

*HOSPITAL
WITHOUT
BORDERS*

À GENÈVE 2018

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TAIWAN AND GLOBAL EPIDEMIC PREVENTION

I. PREFACE

There is no doubt that Taiwan's achievements in public health set an example for the globe. Especially through the improvement of environmental hygiene, universal preventive vaccination, and our diversified epidemic surveillance system, Taiwan has successfully controlled, reduced, and eliminated several important epidemic diseases and pestilences since the 1950s. Over the past 50 years, Taiwan has devoted itself to the prevention of acute infectious diseases. After eliminating malaria and poliomyelitis, Taiwan has also reached the progressive goals of eliminating neonatal tetanus and Measles. However, there is always a risk that these diseases will return before these diseases have been eliminated worldwide.

Epidemics know no national boundaries. Nowadays, many fatal diseases are still prevalent worldwide, and it is imperative that Taiwan participate in global epidemic prevention.

II. FUTURE ENVIRONMENT FORECAST AND POTENTIAL THREATS WORLDWIDE

1. Natural environment change brings challenge to epidemic prevention

After the Second World War, thanks to the improvement of agricultural technology, the development of food processing industries, and

the advance of healthcare, the world population has increased rapidly. According to the United Nations Population Fund, the world population increased from 6 billion in 2000 to 7 billion in 2011. This impact will have a direct impact on basic needs such as living space, food, and other resources. Development of rural and rainforest areas will increase not only human contact with wild animals and unknown pathogens but also the risks of zoonosis.

Moreover, climate change has also effected the evolution of various infectious diseases; for example, changes to temperature, rainfall, and humidity may increase the speed of generation and the spread pathogens, and lead to even more rapid spread of infectious diseases. As extreme weather like monsoons and floods occur more frequently, the risk of epidemic outbreaks becomes higher.

2. Frequent international interaction leads to rapid spread

Recently, Asia has been playing more and more important roles in the global economy, and the flow of travelers to the Asia-Pacific region has rapidly increased. Thanks our very special geographical position as the center of East Asia, along with Japan and Korean to the north and southeast Asian countries to the south, Taiwan is located in the middle of several of the world's busiest air traffic routes. The route from Taoyuan to Hong Kong sees one airplane take off or land every 18 minutes, with a total of and 30,000 flights per year, and became the world's busiest air traffic route in 2017. This means Taiwan has become a worldwide transport, trade, economic, and tourist hub, and has very high risk of spreading pathogens and cross-infection.

Beside the dramatic increase in regular business travelers between Taiwan and China, the amount of tourists coming to Taiwan has also substantially increased. Moreover, most tourists nowadays are drawn to backpacking or in-depth tours, and some cities in Taiwan are planning to hold large-scale international events. In this context of frequent international interaction, the rate of contact between Taiwanese people and international travelers has greatly increased, and this provides channels for the rapid global spread of epidemics.

3. Threats to Taiwan's health environment from epidemics

In recent years, climate change, growing urbanization, and the increase in international travelers have led to many emerging pathogens spreading rapidly not only to new geographic areas but also to many countries with several newly confirmed epidemic cases, thus bringing new threats to human health. Though Taiwan has not yet seen any confirmed cases of these emerging pathogens, they have already caused epidemics to break out in Taiwan's neighboring countries. In the near future, these emerging pathogens may spread through human or cargo travel to Taiwan and pose a new health threat in this country.

Furthermore, zoonotic epidemics have become critical problems in Taiwan's neighboring countries. For example, rabies has the highest fatality rate, and there have been numerous recent cases of people contracting rabies from animal bites in Southeast Asian countries. In addition, Taiwanese travelers also often tour African and Central and South American countries, which increases the risk of contact with pathogens. Meanwhile, the growing likelihood of imported zoonotic epidemics from China and Southeast Asian countries makes the future outbreak of a zoonotic epidemic in Taiwan more and more probable.

III. OUR VISION & OUR APPEAL

Global epidemic prevention knows no boundaries. If Taiwan can, through the WHO, gain access to more information, resources, academic research, and opportunities for co-research on epidemics, our strength in medical technology will enable Taiwan to adopt more effective and comprehensive approaches and strategies to global epidemic prevention, and work with other countries to build a better healthcare environment.

IV. TAIWAN'S PROGRESS IN DOMESTIC EPIDEMIC PREVENTION

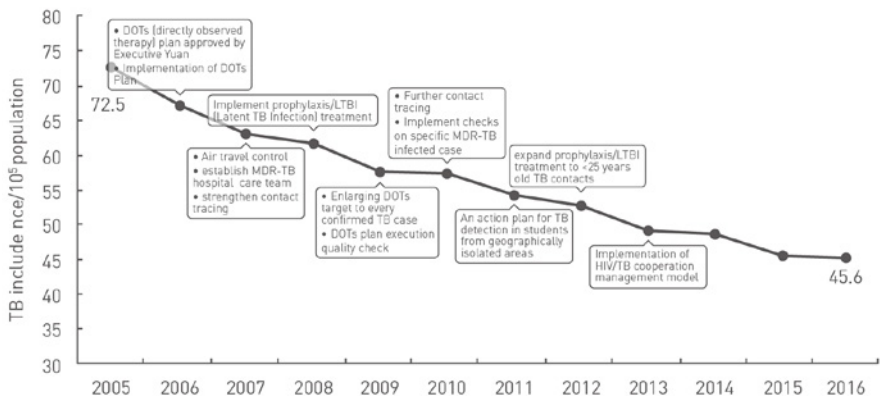
Listed among the Sustainable Development Goals (SDGs) is the eradication of HIV/AIDS, tuberculosis, malaria, neglected tropical diseases, and hepatitis by 2030, and the reduction of premature deaths from non-communicable diseases. Taiwan runs over 50 programs to combat such diseases as AIDS, tuberculosis, malaria, bird flu, Ebola, MERS, zika, dengue fever, breast cancer, and kidney failure in over 20 countries in Africa, Asia, Central and South America, and the South Pacific.

1. Tuberculosis

When the WHO announced its goal in 2006 to reduce the incidence of tuberculosis by 50%, Taiwan also proposed a simultaneous plan to effect a 50% reduction within 10 years. With the comparative basis of 16,472 confirmed cases in 2003, the year before the implementation year, Taiwan saw 11,528 newly confirmed cases in 2013, a decrease of 30%. The rate of new cases in Taiwan

was 49 per 100 thousand inhabitants, compared with 73 per 100 thousand inhabitants in 2003, a drop of 32%.

Tuberculosis is still by far one of most serious epidemics in Taiwan and has a severe impact on Taiwanese public health. In severity, it is far more important than all other epidemics taken together. Not only does it endanger people's health and lives and reduce social



productivity, but it also seriously impacts national competitiveness and our international image.

Tuberculosis epidemic prevention requires international cooperation. We must not scale back our fight against tuberculosis because of the recent reduction in occurrences. Rather, we should continue to improve the existing prevention strategy and make the best use of newly developed equipment and strategies from other countries to prepare for the future.

2. HIV/AIDS

Since its appearance, HIV/AIDS has constantly been a major focus in the fight against global epidemics and has received abundant international attention for several reasons: it mainly affects the more productive younger generation; it cannot be completely cured after infection; and it reduces social productivity and affects national competitiveness. Through the dedicated epidemic prevention system built by the Taiwanese government and NGOs, integrated scanning consultancy services, caring services, research and development, and much international cooperation on public health strategy and resources, Taiwan has made great progress and reached several milestones in HIV/AIDS epidemic prevention.

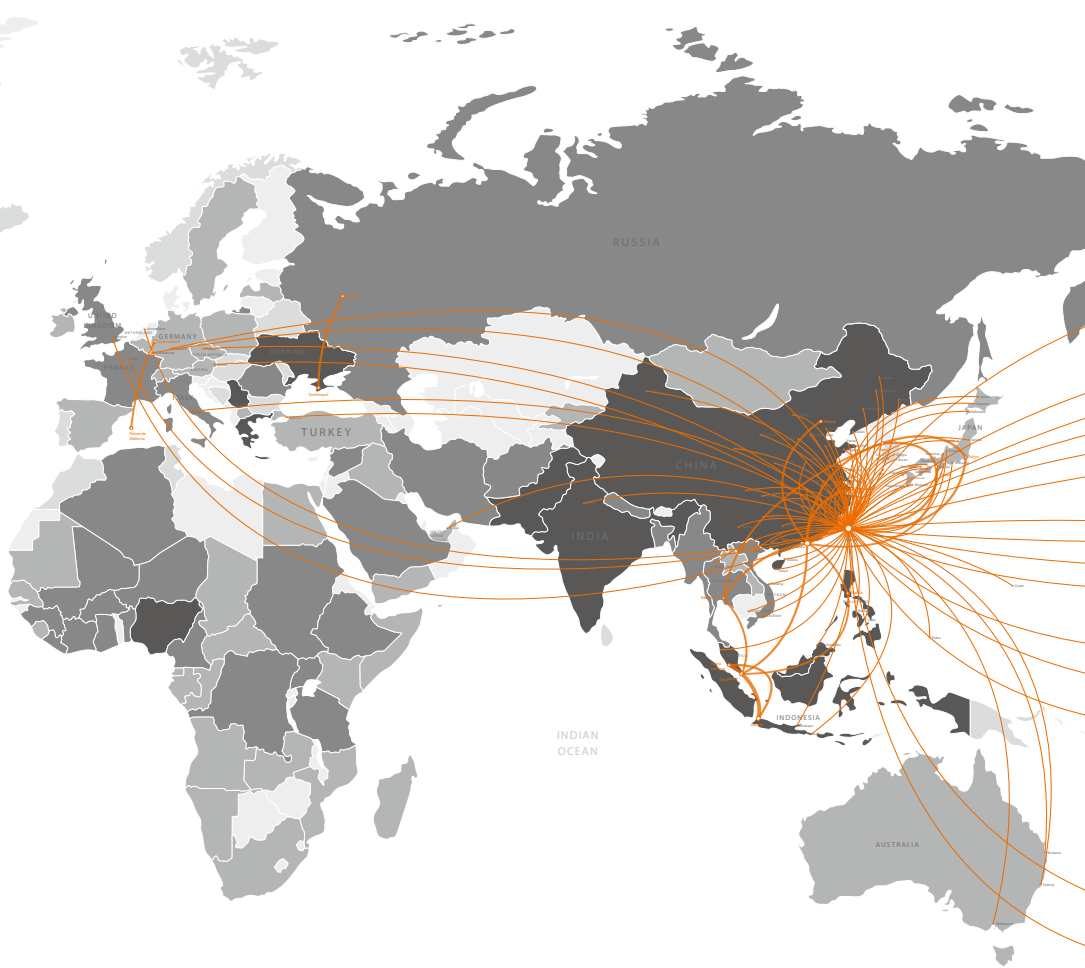
On observing the Taiwan data, we find that proportion of newly confirmed HIV/AIDS cases that also include tuberculosis infections is rather low and is still falling, decreasing from 3.4% in 2007 to 2.9% in 2013. In 2014, the rate fell to 2.5%, which puts Taiwan in the lowest class of 0%–4% in the WHO classification index. According to 2015–2016 WEF global competitiveness report, the overall incidence of HIV/AIDS in the Taiwanese population is 0.2%, which puts Taiwan first among 61 other countries around the world.

