Policy forum

Urbanization and Workers' Compensation in China from 1995 to 2012^{*}

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In order to determine the trend in the number of employees covered by workers' compensation (WC) and trends in the burdens and benefits of WC, and to discuss the possible factors that might influence those trends. A relevant national statistical data from 1995 to 2012 are collected and analyzed. In the results, we found that the proportion of employees covered by WC to total employees in urban areas increased from 13.7% in 1995 to 51.2% in 2012 and also exhibited a significant degree of polarization. In 2012, 27.3% of the peasant workers were covered by WC, which accounted for 37.8% of the total employees covered by WC. Factors found to impact the number of employees covered by WC and trends in the burdens and benefits of WC from 1995 to date in China included urbanization, represented by the migration of farm labor to urban areas, changes in industry mix, regional disparity, GDP movements, and changes to legislation on WC and occupational health and safety. It still has a long way to go to reduce work-related injuries and occupational diseases (ODs) to levels comparable with other industrialized countries.

International Labor According to the Organization, approximately 2.3 million people die from work-related accidents and diseases each year^[1]. The daily death toll amounts to some 6 300 persons around the world. Economic losses due to accidents and unsafe working conditions exceed 1.25 trillion United States Dollars (USD) per year, which is equivalent to 4% of global GDP. In China, work-related injuries and occupational diseases (ODs) present a steady and disturbing growth rate. In 2000, 1.09 million workers died from work-related accidents. Death tolls rose to 1.3 million in 2001 and over 1.4 million in 2002^[2]. By the end of 2010, ODs reached a total of 750 000 cases, including 653 000 cases of pneumoconiosis and 47 000 cases of occupational poisoning. Peasant and migrant workers account for most of the OD cases^[3].

Research shows the rate of economic growth to be an important factor in occupational accidents in the short term^[4]. Other research shows economic development has long been considered an important determinant of changing patterns of disease, disability, and mortality in populations^[5-8]. Statistical analysis reveals that changes in industry mix, economic activity, and changes to workers' compensation and occupational health and safety rates^[9]. claim legislation might impact on Cross-sectional studies have produced clear. inverted U-shaped curves for the relationship between injury mortality and economic development^[10-11]. Syed and Ragnar correlated increases in mortality rates to due work-related injury with rising GDP per capita up to 3 000-4 000 USD, after which the rates decreased significantly^[12]. Since the reforms and opening up in 1979, China's economy has developed rapidly. The GDP per capita reached 3 414 USD in 2008 and 5 949 USD in 2012. During the same period, China has seen the largest human migration in its history, leading to a rise in urban population from 185 million in 1979, to 691 million in 2011. This represents a rise in the proportion of urban to total population from 19.39% to 51.27%, driven largely by rural-to-urban migration^[13]. The shift in population from rural to urban areas in China is expected to continue, with 200 million people predicted to make that move over the next decade^[14]. The growing disease burden in China's rural-to-urban migrant population, which is attributable to lifestyle, occupation, accidents, and injuries, is a major challenge^[5]. Peasant workers, a new kind of working class in the transitional period of China, have made great contributions to China's industrialization, urbanization, and modernization. According to data from China's fifth population census, migrant workers account for 58% of all employees in the secondary industry sector, 52% in the tertiary sector, 68% in manufacturing, and 80% in the construction industry, which has the highest



doi: 10.3967/bes2014.045

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rate of work injuries and ODs^[15]. In 2012, 72.8% of ODs occurred in the coal, railroad, metallurgy, and building material industries^[16].

Historically, compensation systems for work injuries began to emerge in the 19th century around the world. A number of factors contributed to their development. The most obvious was the growing industrialization in Europe and elsewhere^[17]. The Chinese government has made every effort to establish a sound work injury insurance program, as is done internationally, called Workers' Compensation (WC).

This paper examines the trend in the number of employees covered by WC and trends of the burdens and benefits of WC accompanying the development of urbanization and industrialization in China, since 1995. It also analyzes and discusses possible factors that might have caused or influenced these trends.

