



STANDARDIZATION OF WORK ACCIDENTS AND OCCUPATIONAL DISEASES INDICATORS OF SOCIAL SECURITY INSTITUTION BETWEEN 2008-2017 YEARS

2008-2017 YILLARI ARASINDAKİ SOSYAL GÜVENLİK KURUMUNUN İŞ KAZALARI VE MESLEK HASTALIKLARI GÖSTERGELERİNİN STANDARDİZASYONU

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Cite this article as: İşsever H, Ezirmik E, Oztan G, İşsever T. Standardization of work accidents and occupational diseases indicators of social security institution between 2008-2017 years. J Ist Faculty Med 2020;83(4):434-45. doi: 10.26650/IUITFD.2020.0018

ABSTRACT

Objective: The work accidents are one of the biggest issues of today's occupational lives regarding the human losts and economical losts. The humanity lost of this daily issue is pretty huge.

Material and Method: At this study, it is aimed to compare the EU's work accidents resulted with death and SSI Statistical Yearbook datas standardized number of the workers with insurances according to their work accidents, occupational diseases, and death rates from different occupational branches.

Results: At the data which are achieved by indirect standardization method of SSI 2008-2017 Statistical Yearbook, it is seen that the mining industry is leading regarding work accidents, occupational diseases and death rates. Although the highest standardization rate belonged to "Activities of Domestic Employees" in 2008, between 2009-2017 years, the "Mining coal and lignite" placed always at the first place. Regarding the occupational disease standardization between 2008-2017 the "Mining coal and lignite" and "Metal mining" industries are placed at the top.

Conclusion: It is expected to increase the feed back quantity by applying 6331th Occupational Health and Security law in the future. Hence, with the state occupational accidental feedbacks, rates would change and corrective considerations would be more efficient.

Keywords: SSI, work accident, occupational disease, death rate, standardization, worker with insurance

ÖZET

Amaç: İş kazaları, günümüz mesleki yaşamlarının insan kayıpları ve ekonomik kayıplarla ilgili en büyük sorunlarından biridir. Bu sorundan kaynaklı insan kaybı oldukça yüksek sayıdadır.

Gereç ve Yöntem: Bu çalışmada, Ülkemizde SGK İstatistik Yıllığı standardize edilmiş iş kazaları, meslek hastalıkları verilerinin, AB ülkelerinin ölümlü olan ve olmayan iş kazası sonuçlarının karşılaştırılması amaçlanmıştır.

Bulgular: SGK 2008-2017 İstatistik Yıllığı'ndan dolayı standardizasyon yöntemi ile elde edilen veriler değerlendirildiğinde, maden endüstrisinin iş kazaları, iş kazası ölüm oranları ve meslek hastalıkları yönünden ilk sıralarda yer aldığı görülmektedir. En yüksek standardize oran 2008 yılında "Ev içi çalışanların faaliyetleri" ne ait olsa da, 2009-2017 yılları arasında "Kömür ve Linyit Çıkarılması" her zaman ilk sırada yer almaktadır. 2008-2017 yılları standardize edilmiş meslek hastalıkları hızlarında "Kömür ve Linyit Çıkarılması" ve "Metal Cevheri Madenciligi" endüstrileri en üst sıradadır.

Tartışma: 6331'inci İş Sağlığı ve Güvenliği yasının uygulanması ile geri bildirim miktarının artırılması beklenmektedir. Bu nedenle, devletin iş kazasıyla ilgili geri bildirimleriyle oranlar değişecek ve düzeltici hususlar daha etkili olacaktır.

Anahtar Kelimeler: SGK, iş kazası, meslek hastalığı, ölüm oranı, standardizasyon, sigortalı işçi

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Submitted/Başvuru: 21.02.2020 • **Accepted/Kabul:** 20.03.2020 • **Published Online/Online Yayın:** 29.09.2020

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INTRODUCTION

The work accidents, occupational diseases and related deaths are now more important than past at the all around the world. The workers are losing their lives related to the work accidents or diseases every day. Every day, people die as a result of work accidents or work-related diseases more than 2.78 million deaths per year. Additionally, there are some 374 million non-fatal work-related injuries each year, resulting in more than 4 days of absences from work. The human cost of this daily adversity is vast and the economic burden of poor occupational safety and health practices is estimated at 3.94 per cent of global Gross Domestic Product each year (1). The increase of the competition and production and the development of the technology increases the risks against the workers' health and occupational safety. Especially at the XXth century which we faced industrialization and new production methods, the death and loss of organs events increased related to the mechanical causes (2). Thus, the term called "Occupational Health and Safety" (OHS) term became more important accordingly development of the industry and technology by protecting the workers against the negative factors at their workplaces, keeping the production continuously and increasing the efficiency.

Work accident; occurs because of the motion and untrustable conditions and it puts the workers's lives in threat, mostly causes injuries, equipment break downs and interrupts the production and they are unplanned events (3). Today, almost in every business branch, the work accidents may happen. This situation creates a rate of risk either the developed or undeveloped countries. Despite implementing the safety strategies in workplaces, work accidents and incidents have been increasing in parallel to developing industries and consequently their consequences can be unpleasant. The socio-economic impacts and human costs of occupational and industrial accidents are tremendous around the world (4). Thus, this problem is needed to be handled globally by the worldwide countries.

