

Please cite this paper as:

Placzek, O. (2021-02-10), "Socio-economic and demographic aspects of food security and nutrition", *OECD Food, Agriculture and Fisheries Papers*, No. 150, OECD Publishing, Paris.
<http://dx.doi.org/10.1787/49d7059f-en>



OECD Food, Agriculture and Fisheries
Papers No. 150

Socio-economic and demographic aspects of food security and nutrition

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OECD FOOD, AGRICULTURE AND FISHERIES PAPERS

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Socio-Economic and Demographic Aspects of Food Security and Nutrition

Olivia Placzek

In OECD countries, socio-economically disadvantaged groups tend to consume less nutritious food, leading to suboptimal health outcomes, including obesity. Contributing factors include low levels of income and education; time-poor single parent households; and the prevalence and accessibility of fast food restaurants. More broadly, food insecurity also remains a problem in OECD countries, with Indigenous Peoples being particularly vulnerable. Food banks run by non-governmental organisations provide emergency food assistance, sometimes using food recovered as part of food waste policies; however, the sustainability of this approach is contested. Understanding the role that socio-economic and demographic factors play in determining household food purchases and consumption is limited by inadequate and irregular food data collection, including on the prevalence of food insecurity. Lack of data is also hampering evaluation of the effectiveness of policies in addressing the needs of particular socio-economic and demographic groups.

Key words: Obesity, COVID-19, Indigenous Peoples, food banks, food marketing

JEL codes: I18, I38, M38, Q18

Acknowledgements

This paper was written by Olivia Placzek, a consultant, with substantial input from Koen Deconinck and Ellie Avery. The author is grateful for contributions and feedback provided by the following colleagues: Ken Ash, Michele Cecchini, Celine Giner, Sophia Gnych, Lee Ann Jackson, Julia Nielsen, Jessica Wallingford. The paper also benefitted from comments made by Kelly Parsons (Hertfordshire University) and by national food policy experts during the OECD Food Chain Analysis Network meeting held in September 2020. Thanks to Ana-Maria Muresan for statistical support, Michèle Patterson for editorial support preparing this report for publication, and to Helen Maguire and Helia Mossavar-Rahmani for providing administrative support.

Special thanks are offered to the Canadian government who funded the research as a voluntary contribution.

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Key messages

What is the issue and why is it important?

- Diet has significant health impacts. The high overweight and obesity rates in OECD countries that co-exist with food insecurity and poor nutrition, reduces the health, quality of life, and economic welfare of the population.
- Effective food policies and the optimal policy mix should be based on a better understanding of the socio-economic and demographic aspects that can affect food security and nutrition.
- Given the alarming trends in public health, and the fact that no instrument has so far managed to reverse these trends, investment in data and evidence on “what works” could reap large benefits.

What did we learn?

- Groups with a low socio-economic status (SES) often adopt less healthy food choices. Socio-economic factors associated with suboptimal food consumption include: low income and education levels; single parent households; and the prevalence and accessibility of fast food restaurants.
- Food insecurity is a problem in OECD countries, and Indigenous Peoples are particularly vulnerable. Food banks run by non-governmental organisations provide emergency food assistance sometimes using food that has been recovered as part of countries’ food waste policies, although the sustainability of this approach is debated.
- Coordinated government efforts to address COVID-19 impacts have focussed on providing food assistance to vulnerable groups. Measures mostly involve increasing funding for pre-existing programmes, including for food banks.
- The four-track approach outlined by Giner and Brooks (2019^[1]) highlights a range of policy options as a way to influence the supply and demand for healthy and unhealthy foods, although these policy options have not been evaluated in terms of their impact on specific socio-economic groups.
- Lack of data hampers efforts to evaluate the effectiveness of policy responses. Data collection is irregular, data sets are not comparable, and there is no clear understanding of the role that socio-economic and demographics characteristics play in determining what food households purchase and consume, nor on its nutritional content. Regular measurement of the prevalence of food insecurity in OECD countries is inadequate.

Key recommendations

- Countries should undertake more in-depth and regular data collection on food purchases and food intake using dietary surveys. These surveys should include questions on the relative food security and socio-economic and demographic determinants of food security to inform policy development that addresses food insecurity, improves nutrition, and encourages healthier food choices from food purchasing through to consumption.
- Sharing best practices in food assistance policies to address food insecurity of vulnerable groups would be valuable.

1. Introduction

Unhealthy diets are a major cause of health problems worldwide. The Global Burden of Disease Study estimates that poor diets were responsible for 11 million deaths in 2017, with most diet-related deaths and other health problems caused by diets high in sodium and low in whole grains, fruits, nuts and seeds, vegetables, and omega-3 fatty acids (Afshin et al., 2019^[2]). Unhealthy diets, along with the lack of physical exercise, has contributed to the global rise in overweight and obesity; in 2016, 39% of the world's adult population was categorised as overweight (FAO, IFAD, UNICEF, WFP and WHO, 2019^[3]) and this rate continues to increase (FAO, IFAD, UNICEF, WFP and WHO, 2020^[4]). More than half of the adult population is overweight in 34 of the 36 OECD countries, while one adult in four is obese (OECD, 2019^[5]). Obesity and diabetes are associated with a higher risk of suffering from a more severe form of COVID-19 (CDC, 2020^[6]). In addition to shortening lifespans and reducing the quality of life, diet-related health problems impose significant economic costs through higher health care expenditures and lower economic output (OECD, 2019^[5]). Global economic losses due to various types of malnutrition (including undernutrition and obesity) have been estimated at 4-5% of global GDP (FAO, 2013^[7]).

Socio-economic aspects influence the food security and nutrition of households. This is reflected in the choices households make when purchasing and consuming foods. For food insecure households, diminished diet quality increases the risks of malnutrition, which is manifested by undernutrition as well as overweight and obesity (FAO, IFAD, UNICEF, WFP and WHO, 2020^[4]). According to the FAO, living in a household that is food insecure in upper-middle- and high-income countries is a predictor of obesity in children, teenagers and adults (FAO, IFAD, UNICEF, WFP and WHO, 2019^[3]). Since healthier food options (as defined by, for example, World Health Organization guidelines and national dietary recommendations) would have large positive effects on health, quality of life, and economic welfare, countries often seek to stimulate healthier choices through a range of measures (WHO, 2020^[8]).

Giner and Brooks (2019^[1]) describe a four-track policy approach that consists of demand side public interventions, efforts to work with industry at the supply-demand interface, firmer regulations, and fiscal measures. Choosing the optimal mix of these measures and designing effective interventions requires a better understanding of the determinants of healthy or unhealthy food choices¹ at the individual and household levels.

This report draws attention to the socio-economic and demographic factors such as age, income, education, or employment status that influence food choices in OECD countries. The design of policies to promote healthier food choices should take into account socio-economic determinants to maximise their effectiveness. For example, since consumer education programmes and food labels may be less effective in changing food choices of households with lower educational attainment, other policy options may be preferable to reach these groups (Sinclair, Hammond and Goodman, 2013^[9]; Kelly and Jewell, 2018^[10]).

Socio-economic factors may also shape the composition of households' shopping baskets and the food environment may shape the availability of nutritious foods for household purchase. For example, households with higher incomes or educational attainment are more likely to eat fruits and vegetables, and less likely to consume nutrient-poor and calorie-dense highly processed foods that contribute to excess sodium, free sugars, or saturated fat when consumed on a regular basis (often referred to in the literature as ultra-processed foods (UPF)).² More broadly, empirical studies have shown associations between socio-economic factors and a range of food choices, although it is not always clear whether these associations are causal.

¹ The definition of (un)healthy food choices in this report is aligned with the definition proposed in "Policies for Encouraging Healthier Food Choices" (Giner and Brooks, 2019^[1]). This paper avoids labelling certain foods as unhealthy, but rather describes diets/food consumption patterns, as well as habits, choices and preferences that lead to the adoption of dietary choices that are potentially unhealthy. It also describes products that are rich in sugar, salt and fat as unhealthy choices when consumed in excess.

² The terms ultra-processed foods and highly processed foods are used throughout this report to describe this food category. Ultra-processed foods are specifically mentioned when this is the term used by the literature cited.

The persistent problem of food insecurity among subsets of the population in developed countries provides one clear example of how socio-economic and demographic factors affect food options and household nutrition. Estimates suggest that 8 to 20% of the population in developed countries struggles with food insecurity (Pollard and Booth, 2019^[11]), with Indigenous Peoples particularly at risk. Food insecurity is associated with a range of adverse health outcomes, especially for children. Various forms of food assistance programmes have been implemented that target food insecure households. Food banks also play a role in the provision of emergency food assistance. In some countries, unsold food from retailers must be redistributed to food banks in order to reduce food waste. The effectiveness of this approach, which can be seen as trying to address poverty through the reduction of food waste is debated in this report.

The provision of food to vulnerable groups has been an immediate focus of governments in response to the COVID-19 pandemic (Box 1). Most of the measures taken expand funding and flexibility for accessing pre-existing programmes, but others are new.

An improved understanding of the role of socio-economic and demographic aspects of food security and nutrition could help policy makers to design better policies. However, data availability continues to be a problem in most OECD countries. Indeed, it is difficult to know what different groups are eating due to the lack of recent and in-depth data, including data disaggregated by relevant social, economic and demographic factors (including gender, income and education), based on adequate sample sizes. A thorough analysis would require linking information on supermarket purchases with data on household health and income, as well as food composition data to assess the nutritional value of the food consumed. These data are not available in the public domain, although privately-held datasets exist for some of these elements. A similar problem of “data scarcity” exists with respect to food insecurity. In many cases, available data come from NGOs that provide food in emergency situations. Inconsistent definitions and methodologies make data comparison complicated.

This report seeks to investigate the influence of socio-economic and demographic characteristics on food choices, to highlight the issue of food insecurity across OECD countries, and to analyse how policy instruments are used to address food insecurity, improve nutrition, and encourage healthier food choices.³⁴

Many socio-economic factors could influence food choices. Most studies have focused on income, education and employment status, which appear to be strongly related to food purchases. Studies often combine these and other indicators into a single measure of “socio-economic status” (SES), where a low score typically denotes households with lower incomes and educational attainment, and/or lower labour market participation. The following section illustrates the relationship between SES and (un)healthy food choices, focusing on the consumption of UPF and fruits and vegetables. Section 3 takes a more disaggregated view, discussing findings from the literature on the influence of individual factors such as income, age, education or gender, as well as the mechanisms by which these factors might influence food choices. The significance of food insecurity in OECD countries as well as governmental and NGO programmes in place to address it are discussed in Section 4. Section 5 discusses policy implications based on the four-track policy approach and the effectiveness of policy instruments across socio-economic groups.

³ This report focuses on food choices rather than health outcomes, although the available evidence shows that socio-economic factors are also correlated with outcomes such as overweight or obesity. For example, people with lower incomes and education levels are two to three times more likely to be overweight or obese in comparison to those from the highest income and education groups (OECD, 2019^[5]). Interestingly, this correlation is inverted in lower income countries, where obesity is more likely amongst those with higher incomes (Pampel, Denney and Krueger, 2012^[32]).

⁴ The sustainability of food choices and of dietary patterns are not examined in this report.

Box 1. Food assistance in response to the COVID-19 pandemic

In response to the COVID-19 pandemic, many OECD countries have implemented emergency responses to provide food assistance that target vulnerable communities, in particular the elderly, pregnant women, women with young children, low income families, and minority groups. Emergency social protection programmes provide food assistance indirectly to bolster income support to reduce uncertainty for the food insecure. Examples of specific programmes and data collection initiatives taken by OECD countries to ensure the provision and healthy utilisation of food are listed below.

