

Review Article

## THE PREVALENCE OF OCCUPATIONAL INJURIES AND ILLNESSES IN ASEAN: COMPARISON BETWEEN INDONESIA AND THAILAND

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### ABSTRACT

Work is important in daily lives. ASEAN countries, especially in Indonesia and Thailand, the two countries are facing the era of improving industrial. The more increasing industry, the higher the level of accidents and diseases that will burden to the workers. In Indonesia, small industry is the biggest industry with a frequency of 83.70%. Accidents and illnesses to workers is still relatively high, eight workers died every day. In Thailand, 62.6% from 39.3 millions of workers, working as an informal and mostly in the agriculture sector. The number of workers who suffered accidents and diseases is also high, 129.632 in 2011 workers injured at work and accident and 37.933 of them were severe. Furthermore, due to the higher number of accident and diseases related with work in these two countries, it must take a more optimal prevention in order to reduce those problems.

**Keywords:** Occupational Injury, Illnesses, ASEAN

### INTRODUCTION

Employment and working conditions are major social determinants of health.<sup>1</sup> Although those with decent jobs are often healthier and happier than those who are unemployed, many workers are exposed to unhealthy and unsafe working conditions. It was estimated globally that 2.3 million deaths were attributed to work.<sup>2</sup> The ILO reported that there were approximately 321,000 fatal occupational accidents and almost 2.1 million work-related diseases in 2008. Every day, approximately 880 workers die as a result of occupational accidents and more than 6,300 people in the world die as result of work-related diseases. The main

contributors of work-related diseases are work-related cancers (32%), work-related circulatory diseases, such as cardiovascular diseases and stroke (23%) and occupational accidents and violence (18%).<sup>3</sup>

According to the 2002 ILO estimates for Asia, the expected rates of fatal injuries per 100 000 was about 35 in the agriculture sector; 13 in the industry sector and 7 in the service sector. However, the total number of fatal accidents reported to ILO was 12 or only 0.08% of the expected numbers. This trend was seen with the remaining Member Countries, with Indonesia reporting 6%; Thailand 8%. The prevalence of non-fatal

injuries as indexed by the country report of three days absence due to accident, converted as a rate per 100 000 were as follows: 8.9 for Indonesia and 153 for Thailand.<sup>4</sup>

During 2011, there were many incidents of occupational hazards affecting workers in Indonesia. Ironically, work injuries and illnesses continue to occur, even though the government promotes safety with banner campaigns and a National Occupational Safety and Health Month (*Bulan K3 Nasional*), the workplace injuries and illnesses recorded in the media, however, show that the number of workplace accidents in Indonesia is quite high.<sup>5</sup> On the other hand, since Thailand becomes one of newly industrialized countries, the labour force structure will change rapidly to be higher proportions in industrial sector in the near future. Occupational health and safety issues, especially in industry, will become more important.<sup>6</sup> The aims of this paper are to review prevalence of occupational injuries and illnesses between Indonesia and Thailand as ASEAN country and to describe currently planning for reducing the number of death in workers.

## METHODS

Secondary data analysis from literature review was conducted in this study, which is from database such as Scopus, DOAJ, Google Scholar, and also from grey literatures from the report of Ministry of Health Indonesia, Ministry of Public Health Thailand, Indonesian Public Health Association (IPHA), Statistic of Indonesia, and others sources.

## RESULTS AND DISCUSSION

### *Current Status of Occupational Health in the ASEAN country*

Approximately about 630 million employed are active workers in the ASEAN country. 60% are males and 40%

females. Both the male and female tend to be worked in rural areas where most of the agricultural sectors are located. The age distribution of the total work-force shows bimodal values of less than 24 and 24-34 age. The workforce according to the three major economic sectors of agriculture, industry and services.<sup>7</sup>

### *Profile occupational accident in the ASEAN country*

The highest rates (23.1 per 100,000) and absolute fatality figures (80,586) are found in OAI (Other Asia and Island) countries as shown in Table 1. The reason is that the rapidly industrializing countries such as Thailand, and Indonesia have reported high fatal accident frequency rates.<sup>8</sup>

