

Changes in Health Situation in Turkey, 1990-2019: Based on the Global Burden of Disease (GBD) Study 2019

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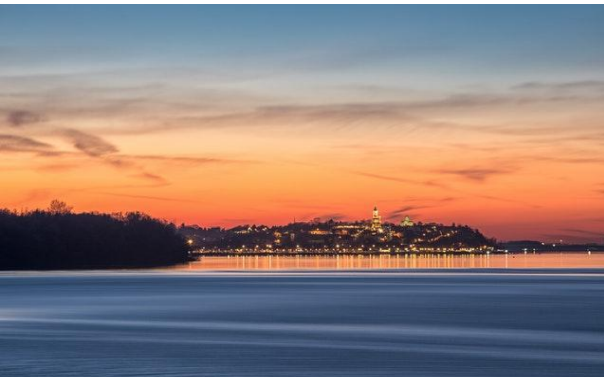
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1. Introduction

- Turkey has a population of 84 million and hosts more than 3.6 million registered Syrians (1990;56 million population)
- Turkey, an upper middle income country, is a founding member of the OECD.
- Health services in Turkey are provided by the public and private sectors.
- The Turkish insurance system is a combination of public and private health insurance (Bismarck, Beveridge, out-of-pocket payments, other funds).
- Ninety-eight percent of the population is under social security.
- As of 2019, 80% of total health expenditures were financed from the public budget (17% out of pocket and 3% from other private funds).

1. Introduction

- Health reforms have started in Turkey since 1990.
- In 1992, a green card application (such as The Affordable Care Act (ACA)-Obamacare) was introduced for low-income citizens (19% of the total population).
- Access to health services has been expanded.
- Beginning in 2003, the Republic of Turkey implemented major health system reforms through the Health Transformation Program (HTP). The HTP aimed to address inequities in health care services across Turkey.
- One of the basic components of the HTP universal health insurance.

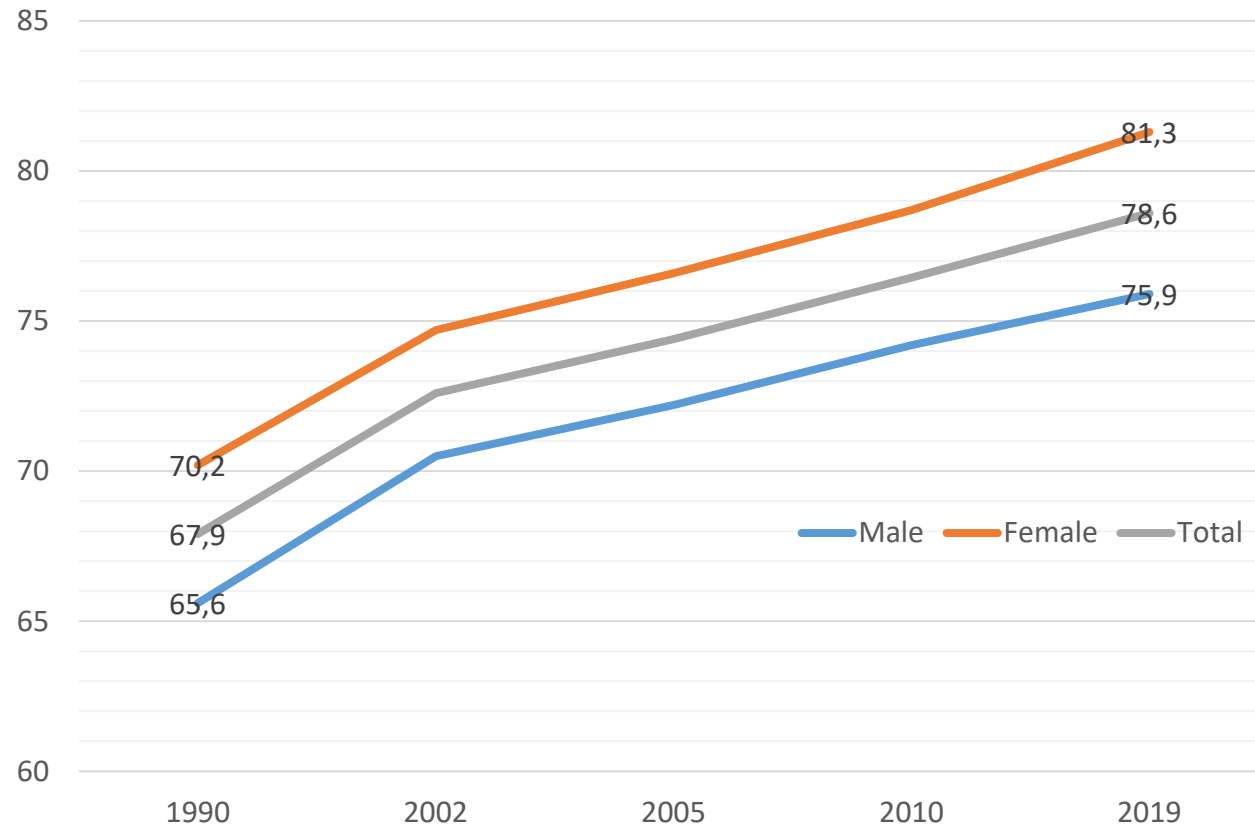
2. Methods

- This research aims to compare the burden of diseases in Turkey between 1990-2019
- The burden of disease was calculated for the year 1990-2019 as years of life lost (YLLs), years lived with disability (YLDs), disability-adjusted-life-years (DALYs), and the contribution of major risk factors to DALYs in Turkey.
- We used the data from the Global Burden of Disease (GBD) 2019 study.
- The GBD project is an international epidemiological project. All GBD methods, data, codes, and estimates are publicly available through interactive and visualization tools.

