

19 Unhealthy diets

Burden, epidemiology and priority interventions

Francesco Branca, Pascal Bovet, Namukolo Covic, Elisabetta Recine

An unhealthy diet is a leading modifiable cause of noncommunicable diseases (NCDs), particularly cardiovascular disease (CVD). A number of population-based interventions in multiple sectors can encourage the adoption of healthy diets by individuals.

Disease burden

According to IHME (Table 19.1), 14.1% (7.9 million) of all deaths in 2019 were attributable to dietary risks (the specific dietary risks considered by IHME in these estimates are listed in the next paragraph), with 86% of these diet-related deaths being attributable to cardiovascular disease (CVD), 8% to cancer and 6% to diabetes. The proportions of deaths attributable to dietary risks increased between 1990 and 2019 in all countries except high-income countries (HICs), which partly reflects aging populations. However, the *age-standardized* rates of mortality attributable to dietary risks decreased in all regions (with the largest decreases in HICs and upper-middle-income countries [MICs]), partly reflecting improvements in some components of the diet over time¹ and improving prevention and control of outcomes due to dietary risks (e.g. CVD), particularly in HICs. Of note, these estimates do not account for malnutrition, underweight, mineral deficiencies and high body mass (BMI) (see Chapter 10 on obesity).

The overall dietary risk described in Table 19.1 combines several specific dietary risks. IHME has estimated that the proportions of all deaths in 2019 that could have been prevented for different dietary risks were (proportions of all CVD deaths that would be prevented are mentioned in parentheses): high sodium 3.3% (9.2%); low whole grains 3.3% (8.6%); low legumes 2.0% (6.0%); low fruit 1.9% (4.5%); high red meat 1.6% (4.0%); high trans fat 1.1% (3.5%); low fibre 1.1% (2.9%); low nuts and seeds 1.0% (3.0%); low vegetables 0.94% (2.8%); low polyunsaturated fats (PUFA) 0.61% (1.9%); low seafood omega 3 fatty acids 0.60% (1.8%); high processed meat 0.54% (1.1%); high sweetened beverages 0.43% (1.1%); low milk 0.29%; and low calcium 0.24%. Notwithstanding the primary goal to improve the overall quality of diet for improved health, these estimates show the potential impacts that could result from interventions on these specific dietary risks.

Table 19.1 Mortality attributable to dietary risks (IHME)

	<i>Global</i>		<i>HICs</i>		<i>Upper MICs</i>		<i>Lower MICs</i>		<i>LICs</i>	
	1990	2019	1990	2019	1990	2019	1990	2019	1990	2019
Proportion of all deaths (%)	11.6	14.1	18.8	13.4	14.9	17.5	7.7	13.0	3.6	6.2
Age-standardized mortality (per 100,000)	154	101	126	58	175	111	162	132	136	114

Key elements of a healthy diet

Briefly, a healthy diet includes the following:^{2,3}

- Breastfeeding infants and young children.
- Balancing energy intake and expenditure to achieve and maintain a healthy body weight.
- Consumption of: (i) at least five portions a day of fruits and vegetables, whole grains (rather than refined grains) and legumes; (ii) proteins from plants (legumes), fish/seafood, meat and poultry, and limit red and processed meat; and (iii) liquid plant oils (e.g. olive, sunflower, soybean) rather than tropical oils (coconut, palm, and palm kernel), animal fats (e.g. butter and lard) and partially hydrogenated oils, and consuming low-fat dairy products instead of high-fat ones, given the high saturated fat content in the latter vs the former.
- Minimizing intake of: (i) beverages and foods containing free sugars (sodas and fruit juices) to keep daily intake of free sugars <10% of total energy intake, or possibly <5% for maximum health benefits and foods with high levels of added salt to keep daily intake <5 g (approx. 2 g sodium) per day.
- Avoiding highly processed foods (as these tend to be high in energy, sugar, fats and salt), and avoiding or limiting alcohol intake.

