33	78.98	610
2000	22,277	21.11	70.26	8.62	42.32	105	13.76	5.68	8.08	76.46	73.83	79.56	616
2001	22,406	20.81	70.39	8.81	42.07	104	11.65	5.71	5.94	76.75	74.06	79.92	619
2002	22,521	20.42	70.56	9.02	41.72	104	11.02	5.73	5.29	77.19	74.59	80.24	622
2003	22,605	19.83	70.94	9.24	40.97	104	10.06	5.80	4.27	77.35	74.77	80.33	625
2004	22,689	19.34	71.19	9.48	40.48	104	9.56	5.97	3.59	77.48	74.68	80.75	627
2005	22,770	18.70	71.56	9.74	39.74	103	9.06	6.13	2.92	77.42	74.50	80.80	629
2006	22,877	18.12	71.88	10.00	39.12	103	8.96	5.95	3.01	77.46	74.57	80.81	632

Soure: Department of Statistics, Ministry of the Interior.

Table 2 Health and Medical Expenditures

Year	Annual Economic Growth Rate	Per Capita GDP	Final Expenditure of Health Care for Private Sectors	% of GDP	% of Private Consumption	Net Expenditures of All Government Fiscal Year	Health and Medical Expenditures	Expenditure of DOH and Affiliated Organizations of Total Central of Government Expenditures	Medical Expenditures as % of GDP	Consumer Price Index	Medical Expenditure Index
	%	US $	million	%	%	NT $ million	%	%	%	2001 = 100	
1994	7.4	11,991	262,483	3.93	6.79	1,826,367	1.58	0.71	5.05	89.93	86.11
1995	6.5	12,906	313,349	4.32	7.43	1,910,066	1.53	0.70	5.49	93.23	87.48
1996	6.3	13,527	355,249	4.47	7.64	1,843,786	1.57	0.63	5.39	96.10	88.96
1997	6.6	13,904	393,237	4.57	7.79	1,878,764	1.51	0.61	5.40	96.96	91.06
1998	4.6	12,679	431,469	4.67	7.94	1,992,593	1.37	0.52	5.48	98.60	91.91
1999	5.8	13,609	469,765	4.87	8.16	2,050,004	1.31	0.51	5.67	98.77	95.11
2000	5.8	14,519	493,863	4.92	8.11	3,140,936	1.28	0.85	5.67	100.01	98.68
2001	-2.2	13,093	516,748	5.24	8.43	2,271,755	1.17	1.07	5.97	100.00	100.00
2002	4.3	13,163	541,498	5.31	8.66	2,144,917	1.29	1.10	6.00	99.80	101.29
2003	3.4	13,327	561,720	5.44	8.93	2,206,223	1.53	1.14	6.20	99.52	104.65
2004	6.1	14,271	586,389	5.44	8.86	2,238,914	1.46	1.17	6.17	101.13	106.72
2005	4.1	15,291	617,934	5.41	8.80	2,309,565	1.18	1.12	6.16	103.46	110.97
2006	4.7	16,030	645,411	5.44	9.00	…	…	…	…	104.08	114.63

Soure: Annual Financial Report, Ministry of Finance.

Table 3 Medical Manpower and Facilities

Year	Medical Care Institutions											
	No.	Hospital							Clinics			
		No.	No.	Western Medicine		No.	Chinese Medicine		No.	Western Medicine	Chinese Medicine	Dentistry
				Public	Private		Public	Private				
				No.	No.		No.	No.		No.	No.	No.
1994	15,752	828	719	97	622	109	1	108	14,924	8,511	1,876	4,537
1995	16,109	787	688	94	594	99	1	98	15,322	8,683	1,933	4,706
1996	16,645	773	684	94	590	89	1	88	15,872	9,009	1,987	4,876
1997	17,398	750	667	95	572	83	2	81	16,648	9,347	2,165	5,136
1998	17,731	719	647	95	552	72	2	70	17,012	9,473	2,259	5,280
1999	17,770	700	634	96	538	66	2	64	17,070	9,378	2,317	5,375
2000	18,082	669	617	94	523	52	2	50	17,413	9,402	2,461	5,550
2001	18,265	637	593	92	501	44	2	42	17,628	9,425	2,544	5,659
2002	18,228	610	574	91	483	36	2	34	17,618	9,287	2,601	5,730
2003	18,777	594	558	91	467	36	2	34	18,183	9,565	2,729	5,889
2004	19,240	590	556	88	468	34	2	32	18,650	9,819	2,852	5,979
2005	19,433	556	531	79	452	25	1	24	18,877	9,948	2,900	6,029
2006	19,682	547	523	79	444	24	1	23	19,135	10,066	3,004	6,065

