



Ankara University
SCHOOL OF MEDICINE

The First Medical School In The Republic of Turkey (1945)

Nutrition and Public Health

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Nutrition...

- **Nutrition** is the intake of food, considered in relation to the body's dietary needs.
- **Good nutrition** - an adequate, well balanced diet combined with regular physical activity – is a cornerstone of good health.
- **Poor nutrition** can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity.

<https://www.who.int/topics/nutrition/en/> 2.3.19

***What is
hidden
hunger?***

Hidden hunger is a lack of vitamins and minerals

- Hidden hunger occurs when the quality of food people eat does not meet their nutrient requirements, so the food is deficient in micronutrients such as the vitamins and minerals that they need for their growth and development.
- **2+ billion people suffer from vitamin and mineral deficiencies.**
- **Women and children in families with low-income and the Poor** often can't get enough **Vitamin A, Iodine and Iron**, and sometimes other essential nutrients. This deprivation limits their growth, development, health and working capacity.
- Ensuring people get vitamins, minerals and essential nutrients will help prevent **malnutrition**.

[https://www.who.int/nutrition/topics/WHO FAO ICN2 videos hiddenhunger/en/](https://www.who.int/nutrition/topics/WHO_FAO_ICN2_videos_hiddenhunger/en/) 22.3.19

The global food system is broken!

- Millions of people aren't getting enough to eat, and millions of others are eating too much of the wrong foods.
- *Many families can't afford enough nutrient rich foods like fresh fruit and vegetables, beans, meat and milk, while foods and drinks high in fat, sugar and salt are cheap and readily available.*
- **Undernutrition** and **overweight** are now problems affecting people within the same communities.

https://www.who.int/nutrition/topics/WHO_FAO_announce_ICN2/en/
22.3.19



<https://youtu.be/-HPNrPQNTR4>

BMI classification

Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m^2). For example, an adult who weighs 70 kg and whose height is 1.75 m will have a BMI of 22.9. $\text{BMI} = 70 \text{ kg} / (1.75 \text{ m}^2) = 70 / 3.06 = 22.9$

The International Classification of adult underweight, overweight and obesity according to BMI



Classification	BMI(kg/m^2)	
	Principal cut-off points	Additional cut-off points
Underweight	<18.50	<18.50
Severe thinness	<16.00	<16.00
Moderate thinness	16.00 - 16.99	16.00 - 16.99
Mild thinness	17.00 - 18.49	17.00 - 18.49
Normal range	18.50 - 24.99	18.50 - 22.99
		23.00 - 24.99
Overweight	≥ 25.00	≥ 25.00
Pre-obese	25.00 - 29.99	25.00 - 27.49
		27.50 - 29.99
Obese	≥ 30.00	≥ 30.00
Obese class I	30.00 - 34.99	30.00 - 32.49
		32.50 - 34.99
Obese class II	35.00 - 39.99	35.00 - 37.49
		37.50 - 39.99
Obese class III	≥ 40.00	≥ 40.00

Source: Adapted from WHO, 1995, WHO, 2000 and WHO 2004.

The global food system is broken!

Stunting

151 million

Children are stunted

Joint malnutrition estimates

Overweight

1.9 billion

Adults 18 years and older

Double burden of malnutrition

SDGs

12 of 17

SDGs require good nutrition in order to be met

Sustainable Development Goals (SDGs)

The global epidemic of overweight and obesity - "**globesity**" - is rapidly becoming a *major public health problem* in many parts of the world. Paradoxically co-existing with undernutrition in developing countries, the increasing prevalence of overweight and obesity is associated with many diet-related chronic diseases including DM (diabetes mellitus), cardiovascular disease, stroke, hypertension and certain cancers.

Did you **know?**

Over
820 million
people suffer from **hunger**.



149 million
children under five are **stunted**,
while **49 million**
are affected by **wasting**.



670+ million
adults and
120+ million
boys and girls
(age 5-19) are **obese**.

40 million children
under five are **overweight**.

Unhealthy diets, combined
with sedentary lifestyles, are the
No. 1 risk factor for
disability and death from
non-communicable diseases.



Health problems linked to
obesity cost national budgets
worldwide an estimated
USD 2 trillion
in treatment each year.



Different forms of
malnutrition can co-exist
within the same household and
even the same individual during
their lifetime and can be passed
from one generation to the next.

Environmental damage
caused by the food
system could increase
50-90% in low- to
middle-income countries due to
the increased consumption of
processed foods and meat.



