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Reducing salt consumption and its negative impacts in the Republic of Moldova

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World Health Organization
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Evidence brief for policy

EVIPNet Europe

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ABSTRACT

High salt intake is one of the main dietary risk factors for death and disability-adjusted life years globally, and one of the main risk factors for hypertension, cardiovascular disease, stroke, stomach cancer and renal disease. Reducing salt consumption and improving dietary habits requires comprehensive policies targeting multiple sectors of the food system and active collaboration among a variety of stakeholders. The Ministry of Health, along with “Nicolae Testemitanu” State University of Medicine and Pharmacy and the WHO Country Office in the Republic of Moldova developed this EBP, supported by technical experts from WHO Regional Office for Europe, to be published under the guidance of the WHO European Evidence-informed Policy Network, to make available evidence-informed options for policy-makers to tackle the problem of reducing salt consumption in the Republic of Moldova. A working group convened by the Ministry of Health identified, selected, appraised and synthesized best available evidence on the problem; formulated the options for tackling it; and weighed up considerations in implementing each option. The seven options grouped across two approaches are: Approach 1 Structural population-level interventions, including (1.1) Food product reformulation; (1.2) Food labelling; (1.3) Food procurement policy in specific settings; (1.4) Restrictions on marketing to children; (1.5) Pricing interventions; and Approach 2 Population-level behaviour change interventions, including (2.1) Health education; and (2.2) Information campaigns.

KEY WORDS
SALT, SODIUM, HYPERTENSION, CARDIOVASCULAR DISEASES, PUBLIC HEALTH, HEALTHY FOOD, MOLDOVA

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CONFLICT OF INTEREST

The authors declare that they have no professional or commercial interest related to this evidence brief for policy. Development partners that have provided support in developing it played no role in identifying, appraising, synthesizing or including evidence in the policy brief.
ABBREVIATIONS

AMI   acute myocardial infarction
ANSP  National Agency for Public Health
BMI   body mass index
GDA   guideline daily amount
CNAM  National Health Insurance Company
CVD   cardiovascular disease
DALY  disability-adjusted life year
DBP   diastolic blood pressure
EBP   evidence brief for policy
EU    European Union
FOP   front-of-pack (labelling)
g     gram
HEI   healthy eating indexes
HFSS  high in fat, salt and sugar
HICs  high-income countries
HTA   health technology assessment
ICER  incremental cost–effectiveness ratio
IHDI  inequality-adjusted Human Development Index
INT$  international dollar
KCI   potassium chloride
LMICs lower-middle-income countries
LLMICs low-income and lower-middle-income countries
LYG   life-years gained
MD    mean difference
MDL   Moldovan leu (currency)
mg    milligram
mHealth mobile health
NCD   noncommunicable diseases
NGO   nongovernmental organization
OECD  Organisation for Economic Co-operation and Development
QALY  quality-adjusted life year(s)
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>RCT</td>
<td>randomized controlled trial</td>
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<tr>
<td>SBP</td>
<td>systolic blood pressure</td>
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<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>SES</td>
<td>socioeconomic status</td>
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<tr>
<td>TL</td>
<td>traffic light</td>
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<td>TV</td>
<td>television</td>
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<tr>
<td>US$</td>
<td>United States dollar</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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MAIN MESSAGES

The problem

In the Republic of Moldova, salt consumption is twice as high as the WHO recommended level, determined by the common habit of adding salt to food and when cooking and eating processed foods with high salt content. This causes many negative health effects. The problem is amplified by a lack of comprehensive, multisectoral interventions for reducing salt intake related to: raising public awareness and changing behaviours; reformulating industrially processed food; setting a framework for the food industry to reduce salt; introducing labelling to highlight the salt content of foods; and monitoring and evaluating salt intake.

Approaches to and options for addressing the problem

Approach 1. Structural population-level interventions

Structural population-level interventions are the most effective in reducing salt intake, as they target the entire population and involve policies creating structural changes in the environment in which individuals live, work, go to school and experience leisure time.

- **Option 1.1. Food product reformulation**
  - Mandatory reformulation of staple foods like breads, processed meat products and dairy products could effectively reduce salt intake and consequently blood pressure and other health risks.
  - Salt intake reduction by reformulation is very cost-effective, produces significant long-term improvements in population health, contributing to avoiding a loss in healthy life-years; it results in cost savings for society by substantially decreasing the burden of cardiovascular disease (CVD), cancer and other diseases and associated health-care expenditures.
  - Efficient enforcement and monitoring are essential to ensure compliance with mandatory regulations.

- **Option 1.2. Food labelling**
  - Nutrition labelling may impact population health by leading to healthier food purchasing and, ultimately, healthier consumption. It has been used as tool to put pressure on the food industry to reformulate food products.
Main Messages

- Alone or in combination with other interventions, nutrition labelling is cost-effective (or even cost-saving) for CVD and stroke prevention, including in lower-middle-income countries (LMICs), representing good value for money.

- Mandatory labelling is much more effective than voluntary.

**Option 1.3. Food procurement policy in specific settings**

- Food procurement policy in specific settings, such as schools, workplaces, or hospitals has a positive impact in relation to availability and selection of healthy food and is effective in reducing salt consumption and increasing cost–effectiveness.

- Healthy food procurement should be paired with additional strategies, such as education-based approaches, especially in developing countries, where salt added by consumers during cooking, before or while eating plays a bigger role in population salt intake.

**Option 1.4. Restrictions on marketing to children**

- Advertising regulation produces cumulative positive impacts on health outcomes, but it takes time to change the social norms associated with children’s dietary behaviour.

- Comprehensive statutory measures are the most effective to protect children’s exposure to marketing of foods high in fat, salt and sugar (HFSS).

- Voluntary regulation produced little or no change in children’s exposure to marketing of unhealthy food.

**Option 1.5. Pricing interventions**

- Substantial tax on foods containing salt/sodium could modestly reduce salt intake.

- Healthy food subsidies and taxation of unhealthy foods are cost-effective, result in a healthier diet and help to reduce noncommunicable diseases (NCDs), notably when used in tandem.

- Health literacy and marketing about healthy eating, as well as supportive pricing policies are likely to be critical success factors.

- Robust monitoring and evaluation plans built in right from the introduction of salt tax are key for determining the utility of this type of intervention.

Approach 2. Population-level behaviour-change interventions

Population-level behaviour change or agentic interventions – aiming to support individuals by providing information, education and skills – are less effective in reducing salt intake.

**Option 2.1. Health education**

- Health education and dietary advice are modestly effective at reducing salt intake and had only a minor impact on reducing blood pressure at population level.
Mobile health (mHealth) interventions and the inclusion of nutritional education in school curricula should be explored, particularly in countries in which the use of large quantities of salt in cooking plays a larger role in population salt intake.

Implementing initiatives together – including structural approaches, such as lowering salt content of foods, or improving the food environment with health education measures to reduce salt intake – is more effective than individual initiatives.

**Option 2.2. Information campaigns**

Population-level awareness-raising interventions are modestly effective in reducing salt intake. Their benefits may diminish over time and are not sufficient to achieve the WHO target of a 30% reduction in average salt intake alone.

Information campaigns can generate demand for policy changes and low-salt foods, and improve the value of structural interventions such as procurement policies, nutrition labelling schemes and fiscal policies.

**Implementation considerations**

In order to ensure a decrease in salt/sodium intake, several implementation considerations must be taken into account at the individual, professional, organizational and system levels. The main approach of a salt-reduction strategy is a combination of interventions targeting consumers, industry and government, in addition to robust monitoring and evaluation mechanisms paired with strong leadership and political commitment.
EXECUTIVE SUMMARY

The problem

In the Republic of Moldova, salt consumption is twice as high as the WHO recommended level, determined by the common habit of adding salt to food and when cooking and eating processed foods with high salt content. This causes many negative health effects. This problem is amplified by a lack of comprehensive, multisectoral interventions for reducing salt intake related to: raising public awareness and changing behaviours; reformulating industrially processed food; setting a framework for the food industry to reduce salt; introducing labelling to highlight the salt content of foods; and monitoring and evaluating salt intake.

Size of the problem

In the Republic of Moldova sodium intake causes 5.41% of deaths, which is comparable to the global average (5.71%). The disease burden caused by sodium intake has been constantly increasing, accounting in 2017 for 41.84 deaths per 100 000 population (48.51 deaths per 100 000 among men and 35.12 among women) and 921.40 disability-adjusted life-years (DALYs) per 100 000 population (1140.68 DALYs for men and 700.47 for women). In the absence of prevention interventions, especially salt-reduction strategies, the prevalence of raised blood pressure increased to 45.5% in 2016 from 40.0% in 2013, with no difference between the sexes.

Salt consumption is higher in men than in women, at 11.5 grams (g) per day versus 10.3 g per day, respectively, and in rural compared to urban areas, at 11.3 g per day versus 10.0 g per day for men and women, respectively. Only 11.3% of the population consume 5.0 g of salt per day or less; in rural areas the proportion is 10.0%, which is lower than in urban areas, where it is 13.5%. Nine out of 10 Moldovans consume too much salt. About a third of the Moldovan population always or often eat processed foods that are high in salt; the percentage of the urban population with this habit is significantly higher than among the rural population. For most children, sodium intake exceeds dietary recommendations and there is some indication that children with backgrounds defined as being of lower socioeconomic status (SES) have the highest salt intake.
Underlying factors

The socioeconomic determinants, such as education, occupation, income, and poverty status in both low-income and lower-middle-income countries (LLMICs) as well as high-income countries (HICs) are strong risk factors associated with high sodium intake.

In the Republic of Moldova the habit of adding salt to food at the table and when cooking is commonplace and, in the absence of interventions, the consumption of discretionary salt increased between 2013 and 2016: 35.4% of adults added salt always or often before eating or while eating in 2016 compared to 24.3% of adults that did so in 2013. Bread provides 5.55 g of salt per day, which is 0.55 g more than the daily recommended amount of salt for an adult diet. The foods sold on the market offer little information about salt/sodium content via labelling. The most commonly available street foods contain large quantities of sodium: savoury pie at 26.4%, sausage rolls at 31.5% and sweet rolls at 36.7% of the recommended maximum daily intake per serving. A little more than half of the adult population of the Republic of Moldova think that a high-salt diet could cause high blood pressure; 38.4% think such a diet could lead to kidney stones; 23.0% recognize osteoporosis as a risk and 6.7% cite stomach cancer as a risk from high salt consumption levels.

Approaches to addressing the problem

Seven options grouped under two main approaches to addressing salt reduction were selected for analysis.

1. **Approach 1.** Structural population-level interventions, with the following options:
   i. Option 1.1. Food product reformulation
   ii. Option 1.2. Food labelling
   iii. Option 1.3. Food procurement policy in specific settings
   iv. Option 1.4. Restrictions on marketing to children
   v. Option 1.5. Pricing interventions.

2. **Approach 2.** Population-level behaviour-change interventions, with the following options.
   i. Option 2.1. Health education
   ii. Option 2.2. Information campaigns.

**Approach 1. Structural population-level interventions**

Structural or upstream interventions are interventions targeting the entire population and typically involve policies such as regulatory approaches, taxes or subsidies, creating structural changes and effectively removing individual choice from the equation.
Option 1.1. Food product reformulation
- Food reformulation across different foods, focusing particularly on bread, sauces and processed meats can effectively reduce salt consumption without a decrease in acceptability for consumers. A whole-of-industry approach needs to be adopted, and this may be achieved more effectively through regulation.
- Reformulation is very cost-effective. Its implementation costs are low and it produces significant long-term improvements in population health, resulting in sizeable cost savings for society by substantially decreasing the CVD burden and associated health-care expenditures.
- Mandatory reformulation is substantially more cost-effective than voluntary. A robust monitoring system is vital to demonstrate programme effectiveness and impact.
- Educational campaigns and labelling should be implemented in parallel, to increase consumer awareness and demand for low-salt products.

Option 1.2. Food labelling
- Nutrition labelling may impact population health by leading to healthier food purchasing and, ultimately, healthier consumption. Mandatory nutrition labelling is much more effective than voluntary.
- Nutrition labelling alone or in combination with food reformulation and health promotion is cost-effective (or even cost-saving) for CVD and stroke prevention, including in LMICs, representing good value for money.
- Food labelling can serve as a tool for putting pressure on the food industry to reformulate food products.
- Consumers prefer simple traffic light (TL) labelling which is easy to understand.
- Robust monitoring and evaluation are essential to determine the utility of the intervention.

Option 1.3. Food procurement policy in specific settings
- Food procurement policy in specific settings, such as schools, workplaces, or hospitals has a positive impact in relation to availability and selection of healthy food and is effective in reducing salt consumption and increasing cost–effectiveness.
- Food standards that restrict sodium intake by decreasing sodium in school and hospital meals improve the overall dietary habits of children both within and outside school and health-care settings.
- Healthy food procurement should be paired with additional strategies, such as education initiatives, especially in developing countries, where salt added by consumers during cooking, before or while eating plays a bigger role in population salt intake.
Option 1.4. Restrictions on marketing to children

- Children’s exposure to food and beverage marketing for unhealthy products can be reduced by regulating the advertising of HFSS foods.
- Advertising regulation produces a cumulative positive impact on health outcomes, but it takes time to change the social norms associated with children’s dietary behaviour.
- Statutory regulation had produced successful outcomes in relation to volume of, or exposure to, advertising of HFSS foods and purchasing of these foods by children.
- Comprehensive statutory measures should be implemented, with adequate monitoring of compliance (and adequate sanctions for non-compliance), based on government-led definitions of the media to be covered, the products to be controlled, and the audience to be protected.
- Voluntary regulation produced little or no change in children’s exposure to marketing of unhealthy food.

Option 1.5. Pricing interventions

- Higher pricing (taxation) and/or food subsidies can be effective for improving population dietary behaviours by increasing the consumption of healthier foods and lowering purchases of HFSS foods. Robust monitoring and evaluation are key for determining the utility of such interventions.
- A combination of taxes and subsidies can have significant behavioural and health impacts. Specific taxes are associated with stronger health benefits than ad valorem taxation.
- Taxes imposed across an entire population will require many stakeholders to be involved, including industry representatives, nongovernmental organizations (NGOs), policy-makers, and relevant commissions, sponsors and advocacy groups in order to promote public acceptance of such interventions.
- Earmarking the revenue from health taxes for specific purposes, such as funding health improvement or disease prevention, can increase public and political support for taxation and may help offset the influence of industry interests.
- Health literacy and marketing about healthy eating, combined with supportive pricing policies, are likely to be critical success factors.

Approach 2. Population-level behaviour-change interventions

Behaviour-change interventions are those that strengthen the health literacy and capacity of individuals, aiming to diminish any personal deficit in terms of information, knowledge or skills related to excess salt/sodium consumption.
Option 2.1. Health education

- Health education and dietary advice appear to be only modestly effective at reducing salt intake and consequently have had only a minor impact on blood pressure, particularly among the general population.
- The benefits of dietary counselling/education decrease over time and are generally not sustainable.
- To be effective, health education should be located in workplaces and other settings outside the health-care environment.
- mHealth interventions and the inclusion of nutritional education in school curricula should be explored, particularly in countries in which the use of large quantities of salt in cooking plays a larger role in population salt intake.
- Implementing initiatives together – including structural approaches such as lowering salt content of foods or improving the food environment with health education measures to reduce salt intake – will make it easier for people to achieve such a reduction.

Option 2.2. Information campaigns

- Population-level awareness-raising interventions can improve salt-related behaviours and/or reduce discretionary salt intake, but these showed only a small effect and the benefits may diminish over time. This public intervention alone is unlikely to be sufficient to achieve the WHO target of a 30% reduction in average salt intake.
- A monitoring framework should be part of the intervention, to allow both the overall impact and impacts across social groups to be evaluated, particularly in LMICs.
- A combination of providing information and enabling structural changes might be the most effective strategy to facilitate behavioural modifications among the population. Information campaigns also generate demand for low-salt foods and for policy changes, as well as improving the value of structural interventions such as procurement policies, nutrition labelling schemes and fiscal policies.

Implementation considerations

Implementation considerations are discussed in detail for each approach within the evidence brief for policy (EBP), with the aim of ensuring the reduction of salt/sodium consumption and its negative impacts/adverse health effects in the Republic of Moldova.

A multicomponent strategy needs to be adopted that includes a combination of actions targeting consumers, industry, and government, in addition to strong leadership and political commitment, as recommended by WHO.
Mandatory structural population-level interventions are more effective than voluntary ones and a whole-of-industry approach should be adopted. These measures may be achieved more effectively through regulation, with the aim of reducing salt intake gradually among the population.

Educational campaigns and product labelling should be implemented in parallel with product reformulation, in order to raise awareness and shift consumer perceptions regarding the health risks and benefits and to increase demand for low-salt products.
DEFINING THE PROBLEM

In the Republic of Moldova, salt consumption is twice as high as the WHO recommended level (1), determined by the common habit of adding salt to food and when cooking and eating processed foods with high salt content (2). This causes negative health effects and leads to avoidable deaths (3). The problem is amplified by a lack of comprehensive, multisectoral interventions for reducing salt intake, related to: public awareness and changing behaviours; reformulating industrially processed food; setting a framework for the food industry to reduce salt; introducing labelling to highlight the salt content of foods; and monitoring and evaluating salt intake (2).

Efforts to reduce salt/sodium consumption in the Republic of Moldova focus on the following issues: (i) how the problem was brought to light; (ii) the magnitude of the problem; (iii) the consequences of the problem; and (iv) the factors that determine access to and consumption of salt.

How the problem was brought to light

The National Programme on Food and Nutrition 2014–2020 (1) and the National Action Plan 2016–2020 on the implementation of the National Strategy for Prevention and Control of Noncommunicable Diseases 2012–2020 set out the Government of the Republic of Moldova’s aims to reduce by 30% sodium/salt intake (to 7.56 g/d) by 2020. Consequently, the Government is aiming to reduce mean blood pressure by 2–3 mmHg. Furthermore, Moldova’s National Development Strategy “Moldova 2030” (approved by the Government of the Republic of Moldova) – which translates the targets and indicators of the 2030 Agenda for Sustainable Development into the national context – aims to reduce premature mortality due to NCDs by one third through prevention and treatment by 2030 (Sustainable Development Goal (SDG) 3.4). (3)

The Government decision to reduce sodium/salt intake represents one of the nine voluntary global targets agreed in the Global action plan for the prevention and control of noncommunicable diseases 2013–2020 by the WHO Member States, including the Republic of Moldova, to prevent and control NCDs (5). In addition, salt reduction is a priority highlighted

1 Government Decision No. 730/2014 on the approval of the National Programme on Food and Nutrition for the years 2014–2020 and the action plans regarding its implementation.
2 If this target will be achieved this reduction would be expected to avert 7.9% CVD events and 10.7% strokes every year, approximately 1460 CVD deaths per year (4).
3 Government Decision No. 377/2020 of 10 June 2020 on approving the draft law approving the National Development Strategy “Moldova 2030”.

1
in the *Action plan for the prevention and control of noncommunicable diseases in the WHO European Region 2016–2025* (6), as well as in the *European food and nutrition action plan 2015–2020* (7).

Achieving this target would only be possible by implementing a comprehensive and multisectoral approach. Integration and implementation of health policies in all areas that generate better health outcomes and reduce the risks factors of NCDs is a priority action in the health areas established in the National Development Strategy (“Moldova 2030”).

### National salt-reduction strategy

The Moldovan Government – using the available evidence (see Box 1) – approved the following measures to reduce salt intake as part of the National Programme on Food and Nutrition 2014–2020:

(a) modifying and introducing amendments to the relevant set of laws\(^4\) in order to: (i) legally limit the salt content of bread; (ii) promote the reformulation of other foods to reduce salt content; (iii) introduce mandatory nutrition labelling, including front-of-pack (FOP) labelling of salt content;

(b) increasing the awareness of the general population;

(c) monitoring the salt intake of the population.

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**Box 1. Mobilizing the evidence about the problem**

The evidence about the problem was sought in the published scientific literature, as well as in other non-scientific sources. Scientific publications were searched for within the HINARI Programme (8), including in PubMed, and informal/unpublished literature was identified by accessing the websites of national and international institutions, such as the Ministry of Health of the Republic of Moldova, the National Bureau of Statistics, the National Agency for Public Health (ANSP), and WHO.

Priority was given to the most recent publications and specifically those developed in or about the Republic of Moldova.

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**Magnitude of the problem**

High sodium intake is one of the main dietary risk factors for death and DALYs globally (3), as well as being one of the main risk factors for hypertension, CVD, stroke, stomach cancer and renal disease (Box 2). In the Republic of Moldova salt intake in adults exceeds by more than twofold the WHO recommended maximum target of 5 g per day (2,10).

\(^4\) Law No. 10/2009 on the state supervision of public health.
DEFINING THE PROBLEM

Box 2. What is sodium/salt?

Sodium is an essential nutrient necessary for maintenance of plasma volume, acid-base balance, transmission of nerve impulses, and normal cell function, and the minimum daily required intake is estimated at 200–500 mg.

