



## Occupational Disease Profile of Turkey: Analysis by Economic Activities and Cities

*Türkiye Meslek Hastalığı Profili: Ekonomik Faaliyet ve İllere Göre Analiz*

### ABSTRACT

Occupational disease is defined in the Social Insurance and General Health Insurance Law No. 5510 as a temporary or permanent illness, physical or mental disability that the insured is exposed to due to a recurring reason due to the nature of his work or due to the operating conditions of the work. The material and moral losses that occur as a result of occupational diseases that are completely preventable have reached significant dimensions, especially in developing societies. In this study, the 10-year occupational diseases profile of Turkey between the years 2011-2021 was examined on the basis of economic activity and city. By determining the economic activities and cities with the most and least occupational diseases, the areas to focus on for the prevention of occupational diseases were determined. By drawing attention to these economic activities, it is aimed to create the necessary policies in terms of occupational health and safety by taking province-specific health measures so that workers do not have occupational diseases. As the basis of this study for further academic studies; it is important to systematically collect data on occupational diseases, to analyse and interpret them, to convey them to the relevant units, and to update occupational diseases prevention policies.

**Keywords:** Occupational disease, Occupational safety, Work disease, Turkey

### ÖZET

5510 sayılı Sosyal Sigortalar ve Genel Sağlık Sigortası Kanunu'nda meslek hastalığı, sigortalının yaptığı işin niteliği veya işletilmesi nedeniyle tekrarlayan bir nedenle maruz kaldığı geçici veya sürekli hastalık, bedensel veya ruhsal özür olarak tanımlanmaktadır. Tamamen önlenabilir nitelikte olan meslek hastalıkları sonucunda meydana gelen maddi ve manevi kayıplar, özellikle gelişmekte olan toplumlarda önemli boyutlara ulaşmaktadır. Bu çalışmada Türkiye'nin 2011-2021 yılları arasındaki 10 yıllık meslek hastalıkları profili ekonomik faaliyet ve şehir bazında incelenmiştir. Ekonomik faaliyetler ile meslek hastalıklarının en çok ve en az görüldüğü iller belirlenerek meslek hastalıklarının önlenmesi için odaklanılacak alanlar belirlenmiştir. Bu ekonomik faaliyetlere dikkat çekilerek, çalışanların meslek hastalığına yakalanmaması için illere özgü sağlık tedbirleri alınarak iş sağlığı ve güvenliği açısından gerekli politikaların oluşturulması amaçlanmaktadır. Daha sonraki akademik çalışmalar için bu çalışmanın temel olarak; meslek hastalıklarına ilişkin verilerin sistematik olarak toplanması, analiz edilerek yorumlanması, ilgili birimlere iletilmesi ve meslek hastalıkları önleme politikalarının güncellenmesi önemlidir.

**Anahtar Kelimeler:** Meslek hastalığı, İş güvenliği, İş hastalığı, Türkiye

### INTRODUCTION

Work accidents and occupational diseases are among the most important problems of working life all over the world and in Turkey. Ensuring the health and safety of employees is extremely important (Koçali, 2021/a). For this reason, it is necessary to ensure the physical and mental well-being of the employees. This is only possible with the correct and complete implementation of occupational health and safety policies. Occupational risks such as dusty, noisy, extremely hot or cold workplace conditions, humid, oxygen-free working conditions, and the necessity of physical work appear as occupational diseases after a while (Reese, 2018; Salguero-Caparrós, et al, 2020). Since the cause of the disease in occupational diseases is in the workplace of the person, there is a causal relationship between the work done in these diseases and the disease (Punnet & Wegman, 2004; Anwer et al, 2021)

According to the World Health Organization (WHO), health is defined not only as the absence of disease or infirmity, but also as a state of complete physical, mental and social well-being. The scope of employee health in occupational health and safety, on the other hand, is expressed as the whole of public health policies that aim to support and protect employee health, and reduce diseases and deaths that occur in production processes (WHO, 1948; Min et al, 2019; Larsen, 2022).

Occupational disease, unlike a work accident, is of a purely occupational nature and results from the nature of the work or the conditions of the work. In other words, it is a disease caused by the work of the employee and different occupational diseases occur according to the work of the person (Spurgeon et al, 1997; İlhan et al, 2006). Dr. Bernardini Ramazzini, who is an Italian physician, wrote the first comprehensive book on occupational diseases named *De Morbis Artificum Diatriba* is today known as the father of occupational health (Felton, 1997). In this book,

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Ramazzini introduced fifty-three diseases in detail and included methods of protection from occupational diseases, nutrition, and hygiene rules. Ramazzini clearly saw the relationship between a person's job and his health status and stated that besides the classical questions that physicians ask during the examination of patients, questions about their profession should be asked. Ramazzini is the first physician to add the question of what you do to the questions that the physician who will examine the patient for the first time should ask (Sigerist, 1936; Gerstman, 2013; Keadle et al, 2021).

