Ankara University
Faculty of Languages, History and Geography
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Mortality

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The content of this course is exactly compatible with the program in which the same course is taught in Turkish, and the open course materials prepared by Prof. Dr. E. Murat Özgür are used.

Mortality

1) Measuring Mortality

a) Crude Death Rate
b) Age Specific Mortality Rate
c) Mortality Rate of Child Under Five
d) Infant Mortality Rate

2) Key Determinants of Mortality

a) Lifespan and life expectancy at birth
b) Mortality, Disease, and the Epidemiological Transition

3) Causes of Death

4) Mortality Differences

a) Age Differences
b) Gender Differences
c) Race and Class Differences

5) Earth Mortality Pattern

- **Crude death rate is the simplest method of measuring mortality.**
- It is found by dividing the number of deaths in a year (D) by the mid-year population (P). It is usually shown as the number of deaths per 1000 population.

CDR = (D : P) x 1000

CDR = Crude death rate
D= Number of deaths in a year
P= Mid-year population for that year

- **Crude death rate in Turkey has been in the range of 5-5.5 ‰ for the last 10 years. In 2019, it was ‰5.3.**
- **Crude death rate in 2018 is higher than the national average in the West Marmara, West and East Black Sea regions of Turkey (above ‰ 7), while it is lower in the eastern regions (below ‰ 5, even ‰ 3.3 in Southeast Anatolia).**

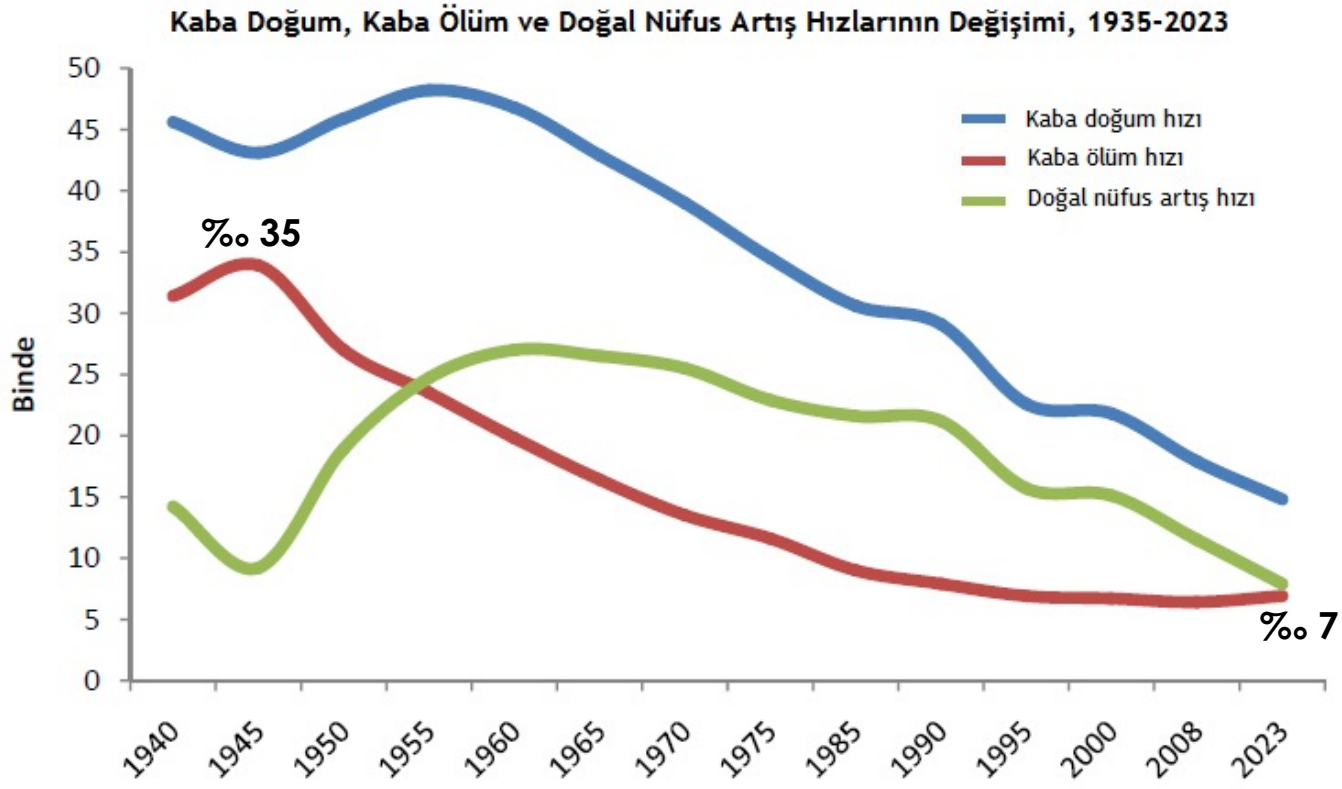
İstatistiki Bölge Birimleri Sınıflamasına Göre Kaba Ölüm Hızı (‰), 2009-2018

İstatistiki Bölge Birimleri	Yıl									
	2009	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*
TR Türkiye	5,1	5,0	5,1	5,0	4,9	5,1	5,2	5,3	5,3	**5,2**
TR1 İstanbul	4,2	4,0	4,0	4,0	3,9	4,1	4,1	4,2	4,2	4,2
TR2 Batı Marmara	7,3	7,3	7,3	7,3	7,1	7,5	7,8	7,7	7,8	**7,8**
TR3 Ege-Aegean	6,0	5,9	6,2	6,2	5,9	6,1	6,4	6,6	6,6	6,6
TR4 Doğu Marmara	5,6	5,5	5,5	5,5	5,4	5,5	5,7	5,7	5,7	5,7
TR5 Batı Anadolu	4,8	4,6	4,7	4,6	4,5	4,7	4,7	4,9	5,0	5,0
TR6 Akdeniz	4,5	4,5	4,5	4,5	4,5	4,6	4,8	5,0	4,9	4,9
TR7 Orta Anadolu	5,7	5,5	5,7	5,5	5,5	5,8	5,9	6,1	6,1	5,9
TR8 Batı Karadeniz	7,0	6,8	7,0	7,0	6,9	7,3	7,4	7,6	7,6	7,6
TR9 Doğu Karadeniz	6,4	6,2	6,5	6,5	6,3	6,8	6,9	7,0	7,3	7,0
TRA Kuzeydoğu Anadolu	5,1	5,0	5,4	5,0	4,8	4,9	5,0	5,0	5,0	4,9
TRB Ortadoğu Anadolu	4,5	4,4	4,5	4,1	4,1	4,1	4,1	4,2	4,2	4,0
TRC Güneydoğu Anadolu	3,8	3,7	3,6	3,5	3,4	3,5	3,4	3,7	3,4	**3,3**

Kaynak: TÜİK, Ölüm İstatistikleri
[31/03/2019 tarihi itibariyle]

Source: http://www.tuik.gov.tr/PreTablo.do?alt_id=1060

- As a part of the demographic transformation Turkey has been experiencing, the crude death rates have been in a constant downward trend, although they increased slightly during the Second World War.
- By the middle of the 21st century, crude birth and crude death rates will equalize and the natural population growth rate will be zero.



Source: Koç et al., 2010: 13

- **The probability of death in a given time frame is not the same for everyone. For this reason, the age-specific death rate method has been developed.**
- In general, mortality rates are relatively low for adolescents and young adults, but are particularly high for older adults.
- It is found by dividing the number of deaths (Da) in a certain age group in a year by the mid-year population (Pa) of the same age group. It is usually shown as the number of deaths per 1000 population.

$$ASDR = (D_a : P_a) \times 1000$$

ASDR = Age-specific death rate

Da = Number of deaths in a year

Pa = Mid-year population for that year

Age-specific Death Rate: Turkey

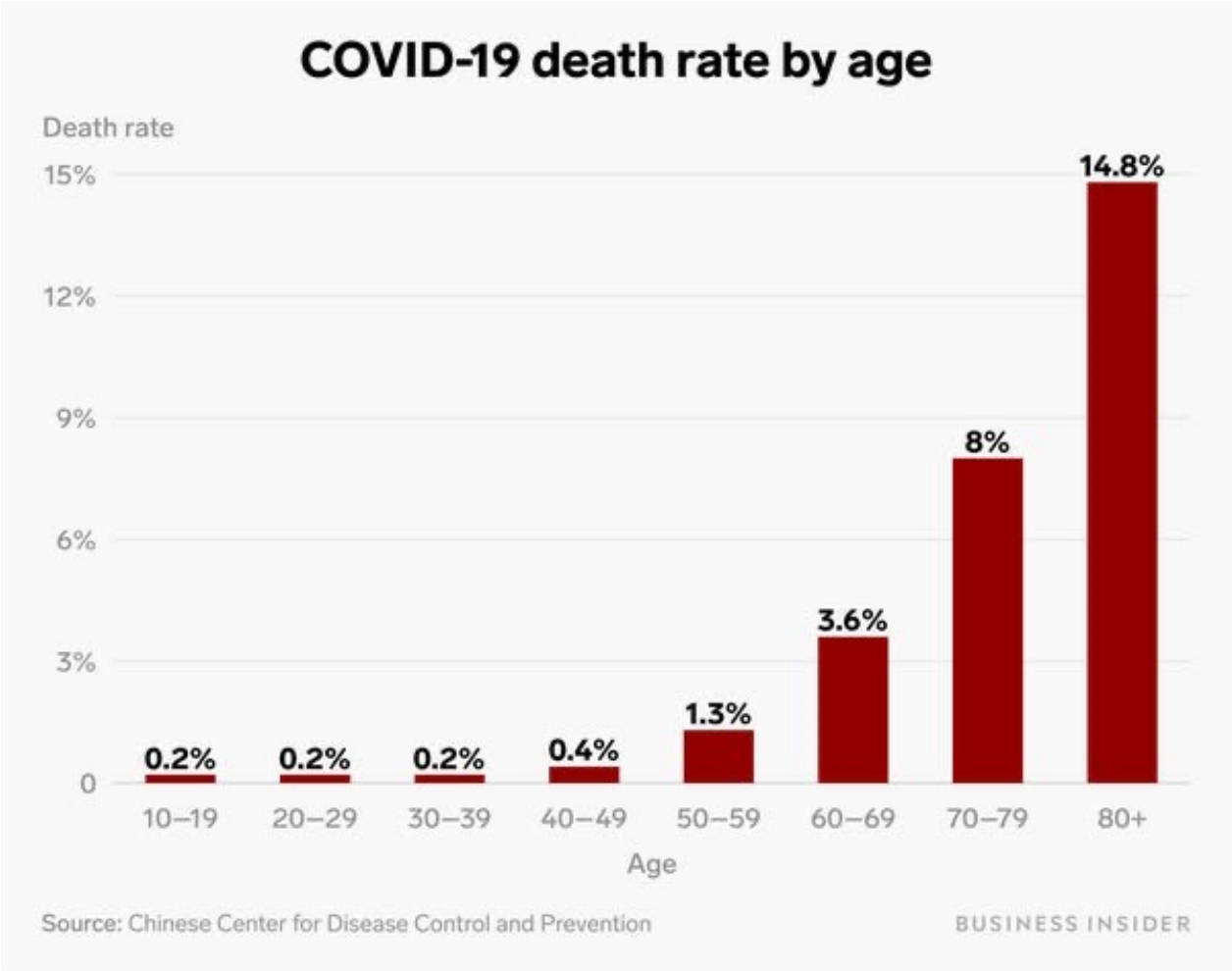
- The age-specific mortality rate, which is ‰2.2 for the population under the age of 5 in Turkey, remains below ‰1.0 until the age of 40. From this age on, the death rate tends to increase more strikingly in men. It becomes more evident from the age of 50.
- Crude death rate for the total population aged 65 and over in 2018 exceeded ‰15, and over 75 years of age, exceeded ‰80. Mortality rates for women are lower than for men in almost every age group.

Cinsiyete göre yaşa özel ölüm hızı, 2009-2018

[31/03/2019 tarihi itibariyle]

(‰)

Yıl	Cinsiyet	Toplam	Yaş grubu														
			0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+
2018	Toplam-Total	5,2	2,2	0,2	0,2	0,4	0,5	0,5	0,6	0,7	1,1	1,9	3,4	5,7	9,7	15,7	26,0	80,5
	Erkek-Male	5,7	2,3	0,2	0,2	0,6	0,7	0,8	0,8	1,0	1,5	2,5	4,6	7,9	13,4	21,4	34,3	90,5
	Kadın-Female	4,8	2,1	0,2	0,2	0,2	0,2	0,3	0,4	0,5	0,8	1,3	2,2	3,5	6,2	10,6	19,2	73,9
2017	Toplam-Total	5,3	2,3	0,2	0,2	0,5	0,5	0,5	0,6	0,8	1,2	2,0	3,4	5,9	9,7	16,1	27,2	82,9
	Erkek-Male	5,8	2,4	0,2	0,3	0,6	0,8	0,8	0,8	1,0	1,6	2,7	4,7	8,2	13,5	22,0	35,7	93,4
	Kadın-Female	4,8	2,1	0,2	0,2	0,3	0,3	0,3	0,4	0,6	0,8	1,4	2,2	3,6	6,1	10,9	20,2	75,9
2016	Toplam-Total	5,3	2,5	0,2	0,2	0,5	0,6	0,6	0,6	0,8	1,2	2,1	3,6	6,0	10,2	16,3	28,1	83,0
	Erkek-Male	5,8	2,6	0,3	0,3	0,7	0,9	0,9	0,9	1,1	1,6	2,7	4,9	8,2	14,0	22,2	36,4	93,5
	Kadın-Female	4,8	2,3	0,2	0,2	0,3	0,3	0,3	0,4	0,6	0,9	1,4	2,3	3,7	6,4	11,1	21,2	75,9
2015	Toplam-Total	5,2	2,6	0,2	0,2	0,5	0,5	0,5	0,6	0,8	1,2	2,1	3,5	6,3	9,9	16,3	28,1	81,4
	Erkek-Male	5,7	2,8	0,3	0,3	0,7	0,8	0,8	0,8	1,0	1,5	2,7	4,8	8,7	13,7	22,1	36,3	92,2
	Kadın-Female	4,7	2,5	0,2	0,2	0,3	0,3	0,3	0,4	0,5	0,9	1,4	2,2	3,9	6,3	11,2	21,3	74,2
2014	Toplam-Total	5,1	2,9	0,2	0,3	0,5	0,5	0,5	0,6	0,8	1,3	2,2	3,7	6,2	10,2	16,2	28,3	79,9
	Erkek-Male	5,5	3,1	0,3	0,3	0,7	0,8	0,7	0,8	1,0	1,7	2,8	5,0	8,5	14,1	21,9	36,6	90,0
	Kadın-Female	4,6	2,7	0,2	0,2	0,3	0,3	0,3	0,4	0,6	0,9	1,5	2,3	3,8	6,5	11,3	21,6	73,1
2013	Toplam-Total	4,9	2,8	0,3	0,3	0,5	0,5	0,5	0,6	0,8	1,3	2,2	3,8	6,3	10,3	16,6	28,5	76,5
	Erkek-Male	5,4	2,9	0,3	0,3	0,7	0,7	0,7	0,8	1,0	1,7	2,9	5,1	8,8	14,3	22,5	36,9	86,9
	Kadın-Female	4,4	2,6	0,3	0,2	0,3	0,3	0,3	0,4	0,6	0,9	1,5	2,4	3,8	6,5	11,5	21,7	69,6



