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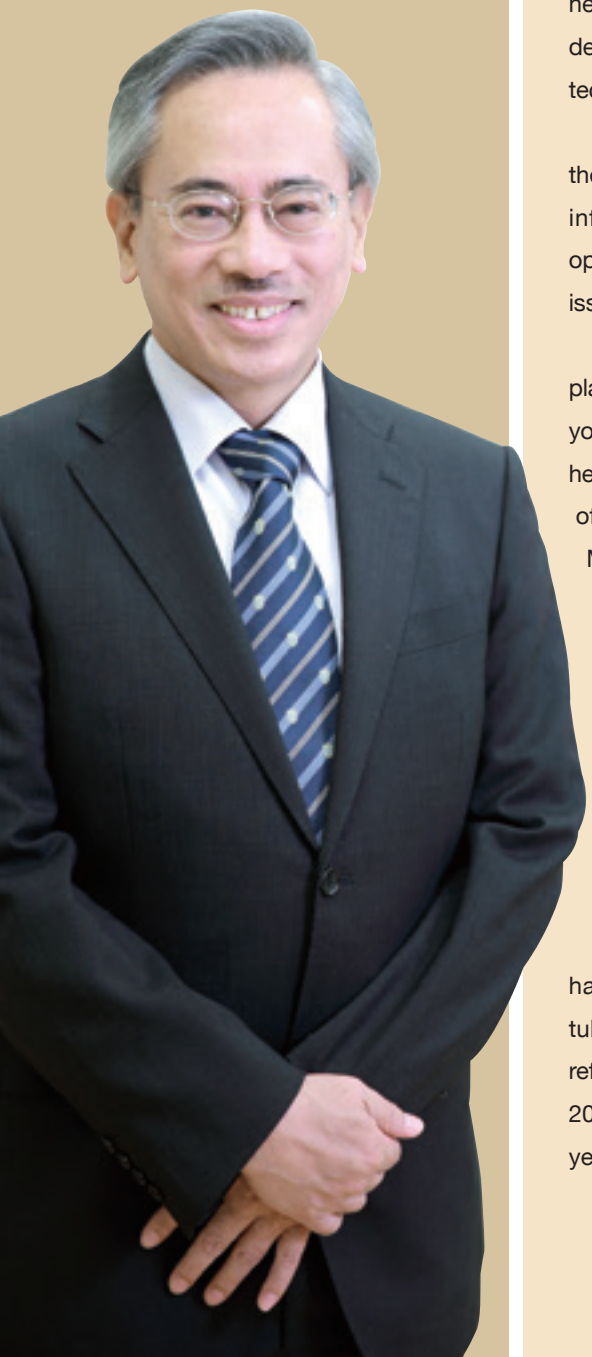
2013 Taiwan Public Health Report

Ministry of Health and Welfare R.O.C. (Taiwan)

2013
Taiwan Public Health Report

Minstry of Health and Welfare, R.O.C. (Taiwan)

Foreword 》



The Department of Health of the Executive Yuan was established 42 years ago on March 17, 1971. In the face of dramatic demographic and social changes in Taiwan, the Department of Health, so as to better care for the physical, mental and social well-beings of the nation's people, was reorganized to become the Ministry of Health and Welfare (MOHW) on July 23, 2013 under the Executive Yuan's reorganization plan. The MOHW is now responsible for all matters related to the nation's health and social welfare, including social insurance, social relief and aid, care for victims of domestic violence and sexual assault, medical professional and medical system planning, nursing and long-term care, healthcare for the indigenous peoples of Taiwan and residents of offshore islands, mental health services, prevention of mental illness and substance abuse, research and development of traditional Chinese herbal medicines, oral health and medical care, technological development and international cooperation.

To fully inform the public about the 2012 operations of the MOHW (formerly, the Department of Health, the Executive Yuan), the 2012 annual report providing information about the public health situation in Taiwan, about government operations in this sector and about concrete achievements in these areas is being issued in 2013.

In order to increase participation from the entire population, we have actively planned health promotion policies for pregnant women, babies, toddlers, children, youths, the middle-aged and the elderly, as well as women. In order to protect the hearing of the newborns, on March 7, 2012, the MOHW announced a program to offer hearing screenings for all babies three months or younger, born on or after March 15, 2012 in Taiwan. By the end of the year, a system to facilitate these screenings had been set up at 309 hospitals, for a coverage rate of 95.9%. With regard to policies aiming at tobacco control, in March of 2012, the MOHW launched its second-generation of policies aiming at smoking cessation, subsidizing smoking-cessation medications under the same scale that applies to purchasing medicine under the National Health Insurance program, and giving low-income persons as well as the indigenous peoples in Taiwan and residents of offshore islands completely free access to those medications, so as to reduce the economic pressures associated with quitting smoking.

Thanks to national efforts, the number of tuberculosis cases in Taiwan has been steadily declining. Taking into account current assessments of the tuberculosis situation and the results of previous efforts, as well as by making reference to the World Health Organization's "The Global Plan to Stop TB 2006-2015," the MOHW drew up a plan to cut the rate of TB in Taiwan by half in ten years. It anticipates that via the TB control strategy of DOTS (directly observed

treatment, short-course) along with fully implementing a plan to test those who have come into contact with TB patients, it will be able to meet the goal of slashing the rate of TB in Taiwan in half by 2015. What's more, as a preventative measure to be taken during the high flu season, beginning on December 1, 2012, it expanded eligibility for obtaining publicly financed antiviral treatments. Now all of those who have had an elevated temperature for 48 hours or who have family members, colleagues or classmates suffering from flu-like symptoms will be eligible.

In order to firmly implement control over food sources, beginning in 2005, Taiwan has been gradually putting into practice HACCP food safety standard operating procedures. In 2012, the dairy processing and boxed lunch industries were all made subject to inspections under these protocols. To ensure the safety of food for the nation's citizens, beginning on May 8, 2012, all food manufacturers have been required to establish a food safety control team with at least one member possessing a food technical specialist license. What's more, at the 35th Pharmaceutical Inspection Convention and Co-operation Scheme (PIC/S) Committee Meeting in Kiev in 2012, Ukraine, Taiwan was formally made the organization's 43rd member state. That development has given Taiwan access to international pharmaceutical safety data and has raised the international competitiveness of Taiwan's pharmaceutical industry.

The implementation of the universal health insurance in Taiwan has provided access to good medical care for many poor and disadvantaged members of the society, making the national health insurance system one of the most important strands in Taiwan's social safety network. In order to ensure the financial sustainability of the national health insurance system, an amendment to the National Health Insurance Act, which was officially promulgated by the President on January 26, 2011, went into effect on January 1, 2013. Among other things, it is aimed at controlling medical expenditures, reducing improper medical treatments, and establishing a mechanism that ties expenditures to revenue, so that the national health insurance system can continue to move forward sustainably on a strong financial footing.

At the end of 2011, those over 65 years comprised 11.15% of the national population. As the population ages, the people of Taiwan will have a growing need for long-term care. In order to develop a long-term care system, MOHW has been actively carrying out planning for a long-term care service network and a "Long-Term Care Services Act," as well as devising a plan for long-term care insurance.

With growing international economic exchange, trade and tourism, the promotion of international health work and medical services has already become a global trend. In May 2005, Taiwan attended the world Health Assembly in the capacity of an observer, and it has been actively providing health-related foreign aid and has engaged in international exchange and cooperation in the field. What's more, it has been actively promoting the internationalization of medical services, effectively leveraging the nation's skills and quality in medical services, as well as raising the international competitiveness of Taiwan's medical services industry.

It was a busy year for the MOHW. Since the Ministry of Health and Welfare was established, we have been holding fast to an administrative vision of "implementing quality, raising efficiency, increasing equality of access to resources, caring for the disadvantaged, providing for the wellbeing of society, and feeding back to the international community." The MOHW has continually engaged in self-examination in order to improve, and it has kept abreast of modern developments in the hope that by firmly implementing its programs and reforms, it will usher in a new era for the health and social welfare of the nation's people.

Minister of Health and Welfare

2013 TAIWAN PUBLIC

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1 Health Policies

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Globalization is a challenge that countries around the world are facing, to improve international competitiveness, It is critical that the government devotes itself to structural changes that raise effectiveness. When reviewing government organization, adherence must be paid to the principles of streamlined performance, flexibility, and efficacy. Taiwan must confront population structural changes owing to aging, a low birth rate, and an increase in new immigrants while improving long-term care services, senior health care and welfare, childrearing, women's rights, and social insurance and assistance. Resources will only be sufficient for achieving these goals if they are distributed more efficiently and usage takes overall circumstances into account.

In order to integrate health and welfare resources, on July 23, 2013, the Ministry of Health and Welfare (hereinafter referred to as the "MOHW") was formally established. It merged the Department of Health with the Ministry of the Interior's Department of Social Affairs, Children's Bureau, National Pension Supervisory Commission, and Domestic Violence and Sexual Assault Prevention Committee. The joint management of policy planning and evaluation related to public health and social welfare has created a comprehensive mechanism that can lead to the ultimate goal of holistic care.

Chapter 1, Administrative Goal Highlights

In accordance with the Executive Yuan's 2012 policy directions, in coordination with the medium term policy plan and approved budget, and on the basis of the current social situation and future requirements, the 2011 policy plan has been set; its objectives and key points are:

1. Improvements to Health Care and Development of Long-Term Care Resources: Build a complete health and medical care system that promotes the rational allocation of medical resources, improves health care accessibility in remote regions, establishes a comprehensive community health care network, and strengthens emergency and critical care networks; plan a compensation system for medical injury while promoting holistic care that features patient-centered safe treatment environments and better care quality, health workers, and medical working environments; raise the quality of psychiatric health care by strengthening mental therapy, mental health, and suicide prevention; build a complete emergency care system with improved response capabilities to sudden events; create a complete long-term care system that includes plans for a network which is widespread, improves transportation, and combines institutional and manpower resources; promote a system for identifying mentally and physically disabled patients while guaranteeing disabled rights; integrate information technology to promote telecare, providing added value for patients.
2. Implement disease control to elimate the threat of disease Threats: Strengthen functions associated with the current communicable disease monitoring system to detect and report diseases, while also increasing international cooperation and exchanges in the area of disease prevention; promote preventive immunizations to raise immunity and strengthen domestic control of communicable diseases, while also executing plans to control dengue fever, enterovirus, tuberculosis, and HIV/AIDS; conduct plans to prepare domestic responses for influenza pandemics, including gathering supplies and

carrying out drills, so when pandemics do occur, their impact can be mitigated.

3. Building Health Support Environments to Expand Preventive Health and Promote Full Participation: Create environments that support health and foster healthy lifestyles while controlling detriments, such as obesity, tobacco, betel quid, and alcohol, to thereby maintain health of individuals, families, and society; build information mechanisms to monitor individual health; improve reproductive health services by building favorable environments for childbirth and breastfeeding, while also expanding care subsidies for rare diseases, strengthening health promotion among children and adolescents, and strengthening preventive health services among adults; improve control of major chronic diseases while expanding cancer screenings to raise the screening rate, improve treatment quality, and reduce mortality rates; build supportive, age-friendly environments that promote active, healthy aging, while also building LOHAS communities, healthy cities, and healthy hospitals, as well as providing guidance on healthy schools and workplaces.
4. Strengthen Food and Pharmaceutical Management to Safeguard Health: Strengthen food, pharmaceutical and cosmetics management and risk assessment, including the formation of a complete drug and food import management system that features better management at the source, assistance to manufacturers in establishing food safety management systems, and stronger cross-departmental coordination and cooperation; build a pharmaceutical review mechanism that is consistent and meets international trends; manage and assist with pharmaceutical control mechanisms to better prevent drug abuse; implement an authorization system for private laboratories that is part of a monitoring network, allowing for better testing capacity and efficiency when emergencies arise.
5. Improvement of Health Insurance and Promotion of Long-Term Care Insurance System to Guarantee People's Rights: Conduct second-generation health insurance reforms and implement instruments for linking revenues and expenditures to ensure the sustainability of health insurance; carry out reforms to the National Health Insurance payment system while enhancing resource efficiency, reducing improper medical care, and making information transparent; conduct detailed planning for a long-term care insurance system while promoting related legislation; strengthen oversight and dispute review mechanisms associated with National Health Insurance.
6. Development of healthcare technology Strengthen medical technology R&D while developing the domestic biomedicine technology industry, promoting health technology services, and raising R&D application capacity; make Chinese medicine research more scientific and modern while promoting related digital knowledge.
7. Promotion of International Exchange and Cooperation: Expand international health cooperation and exchanges at the multilateral, bilateral, and cross-Taiwan Strait levels; participate in international health organizations; take part in international health care assistance and cooperation efforts.
8. Raising Organizational Capacity: Increase the proportion of incoming staff who have passed civil servant examinations to begin fostering the next generation of MOHW health professionals; expand the quantity of health professionals while strengthening education, training, and

continuing education, in order to achieve the professionalism, management skills, and international outlook need for an elite team.

Chapter 2, Health Organization

Organization of health administration came originally in three levels, central, provincial, and county/city. After the promulgation of the Local System Act in 1999, the health organization was reorganized into two levels, the central, and the municipality and county/city

Section 1, The National Health Administration

The Department of Health consists of four bureaus: the Bureau of Medical Affairs, 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 Health Education Promotion Committee, the Information Management Center, the Science and Technology Unit, the National Health Insurance Task Force, the Long-Term-Care Insurance Preparatory Task Force, and the Hospital Management Committee and Legal Affairs Committee. The affiliated organizations under the Department include the Bureau of National Health Insurance, Center for Disease Control, Bureau of Health Promotion, Food and Drug Administration, Committee on Chinese Medicine and Pharmacy, NHI Supervisory Committee, NHI Dispute Mediation Committee, NHI Medical Expenditure Negotiation Committee, 20 DOH hospitals (including six mental hospitals and one chest hospital). In addition, the DOH also financially supported the establishment of units such as the Corporate National Health Research Institutes, Corporate Center, for Drug Inspection and Examination, Taiwan Joint Commission on Hospital Accreditation, Corporate Foundation for Compensation for Drug Hazards, and the Taiwan Organ Registry and Sharing Center (Figure 1-1).

The MOHW was formally established on July 23, 2013, by merging 21 agencies and mission-orientated units under the Department of Health, as well as five affiliated agencies, together with the Ministry of the Interior's Department of Social Affairs, Children's Bureau, Domestic Violence and Sexual Assault Prevention Committee, and National Pension Supervisory Commission, as well as the Ministry of Education's National Research Institute of Chinese Medicine. The MOHW consists of eight departments (Departments of Planning, Social Insurance, Social Assistance and Social Work, Department of Protective Services, Department of Nursing and Health Care Medical Affairs, Mental and Oral Health, and Chinese Medicine and Pharmacy), six administrative departments (Departments of Secretarial Affairs, Personnel, Civil Service Ethics, Accounting, Statistics, and Department of Information Management), and six affiliated third-level agencies (institutes) (Centers for Disease Control, Food and Drug Administration, National Health Insurance Administration, Health Promotion Administration, Social and Family Affairs Administration, and National Research Institute of Chinese Medicine). It also oversees 26 hospitals and 13 social welfare institutions. See Figure 1-2.

Upon establishment, the MOHW increased its staff from 10,845 to 12,182, while its official budget increased from NT$75.6 billion to NT$150.4 billion. Responsibilities spread across a wide range of areas: health care, preventive health, National Health Insurance, disease control, food hygiene, welfare services, social assistance, social insurance, and so on.

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

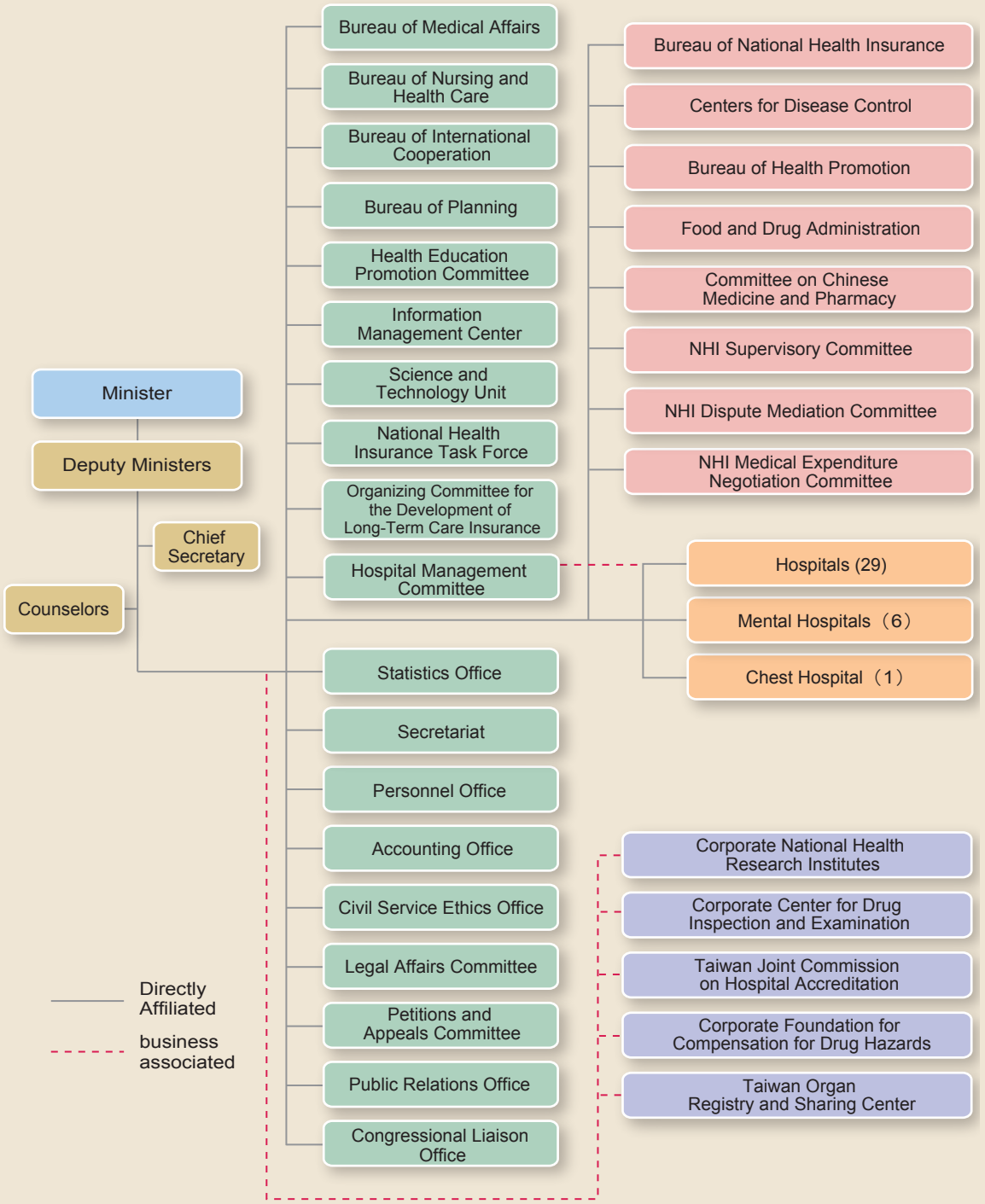
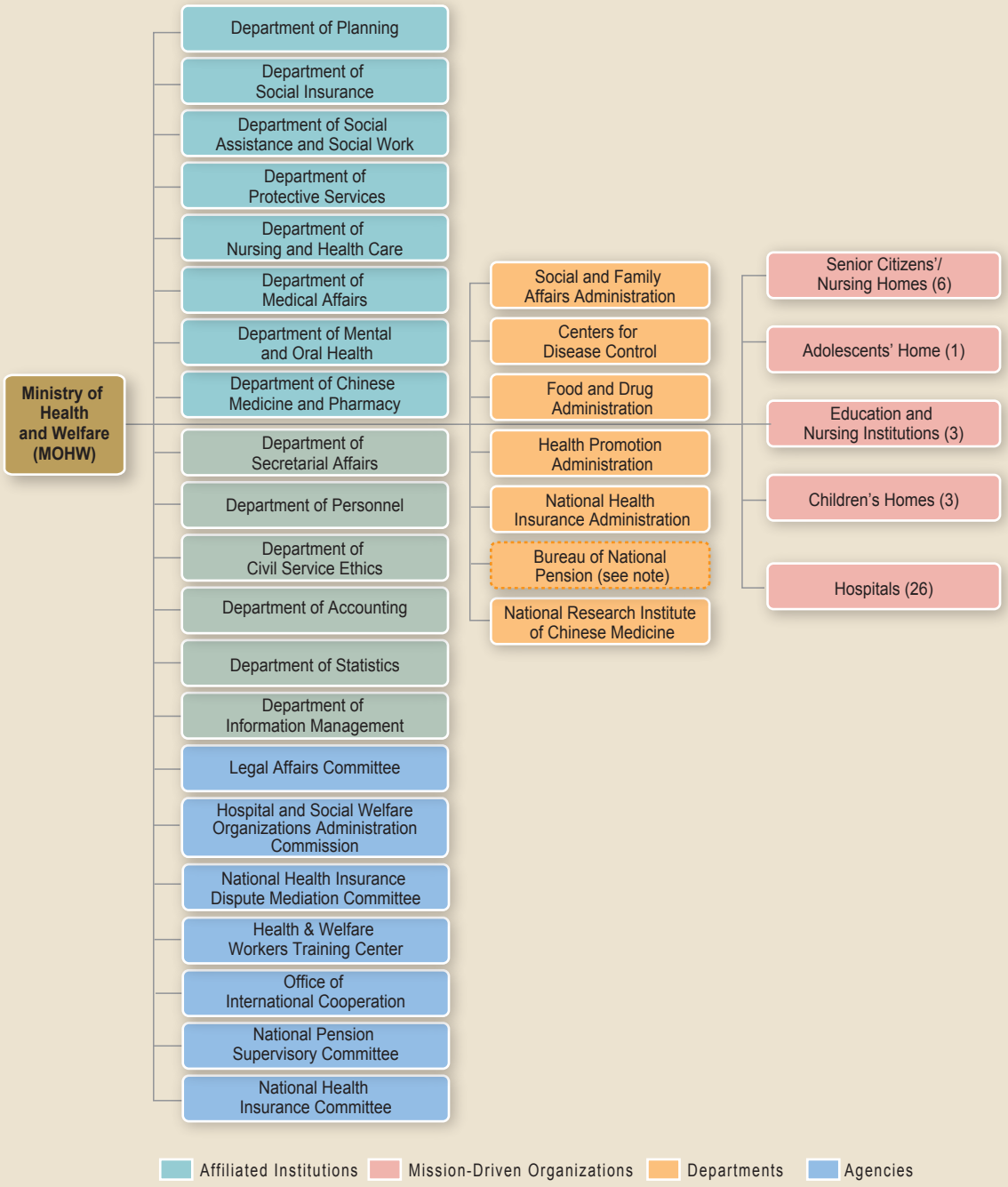


Figure 1-2 Organization of the MOHW



Note: The Bureau of National Pension has not yet been established. According to "The Organizational Act of the Ministry of Health and Welfare," before the bureau is established, its duties are to be commissioned to another agency (institution).

Chapter 3, Central Government Health Budget

In 2012, financial statements audited by the National Audit Office showed health expenditures of NT$80,178.223 million, comprising NT$57,502.710 million for social insurance (71.72%), NT$18,618.891 million for medical and health care (23.22%), NT$3,979.228 million for science (4.96%), NT$76.394 million for education (0.1%), and NT$1 million for social relief (0.001%), as illustrated in Figure 1-3.

In 2013, the health budget totaled NT$75,562.262 million, comprising NT$52,680.726 million for social insurance (69.72%), NT$18,911.693 million for medical and health care (25.03%), NT$3,898.673 million for science (5.16%), NT$70.170 million for education (0.09%), and NT$1 million for social relief (0.001%). See Figure 1-4.

Figure 1- 3 Pie Chart Depicting Audited Financial Statements for Central Government Health Expenditures, 2012

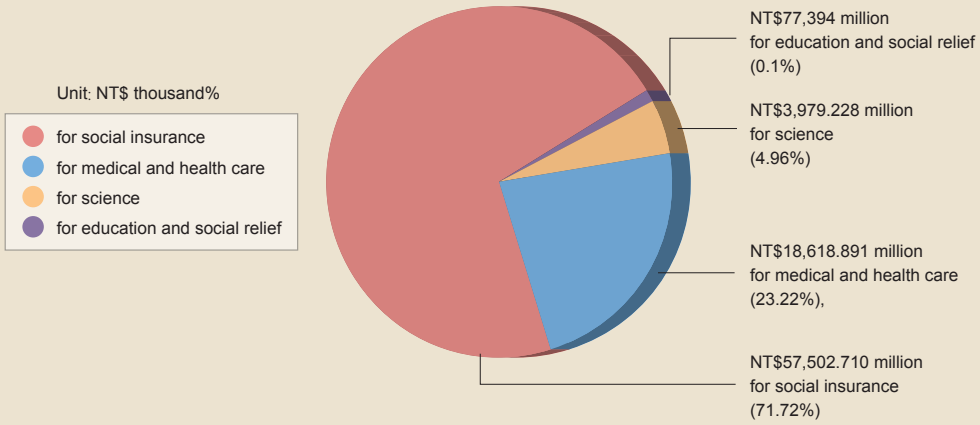
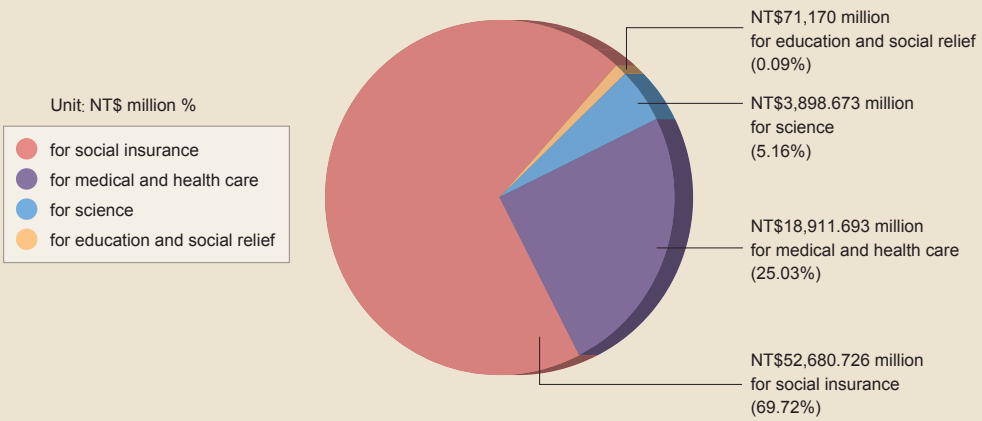


Figure 1-4 Pie Chart Depicting Central Government Health Budget, 2013



2 Health Indicators

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Taiwan's annual growth in average life expectancy over the past half century can be attributed to many factors: rising incomes, improvements in the living environment, better nutrition, advances in medicine and health care. But these positive changes are accompanied by new challenges. In particular, children born during the baby boom trend that accompanied the end of the World War II are now contributing to the aging of society, a condition intensified by a reduction in the birth rate.

These changes are most obvious in the new health and disease issues inherent in an older society, which affect the rate of economic growth as well as expenditures, allocations, promotion, and implementation of national medical and health care. Another important historical factor to consider is the implementation of the National Health Insurance, a major step in Taiwan's development and a defining moment in public health. In the following chapters, these issues will be examined by looking at important health indicators, including population indicators, vital indicators, national health expenditures, and international comparisons.

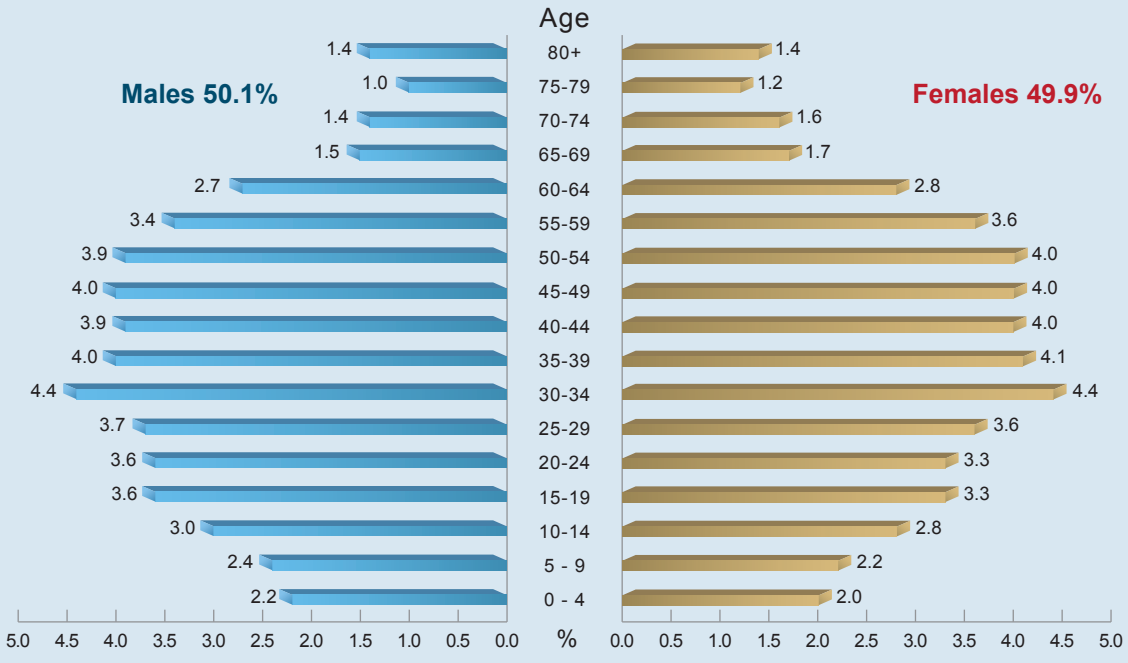
Chapter 1, The Population

At the end of 2012, the total registered population in Taiwan was 23.32 million and the population density was 644 persons per km^2. The densest city was Taipei, at 9,835 persons per km^2, followed by Chiayi City, at 4,518 persons per km^2. The least dense jurisdictions were on the east coast: Hualien County at 72 persons per km^2 and Taitung County at 64 persons per km^2.

1. Age Structure

The population of Taiwan exceeded 20 million at the end of 1989. Since then, a declining birth rate led to slower average population growth of just 0.6% per year. In 2012, Taiwan had a male population of 11.67 million and a female population of 11.64 million. The sex ratio (ratio of males to females normalized to 100) was 100, annual population growth was .391%, and the median age was 36.5 for males and 38.1 for females (see Figure 2-1).

Figure 2-1 The 2012 Population Pyramid



Historic population data show that the percentage of the population older than 64 reached 7% in 1993, making Taiwan an aged society. The percentage of the population younger than 15 had dropped from 20.8% in 2001 to 14.6% in 2012. During the same time period, the proportion of the population older than 64 had increased from 8.8% to 11.2%. Aging of the population is evident in Figure 2-2 and Table 2-1.

The age dependency ratio (the ratio of dependents — people younger than 15 or older than 64 — to the working-age population — those ages 15-64) fell from 42.1% in 2001 to 34.7% in 2012. The decline can be attributed to the rapid decrease in the age dependency ratio, young, (the ratio of dependents younger than 15 to the population aged 15-64) and the steady increase in the age dependency ratio, old, (ratio of population older than 64 to the population aged 15-64).

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

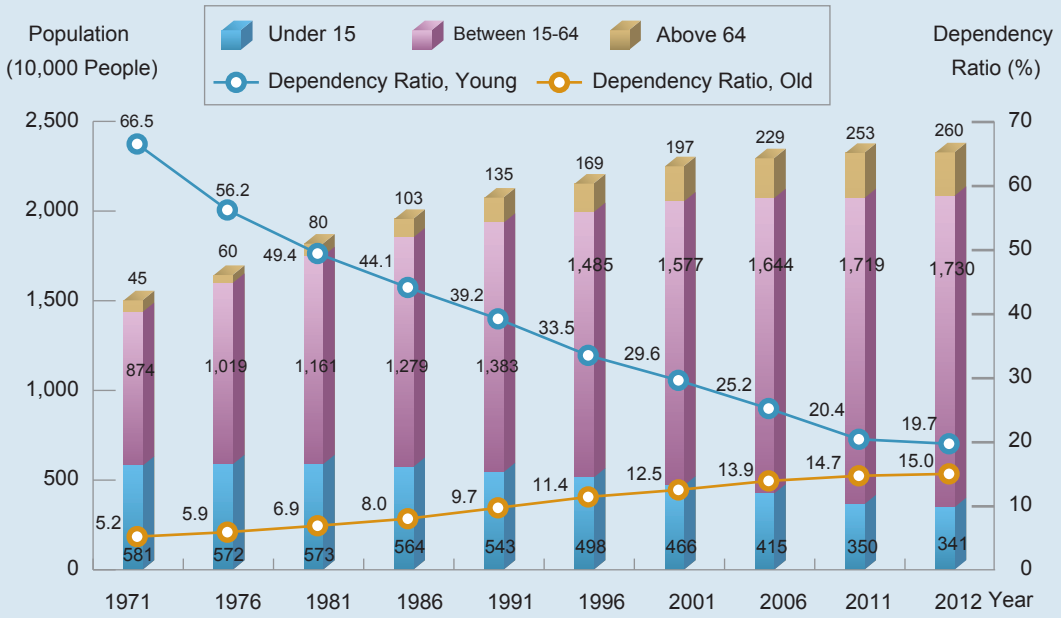


Table 2-1 Age Structure and Child / Edlerly and Aged Dependency Percentage Breakdown over the Years

Year	Total Population	Population Structure			Dependency Ratio	
		Under 15	Between 15-64	Above 65	Age Dependency Ratio, Young	Age Dependency Ratio, Old
	Per Thousand People	%	%	%	%	%
1981	18,194	31.63	63.96	4.41	49.45	6.90
1991	20,606	26.34	67.13	6.53	39.23	9.73
2001	22,406	20.81	70.39	8.81	29.56	12.51
2011	23,225	15.08	74.04	10.89	20.37	14.70
2012	23,316	14.63	74.22	11.15	19.72	15.03

2. Birth and Death

Changes in social values have led to annual decreases in the fertility rate. The crude birth rate (live births per 1,000 people) fell from 11.7 in 2001 to a record low of 7.2 in 2010 (attributable to the impact of the Year of Tiger). The rate rose slightly in 2011 before jumping to 9.9 in 2012, during the Year of Dragon. The crude death rate (total number of deaths per 1,000 people) rose slightly from 5.7 in 2001 to 6.6 in 2012. The rate of natural increase, expressed per 1,000 people, (crude birth rate minus crude death rate) was a record low of 0.9 in 2010, before rising to 3.2 in 2012. The long-term outlook is for a decline in the rate of natural increase (see Figure 2-3).

3. Changes in Life Expectancy

The life expectancy at birth for both sexes increased from 77.2 years in 2002 to 79.5 years in 2012, a rise of 2.3 years in ten years. For males in the same period, the life expectancy at birth increased from 74.6 to 76.4 years, an increase of 1.8 years. For females, it increased from 80.2 to 82.8 years, an increase of 2.6 years. The increase in life expectancy at birth for females was higher than that of males (see Figure 2-4).

Chapter 2, Vital Indicators

1.10 Leading Causes of Death

Transformation to the economic structure, the increase in quality of life, and improvements in health conditions have led to dramatic changes in the leading causes of death. In 1952, acute and communicable diseases took the most lives in Taiwan; today, malignant neoplasms, cardiovascular disease, and accidents are the main culp.

In 2012, there were 153,823 deaths. The standardized mortality rate (based on the WHO standard world population age structure for 2000) was 450.6 people per 100,000 population, a decrease of 2.5% compared to 2011 and a decrease of 16.5% compared to 2002.

Figure 2-3 Crude Birth Rate, Crude Death Rate, and nature increase rate of population by year

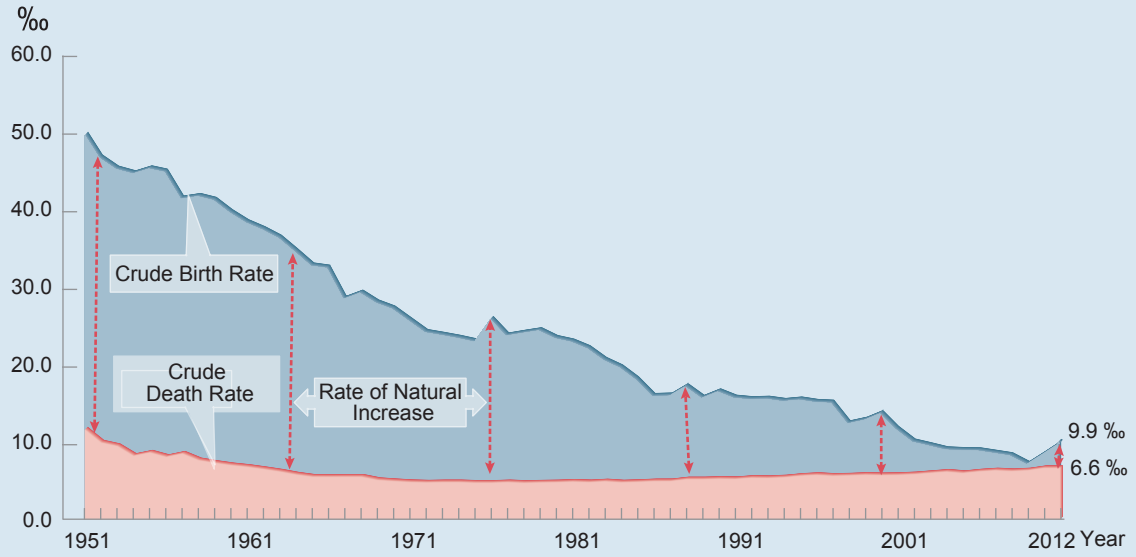
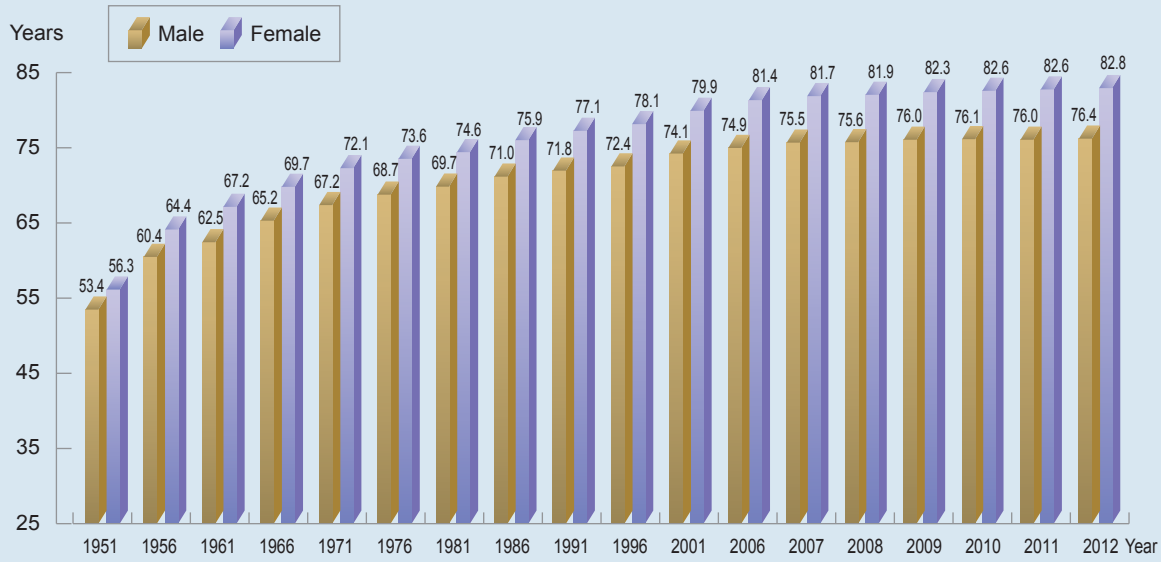


Figure 2-4 Life Expectancy at Birth



Since 2008, causes of death have been compiled according to the International Classification of Diseases, Tenth Revision. In 2012, the 10 leading causes of death were: 1. Malignant neoplasms, 2. Heart diseases (except hypertensive diseases), 3. Cerebrovascular diseases, 4. Pneumonia, 5. Diabetes, 6. Accidents and adverse effects, 7. Chronic lower respiratory diseases, 8. Hypertensive diseases,9. Chronic liver diseases and cirrhosis, and 10. Nephritis, nephrotic syndromes and nephrosis. When compared to 2011, two sets of diseases traded places: 1. Diabetes and Pneumonia, 2. Chronic liver diseases/cirrhosis and Hypertensive diseases. See Figure 2-5.

2. 10 Leading Cancer Causes of Death

In 2012, there were 43,665 cancer deaths, accounting for 28.4% of total deaths. If adjustment is made based on the standard world population age structure in 2000, the standardized cancer mortality rate in 2012 was 131.3 per 100,000 people – a slight increase of 0.7% compared to 2011.

