World Health Organization
REGIONAL OFFICE FOR Europe

Better food and nutrition in Europe:

a progress report monitoring policy implementation in the WHO European Region

World Health Organization
REGIONAL OFFICE FOR Europe

Better food and nutrition in Europe:

a progress report monitoring policy implementation in the WHO European Region

Abstract

This report on progress achieved in the WHO European Region and Member States in implementing the European Food and Nutrition Action Plan 2015–2020 presents selected epidemiological data on the nutritional status of populations throughout the Region and on implementation of policies recommended in regional and global frameworks to promote healthy nutrition and prevent obesity. The data contained in the report are derived from the responses of Member States to the WHO Global nutrition policy review questionnaire.

Keywords
DIET
FOOD
HEALTH POLICY
NUTRITION POLICY
HEALTH PLAN IMPLEMENTATION
HEALTH PROMOTION
PROGRAM EVALUATION

Address requests about publications of the WHO Regional Office for Europe to:
Publications
WHO Regional Office for Europe
UN City, Marmorvej 51
DK-2100 Copenhagen Ø, Denmark
Alternatively, complete an online request form for documentation, health information, or for permission to quote or translate, on the Regional Office website (http://www.euro.who.int/pubrequest).

Contents

Acknowledgements

This publication has benefited from the primary contribution of Jo Jewell and Inês Lança de Morais, under the supervision of João Breda and Gauden Galea (WHO Regional Office for Europe). We also acknowledge the work of Chizuru Nishida and Kaia Engesveen in jointly developing the questionnaire and supporting the data collection (Department of Nutrition for Health and Development, WHO).

The WHO is grateful for the input of the following contributors for the detailed information they provided for some of the case studies and country examples:

- Sirpa Sarlio (Ministerial Adviser, Ministry of Social Affairs and Health, Finland)
- Liisa Valsta and Heli Tapanainen (National Institute for Health and Welfare, Finland)
- Ronit Endevelt (Ministry of Health, Israel)
- Britt Lande and Anniken Owren Aarum (Norwegian Directorate of Health, Norway)
- Loes Neven (Flemish Institute for Healthy Lifestyles, Belgium)
- Gerda Feunekes and Jovanka Vis (Netherlands Nutrition Centre, Netherlands)
- Anne Scott and colleagues (Food and Veterinary Administration, Denmark)
- Sophie Hesina (Federal Centre for Nutrition and Prevention, Austria)
- Maria Flothkötter and Margareta Büning-Fesel (Federal Centre for Nutrition, Germany)
- Emma Boyland (University of Liverpool, United Kingdom)
- Mimi Tatlow-Golden (Open University, United Kingdom)
- Janet Cade, Jayne Hutchinson and Holly Rippin (University of Leeds, United Kingdom)

Funding for this publication was partially provided by the European Commission Directorate General for Health and Food Safety. We also acknowledge the support of funding from the Government of the Russian Federation within the context of the WHO European Office for the Prevention and Control of Noncommunicable Diseases (NCD Office).

Abbreviations and acronyms

BMI	body-mass index
COSI	childhood obesity surveillance initiative
HBSC	health behaviour in school-aged children
HFSS	high in saturated fats, *trans* fatty acids, salt and sugar
NCD	noncommunicable disease

Executive summary

This report on progress achieved in the WHO European Region and Member States in implementing the European Food and Nutrition Action Plan 2015–2020 presents selected epidemiological data on the nutritional status of populations throughout the Region and on implementation of policies recommended in regional and global frameworks to promote healthy nutrition and prevent obesity. The data contained in the report are derived from the responses of Member States to the WHO Global nutrition policy review questionnaire.

Implementation of key policies has improved significantly in recent years. Substantial progress has been made in areas such as school food, food product reformulation, fiscal approaches and surveillance of childhood obesity. Areas in which implementation is lagging and which therefore require more attention include front-of-package labelling and comprehensive marketing restrictions. Other areas in which work might be reinvigorated or extended include support for breastfeeding and good complementary feeding practices.

The report identifies some differences among countries in the breadth and depth of policies. Reformulation is a good example: some countries have taken a minimal approach and others a more ambitious one. More ambitious approaches in food and nutrition policy might be required in the years to come if we are to achieve the Sustainable Development Goals and related targets, agreed upon by governments throughout the European Region.

Introduction

The interrelated challenges of an unhealthy diet and obesity have never been as high on the European public health agenda as they are today. For good reason: the findings of recent work by WHO show that the prevalence of obesity is either rapidly increasing or stabilizing at very high levels in almost all European countries, and dietary behaviour remains far from optimal *(1)*. Excess intake of saturated fats, *trans* fats, salt and sugar contribute to diet-related noncommunicable diseases (NCDs), while inadequate intake of fruit, vegetables and whole grains undermines their beneficial health effects *(2)*. Groups of low socioeconomic status are the most severely affected, with significant economic and welfare costs for individuals and society as a whole *(3)*. Together, these factors paint a bleak picture that requires ambitious action by governments.

The WHO Regional Office for Europe has advocated for implementation of comprehensive policies to promote healthy diets and prevent obesity in the European Region since at least 2000. The first action plan on food and nutrition policy, adopted in 2000, explicitly called on Member States to introduce strategies or action plans on food and nutrition *(4)*. Since then, almost all Member States have adopted some form of government-approved policy on nutrition or obesity. Nevertheless, understanding of the challenge and the evidence for successful policies have increased to such an extent that the guidance must now be updated, refined, expanded and extended. The most recent policy endorsed by Member States – the European Food and Nutrition Action Plan 2015–2020 *(5)* – included state-of-the-art knowledge on the factors that influence dietary behaviour throughout the life-course and policies and interventions for a wide range of settings and domains.

The importance of food environments in influencing people's food preferences, dietary behaviour and health outcomes has been well described in the literature, and a suite of policies is now recognized as essential for creating a healthy food environment *(6)*. Furthermore, the importance of nutrition throughout the life-course, starting in early life, for later development of obesity and NCDs is ever clearer. Tailored policies and interventions are therefore needed, targeting each stage of the life-course. The health system plays a role in promoting healthy diets and weight management, but service delivery and the scope of practice and training for health professionals might have to be transformed, including investment in more diversified human resources at primary care level.

In order to respond to these challenges, Member States should have systems for routine surveillance, monitoring and evaluation, so that they can identify their own challenges and the effects of activities over time. Similarly, policy mechanisms and new policy-making competence are required to facilitate intersectoral action in areas that influence food and diet but may lie outside the traditional purview of the health sector.

The European Food and Nutrition Action Plan 2015–2020 outlines a comprehensive set of policy actions for Member States, which, if implemented collectively, would help to turn the tide on obesity and unhealthy diets. This report provides a snapshot of progress in implementation of these policy actions in the Region at the mid-point of implementation of the action plan. It is based on the most up-to-date data on epidemiology and policy reported to WHO by Member States and on case studies of innovative activities throughout the Region.

Epidemiological context

NCDs are the leading causes of death, disease and disability in the WHO European Region. In 2015, NCDs, including cardiovascular diseases, cancer, diabetes and chronic respiratory disease, caused 89% of deaths in Europe, an increase of 3 percentage points over the proportion in 2000 *(7)*. This burden continues to place increasing strain on health systems, human and economic development and the well-being of large sectors of the population. While most of the countries in the Region are on track to achieve the global target of reducing premature mortality from these diseases by 25% by 2025, morbidity from NCDs remains worryingly high, especially in vulnerable groups, with associated economic and welfare costs *(6)*.

Persistent challenges in addressing the four common behavioural risk factors – tobacco smoking, alcohol consumption, an unhealthy diet and physical inactivity – underlie this trend. Population-level measures are required in response. At the same time, men experience higher rates of premature mortality than women, particularly in the east of the Region, but women spend many of their additional years in poor health. There is thus a growing need for equity- and gender-responsive approaches that take into account the impacts of socioeconomic status, gender and environmental and cultural determinants on risk-taking behaviour, so that responses can be tailored to each group.

Numerous analyses have demonstrated the increasing importance of dietary risk factors in this equation, especially when elements that are usually investigated separately (such as high body-mass index (BMI), excess sodium or salt intake and low fruit and vegetable consumption) are combined in one estimate. The latest results from the ongoing Global Burden of

Disease Study *(8)* show that one in five deaths globally can be attributed to an unhealthy diet; the proportion soars when high BMI and other measures of maternal and child malnutrition are included. The importance of an unhealthy diet and the risks associated with high BMI have increased significantly since previous analyses were performed.

Unhealthy diets in the European Region are characterized by energy imbalance and excessive intake of saturated fats, *trans* fats, sugar and salt *(9–11)*, largely due to increased consumption of highly processed, energy-dense manufactured foods and sugar-sweetened beverages *(5,12)* and inadequate consumption of vegetables, fruits and whole grains *(13)*. Over time, foods and beverages high in saturated fats, *trans* fatty acids, salt and sugar (HFSS products) have become more widely available and cheaper and are heavily promoted, particularly to children *(14)*. Continuous monitoring of the composition of manufactured foods reveals startlingly high levels of nutrients of public health concern and wide variation within and across product categories *(15)*. Poor maternal nutrition (especially excess body weight before, during and after pregnancy), inadequate breastfeeding and inappropriate complementary feeding also play an important but often overlooked role in the development of overweight and obesity *(16)*.

A recent review for WHO of diets in countries in the European Region since 2000 *(17)* found that attainment of the WHO-recommended nutrient intakes was poor throughout the Region. For example, the WHO-recommended upper limit on fat of 30% of total energy intake was exceeded in all countries, and the recommendation that saturated fats represent only 10% of total energy intake was also exceeded in most countries. In all countries that reported on added sugars, intake was over the recommended 5% of total energy intake.[1] The highest intakes are those of children and adolescents, whose intake routinely exceeds the 10% upper limit; sugar-sweetened beverages, confectionery, cakes, pastries and breakfast cereals are the main sources *(18)*. An increasing number of countries have performed surveys of 24-h urinary sodium excretion, which provides the most accurate measure of salt intake. The results show that intake exceeds the WHO recommendation of ≤ 5 g/day in all countries. Some of the highest measured intakes in our Region are in Central Asia, where an intake of 17.4 g/day was reported in Kazakhstan and 14.9 g/day in Uzbekistan.[2]

The prevalence of overweight and obesity in the WHO European Region has thus been increasing steadily, to alarming levels *(19)*. WHO estimated that, in 2010, 56.1% of the adult population of Europe was overweight, and the prevalence had increased to 58% by 2014 (Table 1). In general, men were more frequently overweight than women (62.5% versus 53.7%), and the rate of increase was faster among males, especially in central and eastern European Member States.

[1] Most countries that reported sugar intake defined "added sugars", whereas the intake of free sugars recommended by WHO should be used. The definitions are similar, and WHO has not recommended intake for added sugars. The WHO definition of "free sugars" is broader than that typically used for added sugars, and there is therefore no risk for overestimation.

[2] WHO Regional Office for Europe. Results forthcoming.

Projected trends to 2025 (based on trends since 2000) suggest that more than half the adult population of all countries in the European Region except Tajikistan will be overweight or obese; therefore, the majority of the adult European population will be at increased risks for disease and disability. A similar exercise predicted that, by 2025, obesity will increase in 44 countries. If present trends continue, 33 of the 53 countries are predicted to have a prevalence of obesity of ≥ 20% *(20)*. The WHO European Region is thus unlikely to reach the global target to halt the rise in adult overweight and obesity, and urgent action is needed if the trends are to be changed.

The trends in childhood and adolescent obesity are particularly worrying, as they have implications for health and well-being, not only immediately but also in the future as these groups transition to adulthood. It is generally understood that the risks for many NCDs are determined by risk factors not only in adult life but in childhood or even earlier, during fetal development, and that the risks continue throughout life *(21)*. Promoting good maternal and early-life nutrition, preventing childhood obesity and supporting the development of healthy dietary preferences from an early age are therefore essential.

Data from the WHO European Childhood Obesity Surveillance Initiative (COSI) in 2014 showed that one in three children aged 6–9 years was overweight or obese, and these studies and other research showed that the prevalence was highest in southern European countries and among groups of low socioeconomic status *(22,23)*. In addition, 15–39% of 11-year-old schoolboys and 9–32% of schoolgirls were reported as being overweight or obese in the 2013–2014 study of health behaviour in school-aged children (HBSC), which includes 42 countries in the WHO European Region *(24)*. A recent report from WHO *(25)* indicated that the rate of adolescent obesity has stabilized in some countries, but the prevalence has increased in over half of those covered by HBSC surveys since 2002. The most marked increases have been observed in eastern European countries, where the rates of obesity were relatively low in 2002.

The WHO European Region has witnessed major improvements in infant and young child health in recent decades, and the Region includes countries with the lowest rates of infant and child mortality in the world *(26)*. The rates of stunting and wasting have fallen dramatically, and progress continues rapidly. Although the European Region has the fewest stunted or wasted children worldwide *(27)*, the Region is diverse, and, in some countries, these forms of undernutrition remain a concern, notably in Central Asia and the Caucasus. The availability of data varies, but the prevalence of stunting ranges from 8% in Kazakhstan *(28)* to 26% in Tajikistan *(29)* and that of wasting from approximately 3% in Kyrgyzstan *(30)* to approximately 10% in Tajikistan. The trend across countries in more recent data, however, is towards lower prevalence. At the same time, the prevalence of overweight and obesity is increasing. Addressing the double burden of malnutrition – underweight, micronutrient deficiency and overweight co-existing within the same families and communities – is therefore a priority in some countries *(31)*.

Table 1. Age-standardized prevalence of overweight in 2010 and 2014, observed changes and predicted relative changes up to 2025 in the WHO European Region and in other European country groups

	2010			**2014**			Observed change 2010–2014 (%)			Predicted relative change between 2010–2025 (%)		
	Both sexes	Males	Females	**Both sexes**	**Males**	**Females**	Both sexes	Males	Females	Both sexes	Males	Females
WHO European Region	56.1	60.1	52.4	**58**	**62.5**	**53.7**	3.3	4	2.6	13.8	16.2	11.2
EU-13	56.3	62.8	50.3	**57.8**	**65.2**	**50.9**	2.6	3.8	1.2	11.7	16.1	6.6
EU-15	57.2	64	50.8	**58.9**	**65.7**	**52.3**	2.8	2.6	3.1	12.3	11.5	13.2
NIS	52.8	53.3	52.4	**55**	**56.8**	**53.4**	4.1	6.4	1.9	15.9	23.8	9
SEEHN	53.9	59.3	48.7	**55.6**	**62**	**49.5**	3.2	4.5	1.7	13.7	18.1	8.6

EU-13: the 13 countries that joined the European Union after 2004: Bulgaria, Croatia, Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia
EU-15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom
NIS: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, the Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan
SEEHN: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the former Yugoslav Republic of Macedonia, Israel, Montenegro, the Republic of Moldova, Romania and Serbia

Inadequate early nutrition is also a concern. Recent data on exclusive breastfeeding from 21 countries in the Region show that, on average, only 13% of infants are exclusively breastfed during the first 6 months of life. The European Region has the lowest prevalence of exclusive breastfeeding at 6 months of all six WHO regions *(32)*. The reasons are diverse but include continued promotion of breast-milk substitutes and poor implementation of the International Code on Marketing of Breast-milk Substitutes; high participation of women in the labour market and variable rules for maternity leave among countries; lifestyle choices; and mixed feeding practices. There is considerable scope for increasing the rates of exclusive and continued breastfeeding, in line with WHO recommendations. Recent research continues to confirm the superior nutritional benefits of breastmilk for optimal growth and shows that breastfeeding is intrinsically linked to the best start in life in countries at all income levels *(16)*.

At the same time, evidence suggests that some infants in Europe receive inappropriate complementary feeding, with early introduction of solid foods and/or a nutritionally imbalanced diet *(33)*. The nutritional composition and promotion of some commercial complementary foods has been criticized in studies that showed high levels of sugar and sodium *(34,35)*.

Policy mandates and relevance of this status report

In view of this epidemiological situation, WHO and its Member States have mobilized themselves to ensure that nutrition and prevention of obesity receive attention at the highest political level and that relevant, evidence-informed policies and interventions are clearly defined in guidance and recommendations. Recent work took its lead from the European Charter on Counteracting Obesity *(36)*, adopted in 2006; since that time, there have been many important developments in European and global nutrition policy.

In 2011, the United Nations General Assembly adopted a political declaration on the prevention and control of NCDs *(37)*, which was a first call for United Nations-wide action on the drivers of NCDs, including unhealthy diets. Progress by Member States was reviewed in 2014 *(38)*. In 2012, the World Health Assembly approved the Comprehensive implementation plan on maternal, infant and young child nutrition *(39)*, with six global nutrition targets to be achieved by 2025, including reductions in young child stunting and wasting, no increase in overweight, reductions in maternal anaemia and low birth weight and increased breastfeeding. In 2013, the Health Assembly approved the Global action plan for the prevention and control of noncommunicable diseases 2013–2020 *(40)*, with nine voluntary global targets and 25 indicators, including targets on salt reduction and halting the rise in adult obesity. These global targets are summarized in Box 1.

In Europe, the WHO ministerial conference on nutrition and NCDs in the context of Health 2020, hosted by the Austrian Government in 2013, resulted in the Vienna Declaration, which called for a new European Food and Nutrition Action Plan, which was unanimously adopted by Member States in 2014. The goal of the action plan is to reduce significantly the

burdens of preventable diet-related NCDs, obesity and all other forms of malnutrition through comprehensive, integrated policy action to improve the nutritional quality of diets *(4)*. The specific objectives of the action plan were to:

- create healthy food and drink environments;
- promote the gains of a healthy diet throughout life, especially for the most vulnerable groups;
- reinforce health systems to promote healthy diets;
- support surveillance, monitoring, evaluation and research; and
- strengthen governance, alliances and networks to ensure a health-in-all-policies approach.

Box 1. Global targets relevant for nutrition- and diet-related NCDs

- a 25% relative reduction in risk for premature mortality from cardiovascular diseases, cancer, diabetes and chronic respiratory diseases by 2025
- a 0% increase in the prevalence of diabetes and obesity by 2025
- a 30% reduction in sodium/salt intake by 2025
- a 10% reduction in physical inactivity by 2025
- no increase in childhood overweight by 2025
- end to all forms of malnutrition by 2030

Sources: references *37* and *38*

Within these objectives, more specific policy options were proposed for the consideration of Member States in implementing the action plan. The Regional Office has since prepared policy guidance and tools to support Member States in areas as diverse as surveillance of childhood obesity *(41)*, food marketing to children *(42)*, elimination of *trans* fats *(43)*, use of price policies to promote healthier diets *(44)*, nutrition and weight management in primary care *(45)* and good maternal nutrition *(21)*. WHO has also published updated guidelines on the intake of sodium (salt) *(46)* and free sugars *(47)* to support Member States in defining their population and individual nutritional goals.

Resolution EUR/RC64/R7 on the action plan *(48)* called on the Regional Office to monitor and report on policy implementation in Member States. This report describes the current status of adoption and implementation of relevant policies in Member States at the mid-point of implementation of the action plan, which is a good opportunity to reflect on progress, challenges and opportunities.

This regional agenda is fully aligned with other initiatives, such as the European Union Action plan on childhood obesity *(49)*, the Rome Declaration on Nutrition *(50)* and its accompanying framework for action *(51)*, in addition to the United Nations Agenda for sustainable development *(52)* with the 17 Sustainable Development Goals. The data gathered from Member States will therefore serve many purposes.

Approach and methods

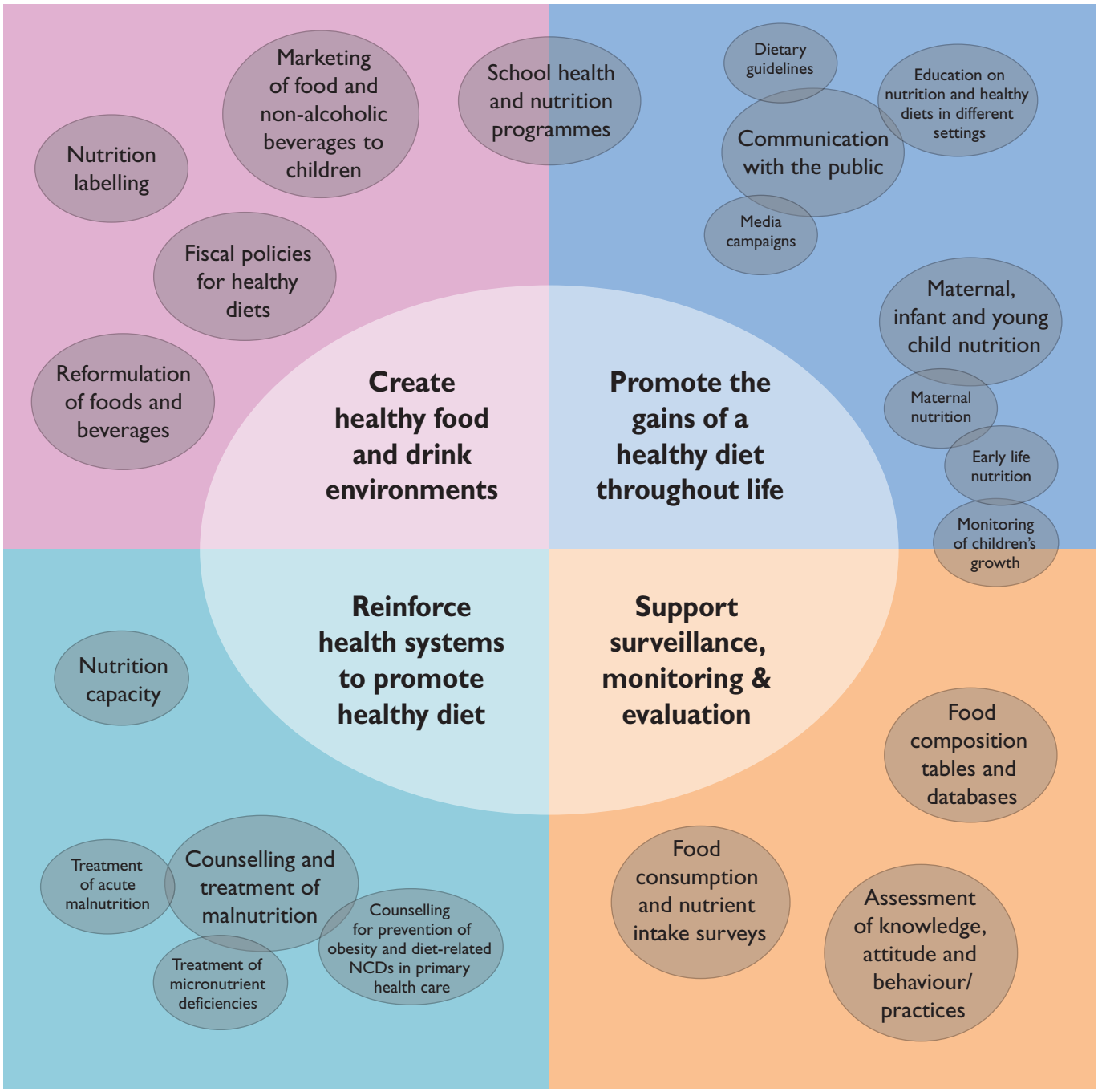
A comprehensive on-line questionnaire, with nine sections, was designed by WHO and circulated to all the WHO regions. Collaboration between WHO headquarters and the WHO Regional Office for Europe ensured that the questionnaire was consistent with the European Food and Nutrition Action Plan and fulfilled our reporting obligations to Member States, including in relation to the European Union Childhood obesity action plan. Parts of the questionnaire were reviewed by external experts and partner agencies to ensure that the questions asked would capture the relevant information. Efforts were also made to collect details of the design and scope of national policies, as research has shown the limits of policy monitoring that fails to make necessary distinctions among different approaches (e.g. comprehensive versus minimal monitoring). Such details of the design and scope of policies are important, because they may affect their effectiveness *(6,53)*.

Internet versions of the questionnaires, with information from WHO databases already entered, were circulated to Member States during the second half of 2016. The questionnaire was available in English, French, Russian and Spanish. Most responses were received before March 2017. An abbreviated questionnaire was prepared as an off-line PDF form and disseminated in January 2017 to obtain information from Member States that had not completed the full on-line questionnaire. The abbreviated version contained 42 questions covering the most important areas, without the level of detail requested in the full on-line questionnaire. Responses from Member States were received up to September 2017. A total of 50 countries responded to the questionnaire, corresponding to 94% of the WHO European Region Member States.

The data reported by Member States were validated to the fullest extent possible against documents submitted by Member States and other resources, such as WHO publications, the academic literature and the databases of partner agencies and regional monitoring initiatives. After careful review, respondents were contacted to obtain any missing information or to seek clarification, if necessary; further documentation was requested in certain cases. The WHO country offices further verified some nutrition actions implemented in Member States.

This report focuses on the sections and indicators most relevant to the European Food and Nutrition Action Plan (Fig. 1). Therefore, not all the indicators for which data were collected are reported, although these will be integrated into WHO on-line databases.

Fig. 1. Objectives of the European Food and Nutrition Action Plan 2015–2020, with the relevant indicators from the global nutrition policy review



Not all countries responded to all sections of the questionnaire. This report gives priority to those indicators relevant to WHO European policy frameworks and for which the most complete information was available. When possible, more detailed information is included, but for fewer countries than those that responded to the full questionnaire or for which policies, protocols, guidelines and regulations were available to the team. As no answers were excluded from the data presentations in the report, the denominators used within the same section may differ.

Structure of the report

The next four sections of this report reflect the four objectives of the European Food and Nutrition Action Plan. The rationale and evidence for action on each objective are recapitulated and compared with existing WHO recommendations and guidance. Summaries of country data are provided to illustrate implementation of various policy actions, with case studies from countries that have taken innovative approaches. The survey did not specifically ask about work by Member States to strengthen governance, alliance and networks for nutrition and food policy; however, the case studies address these aspects explicitly.

Objective 1. Creation of healthy food environments

The environments in which we learn, work and play have a significant impact on the development of our food preferences, food choices and the overall nutritional quality of our diets *(54)*. "Modern" food environments are characterized as promoting high energy intake and excess nutrients from widely available, inexpensive, heavily promoted, highly palatable, manufactured HFSS products *(55)*. The term "obesogenic environment" was first coined in 1997; since then, a large body of research has investigated ways in which environmental factors (such as the availability, price and promotion of foods) influence dietary behaviour and encourage weight gain *(56)*.

The decisions of manufacturers and retailers about the locations of their outlets, the foods they sell, the prices they charge, the promotional strategies they use (including marketing and packaging) and the composition of their products all influence purchase and consumption *(57–59)*. In addition, the foods available in settings such as nursery schools, schools, hospitals and public institutions strongly affect our diets. For example, as children in most European countries spend most of their daily life in a school environment, school food policies are an important entry point for promoting healthy nutrition *(60)*. At the same time, policies that address the supply chain may make it easier or cheaper for manufacturers to include certain ingredients (e.g. sugar, hydrogenated fats, saturated fats) and incentivize their use in food *(61)*. With increasing globalization of food supply chains that encourage adoption of the "western" diet and HFSS products, exposure to unhealthy diets and obesity are concerns throughout the European Region *(62)*.

Governments have therefore been seeking ways to improve their countries' food environment through policy and regulation in areas as diverse as restricting the marketing of food to children, using interpretative front-of-package labelling, enacting healthy food policies for schools and the public sector, banning the use of *trans* fatty acids, reducing sodium and taxing HFSS products, such as sugar-sweetened beverages. These approaches have been supported by reviews of evidence of the cost-effectiveness and effectiveness of different policy options *(63–65)*.

For its part, WHO has issued more guidance in this area, encouraging governments to enforce standards such as the WHO Set of recommendations on the marketing of foods and non-alcoholic beverages to children *(66)*, to explore the option of introducing fiscal measures to influence diets *(67)* and to extend salt reduction initiatives *(68)*. In the European Food and Nutrition Action Plan 2015–2020, countries agreed to consider the following as priorities:

- Adopt strong measures to reduce the overall impact on children of all forms of marketing of foods high in energy, saturated fats, *trans* fats, sugar or salt, including through nutrient profiling.