Occupational diseases are the common name of diseases that occur with the effect of risk factors in the working environment. According to the World Health Organization (WHO), not only known and accepted occupational diseases, but also diseases in which the working environment and working style are an important factor in their formation and development, among other reasons. In other words, it is defined as diseases in which a cause-effect, effect-reaction relationship occurs between a harmful factor and the human body affected by it, if they are specific to the work being worked on. Therefore, there is a causal link, a causal relationship between the disease and the work done (Reitz et al, 2020; Colenberget al, 2021; Haile, 2023)

The definition of occupational disease is also made in the documents of the ILO. Occupational disease is defined as a disease group in which a work-specific cause-effect effect-reaction relationship can be demonstrated between harmful factors and the human body affected by it, in world-accepted sources such as the World Health Organization (WHO) by the International Labor Organization (ILO) with the P155 Protocol of 2002 to the Occupational Safety and Health Convention (1981) and according to this, occupational diseases are diseases arising from the conduct of the work or the factors exposed during the execution of the work.

In Turkey, occupational disease is defined as a temporary or permanent illness, physical or mental disability that the insured is exposed to due to a recurring reason due to the nature of the work he/she works or does, or due to the conditions of the work in Article 14 of the Social Insurance and General Health Insurance Law No. 5510 (2006). The same definition has been made in the first clause of the first paragraph of the fourth article of the Regulation on Determination of the Rate of Loss of Working Power and Profitability (2008), and in the eighth article of the Short-Term Insurance Branch Implementation Communiqué (2008).

In the Occupational Health and Safety Law No. 6331 (2012), occupational disease is defined as a disease resulting from exposure to occupational risks. In the definitions of the Social Insurance and General Health Insurance Law and the Occupational Health and Safety Law, the terms "Due to a Recurring Cause" and "Exposure to Occupational Risks" are included. As can be understood from these expressions, there is a long-term exposure to the factors in the workplace environment for the occurrence of occupational disease.

According to the result of the definitions made, occupational disease is completely occupational and is the common name of diseases that result from the nature of the work done or the conditions of execution of the work and cause physical or mental problems in the person. In other words, occupational disease, unlike a work accident, is entirely due to occupational reasons. This is one of the important elements that distinguishes an occupational disease from an occupational accident.

Occupational health and safety (OHS) is an interdisciplinary and diverse field that includes different branches of science. OHS covers many branches of science, especially law, medicine, engineering, and economics. Although it is a multidisciplinary field covering different branches of science, some basic principles have been adopted for studies in the field of occupational health and safety. The main objective of the principles to be mentioned and the regulations in the ILO standards is to ensure that the work is carried out in a healthy and safe environment (Hasle et al, 2006; Lorti et al, 2013; Wang et al, 2020)

At the beginning of the basic principles of the protection of occupational health and safety are the following principles: regulating occupational health and safety as a right for all employees, establishing policies in this area, establishing a national system, protecting workers against work accidents and occupational diseases, regulating programs and policies for occupational health and safety, preventing work accidents and occupational diseases, occupational health and safety. Promoting the continuous development of health and safety, providing the necessary information in the workplaces for the effectiveness of occupational health and safety policies and programs, establishing an occupational health practice that focuses on the physical, mental and social well-being of all employees, providing necessary training to create a safe and healthy working environment, certain duties and responsibilities to ensure occupational health and safety to employees, employers and competent authorities (Alli, 2008; Kılık, 2014).

While Law No. 5510 deals with occupational disease risk within the framework of occupational accident and occupational disease insurance and general health insurance, Law No. 6331 on Occupational Health and Safety deals

with occupational disease risk with a focus on prevention. In other words, while the Law No. 5510 regulates the occupational disease risk, by defining the occupational disease and determining its elements, and regulates the health and monetary benefits to be provided to the insured when the occupational disease risk arises, the Law No. 6331 includes provisions that will prevent the emergence of the occupational disease risk and protect the workers against this risk. In fact, the risk of occupational disease is one of the intersection points of social security law and occupational health and safety law. While examining the risk of occupational disease, the reason the subject is related to the occupational health and safety law is that the social security law covers the prevention of these risks as well as the compensation of the damages resulting from the risks. In this respect, the concept of occupational health and safety is included in the concept of social security due to its nature. In fact, many conventions, and recommendations of the ILO on occupational diseases regulate the measures to be taken against the risk of occupational diseases rather than compensation for damages, that is, the benefits provided under insurance.

In the period before the Occupational Health and Safety Law No. 6331, occupational health and safety was regulated only in terms of workers and workplaces within the scope of the Labor Law in the Section-V of the Labor Law No. 4857. In this respect, it was clear that occupational health and safety was foreseen only for those within the scope of Law No. 4857, and that there was a large gap for other employees (Alpagut, 2014). Law No. 6331 includes all works and workplaces belonging to the public and private sector, employers and employer representatives of these workplaces, all employees, including apprentices and interns, regardless of their field of activity, except for a limited number of exceptions. In the second paragraph of Article 2 of the Law, it is shown that it is very difficult or even impossible to take occupational health and safety measures due to the nature of the work or the place where it is performed, which is considered as the reason for not being included in the coverage. According to the first clause of the first paragraph of the third article of the Law No. 6331, an occupational disease is a disease that occurs as a result of exposure to occupational risks. Law No. 6331 defined occupational disease more broadly than Law No. 5510. It should be noted that the definition of the disease resulting from exposure to occupational risk as an occupational disease in Law No. 6331 (Baycık, 2013; Koçali, 2021/b).