- In the United Kingdom, food parcels have been delivered to 1.5 million clinically vulnerable citizens advised to isolate for 12 weeks.¹
- In Australia, meal delivery services for the elderly, “meals on wheels”, has received an additional AUD 60 million in funding. The provision of staple food items and essentials as well as meals are now part of the regular deliveries.² In New Zealand and the United Kingdom, extra volunteers have been called on to ensure the uninterrupted provision of meals on wheels services. Young people not in school because of closures are helping with the delivery of food boxes in Israel.
- The United States has provided an extra USD 15.5 billion funding under its Families First Coronavirus Response Act 2020 to extend benefits under its Supplemental Nutrition Assistance Programme (SNAP) and to cover new requests for this assistance.³ By temporarily waiving some programme requirements, i.e. the requirement to be working or actively looking for work, benefits will be more readily accessible. Furthermore, the Act provides increased funding for food programmes that target the elderly, pregnant women and those with young children. For example, the Child Nutrition Programme has been allocated an extra USD 8.8 billion and the Women, Infants and Children Programme is receiving a further USD 500 million in funding. There is also increased funding for emergency food assistance via food banks (USD 850 million).⁴ Additional funding was made available under the Coronavirus Food Assistance Programme (CFAP), with USDA to receive USD 19 billion, of which USD 3 billion is to be used by USDA to purchase fresh produce, dairy and meat, which is to be distributed by food banks to those in need.⁵
- With the closure of schools, free meals to children from low income families are not being provided. In the United Kingdom, the Department of Education is granting digital supermarket vouchers to families with children who are normally fed school lunches.⁶ A similar approach is being taken in the United States. The USDA, in partnership with private companies, is also delivering meals to the homes of eligible rural-based students. As of mid-July, nearly 30 million meals had been delivered to just over 267 000 children via a programme that is in place up to mid-August 2020.⁷
- Guidance on preparing nutritious meals at home on a restricted budget is provided on the USDA’s [MyPlate](#) website, and which is linked to its dedicated COVID-19 website.⁸ The information provided includes meal plans, shopping lists, and recipe tutorials for healthy inexpensive menus to assist the population in confinement at a time when culinary skills are essential to eating well and food consumed away from home is no longer an option due to the closure of restaurants and fast food providers.
- Non-governmental organisations play a crucial role for the most vulnerable groups by providing emergency food via food banks. As a result of COVID-19, many food banks have had to close and those that continue to operate must find ways to work in a manner that is consistent with social distancing restrictions, e.g. arranging to have food parcels delivered directly to homes or giving food parcels to people waiting in cars. Food donations from the food service industry have fallen significantly and food banks are in competition with retailers to buy the same produce.⁹ Given the increase in demand, many food banks are running special COVID-19 appeals to finance their services as unemployment rates rise.¹⁰

- Many governments have increased funds allocated to food banks. For instance, under the Food Policy for Canada's Local Food Infrastructure Fund, an additional CAD 200 million was allocated through the Emergency Food Security Fund to Canadian food banks and other national food rescue organisations to help improve access to food for people experiencing food insecurity because of COVID-19.¹¹
- Food insecurity data is being collected in the United States in weekly online Household Pulse Surveys (HPS) run by the US Census Bureau to produce timely information on the effects of the pandemic.¹² Surveys were run from 23 April 2020 – 22 July 2020, with a second phase running 19 August 2020 – 26 October 2020. Results show that food insufficiency (which measures households sometimes not having enough to eat) is increasing and so is very low food sufficiency (which measures households often not having enough to eat due to a lack of money).

1. <https://www.gov.uk/government/news/first-food-parcels-delivered-to-clinically-vulnerable-people>.

2. <https://www.health.gov.au/ministers/the-hon-greg-hunt-mp/media/meals-on-wheels-programs-reinforced-to-help-senior-australians-at-home>.

3. Formerly known as the Food Stamps programme, this federal programme involves month payments onto Electronic Benefit Transfer (EBT) cards which households can use to buy groceries in authorised retailers nationwide.

4. <https://frac.org/wp-content/uploads/h.r.-6201-top-line-summary-nutrition-provisions.pdf>.

5. <https://www.usda.gov/media/press-releases/2020/04/17/usda-announces-coronavirus-food-assistance-program>.

6. <https://www.gov.uk/government/publications/covid-19-free-school-meals-guidance/covid-19-free-school-meals-guidance-for-schools>

7. <https://www.usda.gov/coronavirus/school-meals>.

8. <https://www.fns.usda.gov/disaster/pandemic/covid-19>.

9. <https://www.nytimes.com/2020/04/08/business/economy/coronavirus-food-banks.html>.

10. <https://p.eurofoodbank.org/social-emergency-fund/>.

11. <https://www.agr.gc.ca/eng/agricultural-programs-and-services/emergency-food-security-fund/?id=1585855025072>.

12. <https://www.census.gov/data/experimental-data-products/household-pulse-survey.html>.

2. Socio-economic and demographic factors and (un)healthy food choices

Households that score lower in terms of SES tend to consume more unhealthy food products and fewer healthier ones compared to households with a higher SES score. In particular, research has found higher consumption of fast food and soft drinks and lower intake of fruit and vegetables, as well as a higher likelihood of skipping breakfast. Households that score lower in terms of SES also tend to consume less vegetable protein, dietary fibre, and micronutrients (Turrell and Kavanagh, 2006^[12]) (Robertson, Lobstein and Knai, 2007^[13]; Pechey and Monsivais, 2016^[14]; Ball, Crawford and Mishra, 2006^[15]; OECD, 2019^[16]). This correlation between socio-economic factors and (un)healthy food choices is seen clearly in the specific cases of UPF consumption and the intake of fruit and vegetables.

2.1. Less healthy food choices: Ultra-processed foods

The NOVA classification places food products into four categories depending on the extent of processing (Monteiro et al., 2019^[17]). Ultra-processed foods (UPF), the category with the highest degree of processing, is defined as formulations of ingredients that result from a series of industrial processes.⁵ Examples of such food products are soft drinks, sweet or savoury packaged snacks, frozen meals, confectionary, mass-produced packaged breads, chicken nuggets and other reconstituted meat products, instant noodles and soups, and other ready-to-eat formulations (Monteiro et al., 2019^[17]).

⁵ For a discussion of the NOVA classification system in general and ultra-processed foods in particular, see Monteiro et al. (2019^[17]). The processed foods sector is covered in more detail in the OECD report *Making Better Policies for Food Systems* (OECD, 2021^[21]).

Ultra-processed foods typically have low nutritional quality, but a high energy density. When the consumption of ultra-processed food increases, the dietary intake of carbohydrates, free sugars, total fats, saturated fats, and sodium increases significantly, while the intake of protein, fibre, potassium, vitamins, and fruits and vegetables decreases (Koiwai et al., 2019^[18]; Rauber et al., 2018^[19]). Due to its poor nutritional quality, UPF can impact health by contributing to overweight, obesity, hypertension and metabolic syndromes (Hall et al., 2019^[20]).⁶

Ultra processed foods are usually characterised by high availability, low cost, and significant marketing presence (OECD, 2021^[21]). The consumption of UPF has increased strongly around the world, and is linked to rising obesity and negative health outcomes (Monteiro et al., 2019^[17]) (Poti, Braga and Qin, 2017^[22]). Consumption of UPF now makes up a sizeable share of total dietary energy consumed in many high-income countries, with estimates ranging from 30% in Mexico to 57-59% in the United Kingdom and United States (Table 1).

Table 1. Average energy intake by NOVA classification

Country and year	Average energy intake by NOVA classification (%)				Reference
	Unprocessed or minimally processed food	Processed culinary ingredients	Processed foods	Ultra-processed foods	
Canada (2015)	39.7	6.7	6.8	46.8	(Nardocci, Polsky and Moubarac, 2019 ^[23])
France (2009-2014)				35.9	(Julia et al., 2018 ^[24])
Japan (2011)	44.9	5.5	11.3	38.2	(Koiwai et al., 2019 ^[18])
Mexico (2012)	54.0	10.2	6.0	29.8	(Marrón-Ponce et al., 2018 ^[25])
United Kingdom (2008-2014)	30.1	4.2	8.8	56.8	(Rauber et al., 2018 ^[19])
United States (2007-2012)	27.5	4.0	10.0	58.5	(Baraldi et al., 2018 ^[26])

Convenience is one of the main reasons for the increase in the consumption of UPF. Food retailers responded to people's demand to have to spend less time in the kitchen by offering a growing variety of fully or partially prepared products (Luiten et al., 2016^[27]). No significant difference in the price between ultra and less processed foods exists, but ready-to-consume UPF are more convenient for time-poor consumers and require less preparation time and fewer cooking skills compared to less processed foods (Luiten et al., 2016^[27]) (Section 3). The relative price of healthy food strongly depends on the definition of healthiness and on the units of measure used in the analysis.

Households that score lower on their SES tend to consume more processed foods whereas more educated, wealthy and less disadvantaged households spend a smaller proportion of their total household food budget on processed foods in general (Venn et al., 2017^[28]). In the United States, average consumption of UPF was high among all socio-economic and demographic groups, but especially among less educated, younger, and lower income households, as well as among Americans of non-Hispanic black and non-Hispanic white origin (Baraldi et al., 2018^[26]). In Canada, in 2004, men as well as individuals who were young, less educated, and lived in rural areas consumed more UPF (Moubarac et al., 2017^[29]). These findings were reconfirmed using Canadian data from 2015 which showed UPF consumption to be higher among people who identified as Indigenous. Immigrants to Canada also ate less UPF than Canadian-born people (Nardocci, Polsky and Moubarac, 2019^[23]). In Japan, less educated individuals and those living in rural areas consume more UPF and eat unhealthier diets (Moubarac et al., 2013^[30]; Koiwai et al., 2019^[18]). In France, consumers with higher intakes of UPF were typically male and younger, and had lower incomes and education levels. They were also more likely to be living alone and to have a higher BMI and a lower level of physical activity (Julia et al., 2018^[24]; Schnabel et al., 2019^[31]).

While socio-economic and demographic factors also influence UPF consumption in Mexico, high SES factors may also be associated with UPF consumption. UPF consumption is higher for pre-school children, but also for households with higher SES scores, higher education levels, and those living in urban areas

⁶ For example, one study found that a 10% increase in the proportion of UPF consumed was significantly associated with a 14% higher risk of all-cause mortality (Schnabel et al., 2019^[31]).

(Marrón-Ponce et al., 2018^[25]). This contrasts with findings from other countries (Marrón-Ponce et al., 2018^[25]). A possible explanation is that the relationship between socio-economic factors and food choices depends on the overall level of economic development in different countries (Marrón-Ponce et al., 2018^[25]; Pampel, Denney and Krueger, 2012^[32]). The trend in obesity and a country's development is referred to as the "obesity transition".⁷

2.2. More healthy food choices: Fruit and vegetables

Worldwide, 2 million deaths are linked annually to low fruit consumption (Afshin et al., 2019^[2]). Insufficient fruit and vegetable intake is estimated to cause around 31% of ischaemic heart disease and 11% of stroke worldwide. The percentage of cancer due to low fruit and vegetable intake ranges from 5-12% for all cancers, and up to 20-30% for upper gastrointestinal tract cancers worldwide (WHO, 2003^[33]). The World Health Organisation (WHO) (2003^[33]) recommends a minimum consumption of 400 g (or "five pieces") per day of fruit and vegetables, and numerous policy initiatives exist worldwide to promote their consumption. Because of the importance of fruits and vegetables for healthy diets, their intake is often used in empirical studies as an approximation for healthy diets.

Despite the importance of fruit and vegetable consumption, most consumers do not eat the recommended daily amount. In the United States, only 6-8% achieve this target. In Europe, this figure is attained by 12% of adults, varying from 4% in Romania and Bulgaria to 25% in Denmark and the Netherlands (OECD/European Union, 2016^[34]).

The available data shows a significant gap in terms of fruit and vegetable consumption between households with lower and higher SES scores. For example, populations with higher levels of education are more likely to consume the recommended daily amount of fruits and vegetables and have a generally healthier diet compared to those with medium or low levels of education (Giskes et al., 2002^[35]). Groups with a higher SES score are more likely to consume fruit and vegetables in higher quantities, but also in greater variety (Darmon and Drewnowski, 2008^[36]). Figure 1 shows that for the United Kingdom, households in the lowest 10% of the income distribution consume about 170 g of fruits and vegetables per person per day, versus more than 270 g for households in the top 10% of the income distribution.