Data sources and analytical methods The data used in this study was sourced mainly from the China Statistical Yearbook 2012^[13], China Labor Statistical Yearbook 2012^[18], China Health Statistical Yearbook 1995-2010^[19]. China's Work Safety Yearbook 1995-2011^[20], Diseases Occupational Report provided by the Ministry of Health of the People's Republic of China (PRC) (MOH, http://www.moh. gov.cn) and National Health and Family Planning Commission of the PRC (NHFPCC, http://www. nhfpc.gov.cn/), Statistical Bulletin provided by the Ministry of Human Resources and Social Security of PRC (MOHRSS, http://www.mohrss.gov.cn/ the SYrlzyhshbzb/zwgk/szrs/), National Bureau of Statistics of China (NBSC, http://data.stats.gov.cn/ workspace/ index?m=hgnd), and China's Work Safety Bulletin provided by the State Administration of Work Safety (SAWS, http://www.chinasafety. gov.cn). The national data in this paper do not include those of the Hong Kong or Macao Special Administrative Regions, or the Chinese Taiwan. Data were entered into Microsoft Excel 2010 and analyzed by descriptive statistics and correlation analysis using SPSS 11.5 for Windows. Since WC data broken down by urban and rural areas and by industry groups were not available, their characteristics were estimated from related data.

The benefits, costs, WC aggregate fund accumulation, and GDP per capita are adjusted to 2012 CNY using the consumer price index (CPI) from fixed-base price indices (1998 = 100) of the *China Statistical Yearbook 2012*, and then converted to USD using the CNY to USD exchange rate at the year-end and provided by the *China Statistical* *Yearbook 2012*. At the end of 2012, the CPI was 580 and the exchange rate 1 CNY = 0.159 096 USD.

The growth rates, using various base years, are calculated as the ratios between the absolute change for each base year and the level corresponding to the previous year, usually expressed as percentages.

This study adopts the four geographical regions of mainland China, according to the China Statistical Yearbook 2012; namely, the eastern, central, western, and northeastern regions, which include: ten eastern provinces (municipalities)-Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan; six central provinces-Shanxi, Anhui, Jiangxi, Henan, Hubei, and Hunan; 12 western provinces (autonomous regions or municipalities)-Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang; and three northeastern provinces-Liaoning, Jilin, and Heilongjiang.

Explanatory Indicators^[13,18] **Notes on Main Statistical** *Primary industry sector* refers to farming, forestry, animal husbandry, and fisheries.

Secondary industry sector refers to mining and quarrying, manufacturing, electricity, gas and water production and supply, and construction.

Tertiary industry sector refers to sectors not included under primary and secondary industry sectors.

Employees refers to persons aged 16 and over who are employment and thus receive remuneration, or earn business income; that is, it reflects the actual utilization of the total labor force during a certain period of time. *Employees* include: (1) total formal employees; (2) re-employed retirees; (3) those employed in urban private enterprises; (4) urban individual laborers; (5) those employed in urban private enterprises and individual households; (6) those employed in township and village enterprises; (7) rural laborers; and (8) other social laborers.

Employees covered by WC or contributions refer to employees who have participated in the WC scheme and employees in private businesses, according to relevant national regulations in the calendar year.

Payroll refers to the average wage, in money terms, per person during a certain period of time for employed persons in enterprises, institutions, and government agencies; that is, it reflects the general level of wage income during a certain period of time.

Beneficiaries refers to people who have received

WC benefits as a result of work-related injury or OD, including medical treatment for work-related injuries with or without impairment, disability rating determination, and workplace deaths.

WC costs are employer expenditures in the calendar year for WC benefits, administrative costs, and/or insurance premiums, including income for comprehensive social benefit funds paid by employers, government financial subsidies, interest income, and other income.

WC benefits are payments in the calendar year from WC funds to those who participated in WC, including medical fees for injured workers and OD patients, injury and disability subsidies, death subsidies, nursing fees, funeral subsidies, injury prevention fees, occupational rehabilitation fees, and other related expenditure.

WC aggregate fund accumulation refers to the balance of WC funds at the calendar year end.

Recognized ODs are ODs recognized by qualified occupational health doctors according to regulatory guidelines and OD diagnosis standards that are included in the official list of ODs and that can be compensated. Only government-authorized doctors at municipal and provincial levels have the authority to diagnose ODs. Pneumoconiosis is the most serious occupational lung disease and accounts for over 80% of total OD cases diagnosed in China.