## MATERIALS AND METHODS

Statistical studies of occupational diseases are a good way to describe and evaluate a country's level of development. In order to carry out statistical studies, the World Labor Organization (ILO) has started to collect occupational disease data since 1941. After 1999, it asked the member countries to present to him the number of occupational diseases, work accidents, the number of incapacities, the number of days lost and accident rates. Since our country is a member of the World Labor Organization (ILO), occupational disease data is kept by the Social Security Institution (SSI) (Jorgensen, 1998; Rantanen et al., 2001; Rantanen and Fedotov, 2011; Ivascu and Cioca, 2019; Koçali, 2021/c).

In the Social Security Institution (SSI) data used in the study, only 4/1-a status workers were taken as a basis instead of all insurance branches. The reason for this is that the Labor Law No. 4857 and the Social Insurance and General Health Insurance Law No. 5510 focus on the workers in the 4/1-a status. Therefore, insured persons in the status of 4/1-b (employer) and 4/1-c (officer) are excluded from the scope of the study. In addition, these data are also outside the scope of the study, since the occupational disease experienced by workers who have no insurance and are employed informally are not included in the Social Security Institution (SSI) system. When this situation is evaluated within the limitations of the research and since the study is covering the whole of Turkey, it does not affect the overall study statistically, since the analysis is made within the development regions with the area narrowing system. The words "employee" and "worker" in the study refer to employees and compulsory insurance holders within the scope of 4/1-a. The study focused on the data of occupational diseases covering Turkey between the years 2011-2021. The data used were taken from the Social Security Institution (SSI) database. In order to obtain efficient and objective results, the obtained data were selected to cover all business lines and without sector discrimination, and were examined with parameters such as occupational diseases, permanent/temporary incapacity periods and number of employees.

## RESULTS

### Occupational Disease by Classification of Economic

When the data on the diagnosis of occupational disease in the 10-year period between 2011 and 2021 in Turkey were examined, a total of 6854 workers were identified in ninety-nine different economic activities codes (URL-1). When the annual distribution of the number of workers who have an occupational disease is examined, as can be seen in Table 1, the number of occupational diseases has been increasing regularly as of 2013. The annual performances of the economic activities are shown in color, and they are marked in green when there is no diagnosis of occupational disease, in yellow when there is a small number, and in red when the number is highest. Thus, the 10-year performance of the economic activities is more clearly shown in a single table.

In 2011, 257 occupational diseases were diagnosed in the “5-Metal ore mining” industry. The reason for this high number is the diagnosis of an occupational disease because of "heavy metal pollution" in the health screening of the workers working in the Kütahya Eti Silver Mine. In addition, the reason for the high number of occupational diseases in the “5-Coal and lignite extraction” industry between 2011 and 2012 is the occupational disease screening studies conducted for workers working in coal mines in Zonguldak (URL-2, 2011; URL-3, 2011). The reason for the sudden increase in the number of occupational diseases in 86-Human Health Services in 2020 is that Covid-19 is considered an occupational disease during the pandemic process (Durmuş, 2020; Emre and Topgül, 2021).

**Table 1:** Number of Occupational Disease by Classification of Economic Activity between 2011-2021

NO	CLASSIFICATION OF ECONOMIC ACTIVITY	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Crop and animal production, hunting and related service activities	0	0	0	0	0	1	1	5	4	1	1
2	Forestry and industrial and firewood production	0	0	0	0	0	0	0	0	0	1	0
3	Fisheries and aquaculture	0	0	0	0	0	0	0	0	0	0	0
5	Coal and lignite extraction	170	231	42	19	84	74	36	95	50	36	36
6	Crude oil and natural gas extraction	0	0	0	0	0	0	0	0	0	0	0
7	Metal ore mining	257	4	1	0	1	0	14	6	7	4	13
8	Other mining and quarrying	3	2	0	2	2	3	4	7	14	2	9
9	Mining support service activities	0	0	1	0	0	2	1	0	1	2	0
10	Manufacture of food products	3	3	0	2	2	2	8	6	23	15	32
11	Manufacture of beverages	0	0	0	0	0	0	0	0	1	1	0
12	Manufacture of tobacco products	0	0	0	0	0	0	0	0	0	0	0
13	Manufacture of textile products	2	1	1	4	7	6	8	19	16	10	27
14	Manufacture of apparel	15	3	4	6	5	2	7	11	13	13	28
15	Manufacture of leather and related products	0	0	0	1	3	3	3	3	4	0	5
16	Tree. Manufacture of wood products and cork products (except furniture), manufacture of articles made of reeds, straw and similar materials	3	3	0	2	5	4	1	1	5	4	7
17	Manufacture of paper and paper products	1	1	0	0	0	0	3	4	3	4	3
18	Printing and reproduction of recorded media	3	0	0	0	0	3	0	5	1	2	8
19	Manufacture of coke and refined petroleum products	0	0	0	0	1	0	1	1	2	0	0
20	Manufacture of chemicals and chemical products	8	1	2	3	4	10	8	8	24	17	18
21	Manufacture of basic pharmaceutical products and pharmaceutical materials	0	1	0	1	0	0	3	0	3	2	6
22	Manufacture of rubber and plastic products	2	2	7	11	5	8	13	24	26	28	43
23	Manufacture of other non-metallic mineral products	16	8	9	62	49	84	115	178	188	60	42
24	Base metal industry	18	6	11	6	29	16	49	64	95	48	64
25	Manufacture of fabricated metal products (except machinery and equipment)	36	27	4	20	26	17	28	34	56	44	70
26	Your computers. Manufacture of electronic and optical products	3	0	0	4	0	2	2	2	2	1	3
27	Electrical equipment manufacturing	4	3	3	13	13	41	24	28	34	24	34
28	Manufacture of machinery and equipment not elsewhere classified	5	4	2	2	8	15	12	16	22	13	30
29	Motor land vehicle. Trailer (trailer) and semi-trailer (semi-trailer) manufacture	5	0	1	22	32	18	33	47	59	38	111
30	Manufacture of other means of transport	7	1	11	13	9	9	22	30	44	22	49
31	Furniture manufacturing	3	0	2	1	2	3	6	6	16	5	4
32	Other manufactures	2	7	0	6	9	2	10	6	9	7	16
33	Installation and repair of machinery and equipment	86	8	4	12	12	9	9	15	25	17	17
35	Electric. Gas. Steam and ventilation system production and distribution	1	0	2	1	0	0	0	0	6	1	6
36	Collection of water. Purification and distribution	0	0	1	0	0	2	0	0	1	0	0
37	Sewage	0	0	0	0	0	0	0	0	0	0	1