Source: https://www.businessinsider.com/coronavirus-death-rate-by-age-countries-2020-3#the-death-rate-varies-by-country-since-different-governments-enact-different-intervention-strategies-and-test-their-populations-at-different-rates-5

- Child mortality is the death rate of children under the age of five.
- Child mortality is also known as the under-five mortality rate. This refers to the probability of death between birth and five years of age per 1000 live births.
- In other words, the under-five mortality rate refers to the probability of dying within five years of birth.

$$U_5MR = (D_{0-4} : B) \times 1000$$

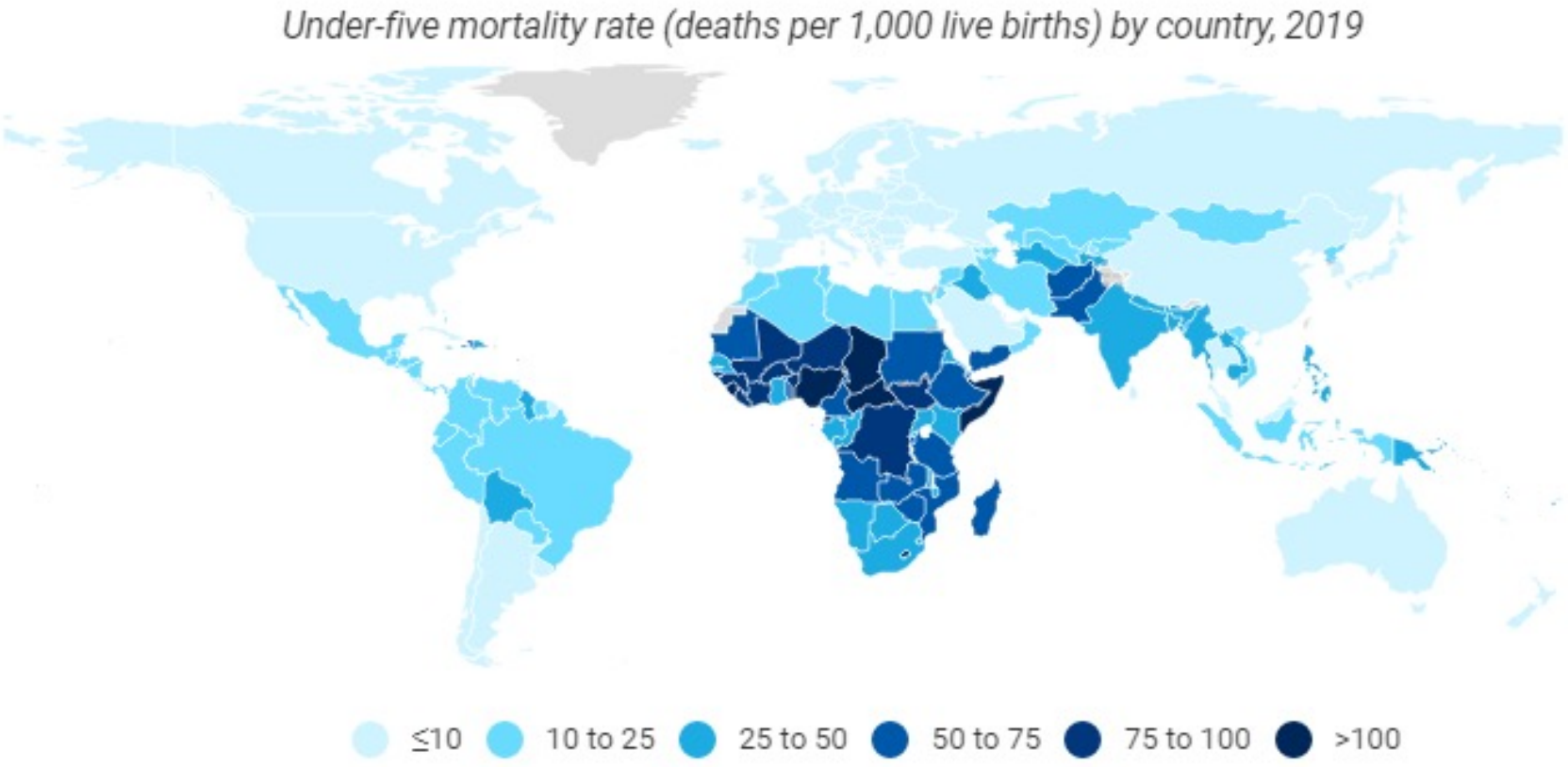
U_5MR = Under-five child mortality rate

D_{0-4} = Number of children aged 0-4 dying in a year

B = Total number of babies born alive in the same year

- The world under-five mortality rate has dropped by a striking 60%, from 93 deaths per 1000 live births in 1990 to 38 in 2019.
- While the under-five mortality rate in Turkey was 17.7 per thousand in 2009, it decreased to 11.2 in 2019.

- Sub-Saharan Africa has the highest national under-five mortality rates (o76%).
- Children continue to face widespread regional and income inequalities in their chances of survival.



Source: https://data.unicef.org/topic/child-survival/under-five-mortality/

Infant Mortality Rate

- **Infant mortality rate is the number of infants who die before reaching the age of one per 1000 live births in a given year.**
- It is not evenly distributed in the first year of life, as most infant deaths occur in the first six weeks.
- Modern medicine can keep infant mortality low.
- **InMR = (D : B) x 1000**

InMR = Infant Mortality Rate

D = Number of babies who died before turning one year (0 age group)

B = Total number of babies born alive in the same year

- Infant mortality rate tends to decrease in Turkey. Infant mortality rate in Turkey fell below 10‰ after 2015. In 2019, it is ‰9.1.

- Infant mortality rate shows some regional differences. The infant mortality rate, which was 6.8 ‰ in the West Marmara Region in 2018, is generally high in the eastern regions. For example, it is at the level of ‰ 13.1' in the Southeastern Anatolia Region. In these regions, infant mortality on a provincial basis (for example, in Gaziantep, Mardin) rises to 15‰.

İstatistiki Bölge Birimleri Sınıflamasına göre bebek ölüm hızı, 2009-2018

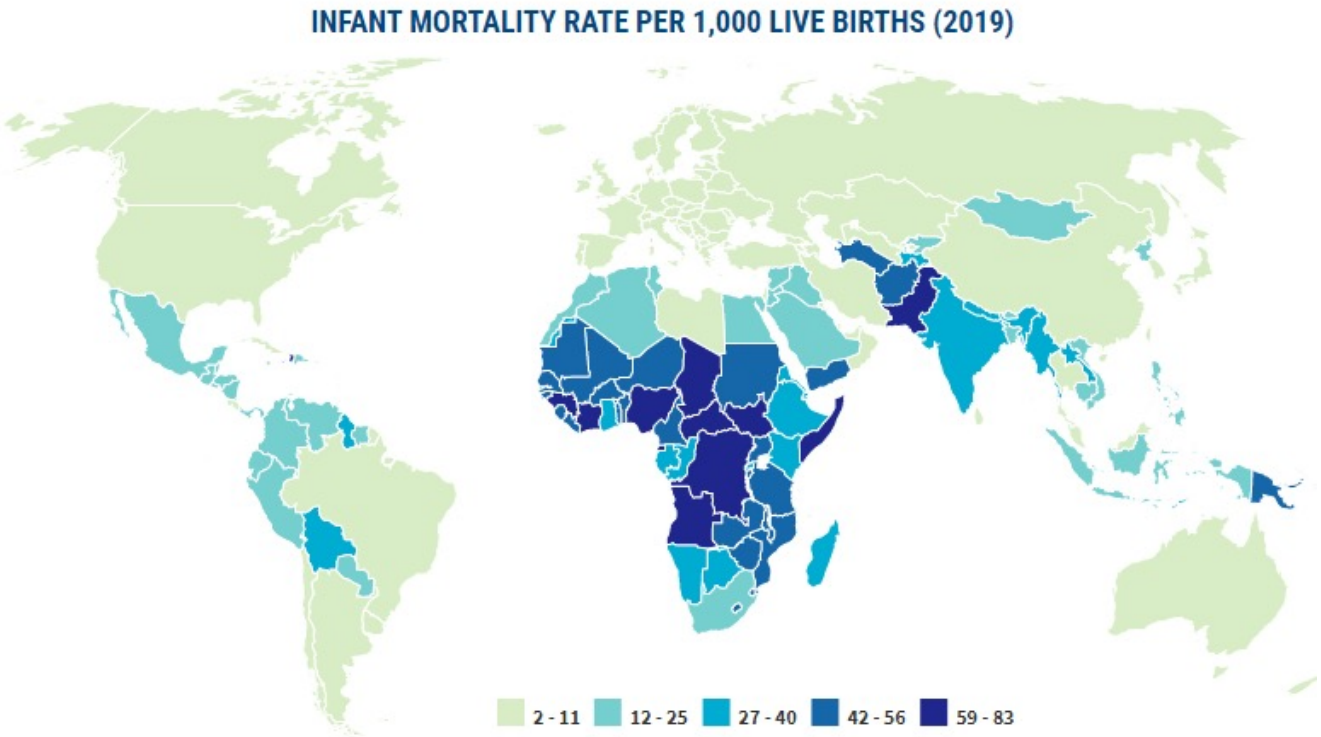
[31/03/2019 tarihi itibariyle] (‰)

İstatistiki Bölge Birimleri	Yıl									
	2009	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*
TR Türkiye	13,9	12,0	11,6	11,6	10,8	11,1	10,2	9,8	9,4	**9,3**
TR1 İstanbul	11,4	9,6	7,9	8,6	8,0	8,9	8,2	8,0	7,6	7,6
TR2 Batı Marmara	13,3	10,3	9,2	10,6	8,9	8,2	7,1	6,5	7,5	**6,8**
TR3 Ege	14,3	11,4	11,2	11,6	8,7	8,9	8,8	8,5	7,8	8,4
TR4 Doğu Marmara	12,8	10,0	9,8	9,8	8,4	8,7	7,8	8,0	7,3	7,8
TR5 Batı Anadolu	13,4	11,5	11,2	10,3	9,1	8,1	8,0	7,6	8,0	8,1
TR6 Akdeniz	13,7	12,1	12,1	12,0	11,6	11,6	10,1	10,0	9,3	9,0
TR7 Orta Anadolu	11,9	10,9	10,9	10,8	9,4	10,0	10,3	8,5	8,8	9,3
TR8 Batı Karadeniz	13,0	11,2	10,2	10,7	8,5	10,1	8,3	8,4	7,4	8,9
TR9 Doğu Karadeniz	11,4	10,6	10,4	10,7	8,2	9,3	7,9	7,2	9,1	7,6
TRA Kuzeydoğu Anadolu	12,6	13,5	15,4	13,1	14,8	13,0	13,4	12,4	11,5	10,6
TRB Ortadoğu Anadolu	17,3	14,3	13,6	13,4	15,4	14,6	14,2	13,5	12,5	11,1
TRC Güneydoğu Anadolu	17,5	15,8	15,8	15,6	15,5	16,4	14,9	14,3	13,3	**13,1**

Kaynak: TÜİK, Ölüm İstatistikleri

Infant Mortality: World, 2019

- The infant mortality rate worldwide is ‰31 for 2019.
- It is low in developed countries (mostly below ‰ 5). It is high in less developed countries (‰ above 30). For example, the infant mortality rate is ‰4 in Europe and ‰49 in Africa, at the two extremes.
- For example, the infant mortality rate is ‰2 in Finland, ‰2 in Japan, ‰3 in Sweden, and ‰3 in South Korea. This is ‰9 in Turkey and ‰10 in China. It is ‰83 in the Central African Republic, ‰73 in Chad and ‰62 in Pakistan.



Source: PRB 2019, World Population Data Sheet

Lifespan and Life expectancy

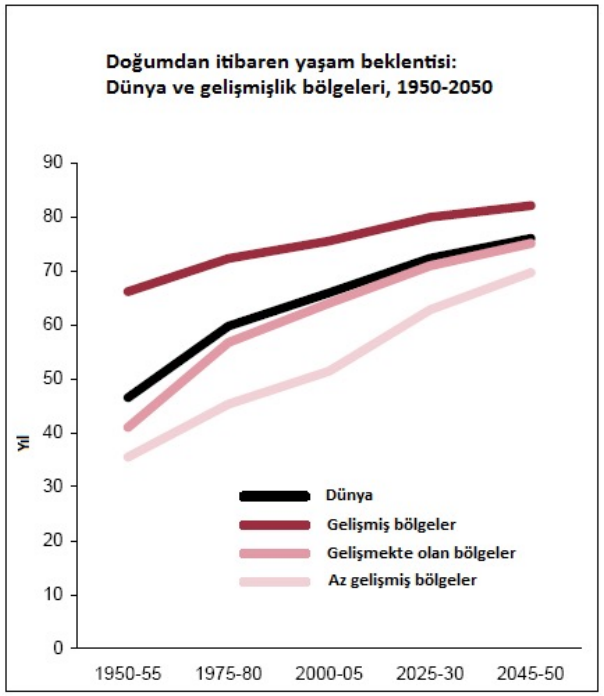
- Life expectancy (i.e. lifespan) is the absolute number of years a person is hoped to survive.
- Longevity is the maximum age that a person can reach under optimum conditions.
- Jeanne Louise Calment, who lived 122 years and 164 days, died in 1997 in France, where she was born and raised, and no one has been documented to have lived to her age.
- The recorded lifespan of Calment indicates that humans can live for 122 years.
- Kane Tanaka is still the oldest person in the world, born on January 2, 1903 in Japan.

Lifespan and Life expectancy

- Life expectancy, if current death trends continue for the rest of that person's life; is the average number of additional years a person is expected to live.

