DEEPLY FELT

OCCUPATIONAL DISEASE AND INJURY PREVENTION

The Establishment and Development of
Occupational Disease and Injury Prevention Service Centers in Taiwan
A Commemorative Chronicle from 2007 to 2021

Occupational safety and Health Administration,
Ministry of Labor, Taiwan, R.O.C.

CONTENTS

PREFACE BY THE DIRECTOR- GENERAL

TO IMPROVE THE PREVENTION AND TREATMENT OF OCCUPATIONAL INJURIES AND DISEASES, AND TO PROTECT WORKERS FROM OCCUPATIONAL ACCIDENTS SIDE BY SIDE

In view of the difficulty of judging the relationship between the cause and effect of occupational Injuries and diseases , especially in earlier time when workers lacked awareness of them, and, in order to provide more convenient diagnosis and treatment services for workers in occupational accidents, the Government has set up regional Occupational Disease and injury Prevention Centers in large Medical Centers in the North, Central, South, and East regions year by year since 2002. Combined with neighboring regional network hospitals, this network of the diagnosis and treatment of OI & OD has gradually reached a national scale.

Integration of occupational disease and injury prevention and treatment network to make medical treatment more convenient for workers experiencing occupational accidents

So far, we have set up 10 Occupational Disease and injury Prevention Centers and 88 occupational disease and injury network hospitals throughout the country. The number of outpatient clinics for OI & OD can reach more than 260 per week, and the number of visits exceeds 20,000 per year. These centers provide integrated services, such as occupational disease and injury prevention, diagnosis, evaluation, rehabilitation, and referral consultations that are accessible to all workers.

In addition, to promote the prevention and treatment of occupational injuries and disease in our country, and provide a rehabilitation network and uniform service quality, the Ministry of Labor has commissioned the establishment of the "Occupational Disease and injury Management Service Center" Since 2007 in order to co-ordinate the management of occupational disease and injury service affairs of Occupational Disease and injury Prevention Centers and network hospitals in various regions. It also established an "Occupational Disease and injury Reporting System," since 2008. All the occupational disease and injury prevention centers and network medical institutions are included in the reporting system, to collect local occupational disease and injury data. At the same time, various Reference Guidelines for the recognition of Occupational Diseases have been revised year by year, which have helped to improve the detection rate of occupational injuries and disease, and to ensure the quality and consistency of recognition.

The "Labor Occupational Accident Insurance and Protection Act", which took effect on May 1, 2022, further protects the rights and interests of workers who have suffered occupational accidents and strengthens the effectiveness of the rehabilitation of workers who have suffered occupational disasters. In order

to cooperate with the implementation of this act, the Occupational Safety and Health Administration has successively formulated and promulgated 8 subordinate legislations such as "Regulations for the Management and Subsidies of Approved Occupational Disease and injury Service Medical Institutions and the Reporting of Occupational Disease and injury", "Regulations for Subsidizing the Prevention of Occupational Accidents and Rehabilitation of Workers Suffering Occupational Accidents ", and "Regulation for the Management and Subsidies of Approved Professional Occupational Rehabilitation Institutions for Workers Suffering Occupational Accidents", and established the Center for Occupational Accident Prevention and Rehabilitation. Also, formulated the "Charter of Endowment of the Center for Occupational Accident Prevention and Rehabilitation".

Occupational accident insurance was withdrawn from the Labor Insurance Act, and merged into the Act for Protecting Workers Suffering Occupational Accidents to formulate a special law to legalize the diagnosis and treatment of occupational injuries and disease and follow-up rehabilitation services. Those tasks are no longer dealt wih through bidding every year. The affairs can be handled by accredited medical institutions from next year, and the reporting of occupational injuries and diseases is expanded. We will integrate resources inside and outside the hospital to provide more complete services for workers who suffer occupational accidents.

Dedicated juristic person works with professional teams to improve the occupational accidents protection system

In the relevant provisions of the special law on prevention and rehabilitation Which range from medical rehabilitation, functional rehabilitation, occupational rehabilitation, and social rehabilitation, to track the process of the workers in occupational accidents, it is necessary to go through the overall service process

of diagnosis and treatment, evaluation, communication, and coordination. Professionals in occupational medicine, rehabilitation, functional therapy, and case management all play very important roles. A dedicated juristic person co-ordinates the government's occupational accident prevention measures and promotes safety and health-related measures, as well as assists in occupational accident worker case management and rehabilitation services. In addition, we try to compensate for the manpower gap in occupational accidents prevention programs and occupational rehabilitation systems at this stage, and further integrate related service resources, to make the occupational accident protection system more comprehensive.

Here, I would like to thank all the regional Occupational Disease and injury Prevention Centers and their regional network hospitals for their efforts and contributions over the years which have provided many resources, continuously expanded services for workers in occupational accidents, and deeply participated in the protection of workers from occupational accidents, thus demonstrating the resilience of our country’s system operation.

I would like to use this documentary to record the characteristic development of occupational disease prevention and control in various centers, and the practical experience gained by cooperating with policies. I believe it fully presents the development process of local occupational disease and injury diagnosis, treatment and reporting service results in our country over the past 10 years, and helps us obtain an in-depth understanding of the prevention, diagnosis, and treatment of occupational injuries and diseases; the system of occupational accident reporting and its applications, and serves as a reference for improving policies related to occupational diseases and injury prevention and control. Our efforts can also make domestic occupational accidents insurance regulations and systems sounder and more comprehensive, and the rights and interests of workers in occupational accidents will be better protected.

It has always been the goal of our efforts to allow Our fellow workers to enjoy a safe and healthy working environment, and to safeguard the rights and interests of workers in occupational accidents. For workers who have unfortunately suffered occupational accidents, helping them get appropriate treatment and related payments and subsidies as soon as possible, and promoting their early return to the workplace and return to normal life is what they need most, and it is also the driving force for our continuous efforts.

Director General

OSHA, MOL, Republic of China (Taiwan)

Chapter I

OVERSEAS OCCUPATIONAL ACCIDENT PREVENTION AND TREATMENT POLICIES AND SYSTEMS

Ping Shih
Attending Physician, Department of Environmental and Occupational Medicine, National Taiwan University Hospital Hsin-Chu Branch

Yue Leon Guo
Attending Physician, Department of Environmental and Occupational Medicine, National Taiwan University Hospital

Since 2007, Taiwan Occupational Safety and Health Administration has entrusted the medical centers in the northern, central, southern, and eastern Taiwan to set up 10 Centers for Occupational Disease and Injury Services, and integrated more than 80 local network hospitals to provide workers with services for the diagnosis and treatments of occupational injuries and diseases. These Centers and network hospitals are coordinated by the Center of Occupational Diseases and Injuries Management and Service (CODIMS). The CODIMS was also responsible for maintaining reporting system for occupational diseases and injuries, disease cluster investigation, and assisting investigation for suspected occupational diseases. Since the implementation of the "Labor Occupational Accident Insurance and Protection Act" on May 1, 2022 and the establishment of the "Center for Occupational Accident Prevention and Rehabilitation (hereinafter referred to as COAPRE)", the above tasks have been transferred to the occupational accident diagnosis and treatment medical institutions and medical institutions of regional occupational accident diagnosis and treatment service network, recognized by the central responsible authority, to continue providing integrated services for workers sustaining occupational accidents.

The regulations and national conditions of Japan and South Korea are similar to those of our country. European countries have valuable experience in the field of occupational safety and health, while Germany, Japan, and South Korea all have separate laws on occupational accident insurance applicable to the whole country, and apply a certain amount of occupational accident insurance expenditures to occupational accident prevention and reconstruction. These are all worthy of our country's reference. Following is a brief introduction to the occupational accident system and recent occupational accident statistics in the above-mentioned countries.

[Table 1-1-1] International Occupational Accident System[1]

Country/Institute		Organization Feature	Domain
Germany	Federal Ministry of Labor and Social Affairs; Federal Insurance Office	Central responsible authority	Policy formulation
	German Social Accident Insurance (Deutsche Gesetzliche Unfallversicherung), DGUV	Registered association[2]	Perform occupational accident compensation, prevention, medical treatment, and reconstruction
Japan	Ministry of Health, Labour and Welfare, MHLW	Central responsible authority	Policy formulation and implementation of occupational accident compensation
	Japan Industrial Safety and Health Association, JISHA	Private legal person	Carry out occupational disaster prevention
	Japan Organization of Occupational Health and Safety, JOHAS	Independent administrative legal person	Implementation of labor-specific subsidy programs for occupational accidents, medical care, and reconstruction work
South Korea	Ministry of Employment and Labor, MOEL	Central responsible authority	Policy formulation
	Korea Occupational Safety and Health Agency, KOSHA	Independent administrative legal person	Carrying out occupational disaster prevention work
	Korea Workers'Compensation & Welfare Service, KCOMWEL	Special legal person	Occupational accident workers' compensation, medical care, and reconstruction
Taiwan	Ministry of Labor	Central responsible authority	Policy formulation, occupational accident workers' compensation
	COAPRE	Foundation	Occupational accident prevention and rehabilitation related businesses (Established in 2022)
	Accredited medical institutions and network hospitals for occupational accident diagnosis and treatment	Approved by the central authority	Integrated service for the diagnosis and treatments of occupational injuries and diseases

1 Reference materials: Official websites of various institutions; Liu Li-Wen, Hsu Chi-Feng. A Comparative Study on Measures of Occupational Accidents Prevention and Rehabilitation in Occupational Accidents Insurance Programs. Institute of Labor, Occupational Safety and Health, Ministry of Labor, Executive Yuan: 2009.

2 The umbrella association of the accident insurance institutions for the industrial and public sectors.

The proportion of non-commuting occupational injury and disease to the insured population in Taiwan is low

Compared with the number of occupational injuries and diseases in the occupational accident insurance systems among the countries listed in [Table 1-1-2], Taiwan has the lowest ratio of non-commuting occupational injuries and occupational diseases to the insured population; however, the fatal occupational injuries account for a large proportion of the insured population in Taiwan compared with other countries. Although the applicable conditions and scope of occupational diseases or occupational injuries are not completely consistent in different countries, it can still be estimated that the statistics of labor insurance benefits in our country's occupational accident insurance system may have errors in the presentation of occupational accident data.

According to the provisions of the "Labor Occupational Accident Insurance and Protection Act", the Ministry of Labor re-established the "Occupational Injury and Disease Reporting System" to expand the informers to include workers themselves, medical institutions, employers, or other third parties who know that workers have suffered occupational injuries and diseases. Meanwhile, a database of occupational accident labor case services has been established to coordinate and integrate occupational accident-related resources, and it is expected to be able to intervene or refer to follow-up services and assistance needed by occupational accident victims as early as possible.

In terms of diagnosis and treatment of occupational injury and disease, the German Social Accident Insurance Agency (DGUV) includes 9 acute care hospitals, 1 hospital specialized in occupational respiratory and skin diseases, 2 outpatient facilities, and other authorized medical institutions. The Japan Organization of Occupations Health and Safety, (JOHAS) has 32 Rosai hospitals to deal with work-related accidents. The Korean Workers' Compensation and Welfare Agency (KCOMWEL) included 10 hospitals specialized medical services on work-related injuries and diseases.

Considering the medical care system and operation situation, the scale of these hospitals

for occupational injuries and diseases in the two East Asian countries - Japan and South Korea are not large (200-400 beds). According to the 2014 overseas inspection data of the Occupational Safety and Health Administration, the proportion of Rosai hospitals in Japan have served less than 5% of patients suffered from occupational accident in recent years, which means that most of their services are used by the general public seeking medical treatment. In order to complement the role of occupational accident hospitals, Japan also has institutions such as worker rehabilitation centers and spine centers. In South Korea's hospitals for occupational injuries and diseases, about 70% medical care provided to occupational accident patients. These hospitals provide one-stop services, including complete care, from treatment, compensation, rehabilitation, reconstruction, and return to work.[3]

[Table 1-1-2] Statistical Data of Occupational Accident Insurance Systems in Various Countries[4]

Country	Year	Number of Occupational Insure	Occupational Accident		Fatal Occupational Accidents		Occupational Diseases
			Non-commuting	Commuting	Non-commuting	Commuting	Total Number
Taiwan	2021	10,741,647	26,317	24,111	221	282	620
Germany	2020	41,219,318	760,492	152,823	399	238	37,181
Japan	2021	61,355,456 (2020)	142,758	7,160	732	135	28,071
South Korea	2020	18,974,513	91,501	NA	882	NA	15,996
Finland	2020	1,906,761 (2018)	86,595	15,967	23	10	1,479 (2016)

3 Chu Jin-long. "Traveling to Japan and South Korea to Investigate Occupational Accident Hazard Prevention and Occupational Accident Labor Reconstruction". Ministry of Labor Occupational Safety Agency: 2014. https://report.nat.gov.tw/ReportFront/PageSystem/reportFileDownload/C10305131/001

4 Sources: Occupational Safety and Health Administration, Bureau of Labor Insurance; The DGUV (German Social Accident Insurance) of Germany; Ministry of Health, Labor and Welfare of Japan; Ministry of Employment and Labor of Korea; Statistics Finland & EUROGIP of Finland.

The density of medical centers in Taiwan and the accessibility of professional medical care are high

Taiwan has universal health insurance and a sound medical system. There are many medical centers and many of them with more than 2,000 beds, so the accessibility of professional medical care is very high.

In terms of medical care outside the acute medical period for workers with occupational accidents, after more than ten years, Taiwan Occupational Safety and Health Administration has entrusted medical institutions to establish ten Centers for Occupational Disease and Injury Services, and the occupational health service network systems. With an appropriate management service system and full cooperation with work ability assessment and strengthening service units, the rich resources of our country's health industry are effectively utilized to shape Taiwan's unique occupational health care services.[56]

Under the operation of this system, all workers who seek help can easily receive medical treatment and care at the medical center level. The management service system of this system has laid a good operating model for occupational disaster prevention and reconstruction work, and it is also the predecessor of the COAPRE.

The "Labor Occupational Accident Insurance and Protection Act" was approved and promulgated on April 30, 2021, specifying that the central responsible authority should donate funds to establish COAPRE to undertake the occupational accident prevention and reconstruction policies planned by the central responsible authority, and coordinate the handling of related businesses.

In 2022, the "Labor Occupational Accident Insurance and Protection Act" and COAPRE were officially launched, opening a new page in the development history of occupational injury and disease prevention services.

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5 Chu PC, Fuh HR, Luo JC, Du CL, Chuang HY, Guo HR, Liu CS, Su CT, Tang FC, Chen CC, Yang HY, Guo YL. The impact of occupational health service network and reporting system in Taiwan. Int *J Occup Environ Health* 2013;19:352-362.

6 Shih P, Chu PC, Huang CC, Guo YL, Chen PC, Su TC. Hospital occupational health service network and reporting systems in Taiwan from 2008 to 2021. *J Occup Environ Med*; in press.

▲Director Tzu-Lien Tzou attended the International Occupational Health Symposium in 2018.

The establishment of COAPRE has brought Taiwan's occupational accident prevention and reconstruction policies into line with those of other countries. The division of responsibilities in follow-up agencies is clearer, and the use of labor information systems and integration of occupational accident care institutions to provide comprehensive occupational disaster prevention and reconstruction services help ensure the safety and health of every worker.