The 10 leading causes of cancer death in 2012 were: 1. Cancers of trachea, bronchus and lung, 2. Cancers of liver and intrahepatic bile ducts, 3. Cancers of the colon, rectum, and anus, 4. Cancer of breast (Female) 5. Cancer of Oral cavity, 6. Cancer of Stomach, 7. Cancer of Prostate, 8. Cancer of Pancreas, 9. Cancer of esophagus, 10. Cancer of cervix uteri and uterus, part unspecified. See Figure 2-6.)

3. Neonatal, Infant, and Maternal Mortality Rates

Advances in public health have led to general declines in both the infant mortality rate (number of deaths of infants younger than 1 year old in a given year per 1,000 live births in the same year) and the neonatal mortality rate (number of deaths of infants younger than 4 weeks old in a given year per 1,000 live births in the same year), apart from a slight increase in 1995 attributed to a new birth reporting system. In 2012, the neonatal mortality rate had declined to 2.3 per 1,000 live births, a decrease of

Figure 2-5 Changes in the 10 Leading Causes of Death

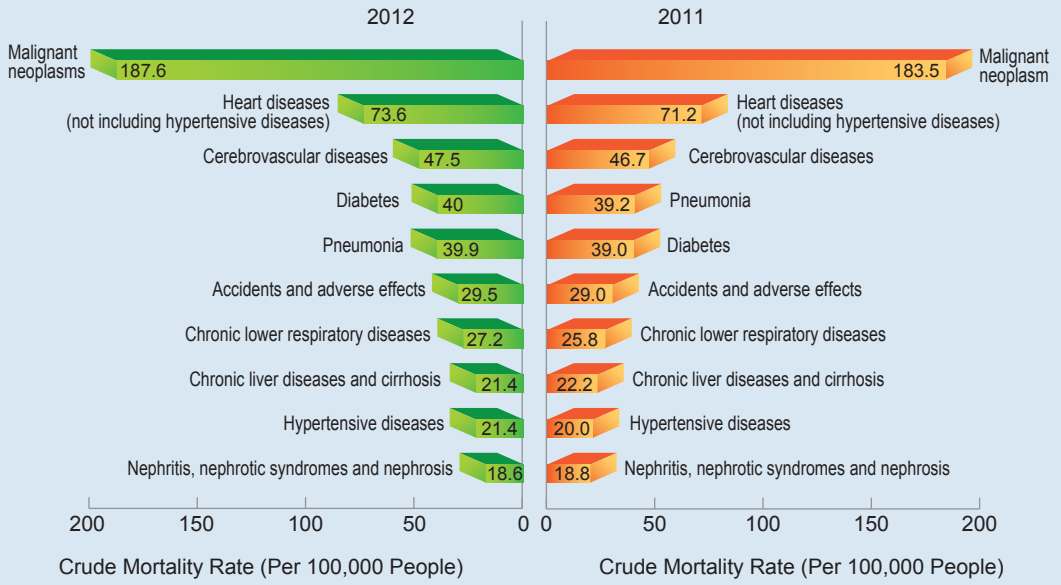
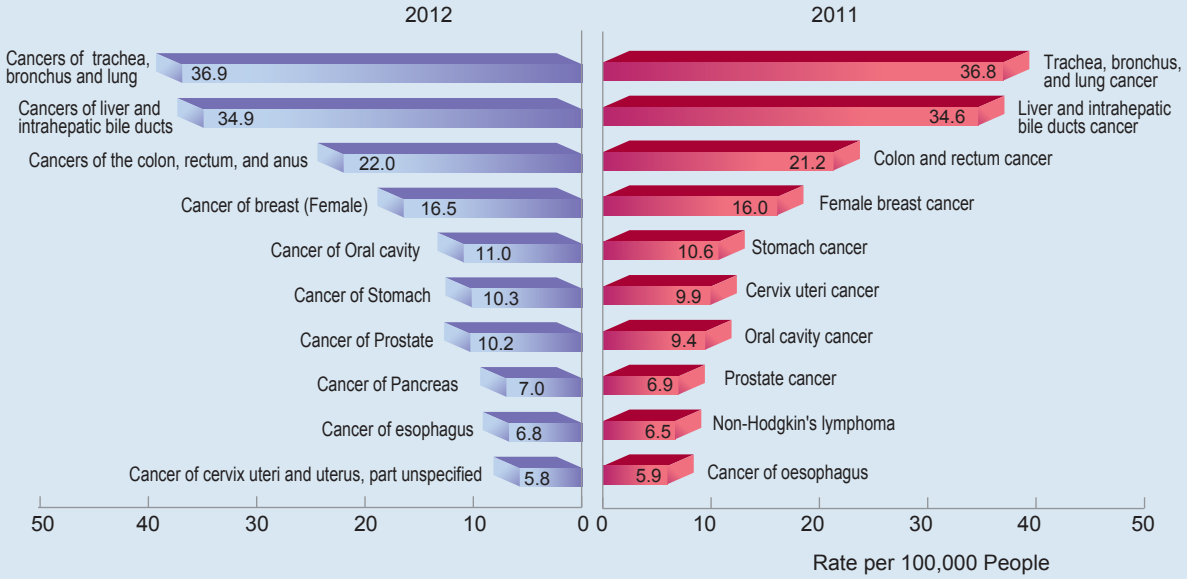


Figure 2-6 Changes in the 10 Leading Causes of Death by Cancer



0.8 since 1981. Over the same period, the infant mortality rate dropped from 8.9 to 3.7 per 1,000 live births, and the maternal mortality rate fell from 19.4 to 8.5 per 100,000 live births. See Figure 2-7.

Chapter 3, National Health Expenditure

Good health care is a basic need in modern society and measure of a country's advancement. Since March 1995, when Taiwan implemented the National Health Insurance, annual spending on health care has risen by 17.3%. This is higher than growth in national income over the same period and has made expenditures on health a larger proportion of GDP. In 2012 NHE totaled NT$930 billion.

Steady growth in NHE per capita has occurred since 1991, while NHE as a percentage of GDP rose from 4.9% in 1994 to 5.3% in 1995 (when National Health Insurance took effect) and 6.6% in 2012. The data suggests that greater accessibility to health services leads to higher expenditures. In 1991, NHE per capita was NT$10,765, and by 2012 it had risen to NT$39,973, equivalent to an annual increase of 6.4%. See Figure 2-8.

Chapter 4, International Comparisons

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

As indicated by the 2012 Population Reference Bureau, the global population in 2012 totaled 7.058 billion. The world's population is currently projected to reach around 9.624 billion by 2050, a rise of 36%. Though the rate of demographic transition is generally on the rise, populations in certain countries have registered negative growth and their rate of demographic transition continues to fall. See Table 2-2.

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

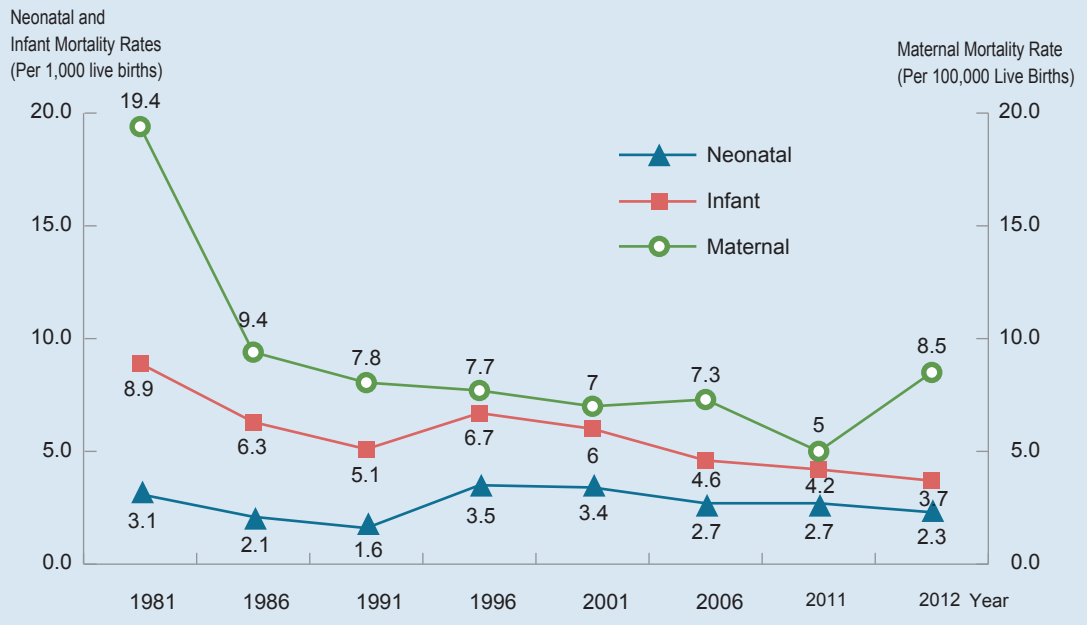
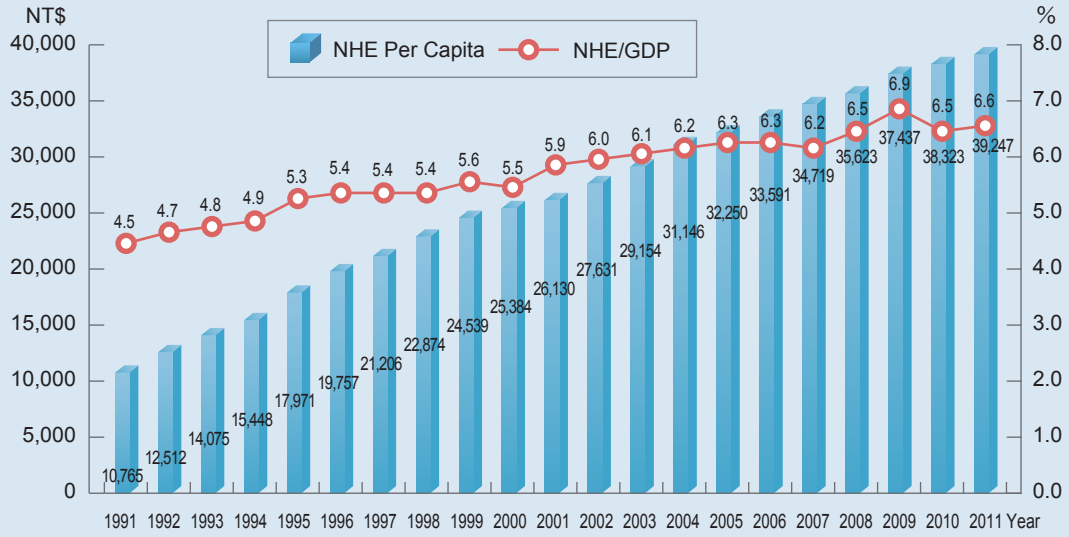


Figure 2-8 NHE/GDP Ratios and NHE Per Capita



The global total fertility rate in 2012 (the average number of live births for a woman over her lifetime) was 2.4. Fertility rates in Asian countries listed below are less than half of that, indicating that Asia has become a low-fertility rate region. The worldwide birth rate now stands at 20 per 1,000 population and the mortality rate at 8 per 1,000 population. Japan and Germany are noted for having fertility rates lower than their mortality rates. In general, demographic structures in developed countries are trending toward low fertility rates and low mortality rates. See Table 2-2.

2. Life Expectancy Comparisons

In 2010, average life expectancy for males at birth in major developed countries was 75 or greater, with both Japan and Australia at 80. Taiwan was 76, similar to Japan's level in 1990. In terms of variation in life expectancy over the 50 years between 1960 and 2010, the average life expectancy for males in Taiwan increased by 14 years, second only to Japan among major developed countries.

In 2010, average life expectancy for females at birth in major developed countries was 81 or greater, led by Japan at 86, which was followed by France at 85 and Australia at 84. Taiwan was 83, similar to Japan's level in 1990. In terms of variation in life expectancy over the 50 years between 1960 and 2010, the average life expectancy for females in Taiwan increased by 17 years, ranking ahead of Japan and all other major developed countries. See Table 2-3.

3. Comparisons of NHE

In Taiwan, NHE per capita were US$1,326 in 2011 — lower than the OECD median of US$3,853. If ranked among OECD member states Taiwan would be 29th, with Estonia, Hungary, Poland, Chile, Turkey, and Mexico having lower per capita expenditure. GDP per capita in Taiwan was US$20,006 — lower

than the OECD median of US$39,324, and ranked 28th among OECD member states, higher than the Slovak Republic, Estonia, Hungary, Poland, Turkey, Chile, and Mexico. Generally, higher GDP per capita is accompanied by higher NHE per capita. In 2011, NHE in Taiwan accounted for 6.6% of GDP, a relatively low amount that was 2.5 percentage points below the OECD median. See Table 2-4.

Table 2-2 Population Structures in Major Countries

	Mid-Year Population (Millions)	Projected Population (Millions)		2012-2050 Population Growth/ Decline Ratio	Total Fertility Rate (Per Woman)	Crude birth Rate	Crude Mortality Rate	RNI
	2012	2025	2050		People	‰	‰	%
Worldwide	7,058.0	8,082.0	9,624.0	1.4	2.4	20	8	1.2
Taiwan	23.3	23.5	20.8	0.9	1.1	9	7	0.2
Singapore	5.3	5.8	6.1	1.2	1.2	10	4	0.5
Japan	127.6	119.8	95.5	0.7	1.4	9	10	-0.2
Korea	489	50.9	47.2	1.0	1.2	10	5	0.4
Canada	34.9	39.9	48.6	1.4	1.7	11	7	0.4
US	313.9	351.4	422.6	1.3	1.9	13	8	0.5
UK	63.2	70.5	79.6	1.3	2.0	13	9	0.4
France	63.6	67.4	72.4	1.1	2.0	13	9	0.4
Germany	81.8	79.2	71.5	0.9	1.4	8	10	-0.2

Source: 2012 World Population Data Sheet, Population Reference Bureau

Table 2-3 Life Expectancy at Birth in Major Countries

	1960	1970	1980	1990	2000	2005	2010	1960	1970	1980	1990	2000	2005	2010
	Males							Females						
Taiwan	62	67	70	71	74	75	76	66	72	75	77	80	81	83
UK	68	69	70	73	75	77	79	74	75	76	79	80	81	83
US	67	67	70	72	74	…	76	73	75	77	79	80	…	81
France	67	68	70	73	75	77	78	74	76	78	81	83	84	85
Germany	67	67	70	72	75	76	78	72	74	76	78	81	82	83
Canada	…	…	72	74	77	…	…	…	…	79	81	82	…	…
Norway	71	71	72	73	76	78	79	76	77	79	80	81	83	83
Netherlands	72	71	73	74	76	77	79	75	77	79	80	81	82	83
Australia	68	67	71	74	77	79	80	74	74	78	80	82	83	84
New Zealand	69	68	70	72	76	78	79	74	75	76	78	81	82	83
Japan	65	69	73	76	78	79	80	70	75	79	82	85	86	86

Notes:1. In 2012, life expectancy at birth in Taiwan was 76.4 for males and 82.8 for females.

2. Source: 2011 OECD Health Data

Table 2-4 Comparisons of NHE Per Capita and GDP Per Capita Between Taiwan and OECD Member States, 2010

Ranking	Country-in order of NHE per Capita	NHE/GDP（%）	NHE per capita（US$）	GDP per capita（US$）
medium		9.3	3,673	36,344
1	United States	17.6	8,233	46,747
2	Norway	9.4	8,097	85,384
3	Switzerland	11.4	7,992	67,489
4	Denmark	11.1	6,278	56,238
5	Luxembourg[2009]	7.9	6,196	104,354
6	Canada	11.4	5,419	46,236
7	Netherlands	12.0	5,308	46,903
8	Sweden	9.6	4,713	49,274
9	Austria	11.0	4,684	45,180
10	Germany	11.6	4,391	40,113
11	France	11.6	4,336	39,460
12	Belgium	10.5	4,288	43,077
13	Australia[2009]	9.1	4,094	45,635
14	Ireland	9.2	4,004	46,168
15	United Kingdom	9.6	3,771	36,344
16	Japan[2009]	9.5	3,735	39,489
17	Finland	8.9	3,733	44,380
18	Iceland	9.3	3,673	39,541
19	New Zealand	10.1	3,251	32,556
20	Italy	9.3	2,983	34,010
21	Spain	9.6	2,733	30,223
22	Greece	10.2	2,575	26,625
23	Portugal	10.7	2,176	21,499
24	Israel[2009]	7.5	1,980	26,033
25	Slovenia	9.0	1,949	22,897
26	Korea	7.1	1,452	20,532
27	Czech Republic	7.5	1,402	18,791
28	Slovak Republic	9.0	1,364	16,035
29	Taiwan	6.5	1,211	18,503
30	Hungary	7.8	1,002	12,863
31	Chile	8.0	947	11,901
32	Poland	7.0	863	12,293
33	Estonia	6.3	847	14,147
34	Turkey[2008]	6.1	625	10,279
35	Mexico	6.2	576	9,305

Source: 2012 OECD Health Data

3 Health Promotion

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37 Chapter 5 Health Dissemination and Monitoring

In order to achieve the goal of "Health for All," as advocated by the WHO, the MOHW formulated policies to promote the health of pregnant women, infants and toddlers, children, teenagers, middle-aged adults, senior citizens, and women in general. In addition, bearing in mind challenges brought by unhealthy lifestyles, empirical data obtained from health surveys and research, human rights and gender equality, as well as the current state of society and likely future trends, the MOHW planned and revised policy goals and strategies. Its purpose was to improve health at the individual, community, national, and global levels.

Chapter 1, Healthy Childbirth and Growth

Section 1, Ensuring the Health of Pregnant Women

1. Prenatal Examinations

1) Pregnant women are offered 10 prenatal exams through medical institutions contracted under the national health insurance program. Since 2001, uses of this service have stayed in the neighborhood of 90%. In 2012, uses of the 10 prenatal examinations averaged 90.9%. At least 1 visit antenatal care coverage is 98.58%. At least 4 visits antenatal care coverage is 97.35%.

2) Since 2010, the MOHW has subsidized group B streptococcus screenings for pregnant women from low-income households. It were made into full subsidies with an increase to NT$500 per screening on April 15, 2012.

2. Sex Ratio at Birth

In 2010, the MOHW established instruments for monitoring the sex ratio at birth of medical care institutions that provide childbirth services. In conjunction with local health bureaus, officials monitored for and inspected institutions with outlying data, eradicated illegal advertisements that guaranteed a male birth or offered sex selection services, and set up reporting mechanisms at local health bureaus. These actions were underpinned by the addition or revision of relevant regulations and stronger public service campaigns. The results have been positive: Taiwan's sex ratio at birth dropped from 1.090 in 2010 to 1.074 in 2012, a 25-year low (since 1987). Gradually, the sex ratio at birth is approaching natural levels. In particular, the past belief that the third child must be male is disappearing. In 2010, the sex ratio at birth of the third child was 1.203, in 2011 it was 1.130, and in 2012 it was 1.115, a 23-year low (since 1989).

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

1. Screenings for Genetic Metabolic Disorders

To screen for genetic metabolic disorders, blood is drawn from newborns after 48 hours of birth. In

2012, 233,118 infants were screened in Taiwan, for a coverage rate of over 99%. Typically, 11 disorders are checked for, including glucose-6-phosphate dehydrogenase deficiency, and newborns with abnormal results receive follow-up care, referrals, diagnosis confirmation, and appropriate treatment.

2. Developmental Screenings, Preventive Health Services, and Joint Evaluation Services for Child Development
   1) For continuous health management and guidance, the MOHW subsidizes medical care institutions in providing children's preventive health care services for children younger than 7. The program strengthens developmental screenings, range of services, referrals, and diagnosis confirmations.
   2) For children suspected of development delay to receive timely assessment and intervention, the MOHW established between one and four children's development joint evaluation centers in each of the nation's cities and counties.
   3. The "Public Breastfeeding Act" was promulgated on November 24, 2010, the MOHW has increased promotion of breastfeeding. Under the baby-friendly hospital initiative it certifies medical care institutions as baby-friendly. It recruits breastfeeding "seed teachers" to speak to mothers about the benefits of breastfeeding and provide training. Cities and counties are encouraged to train breastfeeding volunteers who can form support groups. And the MOHW provides free consultation through a dedicated hotline (0800-870870) and website (http://mammy.hpa.gov.tw/index.asp). Benefits are shown by the increase in mothers exclusively breastfeeding rate under one month, from 46.6% in 2004 to 71.9% in 2012.

Section 3, Health Care for Adolescents

1. The MOHW established a website to provide sex education and information on contraception to adolescents, and it provides online videos through the "Secret Garden" website.
2. The MOHW reaches out to adolescents at the community level to advise and educate them on sexual health. In 2012, speakers shared valuable information with students at 113 schools in 19 cities and counties. The MOHW also used MSN and telephones as counseling platforms, and when necessary assisted adolescents in transferring to individual counseling or medcal care institutions.
3. In cooperation with 39 medical care institutions, the MOHW established adolescent-friendly outpatient services that offer preventive care and reproductive health services. Also, in conjunction with the Ministry of Education and the Centers for Disease Control, the MOHW works through health organizations and local health bureaus and health stations to advocate adolescent sexual health.

Section 4, Vision, Hearing, and Oral Cavity Health

1. Relying on empirical findings, the MOHW cooperates with other government agencies on health campaigns, screenings, and research that can ensure good vision among children. Promotional campaigns using banners and mass media encourage people to protect their eyes by spending two to three hours outside every day, and the MOHW continued encouraging screenings for pre-school children 4 or 5 years of age for strabismus, amblyopia, or visual defects. These interventions, which target children in their early elementary or preschool years, were based on literature review of the epidemiology and prevention of myopia, which revealed that subjecting the eyes to close work over long

periods of time was a major risk factor and extended time outdoors was a protective factor. Results have demonstrated effectiveness of the interventions.

2. On March 7, 2012, the MOHW announced a full subsidy program to screen infants for hearing problems. It covers all infants within three months of birth who were born on or after March 15, 2012.
3. In 2012, the MOHW subsidized fluoride applications every six months for children younger than 5. It also provided dental sealant treatment for first and second grade indigeneous children in mountain areas, residents of offshore islands, the physically and mentally disabled, and low and mid-to-low income households.
4. In 2001, the MOHW launched a program to encourage the use of fluoride-containing mouthrinse by all elementary school children. Also, in 2012, a workshop on children's oral health was held for dentists and related workshops were held at hospitals with dental programs.

Chapter 2, Healthy Living

Section 1, A Tobacco-Free Lifestyle

1. Smoking Cessation

Since 2002, the government has budgeted revenues from the tobacco health and welfare surcharge to subsidize smoking cessation services (NT$250 per week for cessation drugs). Despite these subsidies, each smoker still must pay NT$550-1,250 out of pocket, a burden too heavy for many to bear. The launch of the Second generation smoking cessation payment scheme in March 2012 transformed the payment system for these drugs. Covered like other drugs under the NHI system, copayments plummeted to no more than NT$200 a week, and the drugs were free for low-income households, indigeneous peoples living in mountain areas, and residents of offshore islands. The financial burden of smoking cessation was mitigated substantially.

The Second generation smoking cessation payment scheme added community pharmacies to the ranks of institutions qualified to provide cessation services. Patients benefitted from convenient and flexible hours, along with the professionalism of pharmacists who could provide customized advice and support. The MOHW also trained smoking cessation instructors who could hold cessation classes and provide free telephone consultations. For smokers who quit, professionals provided follow-up guidance and tracking to ensure that these former addicts remained committed. The extra support raised the success rate of cessation.

2. Smoking Cessation Services

1) Total Volume: In 2012, OPD, hospitalization, emergency, and community pharmacies provided smoking cessation therapy or counseling up to 64,967 people, about a 33.2% increase compared to the 48,765 people who received assistance in 2011.
2) Six Months point cessation rate: patients receiving smoking cessation assistance at first time, they were asked to participate in a telephone survey after six months. About 30.1% of subjects interviewed in 2012 reported that they had successfully quit for the full six months, growth of 3.5% compared to the 26.6% who reported success in 2011.

3) Number of Smokers Who Successfully Quit: Extrapolating from the total number of people served and the percentage in surveys who reported that they had successfully quit for a full six months, there were 19,555 smokers who received assistance and quit in 2012, a growth of 50.7% compared to the 12,971 in 2011.
4) Overall Satisfaction Rate: To grasp how smokers respond to cessation programs and whether the programs fulfill their needs, six months after their first visits, patients are asked by telephone whether they are satisfied. Subjects interviewed in 2012 reported a satisfaction score of 81%.

Section 2, Betel Quid Hazards Prevention

Advocacy activities, combined with the cooperation of various government agencies and NGOs, allowed the message of betel quid hazards prevention to spread far and wide. Success is shown by the drop in rate of betel quid chewers among males older than 17, from 17.2% in 2007 to 10.9% in 2012. Work highlights follow:

1. Starting in 2004, the MOHW strengthened betel quid free campaigns in cities and counties with high incidence of oral cavity cancer. Its goal was to eliminate betel quid in schools at or below the high school and vocational school level by bringing anti-betel quid messages into the classroom. In 2012, its campaign targeted 73 junior high schools and elementary schools, four of which were examined under an action research program to aid in future campaigns.
2. Since 2008, the MOHW has provided annual betel quid prevention subsidies to community health building units. Community leaders contribute by leading advocacy campaigns or signing pledges to build betel quid free communities. Concrete actions include: holding of health instruction and speeches, increased publicity through creative campaigns and festival activities, talks by oral cavity cancer patients, assistance in betel quid cessation, and provision of oral mucosa screenings for betel quid users.

3. In 2012, the MOHW worked through local health bureaus (stations) and NGOs to build betel quid-free environments in 305 workplaces with high rates of betel quid use and to hold 402 betel quid cessation classes in 212 hospitals. Since 2005, it has assisted with a tobacco hazards and betel quid prevention plan that built a betel quid-free support environment in the armed forces.

Section 3, Safe Living

1. Building a Safe Household Environment for Children: The HPA created a checklist that people could use to assess whether their homes were safe for children. Parents and caregivers could investigate their household, then improve areas deemed unsafe. Also, staffs from local health departments and centers helped investigate the homes of disadvantaged families with children 6 years old or younger. In 2012, they investigated 24,257 such homes and suggested basic improvements.
2. Making Health Education Part of Children's Preventive Services: To increase knowledge of preventing accidental injury among parents and caregivers, the HPA asked medical professionals to provide guidance during the seven preventive care sessions offered to children 7 years old and under. Doctors and nurses provide age-specific tips for preventing accidental injury. The children's health handbooks they hand out also include a form providing information about accidental injuries among children along with information on basic steps that can be taken to prevent such injuries.

   Creating an Intervention Model for Pediatricians to Help Prevent Accidental Injury:
3. In 2012, the MOHW evaluated the effectiveness of pediatricians instructing parents on preventing accidents or injuries during their children's outpatient visits, then expanded on this research in 2012 to build an intervention model. It held four regional training sessions on instructing parents during outpatient visits and evaluated the effectiveness of pediatricians preventing repeated injuries. Research showed that intervention significantly reduced unsafe behaviors by primary caregivers and led to reduced repeats of injury and accidents among children in comparison to control groups.
4. Promotion of safe communities and safe schools received official recognition following application to the WHO Collaborating Centre on Community Safety Promotion.

Chapter 3, Healthy Environment

Section 1, Healthy Cities

1. The MOHW established a task force of professionals to encourage and assist the promotion of healthy cities by local governments.
2. In 2012, to promote domestic and international exchange of healthy city achievements, the MOHW cooperated with the Taiwan Alliance for Healthy Cities in holding the 4th Taiwan Healthy City Award Ceremony. By the end of 2012, 10 cities and counties and 11 regions were approved as members of the Alliance for Healthy Cities (AFHC) as NGOs. They attended the AFHC's 5th global conference in Australia, where Tainan City, Miaoli County, Pingtung City, and Hsinchu City received the AFHC Award for Creative Developments in Healthy Cities.

Section 2, Healthy Communities

In 2012, as part of its program to build healthy communities, the MOHW subsidized 17 local health bureaus to work with 142 communities under their jurisdiction. Areas of improvement included tobacco, alcohol, and betel quid hazards prevention; obesity prevention; active aging; and promotion of community safety. Achievement highlights follow:

1. Tobacco, Alcohol, and Betel Nut Hazards Prevention: The MOHW held anti-smoking

activities and betel quid cessation classes while also promoting betel quid-free workplaces.

2. Obesity Prevention: Participants in MOHW-weight-loss activities shed a total of 232.5 tons. The MOHW also assisted 1,022 businesses and other locations in eliminating obesogenic environments.
3. Healthy Aging: The MOHW held healthy aging activities and health promotion competitions.
4. Promotion of Community Safety: The MOHW subsidized home safety, fall prevention, transportation safety, and school safety in 28 communities.

Section 3, Health Promoting Schools

1. In 2008, the MOHW launched established the Health Promoting School Promotion Center, which serves as a single advisory mechanism for health promoting schools. And, in 2012, all of the nation's junior high schools and elementary schools along with more than 70% of its high schools and vocational schools fully implemented campus tobacco and betel nut hazards prevention, as well as initiatives to promote healthy BMI , oral health, visual health, sex education, and drug safety.
2. In 2012, the MOHW formulared the health promoting school accreditation program accoding to the WHO 2008 "Health Promoting School: A Framework for Action". The International certification of the health promoting school includes 6 standards, 24 sub-standards, and 63 assessed items. The 214 parcipating schools were deliberated by the international accreditation board, and finally, 4 gold awards, 14 silver awards, and 120 bronze awards were awarded to outstanding schools.

Section 4, Healthy Workplaces

1. Since 2003, the MOHW has cooperated with teams of experts to promote health, provide tobacco hazards control consultations and training, and establish workplace service networks.
2. In 2007, the MOHW launched "Healthy Workplace Accreditation" to advocate for the establishment of workplace health promoting policies and supporting environments based on the WHO "Model of Healthy Workplace Continual Improvement Process." Later in 2012, the MOHW honored 39 healthy workplaces for their excellent performances, and a survey conducted at the workplaces for the same year reveals a smoking rate of 15.8%, which is a 1.1% of reduction on smoking rate compared to 2010.

Section 5, Health Promoting Hospitals

1. Active Participation in the WHO International Network of Health Promoting Hospitals and Health Services

1) By the end of 2012, 93 hospitals in Taiwan have passed the certification of WHO International HPH Network, making the Taiwan Network the largest in the world.
2) The Health Promotion Administration, MOHW, collaborated with the WHO International Health Promoting Hospitals Network secretariat to organize the WHO-HPH Autumn School (WHO-HPH Recognition Project-Advanced Course) in October 2011, and assisted 15 domestic hospitals to participate in this international advanced HPH recognition trial. In 2012, six additional hospitals from Taiwan joined this trial.

2. Promoting of Low Carbon Hospitals

1) The Task Force on Health Promoting Hospitals and Environment, leaded by the Health Promotion Administration, MOHW, collaborated with Health Care Without Harm (HCWH) to hold a Pre-Conference on HPH and Environment on April 11th, 2012. Hospital representatives from 13 nations joined (Taiwanese representatives from 21 hospitals) in the Southeastern Launching Ceremony of the Global Green and Healthy Hospitals Network. They urged nations around the world to recognize the importance of

health institutions practicing environmental sustainability, and to work together in promoting environmental health at the community level.

2) After the WHO and Health Care Without Harm (HCWH) jointly published the "Healthy Hospitals – Healthy Planet – Healthy People" pamphlet in 2008, HCWH expanded on its work in 2011 to produce the "Global Green and Healthy Hospital Agenda." The agenda has 10 interconnected goals related to the impact of the health industry on the environment, and each goal contains a series of action items that hospitals can consider when implementing environmental protection policies. In August 2012, the Health Promotion Administration, MOHW, used these 10 goals as a basis to revise it into a self-assessment form, encompassing 8 dimensions (leadership, chemicals, waste, energy, water, transportation, food, building) and 84 work items, for hospitals to determine their level of environment-friendly measures and actions. Between September and October 2012, the Administration sent this form to hospitals to fill out on a pilot-test basis, of which 150 hospitals responded with a return rate of 91%. Initial analysis suggests that hospitals in Taiwan are strong in the areas of leadership, waste, and water, but weak in the areas of transportation and food.

Section 6, Obesity Prevention

In order to prevent obesity, since 2011 the Health Promotion Administration, MOHW, has implemented a healthy weight management plan. Highlights from 2012 are as follows:

1. Creat a healthy public policy: Promotion of a draft nutrition act and a draft health promotion act. Formulation of an amendment to the "Act Governing Food Sanitation" that would regulate advertisements of foods that are contributing factors to chronic diseases or that are not suitable for children. Launch and implementation of regulations that enforce a woman's right to breastfeed in public to encourage more women to breastfeed and reduce the incidence of obesity among children.
2. Construct a supportive environments: Opened a website and a consultation hotline (0800-367-100) that battle obesity by providing information related to healthy weight management. Published a handbook that offers tools for evaluating obesity prevention qualities in communities. Creation of a healthy eating information system that encourages restaurants to provide menus with clear, easy-to-

understand calorie information on menus. Also verified whether healthy school lunches actually met daily nutritional guidelines.

3. Re-orient health services: Assisted medical care institutions in transforming from a traditional model of diagnosis and treatment to one of health promotion and preventive medicine. Actively provided preventive health and healthy weight management services to the general public.
4. Strengthen community actions: Worked with cities and counties to promote healthy weight management plans that included activities in communities, schools, workplaces, and hospitals.
5. Develop personal skills to lead healthy lifestyles: Revised and published a new handbook encouraging active, healthy lifestyles. Also built a related website and consultation hotline.

Chapter 4, Healthy Ageing

Section 1, Health Policies for Middle-Aged Adults and Senior Citizens

1. A free preventive Health care Service for adults is provided every three years for people aged 40 to 64 and annually for people older than 65.
2. After a pilot program in Chiayi city in 2010, the Age-friendly Cities Plan was expanded to 20 cities and counties in 2012.
3. Besides continuing to implement the "Recognition of Age-Friendly Hospitals and Health Services", 28 hospitals were certified as Age-Friendly hospitals at a special event in 2012 by the MOHW to announce their achievements in age-friendly health care. Other awards were also presented to honor the best age-friendly with composition and the most creative proposals.
4. In 2012, a project encouraging health care institutions to participate in health promotion was launched. This project was run by the local health bureaus and subsidized by the MOHW; a total of 40 institutions participated and chose age-friendly health care as their main focuses within the project.

5. On April 11th, 2012, the proposal to establish "Working Group on HPH and Age-Friendly Health Care" was approved by General Assembly of International HPH Network at the 20th International Conference on Health Promoting Hospitals and Health Care.
6. Following the launch in 2009 of the "Health Promotion Project for the Elderly (2009 to 2012)", a total of 367 health stations and 458 medical care institutions joined 1,473 community care sites in holding senior health promotion activities in 2012. Already more than 80% of community care sites are integrated into the health care system.
7. Townships and villages encouraged seniors to form teams to join National Contest for Elderly Health Promotion.

Section 2, Chronic Diseases Prevention and Control

1. Metabolic Syndromes

Various channels used by the MOHW to educate the general public on prevention of metabolic syndrome raised the recognition rate of waist circumference warning values from 3% in 2006 to 43.9% in 2012. Also, in 2011, the MOHW added BMI, waist circumference measurements, and HDL-C testing to the preventive healthcare cervice for adults.

2. Diabetes Prevention and Control

In 2012, 186 Diabetes Health Promotion Institues and 490 diabetes patient support groups participated in a MOHW-sponsored program to promote the quality of diabetes care. The MOHW also continued to promote a Diabetes shared care Network each city/county and certification system for diabetes medical personnel.

3. Cardiovascular Diseases Prevention and Control

1) The MOHW worked with city and county health bureaus to prevent the "3-highs" (hypertension, hyperglycemia, and hyperlipidemia), and it made blood pressure measurement readily accessible even outside of health care institutions by community blood monitoring stations in various locations.
2) Since 2002, the MOHW has encouraged cities and counties to health authorities reallocate local care and health resources within their jurisdictions and to integrate the preveative healthcare services for adults with cancer screenings.

4. Chronic Kidney Disease Prevention and Control

In 2012, the MOHW awarded 131 medical care institutions for their work in promoting kidney health, and it printed 40,000 copies of a kidney disease management handbook to assist patients in increasing self-care knowledge.

5. Menopausal Health

In order to provide caring service to women undergoing menopause, the MOHW established a toll-free hotline (0800-00-5107) staffed with trained counselors. It also provided accurate menopause-related health information through various media channels.

Section 3, Cancer Prevention and Control

In accordance with the "Cancer Control Act," which was passed in 2003, the MOHW periodically convenes meetings of the Central Cancer Prevention and Control Conference and the Cancer Prevention and Control Policy Commission. To lower cancer mortality rates, from 2005 to 2009 the MOHW carried out the National Cancer Prevention and Control 5-Year Program, followed in 2010 by the second stage of the program, which focused on cancer screenings (2010 to 2013).

1. Cancer Incidence

According to 2010 cancer registry data, the crude incidence rates of cancer for males and females were 437.4 and 344.9 people per 100,000 population, respectively. If the rate is adjusted based on the WHO-constructed standard world population age structure from 2000, the age-standardized incidence rate for males and females drops to 340.7 and 256.2 people per 100,000 population, respectively. The 10 leading cancers for males and females are shown in Tables 3-1, 3-2 and 3-3.

Mortality data from the MOHW show that cancer has been the leading cause of death since 1982, a trend that continued in 2012 when it killed 43,665 people and accounted for 28% of all deaths. Based on the standard world population age structure from 2000, the standardized mortality rate for cancer in Taiwan gradually rose from 118 to 144.3 people per 100,000 population between 1982 and 1997, though it fluctuated between 138 and 144 people per 100,000 population in the decade after 1997 before reaching 131.3 in 2012. A look at cancer types shows that the standardized mortality rates of lung cancer, liver cancer, and cervical cancer all were on the decline (see Tables 3-4, 3-5, and 3-6, along with Figure 3-1).

Table 3-1 Incidence of 10 Leading Cancers, 2010 (Excluding Carcinoma in Situ)

Rank	Site	No. of Cases (People)	Age-Standardized Incidence Rate (Per 100,000 People)
1	Female Breast	9,655	63.2
2	Colorectal	14,040	45.3
3	Liver and Intrahepatic Bile Ducts	11,023	36.1
4	Lungs, Bronchus, and Trachea	10,615	33.6
5	Prostate	4,392	28.8
6	Oral Cavity, Oropharynx and, Hypo pharynx	6,560	21.7
7	Stomach	3,854	12.0
8	Body of Uterus	1,737	11.3
9	Cervix	1,680	10.8
10	Skin	2,978	9.3
	Total	90,649	296.7

Notes: 1.Ranked from highest to lowest age-standardized incidence rate.
2.The age-standardized rate is based on the standard world population age structure in 2000.
3.Source: Health Promotion Administration, MOHW, 2010 cancer registry data

Table 3-2 Incidence of 10 Leading Cancers in Males, 2010 (Excluding Carcinoma in Situ)

Site	No. of Cases	Age-Standardized Incidence Rate (Per 100,000 People)
Colorectal	8,143	54.4
Liver and Intrahepatic Bile Ducts	7,751	52.3
Lungs, Bronchus, and Trachea	6,697	43.7
Oral Cavity, Oropharynx and, Hypopharynx	6,028	40.6
Prostate	4,392	28.8
Stomach	2,415	15.4
Esophagus	2,091	13.8
Skin	1,575	10.2
Bladder	1,427	9.2
Nasopharynx	1,194	8.2
Total	50,892	340.7

Source: Health Promotion Administration, MOHW, 2010 cancer registry data

2. Cancer Screenings

Since 2010, the MOHW has fully subsidized screenings for cervical cancer, breast cancer, colorectal cancer, and oral cancer, making Taiwan the first nation in the world to provide four cancer screening free of charge. Also, through a plan for hospitals to raise cancer health care quality, the Health Promotion Administration subsidized more than 200 hospitals which serve at least 5,000 people older than 29 each year. Screening results from 2012 are shown in Table 3-7:

Table 3-3 Incidence of 10 Leading Cancers in Females, 2010 (Excluding Carcinoma in Situ)

Site	No. of Cases	Age-Standardized Incidence Rate (Per 100,000 People)
Female Breast	9,655	63.2
Colorectal	5,897	36.8
Lungs, Bronchus, and Trachea	3,918	24.3
Liver and Intrahepatic Bile Ducts	3,272	20.5
Thyroid	1,838	12.9
Body of Uterus	1,737	11.3
Cervix	1,680	10.8
Stomach	1,439	8.9
Ovary, Fallopian Tube, and Broad Ligament	1,245	8.5
Skin	1,403	8.4
Total	39,757	256.2

Source: Health Promotion Administration, MOHW, 2010 cancer registry data

Table 3-4 10 Leading Cancers of Death, 2012

Site	Cancers Causing Death	Cases (People)	Age-Standardized Incidence Rate (Per 100,000 People)
1	Cancers of Trachea, Bronchus and Lung	8,587	25.4
2	Cancers of Liver and Intrahepatic Bile Ducts	8,116	24.7
3	Cancers of Colon, Rectum, and Anus	5,131	14.9
4	Breast Cancer (Female)	1,912	11.6
5	Oral Cavity Cancer	2,566	8.1
6	Stomach Cancer	2,386	6.9
7	Prostate Cancer	1,187	6.7
8	Pancreatic Cancer	1,629	4.9
9	Esophegeal Cancer	1,581	4.9
10	Cervical Cancer	669	3.9
	Other Cancer	9,901	30.3
	All Cancer Types	43,665	131.3

3. Raising Cancer Treatment and Care Quality

1) Since 2008, the MOHW has conducted cancer treatment quality certification for hospitals that treat at least 500 new cancer cases each year. It began to use a new set of certification standards in 2011 that it commissioned the National Health Research Institutes to prepare. At the end of 2012, a total of 48 hospitals were certified.