Soure: Office of Statistics, Department of Health

Table 3 Medical Manpower and Facilities (Continued)

Year	Hospitals by Accreditation									
	Medical Centers		Regional Hospitals		District Hospitals		Distric Teaching Hospitals		Psychiatric Hospitals	
	No.	Beds	No.	Beds	No.	Beds	No.	Beds	No.	Beds
1994	13	16,590	45	21,662	509	41,775	57	13,165	29	7,793
1995	14	19,375	44	22,342	505	44,750	63	15,860	30	8,368
1996	14	19,919	45	24,099	479	44,369	68	18,463	28	8,126
1997	16	22,151	51	28,282	468	42,834	69	17,514	26	8,348
1998	17	23,405	51	28,974	469	44,621	67	18,143	27	8,395
1999	18	24,555	51	27,883	426	42,327	66	18,446	32	8,709
2000	23	27,473	63	33,820	387	36,080	49	13,277	32	9,399
2001	24	28,389	66	35,381	401	36,104	47	13,168	35	9,703
2002	23	29,398	71	40,761	385	35,860	41	11,468	36	9,450
2003	23	30,301	72	42,158	372	34,922	42	11,765	37	10,493
2004	24	31,195	72	43,628	359	35,952	42	12,594	37	10,879
2005	22	30,552	64	39,536	352	38,584	41	13,453	38	11,153
2006	24	31,786	55	37,616	344	37,602	37	11,961	37	11,176

Soure: Office of Statistics, Department of Health.

Table 3 Medical Manpower and Facilities (Continued)

Year	Health Stations					No. of Beds					Per 10,000							
							No. of Beds in Hospitals			No. of Obserbation Beds in Clinics	Hospital Beds							Clinics
		Taiwan Province	Taipei City	Kao-hsiung City	Kinmen Matsu			Public	Privat			Acute general beds	Acute psychiatric beds	Chronic general beds	Chronic psychiatric beds	Special beds	Hemodialysis bed	
	No.	No.	No.	No.	No.	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds
1994	369	338	12	11	8	103,733	94,270	37,586	56,684	9,463	48.98	28.94	0.92	1.83	4.98	6.52	1.33	4.46
1995	369	338	12	11	8	112,379	101,430	39,922	61,508	10,949	52.78	30.12	1.22	2.38	5.01	7.16	1.76	5.13
1996	369	338	12	11	8	114,923	104,111	40,125	63,986	10,812	53.39	30.61	1.59	2.18	4.49	7.60	1.90	5.02
1997	369	338	12	11	8	121,483	108,536	41,421	67,115	12,947	55.87	30.46	1.73	2.38	4.71	8.58	2.06	5.95
1998	369	338	12	11	8	124,564	111,941	42,838	69,103	12,623	56.80	30.98	1.80	2.29	5.11	8.76	2.01	5.76
1999	369	338	12	11	8	122,937	110,660	39,440	71,220	12,277	55.65	30.84	2.10	2.28	3.93	8.63	2.32	5.56
2000	369	338	12	11	8	126,476	114,179	40,129	74,050	12,297	56.77	31.03	2.25	2.40	4.38	8.61	2.59	5.52
2001	363	332	12	11	8	127,676	114,640	39,670	74,970	13,036	56.99	30.27	2.27	2.17	4.44	9.24	2.77	5.82
2002	363	332	12	11	8	133,398	119,847	41,904	77,943	13,551	59.24	30.89	2.37	2.19	4.70	10.13	2.93	6.02
2003	372	340	12	12	8	136,331	121,698	42,777	78,921	14,633	60.31	30.77	2.46	1.91	4.89	10.74	3.08	6.47
2004	372	339	12	12	9	143,343	127,667	43,865	83,802	15,676	63.18	31.87	2.59	1.95	5.13	11.55	3.19	6.91
2005	372	339	12	12	9	146,382	129,548	44,273	85,275	16,834	64.29	31.80	2.64	1.94	5.51	11.75	3.26	7.39
2006	372	339	12	12	9	148,962	131,152	44,076	87,076	17,810	65.12	31.88	2.65	1.83	5.71	11.87	3.39	7.79

Soure: Office of Statistics, Department of Health.