Some 6 000 **plant species**
have been cultivated for food
throughout human history. Today,
only 8 of them **supply**
more than 50% of
our daily calories.

Climate change threatens to
reduce both the quality and quantity of
crops, lowering yields.



- ❑ If you do buy canned, dried or frozen goods, choose those low in saturated fat, salt and added sugars.
- ❑ *Look for foods with less than five grams of added sugar per serving, less than 200 milligrams of salt per serving and less than 1.5 grams of saturated fat per serving, experts recommend.*
- ❑ Sturdy veggies and starches — like broccoli, Brussels sprouts and sweet potatoes — also keep for a long time outside the freezer.



Eating too little



Malnourished
and weak

Eating moderately



Healthy Body

Eating in excess
and not moving



Overweight or
Obese

1 40% reduction in the number of children under-5 who are stunted

2 50% reduction of anaemia in women of reproductive age

3 30% reduction in low birth weight

4 no increase in childhood overweight

5 increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%

6 reduce and maintain childhood wasting to less than 5%

Global targets 2025..

To improve

- maternal,
- infant
- and young child nutrition



https://www.who.int/nutrition/topics/nutrition_globaltargets2025/en/ 22.3.19

Burden of Hunger and Undernutrition

- Good governance and democracy and well-targeted aid and the implementation of policies and relevant programmes will reduce the **burden of hunger** and undernutrition in developing countries.
- The adoption of the MDGs by the world's leaders at the Millennium Summit of the UN and the declaration to

'free all men, women, and children from the abject and dehumanizing conditions of extreme poverty'

contributed a sense of urgency to address issues of nutrition and public health. (*Oxford Textbook of Public Health, 6th ed. p. 189*)

Turkish Demographic and Health Survey-2018

NUTRITION OF CHILDREN AND WOMEN

Nutrition is crucial for the growth, health and development of children, and is important for adults in terms of productivity, susceptibility to infections and, also for maternal health of women in particular.

The 2018 TDHS obtained information on several aspects of **infant feeding** practices including the duration and intensity of **breastfeeding**, the types of the complimentary foods given, and the usage of bottles with a nipple. Both the duration and intensity of breastfeeding are crucial to child health and development, as well as the age at which the child starts receiving supplemental foods and liquids.

http://www.hips.hacettepe.edu.tr/eng/tdhs2018/TDHS_2018_main_report.pdf p 133, 20.02.2020

Key Findings

- **Child nutrition:** Among children under age 5, 6% of them are short for their age (stunted), 2% are thin (wasted), 2% are underweight and 8% are overweight.
- **Breastfeeding:** 98% of children are breastfed at some point in their life. Contrary to recommendations, 42% receive a prelacteal feed.
- **Early breastfeeding:** Among children under age 2, 71% were breastfed within 1 hour of birth.
- **Exclusive breastfeeding:** 41% of infants under age 6 months are exclusively breastfed, and the median duration of exclusive breastfeeding is 1.8 months.
- **Maternal nutrition:** 4% of women age 15-49 are too thin. More than half (59%) of women are overweight or obese.

Turkish Demographic and Health Survey-2018

The distribution of height and weight for children under 5 years of age is compared against the *WHO growth standard reference population* (WHO 2006). A wellnourished population will be similar to the reference population while a poorly nourished population will differ from the reference population.

Three indices: *height-for-age, weight-for-height, and weight-for-age* can be expressed in standard deviation units (**Z-scores**) from the median of the reference population and values less than or greater than 2 standard deviations from the median of the *WHO child growth standards* are used to define **malnutrition**.

Turkish Demographic and Health Survey-2018

Stunting, low height-for-age, is a sign of *chronic undernutrition*

that reflects failure to receive adequate nutrition over a long period of time.

The **height-for-age index** provides an indicator of linear growth among children.

The most direct causes of **stunting** are inadequate nutrition (not eating enough or eating foods that lack growth-promoting nutrients) and recurrent infections or chronic diseases which cause poor nutrient intake, absorption, and utilization. Thus, *height-for-age represents a measure of the long-term effects of malnutrition* in a population and does not vary appreciably according to the season of data collection.

The double burden of malnutrition

- ***The double burden of malnutrition*** is a situation where overweight and obesity exist side-by-side with under-nutrition in the same country.
- We see this a lot in countries that are going through fast economic growth, also known as the ***nutrition transition***.

- ***More than 800 million people go hungry yet half a billion people are obese.***

While undernutrition still kills almost 1.5 million women and children every year, growing rates of overweight and obesity worldwide are driving a rise in diseases like cancer, heart disease, stroke and diabetes.