- Consider economic tools, including supply chain incentives, targeted subsidies and taxes, to promote healthy eating, with due consideration to the overall impact on vulnerable groups.

- Promote, through government leadership, product reformulation, improvements to the nutritional quality of the food supply, use of easy-to-understand or interpretative, consumer-friendly labelling on the fronts of packages and healthy retail environments.

- Engage in across-government collaboration to facilitate healthier food choices in settings such as schools, nursery schools, nurseries, hospitals, public institutions and workplaces, including by setting standards.

The following section provides summaries of the data reported by countries to WHO on implementation of policies to promote healthy food environments.

1.1 School food and nutrition

Schools may be important, protected settings for learning healthy dietary preferences and habits. Appropriate action should be taken to ensure the availability of healthier foods and to limit the availability of HFSS products. Specific actions to promote healthy diets in school settings include free or subsidized fruits and vegetables, food- or nutrient-based standards for the foods and meals available in schools, changes to the presentation of food choices at points of offer and nutrition education and skills to increase nutrition literacy and capacity *(69)*.

School food policies can improve knowledge, preferences, attitudes and behaviour towards food. Evidence suggests that nutrition education is most effective if it involves learning skills, such as cooking or food product literacy, rather than just providing information *(70)*. Well-designed policies can also contribute to improving the nutritional quality of diets (i.e. influence caloric and nutrient intake as well as dietary diversity) by limiting the availability of HFSS products and encouraging healthy food choices *(71,72)*. Partial restriction, such as the presence of vending machines, has been shown to undermine the effectiveness of these policies, however, as children can still access HFSS products *(73)*. The evidence therefore suggests that

a comprehensive, multifaceted approach will have more positive results *(74)*.

The WHO Regional Office for Europe has published guidance on the development of school food policies, based on key steps to healthy eating *(75)*. Subsequent research by the European Commission Joint Research Centre on implementation of school food policies in the European Union Member States *(76)* indicated that most countries have taken some action in this area (through either mandatory or voluntary guidelines), although the scope and nature of implementation differ by country. The findings are broadly similar to those of this review.

The data reported by countries to WHO show that most have adopted measures to promote healthy diets in schools (96%), including by setting standards for the foods available (88%) (Fig. 2). The responses to the questionnaire, however, did not indicate whether the policies were universally implemented and enforced. In many instances, the policies declared are mandatory but the scope of the standards varied significantly in terms of the foods and nutrients to which the standards apply (Fig. 3, 4, 5), the availability of HFSS products in schools (e.g. from vending machines) (Fig. 2) and the promotion of fruit and vegetables (Table 2). For example, 58% of countries reported having a school fruit and vegetable scheme; only 23% countries reported a ban on vending machines on school premises; 25% reported salt covered under the mandatory standards in schools and 58% of countries reported standards for foods and beverages served for lunch in school canteens and cafeterias.

1.2 Nutrition labelling

The European Food and Nutrition Action Plan encourages Member States to increase use of consumer-friendly labelling by establishing easy-to-understand or interpretative front-of-package schemes. Front-of-package labelling can facilitate consumer understanding of the nutritional content of many foods, especially complex processed foods, and might also affect their diets by encouraging food producers and retailers to reformulate their products or develop new ones.

Although nutrient declarations on the backs of packages are essential, they are sometimes difficult to understand, particularly by consumers of low socioeconomic status *(77,78)*. Front-of-package labels with interpretative information about nutrient content – explained with words, symbols and colours – have been found to be easiest for consumers to understand and interpret correctly *(79–81)*. Schemes that are less easy to interpret are generally disliked, with a preference for schemes that are simple and easy to use but that still provide full information *(82)*. There is evidence that people who purchase more foods with endorsement and summary logos (e.g. Keyhole, Finnish Heart, Choices, Nutri-Score) have healthier diets *(83–85)*.

Fig. 2. Components of school health and nutrition policy, programme or standard

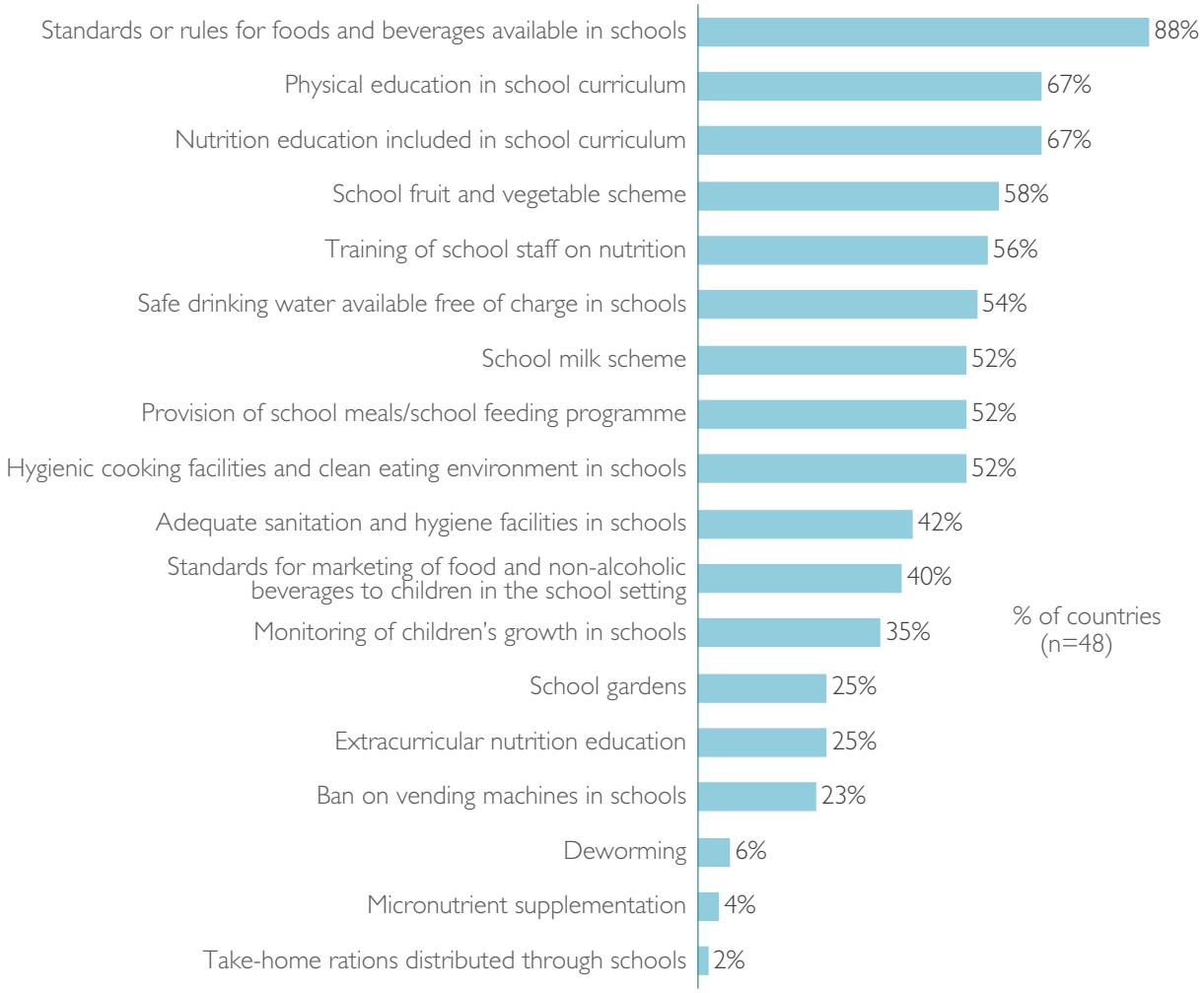


Fig. 3. Meals or snacks to which standards or rules for foods and beverages available in schools apply

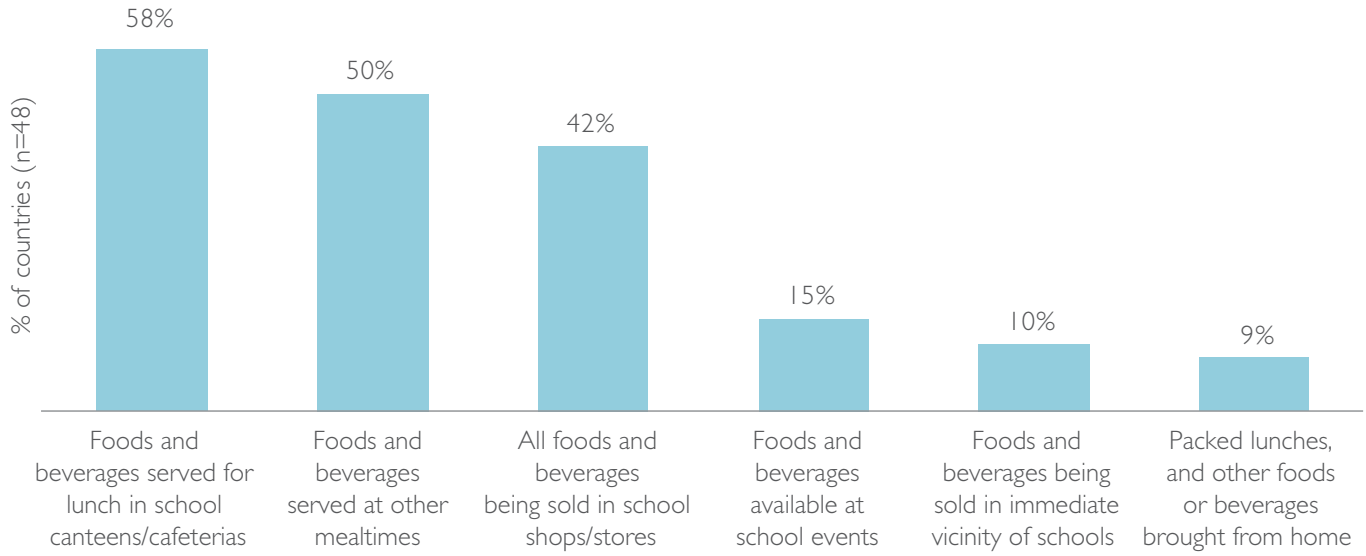
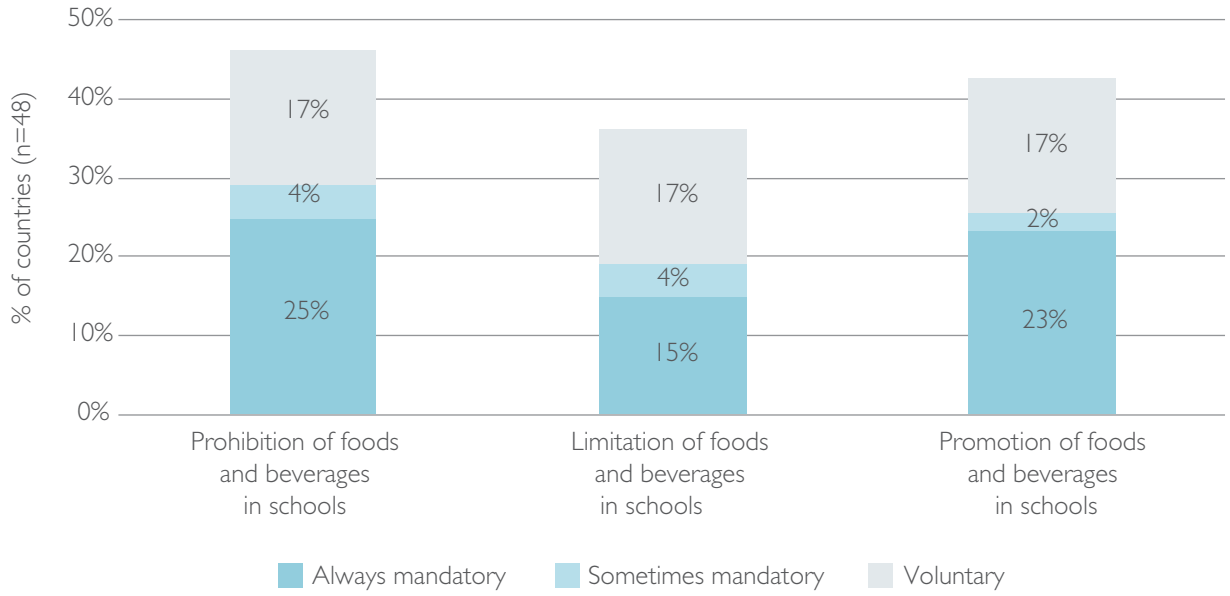


Fig. 4. Mandatory or voluntary prohibition, limitation and promotion of foods and beverages in schools



Widespread use and uptake of a front-of-package labelling system can ensure that a critical mass of pre-packaged food products bear the label; manufacturers and retailers can be important partners at this stage. Experience across Europe shows that this is feasible. Public messages about use of the scheme are also important. Consumers now increasingly request front-of-package information, and continued education will reinforce this tendency.

Much progress is being made in the Region on mandatory nutrition declarations and lists of ingredients: 90% of countries reported declarations on pre-packaged food (of which 76% require mandatory declarations on all pre-packaged foods), and 98% of countries require lists of ingredients (Fig. 6). In addition, many countries reported voluntary front-of-package labelling (67%), although only 27% had issued specific guidelines, legislation or regulations to guide such labelling (Fig. 6). Fig. 7 indicates the nutrients that are to be declared. There was less progress in the use of interpretative front-of-package labelling (27%), which is increasingly understood to be most important for consumers. Some countries are showing leadership in this area, with national schemes for the use of text, symbols, colours and warnings (Fig. 8). Best practices in front-of-package labelling in Europe are summarized in Box 2.

Measures to regulate or guide nutrition or health claims were reported by 87% of countries; however, implementation of the rules was less clear: 68% of countries reported that claims must be substantiated with evidence, and a similar percentage (66%) reported that specific eligibility criteria applied, although the latter figure may not accurately reflect the situation. For example, legislation in 28 European Union countries requires a nutrient profile model for identifying foods, for which claims would not be permitted *(86)*. The European Commission has not yet established a nutrient profile model.

Fig. 5. Nutrients covered under the mandatory or voluntary standards or rules in schools

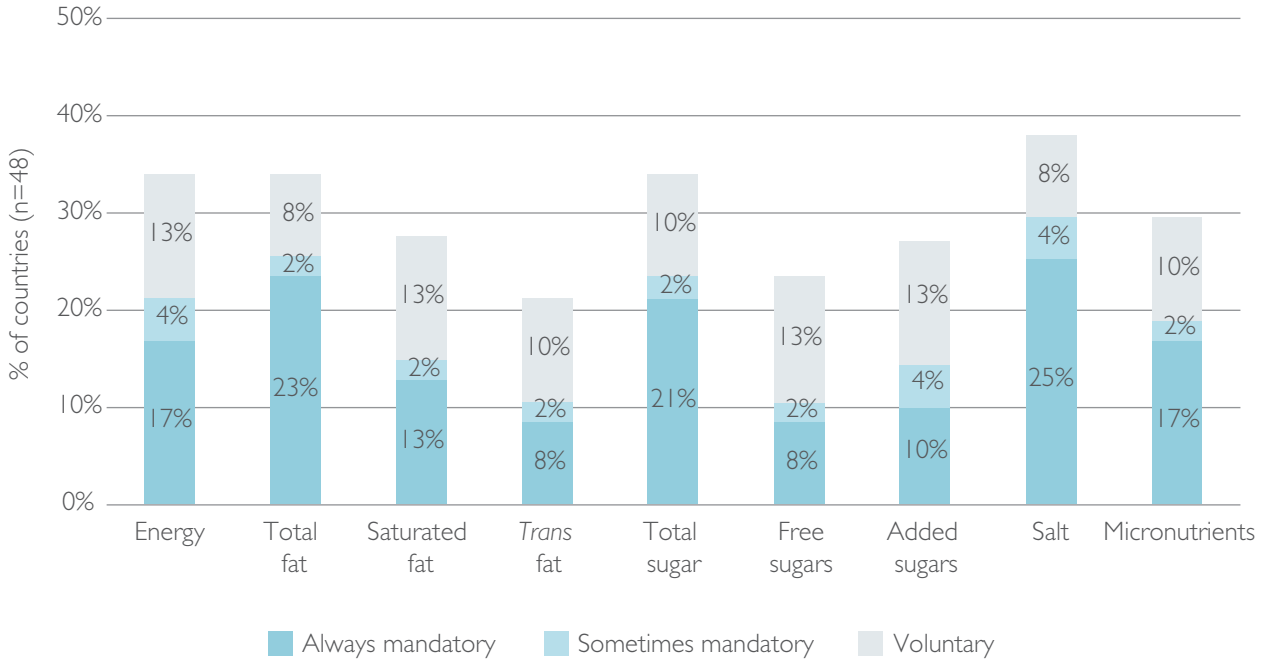


Table 2. School fruit and vegetable and milk schemes

School fruit and vegetable scheme (n=47)	
All children in targeted schools eligible to participate	40%
Types of fruit and vegetable products provided	
Fresh fruit and vegetables	34%
Dried fruit	13%
100% fruit juices	13%
Tinned or otherwise prepared fruit in water	6%
Tinned or otherwise prepared fruit in syrup	2%
Frequency of provision of fruit and vegetables	
Daily	6%
Two or three times per week	13%
Once per week	2%
School milk scheme (n=47)	
All children in the targeted schools are eligible to participate	28%

Box 2. Progress in implementing front-of-package labelling schemes in Europe

Denmark, Iceland, Norway and Sweden: Nordic keyhole

Denmark, Iceland, Norway and Sweden have been working since 2009 to design a joint Nordic nutrition label – the "Keyhole". The logo was first introduced in Sweden in 1989. It certifies that a product has met certain requirements for salt, sugar, fat and fibre content in a category-based nutrient profile model, which was updated most recently in 2015 *(87)*. Its aim is to make it easier for consumers to find and choose healthier foods. In the context of the European Union Directive on nutrition and health claims, the European Commission was notified about the label through a joint Danish, Norwegian and Swedish ministerial order. Each country has evaluated knowledge and awareness of the logo as well as its impact on consumer behaviour and industry activities. For example, in Sweden, it was found that the criteria for Keyhole labelling are used by many companies as a guideline and for quality assurance in product development *(88)*. More recently, Lithuania has also adopted the "Keyhole" logo.

Finland: "Better choice" heart symbol and salt warning labels

Labelling of salt and salt warning labels have been compulsory in Finland since the 1980s. The Finnish Government has made it mandatory to label foods in specific food groups as "high salt" if the salt content exceeds established criteria (see section 1.3). The criteria have been restricted over time and have stimulated industry to reformulate products to avoid application of the label *(89)*.

The Finnish Heart Association introduced a voluntary "Better choice" heart symbol, a nutrition claim logo, in 2000 for foods and in 2007 for meals. In 2010, the Ministry of Social Affairs and Health introduced criteria for the procurement of meal services. The positive logo is administered by the Finnish Heart Association and Diabetes Association but is acknowledged by the authorities, including within national nutrition recommendations *(90)*, and it is the only symbol regarded as a nutrition claim in Finnish law. The nutrient criteria address the main nutritional challenges in Finland, including total fat, saturated and *trans* fats, salt, sugar and fibre, and the main dietary sources of these nutrients as derived from data on population diets. Criteria are set for nine food categories, the criteria differing by category *(91)*.

France: Nutri-score

The "Nutri-score" system includes a summary indicator presented in ordered colours (green–red) and letters (A–E) to define the nutritional quality of a product along a graded scale. The letters ensure better visibility of the label, especially for people who have difficulty in distinguishing colours. The score is based on computation in a nutrient profiling system, derived from that of the United Kingdom Food Standards Agency, which was developed to regulate television advertising to children by the United Kingdom Office of Communications *(92)*.

The profile assigns positive points (0–10) for energy content (kJ), total sugar (g), saturated fatty acids (g) and sodium (mg) and negative points (0–5) for the content of fruits, vegetables, nuts, fibres and proteins. The score is therefore based on a discrete continuous scale, from – 15 (healthiest) to + 40 (less healthy). The number of categories was selected to ensure high discriminatory power within food groups *(93)*.

Development of the five-colour front-of-package "Nutri-score" nutrition labelling system was followed by validation of the various aspects of the label, such as improvements in purchasing intention and the overall nutritional quality of a "shopping basket" *(94)*. In 2017, the French Government signed a decree backing voluntary adoption of the scheme.

United Kingdom: traffic lights

A harmonized "traffic light" labelling system was adopted by the Government in June 2013. It was based on the best available evidence and successful aspects of existing schemes on the market *(95)*. The system is a voluntary, traffic light colour-coded percentage reference intake system, with green, amber and red coding. Manufacturers and retailers can include the words "low", "medium" and "high" if they wish. The system is based on 12 years of research, including by the United Kingdom Food Standards Agency, starting in 2001, of the various schemes used by supermarkets in the country. The main finding was that consumers preferred, and were better able to correctly interpret, the traffic light system when directly compared to other labelling formats. Consumers were also confused by the use of multiple systems in the marketplace.

Threshold cut-off points for colours are established separately for foods and drinks, the criteria for "green" being aligned with the relevant European Union regulations for nutrition and health claims (e.g. low fat = < 3 g/100 g), and criteria for "red" per 100 g are set at 25% of the reference intake for the nutrient. These were tested on the United Kingdom food supply to ensure their appropriateness. The label is now found on an estimated 60% of packaged foods in the country *(96)*.

1.3 Measures to promote reformulation of foods and beverages

Reformulation of foods, whereby the composition of manufactured foods is modified so as to improve the overall nutritional quality of diets, is considered one of the key mechanisms for achieving the goals of population nutrient intake in current food environments *(97)*. Healthier food choices can be provided by reformulating manufactured foods to remove certain harmful ingredients (e.g. partially hydrogenated fats, industrial *trans* fats) or reducing the quantities of nutrients of

Fig. 6. Type of nutrition labelling on pre-packaged foods and beverages

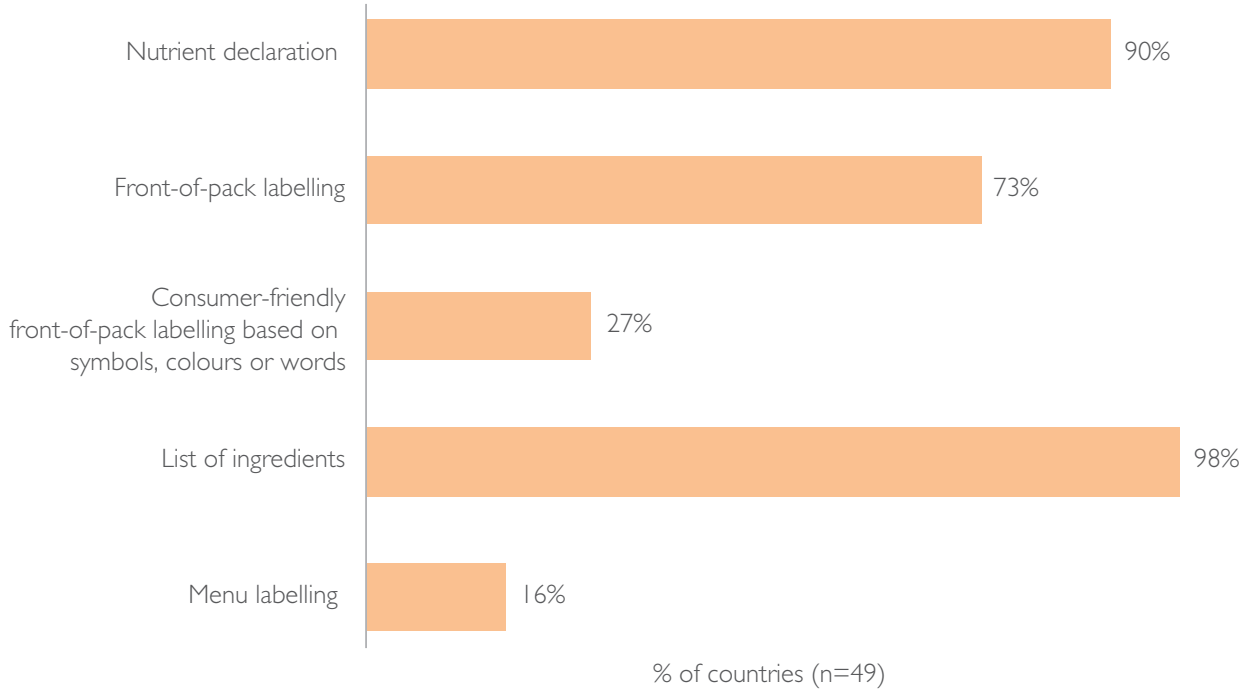


Fig. 7. Mandatory nutrients provided in nutrient declarations

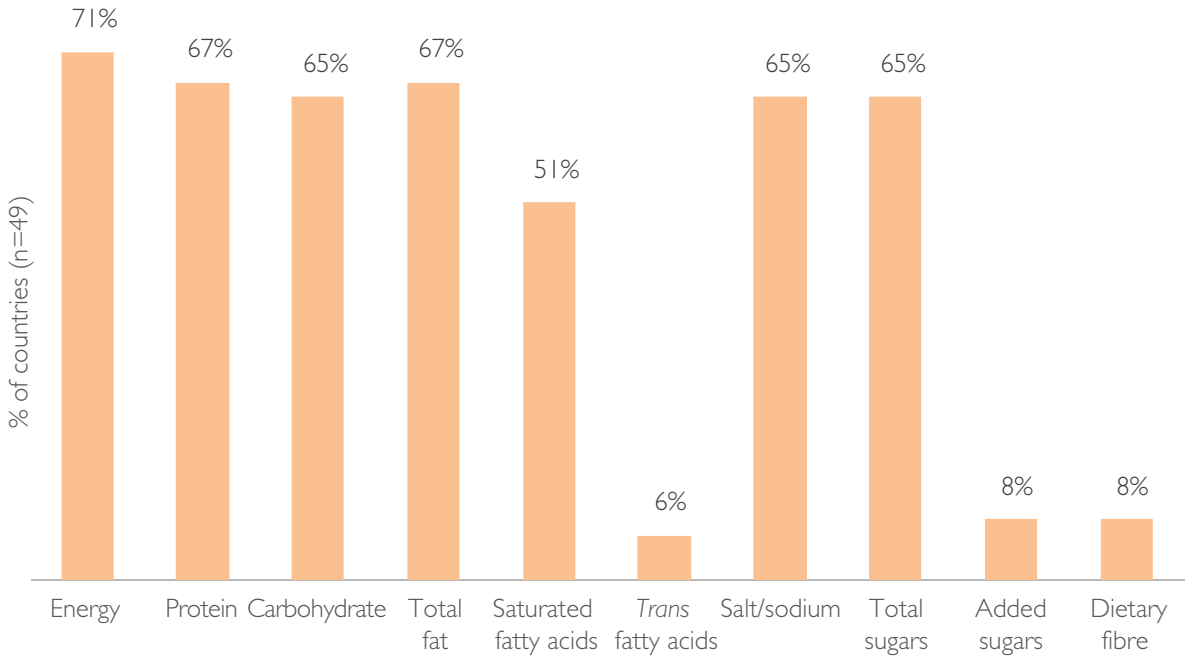
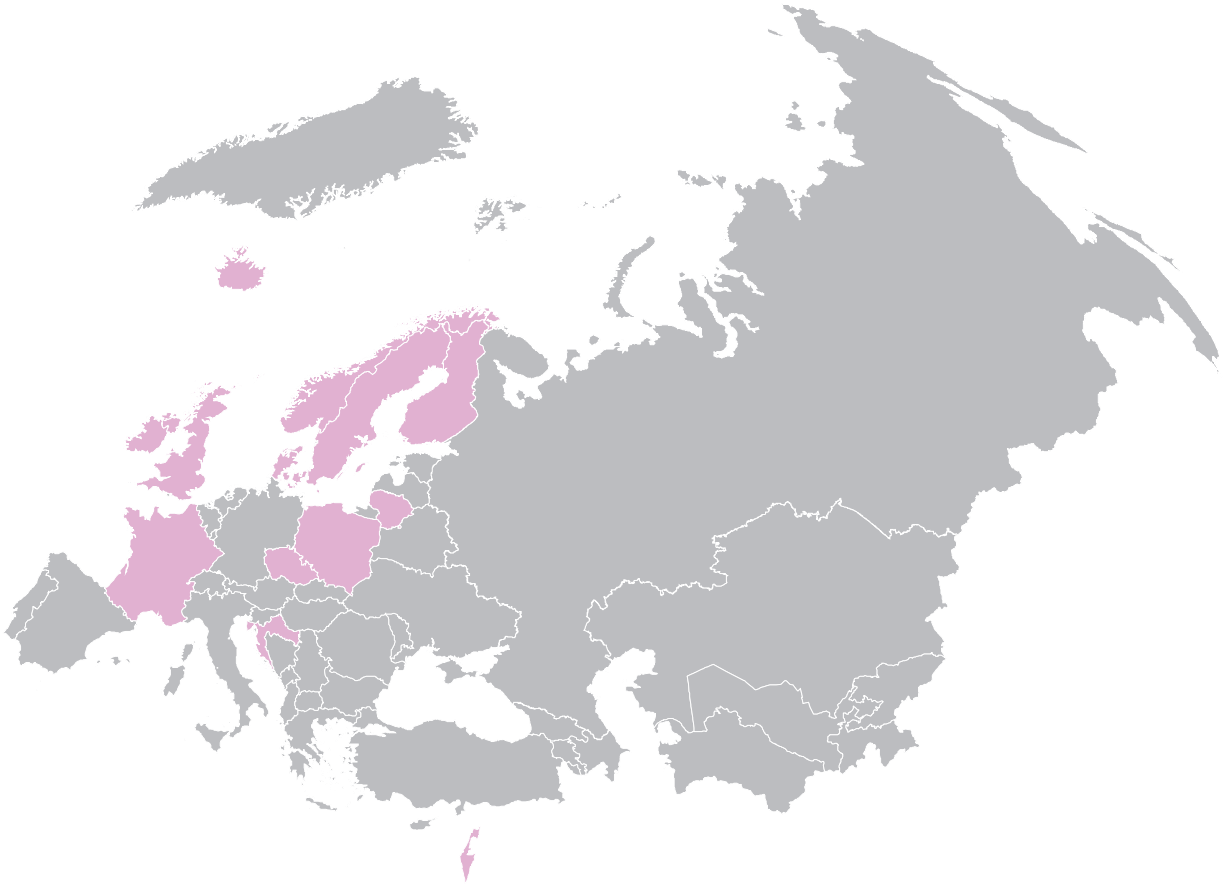


Fig. 8. Countries that have consumer-friendly labelling, with symbols, colours or words



public health concern (e.g. free sugars, saturated fat, salt). The challenge for manufacturers is to maintain, to the best of their ability, characteristics such as flavour, texture and shelf-life *(97)*. WHO recommends salt reduction as one of the most cost-effective, feasible means for preventing NCDs *(98,99)*. In industrial countries, about 75–80% of dietary salt is obtained from manufactured food *(100,101)*.

