2010

Taiwan Public Health Report

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

Taiwan Public Health Report 2010

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

Message from the Minister of Health

The Department of Health is responsible for a vast range of public health issues including health promotion, the National Health Insurance program, pharmaceutical management, food safety, disease control and surveillance, long-term care, biotechnology research and development, and international health affairs. As these matters are integral to the health and welfare of Taiwan's people, all major decisions should therefore meet the people's expectations.

Public Health Reports are published annually to help a wide range of citizens and policy-makers understand the Department's activities over the past year. The 2010 Taiwan Public Health Report chronicles the general status of public health strategies and achievements over the course of 2009.

In 2009, Taiwan was invited to the World Health Assembly (WHA) as an observer. This participation marked a significant breakthrough in Taiwan's efforts to increase its visibility in the international community. We should take advantage of this golden opportunity and step into the international spotlight by actively participating in global initiatives. In this way, Taiwan can obtain the latest information on disease control, food safety, health insurance innovations and health research. Through this participation, Taiwan can align with the world to improve our public health quality and maximize our people's chances to lead healthy lives.

One area of concern is food safety risks. Recent public issues in this area included melamine-contaminated milk powder from China, the quality of fast-food frying oil, and controversy over U.S. beef imports. The public depends on the government to minimize food-related risks, and the Department has been working hard toward achieving that goal. We have carefully studied advanced countries' food management policies, and subsequently merged related agencies to establish a functionally robust, juridically centralized Taiwan Food and Drug Administration (TFDA) under the Department of Health. This agency was officially inaugurated on January 1, 2010, to protect public health as well as consumers' rights and interests.

The H1N1 Central Epidemic Command Center was activated on April 28, 2009, to implement various prevention measures and to track the influenza epidemic's development, possible viral mutation, and plans for a nationwide vaccination campaign. These measures effectively kept the H1N1 mortality rate in Taiwan at just one-third of the average rate among OECD countries, and one-fifth of the mortality rate reported in the United States. Compared with OECD countries Taiwan's H1N1 mortality rate ranked fourth-

lowest, while the number of people who received vaccinations was the fifth-highest globally. Whether measured by H1N1 mortality rate or immunization rate, Taiwan has thus obtained successes comparable to advanced countries.

The success of programs such as emergency medical care and communicable disease control is largely determined by the National Health Insurance system's resource base. For this reason, National Health Insurance is not primarily a financial issue; it is closely linked to the nation's medical care system as a whole. Since its implementation in 1995, the National Health Insurance program has successfully provided universal coverage and accessible medical treatment for all; it has also has been widely praised by the international medical community.

Nevertheless, one cannot make bricks without straw. The National Health Insurance program is facing a burdensome financial future, as its income from health premiums is insufficient to cover enormous expenses. The program's future would be endangered if we failed to address and ensure its financial viability now. We therefore proposed revised formulas for calculating National Health Insurance premiums based on total household income rather than individual salary. This broadens the program's income base and ensures its financial viability while sharing financial responsibilities more fairly to uphold social justice. In response to rising demand for long-term medical care, the Department also formulated the Long-Term Care Service Act and Long-Term Care Insurance Act. The resulting care system can meet the needs of Taiwan's people who require extensive medical attention.

In 2009 the Department tackled many crises and accepted much constructive advice and criticism. Our vision of "Creating a Safe and Healthy Living Environment and Bridging the Gap of Health Differences for All" is central to our activities. With the people's scrutiny and encouragement we vow to do more to make this vision a reality by humbly striving for improvement, so that everyone in Taiwan can enjoy a longer and happier life.

Minister of Health

Chiu, Wen-Ta

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Part I. Health Policies

Staying healthy is one of the basic rights of being human; it is also the ultimate goal that every one aspires after. The DOH has marked"Improving and safeguarding healthfulness for all people, so that everyone lives a longer and happier life,"and set "Creating a Safe and Healthful Living Environment and Bridging the Gap of Health Differences for All as a Trusted Health Promoter"as its vision to formulate mid-term administrative plans for the course between 2009 and 2012, and specific administrative goals for 2009. With "Refining the Medical Care Systems to Ensure Public Wellness,""Implementing Healthcare and Disease Prevention Mechanisms to Guard against the Threat of Illness,""Maximizing the Value of the National Health Insurance System, Upholding Medical Care Equality,""Encouraging Participation by All People, Fulfilling Lifestyle Wellness," "Strengthening Drugs and Food Management, Securing Sanitation and Safety,""Developing Chinese and Western Medicine Biotechnologies, Bolstering Technological Foundation,""Active Involvement in International Health Platforms, Promoting International Alignment,"and "Developing Medical Human Resources and Upgrading Administrative Efficiency"as its central administrative platforms, the DOH aims at actively empowering medical and medical services for all.

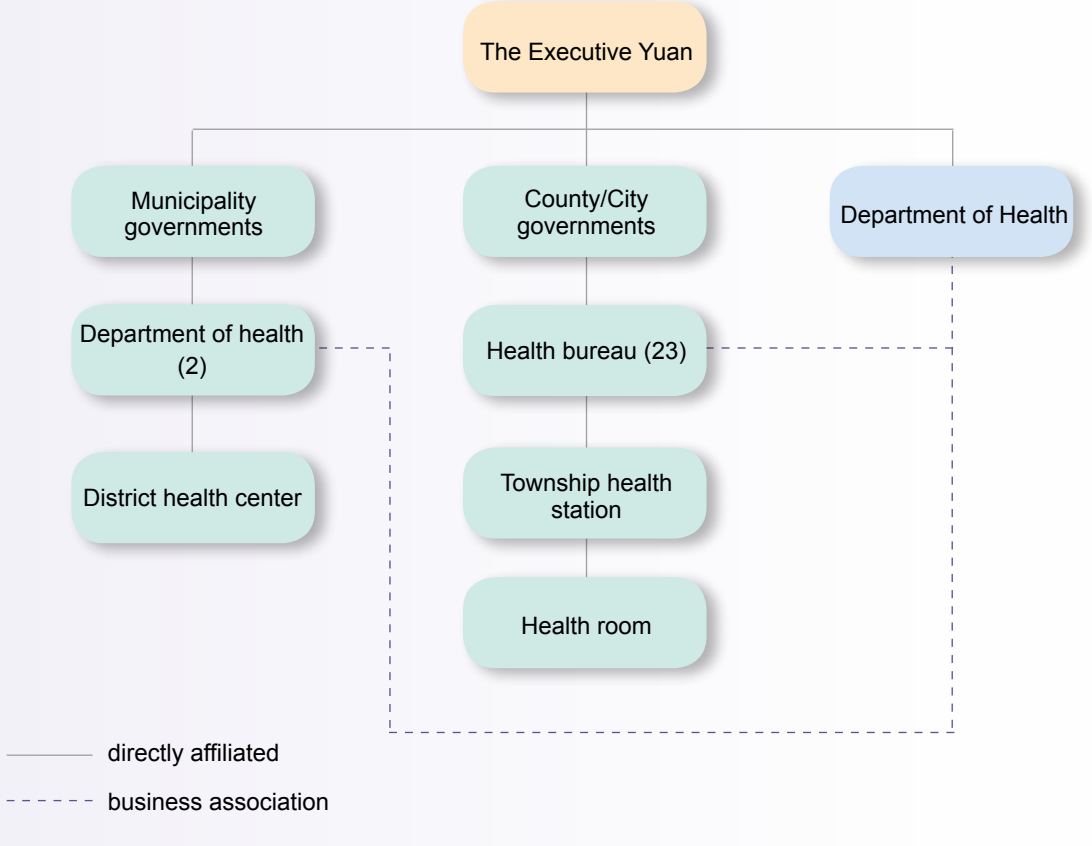
Chapter 1, The 2009 Policymaking and Administrative Highlights

Check the following for the 2009 Administrative Goals and focuses:

1. Refining the Medical Care Systems to Ensure Public Wellness: this involves setting up a National Emergency Medical Service and Critical Care Network and a Community Health Care Network; organizing assessments, reviews and licensing systems of hospital care efficiency; enriching extended care and rehabilitation services for the physically and mentally disabled; strengthening nursing care and nursing staff empowerment measures; formulating a medical relief system for no-fault accidents; finally, fortifying the function of the community mental health centers, and suicide prevention reporting and outreach services.
2. Implementing Healthcare and Disease Prevention and Control Mechanisms to Guard against the Threat of Illness: the DOH implemented disease control and management measures, strengthened a variety of disease control actions and fortified indigenous disease control; the organization also promoted the establishment of a vaccine foundation to expand vaccination program accessibility to the public; finally, it built a robust communicable disease surveillance system and strengthened a collaborative model among different departments.
3. Maximizing the Value of the National Health Insurance System, Upholding Medical Care Equality: this entails extensive financial reforms for the national health insurance system, creating a sustainable national health insurance program, meeting the needs of the underprivileged group requiring specific health care treatments; promoting dental care services in order to reinforce dental medical treatment for children and the disabled.
4. Encouraging Participation by All People, Fulfilling Lifestyle Wellness: this is about creating a healthy support network, establishing a smoke-free support environment, reinforcing cancer prevention and treatment, campaigning for hospice medical care and a support service for cancer patients; installing a quality child birth and care network, safeguarding the health of children and youths; strengthening the prevention and treatment of chronic diseases, such as diabetes, hypertension and hyperlipidemia; assisting in improvement efforts to maintain locally autonomous health care systems, and upgrading community health building know-how and efficiency.

5. Strengthening Drugs and Food Management, Securing Sanitation and Safety: strengthening food source and imported food management, assisting food manufacturers in setting up Hazard Analysis and Critical Control Points (HACCP) system, and pushing for the legislation of the National Nutrition Bill; enhancing pharmaceutical safety and management, fashioning a drug inspection system and drug administration regulation system of international standards; building a safe consumption environment of Chinese medicine; and implementing controlled drug management and counseling to effectively cut down drug abuse.
6. Developing Chinese and Western Medicine Biotechnologies, Bolstering Technological Foundation: conducting assessments and reviews on biomedical and health research effectiveness, policy orientation studies and innovation research initiatives to strengthen the application of health policies; empowering biotechnological and medical programs, bolstering medical and health technology development initiatives; empowering the Biomedical Technology Island Program; and finally, setting up an Excellence for Clinical Trail and Research System.
7. Active participation in international health affairs, Promoting International Alignment: the DOH actively conducts bilateral and multilateral health cooperative and information exchange activities, encourages Taiwan's ascension into the World Health Organization (WHO) and

Figure 1-1 Organizational Structure of the Health Administration



other high-profile health related professional organizations; the organization also provides international medical aid, cooperation in health and international training programs of medical personnel.

8. Developing Health Human Resources and Upgrading Administrative Efficiency: this involves training reinforcement for health and administrative staffs to upgrade their core, professional abilities, management and worldview, and galvanizing medical staff's professional service expertise.

Chapter 2, Health Administrations and Organization

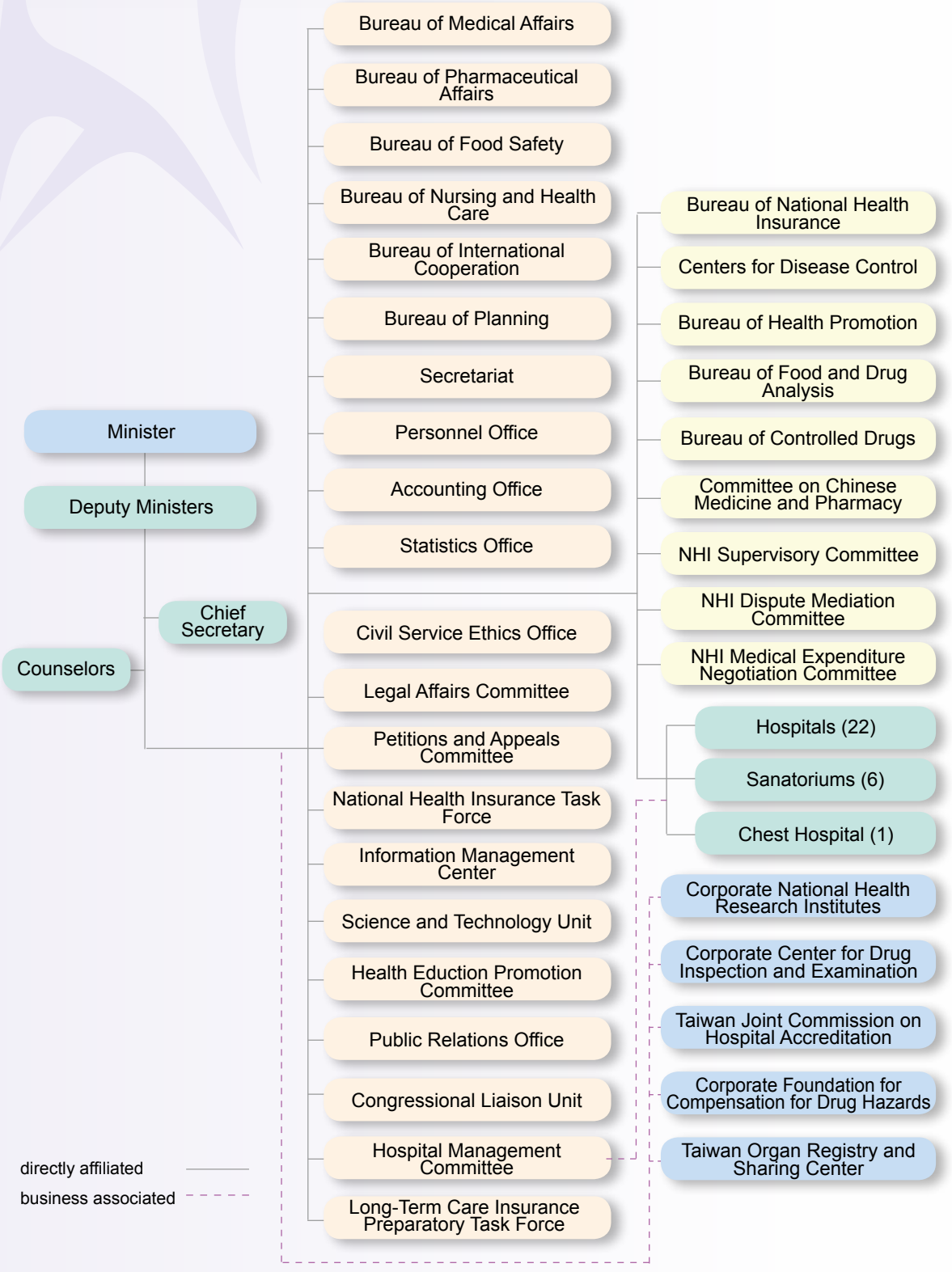
Taiwan's health administration originally consisted of three levels of agencies: central, provincial, and county/city. In keeping with the Local Government Act, promulgated in 1999, health administration and organization was streamlined down to just two levels: central, direct municipalities/counties. See Figure 1 – 1.

The highest competent authority on the central level is the Department of Health under the Executive Yuan. It's the highest-level health administration in Taiwan, and it is in charge of health administration affairs around the country, and responsible for providing professional work counseling, supervision and coordination to local health organizations. Health administrations on the local level are: the health departments or bureaus, established in direct municipalities or county/city governments. These local departments or bureaus are responsible for regional health administration affairs, totaling 25 across the country. One health station is established in each township, totaling 371 around Taiwan. These local establishments are responsible of executing preventive health care services on a regional level.

Section 1, The Health Administration

The Department of Health consists of 6 competent bureaus and committees, they are: the Bureau of Medical Affairs, the Bureau of Pharmaceutical Affairs, the Bureau of Food Safety, the Bureau of Nursing and Health Care, the Bureau of International Cooperation, and the Bureau of Planning, plus several mission-driven agencies, such as the National Health Insurance Task Force, the Information Management Center, the Science and Technology Unit, and the Hospital Management Committee. On July 23rd, 2009, the Long-Term Care Insurance Preparatory Task Force was set up to address promotional campaigns and preparatory arrangements for long-term care insurance systems. Second-tier sub agencies reporting to the DOH are: the Bureau of National Health Insurance, the Centers for Disease Control, the Bureau of Health Promotion, the Food and Drug Administration, the Bureau of Controlled Drugs, the Committee on Chinese Medicine and Pharmacy, the NHI Supervisory Committee, the

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

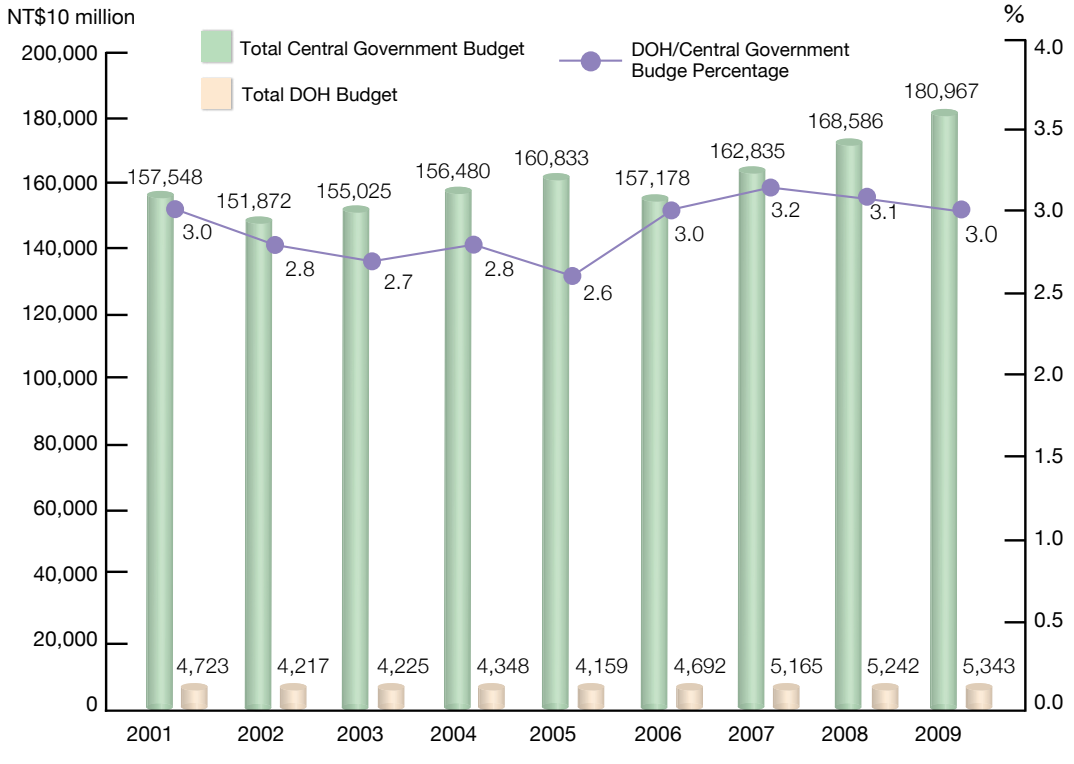


NHI Dispute Mediation Committee, the NHI Medical Expenditure Negotiation Committee, 22 DOH-affiliated hospitals, 6 DOH-affiliated sanatoriums, and 1 Chest Hospital. In addition, the DOH also financially supports the Corporate National Health Research Institutes, the Corporate Center for Drug Inspection and Examination, the Taiwan Joint Commission on Hospital Accreditation, and the Corporate Foundation for Compensation for Drug Hazards, and the Taiwan Organ Registry and Sharing Center. See Figure 1-2

Section 2, Integration and Merger of Food and Drugs Management Agencies in Planning

The structural principles and systems of food and drug administrations in advanced countries have inspired the DOH to merge the Bureau of Food Safety, the Bureau of Pharmaceutical Affairs, the Bureau of Food and Drug Analysis, the Bureau of Controlled Drugs, and the emerging bio-medicine science and technologies under the Bureau of Medical Affairs to inaugurate the Food and Drug Administration (TFDA) of the DOH, a unified agency that combines food management, analysis, legal regulation and scientific studies under the jurisdiction of one centralized agency. In addition, the TFDA will reinforce health risk assessments and risk management needed for protecting consumers, to become an integrated administration, inspection and research institute in charge of food, drugs, cosmetics management and preventing the abuse of controlled substances. The institute will be inaugurated and become operational on January 1st, 2010.

Figure 1 – 3 DOH Budget Percentage of Total Central Government Budget



Section 3. Reorganization Bureau of National Health Insurance

The National Health Insurance is a compulsory social insurance program intimately linked to the rights and interests of the people. To advance the health of all people and forward the interests of the public, the Executive Yuan delivered a revised draft of "Regulation Governing the Organization of the Bureau of National Health Insurance" on February 1st, 2008 to the Legislative Yuan for review. The Act was presidentially decreed and promulgated on January 23rd, 2009 after the third reading at the Legislative Yuan. Various preparatory restructuring tasks were underway during the same year. The BNHI was reorganized to be an administrative organization on January 1st, 2010. The restructuring did not at all affect the rights, the interests of the people, and health care services ensured by the system.

Chapter 3, Budgeting

In 2009, the total health budget was registered at NT$53.4 billion, accounting for 3% of the total central government budget of NT$1, 809.7 billion. See Figure 1-3.

Chapter 4, Policy Review and Assessment

The DOH-initiated review and assessment of local health authorities were designed to objectively measure and showcase the annual administrative performances of these regional establishments, and encourage them to improve public service quality and health administration efficiency. In light of the regionally distinct administration demands of various counties and cities, the DOH moved to integrate and streamline the original assessment accordingly, simplifying the original assessment items (medical administration, long term care, pharmaceutical administration, controlled substances, food, inspection, disease control, health care and health education) into three major categories of "Disease Control and Health Promotion," "Food and Drugs" and "Medical Care." Supervising agencies of the local health centers are put in charge of handling follow-up incentive arrangements after evaluation, in hopes of inspiring administrative efficiency and service quality.

Part II Health Indicators

Part II. Health Indicators

In light of constant changes in Taiwan's social environment, and a move to chronicle progresses and attainments achieved after the implementation of the National Health Insurance, a compendious account of key health indicators is listed here: population, vital indicators, national health expenditures and international statistical comparisons.

Chapter 1, Demographics

By the end of 2009, the total number of registered population in Taiwan was 23.12 million. Of all, male accounted for 11.64 million, and female, 11.48. The sex ratio of population (total male population/total female population *100) in Taiwan was 101. The annual population growth rate was registered at 3.59‰.

1. Age Structure

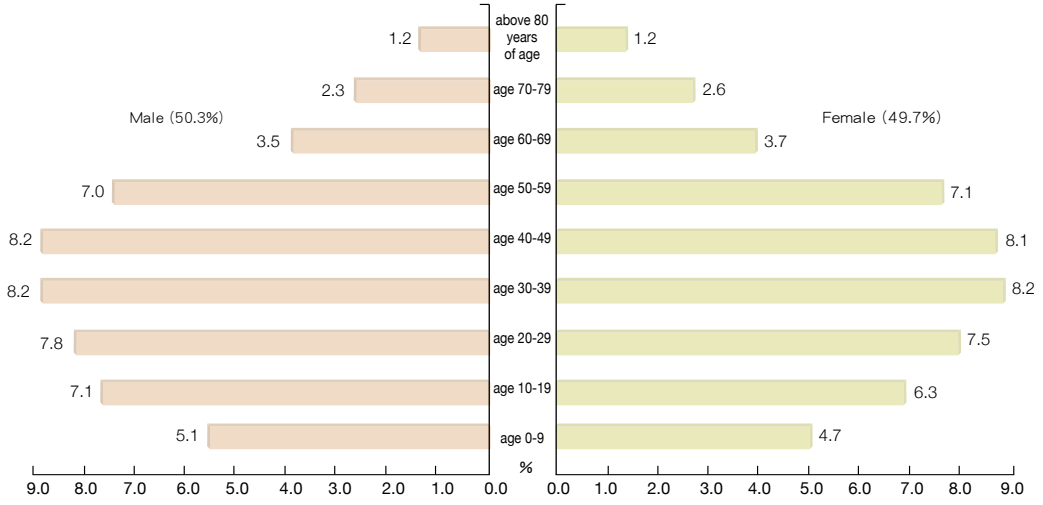
By the end of 1989, population in Taiwan exceeded 20 million. Due to the consistently declining birthrate over the years, age structure in Taiwan began to manifest a constrictive pyramid, with a low birth rate and low mortality rate. See figure 2-1.

This particular constrictive pyramid indicates that structurally, the percentage of elderly people exceeded 7% in 1993, officially making Taiwan an aged society. The population percentage of people between age 0 and 14 dropped to 16.3% in 2009 from 21.4% in 1999; meanwhile, population percentage of people aged 65 and above rose to 10.6%. These indicators signified that Taiwan has distinctly grown to become an aged society (see figure 2-2 and table 2-1).

2. Births and Deaths

Birth rate in Taiwan has steadily declined over the years: the country's crude birth rate (total number of live births in the year/mid-year population * 1,000) had dropped from 12.9‰ in 1998 down to just 8.3‰ in 2009. Crude death rate (total number of deaths over the year/mid-year population * 1,000) has risen slightly, from 5.7‰ in 1999 up to 6.2‰ in 2009. This has resulted in a slight drop in the nature increase rate (crude birth rate — crude death rate), at 2.1‰ in year 2009. See Figure 2-3.

Figure 2-1 The 2009 Population Pyramid



3. Average Life Expectancy

In terms of life expectancy of people of Taiwan: life expectancy at birth for both sexes has improved from 75.0 years in 1996 up to 79.0 years in 2009, registering an increase of 4.0 years over the course of 13 years. The average life expectancy of men in Taiwan increased from 72.4 years up to 75.9 years, figuring a 3.5-year growth; on the other hand, the average life expectancy of women in Taiwan increased from 78.1 years up to 82.5 years, registering a boost of 4.4 years. These statistics indicated that for women, life expectancy at birth is higher than that of men. See Figure 2-4.

Chapter 2, Vital Indicators

1. The Ten Leading Causes of Death

In 1952, the leading causes of death were acute and communicable diseases; by 2009, the

Figure 2-2 Shifts and Trends in Taiwan's Age Structure and Child/Elderly Support over the Years

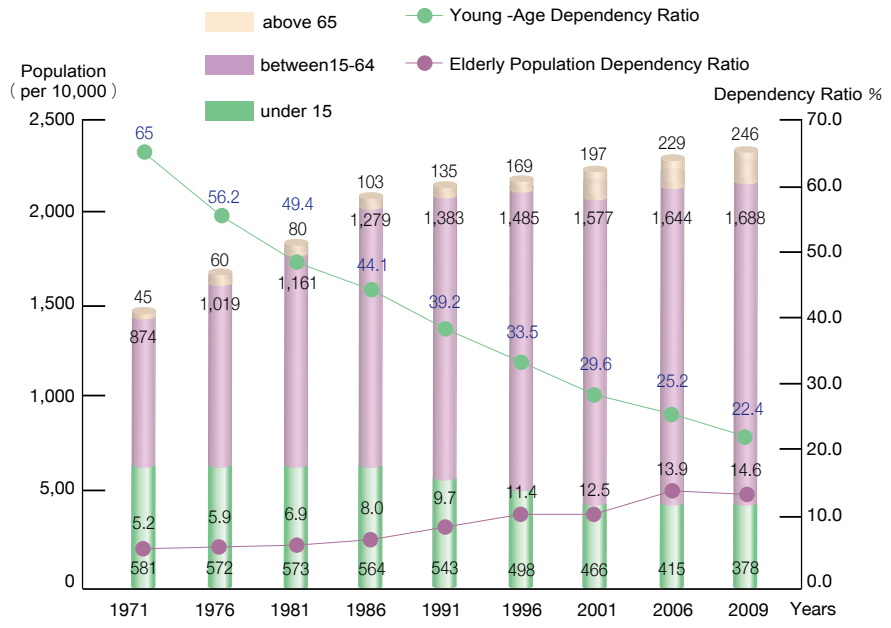


Table 2-1 Age Structure and Child/Elderly Dependency Percentage Breakdown over the Years

Year	Total population	Population structure			Dependency Ratio	
		Under 15	Between 15~64	Over 65	Young -Age Population Dependency Ratio	Elderly Population Dependency Ratio
	per 1,000 people	%	%	%	%	%
1979	17,543	32.72	63.13	4.15	51.84	6.57
1989	20,157	27.50	66.54	5.96	41.33	8.96
1999	22,092	21.43	70.13	8.44	30.56	12.04
2009	23,120	16.34	73.03	10.63	22.38	14.56

leading causes of mortality were chronic diseases, such as malignant tumors and cardiovascular illnesses, and accidents.

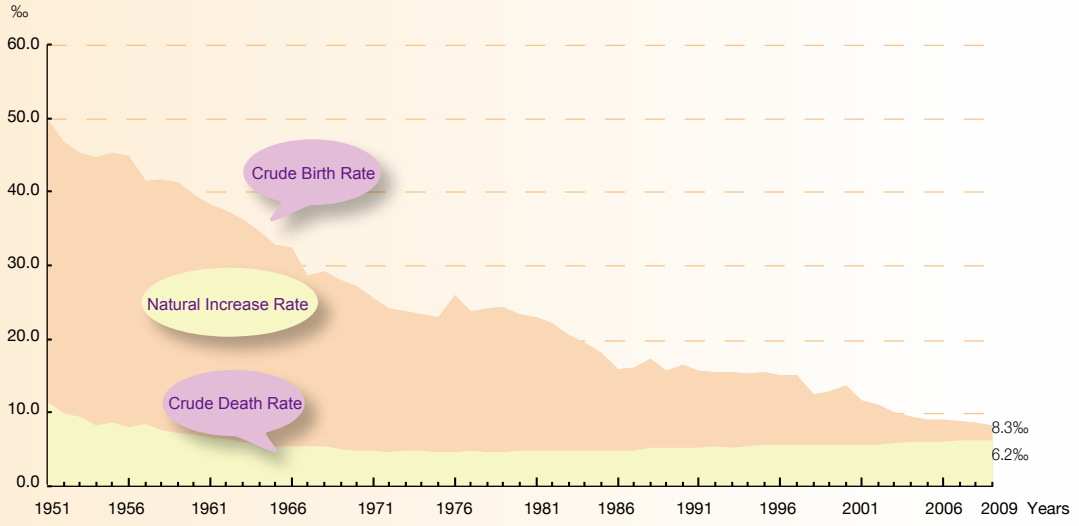
In 2009, the total number of deaths was figured at 142,240. The crude death rate was 616.3 per population of 100,000, registering a drop of 0.4% compared to that in the previous year, and an increase of 28.5% over 1981. If adjusted and calculated on the basis of the 2000 standardized world population and age structure, the standardized mortality rate was 466.7 per population of 100,000, marking a 3.6% decrease compared to that in the previous year, and a 42.5% decrease from 1981. These statistics indicate that mortality in Taiwan has been deeply affected by an aging population.

The causes of death in 2009 were compiled statistically by the ICD-10. The ten leading causes of death were: (1) malignant neoplasms, (2) heart diseases, (3) cerebrovascular diseases, (4) pneumonia, (5) diabetes mellitus, (6) accidents and adverse effects, (7) chronic lower respiratory diseases, (8) chronic liver diseases and cirrhosis, (9) suicide and (10) nephritis, nephritic syndromes and nephrosis. The types of causes of death were listed in the same order of those from last year. In terms of crude death rates by the top ten causes, the number of deaths by malignant neoplasms, diabetes mellitus and accidents adverse effects increased slightly than the previous year; the number of deaths caused by the rest had lessened. Among which, the increase in the number of deaths by accidents adverse effects was triggered by typhoon Morakot. Refer to Figure 2-5.