- Ensuring access to a healthy diet and reducing exposure to foods high in fat, sugar and salt helps prevent malnutrition.

Scaling Up Nutrition (or SUN) Initiative-1

- Several programs to address the problem of nutrition worldwide have been initiated; significant among them has been the ***Scaling Up Nutrition (or SUN) Initiative***.
- **The SUN movement** is built through the engagement of nations affected by undernutrition and is a country-led movement that brings organizations together across sectors to support national plans *to scale up nutrition* and focuses attention on the *1000-day window of opportunity* for impact.
(Oxford Textbook of Public Health, 6th ed. p. 189)

Scaling Up Nutrition (or SUN) Initiative-2

- **The SUN Movement** promotes the implementation of *evidence-based nutrition interventions*, as well as integrating nutrition goals into broader efforts in **critical sectors** such as health, social protection, development, and agriculture.
- The latter has resulted in the recent focus on agricultural strategies to *sustainably reduce undernutrition* just as this approach in the past addressed the challenge of **food insecurity**.
(Oxford Textbook of Public Health, 6th ed. p. 189)



Nutrition

CDC nutrition efforts support public health strategies and programs that improve dietary quality, support healthy child development, and reduce chronic disease.

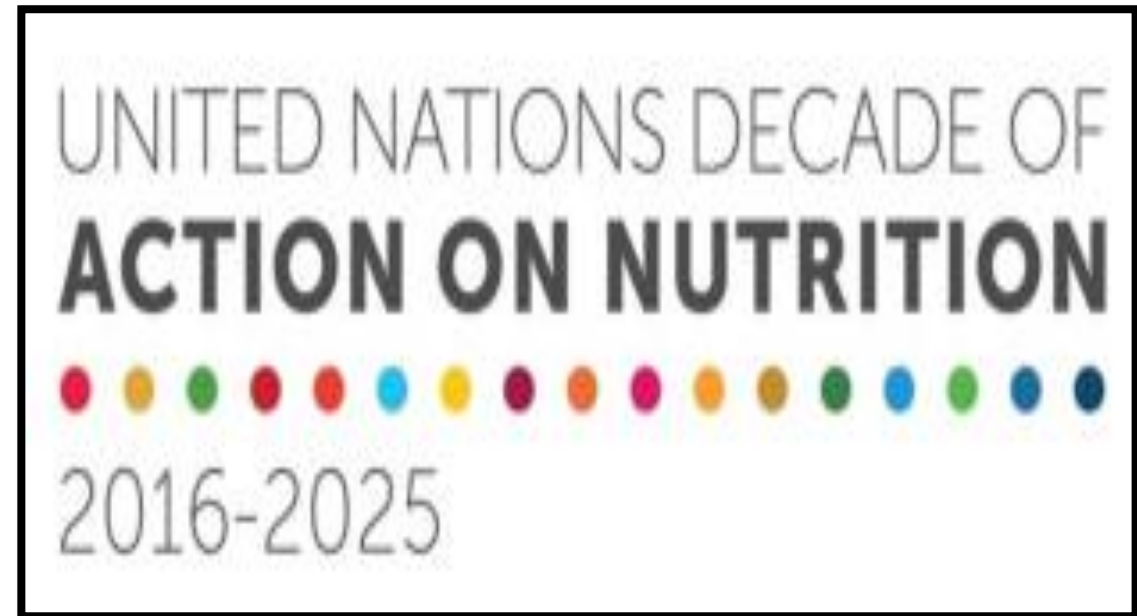
Learn more www.cdc.gov/nutrition/



Diet, nutrition, and chronic non-communicable diseases

- The evidence relating food and nutrition to chronic non-communicable diseases (NCDs) such as
 - *cardiovascular disease,*
 - *type 2 diabetes mellitus,*
 - *and cancers*
- comes from population-based epidemiological investigations and trials.

(Oxford Textbook of Public Health, 6th ed. p. 189)



Diet, nutrition, and cancers-1

- It is now widely accepted that **1/3 of human cancers could relate directly to some dietary component** (Doll & Peto 1981) and it is probable that diet plays an important role in influencing the *permissive role* of carcinogens on the development of many cancers.
- Thus, up to **80 % of all cancers may have a link with nutrition.**
(Oxford Textbook of Public Health, 6th ed. p. 192)



Diet, nutrition, and cancers-2

- Dietary factors are important in the causation of cancers of many sites and dietary modifications may reduce **cancer risk**.
- In general diets high in plant foods, especially vegetables and fruits, are strongly associated with a lower incidence of a wide range of cancers.
- Such diets tend to be low in saturated fat, high in complex carbohydrate and fibre, and rich in several anti-oxidant vitamins.
- Sustained and consistent

- intake of alcohol,

- physical inactivity, and

- obesity and body fatness are also associated with several cancers.