Chapter 2

DEVELOPMENT AND EVOLUTION OF OCCUPATIONAL DISEASE AND INJURY PREVENTION AND CONTROL IN OUR COUNTRY

In the 1970s, labor-intensive industries flourished, and major occupational accidents occurred frequently. From 1972 to 1973, led by the "Philco Incident", several incidents of occupational hepatitis caused by collective poisoning from organic solvents occurred in international electronics factories. These incidents were exposed by the media. Afterwards, it aroused social attention.

These events prompted our country to pass the "Occupational Safety and Health Act", "Organic Solvent Poisoning Prevention Rules", "Labor Work Environment Permissible Exposure Level Standards of Hazardous Substances in the Air", and other regulations from 1974 to 1975, with an aim to protecting the health rights of workers.

National Taiwan University Hospital Established First Occupational Disease Clinic in the 1980s

Around the time of the lifting of martial law in the 1980s, domestic social movements such as environmental protection and labor issues flourished. Taiwan's industrial structure was rapidly transformed. Traditional labor-intensive industries were relocated overseas, and industries were shifted to capital and technology-intensive industries. The number of employed people in the service industry gradually increased.

During this period, the issue of occupational injuries and diseases still received little social attention. owing to relatively weak knowledge of occupational hazards among workers and the lack of implementation of industrial hygiene protection and of pre-employment and regular health monitoring measures, many serious occupational injuries and diseases took place.

Before the 1980s, due to the insufficient training of physicians on the causal relationship of occupational disease identification, the available occupational medical service resources were relatively scarce, and under the circumstances that both laborers and employers lack occupational health-related knowledge, the diagnosis and recognition rate of occupational diseases remained relatively low.

In 1982, Professor Jung-Der Wang, who returned from the United States, took the lead in establishing the "Occupational and Environmental Disease Clinic" at National Taiwan University Hospital, promoting the development of occupational medicine in Taiwan.

In 1984, mining accidents occurred in Tucheng Haishan and Ruifang Coal Mine, causing more than 300 people to be buried alive, with the death benefits of occupational accident insurance issued exceeding NT$120 million. This was the largest mining disaster since the establishment of labor insurance, and coal mining has since declined irreversibly into a sunset industry.

In the same year, the "Labor Standards Act" was promulgated and implemented, aiming to regulate the minimum standards for labor conditions which include wages, working hours, vacations, retirement, dismissal, and other labor protection matters. Chapter VII "Occupational Accident Compensation" (Article 59 to 63) of the "Labor Standards Act" establishes the individual employer's "no-fault compensation liability" for workers with occupational accidents.

Establishment and Improvement of Occupational Disease and Injury Reporting System in the 1990s

In 1988, the number of employed people in our country's service industry surpassed that of the industrial sector. From 1991 to 1993, the government gradually introduced foreign migrant workers into our labor market.

In the 1990s, although the death rate of occupational accidents among workers showed a downward trend, the number of confirmed cases of occupational diseases was still meager.

In order to ameliorate the problem of occupational injuries and diseases among laborers, and increase the notifying rate of occupational injuries and diseases, the Labor Committee of the Executive Yuan (hereinafter referred to as the Labor Committee) before the reform of the Ministry of Labor, at that time, and the Department of Health of the Executive Yuan (hereinafter referred to as the Department of Health) before the reform of the Ministry of

Health and Welfare, established different notification systems, respectively. The occupational injury and disease notification system established by the Department of Health in 1995 is not mandatory. Only some occupational medicine specialists will notify, which is still insufficient compared with other advanced countries.

Rapid Growth of Occupational Disease and Injury Prevention Services in the 2000s

To improve the notification of problems, increase the proportion of occupational injury and disease workers receiving labor insurance benefits, and provide more appropriate assistance, the Council of Labor Affairs planned to set up "occupational injury diagnosis and treatment centers" in medical centers in various districts of Taiwan year by year from 2003, and combined them with neighboring regional hospitals to provide services related to occupational injury and disease diagnosis and treatment at close quarters.

In 2001, the Department of Health announced that occupational medicine was designated as a formal clinical specialty by the Ministry, and published the "Standards for the Accreditation of Hospitals for Specialist Training in Occupational Medicine" in the following year. Occupational medicine specialists or clinical specialists at or above the level of regional hospitals can issue occupational disease outpatient visit sheets, in order to protect the rights and interests of those with occupational diseases or injuries.

In 2003, the "Environmental Medicine Collaboration Center" of the Affiliated Hospital of National Taiwan University School of Medicine was established. It was the first diagnosis and treatment center in the country, and the first director was Professor Jung-Der Wang.

Since 2007, the National Taiwan University Hospital has been entrusted with the "Occupational Injury and Disease Management Service Center Plan" to establish an "Occupational Injury and Disease Management Service Center" (referred to as the Management Service Center) and develop an occupational injury notification system.

The Management Service Center includes prevention and control centers in each district, and integrates the network hospitals in their jurisdictions into the occupational injury

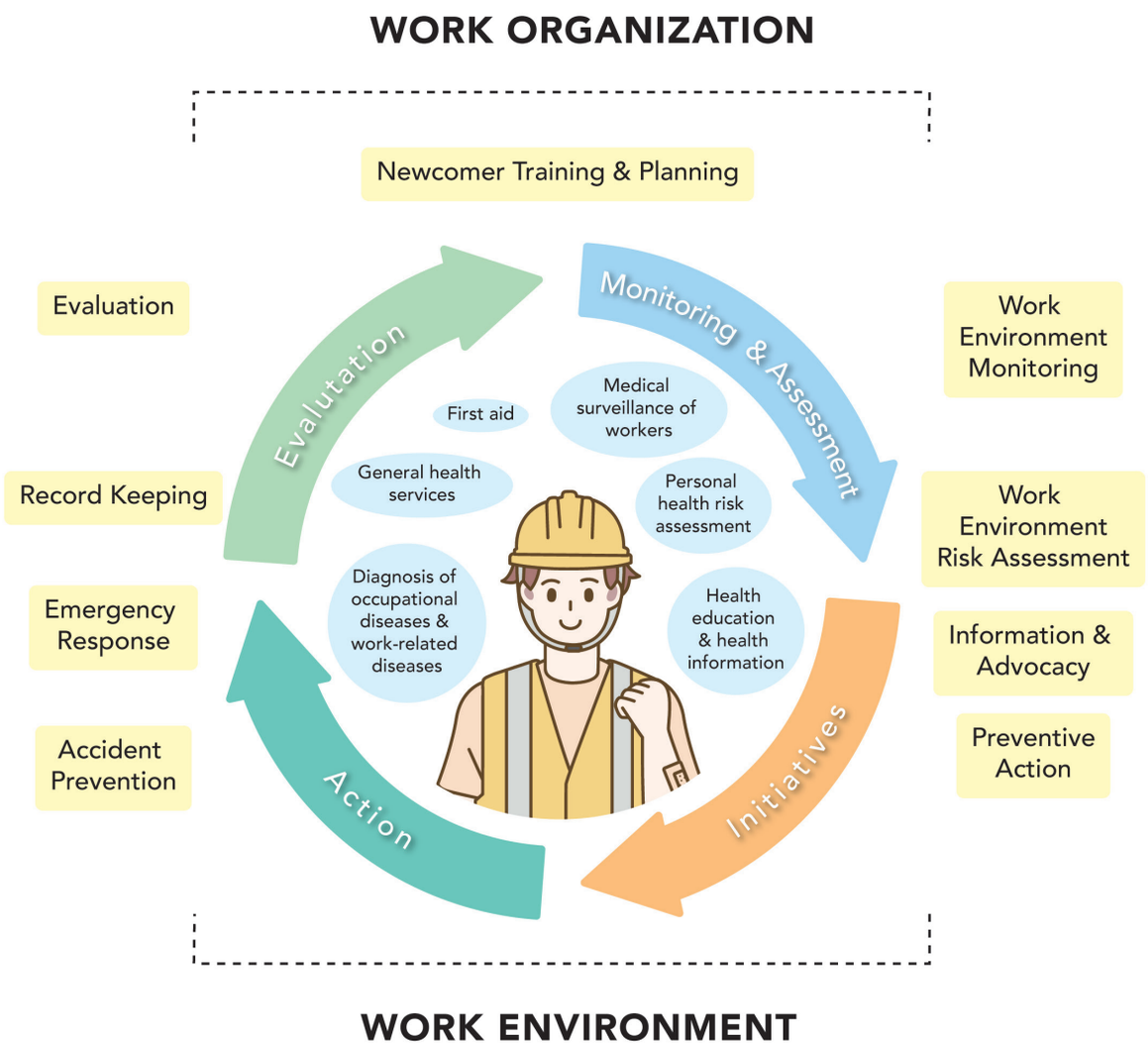
notification system. It drafts and completes the service project operating standard procedures of each prevention and control center, strengthens the service quality of occupational injury and disease diagnosis and treatment, assists the prevention and control center to expand the business of network hospitals and other businesses, promotes the improvement of occupational disease prevention, improves the detection rate, promotes the national occupational disease and injury prevention and rehabilitation network, and unifies the quality of occupational disease and injury services.

In 2008, the "Occupational Injury Notification System" was completed, and the medical institutions of the prevention and control centers in each district were included in the scope of notification. Meanwhile, the "operational standards for service items, such as treatment, investigation, diagnosis, and notification", "supervision and management of service quality", "expanding and developing the number of occupational disease outpatient clinics in network hospitals under the jurisdiction of occupational injury prevention and treatment centers in each district" and "Revision of the Common Occupational Disease Investigation Operation Guidelines" and other policies and measures, were also completed.

Since 2008, the regional occupational disease and injury diagnosis and treatment centers have been renamed "Occupational Disease and Injury Prevention Service Centers", and were combined with the neighboring regional network hospitals to provide more intimate services such as diagnosis, treatment, investigation, identification, and notification of occupational disease and injury. In 2009, referring to the principles of "Basic Occupational Health Service" (BOHS) recommended by the three major international organizations, International Labor Organization, World Health Organization, and International Commission on Occupational Health (ILO/WHO/ICOH), prevention service centers in various districts tried to provide workplace health services for small and medium-sized enterprises. [1] The service content is shown in [Figure 2-1], including: work environment risk and hazard assessment,

1 5 Business units with less than 300 employees.

health promotion education courses, health examination management and follow-up tracking, instruction on the use of personal protective equipment, assistance in returning to work, and ergonomic counseling etc.



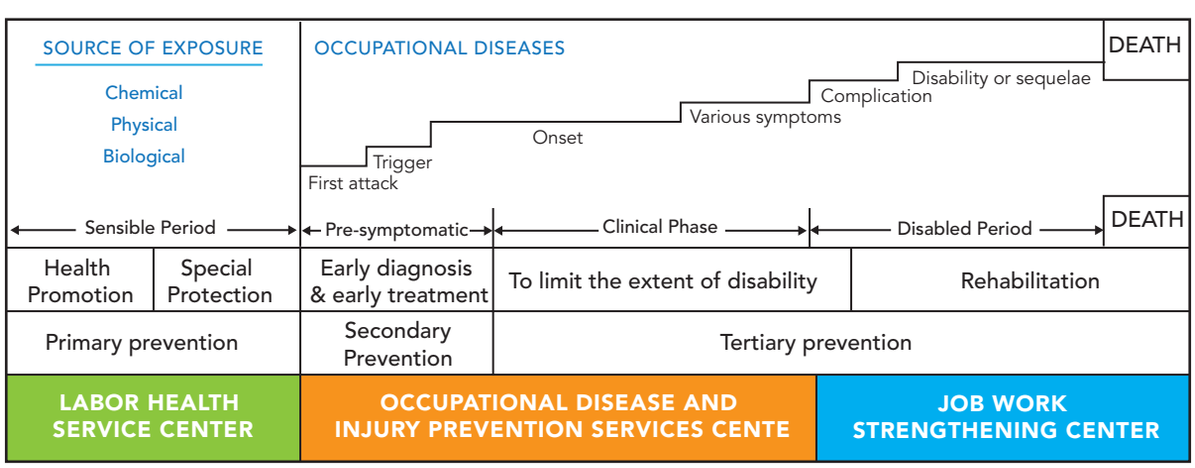
[Figure 2-1] BOHS Basic Occupational Health Services System Structure

In 2015, the Occupational Safety and Health Administration established labor health service centers in the northern, central, and southern districts to provide workplace health services for small and medium-sized enterprises. As shown in [Figure 2-2], combining the occurrence and course of occupational diseases with the public health three-stage, five-level

prevention concept, the labor health service center is mainly responsible for the tasks in the initial stage which include workplace health promotion and protective measures for the particularly hazardous operations.

When the prevention and control center track the cases of occupational accidents, if the enterprise encounters the need to improve the risk control of hazards in the work environment, it will be referred to the labor health service center to assist in the assessment. Institutions served by the labor health service center will also refer the case to the prevention and control center for evaluation, if they encounter workers who request the recognition of occupational disease or are still in poor condition after returning to work and hope to continue to apply for medical treatment.

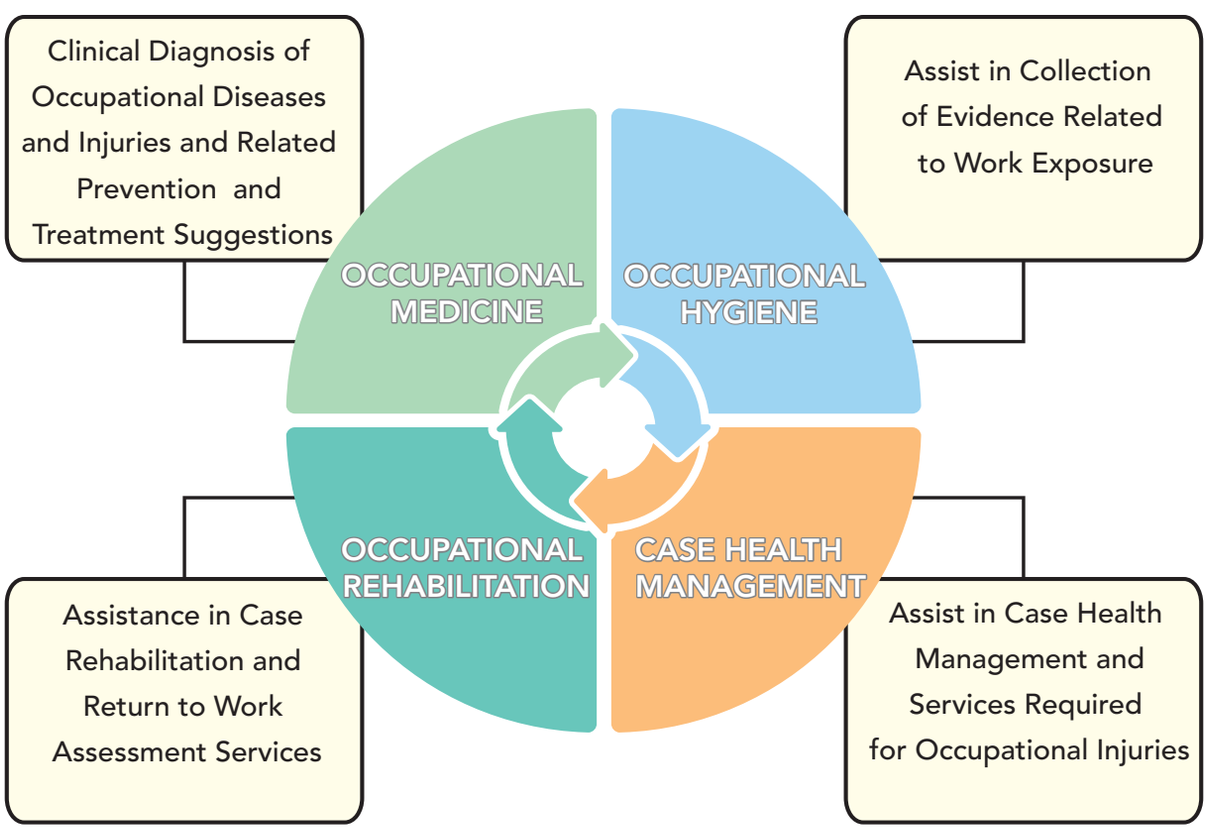
The job work strengthening centers takes over the follow-up work of the Prevention and Control Center, and provides job work strengthening services for workers suffering from occupational accidents. Through the assistance of professionals, these workers can return to the workplace as soon as possible, which reduces the time, money, medical, and social costs that workers spend in waiting or trying to return to work.