OD beneficiaries are cases of ODs at the

calendar year end who have received WC benefits during the calendar year.

Peasant workers refers to the rural labor population whose household registration (registration required in rural areas) is agricultural and who are employed to do non-agricultural activities for six months of the year or more in urban areas (cities or towns) and rely on wages as their main income source^[21].

Local peasant workers refer to those who are engaged in non-agricultural work for at least six months of the year in their hometown^[21].

Migrant workers refer to peasant workers not working in their hometown^[21].

Trends of numbers and percentages of employees in urban areas covered by WC From 1995 to 2012, the number of employees in urban areas increased by 4.0% annually, which represents an addition of 180.62 million employees to the 190.40 million employees in urban areas in 1995. The proportion of employees in urban areas to total population was almost 50% in 2012, an increase of 20.4% from the 28.0% in 1995, indicating an average annual growth rate of 3.3%. Over 50% of the employees in urban areas are covered by WC, as shown in Table 1. There is a positive correlation between the number of employees in urban areas and the number of employees covered by WC during the period from 1995 to 2012 (r=0.972, P<0.01).

Year	Total number of employees (10 000 persons)(1)	Number of employees in urban areas (10 000 persons) (2)	Number of employees in urban areas covered by WC (10 000 persons)(3)	Proportion of number of employees in urban areas to total number of employees (%)(2/1)	Proportion of number of employees in urban areas covered by WC to number of employees in urban areas (%)(3/2)
1995	68 065	19 040	2 615	28.0	13.7
1996	68 950	19 922	3 103	28.9	15.6
1997	69 820	20 781	3 508	29.8	16.9
1998	70 637	21 616	3 781	30.6	17.5
1999	71 394	22 412	3 960	31.4	17.7
2000	72 085	23 151	4 350	32.1	18.8
2001	72 797	24 123	4 345	33.1	18.0
2002	73 280	25 159	4 406	34.3	17.5
2003	73 736	26 230	4 575	35.6	17.4
2004	74 264	27 293	6 845	36.8	25.1
2005	74 647	28 389	8 478	38.0	29.9
2006	74 978	29 630	10 268	39.5	34.7
2007	75 321	30 953	12 173	41.1	39.3
2008	75 564	32 103	13 787	42.5	42.9
2009	75 828	33 322	14 896	43.9	44.7
2010	76 105	34 687	16 161	45.6	46.6
2011	76 420	35 914	17 696	47.0	49.3
2012	76 704	37 102	19 010	48.4	51.2

 Table 1. Number and Distribution of Employees Covered by Workers' Compensation in China, 1995-2012

Note. WC: workers' compensation. Data sources: *China Statistical Database* provided by NBSC (http://data.stats.gov.cn/workspace/index?m=hgnd); *China Labor Statistical Yearbook* provided by MOHRSS (http://www.mohrss.gov.cn/SYrlzyhshbzb/zwgk/szrs/).

From 1995 to 2011, the proportion of employees in the secondary and tertiary industry sectors increased steadily, as shown in Figure 1. In 2011, the number of employees in primary industries was 34.8% of total employees, with 29.5% in secondary industries, and 35.7% in the tertiary industry sector. The average growth rate of employee numbers in the sector was the highest, with 3.0% tertiary industry from 1995 to 2011, followed by the secondary industry sector with 2.3%. In contrast, employee numbers in the primary industries decreased by 1.8%. In some advanced regions, such as Beijing, the number of employees in the tertiary industry sector accounted for over 70%.

Figure 2 illustrates the obvious differences among the four regions for employees covered by WC. The eastern region has the highest number of employees per year from 1995 to 2010, accounting for over 50% of the total labor force. The proportion of employees covered to total employees exhibited a significant polarization gap, being higher in the eastern and northeastern regions and lower in the western and central regions.

From 2006 to 2012, the number of peasant workers covered by WC increased by 18.9% annually, from 25.37 million to 71.79 million, as shown in Table 2. The proportion of peasant workers covered to the total of number of employees covered increased to 37.8% in 2012, with an annual growth rate of 7.3% from 2006 to 2012. In 2012, 27.3% of peasant workers were covered by WC.