Broader determinants

It has been estimated that a healthy diet, which would be based predominantly on fresh and unrefined products is not affordable for around 3 billion people, a challenge across all regions of the world.⁴

There are complex and important relationships between globalization, trade, a country's geographic location, access to global and domestic markets (including volatility in prices), and production, distribution and supply chains that can have a major impact on people's ability to access food for a healthy diet.^{5,6} For example, obtaining affordable fresh, frozen, or other adequately packaged fruit and vegetables on a regular basis throughout the year is obviously more difficult in some places than others. In addition, changes in the food environment

have led to an increase in the consumption of industrially processed foods in many countries.

In addition, a number of determinants affect the population's and an individual's choice of food. These include: (i) biological determinants such as hunger, appetite and taste; (ii) economic determinants such as cost and income; (iii) physical determinants such as access, availability, education, knowledge, skills and time; (iv) social determinants such as class, culture and social context; (v) psychological determinants such as mood, stress and guilt; and (vi) attitudes, beliefs and knowledge about food.⁷

National Food-Based Dietary Guidelines

National Food-Based Dietary Guidelines (FBDGs) provide context-specific guidance on healthy diets and lifestyles, informed by sound scientific evidence and responding to a country's public health and nutrition priorities, food production and consumption patterns, sociocultural influences and accessibility, among other factors. FAO has collected and analyzed FBDGs from over 100 countries worldwide, adapted to their nutrition situation, food availability, culinary cultures and eating habits.⁸

FBDGs can also be used to highlight sustainability considerations that policymakers, food producers and consumers can make to promote alignment between a healthy diet and what a sustainable diet should be, i.e. one that promotes all dimensions of individuals' health and wellbeing; has low environmental pressure and impact; is accessible, affordable, safe and equitable; and is culturally acceptable.⁹

Interventions at the population level

Improving diets requires action across all components of food systems. Food systems include all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, such as socio-economic and environmental outcomes.

Changing diets requires action across: (i) supply chains (including production systems, storage and distribution, processing and packaging, retail and markets); (ii) the food environment (food availability and access, promotion, advertising and information, food quality and safety); and (iii) consumer behaviours (preferences on foods to acquire, prepare, cook, store and eat).^{10,11}

While a number of processed foods (e.g. breakfast cereals, industrially produced bread, etc.) may be fortified/supplemented with a number of potentially healthy nutrients (vitamins, minerals) and can be convenient to consumers (e.g. shorter preparation time), many have high contents of fats, sugars and salt, which can trigger weight gain, hypertension, cancer, CVD and other conditions.

A number of key food system interventions for a healthy diet are described below as well as in other chapters (e.g. Chapter 10 on obesity, Chapter 20 on cholesterol, fats and trans fats, Chapter 21 on salt, Chapter 22 on sugary drinks, and Chapter 26 on alcohol), which also include details on WHO technical packages such as SHAKE (salt reduction), SAFER (alcohol) and REPLACE (trans fats).

Reformulation of processed foods

This is an effective and efficient way to reduce the intake of energy, saturated fats, trans fat, sugars and salt in processed foods. The reformulation of processed foods by industry enables people to avoid making particular efforts to change their usual eating habits. Approaches to the reformulation of selected foods can be mandatory or voluntary. Chapter 23 on food reformulation provides further detail.

Nutrition labelling

Nutrition labelling enables consumers to better select the products they buy. In addition to factual information (e.g. content of macro or micronutrients, e.g. calories, sugar, saturated fats, salt, etc.), interpretive labels (e.g. front-of-pack warning labels with a star rating or colour-coded systems) can be used to facilitate informed choices by consumers. Chapter 24 on nutrition labelling provides further detail.

Fiscal policies

Fiscal and pricing policies, including taxes and subsidies, are valuable tools for promoting healthy diets. There is increasing evidence that raising taxes for the retail price of sugar-sweetened beverages by 10–20% can reduce their consumption (Chapter 22 on sugar-sweetened beverages). There is similar evidence that subsidies for producing fresh fruits and vegetables that reduce prices by 10–30% are effective in increasing their consumption.¹² While taxes on unhealthy foods have been challenged for having a regressive effect, they are most likely to decrease health inequalities.¹³ Chapter 41 on fiscal measures provides more detail.