Table 3 Medical Manpower and Facilities (Continued)

Year	No. of Medical Care Personnel												
		Physicians	Chinese Medicine Doctors	Population Served per Physician (including Chinese Medicine Doctors)	Dentists	Population Served per Dentist	Pharmaceutical Personnel	Population Served per Pharmaceutical Personnel	Nursing Personnel	Population Served per Nursing Personnel	Medical Technologists (Including Assistants)	Medical Radiological Technologists (including Technicians)	Dietitians
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
1994	114,076	24,455	2,833	776	6,973	3,037	18,762	1,129	54,639	388	4,593	1,699	…
1995	118,242	24,465	3,030	777	7,026	3,040	19,224	1,111	57,585	371	4,722	1,793	298
1996	123,829	24,790	2,992	775	7,254	2,967	19,667	1,095	62,268	346	5,034	1,453	293
1997	137,829	25,730	3,299	749	7,573	2,871	21,246	1,023	70,447	309	5,389	2,266	515
1998	144,070	27,168	3,461	716	7,900	2,776	22,761	963	71,919	305	5,583	2,485	575
1999	152,385	28,216	3,546	696	8,240	2,681	23,937	923	76,252	290	6,015	2,500	656
2000	159,212	29,585	3,733	669	8,597	2,591	24,404	913	79,734	279	6,230	2,761	743
2001	165,855	30,562	3,979	649	8,944	2,505	24,891	900	83,281	269	6,542	3,152	778
2002	175,444	31,532	4,101	632	9,206	2,446	25,355	888	90,058	250	6,725	3,410	845
2003	183,103	32,390	4,266	617	9,551	2,367	25,033	903	95,747	236	7,055	3,557	895
2004	192,611	33,360	4,588	598	9,868	2,299	26,079	870	101,924	223	7,122	3,704	978
2005	199,734	34,093	4,610	588	10,141	2,245	26,750	850	105,183	216	7,323	3,880	1,056
2006	206,984	34,899	4,743	577	10,412	2,197	27,413	835	109,538	209	7,459	4,053	1,138

Soure: Office of Statistics, Department of Health.

Table 4 Pharmaceutical Affairs

Year	No.of Pharmaceutical Firms									
		Pharmacies			Medicine Dealers			Pharmacentical Manufacturers		
			Owend and Operated by Pharmacisrs	Owend and Operated by Assistant Pharmacisrs	Western Medicines	Chinese Medicines	Medicial Devices	Western Medicines	Chinese Medicines	Medicial Devices
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
1994	33,585	1,956	894	1,062	11,693	9,321	9,955	251	252	157
1995	34,846	4,862	2,386	2,476	9,074	9,631	10,609	253	249	168
1996	37,176	6,438	3,243	3,195	7,563	9,585	12,948	242	238	162
1997	38,583	6,707	3,443	3,264	7,020	9,123	15,098	243	218	174
1998	39,027	6,434	3,436	2,998	6,466	9,217	16,262	243	217	188
1999	40,322	6,349	3,422	2,927	6,457	9,229	17,627	244	208	208
2000	43,641	6,397	3,491	2,906	6,359	11,161	19,016	243	207	258
2001	47,130	6,440	3,600	2,840	6,524	12,864	20,560	257	202	283
2002	49,752	6,990	3,983	3,007	6,526	13,202	22,268	244	200	322
2003	51,447	7,155	4,193	2,962	6,751	12,799	23,950	243	171	378
2004	52,685	7,435	4,465	2,970	6,759	12,712	24,924	244	171	440
2005	55,802	7,673	4,691	2,982	6,875	12,682	27,641	241	150	540
2006	57,976	7,397	4,598	2,799	6,941	12,577	30,062	238	112	632

Soure: Office of Statistics, Department of Health.