38	Collection of waste. Reclamation and disposal activities, recovery of materials	1	4	1	1	0	4	1	0	5	2	4
39	Remediation activities and other waste management services	0	0	0	0	0	0	0	0	0	0	0
41	Building construction	4	5	5	5	4	16	11	16	19	14	20
42	Construction of non-building structures	2	10	1	2	4	7	3	8	5	6	6
43	Special construction activities	10	15	3	6	6	7	2	6	11	3	9
45	Wholesale and retail trade and repair of motor vehicles and motorcycles	0	0	1	5	5	3	10	5	12	10	9
46	Wholesale trade	1	4	0	10	3	5	6	8	12	5	16
47	Retail trade	1	4	2	1	2	5	7	5	10	13	42
49	Land transport and pipeline transport	3	12	2	5	6	2	10	8	5	11	12
50	Water transport	3	0	0	0	2	0	0	0	0	0	1
51	Airways transporting	0	0	0	0	3	1	1	3	0	0	0
52	Storage and supporting activities for transportation	7	5	0	2	8	6	10	15	21	14	27
53	Postal and courier activities	0	0	0	0	0	0	0	0	0	1	0
55	Accommodation	1	0	0	0	1	3	3	1	3	3	8
56	Food and beverage service activities	0	0	1	1	1	6	6	13	16	9	32
58	Publishing activities	0	0	0	0	0	0	0	0	0	0	0
59	Motion picture. Video and television program production. Sound recording and music publishing activities	0	0	0	0	0	0	0	0	0	0	0
60	Programming and broadcasting activities	0	0	0	0	0	0	0	0	0	0	0
61	Telecommunication	0	0	0	0	0	0	0	0	0	0	0
62	Computer programming. Consulting and related activities	0	0	0	0	0	0	0	0	0	1	0
63	Information service activities	0	0	0	0	1	0	0	1	0	9	3
64	Financial service activities	0	2	0	0	0	1	1	2	1	0	1
65	Insurance, reinsurance and pension funds	0	0	0	0	0	0	0	0	0	0	0
66	Ancillary activities for financial services and insurance activities	0	0	0	0	0	1	0	0	0	0	0
68	Real estate activities	0	0	1	0	1	1	3	0	0	3	6
69	Legal and accounting activities	0	1	0	0	0	0	0	0	0	0	1
70	Head office activities, administrative consultancy activities	3	1	2	2	2	0	0	1	2	3	2
71	Architectural and engineering activities; technical testing and analysis activities	0	0	1	0	0	0	0	2	2	1	4
72	Scientific research and development activities	1	0	0	1	0	0	0	0	0	1	3
73	Advertising and market research	0	0	0	0	0	0	0	0	0	1	2
74	Other professional. Scientific and technical activities	0	0	0	0	0	0	0	0	0	0	0
75	Veterinary services	0	0	0	0	0	0	0	0	0	0	0
77	Rental and leasing activities	0	0	0	0	0	0	0	2	1	0	0
78	Employment activities	0	0	0	0	3	4	1	0	0	2	3
79	Travel agency. Activities related to tour operator and other reservation services	0	0	0	1	0	0	0	0	0	0	0
80	Security and investigative activities	1	0	1	1	1	0	3	0	1	4	3
81	Services related to buildings and landscaping activities	0	2	1	0	4	5	3	13	12	66	31
82	Office management, office support and business support activities	1	2	0	4	0	2	9	3	7	9	8
84	Public administration and defence; compulsory social security	0	0	0	0	0	0	2	0	0	6	7
85	Education	0	2	2	0	3	1	1	2	1	9	4
86	Human health services	1	5	1	1	2	3	2	5	4	119	82
87	Residential care activities	0	0	0	1	0	0	0	0	0	7	3
88	Social services provided without shelter	0	0	0	0	1	1	0	0	0	1	0
90	Creative arts. Performing arts and entertainment activities	1	0	0	0	0	0	0	0	0	0	1
91	Libraries. Archives. Museums and other cultural activities	0	0	0	0	0	0	0	0	0	1	0

