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MORTALITY RATES AND CAUSES BETWEEN 2018 AND 2023 IN TÜRKİYE ACCORDING TO TURKISH STATISTICAL INSTITUTE DATA

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Abstract

Objectives: Mortality statistics are essential for understanding community trends and shaping preventive health services. This study aimed to identify mortality rates and common causes of death in Türkiye, providing a valuable resource for planning health service delivery.

Materials and Methods: This cross-sectional descriptive study analyzed death statistics from 2018 to 2023, sourced from the Turkish Statistical Institute's website between July 10 and August 5, 2024. The study population included all data from Türkiye, encompassing all age groups.

Results: Between 2018 and 2023, Türkiye saw increased mortality rates in both sexes in 2021, linked to COVID-19. The primary causes of death were circulatory diseases (35.48%) and tumors (16.10%). In men, tumors accounted for 18.81% and respiratory diseases for 14.08%; in women, circulatory diseases comprised 38.72% and respiratory diseases 13.02%. Ischemic heart disease was the most common cause of death, with women showing higher rates of hypertensive diseases. Respiratory malignancies led for men (38.98%), while malignant breast tumors were second for women (15.06%). Deaths from Alzheimer's and epilepsy were noted, with 12.29% of men linked to alcohol and drug abuse, which was not reported for women.

Conclusion: This study examined death statistics in Türkiye from 2018 to 2023, emphasizing regional rates and causes. These mortality statistics are crucial for planning health services. The findings will aid health managers and policymakers in enhancing health outcomes. The study concluded that increasing public awareness of common diseases, improving health literacy, implementing preventive measures, and reducing risk factors are vital steps.

Keywords: Mortality rate, causes of death, statistics.

Introduction

Statistical data collected in health-related areas and the objective indicators derived from these data play a critical role in achieving various health goals. These data help to determine the overall health levels of populations and allow for the identification of health priorities. They also provide the basis for effective planning and implementation of health services. These indicators are used to assess health services' success and compare regions or periods. In this context, the focus is usually on fertility, mortality, and disease prevalence indicators. These indicators provide important data for shaping health policies and improving health services.[1,2] Mortality indicates the effectiveness of health services and the level of need for these services. Mortality studies address the relationships between mortality rates the size, structure, and distribution of the population, and the who, how, why, and when of deaths.[3] Mortality statistics are useful in determining trends and differences in mortality in the population, priorities for biomedical research, public health programs, decisions on the allocation of funding, and directions for epidemiological studies.[4]

The disease or injury that directly initiates the process that results in death is defined as the main cause of death.[5] This study examines common causes of death, their rates, and demographics in Türkiye from 2018 to 2023, providing valuable resources for health policymakers and professionals.

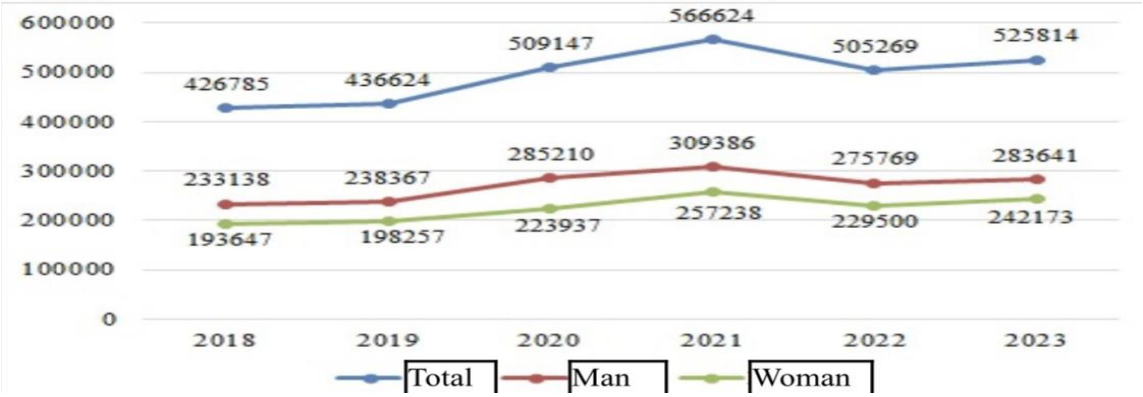
Materials and Methods

Our cross-sectional descriptive study was carried out by examining the statistics of deaths between 2018 and 2023, which were available on the website of TurkStat between 10.07.2024-05.08.2024.[6] Since public data and related literature were analyzed in our study, there was no ethical violation. The population of our study includes all Türkiye data, and the sample includes all age groups. The data used were transferred to the computer environment and evaluated in the Microsoft Office Excel program and IBM SPSS (Version 22.0) statistical package program and $p<0.05$ was accepted as a statistical significance value.