(Oxford Textbook of Public Health, 6th ed. p. 192)

Food safety-1

- **Food safety** refers to whether food is safe for human consumption and hence lacking in biological and chemical contaminants that have the potential to cause illness.
- The increasing concern over the **safety of foods** in the West is a paradox in that the epidemiological evidence on the safety of foods is quite contrary to the perceptions of the public and the media that the food available now is **less safe** than it used to be.
- The **improvements in public health** have virtually eradicated primarily food-borne infections that were associated with morbidity and mortality. (*Oxford Textbook of Public Health, 6th ed. p. 196*)

Food safety-2

- The common **food-borne diseases** currently encountered in the West are usually associated with mild, self-limiting gastroenteritis.
- Studies of **risk perception** suggest that the public becomes alarmed by **health threats** which are disproportionate to the actual risk associated with the disease and that this public concern is fuelled by the media which make health issues into media health scares depending on the news worthiness of the incidents. (*Oxford Textbook of Public Health, 6th ed. p. 196*)

***“Better
nutrition,
better
lives”***

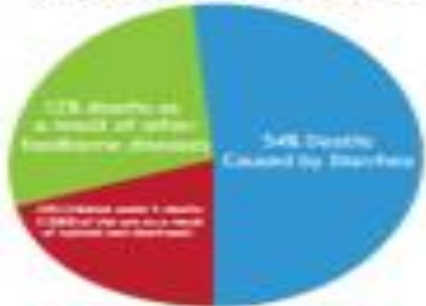
SAFER FOOD FOR ALL REGULATORS

The burden of foodborne diseases

EVERY YEAR 600 MILLION



420 000 deaths a year
as result of foodborne diseases



Foodborne diseases can be:

Short-term	Long-term
Nausea	Cancer
Vomiting	Kidney or liver failure
Diarrhea—commonly	Paralysis
	Brain and neural disorders



WHAT SHOULD
THE GOVERNMENT DO

- Formulate policy & regulatory framework
- Fund research institutions and hospitals
- Regular inspection of food outlets
- Come up with more food safety campaigns to educate public
- Capacity building include training

FOOD SAFETY STARTS WITH YOU

Source: WHO Estimates of the Global Burden of Foodborne Diseases, 2015.



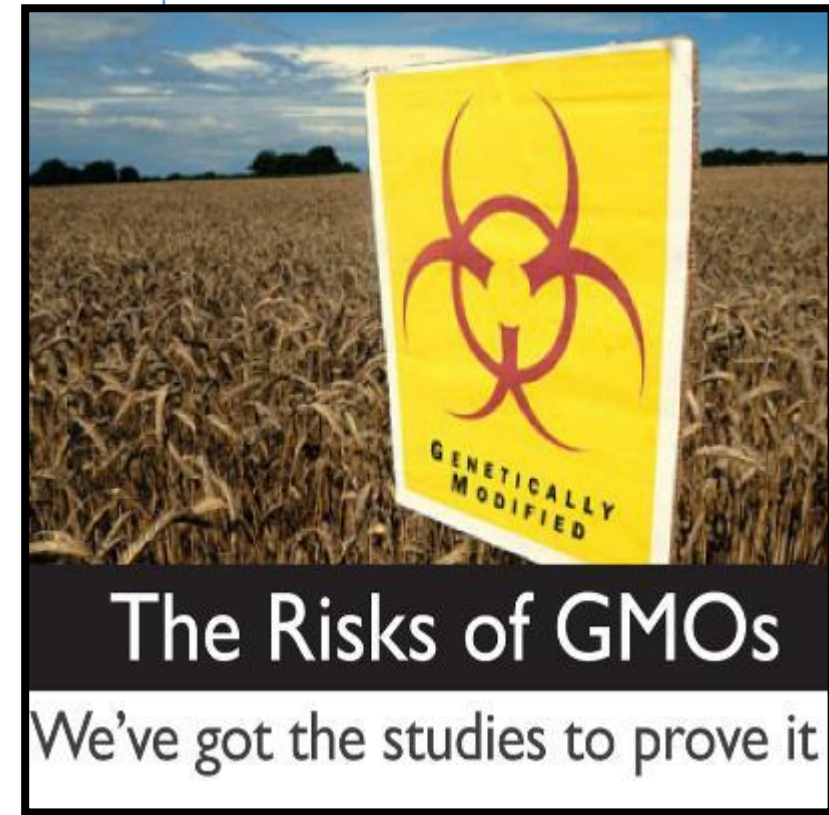
World Health
Organization

In 2015, the world's leading risk factors for premature death were smoking, high blood pressure, high blood sugar, **high body mass index** (BMI), and childhood undernutrition.

