

EDITORIAL

China's occupational health challenges

China is a rapidly developing country that has experienced marked socio-economic changes during the last 30 years. However, this has led to a high prevalence of occupational disease (OD). Until 2013, there were only 603 Chinese institutions that could professionally diagnose OD [1], which corresponds to one institution per 40 000 at-risk workers. Furthermore, these institutions were concentrated in economically developed areas and large cities, with few institutions in the less developed central and western areas, which created an imbalance between supply and demand and increased workers' challenges in accessing OD medical services. In addition, controlling these ODs remains challenging. The Law on Prevention and Control of Occupational Disease (LPCOD) was amended in 2011, which increased the convenience of diagnosing and treating ODs and served as an important remedial measure to protect against an OD epidemic. The applicable LPCOD legislation addresses occupational health (OH) services and OD compensation enforcement based on the OH regulations and provides a legal basis to prevent ODs.

Among the estimated 900 million Chinese workers, ≥25 million workers are exposed to occupational hazards each year, and thousands of new cases of OD have occurred during recent decades (Table 1). A 2009 report by the Chinese Ministry of Health (MoH) indicated that 16 million companies are associated with hazardous materials or working conditions. The report also recorded 18 128 new cases of OD and 748 OD-related deaths each year, with a rapid increase in the number of occupation-related pneumoconiosis cases [11]. However, it should be emphasized that these statistics likely underestimate the large numbers of unreported and undiagnosed cases, such as in village and township enterprises or small informal workshops, where workers face serious health and safety challenges. Furthermore, these statistics probably do not include workers who return to their place of

origin after they are dismissed by their employer because of their illness. Moreover, officials from the Chinese Center for Disease Control and Prevention (CDC) and MoH acknowledge that these statistics are only based on diagnosed cases, and that there is a large gap between the numbers of diagnosed cases and the numbers of actual cases. In 2010, the MoH reported 27 240 new cases of OD, which included 23 812 cases of pneumoconiosis, 2034 cases of occupational poisoning, and 1394 cases of 'other' ODs. Among the various ODs, pneumoconiosis had the highest mortality rate, and 69% of all new cases of OD were from the coal, railway and non-ferrous metal industries [12].

During 1950–2010, the annual number of OD-related deaths in China was approximately 5000, with a cumulative national total of 749 970 cases. These statistics included 676 541 cases of pneumoconiosis, 149 110 deaths and 47 079 cases of occupational poisoning. Thus, China has the highest global incidence of ODs [12], although a recent MoH report indicated that the number of new cases of OD is declining. In China, the strictest occupational exposure limit for respirable crystalline silica was reduced to 0.2 mg/m³, although the implementation of this limit is very poor, especially in developing cities and rural areas. Nevertheless, pneumoconiosis remains the most common Chinese OD, and more workers are experiencing acute occupational poisoning and other ODs [1,13,14]. These trends indicate that the prevalence of OD is increasing, despite improving OH in China. Furthermore, the national distribution and burden of ODs has recently shifted, according to the Three Transfers Theory: from urban areas to rural areas, from coastal economically developed regions to inland economically undeveloped regions and from large-scale state-owned enterprises to small-to-medium-sized privately owned foreign enterprises [15]. These changes complicate OH in China, although these challenges might also help drive progress in controlling ODs.

Table 1. Annual numbers of new cases with ODs in China during 2000–14

	2000 [2]	2001 [3]	2002 [4]	2003 [5]	2004 [6] ^a	2005 [7]	2006 [8]	2007 [9]	2008 [10] ^b	2009 [11]	2010 [12]	2011 [13]	2012 [14]	2013 [1]	2014 [15]
Pneumoconiosis	9100	10 505	12 248	8364	8743	9173	8783	10 963	10 829	14 495	23 812	26 401	24 206	23 152	26 873
Acute poisoning	785	759	590	504	383	613	467	600	760	552	617	590	601	637	486
Chronic poisoning	1196	1166	1300	882	1077	1379	1083	1638	1171	1912	1417	1541	1040	904	795
Other	637	788	683	2761	198	1047	1186	1095	984	1169	1394	1347	1573	1700	1818

^aData were primarily obtained from internal statistics that were maintained by the Chinese Center for Disease Control and Prevention. Additional data were obtained from the indicated references.

^bThe following website was used: http://www.qh.xinhuanet.com/2009-06/09/content_16760903.htm, but it is no longer available because the data were lost after the Ministry of Health was renamed the National Health and Family Planning Commission. Data is now available from the referenced website.

Chinese OH legislation is gradually starting to conform to international standards. In 2001, China ratified the United Nations' International Covenant on Economic, Social, and Cultural Rights, which holds member states accountable for preventing, treating and controlling diseases (including ODs) [16]. In 2006, China approved the Occupational Safety and Health Convention, which advocates for cooperation between workers and enterprises, as well as the systematic prevention of occupational accidents and diseases [17]. Although the approval of Chinese OH legislation has been protracted, several important policies have been introduced, which include labour protection regulations governing the use of toxic substances. Furthermore, the 2001 LPCOD outlined the obligations, rights and legal responsibilities that are related to OD prevention and control, which targeted workers, enterprises, OH technical service institutions and health administrations. After enacting the LPCOD, the MoH issued a series of regulations regarding the implementation of these new measures. In 2011, the LPCOD was amended to increase its focus on improving OD diagnosis and treatment, and the State Administration of Work Safety (SAWS) was identified as being primarily responsible for OH. The SAWS has subsequently issued various regulations with specific rules for LPCOD implementation, and the MoH has modified other regulations that provide rules for treating ODs, such as OH examinations and rules to prevent, diagnose, treat, classify and catalogue ODs [18].