Results

In 2023, Türkiye recorded 525,814 deaths, a 4.1% increase from 505,269 in 2022. Of these, 53.9% were men and 46.1% were women, with a crude death rate of 6.2 per thousand, up from 5.9 in 2022. Between 2018 and 2023, mortality rates increased for both genders in 2021, likely due to the COVID-19 pandemic. (Table 1)

Table 1. Distribution of deaths by year and gender



Between 2018 and 2023, the leading cause of death in Türkiye was circulatory system diseases (35.48%), followed by benign and malignant tumors (16.10%). For men, the most common causes were benign and malignant tumors (18.81%) and respiratory system diseases (14.08%). In women, circulatory system diseases (38.72%) and respiratory system diseases (13.02%) were the top causes. Deaths from external causes, including earthquake-related incidents, accounted for 12.3%, with 45,784 deaths reported from the earthquakes in Kahramanmaraş on February 6. (Table 2)

Table 2. Comparison of genders according to common causes of death

	Total	Men	Women
Mortality-Related Diseases by Gender Between 2018 and 2023	%	%	%
Circulatory system diseases	35.48	32.80	38.72
Benign and malignant tumors (malignant and benign tumors)	16.10	18.81	12.83
Respiratory system diseases	13.60	14.08	13.02
Diseases related to endocrine glands, nutrition, and metabolism	4.42	3.57	5.44
Nervous system and sensory organs diseases	3.89	3.09	4.86
External causes of injuries and poisoning	5.33	6.40	4.02
COVID-19	3.75	3.87	3.61
Others	17.43	17.37	17.50
Total	100	100	100

When we compare mortality rates regionally, the Aegean region ranks first in terms of circulatory system diseases at 38.31% and respiratory system diseases at 15.18%. When we evaluate the mortality rates due to tumors and cancer, Istanbul East West Marmara region has the highest mortality rate with 13.85%. The region with the highest mortality rate due to COVID-19 was the West-Eastern Black Sea region, with a rate of 4.83% (Table 3).

Table 3. Regional distribution of diseases leading to death

	İstanbul East West Marmara	Central Western Anatolia	West East Black Sea	North Eastern and Central Eastern Anatolia	Aegean	Mediterranean	Southeast Anatolia
Circulatory System	34.62	34.83	37.89	33.64	38.31	34.54	33.47
Tumor Cancer	18.47	16.97	15.21	17.15	15.47	13.42	11.1
Respiratory System	13.85	13.34	14.24	13.56	15.18	11.97	11.46
Nervous System	4.31	4.22	3,83	3.98	3.58	3.33	3.18
Endocrine System	4.17	5.50	4.26	4.56	4.24	4.35	3.96
Trauma Poisoning	3.23	4.10	3.24	4.97	4.20	12.62	9.81
COVID-19	4.58	2.52	4.83	3.45	2.57	4.02	3.18
Other	12.72	13.85	12.18	13.58	11.95	11.6	16.46
Unknown	4.03	4.67	4.32	5.11	4.51	4.15	7.38

Ischemic heart disease is the leading cause of death for both men and women, while hypertensive diseases have a higher mortality rate in women. Among malignancies, respiratory system cancers are the most common cause of death in men (38.98%), with a mortality rate 2.9 times higher than in women. In women, malignant breast tumors rank second (15.06%). Alzheimer's disease is the leading cause of death in both genders, but rates are higher in women. Deaths from epilepsy and psychiatric disorders show similar trends, with alcohol and drug use accounting for 12.29% of male deaths, with no reported cases in women. Suicide rates are higher in men (16.87%) compared to women (10.06%), and COVID-19 mortality rates are 1.29 times higher in men than in women. (Table 4)