[Figure 2-2] Three Stages and Five Levels of Prevention Strategies for Occupational Diseases

According to the conceptual diagram of the occupational Injury and disease service division of labor in [Figure 2-3], if a worker has an occupational accident or Physical symptoms related to work the prevention and control center will first assist the worker in the assessment and diagnosis of the occupational injury or disease, assist the worker in applying for labor insurance payment, and refer to relevant units for services according to individual needs.

If the case needs functional rehabilitation, the job work strengthening center or other occupational rehabilitation institutions will provide services and implement the rehabilitation assistance plan required by the case, to assist the workers in occupational accidents to recover their working ability and return to the workplace as soon as possible.



[Figure 2-3] Service Division Structure of Occupational Disease and Injury Prevention

Characteristics and Advantages of Regional Prevention Services in 2010s

Since 2011, the prevention and control centers have begun to develop and construct occupational injury prevention, diagnosis, and referral service with regional characteristics, to strengthen the prevention and control center's diagnosis and treatment skills for specific occupational diseases, thereby improving the detection rate of occupational diseases and the rate of returning to work of these workers.

In terms of characteristic development, the prevention and control center can collect statistics on common diseases in the jurisdiction and consider factors, such as the characteristics of adjacent industries, work environment conditions, and disease diagnosis and treatment needs. It also analyzes the symptoms of occupational diseases, hazard prevention, treatment, etc. It develops assessment and identification, visits factories, etc., and these data will serve to sort out the characteristic occupational diseases in respective regions.

The prevention and control centers gather the statistics of diagnosis, treatment and notification of common occupational diseases which are composed mainly of musculoskeletal, mainly musculoskeletal, poisoning caused by hazardous chemical substances, cerebrovascular diseases, hearing loss, skin diseases, etc. The type of occupational disease is related to the industrial types in the area where the center is located.

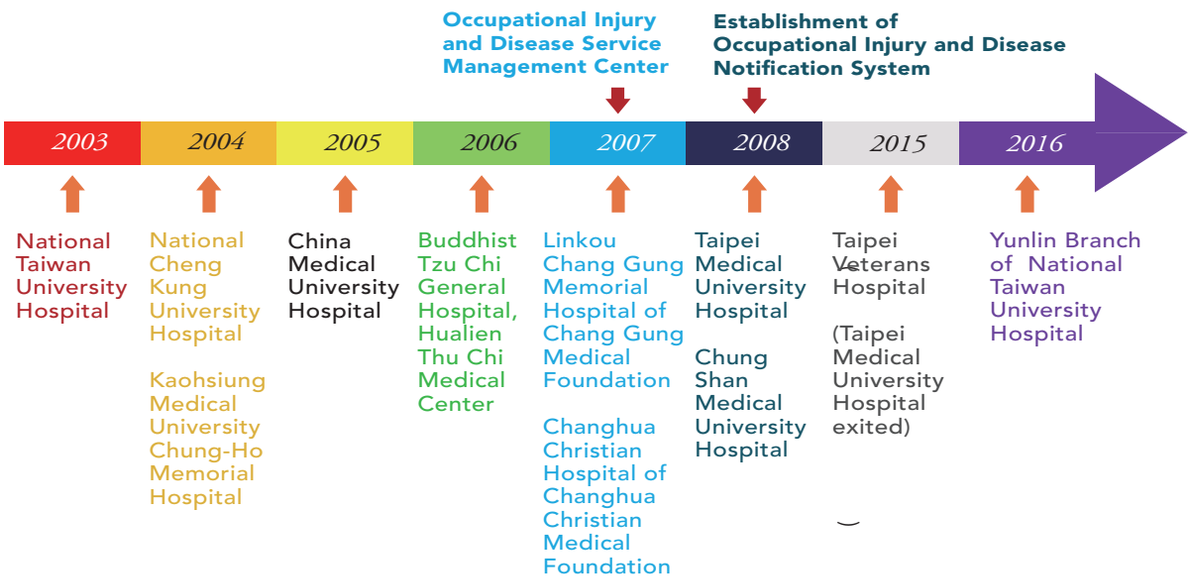
In 2012, in response to the revised plan of the "Occupational Safety and Health Act" and "Act for Protecting Workers from Occupational Accidents", a vocational rehalalitation service network was constructed, and information security control measures for notifying occupational injuries and diseases were strengthened. At the same time, by participating in international conferences and inviting relevant professionals from home and abroad to give seminars on occupational health, occupational safety, and other related issues. Through experience sharing and exchange, the construction of the occupational health service system and the service quality at the prevention and control centers in each district have been improved.

In 2014, the Council of Labor Affairs changed its name to the Ministry of Labor and

established the Occupational Safety and Health Administration at the same time. The planning and related tasks of the Management and Service Center and Prevention Center were also handed over to the Occupational Safety and Health Administration.

In May 2022, the "Labor Occupational Accident Insurance and Protection Act" became effective. In the same year, the COAPRE was established, and the occupational injury and disease notification system was expanded to the "Occupational Injury and Disease Notifying Integration System". It is hoped that the information provided by the multiple notification system will become an important reference for occupational accident prevention and control strategies in the future.

So far, there are 10 prevention service centers in the country, located in the four districts of North, Central, South, and East: National Taiwan University Hospital, National Cheng Kung University Hospital, Kaohsiung Medical University Hospital, China Medical University Hospital, Hualien Tzu Chi Hospital of Buddhist Tzu Chi Medical Foundation, Linkou Chang Gung Memorial Hospital of Chang Gung Medical Foundation, Changhua Christian Hospital of Changhua Christian Medical Foundation, Chung Shan Medical University Hospital, Taipei Veterans General Hospital, Yunlin Branch of National Taiwan University Hospital.



[Figure 2-4] Establishment Time of Occupational Disease and Injury Prevention Centers

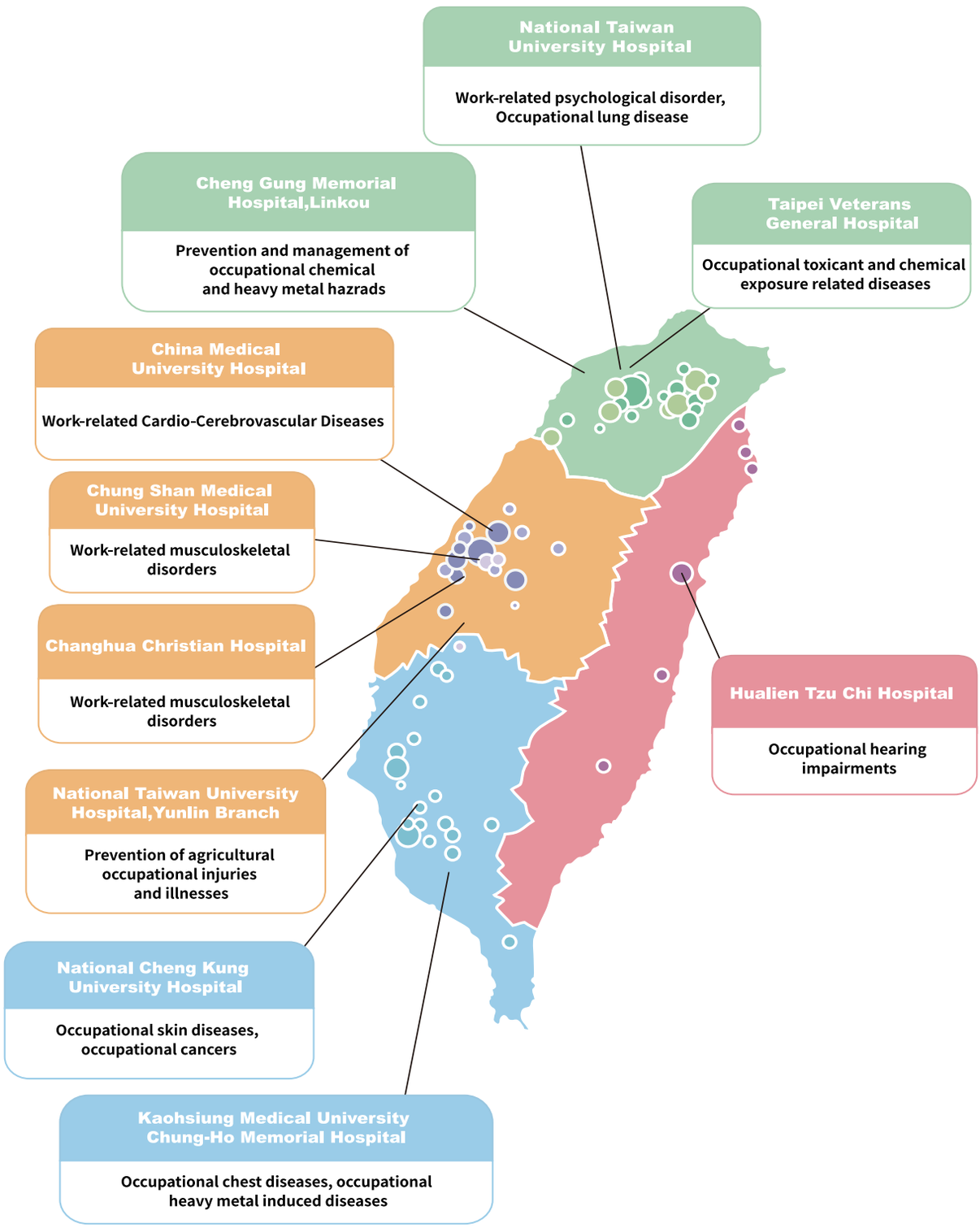
Occupational disease and injury prevention service centers have the academic resources of medical schools, complete medical equipment and medical teams, referrals to various specialists, and other service resources, and can fully integrate with other medical institutions and rehabilitation institutions in the region to form a national occupational disease and injury service network. This provides more convenient integrated services of diagnosis, treatment, and functional rehabilitation for workers with occupational diseases and injuries. To unify the quality of occupational disease and injury services, continuous investment has been made in nurturing occupational disease and injury prevention professionals, education and training, reviewing and revising procedures, and formulating operating standards or tool guidelines for occupational injury and disease services, with an aim to continuously elevating the development of occupational injury and disease services in our country.

The key projects implemented by our country's occupational injury prevention and treatment centers over the years are as follows:

1. Provide labor occupational diseases and injury prevention, diagnosis, assessment, reconstruction, consultation, and referral services: prevent the occurrence of occupational disease and injury improve accessibility for workers sustaining

occupational injury to seek related services.

2. Construct a regional occupational injury and disease service network: cooperate with other in hospitals through the occupational injury and disease prevention and treatment centers, and cooperate with other medical or reconstruction institutions, to establish a regional occupational injury and disease service network. Assist and guide the regional network in handling occupational injury and disease prevention, labor rights consultation, and referral services.
3. Carry out occupational disease investigation and notification of occupational injury and disease cases: handle occupational disease investigation and analysis of disease clusters, notify occupational injury and disease cases, and review the notifying conditions, principles, and criteria.
4. Develop the characteristic service of occupational injuries and diseases prevention and rehalalitation mechanisms: develop the characteristics of occupational injury and disease prevention and rehalalitation service through the integration of existing resources in hospitals, with an aim to providing professional and complete care services for laborers.



[Figure 2-5] Develop the characteristic of 10 Centers for Occupational Disease and Injury Services

Chapter 3

ESTABLISHMENT OF AN OCCUPATIONAL INJURY AND DISEASE NOTIFICATION SYSTEM AND ITS ACHIEVEMENTS

Establishment of Occupational Disease Monitoring and Notification System

The monitoring and reporting cases mechanism of occupational diseases in our country was established by the Council of Labor Affairs and the Department of Health, respectively, including the "Notification and Monitoring System for Workers' Blood Lead Level", "The Hearing Threshold Monitoring System for Workers Exposed to Noisy Environment ", "Occupational Injury and Disease Reporting System of the Ministry of Health and Welfare", "Occupational Hazard of Needle Stick Injuries The Reporting System ", case data of workers with abnormality item in medical examinations, occupational diseases cash payment data of the Bureau of Labor Insurance, etc.

In 1995, the Department of Health established an occupational injury and disease notification system, in which physicians can take their own initiative to notify occupational diseases, but it was not mandatory. Therefore, only some occupational medicine specialists would notify, Also, the main purpose of notifying during this period was epidemiological investigation, without actually linking to the prevention and compensation of occupational injuries and diseases. Before 2007, the number of workers who received the benefits from the Bureau of Labor Insurance due to occupational injuries and diseases, was about 200 to 300 per year on average, after deducting the Labor Insurance benefit applications for workers suffering from pneumoconiosis in 1999, which is relatively low compared with other developed countries.

In order to improve the detection rate of occupational diseases in our country, promote the national occupational injury and disease prevention and reconstruction network, and unify the service quality, the Council of Labor Affairs commissioned the "Occupational Injury and Disease Management Service Center Project" in 2007, to enact the "Operation Standards for Treatment, Investigation, Diagnosis, and Notification Services ". Then, in 2008, the "Occupational Injury and disease Notification System" was established, and the prevention and treatment centers of each district and the network hospitals under it were included in the notification scheme.

It can be seen from [Table 3-1] that after deducting the benefit caseload filed by retired miners suffering from pneumoconiosis, from 2003 to 2005 the numbers of application cases for occupational injuries and diseases benefits were 161, 224, and 177, respectively. From 2006, five prevention and treatment centers, including National Taiwan University Hospital, National Cheng Kung University Hospital, Kaohsiung Medical University Hospital, China Medical University Hospital, and Tzu Chi Hospital have operated occupational injury and disease prevention services. At this time, the benefit payments for occupational musculoskeletal disorders, asthma, and cerebrovascular and cardiovascular diseases were all increasing. In 2015 and 2020, the amount of occupational cancer benefit for payment increased sharply, mainly due to the benefits for cancer-stricken workers in the RCA litigation.