Trends of numbers and percentages of beneficiaries From 1999 to 2012, the number of beneficiaries increased to 1.76 million at an annual growth rate of 21.6%. The ratio of the number of beneficiaries to total employees covered reached 100.5 per 10 000 persons in 2012 compared with 38.3 per 10 000 persons in 1999, as shown in Figure 3.



Figure 1. Trends of proportion of number of employees by three strata of industry in China, 1995-2011. Data source: *China Statistical Database* provided by NBSC.



Figure 2. Trends of number of employees covered and proportion of employees covered to total of employees in four regions in China, 1995-2010. Data source: *China Labor Statistical Yearbook* provided by MOHRSS.

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Figure 4 shows that the number of OD cases that received WC benefits increased by 18.2% annually, with 92 167 beneficiaries in 2011, which is equal to 7.4 times of that in 1999. The proportion of OD beneficiaries to total beneficiaries reached 8.7% in 2002, declined to 5.3% in 2009, and then plateaued. There is a positive correlation between the total number of beneficiaries and the number of OD beneficiaries from 1999 to 2011 (r=0.989, P<0.01).

Figure 5 shows the distribution of numbers and ratios of new cases of OD beneficiaries from 2006 to 2010. From 2006 to 2009, the numbers of new cases of OD beneficiaries at the calendar year-end were stable and mainly from the eastern and western regions; however, in 2010 these increased significantly by 35.7% in the eastern region, 30.7% in the western region, and 27.5% in the central region. The ratio of numbers of new cases of OD beneficiaries to total new ODs recognized declined from 2006 to 2010. In 2010, 58.4% of new

cases of ODs received WC benefits by the calendar year-end.

Costs and benefits, and WC fund balance Figure 6 shows the trends of WC costs and benefits per 100 USD of payroll from 1995 to 2012. WC costs were unstable in the first few years, declined from 1998 to 2010, and then increased in 2011; however, they did not reach the highest level of 0.75 USD, recorded in 1998. WC benefits differed from WC costs, sometimes indicating an opposite trend. WC benefits per 100 USD of payroll increased steadily from 2007 to 2012. The average compensation for recognized claimants rose from 1 604 USD in 1999 to 2 026.5 USD in 2010, and to 3 294.4 USD in 2012, with an average growth rate of being 5.7% over the same period.

Figure 7 shows the trends of WC balance per employee covered at year-end in each of the four regions of China from 1995 to 2011, and their distributions within each region. In contrast to the total

Table 2. Number and Distribution of Peasar	nt Workers Covered by WC in China, 2006-2012
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Year	Total number of peasant workers (10 000 persons) (4)	Number of migrant workers (10 000 persons) (5)	Number of peasant workers covered by WC (10 000 persons)(6)	Proportion of number of peasant workers covered by WC to total number of peasant workers (%)(6/4)	Proportion of number of peasant workers covered by WC to number of employees in urban areas covered (%) (6/3)
2006	13 200	13 181	2 537	19.2	24.7
2007	n.a.	n.a.	3 980	n.a.	32.7
2008	22 542	14 041	4 942	21.9	35.8
2009	22 978	14 533	5 587	24.3	37.5
2010	24 223	15 335	6 300	26.0	39.0
2011	25 278	15 863	6 827	27.0	38.6
2012	26 261	16 336	7 179	27.3	37.8

Note. n.a.: not available. WC: workers' compensation. Data source: *National Statistical Bulletin* provided by MOHRSS (http://www.mohrss.gov.cn/SYrlzyhshbzb/zwgk/szrs/ndtjsj/tjgb/).



Figure 3. Trends of number and ratio of beneficiaries of WC in China, 1999-2012. Data source: *China Labor Statistical Yearbook* provided by MOHRSS.

WC aggregate fund accumulation of the four regions, the balances per capita were close among the four regions. The national WC balance increased steadily, with an annual growth rate of 15.8% from 1995 to 2011.

In 2012, the national WC balance was 737 hundred million CNY, which is equivalent to 117.3 hundred million USD (100 USD = 628.55 CNY). The national WC balance is mainly funded by the eastern region with 62.4 hundred million USD, which accounts



Figure 4. Trends of number and proportion of ODs beneficiaries in China, 1999-2010. Data source: *China Labor Statistical Yearbook* provided by MOHRSS.