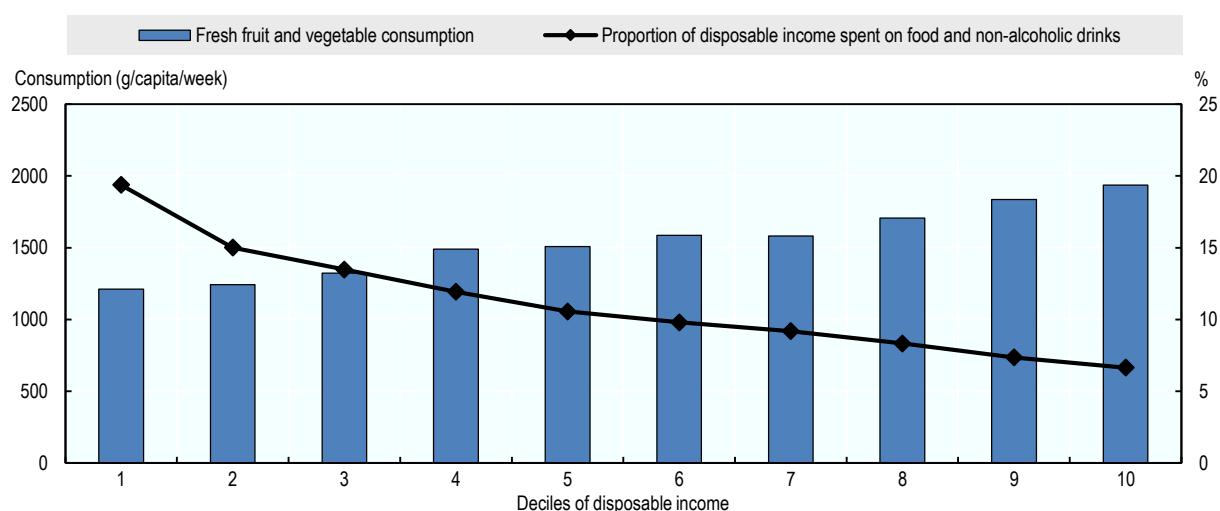
Data for 25 EU Member States also show that the consumption of fruit and vegetables differs by education level (Figure 2). Even among the highest-educated adults only a minority meet the WHO recommended daily intake of 400 g of fruit and vegetables. While on average 14% of adults with higher levels of education consume the recommended daily level of fruit and vegetables, this figure is only 10% for those with the lowest levels of education (OECD/European Union, 2016^[34]). The magnitude of this gap differs by country.

As the examples of UPF and fruit and vegetables show, there is a correlation between socio-economic factors and (un)healthy food choices. However, while these correlations are well-established, it is considerably harder to establish whether a causal link exists. For example, a correlation between income levels and dietary quality could reflect a real causal effect of income on diets, but it could also reflect other factors (e.g. education, employment status, knowledge of cooking and nutrition) correlated with both income and diets. The causal effect might also work in the other direction, with healthier diets allowing people to earn higher incomes.⁸ Even if a causal link from income to healthy diets could be established, it may not be easy to distinguish the precise mechanism through which this effect works. For example, the effect could be due to higher prices of nutritious food, but it could also be the case that lower-income consumers have a higher burden of stress and food insecurity, leading to poor sleep and cognitive overload which make it difficult to achieve healthy diets (Laraia et al., 2017^[37]). With these limitations in mind, Section 3 discusses the available evidence on the relationship between different socio-economic factors and food choices.

⁷ For more discussion on the obesity transition, see Jaacks et al. (181) and Templin et al. (182).

⁸ A similar issue exists in establishing the causal link between income and obesity. A meta-analysis of 21 studies suggests that there is more evidence for obesity causing lower incomes (e.g. through labour-market discrimination or stigmatisation) than for a causal impact of incomes on obesity (Kim and Von Dem Knesebeck^[177]).

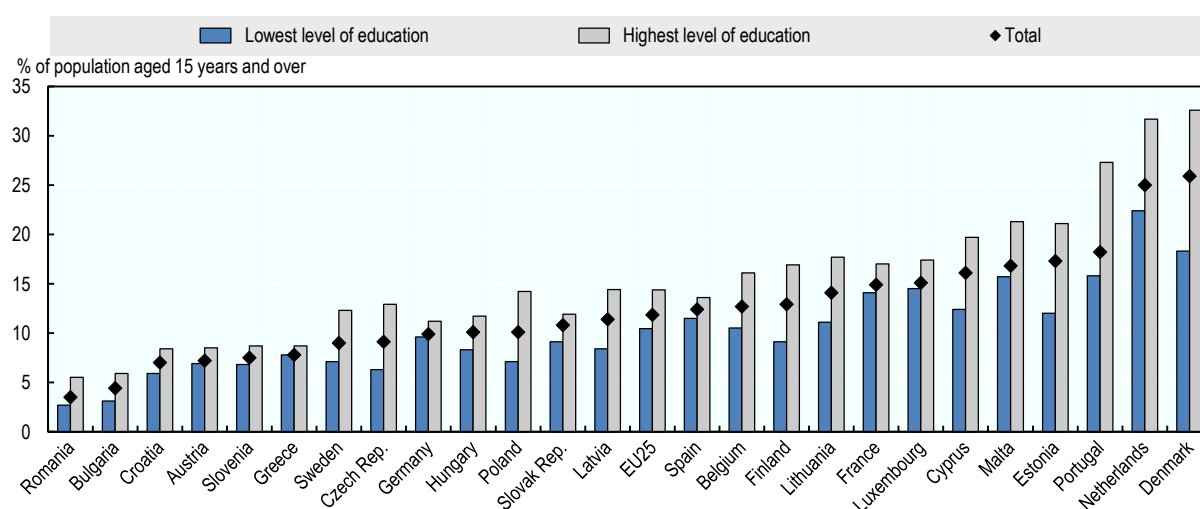
Figure 1. Relationship of income to consumption of fresh fruits and vegetables and the share of income spent on food in the United Kingdom



Note: Consumption and income is presented as three-year averages, 2015-2017. The first decile represents the lowest incomes and the tenth decile represents the highest incomes.

Source: DEFRA, disposable income deciles from the Living Costs and Food Survey Technical Report for survey year April 2015.

Figure 2. Adults consuming at least five fruit and vegetables daily in EU countries, by level of education, 2014



Source: OECD/European Union (2016^[38]).

3. The influence of socio-economic and demographic factors on food choices

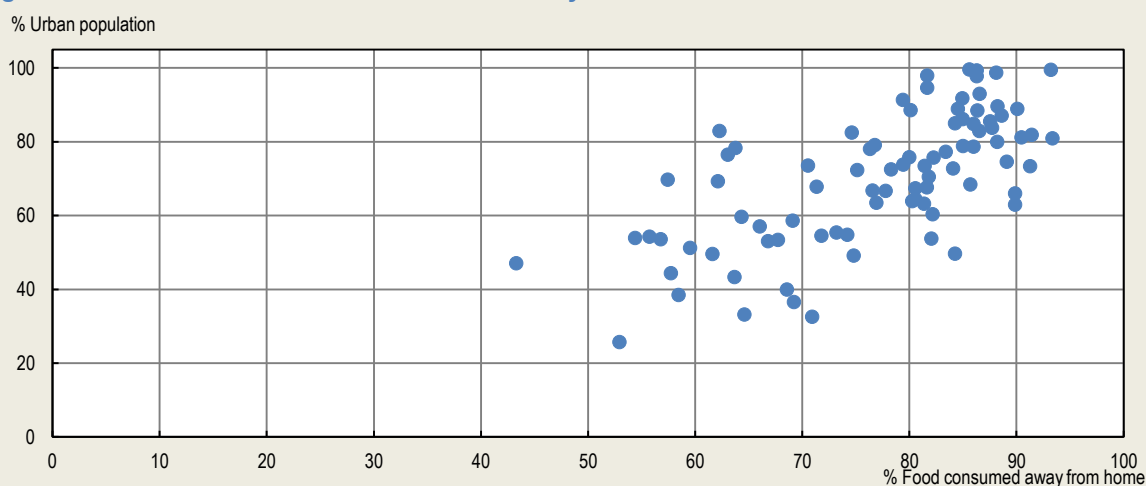
Food choices are determined by a wide range of factors, including availability, cost, preferences, and habits (Vabø and Hansen, 2014^[39]), which in turn are related to socio-economic and demographic factors. Other factors are important in influencing food choice including culture and religious beliefs; these aspects are not covered in this report.⁹ Food choices in adulthood are also shaped in part by food experiences encountered when growing up, highlighting the role of consumers' backgrounds during childhood on future food choices.

This section reviews the available evidence on how different socio-economic and demographic factors influence food choices. Most of the available studies have looked at food consumed at home using household purchasing data. However, food consumed away from home accounts for an increasingly large proportion of all food consumed (Box 2). Where available, information on this category is included, although in general much less is known about consumption patterns and drivers.

Box 2. Consumption of food away from home

Food consumed away from home accounts for a growing share of the food budget. As countries develop and become increasingly urbanised, the importance of food away from home grows (FAFH) (Figure 3). Lack of cooking skills and confidence have been identified as contributors to a decrease in home cooking and barriers to healthy eating (Robson, Crosby and Stark, 2016^[40]). For example, spending on food away from home in the United States surpassed spending on food at home for the first time in 2010 (Saksena et al., 2018^[41]).

Figure 3. Urbanisation and food consumed away from home for 86 countries in 2014



Note: Urban population data are from the World Bank; estimates for shares of food consumed at home are from the Economic Research Service of the USDA.

Source: Seto and Ramankutty (2016^[42]).

People with higher incomes, from least disadvantaged households, and with higher levels of education are more likely to purchase and consume FAFH, especially single adults and younger consumers (Saksena et al., 2018^[41]; Venn et al., 2017^[28]). The number of children in a household is associated with lower expenditure on healthy FAFH, whereas the number of seniors in a household is associated with

⁹ For discussions on the impact of culture on dietary patterns in Switzerland, see Krieger et al (2018^[180]).

greater expenditure shares on healthy FAFH due to health preferences, concerns, and/or dietary restrictions (Leschewski, Weatherspoon and Kuhns, 2018^[43]).

FAFH consumption is associated with greater intake of calories, fat, cholesterol, and sodium, and lower intake of nutrients. It is also linked to an increased risk of obesity (Leschewski, Weatherspoon and Kuhns, 2018^[43]). A greater reliance on eating away from home is associated with less healthy diets and obesity, and is likely driven by the use of fast food outlets. Areas with relatively high densities of fast food outlets are referred to as “food swamps” (Penney et al., 2017^[44]). However, given the growing proportion of food purchased away from home, future work could usefully examine FAFH food choices and purchases across different socio-economic groups to enhance understanding of how socio-economic characteristics and demographics play out in this area across OECD countries.

3.1. Income

The affordability of food (which depends on incomes and food prices) influences consumer food choices. Income in particular appears to play a bigger role than education and occupation as a predictor of food choice (Turrell et al., 2003^[45]).

An empirical regularity known as Engel’s Law holds that as incomes rise, households spend more on food in absolute terms, although the proportion of income spent on food decreases. In the United States in 2016, households in the lowest 10% of incomes spent over 30% of their income on food, a share which fell to 14% for middle-income households and 7% for the highest-income households (USDA, 2018^[46]).

In the United Kingdom, an average 10.6% of household expenditure was spent on food in 2017/18, while for households with the lowest 20% of income, the percentage spent on food was 15.2% (UK Government, 2020^[47]). Based on the Irish Household Budget Survey 2015/16, households in the lowest income decile spent a higher proportion of their total household expenditure budget on food than households in the highest income decile (17.8% compared to 11.7%),. Households in the highest income decile spent 28.4% of the total food expenditure on food away from home compared with 12.7% for households in the lowest income decile (Central Statistic Office, 2017^[48]).

As incomes rise, the basket of food products purchased by households changes. Studies conducted at the household level show that higher incomes are associated with greater purchases of vegetables and fruit, low-fat milk, and high-fibre foods (Darmon and Drewnowski, 2008^[36]). The price of food plays an important role in less healthy consumption patterns, especially in low income households (Drewnowski, 2009^[49]; Pechey and Monsivais, 2016^[14]). Food of lower nutritional value generally costs less per calorie (Darmon and Drewnowski, 2015^[50]). However, many fruits and vegetables are less expensive if prices are instead measured on a dollar-per-edible grams basis (\$/edible grams) or on a dollars-per-portion basis (\$/average portion) (Carlson and Frazao, 2012^[51]) (Frazão, Carlson and Stewart, 2011^[52]). Moreover, low income consumers focus on purchasing food that is filling, rather than nutritionally rich and healthy (IOM and NRC, 2013^[53]). Households with limited income may prioritise certain types of foods over others. Meats are often purchased first. Grains, such as pasta and rice, may also be prioritised because households believe these foods are satiating and serve to “stretch out” other foods (e.g., preparing meat with rice or pasta ensures that the meat can serve more people). Fruits and vegetables, by contrast, are not generally not prioritised (Askelson et al., 2018^[54]). Low income households also purchase lower-priced and private label products, they are more likely to take advantage of promotions (e.g. larger packages or promoted products) and purchase less expensive versions of a given product compared with higher-income households (Akabay and Jones, 2005^[55]).