2. Ten Leading Causes of Death by Cancer

In 2009, the number of deaths by cancer was figured at 39,917. The crude death rate was 173.0 per population of 100,000, registering an increase of 2.2% compared to that in the previous year, and an increase of 125.8% over 1981. If adjusted and calculated on the basis of the 2000 standardized world population age structure, the standardized mortality rate was 132.5 – a slight decrease of 0.9% compared to

Figure 2-3 Crude birth rates, crude death rates, and nature increase rate of population by year



that in the previous year, and just 14.0% increase from 1981. These statistics indicate that mortality rate in Taiwan has also been deeply affected by an aging population.

The ten leading death-causing carcinomas in 2009 were: (1) lung cancer, (2) liver cancer, (3) colon and rectum cancer, (4) female breast cancer, (5) stomach cancer, (6) oral cavity cancer, (7) prostate cancer, (8) oesophagus cancer, (9) pancreas cancer, and (10) cervix uteri cancer. The types of cancers were the same as those from last year, but the order was slightly different. Deaths by cervix uteri cancer and stomach cancer had decreased. See Figure 2-6.

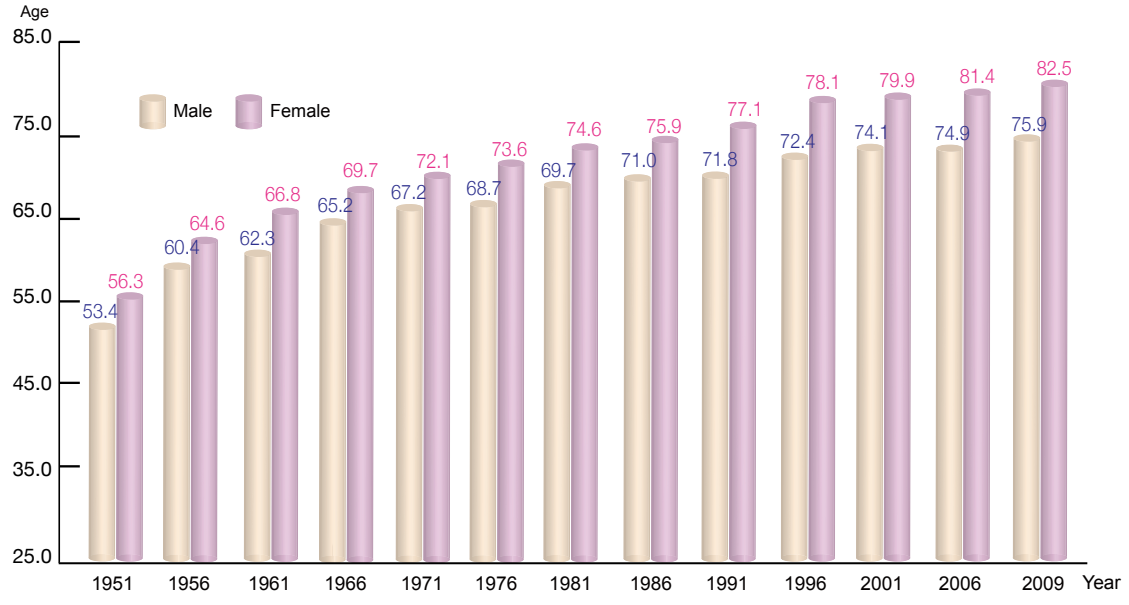
3. Neonatal, Infant and Maternal Mortality Rates

Thanks to advancement and overall upgrade in public health, both infant mortality (deaths of infants under one year of age/number of live births of the year * 1,000) and neonatal mortality (deaths of infants under four weeks of age/number of live births of the year * 1,000) have, in general, been on the decline - despite a slight rise in the showing of statistics, due to the implementation of the new birth reporting system inaugurated in 1995. In 2009, neonatal mortality rate has dropped down to 2.4‰ – that was 38% of the mortality rate registered in 1971; infant mortality rate over the same period has fallen from 15.5‰ down to 4.1‰. On the other hand, maternal mortality rate has plunged from 39.7 per 100,000 in 1971 down to 8.4 in 2009. See Figure 2-7.

Chapter 3, National Health Expenditures

Health care expenditure per capita in Taiwan has risen steadily since 1991. Also, since the inauguration of the National Health Insurance Program in 1995, National Health Expenditure (NHE) percentage of the GDP has steadily climbed from 4.9% in 1994 up to 5.3% in 1995; it has since risen to 6.9% in 2009, indicating a noticeable increase in national medical treatment

Figure 2-4 Life Expectancy at Birth



accessibility since the induction of the National Health Insurance program. Over the last ten-plus years, the average national health expenditure per capita has shown a progressive increase, from NT$10,765 in 1991 up to NT$37,224 in 2009, figuring a 6.1% annual growth. See Figure 2-8.

Chapter 4, International Statistical Comparisons

1. Comparisons in the Rate of Natural Increase (RNI)

As indicated by the 2009 Population Reference Bureau, global populations in 2009 totaled up to 6 billion and 810 million. The world's population is currently projected to reach around nine billion and 421 million by 2050, at 38% in population growth rate. Though the rate of demographic transition in general is on the rise, populations in certain countries have registered negative growths, with continuously declining demographic transition rate. See Table 2-2.

The global fertility rate in 2009 (the average number of children that would be born to a woman over her lifetime) was 2.6. Fertility rates in Asian countries listed below are less than half of that, indicating that Asia has become a low-fertility rate region. Worldwide fertility rate now stands at 20‰, and death rate, 8‰. Fertility rate in Germany dropped lower than mortality rate in that year. In general, demographics structures in developed countries around the world would trend towards low fertility, and low mortality rate.

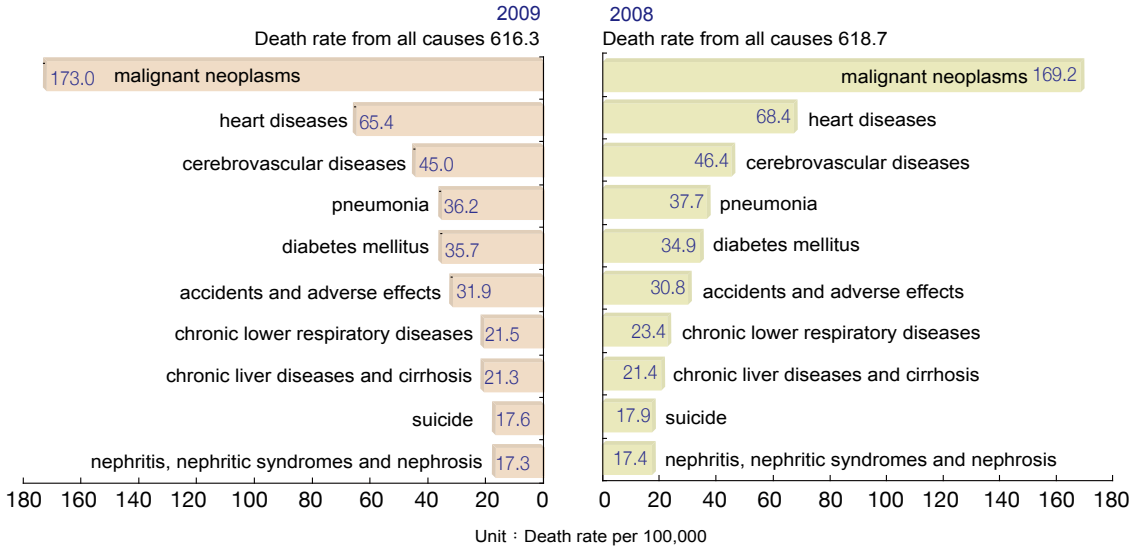
2. Life Expectancy Comparisons

Life expectancies for men at birth in major countries were figured at over 75 of age: men in Japan, Australia and Canada had the longest life expectancy, at 79; life expectancy for men in Taiwan in 2008 was at 76, equaling Japanese men's average expectancy in the 1990's. In terms of variations in life expectancy between 1960 and 2000, the average life expectancy for Japanese men has increased 12.4 years over the span of 40 years, the highest among all countries. Men in Taiwan figured 11.5 years in life expectancy growth over the same period. In 2008, life expectancies for women at birth were well over 80 of age: women in Japan had the highest life expectancy, at 86; Frenchwomen came in second, at 84, and Australian women ranked third, at 84. Life expectancy for women in Taiwan in 2008 was at 82, equaling Japanese women's average expectancy in the 1990's. In terms of variations in life expectancy between 1960 and 2000, the average life expectancy for Japanese women has increased 14.4 years over the span of 40 years, the highest among all countries. Women in Taiwan figured 13.2 years in life expectancy growth over the same period (see Table 2-3).

3. Comparisons of National Health Expenditure between Different Countries

In Taiwan, the National Health Expenditure (NHE) per capita over the course of 2007 was recorded at US$1,056 – lower than the median NHE of US$3,106, and ranked 27th among OECD member countries – higher than Hungary, Estonia, Poland, Chile, Mexico and Turkey. GDP per capita in Taiwan was US$17,154 - lower than the mean GDP of US$35,689, and ranked 25th among OECD member countries – higher than Czech Republic, Estonia, Slovak Republic, Hungary, Poland, Chile, Mexico and Turkey. Overall, higher GDP per capita always results in higher NHE per capita. In 2007, NHE in Taiwan accounted for 6.2% in the GDP – it was 2.2 percent lower than the global mean. Compared with other OECD member countries, Taiwan's NHE/GDP percentage was relatively low (see Table 2-4).

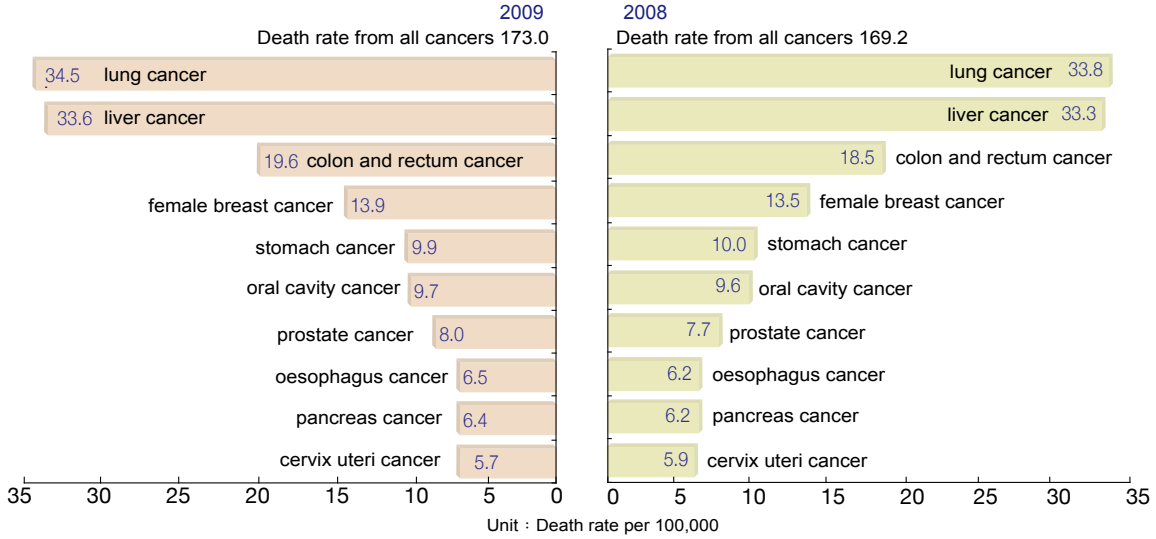
Figure 2-5 Changes in the Ten Leading Causes of Death



Unit：Death rate per 100,000

Note: All causes for deaths in this section are coded by ICD-10

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



Unit：Death rate per 100,000

Figure 2-7 Neonatal, Infant, Maternal Mortality Rates

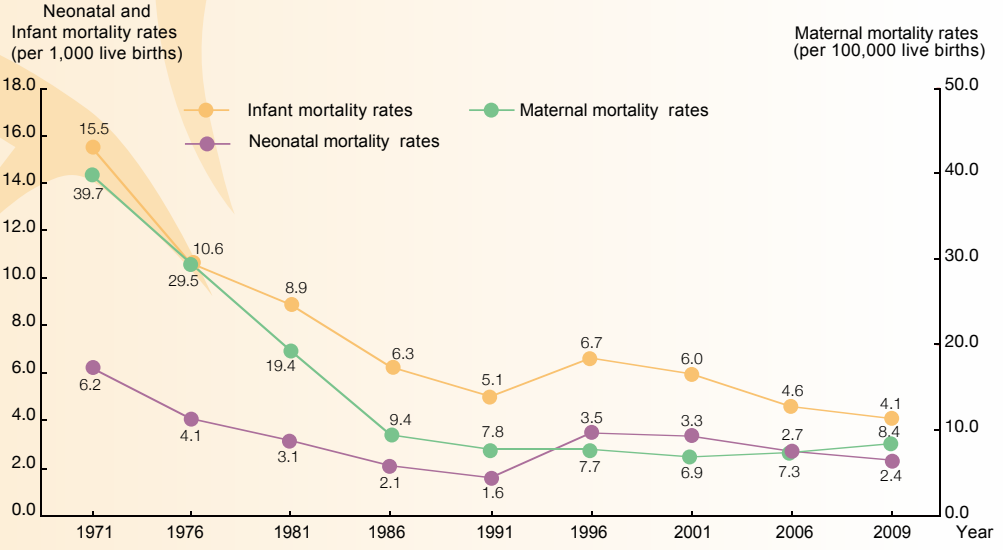


Figure 2-8 NHE/GDP and NHE Per Capita Over the Years

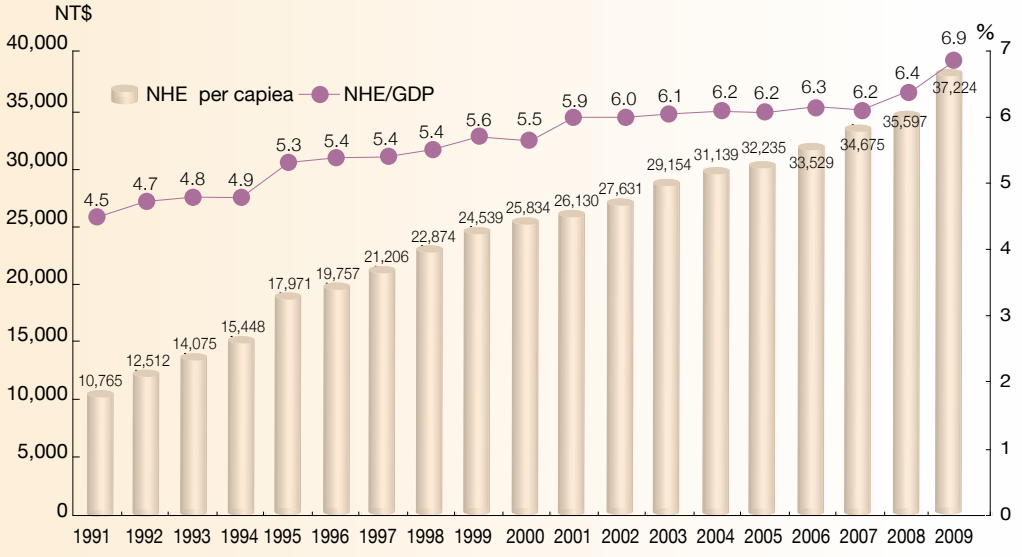


Table 2-2 Population Structures in Major Countries

	Midyear population (million)	Population forecasts (million)		2009-2050 Population growth/ decline %	Total fertility rate	Birth rate ‰	Death rate‰	RNI‰
	2009	2025	2050					
Worldwide	6,810	8,087	9,421	38	2.6	20	8	1.2
Taiwan	23.1	23.9	21.5	-7	1.1	8	6	0.2
Singapore	5.1	5.7	5.6	10	1.3	10	4	0.6
Japan	127.6	119.3	95.2	-25	1.4	9	9	0.0
S. Korea	48.7	49.1	42.3	-13	1.2	9	5	0.4
Canada	33.7	37.6	41.9	24	1.6	11	7	0.3
US	306.8	357.5	439.0	43	2.1	14	8	0.6
UK	61.8	68.8	76.9	24	1.9	13	9	0.3
France	62.6	66.1	70.0	12	2.0	13	9	0.4
Germany	82.0	79.6	71.4	-13	1.3	8	10	-0.2

Source: The 2009 World Population Data Sheet, Population Reference Bureau

Table 2-3 Life Expectancies at Birth in Major Countries

	1960's	1970's	1980's	1990's	2000	2005	2008
Men							
Taiwan	62	67	70	71	74	75	76
UK	68	69	70	73	76	77	78
US	67	67	70	72	74	75	76
France	67	68	70	73	75	77	78
Germany	67	67	70	72	75	76	77
Canada	68	67	72	74	77		79
Norway	71	71	72	73	76	78	78
The Netherlands	72	71	73	74	76	77	78
Australia	68	67	71	74	77	79	79
New Zealand	69	68	70	72	76	78	78
Japan	65	69	73	76	78	79	79
Women							
Taiwan	66	72	75	77	80	81	82
UK	74	75	76	79	80	81	82
US	73	75	77	79	80	80	81
France	74	76	78	81	83	84	85
Germany	72	74	76	78	81	82	83
Canada	74	76	79	81	82	83	83
Norway	76	77	79	80	81	83	83
The Netherlands	75	77	79	81	81	82	82
Australia	74	74	78	80	82	83	84
New Zealand	74	75	76	78	81	82	83
Japan	70	75	79	82	85	86	86

Source: Information on 1960-2005 population records WAS taken from the 2008 OECD Health Data; information of 2008 was taken from WHOSIS 2010

Table 2-4 Comparisons of NHE/GDP per capita between Taiwan and OECD member countries, 2007

Unit：US$

Rank	Nation-ranked by NHE per capita	NHE/GDP (%)	NHE per Capita	GDP per Capita
Median		8.4	3,106	35,689
1	Norway	8.9	7,354	82,317
2	United States	15.7	7,285	46,452
3	Switzerland	10.6	6,093	57,504
4	Iceland	9.1	5,964	65,595
5	Denmark	9.7	5,550	56,974
6	Netherlands	9.7	4,618	47,553
7	Austria	10.3	4,600	44,608
8	Ireland	7.5	4,519	59,903
9	Sweden	9.1	4,510	49,533
10	France	11.0	4,501	40,807
11	Canada	10.1	4,369	43,445
12	Belgium	10.0	4,302	43,181
13	Germany	10.4	4,219	40,433
14	Australia	8.5	3,975	46,734
15	United Kingdom	8.4	3,925	46,534
16	Finland	8.2	3,818	46,503
17	Italy	8.7	3,106	35,689
18	New Zealand	9.1	2,798	30,862
19	Japan	8.1	2,781	34,284
20	Spain	8.4	2,714	32,137
21	Greece	9.7	2,679	27,713
22	Israel	7.8	1,867	24,080
23	Slovenia	7.8	1.834	23,558
24	Korea	6.3	1,373	21,653
25	Czech Republic	6.3	1,141	16,880
26	Slovak Republic	7.7	1,077	13,905
27	Taiwan	6.2	1,056	17,154
28	Hungary	7.4	1,023	13,767
29	Estonia	5.3	845	15,930
30	Poland	6.4	717	11,145
31	Chile	6.2	615	9,877
32	Mexico	5.8	564	9,667
33	Turkey	6.0	530	8,780

Sources: 1. OECD Health Data 2010, June 29.

2. The office of Statistics, the Department of Health.

3. No Statistics available yet for Luxembourg and Portugal.

Part III | Promoting Public Health and Wellbeing

Part III. Promoting Public Health and Wellbeing

Staying healthy is one of the most vital and generally acknowledged basic human rights. To improve physical, mental and social health in Taiwan, the DOH upholds "Cherish life and Promote health" as one of the vision. In accordance with the five priority action of the WHO "Ottawa Charter" of 1986, the DOH actively sets public health policy, builds healthy cities and sites, promotes healthy lifestyles and strengthens preventive health services and health promotion work, and at the same time, striving to reduce health inequality and move towards health for all.

Chapter 1, Healthy Childbirth and Growth

To promote healthy growth and development for infants, toddlers and children, the DOH actively pushes for health promotion initiatives for expectant mothers, women in labor, infants, toddlers, children and teenagers. The DOH also provides screening services to detect abnormality to ensure early-stage remedy measures.

Section 1, Ensuring the Health of Pregnant Women and Women in Labor

1. Pregnant women are offered ten prenatal care inspections at designated hospitals under the National Health Insurance coverage, in hopes of detecting possible complications at various stages of pregnancy to safeguard the health of expectant mothers and fetuses
2. Subsidizing prenatal care inspections for foreign spouses who have not yet been granted permanent residency and therefore not under the NHI coverage. Up to five subsidized prenatal checks are offered for each pregnancy, at NT$600 per subsidy.
3. The DOH continuingly conduct the project of "Building subsidiary facilities and integrating resource for pregnancy counseling, offering four types of induced abortion consultations/ consultation service model.
4. To minimize congenital disorders among newborns, the DOH actively promotes a variety of genetic disease testing, screening and treatment services, including: prenatal genetic disease diagnosis, newborn screenings and genetic counseling services. The fee exemptions or subsidies are available. In 2009, over 90% of expectant mothers over the age of 34 underwent prenatal genetic diagnosis. Health care instructions are available for expectant mothers with abnormal results, who would also be provided suitable prenatal treatments, according to their willingness to receive such care.
5. In hopes of creating a breastfeeding-friendly space around the country, the DOH continues certification programs for Breastfeeding-Friendly Medical Institutes. 113 such organizations were certified in 2009. The DOH also set up a free consultation hotline at: 0800-870-870 and installed a website devoted to promoting breastfeeding. Exclusive breastfeeding rate for mothers at one month after childbirth (total breastfeeding percentage) rose from 54.3% (72.9%) in 2008 to 56.7% (81.3%) just a year later.

Section 2, Health Promotion for Infants, Toddlers, and Children

1. The DOH introduces newborn screening program for screening genetic metabolic disorders. 11 items of diseases are screened, including: lucose-6-phosphate dehydrogenase deficiency (G6PD), etc.
2. Developmental screening surveillance, preventive health care programs for children and Joint Development Assessment are available:
   1) Preventive health care services for children under seven are available for early detection

and intervention. Service utilization reached 71.1% in 2009.

2) To ensure that children suspected of developmental delays would undergo joint analyses and treatment programs as early as possible, the DOH has set up a "Child Developmental Assessment Center" in 25 counties and cities around the country. An additional assessment center was established in seven counties and cities (New Taipei City, Taoyuan County, Taichung County, Taichung City, Kaohsiung City, Hualian County and Taitung County).

3. Pediatric Hearing Care

1) Hearing screening services were conducted nationwide for preschoolers over the age of 3. 84.79% of children underwent the test in 2009, registering a tremendous rise from that of 2002: during the year, only 30.3% of preschoolers underwent the screening.

2) The DOH conducted Hearing and Language Impairment Screening, Monitoring and Remedy Program. Those confirmed to have hearing impairment would be given follow-up treatment.

3) The DOH launched "Early Intervention Programs for Children with Hearing Impairment and Media Awareness Campaign," offering the public free consultation services.

4. Pediatric Eye Care

1) The DOH conducts eyesight inspections and visual impairment screening for preschoolers over the age of 4/under 5. 335,113 preschoolers underwent the screening in 2009. 45,834 children were found to be visually impaired. Over 95% of these cases were designated to specific follow-up care.

2) An extensive survey on the prevalence of myopia among children was conducted for the purpose of setting up a database on children with myopia. The database is used as a reference for myopia prevention programs.

5. Dental Care

1) Two dental fluoride applications, dental inspections and dental health education programs are provided to children under the age of five twice a year. The DOH also offers weekly mouth rinsing with fluoridated water as part of a cavity prevention program to 2,651 primary schools in 25 counties and cities nationwide. 98.5% of schoolchildren took part in the program.

2) Conduct a study project on oral health care for children with developmental delay. The study aimed to provide oral check-up services for the children and to instruct teeth-cleaning skills as well as knowledge of oral health care for care-givers.

3. Health Care for Adolescents

1. A website designated to promote sexual health, sex education and information for teenagers was set up at: www.young.gov.tw: one can access information on sex and accurate contraceptives know-how, plus videoconferencing consultation services for adolescent sex education here on the website.

2. The DOH initiated an "Adolescents-Friendly Physicians/Outpatient Services" and partnered with medical establishments to set up a "Wellness for Teens Outpatient Program." The program is designed to provide teenagers preventive care information and reproductive health services.

3. The DOH launched a "Health Promotion Program on Campuses" for high schools, vocational schools and under. The program served as a platform on campus to pioneer a smoking hazard prevention mechanism for five elementary schools, junior high schools, senior high schools and vocational schools in Taipei City/Taipei County, in hopes of creating a tobacco-free campus initiative

Chapter 2, Healthy Living and Wellness

In 2007, Amendments to the Tobacco Hazards Prevention Act were passed and the most recent amendments : enforce bans on tobacco advertising, warn about the dangers of tobacco, disclose tobacco product contents and enlarge the scope of smoke free environments. The Act went into effect on January 11th, 2009. On January 23rd of the same year, a new amendment raised the Tobacco Health and Welfare Surcharge from NT$10 to NT$20 per pack. This represented a revolutionary advance for Taiwan's Tobacco Hazards Prevention Act, and placed Taiwan at the forefront of tobacco control.

Section 1, A Tobacco-Free Lifestyle

1. The Implementation of New Regulations in the Tobacco Hazards Prevention Act

   1) In keeping up with the spirit of the World Health Organization Framework Convention on Tobacco Control, the revised Tobacco Hazards Prevention Act was promulgated on July 11th, 2007, and formulated eight new regulations. The new regulations went into effect on January 11th, 2009. Article Four was also amended on January 23rd, 2009, increasing the Tobacco Health and Welfare Surcharge from NT$10 to NT$20 per pack, which went into effect on June 1st of the same year.

   2) The 2009 Adult Smokers Behavioral Phone Survey revealed that the number of adult smokers had slid from 21.9% in 2008 down to 20% in 2009. Second-hand smoke exposure in indoor public spaces decreased from 27.8% in 2008 to 7.8% in 2009, indicating that smoking and second-hand smoking exposure had abated and smokers were abiding to the new regulations.

2. Awareness Campaigns and Supporting Tobacco-Free Spaces

   1) Awareness campaigns are conducted via TV, radio broadcasts, newspaper, magazines, outdoor mass media and bulletin boards in health clinics, stores, campuses, workplaces and communities.

   2) The DOH initiated partnership with the National Science and Technology Museum to launch "the Youth Courier Circuit Tour" tobacco hazards prevention campaign in the form of a circuit tour that traveled across 13 high schools and vocational schools.

   3) The DOH partnered with the Ministry of Education to kick off "the Campus Tobacco Control Program" in 2009. Consultation services were provided to 181 workplaces to institute tobacco-free or limited tobacco policies. The percentage of smokers in workplaces was tallied at 18.2% (down 1.8% from a year before). Second-hand smoke exposure in indoor public spaces was measured at 14% (down 12% from a year before). The DOH also conducted 25 tobacco-free community projects to fulfill its vision of "tobacco-free living spaces". Also, the DOH collaborated with the Ministry of Defense to conduct "Integrated Tobacco and Betel Nut Hazards Prevention Project" on military bases for our army.

3. Multiple Smoking Cessation Services

   1) Since 2002 to 2009, 2,146 medical institutions were contracted to provide Outpatient Smoking Cessation Services, including complete clinical services with drug therapy to help people quit smoking. As of December 2009,there were a total of 408,062 who had utilized this service with a six-month success rate of 22.5%.

   2) The Taiwan Smokers' Helpline (TSH) was set up in 2003 to offer professional psychological consultation with toll-free smoke cessation counseling services via phone. Between 2003 and 2009, the helpline received 182,960 (people) enquiries and the six-month success rate was about 30%.

   3) Formed community "quit smoking" classes

provided accessible smoking cessation services to the people.

Section 2, Healthy Living

In addition to the Earthquake on September 21, 1999 and severe flooding unleashed by typhoon Morakot in 2009, the mortality rate for accidents/ injuries has steadily declined over the last decade. In light of creating a healthy living environment, the DOH actively promotes the following measures:

1. Creating a Safe Home Environment: To ensure the safety of toddlers and young children, the DOH conducted home environment safety inspections and provided improvement consultation services via 25 local departments of health and health centers.
2. Inaugurating the Safe Communities and Safe Schools project, while applying for the International Safe Communities and International Safe Schools accreditation from the WHO Collaborating Centre on Community Safety Promotion (WHO CCCSP). By 2009, 11 communities and 17 schools in Taiwan were certified.

Chapter 3, Creating a Healthy Environment

The Department of Health has, for many years, persistently pushed for "Community Health Building program", "Healthy Cities", "Healthy Promoting Hospital", "Healthy Workplaces" and "Schools that Promote Health". In so doing, the DOH has integrated resources from the public and private sectors, encouraged public participation, nurtured health-driven knowledge, explored locally-oriented health issues, consolidated consensus, and established a self-health management mechanism to promote a healthy lifestyle.

Section 1, Healthy Cities

1. The DOH has set up a task force of professionals to offer assistance, while encouraging local administrations to initiate a regional Healthy City campaign. At present, 12 counties/cities have joined the Alliance of Healthy Cities Taiwan.
2. At present, the following administrations have been granted permission to join the WHO Alliance of Healthy Cities in the Western Pacific Region as NGO's: Tainan City, Hualian County, Miaoli County, Chiayi City, Kaohsiung City and Taitung County, plus Daan, Shilin, Beitou, Zhongshan, Songshan and Wanhua districts in Taipei, and Tamsui Township, Shuanxi Village and Pintung City.

Section 2, Healthy Communities

1. In keeping with the five action areas identified in the 1986 Ottawa Charter for Health Promotion, the DOH integrated sources in the communities to develop "Healthy Diets" and "Exercise for Healthy Living." The DOH also designated routes for exercisers interested in brisk walking, and established workout spaces to create a support environment for healthy exercises.
2. The DOH subsidized county and city governments to hire nutritionists and professional physical fitness trainers to provide instructions on healthy diet and exercise tips to people with metabolic syndrome and high-risk sufferers.

Section 3, Health Promoting Schools

1. The DOH and the Ministry of Education worked together to promote the Health Promoting School program. 318 schools joined the program in the 94 academic year; in 97 academic year, the program expanded to include all high schools, vocational schools and under.
2. The DOH initiated the Health Promoting School Program on six components: school health policies, the physical environment of school, the social environment of school,

community relationships, personal health skills and health services. The program aimed at creating a healthy, safe campus, upgrading and ensuring psychosomatic wellbeing of school faculties, student bodies, and the academic communities. In the 98 academic year, 3,868 senior high/vocational schools and under joined the nationwide health promoting program.

3. Since 2005, a series of Health Promoting Schools Initiatives Centers were inaugurated to offer local administrations and various schools complete assistance and services to help implement the sustainable health promoting school program.

Section 4, Healthy Workplaces

1. The development of the Healthy Workplaces in Taiwan has been involved from occupational disease prevention to health promotion, from a more passive angle to minimize occupational disease to proactively upgrade staff health.
2. To promote healthy workplaces, the DOH partnered with professional teams to offer consultation services of health workplace promotion and tobacco hazards prevention. 181 workplaces received DOH's consultation assistance to promote health workplaces.
3. The DOH introduced a self healthy workplace certification mechanism and formulated self-assessment criteria. A total of 1,703 workplaces were approved and certified accordingly.

