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EVALUATION OF SAFETY TRENDS IN CONSTRUCTION, MINING AND TRANSPORTATION SECTORS IN TURKEY

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SUMMARY: Production processes in construction, mining and transportation involves high risks of occupational accidents all over the world. In 2014, 25.6% of the total accidents and 65% of fatal accidents occurred in these three sectors in Turkey. According to the Eurostat data, in 2014, 20% of all work-related accidents and 38% of fatal accidents have occurred in these sectors in EU. The fatality rates in Turkey are very high compared to EU countries. In Turkey, these sectors have high accident risks due to its production processes, use of low-tech, negative conditions and labor-intensive characteristics. Production machines are old, and protective-preventive services are inadequate. Especially in the construction sector, unregistered labor and subcontracting is widespread. Labor inspection is inadequate. In EU accession process, legislative works done in the field of health and safety in Turkey in recent years have not been enough. New regulations were introduced related to protective-preventive services, risk assessment, information and education workers. Nevertheless, occupational accidents has not decreased at the desired level. This paper contains a comparative and statistical analysis of accidents in coal mining, construction and transportation sectors in Turkey and EU. The official statistics data are used in the EU and Turkey. To prevent accidents, action plans must be prepared for each of the three sectors. Practices must be determined and followed strictly within the frame of these action plans

Key words: accidents, accident prevention, public health, safety, Turkey

INTRODUCTION

According to the Turkish Social Security Institute, more than 200 thousand occupational accidents occurred in Turkey in 2014 and 2015. As a result of these accidents, totally 3000 workers died and 5000 workers became permanently incapable. Occupational accidents and safety in Turkey, one of the most important problem areas for many years.

Production processes in some industries such as construction, metal manufacturing, mining and transportation involves high risks of occupational accidents all over the world. As a result of these accidents, thousands of workers are injured or died each year in Turkey. In 2014, 25.6% of the total work-related accidents, 65% of total fatal accidents have occurred in these three sectors in Turkey. As in all developing countries, these sectors have high accident risks due to its production processes, use of low-tech, negative conditions and labor-intensive characteristics. Legislative works done in the field of occupational health and safety in Turkey in recent years have not been enough. However, occupational accidents occurring in these industries have

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been significantly reduced in developed countries and also EU countries.

Accident incidence rates and fatality incidence rates are important indicators to perform statistical evaluations and comparisons related to safety and health. Occupational accident incidence rates and accident fatality rates are calculated and published by Eurostat annually. However, the official sectoral accident incidence rates and fatal accident incidence rates are not calculated and published in Turkey. Accident incidence rates show the trends of accidents in a country. It also allows for estimation and analysis of accidents and comparison by other country and sectors.

The aim of this study is to evaluate the trends of fatal and non-fatal occupational injuries in Turkey by using epidemiologic criterias. The paper aims is to investigate and calculate occupational accidents and incidence rates of fatal and non-fatal accidents in Coal Mining, Construction and Transportation sectors which the most fatal accidents occurring in Turkey. This paper is also aims to comparison the accident and fatality incidence rates with EU countries. Basic reasons of accidents, preventive measures and recommendations are also presented.

MATERIAL AND METHOD

The data that is used in the study is prepared by using the official occupational accident statistics taken from Turkish Social Security Institution and Eurostat. Tables are prepared from sectoral contribution of the recorded official insured workers, accident numbers, accident incidence rates and fatality incidence rates. Occupational accident and fatality incidence rates in coal mining, construction and transportation sectors are also calculated on the basis of years for Turkey. All collected data is used to make comments on the data.

Occupational accident incidence rates and accident fatality rates are calculated and published by Eurostat for EU annually. However, the official sectoral accident incidence rates and fatal accident incidence rates are not calculated and published in Turkey. Therefore, accident incidence rates and fatality incidence rates have been calculated for coal mining, construction and transportation sectors for Turkey and compared with the EU statistics in this paper.

The incidence rate is used in many social sciences, particularly in epidemiology. Incidence in epidemiology is a measure of the probability of occurrence of a given medical condition in a population within a specified period of time. Although sometimes loosely expressed simply as the number of new cases during some time period, it is better expressed as a proportion or a rate with a denominator.