2) The MOHW subsidized NGO to proide cancer patient ancl families information and suppont in 2004, and extended to hospitals to establish "one-step window" for cancer services,

Table 3-5 10 Leading Cancers of Death among Males, 2012

Site	Cancers Causing Death	Cases (People)	Age-Standardized Mortality Rate (Per 100,000 People)
1	Cancers of Trachea, Bronchus and Lung	5,628	34.7
2	Cancers of Liver and Intrahepatic Bile Ducts	5,596	35.8
3	Cancers of Colon, Rectum, and Anus	2,956	18.1
4	Oral Cavity Cancer	2,359	15.3
5	Stomach Cancer	1,502	9.0
6	Esophegeal Cancer	1,477	9.4
7	Prostate Cancer	1,187	6.7
8	Pancreatic Cancer	935	5.8
9	Non-Hodgkin Lymphoma	605	3.7
10	Leukemia	580	3.9
	Other Cancer	4,445	28.1
	All Cancer Types	27,270	170.4

Table 3-6 10 Leading Cancers of Death among Females, 2012

Site	Cancers Causing Death	Cases (People)	Age-Standardized Mortality Rate (Per 100,000 People)
1	Cancers of Trachea, Bronchus and Lung	2,959	17.0
2	Cancers of Liver and Intrahepatic Bile Ducts	2,520	14.4
3	Cancers of Colon, Rectum, and Anus	2,175	12.1
4	Breast Cancer (Female)	1,912	11.6
5	Stomach Cancer	884	5.0
6	Pancreatic Cancer	694	4.0
7	Cervical Cancer	669	3.9
8	Ovarian Cancer	528	3.2
9	Non-Hodgkin Lymphoma	410	2.4
10	Leukemia	364	2.4
	Other Cancer	3,280	19.3
	All Cancer Types	16,395	95.1

allowing hospitals to integrate internal and external resources and provide an environment for patients and their families entitle to comprehensive services.

3) In order to evaluate results of promoting hospice and palliative shared care for cancer patients, the MOHW used death records and the NHI database to determine use of hospice and palliative care by cancer patients in the final year before death. Approximately 20,000 cancer patients used these services in 2012 and the usage rate increased from 7.4% to 47.5% between 2000 and 2011.

Figure 3-1 Changes in Standardized Mortality Rate of 10 Leading Cancers of Death, by Year

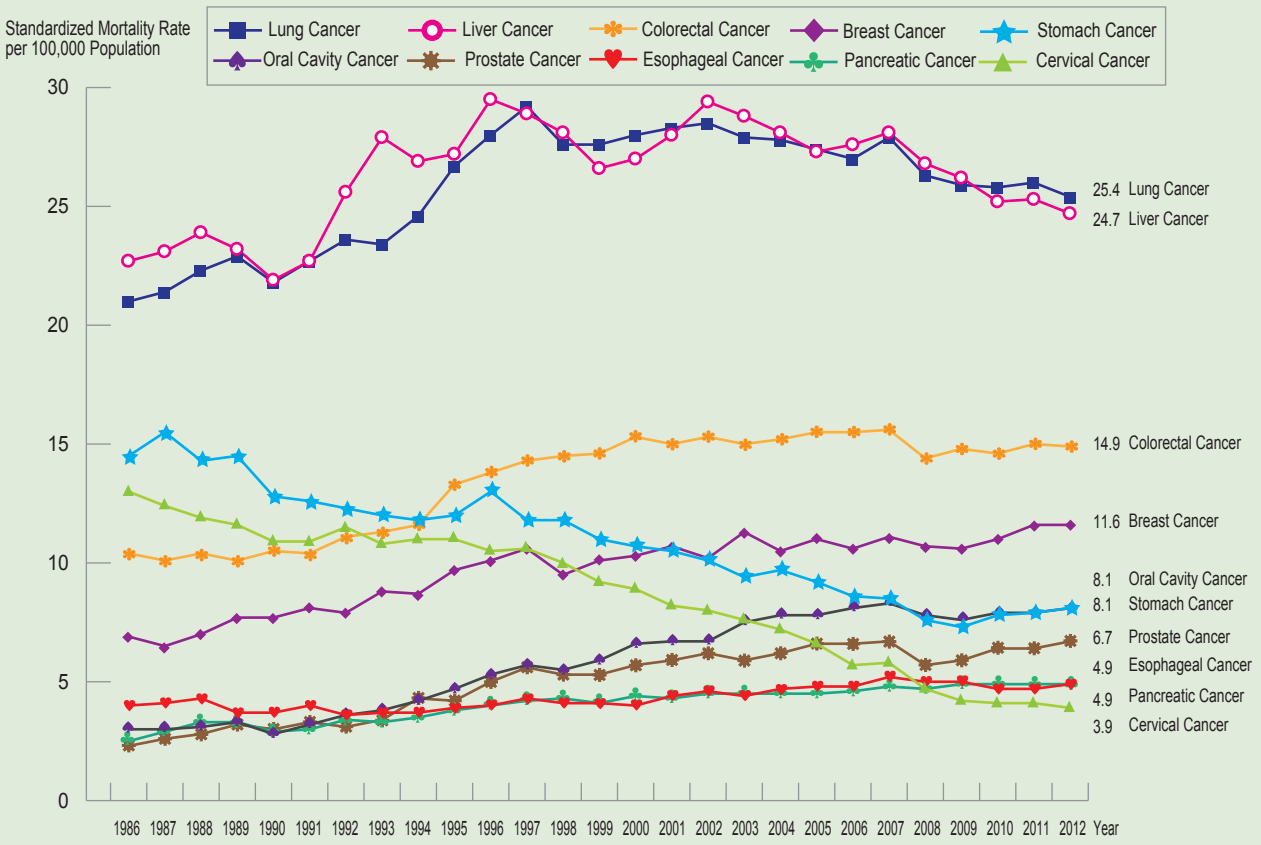

Table 3-7 Screening Volume, Rate, Precancerous Lesions, and Cancer Cases for 4 Major Types of Cancer, 2012

	Screening Volume	Screening Rate	Precancerous Lesions	Cancer Cases
Cervical Cancer	2.135Million	60.8%	9,637	4,045
Breast Cancer	670,000	32.5%	-	3,317
Colorectal Cancer	1.123Million	34.2%	23,775	2,001
Oral Cavity Cancer	982,000	52.5%	3,445	1,232
Total	4.91Million	-	36,857	10,444

Note: Basis for Screening Rates

1. Cervical Cancer Screening Rate: The rate of women aged 30-69 who were screened in the past three years.
2. Breast Cancer Screening Rate: The rate of women aged 45-69 who were screened in the past two years.
3. Colorectal Cancer Screening Rate: The rate of people aged 50-69 who were screened in the past two years.
4. Oral Cavity Cancer Screening Rate: The rate of betel quid chewers or smokers aged 30 or over who were screened in the past two years.

Chapter 5, Health Dissemination and Monitoring

Section 3, Health Surveillance

To ensure that health policies actually improve people's health, the MOHW has grandually developed the surveillance system on non-communicable diseases to collect, analyze, and disseminate health relathed information.

1. The MOHW established a systematic mechanism for national health surveys, based on three main data collection platforms: face-to-face community surveys, self-administered student surveys, and telephone interview surveys. Surveys on whole population and specific age groups were conducted as part of the comprehensive surveillance system. Surveys that took place between 2007 and 2012 or that are scheduled to take place between 2013 and 2016 are listed in Table 5-1.
2. An assessment plan are in place to evaluate and improve the surveillance system. Besides birth reporting system, disease registration on cancers and other major diseases, in 2012, the MOHW conducted pilot study of surveillance on birth defects and unintentional injuries. It is also planed and under process to improve the protocol of survey on breastfeeding, nutrition, oral health, and visual health.
3. Timely and user-friendly query services for health indicators calculated from health surveys and birth reporting data were provided. In 2012, new functions included diverse query routes for indicator and personalized website services were newly added.

Table 5-1 Major Health Monitoring and Surveys, 2007-2016

Survey	→ Cross-Sectional Survey ● Longitudinal Survey									
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Face-to-Face Community Surveys										
National Health Interview Survey			●				●			
Taiwan Longitudinal Study on Aging	→				→				→	
Taiwan Fertility and Family Survey		●				●				●
Taiwan Birth Cohort Study	→	→		→	→	→	→	→		
Self-Administered Student Surveys										
Global Youth Tobacco Survey of Junior High School Students		●		●	●	●	●	●	●	●
Global Youth Tobacco Survey of Senior High School Students	●		●		●	●	●	●	●	●
Taiwan Youth Health Survey of Junior High School Students		●		●		●		●		●
Taiwan Youth Health Survey of Senior High School Students	●		●		●		●		●	
Telephone Interview Surveys										
Adult Smoking Behavior Survey	●	●	●	●	●	●	●	●	●	●
Behavioral Risk Factor Surveillance System	●	●	●	●	●	●	●	●	●	●
Surveys on Health Promotion Issues	●	●	●	●	●	●	●	●	●	●

4 Communicable Disease Control

39 Chapter 1 Communicable Disease Control Act and legal Framework

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Effective Communicable disease control requires continuous epidemic surveillance and investigation, preparedness for disease prevention, research, and immunization. In addition the amendment to laws and regulations must take place at the same time to reflect global trends and changing disease control needs. The amended legal framework for communicable disease control can result in a more comprehensive disease control system that allows for early implementation of measures against outbreaks and ensure the health, and well-being of the peple in Taiwan.

Chapter 1, Communicable Disease Control Act and legal Framework

In order to prevent the occurrence, transmission, and spread of communicable diseases, the "Communicable Disease Control Act" and related regulations have been formulated to specify the obligations and rights associated with the control of communicable diseases and establish procedures for health workers to follow when undertaking disease control activities.

Section 1, Laws and Regulations for Communicable Disease Control

The Communicable Disease Control Act and the HIV Infection Control and Patient Rights Protection Act are important acts governing the implementation of communicable disease prevention and control activities in Taiwan. In 2012, to strengthen prevention and control efforts, amendments were made to six related legal orders and one administrative regulation (See Table 4-1.)

Section 2, Frameworks of Communicable Disease Control

1. Prevention Network

Communicable disease control should be achieved through the efforts of central and local governments. The Centers for Disease Control, Ministry of Health and Welfare (hereinafter referred to as "Taiwan CDC") is the highest authority in Taiwan responsible for the formulation of communicable disease control strategies and plans, and also for the supervision, direction and evaluation of communicable disease control efforts executed by local health bureaus. City and county health bureaus formulate their own action plans in accordance with the strategies and plans established by the central government, and then execute them accordingly.

2. Testing Framework

The Center for Research Diagnostic and vaccine Development of the Taiwan CDC is responsible for the laboratory testing and research of various communicable diseases in Taiwan. To meet testing demands, the Center contracted eight laboratories for virus testing and eight laboratories for *Mycobacterium tuberculosis*, and approved another 281 institutions for communicable disease testing. The center has also formulated the "National Plan for the Quality Management of the Collection and Transportation of Specimens of Communicable Diseases" to assure the quality, timing, and safety of specimen collection and transportation.

3. Command Framework

The National Health Command Center was established in 2005 to integrate disaster-related information provided by central government agencies, local governments, and related organizations into appropriate data that can serve as a reference for decision-making by the commander in terms of disaster prevention efforts. Another breakthrough in Taiwan's clisease control efforts came when Taiwan began to implement of the International Health Regulations (2005) which provides a single platform for communicating with other countries from around the world and facilitates rapid notification and response to major outbreaks and public health emergencies.

Table 4-1 Amended Legal Orders Issued & Administrative Regulation 2012

Name of Legal Order & administrative regulation	Issue Date of Amendments	Objective of Amendments
"Categories of Communicable Diseases and Preventive Measures for Categories IV and V Communicable Diseases"	February 7, 2012	Added brucellosis as a Category IV communicable disease and named corresponding prevention and control measures. Revised the regulations for the disposal of corpse with Creutzfeldt-Jakob disease, which is listed under Category IV
"Regulations Governing Immunization Operation, Examination of Children's Immunization Record, and catch-Up Immunization"	February 21, 2012	Amended Article 7 and the appendix to Article 4 to reflect current immunization programs and schedule changes.
"Regulations Governing Operation of the Communicable Disease Control Medical Network"	October 2, 2012	Amended Article 14, Appendix 1 to Article 2, and Appendix 2 to Article 6, in response to the nationwide administrative district restructuring in 2010, revisions to the standards for establishing medical care institutions in 2012, and practical needs associated with infection control in hospitals.
"Categories of Communicable Diseases and Preventive Measures for Categories IV and V Communicable Diseases"	October 3, 2012	Added severe acute respiratory infections associated with novel coronavirus as a Category V communicable disease and described relevant prevention and control measures. When patients are found to have contracted this disease, all relevant prevention, control measures and reporting timeframe designated for category V communicable disease must be followed.
"Directions Governing the Review of Application for Stay or Residence for HIV-Infected Individuals"	November 27, 2012	Amended Direction 4 and 7 to meet practical needs and achieve compatibility with Article 5 part 3 of the "Basic Code Governing Central Administrative Agencies Organizations," which states that "with the exception of this Code and organic laws and regulations of various agencies, no other laws or regulations may be used to govern the organization of agencies."
"Regulations Governing the Management of Laboratory Diagnoses for Communicable Diseases and Laboratory Testing Institutions"	November 28, 2012	The full regulations were amended to meet practical needs and summarize the regulations collecting and testing of communicable disease specimens.
"Regulations Governing Collection and Review of Relief Fund for Victims of Immunization"	December 14, 2012	A portion of the regulations were amended to meet the needs for practical operations and help the fund reach its annual break-even point, so the objectives of relief fund for victims of immunization could be met.

Section 3, Communicable Disease Control Medical Network

To improve the response capability and capacity for the admittance and treatment of communicable disease patients requiring isolation care in terms of major communicable disease outbreaks, in 2003, MOHW established the Infectious Disease Control Medical Network. In 2007 it was renamed as the Communicable Disease Control Medical Network.

In 2008, MOHW announced revisions to the "Regulations Governing Operation of the Communicable Disease Control Medical Network", which led to division of the network into six regions and created a plan for resource distribution. MOHW also named 137 isolation hospitals and responding hospitals for the admittance and treatment of communicable disease patients requiring isolation care (see Figure 4-1), and asked hospitals to conduct regular testing and inspections on negative pressure isolation wards. To optimize Pandemic preparedness of responding hospitals, each hospital was required to draft emergency response plans, which formed the basis for educational/training exercises and drills. In 2012, the hospitals conducted 276 educational trainings and 25 drills.

Section 4, Disease Surveillance and Investigation Mechanisms

The purpose of disease surveillance is to quickly detect the occurrence of diseases and the emergence of abnormal situations. This information is used to monitor long-term trends for reference during policymaking, and it contributed to the 2012 distribution of notifiable disease information shown in Appendix II. The status of disease monitoring and investigation follows:

1. Diverse Surveillance Systems for Communicable Diseases

MOHW established surveillance systems for schools and institutions with dense populations. The data collected from the department of emergency services, the National Health Insurance system, and death records are used as complements, overcoming limitations inherent in passive notification systems.

1) School-Based Surveillance System: By 2012, there were 659 participating elementary schools (equivalent to about 25% of the nation's public elementary schools), covering 97% of townships and city districts. Students from grades one to six were part of the system (along with children at affiliated kindergartens), and the diseases monitored included influenza-like illnesses, hand-foot-mouth disease or her angina, acute diarrhea, fever, and conjunctivitis.

2) Surveillance System for Densely Populated Institutions: The diseases monitored through this system included cluster outbreaks of respiratory and intestinal diseases. Reported data was compiled and analyzed for early detection of abnormal situations.

3) Real-Time Outbreak and Disease Surveillance System: More than 170 hospitals transmit daily emergency room diagnostic codes that can be quickly analyzed to detect emerging abnormal situations. Diseases or syndromes routinely monitored in 2012 included influenza-like illnesses, enterovirus infection, acute diarrhea, and conjunctivitis.

Figure 4-1 Communicable Disease Control Medical Network

Responding Hospitals

Name of Responding Hospital
Northern Region (60)
Sinwu Branch, Taoyuan Hospital (34)
NTUH Hospital Chu-Tung Branch (8)
NTUH Hospital Hsinchu Branch (10)
Miaoli Hospital (8)

Name of Responding Hospital
Central Region (122)
Nantou Hospital (44)
Taichung Hospital (37)
Fengyuan Hospital (13)
Changhua Hospital (28)

Name of Responding Hospital
Southern Region (65)
Sinying Hospital (11)
Chiayi Hospital (17)
NTUH Hospital Yun-Lin Branch (11)
Chiayi Chang Gung Hospital (14)

Name of Responding Hospital
Taipei Metropolitan Region (125)
Heping Hospital (77)
Lienchiang County Hospital (2)
Kinmen Hospital (4)
New Taipei City Hospital (21)
National Yang-Ming University Hospital (13)
Keelung Hospital (8)

Name of Responding Hospital
Eastern Region (15)
Taitung Hospital (8)
Hualien Hospital (7)

Name of Responding Hospital
Kaohsiung-Pingtung Region (41)
Cishan Hospital (16)
Min-Sheng Hospital (10)
Pingtung Hospital (9)
Tri-Service Hospital, Penghu Branch (6)

At the end of 2013, in a network comprising six regions the MOHW had designated 137 isolation hospitals. Among these, 22 were also named as responding hospitals and 17 served in a cooperative role as support hospitals.

4) Routine Surveillance of NHI Data: Using the same data uploaded to the National Health Insurance Administration IC card registry, this system compiled daily clinical visits, hospital stays, and emergency room visits of selected, designated diseases for secondary statistical analysis. Results were contributed to the routine disease surveillance and analysis.

5) Surveillance of Deaths Caused by Pneumonia and Influenza Deaths: Using data sent daily by the death reporting system of the Department of Statistics, MOHW, this system analyzes reports of deaths that were attributed pneumonia or influenza (P & I) daily from the online death registration database in the Department of Statistics, MOHW in order to monitor P & I mortality trends.

2. Integration of Disease Reporting Systems

1) MOHW has continued the integration of various reporting systems (including the linkage of reporting systems for individual communicable disease cases and symptoms together with systems for outbreak investigation and central management of communicable disease tracking). The ultimate objective is to have a single entry for reporting.

2) An integrated national disease control information network was established to collect communicable disease information from various channels and achieve real-time monitoring of outbreaks.

3. Outbreak Investigation

1) The Field Epidemiology Training Program continues to provide professional training in applied epidemiology.

2) Investigation is needed when communicable disease outbreaks of public health emergency or unidentified origin emerge. In 2012, the MOHW assisted with or participated in the investigation of 448 suspected cluster outbreaks, including sapovirus-induced gastroenteritis caused by the consumption of raw oysters at a restaurant chain, a human metapneumovirus outbreak at a psychiatric ward, an imported case of rabies from China, a regional outbreak of salmonellosis in central Taiwan, a family cluster of cholera in a central Taiwan household, the death of an 11-month-old female infant after receiving an influenza vaccination, and an outbreak of shigellosis in an eastern Taiwan community.

Chapter 2, Control of Major/ Emerging Communicable Diseases

Significant progress in the area of communicable disease control can be attributed to improvements in environmental health conditions and increased advocacy. Communicable diseases eradicated in recent years include smallpox, rabies, malaria, and polio. Nevertheless, increased frequency of international travel raises the threat of emerging and re-emerging diseases, posing a difficult challenge.

Section 1, Tuberculosis Control

A downward trend in tuberculosis (TB) incidence that started in recent years continued in 2012, when confirmed cases totaled 12,338. To continue making progress, the MOHW considered the current situation, past execution results, and the WHO's "Global Plan to Stop TB 2006-2015" to formulate Taiwan's "Mobilization Plan to Halve TB Incidence in 10 Years". It forecasts that this latter goal can be accomplished in 2015 (see Figure 4-2). Achievements of TB control in 2012 are as follows:

1. MOHW advocates the directly observed treatment, short-course (DOTS) strategy, which has effectively lowered treatment failure and relapse rates while preventing the occurrence of multi-drug resistant TB. Among patients who tested positive for TB smear or culture tests, more than 90% participated in DOTS.

Figure 4-2 Reported TB Cases, 2005-2012

2. To improve the treatment success rate of multidrug-resistant TB (MDR-TB), the MOHW launched a dedicated medical treatment and care system. By concentrating on the provision of DOTS-plus services to patients admitted for treatment, the system raised the 24-month treatment success rate from 64.9% in 2007 to 78% in 2012.
3. MOHW also strengthened contact tracing for TB, to quickly identifor the infection source and provide early treatment and monitoring of contacts who become TB cases. Such early diagnosis and treatment is an effective means of blocking further transmission. In 2012, an average of nine contacts were investigated for each TB case.
4. MOHW encouraged directly observed preventive therapy (DOPT) in conjunction with its "Latent TB Infection Treatment Program." In the early stages, by making the target population of contacts younger than 13 of active TB patients, the program effectively reduced the likelihood of onset of active TB. The target population expanded to contacts aged below 13 to birth cohort younger than 1986 whose index cases are highly contagious since April 1, 2012. From 2011 to 2012, accumulated participation by latent TB patients expanded by more than 20%, reaching 5,444 people.
5. For better detection of TB cases, the MOHW conducted nationwide TB screening via mobile chest X-ray vans in mountain areas in 2012.
6. By offering subsidized hospitalization and living expenses for chronic cases, the MOHW encourages the long-term, isolated care needed by patients to prevent further transmission of the disease.

Section 2, Communicable Diseases of the Enteric Tract

1. Enterovirus

In 2012, 153 cases of enterovirus infection with severe complications, including 2 deaths were confirmed. The mortality rate of 1.3% was significantly lower than that during the previous outbreaks of enterovirus 71 (EV-71). Prevention strategies implemented included the following:

1) MOHW commissioned city and county public health bureaus to conduct a program for

improving enterovirus control, including the training of local staff and promotion of community health education.

2) Multiple surveillance systems allowed for prompt warnings to alert both parents and physicians for enterovirus outbreaks. MOHW also used inter-departmental and local government resources to inspect handwashing facilities at educational and nursery school institutions and to strengthen sanitary inspections of public facilities frequented by children.

3) Operation of a medical care network for severe cases of enterovirus infection expedited patient transfers by building direct contact between responsible hospitals. MOHW also ensured the quality of care by organizing physician education and training programs.

4) MOHW took several actions to address an increase in EV-71 infections. It gathered experts and lead officials of regional communicable disease control medical networks to discuss response strategies, and it invited related government agencies and local governments to Participate in hosting a meeting to pledge mobilized response to enterovirus outbreaks. Also, during the peak of enterovirus season, MOHW launched coordination meetings on the management of outbreaks, in accordance with Article 16 of the "Communicable Disease Control Act." This allowed involved agencies to combine resources for achieving a significant results.

5) Taiwan CDC completed the research and development of a rapid screening kit for EV-71, then transferred the technology to a biotechnology company that made it compatible with whole blood samples. In October 2012, the rapid screening kit received the registration and market approval of in vitro diagnostic devices to assist in gaining an early understanding of EV-71 trends currently the vaccine for EV-71 is under development.

2. Hepatitis A

Since June 1995, MOHW has provided hepatitis A immunization for preschool children in 30 mountain indigenous villages and a plain-land indigenous villages located adjacent to mountain regions. The hepatitis A incidence rate in the mountain indigenous villages has dropped from 90.7 people per 100,000 population in 1995 (183 confirmed cases) to zero in 2012, demonstrating the impressive effectiveness of vaccination strategies.

Section 3, Vector-Borne Communicable Diseases

1. Dengue Fever

In 2012, there were a total of 1,478 confirmed dengue fever cases, including of 207 imported cases and 1,271 indigenous cases (35 cases of dengue hemorrhagic fever and seven deaths). Annual confirmed cases of indigenous dengue fever are illustrated in Figure 4-3, and primary control strategies implemented in 2012 are as follows:

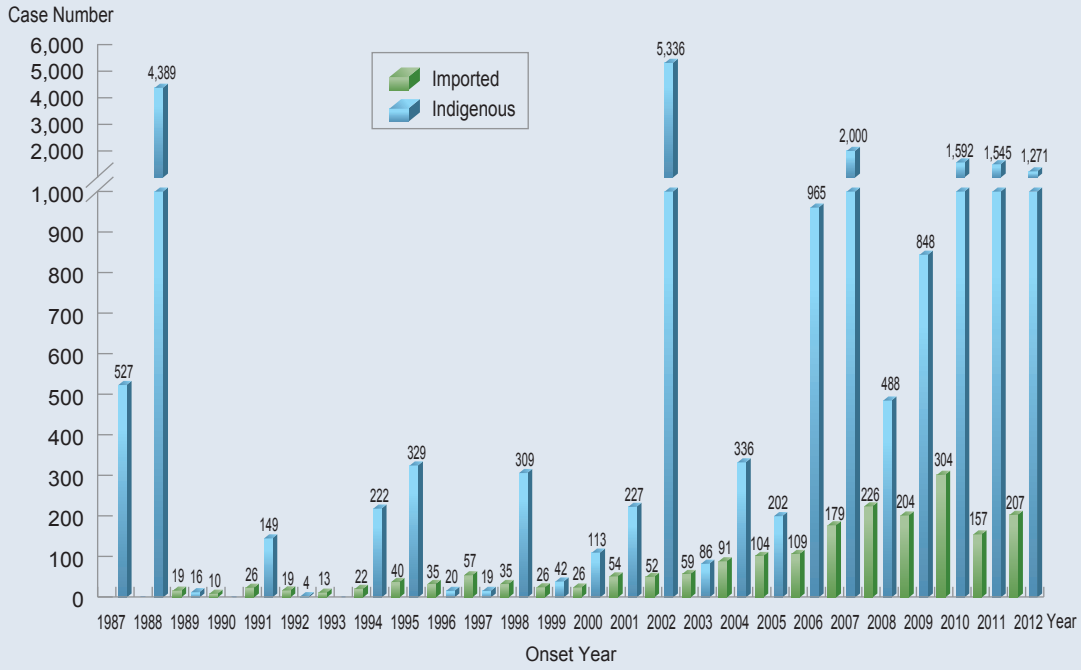
1) Eliminated or reduced vector breeding sites and containers in communities.

2) Adhered to the principal of minimal use of chemical vector controls, when emergency spraying did occur, it was preceded by professional analysis of local circumstances. These precautions were practiced to avoid vector resistance and ensure the effectiveness of spraying during major outbreaks.

3) Continued community mobilization and, when necessary, gathered central and local government agencies to convene coordination meetings on the management of dengue fever. Supplementary efforts included organizing mobile squads that could assist with overseeing the implementation of disease control activities at the city and county level.

4) Strengthened public health education and awareness campaigns. Dengue fever control

Figure 4-3 Annual incidence of Dengue Fever. 1987-2012



guidelines are revised to strengthen education and training of disease control and health care workers.

5) Strengthened disease surveillance and implemented fever screenings and dengue fever rapid tests for incoming travelers at international airports.

2. Japanese Encephalitis

Japanese encephalitis season is from May to October and peaks in June and July. In 2012, there were 32 confirmed cases.

3. Malaria

Malaria has been eradicated in Taiwan. To maintain malaria-free status, MOHW continued surveillance and strengthened the public health education and awareness campaigns to educate the proper precautions against mosquito bites when traveling overseas. In 2012, there were 12 confirmed cases and all were imported.

Section 4, Blood and Body Fluid-Transmitted Communicable Diseases Infections

1. HIV / AIDS

By the end of 2012, the number of HIV reported cases had accumulated to 24,239(9,725 developed full-blown AIDS and there were 3,771 deaths). Of the 2,224 new HIV-infected individuals reported in 2012, 91% infected contracted the disease through unprotected sex, 77% of whom were men who had sex with men (MSM). Primary control strategies and achievement highlights in 2012 include:

1) Enhanced cross-ministerial cooperation under the MOHW Committee of HIV Infection Control and Patient Rights Protection, four groups were established to concentrate on policy formulation, patient rights protection, health education, and clinical trial.

2) To improve HIV prevention and control practices among men who have sex with men, MOHW promoted safe sex and established four MSM

Community Health Centers for homosexuals. In addition, MOHW assisted the Tainan City Health Bureau in forming the first MSM Community Health Center established by a city or county government.On average, There were 3,000 visits a month to this friendly health services environment for the LGBT community.

3) Implemented a harm reduction program to reduce incidence of HIV/AIDS among intravenous drug users. By the end of 2012, a total of 102 institutions provided alternative substitution therapy, there were 928 clean needle and health consultation stations and 415 needle vending machines were available to provided clean needles and syringes. The needle return rate reached 92%.

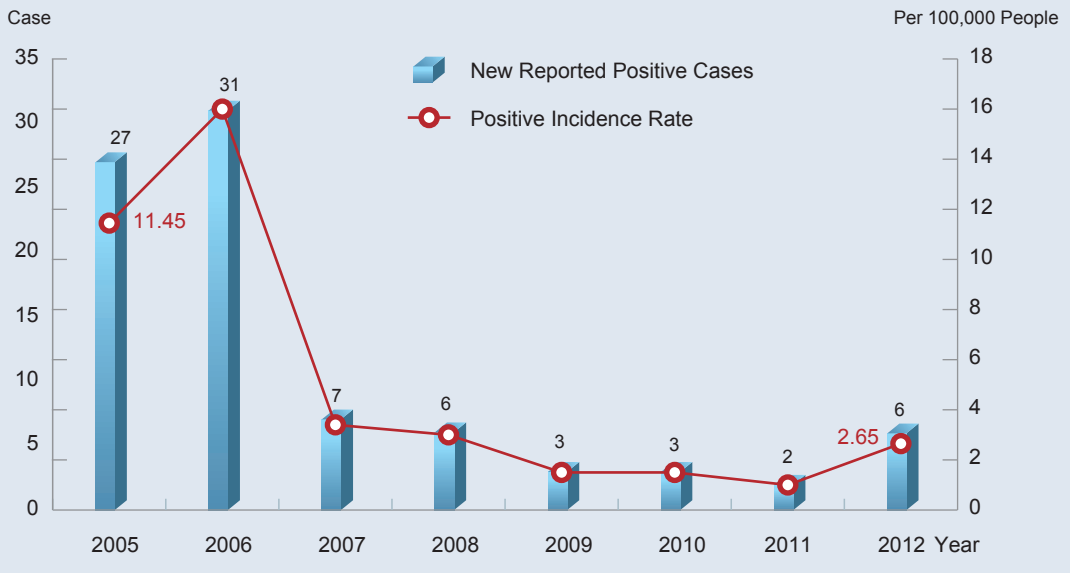
4) To expand HIV counseling and testing, the MOHW commissioned 42 medical care institutions to provide free and confidential testing and consultation services for sexually transmitted diseases. Moreover, between August 1 and October 31, 2013, Taiwan CDC promoted the WE-CHECK community mobilization for HIV testing program.

5) For the prevention of mother-to-child transmission of HIV, in 2005 the MOHW launched a universal HIV screening program of pregnant women. Details are illustrated in Figure 4-4. Pregnant women found to be infected received preventive drugs and other treatment through the cooperation of public health services and medical institutions. In the four consecutive years since 2009, there is no child born with HIV. (by birth year).

2. Sexually Transmitted Diseases

MOHW commissioned a medical association to evaluate and improve the quality of HIV/AIDS and STD clinical treatment. MOHW who conducted training of specialized physicians in respective medical association and the referral of patients to of physicians who ran friendly STD clinics to raise the willingness of patients with STDs to receive treatment. MOHW also continued to promote HIV testing among STD patients.

Figure 4-4 New HIV reported pregnant woman and HIV Positive Rate under Universal Screening Program for Pregnant Women, by Year



3. Hepatitis B and C

1) MOHW facilitates screening of pregnant women for hepatitis B during prenatal care visits and the immunization of the newborns against hepatitis B. Before the immunization program was initiated, the carrier rate among children at age 6 was 10.5%, and after implementating the program, the carrier rate has dropped to approximately 0.8%. Additionally, the program includes hepatitis B booster shots for preschool children and first graders.
2) There are approximately 2.5 milion adult carriers of hepatitis B in Taiwan and 400,000 adult carriers of hepatitis C. To treat patients who are already infected, on October 1, 2003, MOHW launched a pilot program to improve the National Health Insurance treatment services for chronic hepatitis B and C patients. By the end of 2012, there were 105,391 hepatitis B patients and 58,405 hepatitis C patients registered under the program.

Section 5, Control of Emerging Communicable Diseases

Effective and successful response to address challenges and threats posed by emerging infections disease requires a comprehensive and multi-pronged approach. Besides closely monitoring international outbreaks, MOHW strengthens domestic disease surveillance and reporting systems by improving laboratory diagnostic capabilities and drafting preparedness and response strategies and interventions.

On September 24, 2012, after receiving a report of a novel coronavirus outbreak from WHO, the MOHW immediately launched a response mechanism. It enhanced fever screenings at airport border control, and quickly deployed staff to the United Kingdom to obtain the latest laboratory information and standard diagnostic methods concerning the virus. Following an expert consultation meeting, it named severe acute respiratory infections associated with novel coronavirus as a Category V notifiable disease while strengthening the surveillance and reporting of pneumonia cluster infections of unidentified origin. MOHW also issued press statements and reports to health care providers, offering of the latest international disease information and raising the awareness of the general public and physicians.

Between September and December in 2012, MOHW reported 3 suspected cases of severe acute respiratory infections associated with a novel coronavirus. After further investigation, infection with the novel coronavirus was ruled out in all 3 cases. Also, as part of the expanded surveillance program 84 specinens collected from pneumonia patients infected with microbes of unidentified origin were tested. None turned out to be infected with the novel coronavirus. In the future, MOHW will continue to closely monitor the development of outbreaks and adjust international disease the existing emergency preparedness and response plan accordingly.

Section 6, Control of Imported Communicable Diseases

To prevent the importation of communicable diseases, MOHW has implemented the following measures:

1. Quarantine

1) Necessary quarantine measures are implemented with regard to ships, aircrafts, crew member, and passengers. MOHW cooperated with port agencies to establish a public health service task force, which ensures sanitation and hygiene at international exit and entry ports to prevent the important or exportation of communicable diseases.Inaddition, to comply with the International Health Regulations (2005), MOHW evaluates and assists with establishing core capabilities of designated points of entry such as the Taoyuan International Airport and the Port of Kaohsiung.

2) In 2012, of the 17,491,283 people who entered Taiwan, 14,556 were identified as symptomatic by the airport/port diagnostic stations run by the Taiwan CDC, and 115 were confirmed to be infected with a notifiable communicable disease.

2. Communicable Disease Control Related to Travel

1) Taiwan CDC uses thermal imagers at international ports and airports to screen arriving passengers. Those suspected with infections are asked to fill out the "Communicable Disease Survey Form" to facilitate diagnosis and possible follow-up disease prevention measures. MOHW also enhances publicity by using LED displays, stickers, and display stands, along with the dissemination of promotional materials and production of health videos. The added exposure aims to improves knowledge of communicable diseases related to travel as well as self-management of health.

2) Beginning in October 2006, MOHW commissioned contracted hospitals to establish travel health clinics specializing in the provision of immunizations and preventive medicine along with travel health consultations.

Since January 2008, MOHW has undertaken numerous action plans in the area of travel health medicine. Table 4-2 lists the three main work plan and achievement highlights in 2012.

Chapter 3, Emergency Preparedness and Infection Control

Section 1, Pandemic Influenza Preparedness and Response

1. Since 2005, MOHW has been organizing organized pandemic influenza preparedness operations pursuant to the "National Influenza Pandemic Preparedness Plan" and the Phase II Plan (ratified by the Executive Yuan on May 23, 2010). The outlines of Taiwan's influenza pandemic response are hinged on the "Four Major Strategies and Five Lines of Defense". The four major strategies induced disease surveillance and assessment, interruption of transmission, use of influenza antivirals, and use of influenza vaccine. The five lines of defense include containment abroad, border control, community epidemic control, maintenance of medical care system functions, and individual and family protection.
2. According to the "Influenza Pandemic Strategic Plan" (Chinese and English versions) and the "Respective Guidelines and Recommended Actions", MOHM conducts each outlined preparedness strategies, including the critical

Table 4-2 Work Plans and Achievements in the Field of Travel Medicine, 2012

Work Plan	Objective	Achievements
Improve Health Education Measures for Travel Medicine Clinics	Promote a Group Model for Health Education	20 Sessions with Total Attendance of 255
	Advocate Clinical Health Training for Groups of Five or Less	188 Sessions with Total Attendance of 471
Promote Travel Medicine Knowledge	Health Worker Training Classes	12 Classes
	National Seminars	2 Seminars
	Guide and Travel Leader Training	5 Sessions
Distribution of Published Materials	Publish Materials for Clinical Health Workers	Published a Quarterly Travel Medicine Bulletin and a Travel Medicine Guidebook
	Published Materials for Tourists and Travel Workers	Published a Promotional Handbook for Physicians Embarking on Medical Missions

medical equipment and suppies preparation and management, planning of pharmecutical interventions (including vaccination programs and guidance on the use of influenza antivirals), consolidation of health care resources, improvement of community volunteer capacity, organization of training and drills, improvement of risk communication, and participation in international collaboratuon.

3. From July 18 to 20, 2012, Taiwan CDC hosted the three-day APEC Workshop on Influenza Vaccine Policies and Strategies in Post-Pandemic Era. Participants achieved the objective of improving influenza vaccine policies and strategies.
4. Surveillance and Response for Avian Influenza
   1) To coordinate and discuss control efforts, representatives from concerned agencies attend the avian influenza liaison meetings run by the Executive Yuan. MOHW has been monitoring and making regular announcements on the latest global and domestic epidemic situations through the national IHR Focal Point, and it has been cooperating with the Council of Agriculture to establish a single point for the exchange of epidemic information related to avian influenza and human cases of avian influenza.
   2) MOHW improved quarantine control measures by reinforcing fever screenings, travel history inquiries, and disease exposure inquiries of incoming passengers from specific areas, as well as the implementation of self-protection measures undertaken by quarantine inspection staff. Other measures included the provision of avian influenza health education materials in Chinese, Thai, Indonesian, and Vietnamese at international ports for use by incoming and outgoing passengers.
   3) The emergence of highly pathogenic H5N2 avian influenza in domestic animals led to a number of actions by MOHW: 1. Revision of guidelines for workers handling control of H5N2 avian influenza, and 2. Execution of a serological survey for avian influenza viruses among domestic poultry workers.
   4) Between March and August 2012, MOHW conducted a voluntary human H5N1 vaccination program. The objective of the program was to immunize personnel at high risk for avian H5N1 influenza, including health care workers, public health workers and quarantine officers, poultry and livestock farmers and animal health inspectors, and travelers who frequently visit to nations at high risk of A/H5N1 outbreaks.

Section 2, Seasonal Influenza Monitoring and Control

1. Small-scale activity of seasonal influenza, primarily attributed to influenza A/H3N2, emerged in the summer 2012. In contrast, in winter 2012, the influenza activity was lower than that in the previous years. To gather real-time epidemic related updates, a diversified surveillance system was set up to quickly collet updates of on edipemic status, virus activity, and gravity of epidemic conditions. Such in form ation is then regularly released to the general for public information update and awareness.
2. Begining October 1, 2012, MOHW launched its annual seasonal influenza immunization campaign, and from December 26, 2012, it began offering fully subsidized physician examination fee for children under six years of age receiving the vaccine.
3. In November 2012, MOHW revised the "Practical Guidelines for Prevention and Control of Seasonal Influenza", which served as a reference for health care and epidemic prevention workers involved in the execution of influenza prevention and control activities.
4. To meet epidemic control needs during the peak of the influenza season, starting from December 1, 2012, MOHW expanded the use of government funded influenza antivirals. The eligibility was originally limited to patients suffering

complications, those with chronic disease history or an influenza-like illness displaying danger signs, and cluster infections and was expanded to include patients with a persistent high-fever (lasting at least 48 hours) who had a family member, colleague, or classmate diagnosed with an influenza-like illness. MOHW also assisted in expanding the number of health institutions that distributed antivirals to 3,019.

5. To prevent influx of patients with mild symptoms from joining and infecting the crowd of emergency room, MOHW has encouraged hospitals to open clinics for patients with influenza-like illnesses during the Lunar New Year holiday. Furthermore, multiple media channels has been employed to disseminate information on vaccination frequent hand-washing and cough etiquette.