[Table 3-1] Types of Occupational Disease Benefits and Number of Cases of Labor Insurance and the Number of Cases from 2003 to 2021

Year	2003	2004	2005	2006	2007	2008	2009	2010
Total	1,139	1,184	393	298	326	426	532	607
Neck, shoulder and arm disorders	61	85	64	87	98	182	239	303
Pneumoconiosis and Silicosis	978*	960*	216	53	71	56	72	75
Occupational low back pain	44	53	47	61	86	110	138	127
Cerebrovascular disease	0	0	0	13	37	34	26	33
Occupational Asthma	5	2	3	20	10	12	13	22
Occupational skin disease	3	5	6	12	5	3	11	9
Occupational cancer	4	6	4	2	2	1	1	7
Asbestosis	0	2	0	4	2	7	2	4
Noise induced hearing impairment	4	6	6	0	5	3	6	5
Chemical hazard	4	6	4	5	2	1	3	2
Psyciatrical diseases	0	0	0	0	0	0	0	3
Vibration-related disorders	0	1	5	2	0	1	1	5
Others	36	58	38	39	8	17	20	12

[Table 3-1] Explanation:

① Including those persons who have been diagnosed with an occupational disease after resignation and withdrawing from the insurance.

② Including lthe number of persons who have been compensated with Occupational Injury or Disease Disa-bility Compensation, and One-Time Death Compensation for Occupational Accident from the Labor Insurance Pension after the revision and implement of Labor Insurance Act and on January 1, 2009.

③ The high number of benefits caseload in 2003 and 2004 came from the benefits of pneumoconiosis for retired miners.

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
893	908	808	757	975	706	630	757	744	1,144	620
417	393	381	352	393	345	298	363	353	360	356
157	213	180	164	137	118	92	106	144	90	42
170	144	122	121	161	119	102	102	120	128	91
88	92	68	67	83	68	84	69	60	78	47
15	25	20	16	6	11	12	17	13	26	8
10	9	12	3	7	8	2	1	1	5	11
13	6	4	11	146	11	4	55	4	406	7
2	1	4	3	1	0	12	18	16	8	12
1	1	1	1	2	1	1	2	0	0	1
6	1	1	7	8	5	2	0	4	4	2
0	3	3	1	3	6	6	3	8	11	10
1	0	1	0	2	2	0	3	2	4	6
13	20	11	11	26	12	15	18	19	24	27

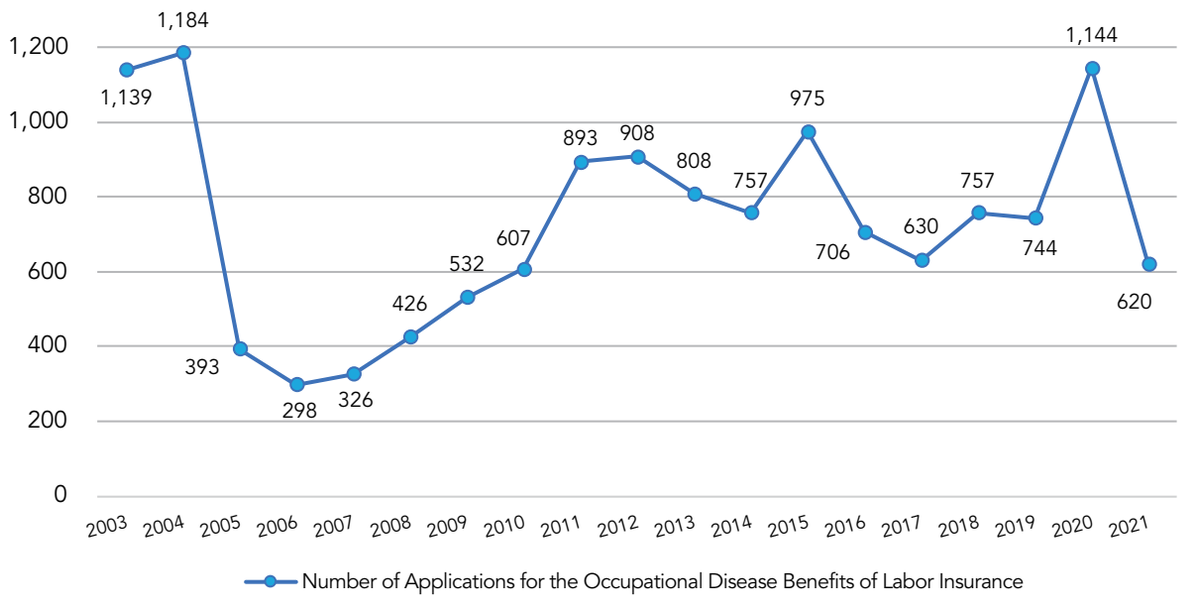
[Figure 3-1] and [Figure 3-2] are the results of Occupational Disease Benefits of Labor Insurance over the years. After comparison with the Occupational Injury and disease Notification System, about half of the approved cases come from those assisted by the prevention and treatment centers. Further comparing top three the highest number of caseloads of Occupational Disease Benefits of Labor Insurance in 2021, such as: arm/shoulder/ disorders, pneumoconiosis and silicosis, occupational low back pain, etc., with the number of occupational disease notified cases, it was found that the number of occupational disease notified cases of neck, shoulder and arm disorders is lower than the number of caseloads of Occupational Disease Benefits of Labor Insurance (Figure 3-3). The possible reason is that the causal relationship between diseases and work is clear clearer than others, and the scope of the reference guidelines for the identification of occupational diseases is broader, thus, the approval rate of the Labor Insurance Bureau is higher, the workers do not necessarily have to seek assistance from occupational medicine physicians to receive the benefits.

In the Notification System, the number of notified cases of occupational low back pain is usually slightly higher the number of caseloads of Occupational Disease Benefits of Labor Insurance over the years. Since 2016, the gap in the number of cases has gradually widened, with the highest number of cases differing in 2018. The reason is that in recent years, the notifying of various types of occupational diseases has been encouraged, and the overall number of notified cases has increased year by year. In addition, because the main purpose of the Notification System is to monitor occupational diseases from the clinical side, as long as the doctor thinks that their symptoms meet the occupational diseases definition, these cases will be notified. Compared to the Labor Insurance the benefits review of labor insurance benefits, it is more relaxed in the notification system. Since the purposes of the two systems are different, the numbers presented are also quite different (Figure 3-4).

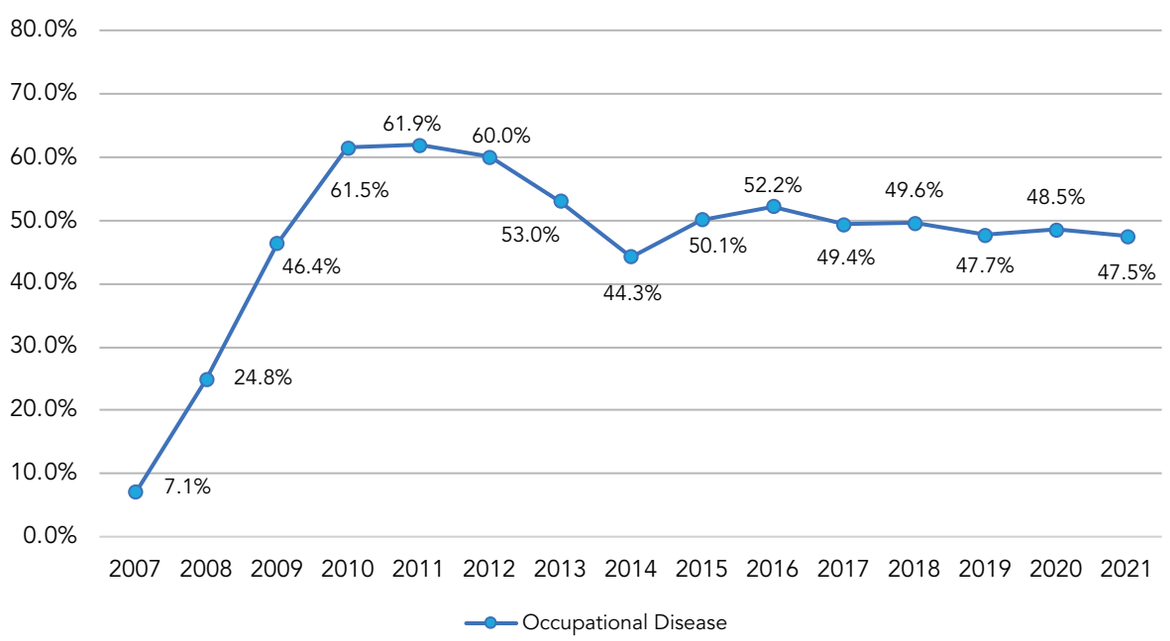
After separating and comparing the statistics of the Labor Insurance benefits for pneumoconiosis and silicosis with the statistics of occupational injury and disease notified case, it is found that the number of the Labor Insurance benefits for pneumoconiosis and

silicosis is higher than the number of notified cases in the notification system. This is probably because pneumoconiosis can be compensated even after retirement, and it is easier to determine the causal relationship between work exposure and the disease in workers suffering from pneumoconiosis. Therefore, those workers can obtain Occupational Disease Benefits of Labor Insurance without seeking the assistance of a professional team of occupational medicine specialists (Figure 3-5).

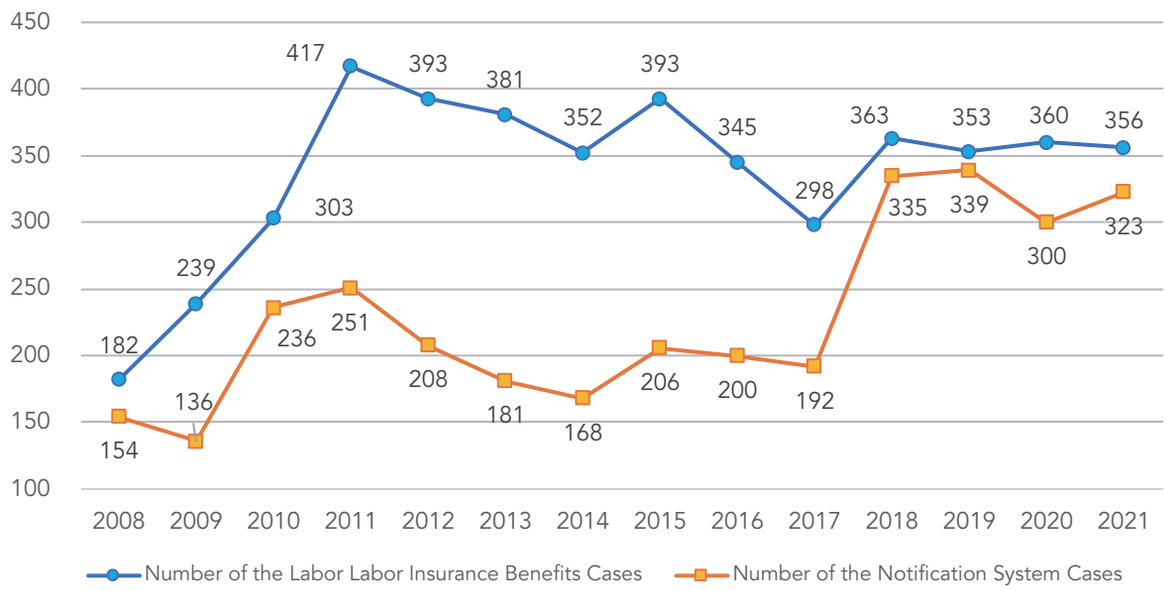
It is worth noting that although the number of Occupational Disease Benefits of Labor Insurance for silicosis cases is relatively low, the numbers of occupational disease notifications have increased in recent years. In addition to notifying policy adjustments, another reason may be that although the Labor Insurance benefits distinguish between coal worker's pneumoconiosis, silicosis, and asbestosis, most physicians usually prescribe the certificate using the diagnosis of pneumoconiosis (because pneumoconiosis is a general term, and silicosis is only one of them). Therefore, most workers apply for the Labor Insurance benefits based on pneumoconiosis in order to comply with the table of occupational disease categories of Labor Insurance scheme. However, when the Occupational injury and disease notification system was established in 2008, it was divided in more detail based on ICD-9 and the reference guidelines for recognition of occupational diseases. Therefore, Pneumoconiosis due to other silica or silicates" in ICD-9 is used in the notifying statistics for silicosis cases, which is why there was a gap between the notification data of occupational injury and disease diagnosis and treatment and the Labor Insurance benefit data. In further analysis the workplaces where the cases occurred in the occupational injury and disease notification system revealed that these diseases occurred mainly located in New Taipei City, in terms of districts, Yingge District and Ruifang District top the list. The distribution is obviously clustered, and the jobs were distributed among ceramist and tile workers, ceramist and tile Workers, foundry operators, sandblasting operators, miners, tunnel workers, etc. If the data can be compared with the specific labor health examination data, which should lead to more comprehensive national estimate (Figure 3-6).



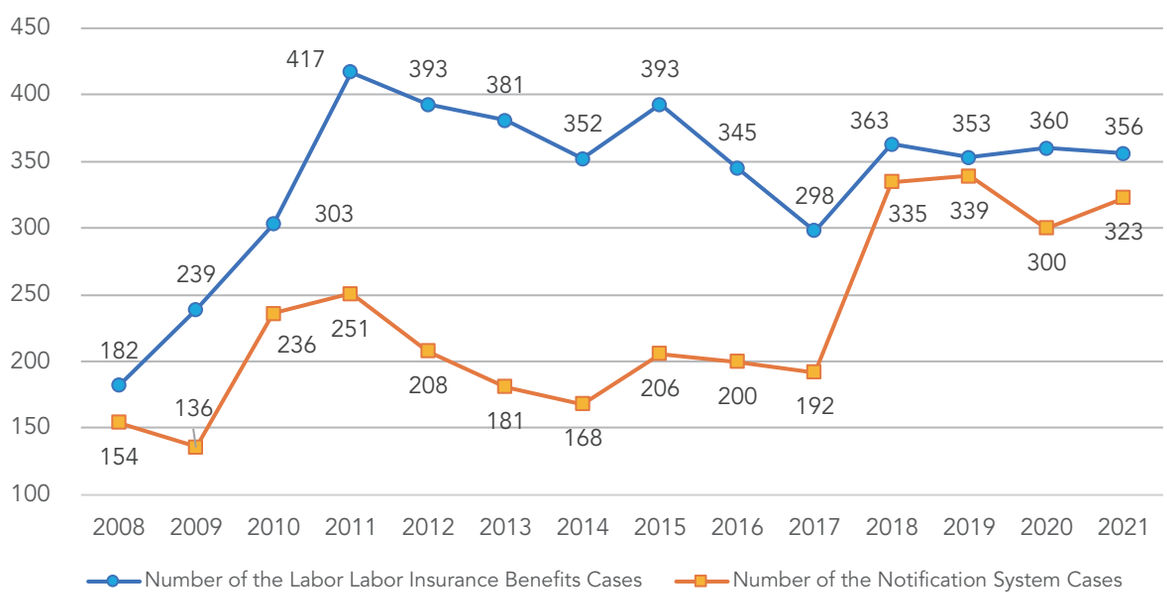
[Figure 3-1] Applications for the Occupational Disease Benefits of Labor Insurance over the Years