Incidence rate is the number of new cases within a specified time period divided by the size of the population initially at risk. For example, if a population initially contains 1,000 non-diseased persons and 28 develop a condition over two years of observation, the incidence proportion is 28 cases per 1,000 persons per two years, i.e. 2.8%. Incidence rate is specified as 1000, 100 thousand or million people. The incidence rate is a calculation method of that allows to make various comparisons and analysis in medicine and social sciences. Incidence rate is also often used in health and safety issues and risk assessment processes (Last, 2001; Coggon, Rose and Barker, 1997; Dembe et al., 2005; Dunn and Clark, 2009; Turkkan and Pala, 2016).

In most of international statistical classifications and also in Eurostat statistical database, occupational incidence rate is calculated as number of occupational accidents for per 100 thousand workers. For this reason, in this paper, occupational accident incidence rates and fatal accident incidence rates in Turkey are calculated by the following formulas:

Occupational Accident Incidence Rate =

$\frac{\text{Annually number of accidents in sector}}{\text{Annually number of insured workers in sector}} \times 100,00$

Fatal Occupational Accident Incidence Rate =

$\frac{\text{Annually number of fatal accidents in sector}}{\text{Annually number of insured workers in sector}} \times 100,00$

RESULTS

Severity of Accidents in Coal Mining, Construction and Transportation Sectors in Turkey

More than 200 thousand occupational accidents occurred in Turkey every year in last decade and as a result of these accidents, approximately 1500 workers died and 2000-3000 workers became permanently incapable annually. Occupational accidents cause approximately \$ 4 billion income loss in social security system. All of occupational accidents are not recorded and many of accidents are not identified.

Mining, construction and transport sectors make a significant contribution to the economy in terms of GDP and employment in Turkey. Table 1 shows the contribution of these sectors to GDP, employment and growth rates. In recent years, there has been significant growth in these sectors in terms of income and employment. Nevertheless, occupational accidents in these sectors can not be prevented despite all precautions.

Production processes in specific sectors such as construction, metal manufacturing, mining

and transportation involves high risks of occupational accidents all over the world and also Turkey. As a result of accidents, thousands of workers are injured or died each year in Turkey. Table 2 presents 3 sectors at which most fatal accidents are seen for the last 12 years in Turkey. According the last decade's data, coal mining sector, which was in the third place after metal product manufacturing and construction sectors in terms of occupational accidents until 2009, has risen to the first place in 2009-2013.

Coal still maintains its importance as a traditional energy source in developing countries and also Turkey. Coal mining has high accident risks due to its production processes, negative conditions and labor-intensive characteristics. Thus, occupational accident rates are 5-6 times more in comparison with the other sectors. Risk factors that cause the accidents in mining sector such as fire, firedamp and dust explosions, smoke inhalation, collapses, landslides, electric shocks, lifting equipments, hand tools and falling objects etc. are investigated in many previous studies (*Groves, Kecojevic and Komljenovic, 2007; Pappas et al., 2003; Grayson, 2001; Hull et al., 1996*).

Table 1. Contribution of the sectors to GDP, employment and growth rates

Tablica 1. Udio sektora u BDP-u, zapošljavanju i stopama rasta

Years	Mining			Construction			Transportation		
	GDP	Employment	Growth Rate	GDP	Employment	Growth Rate	GDP	Employment	Growth Rate
2009	1.5	103,000	-6.7	3.8	1,249,000	-16.1	11.2	1,081,000	-7.8
2010	1.4	115,000	4.7	4.2	1,431,000	18.3	11.1	1,009,000	11
2011	1.5	125,000	3.9	4.5	1,676,000	11.5	11.6	1,044,000	10.4
2012	1.5	113,000	0.8	4.4	1,709,000	0.6	12	1,095,000	2
2013	1.4	105,000	-3.4	4.4	1,782,000	7.4	11.9	1,152,000	3.9
2014	1.5	134,000	5.6	4.6	1,912,000	2.2	12	1,119,000	2.6
2015	1.3			4.8			12		

Table 2. Number of Non-Fatal, Fatal Accidents, Accident Incidence Rates and Fatal Accident Incidence Rates in EU Countries and Turkey (per 100000 workers)***Tablica 2. Broj nesmrtnih nesreća, smrti, stopa učestalosti nesreća i stopa nesreća sa smrtnim ishodom u zemljama EU-a i Turskoj (na 100 000 radnika)**