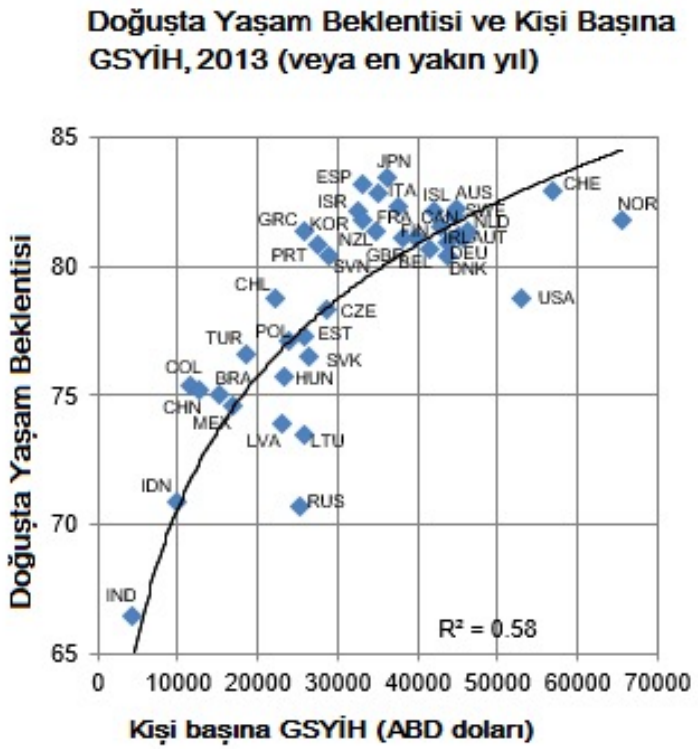
- In other words, life expectancy is the number of years a person is expected to live on average (Hopkin, 2004).
- It is often referred to as life expectancy at birth.
- Human life expectancy at birth is estimated to be 120-125 years in the future.

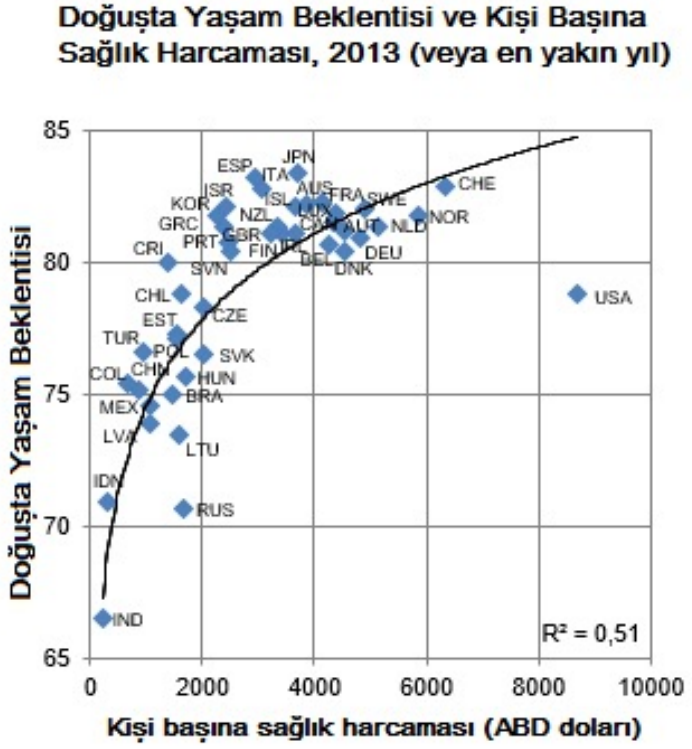
Life expectancy at birth



- Life expectancy at birth refers to the average length of time a newborn is expected to live.
- Worldwide, life expectancy at birth in 2019 is 72 years for both sexes, increasing by nearly 25 years since 1955.
- The increase was 15 years in developed countries (79 years), 28 years in less developed countries (71 years), and 29 years in least developed countries (65 years) (United Nations, 2017 and 2019).
- However, someone born in a developed country is 8 years old than someone born in a developing country. They live 14 years longer than those born in underdeveloped countries.

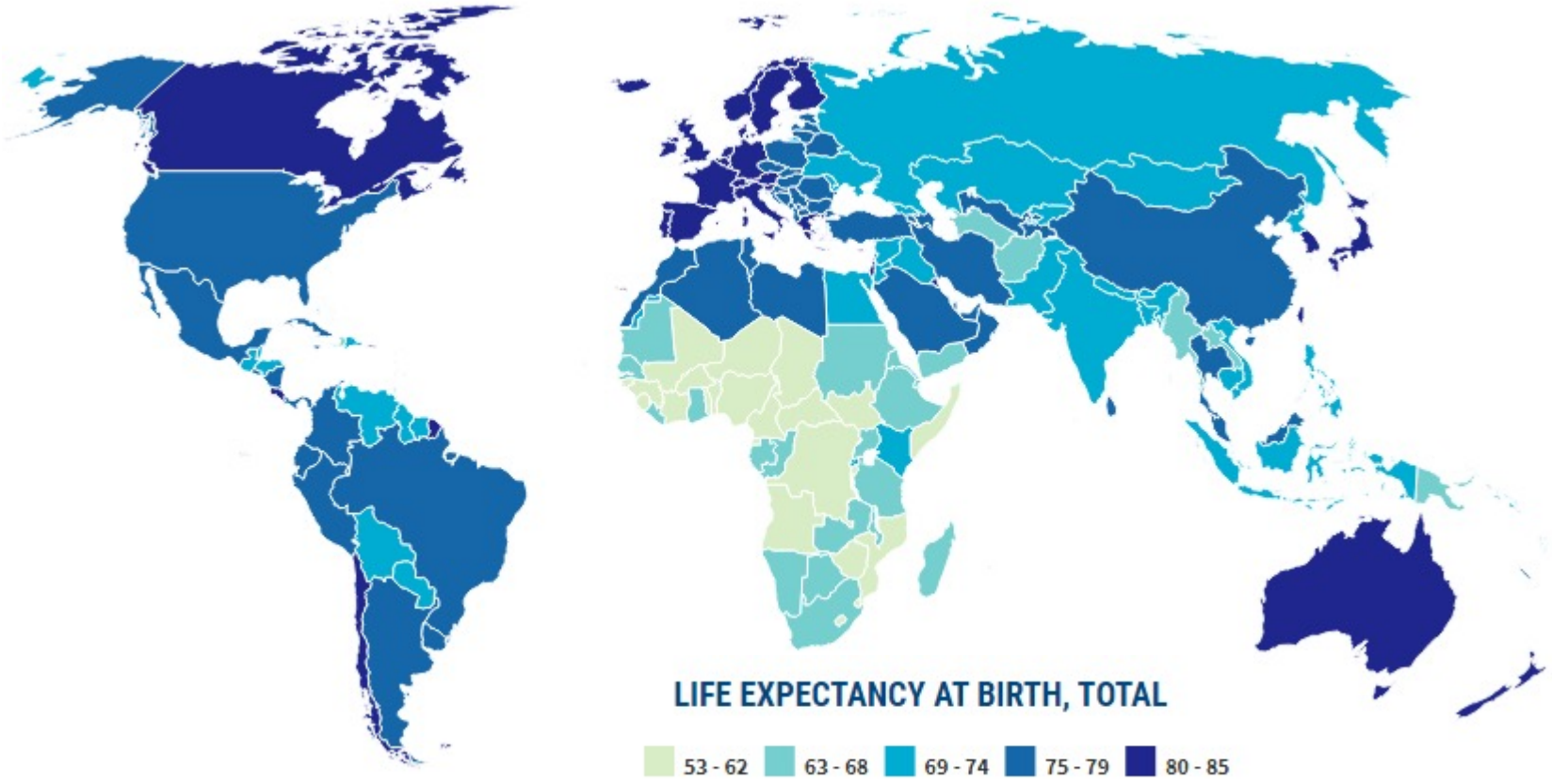
- Life expectancy at birth is associated with per capita income and per capita health expenditure. As income and health expenditure increase, life expectancy at birth increases.





Kaynak: OECD Health Statistics 2015, http://dx.doi.org/10.1787/health-data-en.

Life Expectancy at Birth: World, 2020



Source: https://www.prb.org/international/indicator/life-expectancy-birth-total/snapshot

- **Life expectancy at birth is 4-5 years higher for women than men.**

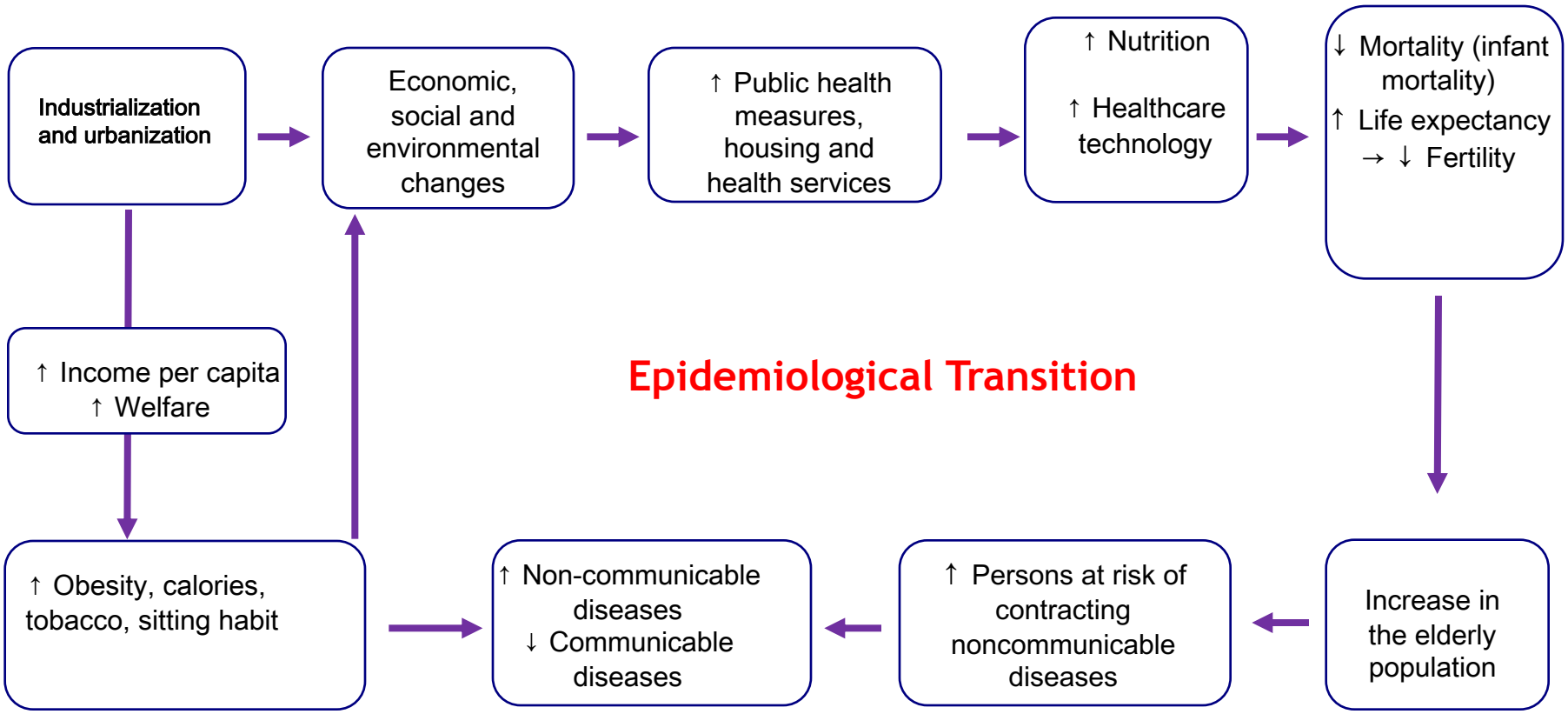
Country	*Woman*	*Man*	*Both*
World	76	71	73
Developed Counties	83	77	80
Less Developed Counties	74	70	72
Least Developed Counties	68	64	66
Japan	88	82	85
Switzerland	86	82	84
China	80	75	78
Turkey	81	76	79
Russia	78	68	73
Central African Republic	57	52	54
Chad	57	54	55

Source: United Nations, 2019

- The role of diseases in all deaths changes over time. This change has led to the emergence of the theory of epidemiological transition (Omran, 2005).
- Many countries have experienced a significant shift from high mortality to low mortality, thanks to social change (with the Industrial Revolution in the West) and medical advances (such as antibiotics, pesticides, healthcare, and other medical technologies that emerged after World War II).

- This shift is an epidemiological transition.
- Transition replaces epidemic contagious diseases, which almost got out of control and spread widely, as the main cause of sickness and death; It refers to the deterioration of tissue and organ structures and the acquisition of diseases due to stress or after human-induced and environmental deterioration.

* Epidemiology is concerned with the study of the distribution of health facts and conditions and their determinants in a given population and the use of these studies in the control of health problems. Epidemiology is concerned not only with death, illness, disability, but also with well-being and improving health.


Industrialization and urbanization
Economic, social and environmental changes
↑ Public health measures, housing and health services
↑ Nutrition
↑ Healthcare technology
↓ Mortality (infant mortality)
↑ Life expectancy
→ ↓ Fertility
↑ Income per capita
↑ Welfare
Epidemiological Transition
↑ Obesity, calories, tobacco, sitting habit
↑ Non-communicable diseases
↓ Communicable diseases
↑ Persons at risk of contracting noncommunicable diseases
Increase in the elderly population

The Epidemiologic Transition

deadly epidemic-infectious diseases

Typhoid
Tuberculosis
Cholera
Diphtheria
Plague
Diarrhea
Flu and pneumonia

Tissue and organ deterioration diseases

Amyotrophic Lateral Sclerosis (ALS)
Alzheimer's
Parkinson's
Multiple system atrophy (MSA)
Vascular occlusion (Atherosclerosis)
Cancer
Diabetes
Heart disease
Corneal disruption (Keratoconus)
Inflammatory Bowel Disease (IBD)
Prostate (Prostatitis)
Bone resorption (Osteoporosis)

- Omran argues that the epidemiological transition has three phases and that mortality patterns differ in successive phases of the transition.

1) **Deadly/Epidemic and Famine Stage**
2) **Regression Stage of Epidemics (Pandemics)**
3) **Stage of Deterioration-Related and Human-Induced Diseases**

A fourth phase was later added to Omran's work.

4) **Hybristic phase:** In this phase, personal behavior and lifestyles strongly influence disease frequency and accident patterns. For example, in the USA there is an increase in cases of homicide, suicide, liver cirrhosis and AIDS, tuberculosis and other infectious diseases as a result of poverty and poor life choices.

- **Another development that does not follow the standard course of the epidemiological transition is the increase in new viral and bacterial diseases.**
- During the past 30-35 years, at least 30 diseases with previously unknown and important consequences have emerged in the world: Rotavirus, parvovirus, ebola, hanta virus, HTLV-1, HHV-8 SARS and COVID-19, as well as those caused by viruses such as legionella, pneumophilia. bacterial diseases such as , campylobacter, helicobacter.
- **Thus, it is now argued that we are entering a new epidemiological transition characterized by the reappearance of infectious diseases previously thought to be under control and the rapid emergence of a number of new diseases (Harper and Armelagos, 2010).**

We have to know why people die?