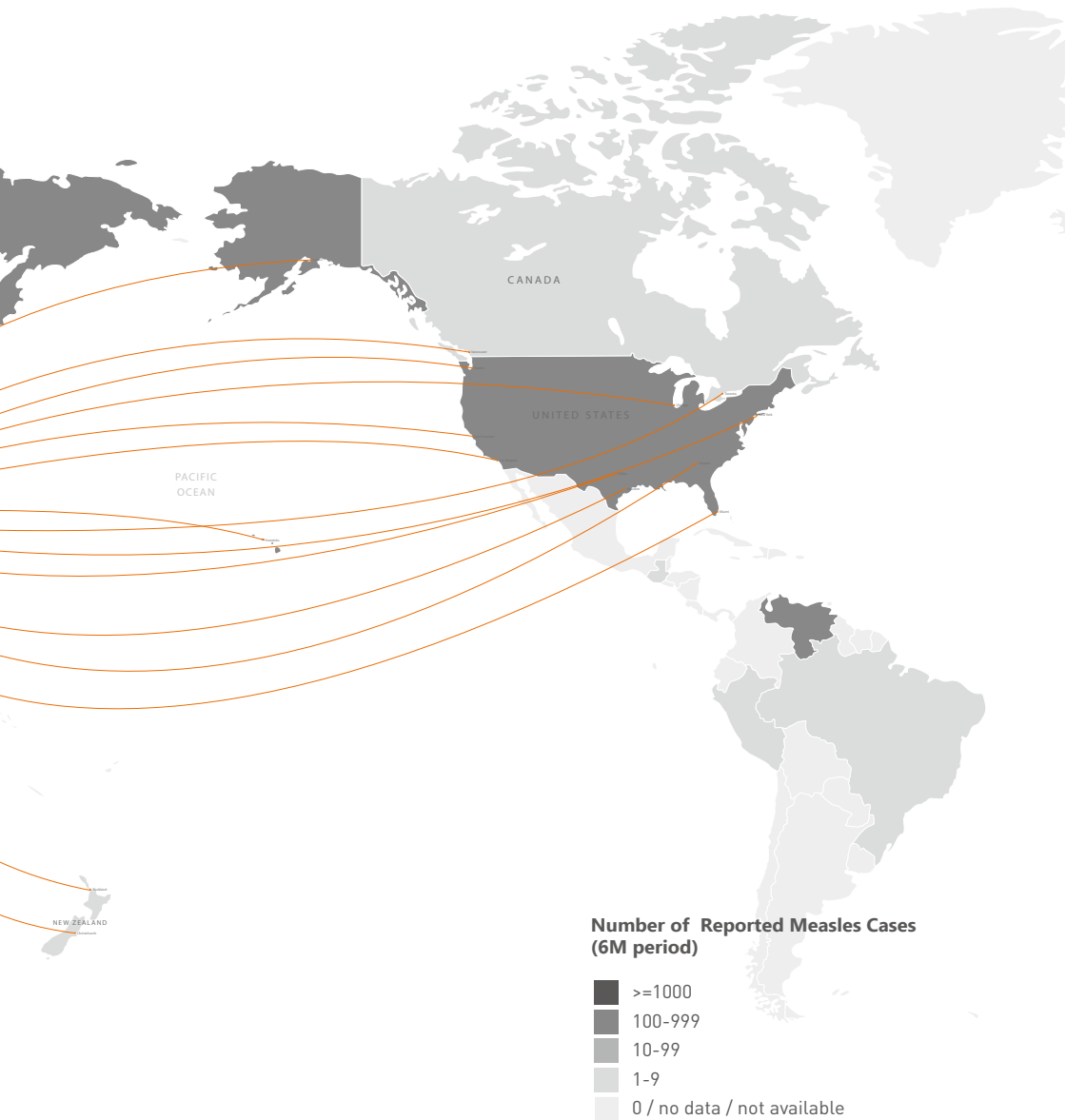
To ensure high-quality and accessible medical care for HIV patients, Taiwan has designated a large number of hospitals nationwide as treatment centers. HIV care initiatives provide patients with self-management programs, enabling them to take control of their day-to-day health and treatment. The government promotes the internationally recommended first-line therapy, comprising daily intake of a three-in-one combination drug, to help patients adhere to treatment plans. All health care expenses for HIV patients are covered under the NHI or other government funds.

In line with the U.N. World AIDS Day campaign My Health, My Right, Taiwan regularly launches public awareness initiatives about the disease so as to end stigmatization and help patients feel respected and accepted. At the same time, Taiwan strives to minimize HIV treatment loopholes and achieve the internationally shared goal of zero new HIV infections, zero discrimination and zero AIDS-related deaths.

3. Malaria

Taiwan has also worked in countries like São Tomé and Príncipe. Health, My Right, Taiwan regularly launches public awareness initiatives about the disease so as to end stigmatization and help patients feel respected and accepted. At the same time, Taiwan strives to reduce the infection rate of five. Yet after Taiwan dispatched Dr. Lien Jih-ching and a team of professionals to the nation in 2000, the child infection rate for malaria was radically cut. In 2015, only one percent of the residents in São Tomé and Príncipe were infected, with no deaths reported. The work of Taiwan's dedicated professionals changed the fate of children here forever.





UNIVERSAL HEALTH COVERAGE IN TAIWAN

I. PREFACE

The World Health Organization (WHO) constitution states that ated professionals changed the attainable standard of health is one of the fundamental rights of every human being.”

The World Health Organization has for years urged Member States to take action to achieve universal health coverage by 2030.In Taiwan, this principle is realized through the National Health Insurance (NHI) program, a global benchmark in universal medical care.

Although not a WHO member, Taiwan has offered universal health coverage to our island’s 23 million citizens since 1995.

II. NATIONAL HEALTH INSURANCE IN TAIWAN

1.Introduction

Launched in 1995, the NHI is a compulsory single-payer social insurance plan covering virtually every citizen and foreign resident. It offers convenient access to inpatient and outpatient services, dental care,prescription medications and traditional Chinese treatments at affordable prices. Users are free to choose doctors and hospitals from over 25,000 contracted facilities, enjoy short wait times and seek specialty care without referral.

12 Taiwan launched the National Health Insurance (NHI) initiative by

integrating medical programs from existing insurance systems for laborers, farmers, and government employees, which covered only half the population. This has since been expanded to provide equal coverage to all citizens from birth, regardless of age, financial status or employment status.

2. Execution and Financial Status

4.69% of the salary

10%

from the **government**

30%
from the
employee

Premiums come from the government, employers and employees, with the fee set as a proportion of salary, currently 4.69 percent.

Workers pay 30 percent, employers 60 percent and the government the remaining 10 percent.

60%

from the **employer**

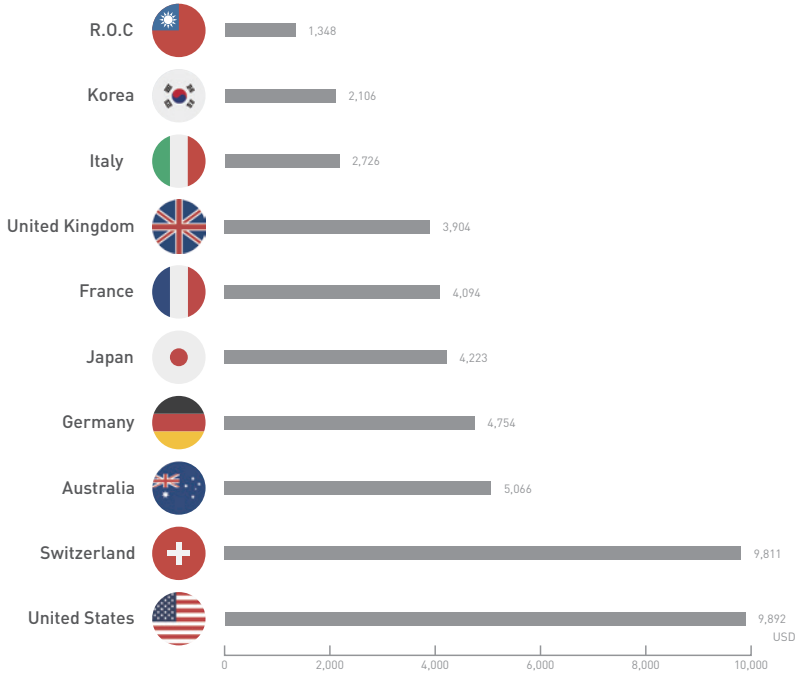
There is also a 1.91 percent levy on supplementary earnings like bonuses and stock dividends to ensure contributions reflect a user's full income. For households below the poverty line, the premium is fully subsidized.

0.14%
total

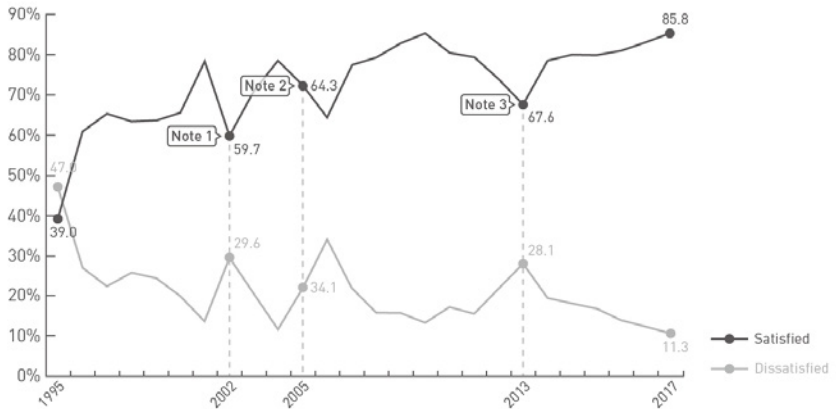
Social justice is the pillar on which the NHI has been built. Premiums come from the government, employers and employees, with the fee set as a proportion of salary, currently 4.69 percent. Workers pay 30 percent, employers 60 percent and the government the remaining 10 percent. There is also a 1.91 percent levy on supplementary earnings like bonuses and stock dividends to ensure contributions reflect a user's full income. For households below the poverty line, the premium is fully subsidized.

The NHI is a public program run by the government based on a single-payer model. Life expectancy in Taiwan has subsequently increased to levels seen in key OECD countries, with women living on average to

Per Capita Current Health Expenditure at Average Exchange Rate



Trend of NHI Satisfaction Surveys

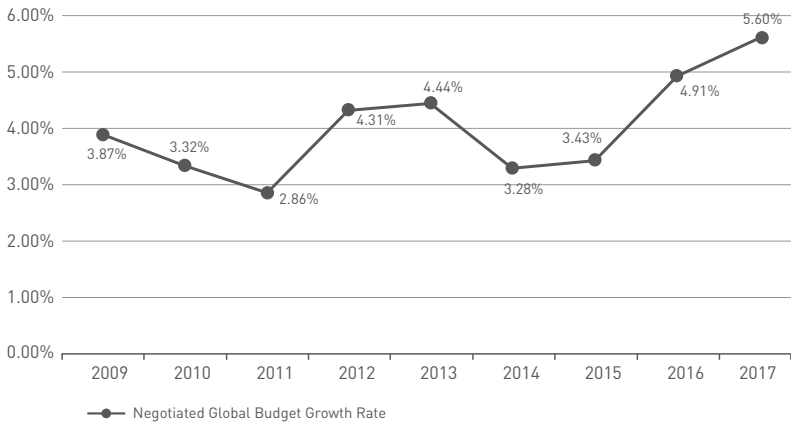


Note 1: The dip in satisfaction rates in 2002 corresponds with a period of adjustment for premium rates and copayments.

Note 2: Similarly, 2005 saw an adjustment to payroll bracket upper limits, the payroll bracket for military, civil service, and teaching personnel, and the amount of tobacco health and welfare surcharges.

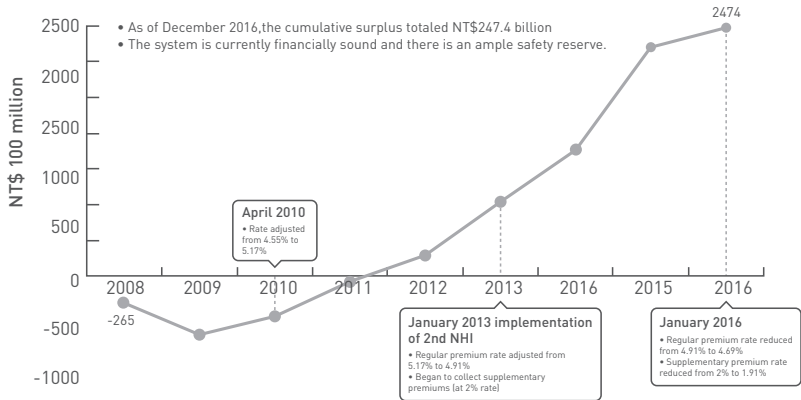
Note 3: The year 2013 saw the implementation of the 2nd Generation NHI system.

Annual Growth Rate of NHI Medical Expenditures



Trend of NHI Satisfaction Surveys

NHI's finances have gone from deficit to surplus after the implementation of 2nd generation NHI



83.4 years old, and men to 76.8. Yet healthcare costs are far lower in Taiwan than in most highly developed countries in Europe and North America, at US\$1,347 per capita per year, representing just 6.3 percent of GDP in 2016. Administrative costs run at less than 1 percent of the total and public satisfaction remains high, at 85.8 percent in 2017.

Taiwan is a public program run by the government based on a single-payer model. Life expectancy in Taiwan has subsequently increased to levels seen in developed countries. Implementing the Global Budget Payment on top of Fee-For-Service reimbursement method effectively reduced annual

medical expenditure growth from 12 percent to 5 percent since 2003. And the way premiums are collected has also changed from being purely payroll-based, to including supplementary premiums based on capital gains, which has created a surplus into the National Health Insurance Fund.

3. Ehealth

Administrative efficiency, as well as oversight of service utilization and quality, is achieved through a powerful centralized information technology system. Every user carries a unique NHI card that tracks personal data including diagnoses, drug allergies and prescriptions, major illnesses and palliative care directives. This strengthens service delivery, promotes medical R&D and provides a potent tool to halt the spread of epidemics. In case of emergency situations such as the 2003 outbreak of severe acute respiratory syndrome, or SARS, authorities can request real-time data updates, enabling rapid identification of potential patients.

We encourage hospitals to upload computed tomography (CT) and magnetic resonance imaging (MRI) scans so they can be retrieved for follow-up consultations. A personalized cloud-based service called My Health Bank also enables patients to check their medical records at any time.

4. Perspective

What has the National Health Insurance Administration in Taiwan done in recent years?

(1) Preparation work for 3rd generation health insurance: re-innovating and improving health insurance system

- a. Maintain financial stability of health insurance system
- b. Implementing emergency latent healthcare and home healthcare integration plan; providing quality-oriented medical services
- c. Increasing integration of health insurance and home medication to through the Long-Term Care 2.0 Service
- d. Implement grading and dual-direction medical referral system.