The reports from countries showed that it is possible to reduce the salt intake of a population by reformulation while maintaining consumer acceptance. Evaluation of the United Kingdom's salt reduction strategy demonstrated its feasibility, with a 15% reduction in salt intake between 2003 and 2011 *(102)*. Average salt intake also fell in Finland, by 25–30% between 1979 and 2007, as a result of systematic action on salt, including labelling regulations that help consumers to identify products with a reduced salt content *(103)*.

Major improvements have also been made in the elimination of *trans* fatty acids in margarine, pastries, cakes and biscuits in Europe[3] through both legislative and voluntary measures (see section 1.4). Manufacturers have used new liquid fats in cooking and baking to replace saturated fats with (poly)unsaturated fatty acids *(97)*.

[3] Rippin H et al. An exploration of socio-economic and food characteristics of high *trans* fatty acid consumers in the Dutch and UK national surveys after voluntary product reformulation (forthcoming).

Given the success of reformulation to reduce salt, it has been proposed that free sugars could be reduced by a similar "systematic, unobtrusive and gradual reformulation programme for manufacturers" to achieve the WHO recommendations *(104)*. Recently, the United Kingdom Government challenged every sector of the food industry (retailers, manufacturers and the out-of-home sector) to reduce the overall sugar content of the food products that contribute the most sugar by 20% by 2020, including an initial 5% reduction in the first year of the programme (see Box 3) *(105)*.

A priority in a successful reformulation plan is use of category-specific targets. Setting clear, progressively lower targets for levels in foods is a straightforward goal for the food industry to achieve within a specified time. The targets should be reasonable (based on evidence of consumer acceptability and feasibility) but should be significant enough to reduce population intake *(106)*. Regardless of the nutrient, initiatives for food reformulation should preferably focus on the basic foods commonly eaten by all socioeconomic groups of the population that make a significant contribution to intake of the nutrient. For example, in most European countries, a few staple food items are responsible for the highest intake of salt, i.e. bread, cereals and bakery products, although other food groups, such as processed meats, dairy products, sauces and convenience meals, also contribute.

Box 3. Paths to improving food products

Notable differences in the approaches to product reformulation are seen in countries in the Region. Some countries use mandatory approaches, setting legal limits on specific nutrients, while others choose voluntary reformulation initiatives through industry engagement.

The mandatory approaches include establishing a maximum limit for the sodium content of foods, taxing certain products differentially, mandatory front-of-package labelling schemes and warning labels and standards for publicly procured foods. Some governments have set targets for certain categories of food product (e.g. reductions in the nutrient contents of specific food categories), while others have set overall population intake targets to be achieved through reformulation (e.g. a reduction in intake of a nutrient by a given date).

Legislative limits

Eleven countries reported mandatory measures to reduce the content of at least one nutrient in food and beverages. This is most common for salt in bread, where countries set maximum limits. These limits date back to at least the 1970s in some countries *(107)*. A recent example is legislation in The Netherlands that applies to salt in bread, for which the criteria were tightened in 2013. The maximum allowed salt content of bread has decreased gradually over the past decade, from 2.5% per 100 g of dry matter in 2009 to 2.1% in 2011 and 1.9% in 2012. The maximum level was last amended on 1 January 2013, to 1.8% per 100 g dry matter. For an average dry matter content of 64%, the limit is approximately 1.15 g/100 g of bread *(109)*. Many bread producers supported the move in order to eliminate unfair competition and to ensure that consumer tastes were adapted to universally reduced salt.

Consistent with the results of monitoring of salt reduction initiatives, other countries report that mandatory school food policies in which standards are set for the nutritional composition of foods are the main vehicle for reformulation *(110,111)*.

Comprehensive reformulation targets

Targets for 14 food categories were set in the United Kingdom for the entire food and drink industry with the aim of achieving a 20% reduction in the sugar content of the products that contribute most to children's sugar intake by 2020. The guidelines recognize that different approaches will be more effective for different categories of products. For example, the baseline sales-weighted average content of total sugar in breakfast cereals was 15.3 g/100 g; the 20% reduction goal for 2020 is 12.3 g/100 g. In the case of confectionery, it was recognized that reductions in portion size would potentially be more effective; and, in the case of sugary drinks, a two-tiered tax was introduced to reduce the sugar content *(112)*.

In The Netherlands, sector-wide agreements have been reached covering the period 2014–2020 to make it easier for consumers to consume less salt, saturated fat and energy. The agreements were reached in a public–private partnership between the Central Bureau for the Food Trade, the Dutch Federation for the Food Industry, the Royal Dutch Hotel and Catering Association, the Dutch Catering Association and Government authorities. To achieve the objectives by 2020, manufacturers are encouraged, when possible, to reduce the energy density of products by reducing sugar and/or (saturated) fat and/or portion sizes. In relation to sugar, specific agreements have been reached for baby foods, dairy products and soft drinks, with category-based benchmarks established. In the case of soft drinks, a reduction in energy intake is adopted as the target *(113)*.

In Norway, the Health Minister established a food industry group to enforce the industry's responsibilities to improve public health. In late 2016, the members of this group signed a letter of intent to improve the Norwegian diet *(114)*, in which the industry set specific population intake goals to be achieved by 2021:

- Reduce salt intake from 10 g/day to 8 g/day.
- Reduce added sugar intake by 12.5%, corresponding to about 11% of energy from added sugars.
- Reduce intake of saturated fat from 14% to 13% of energy (to be achieved by 2018).
- Increase the intake of healthy foods such as fruit, vegetables, whole-grain products and seafood by 20%.

Box 3. contnd.

The signatories are free to choose the approach they wish to use to contribute to the common goal. Possible approaches include:

- reformulating existing products, creating new healthy products or shifting advertising to healthier products; and
- helping consumers to make healthier choices, such as through placement, portion sizes, pricing, packaging, labelling and advertising.

A specific goal has been set for sweetened beverages; in other areas, discussions are under way. The priority food categories for reducing sugar consumption are those that are the greatest source of added sugar in the diet, based on food consumption data:

- breakfast cereals,
- bakery goods (including cakes and biscuits),
- fruit and berry products (including jams and drinks),
- dairy products (including milk, yoghurts and ice cream),
- sugar and confectionery (including chocolate, sweets and sweet spreads), and
- sugary beverages.

Annual evaluations are planned, and the signatories are invited to demonstrate their contribution in the preceding year publicly.

Warning labels for salt, saturated fat and sodium

Finland has made it compulsory for "salt warning labels" to be displayed on processed foods that have been identified as significant contributors to salt intake in the Finnish diet. The labelling strategy has three components: the percentage of salt must be displayed on packages; foods with a salt content above the maximum level must display a high-salt content warning label; and foods with a salt content below a specified level are permitted to display the "Better choice" heart symbol. The thresholds, most recently updated in 2016, are as follows *(115)*:

Food product	Threshold for "high salt" (>) (%)	Upper limit for "Better choice" heart symbol (<) (%)
Cheese	1.4	1.2
Sausages	2.0	1.5
Other "cold cut"		
Meat products	2.2	2.0
Fish products	2.0	1.0% (marinated), 1.3% (smoked), 1.1% (tinned)
Bread	1.1	0.7
Crisp breads	1.4	1.2
Breakfast cereals	1.4	1.0
Salted snacks	1.4	
Ready-to-eat meals and sauces	1.2	0.75% (but different criteria apply for e.g. soups, porridges)

Box 3. contnd.

Israel has also taken steps to introduce warning symbols (or negative front-of-package labelling) on food packages, with easily identifiable icons. The policy establishes thresholds for sugar, saturated fat, sodium and calories and is modelled on the successfully introduced system in Chile (116). If the thresholds are exceeded, the food package must bear a warning symbol and the wording "contains a high amount of (e.g.) sodium". Some food packaging may bear up to three such warning symbols. It is planned that the thresholds will become progressively stricter over time. The three proposed icons are shown below:

Translations (left to right): high amount of sugar; high amount of sodium; high amount of saturated fat

"Positive" front-of-package labelling of packaged foods is also planned in Israel, with easily identifiable green icon to indicate which foods are recommended as healthiest. Category-specific criteria similar to those in widespread use in systems such as the "Keyhole" will be used but adapted to the Israeli context. The backs of packages will state the number of teaspoons of sugar per 100 g, and figures for sugar, salt and saturated fat will be highlighted in bold. The relevant legislation will be introduced by the end of 2017, with implementation scheduled for mid-2018.

Criteria for warning labels on solid foods, by nutrient:

Nutrient (per 100g)	2020 (stage 1)	2021 (stage 2)
Sodium (mg)	500	400
Sugar (g)	13.5	10
Saturated fat (g)	5	4

Most countries in the Region (77%) reported activities to encourage reformulation of food products; however, fewer countries reported specific activities, and many concentrated on salt (55%) rather than on other relevant nutrients such as saturated fat (27%) and sugar (37%) (Fig. 9). The extent of reformulation varied among countries, with far fewer reporting specific targets (11% of countries for saturated fatty acids; 17% for sugars; 30% for salt) or comprehensive reformulation for various product categories (Fig. 10). In some countries, critical elements of an effective reduction strategy were missing, such as data on food composition.

The findings of this WHO policy survey are broadly similar to those of previous research, showing that most European countries have introduced some measures for salt reduction and encourage reformulation to reduce the salt content *(107)*. Box 3 shows the various strategies used to improve food products. Most countries do so by engaging the industry in reducing the salt content of products; bread is the food mainly targeted for reformulation (36%), followed by processed meat (28%) and ready-made foods (23%). Fewer countries have taken steps to establish category-specific targets for a wider range of food products, and far fewer have initiated work on sugar or saturated fat at this stage. For sugar the most common foods targeted for reformulation are yoghurts, cereals and processed fruits and vegetables. For saturated fat, most effort in countries is focused on milk and milk products, ready-made foods and processed meats. Overall, reformulation is least prevalent in eastern European and Central Asian countries. This is potentially a concern, because recent WHO data for six countries in those areas of our Region indicate extremely high levels of salt and *trans* fat in commonly available foods *(108)*.

Compatibility of salt reduction with salt iodization

The best way of preventing vitamin and mineral deficiency is to ensure consumption of a balanced, diversified diet that is adequate in all micronutrients. This is not being achieved in all countries. Actions to further improve vitamin and mineral intake beyond a balanced diet generally include micronutrient supplementation and fortification of foods with micronutrients.

Iodine is the most common micronutrient added to foods in Europe, with salt as the primary vehicle, but iodization is not always mandatory. Food-grade salt was reported to be fortified in 73% of countries; however, in the case of fortification with iodine, it was mandatory in table salt in only 28% of countries. WHO recommends fortification of food-grade salt with iodine, where indicated, as a safe, effective strategy for the prevention and control of iodine deficiency *(117)*. The WHO guideline on sodium intake for adults and children notes that salt reduction and salt iodization are compatible *(35)*. One means of ensuring that salt reduction does not adversely affect iodine levels is to increase the concentration of iodine added to salt, so that iodine intake remains the same even if the salt intake decreases *(55)*.

Fig. 9. Mandatory or voluntary reformulation measures to reduce the content of specific nutrients in foods and beverages

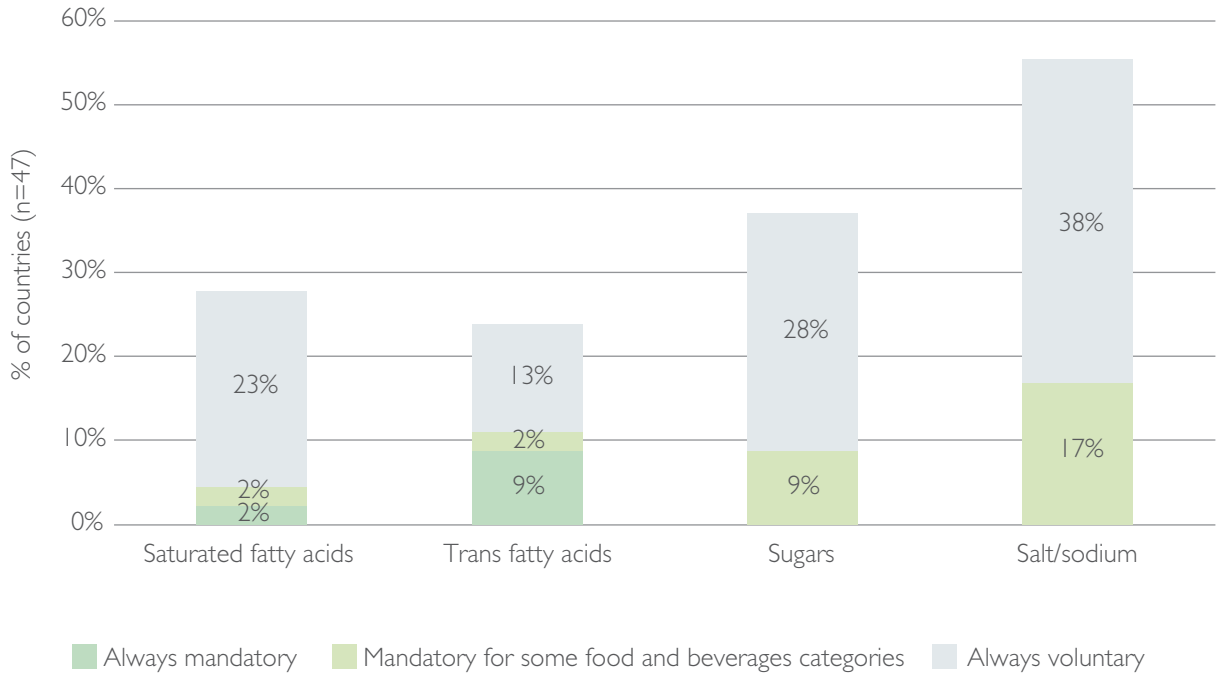
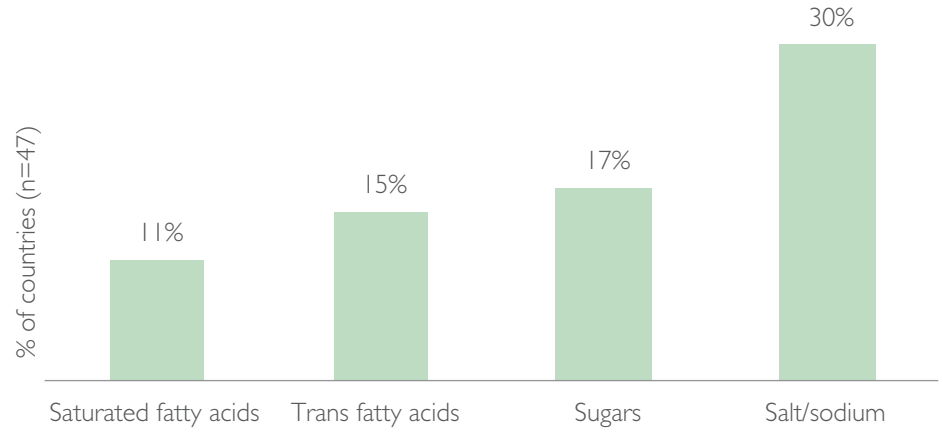


Fig. 10. Specific reformulation targets to reduce the content of specific nutrients in foods and beverages



1.4 Elimination of *trans* fatty acids

Trans fats are a type of unsaturated fatty acid; they may occur naturally or be produced industrially. During partial hydrogenation, the primary reaction used in the industrial production of *trans* fats, oil is hardened, which improves its commercial appeal by enhancing its sensory profile and texture and increasing its shelf life and tolerance to repeated heating *(118)*. The majority of *trans* fat in the diet is of industrial origin.

Guidance for minimizing *trans* fat intake is based predominantly on evidence that their consumption significantly increases the risk for coronary heart disease *(119)*, more than any other dietary source of energy. An increase of 2% in total energy derived from *trans* fat is associated with an increase in the risk for death from coronary heart disease or myocardial infarction of 23% *(120,121)*. In addition, there is evidence that *trans* fat intake is associated with the development of other cardiovascular diseases, central adiposity, diabetes, Alzheimer disease, breast cancer, impaired fertility, endometriosis and cholelithiasis *(121)*.

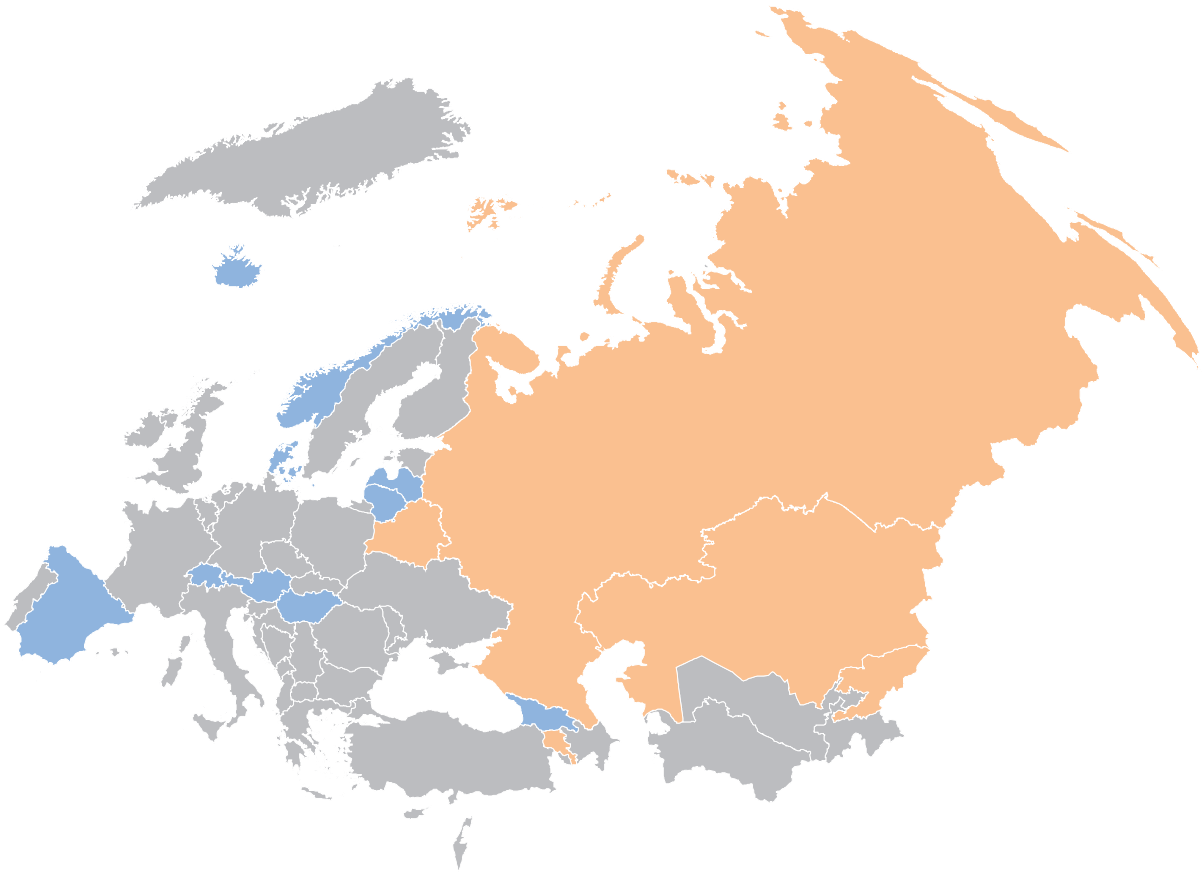
On the basis of this evidence, Denmark was the first country in the world to impose a national limit on the content of industrial *trans* fat in all oils and fats intended for human consumption, in 2003. It set an upper limit for industrial *trans* fats of 2 g/100 g of fat (2% total fat). After a 6-month transition period, when the limit in some foods was slightly less strict, the 2% *trans* fat limit was applied to all foods. Studies on the efficacy of this legislation show that industrial *trans* fats are now "virtually eliminated" from Danish food *(122,123)*, and the decrease in the rate of mortality from coronary heart disease during the period 1980–2009 (70%) was the largest in the European Union. As the decrease was particularly large between 2000 and 2009 as compared with

the rates in other European Union countries, it was concluded that the policy had reduced mortality *(124)*.

Excellent progress has since been made throughout Europe in introducing measures to eliminate industrial *trans* fats from the food supply (Fig. 11). The Danish legislation provided a model for a further seven countries in the Region, and a technical regulation of the Eurasian Economic Union on fats and oils in food products now commits its five member countries to implement a similar measure that limits the availability and use of *trans* fats in food products by 2018 *(125)*. A total of 15 countries report that they have specific measures in place to ban or limit the use of *trans* fats.

Voluntary agreements by food companies to remove *trans* fats from their product ranges have also undoubtedly contributed to a reduction in their use in many European countries, but legislative limits may still be required to fully eliminate them. Leading food companies themselves have called for a legislative ban in the European Union *(126)*.

Fig. 11. Countries with a current (blue) or soon-to-be implemented (orange) legislative ban on *trans* fats in food products



Despite progress in many countries, recent research at the WHO Regional Office for Europe indicates a worrying situation in eastern Europe and Central Asia (Box 4).

1.5 Marketing to children

There is unequivocal evidence that marketing of HFSS products affects children's food preferences, dietary behaviour and intake and influences childhood obesity *(59)*. Marketing of these foods to children is highly prevalent, with active use of persuasive techniques likely to appeal to children in multiple media, including broadcast television and online social media. The foods most commonly advertised to children reported in international studies are "non-core" foods, which should not form the major part of a healthy diet, including fast-food meals, chocolate and confectionery, sugary drinks and breakfast cereals, as well as high-fat, high-sugar or high-salt spreads and sauces *(135)*.

WHO therefore recommends, as stated most recently by the WHO Commission on Ending Childhood Obesity *(55)*, to reduce children's exposure to all such marketing, to introduce restrictions on marketing of HFSS products to children in all media, including digital, and to close any regulatory loopholes *(66)*.

Box 4. Two sides of the story in Europe

Since Denmark introduced legislation to remove *trans* fats from food products, many other European countries have adopted similar legislation, setting mandatory limits on the use of industrial *trans* fats, including Austria, Hungary, Iceland, Latvia, Norway and Switzerland. More countries, such as Lithuania and Spain, have initiated legislative proposals or apply slightly different legislative measures in specific settings. At the same time, companies have been removing *trans* fats from their product ranges voluntarily.

Progressive improvement

The Netherlands and the United Kingdom have largely pursued voluntary industrial *trans* fat reduction *(127,128)*. Voluntary approaches may, however, have significant limitations, as they may not be applied by the entire food supply chain (i.e. small and medium-sized enterprises may continue to use *trans* fats), and reformulation may be uneven for product categories *(43)*. The main concern is that some population subgroups would continue to consume high amounts of *trans* fats even if the average population intake is at or below recommended levels *(129)*. This could occur due to less reformulation of products that are consumed predominantly by low socioeconomic groups or less reformulation of "entry-level" or "basic" food products. These countries, with good dietary intake and food composition data, provide sound case studies for identifying the potential advantages and drawbacks of voluntary approaches *(130)*.

The latest Dutch National Food Consumption Survey *(131)* and the United Kingdom National Diet and Nutrition Survey *(132)* both reported that, on average, adults in the two countries met the WHO and national limits of < 1% total energy intake *(133)*. This may be attributed in large part to successful voluntary reduction programmes; however, these averages do not indicate whether there is higher intake among certain groups such as those with low incomes *(134)*. Further analyses, by the University of Leeds and the Dutch National Institute for Health and the Environment,[4] indicate that, in The Netherlands there are some differences by socioeconomic status and sex, but further investigation may be needed to understand why; no significant trend in socioeconomic characteristics was found for high and lower consumers of *trans* fatty acids in the United Kingdom. It is possible, however, that the intakes in the two countries were underestimated because of the nature of food composition databases and inequalities in consumption of *trans* fatty acids by certain vulnerable groups.

Continuing concern

Although there are clear downward trends in the availability and intake of *trans* fats in the western European diet, concern remains in the east of the Region because of a general lack of policy. As there were few published investigations into the composition of foods in these countries, the WHO Regional Office for Europe is collaborating with the University of Porto to conduct a study (FEEDCities) of commonly available manufactured and homemade foods available on food markets in Central and eastern Europe *(108)*. Studies have been conducted in six countries to determine the nutritional composition of foods, with specific attention to *trans* fats and sodium. The results for the first two countries in which the project has been implemented, Kyrgyzstan and Tajikistan, showed that the mean *trans* fat content per serving in the most frequently available foods was highest in industrial wafers (3.8 g), traditional dumplings (2.9 g) and cakes and pastries (1.6 g), corresponding to 170%, 129% and 83% of the recommended maximum daily intake *(65)*. Clearly, policies to limit the use of industrial *trans* fat in food production in these countries are needed.

[4] Rippin H et al. An exploration of socio-economic and food characteristics of high *trans* fatty acid consumers in the Dutch and UK national surveys after voluntary product reformulation (forthcoming).

Much policy to date has addressed the issue of television food advertising, yet, in the digital age, food and beverage marketing has undergone a shift *(136)*. Targeted or personalized digital marketing, with its capacity to identify the children who are most vulnerable to marketing at their most vulnerable moments, makes it potentially a far more powerful influence on children's preferences and dietary behaviour. Evidence on digital platforms and marketers indicates that digital marketing amplifies the effects of other media. Restrictions must therefore cover all media, including digital, to minimize the likelihood that restriction in one medium simply shifts marketing to other, less regulated media *(42)*.