Figure 6. Trends of workers' compensation costs and benefits per \$100 of payroll in China, 1995-2012. Data source: *China Labor Statistical Yearbook* provided by NBSC; *China Statistical Yearbook* provided by MOHRSS.

for 54.3%, followed by 21.2 hundred million USD (18.5%) from the western region, 20.2 hundred million USD (17.6%) from the central region, and 11.1 hundred million USD (9.7%) from the northeastern region. All five leading WC balance districts in 2011 came from the eastern region, with Guangdong province accounting for 20.4%, Shanghai city for 6.2%, Jiangsu province for 5.8%, Zhejiang province for 5.8%, and Liaoning province for 5.0%. Their total accounted for 43.2% of the national WC balance, which was a decrease of 4% compared with that in 2010.

Trends of occupational injuries and diseases Death tolls of industrial and mining enterprises decreased from 1995 to 2000, increased until 2003, and then decreased steadily again until 2011. Before 2002, the trend of newly recognized ODs was similar to the trend of death tolls for industrial and mining enterprises. However, from 2003 to 2012, they moved in opposite directions, with death tolls down and newly recognized ODs up. The average annual rate was -4.2% from 1995 to 2011. At the same time, GDP per capita rose smoothly prior to 2003 and then mushroomed steadily, as shown in Figure 8. The number of newly recognized ODs reached 27 420 at the end of 2012, with an average annual growth rate of 3.9% throughout the 17-year period from 1995 to 2012, mostly coming from coal mining.



Figure 7. Trends of workers' compensation aggregate fund accumulation per employee covered in China, 1995-2011. Data source: China Labor Statistial Yearbook provided by MOHRSS; China Statistical yearbook provided by MSS.



Figure 8. Trends in death tolls from recognized ODs (industrial and mining) and GDP per capita in China, 1995 to 2010. Data source: Data of ODs from Occupational disease report of China provided by MOH and NHF PCC; Data of death tolls from China's Work Safety Yearbook provided by SAVWS; Data of GDP per capita from China Statistical Yearbook provided by SAWS.

In this study, we found that an effective and sustainable WC system has been established nationwide in China. The past few years have witnessed a significant extension of employment injury insurance coverage for both peasant workers and employees in urban areas. China is in a position to further develop its WC system so as to be in alignment with its rapid economic growth and for the benefit of its massive employee population. We also identified factors that may have impacted the trend in the number of employees covered by WC and the trends of the burdens and benefits of WC from 1995 to date in China. These included urbanization, as evidenced by the migration of farm laborers to urban areas, changes in industry mix, regional disparity, GDP movements, and changes to legislation on WC and occupational health and safety. However, we did not find any trend of inverted U-shaped curves or inflection points for the relationship between the number of ODs and GDP per capita. The number of beneficiaries of WC maintained steady growth from 1999 to 2012, which is different from the trend in advanced countries.

Reductions in employee numbers in some higher-risk industries, such as manufacturing, and the growth of lower-risk service industries-have had a significant impact on incidence rates over the longer term in some developed countries^[9]. Chinese industry has been developing rapidly over the past 60 years and has seen a lot of changes, especially during the past 30 years. The proportion of primary industry employees has been dropping sharply. Both secondary and tertiary industry sector employee numbers have increased, which is a different pattern from that of developed countries, where the proportion of employees usually decreases during industrialization and urbanization. In the 1960s, about 60% of the Chinese labor force was employed in agriculture. In 2011, only 34.8% worked in the primary industry sector. Rapid industrialization and urbanization are leaving many Chinese exposed to serious health risks in the workplace, particularly among migrant workers. The mining of coal, China's most important energy resource, has contributed significantly to the economy, but remains a high-risk working environment for employees. The classic industry ODs, such as pneumoconiosis and chemical poisoning, account for over 90% of all ODs in China, with almost 50% of pneumoconiosis cases coming from coal mining. This is different from the developed countries and is largely explained by the nature of the past and present industrial structure,

and differences in the criteria for recognition of ODs^[22]. Even in the more developed regions of China such as Shenzhen and Beijing cities with 2011 GDP per capita of over 17 000 USD^[23] and 12 643 USD^[24], respectively, pneumoconiosis and chemical poisoning still dominate OD compensation claims.