<https://www.medicalnewstoday.com/articles/313320.php>

Genetically modified (GM) foods

- Another issue that has created a considerable degree of controversy is the use of **biotechnology** to produce **genetically modified (GM) foods**.
- **Genetic modification** of food crops can be used to reduce food losses by increasing resistance to drought, frost, diseases, and pests and help control weeds and reduce post-harvest losses.
- Biotechnology can improve the nutritional value of foods, for example, by increasing protein or micronutrient content or by reducing saturated fat content. (*Oxford Textbook of Public Health, 6th ed. p. 196*)



Genetically modified (GM) foods

- They could help slow down ripening so that foods retain their quality much longer.
- Biotechnology can increase both the yield and the quality of crops grown on existing farmland and thereby reduces pressure on wildlife habitats.
- In the West, particularly in the UK and Europe, the opposition to GM foods is based largely on arguments that raise concerns with *ecological damage* that may follow large-scale use of GM crops.

(Oxford Textbook of Public Health, 6th ed. p. 196)



Genetically modified (GM) foods

- In developing countries the concerns are more related to the use of the '**terminator gene**' technology
- and the dependence on the large multinational agro-companies (MNC) for seeds and chemicals that the small farmers will inherit.
- At the heart of this controversy and the raging debate is the gulf between plant breeders, seed and agrochemical industries who promote biotechnology, and the campaigners who argue that GM technology may have hazardous consequences on the environment. (*Oxford Textbook of Public Health, 6th ed. p. 196*)

- Allergenicity: We already have allergies to peanuts and other foods. Introducing gene may create more allergies.
- Unknown effects on human health
- However, proposal to introduce a gene from Brazil nuts into Soyabeans was abandoned.

On the whole, with the exception of possible allergenicity, scientists believe that GM foods do not present a risk to human health!

Food labelling

- An important source of information for the consumer about the food on the supermarket shelf is the label on a food product.
- **Food labels** provide information that may be of interest to the consumer, especially with regard to the added chemicals (*additives, pesticide residues, colouring and flavouring agents, and preservatives*), fats, sugars, and energy content. (*Oxford Textbook of Public Health, 6th ed. p. 196*)



Functional foods

- New food products are being marketed as health-enhancing or illness-preventing foods.
- These are called **functional foods** or otherwise '**pharma-foods**', '**nutriceuticals**', or **novel foods**.
- Functional foods are generally defined as food products that deliver a health benefit beyond providing nutrients.
- The health benefits of functional foods may be conferred by a variety of production and processing techniques which include: **fortification** of certain food products with specific nutrients, using phytochemicals and active microorganisms, and by genetic modification of foods.
- The topic of functional foods is complex and controversial.

(Oxford Textbook of Public Health, 6th ed. p. 196)

Emerging epidemic of obesity and diet-related chronic diseases and the 'double burden' of malnutrition in developing societies