The trends in increasing prices of healthier food products over the past years could explain a decline in the nutritional quality of food purchases amongst pensioners, households with young children, and lone parent households (Purdam, Garratt and Esmail, 2016^[56]). When food prices increase, households adopt different coping strategies, including reducing the quantity of food purchased and substituting towards lower quality foods that are energy-dense but nutrient-poor. Such coping strategies are more prevalent among households with lower SES scores (Miller et al., 2016^[57]; Headey and Alderman, 2019^[58]).

3.2. Education and food preparation and cooking skills

While income is clearly an important factor in shaping food choices, lack of money is not the only reason why some households adopt unhealthy diets. Other factors such as education or preferences play a role, as they do for other health behaviours such as smoking and exercising (Pampel, Krueger and Denney, 2010^[59]).

The level of education of a consumer is linked to knowledge of food and nutrition, as well as skills in budgeting, shopping and cooking. Consumers with a higher level of education choose healthier foods even when shopping at the same store as food shoppers with a low level of education. Food shoppers with lower levels of education purchase less healthier foods. One explanation for the connection between level of education and food purchase is the level of dietary knowledge, i.e. those who have reached higher levels of education also have higher levels of dietary knowledge, which then encourages healthier food purchases (Turrell and Kavanagh, 2006^[12]). Indeed, such knowledge is strongly linked to improved diet quality (Wardle, Parmenter and Waller, 2000^[60]) (McGowan et al., 2016^[61]).

Foods such as pulses (e.g. lentils, beans, and chickpeas) are filling, nutrient-rich and cheap, but require more knowledge to prepare and cook (especially relative to highly processed foods high in fat, sugar and salt). Limited knowledge on how to cook pulses may explain why these foods are not more widely incorporated into daily diets despite their low cost (Palmer et al., 2018^[62]). More generally, reduced cooking skills could contribute to poor diets. Cooking skills are positively correlated with vegetable consumption and negatively with consumption of convenience foods, which are often less healthy (Hartmann, Dohle and Siegrist, 2013^[63]). Programmes to increase cooking and food skills have grown in popularity in the United Kingdom, continental Europe and the United States as a means to improve dietary quality and intakes of fruit and vegetables (McGowan et al., 2016^[61]). The involvement of teenagers in food preparation at home has shown to have a positive impact on the quality of their diets later in their mid- to late-twenties (Laska et al., 2011^[64]).

The different perceptions of consumers as to what constitutes healthy diets are related to their socio-economic background and level of education. Households with a higher SES may perceive the relevance of certain food topics differently and seek more information than households with a lower SES (Bukman et al., 2014^[65]).

3.3. Occupation

Occupation not only influences household income, but also affects the time available to shop for and prepare food. Lack of time is commonly reported as a barrier to healthy eating (Venn et al., 2017^[28]). The rise in the consumption of convenience and highly processed foods, and processed foods that are high in fat, sugar and salt can be partly explained by a lack of time to prepare food due to different employment arrangements and the increased participation of women in the labour market (Hartmann, Dohle and Siegrist, 2013^[63]). Low wage earners often have multiple jobs, inflexible hours, and shift work. Such occupations are associated with limited time for purchasing and preparing healthier foods. In addition, people (primarily women) in low-income occupations with a heavy caregiving and housekeeping burden and little support may opt for convenience over nutrition. Studies have found that low- and moderate-wage workers have limited time for purchasing and preparing healthier foods (IOM and NRC, 2013^[53]).

Rahkovsky et al. (2018^[66]) examined the impact of time constraints on food choices, and their connection to the growing demand for convenience foods and full-service restaurant meals. Both low income and higher income households are time-constrained for meal preparation, but those with lower SES, in particular low skilled workers (or labourers) and lone parents, are also financially constrained. This implies that occupational status is linked to time and financial constraints that encourage less healthy food choices, especially among low skilled workers.

3.4. Gender

Gender composition within households, as well as the gender of the main shopper, influences food choices and is connected to family practices and household composition. Over the last century, the participation of women in the labour market has increased, leading to a reduction in the time women spend on daily household tasks. Full-time working mothers spend less time on meal preparation, prepare fewer meals for the whole family, and consume less fruits and vegetables (IOM and NRC, 2013^[53]). In the United States, between 2014-17 women were more likely to be involved in food preparation and to spend more time doing this than men (Anekwe and Zeballos, 2019^[67]). A Swiss study found that women of all ages were more skilled in food preparation than were men, and that these skills were positively related with the consumption of more vegetables and lower frequency of consumption of convenience foods (Hartmann, Dohle and Siegrist, 2013^[63]).

In general, women make healthier food choices and are more influenced by quality, price, and family preferences, whereas men seem to be more influenced by taste. Differences have been found among men and women's attitudes related to food and health, as well as on nutritional attitudes and choices, with women demonstrating a stronger belief in healthy eating (Wardle et al., 2004^[68]). A cross-country study of 23 countries supported evidence that women were generally more likely to eat fruits and fibre and to attribute greater importance to healthy eating. The study also indicated that women tended to avoid eating high-fat foods and tried to limit salt intake (Beardsworth et al., 2002^[69]; Hartmann, Dohle and Siegrist, 2013^[63]). In the European Union, women consume more fruit and vegetables than men across all age groups (OECD/European Union, 2016^[34]). In Canada, women were significantly more likely than men to report consuming fruit and vegetables five or more times a day (Colapinto, Graham and St-Pierre, 2018^[70]).

Although there is insufficient data on gender non-binary groups, findings suggest that transgender individuals may be more likely to experience food insecurity than their cisgender counterparts due to high poverty, unemployment, and homelessness rates (Russomanno, Patterson and Jabson, 2019^[71]).

3.5. Age

Nutritional behaviour and eating habits are formed during childhood, yet children's preferred food choices generally are not consistent with a healthy diet (Cooke and Wardle, 2005^[72]). Globally, the prevalence of overweight children under the age of five years is increasing; in 2019, 5.6% of the world's children in this age range were overweight (FAO, IFAD, UNICEF, WFP and WHO, 2020^[4]). Children are also particularly susceptible to advertising, which is usually more intense for less healthy highly processed foods high in salt, sugars, and fats (Box 3).

Results from the 2015 Nielsen Global Survey (based on survey responses from 60 countries supplemented with insights from retail sales data) show that 33% of the second youngest respondents ("Millennials" aged 21-34 years old) rated health attributes higher in terms of importance when making their purchasing decision when compared to all other age ranges. Moreover, 31% of the youngest consumers ("Generation Z" aged under 20 years) are willing to pay a premium for health attributes. This declines with age; the oldest age group ("Silent Generation" aged 65+) are, at 15%, the least willing to pay a premium (Nielsen, 2015^[73]).

Age cohorts show different food consumption behaviours. For instance in the United States millennials (those born between 1981 and the mid-2000s) spend less on food for at home consumption, make fewer trips to the supermarket and purchase more prepared food prepared foods, pasta, and sugar and candies than other generations (Kuhns, 2017^[74]). Being less likely to prepare meals from scratch, younger generations spend less on fresh vegetables (Stewart and Blisard, 2008^[75]), also they have a lower demand for fresh fluid milk (Stewart, 2012^[76]) than older generations.

However, there is no consensus in the literature examining age as a determinant of fruit and vegetable consumption. Some studies find that within higher SES, younger people purchase more fruit and vegetables, but others find that young adults (18-30 years) have the lowest fruit and vegetable consumption of all age groups. In these studies, there is a positive correlation between age and fruit and vegetable consumption that continues to rise until about 60–65 years, and after that it tends to decline (Rekhy and McConchie, 2014^[77]; Freshfel, 2019^[78]).

Elderly people eat less and commonly skip meals, which can lead to suboptimal intakes of energy and nutrients. Consuming less food can result from factors such as poor appetite, dental issues, and physical and mental disabilities that limit acquiring and preparing food. For example, socially isolated elderly people facing financial constraints consume lower levels of fruit and vegetables (Krok-Schoen et al., 2019^[79]; Conklin et al., 2015^[80]). Understanding these effects is important given the aging population in developed countries. The proportion of the population aged 65 and over has increased from less than 9% in 1960 to more than 17% in 2017, and is projected to increase up to 27% by 2050 (OECD, 2019^[81]).

Box 3. Advertising and food choices

Advertising influences food choices and may play a role in stimulating less healthy diets as foods high in salt, sugars, and fats tend to be more frequently advertised than healthier food products. For example, savoury snacks and confectionary are typically the most heavily marketed food products (Matthews, 2008^[82]). Research generally finds a positive association between food promotion and consumption, with an increase in snacking, higher energy intake, and less healthy food choices (Cairns et al., 2013^[83]).

Compared to large advertising budgets spent by food and beverage companies to promote highly processed foods that are high in salt, sugars and fat, public information campaigns to stimulate healthier food choices are considerably smaller (Obesity Health Alliance, 2017^[84]). For example, in 2018 the main brands of crisp, confectionary, and sugary drinks in the United Kingdom spent over GBP 143 million advertising their products in comparison to GBP 4.5 million spent on the UK Government's main healthy eating campaign (O'Dowd, 2017^[85]). In France, the food and beverage industry spent EUR 1.1 billion in 2018 on advertising, with the largest amount spent on promoting fast food restaurants, chocolates, and soft drinks (accounting for one-third of total advertising costs), while 2% was spent on fresh fruit and vegetables advertisements (Escalon, Serry and Resche, 2020^[86]).

Advertising interacts with socio-economic and demographic factors as some groups may be more susceptible to advertising. Children are particularly vulnerable to the influence of food marketing (Emond et al., 2016^[87]) for a variety of reasons. First, such advertising has a direct effect on children's nutritional knowledge and food preferences, as well as on their (or their parents') purchasing behaviour, consumption patterns, and diet-related health (Cairns et al., 2013^[83]). Second, children are disproportionately targeted by food-related advertising, especially on foods that are high in salt, sugars and fat (Escalon, Serry and Resche, 2020^[86]) (Folkvord et al., 2016^[88]). The most commonly promoted categories of foods are pre-sugared breakfast cereals, soft drinks, savoury snacks, confectionery, and fast foods (UK Government, 2019^[89]) (Escalon, Serry and Resche, 2020^[86]). The estimated proportion of marketing that promotes these product categories to children varies between 60% and 90%. Moreover, some marketing techniques used are highly engaging and attractive to children (Cairns et al., 2013^[83]).

The WHO Commission on Ending Childhood Obesity (WHO, 2016^[90]) developed recommendations to reduce the impact of marketing unhealthy products to children. It refers to work on the *Set of Recommendations on the Marketing of Foods and Non-alcoholic Beverages to Children* from 2010 (WHO, 2010^[91]) and recommends that settings where children and adolescents gather, e.g. schools and sports facilities or events, should be free from marketing of unhealthy foods and sugar-sweetened beverages. Restrictions on marketing should be based on identifying (less) healthy foods using independent nutrient profiling models. Recently, the WHO has recommended reducing digital exposure to food marketing (WHO, 2016^[92]).

Several countries have implemented policies to restrict advertising. For instance, the United Kingdom has linked its advertising restrictions for TV and online products high in fat, sugar and salt to the UK Food Standards Agency nutrient profiling score since 2017, especially for food marketing targeting children (UK Government, 2019^[89]).

Another way advertising interacts with socio-economic and demographic factors is that not all children are equally exposed to advertising. In the United States, children aged 8 to 12 years from lower-income households had nearly six hours of screen-time per day (this refers to time spent looking at any type of screen, including computer, phones, electronic devices, or television) compared to nearly four hours for children in higher-income households. A similar pattern was observed among those aged 13 to 18 years (Rideout and Robb, 2019^[93]).