		COAL MINING				CONSTRUCTION				TRANSPORTATION/SHIPPING			
		NON-FATAL ACCIDENTS	FATAL ACCIDENTS	ACCIDENT INCIDENCE RATE	FATALITY INCIDENCE RATE	NON-FATAL ACCIDENTS	FATAL ACCIDENTS	ACCIDENT INCIDENCE RATE	FATALITY INCIDENCE RATE	NON-FATAL ACCIDENTS	FATAL ACCIDENTS	ACCIDENT INCIDENCE RATE	FATALITY INCIDENCE RATE
EU 28	2008	7033	52	2000	14,7	626313	1258	3703	7,4	316328	711	3005	6,7
	2009	6806	49	1784	12,8	548657	1156	3447	7,2	296743	586	2813	5,5
	2010	6146	21	2337	7,9	504532	1049	3214	6,6	313545	680	3004	6,5
	2011	5333	46	1651	14,2	479869	958	3425	6,8	286186	613	2776	5,9
	2012	4388	28	1679	10,7	418414	869	3094	6,6	268705	562	2611	5,4
	2013	4367	27	1818	11,2	378261	787	2821	5,8	283586	549	2724	5,2
	2014	4188	33	1940	15,2	350545	739	2698	5	256798	605	2404	5,6
GERMANY	2008	862	2	1220	2,8	125756	125	4841	4,8	70610	114	3821	6,1
	2009	558	0	1197	0	127649	95	4703	3,5	65789	106	3122	5
	2010	520	0	1427	0	112210	85	4159	3,1	78351	110	3569	5
	2011	430	1	879	2	125306	112	5650	5	74777	98	3532	4,6
	2012	272	2	606	4,4	116909	97	5192	4,3	70816	96	3286	4,4
	2013	297	1	1076	3,6	105052	80	4609	3,5	73634	64	3325	2,8
	2014	303	0	1234	0	114495	99	5003	4,3	65002	81	2877	3,5
SPAIN	2008	2732	3	47839	52,5	162152	180	8961	9,9	44257	86	6077	11,8
	2009	2624	2	35584	27,1	104199	123	7575	8,9	36479	62	5287	8,9
	2010	2256	1	33621	14,9	85513	100	6829	7,9	34565	70	4929	9,9
	2011	1798	6	30249	100,9	68947	106	6754	10,3	29730	74	4459	11,1
	2012	1690	1	33222	19,6	44892	68	5507	8,3	24200	61	3776	9,5
	2013	1372	6	32481	142	37565	58	5389	8,3	25279	40	3915	6,2
	2014	1478	1	35752	24,1	38263	59	6149	9,4	25768	63	4173	10,2
FRANCE	2008	2	0	0	0	109405	74	7382	4,9	57125	37	5881	3,8
	2009	1	0	28	0	102320	133	5368	6,9	56123	87	4366	6,7
	2010	0	0	0	0	98042	113	5430	6,2	59333	90	5906	8,9
	2011	0	0	0	0	98758	130	7012	9,2	58490	95	6147	9,9
	2012	0	0	0	0	92144	124	6000	8	58148	86	5685	8,4
	2013	0	0	0	0	86078	133	5695	8,8	57814	94	5717	9,3
	2014	0	0	0	0	82934	128	6191	9,5	57109	102	4671	8,3