Section 5, Health Promoting Hospitals (HPH)

1. In 2008, Taiwan was granted an observer status and invited to participate in the International HPH Network; the DOH was thus put in charge of developing health promoting hospitals, both in Taiwan and across Asia, while getting actively engaged in international policymaking. The Task Force in charge of mission planning, "Health Promoting Hospitals, Climate Change and the Environment," will work to ensure Taiwan's standing in this international body's policymaking nexus, while vying for a chance for Taiwan to host the International Conference on Health Promoting Hospitals 2012.
2. By January 2010, 61 hospitals in Taiwan have been granted WHO certification; the number of members in the Network ranked number four. Taiwan has the fastest-growing health promotion hospitals network in the world; member hospitals are actively participating in publishing papers and theses in the International HPH Network. For two years straight, the number of papers published by Taiwan's member hospitals was the second highest.

Chapter 4, Healthy Aging

Population in Taiwan has been rapidly aging. Due to a more sedentary lifestyle, and a growingly westernized diet, the number of people suffering from chronic diseases has grown. Diabetes, cardiovascular diseases, kidney diseases and cancers are polled on the list of the

ten leading causes of death. Osteoporosis and urinary incontinence have also become increasingly prevalent with the progressively aging population. To improve quality of life for senior citizens, mitigate the threat of chronic diseases and the burden on the National Health Insurance expenditure, the DOH is devoted to developing health promotion programs for the elderly and chronic diseases and cancer control and prevention.

Section 1, Health Promotion for the Middle Aged and Senior Citizens

1. Health Promotion for the Elderly (2009 – 2012)

   1) The DOH has enumerated eight tasks to promote health for the elderly, including: physical fitness, falls prevention, healthy eating, oral health, tobacco hazards prevention, mental health, social participation, preventive care for senior citizens and screening services. These eight initiatives were designed to ensure independent living for senior citizens and minimize elderly dependency, so that all senior citizens can "live healthily, slow down aging, and extend healthy life expectancy."

   2) The DOH created health station-based, resource-integrated health promotion models for the elderly in the communities. A local administration was chosen respectively in northern, central, southern and eastern Taiwan (Keelung City, Changhua County, Kaohsiung County and Yilan County). Two communities from each administration were chosen to embark on these innovative programs, which were attended by a total of 885 elderly people, registering a 53.2% coverage rate.

2. The DOH worked with Georgetown University and Princeton University in the United States to conduct Social Environment and Biomarkers of Aging Society (or SEBAS for short), and collect self-reports of physical, psychological, and social well-being, plus extensive clinical data based on medical examinations and laboratory analyses among senior citizens in Taiwan in 2000 and 2006, respectively. Study results have been released in succession. Research teams launched task planning for the third survey between 2009 and 2010, to follow-up the progress on the subjects. The studies aimed at exploring psycho-social health and living status of senior citizens in Taiwan.

Section 2, Chronic Diseases Control

1. The DOH provides preventive care services for adults, services include: physical checkups, blood and urine tests and health consultations. These free services are available once every three years to people aged between 40 and 64, and once every year to people above 65 years of age. In 2009, a total of 1.76 million people accepted the services. The services also helped to detect disorder rates of blood pressure, blood sugar and blood cholesterol levels among examinees: disorder rates of these conditions were measured at 21.6%, 7.9% and 12.7%, respectively.

2. Metabolic Syndromes

   1) A diversified campaign was launched: "maintain a healthy waist circumference to prevent metabolic syndrome."

   2) The DOH assisted counties and cities to provide waist circumference measuring services at community blood pressure testing stations, as part of the community-based metabolic syndrome prevention for health promotion campaign.

   3) The DOH encouraged primary medical services facilities to participate in the "Metabolic Syndrome Care Program under the National Health Insurance System."

3. Diabetes Prevention

   1) The DOH integrated resources, such as the Diabetes Association of the Republic of China, to organize awareness campaigns on the World Diabetes Day.

2) The DOH enlisted help from 167 diabetes prevention and health promotion organizations to provide diabetics and high-risk sufferers health promotion services.

3) The DOH assisted counties and cities to develop a shared care network for diabetics, and encouraged the participation of hospitals and clinics to join the "National Health Insurance Coverage for Improving Diabetes Treatment" initiative, in hopes of upgrading care quality for the disease.

4. Cardiovascular Diseases Prevention

1) The DOH initiated cardiovascular diseases prevention campaigns to encourage the public to lead a healthy diet and lifestyle.

2) In honoring the campaign motif of "Salt and High Blood Pressure" on the 2009 World Hypertension Day, and the special theme of "Work with heart" on the World Heart Day, the DOH called on the public to cut down the intake of salt (sodium) and heed the importance of cardiovascular diseases prevention measures.

3) The DOH enlisted 100 office buildings (workplaces) and residential high-rises to organize awareness campaigns and workshops, encouraging people to regularly measure their blood pressure levels, and decrease the intake of salt in their daily diets. The DOH also assisted these grassroots organizations in becoming blood pressure measurement service stations and ensuring their operational sustainability.

5. Chronic Kidney Diseases Prevention

1) Identifying modifiable causes of kidney disease, such as drug intake and diabetic control, the DOH strengthened kidney disease health awareness promotions and encouraged preventive care services for adults, so as to help those high-risk population either with kidney disease or with high blood pressure, high blood sugar and high cholesterol levels to be early identified for intervention and disease control.

2) The DOH combined primary medical services and community resources to monitor and better supervise people with kidney functional abnormalities. The DOH has developed kidney health and disease management and health education guidelines, while setting up a service monitoring mechanism to slow down kidney function worsening, therefore reducing end-stage chronic renal diseases.

6. Osteoporosis and Urinary Incontinence Prevention

According to the 2005 National Health Interview Survey findings, osteoporosis and urinary incontinence became more prevalent with age. Awareness campaigns were therefore initiated through the local departments of health and resources from the private sector, to reach out to women on the importance of appropriate osteoporosis and urinary incontinence prevention.

Section 3, The Cancer Control

Act was legislatively passed in 2003, stipulates Central Cancer Prevention and Control Conference and Cancer Prevention and Control Policy Consultation Commission meeting would be periodically convened, and then, the DOH has draw up the "the National Five-Year Cancer Prevention Program" in 2005. In 2009, the DOH outlined "National Cancer Control Program Phase II Cancer Screening (2010 – 2013)" to promote cancer screening policies and therefore reduce cancer mortality rate.

1. Cancer Incidence

1) According to statistics in the 2007 Cancer Registry, the number of new cancer cases (excluding carcinoma in situ) was 75,769 (43,330 were men, and 32,439 were women). Crude incidence rates of cancer for men and women were 373 and 286 per 100,000 persons, respectively. If calculated and adjusted by the 2000 WHO demographics structure, standardized incidence rates for men and women were

Table 3-1 2007 Top Ten Incidence Cancer for Men
(excluding carcinoma in situ)

Site	No. of Cases	Crude Incidence rate (per 100,000)	Age-Standardized Incidence rate (per 100,000)
Liver and intrahepatic bile ducts	7,210	62	53
Colonrectum	6,040	52	43
Lungs, bronchus and trachea	5,898	51	42
Oral cavity, oropharynx and hypopharynx	5,006	43	36
Prostate	3,367	29	24
Stomach	2,311	20	16
Esophagus	1,685	15	12
Bladder	1,457	13	10
Skin	1,314	11	9
Nasopharynx	1,167	10	8
Others	7,875	-	-
Total	43,330	373	312

Table 3-2 2007 Top Ten Incidence Cancer for Women
(excluding carcinoma in situ)

Site	No. of Cases	Crude Incidence rate (per 100,000)	Age-standardized Incidence rate (per 100,000)
Breast	7,502	66	53
Colonrectum	4,471	39	31
Lungs, bronchus and trachea	3,161	28	22
Liver and intrahepatic bile ducts	2,900	26	20
Cervix	1,749	15	12
Thyroid	1,407	12	10
Stomach	1,301	11	9
Corpus uteri	1,165	10	8
Skin	1,113	10	8
Ovary	1,047	9	8
Others	6,623	-	-
Total	32,439	286	230

312 and 230 per 100,000 persons, respectively. The top ten cancers for men and women are listed in Table 3-1 and 3-2.

2) Betel nut has been listed by the International Agency for Research on Cancer (IARC) as a Category 1 carcinogen to humans. Oral cancer is the fastest-growing cancer for men in Taiwan, and the average death age of oral cancer is 54 years old, which 10-20 years earlier than other cancers. Oral cancer is the most common cancer among men between 25 to 44 years old.

2. Cancer Screening

1) Cervical Cancer Screening

A. Since July 1995, pap smear is available once a year to women over 30 years old. Survey indicated that 69% of women aged between 30 and 69 have pap smear within the last three years.

B. To encourage the low-income women to take pap tests, the DOH has offered incentive plan, allowing 11,349 women to have pap smear. 152 women were detected which have precancerous lesion. The DOH also worked with the Ministry of Justice to provide pap smear in prison. Approximately 2,000 women inmates housed in facilities in Taoyuan, Taichung, Kaohsiung, Hualian and Yilan had undergone the test. 37 inmates were detected which have precancerous lesion.

C. The implementation of pap smear has successfully helped reduce cancer incidence and mortality rate. Age-standardized incidence of invasive cervical cancer decrease from 24 per 100,000 persons in 1995 to 12 per 100,000 persons in 2007. The age-standardized mortality rate of cervical cancer decrease from 11 per 100,000 persons to 4.2 per 100,000 persons.

2) Breast Cancer Screening for Women

A. A two-stage breast cancer screening trail for women aged between 50 and 69 was conducted between July 2002 and June 2004, and then, mammograms became universally available to women aged between 50 and 69 in Taiwan once every two years. On November 17th, 2009, the DOH issued an official statement: the age range of women qualified for subsidized mammograms was widened from the original 50-69 to 45-69. Beginning from January, 2010, women aged between 40 and 44 with a family history of breast cancer were qualified for subsidized mammograms.

B. In 2009, a total of 239,000 women had mammograms (2-year screening rate is 11%), and from the result, over 50% cases of breast cancer were found to be in either stage 0 or stage I , indicating that the screening was contributive to early detection of breast cancer.

3) Colorectal Cancer Screening

A. Starting from 2004, the DOH began promoting fecal occult blood tests (FOBT) for people aged between 50 and 69, and more than 290,000 people had FOBT in 2009 (2-year screening rate is 10%). The positive rate was 4.7%, among then, 304 examinees were diagnosed to have colorectal cancer.

B. Over 40% of the diagnosed with colorectal cancer was either in stage 0 or stage I. This indicated that screening was contributive to early detection of colorectal cancer.

4) Oral Cancer Screening: Starting from 1999, oral visual inspection for high-risk people of smokers or betel quid chewers over 18 years old. A total of 880,000 users received inspections over the course of 2009 (2-year screening rate is 28%).The positive rate was 1%, among then, 696 were diagnosed to have oral cancer.

4. Promoting Cancer Treatment and Care Quality

1) Since 2008, cancer treatment quality accreditation system was developed by the

DOH for hospitals have 500 or more newly diagnosed cancer cases. The mechanism aimed at ensuring quality of medical services for cancer patients. Till now, 40 hospitals had been successfully certified, and certification results were announced on the Internet as reference for patients seeking suitable medical service assistance.

2) The DOH established a collaborative mechanism for hospitals and the private sector, subsidies for "Cancer Resource One-Stop Service." The new service provides cancer treatment care information to patients and their families; it was designed to develop a quality service procedure.

3) The DOH encouraged hospice and palliative care for cancer patients. By yearend 2009, hospice hospitalization, hospice residential care and joint hospice care services were available at 41, 64 and 65 hospitals, respectively.

4) To reduce the hazard of betel-quid, the DOH strengthened consultation assistance and promote teaching capacities to ensure betel-quid-free schools in counties and cities where oral cancer incurrence is high. The DOH also endeavored to create a betel-quid-free support environment in military camps. In communities, the DOH worked with NGO to promote a betel-quid-free culture. It also assisted 120 workplaces of high betel chewing rate to create a betel-quid-free workplaces. After years of efforts, betel chewing rate among men above 18 of age had decrease from 17.5% in 2002 to 14.6% in 2009.

Chapter 5, Infrastructure for Health Promotion

The DOH proposed suitable health promotion policies, established a health surveillance system for non-communicable diseases, and constructed empirical database of Taiwanese health status, health behavior, and health-related attitude. The database can be used for cross-sectional or longitudinal analysis applications, and reinforce the evidence basis for evaluating the effect of policy making and program promotion. Additionally, the DOH intend to improve the health awareness of the general public through dissemination of health information by diversified media, and enhances international interaction via participating in international health promotion activities and sharing the results of health promotion campaign.

Section 1, Health Propaganda

1.The DOH designated a Health 99 website at http://health99.doh.gov.tw in hopes of helping the public better understand health education policies, implement health education, strengthen public health awareness to attain successful health know-how marketing.

2.The DOH formulated a Health Core Education Program to organize nationwide health education awareness circuit tours. The DOH hopes to help the public strengthen their identification awareness of health issues through diverse resources, sustainable promotion and comprehensive campaign package measures.

Section 2, Health Surveillance system

1. The DOH conducted a series of health survey and surveillance system to gradually establish evidence-based database for health promotion and policy making.

2. The DOH developed various data-release mechanisms to improve public awareness of a variety of issues on health.

3. The DOH set up web-based interactive health indicator querying system(http://olap.bhp.doh.gov.tw/), users can query for health indicators by their intentions.

Part IV. Communicable Disease Control

Part IV. Communicable Disease Control

In addition to continuously implementing epidemic surveillance activities, outbreak investigation activities, preparedness plans, and mobilization plans, researches and immunization plans, disease control and prevention activities should be in line with the international trend and the needs of people. To ensure a comprehensive approach to public health, related regulations are amended when necessary to establish a legal framework for disease control.

Chapter 1, Communicable Disease Control Act and other regulations and legal framework

In order to arrest the occurrence, infection and spread of communicable diseases, the Communicable Disease Control Act and related regulations were formulated to specify the obligations and rights of the people for the prevention and control of communicable diseases. The Act and regulations also provide a legal basis for public health personnel to administer disease control activities.

Section 1, Communicable Disease Control Acts and Regulations

The "Communicable Disease Control Act" and "HIV Infection Control and Patient Rights Protection Act" are two crucial implementation acts for the prevention and control of communicable diseases: the former was formulated to promote policies that ensure disease control performance; the latter was formulated to slow the spread of human immunodeficiency virus. To effectively carry out these two key acts, Article 27 of the Communicable Disease Control Act" was amended and promulgated in 2009; six other related regulations and three administrative directions were appended and abolished accordingly.

1. Communicable Disease Control Act

1) In order to promote immunization policies for the citizens, Article 27 of the Communicable Disease Control Act was amended and promulgated to provide a legal source for the national vaccine fund.

2) In response to outbreaks of 2009 pandemic influenza A (H1N1) in Taiwan and overseas, the DOH has twice amended and promulgated "Categories of Communicable Diseases" and "Preventive Measures for Category IV and Category V Communicable Diseases," while giving an advanced notice on the draft amendment to the following two regulations: "Regulations Governing Operation of the Communicable Disease Control Medical Network " and "Regulations Governing the Operational Procedures and Compensation for Designation and Expropriation for the Establishment of Quarantine and Isolation Site and Requisition of Related Personnel." These administrative acts were instituted to strengthen the functioning of the Communicable Disease Control Medical Network and the mechanism for designation and expropriation of the establishment of quarantine and isolation site and requisition of related personnel in order to ensure a robust system for the prevention and control of communicable diseases.

3) To ensure appropriate compensation for victims of vaccinations and the implementation of national immunization policies, the DOH amended and promulgated Article 7 of the Regulations Governing Collection and Review of Relief Fund for Victims of Immunization".

4) To award for those who exhibit excellent and outstanding work performance during biological agent attacks or incidents, those who respond appropriately to international epidemics of Chikungunya fever, and those who comply with the measles elimination goal of the Western Pacific Regional Office of WHO, the DOH amended and

promulgated Articles 3, 5 and 6 of "the Regulations Governing Awards for the Control of Communicable Diseases."

5) To encourage reporting of cases of measles, rubella and Chikungunya fever, the DOH formulated and promulgated communicable diseases shall be designated in accordance with regulations of Paragraph 1, Article 6 of the Regulations Governing Awards for the Control of Communicable Diseases.

2. HIV Infection Control and Patient Rights Protection Act

1) To protect physical and mental health of HIV-infected patients, prevent further transmission from these patients to the general public, and ensure timely medical care of the infected, the DOH amended and promulgated Articles 3 and 8 of the "Regulations Governing Payments for Costs for Laboratory Testing, Prevention and Treatment of HIV".

2) To protect the rights of those who execute the control of HIV infection, the DOH formulated and promulgated the "Regulations Governing Compensations to Persons Infected with HIV through Execution of Preventive Functions".

Section 2, The Communicable Diseases Prevention Framework

1. Prevention Network

The network consists of central and local levels. The Centers for Disease Control under the DOH is the highest-level organization in Taiwan responsible for formulating relevant control strategies and plans of communicable disease, while directing and supervising local health organizations for disease control. Health organizations in counties and cities thereby outline and execute implementation plans according to CDC-formulated strategies and plans.

2. Testing Network

The Research and Diagnostic Center under the CDC is the highest-level supervision and execution agency for testing various communicable diseases. The Center is responsible for identifying pathogens, the research and development of new testing technologies, technology transfer and the formulation of testing standards. In addition, to effectively meet the demands of various communicable disease tests, ten virus laboratories, nine tuberculosis bacilli labs, and 151 testing agencies for communicable disease have been contracted or certified. Also, the "National Management Program for Collection and Transportation of Clinical Specimens" was accordingly instituted to ensure the quality, timeliness and safety of contagious specimen deliveries.

3. Command Architecture

The National Health Command Center (NHCC) was established in 2005 and put in charge to coordinate information supplied by various central government agencies, local governments, and private health organizations. The information is then employed as real-time data required for an integrated disaster management mechanism and as frames of reference for commander-in-chief for decision-making. Further, in light of the implementation of the International Health Regulations 2005 (IHR 2005), a point of contact was set up to facilitate communication with other countries to expedite notifications and ensure timely responses to crucial outbreaks and health emergencies.

Section 3, Communicable Disease Control Medical Network

To upgrade the nation's response capabilities and healthcare quality, the DOH set up the Infectious Disease Control Medical Network in 2003; the organization was rechristened: Communicable Disease Control Medical Network in 2007.

In 2008, the Regulations Governing the Operation of Communicable Disease Control Medical Network was amended and announced. The new regulations designated six

communicable disease control medical sub-networks covering the whole of Taiwan to integrate and coordinate medical resources for disease control in each jurisdiction. Further, 138 isolation and responding hospitals were designated to isolate and treat patients infected with contagious diseases.

Section 4, Epidemic Surveillance and Investigation Mechanism

The Epidemic Surveillance Network was set up for timely detection of disease outbreaks and any abnormalities and to establish long-term trends in the incidence of diseases so as to facilitate formulation of communicable disease control policy. For the distribution of notifiable diseases in Taiwan in 2009, see appendix 2. See the following for details of epidemic surveillance and investigation:

1. Diversified Communicable Disease Surveillance System

The DOH has established different surveillance systems, including sentinel physician surveillance system, school-based surveillance system and populous institution surveillance systems, to ensure watertight disease surveillance.

1) Sentinel physician surveillance: The surveillance reports can provide information on influenza activity and consultation rate. The reports can also serve as a reference for government prevention initiatives, selection of vaccine strains and treatment protocol for patients. By the end of 2009, 800 doctors volunteered to be sentinels of this surveillance network, including 676 physicians in private practices and 124 doctors in hospitals.

2) School-based surveillance system: A total of 602 elementary schools, accounting for 23% of the total number of elementary schools in Taiwan, participated in the network during 2001 to 2009.

3) Populous institutions surveillance: The system monitors clusters of infectious respiratory and gastrointestinal diseases in populous institutions. A total of 2,069 institutions participated in reporting by the end of 2009.

2. Integration of Epidemic Reporting Systems

1) The DOH continues to integrate a variety of disease reporting systems, including the National Notifiable Disease Surveillance System, the Syndromic Reporting System, the Outbreak Investigation System and the National Surveillance Network of Communicable Diseases, and enhance system functions to attain a one-stop reporting architecture so as to improve the efficiency of disease reporting.

2) The DOH set up an integrated national disease control information network, which incorporates information from notifiable diseases databases, the sentinel physicians, the tuberculosis registration system, and a geographic information system-based database. This initiative collects information via multiple channels and monitors real-time epidemic status.

3. Outbreak Investigation

1) The DOH conducted investigations of outbreaks and diseases of unknown cause. In 2009, DOH conducted 24 investigations.

2) On the outset of the 2009 H1N1 influenza pandemic, quarantine was set up at the Taoyuan International Airport staffed by medical officers on a 24-hour basis who worked on shifts to monitor possible importation of the disease from abroad, collecting information for analyses. The analyses are used as a reference when formulating relevant disease control policies.

Chapter 2, Major Communicable Diseases/Emerging Communicable Diseases Control Measures

Significant progresses have been made in communicable disease control initiatives, thanks

to tremendous improvements in environmental health and the continuous implementation of disease prevention campaigns. In recent years, diseases such as smallpox, rabies, malaria and polio have been eradicated in Taiwan. Nevertheless, in the face of increasingly frequent international exchange activities, the threat of emerging and remerging diseases has also intensified accordingly. Communicable disease control remains a challenge in Taiwan.

Section 1, Tuberculosis Prevention

The DOH has been promoting the "Halve the Number of TB Cases within a Decade – a National Movement", which aims to halve the number of individual TB cases by 2015. The campaign integrates three major networks: the public health network, the medical care network and the laboratory testing network, to effectively track down contact persons and screen high-risk groups for TB in hopes of carrying out early intervention for TB patients, establishing a medical treatment network for cases of multidrug-resistant tuberculosis (MDR-TB), improving treatment and diagnosis quality, implementing the Directly Observed Treatment Short-Course (DOTS), and providing a comprehensive, robust medical care program. Highlighted achievements throughout 2009 include the following:

1. DOTS has been underway for years to effectively reduce TB treatment failures and TB recurrence and prevent multidrug-resistant TB through thorough implementation of the following strategy: "Direct drug delivery to the patients, supervision of medication on the spot, and departure after medication."
2. The "Implementation Guidelines on Restriction of Infectious Tuberculosis Patients from Boarding Public Aircraft for Going Abroad" was implemented to curb the spread of TB and improve Taiwan's international image.
3. Hospitalization, medical treatment and life sustenance subsidies to patients of chronic TB have been instituted to encourage patients with such conditions to be hospitalized extensively for treatment so as to curb community infections.

4. The DOH promoted the "Treatment Plan for Latent TB Infection (LTBI)": the Directly Observed Preventive Treatment (DOPT) was implemented for contact persons of confirmed TB cases who are under the age of 13 and evaluated by doctors to require the treatment.
5. The epidemic continued to abate in 2009. The number of confirmed cases dropped 6.6% in 2009 compared to 2008.

Section 2, Communicable Diseases of the Enteric Tract

1. Enterovirus

In 2009, 29 cases of severe enterovirus infection and two deaths were confirmed. Enterovirus control strategies employed in 2009 included: (1) Commissioning county and city health departments to develop an "Enterovirus Control Reinforcement Program" and train locality-specific personnel to strengthen community health awareness; (2) Initiating clinical treatment training programs in caring for cases of enterovirus infection with severe complications and promoting timing of referral and clinical alertness; (3) Operating the medical network for severe enterovirus cases to enhance medical care quality, ensure patient care, and minimize disease mortality and sequelae.

2. Hepatitis A

The DOH continues to provide hepatitis A

immunization to preschool children in 30 aboriginal regions and 9 villages in plain areas adjacent to the aboriginal regions. The hepatitis A incidence rate in the aboriginal regions dropped from 90.7 per population of 100,000 in 1995 (183 confirmed cases) to 0 per population of 100,000. The significant decline manifested the success of the DOH's immunization program.

Section 3, Vector-borne Communicable Diseases

1. Dengue Fever

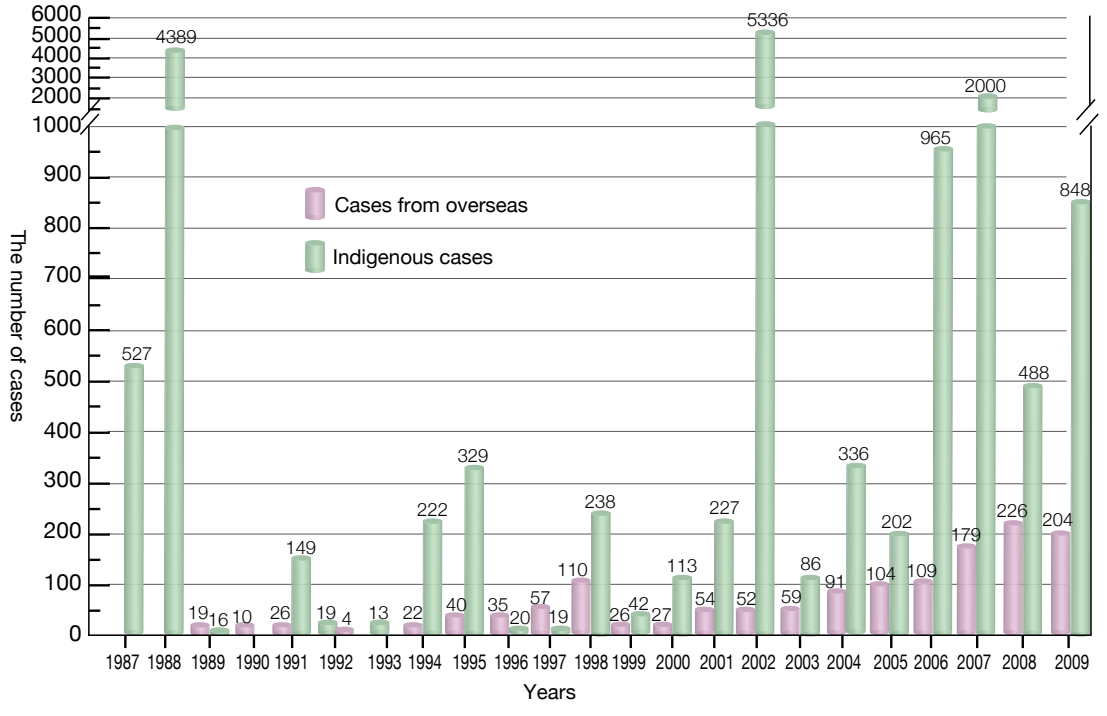
There were 1,052 positive cases of dengue fever in 2009. Among which, 204 were imported, while 848 were indigenous, including 11 cases of dengue hemorrhagic fever, among which four were deaths. For the annual incidence of indigenous dengue fever, please see Figure 4-1

The prevention and control strategies taken against dengue fever include: (1) Organizing mobilization squads, conducting liaison briefings among health and environmental protection authorities, and conducting joint inspections by health and environmental protection authorities; (2) Strengthening public health awareness, amending the Guidelines for Dengue Control, and reinforcing trainings for disease control and medical care personnel; (3) Thorough implementation of action plans aimed at cleaning up vector breeding sources and monitoring infected mosquitoes, and conducting surveillance of virus and analysis of drug resistance in vector mosquitoes; (4) Reinforcing case surveillance, continuous implementation of fever screening and rapid dengue testing at international airports; (5) The World Games 2009 was held in Kaohsiung in July, 2009. To prevent dengue outbreak, the DOH conducted the inspection of mosquito breeding site and ovitrap monitoring. When the World Games ended on July 26, 2009, no indigenous dengue case had been identified.

2. Japanese encephalitis

Each year, Japanese encephalitis is prevalent for several months from May to October with

Figure 4-1 Annual Incidence of Indigenous Dengue Fever from 1987 to 2009



peaks reported from June to July. In 2009, 18 confirmed cases of Japanese encephalitis were reported: the oldest patient was 53 years of age and the youngest was 17 years of age. The patients averaged 48.1 years of age.

3. Malaria

Malaria has been eradicated in Taiwan for 45 years. To maintain Taiwan's malaria-free status and safeguard people's health, the DOH continues to implement malaria surveillance to prevent introduced infections caused by imported cases. Health education campaigns have been reinforced so as to alert travelers to avoid mosquito bites. In 2009, 11 confirmed cases of malaria were reported in Taiwan, all of which were imported.

Section 4, Blood- and Body Fluid-Borne Communicable Diseases

1. AIDS

1) A cumulative sum of 19,105 cases of HIV infection, including 727 infected foreign nationals, was reported by 2009. Among which, 6,116 HIV-positive individuals had developed full-blown AIDS and 2,584 among them had died. The number of new HIV-positive cases dropped to 1,648 in 2009 from 3,381 in 2005, registering a slide in the number of HIV-positive cases in Taiwan for the fourth consecutive year since the discovery of AIDS in 1984.

2) In light of the growing pandemic of AIDS among drug users, the DOH initiated the "AIDS Harm Reduction Program" in 2005. See below for the list of strategies implemented:

A. Health education and consultation services have been introduced to offer early intervention and timely treatment so as to stop the spread of HIV.

B. The Needle-Syringe Program (NSP) was developed to counsel and keep track of drug users, and to prevent infection of hepatitis B virus, hepatitis C virus and human immunodeficiency virus (HIV).

C. The DOH has also been offering the Methadone Maintenance Treatment (MMT) Program, complemented by follow-up consultation, awareness workshops and referral programs to substance dependents. By the end of 2009, a total of 97 institutions across the country had begun providing MMT. 1,000 service stations offering clean needles and health education were set up and 321 vending machines selling clean needles were installed to offer clean needles and syringes free of charge. Needle recycling has improved over the years, with the recycling rate up to 80.3% now.

3) 42 designated AIDS medical institutions around Taiwan now offer free medical treatment. The DOH has also commissioned 18 designated hospitals to conduct anonymous screening free of charge to improve the HIV screening rate among high-risk and specific groups. Thus far, a total of 13,636 people have undergone the screening, and 2.67% of which were tested positive.

4) In a move to prevent vertical (mother-to-child) transmission of HIV, the DOH pioneered a HIV screening initiative for all expectant mothers in 2005. By 2009, 73 expectant mothers were tested HIV-positive, including 17 women of foreign nationalities.

5) In 2008, the "Universal Screening of HIV for STD patients" was administered. By the end of 2009, 38,203 patients underwent the screening.

2. Hepatitis B and C

1) The DOH has been providing prenatal testing of all pregnant women for hepatitis B infection and hepatitis B vaccination to all newborns. This hepatitis B immunization program has helped decrease the hepatitis

carrier rate among 6-year-olds from 10.5% down to 0.8%. In addition, the DOH has been providing catch-up hepatitis B vaccination to preschool children and first graders in elementary schools.

2) The number of hepatitis B carriers in Taiwan is approximately 2.5 million to 3 million; the number of hepatitis C infected is approximately 700,000 to 800,000. The DOH began implementing the "National Health Insurance Program: Trial of Reinforced Treatment for Patients with Chronic Hepatitis B and C" on October 1, 2003, offering treatment to patients infected with hepatitis B and C in hopes of significantly lowering the incidence of cirrhosis and liver cancer.