Table 5 Food Sanitation

Year	Laboratory Testing for Food Sanitation	Disqualified	Inspections for Food Sanitation Establishments							Incidents of Food Poisoning		
				To be Improved		Fined		Suspended			No.of Cases	No.of Deaths
	No.	%	No.	No.	%	No.	%	No.	%	No.	No.	No.
1994	44,205	7.90	257,508	20,335	7.90	1,177	0.46	1	0.00	102	4,276	-
1995	40,410	10.51	237,189	20,390	8.60	1,316	0.55	6	0.00	123	4,950	-
1996	38,475	10.11	210,942	22,229	10.54	2,903	1.38	95	0.05	178	4,043	-
1997	38,606	10.49	197,042	16,582	8.42	1,051	0.53	29	0.15	234	7,235	1
1998	38,141	8.72	179,485	16,821	9.37	1,035	0.58	34	0.02	180	3,951	-
1999	37,773	8.09	181,818	19,020	10.46	37	0.02	10	0.01	150	3,112	1
2000	67,020	4.42	181,865	20,363	11.20	152	0.08	8	0.00	208	3,759	3
2001	34,907	8.56	166,195	20,069	12.08	104	0.06	59	0.04	178	2,955	2
2002	33,971	8.57	158,583	15,978	10.08	69	0.04	9	0.01	262	5,566	1
2003	36,220	10.06	177,102	15,525	8.77	104	0.05	8	0.00	251	5,283	-
2004	37,158	6.89	150,698	13,426	8.91	118	0.07	10	0.00	274	3,992	2
2005	39,395	6.36	182,575	15,218	8.34	51	0.03	5	0.00	247	3,530	1
2006	39,539	…	165,208	24,376	14.75	108	0.07	19	0.01	265	4,401	-

Soure: Office of Statistics, Department of Health.

Table6 Health Promotion and Protection

Year	Use of Child Preventive Healthcare	Use of Adult Prventive Healthcare		Screening for Cervical Cancer	General Fertility of Reproductive Women	Fertility of Women under 20	No.of Births
		40-64	65 and above				
	%	%	%	%	‰	‰	Births
1995	…	…	…	…	55	17.0	329,581
1996	…	…	…	…	54	17.0	325,545
1997	…	…	…	…	53	15.4	326,002
1998	…	…	…	…	43	13.8	268,881
1999	55.75	11.17	30.64	31.04	45	12.9	284,073
2000	65.67	12.01	33.56	34.72	48	14.0	307,200
2001	74.16	13.40	37.59	32.73	41	13.0	257,866
2002	77.88	13.81	41.22	31.91	39	13.0	246,950
2003	78.38	13.97	40.32	27.19	36	11.0	227,447
2004	91.17	13.99	38.21	29.02	34	10.0	217,685
2005	74.48	11.98	63.23	26.39	33	8.0	206,465
2006	86.32	11.37	35.86	29.05	33	7.0	204,459

Soure: Bureau of Health Promotion, Department of Health.

Table 7 Health and Social Insurance

Year	No.of Persons Under Social Insurance	As % of Total Population	No. of Outpatient Visits per 100 Insured Persons			No. of Inpatients per 100 Insured persons			Average Costs per Outpatient Visit			Average Costs per Inpatient Care			Average Days of Hospital Stat		
			Government Employee's Insurance	Laborer's Insurance	Farmer's Insurance	Government Employee's Insurance	Laborer's Insurance	Farmer's Insurance	Government Employee's Insurance	Laborer's Insurance	Farmer's Insurance	Government Employee's Insurance	Laborer's Insurance	Farmer's Insurance	Government Employee's Insurance	Laborer's Insurance	Farmer's Insurance
	1000 Persons	%	National Health Insurance			National Health Insurance			National Health Insurance			National Health Insurance			National Health Insurance		
*1995	19,124	89.54	1,056.23			10.15			529			29,458			9.26		
1996	20,040	93.10	1,360.89			11.72			549			31,901			9.04		
1997	20,492	94.25	1,432.88			11.60			557			32,768			9.21		
1998	20,757	94.66	1,499.66			11.83			588			34,851			8.78		
1999	21,090	96.06	1,527.85			12.28			614			36,098			8.68		
2000	21,401	96.16	1,472.20			12.57			631			36,478			8.73		
2001	21,654	96.64	1,449.86			13.00			659			37,169			8.83		
2002	21,869	97.67	1,451.80			13.47			707			39,160			9.04		
2003	21,984	97.26	1,437.74			12.48			746			43,343			9.64		
2004	22,134	97.55	1,549.52			13.60			776			46,914			9.70		
2005	22,315	98.00	1,546.96			13.35			792			49,212			9.86		
2006	22,484	98.29	1,467.87			12.95			840			50,216			9.92		

Soure: Bureau of National Health Insurance.