- **The epidemiological transition helps explain the change in causes of death due to various diseases.**

- **However, other causes of death should also be taken into account.**
- **Some relationships can be mentioned between the causes of death and the level of economic development.**

- In developed societies where per capita income is high, heart diseases and malignant tumors take the first two places among the diseases that cause death. Diseases such as cerebrovascular diseases, diabetes and Alzheimer's also have an important place in deaths.
- In low-income, backward societies, mostly in Africa, infectious and parasitic diseases such as AIDS, malaria, tuberculosis and diarrhea come to the fore. In addition, diseases related to nutritional deficiencies draw attention.

Top Causes of Death in High and Low Income Countries, 2015

Developed Countries

- Heart diseases
- Cerebrovascular diseases
- Cancerous tumor
- Chronic lower respiratory diseases
- Accidents
- Diabetes
- Flu and pneumonia
- Alzheimer's
- Kidney diseases
- Blood poisoning

Less Developed Countries

- Infectious and parasitic diseases: (diarrheal diseases, malaria, tuberculosis, AIDS, etc.)
- Lower respiratory infections
- Pediatry
- Diseases transmitted through animals (onchocercosis (river blindness), sleeping sickness)
- Malnutrition-based diseases (marasmus, kwashiorkor, beriberi)

Causes of Death in the World

- According to the World Health Organization, more than half (54%) of the 56.4 million deaths worldwide in 2015 were due to the top 10 causes.
- The most important fatal diseases in the world, which resulted in 15 million deaths in 2015, are ischemic heart disease* and stroke. These diseases have remained the leading causes of death globally over the past 15 years.
- While chronic obstructive pulmonary disease (COPD) caused 3.2 million deaths in 2015, lung cancer (together with windpipe cancers) caused 1.7 million deaths.
- Diabetes is the cause of 1.6 million deaths in 2015, down from 1 million in 2000.
- Deaths from Alzheimer's disease and other dementias more than doubled in the 15 years from 2000 to 2015, making it the 7th leading cause of death globally in 2015.
- Lower respiratory infections remained the deadliest infectious disease, causing 3.2 million deaths worldwide in 2015. While the death rate from diarrheal diseases decreased by almost half between 2000 and 2015, it caused 1.4 million deaths in 2015 (WHO, 2017).

* Diseases that occur as a result of the heart muscle not being fed due to various reasons are called ischemic heart diseases.

- Likewise, tuberculosis killed fewer people over the same period. but it still ranks among the top 10 causes of death with 1.4 million deaths.
- HIV/AIDS is no longer among the top 10 causes of death in the world, but it killed 1.1 million people in 2015.
- 1.3 million people died in 2015 due to traffic accidents, nearly three-quarters (76%) of those killed were men.
- More than half (52%) of all deaths in low-income countries in 2015 were caused by infectious diseases, maternal causes, conditions that occur during pregnancy and childbirth, and nutritional deficiencies.
- In contrast, less than 7% of deaths in high-income countries were due to these causes. In high-income countries, cardiovascular diseases and neurological diseases such as Alzheimer's are the leading causes of death.
- Lower respiratory tract infections were among the leading causes of death in all income groups.

- While cancers and non-communicable diseases such as Alzheimer's are particularly noteworthy in male deaths in high-income countries, communicable diseases such as malaria, diarrhea, tuberculosis, accidents and violence cause more deaths in low-income countries.

Causes of Death in Turkey, 2017 and 2018

- According to TurkStat data, approximately 40% of deaths in Turkey were caused by diseases of the circulatory system (cardio-vascular system). It was followed by tumors (20%) and respiratory system diseases (12.5%).

Ölüm nedenlerinin dağılımı, 2017 ve 2018

	2017		2018	
	Sayı	(%)	Sayı	(%)
Toplam	**423 878**	**100,0**	**421 164**	**100,0**
Dolaşım sistemi hastalıkları	167 267	39,5	161 920	38,4
İyi huylu ve kötü huylu tümörler (benign ve malign neoplazmlar)	81 886	19,3	83 163	19,7
Solunum sistemi hastalıkları	50 224	11,8	52 568	12,5
Sinir sistemi ve duyu organları hastalıkları	20 623	4,9	20 766	4,9
Endokrin (iç salgı bezi), beslenme ve metabolizmayla ilgili hastalıklar	20 219	4,8	20 074	4,8
Dışsal yaralanma nedenleri ve zehirlenmeler	21 533	5,1	18 462	4,4
Diğer (enfeksiyon ve parazit hastalıkları, mental ve davranışsal bozukluklar, kas-iskelet sistemi ve bağ dokusunun hastalıkları vb.)	62 126	14,7	64 211	15,2

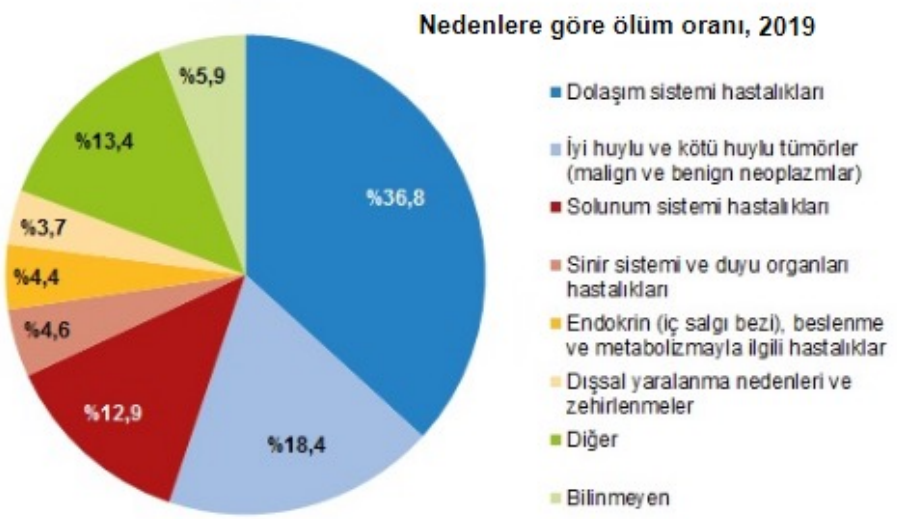
Tablodaki rakamlar, yuvarlamadan dolayı toplamı vermeyebilir.

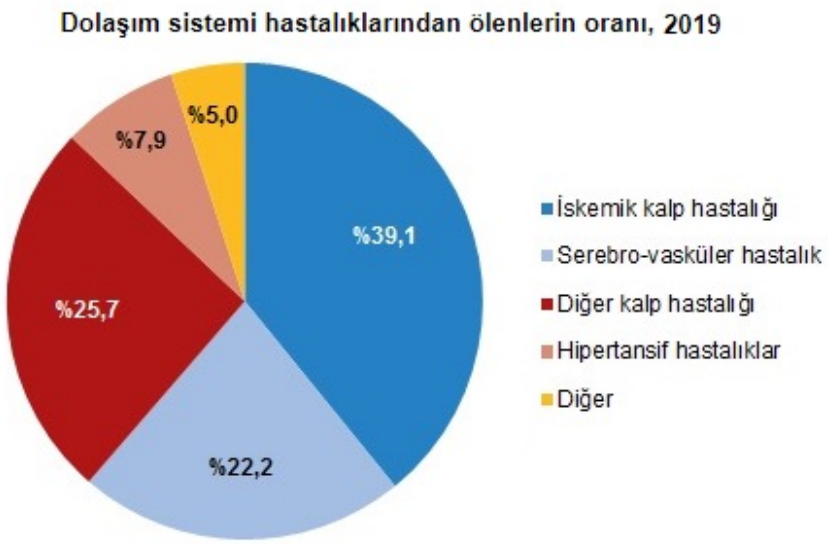
Source: TurkStat Bulletin 26 April 2019, No: 30626

Note: Cause of death statistics, which were produced together with death statistics until 2009 in Turkey, are now published as a separate statistics. Cause of death statistics include the death cases seen by physicians in all provincial and district centers and in all settlements with physicians. The "Death Certificate" filled for these cases is reported to the Turkish Statistical Institute through the health institution to which the physicians are affiliated.

Causes of Death in Turkey, 2017 and 2018

- According to TurkStat's 2019 data, a significant portion of the deaths (37%) in Turkey resulted from diseases of the circulatory system (cardio-vascular system). It was followed by tumors (18%) and respiratory system diseases (13%).
- Ischemic heart disease, one of the circulatory system diseases, was the cause of death for about 4 out of 10 people.



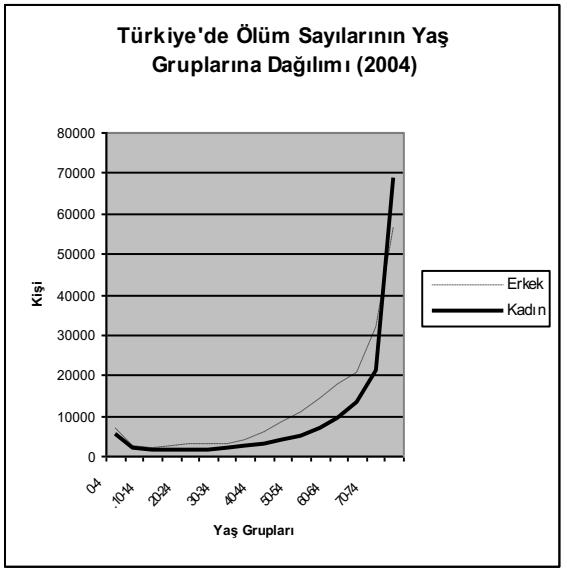


Source: TurkStat Bulletin 24 June 2020, No 33710

1) Age Differences

J shaped mortality curve

- J-shaped curve expressing the probability of death under normal conditions; It indicates mortality that tends to be relatively high for children under one year of age, very low for children and young adults, increasing thereafter, and increasing rapidly with advancing age.
- There are significant differences in age-related mortality between developed and developing countries.
- Half of all deaths in developing countries occur under the age of 5 due to infectious diseases. In these countries, only 5% of deaths occur in those aged 75 and over. In some African villages, the infant and young child mortality rate is 10 times higher than that of the elderly.
- In developed countries, only 2% of deaths are in children under 5 years old. However, the rate of those over the age of 75 is approximately 67%.



2) Sex Differences

a) Biological differences

- Gender differences in mortality are of great interest among demographers. The risk of death is higher for men of all ages; (even in unborn baby boys).
- According to some scientists, women are biologically (related to chromosomes) superior to men.
- Experimental determination of the privileged status of women in other living species such as mice, and the high male fetal mortality in humans are accepted as evidence in this regard.

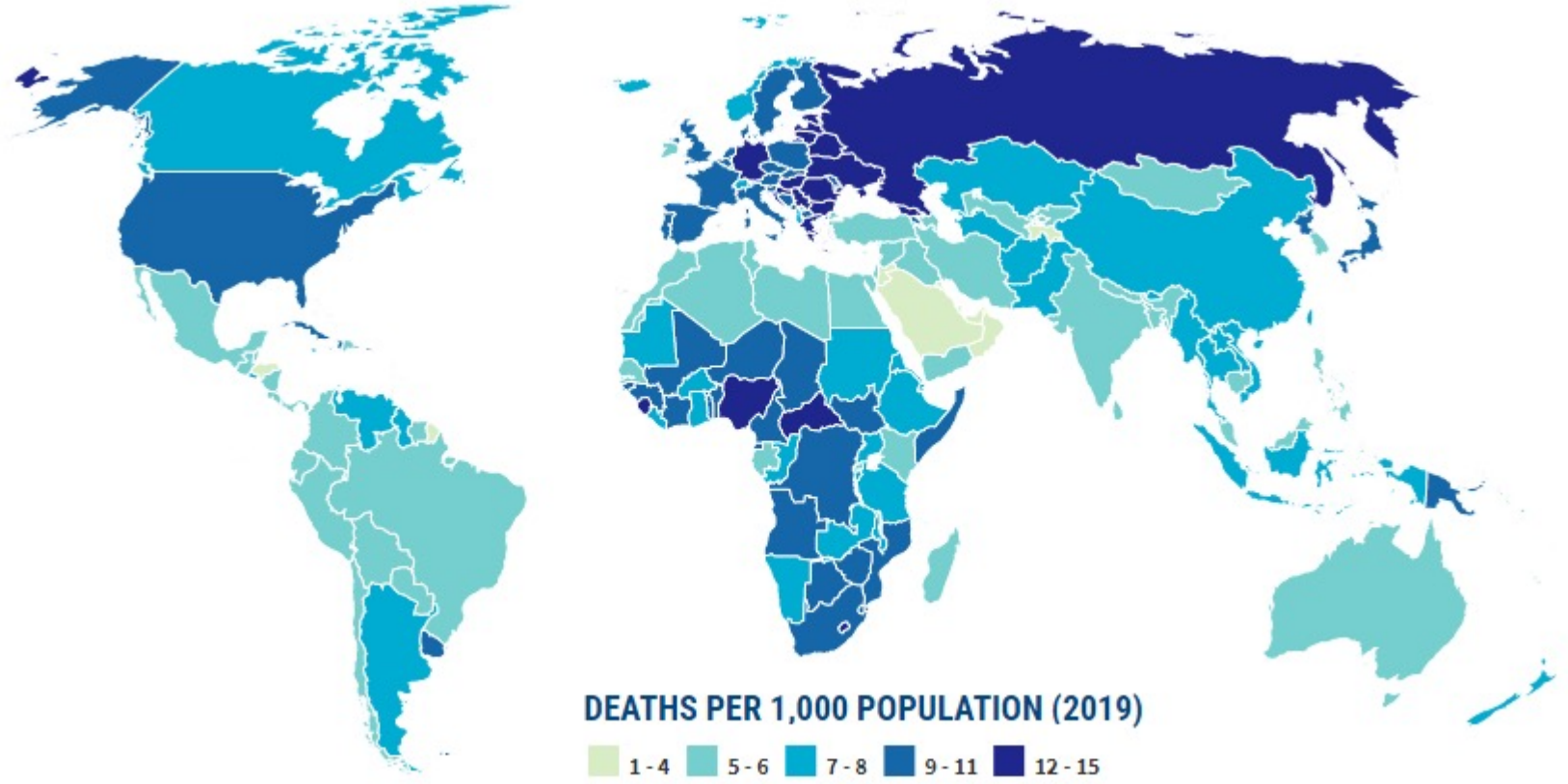
b) Social-economic differences: Occupation, status and role differences

- Another explanation for gender differences in mortality; refers to differences in occupation, status, and roles.
- Men work in more dangerous jobs than women and are under more stress. He usually smokes more, drinks alcohol, drives, and is murdered.
- In general, men abuse their bodies, do not perform regular health checks and drug use.
- The fact that women give birth to fewer children than in the past, thanks to the demographic transition, has also increased their probability of living longer.

3) Race and Class Differences

- Significant biological differences between racial and ethnic groups in disease resistance could not be determined.
- Few diseases are specific to a particular race or ethnicity. The rare best example of such a condition is sickle cell anemia, a black disease.
- The main difference between different groups is the differences in social status in different economic and political systems. For example, in Bangladesh, the death rate decreases as land ownership increases.
- Many differences in mortality today can be attributed to differentiation in socio-economic factors.
- Other differences, such as the difference in mortality rates in rural and urban areas, should not be ignored.