Section 5, Control Measures for Emerging Communicable Diseases

To set up a national background database on host animals of zoonosis and designate laboratories and testing methods, the DOH commissioned academic research institutes to conduct serological surveys of West Nile virus in birds and horses, and conduct epidemiological investigations and establish testing methods on hantavirus, leptospirosis, Q fever in sheeps, cat scratch disease in cats and cat owners (a high-risk group), and toxoplasmosis. In 2009, the DOH conducted a study on fecal cryptococcal disease among Taiwanese pigeons and other species of birds. The cryptococcal isolation rate was found to be 5.6% (77/1,378). All isolates were found to be molecular type VN1.

Section 6, Control Measures for Imported Communicable Diseases

The following control measures are taken to prevent communicable diseases from entering the country:

1. Quarantine

Necessary quarantine measures are conducted on ships, aircrafts, crew members and passengers. The DOH teamed up with port agencies to establish an "international port sanitary group" to ensure sanitation and safety at arrival/departure gates at international ports to prevent importation or exportation of communicable diseases. Additionally, for passengers who are suspected of communicable disease but assessed to not pose an imminent public health risk, the quarantine authorities may permit them to continue their international journey. According to IHR(2005), the quarantine authorities also need to notify the competent authorities at the next port of entry of these passengers' expected arrival.

2. Communicable Diseases Control during Travel

1) For early detection and effective prevention of communicable diseases, the DOH set up infrared thermal apparatus for measuring body temperature of passengers at international airports and seaports to screen arrival passengers for fever. Arrival passengers suspected of communicable diseases are asked to fill out the "Communicable Disease Control Survey Form" for further assessment and follow-up.

2) In January, 2008, the "Training Center for Travel Medicine" was set up to provide travel medicine clinic, public health awareness campaigns, trainings, and publishing and issuing of related publications. Besides, Taiwan CDC signed contracts with 11 hospitals to provide travel medicine services and preventive vaccinations for international travel.

Chapter 3, Pandemic Preparedness and Infection Control

Over the recent year, the increase in the number of biological incidents has highlighted the importance of preparedness for pandemic, resource management, hospital infection control, and potential bioterrorist attacks.

Section 1, Influenza Pandemic Preparedness and Response

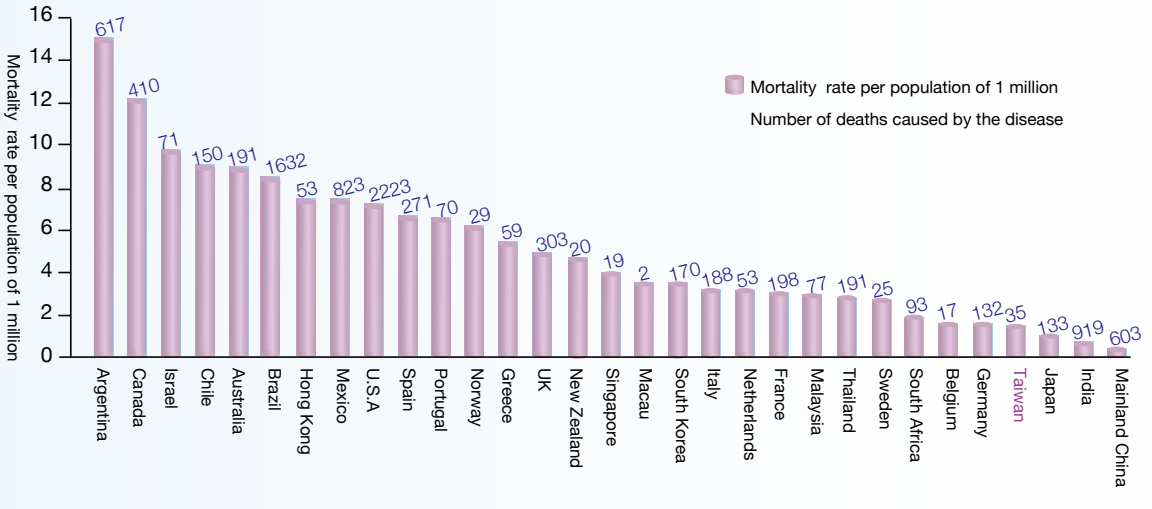
In response to the 2009 H1N1 pandemic,

the Central Epidemic Command Center (CECC) was established on April 28, 2009 to execute a series of disease control programs:

1. Border Control: CECC monitored the international outbreaks and issues travel advisories.
2. Epidemic Surveillance: Four types of surveillance were employed:
   1) Influenza-like illness (ILI) surveillance;
   2 Virological surveillance;
   3) Hospitalized cases with severe complications;
   4) Pneumonia and influenza (P & I) mortality.

   These surveillance data were uploaded to the National Health Insurance database and the death registry database to effectively monitor the development of the pandemic. This information was also wired to the WHO as part of the information feedback mechanism.
3. Medical Treatment Intervention: in order to allow patients with mild symptoms to seek treatment nearby, the government earmarked budget to subsidize antiviral drugs for flu patients with possible infections. In addition, the Communicable Disease Control Medical Network, the Emergency Medical Service Network and hospitals were integrated to ensure an efficient utilization of medical services. The DOH also encouraged hospitals to provide "Special Influenza Outpatient Services," and to assist local governments in setting up over 2,000 "Flu Clinics" to avoid a huge crowd of patients at emergency departments.
4. Vaccination Campaign:
   1) A nationwide H1N1 vaccination campaign was launched in Taiwan on December 12, 2009. The overall vaccination rate was close to 25%, which is very close to that in Sweden, Canada, Netherland, and the U.S. Eighty-two percent of the health professionals received the vaccine, which is the highest around the world. Vaccination rates, from elementary to high schools reached 75%, which is the second highest in the world. The vaccination has effectively lowered the number of class suspensions on campuses.
   2) Between April 26 and December 31, 2009, the H1N1 mortality rate in Taiwan was about 1.5 per 1 million – one of the lowest four rates among all OECD member countries

Figure 4-2 Comparison of H1N1 Mortality Rate in Taiwan with Other OECD Countries



(see Figure 4-2). In order to monitor vaccine safety, a post-vaccination adverse event monitoring system was set up.

Section 2, Defense against Bioterrorism

In a move to continuously upgrade Taiwan's response capabilities against bioterrorist attacks, the Biohazard Response and Verification Expert (BRAVE) was restructured in 2009. "BRAVE" was officially inaugurated in an official ceremony in March of the same year, during which, simulated drills were held as part of BRAVE's capability exercise and planning.

Section 3, Personal Protective Equipment Management

Stockpiles of personal protective equipment (PPE) have been established and managed to respond to potential threats by infectious diseases and biological disasters. With regard to the quantity of safety stock, we not only set up three-tier stockpiles, which are separately managed by the central authority, local governments, and medical institutes, but also develop a Management Information System (MIS) for tracking real-time inventory quantity. On the other hand, we commissioned a professional logistics service provider to handle warehousing and distribution, as well as store those stockpiles in different depots to diversify risks and shorten delivery time. Additionally, to ensure smooth emergency deployment, SOPs for logistics and plans for Business Continuity Management were formulated.

Section 4, Nosocomial Infection Control

To safeguard the safety of patients, effectively minimize nosocomial infections in hospitals and medical institutions, and successfully enforce infection control measures, the DOH formulated and implemented: Regulations Governing Inspection of the Implementation of Infection Control Measures in Medical Care Institutions, which were promulgated in January, 2008. Listed in the following are

highlighted achievements over the course of 2009:

1. The 2009 Nosocomial Infection Control Inspection and Quality Improvement Project was conducted: on-site inspections were administered in 491 hospitals for inspecting the effectiveness of their infection control measures.
2. The DOH continued to encourage hospitals to voluntarily participate in the Taiwan Nosocomial Infection Surveillance System (TNIS). At present, 300 hospitals in Taiwan have participated in the system, which was launched to encourage hospitals to conduct self-monitoring and improve infection control quality.

Section 5, Research and Laboratory Testing

1. Starting July 4, 2008, the DOH began accepting applications from laboratories specializing in infectious disease diagnosis. In 2009, 99 such laboratories were reviewed and certified. 382 inspection items were approved. In total, 151 laboratories and 530 inspection items were reviewed and approved.
2. The DOH initiated the "Development of Monitoring Technologies for Unknown/

Emerging Infectious Pathogenic Agents" to strengthen the collecting of unknown/emerging pathogenic agents, while actively introducing the High Throughput DNA Sequencing Technology and developing multiple molecular testing methods, in hopes of improving the organization's testing capacity for emerging communicable diseases.

3. The project "PulseNet Taiwan" continues to provide rapid diagnosis of food-borne diseases and rapid detection of food-borne pathogens to effectively curb the spread of the disease. It also serves as a platform for exchange and collaboration activities with international disease surveillance systems and academic institutes. Also, the National Influenza Center was established to better integrate domestic and international information on virus surveillance, case reporting and mutation trends and act as a platform for exchange between labs studying influenza here in Taiwan and those overseas.

4. The DOH collaborated with the National Institute of Infectious Diseases (NIID) of Japan to build a molecular epidemiology laboratory network for dengue fever and other vector-borne diseases prevalent in Asia, and create a research and development initiative on multi-locus variable number tandem repeat analysis (MLVA). The DOH also celebrated a collaborative partnership with Aberdeen University in the UK and Chiba University in Japan to exchange information on types of bacteria strains. Also, a partnership was built with the Centers for Disease Control and Prevention of the U.S to conduct a project on ensuring effective tuberculosis treatment study. The DOH worked with the Research Institute of Tuberculosis in Japan on a global monitoring system of the Beijing strain of tuberculosis. In addition, the DOH participated in the "Global Alliance for Vaccines and Immunization" and "PATH Vaccine Fund," a global rotavirus vaccine project spearheaded by the WHO and the Centers for Disease Control and Prevention of the U.S. Taiwan is a member on the Asian Rotavirus Surveillance Network.

5. Pathogen Gene Database: this is a database for genotyping information on 20-plus viruses, bacteria, and fungi, plus a variety of epidemiological data. It's open to all sectors interested in presenting their application in the form of a proposal for enterovirus and influenza virus sequencing and related epidemiological information.

Section 6, Biosafety Concerns and Management in Laboratories

The "Management of Infectious Biological Materials and Laboratory Biosafety" was established with "self-management, precise reporting, and key inspections" as the essential components. 484 institutions had been authorized to set up a biosafety committee (or a specially designated person) by the end of 2009. Meanwhile, the institutions reported 151 types of Risk groups 2 (RG-2) infectious biological materials and 22 types of RG-3 infectious biological materials in total. 16 biosafety level 3 laboratories were also authorized to start operation.

Additionally, by means of a robust laboratory inspection project, the DOH expects that installation units and their staffs will value the importance of biosafety self-management mechanism, ensure that lab work will be operated successfully and safely, and ultimately create a high-qualified biosafety management system in Taiwan.

Chapter 4, Vaccination

Vaccine research and development and immunization are the most cost-effective strategies for vaccine-preventable diseases.

Section 1, Immunization: Current Status and Trend

In Taiwan, the routine vaccinations are

recommended to prevent vaccine-preventable diseases such as tuberculosis (BCG), hepatitis B (HBV), diphtheria, tetanus and pertussis (DTP / Tdap, for infants/elementary school entrants), poliomyelitis(OPV), varicella, measles, mumps and rubella(MMR), Japanese encephalitis, and influenza. In addition, hepatitis A vaccine is also provided in certain areas, including aboriginal regions and their nearby township, Kinmen County and Lienchiang County. Among which, the BCG and Japanese encephalitis vaccines are manufactured domestically.

Beginning October 1, 2009, influenza vaccination services were launched for five categories of people: elderly aged over 65, personnel in government agencies, patients with rare diseases and severe injuries, healthcare personnel, disease control personnel in animal health inspection, and children at six months of age up to the fourth grade. Among which, children aged between three and six were new additions to receive the vaccine.

In March, 2009, Tdap (Tetanus and reduced diphtheria toxoids with acellular pertussis vaccine) was introduced to replace Td (Tetanus and reduced diphtheria toxoid vaccine) for first graders. In July of the same year, children under five years of age who are considered to be at risk were given the Pneumococcal conjugate vaccine (PCV) by the DOH. In addition, Pneumococcal polysaccharide vaccine (PPV) for elderly person aged over 75 was continuously promoted by the DOH. For people who are suspected to have adverse reactions after vaccination, the government has established an application and review system for vaccine injury compensation to compensate people who are found to be injured by vaccines in accordance with legal provisions.

A Vaccine Fund was set up in January 2009 in accordance with the regulations of Article 27 of the Communicable Disease Control Act. With a stable source of funds, Taiwan CDC will gradually introduce new vaccines into the existing routine immunization schedule on the basis of cost effectiveness and the recommendations of the Advisory Committee on Immunization Practices(ACIP) in the next few years. The Fund will operate in 2010.

Section 2, Development and Manufacturing of Serum-based Vaccines

1. Production of Biological Products

   1) Equine serum immunized against snake venom is used to produce antiserum. A total of 204.8 liters of hyperimmune equine plasma was produced throughout the year.

   2) A periodical supply of vaccines, toxoid, antitoxin, and antivenin, totaling 1,447,881 shots, is available.

   3) Foster care and a steady supply of lab animals such as gerbils, guinea pigs, pet rabbits, snakes and ferrets are available.

2. Bio-Products Development

   1) Developing virus-like particle vaccines for enterovirus type 71:

   A. The virus strain targeted for the production of a virus-like particle (VLP) vaccine is confirmed. Mass-production of the vaccine up to 20L is made possible through the use of a bioreactor, achieving a purity level of more than 92%.

   B. Immunization experiments conducted on macaques revealed that the animals produce a high level of antibody titer and neutralization titer after being administered EV71 toxoid particles. Cellular immunoreaction and immunological memory were also detected in the macaques.

   2) The DOH established a process for generating bivalent IgY from brown spotted pit viper and Taiwan bamboo viper antivenin with immunized ducks. Further, the DOH also developed and validated an ELISA analysis method.

Part V Management of Food and Drugs

Chapter 1, Safety Management of Food and Drugs

Chapter 2, Management of Drug Safety

Chapter 3, Laboratory Testing for Food, Drugs and Cosmetics

Part V. Management of Food and Drugs

Owing to the opening of markets and the increasing volumes of international trade in food and drugs, issues such as the reinforcement of safety management of food and drugs and their sources, the provision of real-time consumer safety information, the education of the public on safe use of drugs, the prevention of drug abuse, the establishment of international mutual recognition on quality certification, and the quality upgrades of domestic products have all become of great importance in the policy administration in Taiwan. In addition, traditional Chinese medicine, one of the most distinguishing traditional medical care items, necessitates an equal priority in the construction of a safe Chinese medicine environment, thus facilitating comprehensive drug and food hygiene and safety in the country.

Chapter 1, Safety Management of Food and Drugs

Food begins in agricultural production, followed by processing and distribution, and eventually arriving at consumers' dining table. In this supply and logistics process, the government is responsible for ensuring food safety and taking active and effective management to protect the general public health.

Section 1, Food Safety Management Measures

To alleviate people's concern and fear of purchasing harmful food and to assure the health of the general public, the DOH has strengthened the regulations on imported food, announced information on substandard food items, and set up a food consumption warning system, the Food Safety Signals, and established a food traceability system.

1. In 2009, certain articles in the Enforcement Rules of the Act Governing Food Sanitation were amended, including the labeling regulations on food additive "sweetener", "Specifications and Standards on the Use and Restrictions of Food Additives", "Pesticide Residue Safety Limit Standards", as well as food hygiene standards and relevant rulings.
2. The DOH strengthened the management of imported food, and launched control measures targeted at the import of beef, namely the "Three Controls and Five Verifications". The so-called Three Controls pertain to the security control of the source of origin, the customs declaration, and the market of the imported product. Meanwhile, the so-called Five Verifications refer to the five watertight checkpoints to ensure food safety, including the strict check-up of documents of proof, the clear labeling of product information, out-of-the-box close inspection by the customs personnel, confirmation of food safety with analysis, and real-time information connections for sound verification.
3. The DOH reinforced the reporting system for timely release and announcement of important information or messages.
4. The DOH launched a food safety signal mechanism, a food safety benchmark for the public to identify substandard food, as depicted in Table 5-1. Red light indicates food that might result in serious harm; yellow light is for food under suspicion; whereas the green light designates no problem to human health.
5. The DOH instituted the risk management for food contaminants, formulating the "Management Procedures for the Reporting and Response of Incidents for Environmental Protection and Food Safety".
6. The DOH implemented the classification system and the inspection and seizure measures, set up a hotline for consumers to report to relevant authorities, promoted a special cross-county and municipality project for inspection and seizure of food, as well as provided public awareness education and

promotions to educate the public in identifying harmful food.

7. The DOH reinforced the enhancement of autonomous management of food businesses:
   1) All-inclusive requirements were stipulated, where food businesses must comply with good hygienic practices and clearly label all food additives in accordance with the Act Governing Food Sanitation.
   2) The "Labeling Regulation Governing Packaged Food Claiming to be Vegetarian" went into force on July 1, 2009.
   3) The "Relevant Regulation on the Labeling of Food in Bulk" was promulgated on March 25, 2009, scheduled to go into force in 2010.
8. Management of Genetically Modified Food: In accordance with the Guideline for Food Safety Assessment of Genetically Modified Foods and Guideline for Food Safety Assessment of Genetically Modified Plants with Stacked Traits, genetically modified foods are given permit after approval; the implementation of the labeling system was also practiced. By the end of 2009, 30 genetically modified corn and 4 genetically modified soy beans had been reviewed and approved.
9. Strengthening the Sanitary Management of Dietetic Hygiene: The DOH implemented the HACCP (Hazard Analysis Critical Control Point) system in order to promote the good hygiene mark, such as HACCP Certificate Logo in the food industry. By the end of 2009, 31 lunch box manufacturers and 7 food service companies had passed the evaluation.
10. Promoting the Management of Special Dietary Food: Special dietary food refers to baby formulas and supplementary food for older infants, patient food products that have been adjusted for their nutrient components,

Table 5-1 Food Safety Lights

Light	Denotation
Red Light	a. The food shall not be consumed by human, regardless of the potential harm to human health
	b. The food may result in immediate harm to human
	c. The food's expiration date has passed
	d. The food is dangerously unsafe and may be harmful to human health
	e. The food is in violation with the permissible standards for food safety and may be harmful to human health
	f. The food has been adulterated with drugs
	g. The food is potentially and highly harmful to human health after an assessment of health risks
Yellow Light	a. The food poses no immediate harms to human health, but is under suspicion and warrants in-depth investigations or substantial improvements
	b. The food is suspected to be unsafe
	c. The food is in violation with the permissible standards for food safety and with a high impact level, albeit not harmful to human health
	d. The food is potentially harmful to human health after an assessment of health risks
Green Light	a. The food is inadequately labeled
	b. The food may be harmful, but the risk factors are under control
	c. The food is safe for consumption; harmful effects are fabricated
	d. The food is very unlikely to be harmful to human health after an assessment of health risks

including adjusted proteins, amino acids, fat or mineral-adjusted food and low-allergic food, substitute food for body-weight control, and food for tube-feeding. Any food within the scope of special dietary food shall be submitted to the DOH for review and approval. By the end of 2009, special dietary food reviewed and approved by the DOH included 125 items of baby formula, 68 items of supplementary food for larger infants, 164 items for patient food products, with the list publicly posted on the Department of Health Food Information website.

11. The DOH established a reference information database to provide consumers with the knowledge on correct nutrition labeling and food purchases, promoting public awareness on the nutrition labeling system of commercially packaged food products. Nutritional items mandated to be labeled include calories, protein, fat, saturated fat, trans fat, carbohydrates and sodium, a total of 7 items. The basic daily intake values for 15 nutritional items, including calories, protein, carbohydrates, fat, sodium, calcium, iron, vitamins B1, B2 and E, dietary fiber, vitamins A and C, cholesterol and saturated fat, were established, as well as allowing nutritional claims stating "intake should be moderate" or "may take it as a supplement" for the aforementioned nutrition items.

Section 2, Safety Monitoring Mechanism for Food and Drugs

1. The DOH implemented the registration and approval of food to safeguard the safe use of food of the public:

   1) In accordance with article 14 in the Act Governing Food Sanitation, food additives stipulated by law, food in tablet or capsule forms, shall not be manufactured, processed, formulated, repacked, imported or exported unless a permit license is obtained after the inspection and registration by relevant authorities.

   2) In accordance with the Act Governing Health Food Management, health food shall not be manufactured, imported, labeled or advertised as health food, or emphasized as having health enhancement effects, unless inspected, registered and approved by relevant authorities. As of the end of 2009, a total of 184 health food items have obtained permit license after being reviewed and approved.

2. Each year, the DOH executes commercial product quality monitoring projects, screening products containing pesticides, veterinary drugs and heavy metals; unqualified items are subject to examinations for follow-up administrative processing and tracking in order to improve and enhance source management.

Chapter 2, Management of Drug Safety

The DOH's main tasks in the management of drug safety concern the verification of drug safety, drug efficacy and quality, making sure the safe use of drugs by the general public. End-to-end complementary measures are in place, from the R&D laboratories (manufacturing-end) to the consumer-end, as well as the establishment of pertinent legal regulations, all of which are implemented to ensure effective and high quality safety, creating a reasonable, transparent and sound regulatory environment.

Section 1, Management of Pharmaceutical Affairs

1. Since the implementation of dichotomy of medicine and pharmacy in March, 1997, the efforts have fruited in preliminary results in the division of professional tasks, that is, physicians are responsible for diagnosis and treatment, whereas pharmacists are in charge of executing drug prescriptions.

2. The Investigation and Punishment of Illegal Drug and Unlawful Advertising

1) The DOH executed the "2009 Special Project in the Joint Inspection of Illegal Drugs, Cosmetics and Food", with an emphasis on counterfeit and prohibited drugs, drug stores without legal license, the labeling of medicines, and the illegal practice of un-licensed quacks. In total, 239 sites were inspected, finding a total of 78 cases of violation.

2) The DOH executed the "Illegal Advertising Monitoring Project—A Sub-project of the Print Media Monitoring Project", and monitored 3,458 non-compliance cases. After determined by relevant health governing authorities, letters requesting inspection were sent to the health bureau or departments at the county and municipal levels; a total of 2,226 cases were deemed to be in violation with relevant laws after re-examination, with the penalty amount reaching NT$ 45.317 million, as presented in Table 5-2.

3. To provide drug hazard relief, the "Guideline on Drug Hazards Relief" was promulgated and enforced in October 1998. By the end of 2009, a total of 1,180 valid applications had been processed; of them, 502 cases were determined to meet the relief criteria and received compensation, at a compensation rate of 48.36%.

4. Management of Controlled Drugs

To control the flow of controlled drugs in the country, the DOH has set up a management system for controlled drugs, established a scheduling system for controlled drugs and implemented licensing management and inspection control.

1) Controlled drugs are categorized into four schedules by tendency of addiction, dependence, abuse, and social hazards. On April 9, 2009, Para-methoxy ethylamphetamine (PMEA) and Zaleplon were listed as schedule 3 and 4 controlled drugs, respectively.

2) With the establishment of a management system on the licensing of controlled drugs: only Physicians, dentists, veterinarians, or assistant veterinarians with the prescription license of controlled drugs can administer Schedule 1, 2 or 3 controlled drugs. As of the end of 2009, a total of 12,833 institutions concerned had been issued registration licenses for controlled drugs; and 41,192 physicians, dentists, veterinarians, and assistant veterinarians had been issued the prescription license of controlled drugs.

3) Inspection and Control of Controlled Drugs

A. Permit licenses, letters of agreement or approval shall be applied for and issued pursuant to relevant regulations in order to enhance control of the manufacturing, import, export of controlled drugs, and the use in research, In 2009, a total of 2,114 such applications were reviewed and approved, for the purpose of controlled drugs in the bud from the source of origin to prevent the diversion of controlled drugs.

B. The establishment of a controlled drug management information system facilitates the construction of practical databases on the flow of controlled drugs in line with regulations of relevant laws to prevent the misuse, abuse or diversion of controlled drugs.

Section 2, Good Manufacturing Practice of Pharmaceuticals

To fortify a comprehensive drug review system, to upgrade the quality of domestic pharmaceutical products, to meet demanding international standards, and to improve Taiwan's overall global competitiveness, the DOH has taken steps to actively promote good manufacturing practices (GMP) of pharmaceuticals, as well as obtaining international mutual recognitions.

1. The DOH continued to promote the GMP of pharmaceuticals, fully implementing the international PIC/S GMP standards across the nation. By the end of 2009, 164 domestic pharmaceutical manufacturers had met GMP standards, whereas 117 foreign pharmaceutical manufacturers had passed the PIC/S GMP standards review, with PIC/S member countries accounting for 69%.
2. The DOH continued to push forward the accreditation of GMP review for medical devices. As of the end of 2009, 686 domestic medical device manufacturers had obtained GMP registration and 4,974 manufacturers had obtained QSD (Quality System Document) registration for imported medical devices.
3. The DOH has signed MOUs with 12 EU medical device notified bodies on technical collaboration projects, in addition to signing an MOU on the exchange of technical collaboration in medical devices with the Swissmedic, the Swiss Agency for Therapeutic Products, to facilitate international coordination and mutual recognition in the management of medical devices.

Section 3, Drug Safety Monitoring System

To safeguard the safe use of drugs by the general public, the DOH has spared no efforts in the inspection and seizure of illegal food and drugs, where mail-box and toll-free telephone lines for reporting are set up to curb the rampage and hazards of illegal food and drugs.

1. The DOH continued to practice the safety monitoring system for drugs and designated medical devices. For any drug under safety monitoring period, the manufacturers are required to submit safety reports on a regular basis for the DOH to assess their clinical safety.
2. To timely detect adverse reactions of marketed drugs and new drugs under clinical trial, the National Drug Adverse Reactions Reporting Center was set up to promote the quick response and report by domestic health professionals and the public when

Table 5-2 Statistics on the Illegal Advertisement Monitoring of Print Media

Type of Violation	No.	Closed cases	Unclosed Cases	Violations confirmed	Amount of Fines
	Number of cases	Number of cases	Number of cases	Number of cases	NTD
Traditional Chinese pharmacy	100	96	4	93	2,300,000
Western pharmacy	111	106	5	97	1,900,000
Traditional Chinese medicine	9	9	0	1	100,000
Western medicine	169	152	17	96	1,930,000
Foods	1,635	1,014	621	878	25,770,000
Cosmetics	1,336	1,211	125	1,004	11,187,000
Medical devices	56	42	14	35	1,900,000
Unknown	3	1	2	1	0
Beauty and weight-control products	4	4	0	0	0
Others	35	25	10	21	230,000
Total	3,458	2,660	798	2,226	45,317,000

Note: "Violations confirmed" refers to cases that have actually been penalized by the governing authority.

encountered with adverse drug reactions. By the end of 2009, a total of 42,817 cases of adverse reactions of drugs after hitting the market and 108,075 cases of adverse reactions of drugs under clinical trial had been reported.

Section 4, Prevention and Control of Drug Abuse

According to reports by psychiatric hospitals in 2009, drug abuse or addiction mainly concerned heroin (92.3%) and amphetamines (28.6%). In a bid to prevent drug abuse, the DOH has been actively implementing drug abuse control measures, and entering the neighborhoods to raise public awareness on the issue via diversified promotional activities.

1. The DOH initiated the "Strengthening Drug Abuse Prevention System—A Four Year Project" to expand the scope of drug abuse prevention to the general public.
2. Targeted at different ethnic groups and age groups, various promotional materials, videos and educational materials were produced and distributed, conveying the concept of drug abuse prevention through an array of promotional channels.
3. The DOH set up an "Online Museum of Anti-Drug Resources" to provide the general public with useful information on the harmful effects of drug abuse.
4. The DOH continues to supervise more medical institutions to participate in the "Controlled Drugs Abuse Report". In 2009, a total of 449 medical institutions were involved in the abuse report, with a report rate of 90% from designated addiction rehabilitation institutions.

Chapter 3, Laboratory Testing for Food, Drugs and Cosmetics

Drugs, medical devices, medicated cosmetics, food additives, health food, and genetically modified food must apply for registration and pre-market approval; they may only be manufactured, imported or sold after being issued permit licenses. Biological products such as vaccines and botulinal toxins, and blood-based products must be, in addition to the application for permit licenses, batch-tested for sealing before entering the market. In cases of contingent incidents related to drugs, food and cosmetics, laboratory testing for verification is also required.

In recent years, in view of effectively utilizing private sector laboratory testing resources, the DOH has endeavored to push forward the accreditation of laboratories with an eye to supervise the operation and accreditation of laboratories at the level of international standards to assure the data quality of all commissioned lab tests and to build up the fundamental responsibility of autonomous management in all manufacturers.

Section 1, Laboratory Testing

On one hand, laboratory testing of food and drugs is necessary for policy implementation, but it also serves as support for routine laboratory testing by health bureaus and departments at various governmental levels and other organizations or institutions, and can be seen as safety inspection to better understand the quality of products on the market and to guarantee the hygiene and safety for all consumers.

1. In coordination with policy implementation, the DOH conducted testing for product registration, market approval and issuance of permit licenses; executed batch-testing for the sealing of vaccines, blood products, botulinal toxins; and carried out testing for contingent incidents such as the residue of ractopamine in pork, melamine tainted milk powder, and the concerns of high acid value and arsenic content in frying oil.
2. The DOH supported county and city health bureaus in the spot-checking tests for inspection, testing for foodborne illness outbreaks, as well as providing consumer services.

3. The DOH assisted testing for other organizations or agencies upon request, such as the checking up on manufacturers for product certificates for export by the customs authorities, and provided assistance to judicial courts, local prosecution office, police force and customs authorities for the testing of confiscated drugs or food.

4. Results of laboratory testing are posted on the Consumer Information Network of the DOH for consumers to use as reference in purchasing products. Unqualified products are requested by written notice to be dealt with by local health bureaus, while notification is submitted to relevant government agencies to enhance the management and supervision of products before entering the market.

Section 2, Quality of Laboratory Testing

In order to establish strict and efficient laboratory testing of top quality, the DOH has been actively promoting the Good Laboratory Practice (GLP), developing new test approaches, pushing forward the accreditation of private sector laboratories, and upgrading the testing capacities of local health bureaus. Achievement highlights are presented as follows.

1. The DOH assisted local health bureaus at various governmental levels to meet the criteria set forth in the ISO/IEC17025 quality manual. All 25 health bureaus have acquired the TAF Testing Laboratory Accreditation.

2. The DOH set up a regional integrated laboratory testing system for local health bureaus to facilitate effective division of labor. It is expected that by 2010, all 25 health bureaus will be integrated, where each bureau will develop its own specialty testing items for mutual support, attaining the goal of improving the overall testing efficiency.

3. The DOH continued to promote the accreditation of private sector laboratories. By the end of 2009, 23 laboratories had been accredited for the testing of food, in which 305 items were accredited for the testing, including residues of pesticides, veterinary drugs, heavy metals, food additives, food ingredients, dioxin, microbes, and melamine; 7 laboratories had been accredited for the testing of drugs and cosmetics medicated cosmetics, in which 55 items were accredited for the testing, including hydroquinone, salicylic acid, tranexamic acid, aflatoxin, and microbes; 13 laboratories had been accredited for the testing of drug abuse urine testing, in which 9 items were accredited for the testing, including methamphetamine, amphetamine, morphine, codeine, MDMA, MDA, marijuana, ketamine and norketamine.