The occupational diseases are temporarily or permanently loss of health, disability or psychological injury situation according to the insured worker's work type, repeated conditions or working condition (5). Alike the work accidents, the occupational diseases are handicap for our country. Unfortunately most of the people are unaware of they have occupational disease. The occupational diseases may appear after leaving the work too, so most of the occupational diseases can not defined as occupational diseases by physicians and patients.

In addition to job losses of employees as a result of work accidents and occupational diseases in businesses, the effects of employees' lives on both the economy of the country and the efficiency of the company are not neg-

ligible. In a country where work accidents and occupational diseases are seen as high, considering the losses suffered by the workers, employers and national economy, it would be a better approach to give the necessary importance to occupational safety services (6). Unfortunately, regarding our national death events related work accidents and occupational diseases keep their high rate especially for some particular business branches. "Occupational Health and Safety" became more important for our country by applying to European Union. The exertion for European Union (EU) effected the worker's health and safety in a positive way and pushed our standards to take to the developed countries standards (7, 8).

By taking action on the occupational health and occupational safety cautions, decreasing the work accidents and occupational diseases cause important consequences for workers, employers and finally social safety systems (9). In order to put the happening work accidents and occupational diseases and their consequences in minimum level, first of all the datas should be recorded healthily. Inefficacy of the records is the biggest problem for defination of the real bigness of the troubles.

In our country, the only one resource of the work accidents and occupational diseases is the datas in yearbooks of Social Safety Institute. In this study, it is aimed to be standardized and evaluated according to the number of insured workers and to be compared with the EU results by the data from SSI 2008-2017 statistical yearbook for work accidents, occupational diseases and death rates in "business branches".

MATERIAL AND METHOD

In our study, the number of work accidents, occupational diseases and deaths caused by these reasons were taken from the 2008-2017 SSI statistical yearbook (10) and given in tables by standardized according to the number of 4/1a compulsorily insured workers. In order to control the effects of the mixing variables, a kind of statistical process of indirect method of standardization is used (11). The following formulations are used during the work accident standardization:

Incidence rate = Number of accidents (fatal or non-fatal) / Number of employed persons in the covered population

- **Turkish General Work Accident Rate** = Work Accident Number/Compulsorily Insured Workers Number (4-1/a)
- **Expected Number of Population Examined** = Examined Population (Number of workers) x Turkish General Work Accident Rate
- **Standardised Incidence Ratio (SIR)** = (Number of observed/Expected Number) x 100

As we calculate the confidence interval;

To calculate a 95% confidence interval (CI) for a standardized incidence ratio (SIR), use the following formula:
 $CI = SIR \pm (1.96 \times SE)$ (SE: Standard Error)

where: $SE = SIR / \text{square root of } d$

$d = \text{Number of observed events}$

$$\text{Standard Error} = \frac{\text{Standardized Incidence Ratio}}{\sqrt{\text{Number of observed events}}}$$

Confidence Interval (CI 95%) = $\text{Standardized Incidence Ratio} \pm (1.96 \times \text{Standard Error})$

RESULTS

Work Accident and Occupational Disease indicators in our country between 2008-2017 are given in Table 1.

When Table 1 is examined, there are 1200-1500 deaths in work accidents that occur every year, and there is continuous incapacity between 1800-2000. When occupational diseases are examined; between 500 and 1000 occupational diseases appear to be registered in the system. When we compare our country statistics with other EU countries, a picture in our country that there is almost no occupational disease and deaths from work accidents is very high. When we look at the statistics annuals, it is seen that the rates of work accidents have decreased from 13 to 6 per thousand, and the work accident death rates have changed between 10 and 20 per one hundred thousandth. The number of occupational

diseases in the statistics is also very thought-provoking. Approximately 1000 occupational diseases result in the system in our country annually (10). According to the Social Security Institution (SSI) data, it is seen that especially work accidents are in significant dimensions and the number of occupational diseases is much lower than expected. In addition, losses that are not reflected in SSI statistics and that result from unrecorded and unregistered work accidents and occupational diseases should also be taken into consideration. It should also be noted that data on occupational diseases are only based on cases that have been decided. These statistics show that there is a need to reduce work accidents and that there are problems in the detection and reporting of occupational diseases, in this direction, a result-oriented preventive and preventive study is required.

Table 2 shows the standardized results of occupational accident rates between 2008 and 2017.

When Standardized Accident Rates were examined between 2008-2017; Coal mining is in the first place and Main Metal Industry is in the second place. While the first two branches did not show any change between 2009 and 2017, it is observed that Airways Transporting took the second place in 2013.

When we compare the results of standardization in Turkey 2008-2017 year, we see Table 2 as one of the three big tables (work accident standardization- work field); "Coal and Lignite Mining" with a rate of 900-2877% at the peak of all years. Although their rates are decreasing,

Table 1: Work Accidents and occupational disease rates between 2008-2017.