3. Results

3.1. Population and Life Expantacy

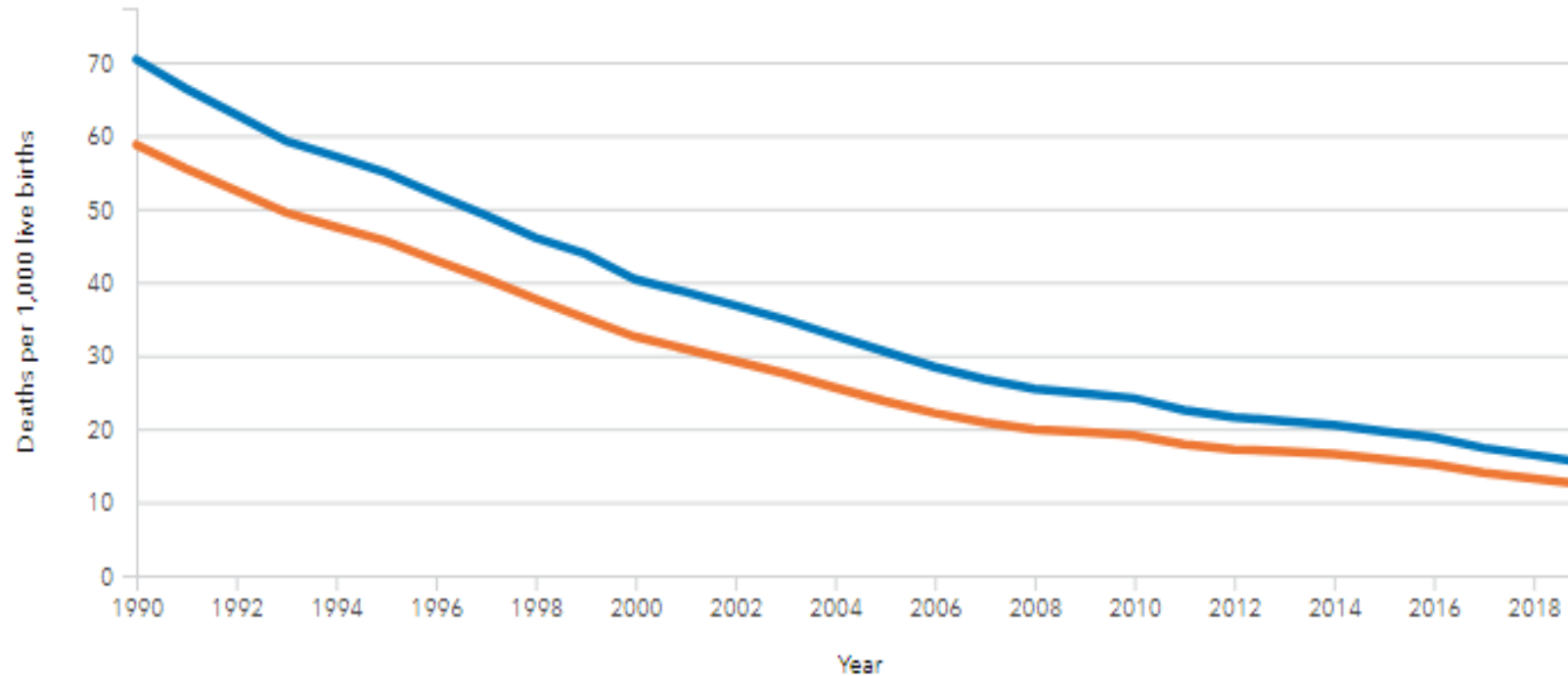
Figure 1. Life Expectancy at Birth by Years



- *The life expectancy at birth in Turkey has gradually increased since 1990 and reached 76 years for men and 81 for women in 2019 (Figure 1).*
- *Increasing life expectancy by 10 years in this period of time is a significant improvement in health outcomes.*
- *Turkey is experiencing a shift in population demographics toward increasing age. The share of people ages 65 years and above within the total population has increased significantly.*

3.2. Deaths

Figure 2. Under-5 and under 1 mortality rate



	Past	
	1990	2019
■ Under-5	70.4	15.4
■ Under-1	58.7	12.4

- In Turkey, under-5 and under 1 mortality drastically decreased between 1990 and 2019.
- In the last three decades, one of the most important epidemiological transitions in Turkey is infant and child mortality rates.
- Increasing immunization rates, and health reforms helped contribute to this decline.
- Child and infant mortality in Turkey has gradually decreased since 1990 and reached 12.4 for under-1 and 15.4 for under-5 in 2019.

3.3. Burden of Disease in Turkey

Figure 3 shows the age-standardised rates of DALYs, YLL, and YLDs.

Percentage change of YLDs, YLLs and DALYs in Turkey by years(1990-2019) are presented in the table 2.

Accordingly, DALYs decrease by 44 percent and YLLs decrease by 58 percent.

There was no significant difference of YLDs rates between 1990 and 2019 in Turkey.

Figure 3. Trend analysis of burden of disease in Turkey from 1990 to 2019

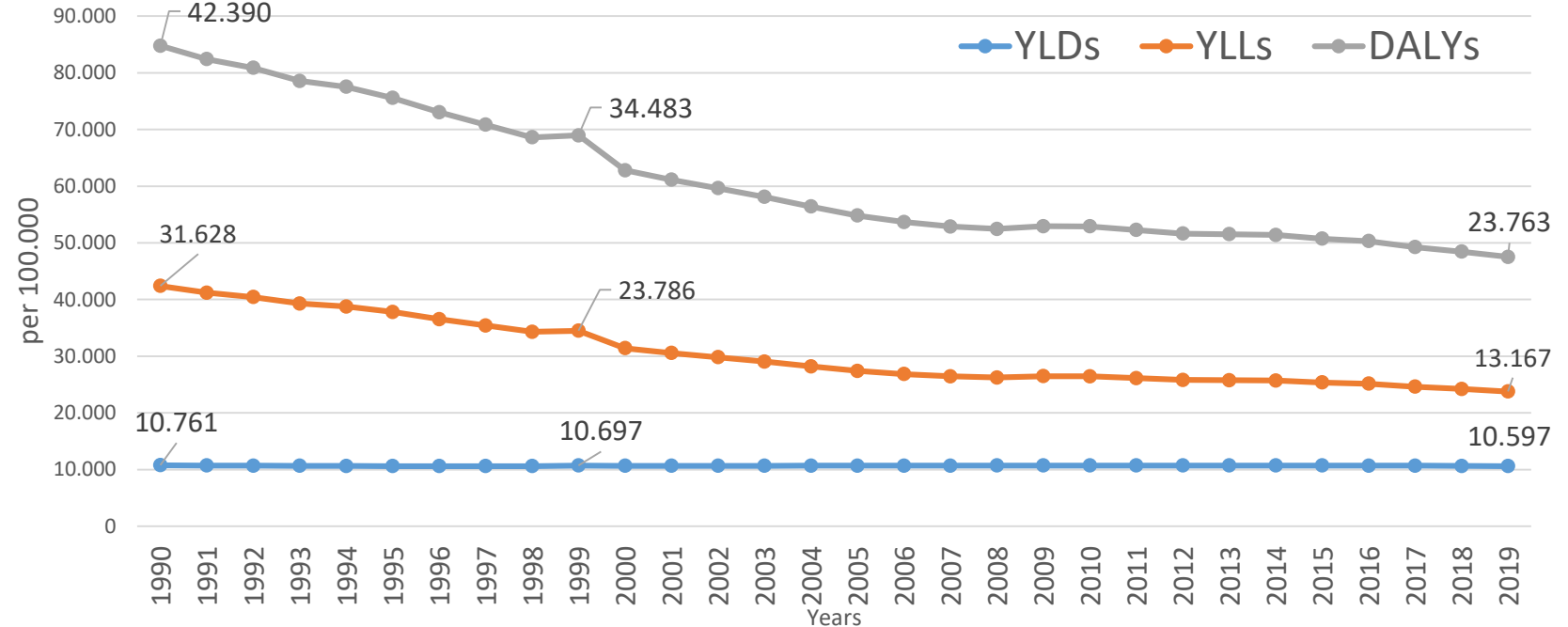


Table 1: Percentage change of burden of YLDs, YLLs and DALYs in Turkey (1990-2019)

Measure	Change (1990 to 2019)-Age- standardized rate (per 100,000)		
	Both	Female	Male
DALYs	-0,44 (-0,47--0,41)	-0,42 (-0,45--0,38)	-0,46 (-0,48--0,43)
Deaths	-0,41 (-0,46--0,35)	-0,40 (-0,45--0,35)	-0,41 (-0,46--0,37)
YLDs	-0,02 (0--0,02)	-0,02 (-0,01--0,05)	0,00 (-,01--0,01)
YLLs	-0,58 (-0,62--0,55)	-0,6 (-0,63--0,57)	-0,57 (-0,6--0,54)