ITALY	2008	42	0	0	0	78155	184	3936	9,2	48659	116	4513	10,7
	2009	42	0	20290	0	67288	184	3374	9,2	43310	85	3977	7,8
	2010	45	0	9890	0	59620	183	3005	9,2	41188	101	3814	9,3
	2011	25	0	22638	0	50364	143	2728	7,7	35361	48	3297	4,4
	2012	39	0	21320	0	39865	110	2273	6,2	30046	57	2821	5,3
	2013	34	0	10827	0	37762	101	2373	6,3	32306	59	3092	5,6
	2014	23	0	6653	0	33005	105	2224	7	30237	59	2910	5,6
CZECH REPUBLIC	2008	722	5	1918	13,2	7664	57	1594	11,8	8472	27	2587	8,2
	2009	543	1	1486	2,7	6015	19	1211	3,8	6378	15	1929	4,5
	2010	449	2	1348	6	5566	27	1197	5,8	6701	24	2042	7,3
	2011	516	7	1528	20,7	3356	29	832	7,1	4058	24	1296	7,6
	2012	744	5	2677	17,9	3034	22	751	5,4	3962	17	1316	5,6
	2013	355	4	1336	15	3126	24	740	5,6	4515	18	1529	6
	2014	334	10	1495	44,7	2756	28	680	6,9	4039	22	1344	7,3
UNITED KINGDOM	2008	255	1	0	0	43830	48	1622	1,7	23945	16	1483	1
	2009	290	3	5175	53,5	32359	41	1498	1,9	24478	10	1729	0,7
	2010	224	1	7744	34,5	28372	50	1342	2,3	21732	12	1556	0,8
	2011	282	6	0	0	28751	53	1343	2,4	18873	12	1315	0,8
	2012	271	0	3126	0	22753	43	1060	2	17520	6	1185	0,4
	2013	157	0	5934	0	24068	51	1123	2,3	2990	65	2045	4,4
	2014	122	0	2725	0	24887	51	1144	2,3	29262	61	2059	4,2
POLAND	2008	1951	20	1140	11,6	10006	125	811	10,1	6040	80	673	8,9
	2009	2266	36	1091	17,3	8215	118	1496	21,4	5375	38	1087	7,6
	2010	2201	15	1702	11,6	8585	114	975	12,9	5993	63	837	8,8
	2011	1930	18	1005	9,3	8755	99	664	7,5	6234	57	692	6,3
	2012	1766	16	1379	12,5	7879	82	880	9,1	6163	61	841	8,3
	2013	1571	8	1336	6,8	6244	71	557	6,3	5564	38	643	4,3
	2014	1455	18	1324	16,3	5863	55	538	5	5537	42	640	4,8
TURKEY	2008	5728	30	11574	61	5574	397	449	32	3388	136	612	24
	2009	8193	3	15763	6	6877	356	560	29	3911	49	669	8
	2010	8150	92	16253	183	6437	475	443	32	4108	159	578	22
	2011	9217	58	17840	112	7749	570	475	35	4142	229	524	29
	2012	8828	20	17327	39	9209	256	514	14	4564	90	532	11
	2013	11289	36	23177	73	26967	521	1457	28	15901	226	1790	25
	2014	10026	335	24419	816	29699	501	1490	25	17074	211	2008	25

Source: Eurostat Databases and Turkish Social Security Institute Statistical Yearbooks

*2015 and 2016 statistics are not yet published in Turkey

Approximately 50,000 workers are employed in coal mining sector in Turkey. However, working conditions and protective measures against occupational accidents are still at a very low level. 91585 occupational accidents occurred and 821 workers died from 2003 to 2014. 955 workers died in 19 great mine accidents, including

the Soma and Ermenek accidents in 2014, since 1983. One of the accidents occurred as landslide, two of them occurred as fire and the rest of them occurred as firedamp explosion. Since 1992, 12 of 13 great accidents occurred in the coal mines that are operated by private sector enterprises.

According to the inspection results of Ministry of Labor and Social Security (2012), it is indicated that 7%, 23% and 83% of the mines don't have technical supervisor, explosives magazine and operation permit document, respectively, 43% of the mines don't measure gases regularly, 26%, 32% and 21% of the mines don't have occupational physician, occupational safety specialist and occupational health and safety committee, respectively. It is also indicated that coal mines don't have appropriate and adequate fortification, adequate ventilating system and escape routes. Expect big ones; mines generally don't have gas monitoring and distant signal systems and circuit breakers.

Construction is also referred as heavy industry due to the equipment used and the complexity of the total production processes. Construction industry uses and produces a wide variety of manufactured components in addition to basic construction materials. There is a major manpower requirement to maintain production in a construction site under hard working conditions with hazardous materials and machines.

Occupational accidents in construction sector are investigated in many different studies. Main reasons of these accidents are; inadequacy of trainings and personal protective equipment, not implementing "working at height" methods, not carrying out periodic maintenance and systematic environment measurements, working with subcontractors and inadequacy of inspections. In addition, managerial faults stand out during analyzing the reasons of accidents. It was observed that some major and minor occupational accidents were not recorded, reasons of these accidents were not analysed, risk assessments were not prepared well enough and precautions were not managed. In Turkey, 30% of the fatal accidents occur in construction sector every year and 30-40% of these accidents occur as "falling down from height". The risk of possible accidents in construction sites depend on five different reasons; falling from height, falling objects and being hit by objects, machinery and crane accidents, electric shock, and explosion. In Turkey, 90% of workers are subcontracted from third party companies in construction sector. Subcontractor system, which is commonly used

in construction sector, limit the organization and to take measures for workers' health and safety (Rivara and Thompson, 2000; Tang et al., 2004; Arioglu and Arioglu, 1997; Ercan, 2010; Gurcanli, Bilir and Sevim, 2015; Gul et al., 2016).