(2) Participate international conference and exchange

- a. Participating in the WHA every year and sharing Taiwan's progress and achievements in the roll-out of public health insurance
- b. Signing Health Insurance Cooperation MOUs with the Philippines in 2012 and South Korea in 2014; building a pattern of long-term international cooperation
- c. Holding various international conferences in Taiwan, in particular the 20th Anniversary Public Health Insurance International Conference

The “no policy is perfect”, future improvement plan:

- (1) Implement medical grading system to shorten urban and rural medical gaps
- (2) Reduce overtime for medical personnel
- (3) Enlist public help to reduce unnecessary medical waste, reduce repeat medication, checks, and examinations
- (4) Develop support measures for chronic and long-term care so as to prevent the financial collapse of the health insurance system
- (5) Improve medical care for cancer patients and offset the increasing cost of cancer care medical expenses

5.Summary

In a globalized world, it is impossible for countries to overcome all their healthcare challenges on their own. It is only through interdisciplinary and international cooperation that we can build a global health system that consistently and cost-effectively meets the healthcare needs of the world's citizens, and bring to fruition the WHO's ultimate goal of health for all.

Taiwan has a great deal of experience in building and maintaining a universal health insurance system, from service provider management to financing and coping with socioeconomic change. More to the point, we believe that Taiwan's healthcare system can serve as a model for other countries.

III. SERVICE CAPACITY AND ACCESS

Basic hospital access and hospital bed density

According to MOHW statistics for 2016, Taiwan has 22,384 medical facilities comprising 490 hospitals and 21,894 clinics. The hospitals have 133,499 beds, equating to a bed density of 56.7 per 10,000 people.



Health-worker density

Taiwan-worker density statistics for 2016, Taiwan has 22,384 medical facilities comprising 490 hospitals and 21,894 clinics. The hospitals have 133,499 beds, equating to a bed density of 56.7 per 10,000 people. We believe that Taiwan's health-certified professionals. Of these, 90 percent go on to work in nursing related fields.

In a given five-year period, an average of 10 percent of nurses aged 20-40 leave the profession. Only 60 percent of certified nurses currently work in the field. The government is pursuing reforms to encourage nurses to remain in the profession. Efforts implemented to date comprise:

- (1) inclusion of nurse-patient ratios in hospital evaluations since 2015;
- (2) an additional monthly bonus from the NHI to hospitals that achieve designated nurse-patient ratios;
- (3) publishing the nurse-patient ratios of all hospitals on a monthly basis since July 2016;
- (4) annual increases in nurses' salaries;

(5) raising the nurse density from 60.48 per 10,000 people in 2012 to 69.40 per 10,000 people by November 2016. In addition, the government is working to boost the number of community health care facilities so as to provide additional career options for nurses.

Access to essential medicines

The NHI covers over 16,000 essential drugs and medications for rare diseases. As of June 2016, a total of 5,992 pharmacies nationwide were contracted under the system, ensuring convenient public access to medications. The pharmacies also provide patient education services, including advice on when and how to take prescribed drugs.



To ensure an equitable distribution of medical resources and further strengthen safety standards, the NHI Administration under the MOHW has enacted reforms in areas like monitoring and control of medication quality. Related measures include regular drug pricing investigations and the establishment of a cloud-based system enabling physicians to access patients' medication records.

Health security: compliance with the International Health Regulations

An International Health Regulations national focal point was launched as the designated contact window with WHO headquarters after Taiwan was incorporated into the operation mechanism of IHR (2005) in 2009. This contact window is charged with reporting major public health events to the WHO, receiving such information from other countries through the IHR Event Information Site and facilitating cross-border communication and referral for cases of major infectious diseases. The government also established IHR core capacities at seven international airports and ports (responsible for 95 percent of the country's visitor traffic and cargo throughput) and continues to promote local capabilities in responding to emergent public health security incidents.



Based on WHO guidelines, in 2016 the government contracted U.S. experts and adopted the IHR 2005: Joint External Evaluation Tool to conduct an external evaluation of the country's emergency response capabilities in addressing public health threats. Among the 48 indicators, Taiwan was found to possess developed or sustainable capacities in 42. Taiwan is the eighth country in the world to have completed such an assessment.

IV. NON-COMMUNICABLE DISEASES

Prevention and treatment of hypertension

According to MOHW statistics for 2016, heart disease, cerebrovascular disease and hypertensive disease—all related to hypertension—were ranked as the second, fourth and eighth leading causes of death in Taiwan, respectively. One in every 4.5 deaths is caused by hypertensive diseases.

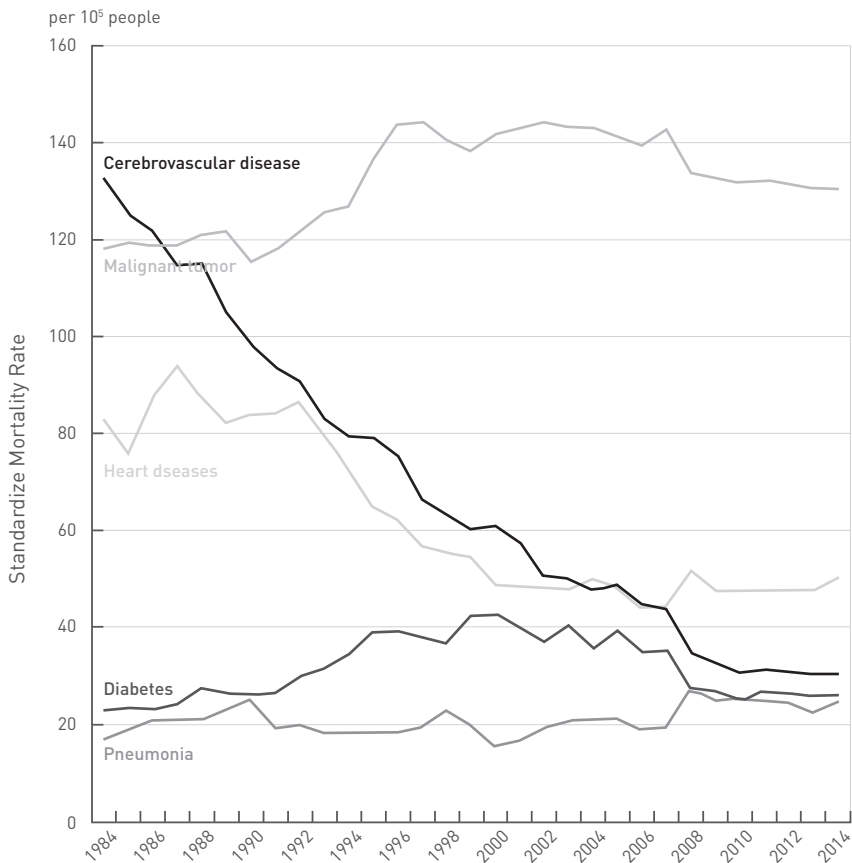


To raise awareness of the issue and encourage people to check their blood pressure, the MOHW's Health Promotion Administration organized a monthlong campaign in cooperation with the Taiwan Hypertension Society, Taiwan Pharmacist Association and Taiwan Millennium Health

Foundation. Over 1,500 blood pressure measurement spots were set up nationwide in locations like convenience stores, cosmetics retail outlets and pharmacies. An estimated 60,000 people checked their blood pressure and consulted with pharmacists through the campaign.

Prevention and treatment of high blood sugar

Diabetes was the fifth leading cause of death in Taiwan in 2016. Working in collaboration with clinics, local foundations and public health and welfare organizations, 22 cities and counties in Taiwan have launched community care networks for diabetes patients since 2003. The networks have helped enhance care quality, develop training and accreditation systems for medical professionals and set up interdisciplinary medical teams. Under the networks, 255 health care facilities have been accredited as diabetes health promotion centers by the HPA. The NHI has also established a pay-



for-performance scheme targeting the disease, providing financial incentives to medical institutions that achieve diabetes treatment standards and goals. In 2016, the proportion of diabetes patients covered by the NHI's pay-for-performance program reached 46 percent. These measures have led to significant improvements in outcomes.

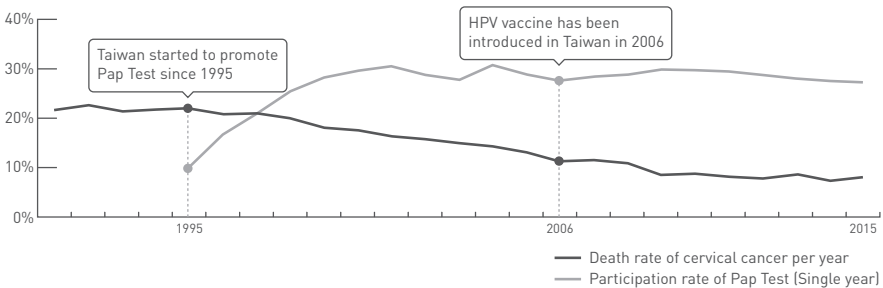
To strengthen public awareness of diabetes prevention, the HPA has also published a series of brochures containing clear information about the disease. Each year on World Diabetes Day, the HPA also collaborates with local government health departments and relevant associations to organize news conferences, lantern ceremonies, hiking events and festivals to boost understanding of diabetes prevention. Taiwan's standardized diabetes mortality rate dropped from 37.1 per 100,000 people in 2012 to 24.5 per 100,000 people in 2016, a decline of 34 percent. This demonstrates the effectiveness of the nation's integrated care networks.

Cervical cancer screening

In line with WHO recommendations, Taiwan offers subsidized screenings for four kinds of cancer: breast, cervical, colorectal and oral. Research shows that cervical screenings can lower the incidence and mortality rates for cervical cancer by between 60 percent and 90 percent. Since 1995, Taiwan health authorities have encouraged women aged 30 and over to undergo cervical cancer screenings



After promoting Papanicolaou Test (Pap Test) in Taiwan, death rate of cervical cancer has decreased every year



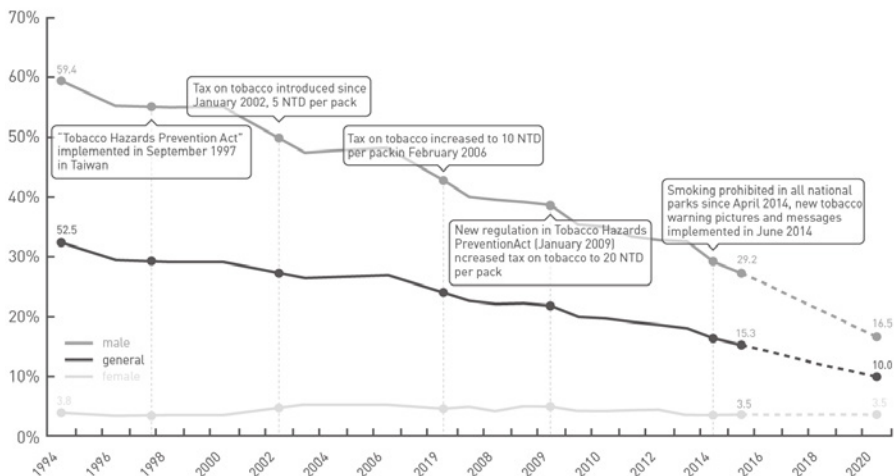
every three years. Women aged 30 and over with an NHI Card and National Identification Card can receive free examinations at NHI-contracted clinics and hospitals. As of the end of 2017, a total of 2.16 million women had undergone screenings, resulting in 3,900 cervical cancer diagnoses. In addition, precancerous lesions were identified in some 9,600 patients. The standardized mortality rate for cervical cancer in Taiwan dropped by about 70 percent from 1995 to 2016.

Tobacco control

Since the Tobacco Hazards Prevention Act took effect in 1997, the HPA has launched various programs in line with the WHO's MPOWER measures. Under the initiative, the WHO urges countries to monitor tobacco use; protect people from tobacco use; offer help to quit tobacco use; warn about the dangers of tobacco; enforce bans on tobacco advertising and promotion; and raise taxes on tobacco products. The measures unveiled in Taiwan include expanding smoke-free areas; launching new packaging warning labels; prohibiting tobacco advertising; increasing taxes on tobacco products; and strengthening cessation services.

The percentage of smokers in Taiwan decreased from 20 percent in 2009 to 15.3 percent in 2016. In addition, the proportion of local high school students smoking dropped from 14.8 percent in 2009 to 9.3 percent in 2016, while the percentage of junior high students smoking declined from 7.8 percent in 2008 to 3.7 percent in 2016. Consistent

Adult (> 18 years old) smoking rate per year and future goal in Taiwan



annual declines underscore the country's progress toward the goal of a 30 percent reduction in the prevalence of tobacco use, as set by the WHO's Noncommunicable Diseases Global Monitoring Framework. The proportion of junior high school students who smoke in Taiwan is lower than the WHO figures for Malaysia, 26.1 percent; Italy, 20.6 percent; South Africa, 15 percent; South Korea, 9.6 percent; Australia, 5.4 percent; and the U.S., 4.2 percent, as reported in the Global Youth Tobacco Survey released in 2016.