### **Indonesia**

According to the Minister of Manpower Regulation No. 03 / MEN / 1998 on Procedures for Reporting and Investigation Accident that the meaning by an accident is an event that is not desired and is not suspected initially that can lead to loss of life and or property.<sup>9</sup>

There are 31 occupational diseases, recognized by Indonesian law, as caused by work or working conditions and the work environment.<sup>10</sup> These are:

1. Pneumoconiosis (*pneumokoniosis*) caused by mineral dust forming scar tissue (*silicosis, antrakosilikosis, asbestosis*) and silicotuberculosis (*silikotuberkolosis*) where in silicosis (*silikosis*) was the main factor causing disability and death.
2. Lung and bronchial disease (*bronkhopulmoner*) caused by hard metal dust.
3. Lung and bronchial disease (*bronkhopulmoner*) caused by cotton dust, vlas, henep and sisal (*bissinosis*).

4. Asthma caused by work that caused by over exposure to substances at work.
5. *Alveolitis allergika* caused by external factors such the inhalation of organic dust.
6. Disease caused by beryllium (*berilium*) or its toxic compounds.
7. Disease caused by cadmium (*kadmium*) or its toxic compounds.
8. Disease caused by phosphorus (*fosfor*) or its toxic compounds.
9. Disease caused by chromium (*krom*) or its toxic compounds.
10. Disease caused by manganese (*mangan*) or its toxic compounds.
11. Disease caused by arsenic (*arsen*) or its toxic compounds.
12. Disease caused by mercury (*raksa*) or its toxic compounds.
13. Disease caused by lead (*timbal*) or its toxic compounds.
14. Disease caused by fluor or its toxic compounds.
15. Disease caused by carbon disulfide (*karbon disulfide*) toxic.
16. Disease caused by halogen derivatives (*derivat halogen*) from aliphatic hydrocarbon (*hidrokarbon alifatik*) or aromatic (*aromatik*) toxic compounds.
17. Disease caused by benzene (*benzena*) or homologous toxic substances.
18. Disease caused by derivatives of nitrogen (*derivat nitro*) and amina from benzene or homologous toxic compounds
19. Disease caused by nitroglycerin (*nitrogliserin*) or nitric acid esters (*ester nitrat acid*).
20. Disease caused by alcohol, glycol or ketone (*alkohol, glikol or keton*).
21. Disease caused by gas or vapor causing asphyxia (*asfiksia*) or poisoning by carbon monoxide (*karbon monoksida*), hidrogenianida, hydrogen sulphide (*hydrogen sulfida*), or derivatives that are poisonous, such as zinc, brass and nickel ammonia (*amoniak seng, braso and nikel*).
22. Auditory abnormalities caused by noise.
23. Disease or injury caused by mechanical vibration (muscle disorder, gout, bone joints, blood vessels or the edge nervous).
24. Disease or injury caused by working in pressurized air.
25. Disease or injury caused by *electro magnetic radiation and ionize radiation*.
26. Skin disease (dermatosis) due to physical, chemical or biological causes.
27. Skin cancer epitelioma primer caused by *ter, pic (chemical names)*, bitumen, mineral oil, antrasena or its compounds or its products or the residue of those substances.
28. Lung cancer or mesothelioma caused by asbestos (*asbes*).
29. Infection caused by virus, bacteria or parasites in working environments with special risks.
30. Diseases caused by high or low temperature or radiation or high air humidity.
31. Diseases caused by the other chemical substances includemedicines.