Previous policy monitoring by the WHO Regional Office for Europe showed that some countries in the Region have explicit regulatory policies for marketing of HFSS products to children, but many limit their scope to broadcast advertising *(137)*. Others were found to rely on general marketing and advertising regulations, which do not specifically address the promotion of HFSS products to children, or on self-regulatory codes of conduct, which are often designed and implemented by the food and advertising industries themselves.

Evaluations of self-regulatory schemes indicate good compliance with agreed criteria, and it could be argued that "some action is better than none" *(138)*. Nevertheless, independent assessments consistently show that self-regulatory or voluntary schemes are typically narrow in scope, with weak criteria and limited government oversight *(139–141)*. For example, use of narrow definitions of "child-directed advertising" in self-regulatory

approaches, typically based on audience indexing, has been criticized *(142)*. Furthermore, focusing on the purported target audience of marketing material means that more qualitative targeting (e.g. use of licensed and brand characters, child-directed messages and themes) is overlooked, despite evidence that children engage with and are affected by such components, even when they appear in adult-targeted promotions *(143)*. Comparisons of nutrient profiling approaches – which are increasingly recognized as an essential component of marketing restrictions – show wide variation. A comparison of the WHO European Regional Office nutrient profile model with the European Union Pledge model showed that, overall, the WHO model is stricter, in that it would permit fewer products to be advertised to children *(144)*.

Countries in the WHO European Region therefore have two challenges. First, they should ensure that the criteria of policies are robust and strict enough to achieve the desired objective of reducing the total amount and power of marketing for HFSS products to which children are exposed. Secondly, the "offline" protection that applies to broadcast media should logically be extended to cover digital media (including social media). Adequate routine monitoring of compliance with policies will also be required *(145)*.

The latest data reveal that many countries in the WHO European Region have taken steps to limit marketing of HFSS products to children (Fig. 12, Box 5), but too many countries (46%) still report no action. The overwhelming preference is for self-regulatory measures, and there is a continuing focus on television rather than other media, such as digital social media platforms, apps or advergames (Fig. 13). Countries have become more aware of and use nutrient profiling and monitoring tools in policy planning, and several have conducted studies on the nature and extent of marketing; however, the use of nutrient profile models in government policies remains limited (13%) and formal monitoring of marketing to children is not widespread (11%).

Fig. 12. Mandatory or voluntary measures to regulate or guide marketing of food and non-alcoholic beverages to children in specific communication channels, settings and contexts

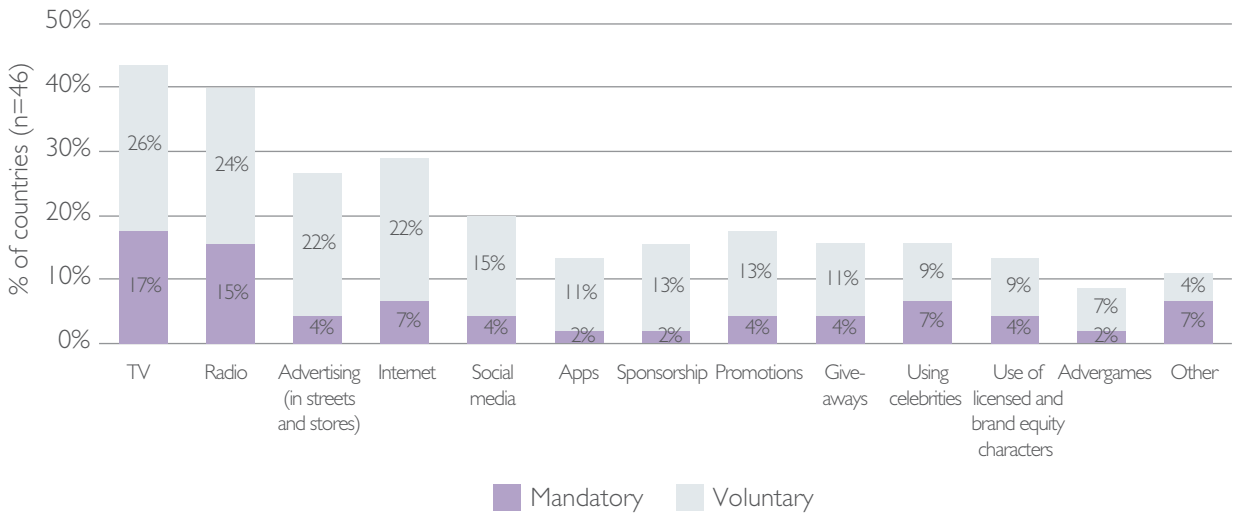
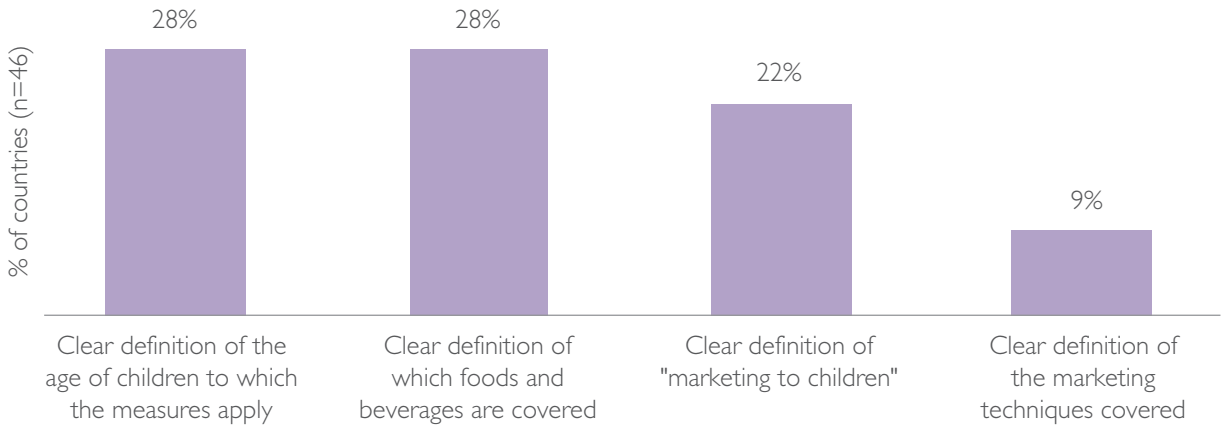


Fig. 13. Clear definitions in the measures to regulate marketing of food and non-alcoholic beverages to children



Box 5. Progress in restricting food marketing to children in Europe

Policies to restrict marketing of HFSS products to children were reported by the majority of European countries (54%), although a significant minority reported no action. As in previous monitoring studies, most countries reported voluntary measures. Furthermore, countries found it difficult to report specific details of the policy. For example, only 43% of countries specified that the measures applied to television, while 28% specified measures that applied to the Internet (Figure 12).

The most common objectives of the policies are to reduce children's exposure to marketing of HFSS products and to prevent misleading marketing messages. Countries were divided in terms of the definitions adopted with regard to age, marketing techniques and the foods covered. The most common approach to defining "marketing to children" was to identify specific programmes, films or other communication channels, including digital, that are directed at or of particular appeal to children. Only six countries reported using a nutrient profile model to define the foods and beverages to which the restrictions apply. Despite this mixed picture from across the Region, there have been some notable developments in recent years.

In 2015, the WHO Regional Office for Europe published its nutrient profile model *(146)*, which was developed with countries participating in the WHO Europe Action Network on Reducing Marketing Pressure to Children. The model has since been used by countries to evaluate policy options and to introduce tighter criteria in national policies and voluntary schemes. Slovenia was the first country in the WHO European Region to integrate the model into national regulations, as part of its revised Media Law, which directs the Ministry of Health to provide nutrition guidelines to support implementation of a national code of conduct. The Ministry thus adapted the WHO model to the Slovenian context, with minor adjustments to thresholds in some categories.

In Portugal, amendments to the Advertising Code adopted by Parliament prohibit "advertising of foods and beverages with a high content of sugar, fat or sodium on television and radio within 30 minutes before and after children's programmes and television programmes which have a minimum of 20% audience under 12 years of age, as well as the insertion of advertising in their interruptions." Although the new rules have been adopted, they have not yet been enforced.

Other countries are monitoring the situation and preparing accountability frameworks for self-regulatory schemes. In 2012, Norway proposed a comprehensive regulation based on the WHO set of recommendations *(66)*. There was significant public debate on the proposal, with support from consumer and public health nongovernmental organizations but major opposition from the food and advertising industries. The regulation was temporarily suspended, and a trial self-regulatory scheme was introduced for 2 years. The Norwegian Food and Drink Industry Professional Practices Committee was established to oversee the scheme, which was largely in line with the legislative proposal, although the age threshold was lowered to 13 years. Marketing was defined as "all sales promoting activities targeted specifically at children", except normal displays in shops, the product itself and its packaging and sponsoring with only the name and logo. The first evaluation was conducted in 2016, with an independent systematic survey of advertising of HFSS products to children on television and the Internet based on a forthcoming Nordic marketing evaluation model. Few television advertisements for HFSS products were found to be associated with typical children's programming. The identified advertisements were judged to have relative little appeal for younger children, with respect to both form and content. On social media, however, the form and content of the advertising were clearly designed for a younger audience with respect to e.g. language, activities portrayed and contests.

Other countries have been attempting to introduce rules that cover digital marketing. The United Kingdom Committee of Advertising Practice has introduced new rules banning the advertising of HFSS products in traditional and online children's media, from magazines and cinema billboards near schools, social media, apps and "advergames" *(147)*. Ireland plans to launch a voluntary code in 2018. The United Kingdom approach complements and is harmonized with previous statutory rules on children's broadcast media; the new rules will apply the same Department of Health nutrient profiling model to differentiate HFSS products and the same age threshold (< 16 years). According to the new rules:

- Advertising that directly or indirectly promotes an HFSS product cannot appear in children's media. This includes new, stricter rules regarding brand marketing when there is a reasonable likelihood that an HFSS product is being promoted.
- Advertising of HFSS products cannot appear in other media for which children make up over 25% of the audience.
- Advertising of HFSS products will not be allowed to include promotions, licensed characters or celebrities popular with children, although advertisers may now use those techniques to better promote healthier options.

Box 5. contnd.

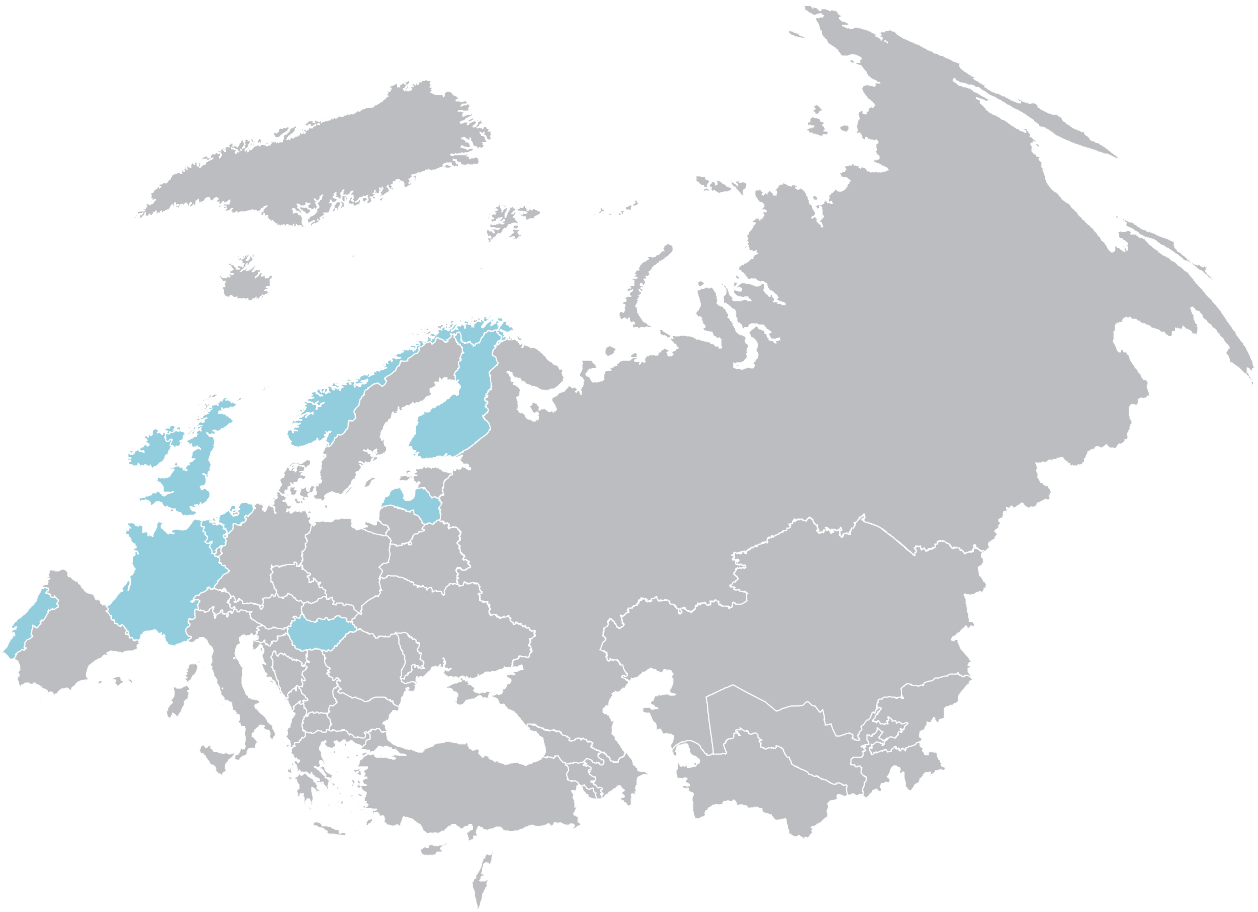
When audience data are not available, the Advertising Standards Authority relies on other factors to assess whether media are directed to children, such as media content, including themes and imagery, and the context in which it appears. It may be difficult to monitor and enforce this rule, given that there is no common industry-wide standard or routine, publically available data on audience share. When the content appeals to children but the context is not targeted at children, it is not immediately clear which will take precedence. Packaging, in-shop marketing, sponsorship and educational materials are not covered by the rules.

1.6 Fiscal policies

Given that price has a well-established role in influencing food choice, interest in taxes and subsidies to improve diets and prevent NCDs remains high. There is increasingly clear, consistent evidence that taxes and subsidies influence purchasing behaviour *(54)*. The collective evidence shows reasonably well that both individual consumers and population groups respond to price changes as predicted and that targeted taxes and subsidies can influence the decisions that consumers make and incentivize healthy eating *(148–151)*. Such changes can contribute to a healthier diet and better weight outcomes *(152)* and will ultimately contribute to the prevention of NCDs and savings in health care costs *(54)*. The size and nature of the effect vary significantly, however, depending on the size and target of the price change *(153)*.

The most common proposal studied is taxation of sugar-sweetened beverages, as these products are easy to define as energy-dense and nutrient-poor and for which there are similar, healthier substitutes. An analysis of 11 systematic reviews on the effectiveness of fiscal policy interventions for improving diets[5] shows that the evidence is strongest and most consistent for taxes in the range of 20–50% decreasing consumption of sugar-sweetened beverages and for subsidies in the range of 10–30% increasing consumption of fruit and vegetables. While the evidence for a net effect of fruit and vegetable subsidies on caloric intake and weight outcomes is mixed, diet quality improves overall, thus leading to improvements in health outcomes.

Fig. 14. Countries with health-related taxes applied to food or drinks



[5] Fiscal policy options with potential for improving diets for the prevention of noncommunicable diseases (NCDs). Geneva: World Health Organization (draft).

Box 6. Rapid advances in application of health-related taxes across Europe

Before adoption of the European Food and Nutrition Action Plan, a small group of countries had already used price policies to promote healthy diets. A report from the WHO Regional Office for Europe *(154)* included case studies from Finland, France and Hungary, which had applied taxes. Denmark formerly had a tax on saturated fat, which the Government decided to discontinue. Ten countries now report fiscal policies to reduce the consumption of HFSS products. The most common food product subject to taxation is sugar-sweetened soft drinks, followed by non-sugar-sweetened beverages.

The "public health product tax" in Hungary remains the most comprehensive in Europe in terms of the number of food product categories covered. The categories of goods affected by the tax are sugar-sweetened beverages, energy drinks, confectionery, salted snacks, condiments, flavoured alcohol and fruit jams. The impact of the tax has been evaluated twice. In the most recent evaluation, most consumers (59–73%) were found to have reduced their consumption of the targeted products, and more than two thirds chose healthier alternatives, most frequently mineral water, fresh fruit and vegetables and herbs and spices. The evaluation showed that the groups at greatest risk, namely adults who are overweight or obese, were approximately twice as likely to change their consumption than adults of normal weight *(154)*.

A recent trend is a two-tiered tax, whereby products with a higher content of the target nutrient are taxed at a higher rate. In the United Kingdom, a new levy applies to the producers and importers of soft drinks containing sugar, with a lower rate applied to drinks with a total sugar content ≥ 5 g/100 mL and a higher rate for drinks with a sugar content of ≥ 8/100 mL *(112)*. The objectives of two-tiered taxes are to encourage producers of soft drinks to reformulate their products in order to reduce the sugar content and to encourage consumers to shift to healthier products. Similar approaches are under consideration in other countries. In October 2017, France amended the taxation thresholds so that beverages containing different amounts of added sugar (< 1 g/100 mL, 2–4 g/100 mL, 5–7 g/100 mL and > 8 g/100 mL) will be taxed at different rates (155). The amended legislation will enter into effect in June 2018. Ireland and Portugal use similar models.

Estonia announced plans to introduce a tiered tax. It is planned that the law, accepted by Parliament in 2017, will lead to the following levies: 0.10 €/L on products with only artificial sweeteners or with a sugar content of 5–8 g/100 mL, 20 €/L on products with both artificial sweeteners and a sugar content of 5–8 g/100 mL and 30 €/L on products with a sugar content > 8 g/100 mL *(156)*. A review has been conducted by the WHO Regional Office for Europe on the basis of the evidence-informed policy network (EVIPNet), with a brief and a modelling exercise, to determine the potential impacts of various taxation scenarios *(157)*.[6]

However, in September 2017, the Government decided that the tax law would not come into effect from 2018; therefore, it remains unknown exactly when it will enter into force.

[6] Thao Thi Hong Thai MA et al. The potential health effects of taxing soft drinks in Estonia (forthcoming).

On the basis of the evidence described above and WHO guidance, a growing number of countries in the Region have introduced health-related taxes on specific foods or nutrients with the objective of influencing what people buy and eat (Fig. 14 and Box 6). A recent trend in the European Region is to establish two-tiered taxes, whereby products in the same category (e.g. soft drinks) are taxed differentially according to their nutritional composition. Estonia, France, Ireland, Portugal and the United Kingdom have all announced or introduced such taxes. Provision of subsidies remains an underused measure; only two countries (Denmark and Hungary) explicitly reported government action to subsidy foods. That said, school fruit and vegetable schemes (e.g. EU School Fruit and Vegetables Scheme) are widespread in the region and may be considered a form of "in-kind" subsidy.

There is a continuing lack of robust data from monitoring and evaluation in the European region, with Hungary the exception. Countries that have recently introduced taxes should establish evaluation frameworks to determine their impact on food choice and shifts in consumption and to fully characterize the substitutions. However, where impact is assessed, the available evidence in terms of changes in patterns of consumption does appear to be consistent with economic theory and other evidence *(31)*.

Objective 2. Promotion of healthy nutrition throughout the life-course

The life-course approach is based on recognition that health and illness are rooted in lived experience at all stages of life, both present and past. The principles of a life-course approach include starting early, reacting appropriately to important transition periods and taking collective action to support the creation of healthy environments *(158)*. The approach starts with maternal nutrition before and during gestation and continues with the promotion, protection and support of exclusive breastfeeding in the first months of life; subsequent actions to encourage healthy diets start with timely introduction of appropriate complementary feeding and then promotion of healthy diets in school settings, promoting healthy foods in the workplace and considering the specific nutritional needs of the older population.

In the European Food and Nutrition Action Plan 2015–2020, governments are encouraged to consider the following priorities for action throughout the life-course:

- Invest in nutrition at the earliest possible stage, before and during pregnancy, including protecting, promoting, supporting and addressing barriers to adequate breastfeeding, and providing appropriate complementary feeding.
- Improve the ability of citizens to make healthy choices, taking into account the needs of different age groups, genders and socioeconomic groups.
- Encourage the use of social media and new techniques to promote healthy food choices and healthier lifestyles.
- Adopt tools and strategies to address the special nutritional needs of vulnerable groups.

2.1 Maternal nutrition

There is growing recognition of the importance of maternal nutrition before and during pregnancy for the later risk for NCDs and obesity in their children. Although the biological mechanisms that increase the risks of offspring for obesity and NCDs are not yet fully understood, evidence indicates important developmental windows during pre- and neonatal periods of life (the first 1000 days). A report from the WHO Regional Office for Europe, Good maternal nutrition – the best start in life *(21)*, summarizes the most recent evidence on maternal nutrition and prevention of obesity and NCDs. It also provides an overview of national recommendations for nutrition, physical activity and weight gain during pregnancy in the Member States in the WHO European Region. The report shows that all forms of malnutrition during pregnancy require attention. Studies of undernourishment in pregnancy indicate a raised risk for abdominal obesity, diabetes and cardiovascular diseases in offspring and show that obesity (and co-morbid conditions) during pregnancy increase the risk for trans-generational effects, whereby offspring are at increased risk, further contributing to entrenched social inequalities in the prevalence of obesity. Overlapping overnutrition (from excess energy intake) and undernutrition (from lack of micronutrients) in pregnant women is an additional concern, particularly in the east of the European Region.

In view of this evidence and in the context of a steep rise in maternal overweight in many European countries, pregnancy is considered an appropriate time for monitoring nutritional status and targeting health-related behaviours. Vitamin and supplementation schemes are an important component of care for pregnant women and women of reproductive age in many countries of the European Region (Fig. 15). At the same time, health professionals also require support in providing guidance to patients regarding healthy diet and weight gain

Fig. 15. Vitamin and mineral supplementation schemes targeting pregnant women and women of reproductive age

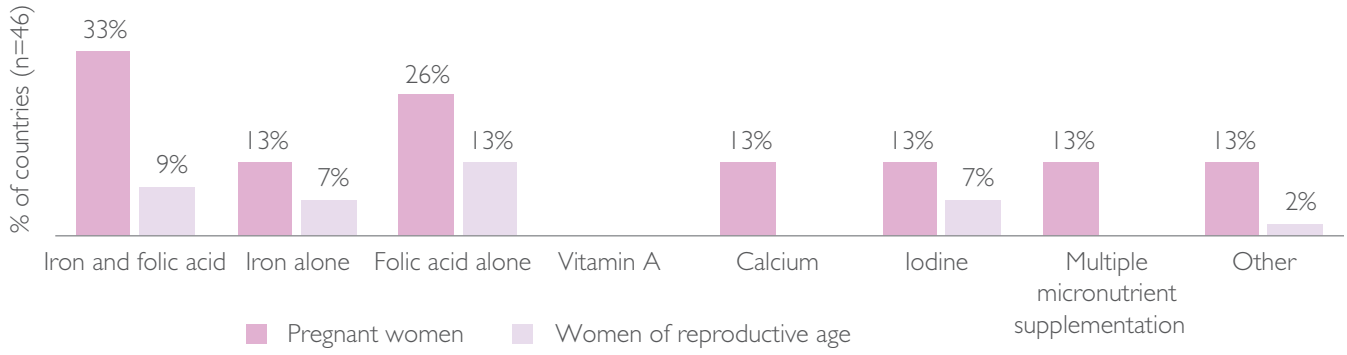
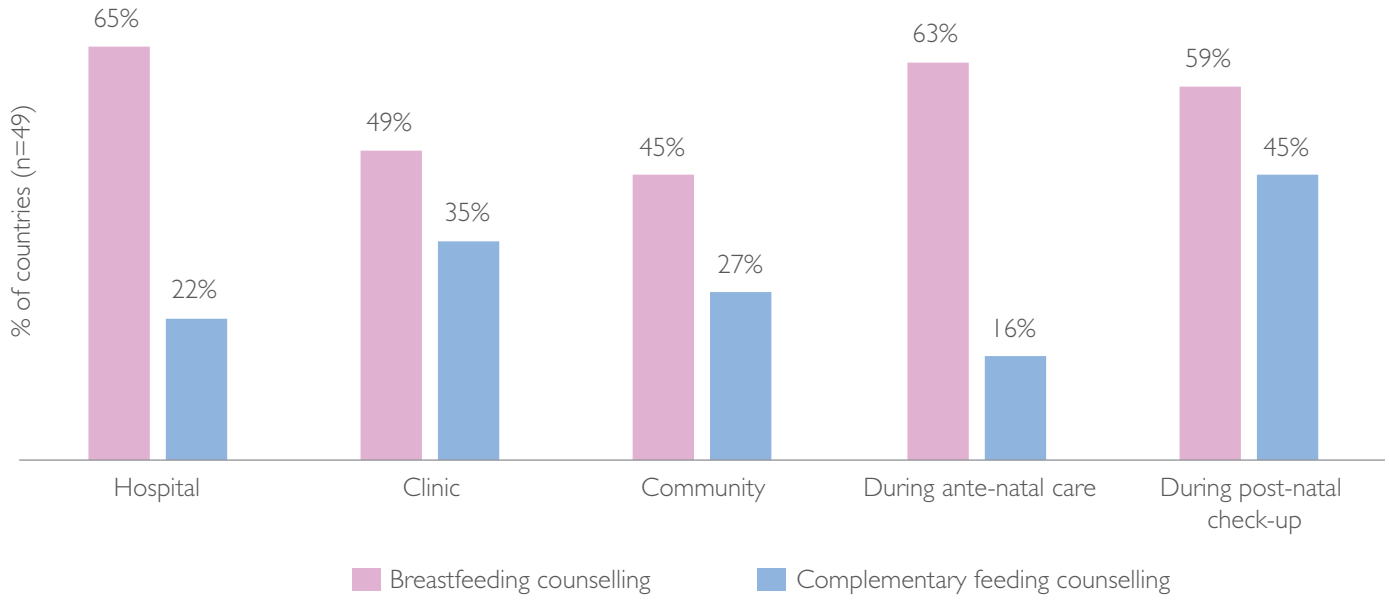


Fig. 16: Countries with specific dietary recommendations and nutrition counselling for at-risk groups



during pregnancy, as well as post-partum weight loss during the first year after pregnancy. Figure 16 provides an overview of the current recommendations and services across countries for this target group.

2.2 Nutrition in early life

Young children's nutrition during the first months and years of life as growth patterns, feeding practices, taste preferences and dietary habits are established is of great importance. Children and adolescents who were breastfed as babies are less likely to be overweight or obese or have type-2 diabetes in adulthood *(159)*. Exclusive breastfeeding from birth to 6 months of age and continued breastfeeding up to 2 years and beyond are thus recommended for optimal growth *(160)*. The benefits are universal: they are as relevant to mothers and children living in high-income countries as to those in living in middle- and low-income countries.

Nevertheless, the European Region has the lowest breastfeeding rate of all the WHO regions. Recent data on exclusive breastfeeding from 21 countries in the Region show that, on average, only 13% of infants are exclusively breastfed during the first 6 months of life. Even though the rate of early initiation of breastfeeding is high in some countries, exclusive breastfeeding rates drop rapidly between 4 and 6 months of age and are very low at 6 months *(32)*.

To protect, promote and support breastfeeding, measures are required at many levels, including full implementation of the International Code of Marketing of Breast-milk Substitutes (the Code), adopted at the Thirty-fourth World Health Assembly in 1981. This depends on whether individual Member States legislate, monitor and enforce the Code;[7] however, it also requires effective training of health workers and peer counsellors to provide support to all mothers to practise the recommended feeding practices, including in difficult situations and through the Baby-friendly Hospital Initiative, which is a global effort launched by WHO and UNICEF in 1991 (since revised) to protect, promote and support breastfeeding in maternity facilities through the "ten steps to successful breastfeeding" *(161)*. Many countries in the European Region have implemented or incorporated the concepts of the Initiative (Fig. 17), but not all are currently operational.