3.6. Household composition

Household composition influences personal choices and certain family practices when consumers make food choices. Differences in food choices are observed for single-headed households compared to married/partnered households. Moreover, the family structure of a household, including the presence of children, single parents and the role of each family member, influences food choices made in that household.

Diets of men who live with someone are nutritionally better than diets of single men, whereas women's diets are worse when they live with others (Coveney, 2002^[94]). The presence of children within a household can influence food choices in a positive or negative direction depending on the age of the children. For instance, adolescents who prepare food for their family often make healthier dietary food choices. If parents choose foods based on children's tastes and preferences, this leads to an under consumption of fruit and vegetables and cereals (Coveney, 2002^[94]). Time constraints due to the presence of children in a family increases demand for fast food because convenience outweighs the monetary costs (Rahkovsky, Jo and Carlson, 2018^[66]). Unhealthy food choices amongst children are a growing concern due to rising childhood obesity across OECD countries.

Single parent families are mainly headed by women. Lone-mother families are one of the most economically deprived households and this influences food choices. Although the dietary patterns of women who are sole parents were nutritious, single parent mothers will sacrifice their own nutritional wellbeing for their children. This may link to the financial constraints of lone-mother families (Coveney, 2002^[94]).

3.7. Place of residence

A household's place of residence influences food availability and health outcomes. Rates of adult obesity are higher in rural areas than in urban areas, and characteristics of obesity also differ (Befort, Nazir and Perri, 2012^[95]). Obesity rates are higher for married rural residents, whereas for urban residents, obesity is associated more with older people, lower levels of education, and being inactive (Befort, Nazir and Perri, 2012^[95]).

Remote communities often do not have sufficient food availability and access. This is particularly the case in the United States, Australia, and Canada and impacts Indigenous communities strongly. Access to affordable and nutritious healthy food is limited, and often the main options are less healthy, processed food (Moeke-Pickering, Heitia Te Whare Wānanga Awanuiārangi and Cote-Meek, 2015^[96]).

Personal transport plays an important role in food access. Households without a personal vehicle or access to public transportation are constrained in how and where they shop. In rural areas, food shopping for healthy and inexpensive foods is challenging, whereas urban populations have greater access to these types of foods (Liese et al., 2007^[97]). People in urban areas tend to work longer hours and this increases their demand for convenient and ready-to-eat products.

Another way in which place of residence can shape food choices is through the food environment, i.e. the availability of different food options. Studies on this issue distinguish between "food deserts" (areas that lack affordable healthy food options) and "food swamps" (areas with a high prevalence of fast food and junk food options). One indicator of a "food desert" is the distance to a supermarket. This measure is correlated with poorer diets (Vaughan et al., 2017^[98]), although the question of causality must be considered. Rather than the lack of availability of healthy food options leading to poorer diets, an alternative possibility is that entrepreneurs are less likely to open businesses selling healthy food options in neighbourhoods where demand is low (Cooksey-Stowers, Schwartz and Brownell, 2017^[99]). Research provides no clear evidence that accessibility increases the consumption of healthier food, and the distance to a supermarket might not be as important as previously assumed (Dubowitz et al., 2015^[100]). A US government initiative to improve the availability of healthy food options also showed limited impact on food choices among low income residents in food deserts. Other factors – such as income, preferences, and consumer knowledge about nutrition – may be more important than the availability of healthy food options (Ver Ploeg and Rahkovsky, 2016^[101]).

Instead of the absence of healthy options (food deserts), the food environment may influence choices by the presence of unhealthy options (food swamps). Food swamps are characterised by a wide availability of, for example, fast food outlets and convenience stores selling calorie-dense foods and sugar-sweetened beverages. In Canada, food swamps are more prevalent than food deserts and thus more significant in influencing diets. Although evidence is lacking on the existence of food deserts, they may be more common than the current literature suggests, and more research is needed (Government of Canada, 2013^[102]). A US study confirmed that the presence of a food swamp is a stronger predictor of obesity rates than food deserts (Cooksey-Stowers, Schwartz and Brownell, 2017^[99]). Research has also drawn a link between obesity and the prevalence of fast food outlets available along people's "commuting corridors" and when these surround their places of work (Burgoine et al., 2014^[103]) (Dornelles, 2019^[104]). The United States has developed two spatial atlases to analyse food access; the Food Access Research Atlas depicting food access for low-income and other income brackets based on census information combined with measures of supermarket accessibility, and the Food Environment Atlas depicting the ability of different communities across the United States to access healthy food.¹⁰

4. Food insecurity in OECD countries

In 2019, an estimated 750 million people worldwide were considered to be severely food insecure. This figure translates into one in every ten persons (FAO, IFAD, UNICEF, WFP and WHO, 2020^[4]). Hunger and food insecurity are mostly associated with the developing world. Globally some 2 billion people experience moderate or severe food insecurity, with cases primarily concentrated in low- and middle-income countries. However, moderate or severe food insecurity also exists in high-income countries and affected an estimated 8% of the population in North America and northern Europe in 2017-19 (approximately 88 million people) (FAO, IFAD, UNICEF, WFP and WHO, 2020^[4]).

Food insecurity is linked to a broad spectrum of negative health outcomes, including malnutrition, overweight and obesity, poor mental health and depression, as well as diabetes and the inability to manage chronic diseases. Food insecurity has particularly severe adverse effects on children's health and development (including cognitive and socio-emotional development) and school achievement (FAO, IFAD, UNICEF, WFP and WHO, 2020^[4]) (Gundersen and Ziliak, 2018^[105]; Wight et al., 2014^[106]; Nyambayo, 2015^[107]).

The economic crisis resulting from COVID-19 has had negative impacts on the food and nutritional security of a growing proportion of the global population as people have lost their jobs or face job losses, including people (primarily women) required to leave their jobs for childcare or eldercare reasons. Governments of OECD countries have responded by implementing general policies to support incomes and, in some cases, specific food assistance measures (Box 1). Collecting information on the increase in the proportion of the population which is food insecure following COVID-19 and sharing best practices in terms of targeting these populations with food assistance measures would be a useful area for further work. Discussions on countries' experience at the OECD Food Chain Analysis Network meeting held in September 2020 highlighted the importance of coordination between all government agencies with responsibilities for food, as well as local authorities and NGOs, to avoid duplication of efforts and enable rapid responses. Dietary guidelines also need to be emphasised in food assistance efforts (OECD, 2020^[108]).

4.1. Defining and measuring food insecurity

The 2030 Agenda for Sustainable Development requires countries work towards achieving "access by all people to safe, nutritious and sufficient food all year round" (SDG Target 2.1) and ending "all forms of malnutrition" (SDG Target 2.2). Countries need to report progress towards meeting these SDGs. While this metric has the merit of being comparable across countries and relatively straightforward to administer, it is not suitable to detect the different rates of food insecurity that can occur across subsets of the population. The FAO defines food insecurity as a "lack of regular access to enough safe and nutritious food for normal

¹⁰ See <https://www.ers.usda.gov/data-products/food-access-research-atlas/> and <https://www.ers.usda.gov/data-products/food-environment-atlas/>.

growth and development and an active and healthy life. This may be due to unavailability of food and/or lack of resources to obtain food.” (FAO, 2019^[109]). The FAO measures the prevalence of moderate or severe food insecurity based on the Food Insecurity Experience Scale (FIES) across more than 140 countries.¹¹ While severe food insecurity is associated with the concept of hunger, people experiencing moderate food insecurity face uncertainties about their ability to obtain food and are forced to compromise on the quality and/or quantity of the food they consume (FAO, IFAD, UNICEF, WFP and WHO, 2019^[3]).

In addition to these global FAO indicators, several countries collect their own data on food insecurity.¹² Countries commonly use semi-regular dietary surveys using different methods ranging from qualitative approaches to quantitative techniques to ascertain food insecurity.¹³ For example, the United States and Canada have incorporated retrospective methods involving an 18-item household questionnaire, and regularly monitor household food insecurity; while in the United Kingdom, a rapid rise in the use of food banks has drawn attention to the issue of food insecurity (Pollard and Booth, 2019^[11]). To understand the magnitude of the problem from 2019, the United Kingdom’s annual Family Resources Survey of 19 000 households included ten questions on food insecurity adapted from the USDA’s methodology and this data will be available in March 2021. The precise extent of food insecurity in developed countries is difficult to assess due to a lack of routine measurement and incompatible definitions¹⁴ across countries as well as the use of different methodologies (Pollard and Booth, 2019^[11]). Methodological inconsistencies means that the rates of food insecurity of countries highlighted in this report are not necessarily comparable.

4.2. Prevalence of food insecurity across OECD countries

The high prevalence of food insecurity across OECD countries underlines a paradox given high obesity rates. Around 2 billion people, or 25.9%, of the world’s population suffered from moderate and severe food insecurity in 2019, according to the FAO (with people from Northern America and Europe experiencing food insecurity accounting for approximately 4.4% of the 2 billion) (FAO, IFAD, UNICEF, WFP and WHO, 2020^[4]). From surveys undertaken by Japan’s National Institute of Population and Social Security Research, in 2007 and 2012 between 15–17% of the population were food insecure (Kimura, 2018^[110]). Food insecure households in Canada accounted for 8.7% of households in 2017-18 (an increase from 8.3% when food insecurity was last measured as part of the 2011-2012 Canadian Community Health Survey) (Tarasuk et al., 2018^[111]) (Government of Canada, 2020^[112]). In the United States in 2019, 10.5% of households were food insecure (a decrease from 11.1% recorded in 2018 and a peak of 14.9% in 2014) and 10% of the surveyed 2 241 households in England, Wales and Northern Ireland combined had low or very low levels of food security in 2018 (UK Food Safety Authority, 2019^[113]). The prevalence of food insecurity in France was 11% (with 7% moderately food insecure and 4% severely food insecure) for a sample 3 157 of adults surveyed as part of the 2014-15 national food consumption survey (ANSES, 2017^[114]).

¹¹ The eight questions in the FIES survey are experienced-based and focus on the previous 12 months. Participants are asked whether due to lack of money and other resources they were worried about not having enough to eat, through to actually having to go without eating for an entire day. National results are then calibrated against the FIES global reference scale to enable comparability across countries (FAO, IFAD, UNICEF, WFP and WHO, 2019^[3]).

¹² The OECD has discussed issues with defining and measuring food insecurity in relation to Indonesia (OECD, 2015^[183]).

¹³ In some cases, methodologies are adapted from other countries. The questions on household food insecurity adapted from methodology developed by the US Department of Agriculture (USDA) are commonly used. The US Household Food Security Survey (HFSS) 18-item module classifies households as being food secure or insecure. Food security levels range from high, marginal, low, to very low (Committee on National Statistics, 2006^[179]). The module collects information about the household, and its adult and child members (USDA, 2000^[186]). There are also the adult food secure 10-item module and 6-item short form of the food security survey module. Countries choose to use the different modules depending on considerations such as survey respondent burden. For example, the last two surveys of the British Food Standards Agency’s “Food and You” survey included the 10-items module questions, whereas in its national food consumption survey (INCA3) 2014-15 France used the 6-item module.

¹⁴ Some countries use food poverty and food insecurity synonymously (Dowler and O’Connor, 2012^[178]), however this report uses the term food insecurity while also citing literature that uses the terminology “food poverty”.

Higher rates of food insecurity are more prevalent in households of lower socio-economic status, those living in disadvantaged neighbourhoods, and especially among lower income households (van der Velde et al., 2019^[115]). Households experiencing food insecurity are more likely to include children, single parents or grandparents with grandchildren, and households with a disabled parent or child (Gundersen and Ziliak, 2018^[105]). In general, women are more likely to be affected by moderate or severe food insecurity than men (FAO, IFAD, UNICEF, WFP and WHO, 2020^[4]). The dietary quality of food purchased by food insecure households is lower compared with food secure households. For example, food insecure households in the United States purchase only half as much fruit, seafood, and plant protein foods and two-thirds as much total protein food as compared to food secure households (Gregory, Mancino and Coleman-Jensen, 2019^[116]).