Section 3, Bioterrorism Defense

1. On May 25, 2011, MOHW and the Ministry of National Defense (MND) signed an agreement that included plans for setting up a comprehensive national response system for bioterrorism defense. Base on this agreement, MOHW & MND co-coducted "Workshop & Exercise for Biodefense Response" on December 13-14, 2012. The course included carrying on the operating procedure of biodenfense response field drill. In order to rasise professional capabilities at both the central and local levels, participants included biodefense – associated – officials from the armed force & local governments.
2. To enhance anti-bioterrorism capacity, Taiwan's Biohazard Response and Verification Expert team (BRAVE) has continued to organize annual training sessions and exercises to improve on-site command , response and risk assessment during incidents. In addition, to strengthen bioterrorism response mechanisms of critical infrastructure protection, on July 10, 2012, MOHW joined a bioterrorism response tabletop exercise at the Port of Kaohsiung. To witness the of front-line workers ability to follow proper procedures upon discovery of suspicious items.

Section 4, Management of Disease Control Supplies

1. To meet biological disaster needs when they arise, MOHW has established a three-tiered system of supply management comprising of central, local, and hospital authorities, and maintained a stockpile of surgical masks. Nationwide stockpiles are carefully monitored through a management information system.
2. MOHW entrusted the management of its central warehouse to a professional logistics company to ensure proper management of stockpiles and effective distribution during emergencies. Stockpiles are divided among numerous warehouses for efficient distribution and diffusion of risk. To maintain central stockpiles of surgical masks and enhance circulation, MOHW introduced a system for joint procurement and distribution. It ensures the quality of surgical masks used in epidemic control and the replacement of old masks during non-epidemic periods. As a result, the stockpiles can meet the needs of an epidemic when it arises.

Section 5, Nosocomial Infection Control

MOHW has formulated and promoted policies to minimize healthcare-associated infections at medical institutions to ensure the safety and well-being of patients. Mojor achievements in 2012 in terms of nosocomial infection control include the following:

1. To fulfill the policy of integrating hospital audits requested by various health departments and to upgrade the quality of inspection on infection control in hospitals, the Taiwan Joint Commission on Hospital Accreditation and Quality of Care was commissioned to conduct on-site inspection of infection control in accordance with the 2012 Plan for Inspection and Enhancement of Hospital Infection Control.

2. To effectively monitor nosocomial infections, MOHW has continued to encourage hospitals to participate in the Taiwan Nosocomial Infections Surveillance System (TNIS). Currently, about 420 hospitals in Taiwan are participating in the system. This system enable hospitals to perform self-monitoring and compare notes with other hospitals, thus facilitating improvements in the quality of Infection Control practices.
3. Taiwan CDC has commissioned 7 medical centers to establish the Center of Excellence for Central Line Care Quality Improvement Program. In this program, these 7 medical centers have to lead another 57 hospitals that were selected as the participating hospitals to implement effective strategies that promote central line-associated bloodstream infection (CLABSI) bundle and to decrease the incidence of CLABSI, thus improving the healthcare quality and reducing medical costs.
4. The emergence of nosocomial norovirus cluster infections in Taiwan and the international outbreak of Middle East respiratory syndrome coronavirus (MERS-COV) created a need for the provision of related reference and procedural information to medical institutions. Taiwan CDC included a link on its website to offer guidance on the control of norovirus infections, and formulated MERS -COV infection control guidelines for medical institutions.
5. The growing severity of antibiotic resistance led MOHW to formulate guidelines for the control of carbapenem-resistant enterobacteriaceae (CRE). These guidance provide clear control procedures for medical care institutions and health agencies to follow while serving as a valuable reference when on outbreak occurs.
6. In order to improve knowledge of infection control among health workers at long-term care institutions, Taiwan CDC published the "Infection Control Guidelines for Long-Term Care Facilities." It also offered digital classes on its website to raise the quality of long-term care.

Section 6, Research and Laboratory Testing

1. In 2012, a total of 121,312 specimens were sent to the Center for Research Diagnostic and Vaccine Development for laboratory testing Of which, 12,637 contained a pathogen or tested positive for a related antibody, accounting for a positive rate of 10.42%.
2. Though developing monitoring techniques and establishing platforms for unknown and emerging infectious diseases, MOHW is able to detect and examine sapovirus, HPeV, aichivirus, astrovirus, HCoV-HKU1, and HBoV. For instance high quantities of human parvovirus B19 have been detected in the case of an individual who died shortly after receiving an immunization, and nucleic acids from the rabies virus in a suspected case of rabies imported from Mainland China.
3. MOHW was Continued the operation of PulseNet Taiwan have also been detected which allows for fast confirmation and comparison of foodborne diseases. In addition to halting the spread of (MERS-COV) outbreaks, the network also serves as an international monitoring platform.
4. International collaboration include cooperation projects with Japan's National Institute of Infectious Diseases on seven work plans addressing tuberculosis, Hansen's disease, amoebic dysentery, pertussis, brucellosis, leptospirosis, diarrhea pathogens, and mosquito-borne diseases and cooperation with Japan's Research Institute of Tuberculosis on research in the Beijing strain family of *Mycobacterium tuberculosis* with distribution in Asia. In addition, MOHW participated in global rotavirus vaccine plans led by WHO and the US Centers for Disease Control and Prevention and sponsored by the Global Alliance for Vaccines and Immunization, PATH Vaccine Fund, and other organizations. Taiwan also remains a member of the Asian Rotavirus Surveillance Network.

5. Taiwan Pathogenic Microorganism Genome Database (TPMGD): The TPMGD contains genotyping and epidemiological data of some 20 different pathogens. It is available to all interested parties who file requests for enterovirus or influenza virus sequences and related epidemiological information.
6. MOHW continued to conduct the authorization system for laboratory testing institutions qualified to perform laboratory diagnoses of communicable diseases. In 2012, 52 testing institutions passed the authorization for 113 items.
7. In 2012, Taiwan CDC published 77 articles in SCI-listed journals.

Section 7, Management of Laboratory Biosafety

1. MOHW established management systems for infectious biological materials and laboratory biosafety on the basis of three core principles: autonomous management, reliable reporting, and inspections. By the end of 2012, 553 units had established biosafety committees (or designated personnel) and declared a total of 129 types of Level 2 infectious agents and 19 types of Level 3 infectious agents. In addition, there were 21 labs approved by MOHW as Biosafety Level 3 labs (BSL-3) or higher (one BSL-3 was suspended). In 2012, MOHW conducted on-site biosafety inspections 68 domestic laboratories, which store or use Level 2 infectious agents. The inspections ensured the operational management of these laboratories was adequate to guarantee the satety of laboratory worker personnel.
2. In accordance with the second part of Article 5 of the "Regulations Governing Management of Infectious Biological Materials and Collection of Specimens from Patients of Communicable Diseases" MOHW announced the biosafety training certification regulations for personnel who work with Level 3 and above infectious biological materials. Compliance is required of medical laboratories.
3. To increase knowledge and awareness of biosafety control and protection among laboratory workers, MOHW has formulated the "Safety Guidelines for Biosafety Level 1 to Level 3 Laboratories" These guidelines are available for reference.

Chapter 4, Immunization

Section 1, Current Immunization Status and Trends

Currently, the government provides infants with free vaccinations as listed in the schedule displayed in Table 4-3. In addition, children in mountain regions and other high-risk areas are also offered to receive hepatitis A immunizations. The government has been able to maintains high immunization rates by providing convienent immunization services through local public health stations and contracted hospitals and clinics. Public health nurses at the health stations regularly follow up on children who have not received up-to-date immunization to ensure those children complete the vaccination series. National immunization coverage rates are detailed in Figure 4-5.

Due to of limited government budgets, funding for regular vaccines and newly included vaccines often falls short, resulting in difficulty in carrying out vaccination work. In 2010, a national vaccine fund was set up according to on Article 27 of the Communicable Disease Control Act. The fund looks for multiple sources of funding, lists budget items independently and exclusively for the procurement of vaccines and implementation of immunization work. As result the government can implement immunization works stably as well as gradually introduce new immunization policies based on the advice and guidance from Advisory Committee on Immunization Practices. New immunization policies introduced in 2012 included the following: 1. In January 2012, the government expanded the PCV

Table 4-3 Immunization Schedule

Age	Vaccine
Within 24 Hours of Birth	HBIG, 1 Dose[1]
	Hep B, 1st Dose
After 24 Hours of Birth	BCG, 1 Dose
1 Month	Hep B, 2nd Dose
2 Months	5-in-1 Vaccine (Diptheria, Tetanus, Pertussis, Haemophilus b, and Polio), 1st Dose
4 Months	5-in-1 Vaccine (Diptheria, Tetanus, Pertussis, Haemophilus b, and Polio), 2nd Dose
6 Months	Hep B, 3rd Dose 5-in-1 Vaccine (Diptheria, Tetanus, Pertussis, Haemophilus b, and Polio), 3rd Dose
1 Year	MMR, 1st Dose VAR, 1 Dose
1 Year, 3 Months	JE, 1st and 2nd Doses (Spaced 2 Weeks Apart) [2]
1 Year, 6 Months	5-in-1 Vaccine (Diptheria, Tetanus, Pertussis, Haemophilus b, and Polio), 4th Dose
2 Years, 3 Months	JE, 3rd Dose
Between 5 Years of age and First Grade[3]	Tdap-IPV, 1 Dose MMR 2nd Dose JE, 4th Dose

Notes: 1. If mothers are highly contagious hepatitis B carriers (HBeAg positive), their babies should be given one dose of hepatitis B immunoglobulin (HBIG) shortly after birth and no later than 24 hours.

2. The first dose of Japanese encephalitis vaccine should be given 15 months after birth, and the second dose should be given two weeks later.

3. From April 2012, Tdap-IPV and MMR 2 are recommended to be given to children between 5 years of age and first grade of elementary school. In April 2012, JE 4th dose was added to the list of immunizations needed before elementary school entrance.

vaccination targets to children under 5 years of age from medium-to-low income households. 2. To further improve the quality of vaccination service, Taiwan CDC revised the schedule of receiving Tdap-IPV and second dose of MMR from entrance into elementary school to 5 years old in April 2012.

Beginning October 1, 2012, Taiwan CDC launched its annual seasonal influenza immunization plan for 2012. There were five main targeted populations: (1)seniors aged over 65, residents and staff in nursing homes and other long-term care facilities, rare disease patients (2) catastrophic illness patients, (3) health workers and disease control personnel, (4) poultry and swine workers and animal health inspectors, (5) and children aged above 6 months to sixth grade. The plan aims to protect high-risk groups and reduced health care expenditures.

In addition, to support victims of immunizations, the government established a review system and a relief fund. Its application and review process offer a legal and adequate relief for victims of immunizations.

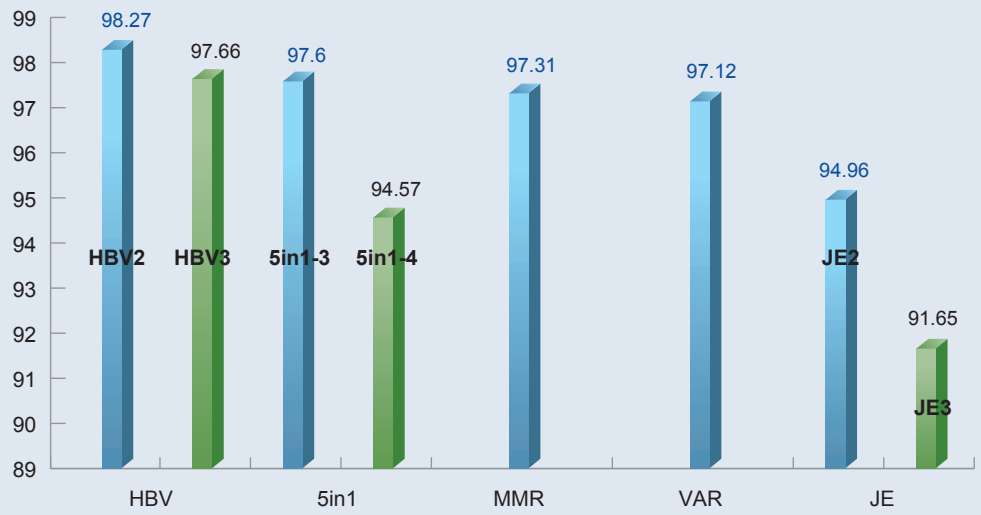
Section 2, Development and Manufacturing of Serum Vaccines

1. Production of Biological Products

1) Antivenin serum is manufactured using horse serum. In 2012, Taiwan produced 243.2 liters of antivenin horse serum.

2) A supply of vaccines, toxoids, and antivenins totaling 2,896,916 doses was manufactured. Income from the sale of these products was NT$64.56 million.

Figure 4-5 Immunization Coverage Rates for Children, 2012



Source: National Immunization Information System, January 2012

Note: HBV-B (hepatitis B vaccine), 5-in-1 (diptheria, tetanus, pertussis, haemophilus b, and polio vaccines), MMR (measles, mumps, and rubella combined vaccine), JE (Japanese encephalitis vaccine); VAR (varicella vaccine).

3) Animals for experiment such as mice, guinea pigs, rabbits, poisonous snakes, and horses are supplied and raised.

4) The vaccine factory operated by Taiwan CDC will be closed in 2015. To prevent shortages of biological preparations, the MOHW decided to commission production of five products, including BCG and purified antivenin serum, by a foreign manufacturer with a local presence. A deal, signed by the National Health Research Institutes, was concluded on December 6, 2012.

2. Development of Biological Products

1) 50 liters of enterovirus 71, C4 subgenogroup were cultivated using a tidal bioreactor and serum free medium, which was used to produce nine batches of prototype vaccine.

2) Researches on the effects of freeze-drying additives toward immunity and the minimum lethal dose of venom from the *Protobothrops mucrosquamatus* were conducted When the venom was in a freeze-dried state, whether it was stored at 4 degrees Celsius or 37 degrees Celsius, the minimum lethal dose dropped between 30 and 90 days of storage.

3) Stability tests on lyophilized antivenin serum for injection were conducted to ensure that antivenin serums for sale continued to meet the PIC/S GMP standards. In order to guarantee the effectiveness of products for the duration of their shelf life.

4) Researches into the production of antivenin serums using venom from free-living snakes rather than captive snakes were Conducted. Initial results are promising. Apart from the brown spotted pit viper, the venom quantity of other snakes exceeds yearly demand. On the other hand, there is no obvious discrepancy in the minimum lethal dose when compared to venom milked from captive snakes. In the future, there will be expanded evaluations and more in-depth qualitative analysis.

5 Management of Food and Drugs

56 Chapter 1 Regulatory Standards and Product Registration

58 Chapter 2 Product Sources Management

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64 Chapter 4 Risk Assessment and National Reference laboratory

67 Chapter 5 Communicating Protection Strategies and Risk to Consumers

The main objective of the Food and Drug Administration, MOHW, (hereinafter referred to as the "Taiwan FDA") is to ensure consistent and improved management of food and drug safety. Major tasks in 2012 were: strengthening regulatory standards and review mechanisms, managing safety and quality at manufacturing sites, building a comprehensive monitoring system for product supply chains, promoting risk assessment and national reference laboratory, improving consumer protection and risk communication channels. The Administration's overriding goal was to provide an environment where consumers could eat at ease and take medicine without fear.

Chapter 1, Regulatory Standards and Product Registration

Section 1, Improving Regulatory Standards

When regulatory problems related to food and drug management emerge, the MOHW assesses the situation and conducts necessary revisions. Its objective is to build a comprehensive food safety system. Changes that took place in 2012 are illustrated in Table 5-1.

Revisions and Additions to Regulations Governing the Management of Pharmaceutical Affairs

Section 2, Management of Registration for Foods and Drugs

1. Enforced registration of ready-to-eat vacuum-prepackaged soybean food products began on November 6, 2011.
2. Implementation of a Registration System for Food Additives: By the end of 2012, 501 manufacturers listed 11,276 food additive products on Taiwan FDA's dedicated system.
3. In accordance with "Health Food Control Act" regulations, health foods must be registered. By the end of 2012, a total of 245 permits were issued.
4. Registration and Pre-market Approval of Drugs: essential review items include results of pharmacology, toxicology tests (PK/PD/BA/BE) and clinical data to ensure effectiveness and safety. The BA, BE, and dissolution tests are primary methods to demonstrate that generic drugs are similar to brand name drugs in terms of therapeutic effect and safety. Until the end of 2012, BA/BE/Dissolution studies had been conducted on 1,855 registed drug products, including 1,745 domestic products.

Table 5-1 Revisions/Additions to Food Sanitation Regulations and Standards in 2012

Date of Revision/ Addition	Name of Regulation/ Standard	Summary of Changes
August 8, 2012	"Act Governing Food Sanitation"	Revised Article 11, Article 17-1, and Article 31, to allow the central competent authority to set a permissible tolerance on chemicals such as the ractopamine found in US beef, along with accompanying labeling and fines for violations.
August 27, 2012	"Act Governing Food Sanitation"	Sent a major draft to the Legislative Yuan. It would increase chapters from seven to ten and articles from 40 to 59.
2012	Regulations Governing Additives, Pesticide Residues, and Veterinary Drug Residues in Foods	Added or revised standards for 346 types of pesticides and 3,485 items of pesticide residue limits; standards for 109 types of veterinary drugs and 1,242 items of veterinary drug resides; norms governing usage scopes limits and specifications for 788 items of food additives; food sanitation standards for 39 items.

Table 5-2 Revisions and Additions to Regulations Governing the Management of Pharmaceutical Affairs, 2012

Date	Regulation/Standard Name	Summary of Changes
July 27, 2012	"Regulations for Governing the Management of Medical Devices"	Amended Annex I to Article 3 and Annex II to Article 4 to renew the classification of medical devices for the purpose of bringing management in line with international norms.
November 1, 2012	classification and registration requirements of Mail Order purchase for medical devices	Opened the sale of low-risk, Class I medical devices by mail order for companies that have physical channels for trade and are licensed by their local health bureau, both adding a new sales channel and ensuring product traceability.
May 8, 2012	"Regulations for Registration of Medicinal Products"	Amended to Articles 6, 7, 38, and 38-1 to 38-4 relaxed information requests by establishing the Certificate of Pharmaceutical Product (CPP) as a supporting document.
August 17, 2012	"Directions on Implementation of Recall Action of Pharmaceuticals"	Drug recall management was modified to fit the Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme (PIC/S).
April 6, 2012	"Schedules and Items of Controlled Drugs"	Added Methylone as a Schedule 3 controlled drug and Remifentanil as a Schedule 2 controlled drug.
September 27, 2012	"Schedules and Items of Controlled Drugs"	Added 4-Fluoromethamphetamine (4-FMA) and 3,4-methylenedioxypyrovalerone (MDPV) as Schedule 2 controlled drugs as well as 1-(3-trifluoromethylphenyl) piperazine (TFMPP) as a Schedule 3 controlled drug.
June 20, 2012	"Enforcement Rules for the Controlled Drugs Act"	To strengthen the integrity of reporting records by institutions and companies. The Controlled Drugs Act was full text amendel including articles in 2012. The amendment clearly stated that the institutions and companies with controlled drugs registration license should report their inventories annually, even the inventories were empty. For reducing the administrative burden of the licensed institutions and companies, the amendment extends the reporting period for Schedule 1 to 3 to make it accords with Schedule 4. On the other hand, the amendment also relaxes the rules of reporting inventories for changing registered particulars of the registration license.
July 1, 2012	Standards for Impurities in Concentrated Chinese Medicinal Formulations	Heavy metals, TVBC of microorganisms, Escherichia coli, and Salmonella contained in concentrated Chinese medicinal formulations must adhere to the permissible tolerance standards announced on August 29, 2011.
May 30, 2012	Adulteration Limits for Chinese Medicinal Materials	Announced permissible tolerance standards for American ginseng and radix hedysari.
April 26, 2012	Chinese Medicinal Materials as Foods	Announced jujubes, Semen coicis, and black beans.
December 22, 2012	"Taiwan Herbal Pharmacopeia, 2nd Edition"	Announced the 2nd edition of "Taiwan Herbal Pharmacopeia," which added 101 new items to bring the total listed to 300. Starting from April 1, 2013, all manufactured and imported Chinese medicinal materials must adhere to regulations contained in the Pharmacopeia.

5. Registration and Pre-market Approval of Medical Devices and Medicated Cosmetics: For management purposes, medical devices in Taiwan are classified into three classes based on risk level.

6. Reform to Pharmaceutical Review Mechanisms: To enhance review transparency, quality and speed, the MOHW integrated various professional review units.

Chapter 2, Product Sources Management

Section 1, Food Sources Management

1. Hazard Analysis and Critical Control Points (HACCP): Implementation is taking place year by year based on product type to achieve the overall goal of preventing food hazards.
2. To effectively manage chef certification, the MOHW formally began using the ROC chef certification information management system on March 27, 2012.,and initiated a project for the chef health education and certification system promotion.
3. Better Management of Plastic Food Containers (Utensils): In 2012, the MOHW gathered 12 types of raw materials and additives used by domestic producers of plastic food containers and utensils. It investigated, high-risk materials in raw materials and used during the manufacturing process. Besides 30 sample plastic food containers (utensils were tested and were found) complied with health standards.
4. Addition of Industrial Food Technicians: In accordance with the MOHW's HACCP regulations, manufacturers are required to establish a food safety management task force with at least one certified food technician starting May 8, 2012.

5. Food Import Management

1) Imported foods are related products shall apply for the import inspection from the office at port of TFDA and only compliant products will be permitted to enter.
2) In 2012, inspection applications were completed for a total of 461,665 batches of food imports, of which 38,793 were inspected, inspection applications of inspection rate was at 8.4% and approximately 1.2% of those failed to meet regulations and were either withdrawn or destroyed.
3) After the Fukushima nuclear accident in Japan, Taiwan suspended import food inspection applications from five prefectures: Fukushima, Ibaraki, Tochigi, Gunma, and Chiba. Since March 20, 2011, radiation monitoring of all types of food products imported from Japan was strengthened.
4) "Three Controls, Five Checkpoints" for Beef Imports: In 2012, Taiwan continued to send inspectors to the United States to ensure at the source that beef exports to Taiwan conformed to health and safety regulations, and on March 20, 2012, Taiwan implemented inspections of every batch of beef from areas that previously exported products containing beta-agonists. After the establishment of permissible tolerance levels for the beta-agonist ractopamine, the MOHW began to inspect all beef products from countries where ractopamine use is permitted. Regulations stipulate a decrease in testing rates for importers that continuously meet compliance standards.

Table 5-3 Producers inspected with HACCP, 2012

Product Types	Period (Years)	Inspected Producers
Seafood	2005-2012	183
Meat Processing Plants	2009-2012	229
Dairy Processing Plants	From July 1, 2012	52
Restaurant Industry — Food Container Producers	2012	189

Section 2, Pharmaceutical Manufacturers Management

1. The MOHW continued implementing the Good Manufacturing Practice (GMP) system for pharmaceuticals; the Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme (PIC/S GMP); GMP/QSD (Quality System Documentation) registration for medical devices; voluntary application for cosmetics; and on-site management of Chinese medicine GMP standards. Achievements are shown in Table 5-4.
2. At the 35th PIC/S Committee Meeting, held on October 1 and 2, 2012, Taiwan FDA has been unanimously accepted as the 43rd member of the PIC/S (Pharmaceutical Inspection Convention and Co-operation Scheme) from January 1, 2013. Being the participating authority of PIC/S, Taiwan FDA can share international pharmaceutical safety information with other nations and enhance the international competitiveness of the domestic pharmaceutical industry.
3. Quality Control of Active Pharmaceutical Ingredients: To improve management of imported

Table 5-4 Pharmaceutical, Medical Device, and Medicated Cosmetic Manufacturers Compliant with GMP, 2012

Product Type	System Name	Manufacturers	Registered Items	Notes
Pharmaceuticals	GMP	158	–	
	PICS/GMP	46	–	
	Inspection at Foreign Plant	186	–	2002-2012
Medical Devices	GMP	–	530	
	QSD	–	3,066	
Cosmetics	Voluntary GMP	26	–	61 Applications
Chinese Medicine	GMP	104	–	

A ceremony to celebrate the joining of PIC/S and the 30th anniversary of the GMP implementation. Dr. Vasiliki Georgia Revithi, PIC/S chairperson representative, attended to present the letter of accession.

active pharmaceutical ingredients, the MOHW established a drug master file (DMF) system.

4. In order to improve management of Chinese medicinal materials at the source, and to comply with the "Cross-Strait Cooperation Agreement on Medicine and Public Health Affairs," the MOHW introduced 10 new border control items for Chinese medicinal materials on August 1, 2012.

Chapter 3, Product Chain Monitoring

Section 1, Food Product Distribution Management

1. The MOHW assists local health bureaus in post-market surveillance of food products to ensure compliance with health standards. Results in 2012 are illustrated in Table 5-5:
2. Continued Expansion of the Product Management Inquiry System: In 2012, the MOHW integrated the Hazard Analysis and Critical Control Points (HACCP) database, the Taiwan International Food Safety Authority Network (TIFSAN), and the ROC chef certification information management system with the food sanitation, poisoning, and inspection registration and management system it completed in 2011. This simplified information access and entry for health bureau inspection workers.
3. A joint-agency initiative conducted food channel inspections, including street fairs specializing in Lunar New Year goods, unusual imported food items, orange daylily farmers and dealers, school cafeteria foods, hotel food safety, labeling on packaged fruits and vegetable drinks, pork balls, and mushrooms used by sticky rice manufacturers. Violators were referred to local health bureaus for handling and guidance.
4. On-Site Inspections of Registered Food Products:In 2012, the MOHW completed on-site inspections of companies that manufacture or sell health food products, capsule/tablet form food containing vitamin, and food additives. Results are shown in Table 5-6.

Table 5-5 Outcomes of Post-Market Surveillance, 2012

Inspected Item	Outcome		
	Total Sampled	Qualified	Qualified Rate (%)
Pesticide Residues in Market Sold and Packaged Agricultural Products	2,363	2,121	89.8
Veterinary Drug Residues in Foods	572	532	93.0
Heavy Metal (Cadmium, Mercury, Lead) Content in Rice	160	160	100.0
Mycotoxin contamination in Foods	356	342	96.1
Heavy Metal Content in Fruits and Vegetables	102	102	100.0
Beta-Agonist Residues in Meat	1,926	1,908	99.1
Pesticide Residues in Rice	91	91	100.0
Products Inspected by City/County Health Bureaus	566,672	561,005	99.0
Inspection of Obligatory Labeling on Beef Products	45,734	45,390	99.4

Note: Local health bureaus conducted follow-up investigation of products that failed inspections. When domestic producers were at fault, officials requested additional oversight from agricultural agencies.

Table 5-6 Outcomes of On-Site Inspections of Registered Food Products, 2012

Type	Inspected Companies	Outcome	Notes
Health Food Product Manufacturers	12	Full compliance	Monitoring of 40 health care items, 11 nutritional labels, and 12 sanitary standards
Domestic Manufacturers of Vitamin Tablets and Gelatin Capsules	30	No major infractions, violators were in compliance upon re-inspection	
Food Additive Manufacturers and Dealers	74	Violators were in compliance upon re-inspection	

Section 2, Medical Product Safety and Quality Control

1. Strengthening Medical Product Safety Control

Medical product safety strategies are enhanced by monitoring/reporting systems for drug safety; adverse reactions to medical products, and Chinese herbal medicines; cosmetic product defects and medical product defects. Integration with reporting databases allows the MOHW to handle issues based on risk priority, achieving the goals of health protection and resource sharing. As a member of the National Competent Authority Report exchange program, under the Global Harmonization Task Force, Taiwan FDA can share international medical devices warning information for early preparation and response. Additionally, the MOHW ensures safety and quality for biologics through comprehensive on-site lot release procedures. Monitoring outcomes are shown in Table 5-7.

2. Investigation and Monitoring of Medical Product Quality:

The MOHW completed 13 investigations covering four types of products — drugs (three), cosmetics (three), medical devices (three), and Chinese medicinal materials (four). A total of 1,111 products were tested, and outcomes are shown in Table 5-8.

Section 3, Suppressing Illegal Food and Pharmaceuticals

1. Integration of Cross-Departmental Resources to Suppress Counterfeit Drugs

The Executive Yuan established the "Strengthening Eradication of Counterfeit Medicines and Illegal Broadcasting Stations" program in March 2010, and it formed the Joint Counterfeit Medicines Task Force with the MOHW, Ministry of Justice, National Police Agency, other related agencies, and city and county governments. Responsibilities included inspection of counterfeit and banned drugs, dietary supplements adulterated with western medicine, Chinese medicinal preparations adulterated with western medicine, and illegal advertisements for food or drugs. Achievement highlights follow:

1) Seizure of Illegal Pharmaceuticals: On average, health agencies continued to conduct over 1,500 pharmaceutical investigations per month. The seizure of illegal pharmaceuticals fell to 1.76% in December 2012, showing a significant decrease in compliance. see Figure 5-1.
2) Seizure of Illegal pharmaceuticals pills: The Joint Counterfeit Medicine Task Force seized 1.837 million illegal pharmaceutical pills prior to establishment to, and after that increase 13.562 million.

Table 5-7 Outcomes of Medical Product Safety and Quality Monitoring, 2012

Medical Product Reporting/Monitoring Systems	Summary of Outcomes
Reporting System for Adverse Reaction to Medical Products	1. There were 32,259 spontaneous adverse drug reacting reports. (2010-2012) 2. Reported 1,422 cases of medical device defect and 157 cases of adverse reaction to medical devices 3. Reported 91 cases of cosmetic product defect
Active Assessment of Drug Safety	Complete safety assessment reports of 17 potential high risk drugs and conduct active surveillance for 7 potential high risk drugs.
Medicinal Product Defect Reporting System	There were 733 spontaneous suspected defective medicinal product reports. Among those reports, 181 reports were high risk defects and 25 products were recalled.
Reporting Center for Adverse Reactions to Chinese Medicinal Herbs	Received 214 reports
National Competent Authority Report (NCAR) exchange program	Received 369 reports from NCAR
Lot Release for Biologics	Completed lot release for 340 lots of biologics. Relesed 12.68 million doses; four lots (249,580 doses) were rejected
QC and Packaging Label Management for Chinese Medicinal Materials	Tested 507 samples and 99.8% passed. Tested 337 samples of Chinese medicinal materials sold on the market for adulteration and 97.9% passed

3) Detection of Illegal Pharmaceuticals: In 2012, 14.4% of tested food products were adulterated with western medicine. Approximately 49.2% of the items were meant to promote virility and 29.50 to assist with weight loss.

4) Illegal Advertisements: The illegal advertisements rate of pharmaceutical, cosmetic, and food fell to 4.70% in December 2012, both reducing misinformation among the general public and cleaning up the media environment.

2. Continued Monitoring of the Marketplace for Illegal Pharmaceuticals, Foods, and Cosmetics

1) In 2012, the government tested 338 batches of imported food products in tablet or capsule form for western medicine, or 4.4% of total shipments. All met regulatory standards.

2) On-Site Inspections for illegal pharmaceuticals. In 2012, the government inspected 323 locations, 51 of which were suspected of violations related to sexual medicines, including the sale of Cialis without a prescription; the sale of counterfeit suparex or strong bull, and the illegal sale of external use aphrodisiacs, including Green Gallant and Louis 16.

3) 2012 Joint Investigation Plan to Target Illegal Pharmaceuticals, Cosmetics, and Food Products: The government inspected 721 clinics, pharmacies, drug stores, cosmetic shops, and medical device sellers for the following violations — sale of counterfeit or banned pharmaceuticals, operating a pharmacy without a license, drug labeling problems, packaging label problems on medical devices, and medical device quality issues. Local health bureaus handled violators through a combination of guidance, improvement deadlines, recalls, and fines.

4) Testing Dietary Supplements Sold in Tablet or Capsule Form for Western Medicine: In 2012, the government checked dietary supplements in tablet or capsular form sold by cosmeceutical shops, pharmacies, drug stores, printed media, network platform radio and television

Table 5-8 Outcomes of Quality Investigation and Monitoring of Drugs and Cosmetic Products

Type	Name of Project	Completed Items	Unqualified Items	Qualification Rate
Drugs	Quality Monitoring of Oral Cardiovascular Drugs, Antidiabetics, and Urinary Tract Antiseptics	83	3	96.4
	The Investigation of Microbial Limit for Oral-Gastrointestinal Gels and Suspensions	85	5	94.1
	Post-market Investigation of Pneumococcal Polysaccharide Conjugate Vaccines in Taiwan	23	0	100.0
	Tota	191	8	95.8
Cosmetic Products	Survey on Microorganisms of Marketed Cosmetic Products	53	6	88.7
	Survey on Methanol, Benzene, and Phthalate Esters of Marketed Nail Polishes	56	12	78.6
	Survey on the Quality of Cosmetics Imported from Mainland China	50	0	100.0
	Total	159	18	88.7
Medical Devices	Survey on the Quality of Surgical Drapes in Taiwan	10	0	100.0
	Post-Market Investigation of Sterilized Surgical Gloves, Sterilized Gauze, Cotton and Surgical dressings.	94	11	88.3
	Post-Market Evaluation for the Performance Study of Anti-HBs diagnosis Kits	28	9	67.9
	Total	132	20	84.8
Chinese Medicinal Materials	Testing for Heavy Metals in Chinese Medicine	200	0	100.0
	Testing for Pesticide Residues in Chinese Medicine	180	0	100.0
	Testing for Aflatoxins in Chinese Medicine	100	0	100.0
	Quality Investigation to Test for Contaminants in Concentrated Chinese Medicinal preparations and Chinese Medicine	149	7	95.3
	Total	629	7	98.9

Figure 5-1 Detection and Seizure Rate of Illegal Pharmaceuticals

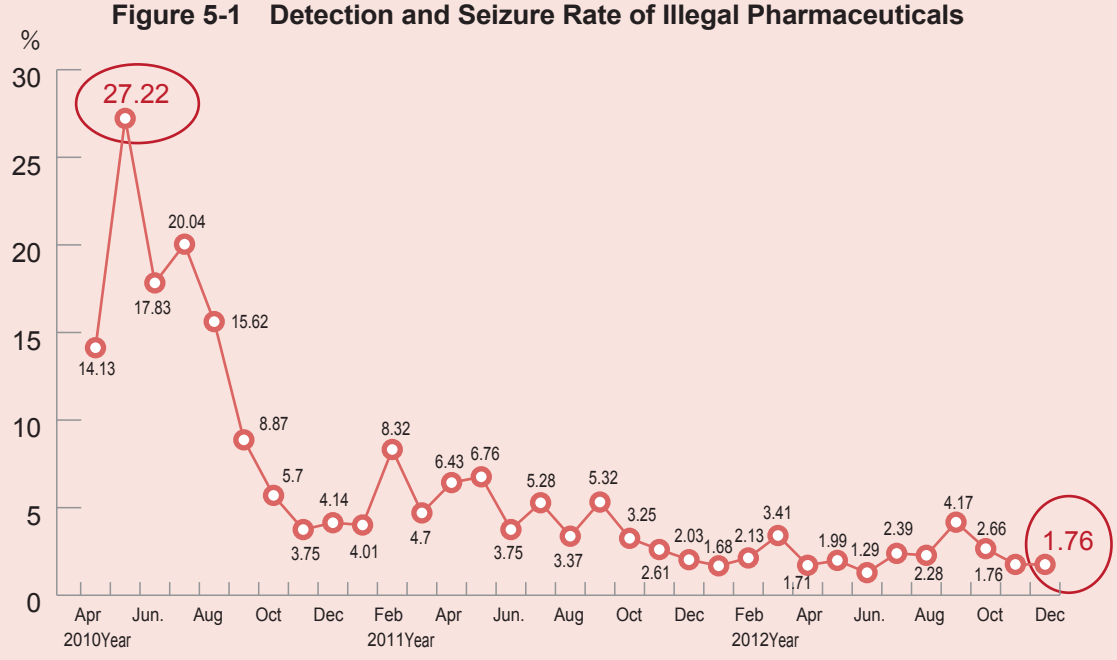
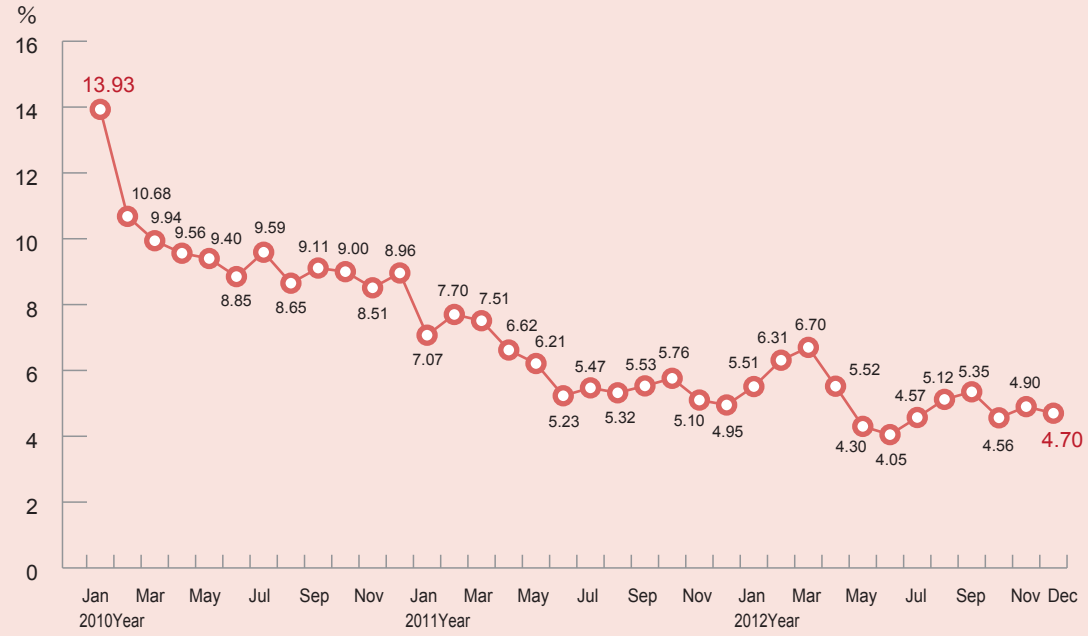


Figure 5-2 Illegal Advertisement Rate Among Foods and Pharmaceuticals, 2010-2012



advertisements, night markets, and agents. Of the 507 samples tested, six were adulterated with western medicines or ingredients that differed from their labels. Violators were reported to city and county health bureaus.

5) Through a combination of cross-departmental cooperation, simplified investigative procedures, and stronger oversight of city and county health bureaus, the MOHW enhanced monitoring of illegal food, drug, and cosmetic advertisements.

6) Testing for Chinese Medicine Mixed with Western Medicine: In 2012, the government tested 143 samples, two of which tested positive for western medicine. Violators were reported to city and county health bureaus.

Section 4, Controlled Drug Management

Controlled drugs are regulated based on their "schedule," and management includes both licensing and inspecting. See Table 5-9.

Chapter 4, Risk Assessment and National Reference laboratory

Section 1, Risk Assessment

1. Consultative Council for Food Safety Risk Assessment: Assists in the development of science and technology used for food safety risk assessment.
2. National Center for Food Safety Education and Research

   The center, formally established in National Taiwan University on August 31, 2012, serves as a platform for long-term, cross-disciplinary cooperation.
3. Implementation of Food Safety Risk Assessment Plans

   1) In 2012, the MOHW introduced training courses in the areas of food safety risk assessment. The courses were designed by the Joint Institute for Food Safety and Applied Nutrition (JIFSAN, a collaboration between the US Food and Drug Administration and the University of Maryland.)

Table 5-9 Outcomes of License Management and Auditing of Controlled Drugs

Management of Controlled Drugs	Summary of Management Results
License Management	1. The medical specialist without the prescription license may not allowed to prescribe Schedule 1, 2 or 3 controlled drugs. 2. There were 14,168 institutions or companies with registration licenses 3. A total of 45,882 people had obtained a prescription license for the use of controlled drugs
Auditing	1. The manufacture, import, and export of controlled drugs, as well as the use of controlled drugs in medical or educational research, all require approval from the authorities in charge. A total of 1,736 permits were issued to allow use of controlled drugs. 2. Auditing took place 16,211 times and there were 109 violations,

2) In 2012, as part of the Total Diet Study (TDS), the MOHW analyzed the types and quantities of pesticides consumed based on eating different types of foods by the general public. It then determined the effects of this exposure on health.
3) Using original data from years of national nutritional surveys, the National Health Research Institutes compiled the National Food Consumption Database, a valuable food safety risk assessment tool.
4) As part of its studies on background dioxin levels, in 2012 the MOHW tested serum dioxin levels in residents of eastern Taiwan. Findings were added to a database on national dioxin levels in the blood of people across Taiwan.
5) Completion of the Chinese version of the WHO's "Principles and Methods for the Risk Assessment of Chemicals in Food" provided a reference for related risk assessment techniques.
6) In 2012, the "Development Program of Industrialization for Agricultural Biotechnology" subsidized case study on the safety assessment of genetically modified papaya, tomatoes, and potatoes. In light of the need to evaluate the effects of genetically modified foods on allergies, the program continued to develop a national blood serum allergen database. Also, in the legal environment in 2012, new draft guidelines were created for the management of food derived from cisgenic plants.