Sodium is the main chemical component in common table salt. It is also found naturally in foods such as milk, meat, and shellfish. Many condiments such as soy and fish sauces, and processed foods such as breads, crackers, meats, and snack foods often contain high amounts of sodium. Thus, a diet high in processed foods and low in fresh fruits and vegetables is often high in sodium, putting people at risk for raised blood pressure and related non-communicable diseases (9).

National evidence shows that average salt consumption in adult population in the Republic of Moldova is 10.8 g per day. Salt consumption is higher among men than women (11.5 g versus 10.3 g per day) and in rural compared to urban areas (11.3 g versus 10.0 g per day). Only 11.3% of the population consumed 5 g of salt per day or less, as per the WHO recommendation (10); in rural areas the proportion was lower (10.0%) than in urban areas (13.5%) (2,4). Thus, nine out of ten Moldovans consume too much salt.

Furthermore, the evidence indicates that salt consumption patterns in the Republic of Moldova are similar in regional comparison. Daily salt consumption in most European countries is estimated or measured to range between 8 g and 12 g per day (11). The global consumption of sodium (6 g per day) is high, with consumption higher than the optimal level in nearly every region of the world (3) and it is increasing comparatively, with the global mean intake of salt at around 10 g daily (4 g/day of sodium) in 2014 (12).

According to national evidence, bread provides more than the daily recommended amount of salt for an adult diet (5.55 g as compared to the 5.0 g recommended by WHO) (2). More than half of the population (55.4%) consumed bread 2–3 times per day, with a higher proportion doing so among the rural population (61.6%) than among people living in urban areas (45.4%) (2).

About a third of the population (27.8% (2) and 32.4% (13) according to two key national surveys) always or often eat processed foods that are high in salt; the percentage among the urban population is significantly higher than among the rural population (39.2% versus 20.8% in one survey (2) and 36.3% versus 29.0 in another (13)). The evidence indicates that in the Republic of Moldova, 1.88 g of salt is consumed for every 100 g of various foods, such as sausages, salami and liver sausage. One fifth of the population consumed such foods and almost a quarter consumed cheese 2–4 days per week. Sweet pastry and ice cream also contributed to the salt intake of the population (in the form of hidden salt) (2).

In contrast to sodium consumption, the evidence shows that less than half of the adult population in the Republic of Moldova (49.7%) consumed adequate amounts of
potassium (>90 mmol per day) (2), which has beneficial effects on blood pressure and cardiovascular health (9). This was more pronounced in those with high sodium intake (14). The percentage was found to be higher among men (52.5%) than women (47.9%) (2), as is the mean potassium daily intake (3.55 g/day for men versus 3.31 g/day for women) (4). The evidence also indicates that half of the population (56.4%) eat fewer than five servings of fruit and vegetables per day (2).

For most children, sodium intake exceeds dietary recommendations and there is some indication that children of lower SES have the highest intake. Children in the Republic of Moldova consume about two times more sodium than potassium (15).

Furthermore, national evidence shows there is a significant decrease in people using iodized salt. In 2016, 64.4% of the population used iodized salt when cooking or preparing food at home (2), whereas in 2013, 81.4% of the population reported that they were using iodized salt; the proportion among the urban population was significantly higher compared to the rural population (89.2% versus 74.4%) (13). Consumption of iodized salt decreased more in rural areas (up to 52.9%) compared to urban areas (86.1%) (2). Both surveys revealed that consumption of iodized salt tended to decrease with age.

### Consequences of the problem

The evidence indicates that a high-sodium diet is one of the most significant dietary risk factors to health globally. More than half of diet-related deaths (3 million deaths) and two-thirds of diet-related DALYs (70 million DALYs) are attributable to high sodium intake (3). Sodium is ranked first for mortality among men, followed by low dietary intake of whole grains and fruit. Low intake of whole grains is the leading risk factor for deaths and DALYs among young adults (aged 25–50 years) and sodium is ranked first among the risk factors for older adults (aged 70+ years) (3).

Furthermore, the evidence from recent decades suggests that high salt intake is an important determinant of rising blood pressure incidence and the associated risks, and causes multiple adverse health outcomes, increased risk of death due to renal causes, risk of kidney disease and/or initiation of dialysis (16). Moreover, the association between sodium intake and blood pressure is linear, with no evident threshold and thus no clear cut off from which a discrete high-risk group of individuals can be identified for targeted intervention (17).

The evidence specifies that unhealthy diet and lifestyle factors are responsible for approximately 80% of CVD, which is the leading cause of death, including premature death and disability worldwide (18). At the same time, excess dietary sodium intake alone is likely to be responsible for about half of the disease burden ascribed to high blood pressure, making

5 This means blood pressure of >140 and/or >90 mmHg, or being on antihypertensive medication.
sodium a major contributor to mortality from CVD (19). Raised blood pressure accounts for 62% of stroke and 49% of ischaemic heart disease (20), contributing to approximately 7% of global DALYs in 2010 and about 9.4 million deaths per year worldwide (21).

The evidence from the systematic reviews and a meta-analysis of prospective cohort studies indicates a direct association between urinary excretion of sodium and cardiovascular mortality, which is more considerable at sodium intakes higher than 2400 mg/d (23). The findings from several systematic reviews conclude that sodium intake by 100 mmol/d increment (24) and higher sodium consumption (by 6%) (25) are associated with an increased risk of stroke incidence. Higher sodium intake is associated with significantly increased risk of stroke morbidity (24,25) and higher stroke (24) and cardiovascular mortality among the general population (26). International evidence indicates that for each additional 500 mg of daily dietary sodium the 10-year stroke risk is increased by 17% (27).

Furthermore, the findings from a regularly updated systematic review confirms that high sodium intake during adolescence is associated with significantly higher blood pressure levels by age 18–25 years in men, but not in women, suggesting the effect of adolescent dietary habits on early adulthood blood pressure may be sex specific (28).

The evidence from a systematic review and meta-analysis of observational studies suggests that sodium consumption is associated with greater body mass index (BMI) and waist circumference (29). Salty foods are often high in fat and energy and are more palatable, encouraging individuals to consume greater quantities of these foods (28).

The economic burden of CVD at the global level was estimated at US$ 863 billion in 2010 and is projected to rise by 21% to US$ 1044 billion in 2030 (30).

In the Republic of Moldova sodium intake causes 5.41% of deaths, which is comparable to the global average (5.71%). The disease burden caused by sodium intake has been constantly increasing, accounting in 2017 for 41.84 deaths per 100 000 population (48.51 deaths among men and 35.12 deaths among women) and 921.4 DALYs per 100 000 population (1140.68 DALYs for men and 700.47 for women) (31).

National evidence indicates that CVD is the leading cause of death in the Republic of Moldova, accounting for more than half of all deaths (58%) (32). Data since the early 2010s show that the standardized death rate due to CVD has the same decreasing tendency as in neighbouring countries, Romania and Ukraine, as well as at regional level. However, this rate is two times higher than the regional-level data and 1.5 times higher than in Romania (33). About one fifth (19.3%) of all cardiovascular deaths are premature; the percentage is higher among men than among women (29.3% versus 11.4%). Premature CVD deaths are responsible for 38.9% of...
the total potential years of life lost due to NCDs (34). CVD causes 29% of total DALYs, with a
difference between age groups as follows: 9.0% of total DALYs within the age group 15–49
years; 31.4% for those aged 50–69 years; and 56.9% for the age group 70+ years (31).

International data indicate that in the Republic of Moldova high blood pressure is one of the
main risk factors for disease burden, accounting for 37.6% of total deaths in 2017 (with this
being one of the highest levels in the WHO European Region, alongside Bulgaria (38.35%),
Georgia (38.34%) and Ukraine (38.0%)). This is growing compared to 2008, when the disease
burden was at 35.8% of total deaths from the high blood pressure risk factor. In 2017, 20.24%
of DALYs were produced by high blood pressure; which is slightly lower than the above-
mentioned countries (Bulgaria 24.65%, Georgia 23.13% and Ukraine 22.49%) (31).

National evidence indicates that, in the absence of prevention interventions, especially salt-
reduction strategies, the prevalence of raised blood pressure increased to 45.5% in 2016 (2)
from 40.0% in 2013 (13), with no difference between the sexes. The proportion of people who
were not taking medication and had raised blood pressure is very high (74.3% in 2016; 76.2%
in 2013) and these proportions are higher in men (82.4% in 2016; 84.1% in 2013) compared to
women (69.2% in 2016; 67.5% in 2013) (2,13).

Furthermore, National Health Insurance Company (CNAM) data indicate that in 2018 the total
amount of financial resources spent on compensated CVD drugs accounted for 215.735 million
Moldovan leu (MDL)\(^7\) (42.46% of the budget for compensated drugs), while MDL 194.553 million
had been spent on antihypertensive drugs (equivalent to 90.2% of the total expenditure for
compensated CVD drugs or 38.3% of the total budget for compensated drugs). In 2017 the
expenditure on compensated CVD drugs was MDL 179.934 million (34.35% of the total for
compensated drugs) and in 2016 this amount was MDL 147.997 million (35.5% of the total for
compensated drugs) (36).

**Factors influencing high salt/sodium intake**

The available evidence indicates that socioeconomic determinants such as education,
occupation, income, poverty status in LLMICs (37) and HICs (38) are strong risk factors associated
with high sodium intake. In HICs the groups with low SES had 14% higher sodium intake than
that of high-SES groups, with the sodium intake being above the WHO recommended limit
for groups of all SES groups (38). A systematic review conducted for LLMICs concludes that
groups with higher SES in LLMICs consume more fats, salt and processed food and were
found to be more inactive. Education is strongly correlated with healthier behaviours in
most settings (37), and consumer behaviour, cooking and eating habits, food marketing and
environmental factors are all strongly linked with high salt consumption (17,39).

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\(^7\) According to the National Bureau of Statistics of the Republic of Moldova, the exchange rate in 2018 was
MDL 19.8442 per €1 (35).
In developed countries processed foods contribute up to 75% of dietary sodium, predominantly from sodium chloride (salt or NaCl), followed by a much lesser proportion from discretionary salt use or that which is naturally occurring (40,41). Cereals and cereal products contribute up to 50% of daily salt intake, with breads providing the most salt from this category. Other major sources are meat and meat products, milk and dairy products, soups, and other foods including sauces, condiments and snack products (41).

**Food habits**

In the Republic of Moldova it is a common habit to add salt to food at the table and when cooking; in the absence of interventions, the consumption of discretionary salt has increased over the years. According to national data, in 2016, 35.4% of adults added salt always or often before eating or while eating, with no difference by area of residence (2), compared to 2013, when 24.3% of adults always or often added salt to food (13). The percentage of men who added salt always or often to their meal was significantly higher than women (47.8% versus 27.7%, respectively, in 2016) (2) and is higher for both sexes compared to data from 2013; 28.0% of men versus 20.3% of women (13).

Study data indicate that six out of 10 adults (61.3%) added salt always or often when cooking or preparing food at home; the proportion of the rural population doing so was significantly higher than among the urban population (69.8% vs 47.5%) (2). In 2013 more than half of adults (51.2%) added salt always or often when cooking food at home (13).

**Food marketing**

Food marketing contributes to the promotion of unhealthy foods, including those with high salt/sodium content. Foods sold in the Republic of Moldova offer little information about salt/sodium content via their labelling. National legislation on the mandatory declaration of nutritional information on the label, including the salt content, came into force on 12 January 2020. The National Agency for Public Health (ANSP) is responsible for enforcement of this, but the mechanism for implementing the legislation has not yet been developed or approved.

Evidence from a moderate-quality systematic review supported by a global study spanning 13 countries showed that children are exposed to an average of five food advertisements per hour, with unhealthy so-called non-core foods accounting for greater than 80% of all televised food advertisements (42). Another moderate-quality systematic review confirmed that commercial television (TV) in the United Kingdom showed up to 12 minutes of advertising per hour and median TV-watching during weekdays for children aged 7–15 years was 2 to 3 hours per day (43). Children are exposed to marketing in different ways, including through media and other channels: TV, radio, internet, SMS messaging, billboards, and in schools and shops; advertising to young people through new media had increased by 50% from 2006.
to 2009 (42). A moderate-quality systematic review found that, despite the requirement of some social media sites that the users must declare their age as being over 13 years, there is good evidence that younger children regularly access these sites: 33% of children aged 8–12 years in the United Kingdom have a profile on Facebook or on a similar social media platform (44).

Moreover, the evidence indicates that the trends in online advertising expenditure for all goods and services in the three leading European markets (France, Germany, United Kingdom) showed a dramatic increase in the period 2000–2010 from a total of less than €0.5 billion to over €10 billion, while in the United States the figure surpassed $39 billion. Annual global expenditure on advertising on social networking sites reached an estimated $US 5.5 billion in 2011. In the United Kingdom, online advertising expenditure exceeded expenditure on TV advertising in early 2009 and in the United States digital advertising has been more prevalent than print and TV advertising since 2019 (44).

**Food environment**

International evidence suggests that food outlets influence the consumption of HFSS foods among children. One systematic review finds that unhealthy diet scores were negatively correlated with the minimum distance to grocery shops and takeaways within 800 m (reflecting the influence of the retail food environment around schools) (45). In the Republic of Moldova, unhealthy foods are easily accessible to school children, as retail food shops and takeaways are located in the immediate vicinity of the schools.

Evidence for the Republic of Moldova indicates that most commonly available street foods (savoury pie, sausage rolls and sweet rolls) provide large quantities of sodium (26.4%, 31.5% and 36.7% of the recommended maximum daily intake per serving, respectively). The content of sodium in a kebab, one of the most widely available street foods, corresponds to 83.6% of the recommended maximum daily intake per serving (46).

**Responsibility and surveillance**

Existing national legislation and regulations indicate that the ANSP is responsible for the monitoring and surveillance aspects of ensuring nutritional health of the Moldovan population, including salt consumption. However, the secondary normative acts – the mechanism for implementing the legislation – have not yet been developed nor approved, and Government Decision No. 1014/2018 does not comprise foods containing salt as an area under its control.

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9. This legislation includes Law No. 10/2009 on the state supervision of public health; Law No. 279/2017 on informing the consumer about food products; and Government Decision No. 196/2011 on the approval of the health regulation on nutrition and health claims made on food.

10. Government Decision No. 1014 of 17 October 2018 on the approval of the methodology of state control over entrepreneurial activity based on the risk analysis carried out by the ANSP.
The activity reports of the ANSP provide no information on monitoring and surveillance activities being carried out on salt consumption since 2014, when the Agency presented only limited information on iodized salt (47).

Knowledge and attitudes

The evidence on awareness and attitudes about salt among the population of the Republic of Moldova indicates that a little more than half (54.9%) of the adult population think that a high-salt diet could cause high blood pressure; 38.4% believe kidney stones could be affected; 23.0% raised osteoporosis as a concern; and 6.7% mentioned a link with stomach cancer (2). At the same time, the proportion of those thinking that consuming too much salt could cause serious health problems decreased from 89.7% in 2013 to 67.2% in 2016. Women were more knowledgeable on this issue compared to men; however, the trend was decreasing in both men (from 86.6% to 64.5%) and women (from 92.8% to 68.9%). Despite displaying some knowledge of the negative health effects of high sodium intake, only 28.2% of those surveyed in 2016 considered lowering salt in diet to be very important, representing a decline from 33.5% in 2013 (2,13).

The national data highlight an increase in the proportion of the population who felt they consumed too much salt or far too much salt, from 14.7% in 2013 to 26.7% in 2016. This tendency was revealed in both men and women, but it was higher and a more significant increase among men (from 15.8% in 2013 to 32.1% in 2016) than women (from 13.6% in 2013 to 23.3% in 2016) (2,13).

The evidence indicates that the population took regular action to control their salt intake: 81.7% limited their consumption of processed foods that are high in salt; 22.3% used spices rather than salt; and one in three did not add salt when cooking. Only 8% looked at salt/sodium content on food labels and 14.3% bought alternatives to salt. One in three avoided eating food prepared outside the home and 0.8% took other measures to reduce salt intake (2,4).

Equity-related observations about the problem

At global level, evidence showed that salt intake was higher in deprived population groups, indicating that higher salt intake among the groups with lower SES causes poor health, amplifies blood pressure levels and the risk of CVD (40,48). Poor fruit and vegetable consumption in these same population groups reduces potassium intake, which is another risk factor for high blood pressure. Furthermore, evidence concluded that food consumption is not simply a matter of knowledge or rational choice for individuals of low SES, but rather is constrained by scarce resources and the need to prioritize other daily expenses perceived as being more important than a healthy diet (48). Likewise, a moderate-quality systematic review found that children from low and middle social class backgrounds attending schools
with more exposure to fast foods and low levels of access to supermarkets were most likely to report infrequent fruit intake (45).

Moreover, evidence concluded that the inequality-adjusted Human Development Index (IHDI)\textsuperscript{11} values among countries with no existing salt-reduction initiatives (mean 0.643) were significantly lower than for those with either partially implemented/planned salt initiatives (mean 0.766) or fully implemented salt initiatives (mean 0.780) (48). Overall, countries with greater financial resources seemed to correspond with those presenting more mature salt-reduction initiatives. At the same time, several champion examples (Bulgaria, Estonia, Hungary and Turkey) have demonstrated that salt-reduction initiatives have also gained importance on the political agenda in countries labelled as low- or middle-income by World Bank classifications (48).

\textsuperscript{11} The higher the level of inequality, the greater will be the decrease in the IHDI value of each area (health, education and income), depending on the level of inequality (48).
APPROACHES TO ADDRESSING THE PROBLEM

The salt intake pattern among the population of the Republic of Moldova is one specific to both LLMICs and HICs \(17,19,40,41\). It comprises elements such as: adding salt during cooking or eating; a significant proportion of salt intake coming from processed foods; the influence of food marketing and a food environment that is not well regulated; and only modest knowledge among the population about the negative effects of salt intake.

Reducing salt consumption and improving dietary habits requires comprehensive policies targeting multiple sectors and active collaboration of a variety of stakeholders. In 2020 the WHO Regional Office for Europe developed a support package to help countries to accelerate salt-reduction efforts in the European Region \(49\). This package provides guidance on how to support the Ministry of Health and the Government of the Republic of Moldova to achieve the objective of a 30% reduction in salt/sodium consumption, along with the SDG target on decreasing NCD mortality by 30%, for which the best available evidence is used and systemized in a scientific and transparent way.

To facilitate discussions with stakeholders on approving the public health policy intervention on population salt/sodium intake reduction, seven options were chosen, grouped into two approaches, as part of the EBP process (see Box 3). The approaches identified (Box 4), were as follows. Approach 1. Structural population-level interventions, with the following five options: Option 1.1. Food product reformulation; Option 1.2. Food labelling; Option 1.3. Food procurement policy in specific settings; Option 1.4. Restrictions on marketing to children; Option 1.5. Pricing interventions. Approach 2. Population-level behaviour-change interventions, with the following two options: Option 2.1. Health education; Option 2.2. Information campaigns.

Box 3. The process of developing the EBP

The EBP, entitled Reducing salt/sodium consumption and its negative impacts in the Republic of Moldova, has been developed to underpin public health interventions on salt reduction. This represents the Government’s commitment to reduce salt/sodium intake by 30% by 2020, set out in the National Programme on Food and Nutrition 2014–2020 and the National Action Plan 2016–2020 on the implementation of the National Strategy for Prevention and Control of Noncommunicable Diseases 2012–2020.

An open consultation process was used, coordinated by two state secretaries, to identify a list of priority issues based on the last available national evidence from among which the topic for the EBP was developed, focusing on the reduction of salt/sodium intake. A working group was established comprising representatives of the Ministry of Health and the “Nicolae Testemitanu” State University of Medicine and Pharmacy. The coordinator of
activities at country level was appointed head of the Ministry’s Department of Analysis, Monitoring and Evaluation of Policies.

This EBP was reviewed by a number of researchers and policy-makers to ensure its scientific rigour and relevance for the health system. Reviewers included representatives of WHO, the EVIPNet Europe Secretariat, the Ministry of Health’s Department of Public Health, the ANSP and the “Nicolae Testemitanu” State University of Medicine and Pharmacy.

Box 4. Policy intervention approaches

**Approach 1. Structural population-level interventions** aim to improve the environment, settings or conditions in which individuals live, work, go to school and experience leisure time. The health issue reflects structural deficits, such as limited availability of appropriate foods or limited access or opportunity to procure appropriate foods as the result of restricted social and economic resources, such as income, social status, place of residence and cultural/ethnic group. Structural interventions are designed to offset, or make up for, these deficiencies \( (17) \).

**Approach 2. Population-level behaviour-change interventions** include efforts that aim to strengthen individuals by providing information, education or skills. The health issue (in this case, excess sodium consumption and associated health problems) reflects personal capacity deficits, such as lack of information, knowledge or skills, and the interventions are designed to offset, or make up for, these deficiencies \( (17) \).

The methodology used for evidence collection is specified in Box 5.