Table 8 Causes of Death

Year	ICD No. Mortality List		08~14			29			250,251,27,28*			181			E47～E53		
	All Causes		Malignant Neoplasms			Cerebrovascular Diseases			Hart Diseases			Diabetes Mellitus			Accidents and Adverse Effects		
	No.of Deaths	Mortality per 100,000	Order	No.of Deaths	Mortality per 100,000	Order	No.of Deaths	Mortality per 100,000	Order	No.of Deaths	Mortality per 100,000	Order	No.of Deaths	Mortality per 100,000	Order	No.of Deaths	Mortality per 100,000
1994	112,238	532.27	1	23,318	110.58	2	13,658	64.77	4	12,005	56.93	5	6,094	28.90	3	13,219	62.69
1995	117,954	554.62	1	25,841	121.50	2	14,132	66.45	4	11,256	52.93	5	7,225	33.97	3	12,983	61.05
1996	120,605	562.49	1	27,961	130.41	2	13,944	65.03	4	11,273	52.58	5	7,525	35.10	3	12,422	57.93
1997	119,385	551.84	1	29,011	134.10	2	12,885	59.56	4	10,754	49.71	5	7,500	34.67	3	11,297	52.22
1998	121,946	558.47	1	29,260	134.00	2	12,705	58.18	3	11,030	50.51	5	7,532	34.49	4	10,973	50.25
1999	124,991	567.87	1	29,784	135.32	3	12,631	57.39	4	11,299	51.33	5	9,023	40.99	2	12,960	58.88
2000	124,481	561.12	1	31,554	142.23	2	13,332	60.10	3	10,552	47.56	5	9,450	42.60	4	10,515	47.40
2001	126,667	566.97	1	32,993	147.68	2	13,141	58.82	3	11,003	49.25	5	9,113	40.79	4	9,513	42.58
2002	126,936	565.08	1	34,342	152.88	2	12,009	53.46	3	11,441	50.93	4	8,818	39.26	5	8,489	37.79
2003	129,878	575.63	1	35,201	156.01	2	12,404	54.98	3	11,785	52.23	4	10,013	44.38	5	8,191	36.30
2004	133,679	590.28	1	36,357	160.54	3	12,339	54.48	2	12,861	56.79	4	9,191	40.58	5	8,453	37.33
2005	138,957	611.34	1	37,222	163.76	2	13,139	57.81	3	12,970	57.06	4	10,501	46.20	5	8,364	36.80
2006	135,671	597.81	1	37,998	166.49	2	12,596	55.19	3	12,283	53.82	4	9,690	42.46	5	8,011	35.10

Soure: Office of Statistics, Department of Health .

Table 8 Causes of Death (Continued)

Year	321			347			350			E54			26		
	Pneumonia			Chronic Liver Diseases and Cirrhosis			Nephritis,Nephrotic Syndrome and Nephrosis			Suicide and Self Inflicted Injury			Hypertensive Diseases		
	Order	No.of Deaths	Mortality per 100,000	Order	No.of Deaths	Mortality per 100,000	Order	No.of Deaths	Mortality per 100,000	Order	No.of Deaths	Mortality per 100,000	Order	No.of Deaths	Mortality per 100,000
1994	8	2,890	13.71	6	4,163	19.74	7	3,211	15.23	13	1,451	6.88	9	2,191	10.39
1995	8	3,070	14.44	6	4,456	20.95	7	3,519	16.55	11	1,618	7.61	9	2,616	12.30
1996	8	3,200	14.92	6	4,610	21.50	7	3,547	16.54	11	1,847	8.61	9	2,656	12.39
1997	7	3,619	16.73	6	4,767	22.03	8	3,504	16.20	10	2,172	10.04	9	2,611	12.07
1998	7	4,447	20.37	6	4,940	22.62	8	3,435	15.73	10	2,177	9.97	9	2,273	10.41
1999	7	4,006	18.20	6	5,180	23.53	8	3,474	15.78	9	2,281	10.36	10	1,856	8.43
2000	8	3,302	14.88	6	5,174	23.32	7	3,872	17.45	9	2,471	11.14	11	1,602	7.22
2001	8	3,746	16.77	6	5,239	23.45	7	4,056	18.15	9	2,781	12.45	10	1,766	7.90
2002	7	4,530	20.17	6	4,795	21.35	8	4,168	18.55	9	3,053	13.59	10	1,947	8.67
2003	7	5,099	22.60	6	5,185	22.98	8	4,306	19.08	9	3,195	14.16	10	1,844	8.17
2004	6	5,536	24.44	7	5,351	23.63	8	4,680	20.67	9	3,468	15.31	10	1,806	7.97
2005	6	5,687	25.02	7	5,621	24.73	8	4,822	21.21	9	4,282	18.84	10	1,891	8.32
2006	6	5,396	23.64	7	5,049	22.12	8	4,712	20.65	9	4,406	19.30	10	1,816	7.96