Marketing

The pervasive marketing of processed foods and drinks high in energy, free sugars or salt influences food preferences, purchases and consumption patterns, particularly in children. Marketing techniques have evolved from using traditional media, such as television, radio and billboards, to digital media including social media, sponsorship, product placement, sales promotion, cross-promotions using celebrities, brand mascots or characters popular with children, websites, packaging, nutrition labelling, point-of-purchase displays, e-mails and text messages. Voluntary and legal instruments have been used to restrict

marketing food and beverages to children, with various scopes (e.g. age of children, target foods and beverages, target marketing approaches).

Following the endorsement of the 2010 WHO set of recommendations on the marketing of foods and non-alcoholic beverages to children,¹⁴ several voluntary pledges were made and a few mandatory regulations were established. Nevertheless, marketing to children remains highly pervasive, including in areas where children gather. Policy and regulator action should therefore be developed and implemented as there is evidence that they are effective in limiting the marketing of unhealthy food to children.¹⁵

Public food procurement

Regulation is important to encourage the public sector to provide foods and beverages in public settings (e.g. hospitals, schools, workplaces, nursing homes, and correctional facilities) that contribute to a healthy diet.¹⁶ Supply chains need to be developed or adapted to ensure the regular provision of fresh foods and food operators need to be adequately trained. These settings have an important role in promoting nutrition literacy.

Communication campaigns

Simple messages need to be developed, carefully aimed at behaviours that require the greatest attention. FBDGs can be used to help develop communication messages for the population, for example through food guides, often using pictorial forms such as food pyramids and food plates as well as providing entry points for different food systems actors to contribute to attaining healthier diets. Development of FBDGs should be promoted in all countries (currently only nine African countries have FBDGs). Online practical tools, such as the USDA programme My Plate, can also be helpful.

Communication campaigns are, however, expensive to implement and have to compete with the much larger investment in food marketing by the food industry (Chapter 50 on communication). While their impact is generally modest,¹⁷ they are important as complementary interventions to the strategies described above.

Interventions at the individual level

Dietary counselling at the healthcare level is an important component of the management protocol for several chronic diseases, mainly CVD, hypertension, obesity and diabetes (this is discussed in other chapters in the compendium).^{18,19}

For a number of population and individual interventions, cost-effectiveness analyses have been conducted, and they form part of the WHO best buys and recommended interventions (Box 19.1).

Box 19.1 shows a menu of cost-effective interventions recommended by the WHO to change diets at the population and individual levels.²⁰

BOX 19.1 WHO BEST BUYS, EFFECTIVE INTERVENTIONS, AND OTHER INTERVENTIONS TO CHANGE DIETS AT THE POPULATION AND INDIVIDUAL LEVELS

Best buys

- Reduce salt intake through reformulation of food products to contain less salt, and set target levels for maximum amounts of salt in foods and meals.
- Reduce salt intake through the establishment of a supportive environment in public institutions such as hospitals, schools, workplaces and nursing homes to enable lower sodium options to be provided.
- Reduce salt intake through behaviour change communication campaigns and mass media.
- Reduce salt intake through the implementation of front-of-pack nutrition labelling.

Effective interventions

- Eliminate industrial trans fats through the development of legislation to ban their use in the food chain.
- Reduce sugar consumption through effective taxation on sugar-sweetened beverages.

Other recommended interventions

- Promote and support exclusive breastfeeding for the first six months of life, including promotion of breastfeeding.
- Implement subsidies to increase the intake of fruits and vegetables (compatibly with available resources).
- Replace trans fats and saturated fats with unsaturated fats through food reformulation, nutrition labelling, fiscal policies or agricultural policies.
- Limit portion and package size to reduce energy intake and the risk of being overweight/obese.
- Implement nutrition education and counselling in different settings (e.g. in preschools, schools, workplaces and hospitals) to increase the intake of fruits and vegetables.

- Implement nutrition labelling to encourage consumers to reduce total energy intake, sugars, sodium and fats.
- Implement mass media campaigns on healthy diets, including social marketing to reduce the intake of total fat, saturated fats, sugars and salt, and promote the intake of fruits and vegetables, as well as drinking water instead of sugar-sweetened beverages.