98% of countries reported that they provided counselling on breastfeeding (Fig. 17), commonly for early initiation and continued exclusive breastfeeding to 6 months (Fig. 18). Hospitals were the most often-cited settings for breastfeeding counselling (65%), followed by primary care clinics (49%) (Fig. 19).; 73% of countries reported that they were currently implementing the Baby-friendly Hospital Initiative (Fig. 17). Case studies of early-life nutrition are described in Box 7.

From the age of 6 months, the breastfed infant's nutritional requirements exceed those provided by breast-milk alone. Hence, timely introduction of nutritionally adequate, safe complementary foods is essential while breastfeeding continues *(163)*. Parents require guidance from health care professionals on the introduction of complementary foods, the variety of foods necessary to meet nutrient requirements, appropriate amounts and an appropriate frequency of meals to ensure appropriate growth. Recent evidence suggests that the commercial complementary food products available on the market contribute to excess intake of nutrients of public health concern, including salt, saturated fats and sugar, and may encourage the development of unhealthy taste or dietary preferences *(34,35)*. It has been shown that preferences are modified by experience and child feeding practices *(164)*. For example, children who eat sweet foods in infancy are more likely to prefer sweeter tastes in later childhood *(165)*. The first foods given to infants are therefore extremely important in ensuring both optimal nutrition and the development of appropriate taste preferences.

[7] The Code was not included in the questionnaire because WHO published an update of country status with regard to the marketing of breast-milk substitutes in 2016.

Fig. 17. Indicators for early-life nutrition: breastfeeding, complementary feeding, Baby-friendly Hospital Initiative and feeding of low-birth-weight infants

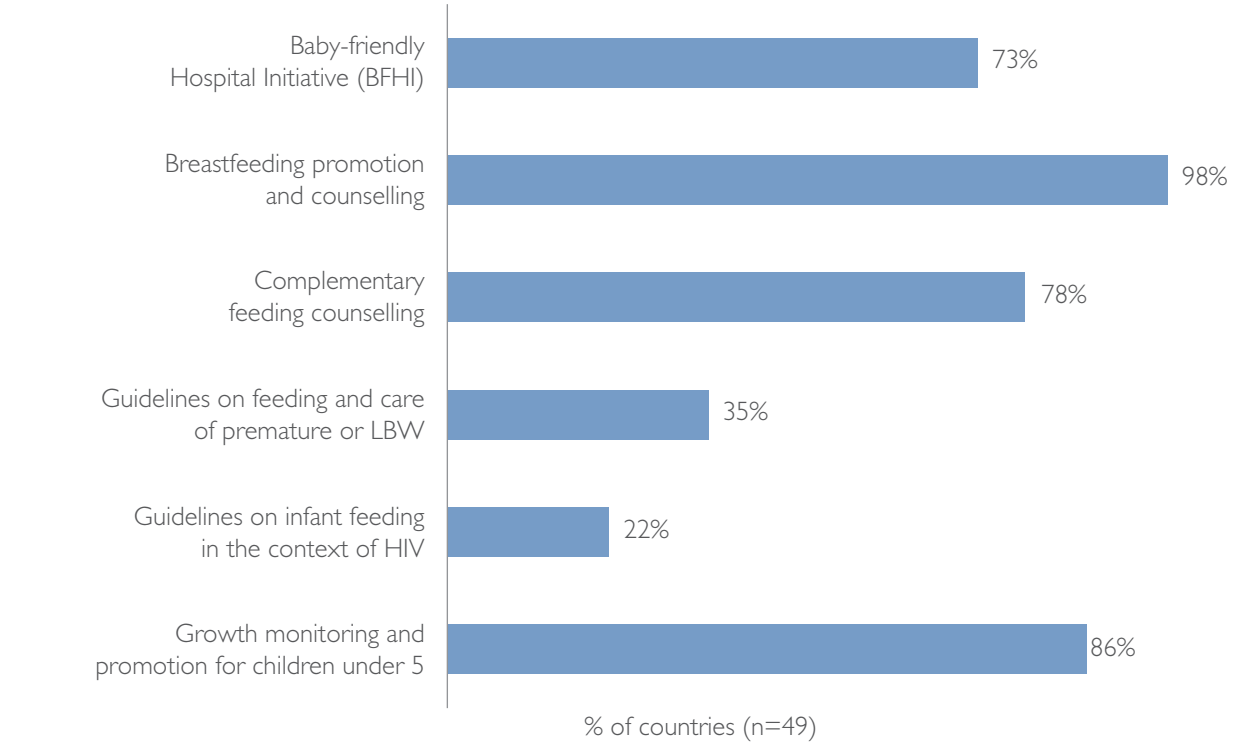


Fig. 18. Components of counselling on breastfeeding and complementary feeding

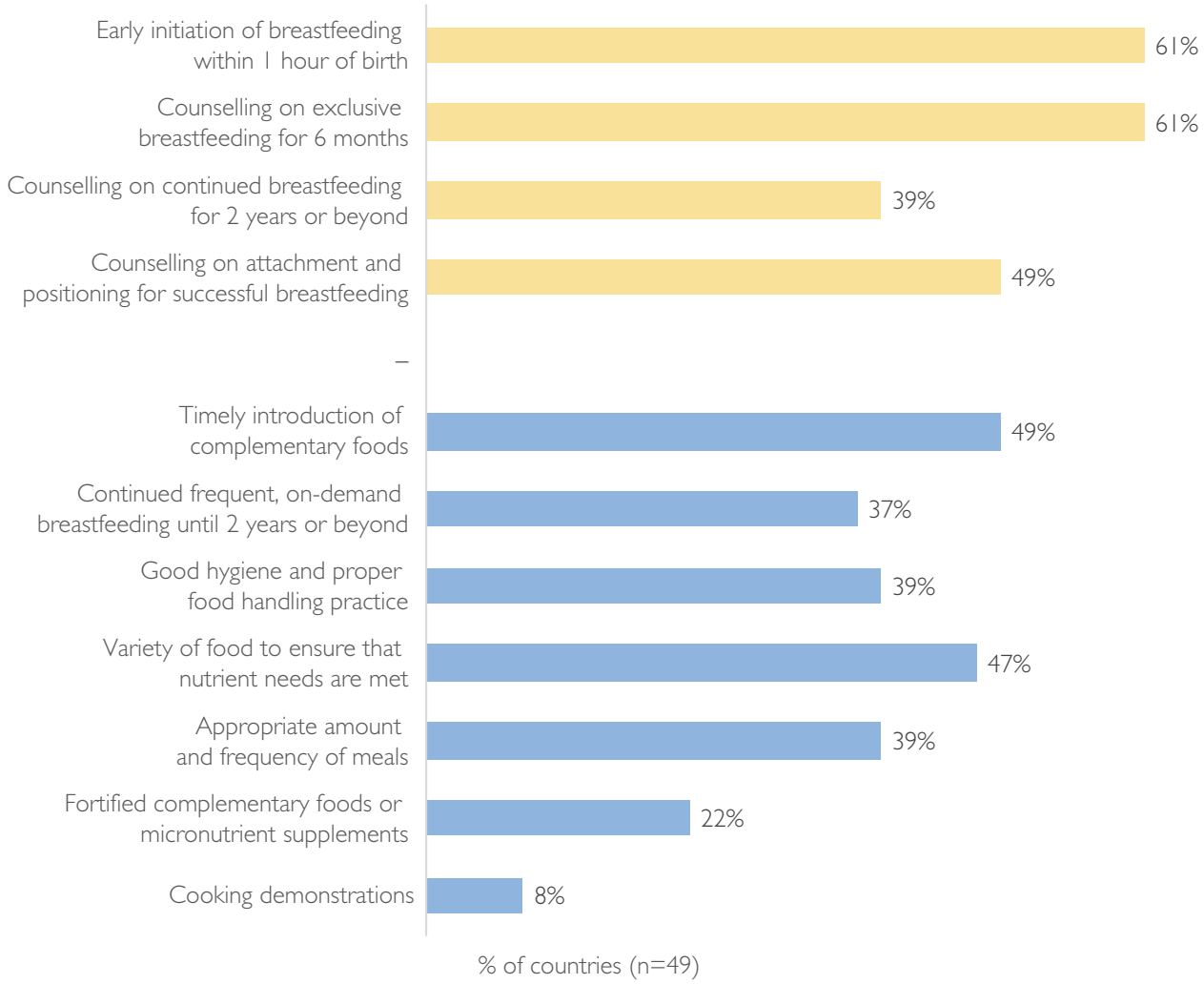
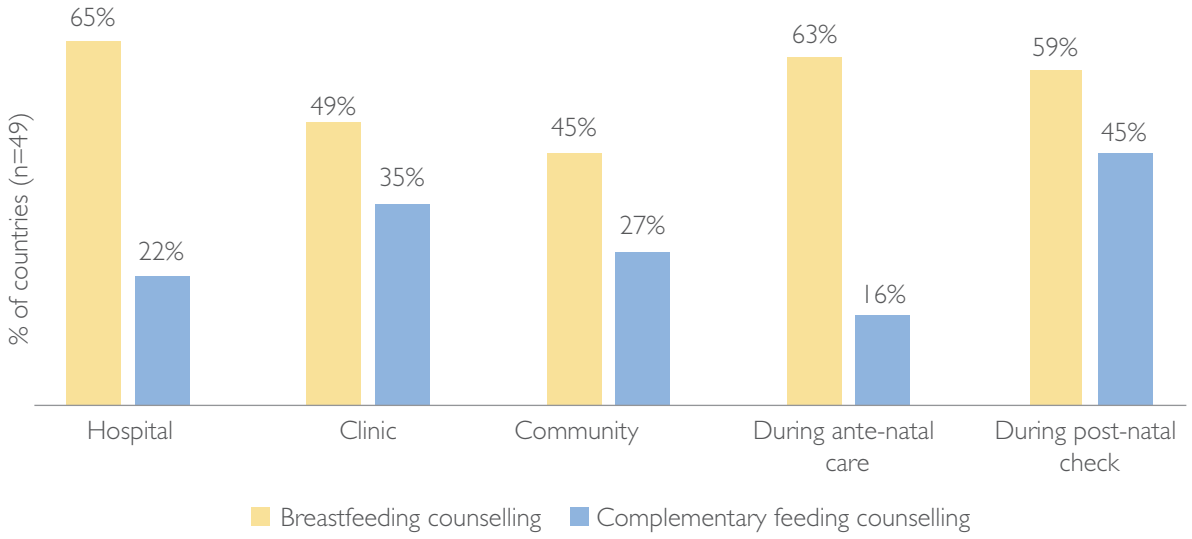


Fig. 19. Settings and time period when counselling on breastfeeding and complementary feeding is provided



Box 7. Case studies of early-life nutrition: experience from Austria and Germany

"Healthy eating from the start!" is a health promotion programme funded by the Austrian Agency for Health and Food Safety, the Federal Ministry of Health and Women's Affairs and the Association of Austrian Social Insurance Institutions. The programme targets pregnant and breastfeeding women and families with children up to 10 years of age. The aim is to support women and families in establishing healthy eating habits from the start, based on sound science. In addition to recommendations, the programme runs free-of-charge workshops on nutrition during pregnancy, lactation and complementary feeding and on training trainers, which are held in Bosnian, Croatian, English, German, Serb, Turkish and sign language; the materials are available on-line *(162)*.

In Germany, in response to the increasing prevalence of maternal and childhood obesity, the Federal Ministry of Food and Agriculture established a network of health professionals and scientific societies to provide face-to-face training for staff and materials for parents. The "Healthy start – young family network", publicized through flyers, posters and web apps, addresses nutrition and physical activity. The network has also published recommendations on nutrition and physical activity for infants and young children and on nutrition in pregnancy in a number of languages. Particular efforts are made to reach ethnic minorities and newly arrived migrant communities and to tailor the materials to their needs. The network was formalized in 2016, although it has been operating since 2009. In 2012–2015, the network distributed 3.6 million information leaflets, trained 3000 health professionals and sent newsletters to 70 000 subscribers. With about 700 000 live births per year in Germany, the network estimates that it has distributed at least one leaflet for every infant.[8]

Sources: the Austrian Centre for Nutrition and Prevention and the German Federal Centre for Nutrition

[8] Personal communication from the German Federal Centre for Nutrition

New global guidance to end the inappropriate marketing of foods for infants and young children, approved by the World Health Assembly in 2016 recommends that such foods be promoted only if they meet all the relevant national, regional and global standards for composition, safety, quality and nutrient levels and are in line with national dietary guidelines *(33)*.

78% of countries reported that they provide counselling (Fig. 17), including timely introduction and an appropriate variety of foods to ensure nutrient needs are met (Fig. 18).

Health-care providers play an important role in tracking child growth and should use routine monitoring as opportunities to measure children's BMI-for-age and give appropriate advice and guidance to caregivers (see Objective 3). This can help to prevent overweight and obesity and also to identify underweight. WHO has issued new guidelines to support primary health care workers in identifying and managing children who are overweight or obese *(166)*. Thus, both the weight and height of all infants and children aged < 5 years who are presented at primary health care facilities should be measured in order to determine their weight-for-height and their nutritional status. Children who are overweight or obese before puberty according to WHO child growth standards are at increased risk for remaining overweight or becoming obese in adulthood. The preschool years (ages 0–5) are therefore an opportunity for prevention, when children can be encouraged to be active, develop healthy eating habits and maintain healthy growth. A case study is presented in Box 8.

Box 8. Talking about weight: experience from The Netherlands

"Talking about weight" is a guideline developed for health care professionals working with infants and young children in The Netherlands *(167)*. When a young child is found to be overweight, the guideline can support health care workers in discussing the child's weight with the parents. It helps professionals to handle this sensitive topic and provides parents with helpful insights and tools to ensure that their child's weight does not further deviate from expected growth patterns. This is done by means of illustrations that help to explain, for example, that their child has gained too much weight (e.g. BMI growth charts for boys and girls and depictions of healthy weight over time) and by tips on addressing the problem (e.g. drawings of appropriate sizes of meals for children and for adults; illustrations showing the estimated number of sugar cubes in soft drinks and juices and in water). The guideline also provides recommended daily intakes for children. Particular attention is given in conversations with parents of Moroccan or Turkish origin about cultural differences in habits and beliefs about their children's weight and eating habits.

About 90% of health care organizations working with infants and young children use the intervention, which was funded entirely by the Ministry of Health, Welfare and Sports.

Source: The Netherlands Nutrition Centre

2.3 Communication with the public

In this era of digital mass media, the public has easy access to an enormous amount of information on health, nutrition and foods, which is a positive development. However, validated information from respected authorities competes with advice from self-declared experts, and controversial statements made by the media may be taken out of context or based on questionable research. Reliable information is often considerably more nuanced and, as a result, is sometimes seen as less interesting or harder to grasp.

Dietary guidelines from a reliable source can nevertheless help the public to recognize which information is correct and how to convert it into action. Dietary guidelines translate nutrient recommendations into simple language and symbols and provide information on commonly consumed foods, portion sizes and consumption behaviour. The guidelines can be communicated to the public in media campaigns in a way that is easily understood. They can also be used as the basis for public policies (such as school food procurement) and nutrition education programmes in various settings to foster healthy eating habits. Dietary guidelines complement rather than replace nutrient recommendations, especially as modern dietary practices include frequent consumption of manufactured food and food eaten outside the home, the nutrient composition of which may vary significantly. Attention must therefore be drawn to nutrient intakes that increase the risk for NCDs.

Most countries in the WHO European Region reported that they had adopted food-based dietary guidelines (80%) and 42% reported nutrient-based dietary guidelines as the basis for guidance to different target groups (Figs 20 and 21). At the same time, 82% of countries reported running media campaigns to promote healthier diets. The objectives of the media campaigns were usually to raise awareness about healthy diets, including increasing fruit and vegetable consumption (37%), and also about the health effects of high intakes of fats, sugars and salt or sodium (39%) (Fig. 22). Less frequent objectives were to provide information on using nutrition labels (22%), interpreting nutrition and health claims (16%) and to control portion size (16%). Preparation of food guides or educational materials was reported by 50% of countries.

Dietary guidelines used in the Flemish region of Belgium are presented as a case study in Box 9.

Fig. 20. National dietary guidelines: food- and nutrient-based dietary guidelines

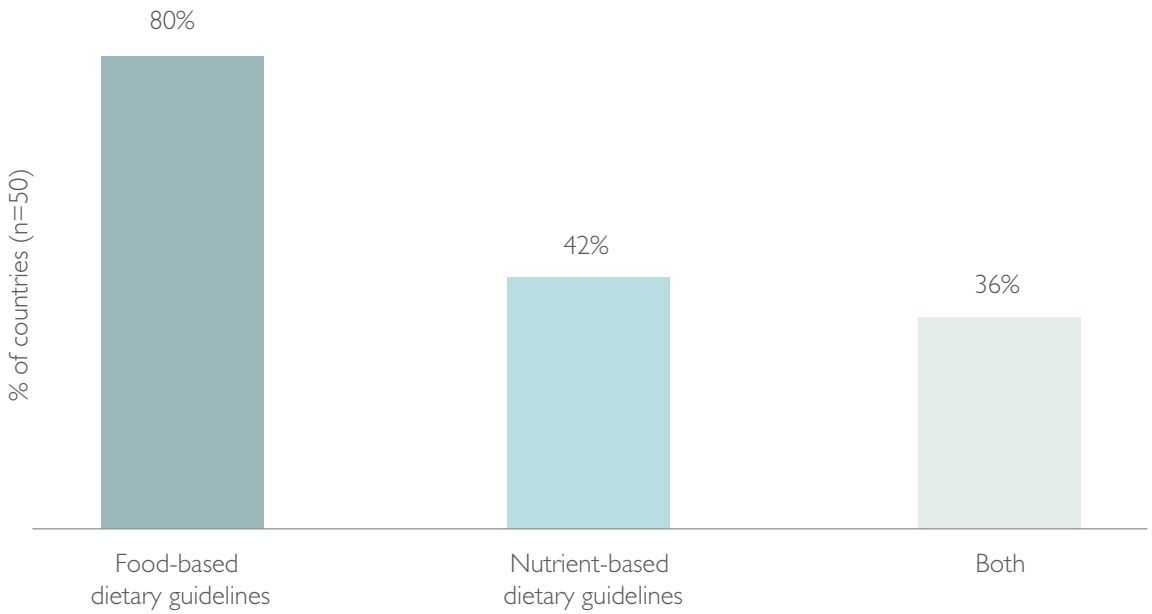


Fig. 21. Target groups for which food- and nutrient-based dietary guidelines exist

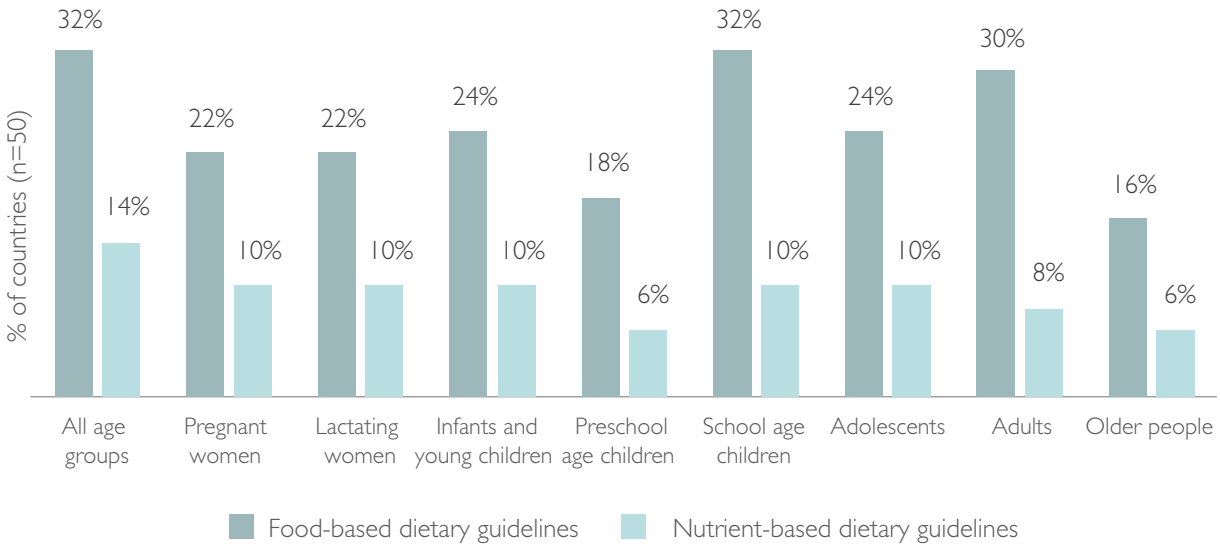
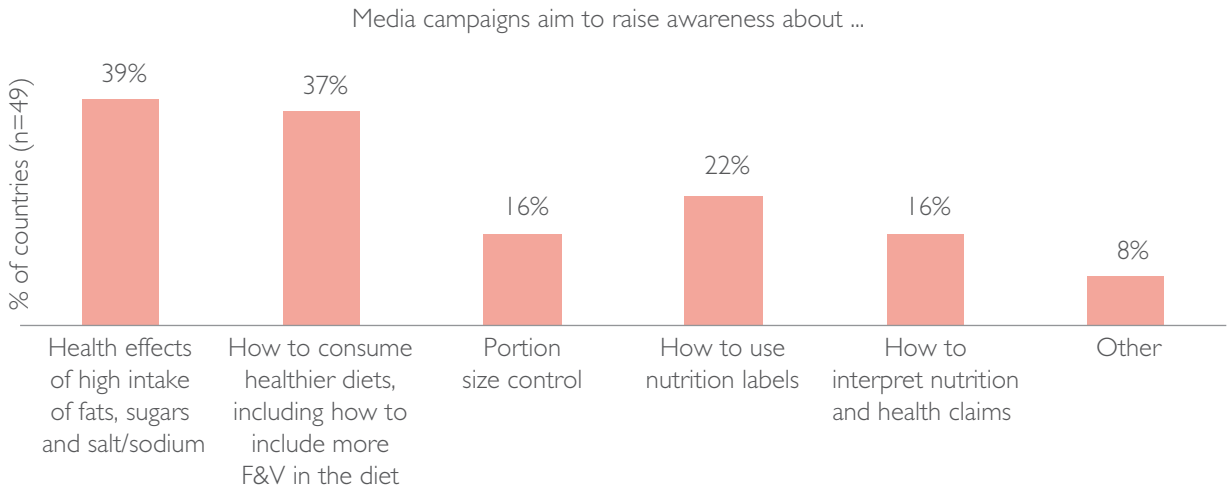


Fig. 22. Objectives of media campaigns on healthy diets and nutrition



Box 9. Case study: food triangle in Flanders (Belgium)

The revised food-based dietary guideline for Flanders was launched in 2017. The "food triangle" approach was based on an extensive literature review and consultation, which indicated that the guide should:

- encourage people to eat proportionally more foods derived from plants than foods derived from animals,
- encourage people to avoid ultra-processed foods as much as possible, and
- communicate the importance of moderating consumption and avoiding food waste.

These starting-points resulted in 10 principles of healthy living with regard to which foods should be consumed and some tips for sustaining behavioural change.

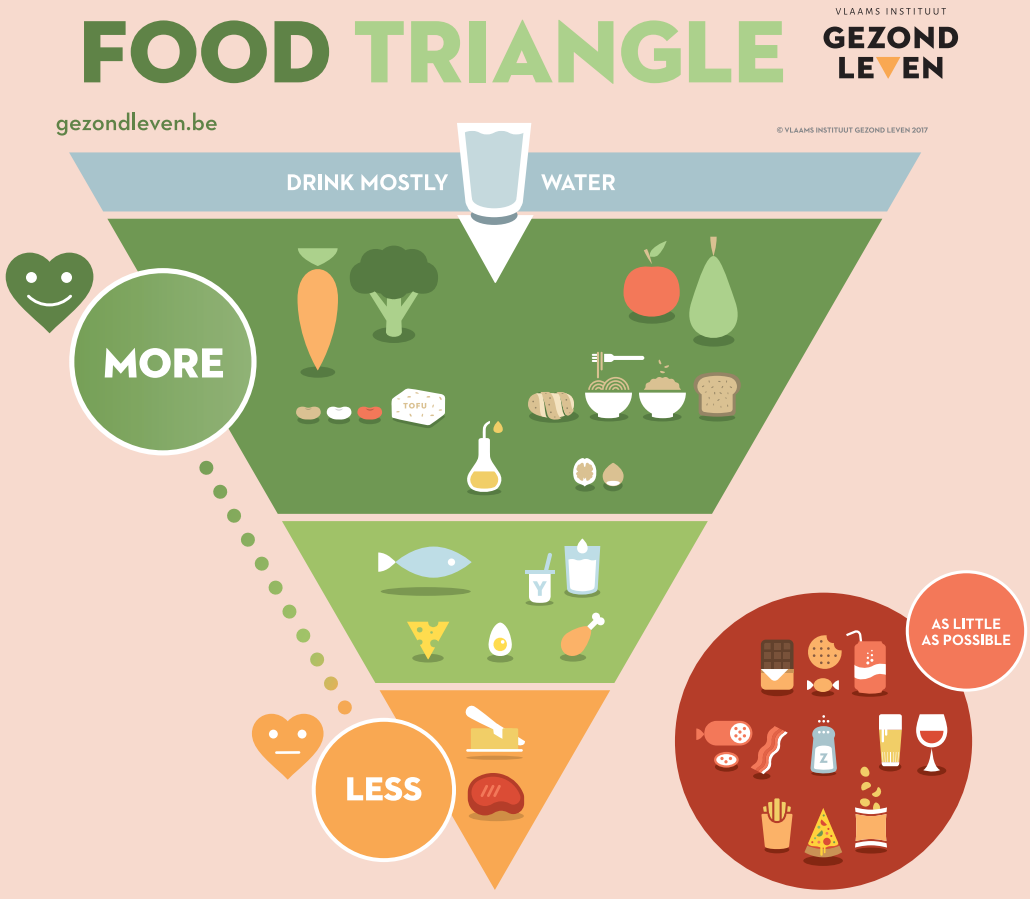
Box 9. Contnd.

1. Make foods derived from plants the basis of every meal.
2. Limit your intake of animal products.
3. Drink water.
4. Choose as few ultra-processed products as possible.
5. Vary your diet, and look for alternatives.
6. Eat at set times, with others.
7. Eat consciously and with moderation.
8. Adapt your environment.
9. Work step by step.
10. Enjoy what you eat!

The category at the top of the triangle is water. The triangle is then divided into three colours that reflect effects on health:

- Dark green indicates foods that originate from plants and have a favourable effect on health.
- Light green indicates foods derived from animals that have a favourable or neutral effect on health, including fish, yoghurt, milk, cheese, poultry and eggs. The guide encourages the public to choose the least processed or non-processed variety of each.
- Orange indicates foods that originate from plants or animals that may have an unfavourable effect on health when consumed in large amounts. These products nevertheless contain some useful nutrients, such as iron in red meat and fat-soluble vitamins in butter.

A fourth, red, category is set apart from the triangle. This indicates highly processed products to which large amounts of sugar, fat or salt are added and which have clearly unfavourable effects on health. They are not considered part of a healthy diet, and the public is advised to eat or drink them rarely and in small portions.



Source: Flemish Institute for Healthy Living

Media campaigns can be used to spread messages about healthy diets. They are typically based on components of the dietary guidelines and may target specific behaviour (e.g. excess salt intake) or specific population groups (e.g. children) (Fig. 23). The most popular channels for media campaigns are internet and social media (37%), television (33%), events (29%) and radio (27%) (Fig. 24). The most popular focus of media campaigns was salt intake (35%), followed by fruits and vegetables (29%) and total fat and sugar (24%) (Fig. 25). Box 10 presents a case study of targeted media campaigns.