92	Gambling and betting activities	0	1	0	0	0	0	1	0	0	0	0
93	Sports activities. Entertainment and leisure activities	0	0	1	0	0	0	0	0	2	0	0
94	Activities of member organizations	0	0	0	0	0	1	0	0	0	0	1
95	Repair of computers, personal and household goods	0	0	0	0	2	1	0	1	0	0	0
96	Other service activities	3	3	2	1	1	0	1	4	1	1	1
97	Activities of households as employers of domestic personnel	0	0	0	0	0	0	0	0	0	0	3
98	Undifferentiated goods and services produced by households for their own use	0	1	0	1	0	0	0	1	0	0	0
99	Activities of international organizations and their representatives	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>		<b>697</b>	<b>395</b>	<b>136</b>	<b>264</b>	<b>374</b>	<b>422</b>	<b>518</b>	<b>746</b>	<b>907</b>	<b>757</b>	<b>1.038</b>

When the 10-year total occupational disease diagnoses are examined, as seen in Table 2, the economic activities with the most occupational diseases are as follows: “5-Coal and lignite extraction” ranks first with 873 (13.97%), “23-Manufacture of other non-metallic mineral products” ranks second with 811 (12.98%), “24-Base metal industry” ranks third with 406 (6.50%), “29-Motor land vehicle Trailer (trailer) and semi-trailer (semi-trailer) manufacture” ranks fourth with 366 (5.86%), and “25-Manufacture of fabricated metal products (except machinery and equipment)” ranks fifth with 361 (5.78%) occupational diseases. It is also possible to see economic activities in the table that do not show any occupational disease. In Figure 1, the first twenty economic activities with the most diagnosis of occupational diseases are shown.

**Table 2:** Total Number, Percent and Placement of Occupational Disease by Classification of Economic Activity between 2011-2021

NO	CLASSIFICATION OF ECONOMIC ACTIVITY	TOTAL (n)	PERCENT (%)	PLACEMENT (1 <sup>st</sup> )
1	Crop and animal production, hunting and related service activities	13	0,21	47
2	Forestry and industrial and firewood production	1	0,02	70
3	Fisheries and aquaculture	0	0,00	77
5	Coal and lignite extraction	873	13,97	1
6	Crude oil and natural gas extraction	0	0,00	77
7	Metal ore mining	307	4,91	6
8	Other mining and quarrying	47	0,75	29
9	Mining support service activities	7	0,11	53
10	Manufacture of food products	96	1,54	19
11	Manufacture of beverages	2	0,03	65
12	Manufacture of tobacco products	0	0,00	77
13	Manufacture of textile products	101	1,62	18
14	Manufacture of apparel	107	1,71	16
15	Manufacture of leather and related products	22	0,35	35
16	Tree. Manufacture of wood products and cork products (except furniture), manufacture of articles made of reeds, straw and similar materials	35	0,56	31
17	Manufacture of paper and paper products	19	0,30	37
18	Printing and reproduction of recorded media	22	0,35	35
19	Manufacture of coke and refined petroleum products	5	0,08	56
20	Manufacture of chemicals and chemical products	103	1,65	17
21	Manufacture of basic pharmaceutical products and pharmaceutical materials	16	0,26	42
22	Manufacture of rubber and plastic products	169	2,70	11
23	Manufacture of other non-metallic mineral products	811	12,98	2
24	Base metal industry	406	6,50	3
25	Manufacture of fabricated metal products (except machinery and equipment)	361	5,78	5
26	Your computers. Manufacture of electronic and optical products	19	0,30	37
27	Electrical equipment manufacturing	221	3,54	8
28	Manufacture of machinery and equipment not elsewhere classified	129	2,06	13
29	Motor land vehicle. Trailer (trailer) and semi-trailer (semi-trailer) manufacture	366	5,86	4
30	Manufacture of other means of transport	217	3,47	9
31	Furniture manufacturing	48	0,77	28
32	Other manufactures	74	1,18	24
33	Installation and repair of machinery and equipment	214	3,42	10
35	Electric. Gas. Steam and ventilation system production and distribution	17	0,27	41
36	Collection of water. Purification and distribution	4	0,06	57