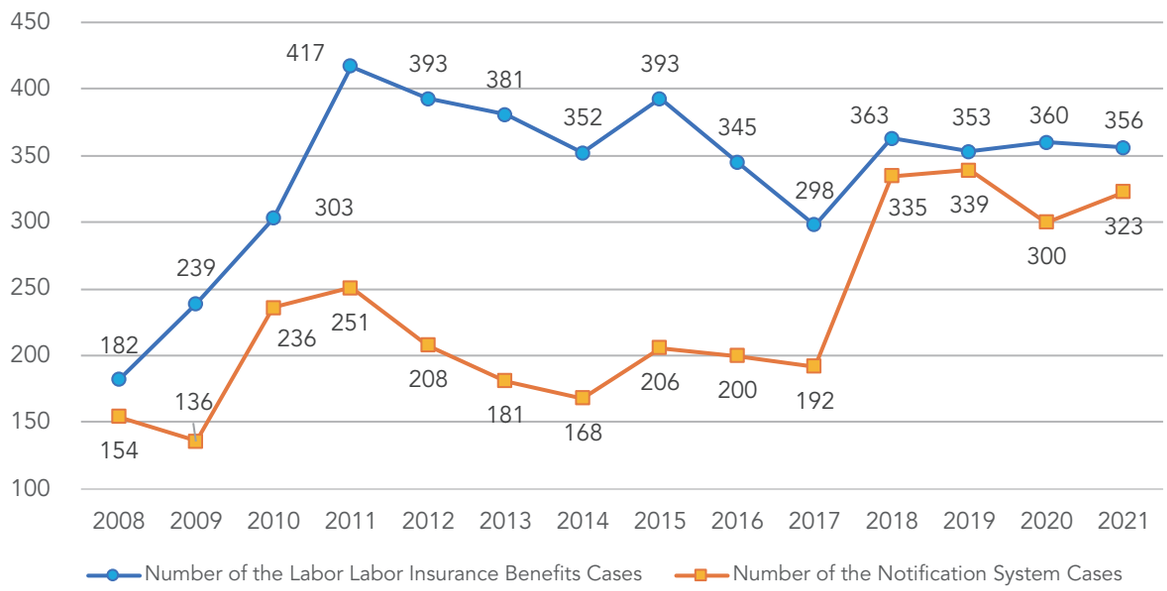
[Figure 3-2] The Occupational Disease Benefits of Labor Insurance Check Data Results Of Occupational Injury/Disease Notification System over the Years



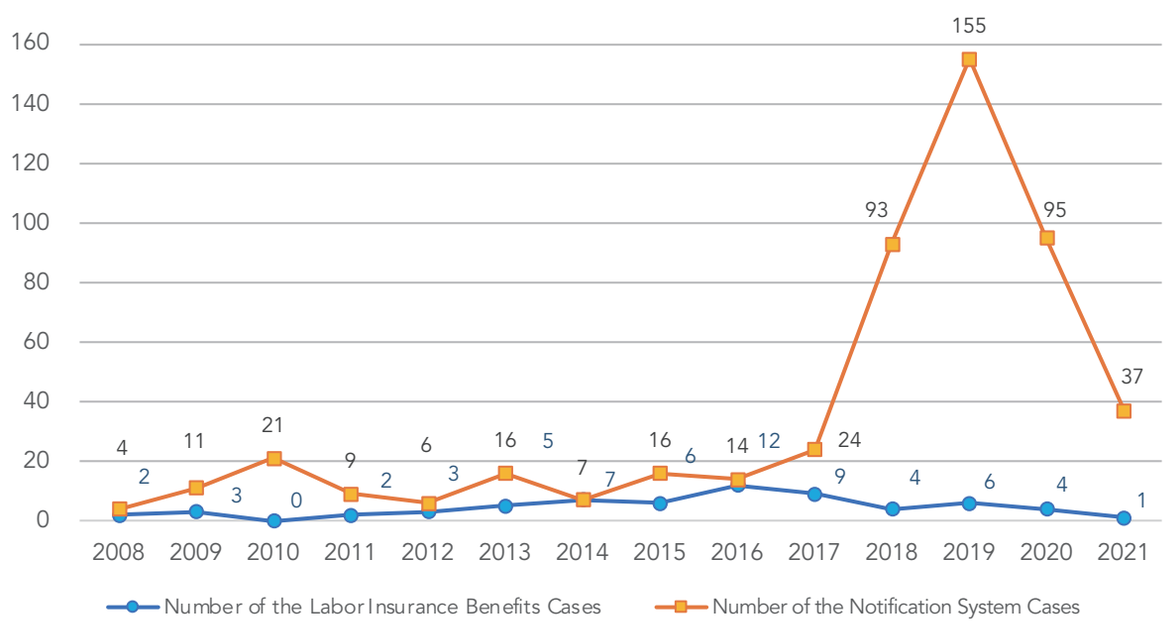
[Figure 3-3] Comparison of the Number of Arm/ Shoulder Disorders Cases Occupational Disease Benefits of Labor Insurance and the Notification System



[Figure 3-4] Comparison of the Number of Occupational Low Back Pain Cases in the Occupational Disease Benefits of Labor Insurance and the Notification System



[Figure 3-5] Comparison of the Number of Pneumoconiosis Cases in the Occupational Disease Benefits of Labor Insurance and Notification System



[Figure 3-6] Comparison of the Number of Silicosis Cases in the Occupational Disease Benefits of Labor Insurance and Notification System

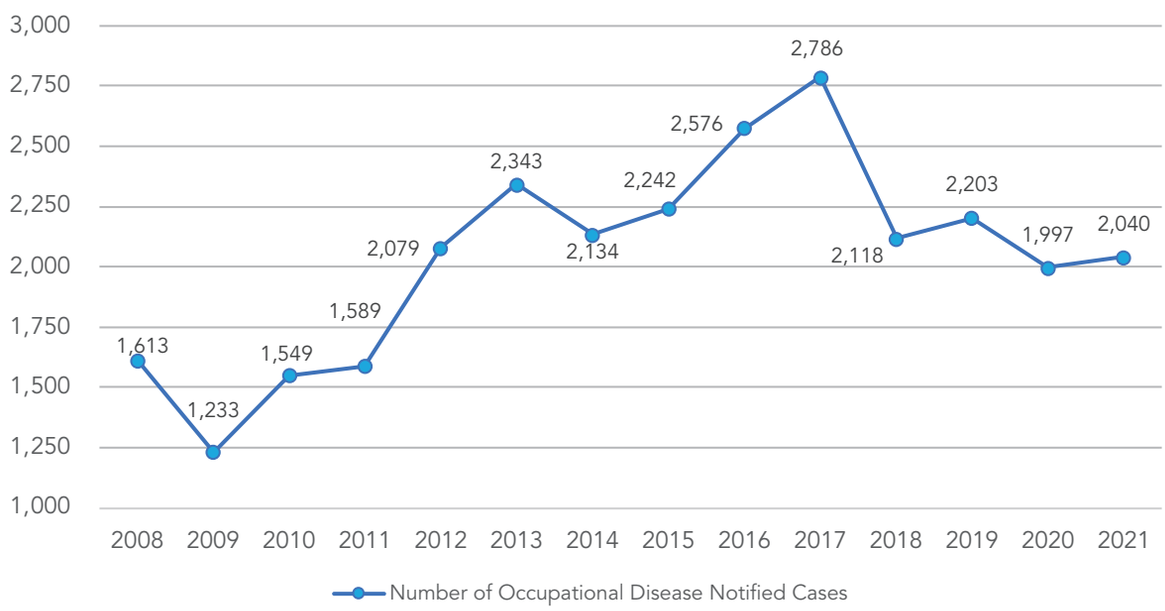
Distribution of Occupational Injury and Disease Reports from 2008 To 2021

Since the establishment of the occupational injury and disease Notification System in 2008, the trend of [Figure 3-7] shows that the number of occupational disease notifications has steadily increased year by year. This is the result of the efforts of various prevention and treatment centers to promote occupational injury and disease service medical services. In 2008, the initial establishment of the Notification System was completed, and it was the first year of test period. The Notification System includes occupational disease cases and some occupational injury cases notified in 2007, so the number of occupational injury cases notified in 2008 is much higher than that in 2009. After the prevention and treatment center and network hospitals became familiar with the operation mode of the occupational injury and disease Notification System in 2008, there was no problem of unfamiliarity with the operation of the the Notification System. Since 2010, the number of cases of occupational disease notifications has increased steadily every year.

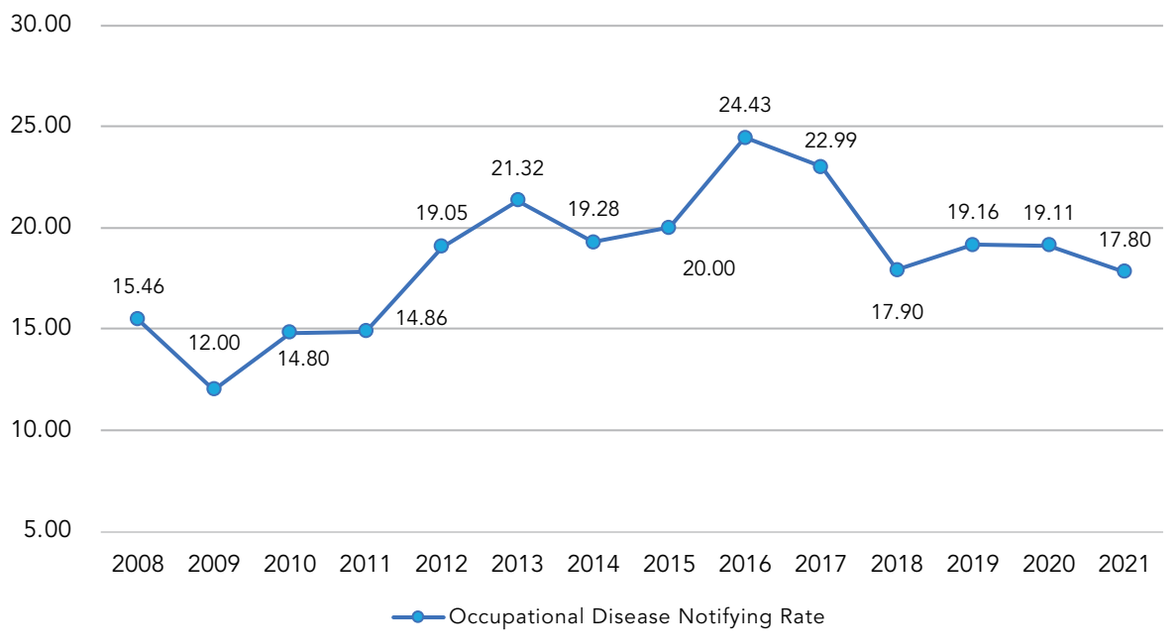
From 2008 to 2021, a total of 28,502 occupational disease notifying passed the quality review. Since 2018, the Occupational Safety and Health Administration has encouraged prevention and treatment centers and network hospitals in the jurisdiction to notify other types of occupational diseases other than noise-induced hearing loss (such as occupational musculoskeletal disorders, work-related diseases caused by asbestos, etc.), and improve the quality of occupational disease notifying cases. Also, they revised the review standards for noise-induced hearing loss caused by occupation, so the number of notifications of noise-induced hearing loss has decreased. In addition, when making a diagnosis of other types of occupational diseases, it is necessary to obtain complete work exposure data before determining whether it is an occupational disease, which takes a long time. Therefore, the number of notified cases of occupational disease has decreased since 2018.

After the prevention and treatment centers and network hospitals became familiar with the adjusted notified cases procedure, the number of notified cases of occupational disease increased slightly in 2019. Our country's early response and prevention measures for the

global outbreak of COVID-19 in 2020 have made the domestic impact of the pandemic less severe than other countries. However, the domestic epidemic broke out in May 2021, and the occupational injury and disease outpatient clinic was affected, which resulted in a decrease in the number of outpatient services and occupational disease notifications (Figure 3-7).



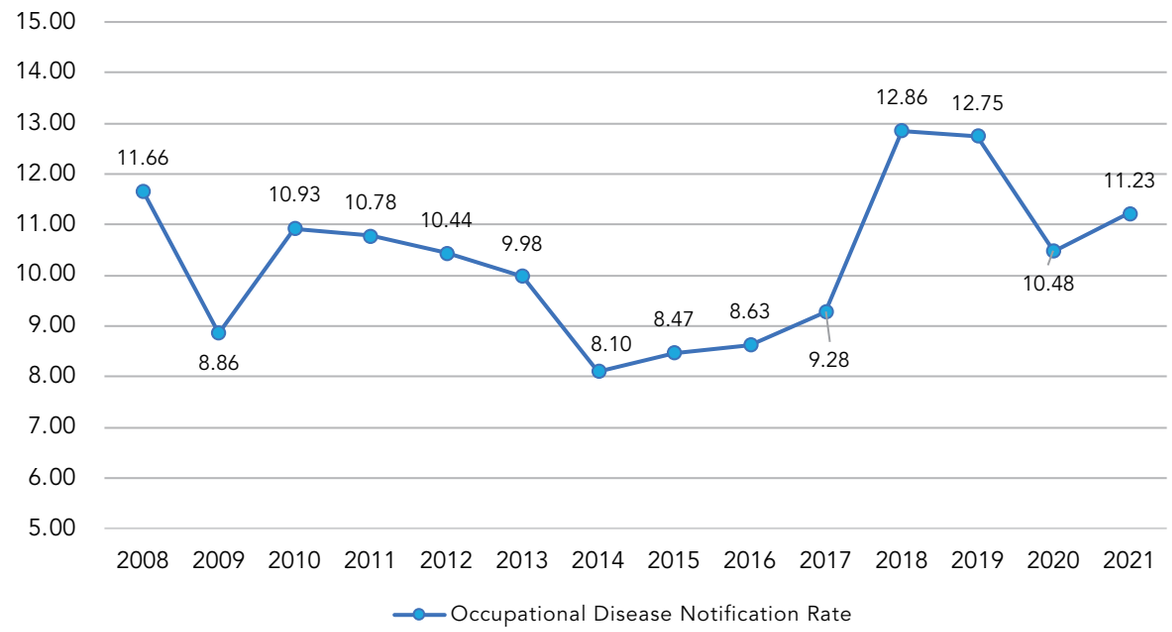
[Figure 3-7] Occupational Disease Notified Cases Over the Years (Notified Cases of Occupational Diseases Diagnosed and Confirmed by ICD-9 and Passed Quality Review)



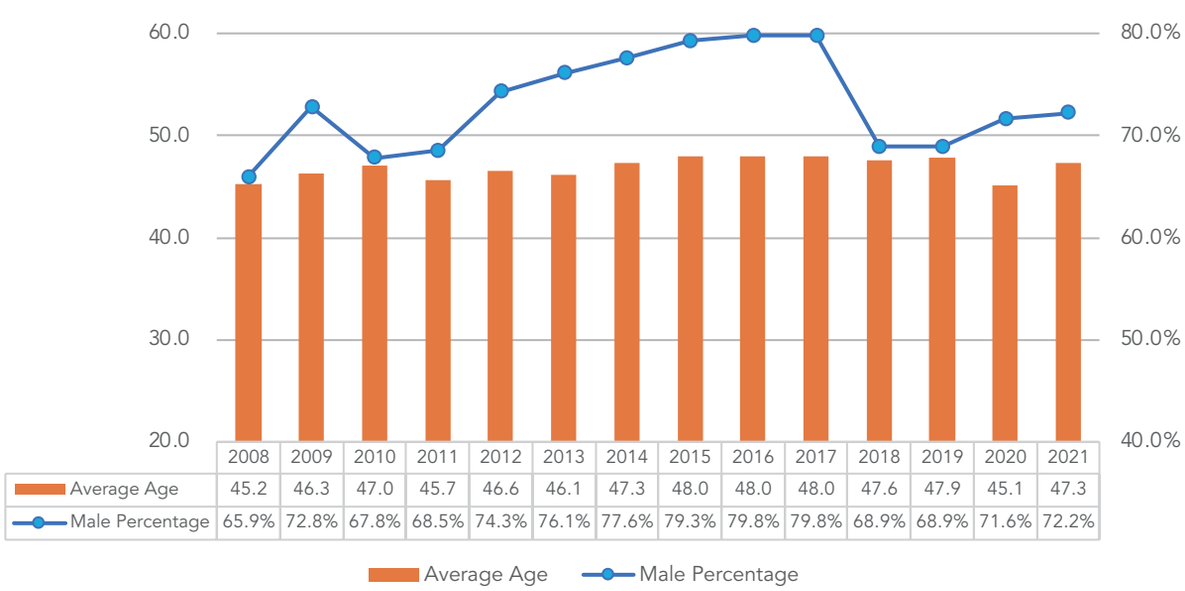
[Figure 3-8] Occupational Disease Notifying Rates over the Years (unit: per 100,000 employed population)

The occupational injury and disease Notification System was started operation in 2008. In that year, the occupational disease notification rate of prevention and treatment network services was 15.5 persons per 100,000 employed population, and the rates increased steadily year by year. The notification rate of occupational diseases has gradually increased, and the notification rate of occupational diseases in 2021 had reached 17.8 persons per 100,000 employed population (Figure 3-8).