4. To strengthen drug risk analysis, experts on the drug safety consultative task force assisted in evaluating the clinical benefits and risks of drugs available on market.

Section 2, National Reference laboratory

1. The MOHW procured the following equipment to advance national reference laboratory functions and develop multiple, accurate, and rapid testing methods: triple quadrupole liquid chromatography tandem mass spectrometer, direct analysis in real time-DART, charged aerosol detector, and microorganism identification system. These facilitated the following analytic and testing techniques: marine toxin and multimycotoxin analysis, pesticide rapid screening, low-VOC analysis (ie. plasticizers), and rapid detection of microorganisms. The equipments were used in research of food and drug analysis to develop rapid detection methods with high efficiency and accuracy, and develop related technical documents for public using.
2. In 2012, the MOHW held inaugural classes on identification of unknown compounds, covering topics such as chromatography, spectroscopy, mass spectrometry, nuclear magnetic resonance, and principles and applications of X-ray interference. The classes, which had a total

attendance of 712, improved the ability of national reference laboratories to detect non-target analytes.

3. Testing Responsibilities
   1) Administrative Testing: Tests conducted for administrative management purposes include permit application tests for medical devices, health food products, special nutritional food products, and food additives; lot release testing for each lot of imported or domestic biologics ; and tests for emergent incidents that occurred — the discovery of counterfeit bone screws and plates; the use of steroid-infused moisturizers by beauty clinics; the detection of dichloromethane and methyl alcohol in essential oils; the incident of Taiwan-made bubble tea materials exported to Germany; and the detection of polycyclic aromatic hydrocarbons in Korean instant noodles.
   2) Assisting Testing: Testing samples Includes inspection samples and samples submitted by consumers that local health bureaus do not have the capacity to test, as well as samples transferred by local health bureaus during complicated food poisoning incidents.
   3) Testing Support: Includes testing support to judicial, military, and police agencies as well as paid and commissioned tests for government agencies, public and public interest organizations.
4. Establishment and Promotion of Testing Methods
   1) 49 testing methods were promulgated, revised and scrapped, and 20 testing methods were recommended for food products. Ten recommended testing methods were added for cosmetic products.
   2) The MOHW held four conferences on differentiation of Chinese medicinal materials and food testing technologys, along with one international conference on food testing technology.
   3) In 2012, the MOHW published the second edition of a book on minimum requirements for biological products and another book titled "An Illustrated Guide to Commonly Misused Chinese Medicinal Materials." The former provided testing methods and monographs for biopharmaceuticals ; the latter provided a reference for dealers and the general public to distinguish between authentic and fake Chinese medicinal materials.
5. Preparation of Reference Standards: In 2012, the MOHW completed a standard preparation for Japanese encephalitis vaccine and an

Two Taiwan Patents Awarded in 2012 for Scientific Research Achievements

international collaborative study to determine its relative potency.

6. Scientific Research Achievements: In 2012, patents awarded in Taiwan related to new food testing techniques included "reference plasmid for detection of clostridium botulinum toxin genes" and "a rapid detection method for identification of puffer fishes".

Chapter 5, Communicating Protection Strategies and Risk to Consumers

Section 1, Providing Information to Consumers

1. Updated Consumer Food and Drug Website (http://consumer.fda.gov.tw/): The Taiwan FDA compiles administrative information and health promotion materials and puts them online for easy consumer reference.
2. Drug safety information monitoring and sharing platform: Monitor domestic and international drug safety information and release to the general public and health care professionals by publishing newsletters, announcements, or sending risk communication letter.
3. Traffic Light System for Food Safety: When incidents occur that raise food safety concerns, the Taiwan FDA operates a traffic light system that provides consumers and businesses with updated information on international food warnings. The system plays a valuable role in maintaining a safe domestic food and drink environment.
4. Convenient Online Payment Platform: The MOHW lets members of the general public and businesses register for a convenient online payment platform. Payment can be made for 25 items by ATM, credit card, at convenience stores, etc. Information on the system and related forms are available online for browsing or download.

Nutritional Indicators and Daily Nutritional Guidelines

5. In 2012, the MOHW published 20 books related to foods and drugs to provide consumers with a diverse range of information.
6. In 2012, the MOHW revised the nutritional information for the various life stages to give better nutritional intake and lifestyle recommendations. People are encouraged to follow the nutritional indicators and daily nutritional guidelines so they can develop the balanced eating habits needed to stay healthy.
7. In order to ensure that people understand how to properly use Chinese medicine, the MOHW encouraged community pharmacies to become consultation points. A total of 50 pharmacies in Taipei were recruited.

Section 2, Risk Communication and Health Advocacy

1. After the government set permissible tolerance levels for ractopamine residue in beef, the MOHW took the following steps to better communicate the policy change and guarantee food safety and consumer health:
   1) The MOHW continued to publish or broadcast food sanitation and safety advocacy messages using electronic and print media, including: "Food & Drug Consumer Newsletter," "Pharmacist Weekly," "Next Magazine," "Business Weekly," and "China Times Weekly."
   2) Health messages were spread using "keywords search on websites", and the MOHW produced a website advocacy logo that affiliated agencies could use to emphasize the integrated nature of health advocacy.
   3) The MOHW produced print materials that it provided to the 29 MOHW hospitals and the six affiliated outpatient centers of the National Health Insurance Administration.
2. Stronger Government Risk Communication: The Taiwan FDA continued to conduct risk management education, training, and drills, including basic and advanced classes, special lectures, and emergency response simulations.
3. On September 23, 2012, for the second year in a row the MOHW held a special event focused on safe medicine use. Through a series of outdoor activities held concurrently in Tainan and Taipei, participants were taught "five no's" and five core principles for taking medicine, messages that became widespread through media coverage.
4. The Taiwan FDA conducted research into online promotion of proper drug use and digital education. By compiling completed teaching and educational materials into digital form and spreading them through social media, the administration was able to expand knowledge of accurate pharmaceutical use.
5. In conjunction with the Executive Yuan's Joint Counterfeit Drug Task Force, the MOHW advocates the "five no's" and five core principles

Five Core Principles for Proper Medicine Use

"Five No's" for Proper Medicine Use

for taking medicine. In particular, the MOHW encouraged adolescents to pay close heed to the medicines they and their parents take and reject any drugs from unknown or unfamiliar sources.

6. In 2012, the MOHW organized three seminars about using of controlled drugs for researchers in medical or educational research projects. The purpose of these seminars was to assist the researchers to understand the related regulations of controlled drugs.
7. Prevention of Drug Abuse:
   1) The MOHW has continued to provide assistance and encourage health institutions to report abuse of controlled drugs. These data were compiled into monthly reports on drug abuse cases and testing statistics along with seasonal newsletters on controlled drugs.
   2) Anti-drug publications issued by the MOHW including pamphlets encouraging people to reject ketamine and a book on overcoming drug addiction. By using a variety of media, the MOHW improved understanding of the proper use of controlled drugs and the dangers of abuse.
   3) Together with 42 groups, including schools, private organizations, and health institutions, the MOHW held events related to the prevention of drug abuse and eight training classes for a nationwide community pharmacist program.
8. Medical Device and Cosmetics Safety: Through a combination of ten activities on safe management of medical devices, the production of promotional materials and short films, contests related to choosing safe medical devices and using the National Cosmetic Product Defect Reporting System website, and dedicated press conferences, the MOHW provided instruction on health-related issues pertaining to medical devices and cosmetics.
9. In 2012, the MOHW began building a health education model to promote the safe use of Chinese medicine. It set five core capabilities in Chinese medicine education — stop, look, listen, choose, use — and it established four resource centers for health education to train seed instructors.
10. Three winning designs selected from a poster contest on safe use of Chinese herbal medicines were printed and distributed to local health agencies.
11. The MOHW investigated the medicinal habits of southern Taiwan residents then formulated a plan to make those habits safer. Initiatives included training seed instructors, who then assisted with 36 activities to promote the safe use of Chinese medicine, and the issuing of questionnaires to gain a reference for future administrative efforts.

Winning Designs from a Contest to Promote Safe Use of Chinese Herbal Medicines

6 Health Care

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With rapid changes underway to medical, social, and economic environments, the assurance of safe treatment has become a major challenge for Taiwan's health system and teams. Key issues to be addressed include the provision of a holistic health care system for all, improving doctor-patient relations, implementing community health care and preventive medicine, and the continuous improvement of health and quality of life.

Chapter 1, Health Care Systems

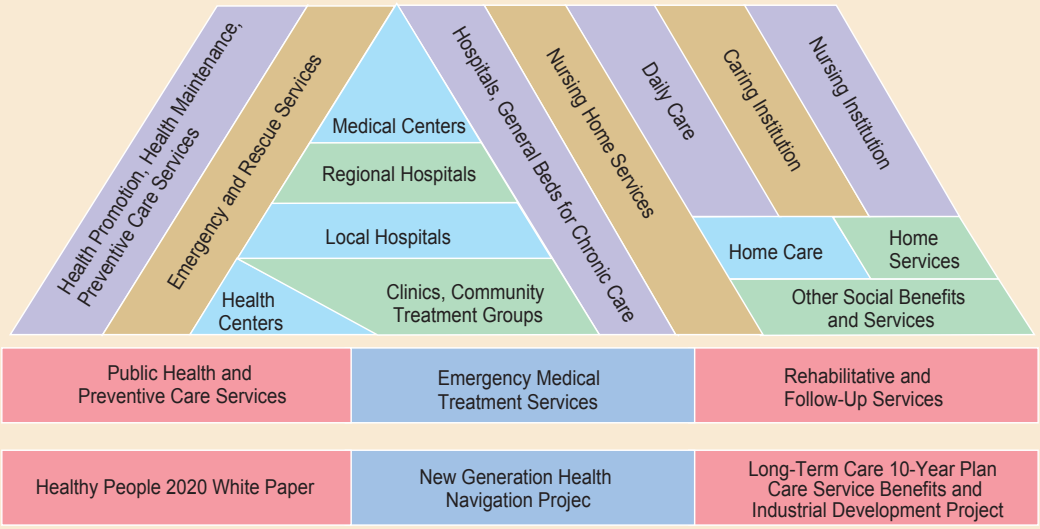
The launch of a medical care network project in 1985 led to the division of Taiwan into 17 health regions. Subsequent planning of the health workforce and facilities set the stage for the balanced allocation of resources and improvement of regional care quality. The project took place in four stages over a period of two decades, gradually leading to a sufficient number of hospital beds and improved quality of care.

In coordination with the post-SARS reform of the health system, the "Holistic Health Care Plan" was enacted between 2005 and 2008. Besides emphasizing safety in a patient-centered medical environment, it developed community-based health care systems. To brace for the impact of the aging population, fewer children, and new infectious diseases, the "New Generation Health Navigation Project" was enacted between 2009 and 2012. This plan enhanced holistic health care for all, based on the principles of suitability, accessibility, sustainability, and comprehensiveness. In the process, it gave people the chance to live longer, healthier, and happier lives. The current health care system is illustrated in Figure 6-1.

Section 1, Medical Care Resources

For the promotion of balanced development of medical care resources, the MOHW established a regional medical care system in accordance with the Medical Care Act and the medical care network

Figure 6-1 The Current Health Care System



project, conducted health need assessments in conjunction with regional support, and handled the fair distribution of regional medical care resources. Achievement highlights in 2012 are as follows.

1. Current Status of Medical Care Institutions:

There were a total of 502 hospitals, 20,935 clinics, 7,620 pharmacies, 447 general nursing homes, 29 psychiatric nursing homes, 498 Nursing Care Institutions, 148 post-natal care institutions, 15 day care institutions, 39 midwifery practices, 429 medical laboratories, 69 medical imaging laboratories, 45 physiotherapy practices, 10 occupational therapy practices, 61 denture care practices, 40 mental counseling centers, 26 psychotherapy centers, and 17 nutritional counseling institutions. These are illustrated in Figure 6-2.

2. Current Status of Hospital Beds:

There were 160,900 beds in medical care institutions (including general beds and special beds) in 2012, or an average of 69.01 beds per 10,000 people. General beds in hospitals included general beds for acute care, general beds for chronic care, beds for acute psychiatric care, beds for chronic psychiatric care, beds for chronic tuberculosis, and beds for Hansen's disease. See Figure 6-3.

3. Medical Region Counseling and Resource Integration:

To improve the quality of medical care, the MOHW enacted the "Medical Region Counseling and Medical Care Resources Integration Plan," in accordance with the "New Generation Health Navigation Project," which was approved by the Executive Yuan on February 12, 2009. Objectives included encouraging medical care institutions and private organizations to follow MOHW health policies and seek autonomous development of medical specializations in each region. This could stimulate local innovations along with the integration of government agency resources.

Figure 6-2 Total Number of Medical Care Institutions, by Year

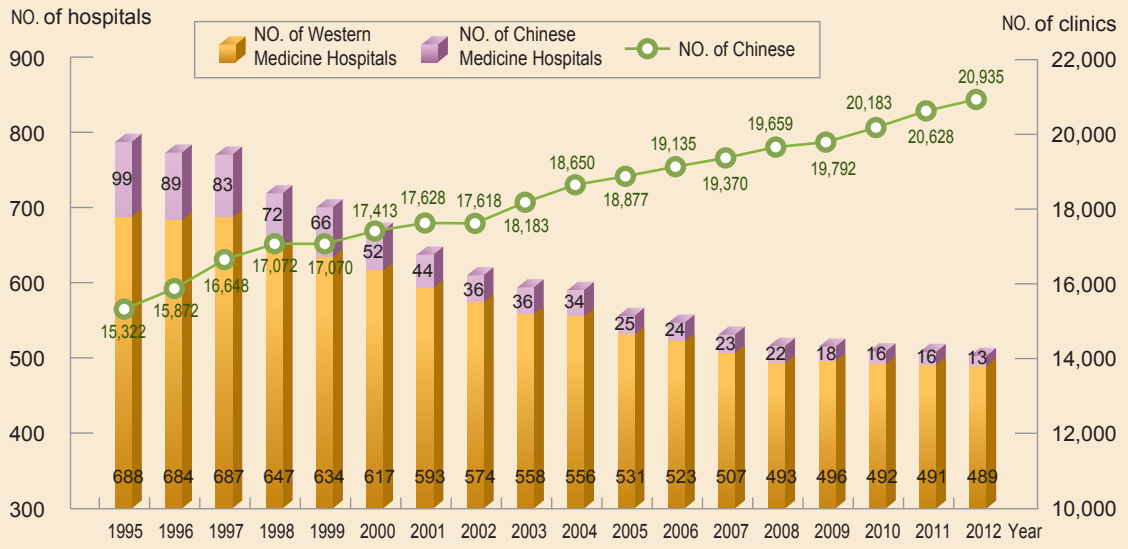
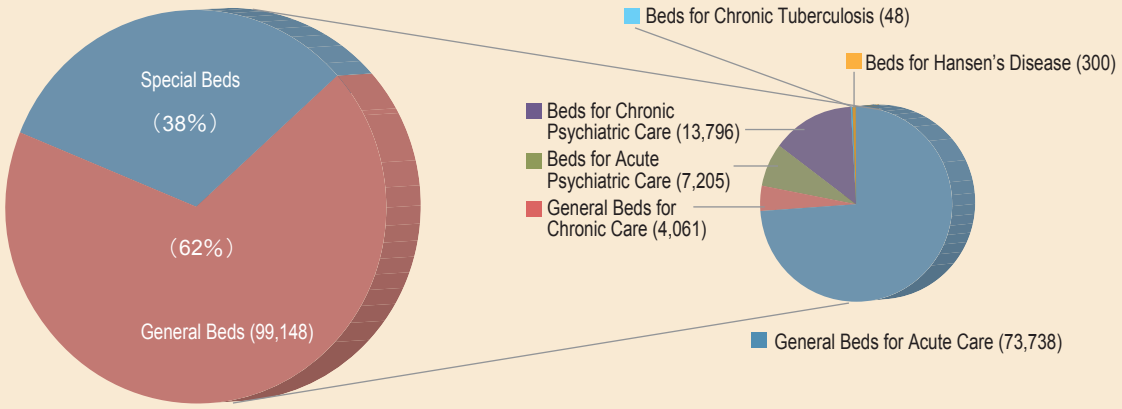


Figure 6-3 Current Status of Hospital Beds in Medical Care Institutions



Section 2, Mental Health Promotion and Suicide Prevention

In Taiwan, the suicide mortality rate per 100,000 people increased from 10.0 in 1997 to 19.3 in 2006. During that time, for 13 consecutive years starting in 1997, suicide was one of the 10 leading causes of death, until a decline that saw the rate fall to 16.8 in 2010 then 15.1 in 2011, finally dropped it out of the 10 (see Figure 6-5). Nevertheless, more than 3,000 deaths a year can still be attributed to suicide, causing incalculable pain for the individuals and families affected. The MOHW considers suicide prevention a vital responsibility and is introducing new measures to prevent such tragedies.

The MOHW established a "National Suicide Prevention Center" for the planning and assessment of prevention strategies, and it launched a toll-free 24-hour "peace of mind hotline" (0800-788995) to provide counseling.

Through a "Suicide Prevention Reporting and Care System" the MOHW increased reporting of suicide attempts. Other measures included subsidies for city and county health bureaus to conduct suicide outreach visits, strengthening the functions of community mental health centers, and activation of community support networks. Using follow-up house visits and referral tracking, the MOHW reduced repetitive suicide attempts and suicide mortality rates, and by holding 67 education and training classes for suicide prevention staff, it improved recognition of high-risk groups and referral capability.

Since 2010, the MOHW has conducted screening for geriatric depression. By the end of 2012, city and county health bureaus screened 561,105 people, accounting for 22.22% of the national elderly population.

In order to promote central cross-departmental cooperation, the Executive Yuan set up the "Psychological Health Promotion and Suicide Prevention Conference," which met three times in 2012. Discussions on response strategies focused on groups such as military servicemen, farmers, office workers, and students.

Chapter 2, Emergency Health Care and Disaster Response

Section 1, Emergency Health Care

1. The MOHW has fortified the capacities of the six Regional Emergency Operation Centers (REOCs). These centers provide real-time monitor and grasp intra-regional emergency health care situations and resource status, and their support to inter-regional disaster response groups strengthens local rescue workers response capability.
2. Classification Standards for emergency Health 2ΩCare Capabilities of Hospitals: Central health authorities must classify the emergency health care capabilities of hospitals responsible for emergency care. Severe-grade hospitals are specifically designated as the last line of hospital referral. They cannot re-transfer sick or injured emergency patients, a restriction that ensures the effectiveness of the hospital referral system and safeguards the rights of patients.
3. An improvement project in areas with insufficient emergency health care resources allowed the MOHW to provide emergency health services to local residents and tourists 24 hours a day or at specific time periods (e.g. evenings and holidays, tourist high season). The project included establishment of three models: emergency health care stations in tourist areas, evening and holiday first-aid stations, and enhanced emergency capabilities of hospitals in regions with insufficient emergency health care resources.
4. The MOHW provided incentives to establish a total of 24 special critical care centers in 17 hospitals located in Kinmen, Lienchiang, Penghu, Hsinchu, Miaoli, Nantou, Yunlin, Pingtung, and Taitung counties. 21 of these centers were certified to provide critical care services associated with trauma, cardiac catheterization, stroke, perinatology, emergency room treatment, and pediatrics.
5. Since 2009, the MOHW has held cardiopulmonary resuscitation and automated external defibrillator (CPR & AED) emergency training classes. As of the end of 2012, classes were held at 223 locations and AED machines were installed and certified at 36 of these locations.
6. A project took place to improve OB/GYN and pediatric care through better integration of resources, expexcting to subsidy 19 hospital's OB/GYN department and 13 hospital's pediatric department in 16 counties, to provide 24-hr OB/GYN and pediatric service in these regions.
7. The MOHW, in conjunction with the National Fire Agency (under the Ministry of the Interior), as well as city and county health bureaus, formed a task force for central and local officials to improve ambulance management through joint, unannounced inspections.

Section 2, Disaster Response

1. In response to typhoons and other disasters, the Central Emergency Operation Center opened nine times in 2012.
2. In accordance with national disaster prevention and rescue drills and evaluations by the Executive Yuan, the MOHW conducted onsite inspections of response and preparations by local governments toward major and complex disasters. Also, in conjunction with the 35th Wanan military drills, the MOHW joined war games and field exercises related to health mobilization and preparation.
3. Disaster struck on December 9, 2012, when a bus rolled off a cliff in the Hsinchu County community of Smangus. The MOHW's Emergency Operations Center, northern district office, contributed to the response by assisting the local public health bureau in monitoring transfer of

the injured to hospital. This allowed victims to receive appropriate treatment in the shortest time possible.

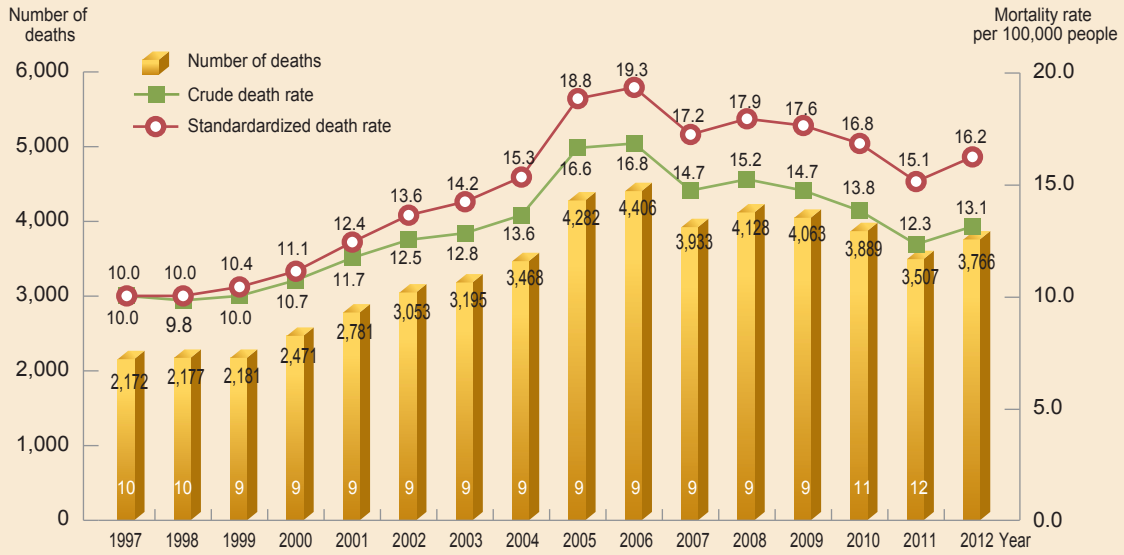
Chapter 3, Psychiatric Care and Mental Health

Section 1, Mental Health Promotion and Suicide Prevention

In Taiwan, the suicide mortality rate per 100,000 people increased from 6.9 in 1994 to 19.3 in 2006. During that time, for 13 consecutive years starting in 1997, suicide was one of the 10 leading causes of death, until a decline that saw the rate fall to 15.1 in 2011 then 16.2 in 2012, finally dropped it out of the 10 (see Figure 6-4). Nevertheless, more than 3,000 deaths a year can still be attributed to suicide, causing incalculable pain for the individuals and families affected. The MOHW considers suicide prevention a vital responsibility and is introducing new measures to prevent such tragedies.

1. The MOHW established a "National Suicide Prevention Center" for the planning and assessment of prevention strategies, and it launched a toll-free 24-hour "peace of mind hotline" (0800-788995) to provide professional counseling.
2. Through a "Suicide Prevention Reporting and Care System" the MOHW increased reporting of suicide attempts. Other measures included subsidies for city and county health bureaus to conduct suicide outreach visits, strengthening the functions of community mental health centers, and activation of community support networks. Using follow-up house visits and referral tracking, the MOHW reduced repetitive suicide attempts and suicide mortality rates, and by holding 67 education and training classes for suicide prevention staff, it improved recognition of high-risk groups and referral capability.

Figure 6-4 Suicide Deaths and Mortality Rates, by Year



3. Since 2010, the MOHW has conducted screening for geriatric depression. By the end of 2012, city and county health bureaus screened 561,105 people, accounting for 22.22% of the national elderly population.
4. In order to promote central cross-departmental cooperation, the Executive Yuan set up the "Psychological Health Promotion and Suicide Prevention Conference," which met 3 times in 2012. Discussions on response strategies focused on special groups such as military servicemen, farmers, office workers, and students.

Section 2, Psychiatric Health Services

1. The MOHW continued an assistance project to build a regional psychiatric care network divided into six areas of medical responsibility with designated core hospitals. Assistance to various city and county governments included: 1. Establishment of regional cross-county, cross-city, and cross-organization resource integration and cooperation mechanisms for psychiatric care, 2. Promotion of mental illness prevention and development of professional psychiatric rehabilitation services at the community level, (3) Professional training for psychiatric care professionals.
2. To effectively account for mental patients in each community, the MOHW encourages municipal, city, and county governments to list mental patients requiring care in their community. It also subsidizes 292 administrators and outreach visitors at the local level who manage patients afflicted with mental illness and track whether they receive treatment. When an attempted suicide is reported, the outreach visitors conduct follow-up visits to investigate needs and evaluate whether referrals are needed.
3. An amendment, promulgated on July 4, 2008, to the "Mental Health Act," led to the establishment of a review commission to handle the mandatory identification and treatment of patients with serious mental illness. After implementation, the average monthly number of times patients were given mandatory hospitalization fell from 140 in 2009 to 106 in 2012, demonstrating that the commission helps to guarantee the rights of the mentally ill patients. Year-by-year review results are listed in Table 6-1.
4. To make treatment more accessible for psychiatric patients, the MOHW subsidizes private sector organizations for the opening or expansion of psychiatric rehabilitation facilities or equipment.
5. The MOHW improved psychiatric rehabilitation facilities and community rehabilitation services to encourage psychiatric patients in stable condition to return to society.

Table 6-1 Review Commission Decisions Related to the Mandatory Identification and Treatment of Patients with Serious Mental Illness

Year	Reviewed Applications	Approved	Approval Rate	Rejected	Rejection Rate	Monthly Average of Patients Given Mandatory Hospitalization
July-December 2008	669	578	86.4%	91	13.6%	–
2009	1,679	1,555	92.61%	124	7.39%	140
2010	1,696	1,611	94.99%	85	5.01%	141
2011	1,251	1,203	96.16%	48	3.84%	104
2012	1,277	1,234	96.63%	43	3.36%	106
Total	6,572	6,181	94.05%	391	5.95%	–

6. Under the Domestic Violence Offender Intervention Project, offenders received cognitive education and counseling, psychological and psychiatric treatment, and treatment for overcoming substance addiction. For sexual assaults, there were 152 hospitals designated to collect evidence of injury and arrange for emergency treatment. Additionally, patients seeking to overcome an addiction to alcohol were hospitalized 1,012 times and received clinical treatment 1,227 times, counseling 1,280 times, and cognitive education 3,888 times.
7. The MOHW designated 109 institutions for drug addiction withdrawal treatment, among them 18 core hospitals, 83 regular hospitals, and eight clinics. It also conducted the "HIV-negative replacement therapy plan" by partially subsidizing the cost of alternative therapies for HIV-negative drug addicts. In 2012, there were 108 alternative therapy institutions nationwide that handled a monthly average of 12,663 alternative therapy cases. Between 2007 and 2012, the total number of patients who sought alternative therapy rose from 12,145 to 38,507 (see Figure 6-5); and the total number of days that patients sought treatment reached 16,828,089. The yearly increase in HIV cases among drug addicts fell from 743 in 2007 to 81 in 2012.

Chapter 4, Long-Term Care Service Systems

Statistics show that citizens older than 65 accounted for 11.5% of the overall population at the of 2012. The aging population, changes in desease patterns, and a sharp increase in the number of disabled people have led to rapidly rising demand for long-term care (LTC), a situation that has become a major national policy concern, The MOHW is committed to building LTC service systems that are accessible, continuous, and effective. Main strategies are summarized as follows:

Figure 6-5 Total Number of Patients Seeking Alternative Therapy

Section 1, Establishing Accessible and Universal Long-Term Care Services

1. Developing an Aging-in Place Service Networ

1) The MOHW assists each city and county in building LTC systems. By the end of 2012, there were 22 LTC management centers with a total of 40 branches and 315 professional staff. From 2008 to the end of 2012, the coverage rate of the total disabled elderly population served by this network has increased 12-times, from 2.3% to 27%.

2) Improving Accessibility of LTC for the Economically Disadvantaged

An analysis of comparative case socioeconomic data on LTC, taken over a five-year period, shows that mid- to low-income households account for 12% of all households receiving assistance (and just 4% of the total population). Low-income households account for 14% of all households receiving assistance (and just 1% of the total population). These figures show that the economically disadvantaged population receives a relatively high amount of assistance.

3) Service Centers in Remote Areas

To build an LTC network for remote areas, the MOHW uses service centers to train local professional staff and combine local resources, including health stations and community care points. In 2011 and 2012 it set up 13 service centers to improve LTC capacity in remote areas.

2. Planning and Implementing an LTC Service Network

The MOHW completed an LTC service network draft plan aimed at building a national LTC system that can meet capacity needs while providing diverse, balanced development of resources. It is expected to bring LTC services to communities across the nation (including remote areas), satisfy household demand, and serve as a basis for implementing LTC insurance. The draft plan, which divides the nation into large (22), medium (63) and small (368) LTC regions based on service needs focus on incentives for resource development and community-based initiatives.

3. Establishing a Legal Basis for LTC

The MOHW, which advocates a legal basis for LTC services, resubmitted a draft "long-term care services act" to the Executive Yuan on February 16, 2012. After clearing the Cabinet on February 23, 2012, the proposed legislation was sent to committee of the Eighth Legislative Yuan and prioritized for review.

4. Planning an LTC Insurance System

1) To develop the native long-term care case-mix as the reference of forming the payment and benefit system of the LTC insurance, the long-term care utilization data of long-term care facilities, including home caring, home nursing, community-base, and residential institutions, had been collected from April 2011 to December 2012. 5,536 subjects in these long-term care facilities were recruited, and the draft report of the long-term care case-mix system will be completed at the end of 2013.

2) To develop the payment standards of LTC insurance reflecting costs and reasonable working conditions, the survey of cost analysis for services provided by long-term care facilities, including home caring, home nursing, community-base, and residential institutions, is processing from July 2011, and it will be finished at the end of 2013.

3) In order to develop assessment tools for the provision of LTC insurance, the MOHW formulated a Multi-dimentional Assessment Intrument (MDAI)(drafts) that can be used to

determine needs. MOHW also built an inventory of LTC need assessment tools around the world. The MDAI (drafts) cover six dimentions: activities of daily living (ADLs) instrumental activities of daily living(IADLs); communication; special and complex care, cognitive mental-, and behavior patterns problems, environment and social participation; and caregivers burden.

4) The MDAI (drafts) are currently used in National Long-Term Care Need Survey (phase II) and LTC case-mix study. Also, since 2012, the MOHW has used the MDAI (drafts) as a basis for assessing patients with dementia, mental disabilities, and mental disorders, as well as those in need of rehabilitation. The information is then used for detailed planning and revising in order to ensure that LTC satisfing the needs of all groups.

Section 2, Training of LTC Professionals

1. The MOHW completed training course plans for the LTC health workforce and management staff of care centers. These plans promote uniform, continuous, and complete implementation.
2. Table 6-2 illustrates LTC staff training courses:

Section 3, Better Quality through Integration of LTC Institutional Management

1. Since 2009, the MOHW has conducted general nursing home evaluation and accreditation in accordance with the "Nursing Personnel Act." And, after inviting the Ministry of the Interior and the Veterans Affairs Commission to jointly complete LTC institution evaluation, accreditation, and integration in 2011, the following year it completed on-site evaluation and accreditation of 311 general nursing homes.
2. General nursing homes that unqualified to achieve accreditation between 2010 and 2012 received regular management guidance and review from local health bureaus.

Section 4, Promotion of Telecare

The planning and implementation of a telecare service development project, taking place between 2010 and 2014, continuesexpansion of the service, and completeof the supporting mechanism in order to promote the industry development. The MOHW achievements are as follows:

Table 6-2 Training Courses for LTC Staff

LTC Health Workforce Training Course	Level I General Course (18 Hours)
	Level II Professional Course (32 Hours)
	Level III Integrated Course (24 Hours)
Care Center, Care Management Staff Training Course	Phase I: Primarily consists of a 40-hour core curriculum course and a 40-hour practical training course.
	Phase II: Design guidelines for curriculum development emphasizing practical matters, coordination, and communication, as well as cross-disciplinary services in individual cases.
	Phase III: Based on continuing education concepts and the development of advanced abilities. Focuses on cross-disciplinary case teaching as well as resource utilization and integration in interregional service systems.

Table 6-3 Implementation and Results of the Telecare Service Development Plan

Service Expansion	Commissioned Taipei's Wan Fang Hospital and the Kaohsiung Medical University Chung-Ho Memorial Hospital to establish two telecare regional service centers, one each in the north and south. The centers provide 24-hour health care consultations, health management, and assistance with patient referrals. They also integrate health care resources to produce added-value services and raise service quality. By the end of December 2012, the centers had formed cooperative relationships with 231 health care institutions, counted 23,955 patients as members, subsidized 3,846 disadvantaged people, provided lifestyle care services 1,352 times, and provided consulting services 51,672 times.
Creating a Sound Environment	Establishing Device Interface Standards: Interfaces of devices used for remote physiological measurement and transmission followed the international standards adopted by the Continua Health Alliance or ISO/IEEE, 11073, HL7, IHE. These standards were promoted among domestic enterprises during three industrial information meetings. Formulating Draft Service Management Regulations: Draft regulations primarily focused on personal data and norms within the service industry. A pair of bills, related to regulations governing the protection of personal data and guidelines for operating telecare services, continued to undergo revisions and promotion.
Information Integration and Interfacing	A new analysis system built to measure the effectiveness of telecare centers can serve as a reference when promoting future projects. Completed apps and drivers for physiological information and transmission that match interface standards for remote physiological measurement and transmission devices. Website modifications made the original project website more user-friendly, while the main themes of health management and chronic disease care targeted the two main audiences — the general public and chronic diseases patients. New functions included database browsing and online interaction features.
Service Advocacy and Promotion	Held five promotional activities for telecare services. Produced short promotional videos shown at McDonald's restaurants across the nation. Promotional information was published in magazines specializing in health and leisure, and pamphlets were produced for handout at related activities.

Chapter 5, Quality of Medical Care

Section 1, Quality of Medical Care Services

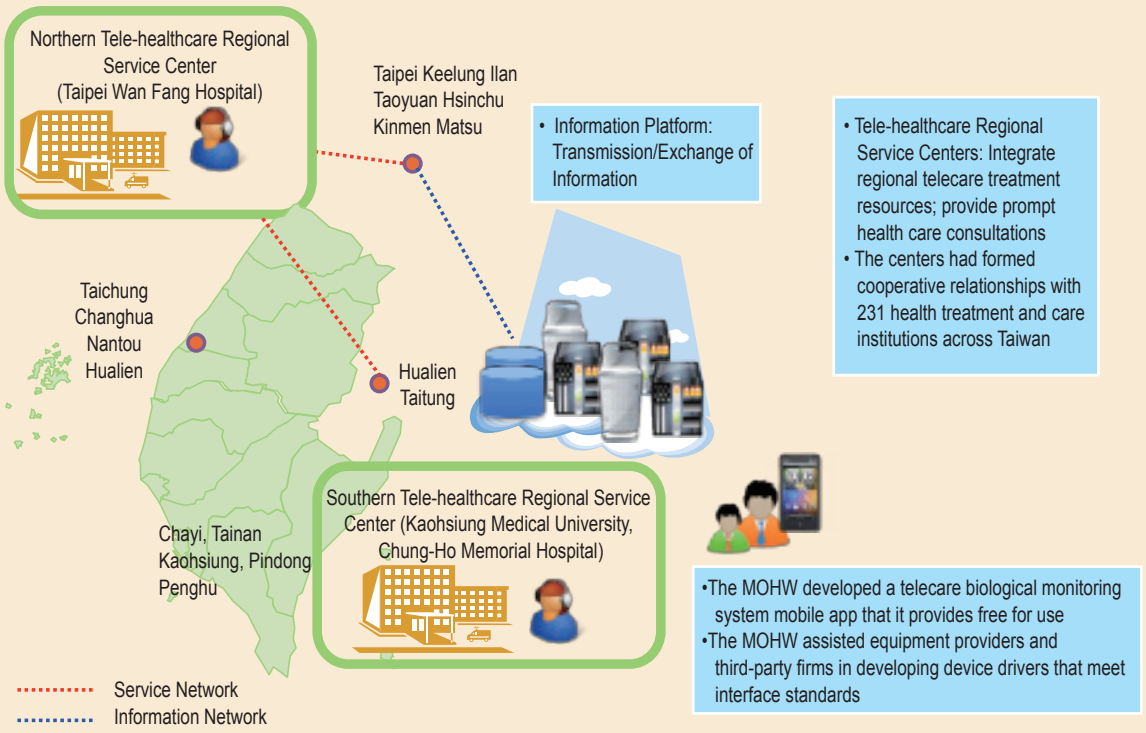
With a view to better quality, the MOHW created a patient-centered safe treatment environment, gradually implemented a hospital evaluation and accreditation system, published annual objectives for medical care quality and patient safety, and developed a patient safety incident reporting mechanism. Achievement highlights from 2012 follow:

1. Patient Safety and Quality of Medical Care

Annual Objectives for Patient Safety and Quality of Medical Care

1) The "Annual Objectives for the Promotion of Patient Safety and Quality of Medical Care in Hospitals for 2012 & 2013," formulated by the MOHW, contained the following 10 objectives: improving safe use of pharmaceuticals, implementing infection control, improving surgical safety, preventing patient falls and lowering degree of injury, managing patient safety in the event of abnormal situations, improving communication between medical staff and caregivers, encouraging patients and family members to carry out patient safety tasks, improving safety management, enhancing hospital fire prevention and response, and improving suicide prevention among hospitalized patients.

Figure 6-6 2012 Telecare Service Overview



2) The "Annual Objectives for the Promotion of Patient Safety and Quality of Medical Care in Clinics for 2012 & 2013" had the following three objectives: improving safe use of pharmaceuticals, preventing patient falls, and improving surgical safety.

3) The MOHW arranges scheduled and non-scheduled assessments of the above objectives and implementation strategies.

2. The MOHW instituted the Taiwan Patient Safety Reporting System (TPR) to gradually build a safe culture for patients and establish a non-punitive learning environment that could prevent repeated occurrence of mistakes. Other steps included publishing reports on the system and offering suggestions on patient safety incidents to medical care institutions.

3. The MOHW set up a patient safety website to provide up-to-date information and serve as a platform for information exchange. The website gathers patient safety information from across the globe for domestic medical care institutions and health workers to learn and exchange, thus encouraging research and development.

4. Regulations associated with safe hospital environments are stipulated under the "Hospital Accreditation Standards." They include safety of the environment and equipment, patient orientation services and management, management of medical care quality, safe use of pharmaceuticals, anesthesia and operations, and infection control.

2. The Hospital Accreditation System

Relying on the core values of patient-centered care and prioritizing patient safety, the MOHW reformed the accreditation system of hospitals and teaching hospitals.

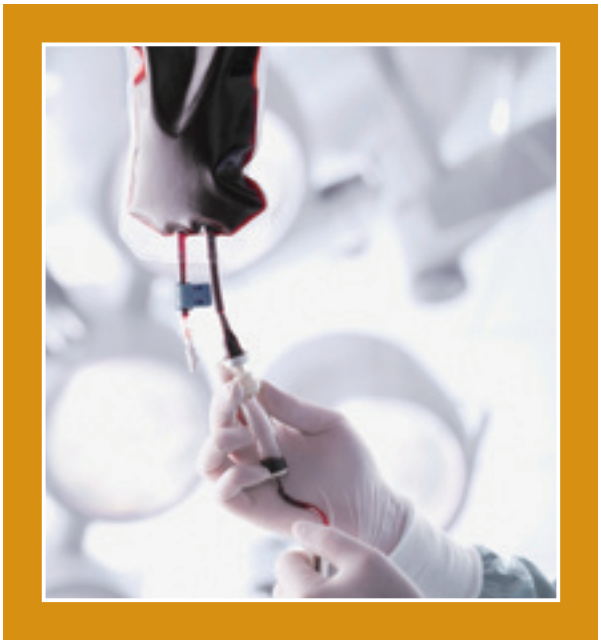
1) The MOHW continued to implement and improve the "Hospital Accreditation Standards" and "Teaching Hospital Accreditation Standards." It also formulated draft hospital accreditation standards and conducted test evaluations for dentistry, hospice and palliative care, and Chinese medicine.
2) For the benefit of improving deficiencies in the internal operations of psychiatric rehabilitation institutions and to ensure quality of care, the MOHW conducted 568 on-site evaluations and accreditation by the end of 2012. In recent years, the need for re-evaluation has been on the decline, dropping from 16 institutions in 2007 to seven in 2012, showing the effectiveness of the accreditation system in raising quality of care. Also, in 2011, an inaugural accreditation system for psychiatric nursing homes began. Nine nursing homes applied for evaluation and accreditation in 2012, eight of which passed.
3) To establish a highly-qualified, patient-oriented Chinese medical care system and to provide a safe environment for the public, the MOHW accredits Chinese medical hospitals and hospitals with Chinese medicine service. In 2011, 40 hospitals were accredited due to the accreditations will expire on December 31, 2014, MOHW is required to update its criteria to prepare to the upcoming accreditations.
4) The MOHW integrated hospital accreditation, inspections of health treatment and hygiene services, and certification of training institutes for specialist medical practitioners, reducing disruption of day-to-day affairs at medical care institutions.