V. REPRODUCTIVE, MATERNAL, NEWBORN AND CHILD HEALTH

Antenatal and delivery care



The NHI offers a range of prenatal and postnatal services to ensure a high-quality, supportive medical environment for expectant parents. Services fully covered under the program include 10 prenatal screenings, one obstetric ultrasound, one Group B streptococcus screening at 35-37 weeks as well as two consultation sessions on prenatal

and postnatal care. Subsidies are also provided for prenatal genetic diagnostic tests. In 2016, expectant mothers underwent an average of 9.48 of the 10 prenatal screenings, while 98.7 percent and 97.7 percent took at least one of the screenings and at least four of the screenings, respectively. The same year, Taiwan's maternal mortality rate was 11.6 deaths per 100,000 live births. When compared to the 2015 rates among Organization for Economic Cooperation and Development countries, Taiwan ranks sixth lowest.

Full child immunization

Vaccination is a vital method of preventing illness and eradicating communicable diseases. For childhood immunization programs, Taiwan currently covers the BCG (Bacillus Calmette-Guerin),

chickenpox, DTaP (diphtheria, tetanus and acellular pertussis), hepatitis A and B, inactivated polio, influenza, Japanese encephalitis, MMR (measles, mumps and rubella), PCV (pneumococcal conjugate vaccine) and pentavalent vaccines.

These are administered by some 373 health centers and over 1,600 contracted hospitals and clinics nationwide. Due to the widespread availability of related services, Taiwan's vaccination rate is over 95 percent for common vaccines. The Centers for Disease Control under the Ministry of Health and Welfare is committed to maintaining high vaccination rates. Taiwan carefully monitors domestic and international development trends and strategies so as to consistently strengthen national immunization policy and introduce new vaccines as appropriate.

Health-seeking behavior for pneumonia

Pneumonia care for patients under 5 is a key indicator of treatment standards, as acute respiratory infections (ARI) are one of the leading causes of death for this age group worldwide. NHI premiums for children under 5 from middle and low-income households are fully subsidized by the government so as to lessen the financial burden on families as well as protect disadvantaged children. Another



government program subsidizes inpatient and outpatient services for all children under 3 from all income backgrounds. Owing to these measures, all children under 5 diagnosed with ARI in Taiwan are able to receive appropriate medical care.



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GLOBAL DEVELOPMENT AND ASSISTANCE

I. PREFACE

Taiwan's aid to other countries began in 1959 with the dispatch of the first Taiwanese overseas aid agricultural specialist to Vietnam. This was a time when Taiwan still had wider international support.

Over the course of nearly 60 years, the nature of Taiwan's overseas aid has developed from basic agriculture and aquaculture technologies and advice on craft skills to financial investment and loans. Taiwan has also set up scholarships and training centers to help diplomatic allies cultivate various types of human resources, improve the healthcare environment and public health services, and provide humanitarian aid. These achievements were made by the Taiwanese government in conjunction with private enterprises and have been highly recognized and appreciated by diplomatic allies.

II. SAFEGUARDING GLOBLE HEALTH

In line with the international effort to achieve the Sustainable Development Goals (SDGs) and ensure that people of all ages, especially infants and children, have access to medical services, Taiwan for children under 5 from middle and lations particularly in Africa, Asia, Central and South America, and the South Pacific. Acting both in residence and as mobile medical teams, these professionals have provided clinical care, offered sanitation education, and provided training in midwifery and medical management. They have also

worked where needed on projects to improve the health of pregnant women and infants.



ICDF Mobile Medicare Team

After serving as a military doctor, Dr. Chi-Fu Chen was sent by the Ministry of Foreign Affairs to Guinea-Bissau and then to São Tomé and Príncipe for a total of 13 years. His tireless efforts to fight malaria in São Tomé and Príncipe earned him the nickname "Mosquito Doctor". Dr. Chen and his achievements against malaria are a true testament to Taiwan's success in medical diplomacy.

After returning to Taiwan in 2014, Dr. Chen put to use his extensive experience in overseas aid and his contacts with humanitarian volunteers from countries across the world when he started to draft the Taiwan Overseas Healthcare Support White Paper for the International Cooperation and Development Fund (ICDF). Dr. Chen visited every hospital listed in this white paper, and in the end he successfully brought 29 Taiwanese public and private hospitals together in consensus and founded the International Healthcare Cooperation Strategic Association (IHCSA) on 14 February 2006. (The number of participating hospitals has since risen to 37.)

The hospitals put aside all preconceived ideas and notions of self-interest to invest their resources in international humanitarian aid. All of them abide by the principles that "healers should heal with a

benevolent heart” and “love has no boundary”. Nowadays, the quality of medicine in Taiwan has reached a sufficiently high level that Taiwan can make significant contributions to the international community.

Taiwanese overseas healthcare aid has also evolved from long-term on-site stationing to mobile units that are dispatched according to need. Currently, the ICDF still maintains long-term dedicated medicare teams in three African countries: Burkina Faso, Swaziland, and the Democratic Republic of São Tomé and Príncipe. The ICDF has also built specific support systems in Taiwan, and currently 19 medical centers and 18 regional hospitals in Taiwan are providing healthcare support to 19 diplomatic allies through regular clinical technology exchanges.

By October 2010, a total of 37 public and private hospitals had joined the IHCSA. Over the past five years, the ICDF has sent 88 mobile medicare teams and over 600 workers to 24 countries for humanitarian aid and clinical technology transfer, providing access to healthcare resources to over 140,000 people in impoverished nations.



North India (2005.12.02-12.25)

Kingdom of Swaziland(2006.03.26-4.05)

Republic of Panama
Republic of Guatemala
(2006.04.18-5.16)

Republic of the Marshall Islands
(2006.06.08-06.20)

Republic of Kiribati
Republic of the Fiji Islands
(2006.07.03-07.21)

Republic of Palau(2006.08.08-08.16)

Independent state of Papua New Guinea(in Port
Moresby)(2006.08.16-08.25)

Independent state of Papua New Guinea(in Wewak)
(2006.08.23-09.01)

Solomon Islands(2006.09.18-09.29)

Tuvalu(2006.09.23-10.07)

Republic of Nauruz(2006.10.09-10.22)

Republic of the Marshall Islands(2006.10.29-11.12)

Republic of Guatemala
Republic of Honduras(2006.11.15-12.15)

III. BUILDING MEDICAL CAPACITY



Among the Sustainable Development Goals (SDGs) is helping developing countries improve their medical care and train healthcare professionals. Through its experiences of setting up a nationwide healthcare system and establishing a medical center ratings system, Taiwan has, in recent years, begun working with developing countries to improve their medical information and management systems. In Belize, Taiwan has worked to prevent kidney failure, while in Paraguay, it has been active in improving medical information management. Taiwan has also not been remiss in helping partner nations upgrade their medical equipment, donating over 5,000 pieces of such equipment to 32 countries in Asia, Africa, Central and South America, and the South Pacific since 2005.



Taiwan has hosted over 1,500 medical personnel from 59 nations seeking to further their medical training since 2002. Among these has been a Fijian psychiatry student who studied at Mackay Memorial Hospital. A short training course in 2014 gave him greater professional confidence, and, by considering how Taiwan had grown from being medically underserved decades ago to a global health leader today, a vision of what medicine in Fiji could become.



Taiwan Health Corp



History

At the end of 2005, Taiwan took action to dispatch the first medical treatment to a refugee camp in Western India to discover an appropriate niche for the medical personnel to participate. Although the staff there had never officially undergone any medical training, as long as they have at least the most basic/fundamental training in healthcare capacity, the state of affairs in local healthcare can be improved with immediate and transformational results.

However, due to the lack of governmental funding, we were unable to provide medical treatments services to countries in Africa with whom Taiwan has diplomatic ties. In response, an enthusiastic/passionate group of medical personnel was formed in 2007, each year voluntarily bearing the financial burden of an air ticket, living/accommodation expenses and fees, along with raising money for medical supplies (raising NT\$250,000 in a short amount of time), to cover the most basic, local medical treatment care, medical treatment services and health education.

In 2010, it became reasonable to make public For the first time and under widespread media acclaim, a team of enthusiastic medical personnel went to Nepal under the name of Taiwan Health Corps,

THC. In May of 2011, “Taiwan Health Services Association” was founded with the purpose of providing training for international healthcare medical treatment staff. Under Doctor Lee’s guidance, 34 original doctors made great and continual effort; we look forward to adding even more medical affairs personnel our principal association. Due to the shortage of resources for medical treatments in the overseas regions, by allowing trainees to learn through hands-on training, we can provide the local people with participation in healthcare services training, to allow the world to see Taiwan’s contribution toward worldwide health work so the world can witness Taiwan’s contribution toward worldwide health work.



Core value

Holding sustainable health care ability construction and function enhancement as the core value, we provide medical service with the locals.

Reach the goal of clinical technique transfer via mutual exchange and interaction. Further on improve the medical service quality in that region.

Service

- 1.To provide resources in medical treatments and healthcare instruction to overseas regions with shortage.
- 2.To develop manpower resources through exchange of medical treatment services, with the goal of achieving improvement in clinical skills, so as to continue to train local personnel in the most basic hygiene healthcare ability.
- 3.To strengthen and store up our country’s practical experience and ability to provide international hygiene and medical treatment aid.
- 4.To gather data on illnesses.
- 5.To assess/evaluate the medical treatment industry.

1. Bangladesh orphanage healthcare project (2013-2014)

Background

The ICDF received a request from the Dharmarajika Buddhist Monastery in Dhaka, Bangladesh, to help them restore the 25-bed health center adjoined to their orphanage. The ICDF sent experts to Dhaka to assess the situation and negotiate an agreement. In the end, it was decided to build a new healthcare center to provide healthcare resources for up to 1000 people, train healthcare personnel, and provide healthcare services. This project aimed to improve the orphanage's basic healthcare capabilities through healthcare training and the provision of healthcare services to staff, teachers, and children, and then to improve the general healthcare environment of the monastery and the surrounding ghettos.

Project Goals

1. Educate and train the monastery's teachers and children in basic healthcare skills and personal hygiene monitoring.
2. Improve the health condition of children in the orphanage through constant short-term healthcare services.
3. Build a frontline health center with basic healthcare capabilities.



3.India Bodhgaya healthcare center enhancement project (7-15 June & 15-23 November 2014)

Background

In April 2012, our organization went to the Bodhgaya region in India to evaluate a healthcare center built by Root the Institute. The evaluation concluded that the Root Institute's healthcare project was sufficiently wide-ranged but lacked expertise; thus, we decided to help the center enhance its clinical capabilities by focusing mainly on continuing to build human resources and enhance clinical capabilities, and then going on to help local healthcare professionals develop their skills, enhance the clinic's service capacities, and improve local residents' health.

Achievements/outcomes

- 1.Accompanying healthcare center personnel on mobile medical service to neighboring villages.
- 2.Carrying out regular inventory of medical equipment and medications.
- 3.Giving vaccination demonstrations.
- 4.Purchasing a refrigerator for drug storage.
- 5.Sponsoring salaries for the dentists in healthcare center.
- 6.Providing 13 public health lectures.



Indian medical personnel came to Taiwan for further training

Ms. Abha Kumari, the healthcare center physiotherapist, came to Taiwan on 4 July 2014. Our organization organized her training in the physiotherapy department at Tri-Service General Hospital, Neihu Branch. She completed her training and left Taiwan on 2 October 2014.



4.Himalayan region basic healthcare training (10-22 January 2016 & 15-29 January 2016)



Background

Our organization has been active in the Himalayan region for years and have learned about the critical lack of medical resources in rural mountain areas, where residents not only live in poverty but also suffer from serious health conditions.

Without easy access to immediate medical assistance to deal with injury or disease, this leads to a vicious cycle that wastes time and effort in getting access to medical resources.

Our research uncovered thousands of small and large Tibetan Buddhist temples in the area which act as religious centers for local residents, who go there seeking almost every kind of assistance.

Poor families even send their children to temples at a very young age to become monks. In some ways, these temples have become the nurseries and education centers of the area. Some of the bigger temples contain 300-400 lamas, while the smaller ones still contain up to around 100 lamas between the ages of 5 and 20.

However, due to a long-term lack of nutrition and basic healthcare knowledge, the temples have to shoulder a tremendous burden.



Thus, our organization made plans to systematically train the basic healthcare personnel of each temple. The plan was aimed at improving the health of the monks and also transforming the temples into the first line of medical aid for residents from surrounding villages.



Project Goals

We focused on building healthcare capabilities through both informational courses and hands-on practice.

Service Achievement

A total of 28 nuns from 7 temples in Nepal, Bhutan, and India (Darjeeling, Himachal Pradesh, and Sikkim) attended the first training course and received certificates.



5. India Darjeeling mountain area healthcare program (23 May–7 June 2015)

Background

In April 2014, in order to improve the quality of medical and healthcare services in the Darjeeling mountain area and the settlement area in Tibet's Sikkim province, our organization visited these areas and made an in-depth evaluation, the conclusion of which was that these rural mountain areas have a critical lack of resources and have no medical or healthcare system. In May 2014, we decided to provide assistance to improve healthcare in these areas.