Soure: Office of Statistics, Department of Health .

Table 9 International Comparison

Year	Life Expectancy												Crude Birth Rate					
	ROC		Japan		USA		Germany		UK		South Korea		ROC	Japan	USA	Germany	UK	South Korea
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female						
	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	‰	‰	‰	‰	‰	‰
1994	71.8	77.8	76.6	83.0	72.4	79.0	73.1	79.6	73.9	79.2	67.0	75.0	15.3	10.0	15.2	9.5	13.0	16.3
1995	71.9	77.7	76.4	82.9	72.5	78.9	73.3	79.7	74.0	79.2	69.6	77.4	15.5	9.6	14.8	9.4	12.6	16.0
1996	72.4	78.1	77.0	83.6	73.1	79.1	73.6	79.9	74.3	79.5	68.0	76.0	15.2	9.7	14.7	9.7	12.6	15.3
1997	73.0	78.6	77.2	83.8	73.6	79.4	74.0	80.3	74.6	79.6	69.0	77.0	15.1	9.5	14.5	9.9	12.5	14.8
1998	73.1	78.9	77.2	84.0	73.8	79.5	74.5	80.6	74.8	79.8	70.0	77.0	12.4	9.6	14.6	9.7	12.3	13.8
1999	73.3	79.0	77.1	84.0	73.9	79.4	74.7	80.7	75.0	79.8	71.7	79.2	12.9	9.4	14.5	9.4	11.9	13.2
2000	73.8	79.6	77.7	84.6	74.1	79.5	75.0	81.0	75.5	80.2	71.7	79.2	13.8	9.5	14.4	9.3	11.5	13.4
2001	74.1	79.9	78.9	84.9	74.4	79.8	75.6	81.3	75.7	80.4	72.8	80.0	11.7	9.3	14.1	8.9	11.3	11.6
2002	74.6	80.2	78.3	85.2	74.5	79.9	75.6	81.6	75.8	80.5	71.8	79.4	11.0	9.2	14.2	9.0	11.3	10.3
2003	74.8	80.3	77.6	84.4	74.4	80.1	75.5	81.4	75.7	80.7	71.7	79.3	10.1	8.9	14.1	8.6	11.7	10.2
2004	74.7	80.8	78.0	85.0	75.0	80.0	76.0	82.0	76.0	81.0	74.0	81.0	9.6	8.8	14.0	8.5	12.0	9.8
2005	74.5	80.8	78.5	85.5	74.9	80.7	75.7	81.8	75.9	81.0	73.4	80.6	9.1	8.4	13.9	8.4	12.0	9.0
2006	74.6	80.8	78.0	84.7	75.0	80.8	75.8	82.0	76.1	81.1	73.6	80.8	9.0					

Soure: WHO(The World Health Report 2004) .