Box 5. Collecting evidence for options to address the problem

Evidence for options to address the problem was found in databases within the Access to Research for Health (HINARI) Programme \( (8) \). Articles were identified by searching in databases for systematic reviews with topic-related key words in the title or in the abstract. The keywords included: (salt OR iodi* OR sodium OR potassium) AND (cook* OR process* OR food OR diet* OR nutrition OR education OR regulation OR marketing OR labelling OR industry) AND (hypertension OR blood OR pressure OR cardiovascular OR stroke OR coronary OR heart OR disease).

Although some of the reviews did not specifically address reduction in salt consumption, they were not initially excluded.

Sources published during the period from July 2010 to July 2019 were analysed.
Key findings were extracted from each identified review, assessed according to quality (using the AMSTAR 2 assessment sheet (50)), local applicability (proportion of studies carried out in Europe and in LMICs), equity aspects (proportion of studies explicitly addressing priority groups) and the degree of focus on the issue. The overall evidence for the options was then summarized and relevant interpretations regarding the key findings of the review authors were included, based on quality, local applicability, equity and the focus on the issue.

A total of 187 systematic reviews were identified. After analysing the titles and abstracts, 84 reviews were selected. Following content-related analysis, 38 systematic reviews were included in the EBP. An overview of the efficiency and cost–effectiveness of the reduction in salt consumption strategies was also included.

**APPROACH 1. Structural population-level interventions**

Structural interventions – also termed upstream interventions – take place at the population level, targeting the entire population. They typically involve policies such as regulatory approaches, taxes or subsidies, creating structural changes and effectively removing individual choice from the equation (40).

**Option 1.1. FOOD PRODUCT REFORMULATION**

**Overview and context**

This option provides an overview of available evidence about food reformulation (mandatory or voluntary by the industry/manufacturers) to reduce salt content of food products by setting maximum limits on salt content by the Government and mandatory reformulation of foods.

In the international literature, food product reformulation is defined as the process of altering a food or beverage product’s recipe or composition to improve the product’s health profile (51). Food product reformulation is a large-scale effort, across multiple settings and jurisdictions, to lower the sodium content of food products at the time of production (17).

In the Republic of Moldova there are no regulations on the salt content to be used in food manufacturing. Every food producer, including bakers, develops their own internal instructions to be applied by their employees in the process of producing food.

**Results of the scientific literature review**

A total of 18 systematic reviews about food product reformulation were found, covering both mandatory and voluntary reformulation. The EBP includes 15 systematic reviews (see Annex 1 and Annex 2).
There is robust evidence on the efficacy of food product reformulation for reducing salt consumption from the perspective of public health and health system benefits: the 15 systematic reviews indicate that food reformulation can effectively contribute to reducing salt consumption/sodium intake, producing considerable health gains (17,19,38,40,41,48,51–59).

Two high-quality and one moderate-quality systematic reviews indicate a sodium intake reduction of between 5% and 81% by introducing food reformulation across different foods, focusing particularly on bread, sauces and processed meat products (41,51,53). The evidence specifies that the strategies addressing a wider spectrum of processed foods and higher percentages of sodium reformulated led to greater reductions in sodium intake (51). A moderate-quality systematic review demonstrates that reformulation of processed foods to their minimal technologically feasible concentration reduces sodium intake among boys (36%), girls (37%), men (38%) and women (37%); this effect for both processed foods and sodium used in home cooking (~25% reduction) could be in the range of 9.5–38.0% (52). A moderate-quality systematic review confirms that, globally, bread is the most targeted food for reformulation, followed by foods such as bakery products, processed meats, dairy products, sauces and convenience meals (53). Nevertheless, comprehensive analyses of the effectiveness and cost-effectiveness of salt reduction in gastronomy are lacking at the time of writing (55).

A moderate-quality systematic review indicates that nationwide reformulation policy might reduce salt consumption by 1 g per day (53). This confirms the findings of another systematic review presenting absolute reductions in sodium intake ranging from 0.009 g to 1.82 g/day per person, depending on the amount of nutrients reformulated, the spectrum of targeted foods and the specifics of the scenario studied (51). The United Kingdom salt-reduction strategy, demonstrating a 1.5 g per day (15%) reduction between 2001 and 2011 was achieved by sustained and progressive industry reformulation (53,54).

A moderate-quality systematic review suggests that salt reduction through reformulation in staple foods such as bread could effectively lower salt intake, without influencing quality or even being noticed by consumers (55). A high-quality meta-analysis of 27 studies comprising 5101 consumers confirms that salt can be reduced in breads and processed meats by up to 40% and 70%, respectively, without a decrease in product acceptability to consumers (41). The evidence demonstrates that consumers gradually adapt to changes in the salt content of foods after three to eight weeks' exposure; small salt reductions in certain products cannot be detected and do not affect acceptability/consumption (41,51). Nevertheless, evidence indicates there is a significant decline in acceptability of cheese, even falling below 20%, pointing to the role of salt as an important contributor to cheese flavour and determining overall enjoyment of cheese (41).

Evidence indicates that the use of salt substitutes (potassium chloride (KCl)) has no significant impact on acceptability of meat products (up to 50% replacement) and cheeses
(up to 25–30% replacement). Therefore, flavour enhancers are recommended for use when salt reduction is greater than 25%, but the results are less conclusive. The evidence suggests that introducing salt substitutes may increase production costs and result in consumer concern regarding the use of ingredients perceived as being unnatural (41).

A moderate-quality systematic review indicated that added potassium-based salt substitute (KCl) in the food can decrease salt intake (59). Evidence from one Taiwanese study suggests that salt enriched with potassium can reduce cardiovascular deaths by 41%, and people can live 0.3–0.9 years longer (40). Furthermore, evidence from two moderate-quality systematic reviews suggests that salt-reduction strategies and iodine deficiency elimination programmes can be integrated; substituting non-iodized with iodized salt in processed foods improved the number of consumers meeting adequate iodine intake targets (48,52).

A high-quality systematic review of modelling studies estimating the effects of reformulation on health outcomes shows a reduction in: CVD mortality of between 0.6% and 1.7%; stroke incidence of 0.5–8.0%; and acute myocardial infarction (AMI) incidence of 0.3–4.4% (51). In the United Kingdom, average blood pressure in the adult population fell by 3/1.4 mmHg over the period 2001–2011 (54). However, significant reductions in CVD mortality would occur only if more than 65% of products available on the market met the reduction criteria (51).

Furthermore, evidence shows a positive association between sodium reductions by reformulation and quality-adjusted life-years (QALYs) gained/DALYs averted: an increase between of 265 and 12 783 QALYs and a reduction of between 6.35 and 1452 DALYs per 100 000 population (51). A high-quality systematic review demonstrates that salt reduction by reformulation is very cost-effective because of the large benefits in DALYs averted (1–3×gross domestic product (GDP) per capita per DALY averted) or QALYs gained at a marginal increase in cost per capita (56).

Three high-quality systematic reviews of economic evaluations and a moderate-quality systematic review all indicate that interventions to reduce sodium consumption, including food reformulation, represent excellent value for money: they are either cost-saving (more health gains at lower cost) or cost-effective (more health gains but at some additional cost) for reducing CVD (19,40,57,58). The intervention has low implementation costs and produces significant long-term improvements in population health, resulting in sizeable cost savings for society by substantially decreasing the CVD burden and associated health care expenditure (19). Lowering salt intake by reducing salt in bread is cost-saving in terms of CVD prevention in LMICs (58). Another moderate-quality systematic review confirms that salt-reduction interventions, including in processed foods, are very cost-effective in the prevention of hypertension, resulting in a gain in QALYs, savings in both medical and productivity costs due to averted hypertension cases, and/or are low-cost in terms of implementation.
Salt reduction through food reformulation has a low incremental cost-effectiveness ratio (ICER\textsuperscript{12}) and greater benefits compared to dietary advice. The effects regarding cancer and other diseases suggest additional benefits of salt-reduction interventions and therefore higher cost-effectiveness of food reformulation (\textsuperscript{55}). Evidence indicates that the full effects of such interventions can be maintained over time (\textsuperscript{19}).

\textbf{Mandatory versus voluntary reformulation}

Three high-quality systematic reviews and one moderate-quality systematic review (\textsuperscript{19,40,51,53}) all found that mandatory reformulation is more effective than voluntary. Mandatory reformulation alone could achieve a reduction of approximately 1.4 g/day, compared to median reduction of 0.7 g/day for voluntary reformulation (\textsuperscript{40}). Evidence indicates that making recommended limits for salt in bread, margarine and cereal products mandatory would potentially avert 18\% of the disease burden arising from excessive salt consumption, which is 20 times greater than what can be achieved with the voluntary approach (\textsuperscript{19}). Mandatory reformulation might also result in greater reductions in DALYs and increases in QALYs compared to voluntary reformulation (\textsuperscript{40,55}). Likewise, a moderate-quality systematic review of simulation studies modelling dietary strategies with the aim of improving diet shows that manufacturers’ voluntary sodium reduction in processed foods in the United States achieved a 9.5\% reduction in population sodium intake, producing decreases of 1.25 mmHg in mean systolic blood pressure (SBP), averting 513,885 strokes and 480,358 myocardial infarctions (\textsuperscript{52}). A number of countries across different regions have introduced mandatory reformulation of foods (Argentina, Belgium, Bulgaria, Greece, Hungary, Netherlands, Paraguay, Portugal, South Africa, Sri Lanka) (\textsuperscript{54}).

Moreover, evidence indicates that the beneficial effects of a mandatory reformulation policy would remain, even if the consumption of discretionary salt increased by 15\% (\textsuperscript{51}). Furthermore, evidence on the possibility that consumers maintained the same caloric intake by eating more food shows that, after reformulation, differences in intakes, including sodium, would still be smaller (\textsuperscript{51}).

Robust evidence from two high-quality systematic reviews indicates that mandatory product reformulation is substantially more cost-effective than voluntary reformulation undertaken by food industry. Mandating the more moderate use of salt in breads, margarines and cereals is easily the most cost-effective strategy for primary prevention of CVD (\textsuperscript{19} (\textsuperscript{58})).

\textsuperscript{12} An ICER represents the economic value of an intervention, compared to an alternative (comparator). It represents a ratio of extra cost per extra unit of health effect and is defined as the ratio of the change in a therapeutic or public health intervention (compared to the alternative, such as doing nothing or using the best available alternative treatment) to the change in effects of the intervention. The change in effects is usually measured in terms of the number of life-years gained (LYG) (DALYs or QALYs gained) by the intervention.

\textsuperscript{13} INT\$ 210/DALY and at absolute risk of CVD; 35\% threshold at INT\$ 526/DALY (\textsuperscript{58}).
Another moderate-quality systematic review confirms that mandatory reduction of salt in the manufacturing of bread, cereals and margarines is very cost-effective; this conclusion is also valid for voluntary reformulation by manufacturers (57). Evidence indicates that both scenarios of reformulation, mandatory and voluntary, appear to be more cost-effective than labelling or dietary advice targeting individuals (40).

However, despite the fact that evidence indicates that mandatory reformulation is more powerful, most countries currently use voluntary reformulation, including industry engagement to reduce the salt content of products (40,54). A high-quality and two moderate-quality systematic reviews demonstrate that establishing salt targets in processed food categories along with a monitoring system contribute to reducing sodium density in foods (54,59); a robust monitoring system is vital to demonstrate programme effectiveness and impact (17,54). Furthermore, evidence from one high-quality and two moderate-quality systematic reviews indicates that the success of voluntary reformulation may be largely dependent on the degree of political pressure applied to the food industry, along with stronger regulatory approaches and regular and independent monitoring, as shown by the way this approach was applied in the United Kingdom (40,48,53).

A high-quality systematic review concludes that the effectiveness of food reformulation on public health is the result of a complex causal chain that includes technical/industrial aspects, marketplace dynamics and consumer reactions. Many aspects of the reformulation models can vary over time, including the industry uptake of reformulated products, consumption habits and preferences, and epidemiological trends in NCDs (51). Mirroring the successful experience of removing trans-fatty acids from processed foods in several HICs, salt reduction in processed food production is likely to have a significant impact (38), and the trans-fat story in Denmark suggests that voluntary reformulation can be an effective place to start (53).

Evidence indicates that the positive effects of reformulation on consumption and health are stronger for sodium-related interventions, but less conclusive for sugar and fats (51). Moreover, a moderate-quality systematic review concludes that targeting a variety of unhealthy foods, rather than individual foods or nutrients, theoretically appears to be most effective for improving dietary habits, particularly in reducing intake of saturated fatty acids, sodium, and added sugar (52).

A high-quality systematic review indicates that national government initiatives have the potential to achieve population-wide reductions in salt intake, particularly if they employ more than one strategy and include structural activities, such as food product reformulation (17).

The main conclusions from the systematic reviews relevant to this option are summarized in Table 1.
Table 1. Summary of main conclusions from the systematic reviews relevant for Option 1.1. Food product reformulation

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
</table>
| Benefits                   | • Two high-quality and one moderate-quality systematic reviews indicate a sodium intake reduction of between 5% and 81% by introducing food reformulation across different food products, focusing particularly on bread, sauces and processed meat products (41,51,54).
|                            | • Three systematic reviews found that food reformulation policy might reduce sodium intake, ranging from 0.009 g to 1.82 g/day per person (51,53,54).
|                            | • A high-quality meta-analysis of 27 studies comprising 5101 consumers confirms that salt can be reduced in breads and processed meats by up to 40% and 70%, respectively, without a decrease in consumer acceptability (41).
|                            | • A high-quality systematic review indicates that food reformulation improves health outcomes by reducing: CVD mortality by between 0.6% and 1.7%; stroke incidence by 0.5%–8.0%; and AMI incidence by 0.3%–4.4% (51).
|                            | • Two moderate-quality systematic reviews show that average blood pressure among the adult population in the United Kingdom fell by 3/1.4 mmHg over the period 2001–2011 (54); in the United States voluntary sodium reduction in processed foods generated decreases of 1.25 mmHg in mean SBP, and averted 513 885 strokes and 480 358 myocardial infarctions (52).
|                            | • Three high-quality systematic reviews and one moderate-quality systematic review (19,40,51,53) found that mandatory reformulation is more effective than voluntary. Mandatory reformulation alone could achieve a reduction of approximately 1.4 g/day, compared to 0.7 g/day median reduction through voluntary reformulation (40).
|                            | • Evidence indicates that the beneficial effects of a mandatory reformulation policy would remain, even if the consumption of discretionary salt were to increase by 15% (51).
|                            | • A high-quality systematic review indicates that national government initiatives have the potential to achieve population-wide reductions in salt intake, particularly if they employ more than one strategy and include structural activities such as food product reformulation (17).
| Potential harms            | • No systematic review provides information on adverse effects of food product reformulation. |
**Table 1. contd**

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resources, costs and/or cost-effectiveness of the intervention</strong></td>
<td>• A high-quality systematic review shows a positive association between sodium reduction by reformulation and QALYs gained/DALYs averted; calculations indicate an increase of between 265 and 12 783 QALYs and a reduction of between 6.35 and 1452 DALYs per 100 000 population (51).</td>
</tr>
<tr>
<td></td>
<td>• A high-quality systematic review demonstrates that salt reduction by reformulation is very cost-effective, producing significant benefits in DALYs averted (1–3×GDP per capita per DALY averted) or QALYs gained at only a marginal increase in cost per capita (56).</td>
</tr>
<tr>
<td></td>
<td>• Four systematic reviews of economic evaluation indicate that interventions to reduce sodium consumption, including food reformulation, represent excellent value for money; they are either cost-saving (more health gains at lower cost) or cost-effective (more health gains but at some additional cost) for CVD (19,40,57,58).</td>
</tr>
<tr>
<td></td>
<td>• The intervention has low implementation costs and produces significant long-term improvements in population health, resulting in sizeable cost savings for society by substantially decreasing the CVD burden and associated health-care expenditure (19).</td>
</tr>
<tr>
<td></td>
<td>• A moderate-quality systematic review confirmed that salt-reduction interventions, including in processed foods, are very cost-effective in the prevention of hypertension, resulting in a gain in QALYs, savings in medical and productivity costs due to averted hypertension cases; and/or they are low-cost in terms of implementation (55).</td>
</tr>
<tr>
<td></td>
<td>• Lowering salt intake by reducing salt in bread is a cost-saving intervention for CVD prevention in LMICs (58).</td>
</tr>
<tr>
<td></td>
<td>• The effects regarding cancer and other diseases suggest additional benefits of a salt reduction and therefore higher cost–effectiveness of food reformulation (55).</td>
</tr>
<tr>
<td></td>
<td>• Two high-quality systematic reviews indicate that mandatory product reformulation is substantially more cost-effective than voluntary reformulation by the food industry. The more moderate use of salt in breads, margarines and cereals is easily the most cost-effective strategy for primary prevention of CVD (19) (INT$ 210/DALY and at absolute risk of CVD; 35% threshold at INT$ 526/DALY) (58).</td>
</tr>
</tbody>
</table>
### Category of the conclusion

(Contd) Resources, costs and/or cost-effectiveness of the intervention

<table>
<thead>
<tr>
<th>Summary of the main conclusions</th>
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<tbody>
<tr>
<td>- A moderate-quality systematic review demonstrated that mandatory reduction of salt in the manufacturing of bread, cereals and margarines is very cost-effective; this conclusion is equally valid for voluntary reformulation (57).</td>
</tr>
</tbody>
</table>

### Uncertainty related to potential benefits and harms (monitoring and evaluation could be justified if the option is examined)

<table>
<thead>
<tr>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>- A high-quality and two moderate-quality systematic reviews demonstrate that establishing salt targets in processed food categories, along with a monitoring system, reduce sodium density in food (54,59); a robust monitoring system is vital to demonstrate programme effectiveness and impact (17,54).</td>
</tr>
<tr>
<td>- Two moderate-quality systematic reviews show the necessity of putting in place a monitoring system for urinary iodine levels, to adjust the levels of micronutrient fortification as part of the aim of reducing salt consumption. Thus, initiatives to reduce dietary salt by reformulation should not adversely impact programmes to prevent iodine deficiency disorders primarily relying on the fortification of salt (48,52).</td>
</tr>
</tbody>
</table>

### Key elements of the policy option if it was applied elsewhere

<table>
<thead>
<tr>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Despite the fact that evidence indicates that mandatory reformulation is more powerful, most countries currently use voluntary reformulation including industry engagement to reduce the salt content of products (40,54).</td>
</tr>
<tr>
<td>- Evidence from one high-quality and two moderate-quality systematic reviews indicates that the success of voluntary reformulation may be largely dependent on the degree of political pressure applied to the food industry, along with stronger regulatory approaches and regular and independent monitoring, as shown by the way this approach was applied in the United Kingdom (40,48,53).</td>
</tr>
<tr>
<td>- Mirroring the successful experience of removing trans-fatty acids from processed foods in several HICs, salt reduction in processed food production is likely to have a significant impact (38), and the trans-fat story in Denmark suggests that voluntary reformulation can be an effective place to start (53).</td>
</tr>
<tr>
<td>- A whole-of-industry approach needs to be adopted, which is likely to require strong strategic focus and direction from governments and other leaders, and may be achieved more effectively through regulation (41).</td>
</tr>
<tr>
<td>- Educational campaigns and product labelling should be implemented in parallel, in order to raise awareness and shift consumer perceptions regarding the health benefits, as well as creating increased demand for low-salt products (41).</td>
</tr>
<tr>
<td>- Salt reduction should be introduced gradually, allowing consumers to gradually adapt to changes in the salt content of foods; small salt reductions in certain products cannot be detected and do not affect acceptability/consumption (51).</td>
</tr>
</tbody>
</table>
Table 1. contd

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(contd) Key elements of the policy option if it was applied elsewhere</td>
<td>• A high-quality systematic review indicates that national government initiatives have the potential to achieve population-wide reductions in salt intake if they employ more than one strategy and include structural activities such as food product reformulation (17).</td>
</tr>
<tr>
<td>Opinions and experience of the stakeholders</td>
<td>• The food industry may invoke the idea that food reformulation is costly, and that the salt industry will see declining sales. Assessing these aspects is complex or even impossible, and sometimes the effect is in fact negligible. For example, as products are reformulated within the natural product life cycle, it is often assumed that considering the costs of reformulation might lead to an overestimation of costs of implementation (55).</td>
</tr>
<tr>
<td></td>
<td>• Reducing salt has the potential to disrupt the sensory profile of food, which may reduce consumers’ overall liking of and/or intent to purchase a product, resulting in potential economic losses for manufacturers (41).</td>
</tr>
</tbody>
</table>

Option 1.2. FOOD LABELLING

Overview and context

This option was identified to present arguments regarding the effects of food labelling on salt consumption and to define the conditions under which these effects are produced.

International evidence indicates that nutrition labelling is recommended as a means to enable consumers to make healthier choices about what they buy and how much they eat (60). There are three categories of nutrition labelling applied in practice: (i) information on nutrient content and percentage daily value of nutrients (such as in Canada); (ii) interpretative labelling/on-package symbols (e.g. –colour-coded TL labelling system) helping consumers to select healthier foods (as in the United Kingdom example); (iii) logos indicating whether a product meets a predetermined guideline regarding healthiness or warning labels (for instance in Finland) (17,61).