Years	Number of the insured	Work accident	Work accident-fatal	Work accident continuous loss of work	Occupational disease	Work accident rate (per 1.000)	Work accident death rate- (per 100.000)	Occupational disease rate- (per 100.000)
2008	8.802.989.00	72963	865	1452	539	8.29	9.8	6.12
2009	9.030.202.00	64316	1171	1668	429	7.12	12.9	4.75
2010	10.030.810.00	62903	1444	1976	533	6.27	14.4	5.31
2011	11.030.939.00	69227	1700	2093	697	6.28	15.4	6.32
2012	11.939.620.00	74871	744	2036	395	6.27	6.2	3.31
2013	12.484.113.00	191389*	1360	1660	371	15.33	10.8	4.68
2014	13.240.122.00	221366*	1626	1421	494	16.72	12.2	3.73
2015	13.999.398.00	241 547*	1252	3433	510	17.25	8.9	3.64
2016	13.775.188.00	286.068*	1405	4447	597	20.77	10.2	4.33
2017	14.477.817.00	359.653*	1633	3987	691	24.84	11.3	4.77

*As of 2013, with the introduction of the work accident notification form electronically, the data of all insured numbers who have had a work accident started to be given by taking into account the European Union Standards (ESAW-European Statistics on Accidents at Work).

Table 2: Standardization of work accident numbers between 2008-2017.

Business code	Business branches	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
5	Coal and lignite mining	900	1.048	1.078	1.462	1.514	2.794	2.877	2.592	2.220	1.411
24	Main metal industry	372	428	493	489	493	483	537	508	574	
9	Mining supporting service						313	509			
3	Fishing and seafood growing		327								
23	Non metallic products	248	256			286		352	345		
25	Factory metal products	248		287	280		317	327	340	317	
6	Crude oil and natural gas industry				294						
7	Metal mineral mining					286					
51	Airways transporting		280	395	370	602					
27	Electric equipment manufacturing						306		300		
29	Motor vehicles and trailer manufacturing			275						407	
30	Manufacture of other transport vehicles	264									
31	Furniture manufacturing									434	744
58	Publishing activities										2.018
91	Library. Archive and museums										1.376
97	Activities of domestic employees										2.607

we should signify that their rates are higher than 1000% level. Beside this, when we evaluate the 2008 year, the "Activities of Domestic Employees" activities are at the first place. The second place belonged to the work accidents during the publishing activities.

At the second place, "Main Metal Industry" is existing which has various rates between 372-574%. At the second place in 2013 year, "Airway Transportation" is existing with the rate of 602%. Despite of the same business branch existed with the rate 395% in 2015, and 370% in 2014 as the third place; it is significant to observe their change where they were not at top 5 in the older years.

"Non-Metallic Products Production" in the 2017, 2016, 2013, 2011, 2010 years, they were among top 5. Although the 2012 rate of this business branch is more than the rate of its last three years, it is not among the top five in ranking; in 2012, business branches are valuable in terms of showing indirect increase of standardization rates. In the

2016 and 2017 years, in order 1048% and 900% rates of "Coal and Lignite Mining" business branch still defending their first place at work accident standardization.

Table 3 shows the standardized results of occupational disease rates between 2008 and 2017.

When we see the Table 3 (the standardization of occupational diseases at the business branches); we realize that the results vary depending the years. Generally, the first place belongs to (with a high rate of 13739% in 2012 year) "Coal and Lignite Mining" business branch.

The "Non-Metallic Products Production" business branch did not be among at top 5 between 2008-2013, they increased their rates in the following years and placed at top 5 with the rates of 1049% and 611% in they years 2014-2017.

Another significant situation at the list is the rate of the "Metal Mineral Mining" in 2011 year. The same sector

Table 3: Occupational diseases standardization between 2008-2017.

Business code	Business branches	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
5	Coal and lignite mining	1.994	4.579	5.760	1.250	3.079	13.739	5.223	3.461	8.056	10.865
7	Metal mineral mining	1.051					538	18.378			
9	Mining supporting services		612			501					
23	Non metallic products manufacturing	1.049	897	611	765						
24	Main metal industry	607		539		245				440	
27	Electric equipment manufacturing		714						645	861	257
28	Machine and equipment manufacturing								514		278
29	Motor vehicles and trailer manufacturing			513	385						
30	Manufacture of other transport vehicles	893	423	521	764	894		308	1.732	1.877	
31	Furniture manufacturing										238
32	Other products						507			575	
33	Machine and equipment installation and repair							858	652		
36	Water collection treatment and distribution					247					
38	Evaluation of wastes						238				
58	Publishing activities										1.213
72	Scientific research and development activities							219			
98	Activities of domestic employees				1.453		1.345				

ranked second in 2017 and third in 2012. It ranked second in "Manufacture of other Transport Vehicles" in 2009 and 2010. It ranks in the top five between 2013 and 2017, but did not rank in the top 5 in 2008 and 2012. It is significant that this business branch did not exist at top 5 in 2008 and 2012 rankings.