Table 4. Distribution of diseases by gender

	Total	Man	Total	Woman	Total
2018-2023	**n**	**n**	**%**	**n**	**%**
Infectious and parasitic diseases	**90907**	**46608**	**100.00**	**44299**	**100.00**
Diarrhea and gastroenteritis	1131	500	**1.07**	631	**1.42**
Tuberculosis	2059	1355	**2.91**	704	**1.59**
Meningococcal infections	61	30	**0.06**	31	**0.07**
Septicemia	80209	40419	**86.72**	39790	**89.82**
HIV disease	728	616	**1.32**	112	**0.25**
Viral hepatitis	1797	1073	**2.30**	724	**1.63**
Others	4922	2615	**5.61**	2307	**5.21**
Benign and malignant tumors	**478219**	**305745**	**100.00**	**172474**	**100.00**
Malignant tumors of the lips, oral cavity, pharynx	4962	3321	**1.09**	1641	**0.95**
Malignant tumor of the esophagus	4649	2753	**0.90**	1896	**1.10**
Malignant tumor of the stomach	37189	24655	**8.06**	12534	**7.27**
Malignant tumor of the colon	36365	21400	**7.00**	14965	**8.68**
Malignant tumor of the rectum and anus	8512	5229	**1.71**	3283	**1.90**
Malignant tumors of the liver, intrahepatic, and bile ducts	16405	10637	**3.48**	5768	**3.34**
Malignant tumor of the pancreas	30509	17586	**5.75**	12923	**7.49**
Malignant tumor of the larynx and trachea/bronchus/lung	142335	119191	**38.98**	23144	**13.42**
Malignant tumor of the skin	3070	1807	**0.59**	1263	**0.73**
Malignant tumor of the breast	26337	356	**0.12**	25981	**15.06**
Malignant tumor of the cervix, uterus	3043	0	**0.00**	3043	**1.76**
Other malignant tumors of the uterus	6334	0	**0.00**	6334	**3.67**
Malignant tumor of the ovaries	9876	0	**0.00**	9876	**5.73**
Malignant tumor of the prostate	20528	20528	**6.71**	0	**0.00**
Malignant tumor of the kidney	5872	4085	**1.34**	1787	**1.04**
Malignant tumor of the bladder	14098	11831	**3.87**	2267	**1.31**
Lymphoid and hematopoietic malignant tumor	37211	21762	**7.12**	15449	**8.96**
Others	70924	40604	**13.28**	30320	**17.58**
Diseases of the blood and blood-forming organs and	**6700**	**3263**	**100.00**	**3437**	**100.00**
Diseases related to endocrine glands, nutrition, and	**131253**	**58085**	**100.00**	**73168**	**100.00**
Diabetes mellitus	97488	42901	**73.86**	54587	**74.61**
Others	33765	15184	**26.14**	18581	**25.39**
Mental and behavioral disorders	**2399**	**1147**	**100.00**	**1252**	**100.00**
Dementia	924	367	**32.00**	557	**44.49**
Due to alcohol use (including alcoholic psychosis)	118	113	**9.85**	0	**0.00**
Drug addiction, toxicomania	33	28	**2.44**	0	**0.00**
Schizophrenia, schizotypal and delusional disorders	301	167	**14.56**	134	**10.70**
Mental (emotional) disorders	107	47	**4.10**	60	**4.79**
Others	916	425	**37.05**	501	**40.02**
Diseases of the nervous system and sensory organs	**115633**	**50262**	**100.00**	**65371**	**100.00**
Meningitis	799	450	**0.90**	349	**0.53**
Alzheimer's disease	77977	29294	**58.28**	48683	**74.47**
Multiple sclerosis	690	305	**0.61**	385	**0.59**
Epilepsy	7824	4278	**8.51**	3546	**5.42**
Others	28343	15935	**31.70**	12408	**18.98**
Circulatory system diseases	**1053924**	**533206**	**100.00**	**520718**	**100.00**
Hypertension	101613	39605	**7.43**	62008	**11.91**
Ischemic heart disease	435627	247048	**46.33**	188579	**36.22**
Other heart disease	253705	122852	**23.04**	130853	**25.13**
Cerebrovascular disease	210757	97817	**18.35**	112940	**21.69**
Others	52222	25884	**4.85**	26338	**5.06**