Simplified information on the key nutritional aspects or characteristics of foods displayed in the consumer’s principal field of vision is known as FOP labelling. It is designed to help consumers to make healthier food choices as well as to stimulate healthy product development and reformulation by the industry. All three above-mentioned types of labelling can be presented as FOP labelling.
In the Republic of Moldova, the declaration of salt content by labelling is mandatory since 12 January 2020, when Law No. 279/2017 on informing the consumer about food products entered into force. According to the law, the salt content of foods forms part of mandatory nutrition declaration (art. 8 (1) letter l) and should be expressed in words and numbers (art. 8 (2)). FOP labelling is applied to mandatory nutrition declaration, including for salt content (art. 29 (3), art. 33 (3) letter a)). The law allows for additional formats for the expression of nutrition information using graphical forms or symbols (art. 8 (2)), and the criteria for expressing nutritional information using graphical forms or symbols (art. 8 (4)). No such criteria, which should be developed by the Government, have been established until now.

Government Decision No. 196/2011 on the approval of the health regulation on nutrition and health claims made on food establishes (in its first Annex) the following provisions applicable to salt/sodium claims on foods: (i) low sodium/salt products contain no more than 0.12 g of sodium, or the equivalent value for salt, per 100 g or per 100 ml; (ii) very low sodium/salt products contain no more than 0.04 g of sodium, or the equivalent value for salt, per 100 g or per 100 ml; (iii) sodium-free or salt-free products contain no more than 0.005 g of sodium, or the equivalent value for salt, per 100 g or per 100 ml; (iv) no added sodium or salt is determined by a claim that a food has no added sodium or salt, or any ingredient that contains added sodium/salt, and the product contains no more than 0.12 g of sodium, or the equivalent value for salt, per 100 g or 100 ml.

The health claims should be authorized by the ANSP and the list displaying authorized health claims made on foods should be made available on the website of the ANSP. As of 25 June 2020 no such a list had been made available, which could indicate that no health claims have been authorized.

**Results of the scientific literature review**

Fourteen systematic reviews were found addressing nutrition labelling of foods, including providing on-package information about sodium/salt content; 12 systematic reviews were included in the EBP (see Annex 1 and Annex 2).

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16 Chapters v & vi of Government Decision No. 196/2011 on the approval of the health regulation on nutrition and health claims made on foods.
Two systematic reviews, one of high and another of moderate quality, find that providing nutritional information directly on food packaging may impact on population health by leading to healthier food purchasing and ultimately, healthier consumption (61,62). There are two ways of encouraging healthier food purchasing and consumption behaviours: (i) by increasing purchasing or consumption of products considered healthy in relation to recognized nutritional guidelines; and/or (ii) by decreasing purchasing or consumption of products considered less healthy in relation to the same guidelines (61).

Evidence from a high-quality systematic review indicates that nutrition labelling alone could modestly reduce salt intake by 0.4 g/day; using nutritional claims and warnings on the label may lower salt intake by 1.2 g/d if the population were to choose products labelled as being low in salt, or, conversely, increased by 1.6 g/day if they choose products labelled as having high salt content (40). A moderate-quality systematic review specifies that salt intake could be lowered by 1.8 g/day among men and by 1.0 g/day among women if foods labelled as being low in salt were consumed, and would increase by an estimated 2.1 g/day in men and 1.4 g/day in women if high-salt products were chosen (52).

Two systematic reviews, one of high and another of moderate quality, indicate that in Finland, the mandatory warning labels on high-salt foods lowered salt intake by 36% between 1978 and 2007 – by approximately 4 g/day; from 13.0 g to 8.3 g/day in men, and from 11 g to 7 g/day in women (40,54). During that period stroke and coronary heart disease mortality fell by over 75% (40). In the United Kingdom, TL food labelling had been used as a reinforcing mechanism together with media campaigns on food reformulation, involving close monitoring and political pressure; these strategies together decreased salt consumption by 15% between 2001 and 2011 (53). Thus, nutrition labelling allows consumers to make informed purchasing and consumption choices at the same time as putting pressure on the food industry to reformulate food products (40,53,54,61).

Likewise, evidence from a high-quality systematic review suggests that nutrition labelling on menus in restaurants could be used as part of a broader range of interventions to increase the impact of efforts to encourage healthier food consumption (61). However, evidence from a moderate-quality systematic review concludes that menu labelling appears weak or ineffective (53).

Evidence from five systematic reviews on cost–effectiveness concludes that nutrition labelling alone or in combination (with food reformulation and health promotion measures) is cost-effective or even cost saving for stroke and CVD prevention, including in LMICs, representing good value for money (19,55–58). Evidence from a moderate-quality systematic review indicates a considerably lower ICER through labelling, with up to -316 870 INT$/LYG over a period of 10 years compared to the status quo, associated with both significant savings in medical costs and an important increase in QALYs and comparatively low number of LYG (1970). Additional benefits of a strategy of salt reduction through labelling and the
associated greater cost-effectiveness are produced by preventive effects relating to cancer and other diseases (55).

FOP labelling increases consumers’ ability to correctly identify a healthier product (compared to food that is not labelled), with the level of sodium in the food being one of more important nutrients (62). Evidence from a high-quality systematic review supports, as a means to encourage healthier food choices, nutrition labelling that is understandable and accessible including in consumer groups such as children, adolescents or older people (61). Evidence from two systematic reviews indicates that among many European Union (EU) consumers, about 50% of those who might use food labels have reported difficulties in interpreting them. Much depends on health literacy; different labelling systems may confuse consumers who prefer simple (TL) labels, which are easier to understand (40,53).

Evidence from a moderate-quality systematic review suggests that FOP labelling and nutritional shelf labelling can help consumers identify healthier products more easily and quickly using nutrient-specific systems such as guideline daily amount (GDA) labels combined with colour-coded nutrient level indicators, compared to simple summary icons that display only numerical information or summary systems for specific individual nutrient criteria, which make labels more difficult to understand. Evidence indicates that FOP labels that are large and positioned in a constant location (on the top right of the label on a food package) capture consumer attention more quickly (62).

Moreover, the evidence concludes that introducing food labelling in supermarkets influenced consumers to purchase healthier products, which in turn is influenced by the level of education efforts and/or the particular communication strategies used. Evidence finds that consumers who had knowledge of food labelling tend to purchase and consume healthier foods than those who did not have prior knowledge. At the same time, consumers of low SES, with higher BMI, and who have children living in their households, along with price-focused consumers are less likely to use food labels than health-conscious consumers and those who have family members with special diets. Individuals with higher education levels were willing to pay more for lower levels of negative nutrients (indicated, for example, by a TL label) (62).

According to evidence from a moderate-quality systematic review, a total of 31 countries around the world had voluntary or mandatory FOP schemes in place related to salt or sodium content in 2014. The most frequently used schemes were logos and symbols, which also includes TL labels, followed by an FOP scheme with the percentage daily intake or GDA system, and warning labels on high-salt foods (54). Meanwhile, the number of countries with mandatory FOP labelling has increased worldwide, including in all 27 EU Member States.18

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17 GDA labels display nutrients per portion in grams and as a percentage.
Despite the fact that FOP schemes have been introduced by different stakeholders – including government, NGOs and industry – evidence from the modelling studies consistently suggests that legislative/mandatory action would be much more effective. Robust monitoring and evaluation plans built into the systems from the outset will be key to determining their utility and making the case for their more widespread use (54).

The main conclusions from the systematic reviews relevant to this option are summarized in Table 2.

**Table 2. Summary of main conclusions from the systematic reviews relevant for Option 1.2. Food labelling**

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
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</thead>
<tbody>
<tr>
<td><strong>Benefits</strong></td>
<td>• A high-quality systematic review concludes that nutrition labelling alone could modestly reduce salt intake by 0.4 g/day; if the population were to choose products labelled as being low in salt, salt intake could be lowered by 1.2 g/day, or if they choose products labelled as having high salt content it could increase by 1.6 g/day (40).</td>
</tr>
<tr>
<td></td>
<td>• Two systematic reviews, one of high and another of moderate quality, indicates that in Finland, the mandatory warning labels on high-salt foods lowered salt intake between 1978 and 2007 by 36% to approximately by 4 g/day (40,54). During that period stroke and coronary heart disease mortality fell by over 75% (40).</td>
</tr>
<tr>
<td></td>
<td>• Evidence from four systematic reviews finds that nutrition labelling allows consumers to make informed purchasing and consumption choices (40,53,54,61).</td>
</tr>
<tr>
<td><strong>Potential harms</strong></td>
<td>• There is no evidence that nutrition labelling causes unintended harm or adverse effects (17,61).</td>
</tr>
<tr>
<td><strong>Resources, costs and/or cost-effectiveness of the intervention</strong></td>
<td>• Evidence from five systematic reviews on cost-effectiveness concludes that nutrition labelling alone or in combination with other interventions is cost-effective or even cost saving for CVD and stroke prevention, including in LMICs, representing good value for money (19, 55–58).</td>
</tr>
<tr>
<td></td>
<td>• Evidence from a moderate-quality systematic review indicates a considerably lower ICER through labelling, with up to -316 870 INT$/LYG across a 10-year period, associated with both significant savings in medical costs and an important increase in QALYs and a comparatively low number LYG (1970) (55).</td>
</tr>
<tr>
<td></td>
<td>• Compared to less-educated individuals, people with higher levels of education are more willing to pay more for lower levels of negative nutrients (e.g. as indicated by a color-coded TL system) (62).</td>
</tr>
</tbody>
</table>
### Table 2. contd

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncertainty related to potential benefits and harms (monitoring and evaluation could be justified if the option is examined)</td>
<td>- A moderate-quality systematic review indicates that robust monitoring and evaluation plans built into food labelling from the outset will be key to determining their utility and making the case for their more widespread use (54).</td>
</tr>
<tr>
<td>Key elements of the policy option if it was applied elsewhere</td>
<td>- Evidence from the modelling studies consistently suggests that legislative/mandatory action will be much more effective than voluntary (54).</td>
</tr>
<tr>
<td></td>
<td>- A moderate-quality systematic review indicates that in the United Kingdom the TL labelling system had been used as a reinforcement mechanism together with media campaigns on food reformulation by the industry, involving close monitoring and political pressure (53). This is confirmed by evidence from another four systematic reviews which find that nutrition labelling had been used as a tool for putting pressure on the food industry to reformulate foods (40,53,54,61).</td>
</tr>
<tr>
<td></td>
<td>- Evidence from a moderate-quality systematic review reports that consumers who had knowledge of food labelling tend to purchase and consume healthier food than those who did not have prior knowledge; consumers of low SES, with higher BMI, who have children living in their households, along with price-focused consumers are less likely to use food labels than health-conscious consumers and those who have family members with special diets (62).</td>
</tr>
<tr>
<td></td>
<td>- Evidence from a moderate-quality systematic review suggests that nutrition labels can help consumers identify healthier products more easily and quickly using nutrient-specific systems such as GDA labels combined with colour-coded nutrient level indicators compared to simple summary icons (62).</td>
</tr>
<tr>
<td>Opinions and experience of the stakeholders</td>
<td>- Evidence from two systematic reviews indicates that among many EU consumers, about 50% of those who might use food labels have reported difficulties in interpreting them. Much depends on health literacy; different labelling systems may confuse consumers who prefer simple (TL) labels, which are easier to understand (40,53).</td>
</tr>
</tbody>
</table>
Option 1.3. FOOD PROCUREMENT POLICY IN SPECIFIC SETTINGS

Overview and context

This option provides an overview of the evidence available about food procurement policy in specific organizational settings, such as schools, hospitals, and workplaces. The reason for identifying this option is that public facilities provide significant amounts of food for consumption, including by vulnerable populations, such as children and seniors. Thus, promoting healthier food environments in public settings can help mitigate adverse health outcomes (63).

According to the available evidence, food procurement policy in specific settings is defined as nutrition policy (e.g. limits on sodium content in foods) implemented within a system of contained food-service settings or environments, particularly publicly funded environments such as schools, colleges/universities, child-care settings, workplaces, recreational facilities, prisons, hospitals and long-term care facilities (17). Healthy food procurement refers to the process of procuring, distributing, selling and/or serving food to facilitate healthier dietary behaviours based on nutritional standards/guidelines containing product-specific restrictions aiming to limit consumption of unhealthy foods (including those high in salt) (63).

Evidence indicates that childhood is a critical period for establishing lifelong eating habits, which influence future risk of obesity and cardiometabolic diseases. Young people consume between a third and half of their meals at school, making this a crucial setting for interventions that alter the food environment (64).

In the Republic of Moldova, product-specific restrictions were introduced in 2012 by amending Law No. 78/2004, prohibiting the serving, offering or selling of unhealthy food in and around schools. In 2016 the Ministry of Health introduced recommendations on preparing and serving meals for preschool institutions19 and modified it in 2018. In February 2020 Law No. 78/2004 was replaced by Law No. 306/2018 on food safety, which establishes general principles regulating food and feed and, in particular, their safety.

National authorities, particularly the Ministry of Health and the Ministry of Education and Research are currently looking to improve feeding practices in educational institutions/settings, to improve the nutritional status of children and students in order to prevent NCDs later in life. A general provision on food procurement is part of the Instruction on organization of provision of meals in educational institutions, approved by Government Decision No 722/2018. In May 2020 both ministries expressed their willingness to improve food procurement policy during a meeting of an intersectoral working group that develops nutritional standards for preschool children. Nutritional standards/guidelines for other

19 Order of the Ministry of Health No. 638/2016 on the implementation of recommendations for a healthy diet and adequate physical activity in educational institutions in the Republic of Moldova.
settings, such as workplaces, hospitals and long-term care facilities are not in place; nor are they yet on the public health policy agenda.

### Results of the scientific literature review

A total of 10 systematic reviews about food procurement policy in specific settings were found and all of them were included in this EBP (see Annex 1 and Annex 2).

Consistent evidence from seven systematic reviews, four of high and three of moderate quality, shows that food procurement policy in specific settings have a positive impact in relation to availability and selection of healthy foods, and are effective in reducing salt intake \(17, 40, 52-54, 64, 65\). Healthy food procurement policies and programmes and nutritional standards can promote healthy food consumption and/or decrease unhealthy food consumption \(63\).

Evidence from a high-quality systematic review indicates that introducing standards for sodium levels in hospital meals decreased the median sodium intake by 19%, from 2636 mg/day to 2149 mg/day, and willingness on the part of hospitals to work collaboratively with governments on defining the framework for nutrient standards can help significantly improve the nutritional content of meals \(65\). A hospital catering initiative to improve the dietary quality of the menu offered resulted in lower overall intakes of salt, sugar, fat and saturated fat in a hospital setting \(63\).

A high-quality systematic review reports that introducing school meal standards contributed to a gradual reduction in the sodium content of foods and consequently salt intake reduction \(65\). A high-quality systematic review supported the importance of the role of schools in improving overall dietary habits of children, both within and outside school, indicating that school meal standards decreased habitual sodium intake by 170 mg/day, sodium intake at in-school lunch by 227 mg/day, and in-school meal (breakfast and lunch) sodium intake by 221 mg/day. This did not lead to any significant compensation in terms of sodium intake elsewhere. Also, competitive food standards that include product-specific restrictions – including limiting less healthy nutrients, such as sugar, salt and fat by calories, or by portion size (or both) – reduced consumption of unhealthy snacks by 0.17 servings/day \(64\), as well as increasing the use of low-sodium canned vegetables, other seasoning instead of salt, and low-sodium recipes among the schools that prepare food on school premises \(65\). Nutritional guidelines in schools led to increased availability (that is, providing more servings at a meal) of fruit and vegetables (ranging from +0.28 servings/day to +0.48 servings/day) \(63\). Evidence from a high-quality systematic review confirms that healthier school lunches not only improved nutrient intake at lunch time, but that these were also associated with improvements in the overall diet of children aged 4–7 years, decreasing sodium intakes significantly between 2003/2004 and 2008/2009, from 2.0 g to 1.85 g per day and from 2.59 g to 2.15 g per day among children aged 11–12 years \(53\).
A high-quality systematic review finds that reduced-sodium lunches (mean difference (MD) -1093 mg) were generally acceptable to uninformed consumers at a university restaurant and lowered daily sodium intake by approximately 900 mg/day (65).

Evidence from a modelling study shows that replacing one unhealthy snack with one healthy snack among the adult population decreased daily salt intake by 0.51 g (7%) which would prevent 2400 coronary heart disease deaths per year and result in 425 fewer stroke deaths per year (52).

A high-quality systematic review reports that food procurement interventions in specific settings, such as schools, workplaces, or hospitals were effective in reducing salt intake; however, effectiveness varies widely (40). Moreover, evidence from a moderate-quality systematic review indicates that salt-reduction interventions, including food procurement policy, are cost-effective (55). Nevertheless, findings were stronger for interventions that involved healthy food procurement paired with additional strategies, such as increased education measures or price reductions (63,66), especially in developing countries, including the Republic of Moldova (2), where salt added by consumers during cooking or before or while eating plays a bigger role in population salt intake (54).

A moderate-quality systematic review demonstrates that procurement policies which incorporate salt standards for foods in public institutions/settings such as public schools and hospitals, as part of their national salt-reduction strategies, were implemented in 42 (19 voluntary; 23 mandatory) countries worldwide by 2014 (as well as more led by state and local government jurisdictions) (54).

**Food environment around schools**

A moderate-quality systematic review indicates that food outlets around schools were associated with increased consumption of food high in salt (and fat and sugar; HFSS foods). There was a positive correlation between distance to grocery shops and healthy eating indexes (HEI); students attending schools with a convenience store or fast-food outlet further than 1 km away had a significantly higher HEI score than students with an outlet within 1 km. Evidence indicates that food outlet density was positively correlated with students’ fast-food purchases; at the same time, unhealthy diet scores (frequency of consuming crisps, sweets, biscuits, fried food, and/or fizzy drinks) were negatively correlated with the minimum distance to grocery shops and takeaways within 800 meters (45).

The main conclusions from the systematic reviews relevant to this option are summarized in Table 3.
### Table 3. Summary of main conclusions from the systematic reviews relevant for Option 1.3. Food procurement policy in specific settings

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>• Consistent evidence from seven systematic reviews, four of high and three of moderate quality, shows that food procurement policies in specific settings have a positive impact in relation to availability and selection of healthy food and are effective in reducing salt (17,40,52–54,64,65).</td>
</tr>
<tr>
<td></td>
<td>• Evidence from a high-quality systematic review indicated that introducing standards for sodium levels in hospital meals decreased the median sodium intake by 19%, from 2636 mg/day to 2149 mg/day (65).</td>
</tr>
<tr>
<td></td>
<td>• Evidence from a high-quality systematic review confirms that healthier school lunches not only improved nutrient intake at lunch time, but that these also improved the overall diet of children aged 4–7 years, decreasing sodium intakes significantly between 2003/2004 and 2008/2009 from 2.0 g to 1.85 g per day and from 2.59 g to 2.15 g per day among children aged 11–12 years (53).</td>
</tr>
<tr>
<td></td>
<td>• A high-quality systematic review supports the importance of schools in improving the overall dietary habits of children both within and outside school, reflecting the fact that school meal standards decreased habitual sodium intake by 170 mg/day (64).</td>
</tr>
<tr>
<td></td>
<td>• Food standards that include product-specific restrictions reduced unhealthy snack consumption by 0.17 servings/day (64) and increased the use of low-sodium canned vegetables, other seasoning and low-sodium recipes among the schools that prepare food on school premises (65).</td>
</tr>
<tr>
<td></td>
<td>• Evidence from a modelling study shows that replacing one unhealthy snack with one healthy snack among the adult population decreased daily salt intake by 0.51 g (7%), which would prevent 2400 coronary heart disease deaths/year and result in 425 fewer stroke deaths/year (52).</td>
</tr>
<tr>
<td></td>
<td>• A high-quality systematic review reports that reduced-sodium lunches (MD -1093 mg) were generally acceptable to uninformed consumers at a university restaurant and lowered daily sodium intake by approximately 900 mg/day (65).</td>
</tr>
<tr>
<td>Potential harms</td>
<td>• A high-quality systematic review identified no adverse effects from this type of intervention (17).</td>
</tr>
</tbody>
</table>
### Table 3. contd

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources, costs and/or cost-effectiveness of the intervention</td>
<td>• Evidence from a moderate-quality systematic review indicated that salt-reduction interventions, including food procurement policy are cost-effective (55).</td>
</tr>
<tr>
<td>Uncertainty related to potential benefits and harms (monitoring and evaluation could be justified if the option is examined)</td>
<td>• No studies were identified.</td>
</tr>
<tr>
<td>Key elements of the policy option if it was applied elsewhere</td>
<td>• Findings support interventions that involved healthy food procurement paired with additional strategies, such as education measures or price reductions (63,66), especially in developing countries, including the Republic of Moldova, where salt added by consumers during cooking or before or while eating plays a bigger role in population salt intake (2,54).</td>
</tr>
<tr>
<td></td>
<td>• Evidence from a high-quality systematic review indicates that willingness on the part of hospitals to work collaboratively with governments on defining the framework for nutrient standards can help significantly improve the nutritional content of meals and to reduce salt intake in hospitals (65).</td>
</tr>
<tr>
<td>Opinions and experience of the stakeholders</td>
<td>• Offering healthy foods in public settings normalizes healthy eating in different contexts and contributes to a broader public health goal of improving the quality of citizens’ diets (63).</td>
</tr>
<tr>
<td></td>
<td>• Stakeholder experiences emphasize the role of contextual factors, such as institutional history, stakeholder engagement, and high-level support, in ensuring successful development and implementation of healthy food procurement policies (63).</td>
</tr>
<tr>
<td></td>
<td>• Nutrition standards and policies need to be adapted to local contexts based on differing cultural, social and spiritual values. These, slower, progressive approaches to change can be applied or, alternatively, regulatory approaches involving stricter implementation guidelines may be more effective in other settings (63).</td>
</tr>
</tbody>
</table>
**Option 1.4. RESTRICTIONS ON MARKETING TO CHILDREN**

**Overview and context**

This policy option was identified to present arguments regarding restricting the marketing of foods high in salt and unhealthy foods, particularly to children.