Section 2, Improving Blood Supply and Transfusion Quality

Taiwan promotes voluntary, non-remunerated blood donation to ensure a safe blood supply. In 1991, the voluntary, unpaid donation rate reached 5.18%, surpassing the standard international goal of at least 5% of the total population. In the years since, Taiwan has remained above this level and kept 100% of its national blood supplies based on strictly altruistic donations, putting it in the ranks of other nations with advanced blood supplies.

In January 2007, the Taiwan Blood Services Foundation took over collection of blood plasma raw materials and the manufacturing of blood products. It currently produces four types of blood products using domestically sourced blood: human serum albumin, human immunoglobulin for intravenous use, anti hemophilic factor VIII, and antihemophilic factor IX. Among them, 100 percent of the human immunoglobulin used in Taiwan is produced domestically and supplied to domestic medical care institutions to guarantee the health of patients.

1. For the sake of reducing the risk of HIV infection among blood transfusion recipients, the MOHW dissuades people at high risk of contracting HIV from using blood donations as a way of testing for the disease. In 2012, 3.76 out of every 100,000 blood donors tested positive for HIV. It was the lowest level in four years and validated the MOHW's campaign.
2. To improve the quality of blood transfusions, the MOHW set standards for the establishment of blood donor organizations and the health of prospective donors. Based on the Standards for Medicament Factory Establishments, the MOHW inspects the raw materials and preparation process associated with blood plasma. It also inspects blood preparation manufacturers to ensure they meet GMP standards.
3. In order to prevent hemolysis in patients who have received blood transfusions, the MOHW screens



and records blood cell antigens of donors. For patients with rare blood types, a special database is available for finding a suitable match when a transfusion is needed.

4. The MOHW commissioned the Taiwan Blood Services Foundation to establish a blood consultation laboratory. It provides consultation and testing services along with education and training on blood transfusion safety to clinical organizations.
5. In order to effectively shorten test window times and reduce the probability of infected blood being transfused, the phased implementation of nucleic acid amplification testing (NAT) began in July 2010. Approval was given in 2012 for the full implementation of NAT for HIV, HBV, and HCV starting from February 2013.

Section 3, Improving Efficiency and Quality of Organ Donation and Transplantation

By the end of 2012, there were approximately 8,000 patients in Taiwan still awaiting organ transplantation. However, averagely only about 800 patients a year could receive a transplant. In order to promote organ donations and increase the sources of organs, the Taiwan Organ Registry and Sharing Center was established in 2002 funded by MOHW. TORSC is in charge of promoting organ donations and the allocation of donated organs. By the efforts contributed so far, the rate of organ donation in Taiwan is rated number two in Asia and the survival rate after surgery is even better than in other developed countries.

1. To establish Organ Procurement Organizations (OPOs) and raise the rate of organ donation by actively encouraging potential organ donors.
2. Fair, just and transparent allocation of organs was achieved through the launch of the Taiwan Organ Registry and Sharing System.
3. On November 15, 2011, the MOHWaccomplished a matching mechanism for the Taiwan Organ Registry and Sharing Systemand the Chronic Infectious Dieseases the tracking system- HIV and Hansen's disease, leading to increased accuracy of the registered data.
4. On December 21, 2011, revisions to the Human Organ Transplantation Act stipulated that the willingness to donate organs should be indicated on the National Health Insurance IC cards and be regarded as official; the MOHW maintains legal authority over the allocation of organs; and the donor's laboratory reports should be submitted to the hospital carrying out the transplantation. These changes ensured comprehensive understanding of the organs status prior to transplantation.
5. At the end of 2012, new SOPs for the donation, transplantation, and allocation of organs were made, several steps were added in the comfirmation of test results between medical groups. This ensures accurate transmission of patient information.

Section 4, Quality of Nursing Care

1. The MOHW promotes an examination system for specialty nurse practitioners. By 2012, 3,728 people had passed and there were 80 training

hospitals for nurses specializing in internal medicine or surgery.

2. Two organizations that offer subsidized continuing education for nursing staff fully planned and executed 302 courses (including video courses). Also, revisions to the regulations governing professional registration and continuing education of nurse were expected to increase total credits for internet and communications courses offered to nurses from 30 to 60.
3. The MOHW sought to simplify paperwork responsibilities of nursing professionals at hospitals by drafting and encouraging general forms for internal medicine and surgical acute wards while also providing suggestions and examples of specific forms. To further reduce the work burden of nurses, the MOHW continued to promote a total nursing care plan involving joint care by nursing professionals and associates.
4. On June 6, 2012, the MOHW instructed hospitals, local health bureaus, and nursing associations to inform affiliates of work hour standards for nursing professionals in medical care organizations and to request adherence to regulations contained in the Labor Standards Act. Any labor violations would be recorded in hospital accreditation . In addition, the MOHW conducted pilot accreditation of six post-natal care institutions and held two explanatory meetings to gather a wider range of opinions. Results contributed to the completion of accreditation standards in 2013 and the subsequent launch of official evaluations in the same year.

Chapter 6, The Medical Manpower

Section 1, Current Status of Medical Manpower

1. According to the licensing system for professional health workers, there are 14 laws and regulations governing the management of health workers, including the "Physicians Act," the "Pharmacists Act," the "Nursing Personnel Act," the "Hearing Specialists Act," the "Speech Therapists Act," and the "Dental Technicians Act," along with acts governing midwifery professionals, dietitians, physical therapists, occupational therapists, medical technologists, medical radiological technologists, psychologists, and respiratory therapists. An act governing optometrists (draft) is under review in the Legislative Yuan.
2. See Table 6-2 for the number of practicing health workers per 10,000 people, as of the end of 2012.

Section 2, Fostering the Health Workforce

To raise the quality of the health workforce, each year the MOHW fosters a diverse range of health workers. Results of cultivation plans and workplace training follow:

1. The MOHW established a quota system for the cultivation of health workers. In principle, 1,300 medical students are to be enrolled each year, and quotas are in place for the training of other categories of health workers. Applications shall be filed prior to the establishment of medical training programs and reviewed by the Ministry of Education for control purposes. Future planning of the physician work force will focus on uniform distribution of resources and be strengthened by a regular assessment mechanism.
2. Since 1969, the MOHW has conducted a local health worker cultivation program to train professionals in remote regions and offshore islands where medical resource shortages exist. The retention rate of government-sponsored physicians is 70%, and over the course of the program the annual number of locally trained government-sponsored physicians rose from 10 to 27.
3. Over the more than three decades of the government-sponsored physician system, gradual improvement is apparent in the physician

shortages that plagued public hospitals, remote regions, and offshore islands. Phased implementation and policy goals have been achieved. Also, starting in 2006, recruitment for 40 government scholarships was gradually reduced before being eliminated in 2009, while the annual number of locally trained government-sponsored physicians rose from 10 to 27.

4. The MOHW commissioned professional medical associations to evaluate specialist practitioners as a way of improving professional medical training. Hospitals for the training of specialist practitioners are accredited every three years in 26 areas of specialization.
5. The MOHW conducts post-graduate general medical training to strengthen holistic care concepts and ability of resident physicians. It launched a post-graduate year (PGY) program in July 2011, and the following year approved 127 hospitals (consisting of 39 training hospitals and 88 partner hospitals) to conduct it.
6. To establish a systematic clinical training program for dentists, improve post-graduate training quality and results, and raise overall quality of health care, on July 1, 2010, the MOHW implemented a two-year general medical training post-graduate program for dentists. By the end of 2012, it had approved 291 medical care institutions to conduct the program.
7. Chinese medicine doctors in Taiwan were trained in either a seven-year or an eight-year system (between 1966 and 1995 there was only a seven-year system, which was increased to eight years in 1996; from 2003, further changes created dual, seven and eight-year systems). After five years of study, students of Chinese medicine enter one of the two tracks.

   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, and the special examination was terminated in 2011.
8. To pave the way for a system of Chinese medicine clinical training, in 2014, the MOHW will implement a training program for supervising physicians at Chinese medicine institutions. All candidates to become supervising physicians will be required to undergo two years of training at a Chinese medicine department of an accredited teaching hospital or an MOHW-designated Chinese medicine hospital. The MOHW began promotion of the training plan in 2009, and by the end of 2011 had assisted 33 training hospitals in accepting 122 new Chinese medicine students. It also provided training for 164 advising physicians and 296 advising pharmacists.
9. The MOHW launched a special program to raise the quality of Chinese medicine practitioners. In 2011, it held 16 seminars focused on the study of Chinese medicine and the integration of Chinese and western medicine along with basic training courses for nurses.

10. In 2007, the MOHW began subsidizing teaching expenses accrued by teaching hospitals. The subsidies support core training courses for health workers accepted into certificate granting programs of no more than two years and covered 75.81% of new health workers accepted into such programs in 2012. By ensuring comprehensive clinical training, the subsidies effectively raised the quality of health service personnel.
11. The MOHW completed a continuing education system for 14 types of health workers. By mandating that health workers spend a certain number of hours in continuing education every six years before they can apply for license renewal, the MOHW ensures that professional skills of health workers are kept up to date.
12. In order to better assess clinical skills of medical students while improving quality of clinical education, the MOHW: expanded medical license exams beyond paper testing, assisted teaching hospitals in adding the programs and facilities necessary for improved clinical skill assessment models (starting in 2010), and revised the enforcement rules of the physicians act. Since 2013, more than 1,300 medical school graduates have passed an Objective Structured Clinical Examination (OSCE) testing doctor-patient communication, physical examinations, and other health care techniques. Only by passing this could graduates advance to the second stage of the doctor's examination.

Section 3, Improving Efficiency and Quality of Organ Donation and Transplantation

By the end of 2012, there were approximately 8,000 patients in Taiwan still awaiting organ transplantation. However, averagely only about 800 patients a year could receive a transplant. In order to promote organ donations and increase the sources of organs, the Taiwan Organ Registry and Sharing Center was established in 2002 funded by MOHW. TORSC is in charge of promoting organ donations and the allocation of donated organs. By the efforts contributed so far, the rate of organ donation in Taiwan is rated number two in Asia and the survival rate after surgery is even better than in other developed countries.

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7

National Health Insurance

88 Chapter 1 Current Status of National Health Insurance

90 Chapter 2 Payment System Reform and Disclosure of Medical Care Quality Information

91 Chapter 3 Expanded Assistance to Disadvantaged Groups

92 Chapter 4 Implementation of the Second-Generation NHI

Implementation of NHI provided an avenue for sick people in disadvantaged groups to receive proper medical care, marking a landmark achievement in the development of Taiwan's social security net. A serious challenge emerged, however, as it became more difficult for limited financial resources to meet pressing health needs. To ensure sustainability, reform of NHI is ongoing. Widespread effort led to an amendment to the National Health Insurance Act, on January 26, 2011, by order of the President, followed by implementation on January 1, 2013. It was a turning point in NHI history as it provided the bedrock needed for the system to continue in a sustainable direction.

Our look at NHI in 2012 will concentrate on current status of health insurance, payment system reform, disclosure of medical care quality, expansion of care for disadvantaged groups, and implementation of the second-generation NHI.

Chapter 1, Current Status of National Health Insurance

Section 1, Current Status of Insurance Enrollment

NHI is a mandatory social insurance. All individuals holding Republic of China citizenship and who have a registered domicile in Taiwan for at least four consecutive months shall, by law, be enrolled. Legal aliens with alien residence certificate and who have established a registered domicile in Taiwan for at least four months shall also, by law, be enrolled. However, those with a regular employer are not subject to the restrictions of the aforementioned four-month period. (Note: Starting from 2013, in conjunction with implementation of the second-generation NHI, the number of months to become a beneficiary of NHI increased from four to six.)

By the end of 2012, total enrollment in NHI was 23,280,949 persons, and the enrollment rate exceeded 99% of the population, nearly approaching the goal of full coverage.

Section 2, Insurance Financing

When NHI began in 1995, the premium rate was set at 4.25%. Initial projections showed that the system could maintain financial balance for five years, but, through a series of cost-cutting measures and strict monitoring of finances, it continued operating at this rate until September 2002. After two years of keeping the balance of revenues and expenditures at a minimum, the premium rate was increased slightly to 4.55%. Due to the economic climate, for eight years through 2009, no further adjustments were made while new stability measures haltered expansion of financial troubles. Measures introduced in 2012 to increase NHI revenues are highlighted as follows:

1) Verification of Insured Amount: Raised insurance premium revenues by NT$1.858 billion.
2) In accordance with adjustments to the basic wage, starting from January 1, 2012, the minimum in the grading table of the insured payroll-related amount was adjusted to NT$18,780. The calculation basis of each tier was then adjusted accordingly.
3) NHI lobbied for approximately NT$1.2 billion annually surpluses from public welfare lottery profits and NT$24 billion from the health and welfare surcharge on tobacco products.

By the end of March 2010, the gap between revenues and expenditures led to an accumulated deficit of NT$60.416 billion. By the end of 2012, this had turned into a surplus of NT$20.561 billion.

Section 3, Health care Utilization status

In 2012, there were 365.37 million outpatient visits, and 3.18 million hospital admissions. Average annual outpatient/inpatient visits per person are shown in Table 7-1.

Table 7-1 Average Annual Medical Utilization per Beneficiary in 2012

Type	No. of Visits	Rate of Change
Outpatient	15.1	0.15%
Western Medicine	12.0	-0.52%
Dentistry	1.4	2.46%
Chinese Medicine	1.7	3.15%
Inpatient	0.14	-0.26%
Days of Stay in Hospital	1.4 days	

Table 7-2 Number and Type of Contracted Medical Care Institutions

Type of Contracted Institution	No.	Contract Rate
Hospitals and Clinics	20,058	93.70%
Pharmacies	5,284	69.12%
Nursing Care Institutions	538	57.91%
Midwifery Practices	12	32.43%
Psychiatric Rehabilitation Institutions	184	96.84%
Physiotherapy Practices	12	30.77%
Medical Laboratories	217	53.58%
Medical Radiological Practices	9	14.06%
Occupational Therapy Practices	3	33.33%

At the end of 2012, there were 26,317 contracted medical care institutions (see Table 7-2), including 20,058 hospitals and clinics, accounting for 93.70% of all hospitals and clinics nationwide. These were widely and evenly distributed across the nation, providing highly accessible health care for beneficiaries.

Section 4, NHI IC Card Applications

Since January 2004, all enrollees of the NHI system have been furnished with an IC card so they can enjoy simpler, more convenient, and safer services. Information stored on the card can be divided into four categories: basic personal data, health insurance information, medical care records, and administrative information. This assists health workers treating patients and protects the health of all by aiding epidemic prevention. Achievement highlights from 2012 follow:

1. Approximately 99.9% of all NHI contracted medical care institutions have been electronically linked to the system and completed authentication.
2. By the end of 2012, 205,039 people marked on their IC cards that they were willing to act as organ donors. In addition, 144,986 people had registered for hospice and palliative care. Placement of this information on IC cards quickly informs health workers of patients' willingness to donate organs and their desires during end-of-life care, so the patients can receive due respect and relief from distress.
3. Records of Medications & Major Tests

   NHI IC cards store records of patients' six previous medical care visits (including 60 sets of records related to doctor's orders, medications, and tests). Information is updated on a recurring basis and available to help doctors avoid repeat medications and tests.

Chapter 2, Payment System Reform and Disclosure of Medical Care Quality Information

Section 1, Promotion of Diverse Health Payment Methods

The NHI payment system under the Global Budget Payment System primarily relies on fee-for-service. Problems with this model include: proliferation of unnecessary examinations, tests, medications, and surgeries. This not only causes excessive growth of medical fees but also impacts the quality of medical care.

A major problem associated with fee-for-service is that it does not contain incentives to raise the quality of care. Recognizing symptoms of an ailing system — the high cost of medical fees, the large quantity of ill patients, and the room for improvement in treatment models — NHIA began to reform the payment system by introducing the pay for performance model (P4P). Since October 2001, phased introduction of P4P has occurred in the treatment of cervical cancer, breast cancer, tuberculosis, diabetes, and asthma. In January 2010, schizophrenia, chronic hepatitis B carriers, and hepatitis C patients were added, and in January 2011, early stage chronic kidney disease was added.

Under P4P, hospitals follow treatment guidelines to provide better care to patients, and case managers undertake disease management to ensure the comprehensive and continuing care needed for effective control of disease. A benefit of P4P is that it contains the incentives to raise quality of health care which are missing from the fee-for-service model, and the NHIA continues to design new payment incentives unique to the treatment techniques used for particular diseases. By striking a balance between controlling medical fees and raising effectiveness/quality of health services, the MOHW can fulfill its mission of creating an NHI system that protects the health of all people.

For hospitals to provide efficient treatment services and reduce unnecessary surgeries, medications, and examinations, so resources can be used effectively and costs can be controlled, the NHIA implemented the Taiwan Diagnosis Related Group (Tw-DRG) system on January 1, 2010. Further advances were made starting July 1, 2011, with the launch of a pilot capitation payment system. This arrangement can allow Taiwan to move beyond the concept of hospitals gaining more payment from the more patients they treat. Instead, it provides greater profits to hospitals and doctors that enhance preventive care and health maintenance, allowing patients to benefit from receiving more holistic treatment and care services.

Section 2, Improvement of Pharmaceutical Pricing and Accessibility

1. Reasonable Pharmaceutical Price Adjustments

To reduce the gap between insurance payments for pharmaceuticals and hospital procurement costs, according to law, the National Health Insurance Administration (NHIA) adjusts pharmaceutical prices every two years. This allows for new drugs to quickly be covered. By 2012, the NHIA adjusted pharmaceutical prices seven times, mitigating growth in expenditures.

2. Expanding the Scope of Pharmaceutical Benefits

Taking into consideration medical care needs of the vast majority of patients and recommendations from clinical pharmaceutical experts and related medical associations, in 2012 the MOHW reduced pharmaceutical restrictions and adjusted payments under NHI. This not only raised quality and choice but also reduced the financial burden of patients.

Expanding the Scope of Pharmaceuticals benefits were including pharmaceuticals used to treat malignant neoplasms, cardiovascular disease, diabetes, etc., to raise quality of care.

3. Ensuring Health Rights and Medications for Rare Disease and Hemophilia Patients

Since 2005, the NHI Committee has earmarked funding under the NHI Global Budget System for hospitals to treat rare diseases and hemophilia.

Section 3, Disclosure of Medical Care Quality Information

1. Disclosure of medical quality information is critical to maintaining the health care rights of all people and advancing the quality of medical care. Affording people direct access to results obtained by monitoring each of the nation's medical institutions leads to greater transparency and oversight. Therefore, the MOHW continues to plan ways of disclosing health insurance treatment quality, and it discloses medical care quality information of health care institutions on the official NHIA website (http://www.nhi.gov.tw), under the designated "Medical Quality Information Disclosure" section.
2. Information on the quality of individual medical institutions can be divided into two major categories. First there are service indicators, with disclosure made of widely applicable and highly feasible service items applicable to hospitals, clinics, Chinese medicine providers, dentists, and dialysis centers. The other category is disease indicators, which are developed from disease types or treatment items and related to medical care service quality. Disclosure was made for six designated diseases – diabetes, knee replacement surgery, hysteromyoma, dialysis, peptic ulcers, and asthma – and described the significance of the disclosure, the reference value, and the meaning. Valuable health information was also provided based on the merits of disclosed items, so people could gain valuable health information.
3. Every enrolled individual could access personal utilization data for the past three months from the NHIA website by using their Citizen Digital Certificate.

Chapter 3, Expanded Assistance to Disadvantaged Groups

To reduce the burden of insurance premiums posed to the disadvantaged groups and prevent economic difficulties from affecting people's right to health, the MOHW implemented the following assistance measures in 2012.

1. Insurance Premiums Subsidies

The NHI premium rate was raised from 4.55% to 5.17% on April 1, 2010. To lower the social impact, the government budgeted funds to cover subsidies for people below a certain income level. The subsidies took each person's economic ability into account and were used to pay additional premiums generated by the premium rate hike which were to be paid by the insured. Total subsidies were NT$9.53 billion between April and December 2010, NT$13.2 billion in 2011, and NT$13.6 billion in 2012. On average they benefitted more than 18 million people each month.

Lacking a legal framework for the subsidies and with 50% of the premium contributed by insured middle-to-low-income households provided by the "Public Assistance Act," the subsidies ended following implementation of the second-generation NHI. This provided a legal basis for premiums and ensured that all beneficiaries contributed an amount based on their ability to pay.

2. Measures to Assist with Payment of Premiums

1) Relief Fund Loan Applications

Individuals who qualify under the "Regulations for Identifying the Underprivileged and the Destitute for National Health Insurance Purposes" can apply for interest-free loans under the National Health Insurance Poverty Relief Fund, to pay owed copayments and treatment fees to contracted medical care institutions. Repayment begins one year after the loans are issued.

2) Payment by Installments

Installment plans were available to reduce pressure of those unable to pay their premiums arrears at one time.

3) Premium Sponsorship Referrals to Public Welfare Organizations (or Philanthropists)

The NHIA assists families with severe financial problems in finding organizations or philanthropists willing to sponsor premium subsidies.

4) Using Public Welfare Lottery Profits to Provide Health Care for the Disadvantaged

In 2012, NHI received NT$350 million from the Public Welfare Lottery system to facilitate proper care for the economically disadvantaged. The money funded plans jointly applied for and executed by the NHIA and 16 cities and counties to assist in payment of insurance arrears and health care fees.

3. Medical Care Assistance for Those Unable to Pay

The MOHW guarantees that the disadvantaged who hold a certificate of poverty issued by their village (town) chief or a hospital can receive treatment when facing a serious illness, even if they are not enrolled in NHI or are in arrears to the system. After receiving treatment, the MOHW considers the merits of each situation then provides support in subscribing to NHI, applying for relief loans, making referrals for payment support, or arranging for installments.

4. Release IC Cards to Eliminate Medical Care Impediments for the Disadvantaged Groups

In 2012, the MOHW continued implementation of the "Worry-Free Medical Service Plan for the Disadvantaged." The plan, which contains a wealth-exclusion clause, allows the disadvantaged to continue enjoying their rights to medical treatment under NHI even when in arrears to the system. It works by unlocking the IC cards of people under 20 years of age, from near-poor households, families facing special situations, and the pregnant.

Also, on May 18, 2012, in the spirit of Article 37 of the National Health Insurance Act, the MOHW passed an execution plan for the suspension of benefits for those in arrears to the second-generation NHI.

5. Reducing the Financial Burden of Patients with Catastrophic Injury or Illness

Patients afflicted with five major types of catastrophic injury or illness—cancer, chronic mental illness, congenital illness, people who require dialysis or rare diseases—were able to get treatment without copayment. At the end of 2012, more than 890,000 patients held 961,265 valid certificates to take advantage of this program (see Table 7-3).

Chapter 4, Implementation of the Second-Generation NHI

A legal amendment in 2011 ushered in the arrival of the second-generation NHI, the most dramatic reform to the health insurance system since its inception. To ensure implementation could proceed

Table 7-3 Issuance of Catastrophic Injury and Illness Certificates

Catastrophic Injury/Illness	No. of valid Certificates	Percentage
Cancers requiring active or long-term treatments	463,703	48.2%
Chronic mental illness	208,325	21.7%
Systemic autoimmune syndromes requiring lifelong treatment	85,473	8.9%
Chronic renal failure (uremia) requiring regular dialysis	71,648	7.4%
Congenital malformations and chromosomal abnormalities of the cardio, pulmonary, gastrointestinal, renal, nervous, or skeletal system	36,375	3.8%
Other	95,921	10.0%
Total	961,265	100%

smoothly, the MOHW poured utmost effort into preparations. After close to two years, its work was completed on schedule.

Section 1, Completion of Preparatory Work

1. Drafting (Revising) and Announcement of New Regulations

The launch of the second-generation NHI required the addition, revision, or scrapping of 36 regulations, comprising: 16 new regulations, 17 revisions, and three scrapped regulations. In 2012, between the start of March and the end of July, the MOHW held a series of meetings to formulate these changes, carefully examining the contents of each article and, when necessary, discussing changes with relevant agencies, NGOs, experts, or scholars. Prior to implementation, the MOHW announced all changes and completed all necessary regulatory revisions.

2. Approval of the 1st Year Premium Rate

Adjustment of the premium rate on April 1, 2010, eliminated NHI's financial deficit. Since the second-generation NHI includes supplementary revenues and places greater emphasis on government funding, in the first year of implementation the premium rate was lowered from 5.17% to 4.91%. At this level NHI finances will remain balanced until 2016.

3. Completion of a Mechanism for Linking Revenues and Expenditures

1) Merger of the NHI Supervisory Committee and the NHI Medical Expenditure Negotiation Committee led to the formation of the National Health Insurance Committee (NHIC). The NHIC was to be formed internally by the MOHW to better coordinate with the reorganization of the ministry.

2) Acting in accordance with the National Health Insurance Act regulations related to the composition and proportion of the NHIC, the MOHW determined the number of members, how they were selected, meeting regulations, self-disclosure of representative's interest, and disclosure to the public. It chose the 35 members of the first session of the NHIC, comprising 18 premium payers (including 12 representatives of the insured, five employers, and one representative of the Directorate-General of Budget, Accounting and Statistics); 10 insurance medical service providers; five experts and reputable public figures; and one representative each from the Council for Economic Planning and the MOHW.

4. Planning of Collection and Payment

1) To achieve implementation of the supplementary insurance premium, the MOHW was responsible for the following: 1. Development of the supplementary insurance premium information system and simulation model; 2. Withholding of the premium payment at the source, including provision of a variety of channels for printing supplementary insurance forms, online information on payments exempted from deductions, and year-long 24-hour payment service; 3. Planning an e-application system for the supplementary insurance premium. Also, for reference purposes, the MOHW: completed a manual on NHI withholdings and the payment of the supplementary insurance premium; sent informative pamphlets and DVDs to 802,000 group insurance applicants and premium withholders.

2) Conducting Explanatory Meetings on the Second-Generation NHI

The MOHW conducted a series of separate explanatory meetings on the second-generation NHI for the general public; premium withholders; central and local government agencies; professional medical organizations; and various labor unions, guilds, associations, and scholarly associations. The meetings provided opportunities for MOHW representatives to communicate directly with those affected by the changes.

5. Promotion Through Diverse Media Channels

The general public can gain an understanding of reforms implemented under the second-generation NHI through television, print media (newspapers and magazines), broadcasts, outdoor LED light boxes, outdoor TV displays, and the internet. Broadcasts and newspaper advertisements were also tailor-made for local audiences to raise message impact.

6. Related Preparation Tasks

Successful planning and execution of the various changes under the second-generation NHI can be attributed in part to gathering a wide range of professional advice. Such advice was valuable in enacting insurance for covering convicts, health technology assessments, the family physician system, financial disclosures by contracted medical care institutions, the disclosure of NHI medical care quality information, and the signing of contacts for drug drug transactions.

Section 2, Implementation of the Second-Generation NHI

Article 104 of the National Health Insurance Act states: "The Executive Yuan shall decide upon the date of implementation of this Act." On April 23, 2012, the MOHW reported on preparation progress to the Executive Yuan, and on October 9, 2012, the Executive Yuan announced that the second-generation NHI would begin on January 1, 2013.

Implementation of the second-generation NHI occurred on schedule. Major points of focus included: moderating use of medical resources, reducing improper health care, establishing a mechanism for linking revenues and expenditures, increasing the premium base among employers and beneficiaries, increasing the burden shared by the government, guaranteeing the rights of the disadvantaged groups, reducing the burden on areas with insufficient medical resources, disclosure of important information, increasing public participation, and addition of those serving sentences in correctional institutions. Expectations are for the second-generation NHI to gradually build toward the vision of a fair, high-quality, and efficient health insurance system for all.

8 Health Care for the Less Privileged Groups

96 Chapter 1 Health Care for the Mentally and Physically Impaired

96 Chapter 2 Health Care for Indigenous Peoples and Residents of Remote Regions and Offshore Islands

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

In 1998, when the WHO announced its policy of "Health for All in the 21st Century," it focused on equity in health, emphasizing treatment among the different sexes and races along with helping the disadvantaged. Since then, additional research has shown that different approaches are needed for these different groups when dealing with factors that affect health and working to prevent diseases.

Chapter 1, Health Care for the Mentally and Physically Impaired

1. The New Disability Evaluation Evaluation System: Full implementation of the new disability evaluation system and needs assessment system occurred on July 11, 2012. Achievement highlights in 2012 include:
   1) Provided training for health professionals who use assessment tools.
   2) Completed the Disability Grading Decision Support System(DGDSS)
   3) To promote the new disability evaluation system, the following advancements were made in relation to procedural planning and promotion of identification: 1. Conducted a nationwide pilot program for authorized hospitals to identify individuals with disabilities. 2. The Ministry of the Interior and the MOHW jointly formulated and announced an act governing implementation rules for the joint identification of individuals with disabilities and assessment of needs while also providing assistance to city and county governments in carrying out the act. 3. Conducted related promotional tasks. 4. Revised and announced regulations governing the identification of individuals with disabilities.
   4) The MOHW monitors progress of the new system to carry out rolling revisions of related procedures and mechanisms.
2. Supporting Medial/Rehabilitation Centers of Assistive Devices for the Disabled: In 2012, the MOHW subsidized 10 disability medical rehabilitation Centers. Full implementation of regulations governing subsidies for medical care fees, rehabilitation fees, and assistive devices for the disabled on July 11, 2012, provided a legal basis to subsidize 15 assistive devices and three types of medical care.
3. As part of the "Preventive Oral cavity Health Services Plan for the Disabled," the MOHW taught oral care skills to health workers who work with the disabled and established eight home visit teams.
4. The MOHW created the nationwide Joint Assessment Children's Development Center, which included the establishment of trans-disciplinary teams, community outreach services, and parental support groups. The total number of such institutions increased from 25 in 2009 to 42 in 2011.

Chapter 2, Health Care for Indigenous Peoples and Residents of Remote Regions and Offshore Islands

1. Improvements to Facilities in Remote Regions and Offshore Islands: Through 2012, the MOHW

subsidized rebuilding or expansion of three health stations (rooms), 38 renovation or repair projects, and repairs to three helicopter pads. It approved subsidies for 314 information equipment items, 241 medical equipment items, two medical vehicles, and 40 medical scooters/motorcycles. These projects bridged the health care gap between rural and urban areas.

2. Fostering Health Workers to Provide Local Support: The MOHW implemented supplementary policies to prevent talent drain and ensure healthy local medical care systems. It offered government scholarships for students who would return to their townships to work following graduation, in conjunction with the Integrated Delivery System (IDS) of the NHI. In 2012, the retention rate of government-sponsored physicians was 72%.
3. In 2013, as part of the Building Healthy Communities Program, the MOHW established two counseling centers and 86 community health building centers in indigenous areas and on offshore islands. It also promoted the Community Health Service Camp for College and University Students in Mountain Areas and Offshore Islands.
4. To make IT advances in remote indigenous communities, the MOHW built shared information platforms.
   1) The DOH established 319 mobile medical stations at 55 health sstations in 15 counties, including Hsinchu, to bring health care to indigenous communities. The MOHW also added native languages to the Clinic Registration System to reduce the health information gap between urban and rural areas.
   2) The MOHW integrated a picture archiving and communication system (PACS) with other medical IT systems to link a total of 32 health stations (including one in Nanao Township, Yilan County) to MOHW hospitals. The advances led to better quality health services in remote indigenous communities.
5. To protect health care rights of people who live in remote regions and offshore islands, the NHI launched the NHI Integrated Delivery System (IDS). The MOHW also reviews telecare consultation services, aeromedical transfers, through remote health care systems. For patients on offshore islands to enjoy convenient health care, the telecare video and consultation services are offered with no restrictions on location or time.
6. Emergency Delivery of Patients in Remote Regions and Offshore Islands
   1) Established the 24-hour National Aeromedical Approval Center.
   2) Formulated guidelines for subsidizing medical transportation costs of patients with critical injuries or illnesses in remote regions or offshore islands.
7. In order to better protect the health of the indigenous peoples, since July 2010, the MOHW has provided an annual health check-up to the indigeneous peoples from age 55, unlike others who must wait until 65. The MOHW also has publicized preventive health and personal health management ideas among the indigenous peoples, including the release of a special indigenous version of an adult preventive health services handbook, which it provided to 55 health stations in the indigenous regions for distribution to individuals who qualified for the health checks.
8. In 2012, the MOHW provided molar sealants to 3,798 first and second graders living in predominantly indigenous mountain regions and on offshore islands.
9. The MOHW continued to subsidize human papillomavirus (HPV) vaccines to girls in the first year of junior high school living in predominantly indigenous mountain regions and on offshore islands.
10. In order to raise maternal and child health among the indigenous peoples, the MOHW cooperated with city and county health bureaus to provide

indigenous women of childrearing age (20-49) with comprehensive pregnancy and child care guidance, consultations, and referral services.

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

Section 1, Community-Based Long-Term Care for people with Dementia or Functional Disabilities

1. To provide appropriate long-term care for people with dementia, the MOHW subsidized beds for dementia patients at 18 seneral nursing homes to enhance dementia care between 2005 and 2010.
2. In early 2011, the MOHW proceeded to conduct an Epidemiological Study of Dementia. The Study, which is expected to be completed by the end of 2013, can facilitate planning of appropriate resources for dementia care and raise the care capacity for people with dementia .
3. The MOHW introduced more diverse services by including community care resources into its plans for a long-term care network for people with with dementia. By the end of 2013, it plans to have at least one institution offering community services to people with dementia in each of the 63 long-term care districts in the nation's 22 cities and counties.
4. Improving Care Services for the Elderly
   1) Since 2009, MOHW hospitals have provided community care services for seniors afflicted with dementia or functional disabilities. By 2012, there were 11 hospitals that offered this care and seven hospitals that provided intermediate care.
   2) By the end of 2012, MOHW hospitals provided 2,260 nursing home beds (including psychiatric nursing homes).
   3) Six hospitals currently provide home-based hospice care (Fengyuan, Taichung, Changhua, Hsinying, Tainan, and Pingtung), nine hospitals provide hospice shared care, and four hospitals provide hospital-based hospice care. Each institution is certified to establish home-based hospice service teams capable of providing

holistic, stay-at-home hospice and palliative care, so elderly cancer patients can remain at their place of residence.

5. In 2013, the addition of 18 MOHW hospitals, including Taichung Hospital and Hua-Lien Hospital, will permit the integration of intermediate care with the government's 10-year long-term care policy. Accessibility and sustainability will contribute to the MOHW's goal of holistic care.

Since 2009, MOHW hospitals have provided intermediate care services. By 2012, there were seven such hospitals, and in 2013, with the addition of Taichung Hospital, Hua-Lien Hospital, and others, their numbers were expected to rise to 18. Allowing intermediate care patients to benefit from the government's 10-year plan for long-term care patients provided an accessible, sustainable care system that could support the government's goal of holistic care.

Section 2, Human Rights Protection and Care of Hansen's Disease Patients

1. On July 18, 2008, the Legislative Yuan passed the "Hansen's Disease Patient Human Rights Protection and Compensation Act," to substitute "Act of Human Rights Protection and Compensation for Hansen's Disease Patients."
2. To provide high-quality care for individual Hansen's disease patients, the MOHW encouraged local public health bureaus to implement a directly observed treatment, short-course (DOTS) project.
3. At the end of December 2012, there were five hospitals officially qualified to diagnose and treat Hansen's disease: the National Taiwan University Hospital, Mackay Memorial Hospital, Taichung Veterans General Hospital, National Cheng Kung University Hospital, and Lo-Sheng Sanatorium and Hospital. Their services raised treatment accessibility.
4. On January 24, 2011, the Lo-sheng Bridge opened. It makes treatment more convenient for residents by crossing over the MRT train depot to connect the new Lo-Sheng place at St. Hope Square to the old place at Bengali Home.

Section 3, Rare Disease Prevention

1. The MOHW announced a total of 193 rare diseases by the end of December 2012, along with 82 drugs and 40 nutritional supplements for sustaining the life of patients. Rare diseases were brought within the scope of serious diseases, reducing some of the medical care burden of the patient.
2. In 2012, in accordance with the "Regulations Governing Medical Subsidies for Patients with Rare Diseases," the MOHW provided full subsidies for 32 types of special nutritional products and nine emergency-use drugs.
3. Expanded Subsidies for Rare Disease Medical Care: The MOHW subsidizes health care fees for rare disease treatments not covered under NHI, including domestic and overseas diagnostic exams, rental of required home medical care equipment, and nutritional counseling. In 2012, it also held 11 subsidy review meetings related to home medical care equipment, 10 expert meetings, and 16 explanatory meetings for patients, patient organizations, enterprises, and medical institutions.

Section 4, Human Rights Protection and Care for HIV Infections

MOHW spares no efforts in protecting human rights and guaranteeing health care services for HIV infections. Taiwan is one of the few countries in the world that provides free medical care for HIV infections. Free access to highly active antiretroviral therapy (HAART) was introduced to Taiwan in 1997, shortly after the therapy was developed.

1. Protection of Human Rights

1) Since the amendment of the "Regulations Governing Protection of the Rights of HIV Patients" took place in 2007, the MOHW has established an appeal procedure for HIV infections to appeal against unfair treatment or discrimination.
2) Since 2007, the MOHW has received a total of 42 applications under the "Operational Directions for Reviewing of Applications for Stay or Residence for HIV-Infected Individuals."

2. Health Care

1) Since February 5, 2005, when budgeting of HIV medical expenses shifted from the National Health Insurance (NHI) to the central competent authority, the government has provided free anti-HIV medications. Coverage rate and accessibility were increased when provision of these medications was extended to include the non-insured HIV infections.
2) To encourage health self-management by HIV infections, and thereby better control the disease, in 2007 the MOHW launched an HIV case management program. In 2012, 46 designated hospitals participated by providing health education and counseling services.
3) Follow-up management by city and county public health bureaus (centers) and case managers encourages patients to visit designated hospitals for treatment. These officials advocate regular clinical visits and adherence to drug regimens as necessary ingredients for the extension of life and the reduction of opportunistic infection. The support not only raises quality of life for HIV infections but also improves the consultations and follow-up examinations for partners of HIV infections.
4) Subsidies are offered to HIV-related NGOs that assist in providing care, medical care arrangements, emergency placement, and case management services.

Section 5, Health Care for the New Inhabitants

1. Differences in language and culture make new inhabitants a disadvantaged group in terms of health. To protect their right to health care, the MOHW assists the new inhabitants in joining the NHI system. It also formulated the "Reproductive Health Management Plan for Parents from Foreign Countries and Mainland China." This provides reproductive health counseling and NHI card management for the new inhabitants and their children while offering advice on reproductive planning and breastfeeding, as well as prenatal health care, examinations, and nutrition.
2. Ensuring the reproductive health of new inhabitants before they have joined the NHI system is critical. To subsidize their prenatal examinations, from 2005 to 2010, the MOHW formulated the "Prenatal Health Subsidy Plan for Foreign Spouses without Household Registration," based on the Ministry of the Interior regulations governing the subsidy guidelines, items, and standards related to the "Foreign Spouse Care and Guidance Fund." There was a limit of five, NT$600 subsidy payouts per pregnancy, though individuals who exhausted their subsidies before enrollment in NHI were allowed to apply for another five subsidies. Starting in 2011, budget responsibility for the prenatal checks shifted to the Health Promotion Administration, MOHW.
3. As part of a project to provide interpretation services for foreign spouses seeking reproductive care, the MOHW encouraged city and county health bureaus to train interpreters, who could help provide the new inhabitants with valuable health care information.
4. The MOHW produced reproductive health materials in numerous languages, including Vietnamese, Indonesian, Thai, English, and Khmer. The materials ranged from pamphlets on reproductive health, infant nurture, prenatal

health, and children's health, to a series of VCD's on reproductive health.