Transportation/Shipping sector at which many of the fatal accidents occur as a result of vehicle accidents, takes the second place after construction sector in terms of accidents involving death in Turkey. According to the ILO, 50% of all goods transported in the world are hazardous materials. A large part of these materials are flammable, combustible and explosive. Transport and storage activities include accident risks for all industrial sectors. The risks of possible accidents in transportation and shipping sector depend on six main reasons; traffic accidents, falling from height, material overthrow or falls, forklift, crane and other machinery accidents, hazardous materials, electric shocks, and fires. The most important risk factor of accidents at work in the transport and storage is traffic accidents. Furthermore; forklifts, pallet trucks and lifting equipment such as mobile cranes, conveyors, hazardous chemicals, unsafe rack and stacking methods, unsuitable platform applications, improper electrical and ventilation systems, manual lifting and carrying works, workload, lack of education are among the leading reasons of occupational accidents. In maritime transport works; crane, forklift accidents and material strike or overthrow accidents are also widely encountered (Kristiansen, 2013; Islam and Hernandez, 2016; Liu and Moini, 2015; Yu et al., 2014).

Statistical View of Accident Incidence Rates in Coal Mining, Construction and Transportation Sectors in Turkey and EU

Total number of insured workers, the number of occupational accidents, fatal accidents and accident incidence rates in coal mining, construction and transportation/shipping industry are shown in Table 2. In 2013, 28.2% per cent of non-fatal accidents, 58% of fatal accidents, and in 2014, 25.6% of the total accidents, 65% of fatal accidents occur in these three sectors. Especially in terms of 2/3 of all deaths occurred in these three industries reveals the importance of preventive measures to be taken.

According to the Eurostat data, in 2013 21% of all work-related accidents in the European Union and 37% of all fatal accidents; in 2014 20% of all work-related accidents and 38% of fatal accidents have occurred in these sectors. In 2013 and 2014, 1363 and 1377 fatal accidents occurred in these 3 sectors in EU. In 2014, as 76% of the deaths death occurred in these sectors in Turkey.

As shown in Table 2, accident incidence rate in the coal mining sector in Turkey is very high compared to EU countries. In some countries not to supply its energy needs from coal such as France and the United Kingdom, fatal and non-fatal accident rates are zero level. In Germany it is very low. In countries which coal production is currently continuing such as Spain and Poland, accident incident rates in is seen that at a very low level compared with Turkey. In Italy, no fatal accident occurred between 2008-2014. In Turkey, the rate of accidents in the coal mining industry is much higher than all EU countries. Only in Spain in 2011 and 2013, incidence rates have occurred over Turkey. In addition, between the years 2008-2004 fatal accident rates are 5-6 times higher than in all other EU countries in the coal mining sector in Turkey. Especially in this period the incidence rates of fatal accidents in coal mining in Turkey significantly increased and after Soma disaster in 2014, it has reached 816 as a startling rate.

Whereas; incidence rates of work-related accidents in the construction and transport sector in Turkey seem low compared to both countries and throughout the European Union (see figure 1). But this is a misleading statistic for Turkey. Occupational accidents occurring in many sectors in Turkey are not reported to social security institutions. Statistics on accidents in the workplaces are not kept at a sufficient level. In addition, the rate of unregistered-uninsured employees by 35%. Therefore, the accident incidence rates in these sectors must be also actually higher.

This situation can be observed more clearly when the incidence rates of fatal accidents investigated (see figure 2). Fatal accident incidence rate in the construction sector in Turkey is around 2-7 times more than in EU countries (see

also table 2). In transport sector, the incidence rate of fatal accidents in Turkey is also 2 to 5 times more than in EU countries.