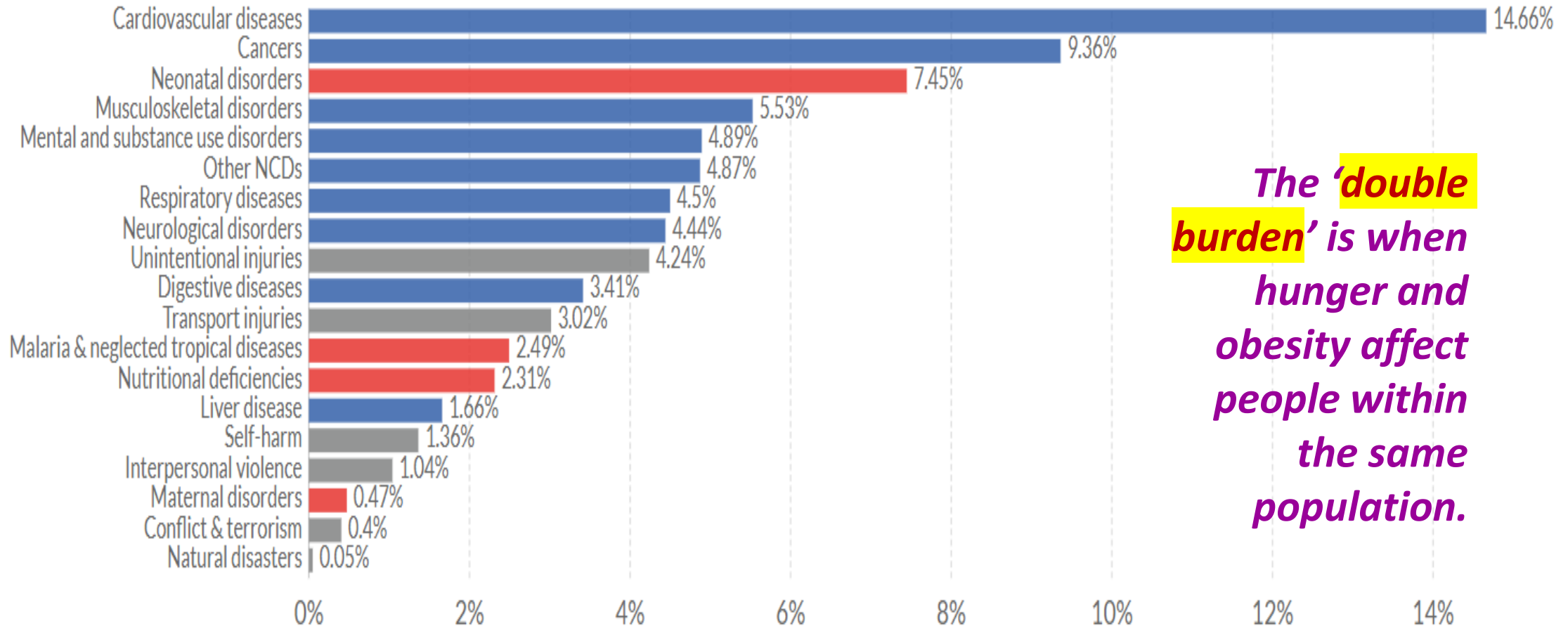
- A critical examination of the principal causes of **mortality and morbidity** worldwide indicates that *malnutrition and infectious diseases continue to be significant* contributors to the *health burden* in the developing world.
- Although reductions in the prevalence of undernutrition are evident, the numbers of individuals affected remain much the same or have even increased, largely due to *huge* increases in the population.

(Oxford Textbook of Public Health, 6th ed. p. 196)

Share of total disease burden by cause, World, 2017

Total disease burden, measured in Disability-Adjusted Life Years (DALYs) by sub-category of disease or injury.

DALYs measure the total burden of disease – both from years of life lost due to premature death and years lived with a disability. One DALY equals one lost year of healthy life.



The 'double burden' is when hunger and obesity affect people within the same population.

Source: IHME, Global Burden of Disease

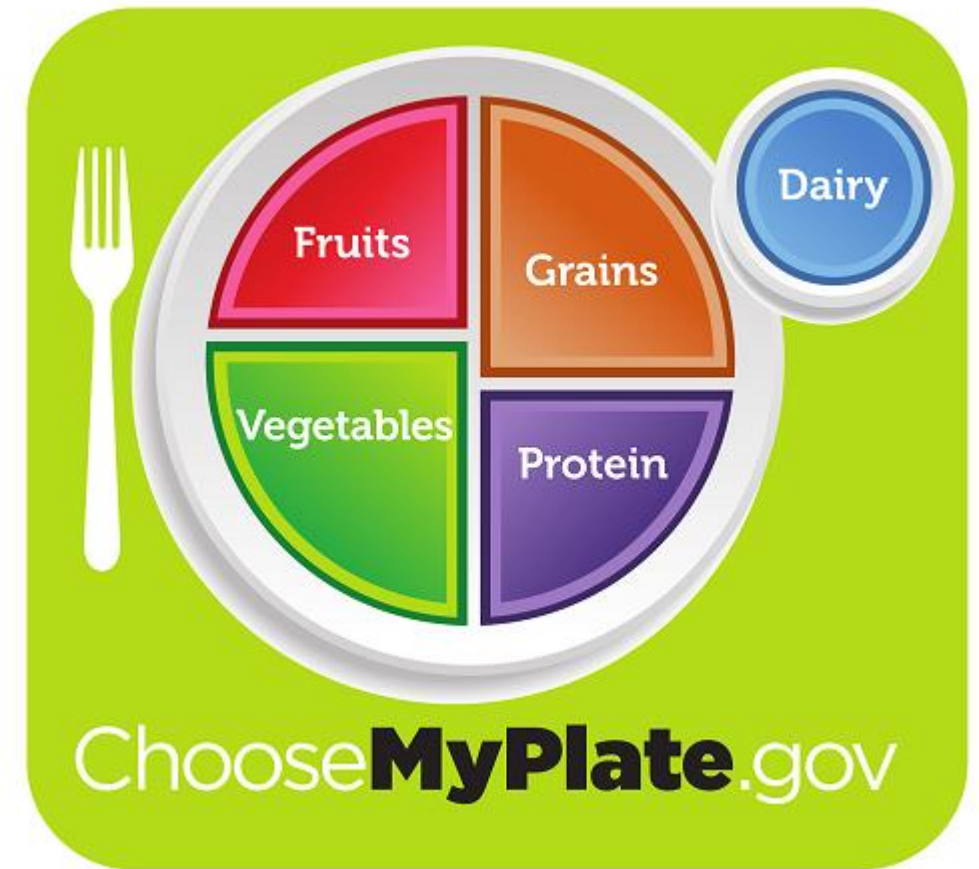
OurWorldInData.org/burden-of-disease • CC BY