Section 6, Health Care for Oil Disease Patients

1. There was an incident of oil disease outbreak in Taiwan due to the consumption of rice bran oil contaminated with polychlorinated biphenyls (PCB). In 2005, Because PCBs was found with the likelihood to be transmitted through the placenta or breast milk, the Health Promotion Administration has consequently made the children of female oil disease patients (born after January 1, 1980) eligible for the services listed above. By the end of 2012, within the total 1,726 oil disease patients, 1,284 patients were first-generation and 442 were second-generation patients.
2. Special health care services to oil disease patients include: 1. To issue the "Health Care Services Implemention Guidelines for PCBs Patients", 2. Fully subsidized co-payments for hospitalization of first generation oil disease patients regardless of the department they seek treatment, 3. Oil disease patients can use their annotated National Health Insurance Card or their oil disease patient treatment card to gain clinical or emergency services in any medical department without copayment, 4. Free annual health examinations, 5. Continued health follow-up management (visits and care), 6. Starting from December 1, 2009, the MOHW-administered Feng Yuan Hospital and Changhua Christian Hospital to hold special oil disease clinics.
3. In 2012, a total of 632 oil disease patients took advantage of the free health examinations (with participation rate of 36.6%), 237 patients received health education and doctors' consultations, and subsidies covered copayments for 13,620 clinical visits and 74 hospital stays.

Section 7, Medical Services for Inmates of Correctional Institutions

1. To protect the health rights of prisoners and improve medical care services and public health in correctional institutions, the MOHW and the Ministry of Justice collaborated on a pilot award scheme for improving medical care. Four correctional facilities were selected to participate in the pilot program starting from September 2010: Keelung Prison, Taoyuan Prison, Yunlin Prison, and Taiyuan Skill Training Institute. They collaborated with MOHW hospitals — Keelung Hospital and Taoyuan General Hospital — as well as the Chiayi Branch of Taichung Veterans General Hospital and the Taitung Branch of Mackay Memorial Hospital.
2. In 2012, 5,800 inmates took advantage of the program. They made a total of 74,518 visits to 1,916 general or specialized clinics and underwent 2,513 regular health examinations, 4,378 cancer screenings, and 1,361 psychotherapy sessions held by drug rehabilitation centers. There were also 25 inmates who received methadone replacement therapy. Comparing 2012 to 2011, the number of guarded medical trips outside the prison by those serving sentences at Keelung or Taoyuan prisons dropped by 10% or more. At all correctional facilities participating in the pilot project, the total number of prisoners with acute medical conditions fell by an average of 6%, 58% of diabetes patients had their HbA1c controlled at 7% or below, 75% of hypertension patients had their systolic/diastolic blood pressure controlled at 130/85 or below, and inmates' satisfaction with medical services at correctional institutions was 86%. The service model tested under this program provided a valuable reference for the NHI as it planned the finalized health service model for those serving sentences in correctional institutions once they were officially covered under NHI.

9 International Cooperation in Health

103 Chapter 1 Joining International Health Organizations

104 Chapter 2 International Exchange and Cooperation

108 Chapter 3 International Medical Aid

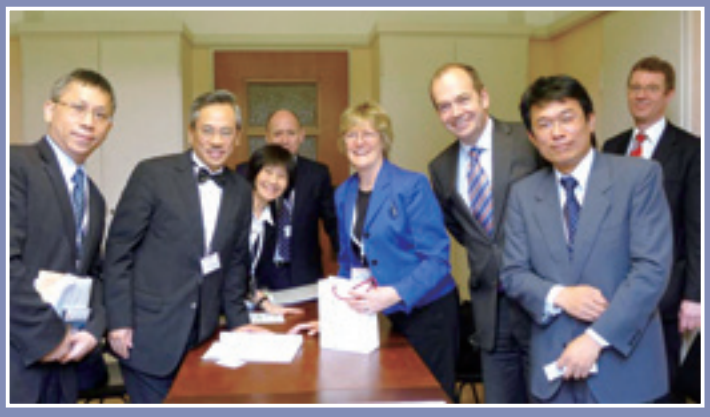
109 Chapter 4 Globalized Medical Services

Chapter 1, Joining International Health Organizations

For many years Taiwan has been actively participating in the international health organizations, such as World Health Organization(WHO) Since 2009, it has been invited to be an observer at the World Health Assembly (WHA), not only affirming Taiwan's medical standing but also providing it another opportunities to demonstrate its strength on the world stage.

Section 1, Participating in the World Health Organization Events

1. In 2012, Minister Wen-Ta Chiu led a delegation to the 65th WHA. He gave a speech to the assembly on Taiwan's famed NHI system, reflecting a main theme of the WHA, "Towards universal coverage." The Taiwanese delegation also presented speeches at 16 technical sessions covering important topics such as execution of the International Health Regulations, the impact of major worldwide assembly events on global health safety, and mechanisms for sharing virus information in preparation for influenza pandemics. While the WHA was underway, Taiwan joined bilateral meetings with 10 nations and entities, including the United States, the United Kingdom, the European Union, Japan, and Australia. These led to new cooperations in areas such as food safety, non-communicable diseases, universal health coverage, and health worker training. The Taiwan delegation also urged major nations to continue to show support for Taiwan's dignified and professional participation in the WHA.
   While attending the WHA, Taiwan met with representatives from the European Union's Directorate General for Health & Consumers(DG SANCO). The two sides signed an authorization agreement governing use of tobacco warning images, turning a new page in bilateral health cooperation. Members of the Taiwanese delegation were also able to forge connections and open new cooperation opportunities by attending activities organized by professional international organizations, including the World Medical Association(WMA) and World Health Professions Alliance (WHPA).
2. In 2012, Taiwan sent delegates to attend 12 WHO technical meetings. Topics of discussion included prevention of influenza pandemics, development of vaccines, pharmaceutical control, health systems, and tuberculosis.
3. WHO is operating many important mechanisms, such as the International Food Safety Authorities Network, the Global Influenza Surveillance and Response System, and the Stop TB Partnership… etc. The MOHW cooperated with the Ministry of Foreign Affairs in advocating Taiwan's participation in WHO mechanisms under the "WHA model."
4. As part of continued efforts to implement the "IHR (2005), Core Competency Assessment and Implementation Plan of Specified Harbors," the MOHW sent delegates to Australia on a benchmark visit and continued to implement WHO plans.



In 2012, Minister Wen-Ta Chiu led a delegation to the 65th World Health Assembly

Section 2, Joining PIC/S

TheTaiwan FDA sought entry into the Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme (jointly referred to as PIC/S). After submitting entry application materials in June 2010, it underwent rigorous vetting that included a series of documents review and on-site assessment. Finally, on October 2, 2012, at the 35th PIC/S Committee Meeting in Kiev, Ukraine, the Committee invited TFDA to join the Scheme starting from 1 January 2013.. It was one of the first times an official Taiwanese agency was invited to become an official member of an international organization. By participating in PIC/S, Taiwan can share pharmaceutical safety information with other nations and establish mutual GMP recognition mechanisms. The resulting expansion of pharmaceutical exports encourages foreign investors to build factories in Taiwan or commission production by local manufacturers, boosting development of the domestic biotechnology and pharmaceutical industry.

Chapter 2, International Exchange and Cooperation

Section 1, Joining or Holding International Conferences

1. Participating in International Conferences

In 2012, the MOHW and affiliated agencies participated in 63 international conferences. Highlights include the following:

1) On June 26 and 27, Minister Wen-Ta Chiu led a delegation to St. Petersburg, Russia, to attend the APEC High-Level Meeting on Health and the Economy. In a speech titled: "A Life Course Approach to Reducing the Economic Burden of Disease," Chiu shared Taiwan's methods and experiences in preventing and controlling non-communicable diseases. The minister also discussed health and economic issues related to the Asia-Pacific region with the leaders of public and private organizations in attendance.
2) From October 3 to 6, Taiwan was represented at the 15th European Health Forum Gastein in Austria by Hsu Ming-Hui, then head of the International Cooperation Department, and Shu-Ti Chiou, director general of the Health Promotion Administration. The theme of the forum was "Crisis and Opportunity — Health in an Age of Austerity." The Health Promotion Administration also sponsored a parallel forum — "Non-Communicable Diseases: Prevention Policy and Health System Response" — in which Director General Chiou was a speaker.

Recession in Europe and public finance problems have raised the severity of challenges to health care systems. Participation in the forum provided strategic and planning reference points Taiwan could use in the future were it to find itself in similar straits.

2. Hosting International Meetings

In 2012, the MOHW and affiliated agencies held a total of 60 international meetings. Highlights include the following:

1) 20th International Conference on Health Promoting Hospitals and Health Services
   The Health Promotion Administration, MOHW, and the WHO Collaborating Centre for Health Promotion in Hospitals and Healthcare joined in hosting this conference. The main theme was "Health Promoting Health Care in a Changing World: Innovation in Service Provision, Health Care Management and Health System Design." The event was a major honor for Taiwan for being the first ever Health Promoting Hospitals and Health Services (HPH) conference outside Europe. During the conference, Director General Chiou was elected as chair of the HPH Governance Board and also named convener of the Task Force on HPH and Environment,

a group originally established on Taiwan's recommendation.

2) APEC Workshop on Influenza Vaccine Policies and Strategies in the Post-Pandemic Era

Taiwan CDC hosted this workshop in July. A total of 26 representatives from 13 APEC members along with 74 domestic experts attended the workshop, which was divided into four main sessions: "Vaccination Policy Formulation," "Vaccination Program Implementation," "Vaccine Safety Monitoring," and " Communication for Vaccination Programmes."

3) Workshop on Cost-Effectiveness of Strategies for Human Security — Strengthening the Performance of Health Care System

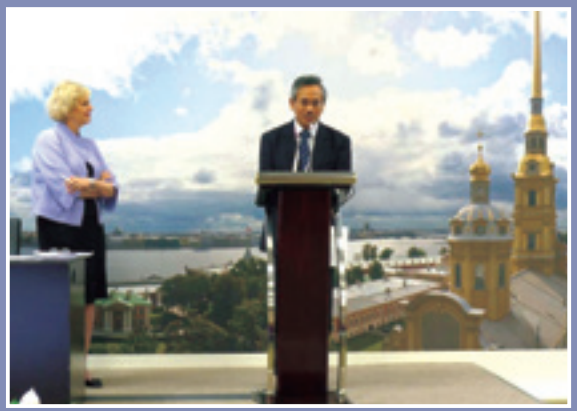
This workshop was hosted in August by the Office of International Cooperation, MOHW. A total of 151 people participated, including six health department representatives from APEC member countries and 12 domestic and foreign speakers, along with domestic and foreign experts, health agency and industry representatives. The workshop aimed to improve the quality and sustainability of health care services in each APEC economy, share cost-effectiveness analysis of health care services, and conduct practical education and training.

4) 17th Asian Harmonization Working Party Annual Conference and the 2012 APEC-AHC-AHWP Joint Workshop on Medical Device Combination Products

Taiwan FDA invited representatives of health agencies and medical device organizations from across the world, as well as industrial experts, to serve as speakers at this November meeting and workshop. Close to 400 people from 27 countries participated in discussion centered on the current situation of Asian Harmonization Working Party policy and working progress of technical committees. Topics ranged from evaluation of medical devices and quality management systems to oversight and software control. Domestic industrial officials used the meeting as an opportunity to hold discussions with related figures from around the world, creating opportunities for future cooperation in research, development, manufacturing, and promotion.

5) 2012 Taiwan Health Forum

This forum, hosted in November by the Office of International Cooperation, MOHW, was based on the theme "Public Health Perspectives in



Minister Chiu gave a speech at the APEC High-Level Meeting on Health and the Economy, June 2012

The APEC High-Level Meeting on Health and the Economy, June 2012

2012 Taiwan Health Forum

a Changing World." Approximately 42 foreign officials and experts from 21 countries joined in discussions on converting public health knowledge to practice and building global health partnerships. They also engaged in round-table meetings to discuss personnel training and the roles of nations providing support. Talks on health topics closely followed by the WHO and the rest of the world provided a reference thatTaiwan can use when setting its own health policies.

Section 2, International Exchange and Cooperation

1. International Cooperation Plans

1) "2012 Promotion Program for Health Care Cooperation with Central and South American Nations": The program benefitted allied nations by training health workers, donating medical supplies, and improving maternal health care and childbirth services.
2) "2012 Promotion Program for Health Care Cooperation with African Nations": The MOHW commissioned the Pingtung Christian Hospital to assist in establishing universal health coverage in Africa, improving maternal and child health, preventing AIDS and parasites, providing e-Health and donations of medical supplies, and training health workers.
3) "2012 Plan for the Taiwan Health Center in the Republic of the Marshall Islands": The health center provided local medical services including parasite control, explanatory meetings on healthy lifestyles and diets, adolescence health education, sexual education, prevention of sexually transmitted diseases, advocacy of tobacco hazards control, and training of seed instructors who can provide training in maternal and child health.
4) "2012 Plan for the Taiwan Health Center (THC) in the Solomon Islands": Provided local medical and hygiene services, a children's parasite prevention plan, and training of seed instructors (who improved the ability of mothers to care for infants, taught CPR techniques for infants, and held workshops to train additional seed instructors in the area of diabetes education).

2. Signing of Memorandums and Agreements

1) Memorandum of Understanding between Taiwan and Australia on Cooperation and Information Exchange in the Area of Food Safety: This memorandum was signed by Ms. Katharine Hsiao-Yueh Chang, Representitive of Taipei Economic and Cultural Office in Australia, and Mr. Kevin Magee, Representitive of Australian Office in Taipei, on June 20, 2012, at the 16th Australia Taiwan Bilateral Economic Consultations. The memorandum primarily covered information exchange, risk analysis, and exchange visits. Each side's goal was to improve food safety management systems and risk analysis through bilateral cooperation.

2) Taiwan-Philippines Health Care Cooperation Conference: Seven agreements were reached during the conference — 1. The Philippines would help Taiwan gain the right to participate in technical meetings of the WHO Western Pacific Region Office, 2. Public-private partnerships in Taiwan's medical care system would become an important topic for future discussions, 3. The Philippines would study Taiwan's NHI system, 4. The two sides would expand collaboration and cooperation in the area of dengue fever imports, 5. The two sides would hold discussions and cooperate in the areas of preventing non-communicable diseases and promoting women's and children's health, 6. The Philippines would send health workers to Taiwan to study stem cell treatment and bone marrow transplantation, 7. The Philippines would attend the Taiwan Health Forum and visit OT/BOT hospitals.

3) "Memorandum of Understanding between The Taipei Economic and Cultural Office in The Philippines and The Manila Economic and Cultural Office in Taiwan on Cooperation in Health Insurance": This MOU was signed on November 15, 2012, by Wen-Ta Chiu, the Taiwan's Health Minister, San-Kuei Huang, the Director General of the Taiwan's Bureau of National Health Insurance, Raymond L.S. Wang, the Taiwan's R epresentative to the Philippines, Enrique T. Ona, the Philippine Health Minister, Ernesto V. Beltran, Senior Vice President of the Philippine Health Insurance Corporation, and Antonio I. Basilio, the Philippine Resident Representative to Taiwan. Besides enhancing bilateral exchange of experiences in relation to universal health insurance implementation, this MOU will show the world the value of Asia's experiences in implementing health insurance. It also provided a mechanism for the two sides to cooperate in health insurance research and to share their achievements in international events and academic journals.

4) Memorandum of Understanding between Taiwan and the United Kingdom on Confidentiality: This memorandum was signed by Kang Jaw-Jou, then director general of the Taiwan FDA, and Kent Woods, chief executive of the United Kingdom's Medicines and Healthcare Products Regulatory Agency.

2012 Taiwan Health Forum

It advanced mutual sharing of non-public documents and information, covering items such as monitoring data of pharmaceuticals available on market, information on quality defects or recalls of pharmaceuticals or medical devices, received applications for market approval or modifications, and completed inspection reports. Future requests from Taiwan can be made via this platform to obtain non-public pharmaceutical documents and information from MHRA.

3. Visits by Foreign Guests

In 2012, the MOHW and affiliated agencies received 1,326 visits by foreign guests from 71 different countries. Besides general calls, the visits presented opportunities for exchanges in the areas of health and welfare policies, pharmaceuticals, food, health insurance, technology, and bilateral cooperation.

4. Invitation for Foreign Visits

Minister Wen-Ta Chiu was invited to lead a delegation on a visit to the United States National Institutes of Health and the University of California, San Diego, from January 24 to 28, 2012. At each location he gave a speech themed on translational medicine and the development of mild brain trauma research. It highlighted the four stages of research into brain trauma over the past three decades in Taiwan and was well received by scholars in attendance, who eagerly discussed Taiwan's achievements in the area of translational research. On the visit, Chiu also met with the director and vice director of the National Institute of Mental Health, an agency affiliated with the institutes. Discussion centered on development of psychiatric care in Taiwan and the future establishment of the MOHW's Department of Mental Health, providing an excellent opportunity for the two sides to foster conditions for future bilateral cooperation and research.

Signing of the Taiwan-Philippines MOU on cooperation in health insurance

Chapter 3, International Medical Aid

Section 1, Disaster Assistance

Haiti Earthquake Disaster Rebuilding Assistance by the ROC: After Haiti fell victim to a major earthquake in January 2010, Taiwan International Health Action quickly dispatched to provide disaster assistance. It proposed three, three-year sub-projects to assist in post-disaster restoration of public health: "Taiwan Health Promotion Center Project," "Medical Equipment Donation Project," and "Epidemic Prevention Project."

Section 2, Medical Assistance

1. "Global Medical Instruments Support & Service Program" (GMISS): This program gathers secondhand medical equipment from health institutions across Taiwan then donates it to diplomatic allies or other friendly nations, in accordance with Ministry of Foreign Affairs policy. In 2012, five nations benefitted from 761 donations: Burkina Faso, Paraguay, St. Vincent and the Grenadines, Honduras, and the Philippines.

2. Taiwan International Healthcare Training Center Program: The program promotes friendly relations and improves quality of health care by training health care workers from allies lacking in medical resources. In 2012, a total of 121 health professionals from 20 nations were trained in courses covering clinical care training, medical affairs management, public health and health insurance, and acupuncture and traditional Chinese medicine.

Chapter 4, Globalized Medical Services

1. Background Development of the Medical Service Industry

Reform to the health care payment system is changing how hospitals operate at the same time that the aging population and technological progress are expanding coverage of the health care services market. The medical industry has moved from simply treating disease to more customer-oriented service. In spite of rising expenditures on health treatment and care, Taiwan's share of these expenditures as a percentage of GDP is low compared to other developed nations. There is still room for growth. Globalized development of health care services presents an opportunity for Taiwan to effectively use its advantages in technique and quality to not only spark further development of Taiwan's health care industry but also raise international competitiveness.

Minister Chiu met with Dr. Antonello Bonci, scientific director of the National Institute on Drug Abuse

2. Development Goals for Globalized Medical Services

The MOHW will increase innovative operational strategies of health care providers by assisting in developing brand, specialties, and diverse services, as well as the expansion of corporate capabilities such as industrial systematization and organizational structure. It will encourage horizontal and vertical integration with organizations inside and outside the industry to further promote diverse development of health care services.

3. Results of Globalized Medical Services Development

1) Medicine and health care are included under the Executive Yuan's policy to promote six emerging industries. An important related initiative is the "Health Care Value-Added Platinum Program."
2) The MOHW continued to use interagency cooperation through the task force for comprehensive planning of globalized health care services. Participating agencies — the Council for Economic Planning and Development, the Tourism Bureau, the Bureau of Foreign Trade, the Mainland Affairs Council, the Overseas Community Affairs Council, the Ministry of Foreign Affairs, along with experts from related fields — conducted joint reviews of the plan's execution results. Their findings benefitted interagency sharing of resources to boost globalization of Taiwan's health care services.
3) The MOHW commissioned the Taiwan Nongovernmental Hospitals and Clinics Association to build a unified window for the globalization of Taiwan's medical services — the Taiwan Task Force for Medical Travel. The task force, which serves as a platform for sharing and spreading information, assisted

the 43 participating hospitals in building an internationally competitive environment by checking foreign language services on their phone systems and websites and conducting on-site guidance and inspections.

4) The MOHW surveyed and estimated supply and demand of key workers in the international medical industry. Through in-depth interviews and investigation, it determined the required skills of key personnel, and by estimating the quantity of professionals expected to graduate from universities and colleges in related subject areas it determined incoming supply.
5) To enhance marketing strategies of Taiwan's medical treatment services, the MOHW commissioned the Taiwan External Trade Development Council to conduct international advertising. Highlights of the council's marketing of Taiwan medical tourism locally and abroad follow:
   A. Established overseas service points to provide consultations and assistance to prospective foreign clients interested in Taiwan's international medical industry.
   B. Produced promotional short videos, pamphlets, and other items.
   C. Participated in international conferences and exhibitions.
   D. Sought visits by foreign media to increase international exposure.
   E. Developed innovative added-value services, such as a smartphone app showing Taiwan's major landmarks and health institutions. Tourists could use the app to gain both travel and health care information.
   F. Added light-box advertisements at airports in Beijing, Shanghai, and Indonesia. The high reach rate raised exposure of Taiwan's medical care services.
6) In December 2011, the National Immigration Agency, Ministry of the Interior, revised the "Regulations Governing the Entry Permission to Taiwan Area for the People from Mainland China" to add "aesthetic medicine" and "health examinations" as reasons for visit. In 2012, following promulgation, the MOHW approved 39 organizations to process applications of the Mainland Chinese interested in coming to Taiwan for these purposes.
7) In May 2012, the MOHW launched a pilot program to ease restrictions on overseas Chinese from designated countries coming to Taiwan for health examinations or aesthetic medicine treatment. The program — covering Myanmar, Laos, and Cambodia — restricted the patients to entering and leaving as a group.
8) From October 24 to 26, 2012, MOHW representatives were in Miami to attend the 2012 World Medical Tourism & Global Health Congress. Taiwan participated in the ministerial summit and general discussion, and it operated a Taiwan medical tourism booth to raise exposure of medical care services.
9) The National Geographic Channel produced the first documentary dedicated to health care in Taiwan: "Taiwan's Medical Miracle." It recorded the experiences of patients from the United States, Egypt, Dubai, and Malaysia who came to Taiwan and underwent successful surgery. The film, which was broadcast 23 times since July 2012, received a warm reception and was watched by a total of 1.3 million people in Taiwan, Malaysia, the Philippines, and Singapore. Viewership ratings were above average for NGC.
10) The MOHW planned a Patients beyond Borders medical travel book on Taiwan, written in simplified characters. The publication examines the overall medical treatment environment, the 43 hospitals participating in the Taiwan Task Force for Medical Travel, the tourism environment, and travel agencies.

10 Science and Technology Research in Health

112 Chapter 1 Health Policy Research

116 Chapter 2 Establishment of Research Environment to enable industrial Development and bio-Tech related Researches

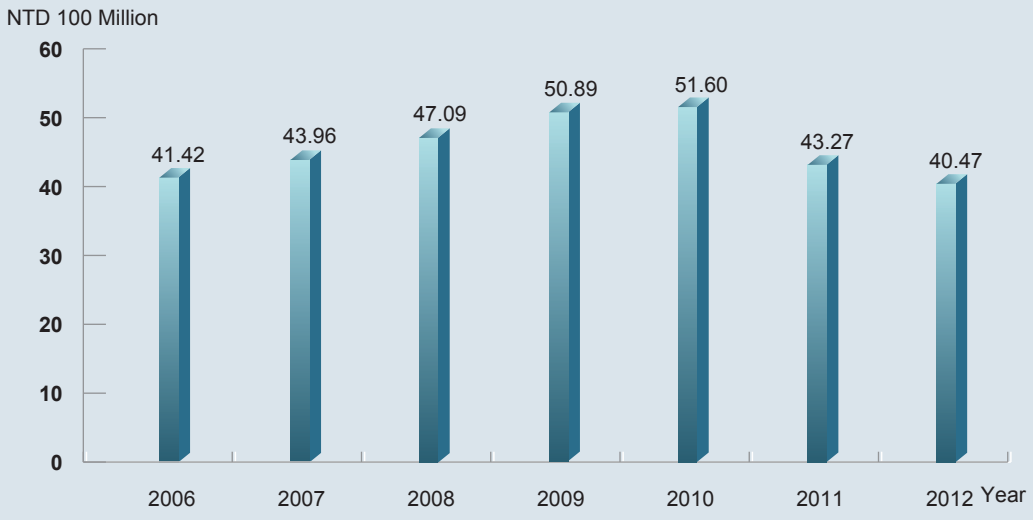
The goal of the MOHW's investment in science and technology research is to improve human wellbeing. By investing in science and technology research we can obtain scientific evidences needed for health policy making improve health and medical services quality and enhance the development of health related industries that in the long run will improve human well-being. In 2012, the health science and technology research budget was NT$4,047,163,000, accounting for 5% of the MOHW's budget. Investment focuses could be divided into two areas: 1. Conducting empirical research needed for food and drug management communicable diseases controll etc health-related plicy making. 2. Building an environment suited to development of the medical industry conducting research in the field of biomedicine technology.

Chapter 1, Health Policy Research

1. Communicable Disease Control

1) Completion of the nation's first large-scale study to evaluate the safety of the H1N1 influenza vaccine for pregnant women showed that there was no discrepancy in the risk of natural miscarriage between women who did and did not receive the vaccine. This result led the MOHW to continue to recommend seasonal influenza vaccinations for pregnant women. It suggests that early-term pregnant women be given priority for adjuvant-free vaccines to effectively safeguard the health of mother and child.
2) A rapid immunochromatographic test (ICT) kit was developed and assembled for the detection of NS1 antigen from all four dengue virus serotypes. The kit can be used in clinical settings or at port quarantine to quickly identify patients with dengue fever, thereby preventing the importation of the disease and reducing burden on domestic disease control efforts.
3) The techonology transfer of the developed IVD techniques for detecting IgM antibodies against enterovirus 71 was made to Formosa Biomedical Technology Corporation to develop the whole blood test. The test, which is already registered, assists physicians in making a

Figure 10-1 Budgets for Science and Technology Research in Health by Year



30-minute diagnosis of severe cases, so they can quickly halt the progression of the disease.

4) A gene test to identify multi-drug resistant mycobacterium tuberculosis that can identify MDR-TB in one week was developed, as opposed to the traditional test that can take up to eight weeks to get the result. In addition, the newly developed test reduces costs by more than one-fifth. This has raised the quality of tuberculosis testing in Taiwan and allowed for fast, accurate diagnosis and treatment while reducing transmission.

2. Food and Drug Management

1) In the area of monitoring food manufacturing and distribution, a convenient "Product Access Management Rapid Inquiry System" was established for front-line inspector. In April 2010 several cases of botulism poisoning occurred from vacuum-packed foods. Following botulism-related research and the announcement of new regulations for the labeling, inspection, and registration of vacuum-packed instant soybean food products, the number of cases of botulism from vacuum-packed foods fell from eight in 2010 to zero in 2012, improvement that showed reduced botulism risk for consumers.

2) In the area of nutrition, Elementary School children's Nutrition and Health Survey in Taiwan showed a rise in height, weight, and body mass index for both sexes. The intake of vitamins E and D among elementary school students who were overweight was below dietary reference intake (DRI) standards.

3) In the area of improved regulations, the MOHW completed research into norms and standards for special dietary foods. This led to drafts on permissible variations in testing values and standards for patients using special dietary foods, norms for patients using prescription foods to achieve a balanced diet, and norms and recommendations for Taiwanese patients using weight-loss meal replacement foods.

4) In the area of drug source management and globalization, Taiwan joined the Pharmaceutical Inspection Co-operation Scheme, or PIC/S, ahead of both Japan and South Korea. It was an achievement that demonstrated international recognition of Taiwan's GMP regulations for drug manufacturers as well as its management systems and inspection standards. Benefits included a reduction in repeat factory inspections and expansion of international markets.

5) In the area of strengthening post-marketing surveillance, a cold chain investigation related to PCV 13 vaccine placed Taiwan first in Asia.

6) Since 2012, the MOHW start to construct a health education model for promoting the safe use of Chinese medicine. It contains five core capabilities in Chinese medicine education — stop, look, listen, choose, use — and established four Health Education Resource Center of Safe Traditional Chinese Medicine

7) For strengthening the safe use of Chinese medicine, three investigations were finished. They are the investigation in monitoring 30 organochloride pesticide residues of Chinese

medicine materials, the investigation in monitoring of aflatoxins of 20 Chinese medicine materials and the study of nephrotoxity related 30 concentrated Chinese medicine products usually used in Taiwan market.

8) For promoting the application of native Chinese herbs in Taiwan, the MOHW completed the development of health food products containing *Dendrobium tosaense* R&D into the anti-inflammation and liver protection capabilities of endemic *Asteraceae* plants. As well as the research in the activities of anti-inflammation and immunity regulation properties of 12 species of native Chinese herbs in Taiwan, including *Dicliptera chinensis* ect.

3. Cancer Prevention

Cancer has been the number one cause of death for 30 years straight. Since 2010 the MOHW funds cancer research at eight cancer excellent centers across Taiwan approximately NT$ 300 million a year(see Figure 10-2). At the local level, the cancer excellent centers serve as central points for expanding cancer medical services to 20 regional hospitals. To provide more accurate diagnostic services and better treatment, MOHW supports the establishment of internationally certified molecular diagnostics laboratories in the 8 cancer excellent centers. Research highlights are as follows:

1) In the area of cancer treatment research, new findings showed that use of antibiotics following surgery for liver cancer patient reduces the recurrence rate, thereby raising the survival rate. The prognosis for advanced bile duct cancer is poor and there is no effective chemotherapy available. Patients with this disease in Taiwan had the opportunity to receive free experimental medicine developed by a foreign pharmaceutical company as part of second stage clinical trials. The value of the furnished medicine was NT$86 million.

2) In the area of cancer risk factors, research showed that 60% of urinary tract cancer patients in Taiwan had aristolochic acids derivatives. Initial analysis shows that aristolochic acid is a major contributing factor to urinary tract disease in Taiwan. Other findings revealed the occurrence of concentrated levels of xenoestrogen phenols in women who contracted breast cancer at a relatively young age, establishing a possible link between breast cancer trending toward younger ages and the consumption of the plasticizer DEHP.

4. Improving the Health Care System

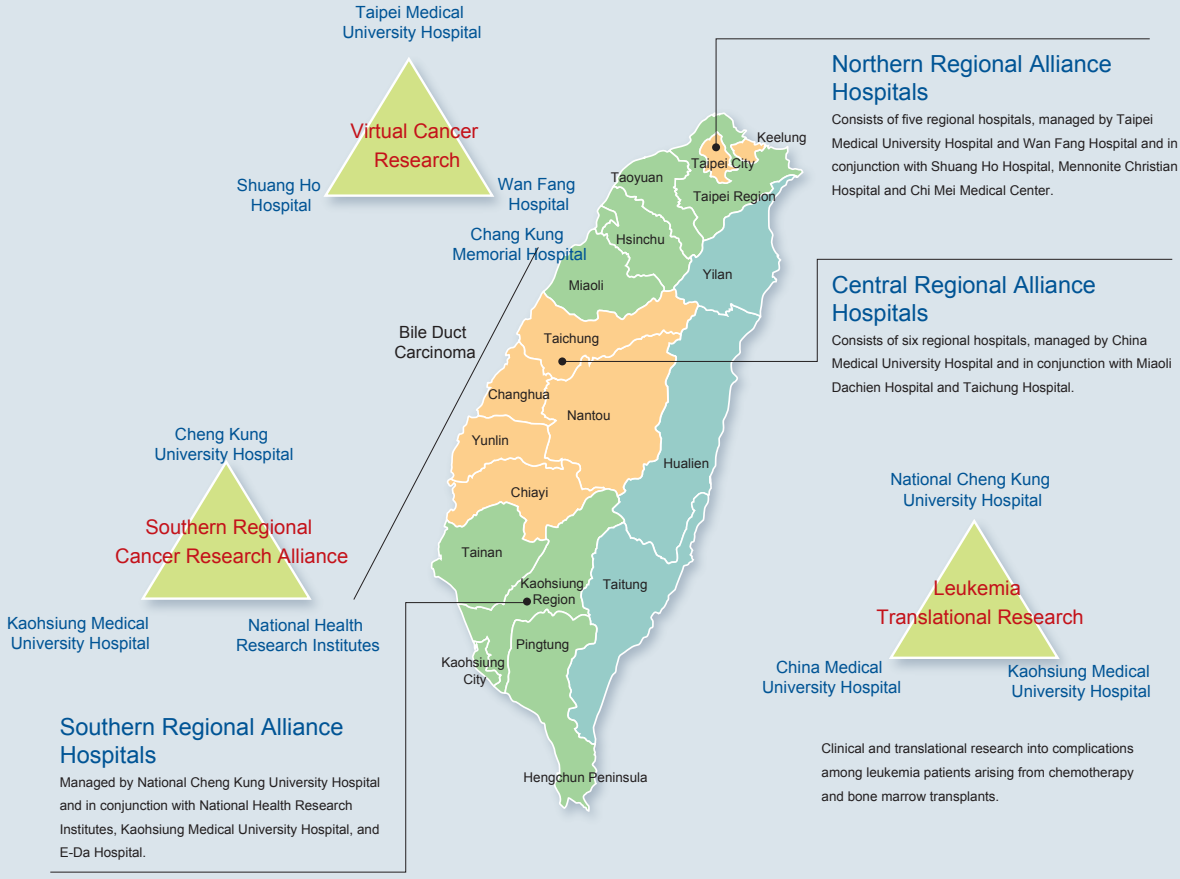
1) To promote tele-care services, the MOHW built tele-care centers in northern and southern Taiwan, recruited 231 health institutions to participate in tele-care, and supported establishment of the website www.tada2002.org.tw to raise understanding of Alzheimer's disease.

2) In 2010, the MOHW fully implemented a Taiwan Triage and Acuity Scale to coordinate limited emergency care resources. In 2012, as part of health science and technology research planning, it updated educational and training materials used for the triage and acuity scale (including triage accuracy and influencing factors as well as the Taiwan triage and acuity scale guideline), built triage standard case databases (adult and child versions), and held 26 training and education sessions. Together, these served as a platform for nursing practitioners to share clinical triage experiences and supported the in-depth analysis and foundational references needed for a stronger triage consensus.

5. National Health Insurance Reform

In accordance with implementation of second-generation National Health Insurance in 2012, the MOHW prioritized 20 research projects on subjects

Figure 10-2 Regional Centers of Excellence for Cancer Research



such as planning of second-generation National Health Insurance finance system and supplementary insurance fees; evaluation of the effectiveness of the Tw-DRGs payment system, the pay for performance system, and a pilot for per capital payment system; and medical technology assessments. The projects, which considered financial risk analysis, the review mechanism for adjusting payment scheme of the National Health Insurance, health care resource allocation mechanisms and the impacts assessment, the drug payment mechanism, surveys into public health care satisfaction, and cost effectiveness of drugs and special medical care materials covered by health insurance, were supplemented by 52 medical technology assessments. Findings were used as a reference during health insurance reform to provide more effective care to beneficiaries.

6. Health Promotion

In 2012, the MOHW introduced the following models as ways of encouraging more people to participate in leading healthy lives: community-based breastfeeding intervention, to assist in formulating policies for raising the rate of exclusive breastfeeding; comprehensive workplace health promotion and evaluation standards, to improve worker health and measure model effectiveness; a fall prevention network for seniors in clinical and community settings, to reduce the occurrence of falls among seniors in daily life; shared care and health promotion among heart disease patients, to

improve self-care capabilities and healthy behaviors (drugs, diet, exercise and smoking cessation) among coronary heart disease patients; physical activity among people with the visually impaired, to encourage four types of activities: practicing tai chi, walking, tandem bicycle riding, and swimming.

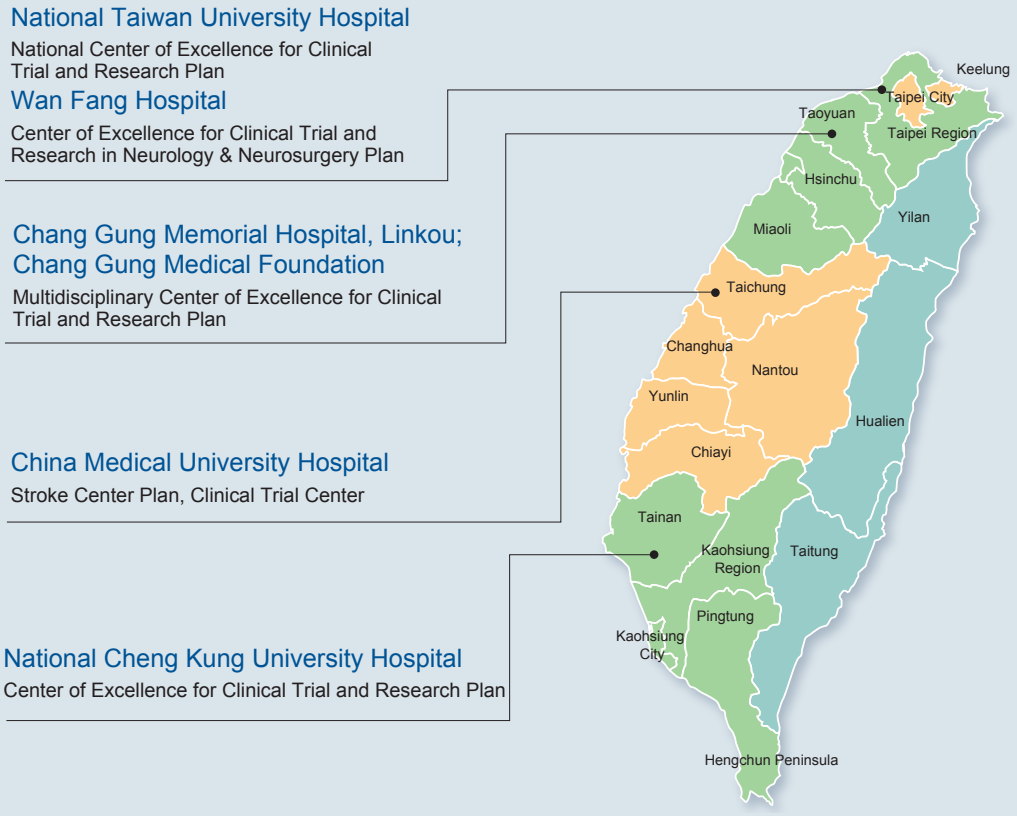
Chapter 2, Establishment of Research Environment to enable industrial Development and bio-Tech related Researches

1. Building an Environment Favorable to Medical Industry Development

To assist Taiwan's upstream, midstream and downstream suppliers of new drugs and medical equipment in developing the R&D capabilities needed for industrialization, the MOHW subsidized the establishment of 1 National Center of Excellence for Clinical Trial and Research and 4 Specialty Centers of Excellence for Clinical Trial and Research (see Figure 10-3). These centers will supplement deficiencies in Taiwan's biomedicine industrial chain development, thereby spurring industrialization of domestic R&D. Highlights in 2012 include the following:

1) The Center for Drug Evaluation assisted domestic academic and industrial institutions in bringing 12 drugs to the clinical trials (each passed Investigational New Drug application) and two medical devices to the clinical trials. It also supported solving medical R&D regulatory issues.

Figure 10-3 MOHW-Subsidized Clinical Trial and Research Centers



2) Major Clinical Trial Cooperations Between Taiwan's Center of Excellence for Clinical Trial and Research and Foreign Pharmaceutical Corporations: National Taiwan University Hospital and United Biomedical, Inc. Asia cooperated on holding first stage clinical trials of the UBITh® vaccine on mild to moderate Alzheimer's patients. National Cheng Kung University Hospital cooperated with Novartis and Bushranger Ingelheim on clinical trial for several new drugs to treat cancer and cardiovascular diseases. China Medical University Hospital and PhytoHealth cooperated on development of a new drug to treat acute ischemic stroke.

3) Eleven members of the pediatric infectious disease research network of the National Health Research Institutes — including National Taiwan University Hospital, Mackay Memorial Hospital, Linkou Chang Gung Memorial Hospital, and China Medical University Hospital — cooperated on epidemiology of major pathogens and antibiotic resistance research associated with bacterial pneumonia among Taiwanese children.

2. Pharmaceutical Biotechnology Research

1) The anti-diabetes drug DBPR108 (Fig. 10-4) has been transferred to Genovate Biotechnology Co., Ltd., and received approval from the Taiwan FDA and U.S. FDA for Phase I clinical trials. A total of 32 subjects have been recruited and the drug candidate is undergoing safety pharmacology analysis and evaluation. This is the first successful example of a domestically invented new chemical entity with relayed development through cooperation among the governmental, academic, and industrial sectors in Taiwan.

2) DBPR110, an anti-hepatitis C virus drug candidate has completed preclinical development and has been transferred to MicroBio Co., Ltd. Completion of clinical trials for DBPR110 will be a milestone in the domestic discovery of new chemical entities.

3) Vaccine Development

A. A Phase I clinical trial of an enterovirus 71 vaccine (Fig. 10-5) has been completed at Taipei Veterans Hospital and National Taiwan University Hospital. The vaccine has shown a good immune response and produced no adverse reactions.