Data in parentheses are 95% Uncertainty Intervals (95% Uis);)

3.3.1. Leading Causes of Deaths

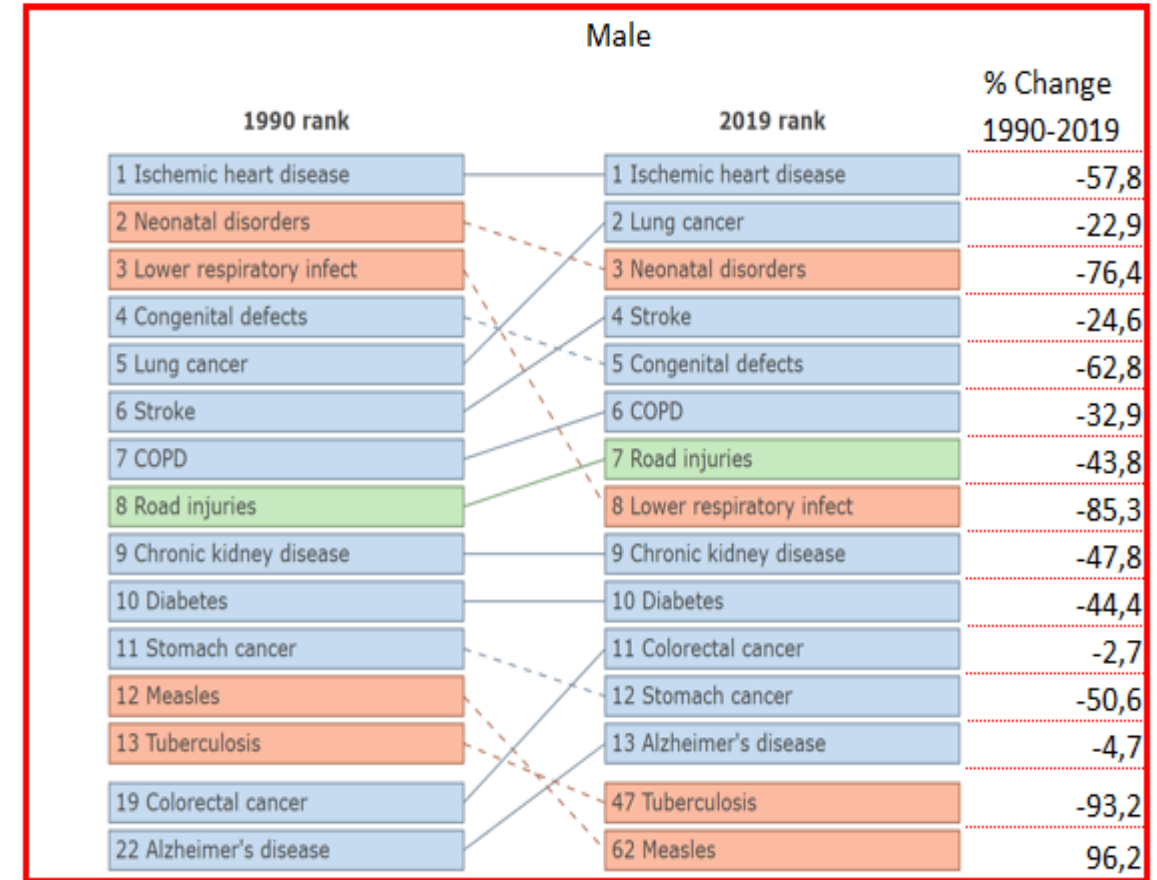
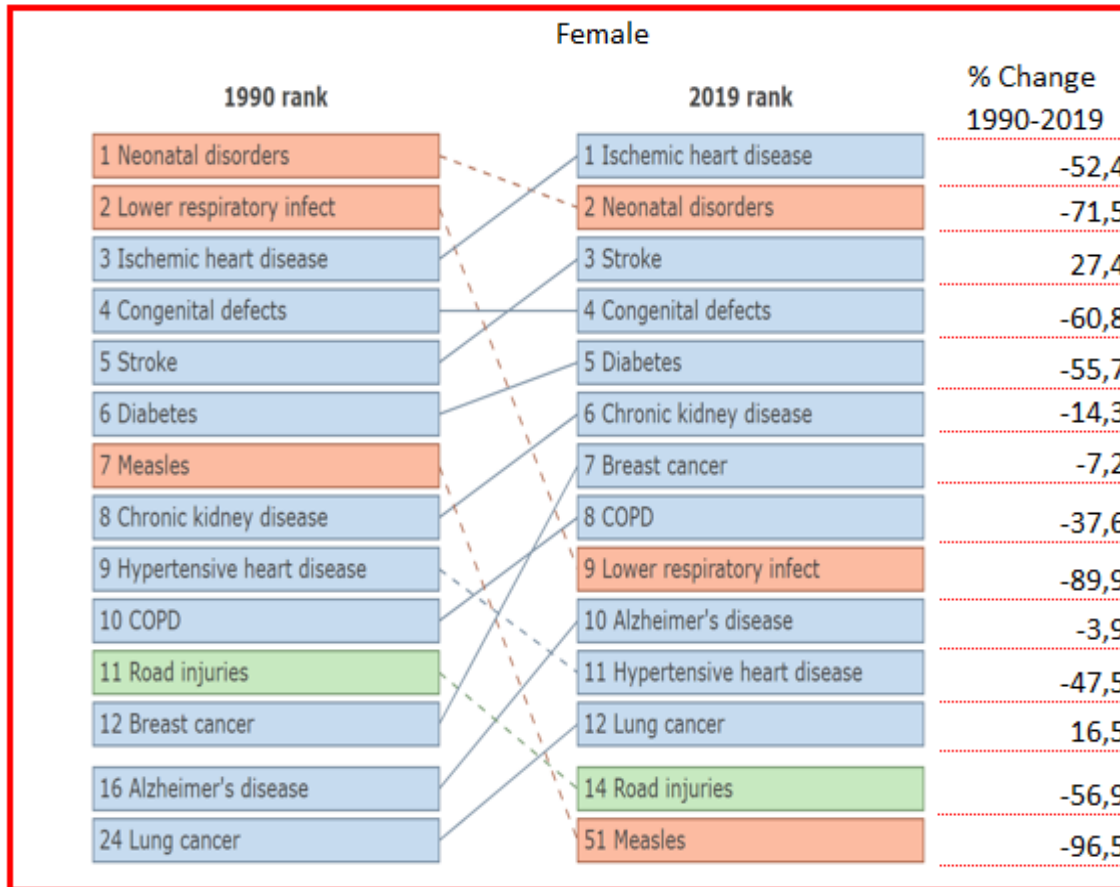
Table 2. Causes of deaths from 1990 to 2019 in Turkey (Both)