Project Goals

1. Helping to improve the functioning of the healthcare center in the Sonada Tibetan settlement area.
2. Enhancing healthcare education and student personal health in Sonada Tibetan schools.
3. Training local healthcare personnel in clinical healthcare skills.

Nature of Services

1. Medical services:

Providing 6 short-term medical services in areas around Darjeeling, including the CST Kalimpong retirement center, the Sonada settlement office, and centres in Rimbick and Ghum. In total, 851 people were registered and examined.

2. Common diseases in the area:

(1) Osteoarthritis (OA)

Our medical team frequently received middle-aged female patients with symptom including pain in the neck, shoulder, hip, and knee, and lack of energy. The patients' lifestyle included carrying heavy loads for long periods and standing or walking for long periods. Many patients were old and a small number were overweight.

(2) Eye diseases

Cataracts are the main cause of blindness among local inhabitants, and the main reason for reduced vision is refractive error. We used medical intervention programs to provide residents with operations to reduce the chance of blindness and incapacitation. Health education about eye disease is also very important. Preventing eye disease (e.g. refractive error) and screening for incurable chronic eye disease are achievable goals.

(3) Diseases of the digestive system

Peptic ulcer sufferers were able to reduce symptoms by taking NSAIDs type analgesics and maintaining a regular and moderate diet, including eating slowly and chewing carefully. Patients were helped to improve nutrition and reduce the intake of foods that worsen symptoms, with a special emphasis on giving up smoking and limiting alcohol consumption.

Medical Course

Providing the following basic medical courses in Tibetan schools:

- 1.CPR (with practice)
- 2.Heimlich maneuver
- 3.How to check for vital signs
- 4.Hemostasis for wounds, wound treatment, incision, and packing of wound, frontline treatment for fractures.



IV. HUMANITARIAN MEDICAL AID



Taiwan has been active in providing nations struck by natural disaster with medical aid and relief supplies, and helping them rebuild, since the 1980s. This commitment was redoubled following the overwhelming international response to the major earthquake that struck Taiwan on September 21, 1999. Accumulated government and private donations provided by Taiwan now total over US\$1 billion. The results of Taiwan's efforts in this vein can be seen the world over.

Two instances when Taiwan lent a helping hand are of special note as they highlight the compassion and magnanimity of Taiwan's people. In 2008, when southwestern China suffered a massive earthquake, the government and people of Taiwan donated a collective US\$230 million, a figure second only to Hong Kong's. In 2011, when Japan also

suffered a devastating earthquake, Taiwan's donations exceeded US\$200 million, and were the greatest cash donation provided by any nation. These totals do not extend to include the cost of donations in kind, and of personnel dispatched to lend a helping hand. Taiwan's efforts were met with a wellspring of gratitude among the Japanese people.

Emergency Relief for Major Flooding in Sri Lanka

On May 26, 2017, Sri Lanka was devastated by its most severe flooding in 14 years, causing 244 deaths and affecting more than 179,000 families, with 698,000 people evacuated from their homes. On May 26, 2017, Sri Lanka was devastated by its most severe flooding in 14 years, causing 244 deaths and affecting more than 179,000 families, with 698,000 people evacuated from their homes.



When Buddha's Light International Association World Headquarters President Most Venerable Hsin Bau and BLIA World Headquarters Acting President Ven. Tzu Jung heard of this disaster, they immediately



instructed BLIA World Headquarters to donate US\$10,000 in emergency relief funding and directed the Buddha's Light Rescue Team to provide humanitarian aid. BLIA World Headquarters Secretary General Ven.

Chueh Pei instructed the Buddha's Light Rescue Team to initiate a three-in-one rescue response comprising medical aid, general supplies and humanitarian assistance.



Before they set off, BLIA World Headquarters President Most Venerable Hsin Bau conferred June 1 the rescue mission flag to the Buddha's Light Rescue Team at Dong Zen Temple, Malaysia. Coordinated by BLIA World Headquarters Vice Secretary-General Southeast Asia Ven. Chueh Cheng, a team of doctors, nurses and first-aid specialists led by Ven.

Ru Xing went to Sri Lanka June 2. Close to the flooding site in Sri Lanka, BLIA Sri Lanka Monastic Advisor Ven. Chueh Men and President Ven. Xin Xi led 40 members and volunteers in gathering spices, dry food, tea, bedsheets, pillows and cleaning supplies for the emergency relief effort.

The Buddha's Light Rescue Team delivered emergency relief supplies to Kalutara and Matugama in western Sri Lanka and Galle and Nagoda in the south, helping ease the suffering of disaster victims.

Medical aid further helped to resolve various illnesses brought by the flooding. The arrival of the Buddha's Light Rescue Team warmed the hearts of the victims. In four days, the Buddha's Light Rescue Team went to seven disaster areas to help 371 families, benefiting more than 5,141 people with its emergency relief efforts.

Loan's Long Ride: How a Vietnamese Girl Fulfilled her Dream



“Daddy, I can finally ride my bike to school!” Dancing with excitement, the 13-year-old girl, Loan, just fulfilled a dream she had had since she was little. Seeing Loan’s joy, A-De, Loan’s father, had complex feelings. “Being poor with four children to raise, I could not afford the medical expenses for Loan’s treatment,” A-De said. “Fortunately, Loan did not need to get an amputation; otherwise, I would have felt guilty for the rest of my life.” Loan suffered from congenital lower limb lymphedema. The disease caused her lower limb to swell up to the size of an elephant’s leg, drawing peculiar looks. As a result, Loan experienced mental anguish. Her most critical conditions were bleeding from the rectum and severe deformity of certain organs such as the large intestine. These led to severe, life-threatening dysfunctions.

Unable to afford treatment for his beloved daughter, Loan’s father said he could only pray for a miracle.

According to A-De, Loan went to Ho Chi Minh City Children’s Hospital when she was 6 months old and was diagnosed with lymphedema. Loan had surgery; however, subsequent treatment did not go well. Medication could not get the condition under control and it got worse. In 2012, Loan received a donation of more than NT\$1 million (US\$34,340) from Taiwan businesspeople and underwent treatment at China Medical Hospital in central Taiwan’s Taichung City.

Her rectum and sigmoid colon hemangioma were resected. The deformity of her perineum was also corrected. As a result, she had 45

no more bleeding from the anus. Parts of the vascular lesions in left lower limb were also removed. Loan needed further surgeries on her thigh and waist. However, A-De did not have the money to continue the treatment. Back in Vietnam, Loan's left thigh became severely infected. When Loan sought treatment, her doctor recommended the amputation of her leg, adding that the procedure might be life-threatening. Worried and helpless, A-De could not afford the huge cost of care with the small income from his coffee farm. "We are Catholic. The only thing I can do is to pray sincerely every day," he said.



CMUH International Medical Service Center Seeks Sponsorship from Taiwan Businesspeople to Fund Loan's Second Surgery.

A miracle occurred in 2016. Aichi Chou, CEO of CMUH International Medical Service Center, and her team secured a donation of NT\$2.5 million from Hong Fu Industrial Group, which has operated in Vietnam for years. This made Loan's second treatment in Taiwan possible. Although life-threatening thrombus occurred unexpectedly during the surgery, Loan's operation was completed without any complications. More good news followed when the donation for her care was increased to NT\$4 million.



Dr. Chen Hung-chi and Dr. William Tzu-liang Chen, the president and vice president of CMUH International Medical Service Center, respectively, led a team consisting of chief physicians from the departments of pediatric cardiology, pediatric surgery, colorectal surgery, rehabilitation and plastic surgery in compiling a treatment plan that involved five interdepartmental reconstructive surgeries

They successfully treated Loan's lower limb lymphedema, which involved complicated issues related to the spleen, thigh, perineum and rectum. "Loan was a very brave girl in enduring pain after surgery and during rehabilitation," said Chen Hung-chi. Chou participated in every aspect



of the entire process and prayed sincerely when the life-threatening thrombus occurred. "We just wanted to save her life. Thank you, heavenly Lord. We did it," she said. William Tzu-liang Chen emphasized that this case highlights Taiwan's global medical contributions and the work of CMUH International Medical Service Center.

'Taiwan is the most wonderful place in the world.'—Loan

Wearing pretty new shoes and accompanied by her father, President Chen and his team, Loan returned to Vietnam in July 2017. "A big thanks to Grandpa Chen, Hong Fu Industrial Group and Taiwan," she said. "Taiwan is the most wonderful place in the world."

The family received lots of love from society during Loan's treatment in Taiwan. Now Loan is in fifth grade studying diligently, learning new words and memorizing Tang dynasty poems. "I want to be a teacher in the future so I can teach children how to write and help more people," Loan said. She helps look after her younger siblings, works on the coffee farm and rides her bike, fulfilling her long-held dream. She also plays with her friends joyfully, and she smiles again.







GLOBAL SNAKEBITE BURDEN

TAIWAN HAS MADE EFFORTS TO REDUCE SNAKEBITE MORTALITY NOW: 0.1%

I. PIONEERING EPIDEMIOLOGICAL RESEARCH INTO SNAKEBITES IN TAIWAN

In Taiwan it was once compulsory to report snakebites. In 1941, Dr Somei To first analyzed data reported to the Department of Police Administration and identified 12,645 cases including 839 deaths during the period 1904 period during lyzed data reported to the D snakebites during this 35-year period was 361.3 cases annually, and the average mortality rate was 24 cases per year. Nearly half of the victims were bitten by *Trimeresurus stejnegeri* (5,987 cases, 47.3%), followed by *Protobothrops mucrosquamatus* (3,283 cases, 26.0%), *Bungarus multicinctus* (894 cases, 7.1%), *Naja atra* (593 cases, 4.7%), *Deinagkistrodon acutus* (240 cases, 1.9%), and *Daboia siamensis* (45 cases, 0.3%).

Unidentified venomous snakebites were found in 1,600 cases (12.7%). The fatality rate following snake envenoming was 0.9% for *T. stejnegeri* bites, 8.4% for *P. mucrosquamatus* bites, 24.2% for *D.*

acutus bites, 2.2% for *D. siamensis* bites, 14.7% for *N. atra* bites, and 23.0% for *B. multicinctus* bites. The above-mentioned venomous snakes were subsequently recognized as the six medically important snake species in Taiwan.

II. STRATEGIES FOR IMPROVING SNAKEBITE MANAGEMENT

Since the 1950s, numerous researchers have joined the Taiwan government in adopting the following strategies to better manage snake envenomation.

1. Comprehensive evaluation of the distribution of venomous snakes;
2. Assessment of the potential risk of medically important venomous snakes;
3. Continuing epidemiological research into snakebites;
4. Governmental production of highly purified monovalent/bivalent antivenoms;
5. Establishment of standardized management protocol for all six medically important venomous snakebites.

The latest epidemiological study estimates that approximately 1,000 people suffered snake envenomation annually in Taiwan in 2002–2005. Moreover, Crotaline snakes (i.e., *T. stejnegeri*, *P. mucrosquamatus*, and *D. acutus*) accounted for more than 70% of the snake envenomations. Since 1986, the Taiwan government has produced four types of antivenom, all with F(ab., *T. stejnegeri*, P lyophilized form, namely a bivalent antivenom against *T. stejnegeri* and *P. mucrosquamatus*, a bivalent antivenom against *N. atra* and *B. multicinctus*, a monovalent antivenom against *D. acutus*, and a monovalent antivenom against *D. siamensis*. With continual improvement in the quality of antivenoms and the establishment of a standard snakebite management protocol by the Taiwan Poison Control Center, the percentage of snake-envenomed patients who received antivenom therapy has increased from 15% to nearly 100%. Consequently, the rate of fatalities from snake envenoming decreased from 6.6% to 0.1%.

III. RESOURCE REQUIREMENTS AND DILEMMAS

In Taiwan, the diagnosis of venomous snakebite depends primarily on the typical manifestations of various snakes as well as their distribution. Although the incidence of venomous snakebites varies by geographic areas and across studies, *T. stejnegeri* and *P. mucrosquamatus* bites are generally most common island-wide. By contrast, *D. acutus* and *D. siamensis* bites generally occur in the southern and eastern parts of Taiwan; whereas *N. atra* bites are most common in central Taiwan.

In addition, different snake bite wounds sometimes share similar features in their acute stage, which has led to diagnostic challenges for emergency physicians and clinical toxicologists, and inappropriate administration of antivenom or concomitant use of more than one type of antivenom has been observed in clinical settings. Moreover, in spite of the effectiveness of antivenom in lowering the rate of fatalities from venomous snakebites, it is less clear whether antivenom can really rectify tissue damage caused by certain snakes, such as *N. atra*.

The lack of a compulsory reporting system for venomous snakebites since 1945 has also led to inadequate monitoring of snake envenomation in Taiwan. It is also difficult to estimate precisely how much antivenom to produce and store given that the incidence of various venomous snakebites is not well known. Finally, the potential long-term sequelae of venomous snakebites and the effects of venomous snakebites among certain subpopulations such as the elderly, pregnant women, and children are less clear and warrant further study.