In addition to being an important cause of NCDs, unhealthy, inequitable and unsustainable food systems are at the root of many of the world's most pressing threats to human, animal and planetary health, including negative impacts on the environment with degradation of arable lands, water and oceans, reduced biodiversity, climate change and air quality.²¹ Political commitment and action across government and society are critical to meet the challenges and have the potential to result in significant co-benefits for health and broader sustainable development (Chapters 53 and 54 on whole-of-government and whole-of-society).

Monitoring

Monitoring nutrition and the impact of policies is critical. Population surveys (e.g. WHO-STEPI, Chapter 5) are useful to assess dietary patterns in the population through food questionnaires and/or using biological markers (e.g. salt in urine, blood carotene levels). The WHO/FAO GIFT platform is used to disseminate information on individual dietary intake.²² Monitoring the policies of countries is done, for example, through the WHO Country Capacity Survey, the WHO Global nutrition policy reviews and the WHO Global database on the Implementation of Nutrition Actions.

Regularly assessment of the content of common processed foods should also be done (e.g. sugar, salt, saturated fats, and trans fats), noting that there are often differences between the same product brands between countries and over time.²³

Notes

- 1 Imamura F et al. Dietary quality among men and women in 187 countries in 1990 and 2010: a systematic assessment. *Lancet Glob Health* 2015;3:e132–42.
- 2 <https://www.who.int/news-room/questions-and-answers/item/healthy-diet-keys-to-eating-well>.
- 3 Lichtenstein AH et al. Dietary guidance to improve cardiovascular health: a scientific statement from the American Heart Association. *Circulation* 2021;144:e472–87.
- 4 The state of food security and nutrition in the world 2021 – Transforming food systems for food security, improved nutrition and affordable healthy diets for all. FAO, IFAD, UNICEF, WFP and WHO, 2021.
- 5 *Managing food price volatility: policy options to support healthy diets and nutrition in the context of uncertainty*. London: Global Panel on Agriculture and Food Systems for Nutrition, Policy brief, 2016.

- 6 Greb F, Rapsomanikis G. Food price volatility in landlocked developing countries. *Ferdi Policy Brief B139*, 2015.
- 7 Pheasant H et al. Health and social behaviour. Chapter 2e *Public Health Textbook*. UK Faculty of Public Health.
- 8 What are food-based dietary guidelines? FAO. <https://www.fao.org/nutrition/education/food-based-dietary-guidelines>.
- 9 Sustainable healthy diets – guiding principles. FAO & WHO, 2019.
- 10 This includes several reports by the high level panel of experts on food security and nutrition. UN Committee on World Food Security.
- 11 Food systems for health: information brief. WHO, 2021.
- 12 Fiscal policies for diet and prevention of noncommunicable diseases: technical meeting report, 5–6 May 2015, Geneva, Switzerland. WHO, 2016.
- 13 Implementing fiscal and pricing policies to promote healthy diets: a review of contextual factors. WHO, 2021.
- 14 Set of recommendations on the marketing of foods and non-alcoholic beverages to children. WHO, 2010.
- 15 Boyland E et al. Systematic review of the effect of policies to restrict the marketing of foods and non-alcoholic beverages to which children are exposed. *Obes Rev* 2022;23:e13447.
- 16 Action framework for developing and implementing public food procurement and service policies for a healthy diet. WHO, 2021.
- 17 Snyder LB. Health communication campaigns and their impact on behavior. *J Nutr Educ Behav* 2007;39(2 Suppl):S32–40.
- 18 Evert AB et al. Nutrition therapy for adults with diabetes or prediabetes: a consensus report. *Diabetes Care* 2019;42:731–54.
- 19 Canuto R et al. Nutritional intervention strategies for the management of overweight and obesity in primary health care: a systematic review with meta-analysis. *Obes Rev* 2021;22:e13143.
- 20 Effective interventions with cost effectiveness analysis \leq I\$ 100 per DALY averted in low- and middle-income countries.
- 21 Food systems for health. WHO. www.who.int/initiatives/food-systems-for-health.
- 22 Global individual food consumption data tool. FAO, WHO. <https://www.fao.org/gift-individual-food-consumption/en/>.
- 23 Arcand JA et al. Sodium levels in packaged foods sold in 14 Latin American and Caribbean countries: a food label analysis. *Nutrients* 2019;11:369.