According to the evidence, children do not have the developmental maturity to recognize the purpose of advertising or to assess advertising claims; only at around 12 years old do children have the cognitive skills to evaluate advertising more critically, and the persuasive intent of advertising is not understood fully until late adolescence or early adulthood (42). Moreover, younger children might be more vulnerable to the influence of food advertising, associate the marketed products with positive features, and subsequently imitate the behaviours they see (67).

In the Republic of Moldova current legislation on marketing and advertising to children forbids only: (i) the involvement and participation of people aged under 18 years, as well as the use of images with their faces in advertising and promotion of unhealthy foods; and (ii) any advertising and promotion of unhealthy food in educational institutions. Moreover, there is no regulation in place banning either digital marketing of unhealthy products to children nor its monitoring, as recommended by WHO (68).

**Results of the scientific literature review**

Seven systematic reviews were identified about the impact of marketing of foods with high salt content and unhealthy food to children; six of these are included in this EBP (see Annex 1 and Annex 2).

Evidence from one high- and two moderate-quality systematic reviews indicates that there is growing evidence, including from regulating bodies and international health organizations, of a relationship between marketing/advertising of foods and the negative impact of this on children’s eating behaviours by increasing dietary intake of HFSS foods, increased risk of overweight and obesity, and poor health outcomes (42,43,67). Moreover, evidence concluded that children are exposed to a high volume of marketing and advertising, of which a substantial proportion is for unhealthy HFSS foods (42,43). The patterns of exposure and the negative impact of food marketing are similar for both HICs and LLMICs (42). Two systematic reviews, one of high quality and another of moderate quality, report that exposure to marketing of unhealthy foods and beverages influenced children’s dietary behaviours during or shortly after exposure to advertisements (43,67) and the effect was greater for children with overweight or obesity, compared to children with healthy body weight (43). Evidence indicates that dietary intake/preference was greater for the marketed dietary products associated with a familiar licensed character/logo than for non-marketed

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20 This is according to Article 23 (4) of Law No. 1227/1997.
products (67). Furthermore, a moderate-quality systematic review indicates that the effects of TV compared to advergame advertising were highly similar, despite TV watching being passive and with interspersed advertising. Combined, both media (TV and advergames) induce a greater effect on dietary intake (43).

Evidence from a high-quality systematic review suggests that younger children (under 8 years of age) might be more susceptible to the impact of food and beverage marketing. They have increased caloric intake, preference scores and often selected unhealthy foods and beverages compared to older children. Thus, children aged 2 or 3 years old, being able to recognize familiar characters and identify food and beverage products, are less capable of understanding the intention behind advertising and differentiating between programme content and advertisements. Findings suggest that child-targeted and adolescent-targeted food and beverage advertisements tend to focus on boys, perhaps because they are more susceptible to external cues (relating to food advertisements) (67).

Nevertheless, three moderate-quality systematic reviews conclude that children’s exposure to marketing of unhealthy food and beverage products can be reduced by regulating the advertising of HFSS foods to children (42–44). A high-quality systematic review reports that a ban on TV advertising of HFSS foods could reduce overweight and obesity in childhood by 18% and 2.5%, respectively (67). Data from surveys of French-speaking children in Québec indicated that the ban on advertising (a result of the Children’s Television Act of 1990) appeared to have an impact, but it is less effective for English-speaking children. However, Québec French-speaking children were still exposed to advertisements for HFSS foods, despite a ban on advertising to children aged under 13 years (42,44). In the United Kingdom, the data indicated a 51% reduction in exposure to TV advertisements for HFSS foods during the period 2007–2010 for children aged 5–9 years, and a reduction of 23% for children aged 10–15 years in a wide segment of TV programming. While the number of HFSS advertisements shown during children’s programming fell from 0.3 million in Q1 2005 to virtually zero in 2009, the numbers of advertisements for HFSS foods shown in non-child programming – but still seen by children – rose from 1.4 to 3.2 million in the same period, possibly due to the proliferation of commercial channels across that period (44). Evidence indicates that parental mediation, in the form of guidance on food consumption or explaining the purpose of advertising could be effective in moderating the influence of TV food advertising and associated dietary intake (42,43). There is still very little evidence that advertising literacy can be used as a successful measure against advertising of HFSS foods (42). Moreover, the emergence of new media channels that can be directly accessed by children raises further concerns about the nature of regulations needed to control exposure of children to unhealthy food marketing (44).

A moderate-quality systematic review confirmed that advertising regulation produces a cumulative positive impact on health outcomes, but it takes time to change the social norms associated with children’s dietary behaviour and these results were only seen after 40 or
50 years. Thus, WHO has recommended greater efforts should be made to reduce children’s exposure to advertising of HFSS foods at the national, cross-border and global levels (69). Furthermore, evidence indicates that leadership from governments and other actors could provide robust standards for monitoring and compliance, including outcomes on health, consumption behaviour, volume of advertising exposure, advertising expenditure and valid nutrient criteria (42).

### Statutory regulation

One high-quality and two moderate-quality systematic reviews indicate that statutory regulation had produced successful outcomes in relation to volume of, or exposure to, advertising of HFSS foods and purchasing of such foods by children (17,42,44). However, there is insufficient evidence to cover the full range of opportunities for marketing to children (44). The evidence explored specifies that the effects could be greater if the regulation were extended to marketing programmes not specifically targeting children but to which large proportions of children are still exposed (17,44).

Furthermore, evidence recommends comprehensive statutory measures are implemented, with adequate monitoring of compliance and adequate sanctions for non-compliance, based on government-led definitions of the media to be covered, the products to be controlled and the audience to be protected. Findings from the literature show a distinct division between industry-sponsored reports, which indicate a remarkable reduction in the promotion of unhealthy foods and children’s exposure, and reports from a variety of other authoritative sources, which show weak or no reductions, or insufficient evidence of change as a result of self-regulation (44). Moreover, evidence indicates that statutory regulations were concentrated in HICs, including Norway, Sweden, the province of Québec, Canada, United Kingdom, South Korea, and United States (17,42,44).

### Self-regulation

Two moderate-quality systematic reviews conclude that introducing voluntary regulation produced little or no change in children’s exposure to advertising, despite the efforts of leading food and beverage companies in proposing a series of company-led pledges to modify their marketing activities directed at children (42,44). A major struggle with these commitments is that companies can define autonomously which of their products are considered healthier, and that many commitments refer only to TV advertising. Use of independently defined measures of nutritional quality by the industry is lacking. Thus, the evidence shows that measures of nutritional quality implemented by the industry are often inadequate, with only 59% of industry-approved HFSS products being classed as healthy foods according to independent criteria (42).

Furthermore, evidence suggests that self-regulatory pledges are unlikely to be sufficiently comprehensive to have the desired effect of reducing children’s exposure to marketing of
unhealthy food. The narrow range of media, the weak definitions of marketing, the lack of support for these pledges of many large food companies and the lack of enforceability or penalties are the main causes of this failure. Evidence indicates that self-regulation is less likely to recognize the use of social networking sites; smart-phone apps; downloadable advergames; the cross-branding of healthier food and beverage products and non-food products with unhealthy food-related brand identities; or marketing in school and other child-friendly settings. Self-regulation does not generally include retail displays and in-store promotions, product design and formulation, or product labelling and packaging, it does not cover the use of licensed characters and tie-in characters from TV shows and cinema films being used on product packaging (44).

Moreover, evidence indicates that there are clear differences in the results from studies funded by the food industry and those funded through national research funding avenues, government and advocacy groups on the regulation of children’s exposure to advertising. The reports not sponsored by the industry show only low levels of improvement over the period. In contrast, there is very strong evidence of improvement reported in industry-sponsored reports, even in countries or regions where other reports or scientific surveys have not found this to be the case (42,44).

The main conclusions from the systematic reviews relevant to this option are summarized in Table 4.

**Table 4. Summary of main conclusions from the systematic reviews relevant for Option 1.4. Restrictions on marketing to children**

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benefits</strong></td>
<td>• A high-quality systematic review reports that a ban on TV advertising of HFSS foods could reduce overweight and obesity in childhood by 18% and 2.5%, respectively (67).</td>
</tr>
<tr>
<td></td>
<td>• In the United Kingdom, the data on the ban on TV advertising indicated a 51% reduction in exposure to TV advertisements of HFSS foods during the period 2007–2010 for children aged 5–9 years, and a reduction of 23% for children aged 10–15 years across a wide segment of TV programming (44).</td>
</tr>
<tr>
<td></td>
<td>• A moderate-quality systematic review confirms that advertising regulation produces a cumulative positive impact on health outcomes, but it takes time to change the social norms associated with children’s dietary behaviour and these results were only seen after 40 or 50 years (42).</td>
</tr>
<tr>
<td></td>
<td>• The evidence specifies that the effects could be larger if the regulation were extended to marketing programmes not specifically targeting children but still to which large proportions of children are still exposed (17,44).</td>
</tr>
</tbody>
</table>
### Table 4. contd

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential harms</td>
<td>- A high-quality systematic review identifies no adverse effects (^{(17)}).</td>
</tr>
<tr>
<td>Resources, costs and/or cost-effectiveness of the intervention</td>
<td>- Evidence from a moderate-quality systematic review indicates that salt-reduction interventions in the whole population are cost-effective (^{(55)}).</td>
</tr>
</tbody>
</table>
| Uncertainty related to potential benefits and harms (monitoring and evaluation could be justified if the option is examined) | - Evidence from a moderate-quality systematic review recommends comprehensive statutory measures with adequate monitoring of compliance and adequate sanctions for non-compliance, based on government-led definitions of the media to be covered, the products to be controlled and the audience to be protected \(^{(44)}\).  
- A moderate-quality systematic review indicates that leadership from government and other actors could provide robust standards for monitoring and compliance, including outcomes on health, consumption behaviour, volume of advertising exposure, advertising expenditure and valid nutrient criteria \(^{(42)}\).  
- Evidence indicated that the emergence of new media channels, which can be directly accessed by children, raises further concerns about the nature of regulations needed to control children’s exposure to unhealthy food marketing \(^{(44)}\). |
| Key elements of the policy option if it was applied elsewhere | - One high- and two moderate-quality systematic reviews indicate that statutory regulation had produced successful outcomes in relation to volume of, or exposure to, advertising of HFSS foods and purchasing of these foods by children \(^{(17,42,44)}\).  
- The evidence concludes that statutory regulation may have the potential to reduce children’s exposure advertising significantly, but the current regulatory environment is insufficient to cover the full range of opportunities for marketing to children \(^{(44)}\).  
- Evidence from two moderate-quality systematic reviews indicates that parental mediation in the form of guidance on food consumption or explaining the purpose of advertising could be effective in moderating the influence of TV food advertising and associated dietary intake \(^{(42,43)}\). |
Evidence suggests that self-regulatory pledges are unlikely to be sufficiently comprehensive to have the desired effect of reducing children’s exposure to marketing of unhealthy food (44).

Two moderate-quality systematic reviews indicate that there are clear differences in the results from studies funded by the food industry and those funded through national research funding avenues, government and advocacy groups on the regulation of children’s exposure to advertising. The reports not sponsored by the food industry show only low levels of improvement over the period. In contrast, there is very strong evidence of improvement reported in industry-sponsored reports (42,44).

### Option 1.5. PRICING INTERVENTIONS

#### Overview and context

This option focuses on pricing interventions to reduce salt intake that can enhance healthier eating by influencing dietary behaviours.

Pricing interventions are defined as large-scale strategies designed to manipulate the price of food ingredients or products in a way that encourages the purchase of healthier foods and discourages the purchase of less healthy foods via fiscal policy; namely, taxation and subsidies (17,70). This may include strategies to manipulate the price of table salt or high-salt products (such as condiments) (17).

In the Republic of Moldova there is no experience of using pricing interventions to improve nutrition. Gradual increasing of tobacco and alcohol taxes has been used to reduce tobacco and alcohol consumption.

#### Results of the scientific literature review

A total of nine systematic reviews were identified and all have been included in the EBP (see Annex 1 and Annex 2).

Three moderate-quality systematic reviews conclude that higher pricing (taxation) and/or food subsidies can be effective for improving population dietary behaviours by enhancing the consumption of healthier foods and lowering purchases of HFSS foods (54,55,70). Furthermore, a high-quality systematic review of evidence for an effectiveness hierarchy of dietary salt-reduction policies concludes that tax on high-salt/sodium foods could modestly
reduce salt intake by 0.3 g/day (40). Evidence indicates that price increases can greatly reduce tobacco and alcohol consumption; nevertheless, salt is cheap, and a substantial tax of at least 40% might be needed to reduce consumption by just 6% (40,52,53). A moderate-quality systematic review indicates that the effects of taxation tend to be proportional to price differences, with larger price changes being associated with greater differences in consumption, and a tax of at least 20% is necessary to have a beneficial health effect (70).

Two moderate-quality systematic reviews conclude that increasing tax on salty snacks by 20% would reduce salt consumption by 115–170 g per person per year (53), and that 1%, 10%, or 20% tax on all salty snacks would reduce their intake by between 6.5 g and 128 g per person per year (52).

Economic evidence from a moderate-quality systematic review shows that salt/sodium tax interventions are very cost-effective in the prevention of hypertension; these are associated with a gain in QALYs, provide savings in medical and productivity costs and/or have low implementation costs and ICER. Preventive effects in terms of cancer and other diseases suggest additional benefits of salt tax interventions and therefore a higher cost-effectiveness (55). Evidence from a modelling study suggests that a 20% tax on major dietary sodium sources might prevent or postpone 2000 deaths annually and might gain more QALYs than other interventions (40). Increasing the price of salty foods by 40% can produce reductions of 0.93 mmHg in mean SBP that would avert 327 892 strokes and 306 137 myocardial infarctions in adults (aged 40–85 years) (52). Furthermore, evidence specifies that the revenue generated by taxation may be used to fund better targeted prevention interventions to reduce NCDs, thus diminishing their burden on society and the medical costs associated with them (70).

A moderate-quality systematic review indicates that the revenue from this type of tax (administered through the additional business rates system21) was highly predictable over a three-year period and the revenue raised in this three-year period was slightly above the Government’s predictions. However, by making the tax uneconomic for retailers to try to avoid, while largely insulating consumers from the burden of the tax, there was no mechanism for stimulating desirable changes in the supply and consumption of unhealthy products, or reducing associated health harms. Furthermore, evidence indicated that depending on the objectives of tax design, taxes can be set at varying levels; for example, if the purpose of a tax is to achieve health gains via behavioural change, it must be set at a sufficiently high level. In contrast, if the aim of a new tax is to raise revenue, a lower rate may be more appropriate for ensuring a stable source of revenue. Therefore, policy-makers need to stay alert to the possibility that such taxes may need to be revised or expanded in response to changing behaviours (72).

21 Business rates are a tax on property used for business purposes, designed to help fund services within local authorities. The Government charges business rates on most non-domestic properties such as offices, shops, pubs and warehouses (71).
Evidence concludes that specific taxes (that is, a fixed value based on the quantity, size or weight of the product) are associated with stronger health benefits than ad valorem taxes, which are proportional to the price. Moreover, taxing final products has a more effective impact on consumers' real expenditures than taxes on manufacturers. Findings suggest that earmarking the revenue from health taxes for specific purposes, such as funding health improvement or disease prevention, can increase public and political support for taxes and may help offset the influence of industry interests. Furthermore, evidence indicates that political support for, and opposition to, health taxes are likely to be key to their implementation, which is likely to be affected by food industry lobbying and/or concerns relating to public interest. It has also been shown that opposition to health taxes can develop relatively quickly (72).

In addition, a moderate-quality systematic review indicates that a price subsidy is another effective tool in increasing uptake of the salt substitutes that can decrease salt intake (59). Another moderate-quality systematic review reports that individuals receiving a 10% and 25% discount were less likely to regularly consume foods high in salt (72). Findings from modelling studies identify cumulative evidence of moderate strength for a subsidy and/or tax of a minimum of 10–15% being most cost-effective, as well as effective for more healthy diet and ultimately for reducing NCDs (ideally used in tandem) (70). Moreover, the revenue from salt taxation can be used to subsidize other, healthier foods, such as fruit and vegetables, thus reducing the regressive potential of taxes on unhealthy products. It may be possible to put together a package of policies with an overall impact on poverty (72).

A moderate-quality systematic review recommends implementing and evaluating healthy food subsidies and taxation on unhealthy foods in a variety of populations and settings, especially where food is purchased by government organizations or NGOs. Health literacy and marketing about healthy eating, along with supportive price policies are likely to be critical success factors (70). Evidence indicates that, while media support for introducing a health tax may be important in order to succeed, it is not sufficient (72). The evidence concluded that robust monitoring and evaluation plans built in right from the introduction of salt tax will be key for determining its utility (54).

A moderate-quality systematic review reports that taxation on high-salt foods is a component of multifaceted national salt-reduction programmes in a number of countries. Fiji and Hungary, for example, adopted a specific sodium tax, Portugal implemented salt-related tax as a general tax, and Hungary introduced a health product tax on an extensive range of pre-packaged foods with high salt and sugar content in 2011. The tax applies to products such as salty snacks with salt content above 1 g per 100 g, condiments with more than 5 g per 100 g and flavouring containing over 15 g per 100 g. Fiji has a tax on monosodium glutamate, which it increased from 5% to 32% in 2012. Portugal has a value-added tax (VAT) on processed or packaged foods, which covers foods high in salt, compared to a reduced VAT for non-
processed foods. In South Africa and Argentina three salt-related taxes and six mandatory FOP labelling schemes (including salt content labelling) have also been implemented (54).

The main conclusions from the systematic reviews relevant to this option are summarized in Table 5.

### Table 5. Summary of main conclusions from the systematic reviews relevant for Option 1.5. Pricing interventions

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>• Three moderate-quality systematic reviews conclude that higher pricing (taxation) and/or food subsidies can be effective for improving population dietary behaviours by enhancing the consumption of healthier foods and reducing purchases of HFSS foods (54,55,70).</td>
</tr>
<tr>
<td></td>
<td>• A high-quality systematic review of evidence concludes that taxation could modestly reduce salt intake by 0.3 g/day (40).</td>
</tr>
<tr>
<td></td>
<td>• Evidence indicates that because salt is inexpensive, a substantial tax of at least 40% might be needed to reduce consumption by just 6% (40,52,53).</td>
</tr>
<tr>
<td></td>
<td>• Increasing the price of salty foods by 40% can produce reductions of 0.93 mmHg in mean SBP that would avert 327 892 strokes and 306 137 myocardial infarctions in adults (aged 40–85 years) (52).</td>
</tr>
<tr>
<td></td>
<td>• Evidence from a modelling study suggests that a 20% tax on major dietary sodium sources might prevent or postpone 2000 deaths annually and might result in a gain of more QALYs than other interventions (40).</td>
</tr>
<tr>
<td></td>
<td>• Two moderate-quality systematic reviews conclude that increasing tax on salty snacks by 20% would reduce salt consumption by 115–170 g per person per year (53), and that 1%, 10%, or 20% tax on all salty snacks would reduce their intake by 6.5–128.0 g per person per year (52).</td>
</tr>
<tr>
<td></td>
<td>• Two moderate-quality systematic reviews indicate that a combination of taxes and subsidies can have significant behavioural and health impacts (70,72).</td>
</tr>
<tr>
<td>Potential harms</td>
<td>• A high-quality systematic review identifies no adverse effects from this type of intervention (17).</td>
</tr>
</tbody>
</table>
### Category of the conclusion

#### Resources, costs and/or cost-effectiveness of the intervention
- Economic evidence from a moderate-quality systematic review establishes that salt/sodium taxation interventions are very cost-effective for the prevention of hypertension; they are associated with a gain in QALYs, provide savings in medical and productivity costs and/or have low implementation costs and ICER (55).
- The evidence specifies that the revenue generated by taxation may be used to fund better targeted prevention interventions for NCDs, thus reducing their burden on society and medical costs associated with them (70).
- Population-based subsidies combined with taxes are likely to be the most cost-effective and the most effective (70).