IV. PERSPECTIVES

1. Because antivenom is relatively expensive, the management of venomous snakebites requires prompt diagnosis and administration of antivenom; however, there continues to be a lack of commercialized serum venom assays in Taiwan. There is an urgent need for a rapid diagnostic test employing serum venom assay in order to increase diagnostic accuracy and avoid application of the wrong antivenom. Research focusing on serum venom assay should therefore be conducted.

The extent of tissue damage caused by certain snakebites (e.g., *N. atra*) and related venom components must be determined. Additional evaluation of the efficacy of specific antivenoms against those venom components should also be performed in order to permit better recommendations on the optimal dose of various antivenoms in the treatment of venomous snakebites in the future.

2. Patient response to antivenom following venomous snakebites varies significantly, even between patients with similar degrees of clinical severity. This is partly attributable to the variation in individual response to antivenom administration. However, in order to improve the care of patients with snake envenomation, the current severity assessment (which is based only on clinical manifestations) must be supplemented with the results of serum venom assay.

3. Venomous snakebite is a neglected tropical injury type that has caused many deaths and morbidities globally, especially in Southeast Asia. Taiwan's valuable experience of dealing with and strategies for managing snakebites will be helpful to other countries seeking better management of venomous snakebites.

MATERNAL, INFANT AND YOUNG CHILD NUTRITION

*IN TAIWAN MORE THAN
95%
OF JUNIOR SCHOOLS AND PRIMARY
SCHOOLS PROVIDE STUDENTS WITH WELL-
BALANCED SCHOOL MEALS*

*IN TAIWAN THE RATE OF EXCLUSIVE
BREASTFEEDING
OF CHILDREN UNDER 6 MONTHS OLD IS UP
TO 45%*

Women's and children's nutrition and health was a social policy issue during economic growth in Taiwan. Like other underdeveloped and developing countries that experienced a baby boom, there was a large

feeding and caring burden. Taiwan has dug itself out of this situation and set milestones, which are valuable for those countries which are still dealing with this problem.

I. TARGET INDICATORS

1. More than 90% of women underwent prenatal examinations at least 10 times, and more than 98% of women underwent prenatal examinations at least once.
2. In Taiwan the rate of exclusive breastfeeding of children under 6 months old was up to 45% in 2016.
3. Rate of school meal provision: more than 95% of junior schools and primary schools provided well-balanced lunch meals to students, and dietitians check that school lunches meet daily nutrition guidelines.
4. Promoting healthy eating behavior off campus: fast-food restaurants offer children's meals with low-fat (<30% of total energy), low-added sugar (<10% of total energy), low-sodium (<400 mg) and low-saturated fatty acids (<10% of total energy).

II. TAIWAN'S MAJOR POLICIES ON INFANT AND CHILD HEALTHCARE

1. Prenatal Examinations for Pregnant Women

The Health Promotion Administration (HPA) offers pregnant women 10 prenatal examinations through medical institutions contracted under the National Health Insurance program. The pick-up rate of this service has been in the region of 90%.

In 2016, on average 94.8% of pregnant women who subsequently had a live birth visited an antenatal clinic 10 times.

2. Creating a Breastfeeding-Friendly Environment to Increase the Rate of Breastfeeding

The (HPA) has implemented a baby-friendly hospital accreditation system as a way of fostering positive change in hospitals. In particular, hospitals are asked to implement the Ten Steps to Successful Breastfeeding to help normalize breastfeeding. In 2015, a total of 182

medical institutions were certified as baby-friendly hospitals, and 80.7% of babies born in Taiwan in 2015 were delivered in these baby-friendly hospitals, a big jump from 39.2% in 2004. During the same period, the percentage of babies aged under 6 months who were exclusively breastfed rose from 24.0% to 45.4%, and the percentage of babies aged under 1 month who were exclusively breastfed rose to 67.5% in 2015.

To make workplaces as breastfeeding-friendly as possible, the HPA joined forces with local public health authorities to help companies set up breastfeeding rooms. The Labor Laws and Act of Gender Equality in Employment also made workplaces provide lactation rooms and staggered breaks for breastfeeding mothers, which were intended to foster a working environment suitable for breastfeeding mothers. By the end of 2016, about 53.6% of working mothers indicated that they had breastfeeding rooms in the workplace (of which 60.8% indicated that they had used the rooms); 80.8% indicated that their workplace supported breastfeeding or expressing milk.

3.Implementing the Public Breastfeeding Act

Taiwan promulgated the Public Breastfeeding Act on November 24, 2010. This Act stipulates that no person can prohibit or prevent a mother from breastfeeding in a public place, or force her to leave for doing so. The Act also stipulates that public places be equipped with breastfeeding rooms and clear signage.

Railway stations, airlines, metro interchange station, public utilities, department stores, and retail stores must all be equipped with breastfeeding rooms.

On December 3, 2013, it was officially ordained that trains (both regular and high-speed rail) must be equipped with breastfeeding rooms.

By the end of 2016, a total of 3,122 public places across Taiwan had been equipped with breastfeeding rooms in accordance with these new regulations, and facilities were voluntarily set up in 918 public places.

4. Establishing Pregnant Women Care Centers

On the principle of comprehensive health care, we provide prenatal and postnatal advice for pregnant women and their families through our national free hotline (0800-870-870), our cloud pregnancy app, and our pregnancy-care website. We provide health information in response to queries about parent-child health, breastfeeding, pregnancy nutrition and weight management, promotion of infant health, physical and mental adjustment, emotional trauma, and referrals for health counseling, care and support services. The hotline received 18,761 calls in 2015, and the website received 2,324,661 hits.

5. School meals at primary school and below

In 1957, when we started providing students with school meals, only five schools took part in the program. By 1992, this had risen to 1,767 schools. The Ministry of Education started the Development and Improvement of National Primary School Lunch for Five Years Project in 1981, and 80% of primary schools and kindergartens joined the program. By 2014, more than 95% of primary schools and kindergartens were providing healthy lunch meals to students.

The School Health Law stipulates that school meal providers produce meals that are hygienic and safe for consumption, as well as implementing nutrition education and ensuring the meal production is assessed by dietitians. In addition, dietitians must check that school lunches meet daily nutrition guidelines. By strengthening the role of dietitians as health promoters on the school campus, and formulating strategies for the improvement of school nutrition education, we encourage students to implement healthy eating behavior on and off campus.

In order to encourage people to increase their intake of fruit and vegetables, we have advocated a weekly Healthy Vegetable Day be implemented in elementary and junior high schools. We have promoted healthy lunchbox certification with “more vegetable, lower calories” and guided the government and the public sector in choosing healthy lunchbox meals. Survey results show that 72% of high schools at vocational level and below promoted at least one vegetarian meal per week.

To improve the care of economically disadvantaged students who are unable to afford lunch expenses and to prevent this affecting students' learning and growth, the government has repeatedly lowered eligibility criteria and applicable targets for economically disadvantaged students, thus increasing the number of financially disadvantaged students who get lunch subsidies. In 2005, 524,803 students got lunch subsidies.

6. Promoting healthy eating behavior off campus

We introduced a policy of restricting advertising and promotion of fast-food restaurants with children's meals where fat accounts for more than 30% of total calories, added sugar accounts for more than 10%, or saturated fatty acids account for more than 10% of total calories, or that contain more than 400 mg sodium. This policy encouraged fast-food restaurants to provide healthier meals, and now fast-food restaurants in Taiwan offers several children's meals with low fat, low added sugar, low sodium and low saturated fatty acids. They have joined the fight to protect children's health and prevent children from developing diet-related noncommunicable diseases.

The HPA has regularly conducted nutrition and health surveys in Taiwan and has published the results. It monitors nutrition status and bodyweight trends using systematic and sustainable methods, and establishes evidence-based national nutritional policies.

Trans-fat-free policies are undertaken in co-operation with the Health Promotion Administration and TFDA. To protect public health, partially hydrogenated oils (PHO) have been prohibited from use in food products since July 1, 2018.

To make it easier to choose healthy food, the HPA promotes clear, easy-to-understand nutritional labeling that includes calorie counts, and encourages restaurants to provide calorie counts on menus.

MHEALTH IN TAIWAN

I. PREFACE

Taiwan is one of the most innovative and productive countries in information technology in the world. Since the 1980s, hospitals and healthcare systems in Taiwan have been implementing the Healthcare Information System for healthcare and hospital management. Digital technology applications in the healthcare system provides highly efficient and low-cost healthcare in Taiwan, and this is also one reason for the success of the National Health Insurance (NHI) program. More than 400 hospitals and 40,000 GP clinics now use electronic medical records (EMRs) and the digital healthcare information system.

In addition to the healthcare information system, information communication technology and mobile health (mHealth) have been deployed for healthcare in Taiwan, including clinic appointment management, a diabetes care program, and a wound care program. Personal Health Records (PHRs) have been gradually built up using EMRs and Ordinary Living Data as they are collected and are then made available for further applications. In the light of the need for personalized healthcare, Taiwan has used PHRs to develop artificial intelligence healthcare services. In addition to mHealth in personal healthcare, mHealth is also used to provide public healthcare services such as infectious disease control (e.g. influenza) and health promotion programs.

II. MHEALTH IN TAIWAN HEALTHCARE

Diagnostic and treatment support systems are often designed to give advice to medical personnel in remote areas about patient diagnosis 59

and treatment. Some projects provide mobile phone applications to help health care workers make diagnoses, and others provide patients with the diagnosis directly. In telemedicine, the patient takes a picture of the wound or disease symptoms and the remote doctor makes a diagnosis and gives advice on treatment. Diagnostic and therapeutic support programs are both being used to reduce expenditure of time and money for patients in remote areas.

This involves building networks that interconnect healthcare workers and enable them to interact with medical institutions, the Ministry of Health and Welfare of Taiwan and other medical information agencies. Such projects also require the use of mobile phones for better organization and “face-to-face” (though not in-person) training. The improved communication project is aimed at increasing knowledge transfer among health care workers and improving patient outcomes through measures such as patient referral procedures.

The mHealth service is widely used in Taiwan hospitals to manage appointments and the continuing care program after patients are discharged. It gives people convenient and easy access to healthcare facilities and provides a seamless, lag-free service.

Projects in this area are designed to use mobile phones to quickly and inexpensively collect and transmit data with relatively high efficiency. Data on the location and level of specific diseases (such as flu) can help the medical system, the Ministry of Health and Welfare, and other organizations to determine disease outbreaks and better deploy medical resources to areas most in need. These projects are particularly useful in emergencies, when it becomes imperative to identify the most places that most urgently require medical care.

III. MHEALTH FOR CONTROL OF CHRONIC DISEASES

Remote monitoring and treatment support can facilitate ongoing patient care. Recent studies also appear to show the efficacy of using smartphones to induce positive and negative moods. In an environment of limited resources and beds, telemonitoring, when properly set up during “outpatient” training, can enable healthcare personnel to better track patient status, maintain drug treatment plans, and arrange follow-ups. These features can use one-way or two-way communication systems. Remote monitoring has been used

in the treatment of cardiovascular disease and chronic lung disease and in the administration of diabetes medication.

In summary, the use of mobile telephony in health care (combined with web-based interfaces) has better convenience and efficiency of data collection, transmission, storage, and analysis management than paper systems. Formal research and preliminary project evaluations show that mobile technology improves the efficiency of healthcare services.

IV. PRIVACY PROTECTION

Although the EMR and mHealth have made rapid progress in Taiwan healthcare, the Taiwanese government strives to protect the privacy and security of personal data. Personal data protection legislation was passed in 2000 and is particularly relevant to healthcare data.

V. FUTURE PROSPECTS FOR MHEALTH

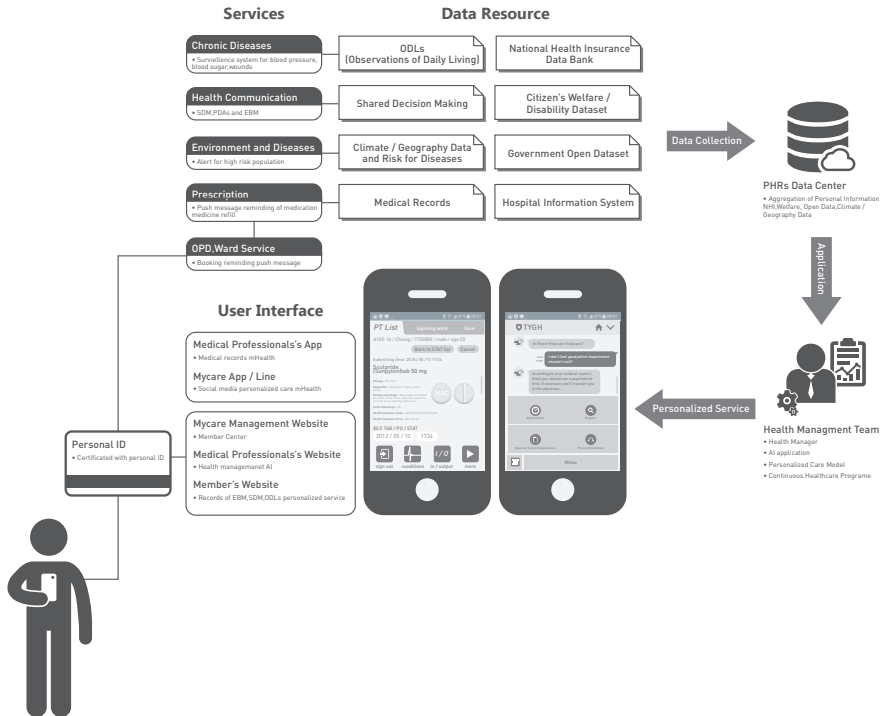
The National Health Insurance Program in Taiwan is well-known for its high performance, high efficiency, high quality, and low cost. Information technology is also playing an essential role in Taiwan's successful healthcare system. Taiwan may be one of the best models in the world for the use of digital technologies in health service delivery and public health.