International Labour Organization (ILO) in 2013 reported that one worker in the world dies every 15 seconds because of occupational accidents and 160 workers suffered work-related illness. The previous year (2012) ILO registering the number of deaths due to accidents and occupational diseases as many as 2 million cases each year.<sup>11</sup> This figure is expected to multiply in number along with increasing the number of small-scale companies in Indonesia of 141.894 (83.70%), industry scale was 14.970 (8.83%) and the number of large-scale industry of 12.660 (7:47%), bringing the total number of industries in Indonesia are some 169.524 company.<sup>12</sup>

There were 98.711 accident cases in 2010 and 99.491 cases in 2011. The data also showed that on average 17 workers/day are functionally disabled, 10 workers/day are partially disabled, 0.2

workers/day are totally disabled, and 8 workers/day die due to work accidents.<sup>13</sup>

**Table 1. Fatal Occupational Accidents, Including Traffic Accidents at Work : Other Asia and Islands**

Country	Reported Fatality Rate (F)	Employment (E) Milions			Fatalities (FXE)	Fatal Accidents reported to ILO	Notes
Bangladesh	11.00	56.160	47%	119.5	6.178		1994
Cambodia	11.00	3.780	43%	8.8	415		1994
Comoros	11.00	0.220	38%	0.6	24		1994
Fiji	40.00	0.240	35%	0.7	96		1992
Hongkong	10.90	2.915			318	255	1994
Indonesia	43.70	78.104	1992		34.131	2618	1994
Korea, Democratic Replubic of korea, Republic of	11.00	10.170	45%	22.6	1.118		1992
Laos	11.00	2.470	55%	4.5	272		1992
Macau	11.00	0.173			19	16	1994
Malaysia	11.00	7.645			840	534	1995
Myanmar	11.00	16.817	40%		1.850		1994
Nepal	11.00	8.240		20.6	906		1992
Pakistan	36.26	33.047	47%		11.984		1992
Philippines	19.20	25.166			4.832	220	1947
PNG	11.00	1.920		41	211		1992
Singapore	10.50	1.649	47%		173	65	1994
Sri Langka	11.00	5.148			566		1994
Thailand	19.20	32.095			6.162	820	1992
Vietnam	11.00	34.050		69.5	3.746		1994
Total	23.12	339.840			80.686		

Based on the report submitted Director General of Trustees Manpower Employment Muji Handaya after delivering results Meeting of the Asia-Europe Meeting (ASEM) Workshop on National Occupational Safety and Health (OSH) that the number of work accidents in Indonesia is high compared to some countries in Asia and Europe.<sup>14</sup>

Sectorally, the majority of workplace accidents occur in construction and manufacturing. In 2010, the Ministry of Manpower and Transmigration recorded that workplace accidents were most frequent in construction services (31.9 percent) and the manufacturing industry (31.6 percent), with lesser percentages in transportation (9.3 percent), mining (2.6 percent), forestry (3.6 percent), and others (20 percent).<sup>11</sup>

There were 177,012 enterprises operating in Indonesia in 2007. Only an estimated 15 per cent of them had received some form of technical OSH assistance. However, of those that received assistance, only about 20 percent were classified as micro, small or medium enterprises (MSMEs). The research parameters provides that 26.64% females and 73.36% of male workers are being monitored. In fact, its only 453 and 840 of them are being monitored for noise and dust environment. The hazards assessment in terms of noise monitoring. Many workers in MSMEs are exposed to high levels of noise. In Makassar, workers were being exposed to noise more than 100db where DKI as capital city of indonesia become the lowest of noise exposed as well as less than 70db.<sup>16</sup>

**Table 2. Work-Accident cases in Indonesia 2001-2010.**

Year	Total Number of Workplace Accidents	Death	Full-Disability	Partial-Disability	Functional Disabilities	Recupeprated
2001	104.774	1.768	280	4.923	7.363	90.440
2002	103.804	1.903	393	3020	6.932	91.556
2003	105.846	1.748	98	3.167	7.130	93.703
2004	95.418	1.736	60	2.932	6.114	84.576
2005	99.023	2.045	80	3.032	5.391	88.475
2006	95.624	1.784	122	2.918	4.973	85.827
2007	83.714	1.883	57	2.400	4.049	75.325
2008	93.823	2.124	44	2.547	4.018	85.090
2009	96.314784	2.144	42	2.713	4.380	87.035
2010	86.6931.883	2.144	31	2.313	3.662(+)	78.722