37	Sewage	1	0,02	70
38	Collection of waste. Reclamation and disposal activities, recovery of materials	23	0,37	33
39	Remediation activities and other waste management services	0	0,00	77
41	Building construction	119	1,90	14
42	Construction of non-building structures	54	0,86	27
43	Special construction activities	78	1,25	22
45	Wholesale and retail trade and repair of motor vehicles and motorcycles	60	0,96	26
46	Wholesale trade	70	1,12	25
47	Retail trade	92	1,47	20
49	Land transport and pipeline transport	75	1,20	23
50	Water transport	6	0,10	54
51	Airways transporting	8	0,13	51
52	Storage and supporting activities for transportation	115	1,84	15
53	Postal and courier activities	1	0,02	70
55	Accommodation	23	0,37	33
56	Food and beverage service activities	85	1,36	21
58	Publishing activities	0	0,00	77
59	Motion picture. Video and television program production. Sound recording and music publishing activities	0	0,00	77
60	Programming and broadcasting activities	0	0,00	77
61	Telecommunication	0	0,00	77
62	Computer programming. Consulting and related activities	1	0,02	70
63	Information service activities	14	0,22	46
64	Financial service activities	8	0,13	51
65	Insurance, reinsurance, and pension funds	0	0,00	77
66	Ancillary activities for financial services and insurance activities	1	0,02	70
68	Real estate activities	15	0,24	43
69	Legal and accounting activities	2	0,03	65
70	Head office activities, administrative consultancy activities	18	0,29	39
71	Architectural and engineering activities; technical testing and analysis activities	10	0,16	50
72	Scientific research and development activities	6	0,10	54
73	Advertising and market research	3	0,05	59
74	Other professional. Scientific and technical activities	0	0,00	77
75	Veterinary services	0	0,00	77
77	Rental and leasing activities	3	0,05	59
78	Employment activities	13	0,21	47
79	Travel agency. Activities related to tour operator and other reservation services	1	0,02	70
80	Security and investigative activities	15	0,24	43
81	Services related to buildings and landscaping activities	136	2,18	12
82	Office management, office support and business support activities	45	0,72	30
84	Public administration and defense; compulsory social security	15	0,24	43
85	Education	24	0,38	32
86	Human health services	225	3,60	7
87	Residential care activities	11	0,18	49
88	Social services provided without shelter	3	0,05	59
90	Creative arts. Performing arts and entertainment activities	2	0,03	65
91	Libraries. Archives. Museums and other cultural activities	1	0,02	70
92	Gambling and betting activities	2	0,03	65
93	Sports activities. Entertainment and leisure activities	3	0,05	59
94	Activities of member organizations	2	0,03	65
95	Repair of computers, personal and household goods	4	0,06	57
96	Other service activities	18	0,29	39
97	Activities of households as employers of domestic personnel	3	0,05	59
98	Undifferentiated goods and services produced by households for their own use	3	0,05	59
99	Activities of international organizations and their representatives	0	0,00	77

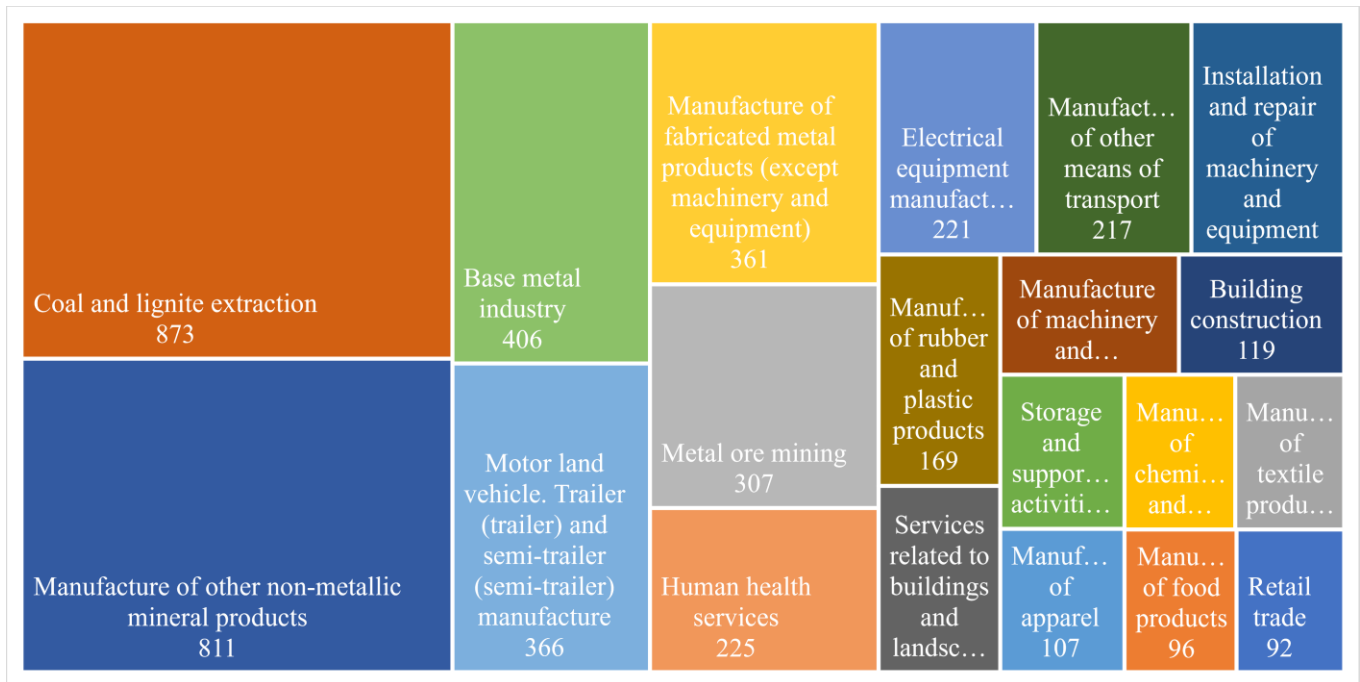


Figure 1: Top 20 Economic Activities with the most Occupational Diseases Diagnosed

### Occupational Disease by Cities

When the workers diagnosed with occupational diseases between 2011-2021 are examined in which city they work; As seen in Table 3, Istanbul-1505, Zonguldak-856, Kocaeli-773, Kütahya-552, Ankara-536, İzmir-371, Bursa-193, Balıkesir-173, Sakarya-160, Manisa-150 and Tekirdağ-109 have become cities with an occupational disease of 100 or more in 10 years. Cities where no occupational disease has been diagnosed are Adıyaman, Ağrı, Bitlis, Muş, Tunceli, Bayburt, Şırnak, Ardahan and Kilis. In Figure 2, the 10-year numbers of occupational diseases in the provinces of Turkey are given. Occupational diseases of one hundred or more are marked in red.