No	Causes of Death	Death Rank		Death, 2019		Age Standardized Death Rate	
		1990	2019	#	% of all-cause death	Per 100.000 (%95% UI)-2019	% Change 1990-2019
1	Ischemic heart disease	1	1	99.046	21,8	121(98-147,2)	-1,9
2	Stroke	4	2	48.947	10,8	60,6(48,7-73,6)	62,4
3	Tracheal, bronchus, and lung cancer	7	3	29.832	6,6	33,8(26,9-41,8)	54,7
4	Chronic obstructive pulmonary disease	9	4	29.015	6,4	35,8(24-44,4)	44,4
5	Alzheimer's disease	13	5	19.721	4,3	25,8(6,6-70)	113,4
6	Diabetes mellitus	8	6	19.699	4,3	23,8(19,1-28,8)	5,4
7	Chronic kidney disease	9	7	19.193	4,2	23,5(19-28,7)	21,5
8	Hypertensive heart disease	10	8	16.257	3,6	20,7(11,3-26,1)	20,4
9	Lower respiratory infections	3	9	14.868	3,3	19(14,8-22,6)	-65,9
10	Colon and rectum cancer	16	10	11.194	2,5	13,1(10,6-15,8)	79,4
11	Stomach cancer	12	11	9.323	2,1	10,7(8,6-13,2)	-6,2
12	Road injuries	11	12	7.749	1,7	9(7-11)	-33,6
13	Cirrhosis and other diseases	15	13	7.349	1,6	8,7(7-10,6)	9,7
14	Pancreatic cancer	33	14	7.132	1,6	8,2(6,6-10,1)	185,2
15	Neonatal disorders	2	15	6.943	1,5	14,7(11,3-18,4)	-88,7
16	Breast cancer	23	16	6.049	1,3	6,8(5,5-8,4)	76,6
17	Prostate cancer	30	17	5.185	1,1	6,4(4,6-8,2)	81,3
18	Congenital birth defects	5	18	5.150	1,1	10,4(7,9-13,2)	-81,9
19	Falls	26	19	5.075	1,1	6,4(3,3-8,5)	58,8
20	Leukemia	18	20	4.405	1	5,3(4,2-6,7)	-20,4
	Sub total			372.132	82		
	All cause Total			454.742	100		

- Table 2 shows the 20 leading causes of death (among Level 3 GBD causes), along with their percentage changes from 1990 to 2019 in Turkey.
- Of the total deaths (men and women) due to all causes in 2019, 82% (372.132) were attributed to the 20 leading causes of deaths.
- In particular, ischemic heart disease, stroke, TBL cancer, COPD,
- Alzheimer's diseases accounted for half of all-cause deaths and had the highest age-standardised mortality rates.
- The highest decrease occurred in neonatal disorders and lower respiratory infections, measles, tuberculosis. By contrast, the highest increase occurred in Alzheimer's disease.

3.3.2. YLLs

Table 3. Percentage Change of Causes of age-standardised YLLs (1990-2019)



Level 3 GBD causes

■ Communicable, maternal, perinatal and nutritional conditions
■ Noncommunicable diseases
■ Injuries

- The causes of premature death in both men and women in Turkey are as follows. Ischemic heart disease, stroke, lung cancer, neonatal disorders, COPD
- These four diseases account for approximately 40% of total YLLs.

3.2.3. YLDs

Table 4: Percentage Change of Causes of age-standardised YLDs (1990-2019)



■ Communicable, maternal, perinatal and nutritional conditions
■ Noncommunicable diseases
■ Injuries

For both men and women, low back pain depressive disorders, diabetes, headache disorders the highest age-standardised YLLs rates.

Diabetes is among the most common causes of YLDs in both men and women.

3.2.4. DALYs

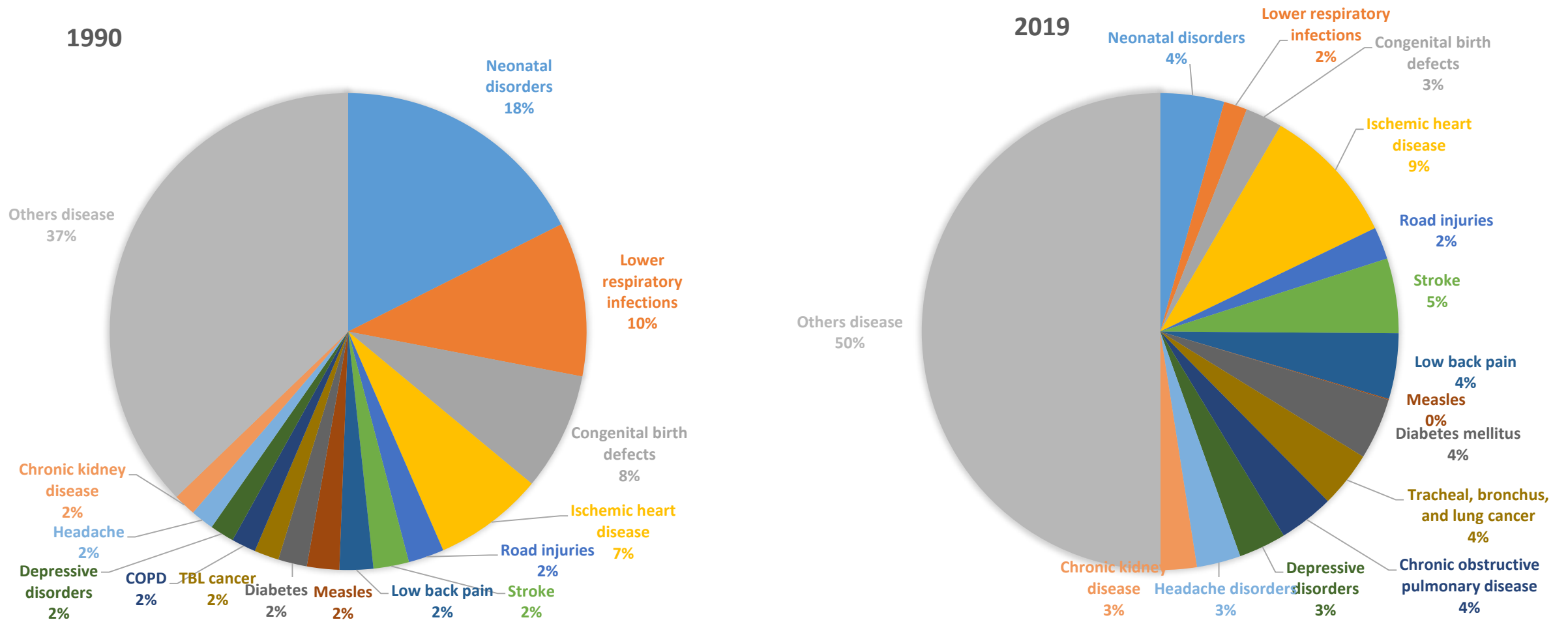
Table 5: Leading causes of DALYs from 1990 to 2019 in Turkey