VI. FUTURE APPLICATIONS FOR MHEALTH

1. Emergency response systems (e.g., road traffic accidents, emergency obstetric care)
2. Human resources coordination, management, and supervision
3. Telemedicine diagnostic and decision support for remote clinicians
4. Clinician-focused, evidence-based formulary, database, and decision support information available at point-of-care
5. Pharmaceutical supply chain integrity and patient safety systems
6. Clinical care and remote patient monitoring

7. Shared Decision Making and health-related mLearning for the general public
8. Training and continuing professional development for health care workers
9. Health promotion and community mobilization
10. Support for long-term conditions, e.g. medication reminders and diabetes self-management
11. Peer-to-peer personal health management for telemedicine
12. Surgical follow-up, e.g. after major joint arthroplasty

Digital Personalized Healthcare



IMPROVING ACCESS TO ASSISTIVE TECHNOLOGY

TAIWAN GIVE DISABLED PEOPLE HOPE

I. PREFACE

The follow-up care system and resources for disabled people in Taiwan has been built through cooperation between the government, NGOs, and universities. In addition to offering assistive technology services, these organizations also hold academic seminars and research programs and offer professional consultation services. They help people to rebuild their confidence and independence, enabling them to get back to normal life as soon as possible.

Some of these organizations are described below:

II. CENTER FOR ASSISTIVE TECHNOLOGY RESOURCES AND POPULARIZATION (CATR@P)

Origin

In 2001, the Ministry of Interior commissioned the Research Center on International Classification of Functioning, Disability and Health and Assistive Technology (RICFAT) at National Yang-Ming University to set

up and manage the 1. Center for Assistive Technology Resources and Popularization (CATR@P). With the reorganization of the Executive Yuan in July 2013, the center's competent authority was changed to the Social and Family Affairs Administration under the Ministry of Health & Welfare.

CATR@P serves central and local governments and Taiwanese society by providing professional consultation on services, research, development and application of assistive technology (AT) for disabilities, special education, job accommodation, healthcare, rehabilitation and long-term care, and by assisting in policy making. CATR@P helps central and local governments to build networks of local AT centers all around the nation and provides seamless support to enhance AT services. CATR@P's mantra is, "Think Globally, Act Locally", and its vision is to show the Taiwan experience of AT services to the world.

In 2016, a total of 499,305 persons with disabilities received assistive technology services and 88,860 obtained subsidies for assistive devices. We also adopted the ISO 9999 classification and terminology of assistive products for persons with disabilities as a national standard and have been providing assistive technology services based on the ICF and ISO 9999 frameworks.

Mission

CATR@P is a national center for the integration and popularization of assistive technology resources. It plays a key role in the formulation of national policies of assistive technology and education and the development of assistive technology related affairs. To enhance the quality of life of people with disabilities, CATR@P assists the central government in improving the quality and widening the reach of assistive technology services. CATR@P's major tasks include:

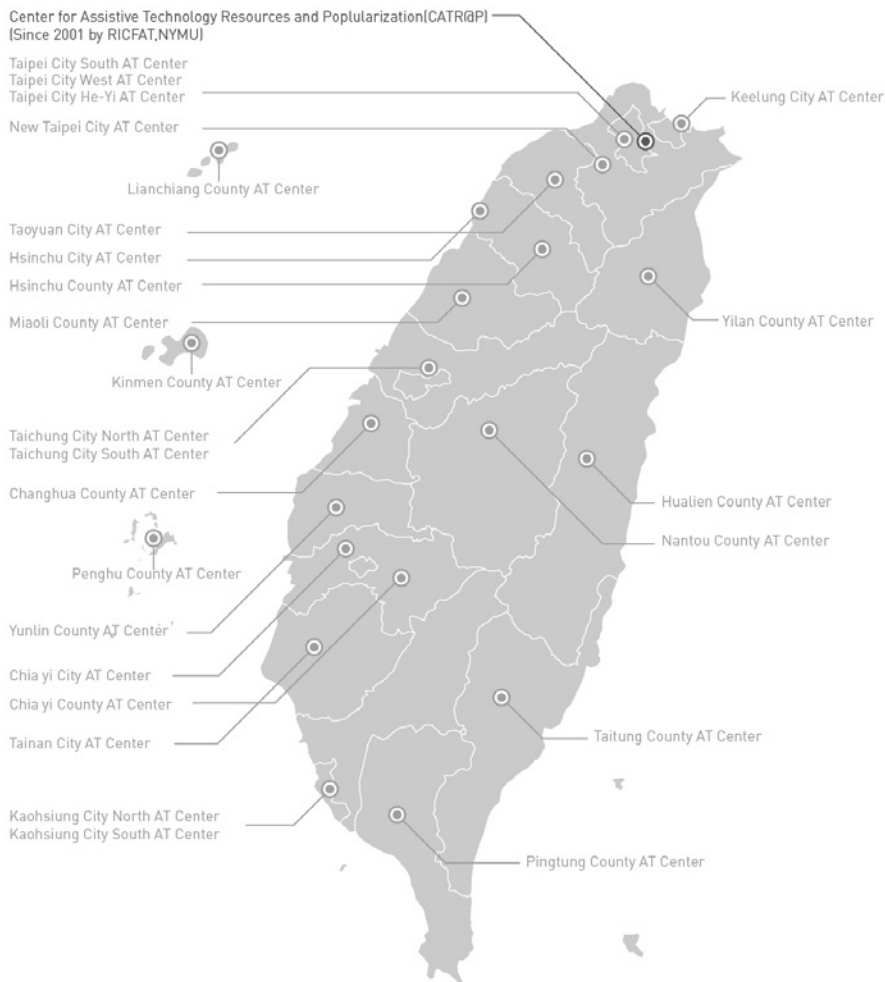
1. Popularizing assistive technology and educating the public on its use
2. Integrating assistive technology resources among users, professionals, academia, industries, & central and local governments

Services

1. Assistive Technology Resource Portal (online service).

64 2. Guided tours of exhibition hall of assistive devices.

CATR@P & Local AT Resource Center



3. Publication of the Journal of Assistive Technology (the first assistive technology journal in Taiwan), e-paper on Assistive Technology, and public education flyers & pamphlets.
4. Public information events on Assistive Technology and AT services.
5. Assistive Technology education, development, and professional credential check.
6. Research on Assistive Technology national policies and regulations of.
7. Communication platform for users, professionals, academia, industries, & government.

III. ASSISTIVE TECHNOLOGY COMMUNICATION AND INFORMATION CENTER

Origin

Speech and Hearing Impairment Resource Center

According to the March 2006 Department of the Interior report on the “Protection of the Physically and Mentally Handicapped”, 946,944, or approximately 4.15% of Taiwan’s population, possess a national physical or mental disability card”.

As for specific disabilities, 100,174, or 10.6% of all registered disabled people, have some form of communication disorder; approximately 11,766 individuals have speech or language disorders (1.24% of total). Disorders of hearing include congenital and acquired, conductive, sensorineural, central, mixed, and psychogenic hearing loss, deafness, cochlear implants, etc. Speech and language disorders include voice, phonological and fluency disorders, as well as aphasia, developmentally delayed language disorders, learning disorders affecting language development, specific disorders of expressive language or of language processing, etc.

The Department of the Interior has asked the Speech-Language-Hearing Association of the R.O.C. (SLHA-ROC) to set up the Domestic Affairs Bureau Center for the Promotion of Assistive Resources for Individuals with Communication Disorders in order to provide people with speech, language, or hearing disorders with access to professional help and other resources.

The SLHA-ROC is a professional association with over 100 members throughout Taiwan, including Speech-Language Pathologists, Audiologists, Otolaryngologists, and Special Education Professionals. Numerous companies are also involved in assistive and rehabilitation services and the manufacture of products for individuals with communication disorders.

The Resource Center is well-equipped to provide people with communication disorders with prompt and effective professional services, to respond to clients’ needs, to increase the depth of support, and to add to the array of available resources.

Mission and services

Persons with various physiological difficulties have a range of assistive devices to choose from—devices which can help to significantly reduce a communication disorder’s negative impact of on daily life. The Speech and Hearing Association of the R.O.C. brings together related professional organizations, individuals, and integrated speech-language and hearing disorder assistive resources to provide a comprehensive and professional service network. Professionals from every county and city have been actively encouraged to take part in local assistive resource centers.

Academic specialists have also contributed to the work of the communication assistance research initiative branch, and there has been an increase in the number of experienced speech-language pathologists associated with the center, based in both counties and cities, enabling the center’s service branch to gather momentum and extend and develop its long-term operations, thus providing great opportunities for people with speech, language, and hearing disorders.

Meanwhile, manufacturers who are incorporating communication disorder assistive devices are providing clients with more resources to choose from, including a professional consultation service. A dialogue platform is currently being set up and will involve users, manufacturers, and city representatives. This platform will give the government a way to promote assistive resources and so better position itself to respond to public demand. This will aid manufacturers in improving their products to better suit individuals with speech and hearing disorders, and will also help people with communication disorders receive wider therapeutic options and support, limit the negative effects of their disorders on their personal, professional, and social lives, and increase their overall quality of life.

IV. ASSISTIVE TECHNOLOGY RESOURCE CENTER FOR PEOPLE WITH FACIAL DISFIGUREMENT

Origin

Facial disfigurements have a direct or indirect impact on the individual, and sometimes even the whole family. By comparison with other types of disabilities, there is greater public reluctance to accept

people with facial disfigurement, and because assistive devices are still not widely used in Taiwan, there are limited options in this field. In addition, many users have been poorly prepared to make use of the assistive devices currently available, which greatly affects the quality of rehabilitation and makes it difficult for people with facial disfigurement to return to society.

The peculiarities of the human face make it very difficult to perfect facial surgery and other therapies for burn survivors. Current assistive devices such as pressure garment masks and facial masks are unsatisfactory in terms of materials, cost, and convenience. Meanwhile, people with non-burn facial disfigurements may not be provided with appropriate assistive devices that are useful for treatment.

The Sunshine Foundation was tasked with establishing the Assistive Technology Resource Center for People with Facial Disfigurement by the Department of the Interior in November 2001. This resource center aims to provide information on assistive devices to people with facial disfigurements, industry, the government, academia, and the general public. It functions as a hub that collects and organizes up-to-date information on the reality and challenges of living with facial disfigurement.

Mission and services

By providing information on assistive devices and popularizing their use, we aim to help people with facial disfigurements to become more independent, improve their quality of life, and find their place in society.

Goals

1. To provide clinical services to benefit people with facial disfigurements.
2. To understand the role of assistive devices and provide related services and advice.
3. To popularize facial assistive device technology and enhance the quality of service for assistive devices.
4. To provide up-to-date and accurate information to people with facial disfigurements, medical professionals, and the general public.

PANDEMIC INFLUENZA PREPAREDNESS FRAMEWORK

TAIWAN CAN HELP THE FRAMEWORKS.

I. PREFACE

The flu is a contagious respiratory illness caused by influenza viruses that infect the nose, throat, and sometimes the lungs. It can cause mild to severe illness, and at times can lead to death. We'll present the classical case to show its complication, including bacterial pneumonia. Besides, worsening of chronic medical conditions, such as congestive heart failure, asthma, or diabetes would be seen in aging people. The flu can be seasonal, and the first and most important step in preventing flu is to get a flu vaccination each year.

Center for Disease Control and Prevention

The Center for Disease Control and Prevention (CDC) also recommends everyday preventive actions (such as avoiding people who are sick, covering coughs and sneezes, and frequent handwashing) to help slow the spread of germs that cause respiratory illnesses like the flu, which affects the nose, throat, and lungs.

Taiwan has seen several kinds of seasonal communicable diseases. Our recovery rate in critical cases has proved that Taiwan has some of the best medical treatment in the whole world. But disease

prevention and health promotion make the best policy, so it is a matter of great importance for global health that Taiwan be able to collaborate with other countries on disease and health matters, and even that it be allowed to join the pandemic influenza preparedness (PIP) framework.

Politics should not get in the way of the fight against infectious disease, which knows no borders. Taiwan is a hub for international trade and travel, so isolating it from international health work is both risky and dangerous and clearly counterproductive to global health.

II. A CASE STUDY

A 29-year-old male with good hygiene habits and no special medical history who worked in administration and denied any relevant medical Travel, Occupation, Contact and Cluster (TOCC) history.

The man complained of shortness of breath and presented a cough, sore throat, and hoarseness for four days. In the first instance, he went to a clinic and received a Tamiflu shot. However, his symptoms became aggravated, and he suffered an intermittent fever with a dry cough and myalgia. He visited a clinic again and was prescribed amoxicillin and ibuprofen, but there was still no improvement. In the end, he was taken to hospital emergency for help.