4.3. Government policies on food insecurity

To tackle the issue of food insecurity, OECD countries have implemented general income support and social safety nets as well as specific food assistance programmes to provide, for example, low income households with food and healthier food choices. Other programmes support pupils and students from low-income households with healthier food options in schools or universities. Access to safe food, a key component food security as defined by the FAO (FAO, 2019^[109]), is also an issue for the food insecure in OECD countries who are more likely to experience food poisoning as a result of keeping leftovers longer and eating food past its use by date (OECD, 2020^[108]).

The examples of government programmes in the following sections include information provided to the OECD by countries that were contacted during the last quarter of 2019. Selected countries were asked about policy instruments used to support healthier food choices, along with evaluations of these programmes. Countries were also asked which tools and policy approaches they implemented to tackle obesity and food insecurity across socio-economic groups, how specific groups were being targeted, and how the effectiveness of policies was being monitored or measured. In terms of data availability, countries were asked whether they had food purchase data linked to the socio-economic characteristics of households, and whether and how these data sets were being used to inform policy development.

The USDA's Supplemental Nutrition Assistance Programme (SNAP)¹⁵ is a domestic food and nutrition assistance programme for low income Americans. In 2019, 45.7 million Americans received SNAP monthly. Expenditure on the SNAP programme had been declining over the period 2015 to 2019, by 18% to USD 60 billion in 2019 (USDA, 2020^[117]). Policy responses to COVID-19 will reverse this trend. Households qualify for this benefit based on their income, expenses, and assets; additional non-financial parameters such as age, student status or immigration status are also considered.

Korea is implementing a customised agri-food food assistance programme called the Food Voucher Assistance Programme (FVAP), based on the USDA SNAP programme. This project is a nutritional supplement programme that allows customers to purchase fresh foods such as vegetables, fruits, milk and eggs. This project targets low-income households. The first pilot programme was run by the Ministry of Agriculture, Foods, and Rural Affairs (MAFRA) for three months in 2018 and involved 1 600 households from a rural and an urban area (Lee et al., 2019^[118]). A second pilot programme was undertaken from September to December 2020 and involved 18 000 households from different regions.

Government policies also support healthier food choices among children of low income families. The USDA has implemented the National School Lunch Programme (NSLP) providing low-cost or free lunches. In 2019, 29.6 million children received daily lunches at a cost of USD 14.2 billion (USDA, 2020^[119]). Free lunches are available to children in households with incomes at or below 130% of the national poverty level, and reduced price lunches are available to children in households with incomes between 130-185% of the national poverty level (USDA, 2020^[120]). In 2018, 357 000 Korean children under the age of 18 years from low income households received daily meals (breakfast, lunch, and dinner on weekdays and lunches on Saturdays).

Elderly people in Korea living just above the poverty threshold are eligible for free meals at special cafeterias or delivered to their homes. Welfare beneficiaries and those receiving sickness benefits can purchase grains from government stocks at a discount price. Another food assistance programme in Korea

¹⁵ Formerly known as the Food Stamp Programme.

provides milk in schools to students from low income households. In 2018, 574 000 students benefited from this programme. Additionally, a fruit snack programme, focussing on elementary schools and after-school care classes, targets 240 000 students across 5 200 schools.

The United Kingdom's Healthy Start scheme is a nationally-implemented policy that introduced vouchers for fruit, vegetables and milk for low income households with young children. Eligibility is based on having a child under the age of four years or being at least ten weeks pregnant, plus receiving, for example, income support (UK Government, 2019^[121]). A similar scheme called the "Nutrition Plus Project" runs in Korea for pregnant women and those with young children under the age of six years old whose household income is 80% or less of the median income level and who are considered at risk, i.e. anaemic, underweight or have poor nutrition. These households receive food parcels twice a month and personalised nutritional training along with group training and home visits. Since 2018, 82 000 people have benefited from this programme.

Canada's Food Policy is structured as a whole-of-government approach with CAD 134.4 million in new investments for the period 2019-2024 to help address food-related priorities. There are four short-term areas of action: 1) help Canadian communities access healthy food; 2) make Canadian foods the top choice at home and abroad; 3) support food security in northern and Indigenous communities (whereby actions will advance efforts towards reconciliation with Indigenous Peoples by strengthening First Nations, Inuit, and Métis food systems, recognising the importance of food to Indigenous culture and wellbeing); and 4) reduce food waste. Also supporting food security, including for Indigenous communities, is the Local Food Infrastructure Fund (LFIF). This is a five-year programme with a budget of CAD 50 million that aims to strengthen food systems and to facilitate access to safe and nutritious food for at-risk populations.

The European Union has a school fruit, vegetable and milk scheme with a budget of EUR 250 million in 2019-2020 to support healthy eating habits for school-age children. During the 2017-18 school year, the programme reached 20 million students, or 20% of children in the European Union (European Commission, 2019^[122]). Italy receives EUR 24.7 million of these funds with approximately 1 million school students participating.

4.4. Indigenous Peoples and food insecurity

Food insecurity is higher for Indigenous Peoples compared to non-indigenous peoples. The United Nations defines Indigenous Peoples as those who inhabited a country prior to colonisation and who self-identify as such due to descent, and belonging to social, cultural or political institutions that govern them. There are approximately 38 million Indigenous Peoples across 12 OECD countries. Indigenous Peoples represent about 5% of the world's population, but they comprise 15% of the world's extreme poor and one-third of the rural poor (OECD, 2019^[123]). Food insecurity among Indigenous communities is often linked to a lack of food access and availability, as well as to continued racism and discrimination (Leblanc-Laurendeau, 2019^[124]).

In Australia, Aboriginal and Torres Strait Indigenous Peoples made up 3.3% of the total Australian population in 2016 (about 460 000 of a population of 22 million people) and are projected to reach about 1.1 million people by 2031 (Australian Government, 2019^[125]). About 22% of Aboriginal and Torres Strait Islanders experience food insecurity compared to 4% of non-Indigenous Australians (Temple and Russell, 2018^[126]).

Based on the 2018 New Zealand census, nearly 776 000 people living in New Zealand were of Māori descent, or 16.5% of the population (Stats NZ, 2019^[127]). One in seven Māori lives in a household classified as having low food security (Moeke-Pickering, Heitia Te Whare Wānanga Awanuiārangi and Cote-Meek, 2015^[96]).

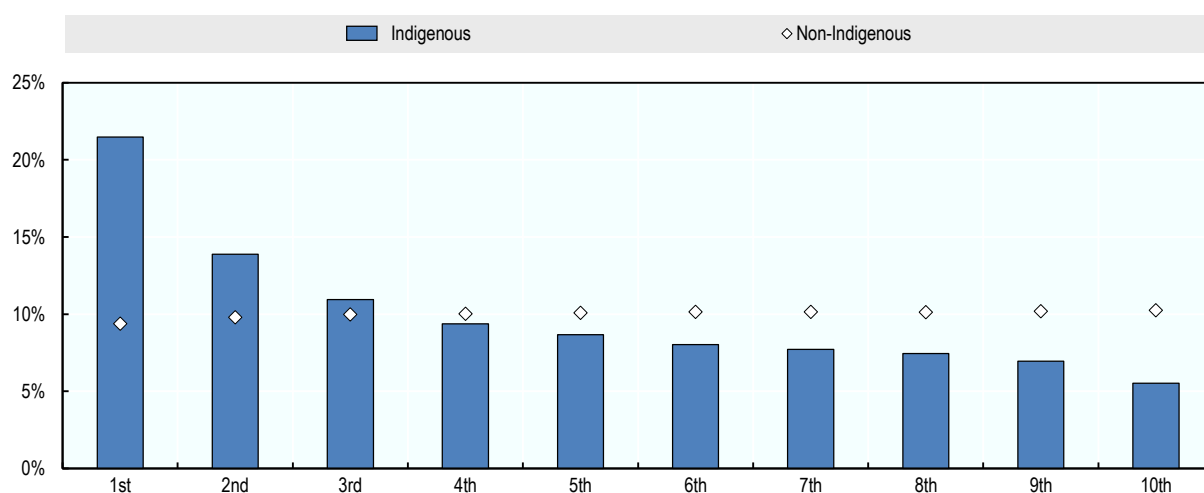
In the United States, an estimated 5.6 million people identified as being American Indian and Alaska Native in 2017. This racial group comprises 1.7% of the total US population. Levels of food insecurity experienced by American Indians are double those of non-Indigenous Peoples, and there is an average food insecurity rate of 25% (Jernigan et al., 2017^[128]).

Indigenous populations of Canada consist of First Nations, Inuit, and Métis. In 2016, there were 1.7 million Indigenous Peoples in Canada, accounting for 4.9% of the total population. Food insecurity for Indigenous households range from 22% to 63%, depending on the population studied, in contrast to 8.4% of Canadian

households overall (Government of Canada, 2020^[129]). Food insecurity is very high in many First Nations communities, reportedly at an average of 48% (Chan et al., 2019^[130]), and also very high in Inuit communities (Huet, Rosol and Egeland, 2012^[131]) where rates have been documented as high as 70% of preschool children in Nunavut (Egeland et al., 2010^[132]).

A recent OECD study (2018^[133]) illustrates the representation of Indigenous Peoples in lower income groups in 2016 in Canada (Figure 4). Non-Indigenous Peoples are represented in each income decile at 10%, whereas 23% of the Indigenous population are in the lowest income decile.

Figure 4. Percentage of Indigenous Peoples in Canada in each income decile group (after tax), 2016



Note: The 10th decile is the top income decile.

Source: (OECD, 2018^[133]) [StatLink http://dx.doi.org/10.1787/888933723986](http://dx.doi.org/10.1787/888933723986)

4.5. Policies targeting food insecurity among Indigenous Peoples

To support the third goal of its Food Policy, several instruments have been implemented in Canada to overcome food insecurity among Indigenous Peoples. The subsidy programme, Nutrition North Canada (NNC), is designed to provide Indigenous Peoples in northern isolated communities with improved access to perishable nutritious food. The overall NNC budget was approximately CAD 99 million in 2018-19. Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)¹⁶ closely monitors compliance and publishes regular reviews to ensure transparency (Government of Canada, 2019^[134]). NNC also implemented a new Harvesters Support Grant to support traditional Indigenous harvesting, food preservation, and food sharing activities, as well as food sharing activities in keeping with Indigenous customs and cultural practices in eligible isolated communities. Funding, which began in April 2020, will distribute CAD 8 million annually to recipient land claim, self-government and Indigenous organisations. As part of the NNC, the Government of Canada funds and supports retail and community-based nutrition education initiatives in eligible communities to increase knowledge of healthy eating and develop skills in selecting and preparing healthy store-bought and traditional foods. These initiatives build upon the funding the Government of Canada provides for a variety of culturally appropriate, community-based programmes and services in Indigenous communities that promote healthy eating, food skills and improve access to healthy foods through Indigenous-determined ways.

Australia has programmes to support healthier food choices for Indigenous groups such as Aboriginal and Torres Strait Islander peoples. The Federal Government invests in food relief, supporting food bank funds. Under the Indigenous Australians' Health Program (IAHP) a number of locally-developed nutrition-related activities are delivered. The Australian Government funds the not-for-profit EON Foundation, to deliver the

¹⁶ Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) continues to renew the nation-to-nation, Inuit-Crown, government-to-government relationship between Canada and First Nations, Inuit and Métis.

Thriving Communities Program in remote Aboriginal schools and communities across Western Australia and the Northern Territory. Partnering with local schools, health services and community organisations, the EON Foundation builds edible gardens in remote Aboriginal communities as a means of promoting food security alongside practical skills and education in gardening, cooking, nutrition and hygiene. Outback Stores Pty Ltd, owned by the government, provides retail management services to remote stores across Australia on behalf of Indigenous communities with the aim of improving the health, employment and economy of these communities (Australian Government, 2019^[135]).

4.6. The role of food banks

Households experiencing food insecurity are often dependent on food banks run by NGOs, i.e. churches and charities (Loopstra and Lalor, 2017^[136]). Food banks, including food rescue and community food organisations, provide “emergency food aid” for vulnerable populations and, as such, provide temporary solutions (Bazerghi, McKay and Dunn, 2016^[137]). Governments in several OECD countries support their work through funds, in addition to government food assistance programmes. In 2013, an estimated 60 million people, or 7.2% of the population, in high-income countries used food banks (Pollard and Booth, 2019^[111]). Due to the economic contraction brought about by the COVID-19 pandemic, there is an increasing demand for emergency food assistance from food banks and it would be useful for governments to monitor this. Concerns exist on the nutritional value of the food provided by food banks, which mainly consists of processed foods which are not of sufficient quality to support healthy diets (Simmet et al., 2017^[138]) (Bazerghi, McKay and Dunn, 2016^[137]). Furthermore, the accessibility of food banks can be limited by their location, short opening hours, combined with eligibility criteria enforced by gatekeeper agencies that determine who can use food banks, thereby potentially limiting the number of times people can be referred (Loopstra, Lambie-Mumford and Fledderjohann, 2019^[139]).