#### Uncertainty related to potential benefits and harms (monitoring and evaluation could be justified if the option is examined)
- Evidence indicates that depending on the objectives of tax design, taxes can be set at various levels. If the purpose of a tax is to achieve health gains via behavioural change, it must be set at a sufficiently high level. In contrast, if the aim of a new tax is to raise revenues, a lower rate may be more appropriate for ensuring a stable source of revenue. Therefore, policy-makers need to stay alert to the possibility that such taxes may need to be revised or expanded in response to changing behaviours (72).
- The evidence concludes that employing substitution patterns with non-taxed products can potentially undermine the intended benefit or effectiveness of food taxes, if used as a sole strategy (70).
- The key factors involved in order to engage effectively with the food industry to embrace food subsidies/taxation remain relatively unexplored, and defining what foods are deemed or labelled as healthy or unhealthy continues to be a source of international debate (70).
- The evidence concludes that robust monitoring and evaluation plans built in right from the outset of salt tax introduction will be key for determining its utility (54).

#### Key elements of the policy option if it was applied elsewhere
- A moderate-quality systematic review indicates that a salt tax of at least 20% is necessary to have a beneficial health effect (70).
### Table 5. contd

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(contd) Key elements of the policy option if it was applied elsewhere</td>
<td>• Specific taxes (that is, a fixed value based on the quantity, size or weight of the product involved) are associated with stronger health benefits than ad valorem taxes (72).</td>
</tr>
<tr>
<td></td>
<td>• A moderate-quality systematic review recommends implementing and evaluating healthy food subsidies and unhealthy food taxation in a variety of populations and settings, especially where food is purchased by government organizations or NGOs. Health literacy and marketing about healthy eating, along with supportive pricing policies are likely to be critical success factors (70).</td>
</tr>
<tr>
<td></td>
<td>• Imposing taxes across an entire population will require the involvement of many stakeholders, including representatives from the industry, NGOs, policy-makers and commissions, sponsors and advocacy groups in order to promote acceptance by the public (70).</td>
</tr>
<tr>
<td></td>
<td>• Evidence indicates that, while media support for introducing a health tax may be important to succeed, it is not sufficient (72).</td>
</tr>
<tr>
<td>Opinions and experience of the stakeholders</td>
<td>• Findings suggest that earmarking the revenue from health taxes for specific purposes, such as funding health improvement or disease prevention, can increase public and political support for taxation and may help offset the influence of industry interests (72).</td>
</tr>
<tr>
<td></td>
<td>• The evidence indicates that political support for, and opposition to, health taxes are likely to be key to their implementation, which is likely to be affected by food industry lobby and/or public interest concerns. It has also been shown that opposition to health taxes can develop relatively quickly (72).</td>
</tr>
<tr>
<td></td>
<td>• Evidence concluded that making the tax uneconomic for retailers to try to avoid, while largely insulating consumers from the burden of the tax, there was no mechanism for stimulating desirable changes in the supply and consumption of unhealthy products, or reducing associated health harms (72).</td>
</tr>
</tbody>
</table>
APPROACH 2. Population-level behaviour-change interventions

Population-level behaviour-change interventions are also termed downstream or agentic interventions, depending on the individual responding (40). They include efforts that aim to strengthen individuals by providing information, education or skills (17).

Option 2.1. HEALTH EDUCATION

Overview and context
The option is about strengthening the health literacy capacity of individuals to diminish any personal deficit in terms of information, knowledge or skills related to excess salt/sodium consumption.

The scientific literature characterizes health education as the provision of in-depth information about salt reduction delivered directly to various groups of people (39). Dietary advice can take many forms, including verbal or written, one-off or multiple contacts with individuals or groups, and may be delivered by health professionals or other agencies, including, for example, fitness consultants, trade unions or commercial organizations (73).

In the Republic of Moldova health education for reducing salt/sodium consumption has not been developed and, therefore, has not been applied.

Results of the scientific literature review
A total of 17 systematic reviews on health education to increase health literacy about salt reduction (and thereby prevention of high-salt consumption) were found and all of them were included in the EBP (see Annex 1 and Annex 2).

Effects on salt intake
Three high- and one moderate-quality systematic reviews indicate that health education, including dietary advice, appears to be only modestly effective at reducing salt intake, particularly among the general population (39,40,53,66). Thus, a reduction of 0.6 g/day for the general population could be achieved by providing short-term dietary advice across a period of more than 12 months (40).

One high-quality systematic review found that a school-based education programme about the harms of high salt intake alone did not significantly reduce salt intake in children aged 10–12 years (39). Two high- and one moderate-quality systematic reviews conclude that involving parents and family members who usually prepare foods in a family-based programme can ensure the intervention is more effective and sustainable (39,40,74). In Finland, a modelling study on education strategy to reduce the use of salt in home cooking reduced salt intake by 50% (2.5 g/day; 15% among men; 1.8 g/day; 13% among women) (52).
Furthermore, two high- and one moderate-quality systematic reviews suggest that people with a clinical diagnosis of CVD were more likely to be motivated to reduce their sodium intake. Likewise, the effects of dietary salt advice were greater among people with hypertension (possibly because of greater adherence to salt-reduction efforts) and to whom underlying risks of CVD were higher (66,73,75). Thus, the evidence shows that advice to reduce salt demonstrated small reductions in urinary 24-hour sodium excretion: normotensives (MD –34.19 mmol/24 hours); hypertensives (MD –20.48 mmol/24 hours) and pooled data (MD –27.21 mmol/ 24 hours) (66). A high-quality systematic review reports that combined dietary advice to reduce salt (or fat) intake and increase fruit and vegetable consumption reduced 24-hour urinary sodium excretion by 40.9 mmol after 3–36 months of intervention (73). A moderate-quality systematic review concludes that adequate health literacy was consistently correlated with higher levels of knowledge of both heart failure and salt intake (76).

One moderate-quality systematic review suggests that mHealth interventions have generally led to salt intake reduction, with an SMS platform being the most commonly used, and a mobile-device video game and mobile app that allows users to actively scan food products and obtain nutritional information have potential for future exploration (77). Evidence indicates that mHealth interventions and the inclusion of nutritional education in school curricula should be explored, particularly in countries in which the use of large quantities of salt in cooking plays a larger role in population salt intake (38,77), which includes the Republic of Moldova.

**Effects on blood pressure**

Health education had only minor effects on blood pressure. Evidence from one high-quality systematic review shows that advice to reduce salt resulted in small reductions in SBP (MD –1.15 mmHg) and diastolic blood pressure (DBP) (MD –0.80 mmHg) in normotensives and greater reductions in SBP in hypertensives (MD –4.14 mmHg), but no difference in DBP (66).

Two high- and two moderate-quality systematic reviews specify that the extent of dietary change is influenced by the intensity and duration of the intervention; a higher intensity intervention is associated with greater dietary changes and better health outcomes (39,73–75). A moderate-quality systematic review reports that advice to reduce sodium intake significantly reduced SBP and DBP over 6–12 months compared to control (SBP –2.31 mmHg; DBP –1.16 mmHg) and still reduced SBP but not DBP over 13–60 months (SBP –1.09 mmHg; DBP –0.52 mmHg) (75). Furthermore, one high- and one moderate-quality systematic review indicate that long-term blood pressure reductions would be smaller, with commensurate reductions in clinical benefit that may diminish over time (53,66). Another high-quality systematic review shows that combining dietary advice to reduce salt (or fat) intake and increase fruit and vegetable consumption reduced blood pressure by 2.61 mmHg for SBP and 1.45 mmHg for DBP (73).
A moderate-quality systematic review reports a trend toward decreasing SBP in adolescents aged 13–16 years who participated in an intensive five-day low-sodium diet regimen as part of a hypertension prevention programme (74). Additionally, a moderate-quality systematic review reveals that lifestyle and nutrition interventions, starting from childhood, were found to be key for the prevention of high blood pressure, because early life factors influence the development of hypertension in adulthood. An online family-based, behaviour-change theory-oriented (individualized) programme that involve parents seems to be the most promising approach, preferably with a duration long enough (at least eight months) for habit formation (74).

At the same time, a high-quality systematic review reports that mHealth intervention aiming to improve several stroke risk factors had no effect on salt intake or blood pressure (65).

**Effects on morbidity and mortality**

Evidence specifies that CVD was lower in people receiving advice to reduce sodium and suggests a subsequent reduction in cardiovascular events, incidence of heart disease, stroke or heart attack (73,75). At the same time, evidence indicates that dietary advice does not reduce all-cause mortality and is insufficiently strong to confirm clinically important effects of such advice on cardiovascular mortality in normotensive or in hypertensive populations (66,75). Moreover, a high-quality systematic review indicates that sustained long-term reductions in DBP of 1 mmHg and 4 mmHg would be predicted to reduce CVD mortality by 5% and 20%, respectively (66).

**Cost-effectiveness and settings**

Two moderate-quality systematic reviews show that the gain of giving dietary advice over the time horizon compared to no intervention is low, only gaining 180–2600 QALYs compared to other interventions (7900–195 000 QALYs) (55,57). Moreover, two high- and two moderate-quality systematic reviews demonstrate that dietary advice is a cost-ineffective approach requiring considerable efforts to implement and would not have an expected effect on the burden of CVD proportionate to its cost (55,57,66,73). Evidence shows that dietary advice for a high-risk group was a cost-ineffective intervention (24 600 INT$/QALY and up to 303 900 INT$/DALY) compared to population-wide approaches (55,57). Thus, it will be essential to establish a mechanism for monitoring the progress at population level of dietary salt intake and blood pressure when introducing dietary advice (66).

Evidence from two high- and one moderate-quality systematic reviews conclude that, to be effective, health education for the general population should be located in workplaces and other non-health settings, not in routine clinical facilities (39,73,75). One high- and one moderate-quality systematic reviews indicate that community-based health education is effective in reducing salt consumption (40,59). Nevertheless, the benefits of dietary counselling/education decrease over time and are thus generally not sustainable. For many
individuals, issues such as competing priorities and financial constraints might reduce compliance and adherence, thus reducing population benefits (40).

Around the world, consumer education interventions are part of almost all salt-reduction strategies and are implemented in conjunction with other population-level salt-reduction measures. Among 75 countries having a national salt-reduction strategy, 71 countries have consumer education campaigns; 50 of which are led solely by government, 16 by both government and NGOs or industry, and five are led solely by NGOs (54). Moreover, evidence concludes that implementing structural initiatives – such as those that lower the salt content of foods or improve the food environment – together with health education measures to reduce the amount of salt consumed will make it much easier for people to achieve a salt intake reduction (39, 66).

The main conclusions from the systematic reviews relevant to this option are summarized in Table 6.

**Table 6. Summary of main conclusions from the systematic reviews relevant for Option 2.1. Health education**

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>Three high- and one moderate-quality systematic reviews indicate that health education, including dietary advice, appears to be only modestly effective at reducing salt intake (39, 40, 53, 66).</td>
</tr>
<tr>
<td></td>
<td>A reduction of 0.6 g/day among the general population could be achieved by providing short-term dietary advice across a period of more than 12 months (40).</td>
</tr>
<tr>
<td></td>
<td>A high-quality systematic review shows that dietary advice reduced blood pressure by 2.61 mmHg for SBP and by 1.45 mmHg for DBP, as well as 24-hour urinary sodium excretion by 40.9 mmol after 3–36 months of intervention (73).</td>
</tr>
<tr>
<td></td>
<td>Two high- and one moderate-quality systematic reviews suggest that people with a clinical diagnosis of CVD are likely more to achieve reductions in their sodium intake and, similarly, the effects of dietary salt advice are greater among people with hypertension and to whom the underlying risks of CVD are higher (66, 73, 75).</td>
</tr>
<tr>
<td></td>
<td>Evidence shows that advice to reduce salt showed minor reductions in SBP (MD –1.15 mmHg) and DBP (MD –0.80 mmHg) among normotensives and greater reductions in SBP among hypertensives (MD –4.14 mmHg), but no difference in DBP (66).</td>
</tr>
</tbody>
</table>
**Table 6. contd**

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benefits</strong></td>
<td>Evidence indicates that dietary advice does not reduce all-cause mortality and it was not possible to confirm any clinically important effects of this type of intervention on cardiovascular mortality among the normotensive or hypertensive populations (66,75).</td>
</tr>
<tr>
<td></td>
<td>Data specifies that CVD incidence was lower in people receiving advice to reduce sodium and suggests a tendency towards a reduction in cardiovascular events, incidence of heart disease, stroke or heart attack (73,75).</td>
</tr>
<tr>
<td></td>
<td>Two moderate-quality systematic reviews show that the gain of dietary advice interventions over the time horizon compared to no such intervention is lower, only gaining 180–2600 QALYs compared to other interventions (which achieved a gain of 7900–195 000 QALYs) (55,57).</td>
</tr>
<tr>
<td><strong>Potential harms</strong></td>
<td>One high- and one moderate-quality systematic reviews identify no adverse effects from this type of intervention (17,75).</td>
</tr>
<tr>
<td><strong>Resources, costs and/or cost–effectiveness of the intervention</strong></td>
<td>Two high- and two moderate-quality systematic reviews demonstrate that dietary advice is a cost-ineffective approach requiring considerable efforts to implement and that it would not have an expected effect on the burden of CVD proportionate with its cost (55,57,66,73).</td>
</tr>
<tr>
<td></td>
<td>Evidence found that dietary advice for high-risk groups is a cost-ineffective intervention (24600 INT$/QALY and &gt;303900 INT$/DALY) (55,57).</td>
</tr>
<tr>
<td><strong>Uncertainty related to potential benefits and harms</strong></td>
<td>The benefits of dietary counselling/education decrease over time and are generally not sustainable (40).</td>
</tr>
<tr>
<td>(monitoring and evaluation could be justified if the option is examined)</td>
<td>One high- and one moderate-quality systematic reviews indicate that long-term blood pressure reductions would be smaller with commensurate reductions in clinical benefit that may diminish over time (53,66).</td>
</tr>
<tr>
<td></td>
<td>It will be essential to establish a mechanism for monitoring the progress at population level of dietary salt intake and blood pressure when introducing dietary advice (66).</td>
</tr>
<tr>
<td><strong>Key elements of the policy option if it was applied elsewhere</strong></td>
<td>Two high- and two moderate-quality systematic reviews specify that the extent of dietary change is influenced by the intensity and duration of the intervention; higher intensity interventions are associated with greater dietary changes and better health outcomes (39,73–75).</td>
</tr>
</tbody>
</table>
### Category of the conclusion

**Summary of the main conclusions**

- Evidence of two high- and one moderate-quality systematic reviews conclude that, in order to be effective, health education among the general population should be located in workplaces and other non-health settings, not in routine clinical facilities (39,73,75).

- One high-quality systematic review shows that a school-based education programme about the harms of high salt intake alone was not significant in reducing salt intake among children aged 10–12 years (39).

- A moderate-quality systematic review demonstrates a trend toward decreasing in SBP in adolescents aged 13–16 years who participated in an intensive five-day low-sodium diet regimen as part of a hypertension prevention programme (74).

- Two high- and one moderate-quality systematic reviews conclude that involving parents and family members who usually prepare foods in a family-based programme can ensure the effectiveness and sustainability of the intervention (39,40,74).

- A moderate-quality systematic review suggested that mHealth interventions have generally led to salt intake reduction; with an SMS platform being the most commonly used, and a mobile-device video game and mobile app that allows users to actively scan food products and obtain nutritional information have potential for future exploration (77).

- Based on a comparison of the intervention characteristics, behavioural interventions that had several types of delivery mode were more likely to be effective (65).

### Opinions and experience of the stakeholders

- A moderate-quality systematic review shows that lifestyle and nutrition interventions, starting from childhood, were found to be key for the prevention of high blood pressure, because early life factors influence the development of hypertension in adulthood (74).

- Evidence indicates that mHealth interventions and including nutritional education in school curricula should be explored, particularly in countries in which the use of large quantities of salt in cooking plays a larger role in population salt intake (38,77), which includes the Republic of Moldova.
Evidence concludes that implementing structural initiatives – such as lowering the salt content of foods or improving the food environment – with health education measures to reduce salt intake will make it much easier for people to achieve a salt intake reduction (39,65,66).

Table 6. contd

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(contd) Opinions and experience of the stakeholders</td>
<td>- Evidence concludes that implementing structural initiatives – such as lowering the salt content of foods or improving the food environment – with health education measures to reduce salt intake will make it much easier for people to achieve a salt intake reduction (39,65,66).</td>
</tr>
</tbody>
</table>

- **Option 2.2. INFORMATION CAMPAIGNS**

  - **Overview and context**

    This policy option provides an overview of the best available evidence about information measures focusing on reducing salt intake and the conditions under which it produced these effects.

    Public-awareness campaigns to reduce salt intake are interventions focusing specifically on salt/sodium or more broadly on diet in order to change salt-consumption behaviour on a large scale. These are often characterized by short messages delivered through diverse mass media, print and digital media that pertain to a whole-government jurisdiction (17,39).

    In the Republic of Moldova, a large quantity of dietary sodium comes from discretionary salt that is added before or while eating, or when cooking. A general message to reduce salt, sugar and fat consumption has been broadcast on TV channels for several years. A dedicated mass-media campaign with a short message to reduce salt intake started in September 2019 (according to the National Programme on Food and Nutrition 2014–2020 and the action plans regarding its implementation), but it was interrupted by the novel coronavirus (COVID-19) outbreak.

  - **Results of the scientific literature review**

    A total of 15 systematic reviews on information campaigns for consumer behaviour change were found; 14 systematic reviews were included in the EBP (see Annex 1 and Annex 2).

    Two high- and one moderate-quality systematic reviews indicate that population-level awareness-raising interventions can improve salt-related behaviours and/or reduce discretionary salt intake, but these showed only small effects and their benefits may diminish over time (39,40,52). Evidence concludes that awareness campaigns might reduce

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22 Government Decision No. 730/2014 on the approval of the National Programme on Food and Nutrition for the years 2014–2020 and the action plans regarding its implementation.
salt consumption from 0.03 g/day to 0.13 g/day (40) and this type of intervention alone is unlikely to be sufficient to achieve the WHO target of a 30% reduction in average salt intake (39).

However, two high- and two moderate-quality systematic reviews conclude that salt-specific awareness campaigns via mass media were cost-effective or even cost-saving, including in LMICs (19,55,57,58). Evidence indicates that in China mass-media campaigns for salt intake reduction were assessed to be very cost-effective over a long period (50 years) (57). Furthermore, a moderate-quality systematic review concludes that public-awareness campaigns can be expensive, especially when it comes to traditional forms of media such as TV and printed media (48).

Economic evidence concludes that mass-media campaigns aiming to reduce salt intake among the whole population are either very cost-effective or cost-saving in the prevention of hypertension and CVD (55,58). They are therefore associated with a gain in QALYs, providing savings in terms of medical and productivity costs due to averted hypertension cases, and/or have low implementation costs. Additional suggested benefits of salt reduction include preventive effects for cancer and other diseases and therefore a higher cost-effectiveness of salt-reduction interventions. Awareness campaigns about salt intake delivered via mass media had a low ICER that can be attributed to the wide reach of this type of intervention and the comparatively low cost per subject (55).

Moreover, a high-quality systematic review specifies that behaviour-change interventions, including information campaigns, not only change people’s knowledge, attitudes and behaviours related to salt consumption, but they can also generate demand for policy changes and for low-salt foods, improving the value of structural interventions such as procurement policies, nutrition labelling schemes and fiscal policies. Thus, additional research is needed to understand the overall benefits of behaviour-change interventions (39). Another high-quality systematic review indicates that, in order to raise consumer awareness and shift perceptions regarding the health benefits of salt reduction and to increase demand for low-salt foods, health-promotion campaigns should be implemented together with product labelling (41). Additionally, two high quality systematic reviews stated that monitoring framework should be part of the intervention, to permit evaluation of both overall impact and impact across social groups, particularly in LMICs (17,39).

Therefore, three high and two moderate quality systematic reviews concluded that a combination of providing information and making structural changes might be the most effective strategy to facilitate behavioural modifications (17,39,40,54,55). A high-quality systematic review showed that the multicomponent nature of salt-reduction strategies allowed the salt-reduction message to be reinforced through several mediums and potentially resulting in a higher intervention dose (65). Another high-quality systematic review confirmed
that salt-reduction interventions focusing on legislation – implemented together with campaigns that educate the public – are cost-effective \((56)\), suggesting that salt intake reduction interventions are one of the so-called best buys globally \((55)\). Such a combination of different approaches was associated with a higher ICER. Therefore, this approach might be most effective to achieve a reduction in salt intake, but it might not be the most cost-effective approach \((55)\).

Evidence at global level showed that raising consumer awareness in relation to salt still forms part of most salt-reduction strategies implemented around the world and, in almost all cases, consumer awareness and education activities are used in conjunction with other salt-reduction strategies \((54)\). The intervention implemented in Vietnam (which included mass-media communications, targeted primary school interventions, training for cooks in community programmes, and a focus on high-risk groups) indicated a small but statistically significant decrease in salt consumption and reduction in both SBP and DBP. There were also significant increases in favourable knowledge and behaviours, including awareness of salt intake causing hypertension and heart attack, as well as leading to stroke \((59)\).

The main conclusions from the systematic reviews relevant to this option are summarized in Table 7.