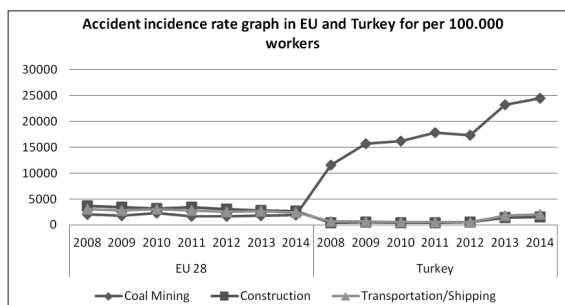


Figure 1. Occupational accident incidence rates in EU and Turkey

Slika 1. Stope učestalosti nesreća na radu u EU i Turskoj

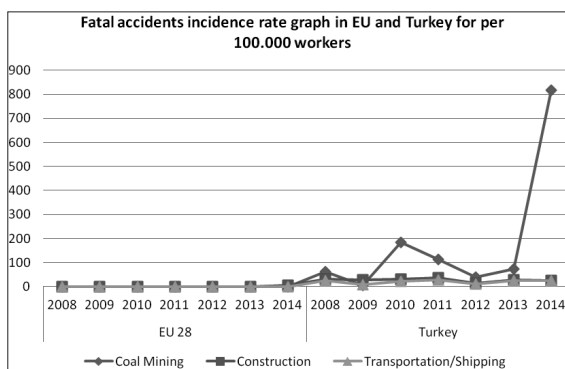


Figure 2. Fatal occupational accident incidence rates in EU and Turkey

Slika 2. Stope učestalosti nesreća na radu sa smrtnim posljedicama u EU i Turskoj

In addition, a significant increase is observed in all three sectors after 2012 in terms of the number of accidents and fatal accidents incidence rates in Turkey. Occupational Health and Safety Act came into force in 2012 in Turkey.

Furthermore, there has been a significant increase in the number of occupational accidents, and accident incidence rates after 2012 in Turkey in all three sectors. The most important reason for this increase is the fact that providing protective-preventive OH&S services was made compulsory in workplaces as per the OH&S Act that was introduced in 2012. The fines regarding the disclosure of occupational accidents to public authorities were increased, and accordingly the occupational accidents that occur in

the workplaces were registered and disclosed to public authorities more often since OH&S professionals began their work. Particularly in the construction and mining sectors, even though a large number of occupational accidents occur because of subcontracting practice rates that go as high as 90%, too many unregistered employees, long working hours, and non-standard working ways; most of these accidents are not registered. It is estimated that the real number of occupational accidents in Turkey is 2-3 times more than the number of occupational accidents that have been registered so far.

Across the EU, a significant decline is observed in the occupational accident incidence rates in all three sectors. In the year 2014, there has been a 40% decrease in occupational accident incidence rates in coal mining, 30% decrease in the construction sector, and 25% decrease in the transportation sector since 2008. Whereas the fatal accident rates seem to have dropped in the construction and transportation sectors, they have remained stable in coal mining. Construction sector has the highest fatality rate among all of the sectors.

DISCUSSION

Member states of the European Union have taken on a "preventive approach" in health and safety, with the extensive regulations they made in accordance with the "Framework Directive 89/391" which was adopted by the EU in 1989. This approach has yielded results in the recent years, having triggered gradual decrease in occupational accident numbers in EU countries. The modern approach in health and safety does not only comprise of legislations, inspection and sanction; but it is primarily based on determining the risks in the workplace, taking precautions and making inspections through organizations at the workplace level.

Turkey is currently a candidate country for European Union accession. Its negotiation process has been continuing since 2003. In Turkey, extensive legal and institutional regulations regarding health and safety have been made as part of adaptation to the European Union. A "preventive approach" that was based on risk assessment

has been adopted in order to comply with the ILO convention no. 161, favored in 2004, and the Framework Directive 89/391 of the European Union. Within this framework; legislative regulations were made on risk assessment, preventive OH&S services, safety specialists, OH&S committees, employee representatives and training. Preparing health and safety plans in constructions and mines was made compulsory. Penalties were increased. A separate Act was passed under the name of 2012 OHS Act, and new directives were prepared. Nevertheless, occupational accidents did not decrease during the 4 year period. Major accidents occurred particularly in coal mines and on construction sites, where tens of workers lost their lives.

Existing problems and evaluations in Turkey may be listed under these titles:

1. Despite the extensive legislative regulations, the number and rates of labour inspections are inadequate. As a matter of fact, among these three sectors that cause the most fatality; while all of the mines were inspected in the year 2013, the inspection rate was 5% in constructions and down to 3% in the transportation sector. The number of inspectors working in the Ministry of Labor and its organizational structure are inadequate.
2. Many studies indicated that there are serious safety deficiencies which restrict a safe production progress in coal mines in Turkey. Mining enterprises in Turkey do not comply with safety rules adequately. There has been a significant increase in accidents that occur in mines as mining basins were turned over to subcontractors by leasing.
3. Approximately 500 fatal occupational accidents occur every year in the construction sector. Each year, 30-40% of overall fatalities occur in the construction sector. Subcontraction rate is 90%, and unregistered and illegal immigrants are employed. Working hours are flexible and long. The workers work under time pressure and heavy working conditions. Workers are poorly educated and the employers lack sensitivity towards occupational safety matters.