Food and nutrition in the prevention of diseases of public health importance

- The public health approach to the prevention of nutrition-related diseases requires;
 - the adoption of *health-oriented nutrition*
 - and food policies for the whole population.
- In most developing countries,
 - the first priority must be ensuring the production or procurement / providing of adequate food supply
 - and its equitable distribution and availability to the entire population
 - along with the elimination of the various forms of nutritional deficiencies. (*Oxford Textbook of Public Health, 6th ed. p. 197*)

Global strategies to reduce the burden of nutritional disorders

- The prevalence of chronic diseases is increasing dramatically, with the majority occurring in developing countries.
- According to estimates made by WHO, 36 million people die annually from NCDs, 63 % of all global deaths are due to NCDs,
- And 9 million people die too young from NCDs, i.e. before the age of 60.
(*Oxford Textbook of Public Health, 6th ed. p. 198*)



Population based study of obesity in Turkey : Results of the Turkey Nutrition and Health Survey (TNHS)-2010

Mean BMI for all age groups were 26.4 ± 4.5 kg /m² in men and 28.9 ± 6.4 kg/m² in women. Overall, prevalence of overweight and obese adults were 34.6% (39.1% in men, 29.7% in women) and 30.3% (20.5% in men, 41.0% in women) respectively. While the adults aged 51-64 years old were more likely to be obese (30.7% in men and 64.4% in women), adults aged 65+ years were found to be more overweight (46% in men and 30.4% in women).



Population based study of obesity in Turkey : Results of the Turkey Nutrition and Health Survey (TNHS)-2010

High ***waist circumference*** and high ***waist-to-hip ratio*** were identified as 24.8% and 54.2% in men, as 53.9% and 40.4% in women, respectively.

Obesity and overweight are major public health problems in Turkey.

Preventive public health measures have started to be implemented by the Turkish government and other bodies to control the increasing trends in obesity.



https://www.who.int/nutrition/multimedia_video/en/

Prevalence of Overweight and Obesity in Turkey

The prevalence of overweight and obesity in both adults and children in Turkey has substantially increased over the past 20 years.

Among adults overweight is more common among men and obesity is more prevalent among women in Turkey.

Among children, the prevalence of obesity was similar in both genders.

To control obesity, necessary precautions should urgently be taken.

The precautions include *serious public health education* encouraging a well-balanced diet and **increasing physical activity**.

(Erem Cihangir, [*IJC Metabolic & Endocrine Volume 8*](#), September 2015, Pages 38-41)

HEALTHY EATING PLATE

Use healthy oils (like olive and canola oil) for cooking, on salad, and at the table. Limit butter. Avoid trans fat.



The more veggies – and the greater the variety – the better. Potatoes and French fries don't count.

Eat plenty of fruits of all colors.



STAY ACTIVE!