Studies on China in comparison with other countries show a strong association between economic growth and urbanization^[25-26]. Economic activity also has a significant impact on incidence rates, but only generates short-term effects^[9]. Song et al. investigated whether there was a relationship between economic development and occupational accidents in China from 1953 to 2008. Their findings identified no relationship between occupational accidents and level of economic development during 1953-1978. However, the fatality rate per 10° workers was a conductive variable to GDP per capita during 1979-2008^[24]. These findings highlight that the causes of occupational injuries and diseases are complex phenomena that cannot be explained solely by economic factors. According to Porru et al., an injury is the result of the complex interaction of many factors, including workers' health, workers' behaviors in the workplace, working equipment, the labor organization, occupational exposure, and working hours. Two reasons explain the positive effect of increasing GDP in lowering the risk of occupational injuries and diseases: First, rising GDP is accompanied by increased investment in safer technologies and occupational safety measures. Second, booming economies are associated with a reduced risk of unemployment^[27-28]. These two situations in China seem more complex and different from those in developed countries.

The third key factor is the introduction of regulations on WC, ODs and safety, and the enforcement and supervision of those regulations from all levels of government and related organizations. This appears to have had a significant one-off impact on the number of ODs, injuries, and WC in China. In this study, the growth rate of the number of employees covered by WC reached peaks in 1996 and 2004, closely coinciding with the introduction of government regulations. In 1996, the government issued the 'Trial Procedures for Industrial Injury Insurance for Enterprise Employees,' requiring that industrial injury insurance premiums be paid by employers instead of by the employees^[29]. After January 2004, the 'Regulations on Insurance for Work-related Injuries' went into effect. Coverage of such insurance expanded rapidly. In 2002, the Law

on Prevention and Control of Occupational Diseases was issued and the List of Occupational Disease and Diagnosing Standards (revised)^[3], which should have impacted the number of ODs. In fact, the number of ODs reported instead declined from 2003 to 2006, since the diagnosis procedures and reporting administration had changed significantly. The WC premium rates across the country rose sharply in 2011, which was in response to the newly revised 'Regulations on Work-related Injury Insurance' coming into force as of January 2011. This expanded the number of enterprises eligible to register with WC to include individual businesses with employees, public institutions, social institutions, privatelyowned non-enterprise entities, foundations, law firms, and accounting firms. The new regulation raised compensation to 20 times the national annual per capita disposable income for urbanites in 2009, or about 340 000 Chinese Yuan (CNY)^[30].

Usually, when laws, regulations, and standards are issued, all levels of government and associated organizations make a particular effort to implement them through announcements and enforcement throughout the country in the first year. The effects are obvious as most of these past problems are solved. In 2006, the Chinese government proposed a five-year plan to build a harmonious society with greater social balance. The State Council issued an official opinion requiring local governments to pay special attention to the migrant worker issue. Consequently, a peace plan was established making work injury insurance for migrant workers a priority, so as to include the majority of migrant workers employed in the informal sectors^[31]. Meanwhile, all contracted employees are required to participate in work injury insurance, whatever the nature of their employment. The growth rate for numbers of peasant workers covered by WC declined rapidly, from 56.9% in 2007 to 5.2% in 2012. Moreover, 48.8% of employees in urban areas and 72.7% of peasant workers are still not covered by WC. However, enforcement has been relaxed after that, for various reasons. The key point is to cover more peasant workers with WC and to establish a highly efficient and equitable WC system that includes insurance premiums, compensation, and rehabilitation, and to strengthen cooperation with departments to improve work injury other prevention. Compensation should not be an end, but rather a means.