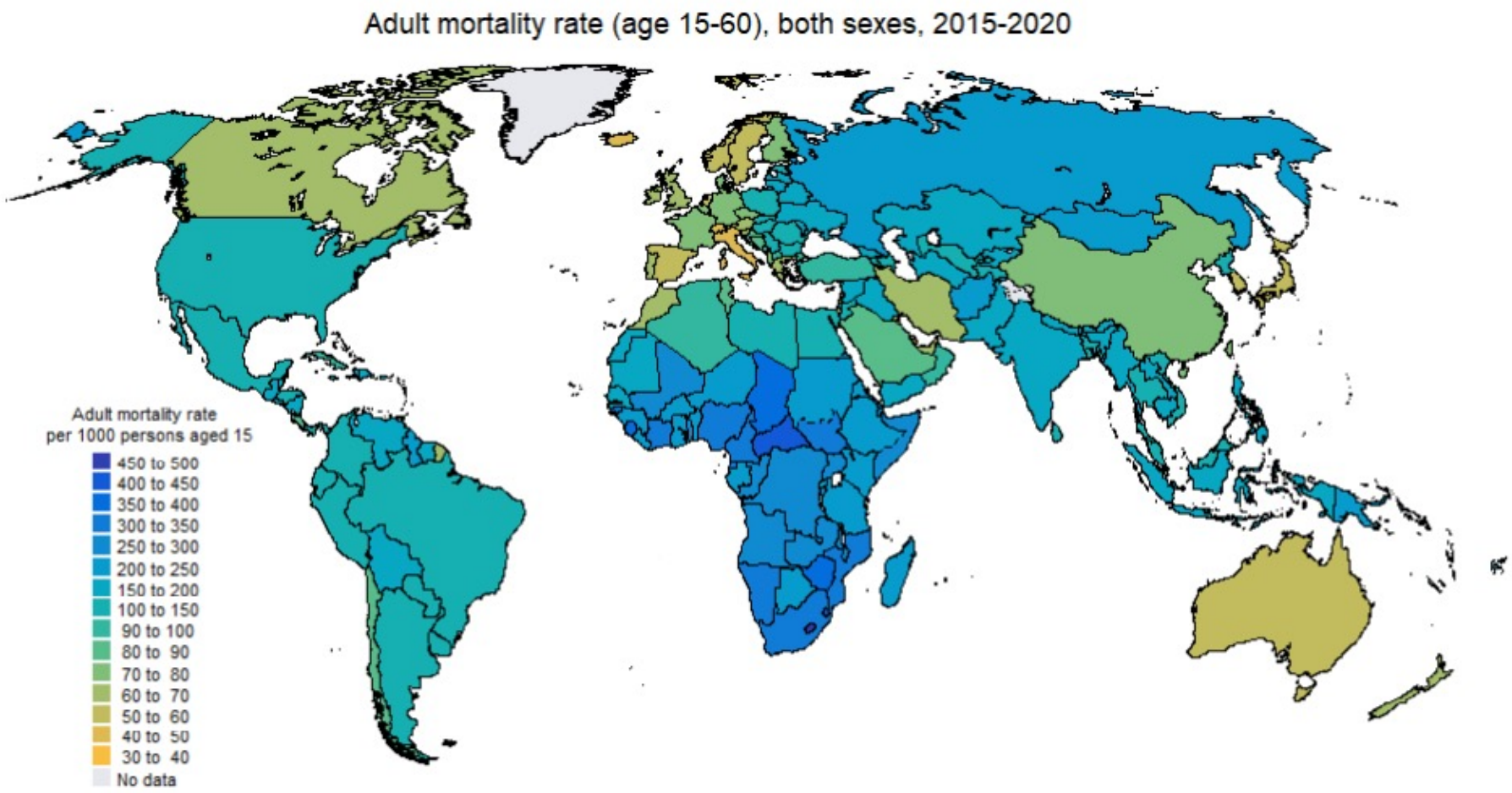
Crude Death Rate: World, 2019 (annual deaths per 1000 population)



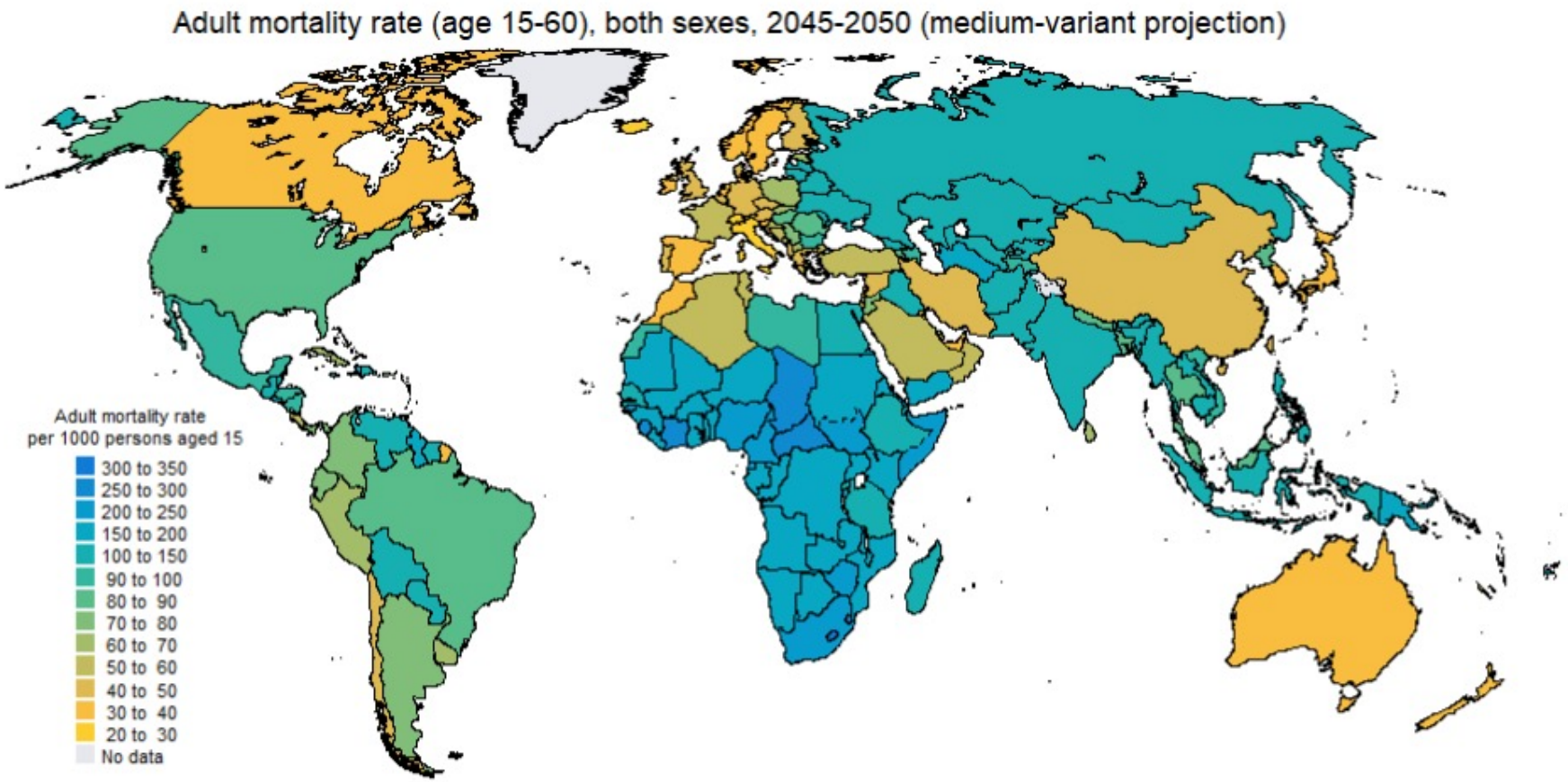
Source: PRB 2019, World Population Data Sheet

Year 2019 (in thousand)
World: 8, Turkey: 5, Qatar and UAE: 1, China: 7, India: 6, Japan and Italy: 11, Bulgaria: 15, Russia: 13, Ukraine: 14, Central Africa C.: 13, Lesotho: 15

- **The world crude death rate in 2019 was estimated at ‰8 (PRB 2019, World Population Data Sheet).**
- Mortality rates of less than 8 per thousand are encountered in a small number of developed countries (such as Australia, Ireland), many developing countries in Latin America, the Middle East (including Turkey), North Africa, and Asia.
- **Crude death rate, which is 11 ‰ in Europe, increases to 13 per thousand towards Eastern Europe.**
- Crude death rate, which is 8 per thousand in Africa, is ‰10 in Central and West Africa and ‰6 in North Africa.
- **Crude death rates are higher in countries such as Lesotho (‰ 14), Chad (12) and the Central African Republic (12).**
- In the absence of major disasters such as major famines, epidemics and nuclear disasters; probably with the epidemiological transition, world mortality rates will continue to decline.
- **Meanwhile, the future course of mortality from infectious diseases such as AIDS is difficult to predict.**



Source: https://population.un.org/wpp/Maps/



Source: https://population.un.org/wpp/Maps/

Major Factors Affecting Mortality Rates in the World

- Family income level
- Social status of the household
- Quality water supply
- Health protection level
- Health education
- Food safety and quality
- Healthcare level
- Medical technology level
- Political stability
- State effectiveness
- Environmental disaster level

- **Infectious and Parasitic Diseases (IPD) is the leading cause of death in developing countries, and despite the success of vaccination programs, many children are at risk from infectious diseases.**
- **Malaria: It has reemerged as major threats to public health in the last 20-25 years. For example, malaria that was eradicated in the past came back worse than before, with reduced adherence to malaria programs after 1963.**

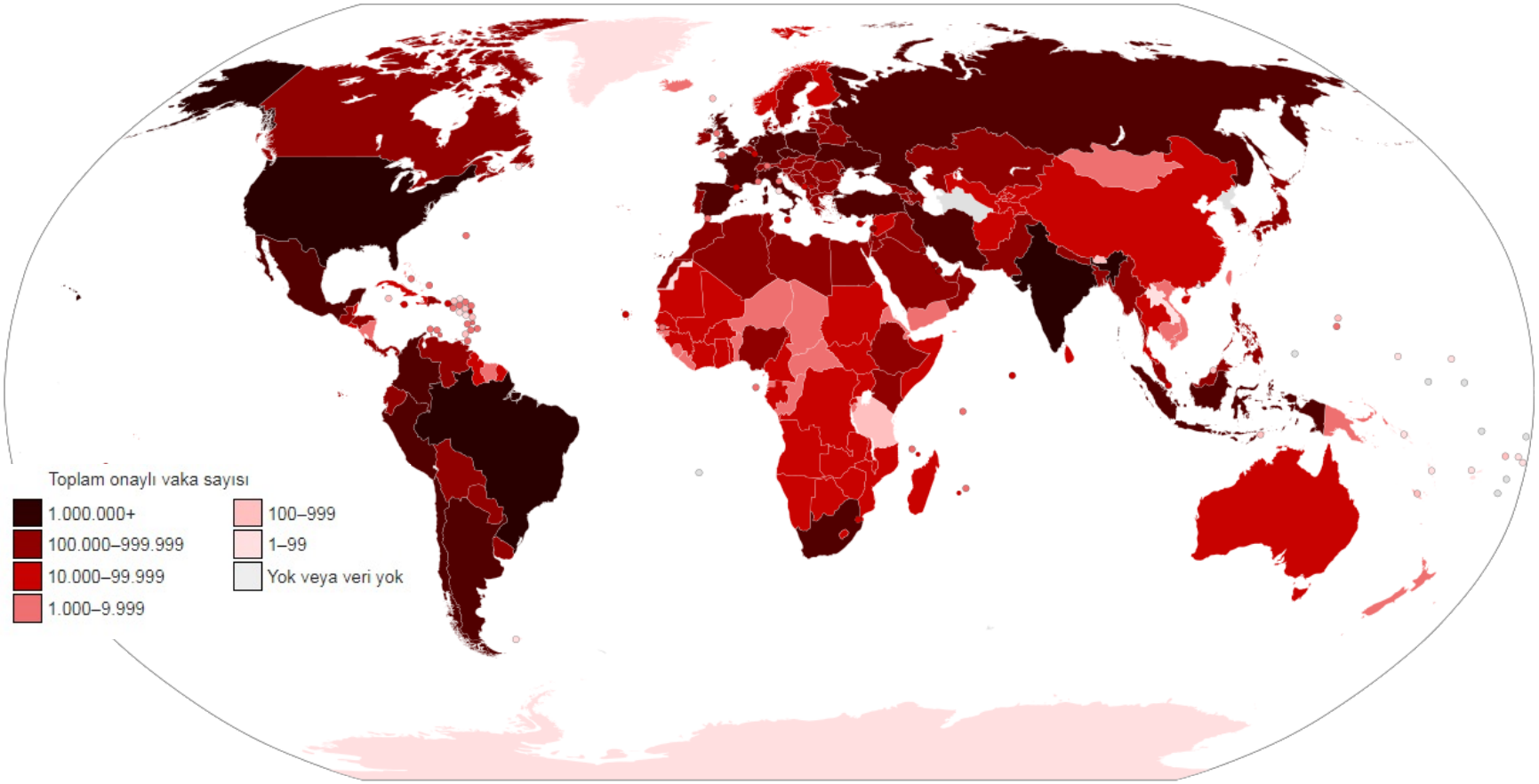
- Long-term use of DDT has spawned DDT-resistant mosquitoes, concurrently, inadequate treatment regimens, inadequate drug provision, and drug abuse have contributed to the rise of drug-resistant malaria.
- According to the WHO, 216 million cases of malaria were reported worldwide in 2016, and 445,000 people died from malaria (more than 90% of deaths from malaria are in Africa.
- The re-emergence of malaria shows that there is no room for slack in the fight against infectious diseases; It has been shown that the causative microbe may develop by transforming into a more contagious form or by appearing in newer ways of infection.

- **The rise of New Infectious and Parasitic Diseases; Multidrug-resistant tuberculosis, malaria and meningitis, and new forms of cholera, most recently covid-19, have shaken our composure in science's ability to control infectious diseases.**
- Various factors have been responsible for the re-emergence of BPHs. One reason why communicable diseases cause a greater percentage of deaths in areas such as sub-Saharan Africa is demographics. Widespread poverty, malnutrition and inadequate public health systems have contributed to the high mortality rates of the young population.
- The majority of existing BPHs can be prevented with vaccination, safe drinking water, proper food storage, safe sex practices, and personal hygiene.
- **Changes in the natural environment have contributed to the re-emergence of BPHs. Human-induced changes have caused genetic changes in organisms or carriers that spread diseases.**
- **Misuse of antibiotics has contributed to an increase in drug-resistant forms of malaria and tuberculosis, and has resulted in an increase in HIV/AIDS, tuberculosis and pneumonia.**

- Agricultural practices have affected the environment in which microbes live and spread.
- Social, economic and political conditions facilitated their return and spread.
- Population movements have long been an important avenue for the spread of diseases.
- Settlement and urbanization have concentrated populations and allowed diseases that have recently been epidemic in confined spaces or for short periods of time.
- Rapid population growth and urbanization have contributed to the increase in BPHs as they mean governments are unable to provide adequate or basic healthcare or infrastructures such as clean water.