4. The DOH has established mechanisms for the supervision and management of laboratories, targeting labs affiliated with the health bureaus and accredited private sector laboratories to conduct the supervision assessments and proficiency tests annually, and encouraging laboratories to participate in international proficiency tests.

Part VI Health Care

Part VI. Health Care

With the rapid changes in health and medical care and in the social and economic environment, the assurance of medical care systems and medical care teams for offering the general public a sound and robust health care has become a significant challenge today. Key issues to be addressed include the provision of a holistic and adequate health care system to the people, implementing community health care and preventive medicine, and the continuous improvement of people's health and their quality of life.

Chapter 1, Health Care Systems

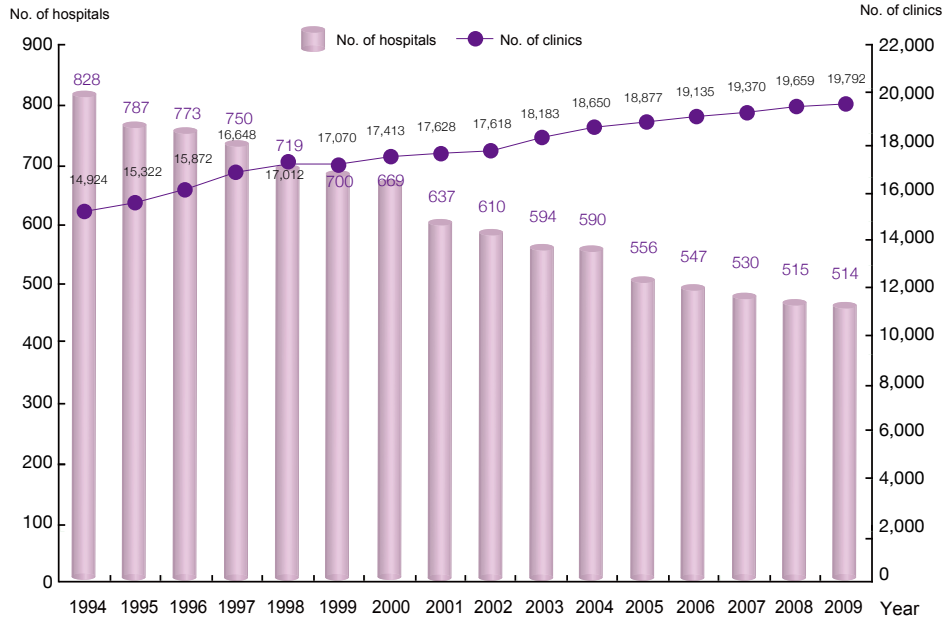
In 1985, in accordance with the promulgation of the Medical Care Act, a health care network project was initiated. Taiwan was divided into 17 medical care regions for the allocation of medical care manpower and facilities to each region. The primary goals of the project are to balance the distribution of medical care resources, to shorten regional differences, to avoid repetitive investment on medical care resources, and to raise the medical care standards in every region of the country.

Over the past two decades, the project has progressed in four phases. Now, the number of hospital beds has steadily become sufficient; the quality of medical care has also seen leaps of advances. Nonetheless, medical care resources in remote areas, mountainous areas, and offshore islands still require further strengthening; and the quality of primary health care still has room for improvement. In coordination with the post-SARS reform of medical care systems, and to brace for the impact brought on by the aging population and new infectious diseases, and to promote holistic health care at the same time to assure the safety of patients, and to construct a patient-centered medical care environment, the "Holistic Health Care Plan" was launched in 2005 and continued onward to 2008. The Plan aimed to provide holistic health care service founded upon suitability, proximity, comprehensiveness and sustainability. Later on in 2009, a new generation health navigation plan was implemented.

Section 1, Medical Care Resources

For the promotion of balanced development in medical care resources, the DOH has

Figure 6-1 Number of Hospitals and Clinics by Year



established a regional medical care system in accordance with the Medical Care Act and the medical care network project, conducted assessments on the health needs of the people by means of regional assistance and organizational operations, and handled the distribution of regional medical resources to advance regional health care plans and standards. Achievement highlights in 2009 are as follows.

1. Current Status of Medical Institutions: In 2009, there were a total of 514 hospitals and 19,792 clinics, as illustrated in Figure 6-1. The number of hospitals has been declining over the years, whereas the number of clinics has been increasing.

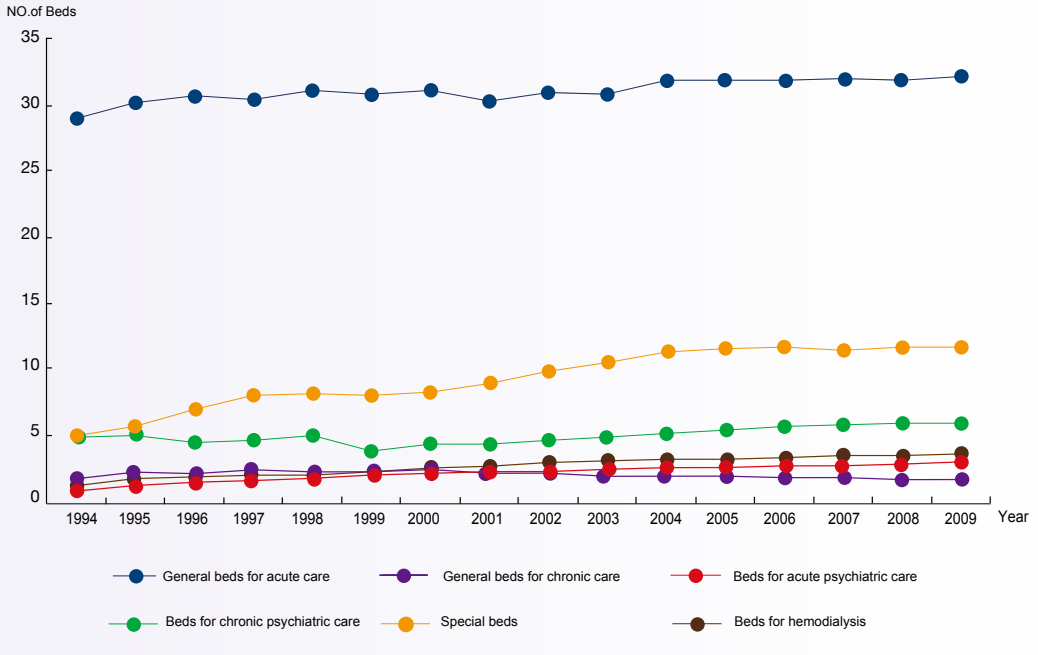
2. Current Status of Hospital Beds: In 2009, there were 156,740 beds in medical care institutions (including general beds and special beds). Of them, general beds accounted for 63%. In all medical care institutions, there were 98,875 general beds (including 74,132 general beds for acute care, 3,880 general beds for chronic care, 6,752 beds for acute psychiatric care, 13,763 beds for chronic psychiatric care, 48 beds tuberculosis care, and 300 beds for Hansen's disease). On average, there were 67.79 hospital beds per 10,000 population. Changes in the hospital beds per 10,000 population by year are shown in Figure 6-2.

3. The DOH has conducted regular inventory of resources to effectively gain control of the addition or reduction of hospital beds in each region, making sure that the public's rights are safeguarded and the resources for medical treatment are properly and efficiently utilized.

4. The DOH conducted the "2009 Medical Region Counseling and Medical Resources Integration Project", with an objective to encourage medical institutions and private-sector organizations to operate in line with related health policies set forth by the DOH, and seek autonomous development of medical features in each region to balance the allocation of medical resources.

5. The Medical Care Development Fund: In order to encourage medical personnel to practice in remote areas with relatively limited resources, the DOH has provided medical care subsidies

Figure 6-2 Number of Hospital Beds per 10,000 Population by Year



to 19 regions with inadequate medical resources (The Improvement Project for Emergency Care in Resource-lacking Regions); and rewarded 4 hospitals for the execution of the "Resource Integration and Quality Improvement Project for Obstetrics and Gynecology, and Pediatrics", all of which are aimed to facilitate the development of medical care, improve the quality of medical care services, and strike a balance of equal medical resources allotment.

Section 2, Community Health Care System

Since the end of 2008, the DOH has been steadily implementing the "Pilot Project for the Construction of Integrated Community Health Care Service Network," in a bid to combine acute medical care resources for regional and categorized integration. In this project, health centers in each region act as operation hubs to connect various relevant agencies, such as clinics, community hospitals, medical institutions (e.g. community pharmacy, medical examination stations, nursing institutions, and psychiatric rehabilitation institutions), social welfare organizations, educational institutions, community groups, to form a community medical care network to provide comprehensive holistic medical care in the prevention of diseases, chronic disease care, and the integration of medical and health information management. Through this project, the integration of resources for improved division and labor is realized, thus enhancing the participation of primary health care institutions in providing public health care services for the goal of developing a human-centered approach for holistic community health care.

Chapter 2, Emergency Medical Care

In order to reinforce the sound development of emergency medical services system across the island, improve the quality of emergency medical services, and secure the life and health of the injured and the sick in emergency

situations, the Emergency Medical Services Act was amended and promulgated on July 11, 2007, with a total of 58 articles. By doing this, the DOH is dedicated to strengthening the national emergency medical care network and actively promoting the integrated medical emergency response mechanism.

1. The DOH has fortified the capacities of the 6 Regional Emergency Operation Center (REOCs) around Taiwan, integrating emergency response measures for hazard (chemical, nuclear power plant and poison), to be able to improve the speed and capacity in the time of dire emergency, and to monitor and have immediate access to all related contingent medical incidents caused by regional catastrophes. With the 6 operation centers, resources can be timely integrated and allocated in response to emergency, while all emergency medical technicians (EMTs) are fully trained to cope with emergency situations.
2. Local health authorities shall appoint emergency responsible hospitals that provide the general public with frontline emergency injury treatment services. The central health authority is responsible for the accreditation of

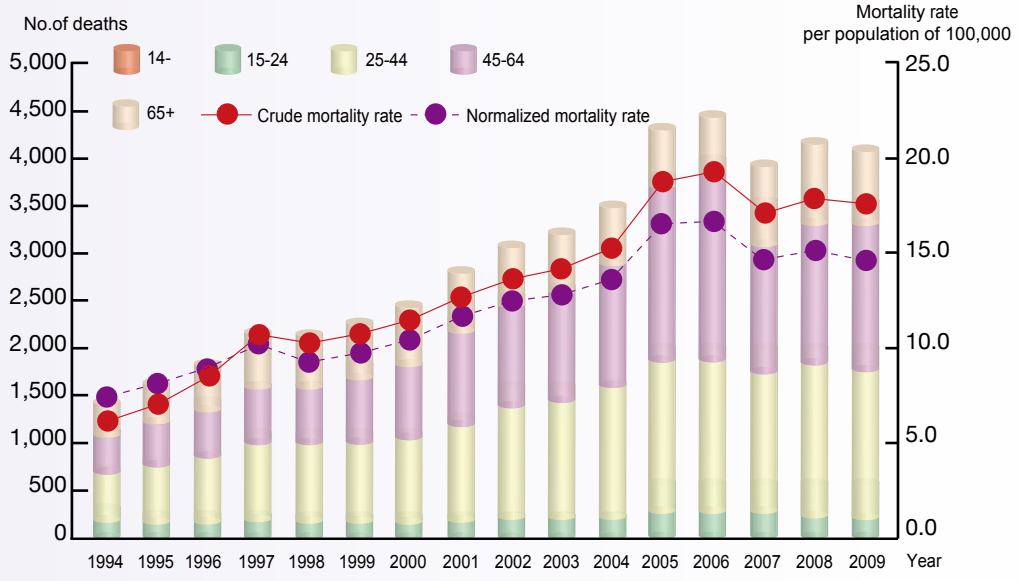
emergency medical capability classification, in which severe-grade hospitals are specifically designated as the last line of hospital referral, ensuring the effectiveness of the hospital referral system and safeguarding the rights of patients. In 2009, the DOH completed the assessment for 129 hospitals, among which 16 hospitals passed the severe-grade assessment and 21 hospitals passed the moderate-grade assessment.

3. The DOH efficiently utilized the Medical Development Fund to carry out the improvement project for regions lacking emergency medical resources ,providing 24-hour and specific-hour emergency medical service (i.e. evenings and holidays, tourist high season), and provided local residents and visitors with their emergency medical needs, including the establishment of three approaches "Emergency Medical Station in Tourist Areas", "Night-time and Holiday First Aid Station" and "Enhancing the Emergency Capacity of Hospitals in Regions Lacking Emergency Medical Resource" to meet the medical demands. In 2009, a total of 22 sites were rewarded.
4. The DOH has been promoting the CPR & AED (cardiopulmonary resuscitation and automated external defibrillator) emergency training classes ever since 2008, targeted at personnel working in public places and tourist areas. Starting 2009, private professional institutions were commissioned to provide training service for personnel in enterprises and offices. The DOH encourages enterprises to purchase AED (automated external defibrillator) for the use in emergency.

Chapter 3, Psychiatric Care, Mental Health, and Suicide Prevention

In consequence of social transformations, interpersonal relationship has become more distant, social support has also weakened,

Figure 6-3 Number of Suicide Cases and Mortality Rate by Year



Note: Dotted line denotes the normalized mortality rate adjusted by the demographic structure of World Standard Population in 2000.

leading to increasing social and mental problems in the society. Prevention of psychiatric disorders and enhancement of mental health have thus become important issues of concern. For this, the DOH has spared no efforts in promoting medical care for psychiatric patients, in mapping out plans for upgraded mental health services, and in providing the public with counseling services on mental health, all of which are measures taken to prevent the occurrence of psychiatric disorders.

Section 1, Psychiatric Care Services

In order to strengthen and provide comprehensive care network for patients with severe psychiatric disorders, and to help psychiatric patients return to the society, the DOH has actively promoted community rehabilitation services. On the other hand, to provide appropriate care for victims of domestic violence or sexual assaults, as well as making sure the offenders received proper medical treatments, the DOH also set up prevention measures regarding domestic violence and sexual assaults. Major achievement highlights in 2009 are as follows.

1. To encourage psychiatric patients in stable conditions, patients with partial functional loss, and patients of high rehabilitation potential to return to the society from the long-term stay in rehabilitation institutions, psychiatric rehabilitation facilities have been substantiated to strengthen community rehabilitation services. In 2009, community rehabilitation centers had served 3,455 patients; while half-way houses had the service capacity of 3,844 beds.
2. To gain real-time knowledge on patient care in the community, the DOH has set up a community follow-up psychiatric care management system, with 104,534 patients currently placed under monitoring for follow-up visits. In addition, the DOH had subsidized 23 counties and cities, allowing 78 community care health visitors to conduct actual house-visits, tracking psychiatric patients after being discharged from hospitals to make certain that they pay regular follow-up hospital visits and offer them adequate referrals, rehabilitation, and follow-up treatment based on their conditions; health visitors also educate the family members on crisis management for high risk patients.
3. The DOH subsidized municipality and county (city) governments, totaling 25, counties and cities to set up community mental health centers to provide the community residents with mental health care, information, and counseling services, and to promote mental health education.
4. In coordination with the domestic violence offender intervention project, the DOH commissioned 105 institutions to provide offender cognitive education and counseling, psychological treatment, psychiatric treatment, and addiction treatment. In 2009, a total of 1,763 persons were serviced, with an intervention implementation rate at 91.53%.
5. The DOH designated 111 institutions for drug addiction withdrawal treatment; of them, 6 are drug addiction withdrawal treatment core hospitals, 98 are drug-addiction withdrawal hospitals and 7 are drug-addiction withdrawal clinics. In addition, to take into account both public health and public safety, the DOH implemented the promotion of the drug addiction withdrawal treatment by partially subsidizing the medical costs involving alternative therapies for HIV-negative drug addicts.

Section 2, Mental Health and Suicide Prevention

According to reports released by the World Health Organization (WHO), it is predicted that by 2020, death by suicide will rank in the ninth place in the top ten causes of death worldwide, and in the eighth place in developed countries. The death rate by suicide in Taiwan had increased from 6.2 per 100,000 population in 1994 to 17.6 in 2009 (see Figure 6-3 for the number of suicide

and death rate by year). For 13 consecutive years, suicide has been on the list of the ten leading causes of death. To ameliorate this situation, the DOH has made suicide prevention and post-traumatic mental health a priority task by launching a series of preventive measures in our mission to promote public health.

1. The DOH established a National Suicide Prevention Center to assist in the planning and evaluation of suicide prevention strategy efficacies and produce suicide-related statistical analysis. A toll-free 24-hour hotline (0800-788995) was set up to provide the public with professional counseling services around the clock.
2. The DOH executed the "National Action Plan on Strategies for the Prevention of Suicide—Second Phase". The plan is formulated on the concept of prevention in three stages and by five levels, where suicide prevention strategy incorporates three dimensions—comprehensiveness, selectiveness and indicativeness. In addition, short, mid and long-term goals for suicide prevention were drafted.
3. The DOH set up a "Suicide Prevention Reporting and Care System" to strength to hire the timely report of suicide attempts, and to subsidize county/city health bureau suicide prevention caring visitors, totaling 112. In collaboration with the community mental health centers, the community support network was activated and promoted, so as to truly implement follow-up house-visits and referral tracking of suicide report cases, trimming down the rate of multiple suicide attempts and suicide mortality rates.

Chapter 4, Long-Term Care Service Systems

Section 1, Strengthening Community-Based Long-Term Care

Based on the population statistics published by the Ministry of the Interior, the population ratio of citizens above the age of 65 accounted for 10.6% of the overall population at the end of 2009. Followed by the aging population, prolonged average life expectancy, changes in disease patterns and the sharp increase in the number of disabled persons, demands for long-term care have increased drastically. To meet these demands, the DOH has actively promoted long-term care services systems to provide the public with integrated, accessible, effective and continuous long-term care services. The main strategies are summarized as follows.

1. The DOH has developed a diversified long-term care service network to enrich the care resources in the communities. Founded upon the concept of aging in home and aging in place, community care and home care are supplemented by institutional care, where hospitals and nursing homes are closely supervised to provide suitable home nursing care services. As of the end of 2009, there were a total of 14 day care centers, 468 home nursing care institutions and 373 nursing homes.
2. The DOH supervised the long-term care management system in all counties and cities to institute long term care management centers; 30 stations were set up and staffed with 315 care managers who are in charge of integrating long term care services.
3. In line with the application and review process of foreign care helpers, the DOH has taken a range of measures to facilitate the seamless integration with long term care management centers, promoting the sound development of care services industry.
4. On July 23, 2009, the DOH established a preparatory task force for long-term care insurance, intended to honor the spirit of self-help and mutual-help social insurance by planning long-term care insurance for the citizens, where the cost of long-term care insurance will be shared by the general public. Through the development of community-based long term care, the DOH aims to

guarantee quality long-term care services for all walks of life.

Section 2, The Promotion of Tele Health Care

In conjunction with the Smart Taiwan project under the "Love Taiwan—Twelve Infrastructure Preliminary Planning Project" of the Executive Yuan, the DOH has been pushing forward tele-health care consulting and health service industry projects in 2009. In the same year, health care industry was designated as one of the six most significant emerging industries by the Executive Yuan.

1. The Construction of Community-based Tele Care Service System: In this system, the Taipei Medical University Hospital, Taiwan Secom Co., Ltd, and Hua-chih Group were designated as service providers, and Cheng-gong Community in Taipei City as a model, to provide 5 types of services, including the promotion of community health stations, audio-visual health education and health consultation, mobile safety positioning, drug safety services, and living resources referral services. In addition, community medical groups are integrated to offer service resources, such as food delivery service, home management, shuttling service, and assistive device rentals. The services are targeted mainly at elderly living alone, people with dementia, hypertension, diabetes, the physically-incompetent, and those who require assistance in daily life. A total of 331 community cases were handled in 2009.
2. The Establishment of Home-based Tele Care Service System: Wan Fang Hospital was designated as the service provider and the Wenshan District in Taipei City as the pilot community, providing 5 services, namely tele physical measurement, tele health education, member house-visits, living resources referrals, and emergency services. These services are further integrated with health care and living service resources, such as human resources dispatch, medical supplies and assistive devices, home cleaning, home laundry, beauty salon services, and more. The home care services are mainly targeted at those in long-term bed rest, the physically-incompetent, and those requiring daily life assistance, as well as people with mild dementia, hypertension, early-phase diabetes and those who are unable to maintain proper self-control. In 2009, 240 home care cases were handled. The DOH also introduced a High-quality Customized Service evaluation system.
3. The Establishment of Institution-based Tele Care Service System: Hsiao Chung Cheng Hospital was designated as the service platform, linking thoracic, orthopedics, nephrology, pharmacists, nutritionists, nurses, infection control division, physical therapists to provide multi-disciplinary and cross-departmental medical care resources. The services are mainly targeted at nursing home residents, family members of local residents, and nursing home professional staff. In 2009, a total of 172 nursing home cases were handled.
4. The Development of Information Exchange Standards and Protocols

To establish continuous care information service network, the DOH has provided continuous value-added applications and services (PHR/PHA) for care services and personal health information. By stipulating standards and protocols for care service electronic records, tele physiological and health care services information transmission, the latest technology can assist the system integration and information interfacing for future tele care services replication and use it as model references.

Chapter 5, Quality of Medical Care

The DOH has made its priority to provide high-quality, all-around, and safe medical

services, create a safe environment for patients seeking medical attention, enhance the quality of medical personnel, strengthen the management of hospitals, continue the effective external quality monitoring of hospitals, establish national blood-quality management, and maintain a fair, just and transparent organ donation mechanism.

Section 1, Quality of Medical Care Services

With the view to reinforce medical service quality, the DOH has created a patient safety-oriented medical care environment, followed out a new hospital accreditation system, published annual objectives for medical quality and patient safety, and developed a patient safety incident reporting mechanism. Achievement highlights in 2009 are as follows.

1. Patient Safety and Quality of Medical Care

   1) The DOH formulated the "Annual Objectives for the Promotion of Patient Safety and Quality of Medical Care in Hospitals for 2008-2009," and carried out both scheduled and irregularly scheduled review assessments.

   2) The DOH instituted the Taiwan Patient Safety Reporting System (TPR) to step by step realize patient-centered medical care, and to establish a non-punitive learning environment to avoid the repeated occurrences of mistakes and errors for improved patient safety. As of 2009, a total of 447 hospitals had taken part in this system, with reported cases totaling at 32,988.

   3) The DOH set up a patient safety website to provide patients with the latest information on safety and to serve as a platform for information exchange. The website records patient safety messages across the globe, for medical institutions and medical personnel to learn and exchange information with the rest of the world, thus encouraging research and development in patient safety.

2. The Hospital Accreditation System

Revolving around the core values of providing patient-centered and patient-prioritized safety services, the DOH has conducted reforms on the accreditation system of hospitals and teaching hospitals.

1) The key features of the new accreditation system have shifted from the focus on structural assessment to the assessment from process and performance aspects. Hospitals are encouraged to develop different types of specialties focusing on the health needs of the community residents. Reforms of the accreditation system for teaching hospitals place more emphasis on the development of training plans for physicians and medical personnel of various disciplines.

2) The DOH practiced a "Scheduled but Not Fixed" regular follow-up supervision and inspection system to ensure the continuous improvement in the quality of medical care. By the end of 2009, 465 hospitals had passed the accreditation, accounting for 91% of all hospitals; moreover, 39 hospitals had been placed under follow-up supervision and inspection.

3) For the benefit of fortifying the management of psychiatric rehabilitation institutions and enhancing the health care quality of psychiatric patients in the community, the DOH implemented the accreditation for psychiatric hospitals and psychiatric rehabilitation institutions. In 2009, a total of 40 psychiatric rehabilitation institutions were accredited. To ensure the operation quality of the aforementioned accredited institutions, the DOH has been conducting follow-up visits to these institutions within the 3-year accreditation validity period.

Section 2, Environmental Protection Measures in Hospitals

Medical wastes can be divided into general industrial waste and hazardous industrial waste. Hazardous industrial wastes generated from

hospitals are primarily biological medical waste. In pursuant to the regulations in the Waste Disposal Act, bio medical waste should be subjected to heat treatment, chemical treatment or sterilization before sending to landfill waste disposal.

1. Based on medical regions as the unit of planning, the DOH has established an integrated medical waste processing and disposal system.
2. Through waste reduction and recycling demonstration projects, the DOH assisted medical institutions to conduct proper medical waste disposal, and approved and issued license to two re-usables processing companies responsible for recycling waste containing heavy metals, sharp instruments after sterilization, and dialysis wastes, and other medical wastes to be recycled and reused.
3. The DOH has supervised 35 medical institutions to take initiative in waste recycle and reuse and autonomous waste reduction management, and conducted a nationwide investigation on the current status on industrial waste treatment and processed quantity in medical institutions, guiding and tracking medical institutions in violation with the Waste Disposal Act and the Water Pollution Control Act.

Section 3, Improving the Quality of Blood Supply and Transfusion

The DOH has pushed forward the quality improvement of blood supply by strengthening the transportation equipment, process, and service quality from blood donation unit. The Blood Derivative Act and enforcement rules have been put into effect to improve the national blood service, upgrade the quality of blood for medical use, and guarantee the safety of blood transfusions.

1. For the sake of reducing the risk of HIV infection by blood transfusion recipients, the DOH has been actively educating the public the correct blood donation attitude, dissuading HIV-positive high-risk people to use blood donation to test for AIDS.
2. The DOH has endeavored to increase first-time blood donation rate. At present, there are more than six million blood donors, at a blood donation rate of 7.74%. In the past seven years, the average amount of blood donated each year was 2,223,706 bags.
3. In response to the blood transfusion needs of medical patients with rare blood group, the DOH has established a rare blood type database, as well as a blood consulting laboratory to provide external consulting and examination services.

Section 4, Improving the Efficiency and Quality of Organ Donation and Transplantation

According to statistics, there are currently about 6,700 patients in Taiwan waiting for organ transplants, but organ donation of the deceased could only be used to treat approximately 700 people, presenting an intractable gap between the vast number of people on the waiting list and the bitter reality. In order to promote the practice of organ donation by the general public and boost the sources of organ donation, the DOH set up an "Incorporated Foundation: Organ Donation and Transplantation Registration Center" (hereafter referred to as the Registration Center) for the promotion of organ donation, and promote effective use of organ donation, all for the purpose of advancing public health. With multiple large-scale measures in place, Taiwan is ranked number two in Asia in organ donation rate, while our organ transplant success rate is competitively neck and neck with the United States and other developed countries.

1. The DOH has set up an organ donation procurement network to actively seek potential donors and laid down standard operating procedures for organ donation and transplant

operations. At present, there are a total of 10 donation procurement hospitals and 190 donation procurement co-op hospitals.

2. The DOH launched the "Organ Donation and Transplantation Registration System". From April 1, 2005 onwards, all cadaveric organ donations have been allotted on the Organ Donation and Transplantation Registration System to establish a fair, impartial and transparent mechanism for organ allocation.
3. The DOH has drawn up the proposed draft amendments of the Human Organ Transplant Ordinance, and submitted it to the Legislative Yuan for deliberation, hoping to improve the management of organ donation and transplantation, simplifying the review process of the donation of living liver, and improving the fairness, impartiality, openness of the allocation system.

Section 5, Quality of Nursing Care

1. The DOH initiated the Nurse Practitioner system. As of the end of 2009, a total of 1,936 people had passed the certification. The DOH also subsidized a nursing care group to carry out amendments concerning relevant laws and regulations in advanced practice nursing. In 2009, a total of 80 hospitals were approved

Table 6-1 Licensed and Practicing Medical Personnel in 2009

Category	No. of Licensed Persons	No. of Practicing Persons	No. of Practicing persons per 10,000 population
Physicians	55,186	37,880	16.38
Dentists	14,992	11,351	4.91
Chinese medicine doctors	11,639	5,290	2.29
Medical technologists (technicians)	18,858	8,203	3.55
Medical radiology technologists (technicians)	7,004	4,651	2.01
Pharmacists (assistant pharmacists)	60,624	29,587	12.80
Nursing personnel	358,931	125,081	54.10
Midwives	53,761	258	0.11
Occupational therapists (technicians)	3,637	2,105	0.91
Physical therapists (technicians)	9,868	4,867	2.11
Counseling psychologists	1,325	524	0.23
Clinical psychologists	858	643	0.28
Dietitians	5,712	1,563	0.68
Respiratory therapists	1,888	1,508	0.65
Language therapists	283	55	0.02
Dental mold technicians	2,753	1,300	0.56
Dental assistants	311	42	0.02
Bone setters	4,374	1,270	0.55

to provide training for nurse practitioners, with the training capacity of 3,797 people.

2. The DOH has taken actions to improve the work environment of nursing personnel and encourage them to stay on the job, and subsidized research projects on the improvement of the workplace and nursing image promotion to help hospitals encourage outstanding nursing personnel to stay on the job.
3. The total nursing care model is promoted, and committed 5 hospitals to implement the total nursing care projects, and completed the total nursing care model handbook for future references in the promotion of related operations.
4. A post-natal care nursing institution quality improvement project was commissioned to draft an amendments of the standard governing the establishment of post-natal care nursing institutions, and develop the outreach model for post-natal care nursing institutions in order to enhance the management and quality improvement.

Chapter 6, Medical Manpower

The number and quality of medical manpower have immense impact on the quality of medical care services and the accessibility to medical care resources. For this, the DOH has continued to conduct projects related to the division of medical manpower and medical personnel training to make a sound and robust medical care system and improve medical quality.

Section 1, Current Status of Medical Manpower

According to the licensing system for professional medical personnel, there are 14 laws and regulations governing the management of medical personnel, including the Physician's Act, Pharmacist's Act, Midwifery Personnel Act, Dietitian's Act, Nursing Personnel Act, Physical Therapist Act, Occupational Therapist Act, Medical Technologist Act, Medical Radiology Technologist Act, Psychology Counseling Personnel Act, Respiratory Therapist Act, Audiologist Act, Dental Technician Act, and Language Therapist Act.

Section 2, Fostering of Medical Manpower

For improvement of the quality of medical personnel, Programs of cultivation and on-job training of medical personnel are conducted every year. Major achievement highlights are as follows.

1. The DOH adopts a quota system for cultivation of medical personnel. In principle, the number of the medical students to be enrolled each year is limited to 1,300. The training of other categories of medical personnel is based on the special quota system. Applications shall be filed prior to the establishment of medical training programs, and be reviewed by the Ministry of Education for control purposes. The goal of planning for the manpower of practitioner in the future will be based on balanced distribution of medical manpower resources, while a periodic assessment mechanism will also be set up. The number of medical personnel licensed and in practice by yearend 2009 is shown in Table 6-1.
2. For the purpose of cultivating local medical and nursing personnel, the DOH has been granting government scholarships to sponsor aboriginal people and residents on offshore islands to be trained as medical personnel ever since 1969, where they are sent back to their home towns for service upon completion of training. Starting from 2002, the DOH has integrated the incubation integration project of Kinmen and Matsu counties. To 2009, a total of 718 medical personnel had been trained; among them, 348 were physicians, 57 dentists, 29 pharmacists and 284 medical personnel of other disciplines, with the current retention rate of government scholarship-sponsored physicians at 70.78%.