**Table 7. Summary of main conclusions from the systematic reviews relevant for Option 2.2. Information campaigns**

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>benefits</td>
<td>• Two high- and one moderate-quality systematic reviews indicate that population-level awareness-raising interventions can improve salt-related behaviours and/or reduce discretionary salt intake, but these showed only small effects and their benefits may diminish over time ((39,40,53)).</td>
</tr>
<tr>
<td></td>
<td>• Evidence concludes that awareness campaigns might modestly reduce salt consumption by 0.03 g/day to 0.13 g/day; and this type of public intervention alone is unlikely to be sufficient to achieve the WHO target of a 30% reduction in average salt intake ((40)).</td>
</tr>
<tr>
<td>potential harm</td>
<td>• One high-quality systematic review identifies no adverse effects of this type of intervention ((17)).</td>
</tr>
<tr>
<td>resources, costs and/or cost-effectiveness of the intervention</td>
<td>• Two high- and two moderate-quality systematic reviews concluded that salt-specific awareness campaigns via mass media are cost-effective or even cost-saving, including in LMICs ((19,55,57,58)).</td>
</tr>
</tbody>
</table>
### Table 7. contd

<table>
<thead>
<tr>
<th>Category of the conclusion</th>
<th>Summary of the main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(contd) Resources, costs and/or cost-effectiveness of the intervention</td>
<td>• Economic evidence shows that mass-media campaigns aiming to reduce salt intake among the whole population are either very cost-effective or cost-saving in terms of prevention of hypertension and CVD (55,58).</td>
</tr>
<tr>
<td></td>
<td>• Information campaigns are associated with a gain in QALYs, providing savings in medical and productivity costs due to averted hypertension cases, and/or have low implementation costs (55).</td>
</tr>
<tr>
<td>Uncertainty related to potential benefits and harms (monitoring and evaluation could be justified if the option is examined)</td>
<td>• Two high-quality systematic reviews state that implementing a monitoring framework should be part of the intervention, to allow both overall impact and impact across social groups to be evaluated, particularly in LMICs (17,39).</td>
</tr>
<tr>
<td>Key elements of the policy option if it was applied elsewhere</td>
<td>• Three high- and two moderate-quality systematic reviews conclude that a combination of providing information and implementing structural changes might be the most effective strategy to facilitate behavioural modifications (17,39,40,54,55).</td>
</tr>
<tr>
<td></td>
<td>• A high-quality systematic review shows that the multi-component nature of salt-reduction strategies allowed the salt-reduction message to be reinforced through several media and potentially resulted in more effective interventions (65).</td>
</tr>
<tr>
<td>Opinions and experience of the stakeholders</td>
<td>• A high-quality systematic review specifies that awareness campaigns alone are unlikely to be sufficient to achieve the WHO target of a 30% reduction in average salt intake, so they should be implemented in combination with structural interventions (39).</td>
</tr>
<tr>
<td></td>
<td>• Behaviour-change interventions, including information campaigns, not only change people’s knowledge, attitudes and behaviours related to salt consumption but they can also generate demand for policy changes and for low-salt foods, as well as improve the value of structural interventions such as procurement policies, nutrition labelling schemes and fiscal policies (39).</td>
</tr>
</tbody>
</table>
Equity-related observations on the approaches

A moderate-quality systematic review concludes that effective salt-reduction policies have the potential to bridge socioeconomic gaps rather than widen them (48). Additionally, a high-quality systematic review specifies that interventions aiming to reduce sodium intake should, therefore, target the overall population, but it is necessary to take into account the higher salt consumption among low-SES population groups (17).

Two high-quality systematic reviews indicate that upstream structural interventions achieve larger improvements in population health and have the greatest potential to reduce socioeconomic inequalities in sodium intake compared to downstream interventions targeting individuals, which typically widen inequalities (38,40).

Furthermore, a moderate-quality systematic review concludes that the design, implementation and monitoring of national salt-reduction initiatives need to identify groups of the population that are more likely to be differently exposed to higher salt intake due to their socioeconomic circumstances (48). A monitoring framework should permit the evaluation of both overall impact and differential impact across social groups, including equity of impact, using high-quality methods (17).

APPRAOCH 1. Structural population-level interventions

☐ **Option 1.1. Food product reformulation**

A high-quality systematic review indicates that salt reformulation policies should be designed, implemented and monitored with regard to their differential impact on different socioeconomic groups in the population (17).

☐ **Option 1.2. Food labelling**

A moderate-quality systematic review indicates that FOP labels are read less often by people of low SES, with higher BMI and who have children living in their households. Health-conscious consumers and those who have family members with special diets are more likely to purchase foods indicated as healthy by FOP- and shelf-labelling systems than price-focused consumers (62). Furthermore, a high-quality systematic review specifies that interpreting labels depends on health literacy and different labelling systems may confuse consumers, reinforcing inequalities. Thus, consumers should be provided with simple labels (using colours, wording and symbols), which are easier to understand (40). Additionally, education and communication innovations for FOP labelling and shelf-based nutrition labelling systems should target consumers who are at high risk for developing obesity-related illnesses and consumers with low SES, high BMI, or with children living in their households (62).
Option 1.3. Food procurement policy in specific settings
Evidence synthesis concludes that offering healthy foods in public settings normalizes healthy eating in different contexts and contributes to creating equitable access to healthy food and improving the quality of populations’ diets. Public facilities serving vulnerable populations, such as schools and hospitals, may call for stricter procurement criteria than those frequented predominantly by healthy adults (63).

Option 1.4. Restrictions on marketing to children
A moderate-quality systematic review indicates the rise of advertising to children in newly industrialized nations and shows that food advertisements were most prominent during children’s programmes; in addition, the food advertised during this type of programme was of poorer nutritional quality than during other programmes not aimed at children (42).

Option 1.5. Pricing interventions
A moderate-quality systematic review suggests that taxes on unhealthy food and beverages may contribute to addressing health inequalities. Poorer groups may be more price sensitive than other socioeconomic groups, and therefore more likely to change their behaviour in response to a tax. Nevertheless, the regressive burden of taxes on food and beverage products suggests that there is a balance to be struck between the inequitable burden of ill-health and the inequitable burden of taxes (72). Additionally, the regressivity of existing taxes does not necessarily imply that tax increases will be regressive, since, if poorer consumers are more responsive, the burden of the tax may shift to wealthier consumers (70,72).

Furthermore, a high-quality systematic review and another moderate-quality systematic review conclude that a combination of taxes and subsidies can have significant behavioural and health impacts and a greater impact on groups with lower SES (72,78). However, a moderate-quality systematic review indicated that low-income French women derived fewer financial and nutritional benefits from implemented food subsidies and taxes than medium-income women, yet diet quality was improved. This emphasized the need to systematically evaluate the effect of dietary tax and subsidy programmes on people with low income, as well as other vulnerable groups, and to introduce them alongside nutritional education and promotion, and workplace wellness initiatives (70). The evidence indicates that these findings are likely to be highly relevant for policy-makers in developing countries, in which efforts to provide universal health coverage require the effective utilization (and growth) of domestic public sector financial resources (72).

Approach 2. Population-level behaviour-change interventions

Option 2.1. Health education
Two high- and one moderate-quality systematic reviews reveal that downstream interventions such as health education and dietary counselling interventions that focus on individual factors
tend to increase socioeconomic inequalities and should be implemented with caution \(17,53,78\). Furthermore, a moderate-quality systematic review indicates that for the largest public health impact, education efforts should target consumers with low SES and high BMI, rather than consumers who are already nutrition focused \(62\).

**Option 2.2. Information campaigns**

A high-quality systematic review concludes that if health promotion is targeted in deprived areas with a high proportion of minority ethnic groups, it may be the case that dietary change will depend as much on wider determinants, particularly access to and availability of healthy foods (e.g. availability of affordable low-salt bread in Turkey), as on information and motivation \(48,73\).
IMPLEMENTATION CONSIDERATIONS

The possible barriers to the implementation of the seven policy options within the two main approaches – along with some strategies to overcome them – are summarized in the tables that follow. For Approach 1. Structural population-level interventions: Table 8 (Option 1.1), Table 9 (Option 1.2), Table 10 (Option 1.3), Table 11 (Option 1.4) and Table 12 (Option 1.5). For Approach 2. Population-level behaviour-change interventions: Table 13 (Option 2.1) and Table 14 (Option 2.2).

Approach 1. Structural population-level interventions

Table 8. Barriers to and strategies for implementation of Option 1.1. Food product reformulation

<table>
<thead>
<tr>
<th>Level</th>
<th>Barriers</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual level</td>
<td>Reformulation can alter the sensory attributes of food products and thus influence consumer acceptability; this may trigger unattended behaviours, including the consumption of more public health sensitive nutrients, or simply more calories (51). Reducing salt has the potential to disrupt the sensory profile of food—including its taste, texture, aroma and appearance—which may reduce consumers’ overall liking of it and their intent to purchase a product (41).</td>
<td>Introduce salt reduction gradually. Consumers gradually adapt to changes in the salt content of foods; small salt reductions in certain products cannot be detected and do not affect acceptability/consumption (51). Educational campaigns and product labelling should be implemented in parallel in order to raise awareness and shift consumer perceptions regarding the health benefits of salt reduction, and create increased demand for low-salt products (41).</td>
</tr>
<tr>
<td>Industry level</td>
<td>As products are reformulated within the natural product life cycle, it is often assumed that considering the costs of reformulation might lead to an overestimation of costs of implementation (55).</td>
<td>A whole-of-industry approach needs to be adopted and may be achieved more effectively through regulation (41).</td>
</tr>
</tbody>
</table>
### IMPLEMENTATION CONSIDERATIONS

**Table 8. contd**

<table>
<thead>
<tr>
<th>Level</th>
<th>Barriers</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industry level</strong></td>
<td>Reducing salt has the potential to disrupt the sensory profile of food, which may reduce consumers’ overall liking of it and their purchase intent for a product, resulting in potential economic losses for the manufacturer (40).</td>
<td>The industry should introduce salt reduction gradually. Consumers gradually adapt to changes in the salt content of foods; small salt reductions in certain products cannot be detected and do not affect acceptability/consumption (51).</td>
</tr>
<tr>
<td><strong>System/society level</strong></td>
<td>Governments may lack the political will to take action, faced with competing chronic disease priorities, limited resources and capacity, and pressure from food industry lobbying (48). Countries with a fully implemented salt-reduction policy have on occasion imported large quantities of foods that are high in salt from other states with no or limited salt-reduction policies set in place (48).</td>
<td>Government commitment for multi-component interventions extending the focus beyond targeting only consumer behaviour, as well as using standardized methodologies to rigorously monitor the salt content of processed foods, will help to combat this barrier to implementation (59). A four-step accountability framework should guide government and food industry engagement. An independent body takes account (assessment), shares the account (communication), holds to account (enforcement) and responds to the account (improvement) (79). The WHO SHAKE Technical Package for Salt Reduction (80) and a country support package to reduce population salt intake in the WHO European Region (49) indicate that the main element of salt-reduction strategies is a combination of actions targeting consumers, industry, and government, in addition to strong leadership and political commitment (59). A whole-of-industry approach needs to be adopted, which is likely to require strong strategic focus and direction from governments and other leaders, and may</td>
</tr>
</tbody>
</table>
be achieved more effectively through regulation (41). This is important to ensuring overall policy coherence within national salt-reduction initiatives (48).

Multisectoral approaches, and other country and context-specific factors such as budget impact, affordability, fairness and implementation must be taken into account when deciding which interventions to invest in (17).

There is an urgent need to invest in health technology assessment (HTA) and policy evaluations using local research data (56).

LMICs need to strengthen and build research capacity for economic evaluations of interventions, and HTA, as well as bridging the gap between research and policy in order to make informed decisions to facilitate priority-setting for the allocation of their scarce resources (58).

Table 9. Barriers to and strategies for implementation of Option 1.2. Food labelling

<table>
<thead>
<tr>
<th>Level</th>
<th>Barriers</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Difficulties can arise in interpretation of food labels and different labelling systems may confuse consumers (40,53).</td>
<td>Improving health literacy will help with implementation, as well as using simple (TL) labels, which are easier to understand (40).</td>
</tr>
<tr>
<td>Industry level</td>
<td>The food industry is frequently resistant to food labelling (citing the costs of labelling) (48).</td>
<td>A whole-of-industry approach needs to be adopted and may be achieved more effectively through regulation (41).</td>
</tr>
</tbody>
</table>
IMPLEMENTATION CONSIDERATIONS

**Level Barriers Strategies**

System level Governments may lack the political will to take action, faced with competing chronic disease priorities, limited resources and capacity, and pressure from food industry lobbying (48).

Government commitment for multi-component interventions extending the focus beyond targeting only consumer behaviour, as well as using standardized methodologies to rigorously monitor the salt content of processed foods, will help to combat this barrier to implementation (59).

The WHO SHAKE Technical Package for Salt Reduction (80) and a country support package to reduce population salt intake in the WHO European Region (49) indicate that the main element of salt-reduction strategies is a combination of actions targeting consumers, industry, and government, in addition to strong leadership and political commitment (59).

There is an urgent need to invest in HTA and policy evaluations using local research data (56).

LMICs need to strengthen and build research capacity for economic evaluations of interventions, and HTA, as well as bridging the gap between research and policy in order to make informed decisions to facilitate priority-setting for the allocation of their scarce resources (58).

**Table 9. contd**

<table>
<thead>
<tr>
<th>Level</th>
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<tr>
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<td>Governments may lack the political will to take action, faced with competing chronic disease priorities, limited resources and capacity, and pressure from food industry lobbying (48).</td>
<td>Government commitment for multi-component interventions extending the focus beyond targeting only consumer behaviour, as well as using standardized methodologies to rigorously monitor the salt content of processed foods, will help to combat this barrier to implementation (59). The WHO SHAKE Technical Package for Salt Reduction (80) and a country support package to reduce population salt intake in the WHO European Region (49) indicate that the main element of salt-reduction strategies is a combination of actions targeting consumers, industry, and government, in addition to strong leadership and political commitment (59). There is an urgent need to invest in HTA and policy evaluations using local research data (56). LMICs need to strengthen and build research capacity for economic evaluations of interventions, and HTA, as well as bridging the gap between research and policy in order to make informed decisions to facilitate priority-setting for the allocation of their scarce resources (58).</td>
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**Table 10. Barriers to and strategies for implementation of Option 1.3. Food procurement policy in specific settings**

<table>
<thead>
<tr>
<th>Level</th>
<th>Barriers</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual level</td>
<td>Limited knowledge of potential positive impacts (63).</td>
<td>Healthy food procurement strategies should be implemented, paired with additional approaches, such as increased education interventions or price reductions (63).</td>
</tr>
<tr>
<td>Industry level</td>
<td>Logistical barriers (e.g. lack of cooks or kitchens in schools)</td>
<td>To combat this type of barrier, it will be necessary to understand the role of contextual</td>
</tr>
</tbody>
</table>
### Table 10. contd

<table>
<thead>
<tr>
<th>Level</th>
<th>Barriers</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry level</td>
<td>and financial issues (pressure to create revenue streams from food service and/or franchising) (63).</td>
<td>factors, such as institutional history, and focus on stakeholder engagement in ensuring successful development and implementation of healthy food procurement policies (63). Willingness on the part of hospitals to work collaboratively with governments on a framework for nutrient standards can help significantly improve the nutritional content of meals and to reduce salt intake in hospitals (65).</td>
</tr>
<tr>
<td>System level</td>
<td>Inconsistent nutrition standards and policies (63).</td>
<td>The leadership role of governments in mandating healthy food procurement policies is important to implementation (63). Integrating both top-down and bottom-up strategies has been deemed beneficial to sustain public engagement and avoid unsustainable changes. In light of the significant role that industry plays in food production and distribution, these innovative partnerships can strengthen healthy food-procurement initiatives (63). It is important to understand the role of contextual factors, such as institutional history, and focus on stakeholder engagement, and high-level support, in ensuring successful development and implementation of healthy food-procurement policies (63). The WHO SHAKE Technical Package for Salt Reduction (80) and a country support package to reduce population salt intake in the WHO European Region (49) indicate that the main element of salt-reduction strategies is a combination of actions targeting consumers, industry, and government in addition to strong leadership and political commitment (59). There is an urgent need to invest in HTA and policy evaluations using local research data (56).</td>
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<th>Level</th>
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<tbody>
<tr>
<td>System level</td>
<td>LMICs need to strengthen and build research capacity for economic evaluations of interventions, and HTA, as well as bridging the gap between research and policy in order to make informed decisions to facilitate priority-setting for the allocation of their scarce resources (58).</td>
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**Table 11. Barriers to and strategies for implementation of Option 1.4. Restrictions on marketing to children**

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<thead>
<tr>
<th>Level</th>
<th>Barriers</th>
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</thead>
<tbody>
<tr>
<td>Individual level</td>
<td>The emergence of new media channels which can be directly accessed by children raises further concerns about exposure of children to unhealthy food marketing (44).</td>
<td>Parental mediation, in the form of guidance of food consumption or explaining the purpose of advertising, could be effective in moderating the influence of TV food advertising and associated dietary intake (42,43).</td>
</tr>
<tr>
<td>Industry level</td>
<td>The proliferation of commercial channels in the implementation of ban advertising regulation (44). Voluntary self-monitoring by the industry and inadequate nutritional standards for defining healthy/unhealthy dietary products, along with the lack of government monitoring and oversight remain key weaknesses and likely account for the lack of reduction in marketing of unhealthy foods and beverages that targets children (67).</td>
<td>A comprehensive statutory measure can be implemented, with adequate monitoring of compliance and adequate sanctions for non-compliance, based on government-led definitions of the media to be covered, the products to be controlled and the audience to be protected (44).</td>
</tr>
</tbody>
</table>
Leadership from government and other actors could provide robust standards for monitoring and compliance, including outcomes on health, consumption behaviour, volume of advertising exposure, advertising expenditure and valid nutrient criteria (42).

The WHO SHAKE Technical Package for Salt Reduction (80) and a country support package to reduce population salt intake in the WHO European Region (49) indicate that the main element of salt-reduction strategies is a combination of actions targeting consumers, industry, and government in addition to strong leadership and political commitment (59).

There is an urgent need to invest in HTA and policy evaluations using local research data (56).

LMICs need to strengthen and build research capacity of economic evaluations for interventions, and HTA, as well as bridging the gap between research and policy in order to make informed decisions to facilitate priority-setting for the allocation of their scarce resources (58).

### Table 11. contd

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<tr>
<th>Level</th>
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<th>Strategies</th>
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<tbody>
<tr>
<td>System level</td>
<td>Governments may lack the political will to take action, faced with competing chronic disease priorities, limited resources and capacity, and pressure from food industry lobbying (48).</td>
<td>Leadership from government and other actors could provide robust standards for monitoring and compliance, including outcomes on health, consumption behaviour, volume of advertising exposure, advertising expenditure and valid nutrient criteria (42). The WHO SHAKE Technical Package for Salt Reduction (80) and a country support package to reduce population salt intake in the WHO European Region (49) indicate that the main element of salt-reduction strategies is a combination of actions targeting consumers, industry, and government in addition to strong leadership and political commitment (59). There is an urgent need to invest in HTA and policy evaluations using local research data (56). LMICs need to strengthen and build research capacity of economic evaluations for interventions, and HTA, as well as bridging the gap between research and policy in order to make informed decisions to facilitate priority-setting for the allocation of their scarce resources (58).</td>
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### Table 12. Barriers to and strategies for implementation of Option 1.5. Pricing interventions

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<tr>
<th>Level</th>
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<tbody>
<tr>
<td>Individual level</td>
<td>Many individuals face issues such as competing priorities and financial constraints (40).</td>
<td>A combination of a food taxes and subsidies can have significant behavioural and health impacts (72,78).</td>
</tr>
<tr>
<td>Organizational level</td>
<td>Retailers may try to avoid tax, while largely insulating consumers from the burden of the tax (72).</td>
<td>Policy-makers need to stay alert to the possibility that such taxes may need to be revised or expanded in response to changing behaviours (72).</td>
</tr>
</tbody>
</table>
A substantial tax of at least 40% might be needed to achieve a small reduction in salt intake \(^{(40,52,53)}\).

Substitution patterns with non-taxed products can potentially undermine the intended benefit or effectiveness of food taxes, if used as a sole strategy \(^{(70)}\).

Governments may lack the political will to take action, faced with competing chronic disease priorities, limited resources and capacity, and pressure from food industry lobbying \(^{(48)}\).

A combination of taxes and subsidies can have significant behavioural and health impacts \(^{(72,78)}\).

Robust monitoring and evaluation plans, built in right from the introduction of salt taxation will be key for determining its utility \(^{(54)}\).

The WHO SHAKE Technical Package for Salt Reduction \(^{(80)}\) and a country support package to reduce population salt intake in the WHO European Region \(^{(49)}\) indicate that the main element of salt-reduction strategies is a combination of actions targeting consumers, industry, and government in addition to strong leadership and political commitment \(^{(59)}\).

There is an urgent need to invest in HTA and policy evaluations using local research data \(^{(56)}\).