Food banks run by NGOs are filling a demand for emergency food assistance. The participation rate of people using food banks is often used to try to approximate the food insecurity rate where recent official survey data is lacking. Since the Great Recession, from 2007 to 2011, the use of food banks has risen steadily. In the United States, participation in food banks continued to climb during the recovery period (Heflin and Price, 2018^[140]). After economies had recovered, in some countries such as United States, the demand for food banks and the SNAP programme decreased (USDA, 2018^[141]). However, in other countries, the demand for food banks continued to increase yearly even after the economy had recovered and the recession had officially ended.

In the United Kingdom, Trussell Trust, a nationwide network of food banks, has seen demand for its service increase year on year since the 2008/09 financial crisis (Loopstra and Lalor, 2017^[136]). Two thousand food banks are currently in operation and this number is increasing. Demand for emergency food parcels rose by nearly 20% over between April 2018 and March 2019 (Tyler, 2020^[142]).

European food banks are under the umbrella of the European Federation of Food Banks (FEBA). FEBA was founded in 1996 with a total 256 organisations in 21 countries (González-Torre, Lozano and Adenso-Díaz, 2017^[143]).

In Japan, the food bank Second Harvest Japan estimated the number of users in 2014 at over 2.3 million, of which 70% were elderly and 20% members of single-mother-headed households (Kimura, 2018^[110]). According to the OECD, Japan has the fourth-highest poverty rate among OECD countries (16% compared to the OECD average of 11.4%) (OECD, 2017^[144]). Yet approximately 15-20 million tonnes of food are wasted annually in Japan.

Korea has 457 food banks that are nationally-run by different levels of government receiving KRW 200 billion in donations annually. These food banks provide food donated by individuals and businesses to 300 000 disadvantaged people and 14 000 facilities.

Food banks play a crucial role in implementing SDG 12 Responsible Consumption and Production to halve food waste by 2030 (SDG Target 12.3). In France, since 2016, food waste at the retail level that is still edible must be donated to food banks, or otherwise retailers will incur a fine of up to EUR 75 000 (Henz and Porpino, 2017^[145]). In 2018, this obligation was extended to private catering companies. Farmers in France can also donate produce from their farms that would otherwise be lost and in return receive a tax reduction (OECD, 2021^[146]). Food Cloud in Ireland is a similar initiative that functions on a voluntary, rather

than mandatory, basis. Similarly, four Canadian provinces¹⁷ offer farmers a tax incentive of about 25% of the value of the fresh food they donate to food banks (Food Banks Canada, 2016^[147]).

Evaluating food rescue or recovery interventions as a method to reduce food waste and food insecurity is difficult as most studies do not include measures of recipient satisfaction with the food rescued and donated, and there is a lack of consistency in data collection and reporting between studies (Hecht and Neff, 2019^[148]). While in the short term, surplus food can be used to feed those facing financial difficulties, this is not a long-term solution (Caraher and Furey, 2017^[149]) (Dachner and Tarasuk, 2017^[150]). The main criticism of using food waste to address the issue of food insecurity is that it runs the risk of “depoliticising” hunger so that governments do not focus on addressing the underlining causes of poverty (Caraher and Furey, 2017^[149]).

Households that are food insecure may not be relying on food banks which might be seen as a last resort (Tarasuk, Fafard St-Germain and Loopstra, 2019^[151]). Reliance on food charity to solve food insecurity is not optimal. This principle is included in Food Banks Canada’s Ethical Foodbanking Code, which commits to “Recognis(ing) that food banks are not a viable long-term response to hunger, and devote part of their activities to reducing the need for food assistance.” (Food Banks Canada, 2019^[152]) Creating enabling environments in which people can purchase food is consistent with seeing access to nutritious food through a rights-based, rather than needs-based, lens and moves away from charity providing the solution (Chilton and Rose, 2009^[153]). This will involve developing policies which address poverty as a determinant of food insecurity. For instance, food insecurity in the Canadian province of Newfoundland and Labrador was significantly reduced following the implementation of a poverty reduction strategy that included an increase in income support for households receiving social assistance indexed to inflation (among other interventions) (Loopstra, Dachner and Tarasuk, 2015^[154]).

5. Implications for policies to promote healthier diets

Governments have implemented different types of programmes to support healthier food choices that often have food security and nutrition objectives. Eligibility for some programmes is determined by socio-economic factors, i.e. income, family status/pregnancy, and children in schools. In other cases, programmes are universal but their impact may differ by socio-economic group. This section highlights specific policy instruments implemented by OECD countries, as well as preliminary insights on the effectiveness of these policies in the context of socio-economic aspects of food security and nutrition, and specifically food choices.

The section is structured around the OECD “four-track” policy approach to encourage healthier food choices (Giner and Brooks, 2019^[1]). This approach aims to encourage healthier food choices in a way that is consistent with the wider objectives of the food and agriculture sector, including those related to environmental sustainability and the livelihoods of agents along the food chain. The first track consists of demand-side public interventions to tackle unhealthy food choices (e.g. education programmes or providing dietary information). The second track consists of voluntary collaboration with the food industry at the supply-demand interface (e.g. food reformulation, food labelling). The third track consists of firmer regulations when public-private incentives are misaligned (e.g. rules on advertising aimed at children), while the fourth track consists of fiscal measures such as placing consumption taxes on unhealthy products.

5.1. Track 1: Demand-side policies

Demand-side public interventions aim to educate and provide information to change consumption patterns. Common policies in OECD countries include campaigns to stimulate the consumption of fruits and vegetables, increase dietary education, and provide dietary information via front-of-pack (FOP) labelling.

¹⁷ Ontario, Quebec, British Colombia, and Nova Scotia.

Fruit and vegetable campaigns

In view of the importance of consuming fruits and vegetables, several promotional fruit and vegetable campaigns have been implemented across OECD countries. Children are often the target of these programmes that are run in schools. The results to date have been mainly an increase in awareness and a modest gain in short-term consumption. Over the long term, however, most campaigns have not been successful in realising their target (Rekhy and McConchie, 2014^[77]). Table 2 offers a comparison of several country campaign investments and policy evaluation. No campaign was specifically designed to target socio-economic characteristics of households.

Table 2. Examples of fruit and vegetable campaigns and their impacts

Country	Campaign	Cost	Evaluation
Australia	"Go for 2&5"	USD 4.17 million (2005 to 2007)	5.6% of Australian adults met the daily recommended intake of fruit and vegetables in 2011-2012
Denmark	"6 a Day"	USD 0.73 million per annum (1999 to 2014)	Increase in fruit and vegetable consumption; however, the average intake of fruit and vegetables was 283g/day and 162g/day (higher than the minimum WHO recommended level of 400g/day, but not as high as the Danish target of 600g/day)
New Zealand	"5+ a Day"		Increase in fruit consumption, but no significant change in vegetable consumption
United Kingdom	"Food Dudes"	USD 16.58 million (1992 to 2014)	Increase in fruit and vegetables consumption, and decrease in unhealthy food consumption
United States	"Fruits & veggies – more matters"	USD 3-5 million per annum (2007 to 2014)	Average consumption per person per day of fruit and vegetable remained unchanged (changes were observed across different groups)

Notes: The official evaluation of the Australian "Go for 2&5" campaign is (Woolcott Research Pty Ltd, 2007^[155]) and figures included in the table are consumption data cited by the source.

Source: Rekhy and McConchie (2014^[77]).

Overall, educational campaigns were more successful when they involved a high degree of collaboration between several stakeholders such as the industry, retail, government and non-profit organisations. Moreover, the campaigns were more effective when they focused on behavioural change, used clear messages, and were run over longer timeframes (Rekhy and McConchie, 2014^[77]).

Increasing dietary education

Many governments undertake efforts to improve the dietary education of the broader public. For example, Korea provides information on agriculture, nutrition, health, dietary habits, agricultural products, and on both processed and traditional foods. In 2018, the country implemented programmes related to early childhood education, local foods and harvest experience, and eco-friendly farming experience. Professional training materials for institutions and universities were introduced, as learning centres on agriculture, rural areas and traditional foods were established. In the United Kingdom, initiatives have aimed to educate consumers about healthier substitutes of less healthy foods ("food swaps") (NHS UK, 2018^[156]). As part of the Nutrition North Canada (NNC) programme, Canada funds and supports culturally appropriate retail and community-based nutrition educational initiatives in communities that are eligible for subsidies to increase knowledge on healthy eating and to develop skills in selecting and preparing healthy store-bought and country foods.

In theory, such efforts could focus on a number of topics where improved dietary education might lead to better food choices. For example, learning to prepare and cook healthier food might lead to less consumption of highly processed foods that are high in salt, fats and sugars, and fewer purchases of food away from home (Fernandes, Rieger and Proença, 2019^[157]).

To be effective, such interventions need to be grounded in behavioural science, which means policies may need to address broader family issues such as time management, parent enthusiasm for cooking, and

picky eating (Robson, Crosby and Stark, 2016^[40]). Indeed, evidence shows that participants with low SES scores prefer to receive dietary advice and engage in physical activities in the company of others. Involving friends, family and peers to create social support is therefore a strategy which could be used to promote healthy lifestyles among lower SES groups (Bukman et al., 2014^[65]).

Providing dietary information: Front-of-pack labelling

Front-of-pack (FOP) nutritional labelling is used across countries to communicate health and other product attributes to consumers. These can be voluntary or mandatory (Giner and Brooks, 2019^[1]). However, some schemes are poorly understood and, more importantly, not trusted by consumers. Evidence shows that consumers are most influenced by FOP labelling only if they are already health conscious when purchasing food products (Sinclair, Hammond and Goodman, 2013^[9]; Julia et al., 2017^[158]; Kelly and Jewell, 2018^[10]).

Moreover, evidence shows that FOP labelling is less effective for lower socio-economic groups. Such labels are more likely to be understood by consumers with a higher education and higher income, whereas comprehension is lower among the most disadvantaged socio-economic groups (Sinclair, Hammond and Goodman, 2013^[9]). For example, it has been found that low socio-economic groups find it difficult to understand labels due to the complexity of numerical information, small print size, and when labels are positioned on the back or side of the packs (Kelly and Jewell, 2018^[10]). Sinclair et al. (2013^[9]) found that older consumers and those with lower levels of education are more likely to disregard or reject FOP nutrition labels.

In a recent evaluation of Australia's implementation of the joint Australia/New Zealand Health Star Rating FOP labelling system, it was found that four years after its introduction, awareness of the scheme was low amongst overweight, rural-dwelling Australians and those from low socio-economic groups (Jones et al., 2019^[159]). Another evaluation of the Health Star Rating system found that, more than four in every five (83.3%) of Australian consumers were aware of the system. Consumers who were more aware of the system were more generally women under the age of 55 years, with a university education, with low BMIs (compared to people considered overweight or obese), and with higher household incomes (over AUD 50 000) (Heart Foundation, 2019^[160]). Priority groups in New Zealand were better informed about the system as a result of targeted efforts to ensure the scheme was tested prior to its launch. It has been recommended that similar approaches be taken in Australia to ensure more equal health outcomes (Jones et al., 2019^[159]).

Japan's labelling system, Foods with Functions Claims (FFC), was launched in April 2015 for certain foods with health functions and benefits. This system is a notification system and foods labelled under FFC must meet government-set criteria and there needs to be evidence from clinical trials to substantiate health claims (Japan Consumer Affairs Agency, 2015^[161]). As of March 2020, 1 325 products were on sale carrying the FFC label (FOODnavigator-asia.com, 2020^[162]).

Included in the European Union's Farm to Fork strategy is a proposal for mandatory harmonised FOP nutritional labelling by the end of 2022 (European Commission, 2020^[163]).