3. The DOH has commissioned professional medical associations to conduct screening and review of specialty physicians to upgrade the quality of medical professional training. Hospitals for the training of specialty physicians are accredited and certified every three years, to ensure the consistent quality of professional medical training and the manpower balance among the different medical specialties.

4. For strengthening the value and ability of total patient care, the DOH has been actively promoting the project of post-graduated year general medical training to improve the quality of training of resident-ship training, and to realize the concept of the "patient-centered" total medical care and offering patients comprehensive health care services.

5. For enhancing the quality of training of dentists before independent practice, the DOH initiated the "Post-graduated two-year training program for dentists before independent practice" in 2008, and the development of the training courses, the establishment of criteria of instructor qualification and the accreditation standards of training institutions were completed at the end of 2009.

6. The DOH has completed the continuing education system for 14 categories of medical personnel, requiring medical personnel to undergo certain hours of continuing education training every 6 years before they may apply for license renewal to ensure that the practicing skills of all licensed medical personnel improving with the times.

7. The training of Chinese medicine practitioners in Taiwan is divided into two systems—the 7-year or 8-year undergraduate training and the 5-year post-baccalaureate program. In order to facilitate the normal development of proper Chinese medicine education, and increase the ratio of properly educated Chinese medicine practitioners, the initial qualifying examination for doctors of Chinese medicine was terminated in 2008, while the special examination for doctors of Chinese medicine will be terminated in 2011.

8. The DOH has launched the training project of intendant doctors in Chinese medical institutions to construct a clinical training system for Chinese medicine practitioners.

Chapter 7, Health and Medical Information

Founded upon the "Internet Health Service Promotion Project" that ran from 2002 to 2005, and the "Health Bureau/Station Internet Public Services Project" the National Health Informatics Project (NHIP) , approved by the Executive Yuan in August of 2007, is going to create a nationwide health information development environment, and to continuously promote major health information infrastructures, in order to enhance medical care quality, patient safety, and efficient utilization of medical care resources, and to achieve the interchange of health information.

Section 1, The National Health Informatics Project (NHIP)

1. Promotion of Electronic Medical Records (EMR)

For the purpose of assisting medical

institutions to develop legal and secure electronic medical records and enhancing the willingness of medical institutions in implementing electronic medical records, the DOH has formulated promotional strategies from four aspects—legal regulations, standard protocols, information security and EMR promotion. Major achievement highlights in 2009 are as follows.

1) The "Regulation Governing EMR Production and Management by Medical Institutions" was amended and promulgated on August 11, 2009, in which related regulations on electronic signature are loosened.

2) The DOH established standards for cross-institutional exchange of electronic medical records, and set up system for the maintenance of electronic medical records standards, so as to sustain the integrity and accuracy of the standards for electronic medical records in Taiwan.

3) The DOH assisted hospitals in accordance with the "Regulation Governing EMR Production and Management by Medical Institutions", implementing electronic image medical reports.

4) The Executive Yuan approved the "Project for Expediting the Implementation of Electronic Medical Records System" on November 18, 2009 to accelerate the implementation process of the use of electronic medical records in medical institutions.

2. Operation of the Healthcare Certification Authority

The Healthcare Certification Authority (HCA) was officially inaugurated on June 13, 2003, and further incorporated into the Government Root Certification Authority (GRCA) on August 19, 2008 to provide medical electronic document certification services and electronic signature protocols.

3. Promoting Value-Added Use of Health Information

The DOH has taken steps to create added value by consolidating individual information for practical utilization, thus promoting the quality of policy-making in public health and also for pragmatic reference in academic research and innovative developments in related industries.

Section 2, Health and Medical Information Services

The DOH has mapped out various information systems for the service, application and management of health information, thereby enhancing cross-institutional flow of information and promoting the efficiency of healthcare services. Major achievement highlights in 2009 are as follows.

1) The Medical Affairs Management System mainly provides the DOH and the health bureaus with information for the management of medical affairs, pharmaceutical affairs, management of nursing/midwifery and psychiatric rehabilitation institutions, as well as the management of medical personnel and their administrative disciplinary measures, and management of special medical equipment and the credit system for the continuing education of medical personnel. The system is connected to other relevant systems in the DOH or affiliated agencies for information interfacing, exchange and sharing.

2) The DOH continued to strengthen the reporting platform of ICU empty beds and deaths for improved reporting efficiency and quality.

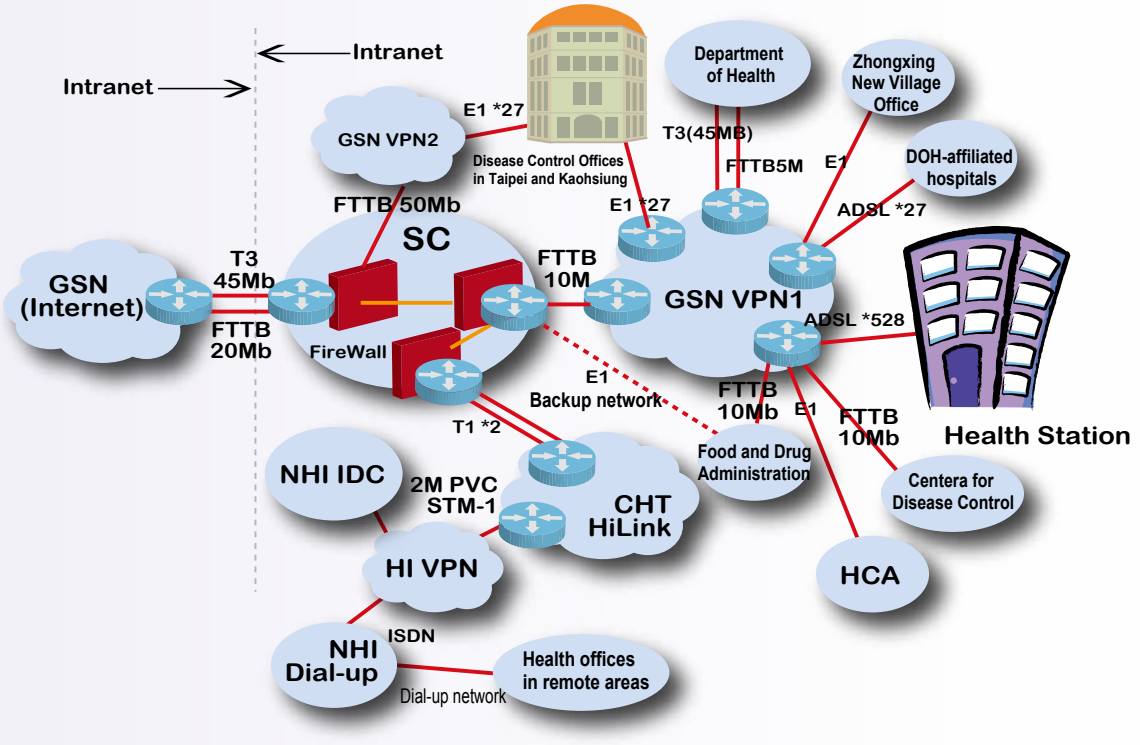
3) The DOH maintained the psychiatric health care reporting system to improve case reports, referrals, and management of health care personnel, in order to increase the number of follow-up cases.

2. Health Information Network

The Health Information Network (HIN) is the national hub for the exchange of health information, as depicted in Figure 6-4,

functioning to provide the exchange and sharing of medical health information. The subordinate Service Center (SC) is responsible for the operation and management of various public information systems in the HIN, and also for providing counseling services to the linking institutions. The SC is also in charge of the management of the network and information security. At the same time, SC also conducts visits to supervise the information environment of health bureaus and health stations at various levels, and assists in upgrading the efficiency and quality of information management of these primary healthcare units, thus bridging the digital divide between urban cities and rural areas.

Figure 6-4 Framework of the HIN Network



Part VII The National Health Insurance

Chapter 1, Current Status of the National Health Insurance

Chapter 2, Reforms of the National Health Insurance System

Part VII, The National Health Insurance

The DOH has dedicated itself to maintain the sustainable operations of the National Health Insurance (NHI). In addition to launching the NHI system reforms and pushing forward the amendments of the Second Generation NHI, the DOH continues to tap into new resources and economize on expenditure to maintain the financial viability of the NHI. This Chapter summarizes the achievement highlights in 2009 and elucidates the current status of the National Health Insurance and the prospect of its reform.

Chapter 1, Current Status of the National Health Insurance

The following six sections will summarize the important business operations of the National Health Insurance, including insurance enrollment, financial status, insurance benefits, health care quality information disclosure, IC card applications and health care for the less-privileged populations.

Section 1, Current Status of Insurance Enrollment

The National Health Insurance is a mandatory social insurance. All individuals holding the Republic of China nationality and have registered their household in Taiwan for more than four months shall, by law, enroll in the NHI. Legal aliens holding certification documents for residency and have resided in Taiwan for more than four months shall also, by law, enroll in the NHI. However, those with employee status are not subject to the restrictions of the aforementioned 4-month period.

By the end of 2009, the total enrollment was 23,025,773 persons, with the enrollment rate of higher than 99% of the population, nearly approaching the goal of full insurance enrollment.

Section 2, Insurance Financing

The DOH has spared no efforts on promoting various measures to expand sources of income and reduce expenditures to maintain financial stability. In recent years, multiple administrative measures have been practiced to alleviate the financial difficulties of the NHI.

1. The DOH promoted various measures to increase sources of income and reduce medical expenditures for NHI financial soundness.

   1) Income Increment on National Health Insurance

      A. The DOH has expedited the billing operations to the interrupted insured, as well as checking insurers' identity and the amount of premium payment.

      B. The DOH had won over NT$ 1 billion from the balance of public-interests lottery and NT$ 18 billion from the health and welfare tax levied on tobacco products.

   2) Containment of Medical Expenditures

      A. The DOH conducted drug price surveys and the 6th drug price adjustment, operations on the reasonable payment for special medical materials, inspections of medical care institutions in violation of regulations, and review and approve reduction on medical costs to contain unnecessary expenditures.

      B. The DOH implemented the collection of higher co-payment to reduce insurance abuse, and to monitor financial balance for medical care items of higher utilization such as out-patient services, drugs and rehabilitation.

      C. The DOH set up a high-tech real-time reporting system to keep the use of expensive medical examination items in check.

Section 3, Insurance Benefits and Payment

To enhance the quality of medical care, work out reasonable payment plans, improve the

pharmaceutical pricing system, and safeguard public rights in drug usage, the DOH carries on to review and revise the National Health Insurance medical payment standards. Important highlights are presented as follows.

1. To Enhance the Quality of Medical Care and Reasonable Payments

1) For Western Medicine

A. The DOH reviewed and amended the "Implementation Project of Reserved Funds for the Assurance of the Overall Quality of Western Medical Primary Care", "Health Care Quality Indicators and Inspection Value", "Improvement Project for Expanding the Promotion of Medical Benefit and Payment", "Integrated Family Doctors Care Plan", "Improvement Project for Areas Lacking Sufficient Medical Resources", and "Project for the Treatment of Chronic Hepatitis B and C", for the purpose of raising the overall medical care quality.

B. To improve the scope and quality of care, the DOH initiated a new practice to adjust the out-patient diagnostic fee upward by 20% and loosened the age restriction from two years of age (inclusive) to three years of age.

C. For the management of the balances after the adjustment of drug prices, the DOH had upward adjusted the scope of insurance benefits for antiviral drugs for hepatitis B and C, cancer targeting drugs, and cholesterol-lowering drugs, after taking consideration the medical needs of the majority of patients and their family members, and the suggestion put forward by clinical pharmaceutical professionals and related medical associations and health policies, and inviting experts and medical researchers for in-depth discussions, so as to improve the care quality for the general public.

2) For Chinese Medicine

A. The DOH reviewed and amended the "Health Care Quality Indicators and Inspection Value", terminated the "Pilot Project of Chinese Medicine Aiding in the Care Patients with Bedsore Under Hospital Care of Western Medicine" and launched the "Pilot Project Chinese Medicine Aiding in the Care Patients with Cerebrovascular Disease Under Hospital Care of Western Medicine", the "Pilot Project on Out-patient Clinic Care Using Chinese Medicine For Children with Cerebral Palsy", "Pilot Project on the Out-patient Clinic Care Using Chinese Medicine for Children With Asthma", and the "Improvement Project for Areas Lacking Sufficient Medical Resources", all of which are implemented to reduce medical expenditures and improve the overall care quality for patients.

B. To improve the quality of medical care, the DOH adjusted the out-patient diagnostic fee upward by 20% for children under the age of three years (inclusive).

3) For Dentistry

The DOH reviewed and amended "The Implementation Project for Retention Money Guarantee in Dentist Clinic For Total Quality Assurance", "Health Care Quality Indicators and Inspection Value", "Pilot Project for Total Special Dental Outpatient Medical Service" (strengthening the dental medical service for patients with congenital cleft lip and palate and craniofacial abnormalities, as well as for patients of moderate to severe mental or physical disabilities), "Improvement Project for Areas Lacking Sufficient Medical Resources" (including mobile medical service plans for dentists to practice in rural areas without dental service), for the sake of improving the dentist clinic medical care quality. At the same time, the DOH also rewarded outstanding contracted dentist clinics, and improved the medical care quality for special target groups.

4) Improvement of the Accessibility of the Insured to Medical Care

For the purpose of improving the accessibility of the insured to medical care, the DOH has promoted the contract signing of medical institutions with the National Health Insurance all around the country. By the end of 2009, there were 24,423 such institutions; among them 19,077 are medical institutions 4,446 are pharmacies, 505 are home care institutions, 153 are psychiatric rehabilitation institutions, 15 midwifery organizations, 201 contracted medical testing laboratories, 17 contracted physical therapy institutions, 8 contracted medical radiation institutions, and 1 contracted occupational therapy institution, allowing NHI contracted medical care institutions to be spread out throughout the country.

2. Improvement of the Pharmaceutical Pricing System to Enhance and Secure Public Rights in Drug Use

1) In order to offer a more reasonable drug pricing system, and to facilitate the incorporation of new drugs into the benefits under the National Health Insurance, the DOH amended the "National Health Insurance Drug Price Benchmark" and conducted the 6th drug price adjustment, completing price adjustments for a total of 7, 600 drug items to ease the expansion of growing expenditures.

2) With the intention to enhance the quality of public drug use and increase medication options to reduce the financial burden of the general public, the DOH adjusted the drug items in insurance drug benefits.

Section 4, Disclosure of Medical Care Quality Information and Public Satisfaction Ratings

1. Disclosing Information on the Quality of National Health Insurance Medical Care

Disclosure of information on the quality of medical care ensures the rights of the public to sound medical care, which promotes the overall enhancement of quality medical care. Via this transparent disclosure, people will have direct access to the results of quality monitoring indicators of various medical care institutions, making the supervision of quality medical care a national task for all citizens. To this end, the DOH has continued to disclose the medical quality information of all hospitals and departments, and publish the information on the National Health Insurance official website (http://www.nhi.gov.tw) under the designated "Medical Quality Information Disclosure" section.

The public may also access the "Multiple Certification Internet Insurance Operation Platform" on the National Health Insurance official website by using the natural person certificate, and query personal NHI medical information in the recent 3 months.

2. Public Service Satisfaction Ratings

For the purpose of understanding the satisfaction ratings for the various policies of the National Health Insurance by people across the nation, the DOH has been conducting satisfaction surveys each year to probe into the overall NHI related policies. In 2009, the overall service satisfaction rating toward the National Health Insurance was 82.9%, and 96.47% toward the Bureau of National Health Insurance, Department of Health.

Section 5, NHI IC Card Applications

Officially launched in January 2004, the health insurance IC card, issued to every insured, provide the public with more simple, convenient and safer service. The NHI IC card stores four categories of information, contains basic personal information, health insurance data, special section for medical care, and health administration special section. The IC card also provides real-time information on medical care, assists in the implementation of epidemic prevention or control, and safeguards the health of all citizens. Achievement highlights in 2009 are as follows.

1. The DOH implemented the "Special Project of Supervising the NHI-Insured with Abnormally High Utilization of Medical Care in Clinics." In 2009, a total of 11,472 patients had visited clinics for more than 20 times according to their NHI IC card data. After counseling and supervision, the number of visits had declined by 40-60%, in which the supervision efficacy and the supervision duration are positively correlated.

2. The DOH implemented the marking of "Organ Donation" on the NHI IC Card. Thus far, 75,555 persons have registered, allowing medical personnel to know about the individual's willingness of organ donation right away. In addition, 35,106 persons have registered for "Hospice and Palliative Care". Hospice and palliative care is provided to terminally ill patients, in hopes of respecting their wishes to die with dignity and in peace.

Section 6, Assistance to Disadvantaged Groups

To ensure the rights to access medical care of those who are unable to pay for their insurance premiums, and to lessen their financial burdens, the DOH has taken various measures to provide assistance to disadvantaged groups, presented as follows.

1. Subsidies on Insurance Premiums

Government agencies at various levels provide subsidies on insurance premiums for people of specific disadvantages groups. They include the low-income households, retired veteran servicemen, unemployed laborers and their dependents, the mentally or physically disabled, the elderly above 70 years of age and children under 18 years of age in near-poor households, and unemployed aboriginal citizens under 20 and over 55 years of age. As of 2009, some 2.96 million people had received insurance subsidies at a total of NT$ 18.4 billion.

2. Assistance Measures on Insurance Premiums

1) The DOH continued the Relief Fund for individuals, who are qualified under the "Regulations Governing Recognition of Individuals in Financial Difficulty or in Special Financial Difficulty for the National Health Insurance," to apply for interest-free loans to pay for overdue insurance premiums and the self-payment medical costs due to the insured institutions. The borrowers may begin to pay back the loans one year after the application. In 2009, 3,674 loans were approved, at about NT$ 215 million.

2) The DOH also continued the insurance installment payment plans for individuals who cannot afford to pay for insurance premiums in full in one payment to apply for installment payment to lessen their financial burden. In 2009, 228,000 people had applied for and made use of this installment plan, with the total amount at around NT$ 5.858 billion.

3) The DOH continued to assist in the referrals to charity groups (or charitable persons) to help economically disadvantaged individuals to pay for their insurance. With the support of these charitable enterprises, organizations, individuals, 3,345 cases had been successfully referred, with assistance funds totaling at NT$ 18.19 million.

4) Assistance Plan to the Economically-disadvantaged

A. With the health and welfare surcharge levied on tobacco products raised from NT$10 to NT$20 per pack, and 4% of the income used to subsidize the insurance premiums of economically-disadvantaged people, a total of 616,000 cases were subsidized in 2009, with the amount totaling at around NT$ 660 million.

B. The DOH had won over the public welfare lottery fund worth NT$400 million to execute the "Project to Assist Disadvantaged Groups in Alleviating Their Burden on Medical Cost", helping 8,083 cases to pay for overdue insurance premiums at a total of NT$196 million. In

addition, the DOH also strived to obtain NT$415.4 million worth of public welfare lottery fund to execute the "Project to Assist Typhoon Victims and Disaster Victims to Pay For Overdue Health Insurance Premiums," in which the fund is first used for compensation to victims in the Typhoon Morakot to pay for their health insurance arrears; low-income households and disadvantaged people in the disaster areas were the next in line to receive compensation to pay for their health insurance arrears.

3. Medical Rights to Those Unable to Pay Insurance Premiums

Individuals not enrolled in the National Health Insurance or their insurance premiums are overdue, may, at time of critical illnesses, with the certificate of poverty issued by village or neighborhood chiefs or hospitals, avail themselves of medical care as insured individuals. After medical treatment, they will then be, upon individual conditions, assisted to enroll in the National Health Insurance, or apply for the Relief Fund, for referral or installment payment. A total of 5,025 people received medical insurance coverage via this approach.

4. Reducing the Financial Burden of Severely Ill Patients

Targeted at patients suffering from cancer, chronic mental illness, hemodialysis, congenital and rare diseases, the DOH has provided preferential premiums to partially cover their medical costs; a total of 780,000 people had received disability certificate as of 2009.

5. Ensuring the Medical Rights and Drug Use of Severely Ill Patients of Rare Diseases and Hemophilia

Since 2005, the National Health Insurance Medical Cost Association has formulated and established the medical bill special funds under the National Health Insurance for patients of rare diseases, hemophilia, and AIDS, providing patients suffering from these ailments with comprehensive medical care and drug use rights.

Chapter 2, Reforms of the National Health Insurance System

Section 1, Reasons of the NHI Reform

The practice of the National Health Insurance is Taiwan's very own pride and joy. Even though the NHI is faced with various difficulties, the DOH makes sure that policy implementation is continued to ensure constant progress. In order to allow the sustainability of the National Health Insurance, NHI reforms are imperative to address the current difficulties faced by the NHI, as presented as follows.

1. Financial Imbalances and Limited Equality in Basic Insurance Premium

With the rapid aging of the population, coupled with medical technology advances and the increased public demands among other factors, there has long been a gap of 2 percentage points between the revenue and expenditure of the National Health Insurance. Although the DOH has taken numerous fine-tuning measures and medical expenditure containment plans to cut back on spending, and these measures have been implemented, but the current premium calculation base formula by one's regular salary should be expanded gradually, to improve fairness and equality among the insurers.

but the DOH has expanded the premium base rate by calculating the premium by the regular salary, to improve the fairness and equality among the insurers.

2. Differences in Premium Payments

At present, due to the difference in occupation categories and income sources, premium payments also differ. For household with more dependents in the family, the insurance burden is also heavier accordingly. The loading of the burden depends on the number of dependents in the households.

3. The Lack of Linked Health Insurance Revenue and Expenditure

Under the current system, the revenue end and the expenditure end of the mechanism is

insufficient linked. On the one hand, the National Health Insurance Supervisory Committee oversees the financial revenue, while the NHI Medical Expenditure Negotiation Committee is in charge of the financial expenditure. This decoupling implies the lack in the linkage between revenue and expenditure ends, making it one of the reasons contributing to the financial imbalances in the National Health Insurance.

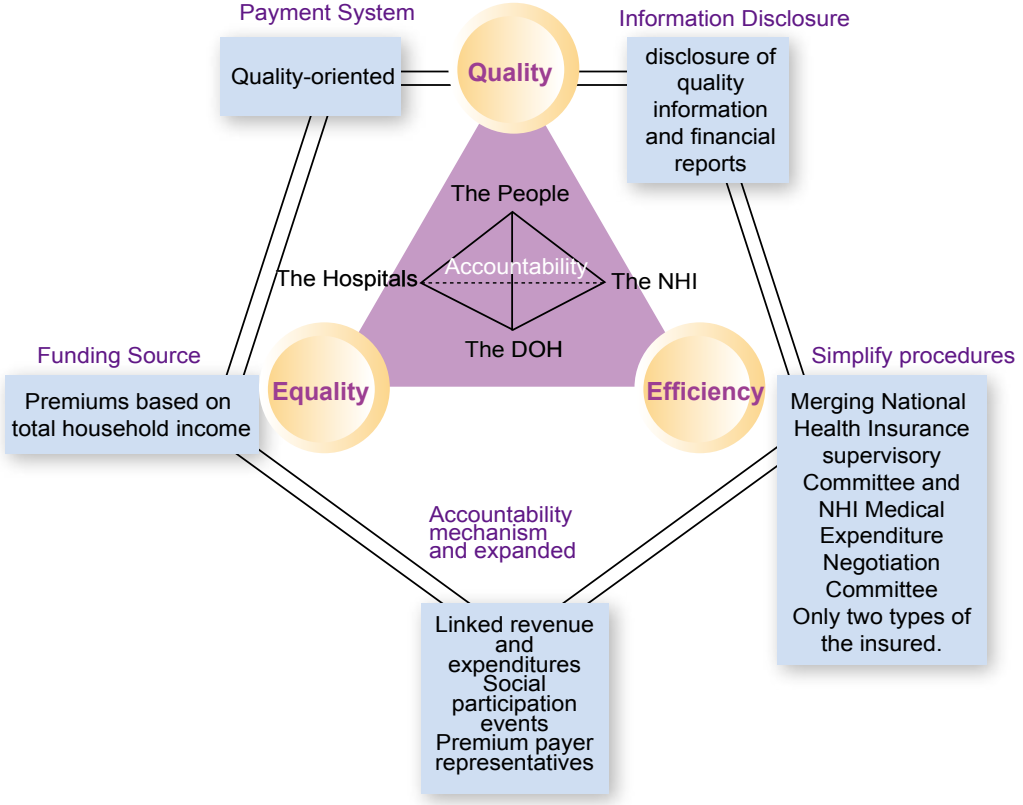
4. Inadequate Disclosure of Medical Information

Owing to the medical information asymmetry, the public often times cannot determine the quality of the medical services they are receiving, and turn to rely heavily on suggestions or referrals from family members or friends, leading to the lack of medical quality information and the increasingly serious situation of misinterpretation of medical information.

5. Insurance Payments Necessitate Quality

Currently the payments under the National Health Insurance paid to medical institutions are in majority based on medical service quantity, but medical quality is often not taken into consideration. In response to the dual concerns of cost and operational difficulties, medical institutions often make excessive use of the NHI payments. With this in mind, the DOH has planned to strength the current payment

Figure 8-1 Core Values of the National Health Insurance



methods and encourage quality improvement across medical institutions.

Section 2, The Core Values NHI Reforms and Key Issues of Law Amendments

After many years of planning, the Second-Generation NHI Planning Task Force of the Executive Yuan has completed a finalized report. With the aim of tackling the aforementioned hardship encountered by the National Health Insurance, policy recommendations are proposed to solve the problem from 4 perspectives, including "strengthening of information to improve the quality of medical care", "financial balance and improve service and purchase efficiency", "expansion of diversified social participation in health insurance policies", and "construction of a systematic power and responsibility mechanism for the NHI system". To this end, the DOH has been actively planning for law amendments for the second-generation National Health Insurance.

1. Goals of Reform: To Assure the Reliability of Medical Care.

2. The Core Values (see Figure 8-1)

1) Quality: The DOH has promoted the disclosure of medical information and quality information to the public, permitting people to opt for the most suitable option using the information as reference, and strengthened the mechanisms to enhance the quality of medical care, in which the payment system is steered toward providing quality health services in line with the reforms.

2) Equality: Using the total household income to determine the premiums for collection to expand the basis of billing rates. Low-income earners may enjoy the medical guarantee under the current system, while high income earners will shoulder more burdens by paying higher insurance premiums. Under this new system, households with the same income will pay the same amount of premium.

3) Efficiency: The DOH will integrate the National Health Insurance Supervisory Committee and the NHI Medical Expenditure Negotiation Committee, implement the revenue and expenditure linking mechanism, and simplify insurance-related procedures.

Part VIII Health Care for the Less Privileged Groups

Part VIII. Health Care for the Less Privileged Groups

With an eye to realize equal health care rights, the DOH is committed to providing health care services to the less privileged groups on the principle of health equality, targeting at low-income families, young children, the elderly aged 65 years and above, residents in remote areas or the indigenous people, and people requiring special care (e.g. the disabled, chronic patients, patients under hospice and palliative care).

Chapter 1, Health Care for the Mentally and Physically Impaired

1. The People with Disabilities Rights Protection Act was promulgated on July 11, 2007. Assessment standards of mental and physical impairment are classified into eight categories of mental and physical impairment, expected to bring into force on July 10, 2012.
2. The DOH is keen on the promotion of handicap assistive device services, subsidizing various counties (cities) to set up the "Medical Rehabilitation Assistance Center" for people of physical and mental disabilities to provide professional consultation on assistive use, assessment and customized design services, as well as providing a service delivery mechanism for people with disabilities in need of medical rehabilitation assistive devices.
3. The DOH actively promotes the preventive oral health care measures for the physically and mentally disabled by offering oral health care services in 30 disability institutions.

Chapter 2, Health Care for Residents in Mountain Areas and Offshore Islands, and Indigenous People

1. Improvement of Hardware Facilities in Mountain Areas, Offshore Islands and Remote Areas: In 2009, the DOH subsidized 5 health centers (stations) in mountain areas and offshore islands for reconstruction and 20 health stations (rooms) for space renovation and repair of facilities. Subsidies were also made to the repair of 4 helicopter pads in townships in the mountain areas. Health stations (rooms) were further subsidized for the procurement of 221 items of medical equipment, 171 items of information facilities and 16 ambulance cars and mobile medical vans. In addition, sea-level areas with aboriginal residents were subsidized to procure a total of 140 items, including mobile medical vans, information and medical equipments. These hardware upgrades improve the quality of medical care and information facilities in remote tribes.
2. Continuous Training of Local Medical Personnel

   1) In line with the complementary measures of

local medical service, graduates on government scholarship are sent back to work in their hometowns. To encourage them to stay on the job, in coordination with the Integrated Delivery System (IDS) of the National Health Insurance, medical personnel are subsidized to stay on after completion of their duties. At present, the retention rate of government-sponsored doctors is 72.5%.

2) In order to achieve the goal of local medical service, and incentivize trained medical personnel to stay on their jobs, the DOH subsidized a total of 3 medical institutions located in the mountain areas and offshore islands, with subsidies totaling at NT$ 1.4 million.

3) The DOH continues to conduct educational training for physicians working in health centers located in mountain areas, including care for acute and critically ill patients, alcohol-cessation, physical therapy, occupational therapy, and rehabilitation for victims of family violence and sexual assaults. By the end of 2009, 96 doctors and 360 medical personnel of various disciplines had been trained.

3. With the Promotion of Community Health Building, the DOH set up 2 counseling centers and 77 community health building centers, and subsidized a total of 40 sessions of "Community Tribe Health Service Camp for College and University Students in Mountain Areas and Offshore Islands during Summer (Winter) Vacation".

4. Promotion of Health Information in Remote Tribes and Establishment of Information Sharing Platform

1) The DOH set up 231 mobile medical stations in 34 townships in 12 counties (including Hsinchu County), providing "mobile clinics" medical care to the tribes; and a "User-friendly Mother Tongue Clinic Registration System" to provide more convenient medical care services to the local residents.

2) The Picture Archiving and Communication System (PACS) is integrated with the Health Information Systems (HIS). In 2009, 31 health centers, including ones in Nanao Township, Yilan County were connected to the DOH Hospital for improved medical care quality in remote tribes.

5. Protecting the Health and the Rights to Medical Care for Residents in Mountain Areas and Offshore Islands: The DOH executed the Integrated Delivery System (IDS) Project of the National Health Insurance—"Medical Efficiency Enhancement Plan for Mountain Regions and Offshore Islands"—where health bureaus in Penghu, Kinmen, Lienchiang and Taitung counties are subsidized to provide tele-medical care, with a total of 24 connection spots.

6. Emergency Delivery of Patients in Mountain Areas and Offshore Islands

1) The "DOH Air Referral Review Center" operates 24/7, 365 days a year. In 2009, 364 applications were received, and 331

were approved, at an approval rate of 90.93%. In addition, 11 air referral visual information systems in mountain areas are in place to improve the care of acute and critically ill patients.

2) The "Guidelines Governing Subsidies to Transportation Costs for Delivery of Critically Ill or Emergency Patients in Mountain Areas and Offshore Islands for Medical Care" was stipulated to subsidize costs for transporting patients to mainland Taiwan for medical care. In 2009, 331 emergency patients were transported; and 24,686 critically ill patients had been subsidized for referred medical care in mainland Taiwan.