Leading Causes 1990	Leading Causes 2019	Number of DALYs in the population	% of total DALY	DALY Age Standardized Rate- 2019 (95% UI)	Mean % Change 1990-2019
1. Neonatal disorders	1. Ischemic heart disease	1.847.044	9,4	2128,4 (1728,8-2583,5)	-0,56
2. Lower respiratory infections	2. Stroke	993.082	5,1	1162,6 (965-1380,4)	-0,24
3. Congenital birth defects	3. Low back pain	874.588	4,5	953,6 (671,3-1283,5)	-0,14
4. Ischemic heart disease	4. Neonatal disorders	845.771	4,3	1599,4 (1295,1-1945,3)	-0,70
5. Road injuries	5. Diabetes mellitus	818.499	4,2	925,3 (749,6-1140,7)	-0,24
6. Stroke	6. Tracheal, bronchus, and lung cancer	743.637	3,8	814,6 (643,8-1017)	-0,19
7. Low back pain	7. Chronic obstructive pulmonary disease	733.647	3,7	855,2 (667,5-1000,4)	-0,22
8. Measles	8. Depressive disorders	632.644	3,2	696,3 (477,3-952,6)	-0,03
9. Diabetes mellitus	9. Headache disorders	588.744	3,0	656,1 (167,7-1433)	0,00
10. Tracheal, bronchus, and lung cancer	10. Gynecological diseases	522.877	2,7	550,3 (373,1-757,7)	-0,07
11. Chronic obstructive pulmonary disease	11. Congenital birth defects	490.771	2,5	968,9 (762,7-1215,8)	-0,60
12. Depressive disorders	12. Chronic kidney disease	479.543	2,4	562 (473,6-667,6)	-0,34
13. Headache disorders	13. Other musculoskeletal disorders	443.940	2,3	472,4 (328,8-648,8)	0,30
14. Chronic kidney disease	14. Road injuries	428.325	2,2	508,9 (412,6-600,4)	-0,46
15. Diarrheal diseases	15. Anxiety disorders	375.857	1,9	433,7 (291,3-617)	0,10
16. Gynecological diseases	16. Oral disorders	354.887	1,8	393,8 (239,3-598)	-0,05
17. Endocrine, metabolic disorders	17. Endocrine, metabolic disorders	344.956	1,8	424,6 (321,8-552,5)	-0,05
18. Anxiety disorders	18. Age-related and other hearing loss	318.835	1,6	369,1 (256,2-516,2)	-0,18
19. Dietary iron deficiency	19. Alzheimer's disease and other dementias	313.664	1,6	395,4 (179,6-892,7)	-0,02
20. Asthma	20. Lower respiratory infections	309.439	1,6	415,3 (339,1-488,7)	-0,88
21. Tuberculosis	21. Falls	291.675	1,5	340,7 (264,6-430,7)	0,04
22. Stomach cancer	22. Neck pain	267.435	1,4	284,8 (188,6-414,8)	0,00
23. Leukemia	23. Colon and rectum cancer	259.024	1,3	289,2 (230,4-354,8)	-0,09
28. Oral disorders	25. Stomach cancer	227.273	1,2	250,5 (198,7-308,5)	-0,52
30. Age-related and other hearing loss	26. Asthma	203.951	1,0	253,5 (182,6-347,1)	-0,42
31. Falls	30. Diarrheal diseases	167.255	0,9	234,6 (173,3-310,4)	-0,48
33. Other musculoskeletal disorders	36. Leukemia	143.270	0,7	176,7 (143,8-214)	-0,51
38. Neck pain	41. Dietary iron deficiency	123.440	0,6	166,8 (100,7-267,2)	-0,56
39. Colon and rectum cancer	81. Tuberculosis	32.706	0,2	37,5 (30,9-45)	-0,91
43. Alzheimer's disease and other dementias	123. Measles	12.909	0,1	25,6 (8,2-60)	-0,96
	Sub total	14.189.690	72,3	NA	NA
	All cause total	19.629.284	100,0	23.763,7 (17351-31973,1)	-43,94

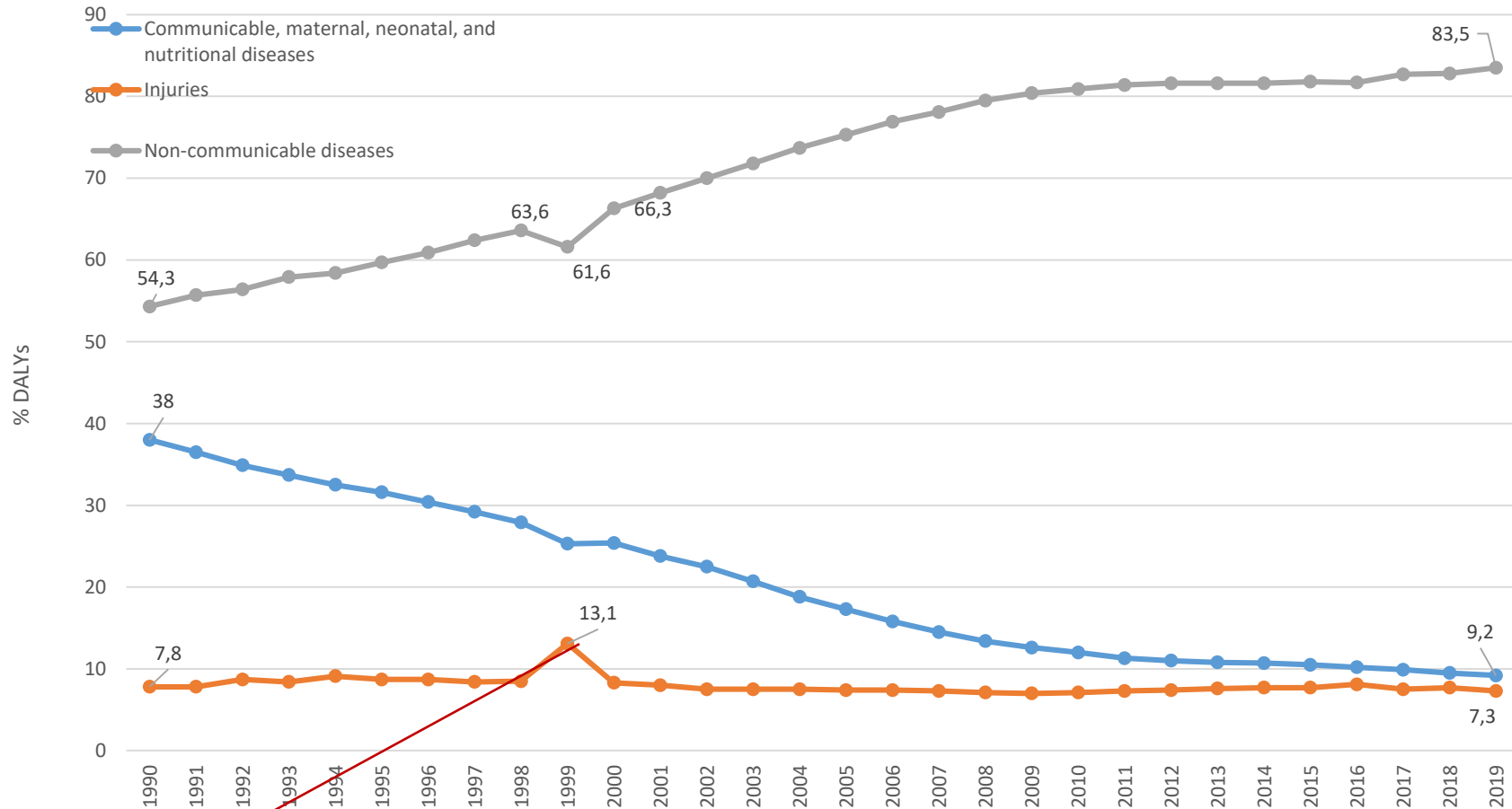
 Communicable, maternal, perinatal and nutritional conditions
 Noncommunicable diseases
 Injuries

3.2.4. DALYs

Figure 4. Leading causes of DALYs from 1990 to 2019 in Turkey



3.2.4. DALYs Figure 5. Total disease burden by level 1 cause, Turkey, 1990 to 2019



As can be seen from the figure, there has been a major shift in the main disease burden from communicable diseases to non-communicable diseases (NCDs) in the last three decades in Turkey.