However, if noise-induced hearing loss cases are excluded, the occupational disease notification rate has increased from 11.7 persons per 100,000 employed population in 2008 to 12.9 in 2018 (Figure 3-9). From this, it can be inferred that the strategy of encouraging prevention and treatment centers and network hospital doctors to notify other types of occupational diseases other than noise-induced hearing loss in 2018 was successful.



[Figure 3-9] Occupational Disease Notification Rate over The Years After Excluding Noise-Induced Hearing Loss Cases (unit: per 100,000 employed population)



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Average Age	45.2	46.3	47.0	45.7	46.6	46.1	47.3	48.0	48.0	48.0	47.6	47.9	45.1	47.3
Male Percentage	65.9%	72.8%	67.8%	68.5%	74.3%	76.1%	77.6%	79.3%	79.8%	79.8%	68.9%	68.9%	71.6%	72.2%

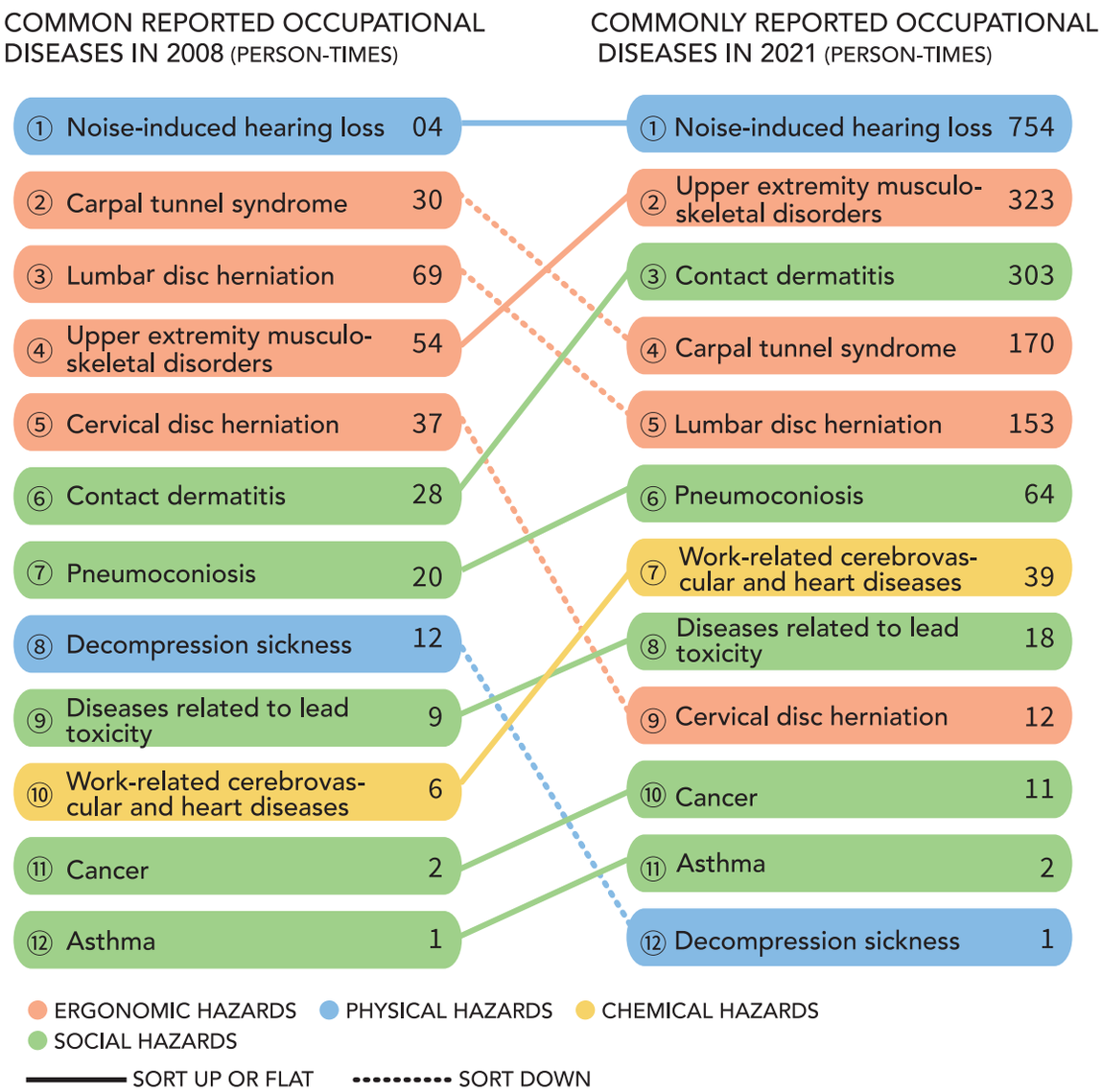
[Figure 3-10] Average Age and the Male Ratio of Occupational Disease Notified Cases over the Years

As shown in [Figure 3-10], the average age of occupational disease notified cases has gradually increased over the years. In 2008, the average age of patients in occupational disease notified cases was 45.2 years old, and by 2021 it was 47.3 years old. More than 60% of the notified cases over the years were men.

Commonly notified occupational diseases and their corresponding types of occupational hazards are sorted by the total number of annual notifications, and the difference between 2008 and 2021 is shown in [Figure 3-11].

In 2008, the top notified diagnosis was noise-induced hearing loss, with 404 cases; the second one was carpal tunnel syndrome, with 230 cases; the third one was Lumbar herniation of intervertebral disc, with 169 cases. In 2021, noise-induced hearing loss is still the top notified, with 754 cases; the second and third most commonly notified diseases were upper limb musculoskeletal disorders and contact dermatitis, with 323 and 303 cases respectively.

If classified by the types of occupational hazards, among the 12 major notified occupational diseases before 2008, human-induced hazards accounted for the most. By 2021, ergonomic hazards still accounted for the largest number, while work-related cerebro-cardiovascular diseases with psychosocial hazards (such as overtime and other workload factors) ranked to the seventh most notified, with a total of 39 people in 2021. In addition to Work-related cerebro-cardiovascular diseases, and noise-induced hearing impairment, the number of notifications of contact dermatitis, upper limb musculoskeletal disorders, and pneumoconiosis also showed an increasing trend.



[Figure 3-11] The Top 12 occupational Disease Notified Cases in 2008 and 2021

The total number of cases notified through the Notification System in 14 years was 28,502, of which noise-induced hearing loss accounted for the most, with a total of 12,481 persons, from 2008 to 2021, accounting for 43.7% of the total number of cases; followed upper limb musculoskeletal disorders, with a total of 3,281 persons, accounting for 11.5% of the total number of cases. The third was carpal tunnel syndrome, 2,915 persons, accounting for 10.2%, as shown in [Figure 3-12].

The number of notifications of noise-induced hearing loss is significantly higher than that of other types of occupational diseases. The main reason for this is that exposure to noise in the workplace is one of the 40 particularly hazardous operations regulated by the "Labor Health Protection Rules". Exposed workers are required to go to qualified medical institutions to receive special health examinations and health classification management every year, according to law. Occupational medicine physicians of the prevention and treatment network hospitals regularly conduct special health checkups for workers in noisy environments, and can then assess whether the hearing loss of the case is caused by Work-related noise, based on the results of the pure-tone audiometry and the measurement value of the ambient noise in the workplace. The case can then be confirmed and notified as occupational diseases.

The promotion and implementation of the above occupational safety and health related regulations will increase the notification rate of specific diagnosed occupational diseases. In addition, If any news of significant occupational hazard is notified and raises concerns, or when the Occupational Safety and Health Administration revises the reference guidelines for occupational disease recognition, it may also alert the front-line occupational medicine physicians to identify and notify more occupational diseases. Taking occupation-induced cerebrovascular and heart disease as an example, in 2010, the media widely notified that an employee of a technology company died of overwork due to overtime, this event prompted the Occupational Safety and Health Administration to revise the " Work-related cerebrovascular and heart disease" at the end of the same year via “Reference Guidelines for the Recognition". The newly revised guidelines specifically designate the factors such as overtime work and work overload as essential requirement for the recognition of occupational diseases. From [Figure 3-12], among the number of notifications of work-related cerebro-cardiovascular diseases over the years, before 2010, there were less than 10 person-times. After the announcement of the revised recognition guidelines in 2011, the number of notifications reached 21 person-times.

In addition, the interdisciplinary consultation and referral mechanism in medical field also affects the notification rate of occupational diseases. Since Taiwan's overall health care

system is still based on the National Health Insurance, the vast majority of workers, regardless of whether or not they have an occupational disease, will first seek medical assistance from a medical specialty other than occupational medicine when they become ill. If we look at the number of notified cases of contact dermatitis over the years, there were only 28 cases in 2008 and 303 cases in 2021, a significant increase in the number of notified cases. After analyzing the source of the notification, it is assumed that the possible reason is that the specific dermatologists in the prevention and treatment network have complete occupational medicine specialty training and are able to collect the information related to occupational exposure and help identify occupational disease notifications while treating patients with skin disorders in the outpatient clinic. In contrast, the cumulative number of occupational cancer notifications was only 175, a much lower notification rate than in other developed countries. In addition to the long induction period of cancer itself and the difficulty of collecting evidence of occupational exposure, it is not easy to establish a complete referral mechanism for occupational cancer in the medical institutions of the prevention and treatment network because of the wide range of specialties that cancer patients visit.

[Table3-2] Common Occupational Disease Diagnosis Age, Gender, and Industry Distribution

Occupational Disease Diagnosis	Total	Average Age	Male Percentage	Commonly Reported Industries
Noise-induced hearing loss	12,481	41.5	93.1%	Manufacturing, construction, transportation, and warehousing
Upper extremity musculoskeletal disorders	3,281	48.6	50.2%	Manufacturing, construction, accommodation, and catering
Carpal tunnel syndrome	2,915	48.9	32.7%	Manufacturing, accommodation, and catering, - other service industries *
Lumbar disc herniation	2,188	49.6	83.8%	Construction, manufacturing, transportation, and warehousing
Contact dermatitis	2,594	37.4	56.3%	Accommodation and catering industry, professional scientific and technical service industry, manufacturing industry

Occupational Disease Diagnosis	Total	Average Age	Male Percentage	Commonly Reported Industries
Pneumoconiosis	1,285	64.4	75.2%	Manufacturing, mining, and earth and rock extraction, construction
Decompression sickness	321	36.7	99.9%	Agriculture, forestry, fishery and animal husbandry, water supply and pollution control, other service industries *
Diseases associated with lead toxicity	355	40.5	65.1%	Manufacturing, construction
Work-related cerebrovascular and heart diseases	300	51.9	82.8%	Manufacturing, transportation and storage, other services *
Cervical disc herniation	200	51.0	89.8%	Construction, manufacturing, transportation, and warehousing
Wheezing	151	52.4	90.3%	Manufacturing, construction, accommodation, and catering
Cancer	175	62.3	94.3%	Construction, manufacturing, other services, professional, scientific, and technical services

* Note: Other service industries include hairdressing, car repair, security, etc.

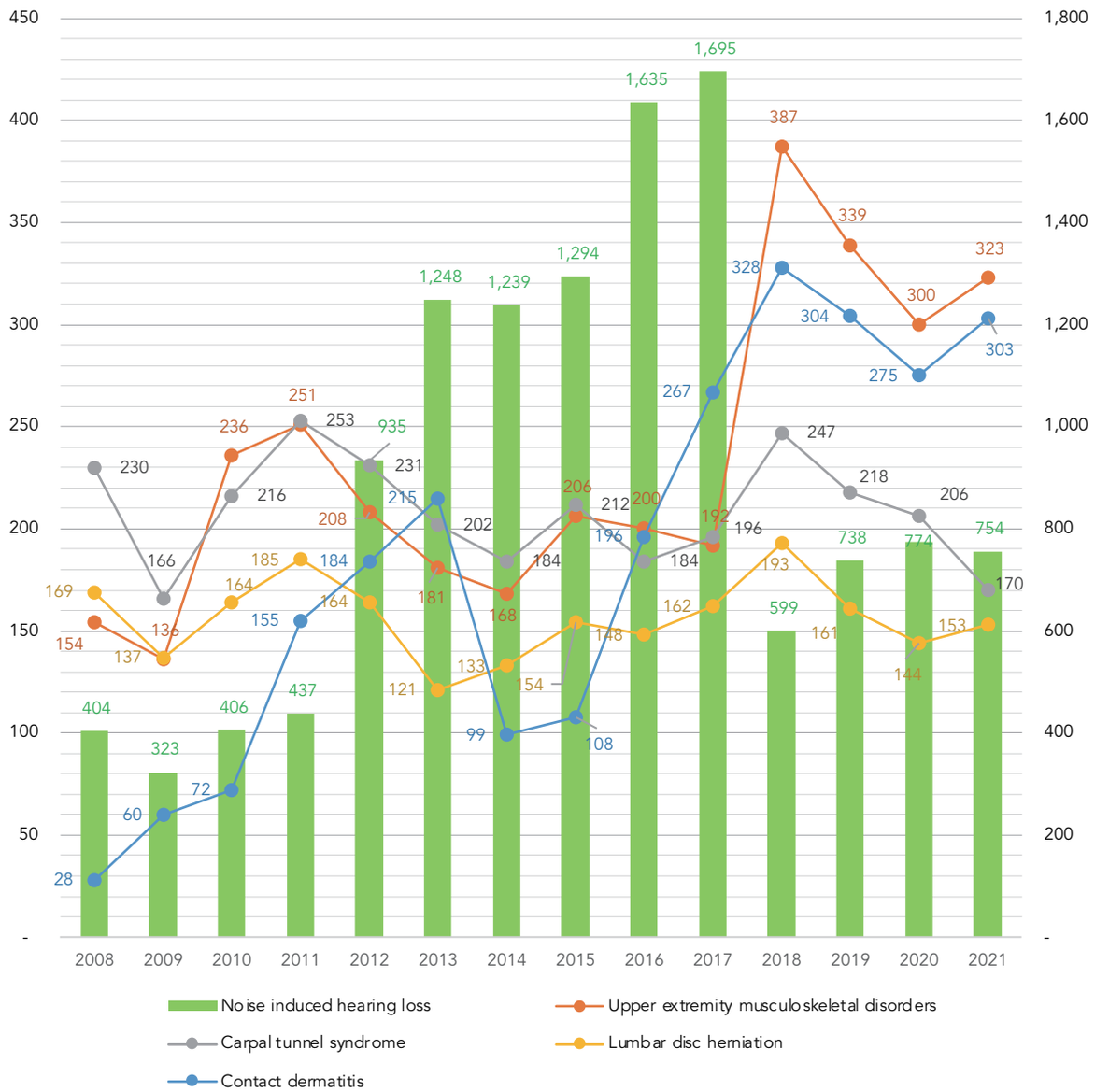
According to different occupational diseases, the average age, sex ratio and common industries of notified cases are shown in [Table 3-2]. The average age of diagnosis of most occupational diseases is between 40 and 50 years old, while the age distribution of contact dermatitis cases is lower, with an average age of 37.4 years. The average age of pneumoconiosis and cancer cases at the time of notification is higher, 64.4 and 62.3 years respectively , mainly because these two diseases usually progress to manifest themselves clinically in middle or even old age.