"Machine and Equipment Installation and Maintenance" in order had 652-858% rates and took third place in the years 2010-2011; in the following years this rate significantly decreased and in the year of 2015 this business brand did not exist at the top 5 ranking. This situation can be taken as an improvement for this business branch. "Coal and Lignite Mining" business branch with rates of in the years of 2016 and 2017 in order 4579% and 1994%,

still defend their place at the top regarding the occupational diseases standardization.

Table 4 shows the standardized results of occupational accident mortality rates between 2008 and 2017.

When we check the Table 4 (standardization of deaths in business branches), the business branches existing with 235-7724% rates at the top varies depending the years.

In the year 2010, the "Telecommunication" business branch took fifth place with the rate 854%. In the years of 2010-2011, "Creative Arts and Entertainment Activities" took first place with pretty high rate of 7400%; "International Organization and Representative Activities" business branch had 1016-1329% rates and took third place;

Table 4: Standardization of the fatal work accidents rate between 2008-2017.

Business code	Business branches	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
5	Coal and lignite mining	749		713	6.799	739	654	748	1.265		
6	Crude oil and natural gas removal					885					
7	Metal mineral mining	524		645		665	518	540			
8	Other mining and quarries	529	1.040	742	562	459	480			235	
9	Mining supporting service					561				417	
11	Beverage manufacturing						395				
12	Tobacco products manufacturing		525								
39	Improvement and other waste management services		860	535						828	
42	Construction of non-building buildings		352	377	351					416	904
43	Special construction activities		392								
50	Waterway transport	1.034			478						
58	Publishing activities									1.049	4.442
61	The telecommunication								854		
68	Real estate activities										870
90	Creative arts. entertainment activities							7.724	7.479		
91	Library archive and museums							1.667	905		3.351
92	Gambling and betting activities						738				
97	Activities of domestic employees										6.896
98	Own needs activities by households	631									
99	International organization and representation activities				448			1.329	1.016		

"Library, Archive and Museums" business branch with the rates in order 905-1667% and took fourth place and second place. The same business branch ranked third in 2008. "Gambling and Betting Activities" took first place in the year of 2012 with 738% rate. It is surprising that these business branches took top places with these rates in the indicated particular years only.

In 2013, "Crude Oil and Natural Gas Removal" business branch took first place with 885% rate. "Coal and Lignite Mining" business branch which took also first place regarding the standardization of work accidents and occupational diseases, leded at top with 6799% rate in 2014. In this year, mining work accidents happened and resulted with deaths in Soma/Manisa (301 deaths), in Ermenek/

Karaman (18 deaths). Additionally, the death resulted mining accidents explain this year's high rates in Dagkonak-Kemerli/Sirnak, Amasra/Bartın, Gelik/Zonguldak, Alacakaya/Elazığ, Genc/Bingöl, Elbistan/Kahramanmaraş. This business branch is also the only business branch which took always first place in 6 years of rankings.

In the year of 2015, "Other Mining and Quarrying" business branch took first place with the rate of 742%. It is very important that they were in top ten in the former years for their first place explanation for this year. "Metal Mining" business branch could be evaluated with the same logic that they were at top 10 for the past 10 years and most of them they were among top 5. The second place filled by "Coal and Lignite Mining" business branch in 2015 which never came out of top 5 in all past years. Beside this, the first three places took by mining industry, significantly. "Construction of Non-Building Buildings" is another significant business branch in this table with regularly increasing rates in 2015 with 377% rate.

"Other Mining and Quarrying" business branch took first place in 2016 with 1040% rate, "Improvement and Other

Disposable Management Systems" business branch took second place. May be the most significant point at the standardization of the work accidents resulted with death rates in 2016, is the situation of "Coal and Lignite Mining" and "Metal Mining" business branches this year did not be among top five although they had significant death rates in the past years.

In 2017, "Waterway Transportation" took first place with the rate 1034%. This business branch as different than evaluated other business branches, had high standardization rate as a first time. The highest death rate belonged to "Coal and Lignite Mining" business branch almost each of the past years and took second place this year with 749% rate.

Table 5 shows the Standardized Work Accident Rates in the Top Ten in 2017.

In the Table 5, the data for 2017 were standardized by work accidents by number of the insured workers on the basis of business branches, ranked from small to large and the first five business branches were listed in order as

Table 5: The values of the standardized work accident rates in top ten in 2017.

Business branches	Number of work accidents	Number of Insured	Expected Number	SIR	SE	CI 95%	
						Lower	Upper
05-Coal and lignite mining	8.468	37.596	939.90	900.95	9.79	881.35	920.14
24- Main metal industry	15.670	168.084	4202.10	372.91	2.98	353.31	378.75
30- Manufacture of other transport vehicles	3.397	51.278	1281.95	264.99	4.55	245.39	273.90
25-Manufacture of fabricated metal products except machinery and equipment	23.627	379.581	9489.52	248.98	1.62	229.38	252.15
23-Manufacture of other non-metallic mineral products	14.183	228.354	5708.85	248.44	2.09	228.84	252.53
38-Waste collection rehabilitation and disposal activities. recovery of substances	6.106	98.399	2459.97	248.21	3.18	228.61	254.44
07- Metal mineral mining	1.622	27.746	693.65	233.84	5.81	214.24	245.22
29-Manufacture of motor vehicle land vehicles (trailers) and semi trailers	11.475	202.365	5059.12	226.82	2.12	207.22	230.97
51- Airways transporting	1.420	25.244	631.10	225.00	5.97	205.40	236.71
17-Manufacture of paper and paper products	3.078	55.194	1379.85	223.07	4.02	203.47	230.95

SIR: Standardized Incidence Ratios, SE: Standard Error

Table 6: The values of the standardized work accident resulted with death rates in top ten in 2017.