Respiratory system diseases	**403892**	**228871**	**100.00**	**175021**	**100.00**
Acute upper respiratory infections and influenza	608	330	**0.14**	278	**0.16**
Pneumonia	211184	111600	**48.76**	99584	**56.90**
Chronic lower respiratory diseases	146466	92496	**40.41**	53970	**30.84**
Others	45634	24445	**10.68**	21189	**12.11**
Digestive system diseases	**63531**	**33225**	**100.00**	**30306**	**100.00**
Stomach, duodenal, and small intestine ulcers	3527	1981	**5.96**	1546	**5.10**
Crohn's disease and ulcerative colitis	523	309	**0.93**	214	**0.71**
Paralytic ileus and intestinal obstruction (without hernia)	6587	3307	**9.95**	3280	**10.82**
Chronic liver disease	14551	8751	**26.34**	5800	**19.14**
Pancreatic diseases	4125	1924	**5.79**	2201	**7.26**
Others	34218	16953	**51.02**	17265	**56.97**
Diseases of the skin and subcutaneous tissue	**2055**	**820**	**100.00**	**1235**	**100.00**
Diseases of the musculoskeletal system and connective	**6594**	**2575**	**100.00**	**4019**	**100.00**
Rheumatoid arthritis and osteoarthrosis	1230	397	**15.42**	833	**20.73**
Others	5364	2178	**84.58**	3186	**79.27**
Genitourinary system diseases	**110749**	**54849**	**100.00**	**55900**	**100.00**
Kidney and ureter diseases	99230	49197	**89.70**	50033	**89.50**
Prostate hyperplasia	1225	1225	**2.23**	0	**0.00**
Inflammatory diseases of the female pelvic organs	78	0	**0.00**	78	**0.14**
Others	10216	4427	**8.07**	5789	**10.36**
Complications of pregnancy, delivery, and puerperium	**855**	**0**	**0.00**	**855**	**100.00**
Pregnancy complications that occur predominantly in the	126	0	**0.00**	126	**14.74**
Pregnancy complications, mainly during labor and delivery	104	0	**0.00**	104	**12.16**
Others	625	0	**0.00**	625	**73.10**
Specific conditions arising from the perinatal period	**32341**	**18235**	**100.00**	**14106**	**100.00**
Disorders associated with short gestation and low birth	3445	1938	**10.63**	1507	**10.68**
Others	28896	16297	**89.37**	12599	**89.32**
Congenital disorders and chromosome-related	**20737**	**11036**	**100.00**	**9701**	**68.77**
Congenital disorders of the nervous system	3143	1426	**12.92**	1717	**12.17**
Congenital disorders of the circulatory system	9488	5240	**47.48**	4248	**30.11**
Others	8106	4370	**39.60**	3736	**26.49**
Symptoms, signs, and abnormal findings, ill-defined	**45515**	**25808**	**100.00**	**19707**	**100.00**
Sudden infant death syndrome	1016	544	**2.11**	472	**2.40**
Unknown and unspecified causes	20105	13135	**50.90**	6970	**35.37**
Others	24394	12129	**47.00**	12265	**62.24**
COVID-19	**111411**	**62884**	**100.00**	**48527**	**100.00**
External causes of injury and poisoning	**158180**	**104062**	**100.00**	**54118**	**100.00**
Accidents (Transportation Accidents, Accidental Falls,	128482	81351	**78.18**	47131	**87.09**
Suicide and intentional self-harm	23001	17556	**16.87**	5445	**10.06**
Homicide, assault	5796	4691	**4.51**	1105	**2.04**
Others	901	464	**0.45**	437	**0.81**
Unknown	**135366**	**84828**	**100.00**	**50538**	**100.00**

Discussion

Improving living conditions and health services worldwide increases the average life expectancy. The aging of the world population is the most important sociological change of the 20th century. In the early 1900s, deaths due to infectious diseases decreased after practices to improve public health, and deaths due to non-communicable, chronic diseases increased with the prolongation of human life.[7] When the worldwide data are analyzed, it is determined that the number of elderly people aged 65 years and over was 258 million in 1980, 703 million in 1990, and 771 million in 2022.[8]

Ischemic heart diseases are the most common cause of death in both men and women in Türkiye, as in the whole world. Between 2009 and 2016, the rate of circulatory system-related deaths was 35.84% in men and 43.97% in women.[9] In our data, this rate decreased to 32.80% in men and 38.72% in women between 2018 and 2023. In countries with a high sociodemographic index, there has been a significant decrease in mortality rates related to cardiovascular disease in the last 25 years, and chronic diseases associated with the continuous aging of the population have caused a plateau in the decrease in mortality rates in the last 5 years.[10] Approximately 20.5 million people worldwide die each year due to cardiovascular disease.[11] The most common causes of cardiovascular diseases are atherosclerotic heart disease, heart failure, and atrial fibrillation.[12] Cardiovascular diseases account for 23% of deaths in high-income countries and 42% of deaths in low- and middle-income countries.[13,14] Studies show that cardiovascular-related deaths in many countries have increased after the COVID-19 pandemic.[15] While there was a rapid increase in cardiovascular mortality in the first two years of the COVID-19 pandemic, mortality rates decreased between 2021 and 2023. The groups with the fastest increase in mortality rates are young people and male patients, while the fastest decrease is seen in this group. While there was a rapid increase in cardiovascular mortality in the first two years of the COVID-19 pandemic, mortality rates decreased between 2021 and 2023. The groups with the fastest increase in mortality rates are young people and male patients, while the fastest decrease is seen in this group.[16]