This study shows that China's eastern region has the highest national balance of WC fund deposits

(54.3%). In fact, the eastern region has the most employees of the four regions and the highest growth rate of employees covered by WC from 1995 to 2012. During this period in China, the WC premiums were charged by the social insurance agencies established by labor security administrative departments, and deposited into a dedicated social security fund account to pay for work-related injury insurance benefits, assessments of work capability, payments for other work-related injury and expenses, as stipulated in the regulations. The WC premiums could be used in the cities or provinces, where the employers were registered and employees worked; however, these funds could not be transferred to other cities or provinces. The Regulations on Work-related Injury Insurance requires the handling and coordination of WC premiums to be gradually transferred to the provincial level, but continues to be managed at the municipal level in some provinces. Yet migrant workers often transfer from one city to another or from one province to another. The eastern region is the largest migration destination region, receiving 70% of all rural migrant workers in 2004. Within the eastern region, Guangdong is the province with the greatest number of rural migrant workers (about 34 million), representing 44% of the current population in the province^[32]. The current model of collection and payment of work-related injury insurance premiums should be changed to meet the practical demands of a peripatetic workforce and to be more equitable.

The WC premiums should be paid by employers on time. The rate of the WC premium should be determined according to the principle of outlays determining charges, with income and outlay balanced in China. The State should determine the premium rate differentials between industries according to the relative degree of risk inherent in different industries, and determine several tiers of premium rates within each industry according to circumstances, such as the use of WC premiums and the frequency of occurrence of work-related injuries^[30]. For example, in Shanghai, the employer pays the basic WC premium rate of 0.5 % of the payment base in a unified manner. An employer with an industrial injury accident pays a floating rate based on the basic rate stipulated in the regulations. The floating rate is checked once a year and categorized into five grades, according to the employer's use of WC premiums and the occurrence of injury accidents^[33]. For the long term, it would be

useful to consider WC benefits and employer costs relative to aggregate wages of covered workers. This would be the case if there were no changes in the frequency or severity of injuries, and if cover for employees' wages and medical payments paralleled the growth of wages. In reality, however, WC costs per 100 USD of payroll have not kept pace with WC benefits per 100 USD of payroll.

In most countries, the cost of OD compensation is greater than that for occupational injuries, accounting for over three quarters of the total compensation costs^[34]. In comparison, the cost of OD compensation in China is lower than that for occupational injuries. Prevention and control of ODs are usually given less attention in China. Improvements can be seen faster in the case of occupational injuries than ODs. ODs often have long latency periods and might be the result of various work-related factors over time, such as work hours and workload. Harmful exposure occurring now usually leads to ill health in the future.

The number of newly recognized ODs has increased, and the proportion of OD beneficiaries to total beneficiaries has kept a low, but stable level in recent years; the ratio of OD beneficiaries to total new OD cases being 0.66±0.09. The number of work-related injuries has increased proportionally with that of ODs in recent years. At the same time, death tolls in industrial and mining enterprises have decreased. This situation needs to be further explored.

In China, the list of recognized ODs has just been revised for the first time since 2002, and still does not include stress, lumbago, or musculoskeletal disorders (MSDs)^[35]. Particularly for diseases such as lumbago and MSDs, recognition can greatly influence the overall cost of OD compensation^[36]. If the industry structure changes further, then the spectrum and burden of ODs will also change. Most of the ODs recognized in China have occurred in the secondary industry sector. In the future, the spectrum of ODs would change. Moreover, the number of ODs recognized each year might increase sharply. The burden of the WC would be challenged from not only by classic but also modern industrial diseases.

A workable WC system has been established nationwide in China. However, there is still a long way to go to obtain the same rate of decreasing work injuries and ODs as in many industrialized countries. This is largely due to progress in safety measures at work and the extensive introduction of

automated processes and equipment, and the reduction of the absolute number of workers engaging in more dangerous work due to the change of industrial structure from heavy to light industries^[37]. The coming years are likely to see rapid changes in OD distribution and type in China, increasing on requiring focus prevention management. If good prevention and protection measures are taken, then most of the industrial injuries and ODs could be avoided or reduced in severity. Therefore, it is of the utmost importance to establish a good, fair, and equitable industrial injury insurance system.

The views expressed in this paper are the authors' own and do not necessarily reflect the views or policy of the National Institute of Occupational Health & Poison Control, Chinese Center for Disease Control.

^{*}Contract grant sponsor: Key technology to prevent and control new official occupational disease (201402021); China- Australia Health and AIDS Project (FA33HSS108).

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Received: December 20,2013; Accepted: February 18, 2014

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