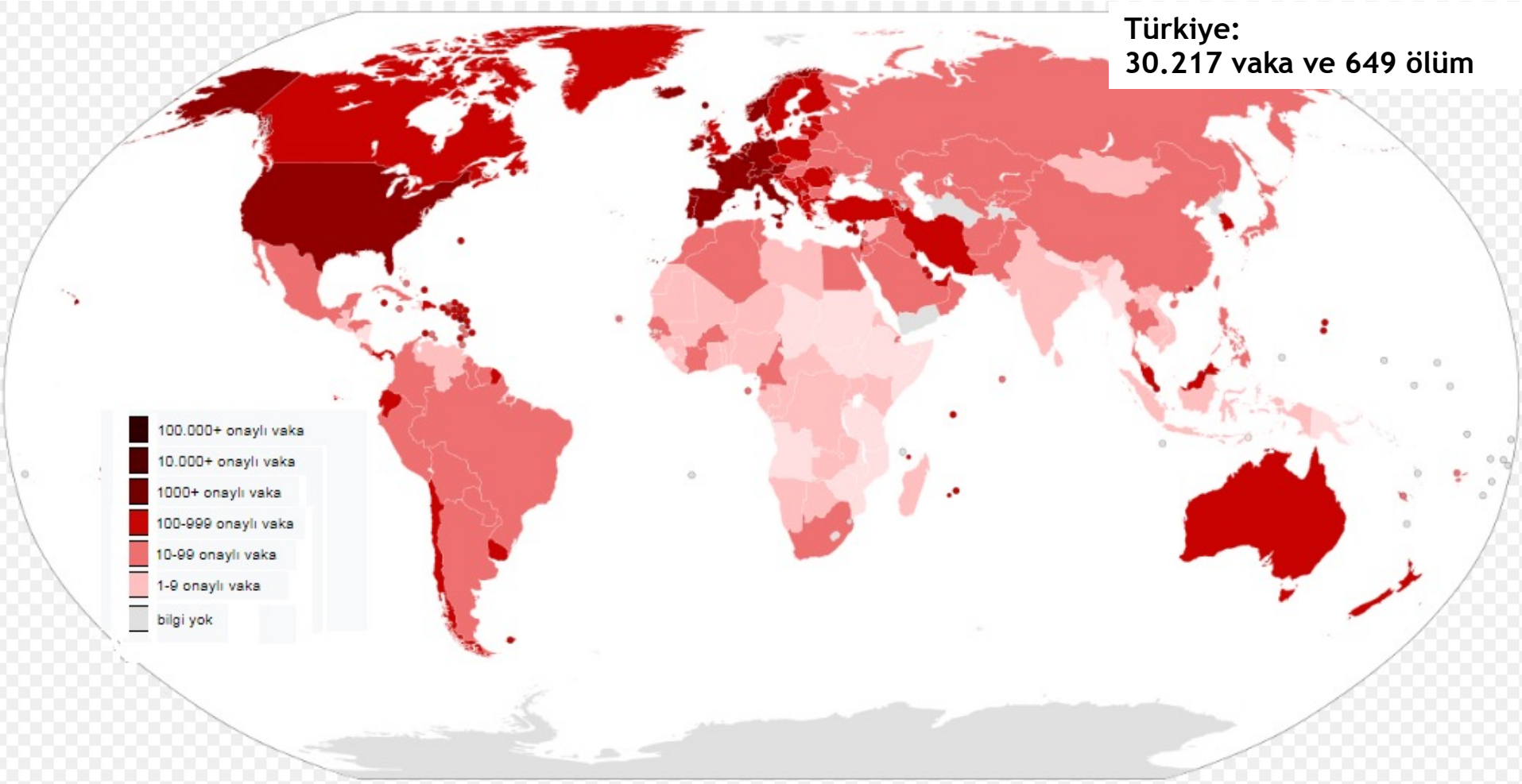
- The 21st century has brought new challenges in the control of Infectious and Parasitic Diseases (BPH's).
- Civil conflicts have hindered the delivery of needed medicine and food, leading to the inability to provide public health services and has been the most important cause of the increase in BPHs.
- The refusal of individuals or societies to vaccinate can also lead to the spread of preventable diseases and deaths.
- Perhaps more worrying is the speed of the disease and the ease with which it is carried.
- The acceleration of movement between countries, thanks to air travel, has brought additional challenges to the control of BPHs.
- By planes, the possibility of spreading diseases around the world can be within hours.
- The Covid-19 disease, which is spread by the contagion of coronaviruses, is the closest and most vivid example that the whole world has experienced.

Distribution of Covid-19 Case Numbers in the World, as of 1.4.2021



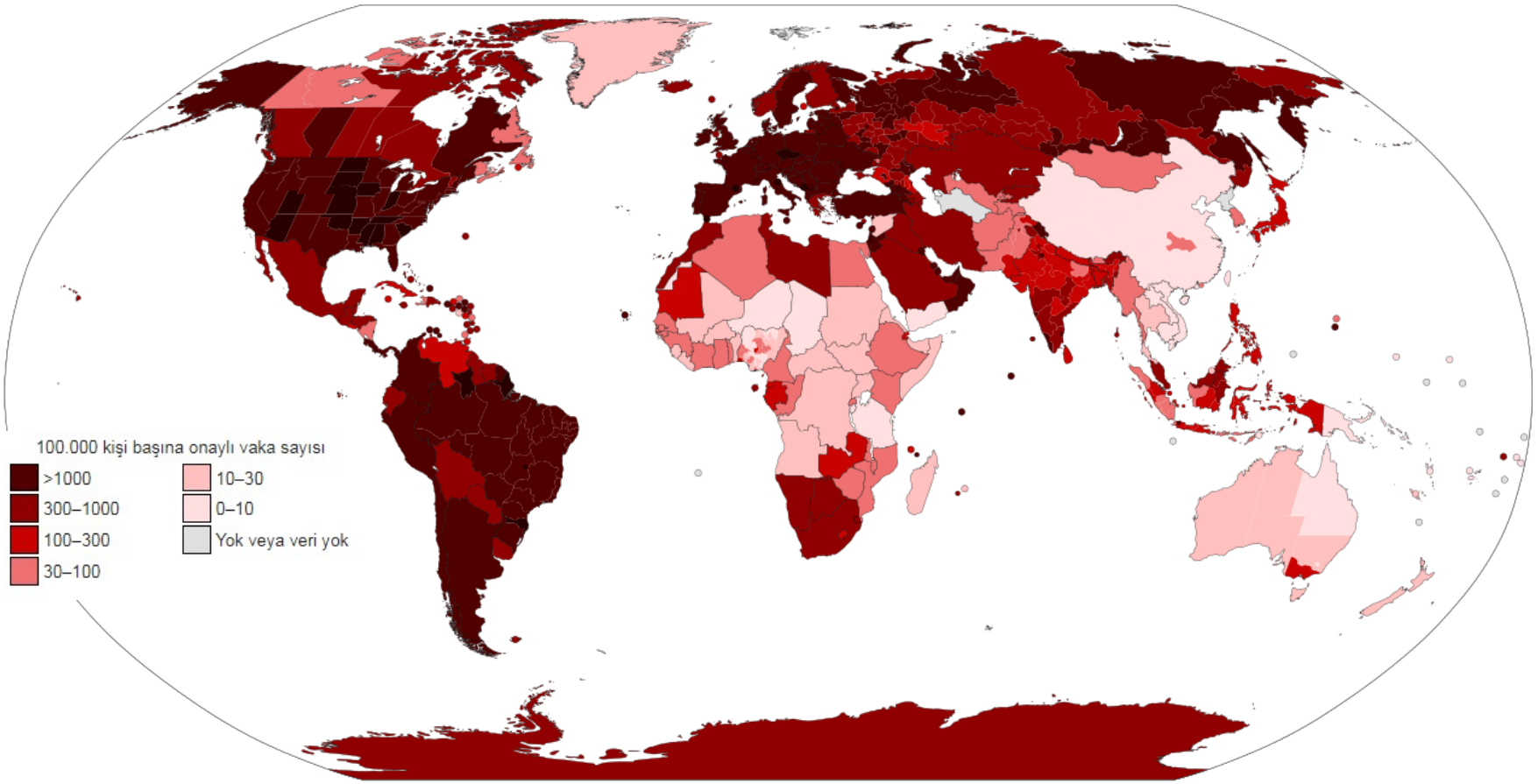
Source: https://tr.wikipedia.org/wiki/%C3%9Clke_ve_b%C3%B6lgelere_g%C3%B6re_COVID-19_pandemisi#/media/Dosya:COVID-19_Outbreak_World_Map.svg

Distribution of the Number of Covid-19 Cases Reported in the World, as of 6.4.2020



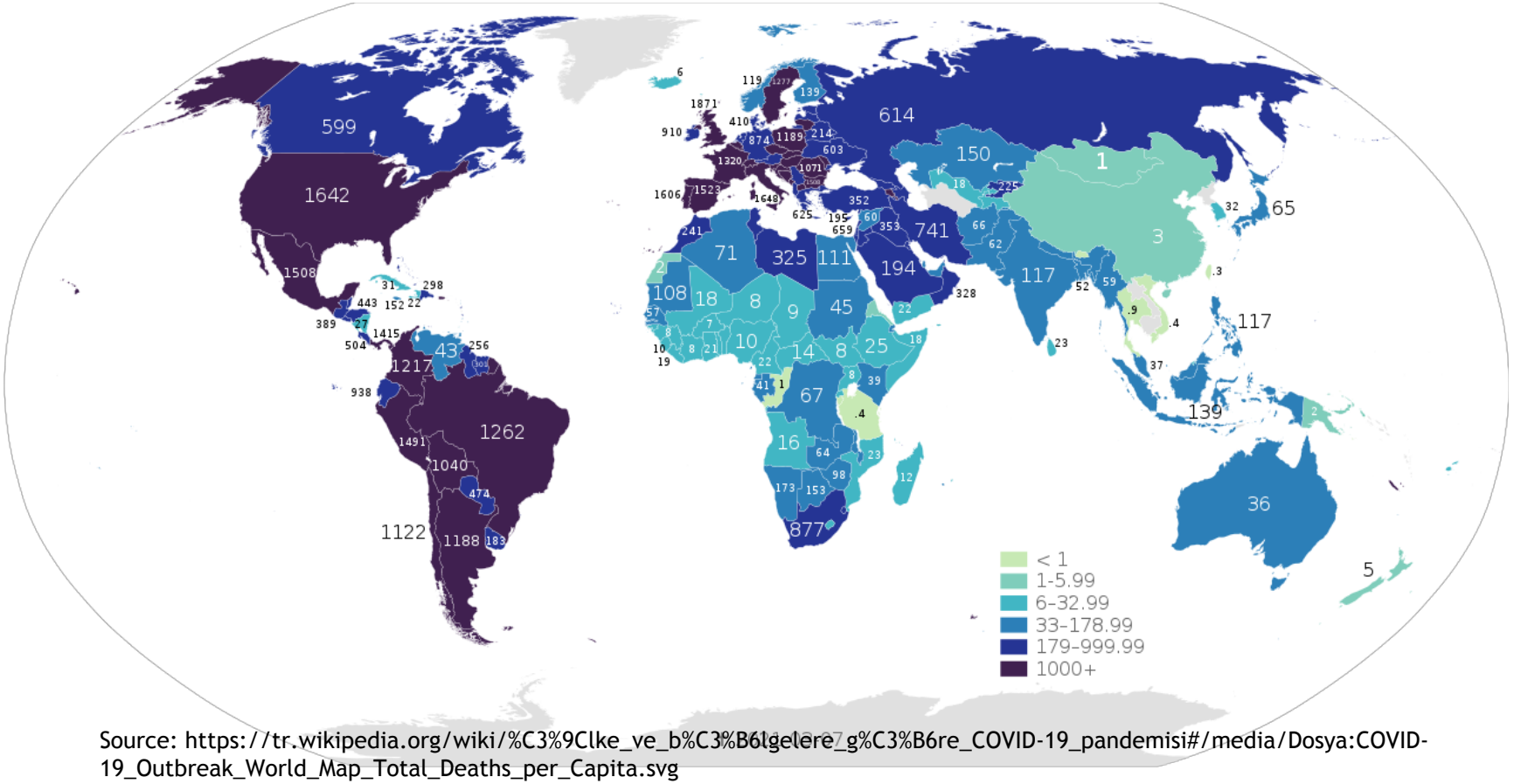
Source: https://tr.wikipedia.org/wiki/2019-20_koronavir%C3%BCs_pandemisi#/media/Dosya:COVID-19_Outbreak_World_Map_per_Capita.svg

The number of confirmed cases per 100,000 people in the world, as of 24.3.2021



Source: https://tr.wikipedia.org/wiki/%C3%9Clke_ve_b%C3%B6lgelere_g%C3%B6re_COVID-19_pandemisi#/media/Dosya:COVID-19_Outbreak_World_Map_per_Capita.svg