Business branches	Death	Exp. death rate	SMR	SE	Lower	Upper
50-Waterway transportation	17	1.64	1034.72	250.96	542.84	1526.59
05-Coal and lignite mining	31	4.14	749.60	134.63	485.72	1013.47
08-Other mining and quarrying	38	7.17	529.99	85.98	361.48	698.51
07- Metal mineral mining	16	3.05	524.24	131.06	267.36	781.11
49-Land transport and pipeline transport	211	60.54	348.51	23.99	301.49	395.54
42-Civil engineering	158	45.89	344.28	27.39	290.60	397.97
43-Special construction activities	89	36.80	241.87	25.64	191.62	292.12
41-Building construction	340	146.49	232.10	12.59	207.43	256.77
23-Manufacture of other non-metallic mineral products	58	25.12	230.90	30.32	171.48	290.33
35-Electricity, gas, steam and ventilation system production and distribution	25	11.65	214.54	42.91	130.44	298.64

SMR: Standardized Mortality Ratio. SE: Standard Error

“Coal and Lignite Mining”, Metal Mining”, “Other Transportation Vehicle Production”, “Machinery and Fabrication of Metal Products Excluding Equipment”, “Other Non-Metallic Mineral Manufacturing”.

Table 6 shows the Standardized Work Accident Death Rates in the Top Ten in 2017.

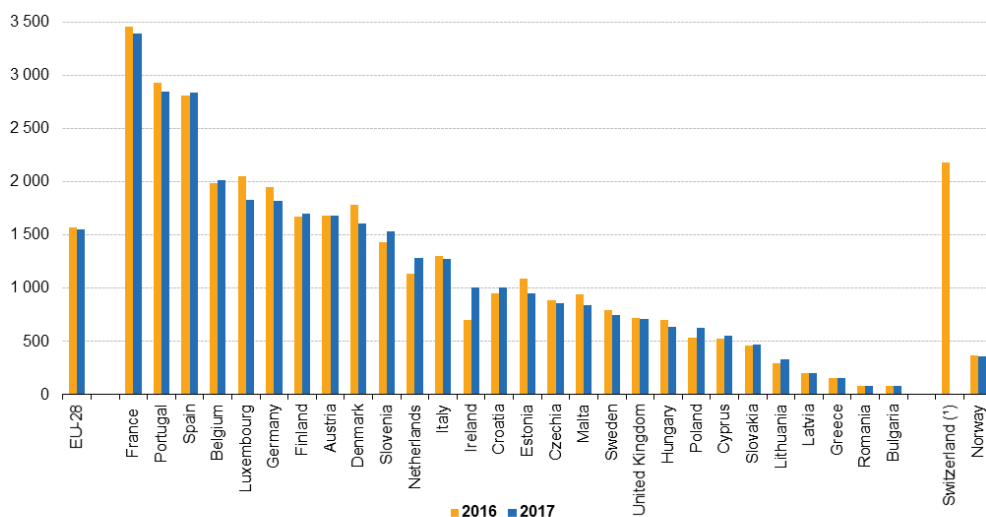
In Table 6, the data for 2017 were standardized according to the number of insured workers on the basis of business

branches and ranked from small to large, and the first five business branches were “Water Transportation”, “Coal and Lignite Mining”, “Mining and Quarrying”, “Metal Mineral Mining”, “Land Transport and Pipeline Transport”.

When we evaluate the EU countries;

Work accidents resulted with death in 2010 result from the six regions where WHO separated the world (including Russia, Georgia, Tajikistan, Kyrgyzstan, Uzbekistan, Ukraine,

Non-fatal accidents at work, 2016 and 2017
 (incidence rates per 100 000 persons employed)



Note: non-fatal (serious) accidents reported in the framework of ESAW are accidents that imply at least four full calendar days of absence from work. Ranked on the values for 2017.

(*) 2016 data.

Source: Eurostat (online data code: hsw_n2_01)



Figure 1: EU-28 countries 2016-2017 non-fatal work accident counts and incidence rates (per 100.000 workers)

Moldova, Tajikistan, Turkmenistan, Kazakhstan, Israel, Armenia, Kosovo in addition to EU countries) its rate is 2.9 (per 100.000 workers) (12). This ratio is 14.4 in the same year in which the source of Turkey's statistical yearbook SSI data (10). The rate of EU countries in 2014 is 1.27 (per 100,000 workers) (12). This ratio is 12.2 in the same year, Turkey's Statistical Yearbook SSI data source. Similar to 2010, most of the Work accidents in 2014 had occurred in the SEARO and WPRO regions as shown in Table 10. About two-thirds of the work accidents fell almost equally under these two regions. Compared to the 2010 figures, there was a rise in the number of work accidents for all the WHO regions except for the HIGH (High Income countries) and EURO regions.