For most occupational diseases, the proportion of men is more than half. For decompression sickness, noise-induced hearing loss, asthma, and cancer, the proportion of men is as high as more than 90%. For carpal tunnel syndrome alone, most notified cases are female (32.7%). It is speculated that women are more likely to be engaged in jobs with highly repetitive wrist motion in the workplace, so the incidence rate is higher than men.

The manufacturing industry is the industry where most notified occupational diseases were discovered, including noise-induced hearing loss, carpal tunnel syndrome, upper limb musculoskeletal disorders, lumbar herniation of intervertebral disc, and other disorders. These

are mainly due to the working environment of the manufacturing industry, where machines are often running on site and full of noise, and most of them are still labor-intensive operations. Workers in these environments are potentially exposed to various ergonomic hazards, such as repetitive hand movements, lifting arms over shoulders, bending over for long periods of time, and lifting heavy loads.

From 2008 to 2021, there were a total of 300 work-related cerebro-cardiovascular diseases, and the largest proportion of notifications was in the manufacturing, transportation, and warehousing industries, and other service industries (including security), where workers are often exposed to risk factors, including long working hours, rotating shifts, or night shifts, etc. Medical literature has demonstrated that the above factors can significantly increase the risk of work-related cerebrovascular and heart diseases.



Occupational Disease Diagnosis	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Pneumoconiosis	20	56	88	36	94	153	80	78	70	81	137	197	131	64
Decompression sickness	12	70	45	49	69	26	19	18	2	4	1	3	2	1
Diseases associated with lead toxicity	9	38	22	9	21	48	36	17	21	31	24	40	21	18
Work-related cerebrovascular and heart diseases	6	10	10	21	19	15	15	17	19	24	42	35	28	39
Cervical disc herniation	37	14	12	17	17	14	11	16	10	8	18	7	7	12
Asthma	1	9	90	31	1	3	3	1	0	3	4	0	3	2
Cancer	2	13	9	13	21	6	11	5	6	11	25	26	16	11
Other	541	201	179	132	115	111	136	116	85	112	113	135	90	190

[Figure 3-12] Number of Notifications of Common Occupational Disease Diagnoses over the Years

[Table 3-3] Common Sources of Occupational Disease Outpatient Clinics and the Proportion of Notifications Areas

Occupational Disease Diagnosis	Total	Outpatient Ratio	Proportion of Sick Leave due to Work-related Illness	Common Notification Areas
Noise induced hearing loss	12,481	49.8	0.2	Taoyuan City, Taichung City, New Taipei City
Carpal tunnel syndrome	3,281	67.1	43.8	Taichung City, Taipei City, New Taipei City
Upper extremity musculoskeletal disorders	2,915	71.5	50.5	Taichung City, Kaohsiung City, Tainan City
Lumbar disc herniation	2,188	75.8	60.3	Taichung City, New Taipei City, Changhua County
Contact dermatitis	2,594	90.4	26.5	Kaohsiung City, Tainan City
Pneumoconiosis	1,285	41.6	12.6	New Taipei City, Taoyuan City
Decompression sickness	321	99.0	12.7	Pingtung County, Taitung County
Diseases associated with lead toxicity	355	34.7	0.1	Yilan County
Work-related cerebrovascular and heart diseases	300	43.6	89.7	Taipei City, Taichung City, New Taipei City
Cervical disc herniation	200	77.1	48.8	Taichung City, New Taipei City, Taipei City
Asthma	151	63.2	27.1	Kaohsiung City, New Taipei City, Pingtung County
Cancer	175	42.3	40.0	New Taipei City, Kaohsiung City, Taichung City

[Table 3-3] shows the outpatient ratio of common sources of occupational diseases, the ratio of work loss due to illness, and common notification areas. Most of the cases of cancer, asthma, and pneumoconiosis come from referrals from other departments in the hospital, while noise-induced hearing loss and lead toxicity-related diseases are mostly diagnosed through worker special health examinations, follow-up examination and Re-classification by occupational medicine specialists.

Among the cases of people who had stopped working due to occupational diseases,

Work-related cerebrovascular and heart diseases were the highest (89.7%), followed by lumbar disc herniation (60.3%), and upper limb musculoskeletal disorders ranked third (50.5%). Cases of Work-related cerebrovascular and heart diseases need to spend a long time on rehabilitation, and may even suffer from sequelae or physical paralysis and cannot continue to work. Therefore, that proportion of people who stop working due to illness is much higher than other types of occupational diseases.

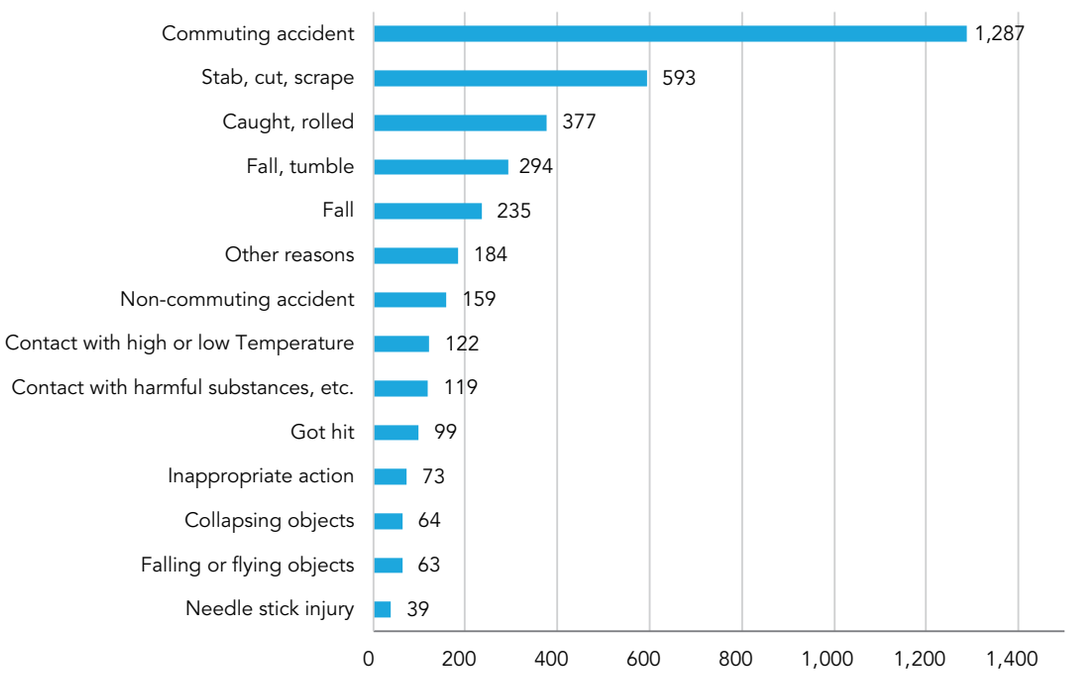
Workers suffering from lumbar disc herniation, upper limb musculoskeletal disorders, or cervical disc herniation often have to bear weight or have to at work. Most of the patients who seek medical treatment has waited until the symptoms cause serious pain, numbness, weakness, or other discomforts, and affected their work., which affect their work. Therefore, the severity of the disease and the proportions of stopping work due to illness are also high. Because the treatment process of cancer is complicated and takes more time than other diseases, the proportion of people who stop work is also high.

In addition to stopping work due to illness, the proportion of death cases is also one of the indicators for evaluating the severity of the disease. The proportion of death cases of occupational-induced cerebrovascular and cardiac diseases and occupational cancer were 24.1% and 22.2%, respectively, which are far higher than other types of occupational diseases.

New Taipei City and Taichung City are areas where notified occupational diseases often occur. New Taipei City has the largest labor population in our country, and Taichung City has the third largest labor population. Their industries are dominated by Traditional and labor-intensive enterprises, so the proportion of workers with occupational diseases is relatively high. In addition, because there are 3 prevention and treatment centers in the Greater Taipei Metropolitan Area (National Taiwan University Hospital, Linkou Chang Gung Hospital, and Taipei Veterans General Hospital), and 2 prevention and treatment centers in the Taichung Metropolitan Area (China Medical University Hospital and Chung Shan Medical University Hospital), the number of occupational injury and disease services that can be provided is relatively high, so the proportion of completed occupational injury and disease notifications is

also relatively high.

[Figure 3-13] is the occupational injury notification data of the prevention and control centers and the network hospitals in 2021, which is different from the "Occupational Safety and Health Act" which stipulates that one death, three injuries and one hospitalization must be notified. It belongs to the medical end in occupational injury and disease notification, which is made possible by a cooperative referral mechanism Only those injuries and diseases which meet the definition of occupational accidents will be notified. Therefore, the most notified occupational accidents were commuting to and from work, accounting for 27.6%. A total of 3,708 occupational injuries were notified in 2021.



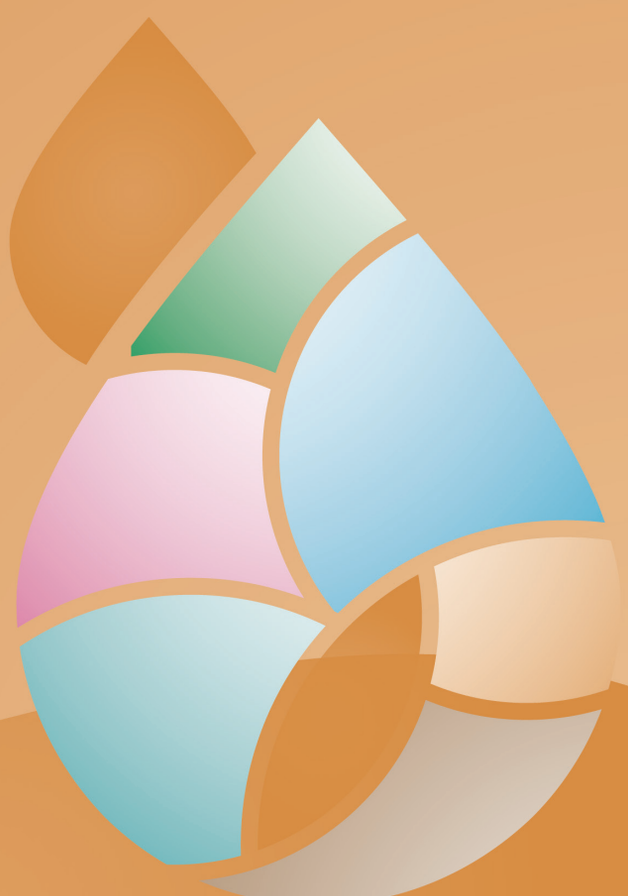
Note: Other reasons include the types of occupational accidents that cannot be classified (that is, occupational injury notification cases classified them as " others " in the Notification System for occupational accidents), a total of 98 cases, and the types of occupational accidents that account for less than 2.0% of the total number of occupational injury notifications in the notification system, including: collision (23 cases), explosion (20 cases), electric shock (19 cases), blood contamination (14 cases), stampede (6 cases), object rupture (2 cases), fire (2 cases), etc.

[Figure 3-13] Notification Data of 2021 Occupational Injury and Disease Notification System Occupational Injury

Chapter 4

CURRENT SITUATION AND FUTURE ISSUES OF OCCUPATIONAL DISEASE AND INJURY

Po-Ching Chu
Attending Physician, Department of Environmental and Occupational Medicine, NTUH



Prevention Service centers and Their Network Hospitals Divide Responsibilities, to Build the Occupational Disease and Injury Services

In 2021, there were a total of 88 network hospitals under the 10 prevention service centers, and each center had 4 to 13 network hospitals.

The Prevention Centers provide professional medical services from prevention to treatment, rehabilitation, and return to work. They maintain activities to ensure the health of workers in the workplace, provide nearby services such as occupational injury prevention, diagnosis, evaluation, and vocational rehabilitation, establish a regional occupational injury service network, conduct occupational disease investigations, report occupational accident cases, and develop special services of special issues for occupational accident prevention or rehabilitation mechanisms.

Network hospitals provide closer diagnosis of causal relationship, consultation, referral services for workers suffering occupational injury and disease, and increasing the notifying rate of occupational diseases.

Experiences of Medical Institutions for Occupational Disease and Injury from Other Countries

In South Korea, the medical institutions are supported by the government and provide a one-stop service

The characteristics of medical institutions for occupational disease and injury in South Korea is different from that of our country. All 10 institutions are public hospitals. The operation of occupational injury and disease medical institutions in South Korea is mostly in deficit. Therefore, the source of funding for maintaining operations is from government support and the services for non-occupational accident patients. At present, there have been several articles evaluating the service quality of medical institutions for occupational disease and injury in South Korea. The services content of the hospitals include work-related accident, medical care, compensation, rehabilitation, and return to work services.

Japan prefers health promotion to prevention for falling visiting rate of patients with occupational injuries

There are 32 medical institutions for occupational disease and injury in Japan, and their services include:

1. Providing professional medical services from prevention to treatment, rehabilitation, and return to work.
2. The activities to maintain and ensure the health of workers in the workplace.

However, the literature in 2008 mentioned that the proportion of patients who visited medical institutions for occupational disease and injury due to occupational accidents dropping significantly, from about 50% to the current 4%. Therefore, in order to enable medical institutions for occupational disease and injury to continue to operate, it has been transformed into services to promote and maintain workers' health.

These services include the prevention and treatment of occupational disease and injury, as well as support for patients who return to work after injury or illness.

CCPP France leads occupational medicine, and builds a platform for professional dialogue

In French, there are 30 Occupational Disease Consultation Centers (CCPP), most of which are in university-affiliated medical centers with complete medical facilities and staff who can provide professional specializing in occupational diseases and related medical fields.