Confirmed deaths per 1 million people, 7.3.2021

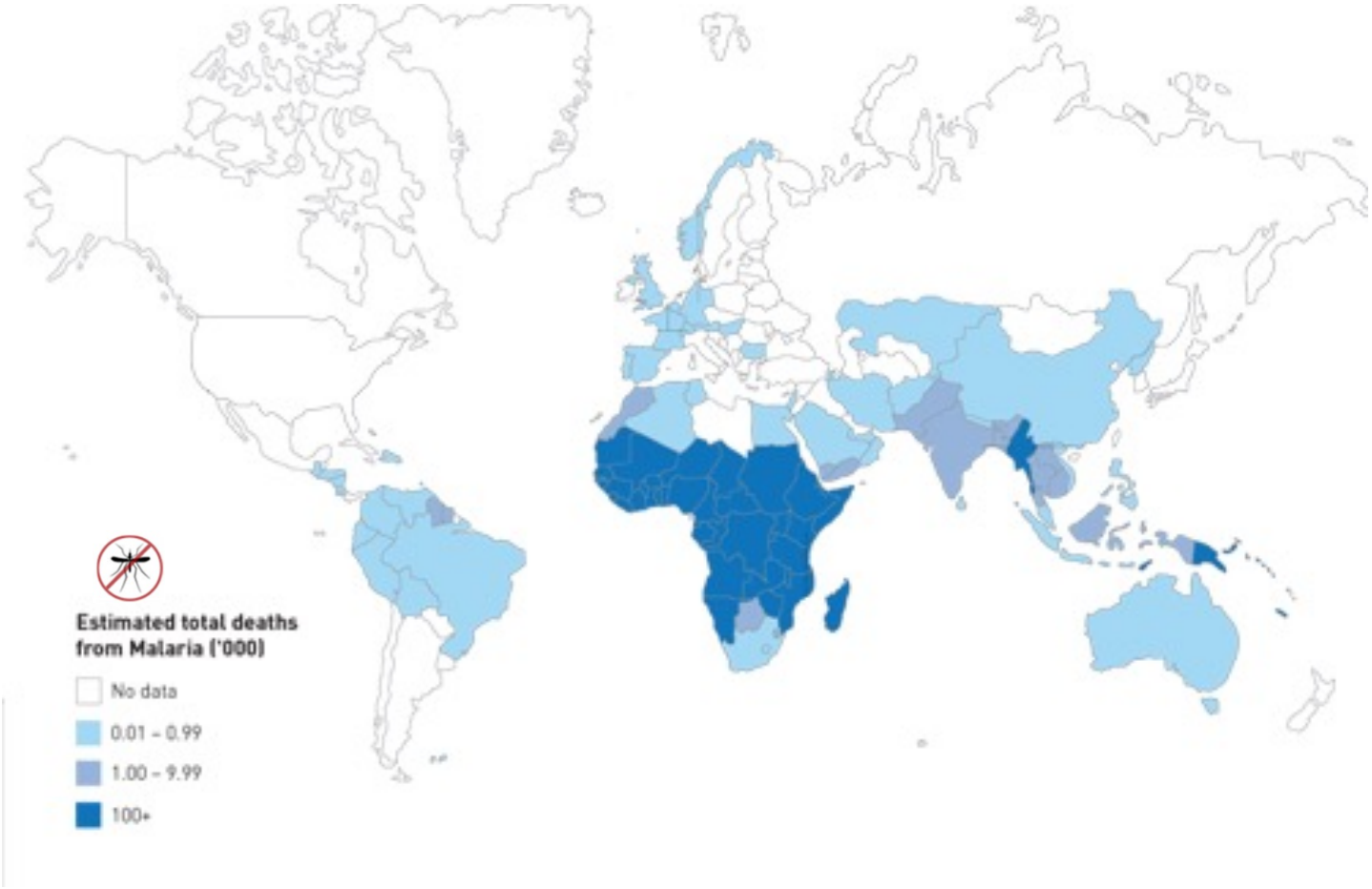


Source: https://tr.wikipedia.org/wiki/%C3%9Clke_ve_b%C3%B6lgelere_g%C3%B6re_COVID-19_pandemisi#/media/Dosya:COVID-19_Outbreak_World_Map_Total_Deaths_per_Capita.svg

21.03.2022
Coronavirus Cases: **472.688.046**
Deaths: **6.105.730**

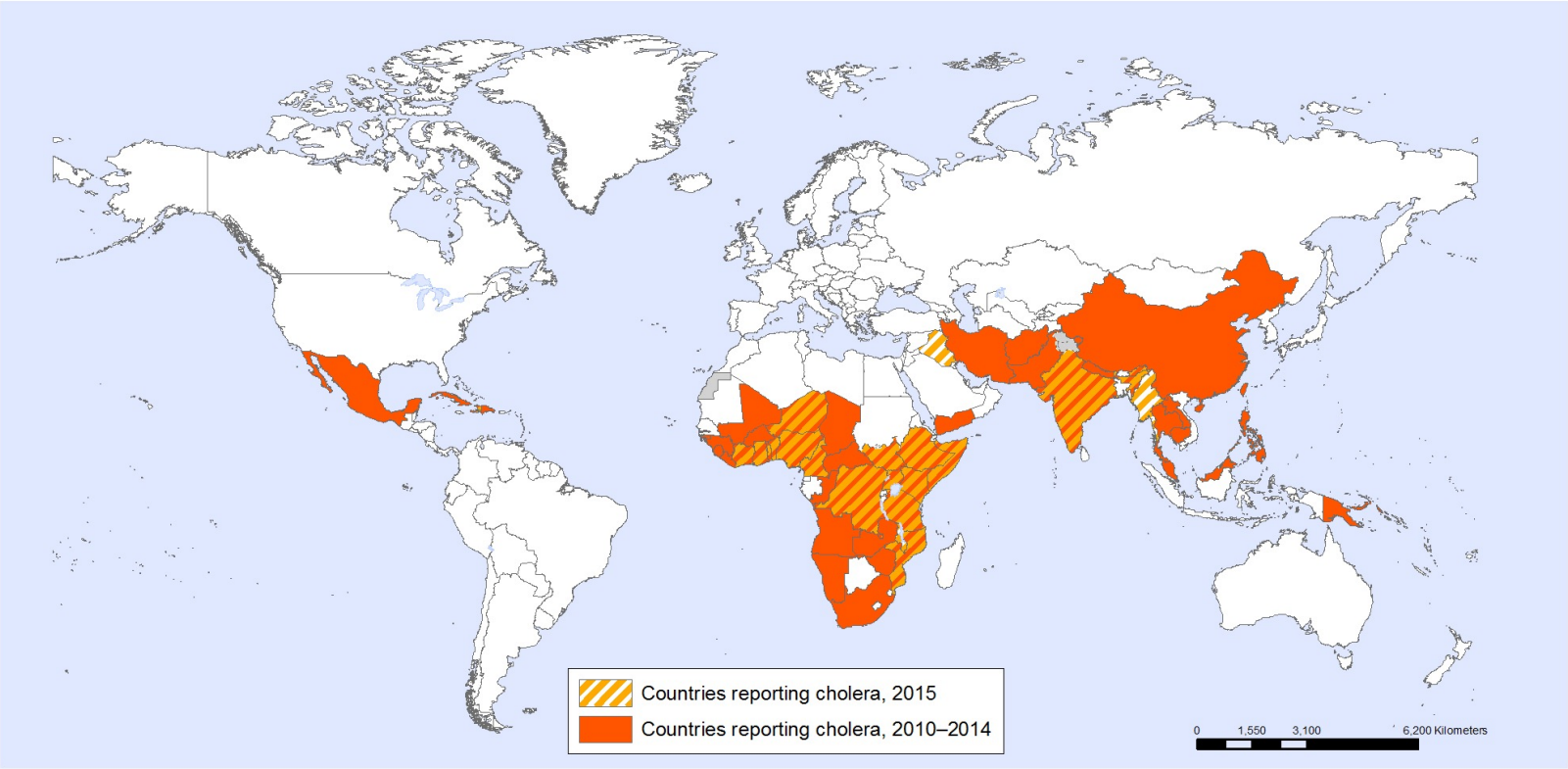
Source: https://www.worldometers.info/coronavirus/

Estimated Number of Reported Malaria Deaths: World, 2010



Source: https://www.researchtrends.com/issue14-december-2009/behind-the-data/

Cholera Reported Countries, 2010-2015



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Information Evidence and Research (IER)
World Health Organization

World Health Organization

- **The Human Immunodeficiency Virus (HIV), which causes AIDS, has changed mortality patterns and life expectancies worldwide, and perhaps sums up very well the potential for the emergence of new infectious diseases and their devastating effects.**
- By attacking the immune system, HIV overwhelms the human body's ability to fight disease and infection. It is a virus that causes AIDS (Acquired Immune Deficiency Syndrome), which is the last and severe form of HIV (Human Immunodeficiency Virus).
- **HIV is spread through direct contact with bodily fluids (especially blood, breast milk, semen, and vaginal fluids). Sexual contact, when drug users share injectors, are the main routes of spread.**
- Two subtypes of HIV have been identified: HIV-1, which is found worldwide, and HIV-2, which is common in West Africa and particularly in the Portuguese colonies. The routes of spread and risk factors for both types are the same. However, the latent period of HIV-2 is longer.
- **The virus that causes AIDS was first identified in the USA in 1981. However, investigations began after the discovery of cases in many different regions.**

*For additional information:, http://www.hatam.hacettepe.edu.tr/klinik.shtml

- **The number of children and adults living with HIV/AIDS worldwide has been estimated by WHO as 36.7 million people with HIV, and the virus has become a thoroughly modern pandemic. In 2015, 2.1 million new HIV infections occurred worldwide.**
- The number of people receiving treatment in East and South Africa, the most affected region of the world, has doubled since 2010 to reach approximately 10.3 million.
- **In 2011, the rate of people with HIV/AIDS virus among the population aged 15-49 is estimated to be 0.8% worldwide and 4.6% in Africa. However, this rate rises above 20% in some countries, especially among women (Swaziland: 26.0%; Botswana: 23.4%; Lesotho: 23.3%).**
- HIV/AIDS is now a leading cause of death worldwide. Close to 5 million new cases emerged in 2003 (Nakashima, 2004), and more than 20 million people have died from AIDS so far.
- **HIV/AIDS remains a serious health and survival problem in the African continent, especially in the southern, eastern and central parts of Africa, and as a contagious disease, it has an impact on mortality.**

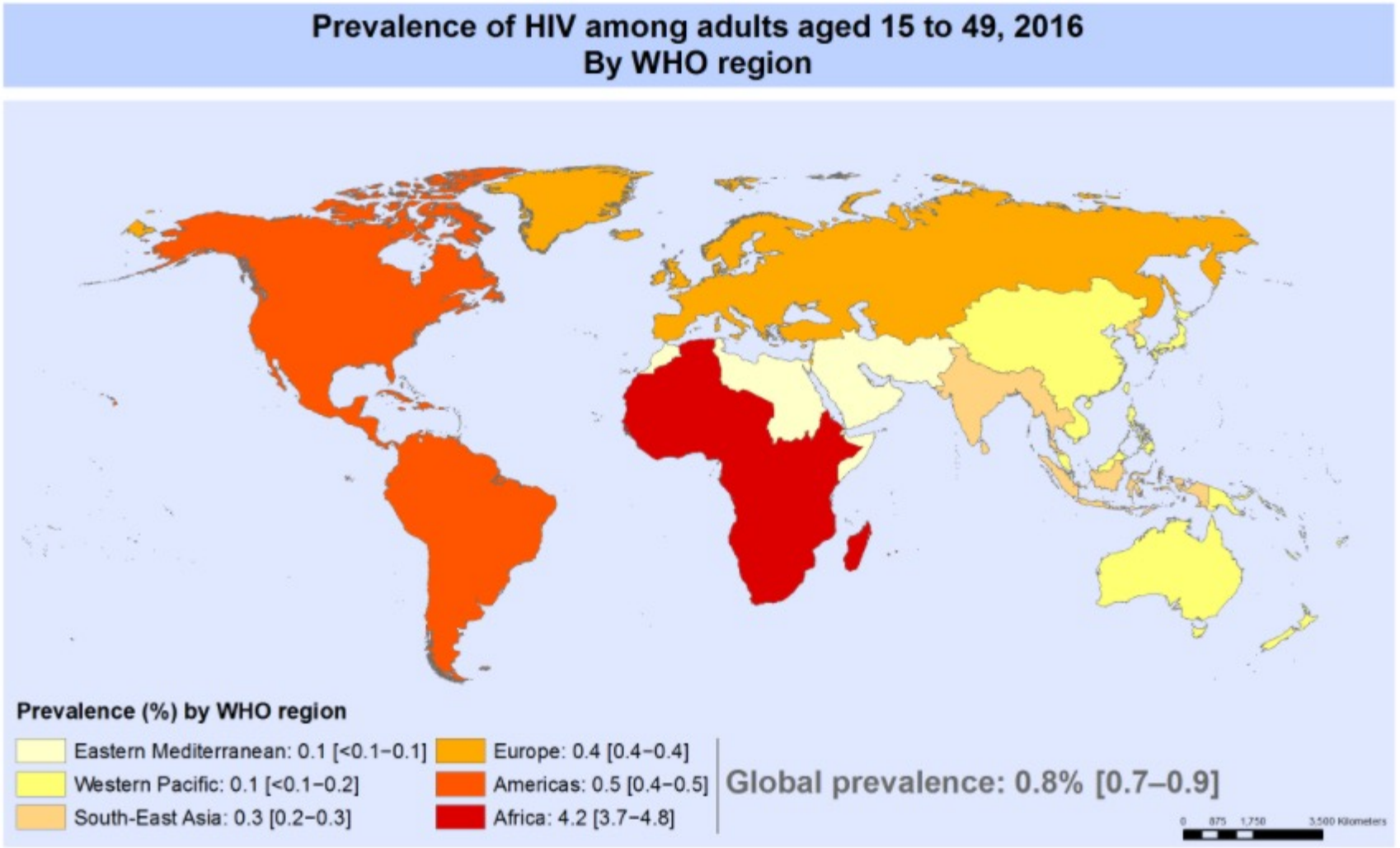
- **Men were more affected in the initial phase of the epidemic, but women outnumbered men in new cases in poor and low-status countries (Lamptey et al., 2002).**

- In Africa, biological and socio-economic factors (such as women's lack of education, forced marriage, men's preference for younger women) and multiple sex partners and prostitution are helping to spread HIV worldwide.