Figure 1 shows the 2016-2017 Non-Fatal Occupational Accident Numbers and Frequency Rates in EU-28 countries.

Across the EU-28, there were 1558 non-fatal accidents per 100 000 persons employed in 2017. In 2017, the range for incidence rates among the EU Member States was from less than 100 non-fatal accidents per 100.000 persons employed in Bulgaria and Romania to more than 2800 per 100.000 persons employed in Spain and Portugal, while a considerably higher rate was recorded in France (3396 accidents per 100.000 persons employed; see Figure 2). Particularly low incidence rates for non-fatal accidents may reflect an under-reporting problem caused by a poorly-established reporting system, little financial incentive for victims to report, non-binding legal obligation for the employers, etc. In the same way, the well-established re-

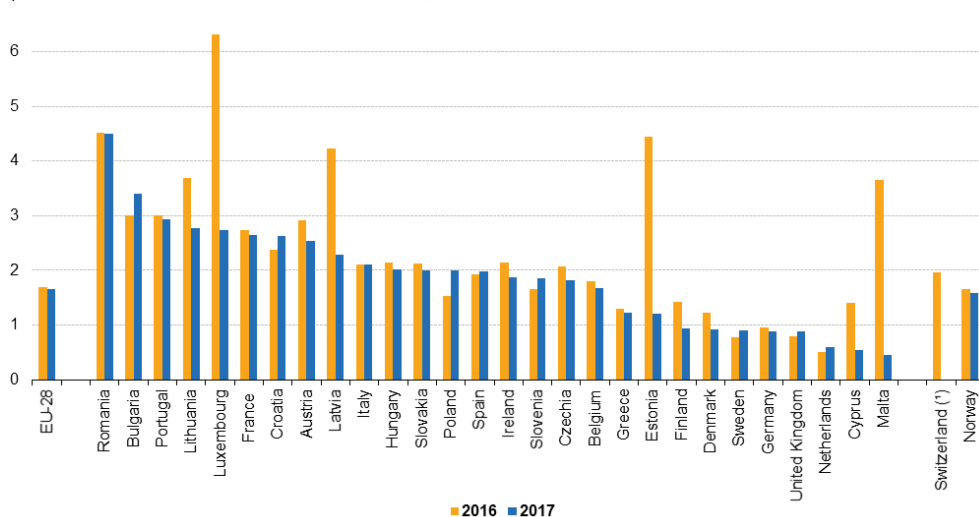
porting/recognition systems may often explain the high incidence rate in some countries. The phenomenon of low non-fatal incidence rates can be considered to reflect under-reporting following the assumption that many accidents remain unreported. The situation for incidence rates of fatal accidents is different as it is much more difficult to avoid reporting fatal accidents (13).

Beside this, considering that the dimensions of the workforces are different, the incidence rate gives the results more clearly. Therefore, considering the incidence rates; in 2017, the incidence of non-fatal workplace accidents in the EU-28 was highest in "Construction", with 2876 accidents per 100.000 employees. This is followed by the "Transport and Storage" (2663 per 100.000), "Administrative and Support Service Activities" (2365 per 100.000), "Agriculture" (2099 per 100.000) business branches (13).

EU-28 countries 2016-2017 Fatal Work Accident Counts and Incidence rates are presented in Figure 2.

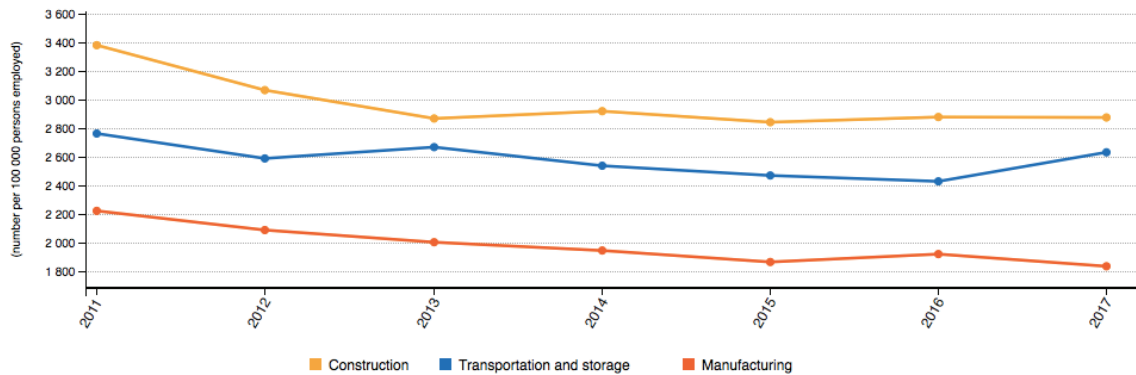
In 2017, there were just over 3.3 million non-fatal accidents that resulted in at least four calendar days of absence from work and 3.552 fatal accidents in the EU-28, a ratio of approximately 942 non-fatal accidents for every fatal accident. There was an increase in the total number of non-fatal accidents at work in the EU-28 between 2016 and 2017, some 4.574 more (equivalent to growth of 0.1%). By contrast, there were 36 fewer fatal accidents at work in the EU-28 during 2017 when compared with a year before (equivalent to a decrease of 1%) (13).