Cancer was the second most common cause of death in men at 18.81%, while it ranked third for women at 12.83%. Between 2009 and 2016, cancer rates were 24.71% for men and 16.11% for women. The leading cause of cancer-related deaths in men was respiratory system cancers, accounting for 40.20%.[9] Lung cancer represents 12.4% of all cancers diagnosed globally and accounts for 18.7% of cancer deaths. The highest incidence rates in men are found in East Asia, followed by Micronesia/Polynesia and Eastern Europe, with Turkey having the highest national rate. For women, the highest incidence rates are seen in North America, East Asia, and Northern Europe, with Hungary having the highest national rate.[17] China has a disproportionate cancer burden for its population size. China accounts for 30.2% of cancer-related deaths worldwide. As in our study, the most common cancer types in China are lung cancer, colorectal cancer, and breast cancer.[18] According to the GLOBOCAN analysis, the most common cancers causing death worldwide are lung cancer

(18.2%), colorectal cancer (9.5%), liver cancer (8.4%), stomach cancer (7.8%), and breast cancer (6.9%). In the USA, the leading causes of cancer-related deaths are lung cancer (22.6%), colorectal cancer (8.9%), pancreatic cancer (7.8%), breast cancer (7%), and prostate cancer (5.3%).[19]

Sepsis is a significant public health issue, particularly among the elderly in developed countries. The Centers for Disease Control and Prevention estimates that around 1.7 million people in the USA develop sepsis each year, leading to about 270,000 deaths. [20] In Turkey, our data shows that 80,209 patients died from sepsis between 2018 and 2023, accounting for 86.72% of infectious disease-related deaths in men and 89.82% in women.

SARS-CoV-2 is the cause of the COVID-19 pandemic, which has affected millions worldwide since it began in December 2019. Declared a pandemic by the World Health Organization (WHO) in March 2020, COVID-19 presents symptoms ranging from asymptomatic cases to acute respiratory distress syndrome. Over 702 million infections and more than 6.97 million deaths have been reported globally. In the USA, there have been over 110 million infections and 1.19 million deaths.[21] In our country, 111,411 deaths due to COVID-19 were reported between 2018 and 2023. The mortality rate is 1.1% for those under 50, while it increases exponentially for those 50 and older, with the highest rates observed in patients aged 80 and above. The risk of mortality significantly increases in those aged 60 to 69.[22] Among 3714 articles and 87 studies reviewed, Diabetes Mellitus was identified as the most common determinant of COVID-19 mortality, followed by Chronic Obstructive Pulmonary Disease and malignancies.[23]

The number of reported suicide deaths was 23,001, with men being 1.6 times more likely to die by suicide than women. Suicide poses a significant global public health issue, leading to over 700,000 deaths annually. While more common in older age groups, it is the fourth leading cause of death among young adults.[24,25] The WHO mortality database indicates that, over the last 30 years, suicide rates in men have been 2 to 5 times higher than in women.[26] Alzheimer's is an irreversible neurological disorder characterized by cognitive decline, memory loss, and impaired daily functioning. Although the global prevalence of dementia and Alzheimer's disease is estimated to be 55 million people, 60% are known to be in low and middle-level countries. Approximately 10 million newly diagnosed patients are reported each year.[27] Data show that while the number of Alzheimer's patients was 19.79 million in 1990, this number increased by 161% in 2019, reaching 51.62 million. In 2050, this number is projected to reach 152.8 million. As the elderly population increases, age-related Alzheimer's disease and related deaths also increase.[28] In our study, deaths due to dementia between 2018 and 2023 were 924, and deaths due to Alzheimer's disease were 77,977.

In conclusion, advancements in health and science technologies are increasing life expectancy and the elderly population, leading to a diversification of diseases and causes of death associated with aging. In Türkiye,

cardiovascular diseases, cancers, and respiratory diseases are the most common causes of death, presenting significant public health challenges. Family medicine plays a crucial role in addressing these issues. Primary health care services facilitate early diagnosis and intervention by continuously monitoring individual health. Chronic disease management, including hypertension and diabetes, allows family physicians to reduce complication risks. Regular cancer screenings (e.g., breast, cervical, and colon) enable early detection and treatment.

This analysis is crucial for understanding the prevalence of causes of death and the potential for prevention. By evaluating lifestyles and health histories, family physicians can identify risk factors and promote healthy living. They play a vital role in managing cardiovascular diseases and cancers. In Türkiye, the effectiveness of these services is essential for sustaining the health system and improving public health.

Ethical Considerations: Since public data and related literature were analyzed in our study, there was no ethical violation.

Conflict of Interest: The authors declare no conflict of interest.

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