The study was conducted in Semarang to determine the relationship between the characteristics workers, job characteristics, and the amount of dust is inhaled by events pulmonary function impairment in workers painting the car in the city of Semarang, Indonesia. The results showed the opportunity to impaired lung function is at 99 %. Based on the findings of the high prevalence of impaired workers lung function (46.7%).<sup>17</sup>

More than IDR 550 billion in OSH-related compensation that had been paid in Indonesia from 2002 to 2005, according to the data of PT. Jamsostek (a state-owned limited liability company in the business of social security of workers). This compensation was part of OSH-related direct losses incurred by 7.5 million formal sector workers who were active participants of Jamsostek (social security programs for workers).<sup>18</sup> In order to manage those problems, Indonesia needs the program. It had released by the national occupational safety and health council Indonesia called National occupational safety and health work program 2007 – 2010. There were 6 main programs such as Coordination and synergy among stakeholders, Harmonization of laws and regulations, standards & guidelines on OSH, Improving the roles & functions of OSH inspection, OSH implementation in

the world of business, OSH maintenance and enhancing OSH competence, implementation of integrated OSH Information system.<sup>19</sup>

### Thailand

The Cabinet Resolution of the Kingdom of Thailand endorsed the declaration of the policy “Safe and Healthy Workforce” on 11 December 2007 as a national agenda that shall be observed by all sectors. According to a survey by the National Statistics Office (NSO), there are 39.3 million people in the labour workforce. Of those, 24.6 million (62.6%) are informal workers, who are neither protected by the existing labour protection laws nor by the social security laws, and the rest 14.7 million (37.4%) as so called formal workers. More than half of informal workers, 15.1 million (61.4%), are in agricultural sector while 7.3 million (29.7%) of those are engaged in the service sector, and 2.19 million workers (8.9%) are engaged in the manufacturing sector.<sup>20</sup>

The number of occupational accidents (all cases) fell from 149,436 in 2009 to 146,511 in 2010 and 129,632 in 2011. In addition, the number of severe work-related accidents dropped from 42,838 in 2009 to 42,698 in 2010 and to 37,933 in 2011.

**Table 3. Occupational accident or diseases statistics (all cases) during 2003-2011 classified by top 10 causes of accident.**

Causes of accident	Year								
	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cut/Stabbed by materials/objects	52.249	53.198	51.834	49.655	47.385	41.502	34.485	33.648	29.382
Materials/objects collapsed/felt on top	28.318	27.970	28.737	27.265	26.285	22.506	19.376	20.049	20.237
Materials/objects/chemicals splashed into eyes	35.987	37.215	36.107	33.664	32.649	29.518	23.679	22.732	19.471
Hit/crashed by materials/objects	36.340	38.074	36.415	35.217	33.425	29.884	25.021	24.186	18.863
Pinched/pulled by materials/objects	13.783	14.214	14.085	13.242	12.963	11.961	9.948	10.300	9.158
Fall from height level		8.976	9.299	9.362	9.540	8.874	8.112	7.478	7.113
Fall, slip	7.923	5.905	6.523	6.140	6.423	6.591	6.501	6.438	5.879
Vehicle accidents	5.265	6.082	6.249	6.045	6.448	5.691	5.288	4.979	4.423
Diseases related with work's nature condition	6.729	7.502	7.626	7.859	7.244	5.977	4.575	5.047	4.323
Result of extreme heats/ exposed to heat	8.460	5.538	5.064	4.753	4.634	4.104	3.257	3.240	2.780

There were greater differences in the prevention of cases (both all and severe) between 2010 and 2011 compared to those between 2009 and 2010, which may be due in part to carry-over benefits in 2011 from programmes implemented in 2010( Table 3 & figure 6).<sup>21</sup>