Fatal accidents at work, 2016 and 2017
 (incidence rates per 100 000 persons employed)



(*) 2016: data.
 Source: Eurostat (online data code: hsw_n2_02)

Figure 2. EU-28 countries 2016-2017 fatal work accident counts and incidence rates in business branches (per 100.000 workers)



Note: non-fatal accidents reported in the framework of ESAW are accidents that imply at least four full calendar days of absence from work (serious accidents).
 Source: Eurostat (online data code: hsw_n2_01)



Figure 3: EU-28 countries 2011-2017 non-fatal work accidents incidence rates (per 100.000 workers)

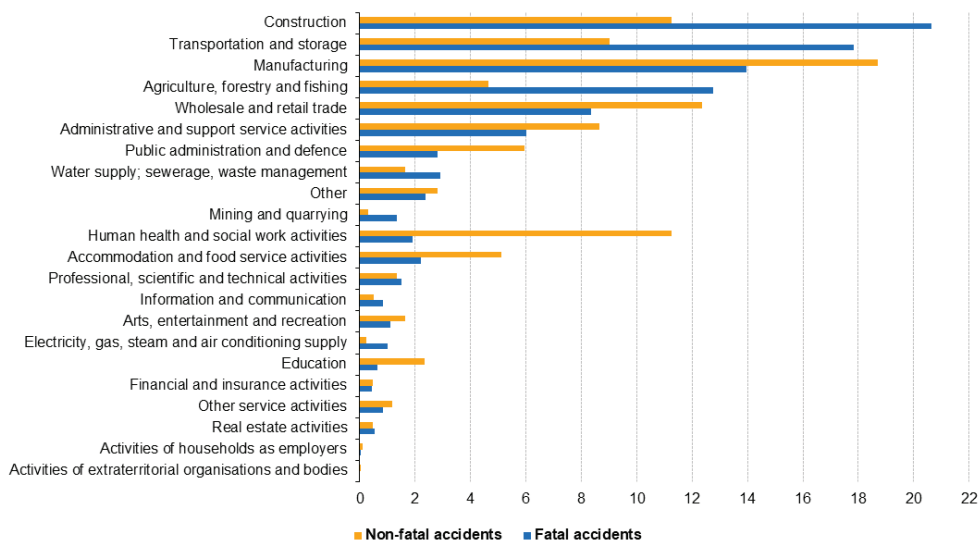
Non-Fatal Occupational Accident Rates by business lines in EU-28 countries between 2011-2017 are shown in Figure 3.

In 2017, more than 3.3 million of non-fatal work accidents occurred in the EU-28, resulting at least four calendar days of absenteeism, between 2011 and 2017, 2.1% of the total number of non-fatal accidents in the workplace in the EU-28 there was a decrease (14).

The Fatal and Non-Fatal Work accidents in EU countries in 2017 according to NACE section are shown in Figure 4.

Within the EU-28, the construction, transportation and storage, manufacturing, and agriculture, forestry and fishing sectors together accounted for around two thirds (65.2%) of all fatal accidents at work and more than two fifths (43.6%) of all non-fatal accidents at work in 2017. In 2017, one fifth (20.6%) of all fatal accidents at work in the EU-28 took place within the construction sector, while the transportation and storage sector (17.8%) had the next highest share; manufacturing (14.0%) and agriculture, forestry and fishing (12.8%) were the only other NACE sections to record double-digit shares of the total number of fatal accidents. Non-fatal accidents were rel-

Fatal and non-fatal accidents at work by NACE section, EU-28, 2017
 (% of fatal and non-fatal accidents)



Note: non-fatal (serious) accidents reported in the framework of ESAW are accidents that imply at least four full calendar days of absence from work. Ranked on the values for fatal accidents.
 Source: Eurostat (online data codes: hsw_n2_01 and hsw_n2_02)



Figure 4: The fatal and non-fatal work accidents in EU countries in 2017 (per 100.000 workers)

atively high within manufacturing (18.7%), wholesale and retail trade (12.5% of the total in the EU-28 in 2017), construction (11.3%), human health and social work activities (11.3%). Administrative and support service activities as well as public administration and defence accounted for 8.6% and respectively 6% (13).

CONCLUSION

The most common tendency for occupational health and safety issues is the examination of work accident and occupational disease reports and records. The available data is held by Social Security Institution in Turkey. There is no information regarding work accidents and occupational diseases for areas not covered by law. There is also no information regarding unregistered employees. An important point that very little occupational diseases related to Turkey and this is not reflected enough to the records.