He was acutely ill, presenting dyspnea and hemoptysis, and even showing signs of breathing with accessory muscles. The vital signs showed tachycardia and extremely desaturation (i.e. low blood oxygen). A chest physical examination revealed dull percussion, and auscultation revealed stridor with bilateral coarse crackling sounds during breathing. Respiratory failure was deemed to be imminent as the patient was critical even with the support of a non-rebreather mask at 15 lpm. The chest image showed severe bilateral consolidation and opacities.

After intubation for ventilator support, the patient was managed in the intensive care unit as suffering from adult respiratory distress syndrome (ARDS). The ventilator was set at high positive end-expiratory pressure (PEEP) with low tidal volume. The infection department was consulted and we reported the sample to the

Case Scenario

- Shortness of breath for hours
- Medication: Tamiflu from local medical doctor

T.O.C.C Negative
[Travel,Occupation,Contact,Cluster]

- Dyspnea and hemoptysis
- Breathing with accessory muscle use
- Stridor,bilateral coarse crackles

TPR: 35.7 / 125 / 38,BP: 106 / 62 mmHg
Oxygen supply by Non-rebreathing mask 15L / min

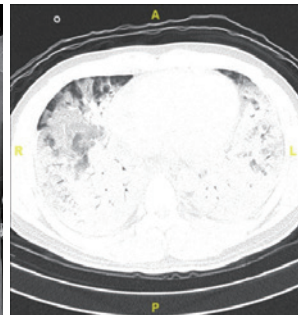
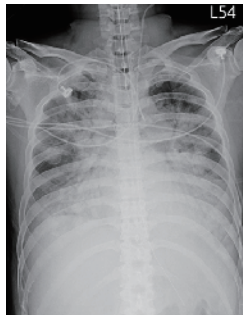
ABG		
PH	7.426	
PCO2	31.0	mmHg
PO2	44.3	mmHg
HCO3	19.9	mmol / L
O2SAT	82.1	%

Influenza virus A Ag	Negative
Influenza virus B Ag	Negative
Creatinine	2.12 mg / dL
ALT(SGPT)	119 IU / L
CPK	3583 IU / L
CK-MB	61 U / L
TROPONIN-T	27.1 ng / L

WBC	24.02	10 ³ / μ L
Neutrophil	85.0	%
Band	2.0	%
UER-CRP	15.660	mg / dL
LDH	1151	IU / L

Intubation
+
Ventilator, ICU care

Ceftriaxone
+
Moxifloxacin
+
Pevamivir



- No response to recruitment maneuvers
- On V-V mode ECMO

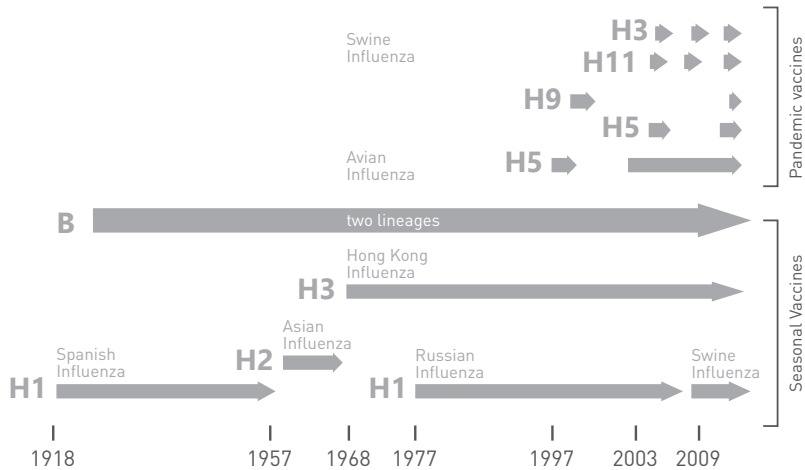
Adult respiratory distress syndrome

CDC: SwH1 influenza pneumonia

CDC. Peramivir was prescribed as influenza pneumonia was strongly suspected. Even after combined antibiotics therapy (Levofloxacin and Sawacillin, dosage as recommended on the label), the patient's condition became worse and the intubated patient did not respond to recruitment maneuvers. Subsequent laboratory data showed likelihood of multiple organ damage. The extracorporeal membrane oxygenation (ECMO) team was notified in time.

With veno-venous ECMO treatment, the patient came through the critical stage of his illness, and we switched to a combined antibiotics course of ceftriaxone and moxifloxacin and continued intensive chest care. The CDC report pointed to SwH1 influenza pneumonia. Oxygen demand was de-escalated, and the ECMO removed as the chest images showed improvement and the patient was put on a weaning protocol. After being successfully weaned off the ventilator, the patient was extubated and transferred to ordinary ward.

He was discharged from hospital and now has regular follow-up checks at a clinic.



III. BACKGROUND

In the past 100 years, influenza pandemics occurred in 1918, 1957, 1968, 1977, and 2009. Recent risk assessments show that influenza H7N9 and H5Nx are the two animal influenza viruses with the highest pandemic potential. Influenza H7N9 viruses in particular currently pose the greatest threat to human health. Vaccination is the most

cost-effective strategy to prevent damage caused by influenza pandemics. Pre-pandemic influenza H5 vaccines have been licensed, but no influenza H7N9 vaccine has been developed.

IV. ACHIEVEMENTS

Taiwan currently has one government-sponsored pilot plant (National Health Research Institutes, NHRI) and two private vaccine plants (AdImmune and Medigen Vaccines).

In the past 10 years, funded by Taiwan government, these three organizations have worked hard to develop influenza H5N1 and H7N9 vaccines. In particular, the influenza H7N9 vaccine candidates have completed phase II clinical trials and could be approved for routine use after finishing phase III trials in the near future.

V. POTENTIAL COLLABORATION

1. Taiwan could help train international scientists.
2. Taiwan vaccine companies could form joint ventures with international partners to build vaccine plants overseas.
3. The Taiwan government could donate money and vaccines to international NGOs, such as the Global Alliance on Vaccine and Immunization (GAVI) and others.

VI. ARTIFICIAL INTELLIGENCE BRINGS INSTANT PREDICTIONS OF FLU OUTBREAKS

Acer joined forces with the Taiwan Center for Disease Control to launch the Influenza Forecast Website. Using artificial intelligence and big data analysis to predict imminent flu epidemics within a four-week window with error that would be less than 10%, the website is a convenient and effective way to provide counties and municipalities with information to prevent flu epidemics.

RHEUMATIC FEVER AND RHEUMATIC HEART DISEASE

*RHEUMATIC FEVER
HAS BEEN ELIMINATED ,THE RECURRENCE
RATE REDUCE TO
ZERO.*

I. PREFACE

Bacteremia infection leads to diseases such as rheumatic fever in 3% of cases, but probably more in conditions of overcrowding and poverty. Although 3% is quite low, this type of infection is very serious as it leads to degradation of the heart valves, and this eventually requires highly invasive interventions such as open-heart surgery, which is never cost-effective by comparison with preventive care.

Taiwan's experience in this area could be invaluable for underdeveloped and developing countries worldwide. Bacteremia and rheumatic fever are extremely rare in Taiwan nowadays. Our virtual elimination of these diseases is attributable to the success of our national antibiotic policies and achievements in public oral hygiene.

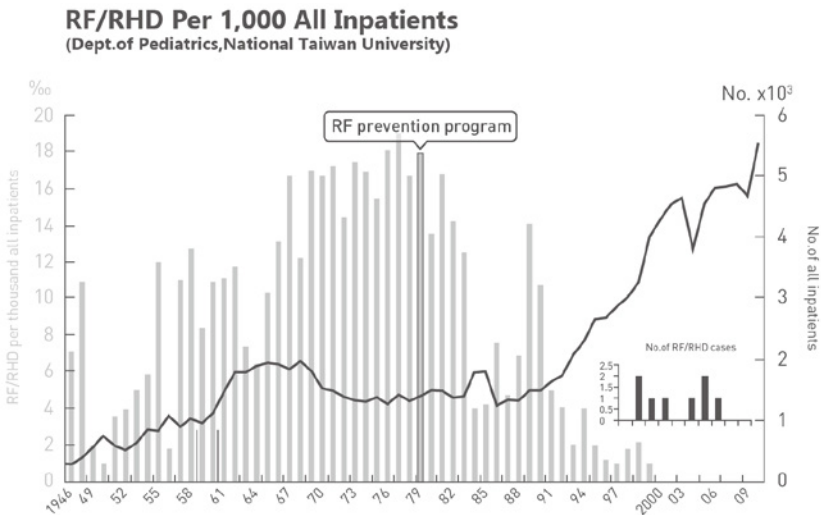
Rheumatic fever was probably rare or non-existent in Taiwan before the 20th century. Rates of rheumatic fever in Taiwan are similar to

those found in the West, with the exception of carditis (67% to 93% higher in Taiwan) and polyarthritis (27% to 53% lower in Taiwan). The most common types of valvular lesion are mitral (77% to 88% of cases), followed by mitral and aortic (9% to 17%), triple (0% to 10%), and isolated aortic (0% to 2%).

The successful implementation of preventive treatment depends on the local economy and living conditions— per capita GDP in Taiwan increased from US\$1,895 in 1975 to US\$ 29,829 in 2010. Another important factor in the elimination of rheumatic fever was secondary prevention programs and public awareness: in the past cultural aversions to the use of penicillin impeded prevention programs.

II. PROSPECTIVE RHEUMATIC FEVER SECONDARY PREVENTION PROGRAMS: 1979–2000, TAIWAN

1. Establishment of rheumatic fever (RF) and rheumatic heart disease (RHD) clinics and a registry
2. Benzathine penicillin G injections (every 3 or 4 weeks)
3. Public education of families and communities: pamphlets, brochures, and posters
4. Calls for nationwide action by the Ministry of Education
5. Yearly child health surveys in schools
6. Lectures and workshops

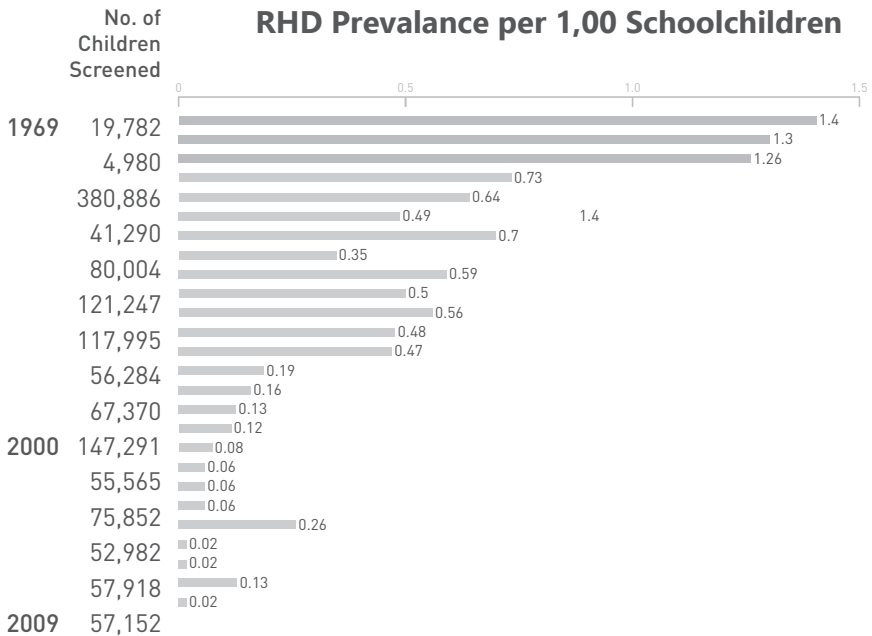


III. DURATION OF SECONDARY PREVENTION

1. Rheumatic fever sufferers who do not have carditis require secondary prevention treatment for 5 years after the last attack, or until above the age of 18.

2. Those who do have carditis require treatment for 10 years after the last attack, or until the age of 40.

3. Those with persistent valvular disease require continuing treatment into adulthood, perhaps even lifelong treatment.



IV. CONCLUSION

A prospective, controlled study of 230 patients with heart disease from 1972 to 1992 revealed that intramuscular injections of 1,200,000 units (2 ml) of benzathine penicillin H every 3 to 4 weeks almost completely prevented the recurrence of rheumatic fever. Patients receiving this treatment enjoyed a 98% survival rate, and 46% to 61% of their valve lesions and murmurs were resolved. Penicillin prophylaxis has been a breakthrough in the control of rheumatic fever.

1. Benzathine penicillin G, 1.2 million units, administered every 3 to 4 weeks is a practical and cost effective treatment.

2. Rheumatic fever recurrence rates decreased from about 20%–31% to 0–3.0%.

3. Valvular heart disease is healed or normalized in 45%–78% of mitral regurgitation cases and in 0%–18% of aortic regurgitation cases.

4. Hospital inpatient statistics and surveys of schoolchildren reveal that rheumatic fever and rheumatic heart disease have been eliminated in Taiwan during this period of economic development and improvements in living conditions.

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