Given that comprehension is a major barrier to the success of labelling products, policies should identify and target subsets of the population that need support to understand them correctly. Current FOP labelling schemes might need to be adapted to improve communication of information or to appeal to the targeted socio-economic group in order to ensure that consumers fully understand labels. Even if the direct impact of FOP labelling on food choices by lower SES households is unclear, mandatory labels could still improve food choices indirectly by stimulating product reformulation.

5.2. Track 2: Supply-side policies

Supply-side policies at the supply-demand interface focus on voluntary collaboration with the food industry. Possible initiatives are food reformulation and improvements in the food environment.

Reformulating food products

The reformulation of products has been used as a policy instrument by several countries, such as the United Kingdom, which has focused on reducing salt and sugar. The United States implemented a mandatory reformulation programme for trans fats and Canada banned partially hydrogenated oils (OECD,

2021^[21]). By the end of 2021, the European Union will have initiated several actions, including setting a threshold for certain nutrients so as to encourage the reformulation of processed foods (European Commission, 2020^[163]). Further OECD country examples of public-private co-operation to encourage more balanced diets through reformulation are listed in Giner and Brooks (2019^[1]). This is a promising policy instrument to increase healthier food choices because no behaviour change is needed from the consumer.

Nutritional labelling schemes can incentivise product reformulations to achieve a better rating. A successful example is given by New Zealand, where almost 80% of products with a Health Star Rating label have been reformulated since the voluntary FOP labelling was introduced in 2014 (MPI, 2018^[164]) (OECD, 2019^[165]). A mandatory labelling system across all products and food categories might therefore lead to reformulation of less healthy products; similar effects might be expected from nutritional information labels for fast food menus (Hyman, Kopf and Lee, 2010^[166]; The Senate Australia, 2018^[167]).

Improving the food environment

A lack of dietary and cooking knowledge, as well as a lack of time to prepare and cook food, are important constraints to healthier food choices among lower socio-economic groups. One possible response could be to expand healthier food choices into ready-to-eat and convenience food options sold in supermarkets and food away from home settings. These are recommended interventions to facilitate population-wide improvement in diets (The Senate Australia, 2018^[167]). The dietary quality of different food away from home establishments varies and public health interventions may be most effective if they focus on modifying peoples' use of fast food outlets (Penney et al., 2017^[44]).

5.3. Track 3: Regulations when public-private incentives are misaligned

Where incentives of the public and private sector are misaligned, firmer approaches may be necessary. A notable example is restrictions on food marketing.

Restrictions on food marketing

Consumers' desire to purchase and consume products can be influenced through marketing tools, such as TV advertisements, in-store promotions, and online offers (Box 3). Restrictions on food marketing have been implemented in several OECD countries, and the WHO has developed recommendations to protect consumers from making less healthy food choices (WHO, 2010^[91]). The Australian Senate Committee into the Obesity Epidemic introduced recommendations in 2018 to restrict promotions and to implement marketing regulations and restrictions based on the Health Star Rating FOP labelling scheme. Although the Australian government has yet to respond to these recommendations (The Senate Australia, 2018^[167]), there has been agreement on a national interim voluntary guideline for Australian State governments to use in their policy settings to reduce children's exposure to the promotion of unhealthy food and drinks (COAG Health Council, 2019^[168]). Similarly, the United Kingdom implemented a Childhood Obesity Plan including advertising and promotion regulations for unhealthy foods and drinks (UK Government, 2018^[169]). Additionally, as part of its tackling obesity strategy, a ban on advertisements on television and online before 9 pm of food high in fat, sugar and salt will be implemented, along with an end to in-store "buy-one-get-one-free" promotions for such products (Government of the United Kingdom, 2020^[170]). By the end of 2022, the European Union will restrict marketing of foods with salt, sugars and/or fat above certain thresholds (European Commission, 2020^[163]).

5.4. Track 4: Fiscal measures

Fiscal measures are the fourth track used in OECD countries. An example of a fiscal measure is the implementation of a tax on less healthy foods. Conversely, some targeted food assistance programmes aim to make healthy food choices cheaper for recipients; these can be regarded as targeted subsidies.

Health-related food taxes

Twelve OECD countries have implemented health-related taxes at the central government level as of October 2018, and several food taxes have been introduced at the local government level in the United

States and Spain. Taxes tend to be implemented on food products with negative health outcomes and the most common product to be taxed is soft drinks (Giner and Brooks, 2019^[1]).

The welfare effects of health-related taxes are not always straightforward. A tax raises prices, which normally creates an economic efficiency loss and hurts consumers financially. Moreover, as poorer households usually spend a higher share of their income on food, such a tax is likely to be regressive (i.e. disproportionately affecting poorer households relative to their household income). But if the tax is effective at reducing less healthy food choices, these negative effects could be offset by savings in health care costs, thus potentially leading to a positive net welfare effect (Okrent and Alston, 2012^[171]). Moreover, as less healthy food choices are often more prevalent among lower income groups, the private benefits of a health-related tax (such as lower out-of-pocket health care expenditures and improvements in quality of life) would also be concentrated among these groups (Sassi et al., 2018^[172]). The net impact of such a tax will thus depend on the context and on the specifics of the policy design. Nevertheless, the potential negative financial impact of health-related taxes on poorer households needs to be kept in mind as a drawback.

In many countries no value added taxes (VAT) or discounted rates are levied on basic foodstuffs (OECD, 2020^[173]). Lower VAT rates applied to fresh fruit and vegetables are used in some countries to encourage consumption. Studies measuring the impacts of reducing VAT applied to fruit and vegetables on consumption, and in terms of health outcomes and cost effectiveness, are not conclusive (Dallongeville et al., 2009^[174]).

Targeted food assistance programmes

The United Kingdom's Healthy Start scheme described above provides vouchers for fruit and vegetables to low income households with children. This policy has led to increased spending on fruit and vegetables and has been more effective than an equivalent-value cash benefit. Moreover, the policy has improved the nutrient composition of households' shopping baskets (Griffith, von Hinke and Smith, 2018^[175]). This is consistent with findings from Darmon and Drewnoski (2008^[36]), whose research in the United Kingdom and United States concluded that providing such vouchers to women with low incomes is an effective way of increasing consumption of these products. Indeed, it is more effective than providing dietary advice alone, which had no effect on the consumption of fresh produce (Darmon and Drewnowski, 2008^[36]). Household food security can also be improved through such an initiative.

5.5. Socio-economic and demographic factors and policy effectiveness

OECD countries implement a range of policy instruments to encourage the consumption of healthy foods, for example, through education campaigns, FOP labelling, and restrictions on food advertising, but also health-related taxes. The available evidence on the effectiveness of the four-track approach shows that these policy instruments can support healthier food choices. Taking into account socio-economic and demographic determinants of food choices can help policy makers choose the most effective policy mix and help tailor that policy mix to socio-economic and demographic groups where less healthy food choices are most prevalent. However, policy instruments have rarely to date targeted specific household groups, despite evidence suggesting important differences between these groups in terms of food choices.

Demand-side policies that focus on the provision of information have had limited impact. As discussed earlier, this may be due in part to the fact that households with lower SES are less likely to understand information provided on, for example, FOP labels. It may also reflect other constraints (e.g. income, time) which make it harder for these households to make food choices consistent with a healthy diet. In light of these findings, policy makers should consider putting more emphasis on other tracks that require fewer behavioural changes by consumers.

Product reformulation therefore seems more promising as it allows consumers to effortlessly make healthier food choices. Demand-side policies such as FOP labelling could still play a role by incentivising such product reformulation. While promising as a method to reduce less healthy food choices, reformulation cannot be used to promote greater consumption of, for example, fruit and vegetables, and other actions are therefore needed.

Firmer regulations can be used where public and private incentives are not aligned, as is the case for, for example, food marketing and advertising, in particular to children. As highlighted earlier (Box 3), children from lower-income groups are also more exposed to advertising. Several OECD countries restrict television and online marketing of highly processed foods high in fat, sugar and salt targeting children (OECD, 2021^[21]). Relatively little is known about the potential for other types of regulations, e.g. on limiting the prevalence of “food swamps”.

Finally, growing evidence suggests that fiscal measures such as health-related food taxes would be effective in shaping consumer food choices, particularly for specific food products. These policies should be carefully designed to avoid financially hurting lower-income groups. Targeted food assistance programmes favouring healthy diets (e.g. vouchers for fruits and vegetables) appear promising as these could simultaneously reduce food insecurity while directly stimulating healthier food choices without imposing financial penalties.

Overall, more evidence is needed on the socio-economic and demographic determinants of food security and nutrition, on the effectiveness of various policy measures, and on their interaction. This report finds that there is a scarcity of data needed to assess these issues. In order to monitor the health and sustainability of their populations’ food consumption, governments need to evaluate the effectiveness of policies encouraging healthier diets. For this, recent and in-depth data is essential. Different “layers” of information are necessary for food policy formulation and evaluation. These layers should include information on household food insecurity (particularly for vulnerable groups such as Indigenous Peoples), the food environment (including household purchases in supermarkets as well as food away from home purchases), on the socio-economic characteristics of the consumer household, as well as information on food products (e.g. composition and nutritional information).

A thorough analysis would require linking information on, for example, supermarket purchases with data on household information, as well as food composition data, to assess the nutritional value of the food consumed in relation to socio-economic determinants. These data are often not available in the public domain, although privately-held datasets exist for some of these elements. An overview of the data that OECD countries use can be found in Giner and Brooks (2019^[1]). It shows that most OECD countries undertake food intake surveys on a semi regular basis. In some instances, there is a time lag of up to a decade between different survey rounds for reasons of cost.

Data gaps need to be addressed if governments are to be able to ascertain the effectiveness of their food policy approaches. Recent and in-depth data is required to develop specific policies that encourage food choices among different socio-economic and demographic groups, as well as to address the issue of food insecurity across OECD countries. Digital technologies could reduce the costs associated with data collection and analysis, although the high costs associated with purchasing data from private marketing companies are likely to remain a barrier for governments. Nevertheless, digital technology should be capable of, for example, collecting and processing data through the use of a mobile app or the extracting information from food receipts using Universal Product Codes (UPC) that are linked to food composition databases.¹⁸

6. Conclusion

Socio-economic and demographic factors play an important role in shaping (un)healthy diets. Households with higher incomes and levels of education typically consume less unhealthy food (e.g. highly processed foods high in salt, fats and sugars) and more healthy food (e.g. fruits and vegetables). Several mechanisms could explain this correlation. For instance, higher incomes make it possible to purchase higher-quality food items; higher education levels make it more likely that people have a better knowledge of diets and nutrition, as well as how to prepare and cook food. Types of occupations also affect the availability of time and money to make food choices. Place of residence is associated with variations in the food environment: while recent research casts doubt on the importance of “food deserts” (i.e. the absence of healthy food

¹⁸ For more information see “Digital opportunities for demand-side policies to improve consumer health and the sustainability of food systems” (Baragwanath, 2021^[184]).

options), “food swamps” do seem to have an impact (i.e. the availability of less healthy food options). Rural and remote areas seem to have less favourable food environments.

If socio-economic and demographic factors shape food choices, then policies to encourage healthier food choices must take into account these factors to design an effective policy mix. This is increasingly important with the growing number of households struggling financially as a result of job losses provoked by COVID-19. Evidence suggests that information-heavy approaches are less effective with households with a lower SES. Such approaches should therefore be modified to better target SES households, or complemented with other approaches that allow consumers to make healthier food choices with less effort, e.g. product reformulations. Restricting marketing towards a specific target audience could also be effective.

Regulations on the food environment should be investigated further. Understanding the socio-economic determinants of food choices also helps in designing equitable approaches. For instance, health-related food taxes might disproportionately impact lower-income households (although these households might also stand to gain more from improved health outcomes). Targeted food assistance programmes to tackle food insecurity could be effective in stimulating healthier diets through, for example, the use of vouchers for fruit and vegetables.

To improve targeting and the overall effectiveness of such policies, a better evidence base is needed. This requires addressing “data scarcity” on healthier diets and on the number of food insecure households. Further research is needed for all policy approaches in order to determine which combination of instruments are more likely to be the most effective across various socio-economic groups. Monitoring and constant evaluation are important to measure the success of the policies implemented. Given the alarming trends in public health, and the fact that no instrument has so far managed to reverse these trends, investment in data and evidence on “what works” could reap large benefits.

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