Statistical information about work accidents and occupational diseases are reported after the incident. As for preventive practices, clearer and premise indicators should be developed. By using these indicators, a system can be established on how to prevent diseases and accidents. It may be difficult to create such indicators, however, these indicators can accurately and clearly illustrate the subject. Global exertion is needed to improve the issue of indicators.

Work accidents, occupational diseases, the number of deaths occurred in Turkey "business branches" have been examined and standardized, examined changes compared to the past years; then EU rates are given. There is no major changes in the published annuals other than those known on the business branches (except for the unexpected branches of business from time to time).

Work accident death rate when compared to the EU countries and Turkey in terms of the way it is noteworthy that there is a high difference. On the basis of statistics for 2014 work accident death-rate care from the EU-28 average of 1.83, while this ratio was realized as 12.2 in Turkey. According to work accident fatality rate in Turkey has realized more than approximately 6.7 times higher than the EU average (15).

When we evaluate all these datas, the results obtained from Turkey shows a bad scene compared to EU countries. Turkey has taken a very important step by adopting the proactive and adopting participatory approach and spread this to the also all around the state by taking to the scope of the installation law No. 6331 Occupational Health and Safety Prevention. A protective and preventive approach has been adopted in terms of occupational health and safety with this law prepared on the basis of the ILO and EU acquis. This development by building modern occupational health and safety system based on

the principle of protection, Turkey has fulfilled the legislative infrastructure for review at regular intervals. It is now in an effort to ensure effective implementation of this system. However, the available data indicate that a desired level of gain has not yet been achieved in work accidents.

When the data is analyzed, work accidents and occupational diseases are predominantly concentrated in the branches of "Coal Mining", "Metal Industry", "Construction", "Motor Vehicle Manufacturing". These business branches where serious deaths occur, require more precautions. However, firstly, work accident and occupational disease data should be recorded officially. Having rooted culture of safety in Turkey, it is seen a major problem in terms of occupational health and safety. At this point, it is necessary to create a long-term action plan for the development of Turkey's safety culture. In this context, it is necessary to contribute more to the social dialogue-based work carried out by institutions and organizations related to occupational health and safety (16).

In business branches where fatal work accidents occur, increasing occupational safety performance and reducing work accidents and negative consequences will enable more effective measures to be taken in the field of occupational health and safety, ensure that employees comply with occupational safety rules, and work in a more controlled manner in the related field. The registration system regarding work accidents and occupational diseases should be developed in a way to reach real numbers in this field. Sensitivity should be increased especially in occupational diseases and real numbers should be reflected in national statistics. A modern approach to occupational health and safety has been adopted by reviewing national policies and practices in line with the ILO Conventions 155 and 187 and Recommendation 197.

Occupational injuries remain an important issue worldwide particularly after the economic globalization and industrialization. High risk nature of certain occupations and concentration of migrant workers and ethnic minorities in these high risk occupations contribute to the increased rate of fatal occupational injuries. Impacts at individual, community, societal and organizational levels warrant development and implementation of effective prevention programs and enforcement of laws to assure safe workplaces (17).

The insufficiency of records is the biggest obstacle to the determination of the real dimensions of the occupational safety problem in our country. However, with the enforcement of the Occupational Health and Safety Law No. 6331, it is expected that the notifications will increase and reach the expected figures. Thus, different rates will be observed in the coming years with work accidents to be announced from the public and effects of protective measures can be evaluated.

Ethics Committee Approval: This study was approved by the Istanbul Faculty of Medicine Clinical Investigations Ethics Committee. (Number: 20, Date: 06/01/2020)

Peer Review: Externally peer-reviewed.

Author Contributions: Conception/Design of Study- H.İ. E.E., G.Ö. T.İ.; Data Acquisition- H.İ. E.E., T.İ.; Data Analysis/Interpretation- H.İ., G.Ö., E.E.; Drafting Manuscript- H.İ. E.E., G.Ö. T.İ.; Critical Revision of Manuscript- H.İ., T.İ., G.Ö.; Final Approval and Accountability- H.İ. E.E., G.Ö. T.İ.

Conflict of Interest: Authors declared no conflict of interest.

Financial Disclosure: Authors declared no financial support.

Etik Komite Onayı: Bu çalışma için etik komite onayı İstanbul Tıp Fakültesi Klinik Araştırmalar Etik Kurulu'ndan alınmıştır. (Sayı: 20, Tarih: 06/01/2020)

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Çalışma Konsepti/Tasarım- H.İ. E.E., G.Ö. T.İ.; Veri Toplama- H.İ. E.E., T.İ.; Veri Analizi/Yorumlama- H.İ., G.Ö., E.E.; Yazı Taslağı- H.İ. E.E., G.Ö. T.İ.; İçeriğin Eleştirel İncelemesi- H.İ., T.İ., G.Ö.; Son Onay ve Sorumluluk- H.İ. E.E., G.Ö. T.İ.

Çıkar Çatışması: Yazarlar çıkar çatışması beyan etmemişlerdir.

Finansal Destek: Yazarlar finansal destek beyan etmemişlerdir.

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