Fig. 23. Target groups of media campaigns on healthy diets and nutrition

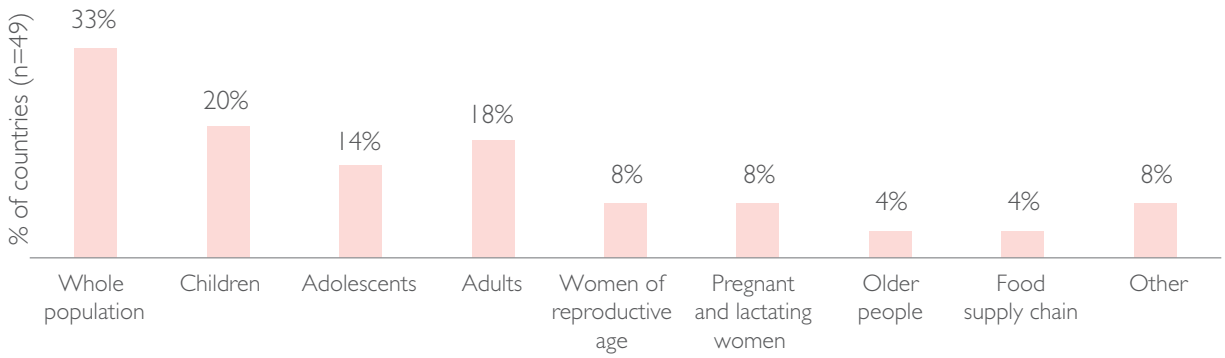


Fig. 24. Channels through which media campaigns on healthy diet and nutrition are implemented

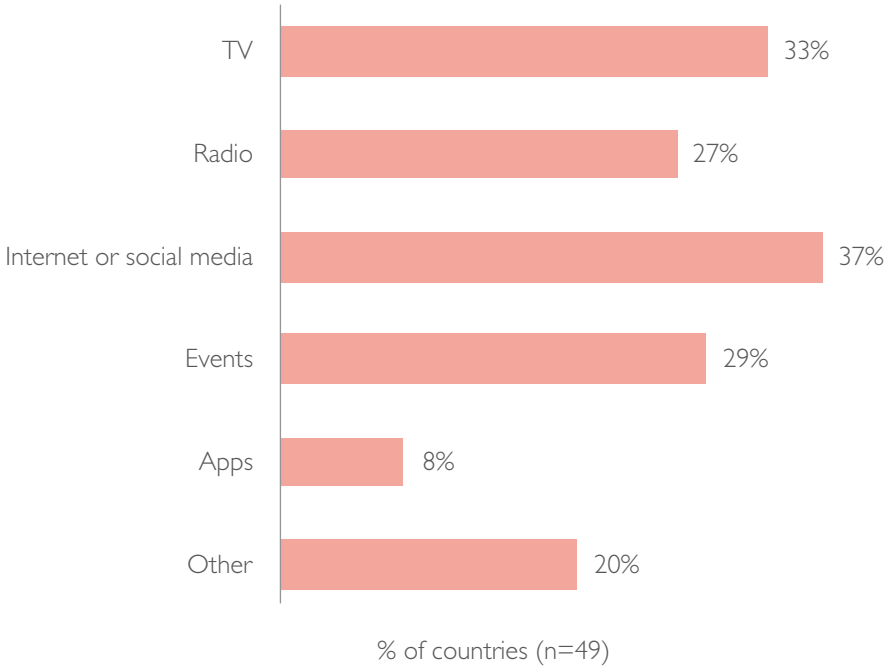
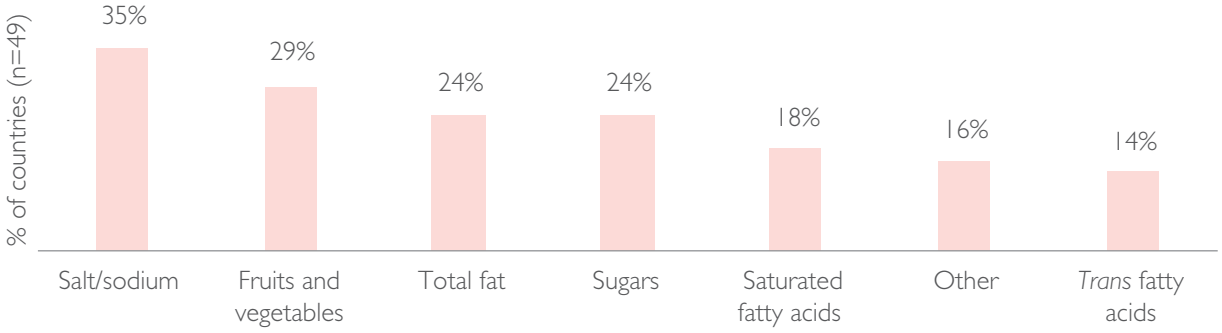


Fig. 25. Nutrients, foods or beverages addressed by media campaigns on healthy diets and nutrition



Box 10. Case study: reaching the public and specific target groups

The Dutch food-based dietary guideline is known as the "wheel of five" and combines health with sustainability. The Voedingscentrum (Netherlands Nutrition Centre) launched a campaign in 2017 to bring the wheel's advice into the daily lives of consumers by posts on social media platforms. The topics selected for raising awareness included legumes, whole-grain products, nuts and fruit. For each topic, the Nutrition Centre analysed the behaviour of consumers as the basis of a communication strategy and prepared up to three social posts for each topic. For example, their analysis showed that the Dutch population found it difficult to distinguish legumes from vegetables. So, in an interactive promotional advertisement that opens within Facebook, they demonstrated what legumes are and their benefits. The analysis showed that consumers were familiar with the benefits of whole grains but would welcome tips on incorporating them into their diet. The promotional interactive posts provided recipes for breakfast, lunch and dinner. Video posts were also used, such as the "50/50 whole grain challenge", which encouraged people to exchange half of their rice, bread or pasta for a whole-grain variety.

Supported by Government funding, the campaign was viewed 15 million times and reached 1.4 million individuals. The interactive format (known as Facebook canvas) often performed best, receiving the most clicks and engagement; people spent 20–33 s looking at the information. The Nutrition Centre plans to examine the impact of the campaign according to level of education in order to establish whether different socioeconomic groups respond differently to the posts.

Denmark has also worked to ensure that programmes and initiatives reach the right target audiences, by tailoring their communication materials. For example, most Danish consumers recognize the Nordic Keyhole logo on packaged foods, and many find that healthy food choices have become easier. Analysis showed, however, that men (and particularly men with less education) are less likely to recognize or choose products with the Keyhole logo. The Danish Food and Veterinary Administration therefore decided to tailor their last two campaigns to this group, including recipes targeting men and spokespersons likely to appeal to this group *(168)*. Both campaigns were evaluated in a YouGov analysis, which showed that women also tend to listen when men are targeted *(169)*.

The Danish authorities have tailored materials to reach expectant mothers and the mothers of infants and young children. The materials have been translated into other commonly spoken languages, and specific materials have been produced for newly arrived communities to assist them in identifying and providing healthy foods for young children in their new country *(170)*. Specific dietary advice has also been prepared for the older population, as a supplement to standard dietary guidelines *(171)*. Support materials for local municipalities, nursing homes and companies that deliver food to the elderly have been developed, and they can share their experience and best practices in providing healthy meals for this population.

The platform was developed by the Danish Food and Veterinary Administration, the Danish Health Authority, the Danish Diet and Nutrition Association and "Madkulturen" (Food Culture) and has been in place since 2015 *(172)*.

Sources: The Netherlands Nutrition Centre and the Danish Food and Veterinary Authority

Objective 3. Reinforcement of health systems to promote healthy nutrition

3.1 Education and counselling on nutrition and healthy diets for prevention of overweight, obesity and diet-related noncommunicable diseases in primary health care

Services in primary health care for addressing nutrition and body weight have been shown to help patients make useful changes to their diets and to manage their weight in the short term. The best results are observed when the intervention is appropriately tailored to each person's requirements and barriers. A review of the topic from the WHO Regional Office for Europe *(45)* indicated that services to address diet and physical activity simultaneously are the most effective. Initial referral by a primary care physician and routine follow-up by nurses and allied health professionals (such as dieticians and physiotherapists) result in better outcomes, as support in self-management is crucial for patient engagement in a longer-term strategy.

As a result, the WHO Food and Nutrition Action Plan calls on Member States to:

- ensure that nutrition and healthy eating are priorities in people-centred health and social care systems, including nutrition counselling in primary health care;
- ensure universal health coverage for preventable and treatable diet-related problems, with a continuum of high-quality nutrition services and appropriately qualified and resourced health professionals; and
- establish nutritional assessment and intervention procedures for different age groups, especially children and the elderly.

The challenges to the delivery of such services in primary care are numerous. Many studies found lack of clear guidance in clinical recommendations; outdated knowledge and competence of primary care providers, including the skills to assess and address patient resistance to behaviour change; unclear scope of practice; and limited task-sharing in interdisciplinary teams (i.e. doctors, nurses, dieticians).

Given the current burden of disease and the distribution of modifiable risk factors, promotion of healthy diets and of physical activity should be a core competence of primary care providers in most countries. Even opportunistic provision of individual support to high-risk populations attending primary care can, however, represent in an overwhelming workload for primary care providers. Health service delivery will have to be further transformed to incorporate diet and physical activity services at scale.

Most countries (93%) reported that they provided education and counselling on nutrition and healthy diets for patients, with the most common setting being primary care (54%); however, many countries reported only delivering information, and far fewer incorporated elements of behaviour change communication (20%) (Fig. 26). Some countries reported targeting specific population groups, especially pregnant and lactating women (Fig. 27). In most cases, however, education and counselling were targeted to the general population (46%). The most popular topics were the health effects of high levels of saturated fat, sodium and sugar in the diet (57%) and the benefits of eating more fruits and vegetables (52%).

Fig. 26. Approaches used in delivering education and counselling on nutrition and healthy diets

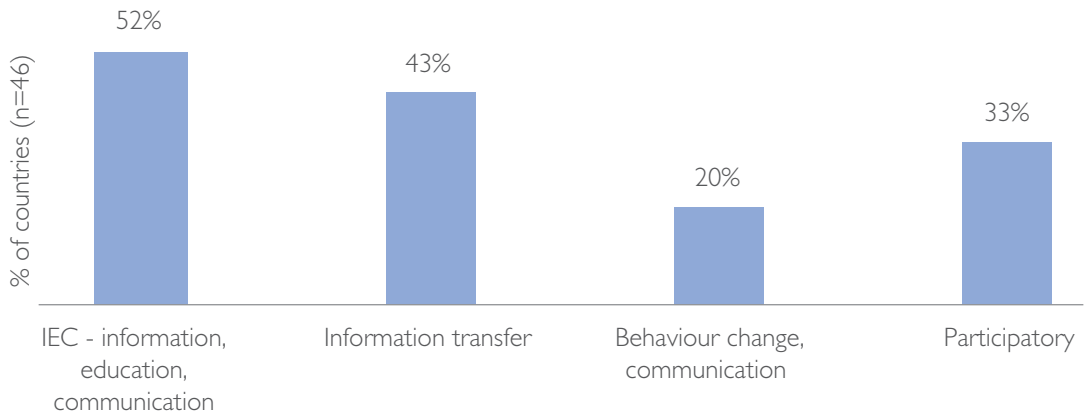
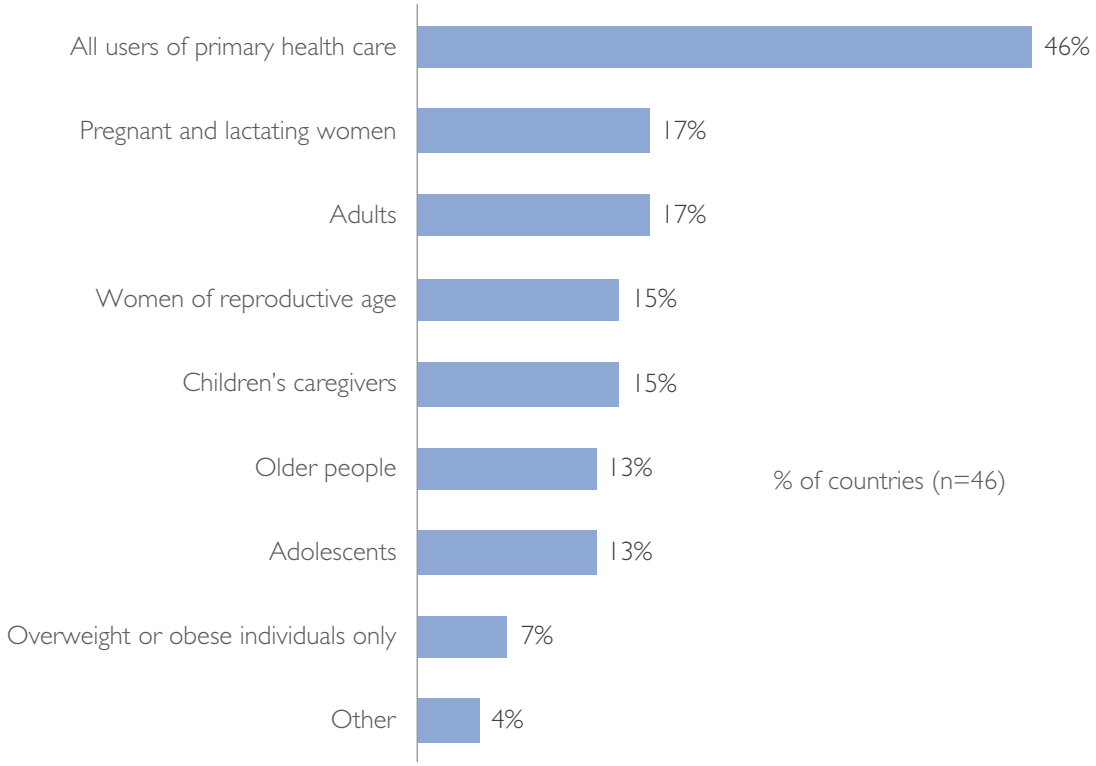


Fig. 27. Target groups for education and counselling on nutrition and healthy diets in primary health care



3.2 Nutrition capacity

A key requirement for improving the integration of diet and weight management into primary care is the availability of "nutrition capacity", i.e. knowledge, ability and expertise in nutrition, in the health system. The majority (78%) of countries reported that they had higher education institutions that offered training in nutrition, and 58% reported that maternal, infant and young child nutrition was included in pre-service training for health professionals (Table 3). Most of the higher education training programmes were in public health nutrition and clinical nutrition.

Table 3. Nutrition capacity in countries

Nutrition capacity (n=44)	
Higher education in nutrition	
Higher education training institutions that offer training in nutrition	77%
Nutritionists and dieticians	
Trained nutritionists and dieticians working in nutrition-related areas in government or nongovernment sectors	86%
Nutrition training for health personnel	
Health personnel trained in maternal, infant and young child nutrition	77%
Maternal, infant and young child nutrition included in pre-service training of health personnel	57%
Maternal, infant and young child nutrition included in in-service training of health personnel	41%

The survey also required countries to report on actions to prevent and treat malnutrition. This is particularly important in some countries within our region where there is a greater risk of malnutrition or nutrition insecurity (e.g. seasonal lack of dietary diversity). Actions to address malnutrition included dietary interventions, but also specially formulated supplementary foods and micronutrient supplementation.

"Malnutrition" covers deficiencies, excesses and imbalances in a person's intake of energy or nutrients. The double burden of malnutrition is the coexistence of undernutrition with overweight and obesity or diet-related NCDs. This double burden may exist at individual level (for example, obesity with a deficiency of one or various vitamins and minerals or overweight in an adult who was stunted during childhood), at household level (a mother who is overweight or anaemic and a child or grandparent who is underweight) and at population level (with a high prevalence of both undernutrition and overweight in the same community, country or region) *(31)*.

The double burden of malnutrition is a continuing concern in some countries in the WHO European Region, with significant portions of the population who are stunted (up to 26% in Tajikistan) and pockets of population who are underweight (up to 12% in Tajikistan). These conditions co-exist with increasing rates of diet-related NCDs and overweight in the same settings *(7)*.

Inadequate intake of vitamins and minerals (micronutrients) also remains a challenge in some countries, iodine and iron being the most important in terms of public health. The groups most vulnerable to micronutrient deficiency are pregnant women, lactating women and young children, because they have a relatively greater need for vitamins and minerals and are more susceptible to the harmful consequences of deficiencies *(173)*. Malnutrition in children, particularly severe acute malnutrition, increases their risk for dying from common childhood illnesses; it contributes to 45% of deaths in children under 5 years of age *(174)*. Globally, in 2016, an estimated 52 million preschool-age children were wasted, of whom 17 million were severely wasted *(27)*.

Specific programmes and interventions can be established to prevent acute malnutrition, such as improved maternal and antenatal care, support for exclusive breastfeeding and appropriate complementary feeding, food distribution programmes and dietary interventions with nutrient and energy-dense locally available foods *(31)*. In food-insecure settings, distribution of supplementary foods is usually necessary, either to vulnerable groups or to specific groups (e.g. all children aged from 6 months to 5 years) (Fig. 28). Table 4 illustrates implementation of programmes for the management of severe and moderate acute malnutrition.

Fig. 28. Supplementation for pregnant women, women of reproductive age and children

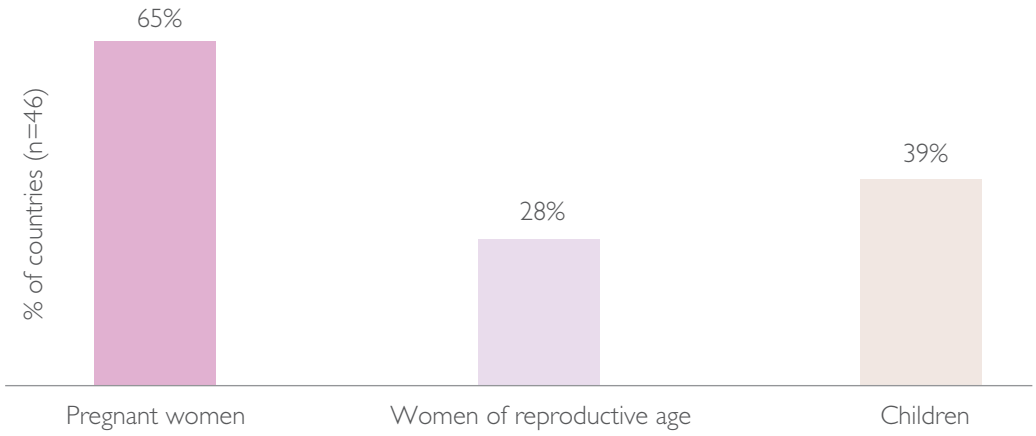


Table 4. Programmes related to the treatment of moderate- and severe-acute malnutrition

Treatment of acute malnutrition (n=40)			
Programmes related to the management of moderate acute malnutrition (MAM)	25%	**Programmes related to the management of severe acute malnutrition (SAM)**	28%
MAM protocol	18%	**SAM protocol**	13%
Target groups		**Target group**	
Children 0-5 months with MAM	13%	Children 0-5 months with SAM	10%
Children 6-59 months with MAM	13%	Children 6-59 months with SAM	8%
Other	10%	Other	3%
Components		**Components**	
Breastfeeding promotion and support	18%	Inpatient treatment	13%
Nutrition counselling	15%	Outpatient treatment	8%
Activities that identify and address the underlying causes of malnutrition	10%	**Regular screening for SAM**	10%
Water, sanitation and hygiene interventions	8%		
Provision of supplementary foods	8%		
Food security interventions	3%		
Other	3%		
Conditional or non-conditional cash transfers	0%		

Objective 4. Surveillance, monitoring and evaluation

Good-quality health information is essential for planning and implementing nutrition policies. Detailed, comprehensive assessments of the magnitude of any problem are required to ensure an adequate political response and the necessary information to respond in a timely manner. The European Food and Nutrition Action Plan explicitly encourages Member States to "strengthen and expand nationally representative diet and nutrition surveys" and to ensure the availability of anthropometric data (particularly for children). It calls on countries to:

- consolidate, adjust and extend existing national and international monitoring and surveillance systems, such as the Childhood Obesity Surveillance Initiative and the Health Behaviour in School-aged Children surveys;
- establish and maintain nutrition and anthropometric surveillance systems that allow disaggregation by socioeconomic status and gender;
- establish and extend food composition databases as a priority;
- make effective, proper use of the available data, including through knowledge translation and transfer, to inform policy-making; and
- monitor and evaluate diet-related activities, interventions and policies in different contexts in order to determine their effectiveness and to disseminate good practice.

An unpublished assessment by the Regional Office in 2005 indicated that only 13 (25%) of the 53 European Member States of WHO had nationally representative data on the prevalence of overweight or obesity in children aged 6–10 years based on objective measures that were available from 1999 onwards. For the age group 0–6 years, 15 (28%) countries had data on overweight. WHO therefore called for the development of standardized, harmonized surveillance systems, and significant progress has been made (Box 11).

Dietary surveys to assess food and nutrient intake are also important for assessing dietary patterns in the population. They provide a means of monitoring trends, identifying areas of concern and inequality and evaluating policy impact, thereby ultimately contributing to the promotion of best practice across the Region. A global review of national surveys during 1990–2010 *(9)* covered only dietary fat and oil intake. A comprehensive, updated review of dietary surveys is thus needed for an assessment of total nutrient and food intakes in different populations and subgroups in Europe *(8)*.

Box 11. WHO Childhood Obesity Surveillance Initiative

The WHO COSI system ensures continuous, systematic collection, analysis, interpretation and dissemination of descriptive information for monitoring excess body weight. The aim of the system is to measure trends in overweight and obesity in children aged 6.0–9.9 years to clearly understand the epidemic, to reverse it and to allow comparisons among countries in the European Region. The use of a standardized surveillance protocol over time provides comparable longitudinal information on nutritional status, making it possible to monitor the obesity epidemic in children and identify groups at risk.

A first round of data collection with the COSI protocol took place during the school year 2007–2008, a second during the school year 2009–2010 and a third during the school year 2012–2013. The most recent, fourth, round was held during the school year 2015–2016. Fig. 29 shows the latest data on the prevalence of overweight and obesity in school-age children.

COSI is now established in 35 Member States of the WHO European Region, and the number of countries is increasing with each data collection round. It is a unique system that provides a large data set covering at least 250 000 children in the Region and is based on nationally representative samples and standardized measures of weight and height.

4.1 Monitoring the growth of children under 5 years

Growth monitoring programmes were reported by 91% of the countries that responded to the survey. Taking measurements is the most common component of such programmes (46%) (Fig.30). Overweight and obesity were the most commonly monitored indicators (26%), usually measured as height:length and weight. A recent review by the WHO Regional Office for Europe found that 35 of the 53 Member States have published data on the prevalence of overweight and obesity in children under the age of 5 years *(175)*. Nevertheless, the current status of surveillance and monitoring in the European Region for these children is discouraging, with pervasive inconsistency in both methods and collection. Surveillance of children under the age of 5 years should be strengthened in order to ensure timely, regular, high-quality data for designing policies and interventions.

Fig. 29. Preliminary prevalence values for overweight and obesity from the WHO European Childhood Obesity Surveillance Initiative 2012/2013 and 2015/2016 data collection rounds

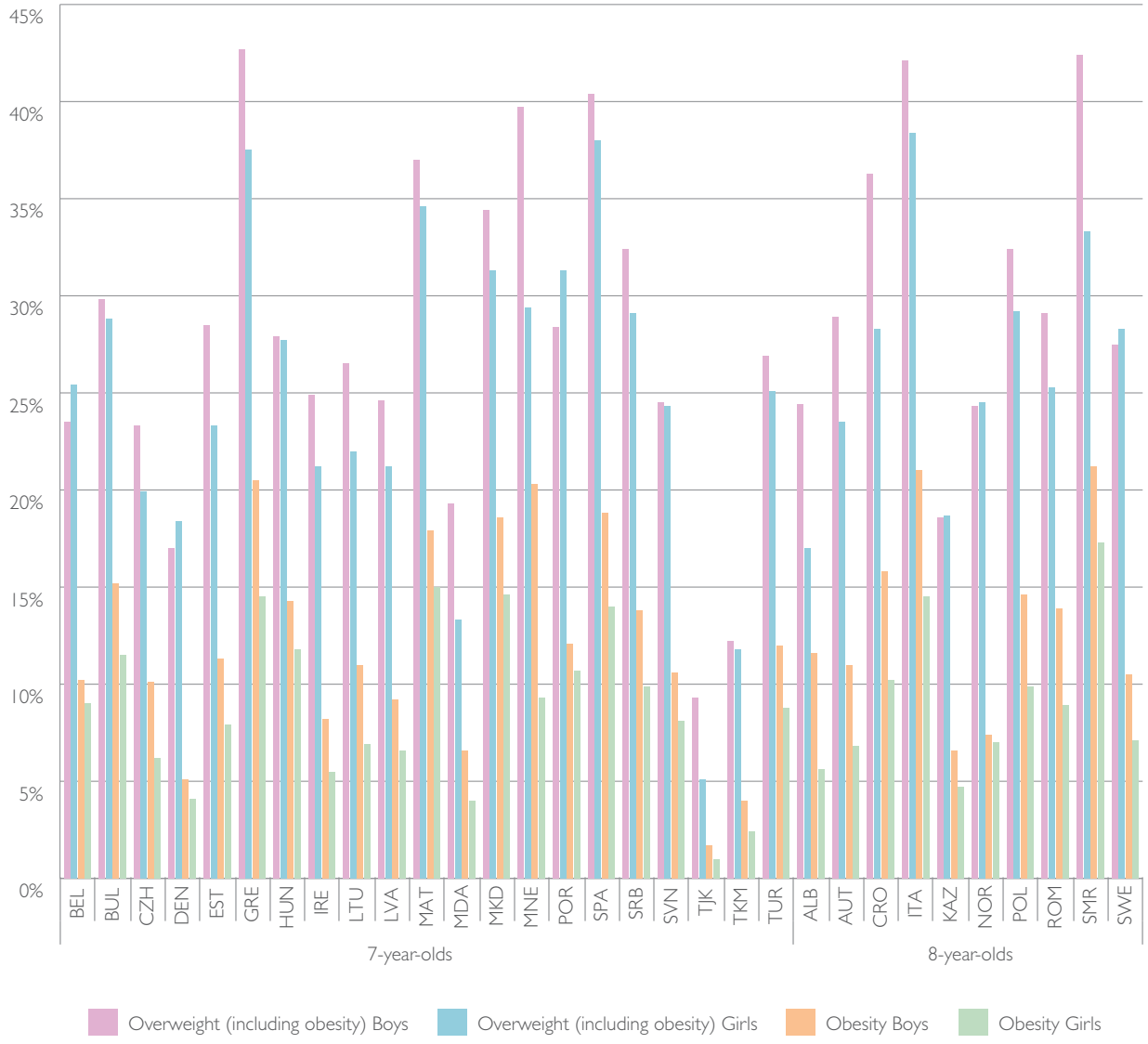
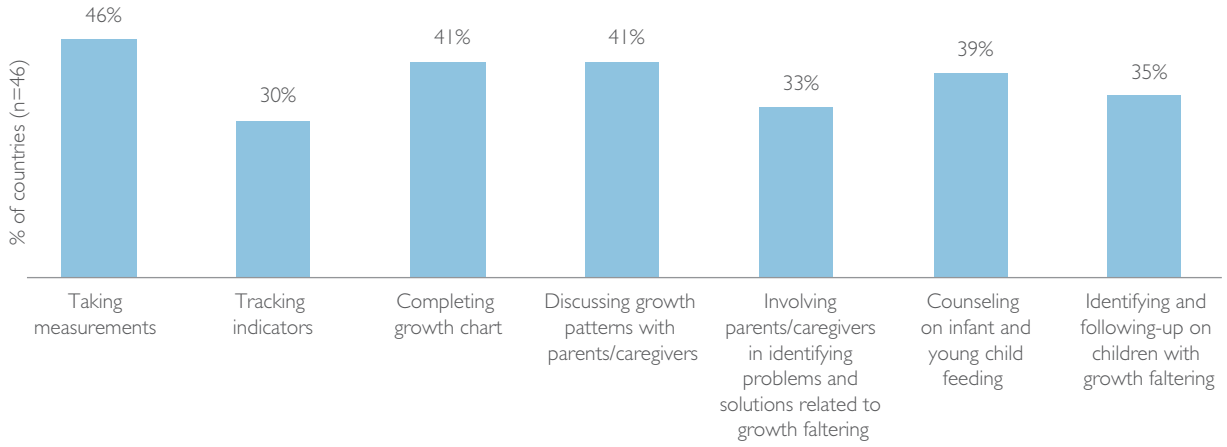


Fig. 30. Components of growth monitoring and promotion for children less than 5 years of age



4.2 Surveys of food consumption and nutrient intake

Implemented or planned food consumption or nutrient intake surveys were reported by 88% of countries (Fig. 31). The most common methods used for dietary assessment were multiple 24-h dietary recall (31%) and food frequency questionnaires (31%), followed by food diaries (27%) (Fig. 32). A literature review by the Regional Office *(8)*, however, found that fewer than two thirds of Member States, mainly central and eastern European countries, had conducted nationally representative dietary surveys. The reasons for the difference between Member States' responses and the results of the literature review may include publication bias or stricter inclusion criteria for the literature review than for the survey, as they excluded surveys that were not nationally representative (e.g. regional), those that did not cover the whole diet or all food groups, those conducted before 1990 and those with small samples. The coverage of dietary surveys could nevertheless clearly be improved.