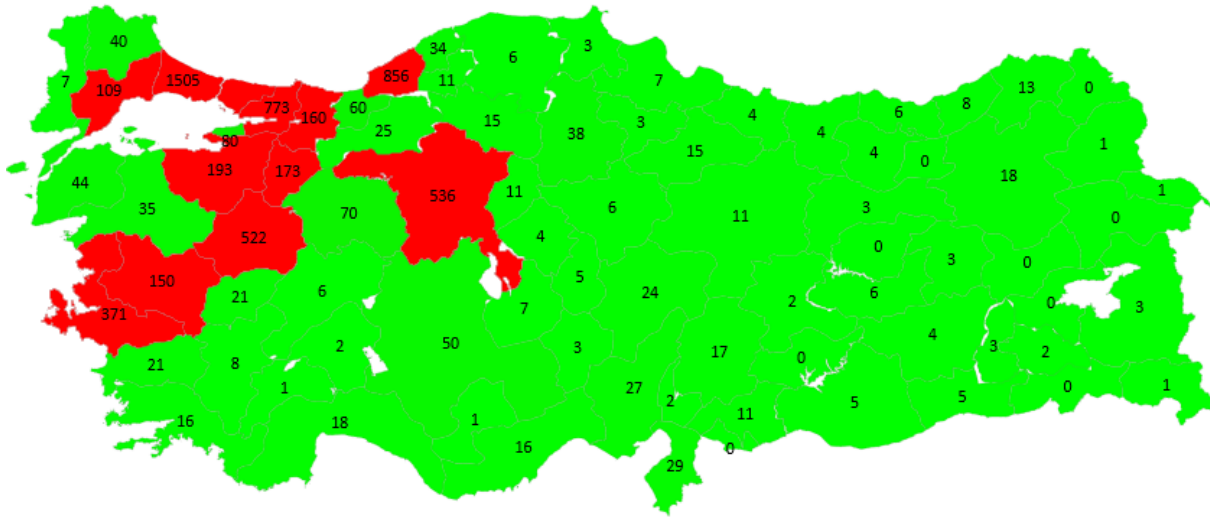
When we examine these provinces as regional development and industrial zones, we can say that they are compatible with each other, and the number of occupational diseases increases when the level of development and industry rate in the city increases (Koçali, 2022).

Table 3: Number of Occupational Disease by Cities between 2011-2021

CODE	CITY	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	TOTAL
01	Adana	0	0	1	0	0	0	5	3	3	8	7	27
02	Adıyaman	0	0	0	0	0	0	0	0	0	0	0	0
03	Afyonkarahisar	0	0	0	0	0	0	1	1	1	1	2	6
04	Ağrı	0	0	0	0	0	0	0	0	0	0	0	0
05	Amasya	0	0	0	0	0	0	0	0	2	0	1	3
06	Ankara	154	63	6	9	46	30	52	60	54	31	31	536
07	Antalya	0	0	0	2	3	0	5	1	2	2	3	18
08	Artvin	0	1	0	0	0	0	0	0	1	6	5	13
09	Aydın	1	0	1	5	0	0	1	3	4	1	5	21
10	Balıkesir	1	5	1	3	1	2	5	4	5	3	5	35
11	Bilecik	4	1	6	31	2	8	10	27	51	22	11	173
12	Bingöl	0	0	0	0	0	3	0	0	0	0	0	3
13	Bitlis	0	0	0	0	0	0	0	0	0	0	0	0
14	Bolu	0	1	0	2	0	4	2	8	0	3	5	25
15	Burdur	0	0	0	0	0	0	0	1	0	0	0	1
16	Bursa	4	1	7	1	1	5	6	25	29	67	47	193
17	Çanakkale	0	0	1	5	4	5	5	6	11	3	4	44
18	Çankırı	0	2	3	0	1	0	1	2	2	1	3	15
19	Çorum	0	0	0	0	4	16	3	9	0	4	2	38
20	Denizli	1	1	0	0	0	1	1	0	2	1	1	8
21	Diyarbakır	0	0	0	0	0	0	1	0	0	0	3	4
22	Edirne	0	2	0	0	0	0	0	1	1	2	1	7
23	Elazığ	0	0	0	0	0	0	1	1	2	0	2	6
24	Erzincan	0	0	0	0	0	0	3	0	0	0	0	3