In these thirty years, the 1999 Marmara Earthquake took place. About thirty thousand people died.

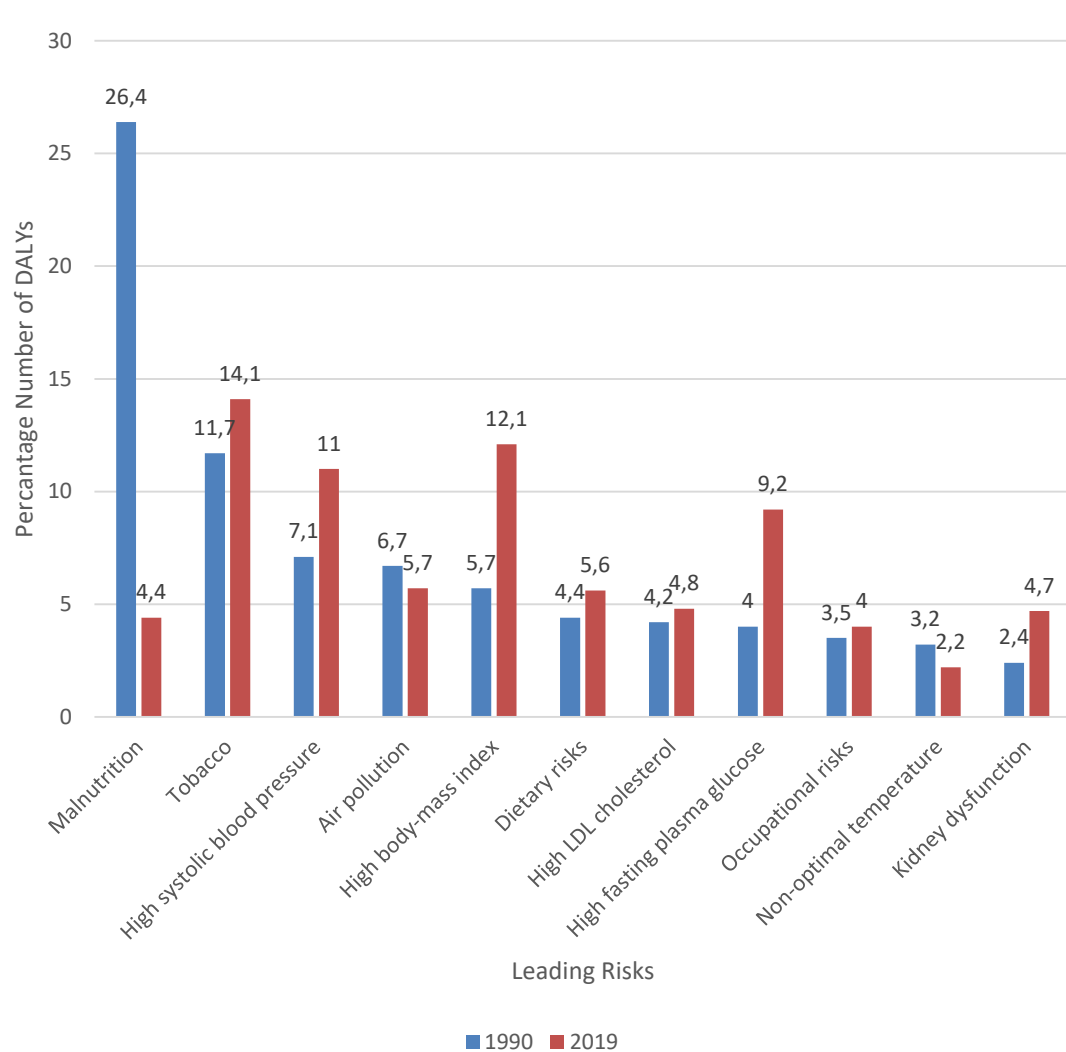


Photograph of destruction caused by the Marmara Earthquake in 1999 with an estimated loss of like of ~30,000 people.

Source: USGS, 2000
<https://www.ldeo.columbia.edu/tamam/tamam-background/izmit-earthquake-and-marmara-sea>

3.2.5. Risk Factor

Figure 7. Leading Level 2 risk factors of DALYs with percentage changes from 1990 to 2019



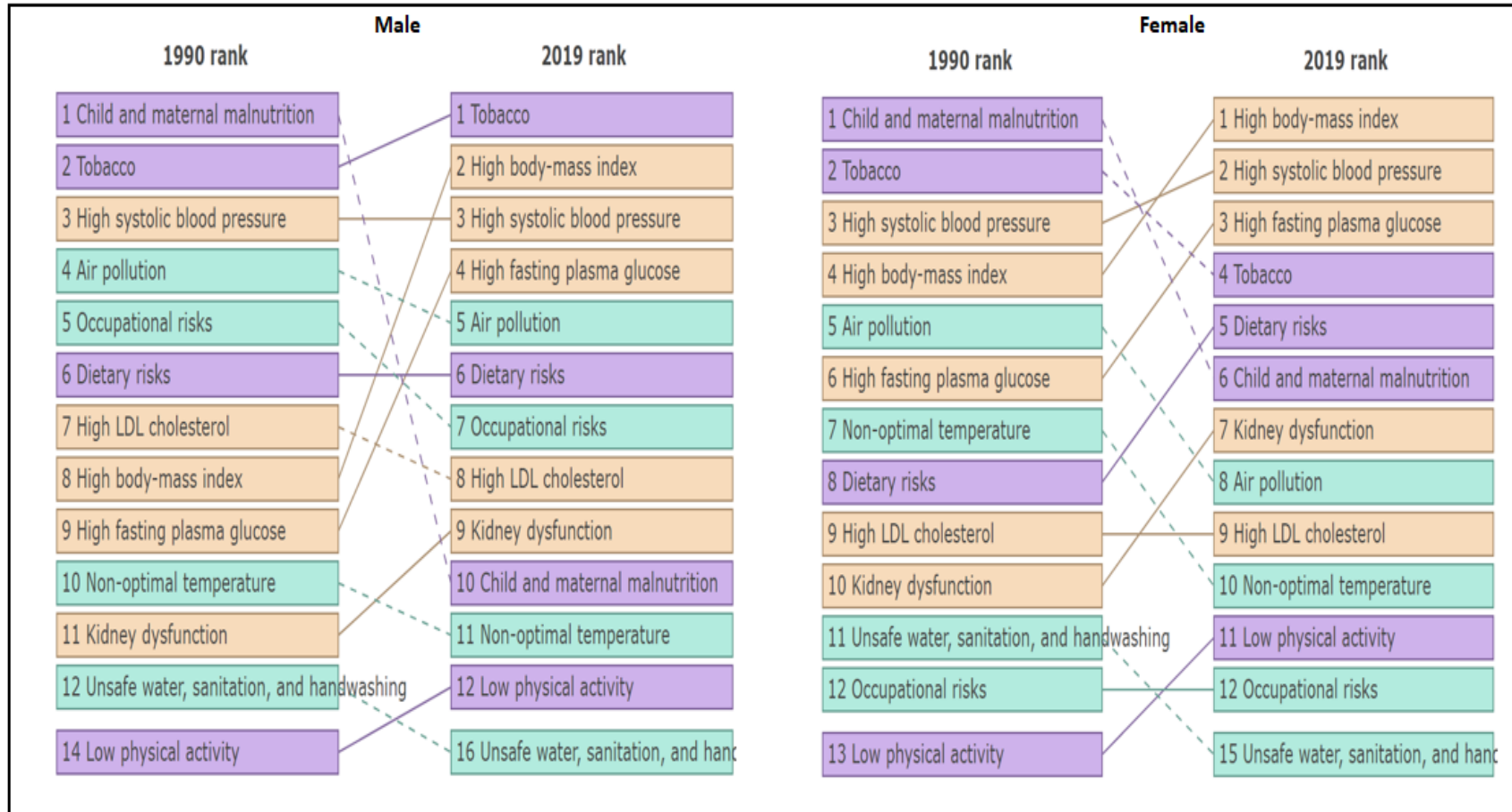
Leading Risks 1990	Percentage number of DALYs, 1990	Percentage number of DALYs, 2019
Metabolic risks	40,5	50,7
Environmental/occupational risks	14,6	16,1
Behavioral risks	45,0	33,2