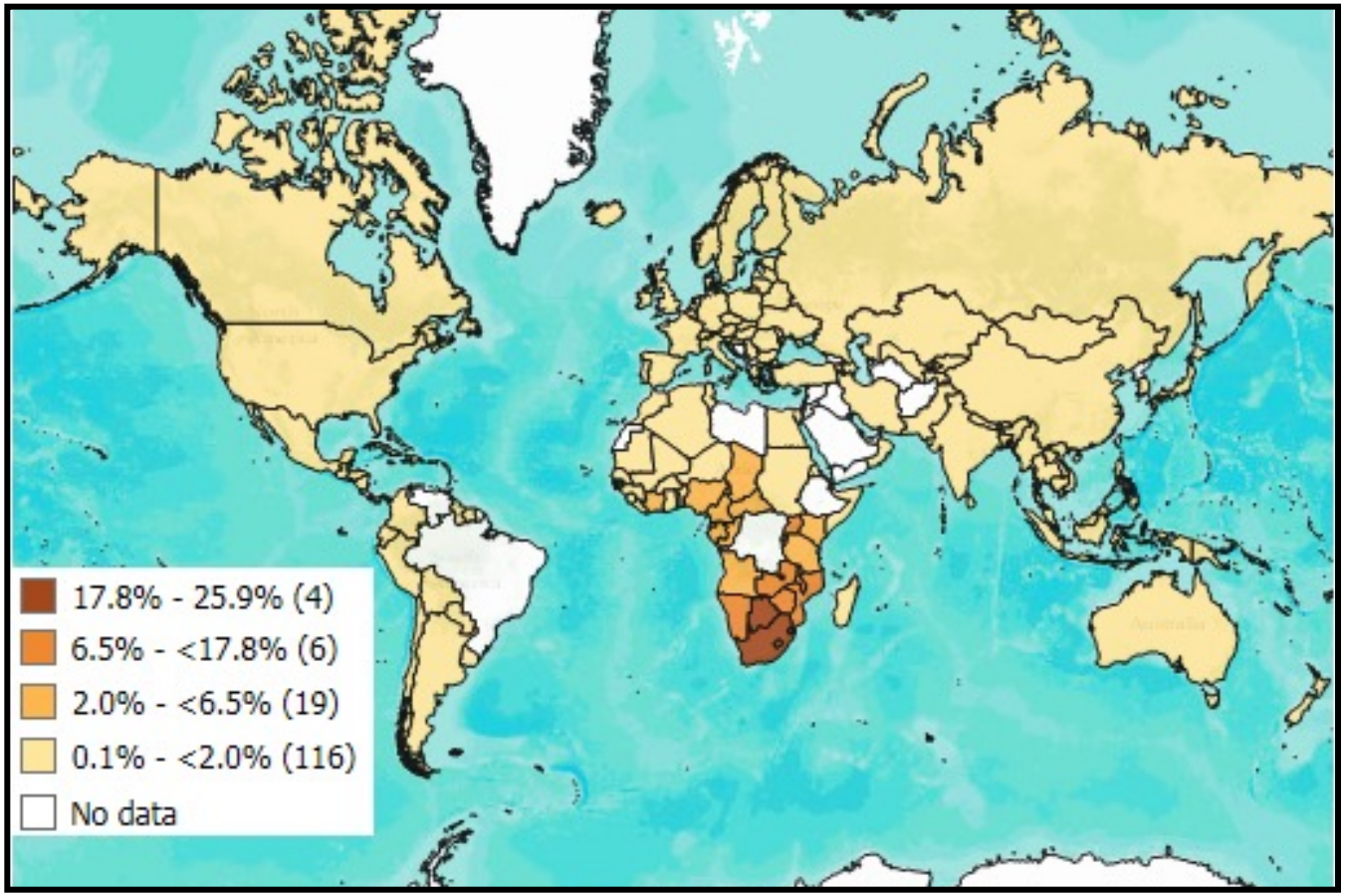
- **In AIDS-affected countries, infant mortality rates have increased, life expectancy at birth has decreased, and there has been a jump in deaths from various diseases.**

- AIDS has led to a rapid increase in the number of orphaned children because their parents died.

HIV-AIDS Frequency Among 15-49 Age Group Population: World, 2016



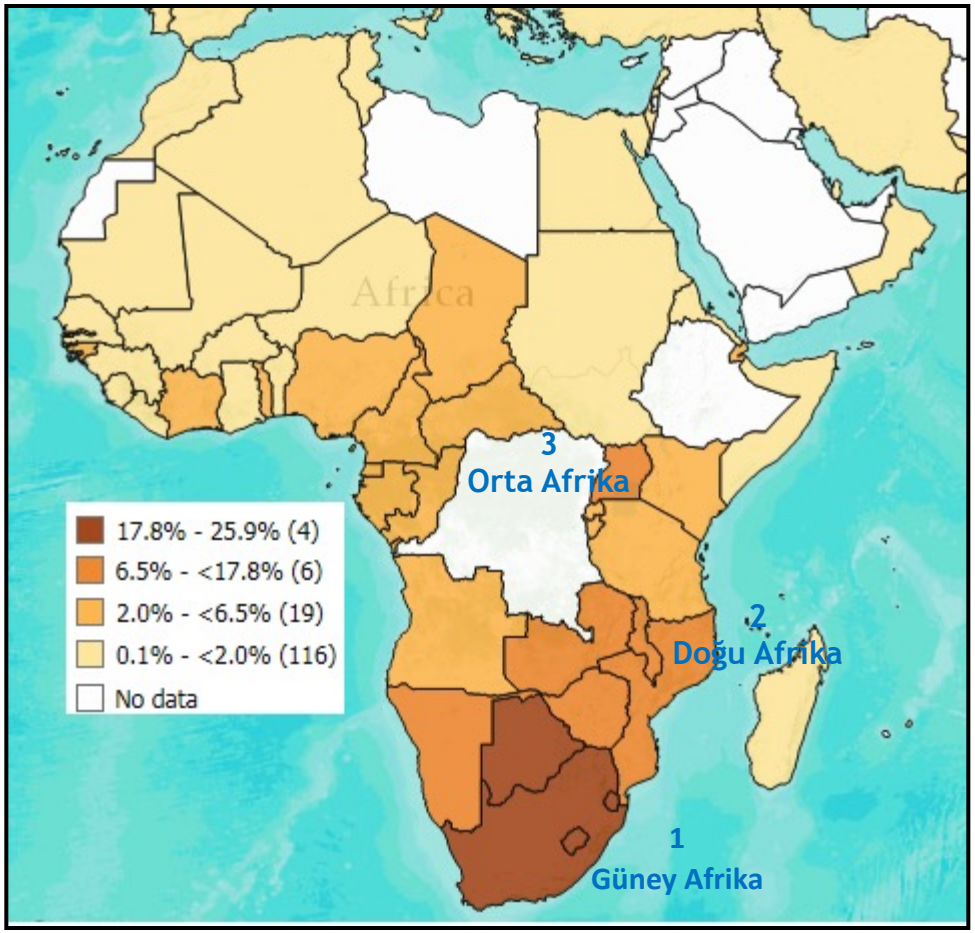
HIV-AIDS Among the 15-49 Age Group Population: World, 2009



Turkey: Less than 0.1%. World: 0.8%; Swaziland: 25.9%; Botswana: 24.8%; Lesotho: 23.6%; South Africa: 17.8%.

Source: PRB 2011 World Population Data Sheet

HIV-AIDS Among the 15-49 Age Group Population: Africa, 2009



Source: PRB 2011 World Population Data Sheet

Turkey: Less than 0.1%. World: 0.8%; Swaziland: 25.9%; Botswana: 24.8%; Lesotho: 23.6%; South Africa: 17.8%.

- *Demographic Results:*

- HIV/AIDS has wreaked havoc on the population structure of many African countries, and its most obvious consequence has been increased mortality.

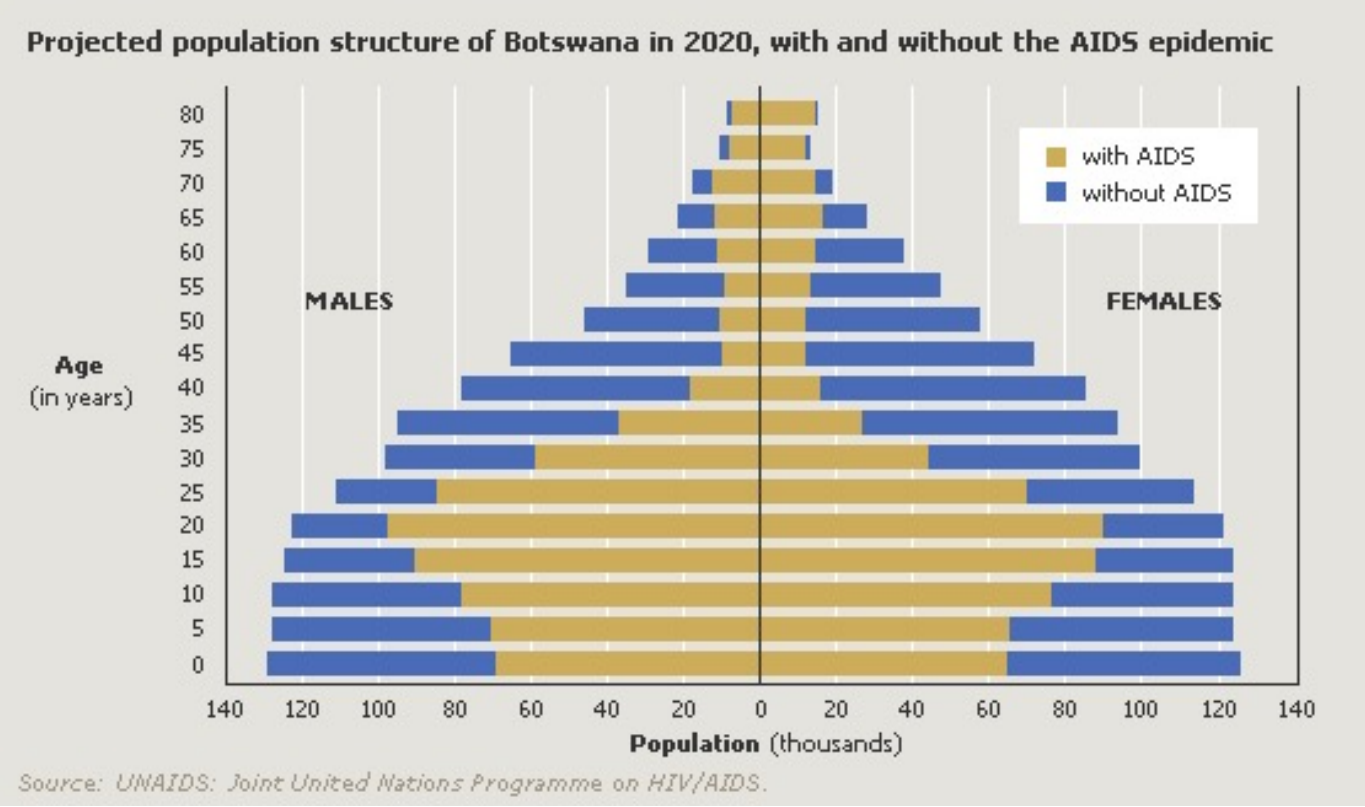
- In countries with high HIV/AIDS incidence rates, the broad-based traditional population pyramid representing the young population has been reconstructed by carving out the young adult population group and is characterized as a population chimney.

- The high mortality caused by AIDS has also changed population growth rates. Therefore, some African countries are expected to experience negative natural growth rates this century.

- HIV/AIDS has reduced the life expectancy, which generally increases due to the developments in diet and health in the world, to less than 45 years in some countries in Africa in 2000-2005.

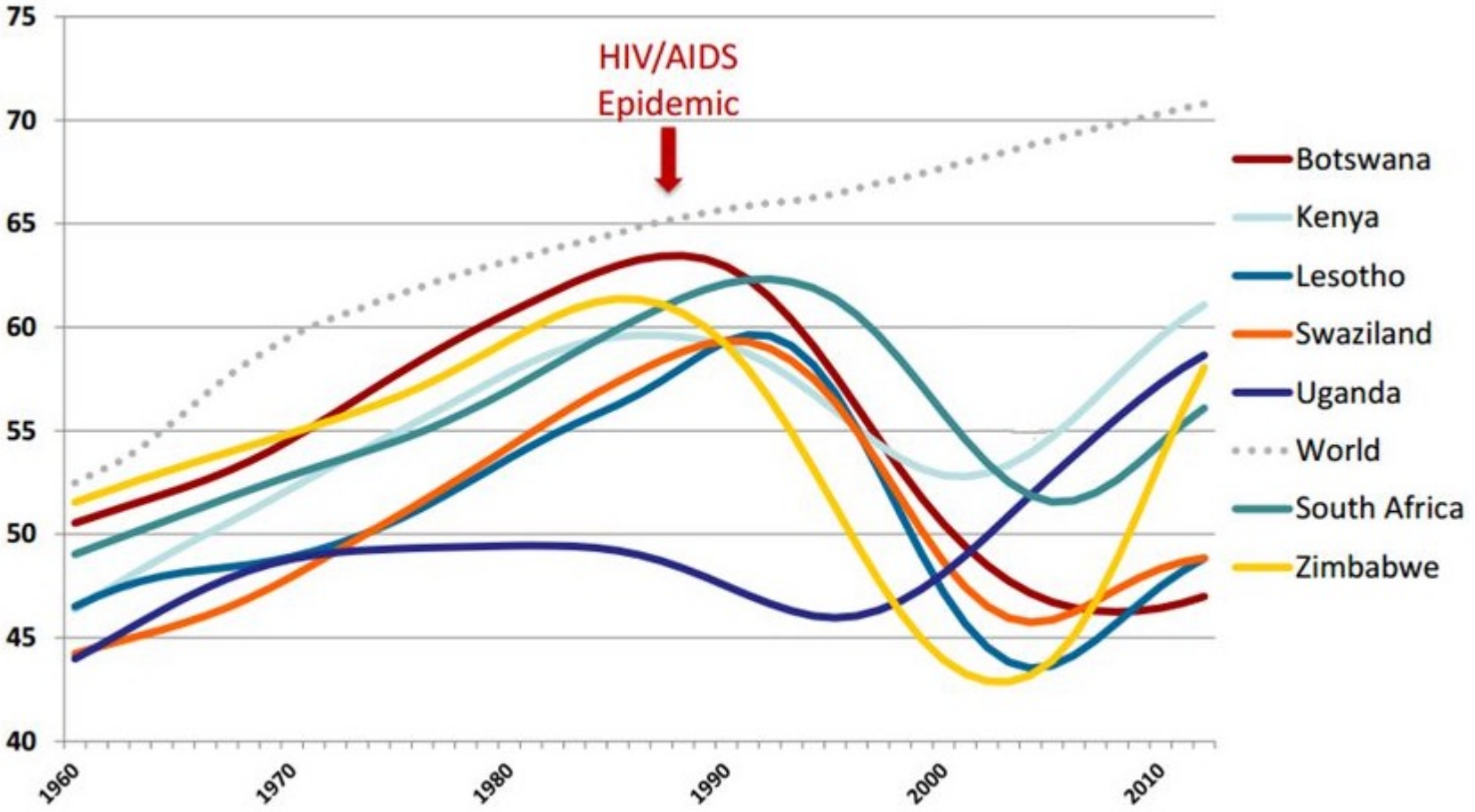
Impact of HIV/AIDS on Population Structure: Botswana

- Many young people (especially the 25-45 age group) lost their lives due to AIDS, and even in some countries such as Botswana, the age structure was affected by this situation.



Source: http://www.globalchange.umich.edu/gctext/Inquiries/Inquiries_by_Unit/Unit_6.htm

The Effect of HIV/AIDS on Life Expectancy at Birth



Ambassador Deborah L. Birx, MD. "Delivering an AIDS-free Generation." Kaiser Family Foundation Town Hall Forum. 23 June 2014.

- *Social Results:*
- The impact of HIV/AIDS has reached almost every corner of daily life and has affected individuals, families and communities.

- In the countries most affected by the epidemic, HIV has occurred in a climate of deteriorating public services, weak employment and poverty, all of which have reduced the ability to fight the disease. Families have carried a large part of the burden, with differences in coping ability based on wealth and income.

- In poor families, the death of an adult member reduces the allowance for food and drink. The death of just one parent also disrupts life and economic capabilities. Many families are unable to cope with the death of a loved one or the burden of care associated with illness or death.

- Even if they are not infected, the responsibility for childcare falls on women. The burden of widows, who are deprived of property and inheritance rights in many African countries, also increases as they lose their economic livelihoods due to epidemics. Too often, children are left with a future that reflects only what the streets have to offer.

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