25	Erzurum	0	6	0	0	0	0	3	1	2	2	4	18
26	Eskişehir	7	0	0	0	2	0	2	27	15	9	8	70
27	Gaziantep	0	0	0	0	0	0	2	4	2	2	1	11
28	Giresun	0	1	0	0	1	0	1	0	0	0	1	4
29	Gümüşhane	0	0	0	0	0	1	0	2	0	1	0	4
30	Hakkari	0	0	0	0	0	0	0	0	1	0	0	1
31	Hatay	0	0	0	0	4	4	3	3	5	2	8	29
32	Isparta	1	0	0	0	0	0	0	0	0	0	1	2
33	Mersin	0	2	0	0	0	0	4	3	0	1	6	16
34	İstanbul	47	21	39	117	105	112	124	146	186	256	352	1505
35	İzmir	14	20	3	10	12	34	38	26	115	43	56	371
36	Kars	0	0	0	0	0	0	0	0	0	1	0	1
37	Kastamonu	1	0	1	0	0	0	0	1	0	2	1	6
38	Kayseri	0	0	0	1	2	0	2	4	9	0	6	24
39	Kırklareli	3	0	0	2	0	4	14	4	9	2	2	40
40	Kırşehir	0	0	0	0	0	1	1	0	0	2	0	4
41	Kocaeli	2	11	10	33	56	29	69	89	133	92	249	773
42	Konya	4	0	0	0	3	4	2	8	6	10	13	50
43	Kütahya	278	7	2	6	8	11	47	70	70	15	8	522
44	Malatya	1	0	0	1	0	0	0	0	0	0	0	2
45	Manisa	2	8	1	2	4	16	8	46	25	18	20	150
46	Kahramanmaraş	1	6	0	0	0	0	0	0	1	8	1	17
47	Mardin	0	0	0	4	0	0	0	0	0	0	1	5
48	Muğla	1	1	2	0	1	2	0	0	6	2	1	16
49	Muş	0	0	0	0	0	0	0	0	0	0	0	0
50	Nevşehir	0	0	0	0	0	1	0	0	3	0	1	5
51	Niğde	0	2	0	1	0	0	0	0	0	0	0	3
52	Ordu	0	0	0	0	0	0	0	0	0	3	1	4
53	Rize	0	1	0	0	1	1	3	0	2	0	0	8
54	Sakarya	8	0	0	4	4	5	14	19	30	36	40	160
55	Samsun	0	0	0	0	1	1	2	0	0	2	1	7
56	Siirt	0	0	0	0	0	2	0	0	0	0	0	2
57	Sinop	0	0	0	0	0	1	0	0	1	1	0	3
58	Sivas	0	3	0	0	0	0	0	0	2	6	0	11
59	Tekirdağ	0	0	0	0	5	19	8	9	19	18	31	109
60	Tokat	1	0	0	0	0	1	5	1	1	3	3	15
61	Trabzon	0	1	0	1	1	0	1	0	1	0	1	6
62	Tunceli	0	0	0	0	0	0	0	0	0	0	0	0
63	Şanlıurfa	0	0	2	0	1	0	1	0	0	0	1	5
64	Uşak	0	1	1	0	2	1	2	7	2	3	2	21
65	Van	0	0	0	0	0	0	2	0	0	0	1	3
66	Yozgat	0	0	0	0	1	0	0	0	0	5	0	6
67	Zonguldak	159	221	43	21	90	87	40	87	48	32	28	856
68	Aksaray	0	0	0	0	0	0	4	0	0	1	2	7
69	Bayburt	0	0	0	0	0	0	0	0	0	0	0	0
70	Karaman	0	0	0	0	0	0	0	0	0	1	0	1
71	Kırıkkale	1	0	4	2	0	0	1	2	1	0	0	11
72	Batman	0	1	0	0	0	1	0	0	0	0	1	3
73	Şırnak	0	0	0	0	0	0	0	0	0	0	0	0
74	Bartın	0	4	0	1	4	4	3	11	6	0	1	34
75	Ardahan	0	0	0	0	0	0	0	0	0	0	0	0
76	Iğdır	0	0	0	0	0	0	0	1	0	0	0	1
77	Yalova	0	0	0	0	1	1	6	12	24	13	23	80
78	Karabük	1	1	1	0	1	1	0	2	1	0	3	11
79	Kilis	0	0	0	0	0	0	0	0	0	0	0	0
80	Osmaniye	0	0	1	0	0	0	0	0	0	0	1	2
81	Düzce	0	0	0	0	2	4	4	9	11	10	20	60



**Figure 2:** Cities and Number of Occupational Diseases

## CONCLUSION

Business life is developing in all societies, and an increase is observed in the number of people working in this field. Employees constitute an important group in terms of health protective and improving activities, which is the basic approach of public health. Industrialization and the rapid development and spread of new technologies have led to the increasing importance of measures for the immediate or later protection of employees, especially in workplaces and outside the workplace.

The studies carried out to protect the employees from risk factors that may adversely affect their health in the workplace environment, to ensure the continuity of production and to increase the efficiency express the importance of the concept of occupational health and safety. Parallel to the developments in industry and technology, the importance of this concept is gradually increasing. For this reason, sources of danger should be determined in workplace environments, risk assessment should be made in terms of health and safety, and protection measures should be determined and implemented. In addition, employees should be informed about this issue. Measures to be taken regarding occupational health and safety should not be seen as a cost. Labor should be protected in order to reduce the number of occupational diseases.

In Turkey, it is obvious that there is a need for a systematic, effective and solution-producing structuring in terms of diagnosing occupational diseases, arranging treatments, and realizing the necessary rehabilitation. Some of the reasons for the insufficient number of occupational diseases reported in Turkey can be listed as some legal and medical regulations, malfunctions in the functioning of inspection and control mechanisms, and the reasons for the lack of knowledge and education of the relevant parties. It is important to systematically collect data on occupational diseases, to analyze and interpret them, to convey them to the relevant units, and to update occupational diseases prevention policies.

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