4. Most of the fatal accidents in the transportation sector occur in the form of traffic accidents. Traffic safety and the culture of abiding by the traffic rules are extremely poor. Hence, more than 5 thousand people are killed in traffic accidents each year in Turkey. Inspections and penalties fail to suffice.
5. Separate from legal arrangements, action plans must be prepared for each of the three sectors. Practices must be determined and followed within the frame of these action plans.
6. The competition conditions in all three sectors impose fast-paced working under time pressure. It is crucial that employers are inspected and made more sensitive towards this issue.
7. In all of the sectors in Turkey, flexible working forms such as part-time working and working within time limits have become increasingly widespread. Workers work long hours, under poor conditions for a low salary. Additionally, cost-cutting concerns that have arisen due to subcontracting in the construction and mining sectors also cause occupational safety precautions to be neglected.
8. Working times of safety specialists are not adequate. There is no obligation in workplaces that employ less than 250 workers and that fall under the very high-hazard classification to have a full-time specialist on site. In accordance with hazard classification and employee count, workplaces may get part-time service from external health and safety services. However, such external resources provide low quality services.
9. Production equipment used in mines and some construction sites are outdated, defective or have been neglected. Many fatal occupational accidents occur due to the machines, lifting devices and hand tools used in production. Even though the legislative regulations concerning this issue have been improved, still not enough care is taken regarding the periodic maintenance within the OH&S management systems. Public authorities must also monitor whether or not periodical maintenance is carried out regularly during inspections.
10. The protective equipment provided to the workers are insufficient, defective or unfit. The trainings that workers receive on the utilization of this equipment are inadequate. The efficiency of occupational safety trainings provided in workplaces must be evaluated and continuously improved.
11. Safety issues is not regarded as part of system awareness, and occupational safety is perceived to be the responsibility of safety professionals. OH&S management system practices, OH&S organizations and awareness raising trainings have not reached a sufficient level. Safety works particularly in the mining, construction and transportation sectors must be practiced within the scope of management systems.

Conflicts of interest

The authors declare no conflicts of interests.

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EVALUACIJA SIGURNOSTI NA RADU U GRAĐEVINARSTVU, RUDARSTVU I PRIJEVOZU U TURSKOJ

SAŽETAK: Proizvodni procesi u građevinarstvu, rudarstvu i prijevozu svuda u svijetu visoko su rizični sektori. U Turskoj se 2014. godine 25,6 % svih nesreća i 65 % nesreća sa smrtnim posljedicama dogodio upravo u tim sektorima. Prema podacima Eurostata, godine 2014. ti su sektori u EU bilježili 20 % ukupnih nesreća na radu, a 38 % bilo je sa smrtnim posljedicama. Stopa smrtnosti u Turskoj vrlo je visoka u usporedbi s EU. U Turskoj, navedeni sektori vrlo su visoko rizični, i to zbog nepravilnosti u proizvodnim procesima, zastarjele tehnologije, loših uvjeta rada i velikog broja radnika. Proizvodni strojevi su stari, a zaštita na radu neprimjerena. Najveći problem je u građevinarstvu, i to zbog raširenosti rada na crno i prepuštanja poslova podizvođačima. Inspekcija rada ne radi dovoljno dobro. Nadalje, u pristupnom procesu za ulazak u EU legislativa povezana sa zaštitom zdravlja i sigurnost na radu nije se razvijala kako treba. Uvedena je nova regulativa u vezi sa zaštitom i prevencijom, procjenom rizika na radu te informiranjem i edukacijom radnika. Unatoč tome, stopa nesreća na radu nije opala do zadovoljavajuće razine. Članak donosi komparativnu i statističku analizu nesreća u rudarstvu, građevinarstvu i prijevozu u Turskoj i EU. Korišteni su službeni statistički podaci EU-a i Turske. Kako bi se nesreće spriječile, potrebno je donijeti akcijske planove za svaki od ovih sektora. Praksa mora strogo slijediti odredbe donesenih akcijskih planova.

Ključne riječi: nesreće, sprečavanje nesreća, zdravlje ljudi, sigurnost, Turska

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