Chapter 3, Health Care for Groups with Special Health Needs and New Immigrants

Section 1, Human Rights Protection and Care for Hansen's Disease Patients

1. On August 13, 2008, the Hansen's Disease Patient Human Rights Protection and Compensation Act was promulgated and enforced. The Act aims to provide comfort and compensation to patients suffering from Hansen's Disease for they have to endure the physical and mental torment from the social exclusion accompanied by the implementation of the quarantine treatment policies, ensure their rights in getting medical and nursing care, including restoration of their reputation and mourning of the deceased, and, at the same time, promote social education. Compensation funds were paid out to the patients, with the total amounting to NT$ 729,133,329.

2. Holistic care for Hansen's disease patients has been implemented to enhance the quality of health care service. To improve medical accessibility for Hansen's disease patients, 4 hospitals, including National Taiwan University Hospital, Mackay Hospital, Taichung Veterans General Hospital and National Cheng Kung University Hospital were designated as the hospitals for diagnosing and treating Hansens' disease beginning January, 2009.

3. Plans for setting up the Lo Sheng Campus were formulated. On August 14, 2009, the Losheng Sanatorium was listed as one of the potential candidates in Taiwan to apply for the World Heritage Site. On September 7 of the same year, the Losheng Sanatorium was announced and listed as a "Cultural Landscape" and "Historic Building" in Taiwan.

Section 2, Prevention of Rare Diseases

1. Rare Disease Prevention and Orphan Drug Act was enforced in August, 2000. Taiwan is the fifth country in the world after the US, Japan, Australia and the EU to enact laws and regulations for the prevention and control of rare diseases. The Act is primarily enforced to prevent the occurrence of rare diseases, to provide early diagnosis and care for patients of rare diseases, to help patients to access proper drugs and special life-sustaining nutrient food for rare diseases, and to encourage and ensure the supplies, manufacturing, research and development of these drugs and nutrient food.

2. To provide patients of rare diseases with holistic care, the DOH has announced 184 rare diseases, 74 drugs for rare diseases, and 40 items of special life-sustaining nutrient food, where rare disease patients are subsidized to receive full coverage on special life-sustaining nutrient food and emergency drugs, with 297 patients receiving the subsidies. Furthermore, rare diseases are included for payment in the National Health Insurance under the category of critical illnesses and injuries and metal and physical impairment, alleviating the burden of co-payment when seeking medical attention. The DOH also provides hereditary diagnosis and counseling for rare disease patients and their family members, strengthening related

promotional campaigns for rare disease prevention.

3. The DOH offers partial subsidies for international medical cooperated commissioned inspection services, with a total of 39 people receiving the subsidies. In 2010, subsidies for medical diagnosis and treatment not covered by the National Health Insurance were registered at approximately NT$36 million.

Section 3, Human Rights Protection and Care for HIV-Infected Patient

The DOH has made every endeavor in ensuring human rights protection and health care for AIDS patients. Taiwan is one of the few countries that provide free medical care for the HIV-infected. When Highly Active Antiretroviral Therapy (HAART) was first developed, it was immediately introduced in Taiwan and offered to the infected free of charge.

1. Protection of Human Rights

1) On December 17, 1990, the "AIDS Prevention and Control Act" was promulgated to effectively regulate the prevention of HIV infection and protect the rights of the infected. On July 11, 2007, the Act was amended and renamed the "HIV Infection Control and Patient Rights Protection Act" to respond to the spirit of human rights and meet the demands of AIDS control.

2) Based on the "HIV Infection Control and Patient Rights Protection Act", two sets of regulations, the "Regulations Governing Protection of the Rights of HIV-Patients", and the "Operational Directions for Reviewing Applications of Stay or Residency of HIV-Infected Individuals", have been formulated to uphold the dignity and rights of the infected.

3) To safeguard the rights of personnel executing the "HIV Infection Control and Patient Rights Protection Act", the "Regulations Governing Compensations to Persons Infected with HIV through Execution of Preventive Functions" was formulated in accordance with the foregoing Act so as to provide compensation for those who become infected by HIV in line of work.

2. Health Care

1) Since the amendment of the "AIDS Prevention and Control Act" (now renamed the "HIV Infection Control and Patient Rights Protection Act)" on February 5, 2005, AIDS-related medical expenditures are covered by government's budget instead of the National Health Insurance. Aside from providing free anti-HIV medications, the payment has been extended to the non-insured HIV-infected to improve the coverage of medical care and access to medical care. In 2009, 13,278 patients sought medical attention, at an annual consultation rate of 84.1%.

2) To improve medical care and strengthen the health self-management of the HIV-infected, a case-management project for people with HIV infection has been implemented since 2007. In 2009, 24 designated HIV/AIDS

hospitals participated in this project to provide patients with health education and counseling services. A cumulative total of 5,932 patients have participated in the project.

3) Through follow-up activities conducted by county/city health bureaus and case-managers, patients are cared and guided to pay regular visits to designated hospitals for treatment. The project also aims to provide monitoring care for the patients, thus improving their willingness to seek medical care. Counseling services and follow-up testings for people who have come in contact with the HIV-infected are also reinforced.

4) The DOH has subsidized non-governmental organizations (NGOs) and private sector institutions to assist in the care of HIV-infected patients, making arrangement for their medical care, emergency placement, and other services. In 2009, 159 HIV-positive patients received care services and 512 persons received case management services through NGOs and private sector institutions.

5) To enhance the counseling and health education services for the HIV-infected in correctional institutions, the DOH commissioned 4 NGOs in 2009 to provide counseling and health education services in correction institutions. Through appropriate counseling services, patients are encouraged to accept medical care, thereby protecting themselves and others, to reduce the spread of HIV infection.

Section 4, Health Care for the New Immigrants

Attributed to the differences in language communication and cultural customs, new immigrants are disadvantaged in terms of health. To protect their rights to proper health care, the DOH has launched diversified measures, presented as follows.

1. Promotion of NHI Card Management of Foreign Spouses and Education on Reproductive Health: The DOH applied for subsidies from the foreign spouse care counseling fund of the Ministry of the Interior to provide funding for costs of prenatal care for foreign spouses who have not yet obtained household registration. The “Translator Service Project for Foreign Spouses on Reproductive Health” was also promoted, involving a total of 190 health centers in 21 counties and cities.

2. To prevent infectious diseases from spreading through Taiwan, all legal foreign laborers are required to provide health examination certificate prior to the application for visa entry; they shall also proceed to designated hospitals for health examinations within three days after entry, and once their employment duration has reached 6 months, 18 months and 30 months, which can be done 30 days before or after the actual date of the said duration. Those who fail the health examination after entry shall be repatriated except those infected with Amoebic Dysentery passed the re-examination within 45 days and those infected with syphilis received complete treatment within 30 days.

3. Persons holding certified documents of permanent residency in Taiwan such as residency permit for aliens, may enroll in the National Health Insurance in accordance with regulations of the National Health Insurance Act. Once be issued with the NHI card, they are entitled to essential and inclusive medical care services at contracted medical institutions at times of illnesses, injuries, child delivery, and accidents.

4. The DOH has produced educational materials in different languages on communicable disease control, management of chronic diseases, and the National Health Insurance, and contacted relevant new immigrant institutions to aid in the promotion of health education information.

Section 5, Community-Based Long-Term Care for the Elderly with Dementia or Functional Disabilities

1. Through an array of care systems, the DOH provides quality health care services to patients with dementia or functional disabilities and their family members as caregivers.
2. The DOH completed the implementation of the community-based care services for people with dementia or functional disabilities in 5 DOH-affiliated hospitals. As of the end of December 2009, the case number had reached 9,597, which is testament to the goal of long-term care in local care service for the elderly.

Section 6, Care for Yusho Disease Patients

1. To offer easy medical access for Yusho Disease patients, the DOH and the Bureau of National Health Insurance jointly noted the Yusho disease on the NHI IC card. In the future, patients may present the NHI IC card or Yusho card to NHI contracted hospital for medical treatment, where they are waived of co-payments regardless of any outpatient departments, including holiday outpatient clinic and emergency room.
2. In order for female patients to take care of their children, the DOH has listed and placed the second generation children born after the Yusho incident (1980 inclusive) under management to provide them with health care services starting on July 1, 2005. The Yusho patients may also have a health examination each year free of charge.
3. Since Yusho patients are mainly distributed in Taichung County and Changhua County, the DOH has requested the DOH-affiliated Fengyuan Hospital and Changhua Christian Hospital to open up "Yusho Special Clinic" starting from December 1, 2009.

Chapter 4, Health Care for the Financially-disadvantaged

To ensure the complete access to NHI medical care for those who are facing financial hardship, the DOH continues to push forward measures to assist them in 2009, presented as follows.

1. Subsidies on Insurance Premiums
2. Assistance on Insurance Premiums
   1) The Relief Fund
   2) Installment Payment
   3) Referral to Charity Groups (or Chartable Persons) for Premium Payments
   4) Assistance Plans to the Financially-disadvantaged with Overdue Premiums
3. The DOH assists those who are unable to pay for their insurance premiums to apply for the Relief Fund, installment payment, or other alternative assistance channels. For more details, please refer to Chapter 1, Section 6 "Assistance to Disadvantaged Groups" in Part VII "The National Health Insurance.

Part IX International Cooperation in Health Issues

Part IX. International Cooperation in Health Issues

The promotion of international health affairs is more than a global trend: it is an integral part of Taiwan's efforts to become a key player in the international arena.

To this end, the DOH has tirelessly worked to advance international cooperation and exchange. These efforts have included: planning, promotion and coordination of policies concerning international aid; collection of information; participation in international organizations; enhancement of Taiwan's international image; recruitment of experts and specialists; and talent training and development.

Such activities fit with global trends to develop multiple international health cooperation models to attain Taiwan's ultimate policy goals – giving back to the global community and contributing to world health, and particularly seeking to help the weak and the needy.

Chapter 1. Joining the World Health Organization

Over the years, with the support of allied countries and international friends, the international community has gradually come to realize the necessity of Taiwan joining the World Health Organization. Many major international health organizations have openly supported Taiwan's appeals to join the WHO.

In May 2009, after years of efforts, Taiwan attended the World Health Assembly in the capacity of an observer.

1. Current WHO Membership Status

For the past 13 years, Taiwan has attempted to join the WHO. During this period Taiwan experienced outbreaks of SARS and enterovirus; these events made the international community realize once again the importance of cross-border cooperation in disease control and health care, and of Taiwan becoming a WHO member.

Taiwan will continue to participate in international health-related meetings and activities to fulfill its responsibilities as a member of the global village and to gain other countries' support and recognition.

1) At the invitation of WHO Director-General Margaret Chan in April 2009, former Health Minister Yeh Chin-chuan led a delegation of experts and officials to participate in the World Health Assembly in Geneva, Switzerland, starting on May 18, 2009. After 38 years of exclusion from the international health community, Taiwan has finally made a comeback.

2) During the Assembly, our delegates held talks with health ministers from the United States, Japan, and the EU. They also took part in World Health Organization-related activities and informal bonding with the international community. Clearly WHO and the international community increasingly recognize the necessity of Taiwan's involvement in global health and safety.

3) On January 13, 2009, Taiwan was officially invited by the WHO to become one of the enforcers of the International Health Regulations (IHR). The Center for Disease Control under the Department of Health immediately established a contact window with the International Health Regulations (IHR) of the World Health Organization.

Through the IHR notification mechanism, Taiwan will be able to immediately access the latest information on epidemics and the spread of

disease worldwide, as well as and monitoring status and other information that will help protect people in Taiwan and around the globe.

Chapter 2. International Exchange and Cooperation in Health

To strengthen medical cooperation between Taiwan and our allied countries and to fulfill our responsibilities in the international community, the Department of Health has mediated in many ways to improve medical and health standards. The Department has helped Taiwan to gain attention and understanding from countries around the world, and it cooperates with various international organizations to provide health care assistance.

The Department also conducts exchanges with other countries, and its health diplomacy efforts receive international media coverage and give the nation higher international visibility.

Section 1. Participation in and Hosting of International Conferences, Symposia, and Consultation Meetings

1. International Conferences

1) The DOH participated in the 2009 APEC Health Working Group (HWG) meeting, and was granted vice chairmanship preferential rights from 2011 to 2012. The Department's proposal for an Innovative Services Telecare Workshop was also accepted.

2) The DOH participated in the OECD's 2009 Forum, and called on key executives and project staff in the OECD Employment Labour and Social Affairs Committee to strengthen exchanges with Taiwan. The Department also took part in an OECD expert conference in South Korea, the Technical Workshop and the 5th Asian-Pacific Regional Experts Meeting on Health Accounts, sharing Taiwan's health data compilation and application strategies with the participants.

3) The DOH collaborated with the International Forum Gastein to co-organize the 12th European Health Forum Gastein. Parallel forums were hosted by Taiwan on "Public strategies for coping with economic downturn" and "Where are the safety nets for health finance in crisis? Experiences in Taiwan and Asia."

4) In 2009, the DOH held the 5th Global Forum for Health Leaders, attracting more than 200 guests from 35 countries. With a theme of *Prevention and Innovation in Global Perspective*, the Forum discussed issues spanning from healthy lifestyles and preventive medicine to innovative concepts for health-care delivery.

2. Symposia

1) "Love without Borders: A Seminar on International Medical Relief Integration, Cooperation and Outlook" was another event planned and sponsored by the Department of Health. This event supported Taiwan International Health Action (TaiwanIHA) in its mission of promoting international cooperation, world peace and global sustainable development. It also facilitated exchange between international organizations and NGOs in Taiwan.

During the meeting, Taiwan International Health Action signed a bilateral cooperation memorandum of understanding with the Association of Medical Doctors of Asia (AMDA).

2) To promote international exchanges on Chinese medicine and pharmacy through discussions on both Chinese and Western medicine, the DOH organized the following symposia: the 2009 International Symposium on Traditional Chinese Medicine as Complementary Medicine; the 2009 Seminar on Cross-strait Hospital Management and Development of Integrative Chinese and Western Medicine; the 2009 International Symposium on Sleep

Disorders; the 2009 Seminar on Biomedical Science and Forward-looking Scientific Knowledge; the 2009 Conference on Evidence-based Medicine in Taiwan, China and Hong Kong; the 2009 International Forum on Mental Health; and the Asian Acupuncture Forum and International Academic Conference.

3) On September 19 and 20, 2009, the DOH hosted the 2009 International Seminar on Cancer Registry, inviting 13 experts from the UK, the US, Norway, Brazil, Japan, Korea and Thailand as speakers. In addition to the sharing of operational experiences of national cancer registries, we attempted to further develop a cancer registries alliance in the Asia-Pacific region.

3. Consultative Meetings

1) The DOH participated in the 34th Taiwan-Japan Economic and Trade Conference held in Tokyo. The Department was involved in discussions on ten topics, including food safety and drug administration.

2) The DOH took part in the 21st Consultative Meeting of the European Union, and presented a proposal to "Help Taiwan to Actively Participate in the World Health Organization for Better Global Health," urging the EU to continue to assist in seeking Taiwan's active participation in WHO.

Section 2. Exchange and Cooperation

1. The DOH carried out a 2009 Medical Cooperation Project with Belize and another Medical and Health Cooperation Promotion Project in West Africa. These efforts provided training for local medical personnel as well as donations of used medical equipment in the Global Medical Instruments Support and Service program.

2. The Department of Health administered a Cooperation Project for the Promotion of National Health in Africa and an Emergency Disaster Response Training Camp for Commanders in Kenya. It also sponsored the 2009 SADC Regional Forum for HIV Cross-Border Patient Challenges in Zanzibar, Tanzania.

3. The DOH launched the Taiwan Health Center Project with our diplomatic allies, the Republic of the Marshall Islands and the Solomon Islands, to help plan and promote campaigns for health education and public health.

4. The DOH participated in bilateral talks with Israeli officials to fully implement the Taiwan-Israel Medical and Health Cooperation Agreement for long-term cooperation and exchanges.

5. On August 28, 2009, several experts in the Japan International Disaster Relief Team flew to Taiwan to provide assistance in the aftermath of Typhoon Morakot. The DOH also conducted the Taiwan-Japan Technology Exchange Project and the Taiwan-Japan Technical Cooperation Project.

6. In response to the increasing frequency of cross-strait exchanges, the Mainland Affairs Task Force under the Department of Health was established on February 27, 2009. On August 13, 2009, a Mainland Affairs Office under the Department of Health was set up to offer parallel contact channels with health authorities in China.

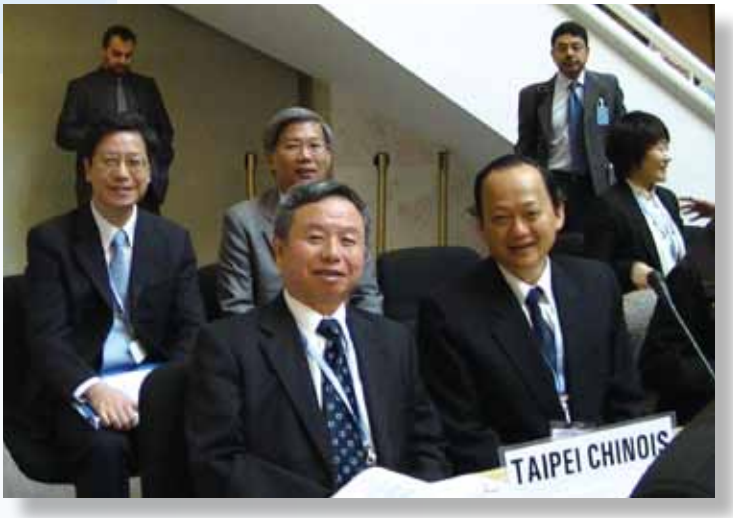
Section 3. Education and Training

1. The Taiwan Health Center in the Republic of the Marshall Islands conducted health education projects for oral health of school-age children, preventive screening of diabetes, health promotion campaigns and cooking classes, and assisted our diplomatic allies in the training of professional medical personnel.

2. The Taiwan Health Center in the Solomon Islands offered regular health examinations and health education activities to local residents. The Center also organized diabetes, hypertension and gout prevention health

education lectures, as well as parasite screening, treatment planning, and preventive education and health promotion services.

3. The DOH continued to operate the Taiwan International Medical Training Center program for health and medical personnel. This program promotes internationalized health services by establishing a collaborative mechanism for Taiwan to conduct international exchanges and to foster cooperation in health affairs.



Chapter 3. International Medical Aid

In the face of new challenges posed by globalization, where diseases easily cross borders and health issues have no national boundaries, the DOH has tirelessly promoted international cooperation in health and medical aid. These efforts help to raise Taiwan's profile in the international community and promote the expansion of Taiwan's health diplomacy.

Section 1. Medical Aid

1. When a cholera outbreak ravaged Zimbabwe in May 2009, Taiwan International Health Action and World Vision Taiwan immediately signed a memorandum of cooperation for the delivery of medical supplies. This effort donated about US$ 20,000 worth of drugs for cholera to assist in public health emergency relief programs.
2. When Typhoon Ketsana devastated the Philippines in October 2009, Taiwan International Health Action also immediately dispatched relief teams of six physicians and nurses to bring the TaiwanIHA standard kit for hurricane and flood relief to the Philippines, and provided related medical assistance.

Section 2. Medical Assistance

1. In 2009, National Taiwan University Hospital was commissioned to conduct a Global Medical Instruments Support and Service (GMISS) program. A total of 37 medical institutions and manufacturers donated 648 medical devices that benefited 9 countries.
2. The DOH's international aid projects included donating a CT scanner to Sukhbaatar Provincial Hospital in East Mongolia and donating laboratory test equipment for the Solomon Islands Central Hospital. Other Department-sponsored aid projects included medical and ward equipment improvements for the Central Hospital of the Democratic Republic of São Tomé and Príncipe; hemodialysis and related equipment for the Provincial Hospital in Kisumu, Kenya; purchase of WHO Blue Trunk Libraries and ultra-low-temperature freezer equipment for Swaziland; and medical examination equipment for Burkina Faso.

Chapter 4, Globalized Medical Services

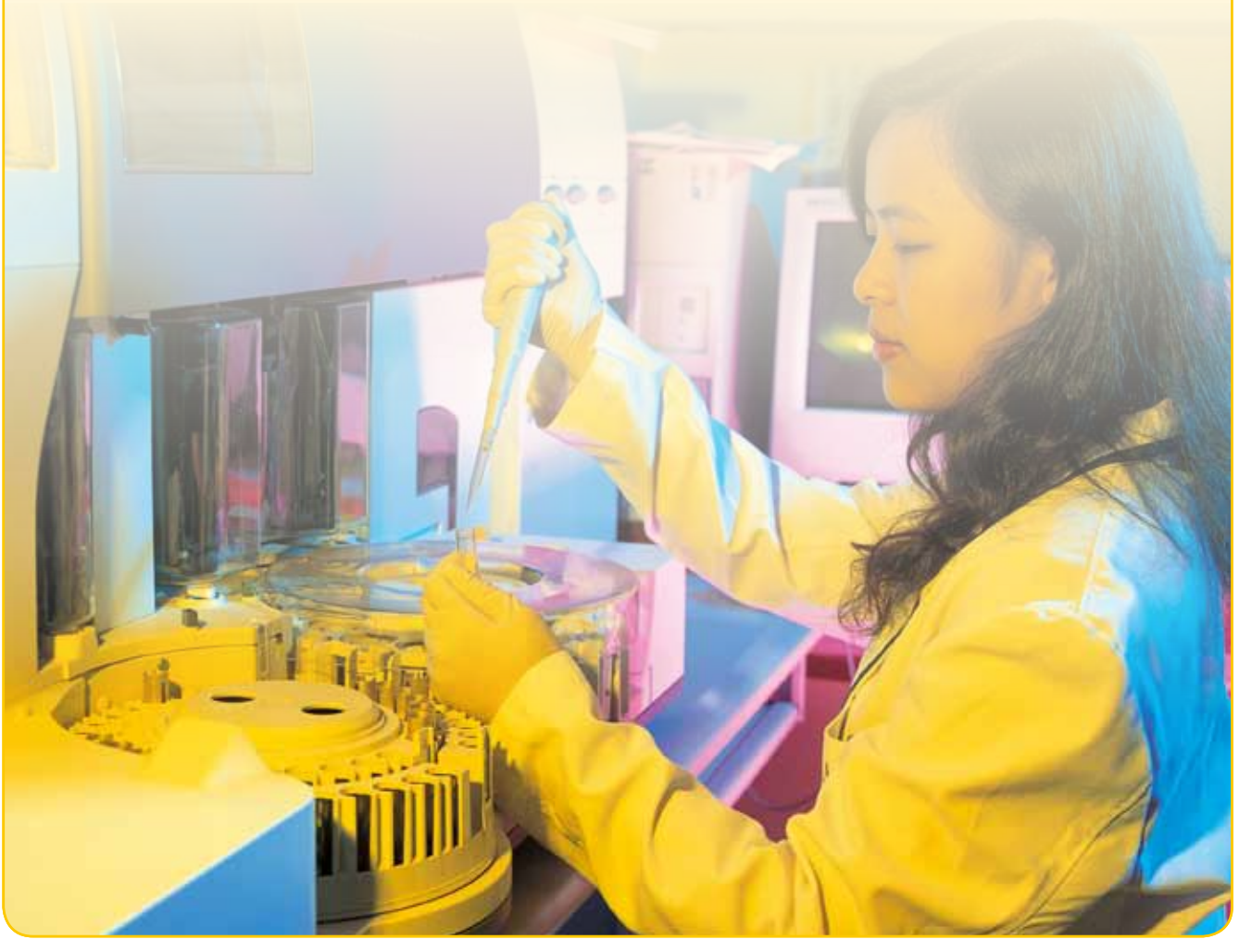
In response to the public and insurance companies seeking medical services of lower cost and higher quality, cross-country and cross-border medical treatments are now all the rage, charting a path for a globalized trend in the medical industry.

The DOH currently promotes international

medicine and medical tourism related projects, on condition that the medical rights of Taiwan's citizens are not affected. In the future, the DOH will continue to prioritize our citizens' medical rights for high-quality services, and properly monitor the quantity of people seeking medical treatments in Taiwan from around the world and from Mainland China. The promotion of globalized medical services and the medical branding of health care services are expected to open up new territories and connection for Taiwan to tap into more resources. The promotion strategies are 5-fold, as follows.

1. International Marketing: The aim is to strengthen Taiwan's international image, to boost Taiwan's medical care visibility, to actively open up markets overseas and in Mainland China for the promotion of the service models, and to develop co-operation channels.
2. Quality of Medical Care: The aim is to continue the improvement of quality control and monitoring, to improve the overall health image, and to ensure the balanced development of the health care industry and social equity.
3. Tourism Resources Integration: The aim is to strengthen the strategic cooperation between the tourism industry and the medical industry, to enhance the added value of linked health care, to strengthen the tourism infrastructure and information services, and to improve the quality of travel.
4. Complementary Policies: The aim is to simplify immigration procedures for foreigners to improve their willingness to come to Taiwan for medical treatment, to continue the review and loosening of related legal restrictions, and to facilitate the creation of a sound industry environment.
5. Cross-sector Coalitions: The aim is to construct cross-sector cooperation models among tourism industry, hotel industry, airline industry, insurance industry at home and abroad, to extend the value chain of medical services and value added services for all-around services, and to build an industry business operation model.

Part X Medical Science and Technology Research



Part X. Medical Science and Technology Research

In 2009, the DOH employed a total of 5,750 people in the fields of medical health, pharmaceuticals, food, and bio-technology research. These programs include "National Science and Technology Research Project", "Priority Science and Technology Projects", and "General Science and Technology Research Projects" with the total budget of NT$ 5.089 billion, which is an 8% increase compared to the budget of NT$ 4.709 billion in 2008 (see Figure 10-1).

Chapter 1, Priority Science and Technology Projects

1. Integration of Substance Addiction Project

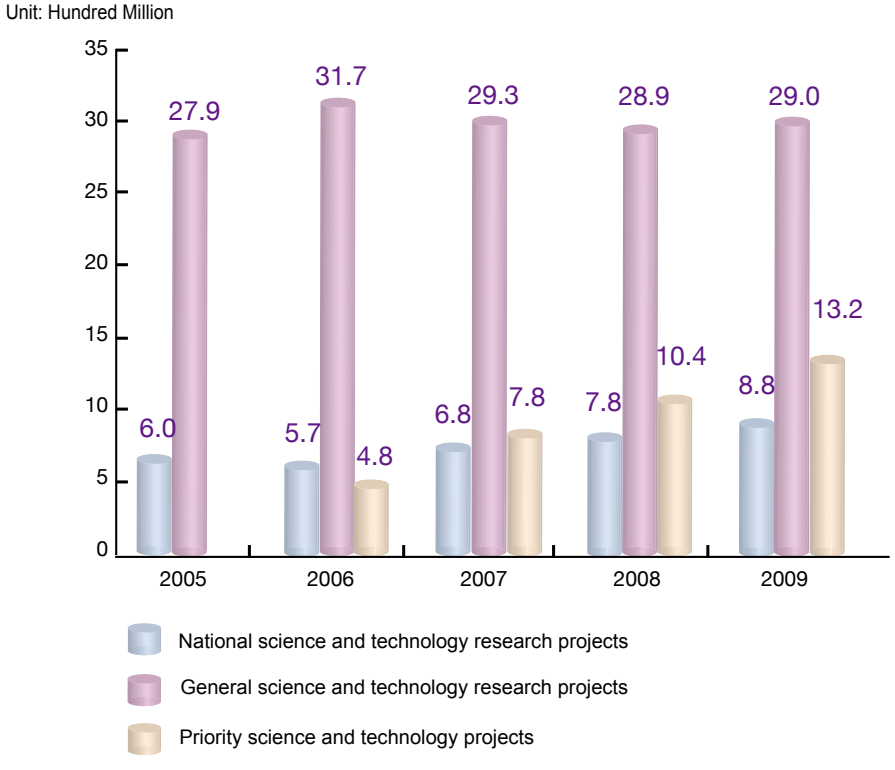
1) Mass spectrometry was employed to establish a mechanism for identification of new amphetamine-type drugs.

2) The DOH published addiction-related substances and manuals for the prevention campaigns of adolescent drug abuse and set up the "Drug Abuse Prevention Learning Network" website (http://vlab.tmu.edu.tw/VDASS2009) to provide information for the public to use as a reference regarding drug abuse prevention policies and educational counseling.

2. Food Safety and Nutrition Research Projects

The DOH completed the examinations for insecticide residues from commercial agricultural products, animal drug residues in food, labeling of genetically modified food, vegetarian food adulterated with animal ingredients, aflatoxin, and heavy metals, with a

Figure 10-1 Allocation of Funds for Science and Technology Research



total of 248 items subjected to quality inspection. The DOH continued to establish the traceability system for 10 various classes of processed food.

3. The Bio-Medical Technology Island Program

1) The Establishment of Excellence for Clinical Trials and Research System: The National Center of Excellence for Clinical Trial and Research at the National Taiwan University Hospital co-established a clinical research center with internationally renowned pharmaceutical companies , including GSK, Novartis, Boehringer Ingelheim and Pfizer. The Centers of Excellence for Clinical Trial and Research of National Cheng Kung University Hospital, National Defense Medical Center and Wanfang Hospital with respective specialties in tumor, cancer, stroke and brain trauma cooperated with universities in Sydney, Australia, UCSD in the United States, University of Michigan, the Mayo Clinic and Ohio State University, and the prestigious Catholic Medical Center in South Korea to conduct clinical trials and researches in cervical cancer, liver cancer, breast cancer, and dentistry.

2) The aim of the DOH's project of "Establishment of Taiwan Biobank: proposal for preparatory phase" is to achieve a balance between establishment of genomic biomedical research and protection for participants' right.

Chapter 2, General Science and Technology Research Projects

1. Projects on Science and Technology Research Policies in Medical Health

The DOH completed the telephone surveys in subjects of "Health Hazard Behavior Monitoring," "Smoking Behavior in Adults," "Percentage of Breast-feeding and Related Impact Factors" for the use as references for health policymaking.

2. Projects on the Science and Technology Research Policies in Pharmaceuticals

1) The sesquiterpenes extracts of natural plant asafetida were found to have antiviral activity against Type A influenza virus (H1N1). The results have been published in the internationally authoritative Journal of Natural Products and have also gained attention from the World Health Organization (WHO).

2) The traditional Chinese medicine San Huang Xie Xin Tang and composite gentian drugs containing coptisine were found to have good inhibitory effects on Type A influenza virus (H1N1) to reduce the damage of the virus to the host cell.

Chapter 3, National Science and Technology Research Projects

1. National Research Program for Genomic Medicine—Research on Medical Health Service Applications

A new cancer metastasis pathway of the p53 tumor suppressor gene was found, which was

deemed to be the main mechanism of the development of lung cancer and metastasis. It is an important target for the treatment of lung cancer. The results were published in the top international leading journal: Nature Cell Biology (impact factor of 17.776).

2. National Science and Technology Projects for Biotechnology and Pharmaceuticals-Promotion of Clinical Trial and Translational Medicine

   1) A number of the carbohydrate-binding domains of proteins associated with high correlation to endometriosis were screened for the design of antigen and antibody. The results have been patented in Taiwan. And these findings will contribute to the development of serum diagnostic reagents for endometriosis.

   2) The low dose with high antigenic "attenuated recombinant BCG vaccine strain" was found to produce improved efficacy in bladder cancer immune therapy. The results have been patented in the United States. Further research will be carried out to continuously develop the recombinant BCG vaccine for tumor treatments.