Table9 International Comparison (Continued)

Year	Standardized Mortality Rate						Inhant Mortality Rate						No. of Physicians per 10,000					
	ROC	Japan	USA	Germany	UK	South Korea	ROC	Japan	USA	Germany	UK	South Korea	ROC	Japan	USA	Germany	UK	South Korea
	per 100,000	per 100,000	per 100,000	per 100,000	per 100,000	per 100,000	‰	‰	‰	‰	‰	‰	No.	No.	No.	No.	No.	No.
1994	638.6	438.7	618.7	627.2	603.5	704.0	5.1	4.2	8.0	5.6	6.2	8.9	12	18	26	30	17	11
1995	647.7	446.7	616.3	616.4	609.1	677.5	6.4	4.3	7.6	5.3	6.2	8.5	11	18	26	31	18	11
1996	641.1	420.0	603.7	601.6	593.8	649.1	6.7	3.8	7.3	5.0	6.1	8.3	12	18	26	31	18	12
1997	610.7	413.9	591.1	576.0	581.1	634.5	6.4	3.7	7.2	4.9	5.9	8.0	12	19	27	31	19	12
1998	600.8	412.4	583.8	561.4	574.8	615.6	6.6	3.6	7.2	4.6	5.7	7.9	12	19	27	32	19	13
1999	594.1	417.4	586.6	549.8	571.4	606.8	6.1	3.4	7.1	4.5	5.8	7.8	13	19	28	32	20	13
2000	569.4	394.9	576.3	536.6	546.8	589.9	5.7	3.2	6.9	4.4	5.6	7.7	13	19	28	33	20	13
2001	558.7	384.5	-	520.0	538.4	561.9	6.0	3.1	6.9	4.3	5.5	7.6	14	21	28	33	…	14
2002	539.8	375.8	-		534.0	556.6	5.4	3.0	6.9	4.2	5.2	9.6	14	…	…	…	…	…
2003	532.3		-				4.9	3.0	6.7	4.2	5.3	…	14	…	…	…	…	…
2004	528.7		-				5.3	…	…	…	…	…	15	…	…	…	…	…
2005	530.0		-				5.0	…	…	…	…	…	15	…	…	…	…	…
2006	495.4		-				4.6	…	…	…	…	…	15	…	…	…	…	…

Soure: WHO (The World Health Report 2004) .

Table9 International Comparison (Continued)

Year	No. of Hospital Beds per 10,000						Occupancy						Average Days of Hospital Stay					
	ROC	Japan	USA	Germany	UK	South Korea	ROC	Japan	USA	Germany	UK	South Korea	ROC	Japan	USA	Germany	UK	South Korea
	Beds	Beds	Beds	Beds	Beds	Beds	%	%	%	%	%	%	Days	Days	Days	Days	Days	Days
1994	49	129	…	114	…	41	73.1	81.0	62.9	82.5	76	77.0	10.2	45.5	8.2	14.0	10.2	13.0
1995	53	130	99	112	83	44	68.6	81.6	62.8	82.1	76.0	66.3	10.2	44.2	7.8	13.5	10.2	13.0
1996	53	132	98	114	83	46	66.0	82.2	61.5	80.6	75.9	70.1	9.4	43.7	7.5	12.9	10.3	13.0
1997	56	132	98	115	73	48	63.1	81.7	61.9	81.1	76.4	69.7	9.2	42.5	7.3	11.9	9.3	13.0
1998	57	134	97	…	81	52	60.8	81.6	62.6	82.3	76.1	66.9	8.7	40.8	7.1	11.7	8.9	13.0
1999	56	134	95	148	79	55	62.8	81.9	63.4	82.2	74.0	66.9	8.5	39.8	7.0	11.6	8.2	12.0
2000	57	135	93	…	77	61	64.0	81.8	63.9	81.9	75.0	67.2	8.7	39.1	6.8	11.4	8.4	14.0
2001	57	136	91	149	76	…	68.7	81.0	64.5	81.1	75.2	67.3	8.8	38.7	6.7	11.2	8.4	13.0
2002	59	135	90	…	74	…	70.0	80.0	65.7	80.1	74.9	65.2	*8.8	37.5	6.6	10.9	8.1	13.0
2003	60	135	…	…	72	…	*66.0	79.5	66.2	…	74.8	71.6	*9.4	36.4	6.5	…	7.6	13.5
2004	63	…	…	…	…	…	*68.9	…	…	…	…	…	*9.7	…	…	…	…	…
2005	64	…	…	…	…	…	*69.2	…	…	…	…	…	*9.5	…	…	…	…	…
2006	65	…	…	…	…	…	*67.8	…	…	…	…	…	*9.6	…	…	…	…	…

Note: *General Beds

Soure: WHO (The World Health Report 2004) .

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