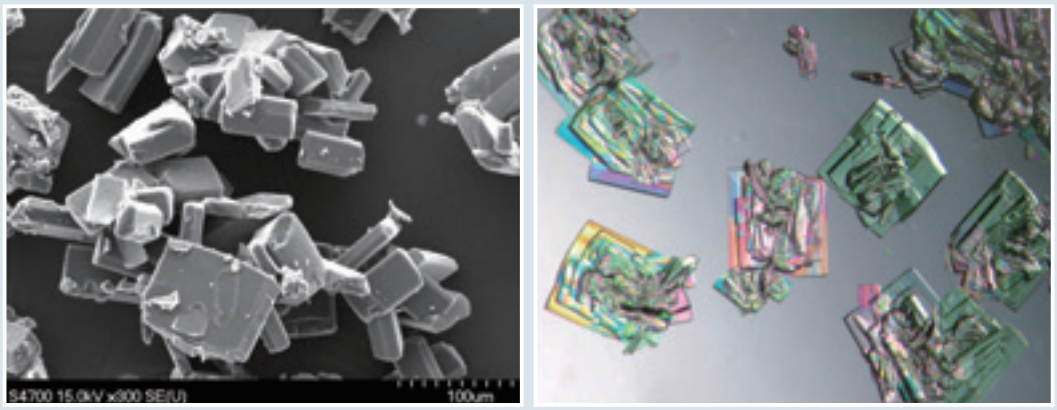
B. Collaboration with TWi Pharmaceuticals is underway to facilitate the clinical development of a respiratory syncytial virus (RSV) vaccine. This vaccine candidate, which is a replication-defective adenoviruses (rAd) carrying F gene of the RSV B1 strain, does not induce side effects such as fever, severe pulmonary inflammation, injection-site reaction, or flu-like symptoms. Related applications for U.S. and Taiwan patents have been filed. This vaccine can be administered intranasally to provide safe and convenient protection for infants and elderly once it passes clinical trials.

C. A meningococcal group B subunit recombinant vaccine is under review by the Taiwan FDA for pre-clinical toxicology studies and is expected to enter Phase I clinical trials. A second round of bidding for the related technology transfer was held on April 27, 2012.

D. The NHRI-developed therapeutic human papillomavirus (HPV) vaccine received the ninth National Innovation Award, and has been granted patents in Taiwan and the United States. The team has produced a

large amount of rlipo-E7m, a recombinant lipoprotein derived from HPV E7 (E7m), and demonstrated its therapeutic efficacy in the TCI murine model. If it passes clinical trials, this vaccine could be used on patients with precancerous lesions of cervical intraepithelial neoplasia for subsequent cervical cancer prevention, or used in conjunction with traditional radiation therapy or chemotherapy.

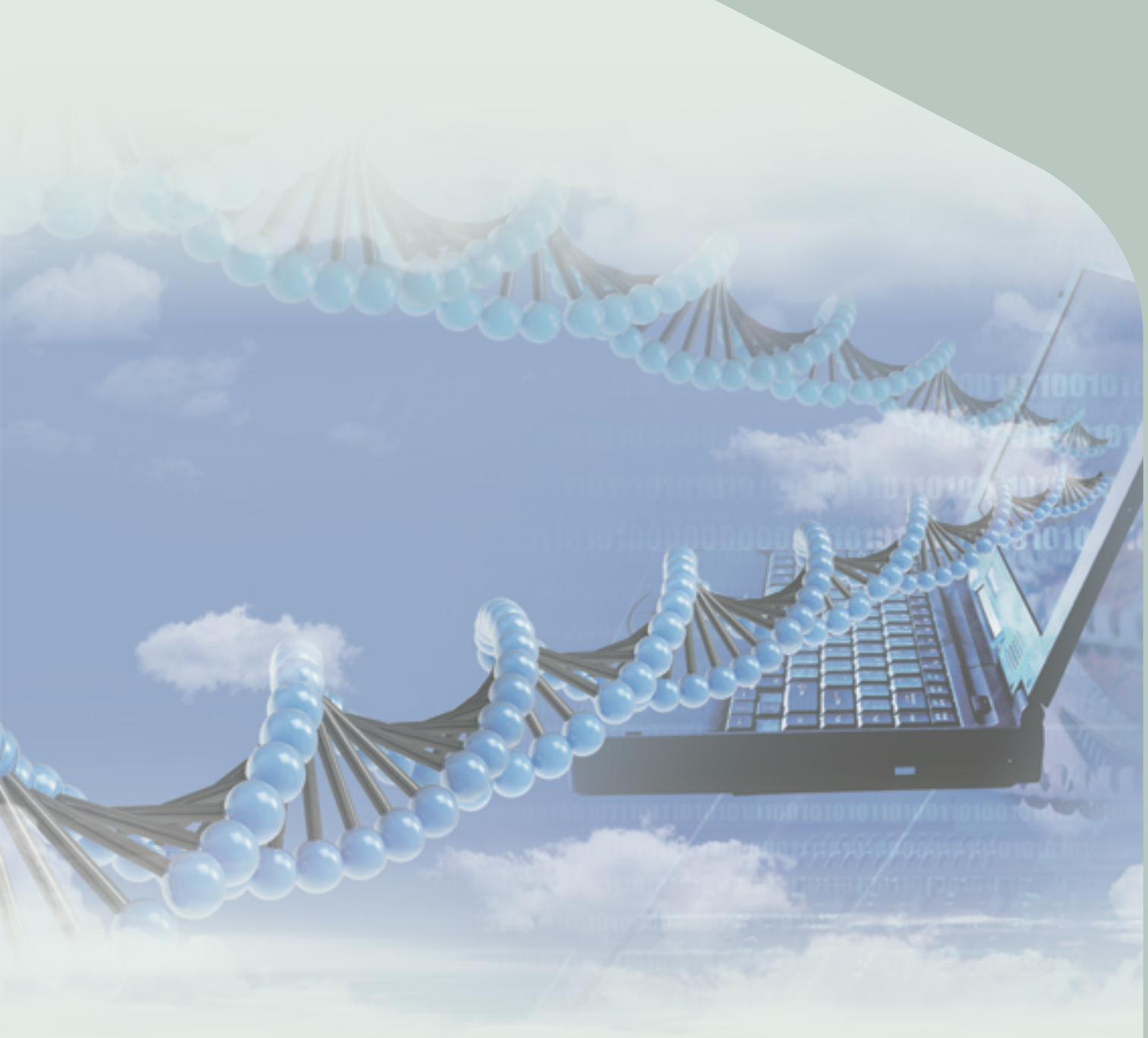
Figure 10-4 DBPR108, a domestically developed anti-diabetes drug has received approval from the U.S. FDA and the Taiwan FDA for Phase I clinical trials, which began in Taiwan in the first half of 2012.



Source: Institute of Biotechnology and Pharmaceutical Research, National Health Research Institutes

Figure 10-5 A domestically developed, cell-based enterovirus 71 vaccine (for clinical trial use).

Source: National Institute of Infectious Diseases and Vaccinology, National Health Research Institutes



11 Health and Medical Care Information

120 Chapter 1 Digitization of health care Administration

122 Chapter 2 Medical Care Services and Applications

125 Chapter 3 value - added services for medical care

Plans underway by the MOHW aim to build an environment conducive to health information development. Through innovative health information service models, the MOHW can foster better health care quality and patient services.

Chapter 1, Digitization of health care Administration

Section 1, Health Information Services

1. Medical affairs management systems provide the MOHW and local health bureaus a framework for managing medical, pharmaceutical, nursing, and psychiatric rehabilitation institutions, as well as health workers, administrative disciplinary actions, designated medical instruments, and continuing education credits for medical personnel.
2. Completed an online platform for reporting the quantity of beds available in intensive care units and an automatic notification function for reporting deaths.
3. The MOHW continued to urge health care workers to conduct reporting, referrals, and management of cases involving attempted suicide or identification of mental or physical disabilities. Their support makes follow-up care possible.
4. To offer health information and related services to the general public, the MOHW oversees the operation of 343 health station websites.
5. An online application system provides the general public with downloads of application forms, application tracking, and notification of pickups. It offers several authentication methods and is linked to the e-payment platform of the Research, Development and Evaluation Commission as well as the payment systems of major banks and convenience stores.
6. Introduction of secure mechanisms for electronic authentication, certification, and signatures brought document processing online.

Section 2, Integrated Application Platform for the Public Health Information System

To promote the information exchange that public health workers need to fully realize their professional capabilities and raise service effectiveness, the MOHW continued the following: operation of portals for health agencies; operation of an integrated platform for public health information applications; provision of universal system components; assistance with service integration for each public health supervisory agency to expedite the sharing of modules, components, and services between public health systems; and simplification of sign on procedures.

The MOHW provides city and county health bureaus with authentication security and control mechanisms. During system log in, information handling, and the transmission of sensitive information, these mechanisms provide needed security guarantees.

Section 3, The Health Information Network

The Health Information Network (hereinafter referred to as "HIN") serves as a national hub for the sharing and exchange of health and medical care information (see Figure 11-1). The HIN service center is responsible for operations and management of public information systems along with related consultation services, so it can boost efficiency and quality of networks run by health agencies.

Section 4, Information Security

The MOHW built comprehensive protection and surveillance mechanisms, including firewalls, intrusion prevention systems, anti-virus systems, webpage filtering, spam filtering, vulnerability assessments, and source code analysis and repairs. To comply with ISO 27001:2005 information security management standards, the MOHW integrated and verified the information security management systems of its affiliated information center, National Medical Service Information Network Service Center, and Healthcare Certification Authority. Additionally, the MOHW offered various information security training sessions to raise awareness and capabilities.

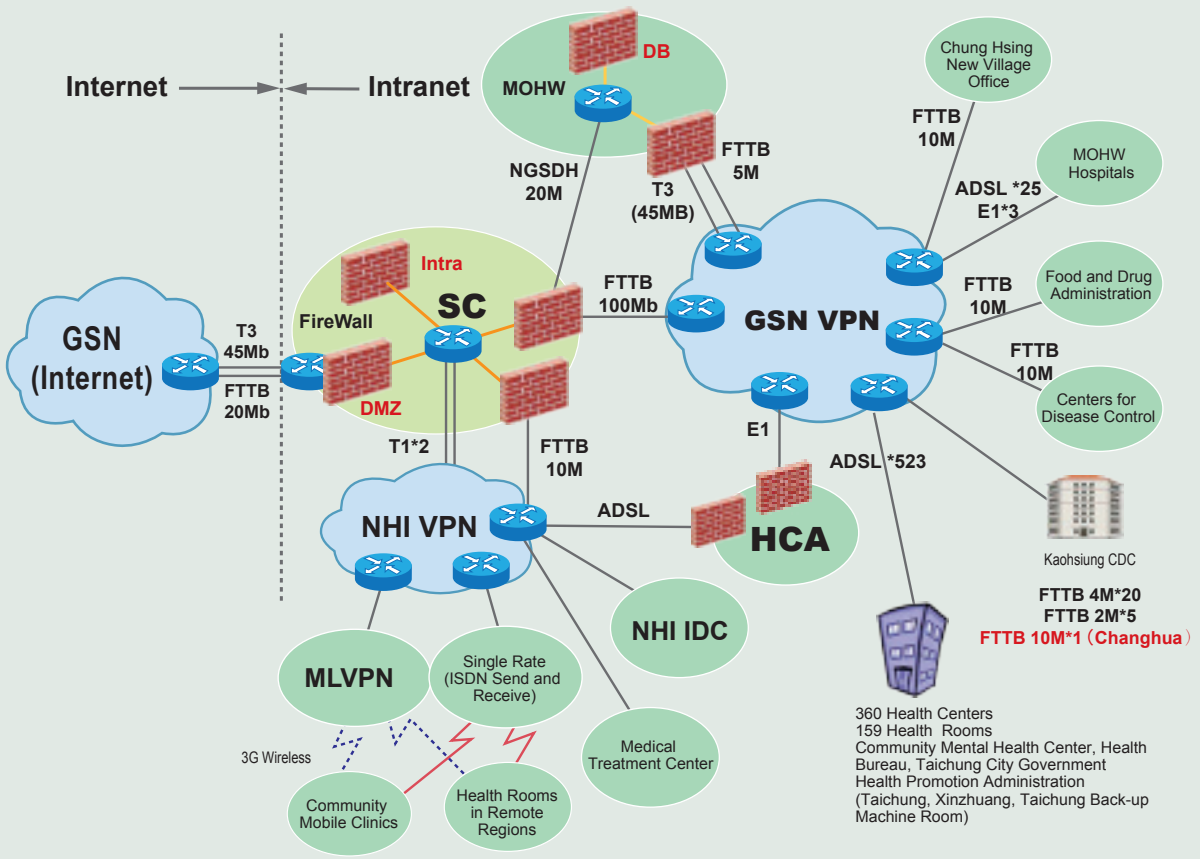
Section 5, Formosans'e Medical School — a Digital Medical Learning Platform

1. To raise public understanding of preventive care, teach chronic disease patients and their families self-care, and provide medical professionals with continuing education opportunities, the MOHW designed digital multimedia courses on the 10 leading causes of death and 13 chronic diseases.
2. For the third consecutive year in 2012, the MOHW provided staff of health bureaus and stations with digital courses on a variety of topics, including: application of epidemiology, communication with the public and media, women's health and maternal and child health, community cancer prevention and screening, health promotion, health education, healthy behaviors, healthy diets, adolescent health and sex education, chronic disease prevention and control, pediatrics, community information management and operations, tobacco hazards prevention, obesity prevention, healthy ageing, and applied statistics for health stations. By the end of 2012, the MOHW had provided 264 classes and 417 total hours of digital courses in four main categories: the general public, medical professionals, continuing education, and health bureaus (stations).

Section 6, Taiwan e Doctor — Medical Consultation Service Network

1. The MOHW bolstered services by establishing the Taiwan e Doctor website, providing the general public with free online consultation services related to health care, rare diseases, pharmaceutical products, nutrition, and preventive care.

Figure 11-1 Structure of HIN



2. Consultation team is comprised of 249 attending physicians, eight nutritionists, 27 pharmacists, and eight nurses from 36 hospitals, including the MOHW hospitals and the National Taiwan University Hospital, the Veterans General Hospitals, and Chang Gung Memorial Hospital. They provide medial consultation related to 34 specialties — including internal medicine, OB/GYN, and dermatology — allowing the general public to quickly receive accurate health and nutritional knowledge as well as pharmaceutical information.

Chapter 2, Medical Care Services and Applications

Section 1, Promoting Electronic Medical Records

Promotion of electronic medical records (EMR) can be broken down into four categories — regulatory, standards, security, and promotion. As of the end of 2012, the MOHW completed the following steps:

1. Formulated standards for EMR interoperability between hospitals, including 117 medical record forms and a compliance mechanism. This ensured completeness and accuracy of records.

2. Formulated standards and norms for sharing four EMR types: medical imaging reports, blood tests, discharge summaries, and outpatient medication records. Also completed draft templates for three EMR types: outpatient record forms, pathology reports, and surgical records.
3. Instructed 282 hospitals on implementing EMR based on the "Regulations Governing the Development and Management of Electronic Medical Records."
4. Conducted EMR inspections passed by 207 hospitals.
5. Assisted hospitals in strengthening EMR security capabilities. A total of 93 hospitals met ISO 27001:2005 standards.
6. Conducted the "EMR and Interoperability Assistance Program" from 2010 to 2012, to expedite implementation and interoperability of EMR. Certified a total of 191 hospitals.

Section 2, Operation of the Healthcare Certification Authority

The Healthcare Certification Authority (HCA) formally began operations on June 13, 2003, to provide certification and electronic signatures for medical e-documents.

To boost the security of public key certificates used for medical purposes, starting from January 1, 2011, the HCA increased the size of public key certificates it issues from 1,024 to 2,048 bits. By the end of 2012, the HCA had issued 366,531 medical IC certification cards for use in the following areas: EMR, hospital information systems, health insurance information networks, health information reporting platforms, public health information portals, regional medical information platforms, management of subsidies for teaching fees accured by teaching hospitals, management of psychiatric care information, management of emergency medical care, joint procurement networks for pharmaceutical products, online application systems for health workers, online application and cancellation of certificate insurance, online birth notifications, disease prevention information exchange centers, centralized communicable disease tracking systems, community medical information management, exchange and reading of e-documents between health institutions, and NHI IC cards.

Section 3, Establishment of an Image Exchange Center and Image Reading Center

In 2010, the MOHW established national medical image exchange and reading centers, providing an online platform for hospitals to exchange medical images and readings. Additional image reading services furnished to health care servies in the cloud for remote regions or offshore islands mitigated the lack of local radiologists.

Section 4, Online Signature of Public Documents

Envisioning the secure digitalization of official documents, on January 25, 2010, the Executive Yuan called for a reduction in the paper used to create official documents by issuing Yuan-Shou-Yan-Xun No. 0992460081. The MOHW fulfilled these objectives in 2011 and 2012 by building integrated electronic document systems at 20 of the hospitals it oversees, then assisted in bringing these systems online at the end of August 2012. Each system features electronic signature functions, and 13 of them use cloud computing facilities run by the MOHW's hospital management committee.

By the end of December 2012, a total of 25 MOHW hospitals had built online signature systems for electronic documents (the system at Kinmen Hospital was scheduled for completion in 2013). Data obtained from the National Archives Administration on the exchange and processing of electronic documents showed that each hospital surpassed the Executive Yuan's 2012 goal of handling at least 30% of documents electronically.

Section 5, Medical IT Advances at Health Stations in Remote Regions and Offshore Islands

Establishment of hospital information systems (HIS) and picture archiving and communication systems (PACS) provide interregional information mechanisms that link local health stations, remote supporting hospitals and hospitals that provide emergency care.

1. From 2006 to 2012, the MOHW installed HIS at 319 mobile medical stations and 55 health stations in 15 counties, including Yilan. Over the course of several years, it installed PACS (including remote access) with links to MOHW hospitals at 32 health stations. Support from specialists at these major hospitals allows local health institutions to make diagnoses using medical images, thereby reducing patient transfers. Patients benefit from fast service and the health care system benefits from efficient use of resources, raising overall quality of health care.
2. On December 4, 2012, the MOHW held a press conference in Fu-Hsing Township, Taoyuan

County, on use of cloud computing for health care in remote regions and offshore islands. It explained progress in the area of medical digitalization along with related health care measures and the benefits of putting EMR in the cloud. The MOHW hopes that its policy and technological integration can lead to suitable health care environments in all locations.

3. Achievements of HIS and PACS Implementation
   1) Establishment of an outpatient health data database prototype at the Pingtung County Health Bureau.
   2) Installation of an image reading center at the MOHW-affiliated Taoyuan General Hospital.
   3) The HIS system was used for 806,121 outpatient-visits in 2012. Estimated savings on patient transportation costs were more than NT$1.5 billion.
   4) PACS was used in 7,635 cases in 2012. Estimated savings on patient transportation costs were NT$14.50 million.

Chapter 3, value - added services for medical care

Section 1, Building a Health Database and Service Platform

The Collaboration Center of Health Information Application, established by the Department of Statistics, MOHW, offers databases and service platforms that expand the ministry's data processing and analytic capabilities while providing statistical support in the area of policymaking. The center's initial role is one of administrative support — it provides trusted data that agencies need when establishing indicators or conducting analysis.

In its early stages, the Center will improve capabilities of research institutions. As it builds trust and cooperation and learns through interaction, stronger future development will lead to a sustainable operational model.

Section 2, Development of Cloud Added-Value Applications for Health Data

The Board of Science and Technology, Executive Yuan, provided renewed support by approving modifications, to take place between 2012 and 2015, that would allow the MOHW to build cloud added-value applications for health data. Cloud functionality will provide a framework for hosted services such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). It will use standardization and modularity to seek customers and diversify content. Also, besides moving platform services to the cloud, the MOHW will build health databases on the precondition that they contain sufficient information security safeguards. Database files will be multivariate: some will focus on themes such as disease type or region, some will speed up processing of secondary data or sampling, and some will be simulation data files used for testing programs or review. Indicator inquiry systems will move toward greater customization and offer various online inquiry methods to provide fast and convenient services to diverse groups.

Section 3, Establishment of Research Sub-Centers Specializing in Added-Value Applications for Health Information

Considering the desire for balanced regional development and to expand the capacity of added-value applications for health information, research sub-centers were formed. Their establishment was based on standards of the Collaboration Center of Health Information Application and meant to serve diverse educational and research functions.

Only after inspection of a research sub-center's environmental and spatial needs, its facilities, and comprehensive discussion of staff allocation occurs can approval be granted for establishment and operations to begin. By the end of 2012, research sub-centers were established at the China Medical University, Taipei Medical University, and the National Taiwan University.

12 Appendix

127 Appendix 1 Health Indicators

134 Appendix 2 Number of Notifiable Diseases

Appendix 1 Health Indicators

Table 1 Important Population Indicators

year	Total Population	Population Composition			Crude Birth Rate	Crude Death Rate	Natural Increase Rate	Total Fertility Rate	Adolescent Pregnancy	Population Density
		Under 15	15-64	Over 65						
	(1.000 persons)	%	%	%	%	%	%	per Woman	%	People/Km^2
1995	21,357	23.8	68.6	7.6	15.5	5.6	9.9	1.8	17	590
2000	22,277	21.1	70.3	8.6	13.8	5.7	8.1	1.7	14	616
2005	22,770	18.7	71.6	9.7	9.1	6.1	2.9	1.1	8	629
2006	22,877	18.1	71.9	10.0	9.0	6.0	3.0	1.1	7	632
2007	22,958	17.6	72.2	10.2	8.9	6.2	2.8	1.1	6	634
2008	23,037	17.0	72.6	10.4	8.6	6.3	2.4	1.1	5	637
2009	23,120	16.3	73.0	10.6	8.3	6.2	2.1	1.0	4	639
2010	23,162	15.7	73.6	10.7	7.2	6.3	0.9	0.9	4	640
2011	23,225	15.1	74.0	10.9	8.5	6.6	1.9	1.1	4	642
2012	23,316	14.6	74.2	11.2	9.9	6.6	3.2	1.3	4	644

Source: Department of Statistics, Ministry of the Interior

Table 2 Life Expectancy and Mortality Rate

Year	Life Expectancy at Birth			Mortality Rate of Children Under 5	Mortality Rate of Adults 15-60
	Total	Males	emales		
	Years	Years	Years	per Thousand People	per Thousand People
1995	74.5	71.9	77.7	9.0	131.4
2000	76.5	73.8	79.6	8.5	119.0
2005	77.4	74.5	80.8	6.9	112.8
2006	77.9	74.9	81.4	6.6	112.8
2007	78.4	75.5	81.7	6.4	105.6
2008	78.6	75.6	81.9	6.3	103.3
2009	79.0	76.0	82.3	5.6	101.0
2010	79.2	76.1	82.5	5.5	99.2
2011	79.1	76.0	82.6	5.7	99.0
2012	79.5	76.4	82.8	5.1	96.3

Source: Department of Statistics, Ministry of the Interior

Table 3 Health Expenditure

Year	Economic Growth Rate	Per Capita GDP	Health Expenditure					Total Expenditure on Health as % of GDP	Per Capita Total Expenditure on Health
				Financial Agents	Financial Resource				
				Public Sector	General Government	Households	Out-of-Pocket		
	%	US$	Million NT$	%	%	%	%	%	NT$
1995	6.4	12,918	382,195	62.9	31.9	45.0	27.8	5.25	17,971
2000	5.8	14,704	563,124	60.0	26.6	51.8	31.9	5.53	25,384
2005	4.7	16,051	733,045	56.9	24.7	53.8	35.4	6.24	32,250
2006	5.4	16,491	766,666	57.3	24.8	52.5	34.3	6.26	33,591
2007	6.0	17,154	795,662	57.7	24.0	52.9	34.9	6.16	34,719
2008	0.7	17,399	819,240	57.2	23.9	53.7	35.7	6.49	35,623
2009	-1.8	16,359	863,996	57.5	24.0	52.6	35.4	6.92	37,437
2010	10.8	18,503	886,834	57.0	25.4	54.9	36.2	6.51	38,323
2011	4.1	20,006	910,267	57.0	25.2	55.7	36.3	6.62	39,247
2012	13	20,386	…	…	…	…	…	…	…

Source: Directorate-General of Budget, Accounting and Statistics, Executive Yuan; Department of Statistics, MOHW

Table 4-1 Health Workforce and Infrastructure-Institutions

Year	Medical Care Institutions											
		Hospitals							Clinics			
			Western Medicine			Chinese Medicine				Western Medicine	Chinese Medicin	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
2000	18,082	669	617	94	523	52	2	50	17,413	9,402	2,461	5,550
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
2010	20,691	508	492	81	411	16	1	15	20,183	10,599	3,289	6,295
2011	21,135	507	491	81	410	16	1	15	20,628	10,815	3,411	6,402
2012	21,437	502	488	81	407	14	1	13	20,935	10,997	3,462	6,476

Source: Department of Statistics, MOHW

Table 4-2 Health Workforce and Infrastructure-Beds

Year	Beds							Beds Per 10,000 Population				
		Hospitals					Clinics		Hospitals			Clinics
			Public	Private	Acute Beds					Acute Beds		
						General Beds					General Beds	
	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds	Beds
1995	112,379	101,430	39,922	61,508	66,928	64,322	10,949	52.8	47.7	31.3	30.1	5.1
2000	126,476	114,179	40,129	74,050	74,135	69,124	12,297	56.8	51.3	33.3	31.0	5.5
2005	146,382	129,548	44,273	85,275	78,423	72,411	16,834	64.3	56.9	34.4	31.8	7.4
2006	148,962	131,152	44,076	87,076	79,005	72,932	17,810	65.1	57.3	34.5	31.9	7.8
2007	150,628	131,776	44,873	86,903	79,695	73,337	18,852	65.6	57.2	34.7	31.9	8.2
2008	152,901	133,020	45,450	87,570	80,021	73,426	19,881	66.4	57.6	34.7	31.9	8.6
2009	156,740	134,716	45,913	88,803	80,884	74,132	22,024	67.8	61.7	35.0	32.1	9.5
2010	158,922	135,401	45,981	89,420	81,072	74,140	23,521	68.6	62.0	35.0	32.0	10.2
2011	160,472	135,431	45,603	89,828	81,173	74,082	25,041	69.1	58.3	35.0	31.9	10.8
2012	160,900	135,002	45,549	89,453	81,064	73,876	25,898	69.0	57.9	34.8	31.7	11.1

Table 4-3 Health Workforce and Infrastructure-Medical Personal

Year	Registered Medical Personnel in Hospitals and Clinics						Registered Medical Personnel in Hospitals and Clinics per 10,000 Population					
		Physicians	Doctors of Chinese Medicine	Dentists	Pharmacists & Assistants	Nurses		Physicians	Doctors of Chinese Medicine	Dentists	Pharmacists & Assistants	Nurses
	People	People	People	People	People	People	People	People	People	People	People	People
1995	97,262	24,452	2,838	7,026	4,533	51,885	45.5	11.4	1.3	3.3	2.1	24.3
2000	136,199	29,522	3,647	8,597	11,230	70,743	61.1	13.3	1.6	3.9	5.0	31.8
2005	170,810	34,061	4,596	10,140	12,290	92,447	75.0	15.0	2.0	4.5	5.4	40.6
2006	176,257	34,864	4,727	10,412	12,804	95,354	77.1	15.2	2.1	4.6	5.6	41.7
2007	182,601	35,815	4,848	10,740	13,308	98,839	79.5	15.6	2.1	4.7	5.8	43.1
2008	190,102	37,099	5,099	11,093	13,960	102,767	82.5	16.1	2.2	4.8	6.1	44.6
2009	198,056	37,841	5,277	11,351	14,398	107,775	85.7	16.4	2.3	4.9	6.2	46.6
2010	204,745	38,849	5,341	11,656	14,813	111,087	88.4	16.8	2.3	5.0	6.4	48.0
2011	211,339	39,960	5,556	11,992	15,219	114,300	91.0	17.2	2.4	5.2	6.6	49.2
2012	217,781	40,897	5,729	12,391	15,594	117,804	93.4	17.5	2.5	5.3	6.7	50.5

Table 5 Food and Pharmaceutical Affairs

Year	Incidents of Food Poisoning			Number of Pharmaceutical Firms			
		No. of Cases	No. of Deaths		Pharmacies	Dealers of drugs or medical devices	Manufacturers of drugs or medical devices
	Piece	People	People	Stores	Stores	Stores	Stores
1995	123	4,950	-	34,846	4,862	29,314	670
2000	208	3,759	3	43,641	6,397	36,536	708
2005	247	3,530	1	55,802	7,673	47,198	931
2006	265	4,401	-	57,976	7,397	49,580	999
2007	240	3,223	-	59,061	7,381	50,633	1,047
2008	269	2,921	-	58,834	7,215	50,514	1,105
2009	351	4,642	-	58,524	7,450	49,814	1,260
2010	503	6,880	1	60,222	7,558	51,289	1,375
2011	426	5,819	1	63,274	7,699	54,090	1,485
2012	527	5,701	-	64,024	7,620	54,843	1,561

Source: Department of Statistics, MOHW

Table 6 National Health Insurance (NHI)

Year	NHI Beneficiaries		NHI Usage				
		As % of Total Population	Outpatient Visits per Beneficiary	Inpatient Visits per 100 Beneficiaries	Average Costs per Outpatient	Average Costs per Inpatient	Average No. of Days of Hospital Stay
	Thousands of People	%	Visits	Visits	Visits	Visits	Days
1995	19,123	89.5	10.6*	6.1*	530	29,418	9.4
2000	21,401	96.1	14.7	12.6	631	36,478	8.8
2005	22,315	98.0	15.5	13.4	792	49,212	9.9
2006	22,484	98.3	14.7	13.0	840	50,216	9.9
2007	22,803	99.3	14.8	13.0	857	50,809	10.0
2008	22,918	99.5	14.9	13.3	899	51,475	10.2
2009	23,026	99.6	15.5	13.7	914	51,374	10.2
2010	23,074	99.6	15.6	13.9	932	51,267	10.2
2011	23,199	99.9	16.2	14.1	950	51,809	10.2

Source: National Health Insurance Administration, MOHW

Table 7 Mortality Statistics — Major Causes of Death

Year	Infant Mortality Rate per 1,000 Live Births	Maternal Mortality Rate per 100,000 Live Births	All Causes of Death		Major Causes of Death									
					Malignant Neoplasms		Heart Disease		Cerebrovascular Diseases		Pneumonia		Diabetes	
			Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population
1995	6.5	7.7	117,954	647.7	25,841	136.4	11,256	64.7	14,132	79.0	3,070	18.4	7,225	39.2
2000	5.8	7.8	124,481	569.4	31,554	141.6	10,552	48.8	13,332	61.1	3,302	15.6	9,450	42.7
2005	5.0	7.3	138,957	530.0	37,222	141.2	12,970	48.3	13,139	48.9	5,687	21.0	10,501	39.4
2006	4.6	7.3	135,071	495.4	37,998	139.3	12,283	43.8	12,596	44.7	5,396	18.9	9,690	34.9
2007	4.7	6.9	139,376	491.6	40,306	142.6	13,003	44.4	12,875	43.8	5,895	19.6	10,231	35.5
2008	4.6	6.6	142,283	484.3	38,913	133.7	15,726	51.7	10,663	35.0	8,661	27.5	8,036	26.9
2009	4.0	8.3	142,240	466.7	39,918	132.5	15,094	47.7	10,383	32.8	8,358	25.3	8,230	26.6
2010	4.2	4.2	144,709	455.6	41,046	131.6	15,675	47.4	10,134	30.6	8,909	25.6	8,211	25.3
2011	4.2	5.0	152,030	462.4	42,559	132.2	16,513	47.9	10,823	31.3	9,047	24.8	9,081	26.9
2012	3.7	8.5	153,823	450.6	43,665	131.3	17,121	47.9	11,061	30.8	9,314	24.4	9,281	26.5

Source: Department of Statistics, MOHW

Notes: 1. The standardized mortality rate is based on the WHO standard world population age structure for 2000.

2. The MOHW began using the International Classification of Diseases (ICD-10) as a standard diagnostic tool in 2010.

Table 7　Mortality Statistics — Major Causes of Death）

Year	Major Causes of Death											
	Accidents		Chronic Disease of Lower Respiratory Tract		Chronic Liver Disease and Cirrhosis		Hypertensive Diseases		Nephritis, Nephrotic Syndrome, and Nephrosis		Suicide	
	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population
1995	12,983	62.6	4,018	23.5	4,456	22.8	2,616	15.3	3,519	19.9	1,618	7.8
2000	10,515	46.5	4,717	21.9	5,174	22.6	1,602	7.5	3,872	17.9	2,471	10.6
2005	8,365	34.0	5,484	20.0	5,621	21.3	1,891	7.0	4,822	17.9	4,282	16.6
2006	8,011	31.9	4,970	17.2	5,049	18.6	1,816	6.4	4,712	16.8	4,406	16.8
2007	7,130	27.9	4,914	15.9	5,160	18.4	1,977	6.6	5,099	17.3	3,933	14.7
2008	7,077	27.0	5,374	16.9	4,917	17.1	3,507	11.2	4,012	13.2	4,128	15.2
2009	7,358	27.7	4,955	14.9	4,918	16.6	3,721	11.5	3,999	12.5	4,063	14.7
2010	6,669	24.4	5,197	14.8	4,912	16.1	4,174	12.2	4,105	12.4	3,889	13.8
2011	6,726	24.1	5,984	16.2	5,153	16.5	4,631	12.9	4,368	12.6	3,507	12.3
2012	6,873	23.8	6,326	16.4	4,975	15.6	4,986	13.3	4,327	12.1	3,766	13.1

Table 7　Mortality Statistics — Major Causes of Cancer Death

Year	Major Causes of Cancer Death									
	Cancers of Liver and Intrahepatic Bile Ducts		Cancers of Trachea, Bronchus and Lung		Cancers of Colon, Rectum, and Anus		Breast Cancer (Female)		Prostate Cancer	
	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population	Number of Deaths	Standardized Mortality Rate per 100,000 Population
1995	5,204	27.2	5,030	26.7	2,469	13.3	918	9.7	371	4.2
2000	6,001	27.0	6,261	28.0	3,376	15.3	1,149	10.3	635	5.7
2005	7,108	27.3	7,302	27.4	4,111	15.5	1,439	11.0	909	6.6
2006	7,415	27.6	7,479	27.0	4,284	15.5	1,439	10.6	957	6.6
2007	7,809	28.1	7,993	27.9	4,470	15.6	1,552	11.1	1,003	6.7
2008	7,651	26.8	7,777	26.3	4,266	14.4	1,541	10.7	892	5.7
2009	7,759	26.2	7,951	25.9	4,531	14.8	1,589	10.6	936	5.9
2010	7,744	25.2	8,194	25.8	4,676	14.6	1,706	11.0	1,021	6.1
2011	8,022	25.3	8,541	26.0	4,921	15.0	1,852	11.6	1,096	6.4
2012	8,116	24.7	8,587	25.4	5,131	14.9	1,912	11.6	1,187	6.7

Table 8 International Comparisons

Country	Population Statistics					Life expectaucy and Mortality						
	Median Age	Crude Birth Rate	Crude Death Rate	Total Fertility Rate	Adolescent Birth Rate	Life Expectancy at Birth			Infant Mortality Rate	Under-5 Mortality Rate	Adult Mortality Rate (Age 15-60)	
						Total	Male	Female			Male	Female
	2012	2012	2012	2012	2005-2012	2012	2012	2012	2012	2012	2012	2012
	Years	%	%	per Woman	%	Years	Years	Years	per 1,000 Live Births	per 1,000 Population	per 1,000 Population	per 1,000 Population
Taiwan	38	8	7	1	6	79	76	83	5	6	140	56
Japan	45	9	10	1	5	79	76	82	5	3	84	46
Korea	38	10	6	1	2	72	68	76	6	5	102	42
US	37	14	8	2	39	75	72	79	9	8	131	77
Canada	40	11	7	2	14	77	74	80	7	6	84	53
UK	40	12	9	2	25	76	73	79	8	5	91	57
Australia	37	14	7	2	16	77	74	80	8	5	80	46
Germany	45	9	10	1	9	76	72	79	7	4	96	51
France	40	13	8	2	12	78	73	82	7	4	113	53

Source: WHO, OECD, MOHW

Table 9 International Comparisons

Country	Health Expenditure						
	Health Expenditure Ratios			Per Capita Health Expenditures			
	Total expenditure on health as % of gross domestic product	General government expenditure on health as % of total expenditure on health	Out-of-pocket expenditure as % of private expenditure on health	Per capita total expenditure on health at average exchange rate (US$)	Per capita total expenditure on health (PPP int. $)	Per capita government expenditure on health at average exchange rate (US$)	Per capita government expenditure on health (PPP int. $)
	2010	2010	2010	2010	2010	2010	2010
	%	%	%	US$	PPP int. $	US$	PPP int. $
Taiwan	6.5	57.2	86.0	1,208	2,307	692	1,321
Japan	9.2	80.3	82.0	3,958	3,120	3,179	2,506
Republic of Korea	7.1	58.2	76.8	1,452	2,035	845	1,185
USA	17.6	48.2	22.7	8,233	8,233	3,967	3,967
Canada	11.4	71.1	49.0	5,257	4,443	3,736	3,157
UK	9.6	83.2	53.1	3,495	3,433	2,908	2,857
Australia	9.0	68.5	59.4	5,174	3,685	3,545	2,525
Germany	11.5	76.8	51.4	4,654	4,342	3,573	3,334
France	11.7	76.9	32.2	4,618	3,997	3,553	3,075

Source: WHO, MOHW

Appendix 2 Number of Notifiable Diseases

Table 1 Number of Confirmed Cases of Acute Notifiable Diseases in 2012

Categories	Diseases	Total	Indigenous Cases	Imported Cases
I	Smallpox	0	0	0
	Plague	0	0	0
	SARS	0	0	0
	Rabies	1	0	1
	Anthrax	0	0	0
	H5N1 Influenza	0	0	0
II	Diphtheria	0	0	0
	Typhoid Fever	26	15	11
	Dengue Fever	1,478	1,271	207
	Dengue Hemorrhagic Fever / Dengue Shock Syndrome	36	35	1
	Meningococcal Meningitis	6	5	1
	Paratyphoid Fever	8	1	7
	Poliomyelitis	0	0	0
	Acute Flaccid Paralysis	51	51	0
	Shigellosis	155	49	106
	Amoebiasis	258	86	172
	Malaria	12	0	12
	Measles	9	4	5
	Acute Hepatitis A	99	73	26
	Enterohaemorrhagic E.coli Infection	0	0	0
	Hemorrhagic Fever with Renal Syndrome	1	1	0
	Hantavirus Pulmonary Syndrome	0	0	0
	Cholera	5	5	0
	Rubella	12	6	6
	Chikungunya Fever	5	0	5
	West Nile Fever	0	0	0
	Epidemic Typhus Fever	0	0	0
III	Pertussis	54	53	1
	Tetanus ※	17	-	-
	Japanese Encephalitis	32	32	0
	Congenital Rubella Syndrome	0	0	0
	Acute Hepatitis B	97	93	4
	Acute Hepatitis C	34	34	0
	Acute Hepatitis D	0	0	0
	Acute Hepatitis E	9	7	2
	Acute Hepatitis Unspecified	10	10	0
	Mumps ※	1,061	-	-
	Legionellosis	88	83	5
	Invasive Haemophilus Influenzae Type b Infection	3	3	0
	Neonatal Tetanus	0	0	0
	Enteroviruses Infection with Severe Complications	153	152	1

Categories	Diseases	Total	Indigenous Cases	Imported Cases
IV	Herpesvirus B Infection	0	0	0
	Leptospirosis	91	91	0
	Melioidosis	29	29	0
	Botulism	0	0	0
	Invasive Pneumococcal Disease	749	746	3
	Q Fever	53	48	5
	Endemic Typhus Fever	37	32	5
	Lyme Disease	1	0	1
	Tularemia	0	0	0
	Scrub Typhus	460	458	2
	Varicella ※	8,373	-	-
	Cat-Scratch Disease	76	76	0
	Toxoplasmosis	12	11	1
	Complicated Influenza	1,595	1,593	2
	NDM-1 Enterobacteriaceae	0	0	0
	Brucellosis	0	0	0
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
	Severe Acute Respiratory Infections Associated with Novel Coronavirus	0	0	0

Notes: 1. Data were downloaded on May 1, 2013.
2. Day of disease onset is used as the basis of analysis for all acute notifiable diseases.
3. ※ Tetanus, mumps, and varicella were reported cases (not confirmed by the examination of specimen).
4. No wild poliovirus was detected in Taiwan since 1984. Nationwide surveillance of acute flaccid paralysis has been used for detecting cases of poliomyelitis after implementing the "Eradication Program for Measles, Congenital Rubella Syndrome, Poliomyelitis and Neonatal Tetanus" in 1992.

Table 2 Number of Confirmed Cases of Chronic Notifiable Diseases in 2012

Categories	Diseases	No. of Confirmed Cases
II	MDR-TB	140
III	Smear-Positive TB	4,739
	Others TB	7,599
	Syphilis	5,896
	Gonorrhea	1,983
	HIV Infection	2,224
	AIDS	1,280
	Hansen's Disease	13
IV	Creutzfeldt–Jakob Disease	0

Notes: 1. Data were downloaded on May 1, 2013.
2. The caseload of MDR-TB and that of smear-positive and other tuberculosis were calculated based on the Taiwan CDC's registration dates and notification dates respectively, whereas the other chronic notifiable diseases were analyzed based on diagnosis dates.

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