During 2003 – 2011, the first cause of occupational accident is cut or stabbed by materials or objects, the second cause is materials/objects collapsed/felt on top, and the third cause is materials or objects or chemical substances splashed into eyes. In 2011, the first cause of occupational accident, cut or stabbed by materials or objects, was 10 times higher than that of the tenth occupational accident, results of extreme heat/exposed to heat. Top 10

causes of occupational accidents shows in table 4.<sup>22</sup>

Size of Establishment and Number of Occupational Accident Cases Table 4 shows occupational accidents or diseases statistics (all cases) during 2003 – 2011 classified by size of establishment. In 2011, the highest occupational accident cases is establishment having 200-499 workers follow by 20-49 workers, and >1,000 workers, respectively.<sup>22</sup>

Occupational Accident Classified by Age shows in table 6 occupational accident classified by age (all cases) during 2003 – 2011. In 2011, the highest occupational accident cases are age between 25-29 years old follow by 30-34 years old, and 20-24 years old, respectively.

**Table 4. Occupational accident or diseases statistics (all cases) during 2003-2011) classified by size of establishment.**

Size of Establishments (No. of workers)	Year								
	2003	2004	2005	2006	2007	2008	2009	2010	2011
1-4	4,349	5,256	5,758	5,404	5,568	5,009	5,035	4,469	-
5-9	9,431	9,925	10,226	9,625	9,893	8,740	8,028	7,570	22,437
10-19	15,653	15,936	16,278	16,177	15,334	13,904	12,759	12,038	11,002
20-49	31,536	31,998	32,742	30,179	29,282	26,477	23,114	22,610	20,388
50-99	26,707	27,683	27,606	26,765	25,153	23,195	19,182	18,258	15,158
100-199	33,702	35,150	33,317	30,157	29,666	26,127	23,103	22,134	17,562
200-499	41,996	42,283	41,944	41,482	38,642	33,113	25,884	26,448	22,134
500-999	22,360	22,917	21,735	20,489	19,992	18,075	14,290	14,349	12,727
>1.000	23,939	24,386	24,629	23,979	25,122	21,862	18,041	18,635	19,226
Total	210,673	215,534	214,235	204,257	198,652	176,502	149,436	146,511	129,632

Occupational Accident or Disease Statistics (All Cases) Classified by Type of Establishment shows in table 6 occupational accident or disease cases (all cases) during 2003–2011 classified by size

of establishment. In 2011, the highest occupation accident cases are metal manufacture follow by commercial establishments, and other establishments, respectively.

**Table 5. Occupational accident or diseases statistics (all cases) during 2003-2011 classified by age.**

Age	Year								
	2003	2004	2005	2006	2007	2008	2009	2010	2011
13-19	11,472	15,827	10,318	12,654	11,648	10,342	7,738	8,111	6,960
20-24	39,926	52,287	36,204	42,790	37,946	31,617	23,799	23,116	20,023
25-29	38,895	52,862	39,910	50,473	47,015	40,520	32,728	36,652	24,971
30-34	26,242	36,465	27,388	36,898	37,233	33,180	28,907	22,254	24,831
35-39	17,167	25,511	18,593	25,935	26,871	24,625	21,741	21,556	19,253
40-44	10,082	15,879	11,528	16,930	17,772	16,677	15,611	15,440	14,665
45-49	5,761	9,347	6,823	10,161	10,883	10,451	9,944	10,192	9,750
50-54	2,765	4,756	3,267	5,346	5,956	5,852	5,765	5,789	5,730
55-59	992	1,892	1,254	2,301	2,521	2,488	2,409	2,580	2,591
>60	382	708	421	769	807	750	794	819	858

Organ of Occupational Accidents shows in table 7 occupational accident cases (all cases) during 2003-2011 classified by organ with total of 2 organs. In 2011, top 3 organs of occupation accidents are (1) fingers, (2) multiple organs, and (3) eyes.

Table 8 and 9 shows provinces with high occupational accident cases and occupational accident rate per 1,000 workers (all cases) in 2011 and 2010,

respectively. In 2010 and 2011, provinces with the highest occupational accident cases and occupational accident rate per 1,000 workers (all cases) are Bangkok and Samut Prakan, respectively.