Sodium intake surveys were reported by 24% of countries (Fig. 33), and 22% of these countries reported use of the gold-standard 24-h urinary sodium excretion method (Fig. 32).

Fig. 31. Countries that have performed a food consumption or nutrient intake survey and have national food composition tables

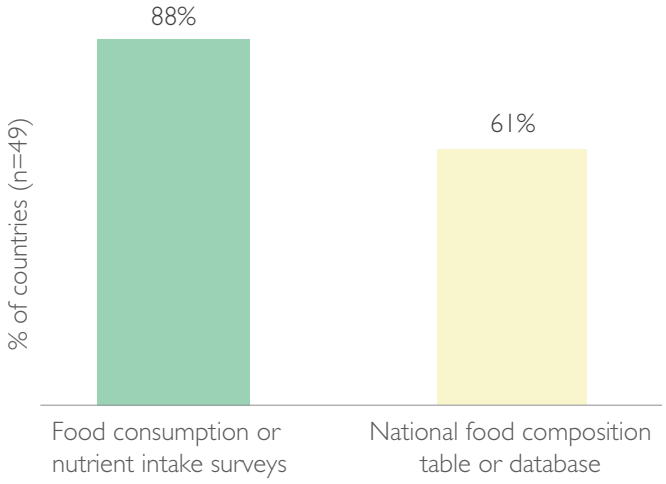
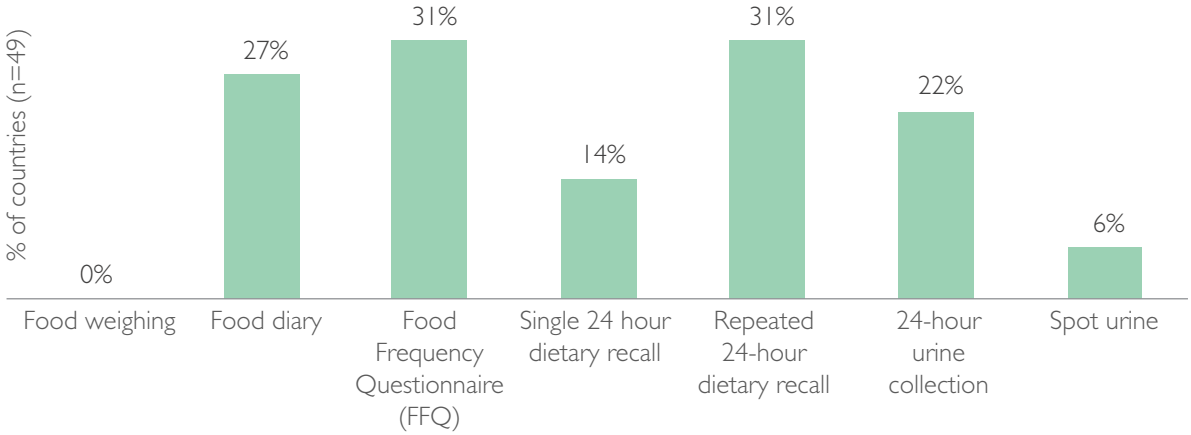


Fig. 32. Methods used in food consumption or nutrient intake surveys



Countries also provided details on other nutrients included in the surveys and the types of food for which data was collected (Figs 33 and 34). Stratifiers used to disaggregate data in surveys of food consumption and nutrient intake are shown in Fig. 35.

The WHO Regional Office for Europe and the George Institute for Global Health have been collaborating to devise "salt reduction models" to reduce population intake of salt.[9] A "salt model" indicates the reductions required in discretionary salt use, moderation in consumption of salty foods and a reduction in the salt content of processed foods in order to achieve the WHO-recommended target for population salt intake of < 5 g/day. Similar models have been developed and used in the Netherlands, New Zealand and the United Kingdom. The models require data on food intake and discretionary salt use, baseline data on salt intake by the population and information about the composition of commonly consumed foods.

[9] WHO Regional Office for Europe and George Institute for Global Health. Using dietary intake modelling to achieve a 30% reduction in population salt intake. Copenhagen: WHO Regional Office for Europe (forthcoming).

Fig. 33. Nutrients assessed in the food consumption / nutrient intake surveys

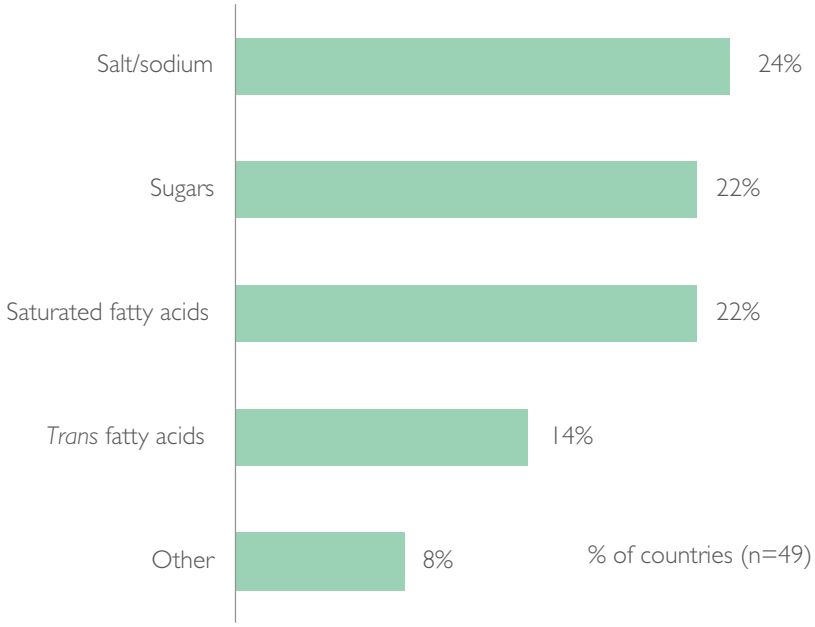


Fig. 34. Foods and beverage categories assessed in the food consumption surveys

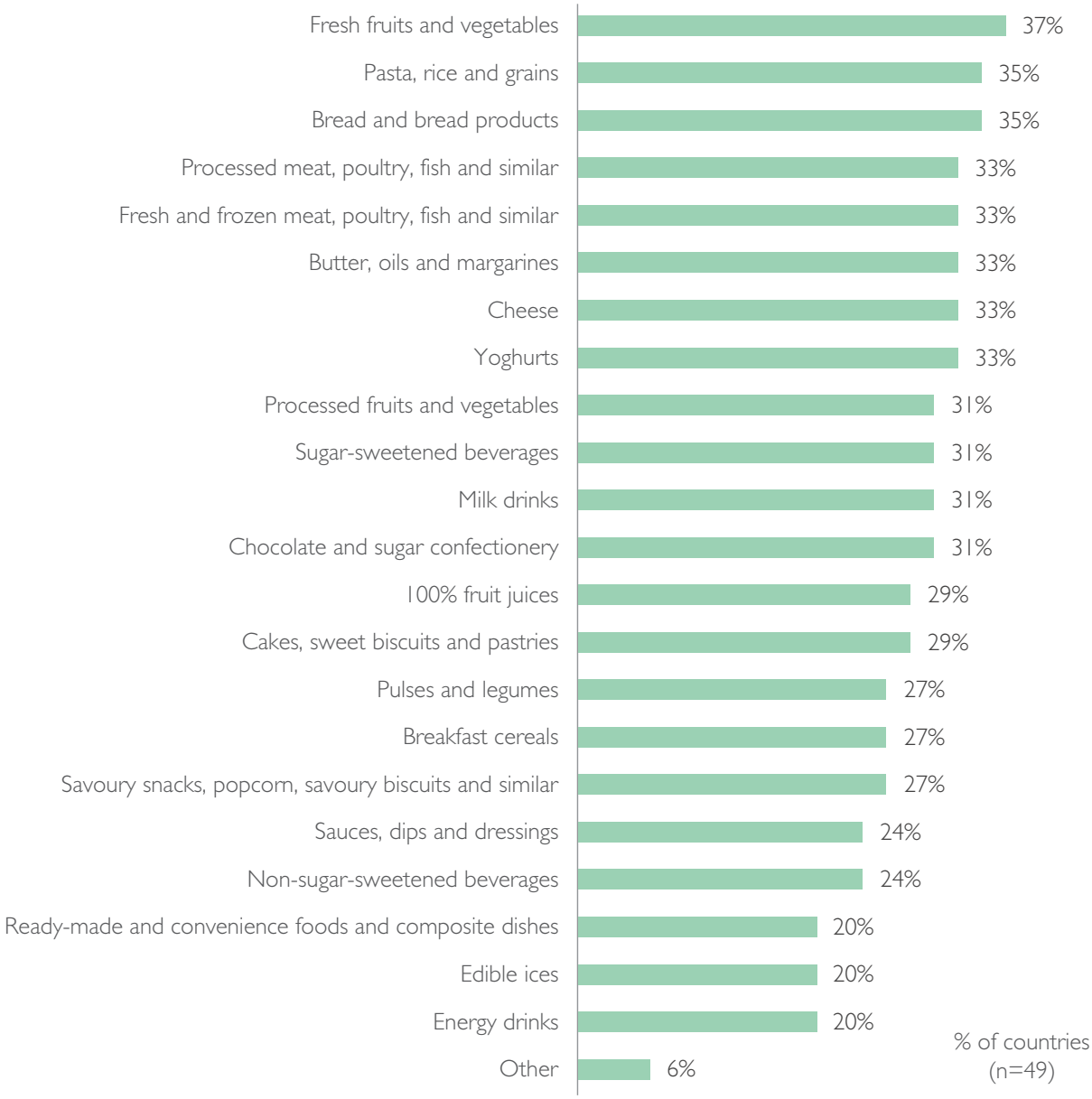
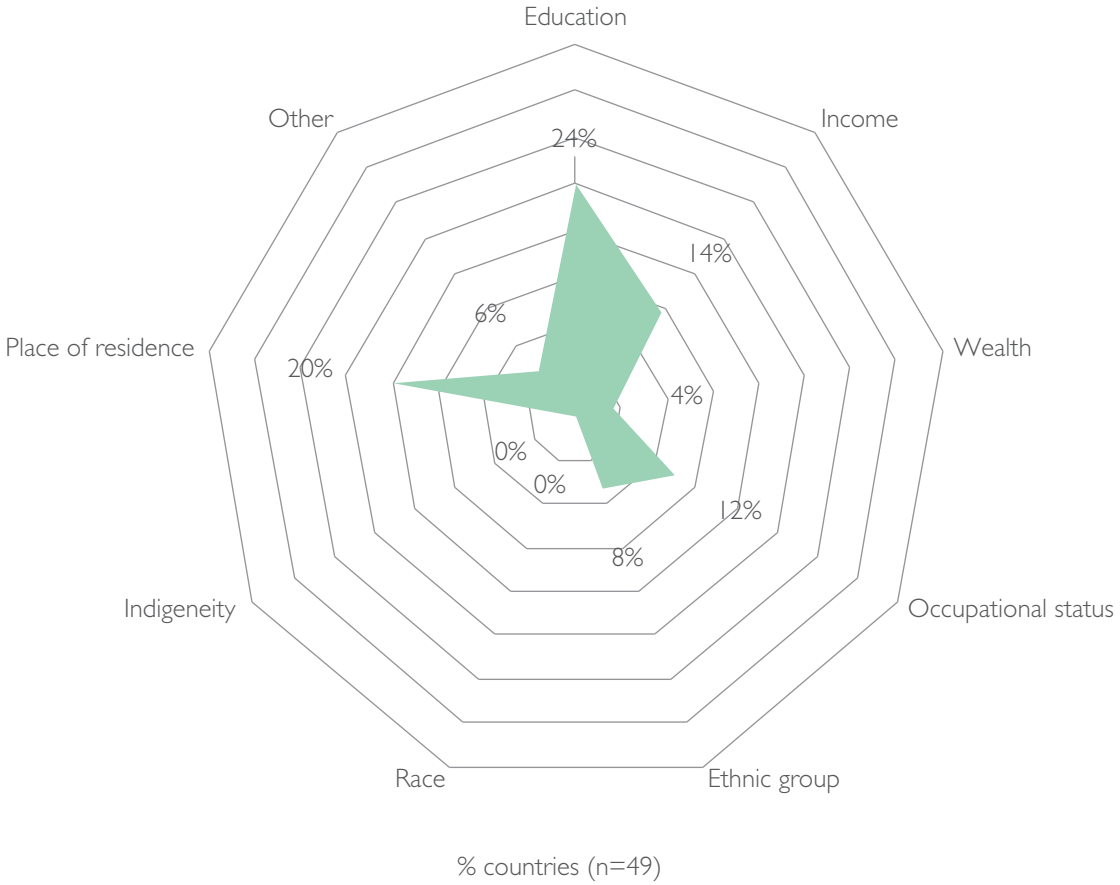


Fig. 35. Stratifiers used to disaggregate data by social determinants in food consumption and nutrient intake surveys



Kazakhstan is the first country for which this exercise has been completed, with calculation of the required reductions in the salt content of processed foods, moderation in consumption of salty foods and reduction of discretionary salt use. If the targeted reductions are achieved, the salt intake of the Kazakh population would be < 5 g/day. Achievement of the reformulation targets for processed foods would result in a 28% reduction in daily sodium intake, and successful moderation of consumption of salty foods to the targeted levels would result in a 40% reduction.

Conclusions

This report indicates progress in Member States in the WHO European Region in implementing the European Food and Nutrition Action Plan 2015–2020. It presents selected epidemiological data on nutritional status throughout the Region and reports on implementation of recommended regional and global policy frameworks to promote healthy nutrition and prevent obesity. It includes case studies of particularly innovative policies and programmes that may be considered good examples.

The findings indicate that implementation of key policies has improved significantly in recent years as compared with previous reports. Substantial progress has been made in areas including school food, food product reformulation, fiscal policies and surveillance of childhood obesity. Areas in which implementation is lagging include consumer-friendly front-of-package labelling and the introduction of comprehensive marketing restrictions with appropriate criteria. Evidence suggests that these are critical but remain underused. Other areas might have to be "reinvigorated" or extended, such as support for breastfeeding and appropriate complementary feeding if Member States are to achieve the ambitious goals they have set for themselves.

The report also identifies some differences among countries in terms of the breadth and depth of policies. Reformulation is a good example: while some countries take a minimal approach, focusing on one nutrient and one product category, others reported more ambitious approaches, covering multiple nutrients and multiple food product categories, so that they are in a better position to influence dietary intake. A move towards more ambitious policies may be required in the years to come if we are to achieve the global Sustainable Development Goals and related nutrition and NCD targets agreed upon by governments throughout the European Region.

References

1. NCD Risk Factor Collaboration. Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128·9 million children, adolescents, and adults. Lancet. 2017. doi: 10.1016/S0140-6736(17)32129-3.

2. Healthy diet (Fact sheet No. 394). Geneva: World Health Organization; 2015.

3. Turrell G, Vandevijvere S. Socio-economic inequalities in diet and body weight: evidence, causes and intervention options. Public Health Nutr. 2015;18:759.

4. First action plan on food and nutrition policy 2000–2005. Copenhagen: WHO Regional Office for Europe; 1999.

5. European Food and Nutrition Action Plan 2015–2020. Copenhagen: World Health Organization Regional Office for Europe; 2014.

6. Swinburn B, Vandevijvere S, Kraak V, Sacks G, Snowdon W, Hawkes C et al. Monitoring and benchmarking government policies and actions to improve the healthiness of food environments: a proposed government healthy food environment policy index. Obes Rev. 2013;14(Suppl1):24–37.

7. Monitoring noncommunicable disease commitments in Europe. Copenhagen: WHO Regional Office for Europe; 2017.

8. Abajobir AA, Abate KH, Abbafati C, Abbas KM, Abd-Allah F, Abdulle AM et al. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet. 2017;390:1345–422.

9. Micha R, Khatibzadeh S, Shi PL, Fahimi S, Lim S, Andrews KG et al. Global, regional, and national consumption levels of dietary fats and oils in 1990 and 2010: a systematic analysis including 266 country-specific nutrition surveys. BMJ 2014;348 :g2272.

10. Powles J, Fahimi S, Micha R, Khatibzadeh S, Shi PL, Ezzati M et al. Global, regional and national sodium intakes in 1990 and 2010: a systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide. BMJ Open 2013;3:e003733.

11. Singh GM, Micha R, Khatibzadeh S, Shi PL, Lim S, Andrews KG et al. Global, regional, and national consumption of sugar-sweetened beverages, fruit juices, and milk: a systematic assessment of beverage intake in 187 countries. PLoS One. 2015;10:e0124845.

12. Imamura F, Micha R, Khatibzadeh S, Fahimi S, Shi PL, Powles J et al. Dietary quality among men and women in 187 countries in 1990 and 2010: a systematic assessment. Lancet Global Health. 2015;3:e132–42.

13. Vereecken C, Pedersen TP, Ojala K, Krølner R, Dzielska A, Ahluwalia N, et al. Fruit and vegetable consumption trends among adolescents from 2002 to 2010 in 33 countries. Eur J Public Health. 2015;25(Suppl2):16–9.

14. Vandevijvere S, Chow CC, Hall KD, Umali E, Swinburn BA. Increased food energy supply as a major driver of the obesity epidemic: a global analysis. Bull World Health Organ 2015;93:446–56.

15. Milder IEJ, Toxopeus IB, Westenbrink S, van den Bogaard CHM, van Raaif JMA, Temme EHM. Salt, saturated fat and sugars in selected foods in EU Member States. 2015. (http://www.akkoordverbeteringproductsamenstelling.nl/dsresource?type=pdf&disposition=inline&objectid=rivmp:312278&versionid=&subobjectname=, accessed 11 November 2017).

16. Horta BL, Victora CG. Long-term effects of breastfeeding: a systematic review. Geneva: World Health Organization; 2013 (http://apps.who.int/iris/bitstream/10665/79198/1/9789241505307_eng.pdf, accessed 11 November 2017).

17. Rippin H, Hutchinson J, Evans C, Jewell J, Breda J, Cade J. Adult nutrient intakes from current national dietary surveys of European populations. Nutrients. 2017.

18. Azais-Braesco V, Sluik D, Maillot M, Kok F, Moreno L. A review of total and added sugar intakes and dietary sources in Europe. Nutr J. 2017;16:1–15.

19. European Health for All family of databases. Copenhagen: World Health Organization Regional Office for Europe; 2016 (http://www.euro.who.int/en/data-and-evidence/databases/european-health-for-all-database-hfa-db, accessed 11 November 2017).

20. Pineda E, Sanchez-Romero L, Brown M, Jaccard A, Jewell J, Galea G et al. Feasibility of achieving the 2025 WHO global targets for body mass index: predicting obesity trends in 53 countries in the WHO European Region. Obesity Facts. 2017 (Forthcoming).

21. Good maternal nutrition. The best start in life. Copenhagen: WHO Regional Office for Europe; 2016 (http://www.euro.who.int/__data/assets/pdf_file/0008/313667/Good-maternal-nutrition-The-best-start-in-life.pdf?ua=1, accessed 11 November 2017).

22. Wijnhoven TMA, van Raaij JMA, Spinelli A, Starc G, Hassapidou M, Spiroski I et al. WHO European Childhood Obesity Surveillance Initiative: body mass index and level of overweight among 6–9-year-old children from school year 2007/2008 to school year 2009/2010. BMC Public Health. 2014;14:806.

23. Ahrens W, Pigeot I, Pohlabein H, De Henauw S, Lissner L, Molnar D et al. Prevalence of overweight and obesity in European children below the age of 10. Int J Obes. 2014;38:S99–107.

24. Growing up unequal: gender and socioeconomic differences in young people's health and well-being. Health Behaviour in School-aged Children (HBSC) study: international report from the 2013/2014 survey. Copenhagen: World Health Organization Regional Office for Europe; 2016 (http://www.euro.who.int/en/publications/abstracts/growing-up-unequal-gender-and-socioeconomic-differences-in-young-peoples-health-and-well-being.-health-behaviour-in-school-aged-children-hbsc-study-international-report-from-the-20132014-survey, accessed 11 November 2017).

25. Inchley J, Currie D, Jewell J, Breda J, Barnekow V, editors. Adolescent obesity and related behaviours: trends and inequalities in the WHO European Region, 2002–2014. Observations from the Health Behaviour in School-aged Children (HBSC) WHO collaborative cross-national study. Copenhagen: World Health Organization Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0019/339211/WHO_ObesityReport_2017_v3.pdf, accessed 11 November 2017).

26. Investing in children: the European child and adolescent health strategy 2015–2020. Copenhagen: World Health Organization Regional Office for Europe; 2014 (http://www.euro.who.int/__data/assets/pdf_file/0010/253729/64wd12e_InvestCAHstrategy_140440.pdf, accessed 11 November 2017).

27. Levels and trends in child malnutrition. Joint UNICEF, World Health Organization, World Bank Group child malnutrition estimates. Geneva: World Health Organization; 2017 (http://www.who.int/nutgrowthdb/jme_brochoure2017.pdf, accessed 11 November 2017).

28. Kazakhstan, multiple indicator cluster survey 2015. New York City (NY): UNICEF; 2017 (http://mics.unicef.org/surveys, accessed 11 November 2017).

29. Tajikistan Demographic and Health Survey 2012. Dushanbe: Ministry of Health; 2013.

30. Kyrgyzstan, multiple indicator cluster survey 2014. New York City (NY): UNICEF; 2015 (http://mics.unicef.org/surveys, accessed 11 November 2017).

31. Double-duty actions for nutrition – policy brief. Geneva: World Health Organization; 2017 (http://www.who.int/nutrition/publications/double-duty-actions-nutrition-policybrief/en/, accessed 11 November 2017).

32. Bosi AT, Eriksen KG, Sobko T, Wijnhoven TM, Breda J. Breastfeeding practices and policies in WHO European Region Member States. Public Health Nutr. 2016;19:753–64.

33. Guidance on ending the inappropriate promotion of foods for infants and young children. Report by the Secretariat (Document A69/7 Add.1). Geneva: World Health Organization; 2016 (http://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_7Add1-en.pdf, accessed 11 November 2017).

34. Elliott CD, Conlon MJ. Packaged baby and toddler foods: questions of sugar and sodium. Pediatr Obes. 2015;10:149–55.

35. García AL, Raza S, Parrett A, Wright CM. Nutritional content of infant commercial weaning foods in the UK. Arch Dis Child. 2013;98:793–7.

36. European Charter on counteracting obesity. Copenhagen: World Health Organization Regional Office for Europe; 2006 (http://www.euro.who.int/__data/assets/pdf_file/0009/87462/E89567.pdf, accessed 11 November 2017).

37. Resolution 66/2. Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases. New York City (NY): United Nations; 2012 (http://www.who.int/nmh/events/un_ncd_summit2011/political_declaration_en.pdf, accessed 11 November 2017).

38. Resolution 68/300. Outcome document of the high-level meeting of the General Assembly on the comprehensive review and assessment of the progress achieved in the prevention and control of non-communicable diseases. New York City (NY): United Nations; 2014 (http://www.who.int/nmh/events/2014/a-res-68-300.pdf, accessed 11 November 2017).

39. Comprehensive implementation plan on maternal, infant and young child nutrition. Geneva: World Health Organization; 2014 (http://apps.who.int/iris/bitstream/10665/113048/1/WHO_NMH_NHD_14.1_eng.pdf, accessed 11 November 2017).

40. Global action plan for the prevention and control of noncommunicable diseases 2013–2020. Geneva: World Health Organization; 2013 (http://apps.who.int/iris/bitstream/10665/94384/1/9789241506236_eng.pdf?ua=1, accessed 11 November 2017).

41. Childhood obesity surveillance initiative (COSI). Protocol October 2016. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0018/333900/COSI-protocol-en.pdf?ua=1, accessed 11 November 2017).

42. Tackling food marketing to children in a digital world: trans-disciplinary perspectives. Children's rights, evidence of impact, methodological challenges, regulatory options and policy implications for the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2016 (http://www.euro.who.int/__data/assets/pdf_file/0017/322226/Tackling-food-marketing-children-digital-world-trans-disciplinary-perspectives-en.pdf, accessed 11 November 2017).

43. Eliminating trans fats in Europe. A policy brief. Copenhagen: WHO Regional Office for Europe; 2015 (http://www.euro.who.int/__data/assets/pdf_file/0010/288442/Eliminating-trans-fats-in-Europe-A-policy-brief.pdf?ua=1, accessed 11 November 2017).

44. Using price policies to promote healthier diets. Copenhagen: WHO Regional Office for Europe; 2015 (http://www.euro.who.int/__data/assets/pdf_file/0008/273662/Using-price-policies-to-promote-healthier-diets.pdf, accessed 11 November 2017).

45. Integrating diet, physical activity and weight management services into primary care. Copenhagen: WHO Regional Office for Europe; 2016 (http://www.euro.who.int/__data/assets/pdf_file/0016/324304/Integrating-diet-physical-activity-weight-management-services-primary-care.pdf?ua=1, accessed 11 November 2017).

46. Guideline: Sodium intake for adults and children. Geneva: World Health Organization; 2012 (http://apps.who.int/iris/bitstream/10665/77985/1/9789241504836_eng.pdf, accessed 11 November 2017).

47. Guideline: Sugars intake for adults and children. Geneva: World Health Organization; 2015 (http://apps.who.int/iris/bitstream/10665/149782/1/9789241549028_eng.pdf, accessed 11 November 2017).

48. WHO Regional Committee for Europe resolution EUR/RC64/R7 on a European Food and Nutrition Action Plan 2015–2020. Copenhagen: WHO Regional Office for Europe; 2014 (http://www.euro.who.int/__data/assets/pdf_file/0020/259211/64rs07e_FoodNutAP_140732.pdf?ua=1, accessed 11 November 2017).

49. EU Action Plan on Childhood Obesity 2014-2020. Brussels: European Commission; 2014 (https://ec.europa.eu/health/sites/health/files/nutrition_physical_activity/docs/childhoodobesity_actionplan_2014_2020_en.pdf, accessed 11 November 2017).

50. Second International Conference on Nutrition. Conference outcome document (ICN2 2014/2). Rome Declaration on Nutrition. Rome: Food and Agriculture Organization of the United Nations; 2014 (http://www.fao.org/3/a-ml542e.pdf, accessed 11 November 2017).

51. Second International Conference on Nutrition. Conference outcome document (ICN2 2014/3 Corr.1). Framework for action. Rome: Food and Agriculture Organization of the United Nations; 2014 (http://www.ifrc.org/docs/IDRL/a-mm215e.pdf, accessed 11 November 2017).

52. Transforming our world: the 2030 Agenda for Sustainable Development. A/RES/70/1. New York City (NY): United Nations; 2015 (https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf, accessed 11 November 2017).

53. Hawkes C, Allen K, Jewell J. A food policy package for healthy diets and the prevention of obesity and diet related non-communicable diseases: the NOURISHING framework.

54. Lobstein T, Jackson-Leach R, Moodie M, Hall K, Gortmaker S, Swinburn B et al. Child and adolescent obesity: part of a bigger picture. The Lancet. 2015; 385(9986): 2510-2520.

55. Report of the Commission on Ending Childhood Obesity. Geneva: World Health Organization; 2016 (http://apps.who.int/iris/bitstream/10665/204176/1/9789241510066_eng.pdf?ua=1, accessed 11 November 2017).