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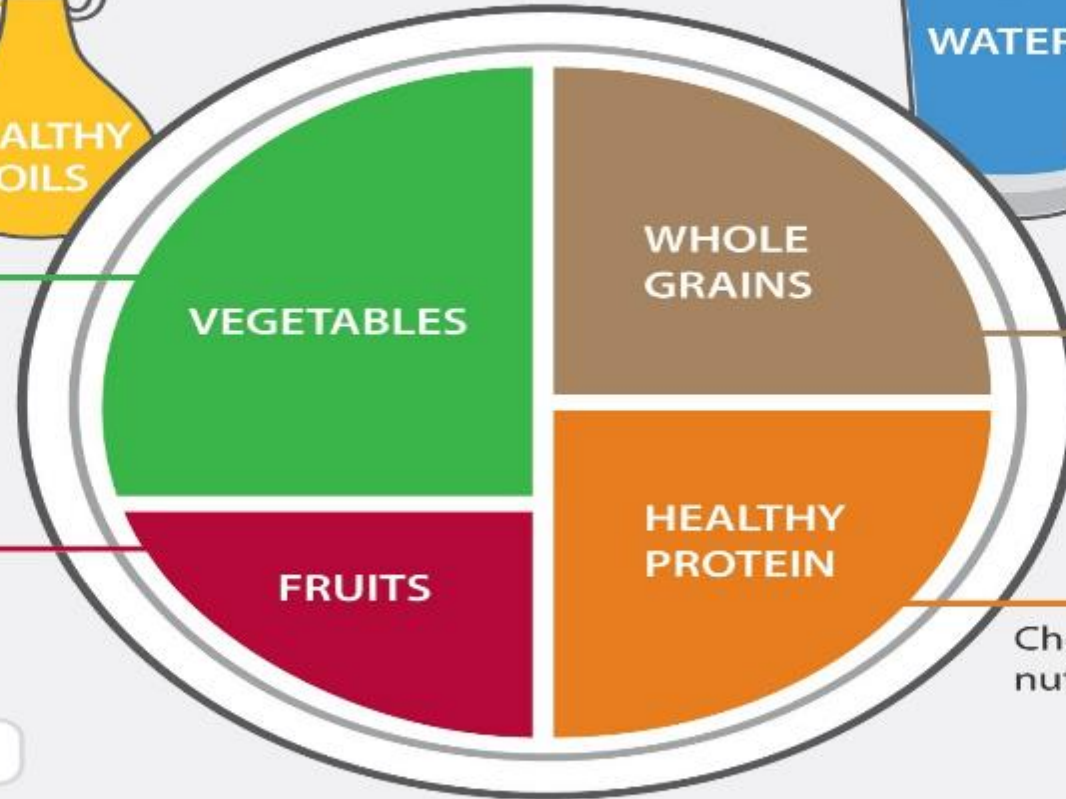
Harvard School of Public Health
The Nutrition Source
www.hsph.harvard.edu/nutritionsource



Drink water, tea, or coffee (with little or no sugar). Limit milk/dairy (1-2 servings/day) and juice (1 small glass/day). Avoid sugary drinks.

Eat a variety of whole grains (like whole-wheat bread, whole-grain pasta, and brown rice). Limit refined grains (like white rice and white bread).

Choose fish, poultry, beans, and nuts; limit red meat and cheese; avoid bacon, cold cuts, and other processed meats.



Harvard Medical School
Harvard Health Publications
www.health.harvard.edu



Nutrition and COVID-19

While all groups are affected by the COVID-19 pandemic, the elderly, underrepresented minorities, and those with underlying medical conditions are at the greatest risk.

The high rate of consumption of diets high in saturated fats, sugars, and refined carbohydrates (collectively called Western diet, WD) worldwide, contribute to the prevalence of obesity and type 2 diabetes, and could place these populations at an increased risk for severe COVID-19 pathology and mortality.

WD consumption activates the innate immune system and impairs adaptive immunity, leading to chronic inflammation and impaired host defense against viruses.

Furthermore, peripheral inflammation caused by COVID-19 may have long-term consequences in those that recover, leading to chronic medical conditions such as dementia and neurodegenerative disease, likely through neuroinflammatory mechanisms that can be compounded by an unhealthy diet. Thus, now more than ever, wider access to healthy foods should be a top priority and individuals should be mindful of healthy eating habits to reduce susceptibility to and long-term complications from COVID-19.

[The impact of nutrition on COVID-19 susceptibility and long-term consequences](#), 25.3.21



Food and Agriculture
Organization of the
United Nations

SUSTAINABLE
DEVELOPMENT
GOALS



16 October 2019
World Food Day

OUR ACTIONS ARE OUR FUTURE



HEALTHY DIETS

FOR A
#ZEROHUNGER
WORLD

Working for #ZeroHunger

Nutrition is for Everyone



***Thank you
for sincere
co-operation***

Article 25 of The Universal Declaration of Human Rights

Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.....