Established on 11 December 2009, the Occupational Safety and Health Bureau (OSH Bureau) under the Department of Labour and Protection Welfare (DLPW) of the Ministry of Labour (MOL), Thailand, is a key government agency responsible for

driving the adoption of effective practices complying with the national agenda “Safe

and Healthy Workforce” and for realizing the implementation strategic framework.

**Table 6. occupational accident and diseases statistics (all cases) during 2003-2011) classified by type of establishment.**

Type of establishment	Year								
	2003	2004	2005	2006	2007	2008	2009	2010	2011
Survey and Mining	1,171	1,240	1,072	1,073	978	1,255	722	723	602
Food/beverage manufacture	17,845	16,518	15,882	15,226	14,931	10,107	12,880	12,571	10,888
textile/ornament manufacture	17,485	16,147	14,386	13,676	11,895	8,207	8,326	7,583	6,313
Forestry, wood products	13,983	13,403	11,501	10,008	8,706	4,978	5,838	5,637	4,471
Paper products, printing	5,133	5,429	5,115	4,777	4,924	6,140	3,763	3,600	3,318
Chemical/petroleum products	18,670	18,887	17,587	16,936	16,517	8,592	12,278	22,315	11,203
Non-metal element products	5,338	5,726	5,673	5,207	4,912	3,908	3,530	3,625	3,093
Basic metal manufacture	13,020	13,766	13,080	12,358	11,719	6,674	8,184	8,061	7,443
Metal products	38,679	39,300	38,542	38,255	35,573	20,351	25,634	25,939	23,381
Vehicle assembly	16,293	15,951	16,671	15,198	14,028	16,957	9,855	11,486	10,303
Other manufacture	2,918	3,058	2,788	2,604	2,664	3,227	1,782	1,844	1,423
Utilities	603	628	515	534	516	1,038	504	460	419
Construction, machine installation, dig water-well	15,728	18,982	20,979	20,201	21,021	19,888	15,184	12,919	10,619
Transportation	5,920	6,132	6,489	6,096	6,017	17,027	5,094	5,061	4,566
Commercial	20,507	21,624	22,992	22,247	23,194	105,760	18,818	18,038	16,278
Other	17,380	18,743	20,963	19,861	21,057	94,103	17,044	16,649	15,312
Total	210,673	215,534	214,235	204,257	198,652	328,212	149,436	146,511	129,632

**Table 7. Occupational accident or diseases statistics (all cases) during 2003-2011 classified by organ.**

Organ of Occupational Accident	Year								
	2003	2004	2005	2006	2007	2008	2009	2010	2011
Head	7,190	7,463	7,434	7,350	7,005	5,467	4,693	4,536	4,070
Eyes	42,835	44,300	43,335	40,414	39,193	35,099	28,209	26,753	23,087
Nose	643	683	645	632	650	588	502	484	442
Ears	468	489	462	424	375	371	302	277	238
Mouth/teeth/jaw/and other oral organs	904	973	1,015	931	932	795	680	647	622
Face/cheek/eyebrow/chin/neck	4,600	4,731	4,864	4,571	4,842	4,936	4,429	3,741	3,095
Neck	-	-	-	-	-	-	-	467	422
Back	5,101	4,627	4,878	5,039	4,976	4,309	4,381	4,242	3,855
Rib/costa border/body	1,204	1,309	1,329	1,374	1,338	1,122	995	962	842
Chest and thoracic organs	1,652	1,657	1,798	1,845	1,696	1,499	1,297	1,239	1,038
Pelvic/abdomen and abdominal organs	513	502	531	493	432	397	355	368	321
Sexual organ	107	118	88	88	90	93	81	72	61
Shoulder/scapular/armpit	2,146	2,168	2,275	2,251	2,393	2,119	1,864	1,809	1,622
Arms/elbow	11,116	11,087	11,575	10,746	10,190	9,044	7,609	7,742	6,783