Despite the high Chinese prevalence of ODs, OH services are not standardized, which can create inaccurate hazard estimates and non-standardized health examinations, diagnostic practices and health reports. Furthermore, medical examination and OD identification services are inadequate [19], which complicates the diagnosis of ODs. Moreover, despite the adoption of the LPCOD and other worker protection laws, and acknowledgement that freedom from unsafe working conditions is a worker's right, OH authorities do not proactively prevent ODs. Thus, malpractice lawsuits are common, as workers attempt to defend their rights.

The Chinese OD compensation system is also insufficient, which makes it difficult to maintain insurance policies for individuals with ODs. For example, a 2011 survey revealed that 50% of injured workers were unable to work, but only received a one-time payment. Moreover, among the patients who received a one-time payment, the payment did not cover follow-up treatment (78%) or only covered 2 years of treatment (47%) [20]. However, the treatment and rehabilitation of OD cases is a long-term and complex process, and some ODs (e.g. pneumoconiosis) require ongoing treatment. Thus, coverage for 2 years of treatment may be inadequate.

Although China enacted OH legislation in 2001, changes to the primary inspection agency have created confusion. Between 1998 and 2011, many different

administrative departments were responsible for implementing OH-related laws [16,21]. However, Chinese workers face challenges in accessing OH protection and medical services, as many employers exhibit poor compliance with OH laws, which leads employees to seek the help of OH administrative departments. The primary responsibility for OH administration now rests with the SAWS [18], although that department's responsibilities overlap with those of the MoH and other departments. Therefore, workers are frequently referred to different regulatory departments, which creates loose and ineffective enforcement of OH laws [21]. In addition, local governments often focus on economic development, without enforcing OH laws. This focus frequently results in neglect regarding the required education of employers on OD and OH, poorly funded regulatory efforts and lax punishments. Furthermore, because of the insufficient funding and training, the actual demand for OH regulatory staff cannot be fulfilled. Moreover, implementation of OH inspections and surveillance is often a passive reaction to worker protests.

The average rate of OH inspection coverage in China is low (10%) compared with other industrialized countries (20–50%) [22]. In 2009, only 125 231 of the estimated 16 million companies (0.78%) in China were actually inspected, and <60% of the inspected companies produced the required OH records. Moreover, among the inspected companies with documented occupational hazards, only 59% of employees had undergone medical examinations. The remaining employees were exposed to workplace occupational hazards without proper OH documentation. Furthermore, <1% of employees who underwent medical examinations were suspected of having ODs, and only 28% of the 21 000 suspected cases were actually diagnosed [21]. However, these issues may have been improved by the 2011 LPCOD amendment, which included strict inspection criteria and severe penalties for offences [17].

Chinese OH is an important issue, although ODs remain underestimated because of the high number of unreported and undiagnosed cases. Undiagnosed cases are often observed among individuals who are working in villages and small informal workshops, and these individuals frequently return to their home towns after being dismissed following the acquisition of an OD. In addition, Chinese officials have acknowledged that the reported data are only based on diagnosed cases, and that there is a large gap between the diagnosed and actual cases [23]. To continue OH improvements, the Chinese government must improve its OD diagnosis processes, regulations and standards. It must also better enforce laws regarding the supervision and management of workers. All government departments that are involved in regulating OH can recommend additional effective approaches to address the management, diagnosis, treatment and compensation of OD cases.

In summary, ODs result from work-related exposure to harmful materials, and persistent exposure poses a serious threat to workers' health. Thus, China's rapid socio-economic development has led to a high prevalence of ODs, which highlights the importance of legally mandating the classification and categorization of ODs. However, it is challenging to maintain effective OH in China, and it is difficult to obtain an accurate picture of the national OH status. Nevertheless, the incidence of ODs is currently at an unacceptable level. Despite several government attempts to resolve this situation, economic development remains the dominant motivating force in China, and the Chinese government must design policy strategies to incentivize multinational firms to improve conditions in factories and to strengthen the enforcement of existing regulations [19]. Although it is difficult to balance economic growth and OH safety, this balance has not yet been achieved in China and the Chinese government is attempting to reduce the incidence of ODs.

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Zhansai Zhang*

Department of Occupational Disease,
Shanghai Pulmonary Hospital,
Tongji University School of Medicine,
Shanghai 200433, China

Yanfang Zhao*

Department of Health Statistics,
Second Military Medical University,
Shanghai 200433, China

Daoyuan Sun

Department of Occupational Disease,
Shanghai Pulmonary Hospital,
Tongji University School of Medicine,
Shanghai 200433, China
e-mail: dysun2014@126.com

*These authors contributed equally to this work.

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