Over the past three decades metabolic risk has increased by 10%, behavioral risk has decreased by 12%, and environmental risk factors have increased by 2%.

The leading Level 2 risk factors for DALYs are presented in figure 7. Although the risk factor for malnutrition was very high in the past, it has decreased considerably today. However, tobacco and obesity have increased considerably today.

3.2.5. Risk Factor

Table 6: Age-standardized rates of DALYs for the leading Level 2 risk factors

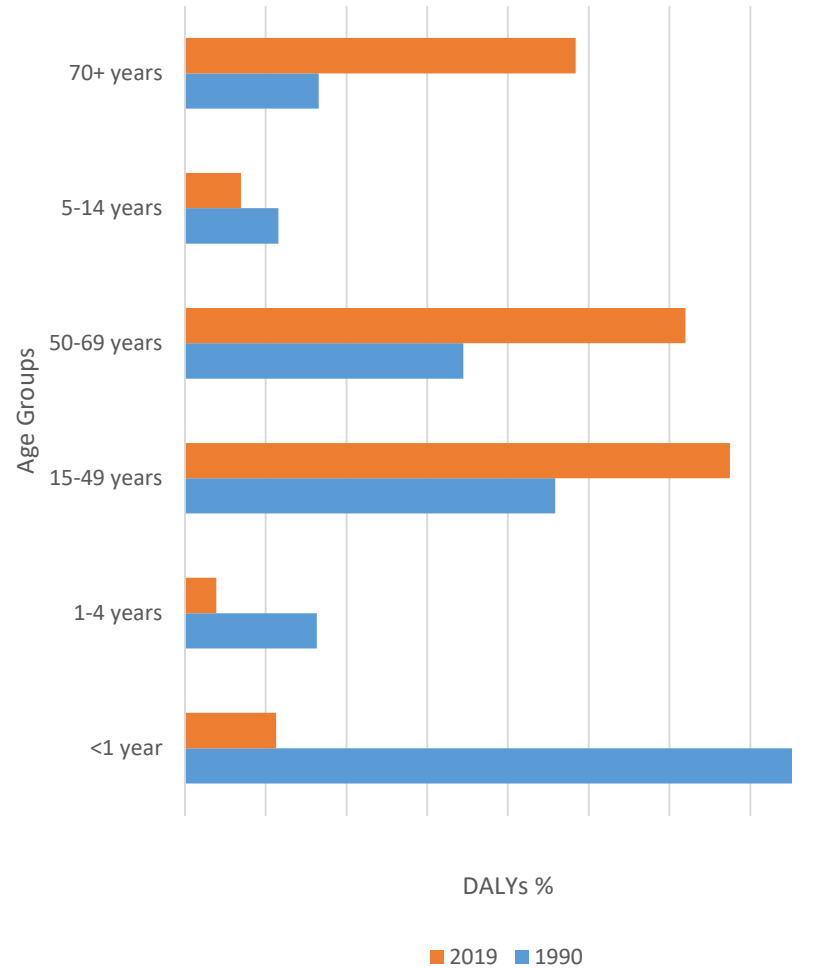


What is the difference between men and women in terms of risk factors in Turkey?

- Tobacco use is the first risk factor for men due to the very high smoking rate. High body mass index, high blood pressure and come next to men.
- The risk factors for women are high body mass index, high blood pressure and high fasting plasma glucose respectively.
- Tobacco use is the first risk factor for men, while it ranks fourth for women.

3.2.6. Age Groups

Figure 8: Percentage Change of DALY number by Age Groups in Turkey (1990-2019)



In the 1990s, 50% of DALYs number were in the under-5 age group and 30% were in the 50 and over age group. In 2019, this rate is 14% in the under-5 age group, and 54% in the 50 and over age group.