Wrists	4,826	5,047	5,087	4,950	4,858	4,401	3,761	3,929	3,512
Hands	14,908	14,924	14,534	13,688	13,517	12,296	10,169	10,046	8,812
Thumbs	-	-	-	-	-	-	-	8,217	7,478
Fingers	62,250	63,333	61,347	58,376	55,516	49,244	41,078	32,612	29,157
Waist	304	380	393	399	363	274	273	232	191
Hip/buttock	732	826	858	902	874	796	705	669	582
Legs/shin/calf/knee	10,790	11,107	11,043	10,970	10,663	9,416	8,271	8,080	7,248
Ankles	3,856	4,198	4,182	4,121	4,234	3,866	3,499	3,465	2,930
Feet/heel/skin bridging toes	12,940	13,402	13,703	13,001	12,695	10,904	9,305	9,158	8,216
Toes	8,611	9,247	8,962	8,826	8,581	7,418	6,452	6,354	5,718
Multiple organs injury	12,302	12,201	13,154	12,058	12,451	11,246	10,120	9,856	8,851
Blood circulation system	49	33	113	60	155	101	112	61	79
Others	370	447	344	397	298	364	294	493	360

**Table 8. Top 10 Provinces with high occupational accident cases and occupational accident rate per 1,000 workers (all cases) in 2011.**

No	Province	Number	No	Province	Rate
1	Bangkok	37,229	1	Samut Prakan	34.90
2	Samut Prakan	25,754	2	Samut Sakhon	25.31
3	Chonburi	10,475	3	Chachoengsao	23.30
4	Samut Sakhon	9,369	4	Phetchabun	22.68
5	Pathumthani	7,024	5	Nakhon Pathom	21.09
6	Rayong	6,219	6	Nakhon Sawan	20.73
7	Chachoengsao	4,500	7	Trang	19.39
8	Nonthaburi	3,794	8	Satooon	18.87
9	Nakhon Pathom	4,009	9	Udonthani	18.74
10	Ayutthaya	4,038	10	Singburi	18.43

**Table 9. Top 10 provinces with high occupational accident cases and occupational accident rate per 1,000 workers (all cases) in 2010.**

No.	Province	Number	No.	Province	Rate
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4	Samut Sakhon	9,369	4	Trang	24.84
5	Pathumthani	7,024	5	Singburi	24.70
6	Rayong	6,219	6	Nakhon Sawan	24.37
7	Chachoengsao	4,500	7	Nakhon Pathom	21.06
8	Nonthaburi	4,038	8	Nakhon Nayok	21.06
9	Nakhon Pathom	4,009	9	Rayong	20.94
10	Ayutthaya	3,794	10	Udonthani	20.58

**Table 10. Budget spending by the OSH bureau, Thailand in the fiscal years 2010 and 2011 for propelling the national agenda “ safe and healthy workforce” implementation strategy.**

Strategies	Fiscal year 2010 (Baths)*	Fiscal year 2011 (Baths)*
1. Knowledge management in the field of occupational safety and health	12,419,432.13	14,623,482,60
2. Capacity building of personnel and concerned parties in all sectors	5,885,343,81	6,637,554,35
3. Promotion and development of safety and health networks	1,622,510,10	839,461,60
4. Development of the safety and health information system	20,200,00	137,361,25
Total	19,947,486,04	24,237,859,80

In accordance with the three-year work plan under the national agenda implementation strategic framework, the OSH Bureau was allocated a budget of 19.95 million bahts in the fiscal year 2010 and 24.24 million bahts in the fiscal year 2011 for driving the four main strategies (Table 1). Thirty projects in 2010, and 25 projects in 2011, were organized by agencies concerned with OSH under the DLPW (the OSH Bureau, 12 areas of OSH Centers, 77 LPW Provincial Offices, and 10 LPW Working Groups in Bangkok).

## CONCLUSION

As this review has shown, The factors that can cause work accidents is still rated higher in ASEAN countries, especially in Indonesia and Thailand. The existing program is considered to reduce the number of workplace accidents. Health and Safety is an effort to protect the safety of workers in order to realize optimal productivity, organized occupational health and safety efforts. That effort is intended to provide assurance of safety and improve the health of the workers by preventing accidents and occupational diseases, control of hazards in the workplace, health promotion, treatment and rehabilitation.

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