The goal of centers established is to help clinicians and professionals providing occupational health services in the diagnosis of occupational diseases. In addition, the National Network for the Monitoring and Prevention of Occupational Diseases (RNV3P), which consists of 30 CCPPs in France and their networks for occupational health services (similar to institutes for occupational health services), provides a platform for dialog between clinicians and other occupational health professionals.

Finland promotes occupational health from both personal and an occupational perspective

Finland adopts a dual-track system, which is parallel to the basic care system and the occupational health system. In Finland, there are 5 medical institutions for occupational disease and injury. Four of them are occupational medicine integrated clinics belong to university hospitals, another one is an occupational medicine clinic belong to the Finnish

Occupational Health Institute (for the national occupational disease referral point), and the services provided by the clinics include occupational disease research, work capacity assessment, work and operational capacity assessment of rescue personnel, and pregnancy and work consultation services.

Number of Case Management Services in Taiwan Increased Significantly from 2008 to 2021

From 2008 to 2021, there was no significantly increase in the number of network hospitals (from 81 to 87), but the number of weekly outpatient clinics between 2008 and 2021 increased significantly from 252 to 299. In 2021, 11,930 to 12,092 workers with first visits visited the centers and network hospitals, and 22,464 to 23,210 workers with total visits visited from 2008 to 2021. Whether the increase in the number of clinics provides corresponding the service amount, it is worth conducting efficiency evaluation in the future.

From 2008 to 2021, the number of case management services in the occupational disease and injury prevention service centers increased from 1,743 to 2,582. At the same time, from 2008 to 2021, the number of occupational disease and injury prevention consultation and referral services in the centers increased from 5,212 to 9,050. Perhaps the reasons for the increase in the above two numbers are increasing funding, and promotion on occupational injury and disease services inside and outside the hospitals. In the future, the service quality of case management services and consultation and referral services will be evaluated to ensure that both quantity and quality continue to improve.

▲2021 National Occupational Accident and Disease Network Integrated Prevention Results Presentation

Concurrent Development of Overworking Law Regulations and Supervision, plus Prevention and Treatment Through Occupational Medicine

Prevention on worker with disease related to work stress are important labor policy issues in many Asian countries. Asian countries generally have long working hours, and neighboring countries such as Japan and South Korea have also seen cases of sudden death related to work stress. In 2010, the sudden death of young engineers in the science and technology industry caused widespread social concern, and also started the movement of preventing overwork in our country.

The “Occupational Safety and Health Act”, 2021, updates the "Provisions on Prevention of Overwork" to specify and regulate employers' engagement in shifts, night work, long-term work, and other operations. To prevent workers from contracting diseases due to abnormal workloads, preventive measures should be taken, including identifying and evaluating high-risk groups, arranging doctor interviews and health guidance, adjusting or shortening working hours and changing work content, implementing health examinations, management, and health promotion. The Occupational Safety and Health Administration also issued "Guidelines for Prevention of Overwork Related Diseases" to assist industrial institutions in complying with the provisions.

In 2011, 2019, 2020, and 2021, the number of overwork project services case were 54, 38, 31, and 58, respectively, which is not significantly increasing. However, the pass rate was 50, 50, 55, and 35%, respectively. The possible reason for the decrease of pass rate in 2021 may be that the Occupational Safety and Health Administration has newly focused on workers without increasing overtime hours before the onset of the disease but have other occupational exposures related to work stress.

Among the 58 overwork project evaluation cases in 2021, the top three industries and occupations are security jobs in the supporting the service industry, operators or supervisors in the manufacturing industry, and drivers in the transportation and logistics industries. It is worth taking occupational preventive measures for cardiovascular disease in these industries.

In 2021, there were 8 cases of occupational disease investigation, which were mostly belong to suspected occupational triggers to cerebrovascular disease, suspected occupational triggers to mental illness, and suspected occupational cancer. The disease attributes could be divided into two categories: diseases related to work-related social psychological factors and occupational cancers, which is difficult to evaluate. After investigation, it should be considered whether the existing guidelines of occupational diseases need to be revised.

Analyzing the number of occupational disease cases paid by our country's Labor Insurance over the years, from 426 people per year in 2008 (in that time, the Occupational Accident and Disease Service Center was established) to 1,009 people in 2021. However, the number of reporting occupational disease in the centers and networks over the past years was 1,626 in 2008, and 2,043 in 2021. The establishment of the Occupational Accident and Disease Management Service Center and the subsequent establishment of the national occupational injury and disease reporting system may have had a significant impact on the detection and identification of occupational diseases, and the increase of reporting occupational disease.

After comparing the top five types of diseases reported as occupational diseases in 2008 and 2011, noise induced hearing loss is still the leading cause. In 2011, contact dermatitis

was newly listed on the top five. At the same time, the ranking of upper limb musculoskeletal disorders is also rising. Therefore, in the future, it is worth exploring whether the increase in contact dermatitis and the increase in upper limb musculoskeletal disorders are nationally, and it is important to understand the industries and occupations related to above two types of diseases, so as to facilitate the planning of effective strategies for the prevention of these occupational diseases.

There are some differences in the number of visits to 10 occupational disease and injury prevention service centers, and there are also differences in the number of labor insurance payments for occupational injury in these hospitals. The reasons for the differences in the number of services provided by the centers are worth further exploring, such as workers' preferences for hospitals, regional factors, the direction of hospital management and so on.

From 2019 to 2020, the average annual number of medical visits for occupational diseases paid by Labor Insurance in medical institutions across the country was 9,908, while the average annual number of medical visits for occupational diseases paid by Labor Insurance in medical institutions of the centers and their networks was only 3,021. It can be seen that the number of medical visits for workers with occupational diseases paid by Labor Insurance in the centers and their networks is only about one-third of the overall number in all medical institutions across the country. So, in the future, the two-way referral system between the occupational injury and disease prevention and treatment network and the non-occupational medical institutions should be strengthened.

Chapter 5

LEARNING FROM ADVANCED COUNTRIES TO CONSTRUCT MORE COMPREHENSIVE AND INTEGRATED SERVICE SYSTEM FOR OCCUPATIONAL ACCIDENTS AND DISEASES IN OUR COUNTRY

Qiu-Miao Lin
Director, Occupational Safety and Health Administration, Ministry of Labor

Qing-Zong Ye
Section Chief, Occupational Safety and Health Administration, Ministry of Labor

Learn from International Experience, Improve Legal System for Occupational Disease and Injury Services in Our Country

The establishment and development of Occupational Disease and Injury Prevention Service centers in Taiwan has gradually developed into the present scale over the decades since the 1990s, through efforts by the National Health Administration of the Executive Yuan, the Council of Labor Affairs (Bureau of Labor Insurance, Department of Occupational Safety and Health) and the Occupational Safety and Health Administration of the Ministry of Labor (hereinafter referred to as OSHA) after the restructuring in 2014. In 2021-2022, the Labor Occupational Accident Insurance and Protection Act (hereinafter referred to as the Accident Insurance Act) was passed and implemented. The government has used special funds for occupational accident victims for many years, and now it takes on to transform the Occupational Disease and Injury Prevention Service centers sponsored by the planning subsidy and Procurement Act into an Accredited Medical Institution (hereinafter referred to as a designated specialized hospital for the diagnosis and treatment of occupational injuries and diseases), thus incorporating labor occupational accident and disease services and other measures inside the provisions of the law, and providing subsidies through stable funds.

Based on the spirit of prevention, compensation, and rehabilitation of occupational accidents, and based on the experience of neighboring countries such as Japan and South Korea, we hope that the designated specialized hospitals can develop in the same way as the "labor accident hospitals" in those two countries. Article 73 of the Accident Insurance Act stipulates that “in addition to treatment and notification of occupational accidents and diseases, designated medical institutions must have a variety of medical specialties, the capability of preventing and treating occupational accidents and diseases in the region, the establishment of a counseling network in-hospital, research and teaching capabilities”. Considering the size of the hospital, staffing, and capacity of diagnosis and treatment services of the Occupational Disease and Injury Services Prevention Centers in the past, we have formulated measures for the designation, management and subsidy of occupational

accidents diagnosis and treatment medical institutions, and the measures for the notification of occupational accidents and diseases (hereinafter referred to as the designation measures). The designation measures specify the basic conditions of designated medical institutions, to ensure that the designated specialized hospitals have the functions of medical diagnosis and treatment, rehabilitation, and reconstruction services for accidents and diseases, and to assist workers suffering from occupational injuries and diseases to return to the workplace smoothly, which requires integrated service capabilities. At the same time, it has also established that, after the implementation of the Accident Insurance Act, occupational accidents and diseases services have a clearer management mechanism. Based on the role and functions of the existing prevention centers, the specialized hospitals should be able to gradually expand the scope of services and improve the quality, plus, provide a complete one-stop service model for workers suffering from occupational accidents from notification, diagnosis, and treatment, to return to the workplace.

▲ Chairman Ming-Chun Hsu participated opening ceremony of COAPRE in 2022.

Expand Occupational Disease and Injury Notification, Strengthen Integration Mechanism Within Hospital, and Provide Early Intervention Services

One of the purposes of the occupational disease and injury notification is to grasp the workers who have encountered occupational injuries and diseases, and to intervene early to provide occupational rehabilitation-related services. To improve the notifying rate and improve the quality of occupational injuries and disease response in our country, the OSHA has also re-established and optimized the occupational disease and injury notification system. In addition to providing designated specialized hospitals and affiliated network hospitals with quality review mechanisms for occupational accidents and diseases notification, in accordance with Article 73 of the Accident Insurance Act, all workers who have encountered occupational accidents or diseases, employers, or persons who know that they have encountered occupational accidents or diseases (including various medical institutions) can take the initiative to report through the online notification platform established by the OSHA. After receiving the report, the OSHA will provide necessary assistance and referrals. In accordance with Article 65 of the Accident Insurance Act, the OSHA has integrated the major occupational disease and injury notification cases of the Accident Insurance Act, the payment recipients of occupational accidents and diseases insurance, the occupational disease and injury notification cases received by the county and municipal labor or social bureaus (offices) and the information reported through the online notification platform, and established a complete occupational disease and injury notification and service integration system. Through the case professional service personnel of the municipalities directly under the Central Government, counties, and cities, the case managers of the hospitals responsible for the diagnosis and treatment of occupational accident and disease cases, and the case managers of the hospitals responsible for the functional rehabilitation of occupational accident and disease victims, are able to intervene as soon as possible to assist and advise. The case management service personnel of the counties, cities, and medical institutions are urged to interact with each other. Contact, cooperation, and referrals will expand the service orientation, strengthen preventive intervention and

rehabilitation assistance, and provide a comprehensive, accessible, and seamless service network for occupational accident or disease sufferers.

In addition to the above-mentioned expanded notification and integration, the notification system also continues to monitor the status of occupational accidents and diseases in our country from the clinical side, by using designated hospitals and network hospitals as a reference for the research and analysis of occupational disease and injury prevention and control policies.

Considering the diverse types of occupational injuries and diseases, in order to provide integrated services for the diagnosis and treatment of occupational injuries and diseases in different departments in the hospitals, in accordance with the attached resolution passed by the Legislative Yuan. When considering the Accident Insurance Act, each designated specialized hospital is required to propose a specific, in-hospital integration plan, and set up a medical committee (group) coordinated by personnel on the highest hospital level, which is included as one of the reviewing criteria of a designated medical institution. When handling cross-disciplinary referrals and occupational injury and disease reports, this makes it possible to effectively cooperate and coordinate medical resources within the hospital, and provide integrated and continuous diagnosis, treatment, and care services for occupational accident or disease victims, by cross-specialty and cross-disciplinary medical teams.

♦ Provide On-Site Visits for Suspected Occupational Diseases to Improve the Quality of Diagnosis

In view of the difficulty of assessing the causal relationship in suspected occupational disease cases, in order to provide appropriate assistance to workers suspected of suffering from occupational diseases, occupational medicine specialists must conduct on-site visits depending on the situation of the case, to understand the actual operation of the job and the hazard factors exposed, etc. As a reference for the assessment and diagnosis of occupational diseases, this process is very important and will improve the quality of diagnosis, thereby

reducing disputes between employees and employers, or for the payment of occupational accident insurance. In addition, for workplace hazards that have not been verified in the past, and emerging occupational diseases, there is an urgent need for relevant medical personnel to conduct the inquiry in the spirit of exploration and perseverance. Through the examination, study, and analysis of exposure factors and clinical diseases, the relationship between specific diseases and occupational exposure can be discovered. Consequently, on-site visits are an extremely important part of that investigation.

Considering that industrial institutions may not be willing to cooperate and allow occupational medicine doctors to carry out site visits, it will make hazard exposure assessments difficult. The relevant regulations of the Accident Insurance Act have stipulated that, if necessary, the central responsible authority may be requested to coordinate with the labor inspection agency to send personnel to assist, in response to the needs of occupational medicine specialists to visit a factory. In addition, with reference to foreign experience, on-site visits can not only help understand the actual situation of the case in the workplace, but also instruct stakeholders with the knowledge of occupational disease prevention.

Established a Nonprofit Corporation to Integrate Prevention and Rehabilitation. The Occupational Accidents Service Has Reached a New Milestone

The Accident Insurance Act has been officially implemented. The Act covers complete and standardized areas such as prevention, compensation, diagnosis, and treatment of occupational accidents and diseases, as well as rehabilitation. It also means that our country's system of occupational injury and disease diagnosis, treatment and rehabilitation services will start a new chapter. Through the establishment of the Occupational Accidents and Diseases Prevention, Treatment, and Rehabilitation Centers as a nonprofit corporation, public-private cooperation will be used to expand the services for notifying occupational injuries and diseases, as well as for diagnosis and treatment, and assisting workers suffering occupational injuries or diseases to return to work. Unlike in the past, where the rehabilitation of workers suffering

occupational injuries or diseases was based on strict case-opening criteria (If they can return to their original workplaces within 2 months, then the case can be opened), and limited assistance in the form of program subsidies. After the implementation of the new law, in line with the norms of relevant measures, the government will more actively promote rehabilitation assistance, and occupational rehabilitation services, for workers suffering occupational accidents or diseases, and improve the protection mechanism for workers at risk of or suffering from occupational accidents or diseases, with the goal of not leaving any affected workers behind in jeopardy.

DEEPLY FELT
OCCUPATIONAL DISEASE AND INJURY PREVENTION

PUBLISHER Occupational Safety and Health Administration, Ministry of Labor

DIRECTOR GENEAL Tzou, Tzu-Lien

CONVENER Lin,Qiu-Miao

EDITORS Liu, Yue-Se; Li, Shi-Hong;Ye, Qing-Zong; Peng, Hong-Yi; Chen, You-Xuan; Zhang, Jia-Chen; Chen, You-Yi; Liu, Yi-Ping; Yang, Ya-Wen; Xiao, Yi-Ling; Zhang, Ya-Wen; Xie, Jia-Li; Chen, Zhi-An; Wang, Han-Ke; Qiu, Xiao-Ling; Chen, Hui-Jun

ADDRESS No.439 Zhongping Rd. Xinzhuang Dist New Taipei City Taiwan R.O.C

TEL +886-2-8995-6666

WEBSITE https://www.osha.gov.tw/

DESIGN Zhenzhi Integration Creative Marketing Co.Ltd

TEL +886-2-2553-6152

PUBLICATION DATE Dec 2022

ISBN 978-626-7125-90-8

GPN 1011102351