3. National Nano Science and Technology Project—Application of Nanotechnology in Biomedicine and Relevant Legal Regulations

The DOH completed the Nano Food Knowledge Network and FAQ (http://140.11289.45/nanofood) to provide the public with a wealth of basic reference information on nano food products to understand nanotechnology relating information around the world and to reduce unnecessary misunderstanding and panic on this new technology.

Chapter 4, Research Projects of the National Health Research Institute

The National Health Research Institutes (NHRI) conducts research on medical health, biomedical technology, and pharmaceuticals, as well as on the development of biological agents and products derived from medical engineering. NHRI also offers resources and services related to biomedical research. Some of NHRI's major achievements in 2009 are as follows.

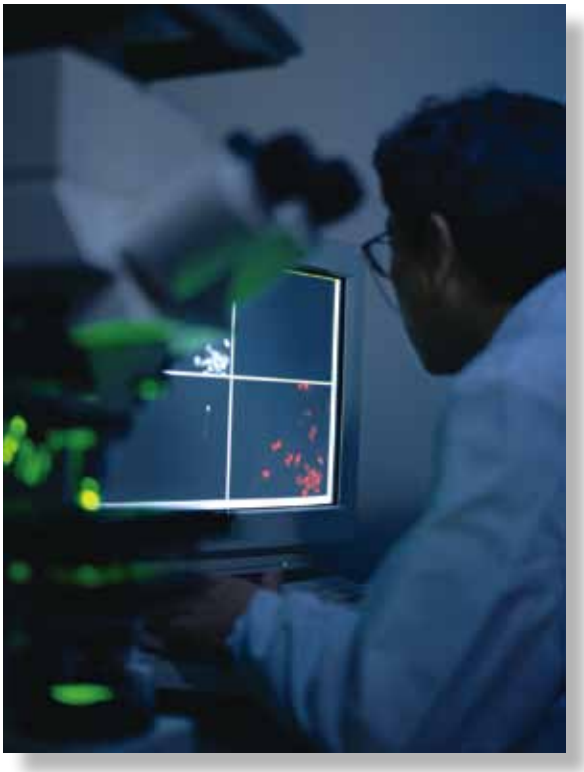
1. Translational Cancer Research

   1) NHRI jointly established the Early-Phase Clinical Trial Center with National Cheng Kung University Hospital. The center is dedicated to phase I and II clinical trials of new anti-cancer drugs to improve the quality care of cancer patients.

   2) Rapamycin in combination with standard chemotherapeutic agents such as Carboplatin improves the efficiency of ovarian cancer treatment.

2. New Drug Discovery

   1) Anti-cancer drug development: Using aurora A & B kinases and epidermal growth factor receptor (EGFR) kinase inhibitors as molecular targets, several potential lead



compounds of anticancer drug targets have been found.

2) Anti-metabolic disease drug discovery: Anti-diabetic drug candidate DBPR108P has undergone preclinical studies and is expected to enter human clinical Phase I trials.

3) Anti-viral drug discovery: Oral anti-hepatitis C lead compounds have been confirmed to exhibit significant anti-hepatitis C viral activity.

3. Molecular and Genomic Medicine Research

1) The *Cisd2* gene located on human chromosome 4q has been shown to determine human premature aging and regulate aging and longevity in mammals. This finding will be of immense assistance in the development of anti-aging and life-prolonging medical treatments.

2) Cigarettes smoking has been found to be associated with the DNA repair gene hOGG1. Smokers with Cys/Cys genotype who smoke more than 40 packs of cigarettes per year have 3.6 more times the risk of developing lung cancer than those carrying the Ser/Ser genotype.

4. Translational Medicine on Infectious Diseases

Studies found that extended-spectrum beta-lactamase-producing Klebsiella pneumoniae (ESBL) is resistance to beta-lactam and aminoglycoside. This warrants attentions from those involved in infectious disease control in Taiwan and the rest of the world.

5. Mental Health and Addiction Medicine Research

A gene-dose statistical model has been applied in the analysis of CYP2C19 polymorphism to predict the blood concentration of antidepressant escitalopram (ECIT).

6. Translational Medicine on Aging Syndrome

1) The risk factors for hip fracture in the elderly have been investigated. The findings

showed that women with lower milk intake, lower peak flow rate, weaker hand grip strength, and lower bone density are prone to suffer from hip fractures. On the other hand, men with poor cognitive functions and lower bone density have higher risks of hip fracture.

2) The pathogenesis and mechanism study of osteoarthritis in aging indicates that the accumulation of advanced glycation end product (AGE) in the cartilage leads to cartilage breakdown. This might be used as a potential target in OA therapy and prevention.

7. Environmental Health and Occupational Medicine Research

1) Gene polymorphism has been found to influence the human metabolism of arsenic, but it does not affect the cytotoxicity of vascular endothelial cell.

2) Sidestream smoke extract from second-hand smoke contains estrogen-like effects, where smoke particles and estrogen

receptor ER α exhibited an additive effect.

3) The calculation of lifetime cancer risk from arsenic exposure has been completed, suggesting that arsenic in urine should be below 35μg/L in order to achieve an acceptable lifetime cancer risk level. Another study found that smokers in high arsenic exposure area have a higher risk of developing lung cancer.

8. Translational Medicine on Cardiovascular Medicine

1) Stem cell research on adult hair follicle will help in understanding hair-loss disorder and wound healing in humans.

2) Rosiglitazone has been found to protect against ischemia-reperfusion injury.

3) Examination of knockout mice that are deficient in ApoE alone or both deficient in both ApoE and CRP2 fed on a high-fat diet has demonstrated CRP2 is associated with vascular disease as the atherosclerotic lesions in the latter are move advanced and complex.

9. Immunology Research

1) Through tissue culture, transgenic techniques and the RNA interference approach, the GLK kinase (MAP4K3) has been found to positively regulate T cell activation; mouse models further confirmed its in vivo function.

2) The focal adhesion protein (FAK) has been found to be activated in JKAP phosphatase (DUSP22) knockout mice, which consequently affects the migration of lung cancer cells.

3) Serum-free cell culture methods has been developed for new influenza H5N1 vaccine production, which is currently undergoing phase I clinical trials.

10. Nanomedicine Research

Studies have demonstrated the inhibitory effect of Ferucarbotran (Resovist), an ionic superparamagnetic iron oxide (SPIO) nanoparticle on osteogenic differentiation and its signaling mechanism in human mesenchymal stem cells (hMSCs). The MRI image of Resovist-labeled hMSCx indicates high labeling efficiency and long-term imaging ability.

Appendix

Appendix 1 Health Indicators

Table1 Population Statistics

Year	Total Population	Population Composition			Dependent population index	Sex Ratio (men per 100 women)	Crude Birth Rate (CBR)	Crude Death Rate (CDR)	Natural Increase Rate (NIR)	Life Expectancy			Population Density (Persons/ ㎢)
		Aged under 15	Aged 15-64	Aged over 65						Total	Male	Female	
	(1,000 persons)	%	%	%	%		‰	‰	‰	Years	Years	Years	
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	77.90	74.86	81.41	632
2007	22,958	17.56	72.24	10.21	38.43	102	8.92	6.16	2.76	78.38	75.46	81.72	634
2008	23,073	16.95	72.62	10.43	37.70	102	8.64	6.25	2.40	78.57	75.59	81.94	637
2009	23,120	16.34	73.03	10.63	36.93	101	8.29	6.22	2.07	79.01	76.03	82.34	639

Notes: 1.Economic growth rate is calculated by actual GDP. 2.(f) deontes estimates.
Source: Department of Statistics, Ministry of the Interior.

Table 2 Health and Medical Expenditures

Year	Annual Economic Growth Rate	Per Capita GDP	Private Final Consumption on Health Care Expenditure		
				% of GDP	% of Private Consumption
	%	USD $	NTD $ million	%	%
1995	6.4	12,918	297,442	4.09	7.15
1996	5.5	13,428	337,254	4.27	7.36
1997	5.5	13,810	373,197	4.35	7.51
1998	3.5	12,598	409,417	4.45	7.65
1999	6.0	13,585	445,716	4.62	7.87
2000	5.8	14,704	468,162	4.60	7.82
2001	-1.7	13,147	490,076	4.94	8.13
2002	5.3	13,404	525,273	5.05	8.42
2003	3.7	13,773	552,375	5.16	8.63
2004	6.2	15,012	594,186	5.23	8.73
2005	4.7	16,051	626,961	5.34	8.84
2006	5.4	16,491	645,441	5.27	8.90
2007	6.0	17,154	679,179	5.26	9.05
2008	0.7	17,399	708,184	5.61	9.31
2009	-1.9	16,353	741,037	5.94	9.78

Source: Annual Financial Report, Ministry of Finance.

Net Government Expenditures (Fiscal Year)	Health Expenditures as % of Net Government Expenditures	National Health Expenditure of DOH and Affiliated Organizations as % of Total Central Government Expenditures (Fiscal Year)	National Health Expenditure as % of GDP	Consumer Price Indices	Medical Care Price Indices
NTD $ million	%	%	%	Year 2006 = 100	
1,910,066	1.53	0.85	5.25	89.58	76.32
1,843,786	1.57	0.78	5.36	92.33	77.60
1,878,764	1.51	0.79	5.35	93.17	79.44
1,992,593	1.37	0.66	5.43	94.73	80.18
2,050,004	1.31	1.15	5.60	94.90	82.96
3,140,936	1.28	0.85	5.53	96.09	86.08
2,271,755	1.17	1.07	5.88	96.08	87.23
2,144,994	1.29	1.10	5.96	95.89	88.36
2,216,514	1.54	1.14	6.15	95.62	91.29
2,245,047	1.48	1.15	6.20	97.17	93.09
2,291,999	1.22	1.11	6.24	99.41	96.80
2,214,226	1.39	1.44	6.25	100.00	100.00
2,290,169	1.42	1.61	6.16	101.80	103.91
2,343,585	1.47	1.30	6.45	105.39	106.17
2,670,898	1.34	1.59	6.87	104.47	106.81

Table 3 Medical Facilities

Year	Medical Care Institutions											
		Hospitals							Clinics			
			Western Medicine			Chinese Medicine				Western Medicine	Chinese Medicine	Dentistry
				Public	Private		Public	Private				
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
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	3,006	6,065
2007	19,900	530	507	79	428	23	1	22	19,370	10,197	3,069	6,104
2008	20,174	515	493	79	414	22	1	21	19,659	10,326	3,160	6,173
2009	20,306	514	496	79	417	18	1	17	19,792	10,361	3,217	6,214

Source: Office of Statistics, Department of Health

Primary Health Care Units					No. of Beds				
	Health Stations					No. of Beds in Hospitals			No. of Observation Beds in Clinics
	Taiwan Province	Taipei City	Kaohsiung City	Kinmen and Matsu			Public	Private	
No.	No.	No.	No.	No.	Beds	Beds	Beds	Beds	Beds
369	338	12	11	8	112,379	101,430	39,922	61,508	10,949
369	338	12	11	8	114,923	104,111	40,125	63,986	10,812
369	338	12	11	8	121,483	108,536	41,421	67,115	12,947
369	338	12	11	8	124,564	111,941	42,838	69,103	12,623
369	338	12	11	8	122,937	110,660	39,440	71,220	12,277
369	338	12	11	8	126,476	114,179	40,129	74,050	12,297
363	332	12	11	8	127,676	114,640	39,670	74,970	13,036
363	332	12	11	8	133,398	119,847	41,904	77,943	13,551
372	340	12	12	8	136,331	121,698	42,777	78,921	14,633
372	339	12	12	9	143,343	127,667	43,865	83,802	15,676
372	339	12	12	9	146,382	129,548	44,273	85,275	16,834
372	339	12	12	9	148,962	131,152	44,076	87,076	17,810
372	339	12	12	9	150,628	131,776	44,873	86,903	18,852
372	339	12	12	9	152,901	133,020	45,450	87,570	19,881
371	339	12	12	8	156,740	134,716	45,913	88,803	22,024

Table 3 Medical Facilities (Continued)

Year	Per 10,000 population							
	No. of Beds in Hospitals							Clinics
	Beds	Acute general beds	Acute psychiatric beds	Chronic general beds	Chronic psychiatric beds	Special beds	Hemodialysis beds	
	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds
1995	52.78	30.12	1.22	2.38	5.01	7.16	1.76	5.13
1996	53.39	30.61	1.59	2.18	4.49	7.60	1.90	5.02
1997	55.87	30.46	1.73	2.38	4.71	8.58	2.06	5.95
1998	56.80	30.98	1.80	2.29	5.11	8.76	2.10	5.76
1999	55.65	30.84	2.10	2.28	3.93	8.63	2.32	5.56
2000	56.77	31.03	2.25	2.40	4.38	8.61	2.59	5.52
2001	56.99	30.27	2.27	2.17	4.44	9.24	2.77	5.82
2002	59.24	30.89	2.37	2.19	4.70	10.13	2.93	6.02
2003	60.31	30.77	2.46	1.91	4.89	10.74	3.08	6.47
2004	63.18	31.87	2.59	1.95	5.13	11.55	3.19	6.91
2005	64.29	31.80	2.64	1.94	5.51	11.75	3.26	7.39
2006	65.12	31.88	2.65	1.83	5.71	11.87	3.39	7.79
2007	65.61	31.94	2.77	1.75	5.78	11.52	3.48	8.21
2008	66.37	31.87	2.86	1.71	5.93	11.69	3.53	8.63
2009	67.79	32.06	2.92	1.68	5.95	15.50	3.57	9.53

Source: Office of Statistics, Department of Health

Table 4 No. of Medical Personnel in Practice

Year	No. of Praciting Medical Care Personnel						
		Physicians (Western Medicine)	Physicians (Chinese Medicine)	Population Served per Physician (including Chinese Medicine Doctors)	Dentists	Population Served per Dentist	Pharmaceutical Personnel
	No.	No.	No.	No.	No.	No.	No.
1995	118,242	24,465	3,030	777	7,026	3,040	19,224
1996	123,829	24,790	2,992	775	7,254	2,967	19,667
1997	137,829	25,730	3,299	749	7,573	2,871	21,246
1998	144,070	27,168	3,461	716	7,900	2,776	22,761
1999	152,385	28,216	3,546	696	8,240	2,681	23,937
2000	159,212	29,585	3,733	669	8,597	2,591	24,404
2001	165,855	30,562	3,979	649	8,944	2,505	24,891
2002	175,444	31,532	4,101	632	9,206	2,446	25,355
2003	183,103	32,390	4,266	617	9,551	2,367	25,033
2004	192,611	33,360	4,588	598	9,868	2,299	26,079
2005	199,734	34,093	4,610	588	10,141	2,245	26,750
2006	206,959	34,899	4,743	577	10,412	2,197	27,412
2007	214,748	35,849	4,862	567	10,740	2,138	28,040
2008	223,623	37,142	5,112	545	11,093	2,077	28,741
2009	233,553	37,880	5,290	536	11,351	2,037	29,587

Source: Office of Statistics, Department of Health.

Table 4 No. of Medical Personnel in Practice (Continued)

Year	Population Served per Pharmaceutical Personnel	Nursing Personnel	Population Served per Nursing Personnel	Medical Technologists (Including Assistants)	Medical Radiology Technologists (including Technicians)	Dietitians
	No.	No.	No.	No.	No.	No.
1995	1,111	57,585	371	4,722	1,793	298
1996	1,094	62,268	346	5,034	1,453	293
1997	1,023	70,447	309	5,389	2,266	515
1998	963	71,919	305	5,583	2,485	575
1999	923	76,252	290	6,015	2,500	656
2000	913	79,734	279	6,230	2,761	743
2001	900	83,281	269	6,542	3,152	778
2002	888	90,058	250	6,725	3,410	845
2003	903	95,747	236	7,055	3,557	895
2004	870	101,924	223	7,122	3,704	978
2005	850	105,183	216	7,323	3,880	1,056
2006	835	109,521	209	7,457	4,052	1,137
2007	819	114,179	201	7,642	4,211	1,239
2008	802	119,093	193	7,896	4,443	1,379
2009	781	125,081	184	8,203	4,651	1,563

Source: Office of Statistics, Department of Health.

Table 5 Pharmaceutical Affairs

Year	No. of Pharmaceutical Units									
		Pharmacies			Medicine Dealers			Pharmaceutical Manufacturers		
			Owned and Operated by Pharmacists	Owned and Operated by Assistant Pharmacists	Western Medicines	Chinese Medicines	Medicial Devices	Western Medicines	Chinese Medicines	Medicial Devices
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
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	129	632
2007	59,061	7,381	4,663	2,718	6,848	12,505	31,280	244	121	682
2008	58,834	7,215	4,628	2,587	6,630	12,234	31,650	245	111	749
2009	58,524	7,450	4,902	2,548	5,370	11,481	32,963	280	134	846

Notes: No. of pharmacies in 2009 includes 2,797 retail stores selling Chinese medicine besides Western medicine.
Source: Office of Statistics, Department of Health.

Table 6 Food Sanitation

Year	Laboratory Testing for Food Sanitation		Inspections for Food Sanitation Establishments				
		Disqualification ratio		Disqualified			
				Under Supervision or To Be Improved		Fined	
	Piece	%	Store	Store	%	Store	%
1995	40,410	10.51	237,189	20,390	8.60	1,316	0.55
1996	38,475	10.11	210,942	22,229	10.54	2,903	1.38
1997	38,606	10.49	197,042	16,582	8.42	1,051	0.53
1998	38,141	8.72	179,485	16,821	9.37	1,035	0.58
1999	37,773	8.09	181,818	19,020	10.46	37	0.02
2000	67,020	4.42	181,865	20,363	11.20	152	0.08
2001	34,907	8.56	166,195	20,069	12.08	104	0.06
2002	33,971	8.57	158,583	15,978	10.08	69	0.04
2003	36,220	10.06	177,102	15,525	8.77	104	0.06
2004	37,158	6.89	150,698	13,426	8.91	118	0.08
2005	39,395	6.36	182,575	15,218	8.34	51	0.03
2006	39,539	-	165,208	24,376	14.75	108	0.07
2007	38,729	-	156,794	27,769	17.71	94	0.06
2008	43,545	6.04	143,779	34,177	23.77	65	0.05
2009	38,770	6.84	150,675	32,463	21.55	92	0.06

Source: Office of Statistics, Department of Health.

Inspections for Food Sanitation Establishments				Incidents of Food Poisoning		
Disqualified						
Suspended		Transferred to Court			No. of Cases	No. of Deaths
Store	%	Store	%	Piece	Person	Person
6	0.00	-	-	123	4,950	-
95	0.05	-	-	178	4,043	-
29	0.01	-	-	234	7,235	1
34	0.02	-	-	180	3,951	-
10	0.01	-	-	150	3,112	1
8	0.00	-	-	208	3,759	3
59	0.04	-	-	178	2,955	2
9	0.01	-	-	262	5,566	1
8	0.00	-	-	251	5,283	-
10	0.01	-	-	274	3,992	2
5	0.00	-	-	247	3,530	1
19	0.01	6	0.00	265	4,401	-
11	0.01	4	0.00	240	3,223	-
81	0.06	6	0.00	269	2,921	-
18	0.01	6	0.00	351	4,644	-

Table 7 National Health Insurance

Year	No. of Persons Under Social Insurance		No. of Outpatient Visits per 100 Insured Persons	No. of Inpatients per 100 Insured Persons	Average Costs Per Outpatient Visit (NTD$)	Average Costs Per Inpatient Care (NTD$)	Average Days of Hospital Stay
		As % of Total Population	National Health Insurance	National Health Insurance	National Health Insurance	National Health Insurance	National Health Insurance
	1000 Persons	%	No.	No.	No.	No.	No.
*1995	19,123	89.54	1,055.81	10.14	530	29,418	9.41
1996	20,041	93.11	1,360.89	11.72	549	31,935	9.03
1997	20,492	94.25	1,431.49	11.61	557	32,760	8.75
1998	20,757	94.66	1,499.66	11.83	588	34,851	8.78
1999	21,090	95.46	1,527.86	12.28	614	36,098	8.68
2000	21,401	96.07	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	97.11	1,451.80	13.47	707	39,160	9.05
2003	21,984	97.26	1,432.15	12.44	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
2007	22,803	99.32	1,480.50	13.02	857	50,809	10.02
2008	22,918	99.48	1,488.08	13.30	899	51,475	10.24
2009	23,026	99.59	1,548.47	13.66	914	51,374	10.18

Notes: * denotes that data was only avaiable from March to December in 1995.
Source: Bureau of National Health Insurance.

Table 8 Causes of Death

Year	All Causes		Malignant Neoplasms			Heart Diseases		
	No.of Deaths	Mortality per 100,000 population	Rank	No. of Deaths	Mortality per 100,000 population	Rank	No. of Deaths	Mortality per 100,000 population
1995	117,954	554.6	1	25,841	121.5	4	11,256	52.9
1996	120,605	562.5	1	27,961	130.4	4	11,273	52.6
1997	119,385	551.8	1	29,011	134.1	4	10,754	49.7
1998	121,946	558.5	1	29,260	134.0	3	11,030	50.5
1999	124,991	567.9	1	29,784	135.3	4	11,299	51.3
2000	124,481	561.1	1	31,554	142.2	3	10,552	47.6
2001	126,667	567.0	1	32,993	147.7	3	11,003	49.3
2002	126,936	565.1	1	34,342	152.9	3	11,441	50.9
2003	129,878	575.6	1	35,201	156.0	3	11,785	52.2
2004	133,679	590.3	1	36,357	160.5	2	12,861	56.8
2005	138,957	611.3	1	37,222	163.8	3	12,970	57.1
2006	135,071	591.8	1	37,998	166.5	3	12,283	53.8
2007	139,376	608.2	1	40,306	175.9	2	13,003	56.7
2008	142,283	618.7	1	38,913	169.2	2	15,726	68.4
2009	142,240	616.3	1	39,917	173.0	2	15,093	65.4

Year	Cerebrovascular Diseases			Pneumonia			Diabetes		
	Rank	No. of Deaths	Mortality per 100,000 population	Rank	No. of Deaths	Mortality per 100,000 population	Rank	No. of Deaths	Mortality per 100,000 population
1995	2	14,132	66.5	8	3,070	14.4	5	7,225	34.0
1996	2	13,944	65.0	8	3,200	14.9	5	7,525	35.1
1997	2	12,885	59.6	7	3,619	16.7	5	7,500	34.7
1998	2	12,705	58.2	7	4,447	20.4	5	7,532	34.5
1999	3	12,631	57.4	7	4,006	18.2	5	9,023	41.0
2000	2	13,332	60.1	8	3,302	14.9	5	9,450	42.6
2001	2	13,141	58.8	8	3,746	16.8	5	9,113	40.8
2002	2	12,009	53.5	7	4,530	20.2	4	8,818	39.3
2003	2	12,404	55.0	7	5,099	22.6	4	10,013	44.4
2004	3	12,339	54.5	6	5,536	24.4	4	9,191	40.6
2005	2	13,139	57.8	6	5,687	25.0	4	10,501	46.2
2006	2	12,596	55.2	6	5,396	23.6	4	9,690	42.5
2007	3	12,875	56.2	6	5,895	25.7	4	10,231	44.6
2008	3	10,663	46.4	4	8,661	37.7	5	8,036	34.9
2009	3	10,383	45.0	4	8,358	36.2	5	8,229	35.7

Notes: 1. Data have been coded in ICD-10 since 2008.
2. Chronic diseases of lower respiratory tract can only be found coded in the ICD-10 digit coding system.
Source: Office of Statistics, Department of Health.

Table 8 Causes of Death (Continued)

Year	Accidents			Chronic diseases of lower respiratory tract			Chronic liver diseases and cirrhosis		
	Rank	No. of Deaths	Mortality per 100,000 population	Rank	No. of Deaths	Mortality per 100,000 population	Rank	No. of Deaths	Mortality per 100,000 population
1995	3	12,983	61.1	-	4,017	18.9	6	4,456	21.0
1996	3	12,422	57.9	-	4,310	20.1	6	4,610	21.5
1997	3	11,297	52.2	-	4,457	20.6	6	4,767	22.0
1998	4	10,973	50.3	-	4,961	22.7	6	4,940	22.6
1999	2	12,960	58.9	-	5,046	22.9	6	5,180	23.5
2000	4	10,515	47.4	-	4,717	21.3	6	5,174	23.3
2001	4	9,513	42.6	-	5,159	23.1	6	5,239	23.5
2002	5	8,489	37.8	-	5,226	23.3	6	4,795	21.4
2003	5	8,191	36.3	-	5,192	23.0	6	5,185	23.0
2004	5	8,453	37.3	-	5,292	23.4	7	5,351	23.6
2005	5	8,364	36.8	-	5,484	24.1	7	5,621	24.7
2006	5	8,011	35.1	-	4,969	21.8	7	5,049	22.1
2007	5	7,130	31.1	-	4,914	21.4	7	5,160	22.5
2008	6	7,077	30.8	7	5,374	23.4	8	4,917	21.4
2009	6	7,358	31.9	7	4,955	21.5	8	4,918	21.3

Year	Suicide and Self Inflicted Injury			Nephritis, nephrotic syndrome and nephrosis		
	Rank	No. of Deaths	Mortality per 100,000 population	Rank	No. of Deaths	Mortality per 100,000 population
1995	11	1,618	7.6	7	3,519	16.6
1996	11	1,847	8.6	7	3,547	16.5
1997	10	2,172	10.0	8	3,504	16.2
1998	10	2,177	10.0	8	3,435	15.7
1999	9	2,281	10.4	8	3,474	15.8
2000	9	2,471	11.1	7	3,872	17.5
2001	9	2,781	12.5	7	4,056	18.2
2002	9	3,053	13.6	8	4,168	18.6
2003	9	3,195	14.2	8	4,306	19.1
2004	9	3,468	15.3	8	4,680	20.7
2005	9	4,282	18.8	8	4,822	21.2
2006	9	4,406	19.3	8	4,712	20.7
2007	9	3,933	17.2	8	5,099	22.3
2008	9	4,128	17.9	10	4,012	17.5
2009	9	4,063	17.6	10	3,999	17.3

Notes: 1. Data have been coded in ICD-10 since 2008.
2. Chronic diseases of lower respiratory tract can only be found coded in the ICD-10 digit coding system.
Source: Office of Statistics, Department of Health.

Table 9 International Comparison

Year	Life Expectancy												Crude Birth Rate					
	Taiwan		Japan		US		Germany		UK		South Korea		Taiwan	Japan	US	Germany	UK	South Korea
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female						
	Years	Years	Years	Years	Years	Years	Years	Years	Years	Years	Years	Years	‰	‰	‰	‰	‰	‰
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	78.0	77.0	83.6	73.1	79.1	73.6	79.9	74.3	79.5	70.1	77.8	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	70.6	78.1	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	71.1	78.5	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	72.3	79.6	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	73.4	80.5	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	73.9	80.8	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	74.5	81.4	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	75.1	81.9	9.1	8.4	13.9	8.4	12.0	9.0
2006	74.9	81.4	78.0	84.7	75.0	80.8	75.8	82.0	76.1	81.1	75.7	82.4	9.0	8.7	14.2	8.2	12.4	9.2
2007	75.5	81.7	79.2	86.0	76.0	81.0	77.4	82.7	77.0	82.0	76.1	82.7	8.9	8.7	14.3	8.3	12.8	10.0
2008	75.6	81.9	79.0	86.0	76.0	81.0	77.0	83.0	78.0	82.0	76.0	83.0	8.6	8.7	14.3	8.3	-	9.4
2009	75.9	82.5	-	-	-	-	-	-	-	-	-	-	8.3	-	-	8.1	-	9.0

Source: The WHO and the OECD website.

Appendix 2 Number of Notifiable Diseases

Table 1 Number of Confirmed Cases of Acute Infectious Diseases, 2009

Category	Disease	Total	Indigenous	Imported
I	Smallpox	0	0	0
	Plague	0	0	0
	SARS	0	0	0
	Rabies	0	0	0
	Anthrax	0	0	0
	H5N1 Influenza	0	0	0
II	Diphtheria	0	0	0
	Typhoid Fever	80	16	64
	Dengue Fever	1,052	848	204
	Meningococcal Meningitis	2	2	0
	Paratyphoid Fever	6	2	4
	Poliomyelitis	0	0	0
	Acute Flaccid Paralysis	45	45	0
	Shigellosis	91	39	52
	Amoebiasis	190	122	68
	Malaria	11	0	11
	Measles	48	39	9
	Acute Hepatitis A	234	210	24
	Enterohaemorrhagic E. coli Infection	0	0	0
	Hemorrhagic Fever with Renal Syndrome	0	0	0
	Hantavirus Pulmonary Syndrome	0	0	0
	Cholera	3	3	0
	Rubella	23	15	8
	Chikungunya Fever	9	0	9
	West Nile Fever	0	0	0
	Epidemic Typhus Fever	0	0	0
III	Pertussis	90	90	0
	Tetanus *	12	-	-
	Japanese Encephalitis	18	17	1
	Congenital Rubella Syndrome	0	0	0
	Acute Hepatitis B	152	146	6
	Acute Hepatitis C	131	131	0
	Acute Hepatitis D	1	1	0
	Acute Hepatitis E	9	5	4
	Acute Hepatitis Unspecified	18	18	0
	Mumps *	1,068	-	-
	Legionellosis	84	82	2
	Invasive Haemophilus Influenzae Type b Infection	14	14	0
	Neonatal Tetanus	0	0	0
	Enteroviruses Infection with Severe Complications	29	29	0

Table 1 Number of Confirmed Cases of Acute Infectious Diseases, 2009 (Continued)

Category	Disease	Total	Indigenous	Imported
Ⅳ	Herpesvirus B Infection	0	0	0
	Leptospirosis	203	201	2
	Melioidosis	44	44	0
	Botulism	1	1	0
	Invasive Pneumococcal Disease	690	689	1
	Q Fever	89	89	0
	Endemic Typhus Fever	40	38	2
	Lyme Disease	0	0	0
	Tularemia	0	0	0
	Scrub Typhus	353	352	1
	Varicella＊	10,931	-	-
	Cat-Scratch Disease	26	26	0
	Toxoplasmosis	7	7	0
	Severe Complicated Influenza Case	1,134	1,127	7
Ⅴ	Rift Valley Fever	0	0	0
	Marburg Haemorrhagic Fever	0	0	0
	Yellow Fever	0	0	0
	Ebola Haemorrhagic Fever	0	0	0
	Lassa Fever	0	0	0

Notes: 1. The classification of notifiable diseases was announced on October 9, 2007, and amended on October 24, 2008 and June 19, 2009.
2. Data were obtained on May 1, 2010.
3. Data were analyzed by the onset dates.
4. ＊Calculation for Tetanus, Mumps and Varicella was based on the reported data without specimen collection. A further epidemiological investigation wasn't performed in all cases where infection was confirmed.

Table 2 Number of Confirmed Cases of Chronic Infectious Diseases, 2009.

Category	Diseases	No. of Confirmed Cases
Ⅱ	MDR-TB	181
Ⅲ	Smear- positive Tuberculosis	5,211
	Other Tuberculosis	8,110
	HIV Infection	1,648
	Hansen's Disease	7
	Syphilis	6,668
	Gonorrhea	2,137
Ⅳ	Creutzfeldt-Jakob Disease	3

Notes: 1. The number of confirmed tuberculosis cases was cumulated according to the date of notification whereas the number of confirmed MDR-TB cases was cumulated according to the date of registration.
2. Data were obtained on May 1, 2010.

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