56. Egger G, Swinburn B. An "ecological" approach to the obesity pandemic. BMJ 1997;315:477–80.

57. Hawkes C. Dietary implications of supermarket development: a global perspective. Dev Policy Rev. 2008;26:657–92.

58. Dawson J. Retailer activity in shaping food choice. Food Qual Preference. 2013;28:339–47.

59. Cairns G, Angus K, Hastings G, Caraher M. Systematic reviews of the evidence on the nature, extent and effects of food marketing to children. A retrospective summary. Appetite. 2013;62:209–15.

60. Caldeira S, Storcksdieck gennant Bonsmann, Bakogianni I, Gauci C, Calleja A, Furtado A. Public procurement of food for health. Technical report on the school setting. Brussels: Maltese presidency, European Union; 2017 (https://ec.europa.eu/jrc/sites/jrcsh/files/public-procurement-food-health-technical-report.pdf, accessed 11 November 2017).

61. Waterlander WE, Ni Mhurchu CN, Eyles H, Vandevijvere S, Cleghorn C, Scarborough P et al. Food futures: developing effective food systems interventions to improve public

health nutrition. Agric Syst. 2017;20. doi: 10.1016/j.agsy.2017.01.006.

62. FEEDCities project: the food environment description in cities in eastern Europe and Central Asia – Kyrgyzstan (technical report, August 2017). Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0006/351996/FEED-KGZ-report-web-new.pdf, accessed 11 November 2017).

63. Cecchini M, Sassi F, Lauer JA, Lee YY, Guajardo-Barron V, Chisholm D. Tackling of unhealthy diets, physical inactivity, and obesity: health effects and cost-effectiveness. Lancet. 2010;376:1775–84.

64. Capacci S, Mazzocchi M, Shankar B, Macias JB, Verbeke W, Pérez-Cueto FJ et al. Policies to promote healthy eating in Europe: a structured review of policies and their effectiveness. Nutr Rev. 2012;70:188–200.

65. Mozaffarian D. Dietary and policy priorities for cardiovascular disease, diabetes, and obesity. Circulation. 2016;133:187–225.

66. Set of recommendations on the marketing of foods and non-alcoholic beverages to children. Geneva: World Health Organization; 2010 (http://apps.who.int/iris/bitstream/10665/44416/1/9789241500210_eng.pdf, accessed 11 November 2017).

67. Fiscal policies for diet and prevention of noncommunicable diseases: technical meeting report, 5–6 May 2015, Geneva, Switzerland. Geneva: World Health Organization; 2016 (http://apps.who.int/iris/bitstream/10665/250131/1/9789241511247-eng.pdf, accessed 11 November 2017).

68. SHAKE the salt habit. The SHAKE technical package for salt reduction. Geneva: World Health Organization; 2016 (http://apps.who.int/iris/bitstream/10665/250135/1/9789241511346-eng.pdf, accessed 11 November 2017).

69. Hawkes C, Smith TG, Jewell J, Wardle J, Hammond RA, Friel S et al. Smart food policies for obesity prevention. Lancet. 2015;385:2410–21.

70. Hoelscher DM, Kirk S, Ritchie L, Cunningham-Sabo L, Academy Positions Committee. Position of the Academy of Nutrition and Dietetics: interventions for the prevention and treatment of pediatric overweight and obesity. J Acad Nutr Diet 2013;113:1375–94.

71. Chriqui JF, Pickel M, Story M. Influence of school competitive food and beverage policies on obesity, consumption, and availability: a systematic review. JAMA Pediatr 2014;168:279–86.

72. Driessen CE, Cameron AJ, Thornton LE, Lai SK, Barnett LM. Effect of changes to the school food environment on eating behaviours and/or body weight in children: a systematic review. Obes Rev 2014;15:968–82.

73. Spence S, Delve J, Stamp E, Matthews JN, White M, Adamson AJ. The impact of food and nutrient-based standards on primary school children's lunch and total dietary intake: a natural experimental evaluation of government policy in England. PLoS One. 2013;8:e78298.

74. Adamson A, Spence S, Reed L, Conway R, Palmer A, Stewart E et al. School food standards in the UK: implementation and evaluation. Public Health Nutr. 2013;16:968–81.

75. Food and nutrition policy for schools. A tool for the development of school nutrition programmes in the European Region. Copenhagen: WHO Regional Office for Europe; 2006 (http://www.euro.who.int/__data/assets/pdf_file/0019/152218/E89501.pdf, accessed 11 November 2017).

76. Joint Research Centre. School food policy country factsheets. Brussels: European Commission; 2015 (https://ec.europa.eu/jrc/en/publication/school-food-policy-country-factsheets, accessed 11 November 2017).

77. Campos S, Doxey J, Hammond D. Nutrition labels on pre-packaged foods: a systematic review. Public Health Nutr. 2011;14:1496–506.

78. Grunert KG, Fernández-Celemín L, Wills JM, Storcksdieck genannt Bonsmann S, Nureeva L. Use and understanding of nutrition information on food labels in six European countries. Z Gesundh Wiss. 2010;18:261–77.

79. Hersey JC, Wohlgenant KC, Arsenault JE, Kosa KM, Muth MK. Effects of front-of-package and shelf nutrition labeling systems on consumers. Nutr Rev. 2013;71:1–14.

80. Savoie N, Barlow Gale K, Harvey KL, Binnie MA, Pasut L. Consumer perceptions of front-of-package labelling systems and healthiness of foods. Can J Public Health. 2013;104:e359–63.

81. Malam S, Clegg S, Kirwan S, McGinigal S, BMRB Social Research. Comprehension and use of UK nutrition signpost labelling schemes. London: Food Standards Agency; 2009 (http://webarchive.nationalarchives.gov.uk/20120403185003/http://www.food.gov.uk/multimedia/pdfs/pmpreport.pdf, accessed 11 November 2017)

82. Bialkova S, van Trijp H. What determines consumer attention to nutrition labels?. Food Qual Preference. 2010;21:1042–51.

83. Vyth EL, Steenhuis IHM, Roodenburg AJ, Brug J, Seidell JC. Front-of-pack nutrition label stimulates healthier product

development: a quantitative analysis. Int J Behav Nutr Phys Activ. 2010;7:65.

84. Mhurchu CN, Eyles H, Choi YH. Effects of a voluntary front-of-pack nutrition labelling system on packaged food reformulation: the health star rating system in New Zealand. Nutrients. 2017;9. doi: 10.3390/nu9080918.

85. Julia C, Blanchet O, Méjean C, Péneas S, Ducrot P, Allès B et al. Impact of the front-of-pack 5-colour nutrition label (5-CNL) on the nutritional quality of purchases: an experimental study. Int J Behav Nutr Physical Activ. 2016;13:101.

86. Regulation (EC) No. 1924/2006 of the European Parliament and of the Council on nutrition and health claims made on foods. Brussels: European Commission; 2006 (http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02006R1924-20141213, accessed 11 November 2017).

87. Regulations amending the National Food Agency's regulations (SLVFS 2005:0) on the use of a particular symbol; adopted on 26 January 2015 (LIVSFS 2015 : 1 (H 28). Uppsala: National Food Agency; 2015 (https://www.livsmedelsverket.se/globalassets/om-oss/lagstiftning/livsmedelsinfo-till-konsum---markning/livsfs-2015-1-particular-symbol-eng.pdf, accessed 11 November 2017).

88. Report. A qualitative study concerning the Keyhole's influence over 25 years on product development (Dna 2014/28894, Case no. 2.2.2). Uppsala: National Food Agency; 2015 (https://www.livsmedelsverket.se/globalassets/rapporter/2015/keyholes-influence-on-product-development-2015.pdf, accessed 11 November 2017).

89. Thresholds for "high salt" from legislation (Asetus eräiden elintarikkeiden ilmoittamisesta voimakassuolaisiksi 1010/2014), enforced since 13 December 2016. Helsinki: Government of Finland.

90. Heart symbol. A better choice. Helsinki: Finnish Heart Association; 2017 (https://www.sydanmerkki.fi/en, accessed 11 November 2017).

91. Heart symbol. Criteria. Helsinki: Finnish Heart Association; 2017 (https://www.sydanmerkki.fi/en/criteria, accessed 11 November 2017).

92. Nutrient profiling technical guidance. London: Department of Health; 2011 (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216094/dh_123492.pdf, accessed 11 November 2017).

93. Julia C, Hercberg S. Development of a new front-of-pack nutrition label in France, the 5-colour nutrition label, 'Nutri-Score'. Copenhagen: WHO Regional Office for Europe (Public Health Panorama); 2017.

94. Ducrot P, Julia C, Méjean C, Kesse-Guyot E, Touvier M, Fezeu LK et al. Impact of different front-of-pack nutrition labels on consumer purchasing intentions: a randomized controlled trial. Am J Prev Med. 2016;50:627–36.

95. Guide to creating front of pack (FoP) nutrition label for pre-packed products sold through retail outlets. London: Department of Health; 2013 (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/566251/FoP_Nutrition_labelling_UK_guidance.pdf, accessed 11 November 2017).

96. FLICC: Front of pack food labelling: impact on consumer choice. Guildford: Food, Consumer Behaviour and Health, University of Surrey; 2017 (https://www.surrey.ac.uk/food-consumer-behaviour-and-health-research-centre/research/front-pack-labelling-impact-consumer-choice, accessed 11 November 2017).

97. van Raaij J, Hendriksen M, Verhagen H. Potential for improvement of population diet through reformulation of commonly eaten foods. Public Health Nutr. 2009;12:325–30.

98. From burden to best buys: reducing the economic impact of non-communicable diseases in low- and middle-income countries. Geneva: World Economic Forum; 2011 (http://apps.who.int/medicinedocs/documents/s18804en/s18804en.pdf, accessed 11 November 2017).

99. Appendix 3. In: Global action plan for the prevention and control of noncommunicable diseases. Geneva: World Health Organization; 2017 (http://apps.who.int/iris/bitstream/10665/94384/1/9789241506236_eng.pdf?ua=1, accessed 11 November 2017).

100. Mattes RD, Ronnelly D. Relative contributions of dietary sodium sources. J Am Coll Nutr. 1991;10:383–93.

101. Kloss L, Meyer JD, Graeve L, Vetter W. Sodium intake and its reduction by food reformulation in the European Union – a review. NFS J. 2015;1:9–19.

102. He FJ, Pombo-Rodrigues S, MacGregor GA. Salt reduction in England from 2003 to 2011: its relationship to blood pressure, stroke and ischaemic heart disease mortality. BMJ Open. 2014;4:e004549.

103. Laatikainen T, Pietinen P, Valsta L, Sundvall J, Reinivuo H, Tuomilehto J. Sodium in the Finnish diet: 20-year trends in urinary sodium excretion among the adult population. Eur J Clin Nutr. 2006;60:965–70.

104. Hashem KM, He FJ, MacGregor GA. Systematic review of the literature on the effectiveness of product reformulation

measures to reduce the sugar content of food and drink on the population's sugar consumption and health: a study protocol. BMJ Open. 2016;6:e011052.

105. Sugar reduction: achieving the 20%. A technical report outlining progress to date, industry guidelines, 2015 baseline levels in 9 food categories and the next steps. London: Public Health England; 2017 (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/604336/Sugar_reduction_achieving_the_20_.pdf, accessed 11 November 2017).

106. Webster J, Trieu K, Dunford E, Hawkes C. Target salt 2025: a global overview of national programs to encourage the food industry to reduce salt in foods. Nutrients. 2014;6:3274–87.

107. Trieu K, Neal B, Hawkes C, Dunford E, Campbell N, Rodriguez-Fernandez R et al. Salt reduction initiatives around the world – a systematic review of progress towards the global target. PLoS One. 2015;10:e0130247.

108. Gelormini M, Padrao P, Lunet N, Jewell J, Lanca de Morais I, Breda J. Monitoring and surveillance of street food vendors to prevent NCDs: the FEED Cities project. Copenhagen: WHO Regional Office for Europe (Public Health Panorama); 2017.

109. Besluit van 15 november 2012, houdende wijziging van het Warenwetbesluit Meel en brood inzake het maximale zoutgehalte van brood [Commodities Act with regulation of the maximum level of salt in bread] (No. 598). The Hague: Staatsblad van het Koninkrijk der Nederlanden; 2012 (https://zoek.officielebekendmakingen.nl/stb-2012-598.html, accessed 11 November 2017).

110. Mapping salt reduction initiatives in the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2013 (http://www.euro.who.int/__data/assets/pdf_file/0009/186462/Mapping-salt-reduction-initiatives-in-the-WHO-European-Region.pdf, accessed 11 November 2017).

111. Survey on Members States' implementation of the EU salt reduction framework. Brussels: European Commission (https://ec.europa.eu/health/sites/health/files/nutrition_physical_activity/docs/salt_report1_en.pdf, accessed 11 November 2017).

112. Policy paper. Soft drinks industry levy. London: Her Majesty's Government; 2016 (https://www.gov.uk/government/publications/soft-drinks-industry-levy/soft-drinks-industry-levy, accessed 11 November 2017).

113. National agreement to improve product composition 2014–2020. The Hague: Centraal Bureau Levensmiddelenhandel; 2014 (http://www.akkoordverbeteringproductsamenstelling.nl/en, accessed 11 November 2017).

114. Signerte intensjonsavtale for sunnere mat [Signed intention agreement for healthier food]. Oslo: Ministry of Health and Care Services; 2016 (https://www.regjeringen.no/no/aktuelt/signerte-intensjonsavtale-for-sunnere-mat/id2522820/, accessed 11 November 2017).

115. Kauppa – ja teollisuusministeriön asetuselintarvikkeiden pakkausmerkinnöistä [Decree on the labelling of foodstuffs] 1084/2004. Helsinki: Ministry of Trade and Industry; 2015 (http://www.finlex.fi/fi/laki/alkup/2004/20041084, accessed 11 November 2017).

116. The implementation of new regulations on nutritional labelling. Geneva: World Trade Organization (http://www.wto.org/english/tratop_e/tbt_e/8_Chile_e.pdf).

117. Guideline: fortification of food-grade salt with iodine for the prevention and control of iodine deficiency disorders. Geneva: World Health Organization; 2014 (http://apps.who.int/iris/bitstream/10665/136908/1/9789241507929_eng.pdf?ua=1, accessed 11 November 2017).

118. EFSA Panel on Dietetic Products, Nutrition and Allergies. Scientific opinion on dietary reference values for fats, including saturated fatty acids, polyunsaturated fatty acids, monounsaturated fatty acids, trans fatty acids, and cholesterol. EFSA J. 2010;8:1461–568 (http://www. efsa.europa.eu/de/efsajournal/pub/1461.htm, accessed 11 November 2017).

119. Mozaffarian D, Katan MB, Ascherio A, Stampfer MJ, Willett WC. Trans fatty acids and cardiovascular disease. N Engl J Med. 2006;354(:1601–13.

120. Brouwer IA, Wanders AJ, Katan MB. Trans fatty acids and cardiovascular health: research completed? Eur J Clin Nutr. 2013;67:541–7.

121. Mozaffarian D, Aro A, Willett WC. Health effects of transfatty acids: experimental and observational evidence. Eur J Clin Nutr. 2009;63(Suppl2):S5–21.

122. Stender S, Dyerberg J, Astrup A. Consumer protection through a legislative ban on industrially produced trans fatty acids in foods in Denmark. Scand J Food Nutr. 2006;50:155–60.

123. Leth T, Jensen HG, Mikkelsen AA, Bysted A. The effect of the regulation on trans fatty acid content in Danish food. Atherosclerosis Suppl. 2006;7:53–6.

124. Restrepo BJ, Rieger M. Denmark's policy on artificial trans fat and cardiovascular disease. Am J Prev Med. 2016;50:69–76.

125. Technical regulation on butter and fat products. Moscow: Eurasian Economic Commission; 2011 (TP TC 024/2011) (in Russian) (http://www.eurasiancommission.org/ru/act/texnreg/deptexreg/tr/Documents/TR%20TS%20MasloGirov.pdf, accessed 11 November 2017).

126. Open letter: Call for a legislative limit for the amount of industrially produced TFAs in foods. Brussels: The European Consumer Association (BEUC); 2015 (http://www.beuc.eu/documents/files/Open%20Letter_industrially_produced%20TFAs_freeEU.pdf, accessed 11 November 2017).

127. Task Force Vetzuursamenstelling [Taskforce on fatty acid composition. Final report.] Wagengingen: Dutch Bakery Centre; 2010 (http://www.nbc.nl/sites/default/files/artikelen/6%20-%20Eindrapport%20Task%20Force%20vetzuursamenstelling%202003-2010.pdf, accessed 11 November 2017).

128. Public health responsibility deal: food pledgses. London: department of Health; 2011 (https://responsibilitydeal.dh.gov.uk/food-pledges/, accessed 11 November 2017).

129. Downs S, Thow A, Leeder S. The effectiveness of policies for reducing dietary trans fat: a systematic review of the evidence. Bull World Health Organ. 2013;91:262–9H.

130. Hendry V, Almiron-Roig E, Monsivais P, Jebb SA, Benjamin Neelson SE, Griffin SE et al. Impact of regulatory interventions to reduce intake of artificial trans-fatty acids: a systematic review. Am J Public Health. 2015;105:e32–42.

131. Van Rossum CTM, Fransen HP, Verkaik-Kloosterman J, Buurma-Rethams EJM, Ocke MC. Dutch National Food Consumption Survey 2007–2010: Diet of children and adults aged 7 to 69 years (Report 350050006). Bilthoven: National Institute for Public Health and the Environment; 2011 (http://www.rivm.nl/bibliotheek/rapporten/350050006.pdf, accessed 11 November 2017).

132. Bates B, Lennox A, Prentice A, Bates C, Page P, Nicholson S et al. National diet and nutrition survey: results from years 1, 2, 3 and 4 combined of the rolling programme (2008/2009–2011/2012). London: Public Health England; 2014 (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/594361/NDNS_Y1_to_4_UK_report_full_text_revised_February_2017.pdf, accessed 11 November 2017).

133. Technical Report Series 916: Diet, Nutrition and the Prevention of Chronic Diseases. Geneva: World Health Organization; (2003).

134. Stender S, Astrup A, Dyerberg J. A trans European Union difference in the decline in trans fatty acids in popular foods: a market basket investigation. BMJ Open. 2012;2:e000859.

135. Kelly B, Halford JC, Boyland EJ, Chapman K, Bautista-Castaño I, Berg C et al. Television food advertising to children: a global perspective. Am J Public Health. 2010;100:1730–6.

136. Sandberg H, Gidlöf K, Holmberg N. Children's exposure to and perceptions of online advertising. Int J Commun. 2011;5:21–50.

137. Marketing of foods high in fat, salt and sugar to children: update 2012–2013. Copenhagen: WHO Regional Office for Europe; 2013 (http://www.euro.who.int/__data/assets/pdf_file/0019/191125/e96859.pdf, accessed 11 November 2017).

138. Monitoring report 2015. EU pledge. Brussels: EU Pledge Secretariat; 2016 (http://www.eu-pledge.eu/sites/eu-pledge.eu/files/reports/EU_Pledge_2015_Monitoring_Report.pdf, accessed 11 November 2017).

139. Galbraith-Emami S, Lobstein T. The impact of initiatives to limit the advertising of food and beverage products to children: a systematic review. Obes Rev. 2013;14:960–74.

140. Raine KD, Lobstein T, Landon J, Kent MP, Pellerin S, Caulfield T et al. Restricting marketing to children: consensus on policy interventions to address obesity. J Public Health Policy 2013;34:239–53.

141. Roberto CA, Swinburn B, Hawkes C, Huang TT, Costa SA, Ashe M et al. Patchy progress on obesity prevention: emerging examples, entrenched barriers, and new thinking. Lancet. 2015;385:2400–9.

142. Harris JL, Sarda V, Schwartz MB, Brownell KD. Re-defining "child-directed advertising" to reduce unhealthy television food advertising. Am J Prev Med 2013;44:358–64.

143. Fischer PM, Schwartz MP, Richards JW Jr, Goldstein AO, Rojas TH. Brand logo recognition by children aged 3 to 6 years. Mickey Mouse and Old Joe the Camel. J Am Med Assoc 191;266:3145–8.

144. Joint Research Centre. Comparison of the nutrient profiling schemes of the EU Pledge and the World Health Organization Regional Office for Europe. Brussels: European Union; 2015 (https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/comparison-nutrient-profiling-schemes-eu-pledge-and-world-health-organization-regional, accessed 11 November 2017).

145. Boyland E, Jewell J, Breda J. Monitoring food marketing to children. A proposed tool for the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2016 (http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/publications/2017/monitoring-food-and-beverage-marketing-to-children-via-television-and-the-internet-2017, accessed 11 November 2017).

146. WHO Regional Office for Europe nutrient profile model. Copenhagen: WHO Regional Office for Europe; 2015 (http://www.euro.who.int/__data/assets/pdf_file/0005/270716/Nutrient-children_web-new.pdf?ua=1, accessed 11 November 2017).

147. Food: HFSS overview. London: Advertising Standards Agency; 2017 (https://www.asa.org.uk/advice-online/food-hfss-overview.html, accessed 11 November 2017).

148. Andreyeva T, Long MW, Brownell KD. The impact of food prices on consumption: a systematic review of research on the price elasticity of demand for food. Am J Public Health 2010;100:216–22.

149. Sassi F, Belloni A, Capobianco C. The role of fiscal policies in health promotion (OECD Health Working Papers). Paris: Organisation for Economic Co-operation and Development; 2013 (http://www.oecd-ilibrary.org/social-issues-migration-health/the-role-of-fiscal-policies-in-health-promotion_5k3twr94kvzx-en?crawler=true, accessed 11 November 2017).

150. Thow AM, Downs S, Jan S. A systematic review of the effectiveness of food taxes and subsidies to improve diets: understanding the recent evidence. Nutr Rev. 2014:72:551–65.

151. Eyles H, Mhurchu CN, Nghiem N, Blakely T. Food pricing strategies, population diets, and noncommunicable disease: a systematic review of simulation studies. PLoS Med 2012;9: e1001353.

152. Powell LM, Chriqui JF, Khan T, Wada R, Chaloupka FJ. Assessing the potential effectiveness of food and beverage taxes and subsidies for improving public health: a systematic review of prices, demand and body weight outcomes. Obes Rev. 2013;14:110–28.

153. Hawkes C. Food taxes: what type of evidence is available to inform policy development? Nutr Bull. 2012;37:51–6.

154. Assessment of the impact of a health product tax. Final report. Budapest, November 2015. Copenhagen: WHO Regional Office for Europe; 2015 (http://www.euro.who.int/__data/assets/pdf_file/0008/332882/assessment-impact-PH-tax-report.pdf?ua=1, accessed 11 November 2017).

155. Amendement No. 866 presenté par M. Door, M. Viry, M. Perrut, M. Lurton, M. Cherpion et Mme Louwagie. Article additionel après l'article 13. Paris: Assemblée Nationale; 2017 (http://www.assemblee-nationale.fr/15/amendements/0269/AN/866.asp, accessed 11 November 2017).

156. Kohler K, Reinap M. Paving the way to a sugar-sweetened beverage tax in Estonia. Copenhagen: WHO Regional Office for Europe (Public Health Panorama); 2017.

157. Evidence brief for policy. EVIPNet Europe. Number 1. Reducing the consumption of sugar-sweetened beverages and their negative health impact in Estonia. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/__data/assets/pdf_file/0016/324205/EBP-1-Web.pdf?ua=1, accessed 11 November 2017).

158. The Minsk Declaration. The life-course approach in the context of Health 2020. Copenhagen: World Health Organization Regional Office for Europe (http://www.euro.who.int/__data/assets/pdf_file/0009/289962/The-Minsk-Declaration-EN-rev1.pdf, accessed 11 November 2017).

159. Horta BL, Loret de Mola C, Victora CG. Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: a systematic review and meta-analysis. Acta Paediatr. 2015;104:30–7.

160. WHO recommendations on postnatal care of the mother and newborn. Geneva: World Health Organization; 2013 (http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649_eng.pdf?ua=1, accessed 11 November 2017).

161. World Health Organization, UNICEF. Baby-friendly hospital initiative. Revised, updated and expanded for integrated care. Geneva: World Health Organization; 2009 (http://www.who.int/nutrition/publications/infantfeeding/bfhi_trainingcourse/en/, accessed 11 November 2017).

162. "Healthy eating from the start!". Vienna: Federal Ministry of Health, Main Association of Austrian Social Security Institutions, Austrian Agency for Health and Food Safety; 2017 (http://www.richtigessenvonanfangan.at/en/healthy-eating-from-the-start/, accessed 11 November 2017).

163. World Health Organization, UNICEF. Global strategy for infant and young child feeding. Geneva: World Health Organization; 2003 (http://www.who.int/nutrition/publications/infantfeeding/9241562218/en/, accessed 11 November 2017).

164. Scaglioni S, Salvioni M, Galimberti C. Influence of parental attitudes in the development of children eating behaviour. Br J Nutr. 2008;99:22–5.

165. Pepino M, Mennella J. Factors contributing to individual differences in sucrose preference. Chem Senses. 2005;30(Suppl.1):i319–20.

166. Guideline. Assessing and managing children at primary health-care facilities to prevent overweight and obesity in the context of the double burden of malnutrition. Update

for the integrated management of chilhood illness (IMCI). Geneva: World Health Organization; 2017 (http://apps.who.int/iris/bitstream/10665/259133/1/9789241550123-eng.pdf?ua=1, accessed 11 November 2017).

167. Pratenovergewicht. Informatiemap voor de JGZ om overgewicht te bespreken metouders [Talking about weight. Information folder for JGZ professionals]. The Hague: Netherlands Nutrition Centre Foundation; 2016 (http://issuu.com/voedingscentrum/docs/praten_over_gewicht_2d640f7020af3a/, accessed 11 November 2017).

168. Keyhole campaign. Glostrup: Danish Veterinary and Food Administration; 2017 (http://altomkost.dk/noeglehullet/kampagner/aarets-noeglehulsprodukter-2017/, accessed 11 November 2017).

169. Keyhole materials. Glostrup: Danish Veterinary and Food Administration; 2017 (http://altomkost.dk/noeglehullet/materialer/#c38775, accessed 11 November 2017).

170. Sunde børn i et nyt land 0-2 år [Healthy children in a new country: 0–2 years]. Copenhagen: National Board of Health; 2017 (https://www.sst.dk/da/udgivelser/2017/sunde-boern-i-et-nyt-land-0-2-aar, accessed 11 November 2017).

171. Råd om mad når du er over 65 år – supplement til De officielle Kostråd [Advice on food when you are over 65 years – supplement to the official Dietary Council]. Glostrup: Danish Veterinary and Food Administration; 2017 (http://altomkost.dk/deofficielleanbefalingertilensundlivsstil/personer-med-saerlige-behov/65/, accessed 11 November 2017).

172. Better meals. Copenhagen: Ministry of the Environment and Food; 2017 (http://bedremaaltider.dk/, accessed 11 November 2017).

173. World Health organization, World Food Programme, UNICEF. Preventing and controlling micronutrient deficiencies in populations affected by an emergency. Geneva: World Health Organization; 2007 (http://www.who.int/nutrition/publications/WHO_WFP_UNICEFstatement.pdf, accessed 11 November 2017).

174. Children: reducing mortality. Fact sheet. Geneva: World Health Organization; 2016 (http://www.who.int/mediacentre/factsheets/fs178/en/, accessed 11 November 2017)

175. Jones RE, Jewell J, Saksena R, Salas XR, Breda J. Overweight and obesity in children under 5 years: surveillance opportunities and challenges for the WHO European Region. Front Public Health. 2017;5. doi: org/10.3389/fpubh.2017.00058.

The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

Member States

Albania
Andorra
Armenia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Kazakhstan
Kyrgyzstan
Latvia
Lithuania
Luxembourg
Malta
Monaco
Montenegro
Netherlands
Norway
Poland
Portugal
Republic of Moldova
Romania
Russian Federation
San Marino
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Tajikistan
The former Yugoslav Republic of Macedonia
Turkey
Turkmenistan
Ukraine
United Kingdom
Uzbekistan

World Health Organization Regional Office for Europe
UN City, Marmorvej 51, DK-2100 Copenhagen Ø, Denmark
Tel.: +45 45 33 70 00 Fax: +45 45 33 70 01
Email: euwhocontact@who.int
Website: www.euro.who.int