3.2.7. International Comparison of Turkey's Disease Burden

Figure 9. International Comparison of DALYs Rate, 1990, 2019

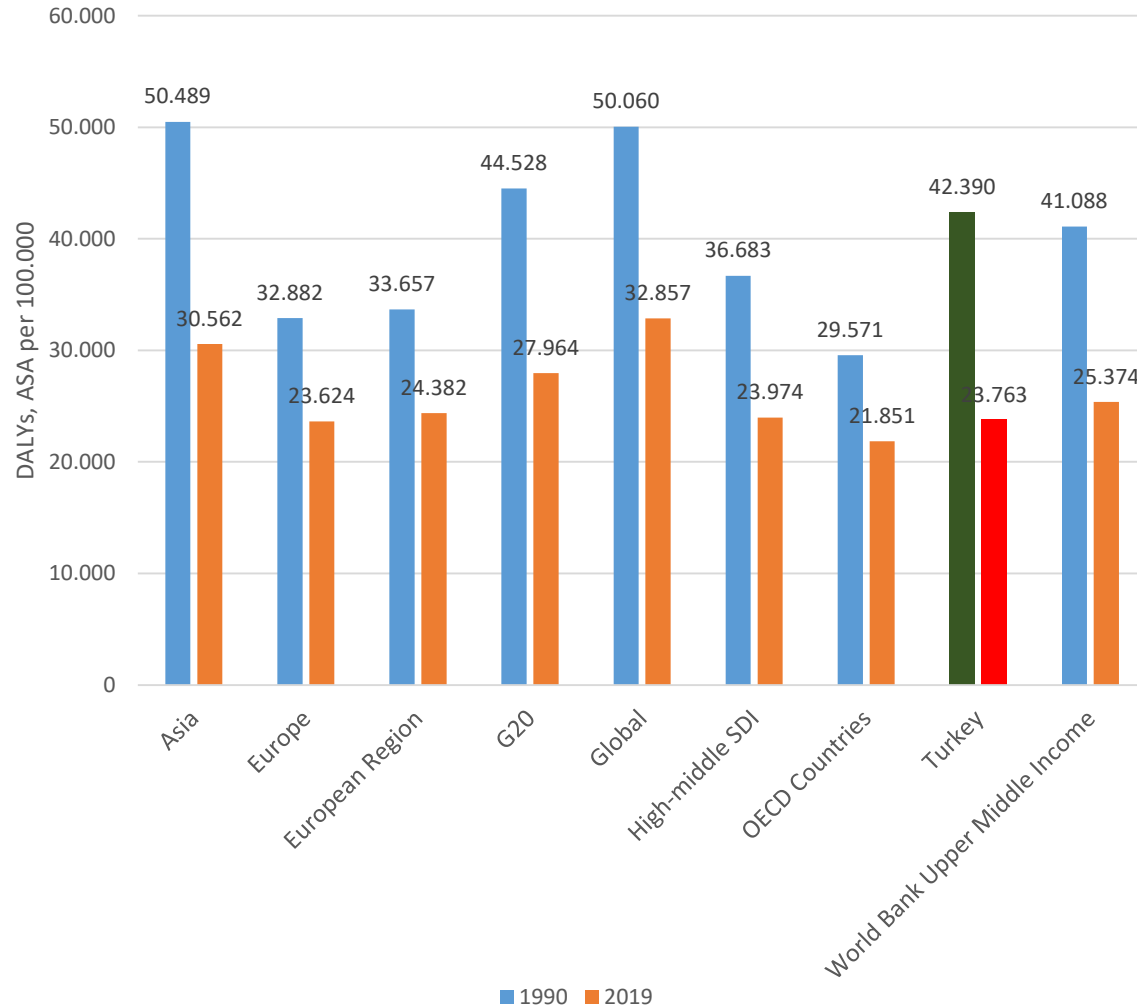
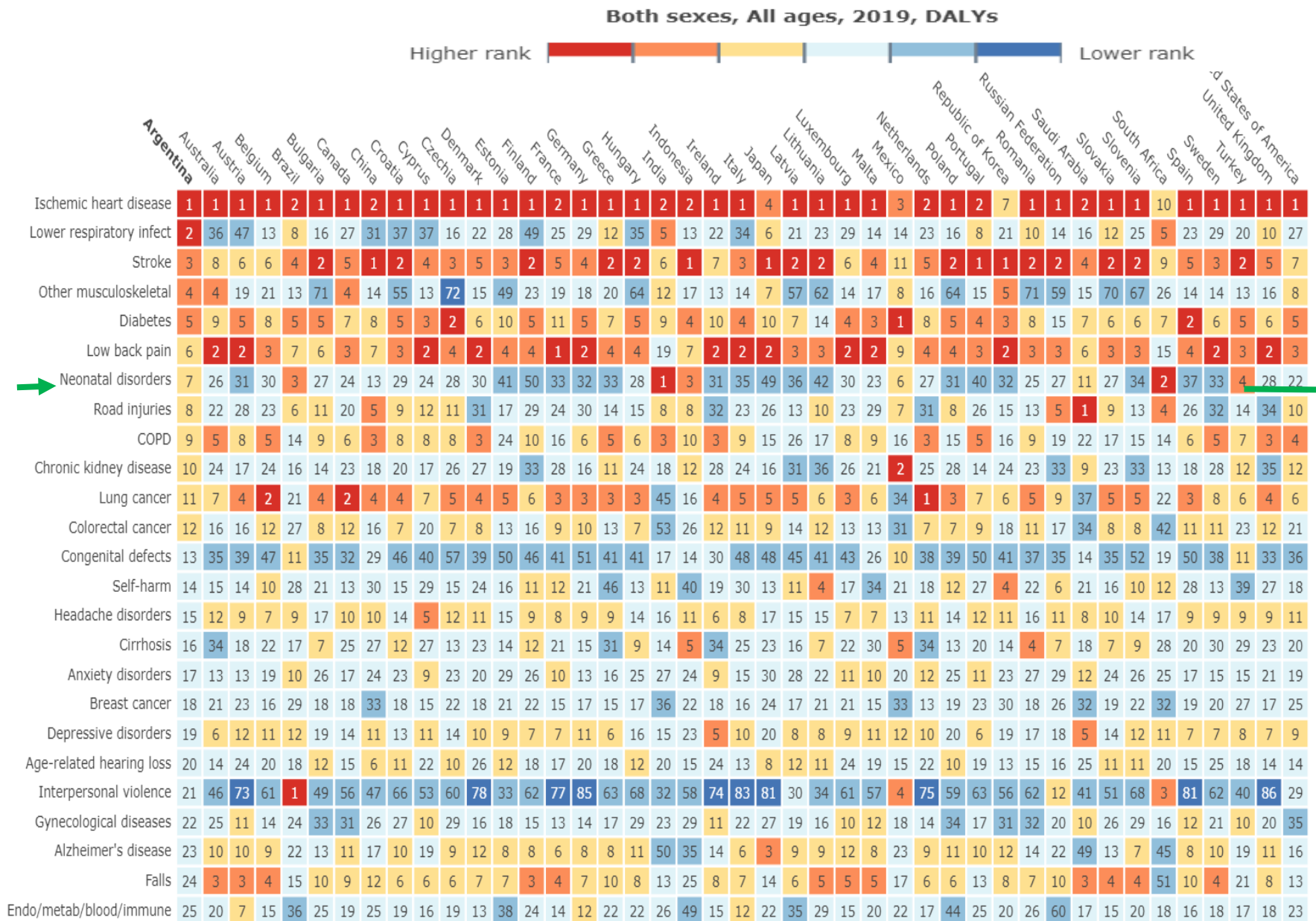


Table 7. Percentage change of DALYs in Global

Region	% Change AS per 100.000 (1990-2019)
Global	-0,34 [-0,3--0,38]
Turkey	-0,44 [-0,37--0,5]
High-middle SDI	-0,35 [-0,31--0,38]
G20	-0,37 [-0,34--0,41]
OECD Countries	-0,26 [-0,23--0,29]
World Bank Upper Middle Income	-0,38 [-0,34--0,43]
European Region	-0,28 [-0,24--0,31]
Asia	-0,39 [-0,36--0,43]
Europe	-0,28 [-0,25--0,31]

The International Comparison of Turkey's Disease Burden is presented in the table and figure. Turkey's disease burden is lower than many countries at the global level. However, it is higher than the average of countries in Europe, OECD, G20, high income groups.

Figure 10. Ranking 20 countries according to age- standardised DALYs per 100,000, 1990–2019



Turkey exhibited a disease burden performance similar to the G-20 countries in terms of age-standardized DALY rates in 2019. However, while neonatal disorders are the fourth reason in Turkey, it comes after the thirtieth cause in many countries globally. Regarding this disease, countries such as Indonesia, South Africa, Brazil and Turkey show similarities.

4. Conclusion

- Turkey has undertaken major reforms to transform and improve the health system and its outcomes. As a result of the health policies implemented between 1990-2019 in Turkey, there has been an epidemiological transition that significantly improves health indicators.
- The Turkish healthcare system has successfully managed communicable diseases, but there has been an increase in non-communicable diseases.
- Efforts to promote healthy diets and active life styles have yet to reduce tobacco and obesity rates, which remain a growing problem and a key challenge for Turkey.
- A cost-effective, accessible, and sustainable health system and public health planning are needed in Turkey, taking into account major demographic changes.

- Thank you very much
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