LMICs need to strengthen and build research capacity for economic evaluations of interventions, and HTA, as well as bridging the gap between research and policy in order to make informed decisions to facilitate priority-setting for the allocation of their scarce resources \(^{(58)}\).

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<thead>
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<th>Strategies</th>
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<tbody>
<tr>
<td>(contd) Organizational level</td>
<td><strong>Substitution patterns with non-taxed products can potentially undermine the intended benefit or effectiveness of food taxes, if used as a sole strategy:</strong> (^{(70)}). Governments may lack the political will to take action, faced with competing chronic disease priorities, limited resources and capacity, and pressure from food industry lobbying (^{(48)}).</td>
<td>A combination of taxes and subsidies can have significant behavioural and health impacts (^{(72,78)}). Robust monitoring and evaluation plans, built in right from the introduction of salt taxation will be key for determining its utility (^{(54)}). The WHO SHAKE Technical Package for Salt Reduction (^{(80)}) and a country support package to reduce population salt intake in the WHO European Region (^{(49)}) indicate that the main element of salt-reduction strategies is a combination of actions targeting consumers, industry, and government in addition to strong leadership and political commitment (^{(59)}). There is an urgent need to invest in HTA and policy evaluations using local research data (^{(56)}). LMICs need to strengthen and build research capacity for economic evaluations of interventions, and HTA, as well as bridging the gap between research and policy in order to make informed decisions to facilitate priority-setting for the allocation of their scarce resources (^{(58)}).</td>
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Table 12. contd
### Approach 2. Population-level behaviour-change interventions

#### Table 13. Barriers to and strategies for implementation of Option 2.1. Health education

<table>
<thead>
<tr>
<th>Level</th>
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</thead>
<tbody>
<tr>
<td>Individual level</td>
<td>It is difficult to maintain a low-salt diet by dietary salt advice alone, even with an intensive intervention on an individual basis (75). For many individuals, issues such as competing priorities and financial constraints might reduce compliance and adherence (40).</td>
<td>Changes in food production and catering practices may represent an alternative intervention (75).</td>
</tr>
<tr>
<td>Organizational level</td>
<td>Dietary advice is a cost-ineffective approach, requiring considerable efforts to implement (55,57,66,73).</td>
<td>Effective health education for the general population should be delivered in workplaces and other non-health settings, not in routine clinical facilities (39,73,75).</td>
</tr>
<tr>
<td>System level</td>
<td>Governments may lack the political will to take action, faced with competing chronic disease priorities, limited resources and capacity, and pressure from food industry lobbying (48).</td>
<td>The WHO SHAKE Technical Package for Salt Reduction (80) and a country support package to reduce population salt intake in the WHO European Region (49) indicate that the main element of salt-reduction strategies is a combination of actions targeting consumers, industry, and government in addition to strong leadership and political commitment (59). There is an urgent need to invest in HTA and policy evaluations using local research data (56). LMICs need to strengthen and build research capacity for economic evaluations of interventions, and HTA, as well as bridging the gap between research and policy in order to make informed decisions to facilitate priority-setting for the allocation of their scarce resources (58).</td>
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**Table 14. Barriers to and strategies for implementation of Option 2.2. Information campaigns**

<table>
<thead>
<tr>
<th>Level</th>
<th>Barriers</th>
<th>Strategies</th>
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</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Many individuals may not perceive any personal relevance and hence fail to engage in any behaviour change (40).</td>
<td>Prioritizing the categories of food that contribute most to salt intake among the population can help to overcome this barrier to implementation (12).</td>
</tr>
<tr>
<td>System</td>
<td>Governments may lack the political will to take action, faced with competing chronic disease priorities, limited resources and capacity, and pressure from food industry lobbying (48). Even when resources are available, countries may not have sufficient experience in running public-awareness initiatives (48).</td>
<td>Government commitment for multi-component interventions extending the focus beyond targeting consumer behaviour will help with implementation (59). The WHO SHAKE Technical Package for Salt Reduction (80) and a country support package to reduce population salt intake in the WHO European Region (49) indicate that main element of salt-reduction strategies is a combination of actions targeting consumers, industry, and government in addition to strong leadership and political commitment (59). There is an urgent need to invest in HTA and policy evaluations using local research data (56). LMICs need to strengthen and build research capacity for economic evaluations of interventions, and HTA, as well as bridging the gap between research and policy in order to make informed decisions to facilitate priority-setting for the allocation of their scarce resources (58). Governments should adopt a whole-of-government and health-in-all-policies approach that incorporates health norms and practices with other parts of government to minimize both intersectoral conflicts and industry interference (81).</td>
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</tbody>
</table>
NEXT STEPS

The aim of this EBP is to foster dialogue informed by the best available evidence. The intention is not to advocate for specific policy approaches or close off the discussion. Further actions will flow from the deliberations that the EBP is intended to inform. These will include discussion among policy-makers and stakeholders regarding the policy approaches described in this brief and this may lead to refining certain elements; for example, by incorporating, removing or modifying some components.

The Ministry of Health of the Republic of Moldova has therefore scheduled a policy dialogue with representatives of relevant ministries and authorities, as well as NGOs. The EBP and the dialogue summary will be presented for discussion at the second policy dialogue that is planned to be organized at the Parliament of the Republic of Moldova.
REFERENCES


### ANNEX 1. Reliability and acceptability of the systematic reviews found for the seven policy options according to the AMSTAR/AMSTAR 2 critical appraisal tool

<table>
<thead>
<tr>
<th>Approach/Option(s)</th>
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<tbody>
<tr>
<td><strong>Approach 1.</strong> Structural population-level interventions:</td>
<td>Schorling E, Niebuhr D, Kroke A.</td>
<td>Moderate 7/10</td>
<td>Acceptable</td>
<td>Included</td>
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<td>Option 1.5. Pricing interventions</td>
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## Evidence Brief for Policy

### Annexes

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| Option 1.3. Food procurement policy in specific settings | | | | |
| Option 1.5. Pricing interventions | | | | |
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<tr>
<td>Option 1.1. Food product reformulation</td>
<td>Grieger JA, Johnson BJ, Wycherley TP, Golley RK. Evaluation of simulation models</td>
<td>Moderate AMSTAR 2</td>
<td>Acceptable</td>
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<tr>
<td>that estimate the effect of dietary strategies on nutritional intake: a</td>
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<td>preventions for cardiovascular disease in the Asia-Pacific Region: a systematic</td>
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<td><strong>Approach 1. Structural population-level interventions:</strong></td>
<td>Singh K, Chandrasekaran AM, Bhaumik S, Chattopadhyay K, Gamage AU, De Silva P,</td>
<td>Strong 8/10 (AMSTAR rating</td>
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<td>Included</td>
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<td>et al. Cost-effectiveness of interventions to control cardiovascular diseases</td>
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<td>Option 1.2. Food labelling</td>
<td>and diabetes mellitus in South Asia: a systematic review. BMJ Open 2018;8(4):e01</td>
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</table>
### Approach/Option(s) | Systematic review | Rating | Local acceptability | Inclusion in policy brief
--- | --- | --- | --- | ---
**Approach 1. Structural population-level interventions:**
  - **Option 1.1.** Food product reformulation
  - **Option 1.2.** Food labelling
**Approach 2. Population-level behaviour-change interventions:**
  - **Option 2.2.** Information campaigns


**Rating:** Strong 9/10 (AMSTAR rating from McMaster Health Forum)

**Local acceptability:** Acceptable

**Inclusion in policy brief:** Included

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**Approach 1. Structural population-level interventions:**
  - **Option 1.1.** Food product reformulation
  - **Option 1.2.** Food labelling
**Approach 2. Population-level behaviour-change interventions:**
  - **Option 2.2.** Information campaigns

Aminde LN, Takah NF, Zapata-Diomed B, Veerman JL.

**Rating:** High AMSTAR 2

**Local acceptability:** Acceptable

**Inclusion in policy brief:** Included

---

**Approach 1. Structural population-level interventions:**
  - **Option 1.1.** Food product reformulation
**Approach 2. Population-level behaviour-change interventions:**
  - **Option 2.1.** Health education

de Mestral C, Mayén AL, Petrovic D, Marques-Vidal P, Bochud M, Stringhini S.

**Rating:** High AMSTAR 2

**Local acceptability:** Acceptable

**Inclusion in policy brief:** Included

---

**Approach 1. Structural population-level interventions:**
  - **Option 1.1.** Food product reformulation
**Approach 2. Population-level behaviour-change interventions:**
  - **Option 2.2.** Information campaigns

Jaenke R, Barzi F, McMahon E, Webster J, Brimblecombe J.

**Rating:** High AMSTAR 2

**Local acceptability:** Acceptable

**Inclusion in policy brief:** Included

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**Approach 1. Structural population-level interventions:**
  - **Option 1.1.** Food product reformulation
**Approach 2. Population-level behaviour-change interventions:**
  - **Option 2.2.** Information campaigns


**Rating:** Moderate AMSTAR 2

**Local acceptability:** Acceptable

**Inclusion in policy brief:** Included
## Annex 1. contd

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| **Approach 1. Structural population-level interventions:**  
  Option 1.1. Food product reformulation | Federici C, Detzel P, Petracca F, Dainelli L, Fattore G.  
The impact of food reformulation on nutrient intakes and health. a systematic review of modelling studies.  
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The cost-effectiveness of interventions designed to reduce sodium intake.  
J Hypertens. 2011;29(9):1693–1699 ([https://doi.org/10.1097/HJH.0b013e328349ba18](https://doi.org/10.1097/HJH.0b013e328349ba18)). | Weak 4/10 (AMSTAR rating from McMaster Health Forum) | Not assessed | Not included |
| **Approach 1. Structural population-level interventions:**  
  Option 1.1. Food product reformulation  
  Option 1.2. Food labelling | Muthuri S, Oti S, Lilford R, Oyebode O.  
Salt reduction interventions in sub-Saharan Africa: a systematic review.  
PLoS ONE 2016;11(3):e0149680 ([https://doi.org/10.1371/journal.pone.0149680](https://doi.org/10.1371/journal.pone.0149680)). | Moderate 5/10 (AMSTAR rating from McMaster Health Forum) | Not assessed | Not included |
| **Approach 1. Structural population-level interventions:**  
  Option 1.1. Food product reformulation  
  Option 1.2. Food labelling  
  Option 2. Population-level behaviour-change interventions:  
  Option 2.2. Information campaigns | Wamba AA, Takah NF, Johnman C.  
The impact of interventions for the primary prevention of hypertension in sub-Saharan Africa: a systematic review and meta-analysis.  
PLoS ONE 2019;14(7):e0219623 ([https://doi.org/10.1371/journal.pone.0219623](https://doi.org/10.1371/journal.pone.0219623)). | High 9/10 (AMSTAR rating from McMaster Health Forum) | Not assessed | Not Included |
| **Approach 1. Structural population-level interventions:**  
  Option 1.2. Food labelling | Crockett RA, King SE, Marteau TM, Prevost AT, Bignardi G, Roberts NW, et al.  
Nutritional labelling for healthier food or non-alcoholic drink purchasing and consumption.  
Cochrane Database Syst Rev. 2018;2:CD009315 ([https://doi.org/10.1002/14651858.CD009315.pub2](https://doi.org/10.1002/14651858.CD009315.pub2)). | Strong 9/10 (AMSTAR rating from McMaster Health Forum) | Acceptable | Included |
| **Approach 1. Structural population-level interventions:**  
  Option 1.2. Food labelling | Hersey JC, Wohlgenant KC, Arsenault JE, Kosa KM, Muth MK.  
Effects of front-of-package and shelf nutrition labelling systems on consumers.  
<table>
<thead>
<tr>
<th>Approach/Option(s)</th>
<th>Systematic review</th>
<th>Rating</th>
<th>Local acceptability</th>
<th>Inclusion in policy brief</th>
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<tr>
<td><strong>Approach 1. Structural population-level interventions:</strong></td>
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<td><strong>Approach 2. Population-level behaviour-change interventions:</strong></td>
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<td><strong>Approach 2. Population-level behaviour-change interventions:</strong></td>
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<td><strong>Approach 1. Structural population-level interventions:</strong></td>
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<tr>
<td><strong>Option 1.3. Food procurement policy in specific settings</strong></td>
<td>Chambers SA, Freeman R, Anderson AS, MacGillivray S.</td>
<td>Moderate 7/10</td>
<td>Acceptable</td>
<td>Included</td>
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<td>Wright A, Smith KE, Hellowell M. Policy lessons from health taxes: a systematic review of empirical studies. BMC Public Health 2017;17(583) [<a href="https://doi.org/10.1186/s12889-017-4497-2">https://doi.org/10.1186/s12889-017-4497-2</a>].</td>
<td>Moderate AMSTAR 2</td>
<td>Acceptable</td>
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### Approach/Option(s)

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<td><strong>Approach 2. Population-level behaviour-change interventions:</strong></td>
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<tr>
<td><strong>Option 2.2. Information campaigns</strong></td>
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<td><strong>Approach 2. Population-level behaviour-change interventions:</strong></td>
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<td><strong>Option 2.1. Health education</strong></td>
<td>Price HC, Nicholls A.</td>
<td>Moderate 6/10</td>
<td>Acceptable</td>
<td>Included</td>
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<tr>
<td><strong>Approach 2. Population-level behaviour-change interventions:</strong></td>
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<tr>
<td><strong>Option 2.1. Health education</strong></td>
<td>Kalyoncu ZB, Pars H, Bora-Günes N, Karabuluty E, Aslan D.</td>
<td>Moderate 6/10</td>
<td>Acceptable</td>
<td>Included</td>
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<tr>
<td><strong>Approach 2. Population-level behaviour-change interventions:</strong></td>
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<tr>
<td><strong>Option 2.1. Health education</strong></td>
<td>Cajita MI, Cajita TR, Han HR.</td>
<td>Moderate AMSTAR 2</td>
<td>Acceptable</td>
<td>Included</td>
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<tr>
<td><strong>Approach 2. Population-level behaviour-change interventions:</strong></td>
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## ANNEX 2. Summary of systematic reviews relevant to Option 1.1, Option 1.2, Option 1.3, Option 1.4 and Option 1.5, Approach 1. Structural population-level interventions; and Option 2.1, Option 2.2, Approach 2. Population-level behaviour-change interventions

<table>
<thead>
<tr>
<th>Reference</th>
<th>Focus of systematic review</th>
<th>Main findings</th>
<th>Rating</th>
<th>Proportion of studies conducted in Europe and/or in LMICs</th>
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</thead>
<tbody>
<tr>
<td>Schorling E, Niebuhr D, Kroke A.</td>
<td>To analyse and compare the cost–effectiveness of different interventions to reduce salt consumption (salt reduction or substitution in processed foods, taxation, labelling, awareness campaigns and targeted dietary advice)</td>
<td>For Option 1.1, Option 1.2, Option 1.3, Option 1.4, Option 1.5, Option 2.1, Option 2.2: Population-wide salt reduction could be cost-effective in prevention of hypertension and CVD in OECD countries. However, comparability between study results is limited due to differences in modelling, applied perspectives and considered data. The ICER was particularly low for taxes on sodium or salt, food reformulation by manufacturers and labelling compared to the status quo or no intervention. Dietary advice for a high-risk group was not cost-effective. Salt reduction in processed foods was associated with a gain in QALYs, providing savings in terms of medical and productivity costs due to averted hypertension cases, and/or having low implementation costs. The review demonstrates that salt-reduction interventions in non-OECD countries were cost-effective as well, suggesting that they are one of the best buys, globally.</td>
<td>Moderate 7/10 (AMSTAR rating from McMaster Health Forum)</td>
<td>14 studies were included, all conducted in OECD countries; 7 of which were conducted in Europe</td>
</tr>
<tr>
<td>McLaren L, Sumar N, Barberio AM, Trieu K, Lorenzetti DL, Tarasuk V, et al.</td>
<td>The impact of population-level interventions for dietary sodium reduction in government jurisdictions worldwide, along with the differential impact of those initiatives by social and economic indicators</td>
<td>For Option 1.1, Option 1.2, Option 1.3, Option 1.4, Option 1.5, Option 2.1, Option 2.2: National population-level dietary sodium-reduction initiatives have the potential to achieve population-wide reductions in dietary sodium intake, particularly if they are multi-component in nature and incorporate intervention activities of a more structural nature (e.g. food product reformulation); particularly amongst men. Single-component initiatives consisting only of public education had only a very modest impact in terms of reducing salt intake. Heterogeneity across studies was significant, reflecting different contexts (population and setting) and characteristics of the initiatives. Implementation of future initiatives should embed more effective means of evaluation to help gain a better understanding of the variation in the effects.</td>
<td>Strong 9/10 (AMSTAR rating from McMaster Health Forum)</td>
<td>15 studies (countries) were included, of which 9 were conducted in Europe; 0 studies were conducted in LMICs</td>
</tr>
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</table>

### Schorling E, Niebuhr D, Kroke A.

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<th>Rating</th>
<th>Proportion of studies conducted in Europe and/or in LMICs</th>
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<tbody>
<tr>
<td>Hyseni L, Atkinson M, Bromley H, Orton L, Lloyd-Williams F, McGill R, et al. (2016). The effects of policy actions to improve population dietary patterns and prevent diet-related non-communicable diseases: Scoping review. Eur J Clin Nutr. 2017;71:694–711 (<a href="https://doi.org/10.1038/ejcn.2016.234">https://doi.org/10.1038/ejcn.2016.234</a>).</td>
<td>To collate the current evidence on policy interventions to promote healthier dietary consumption (reformulation, labelling, settings, pricing, health education and mass-media campaigns)</td>
<td>For Option 1.1, Option 1.2, Option 1.3, Option 1.5, Option 2.1, Option 2.2: Multi-component interventions appear to be more effective than single interventions. Mandatory reformulation is consistently found to be more effective than voluntary reformulation. Moreover, labelling may help to add pressure for reformulation by manufacturers and inform consumer choice. However, much depends on individual awareness, knowledge and ability to interpret labels correctly. Health-promotion campaigns and nutritional education benefits appear to have only modest results and effects usually reduce over time. Downstream interventions (such as advice to individuals) may widen the inequalities gap, whereas population-based policy interventions may reduce inequalities.</td>
<td>Moderate 5/10 (AMSTAR rating from McMaster Health Forum)</td>
<td>58 studies were included, 36 of which were conducted in or including Europe; 2 in LMICs</td>
</tr>
<tr>
<td>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(7):e0130247 (<a href="https://doi.org/10.1371/journal.pone.0130247">https://doi.org/10.1371/journal.pone.0130247</a>).</td>
<td>To quantify progress with the initiation of salt-reduction strategies around the world in the context of the global target to reduce population salt intake by 30% by 2025</td>
<td>For Option 1.1, Option 1.2, Option 1.3, Option 1.5, Option 2.1, Option 2.2: Salt-reduction interventions studied were cost-effective and also affordable. Feasible and culturally acceptable to implement in any resource setting, including lower income settings. The majority of programmes were found to be multi-component and include reformulation, FOP labelling schemes, taxation on high-salt foods and interventions in public institutions, with 93% of countries implementing more than one type of strategy. The use of education campaigns is a key element of almost every salt-reduction strategy. Modelling studies consistently suggest that legislative action is much more effective. A high majority (81%) of national salt-reduction strategies include industry engagement to reduce the salt content of products. Implementing clear monitoring approaches is vital to demonstrate programme effectiveness.</td>
<td>Moderate AMSTAR 2</td>
<td>55 studies were included describing 75 national salt-reduction strategies, of which 34 studies were conducted in Europe; 11 studies were in LMICs</td>
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<tr>
<td>Reference</td>
<td>Focus of systematic review</td>
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<tr>
<td>Hyseni L., Elliot-Green A., Lloyd-Williams F., Kypridemos C., Flaherty M., McGill R., et al. (2017). Systematic review of dietary salt reduction policies: Evidence for an effectiveness hierarchy? PLoS ONE 12(5):e0177535 (<a href="https://doi.org/10.1371/journal.pone.0177535">https://doi.org/10.1371/journal.pone.0177535</a>).</td>
<td>Effectiveness of possible salt-reduction interventions; comparison of downstream, agentic approaches targeting individuals with upstream, structural policy-based population strategies</td>
<td>For Option 1.1, Option 1.2, Option 1.3, Option 1.5, Option 2.1, Option 2.2: Comprehensive strategies involving multiple components (reformulation, food labelling and media campaigns) and upstream population-wide policies such as mandatory reformulation generally appear to achieve larger reductions in population-wide salt consumption than downstream, individually focused interventions (e.g. dietary counselling to individuals and schoolchildren, and media campaigns in isolation). This effectiveness hierarchy might deserve greater emphasis in future NCDs prevention strategies.</td>
<td>Strong 8/10 (AMSTAR rating from McMaster Health Forum)</td>
<td>70 studies were included, 31 of which were conducted in Europe; 23 studies were conducted in LMICs</td>
</tr>
<tr>
<td>Grieger J.A., Johnson B.J., Wycherley T.P., Golley R.K. Evaluation of simulation models that estimate the effect of dietary strategies on nutritional intake: a systematic review. J Nutr. 2017;147(5):908–931 (<a href="https://doi.org/10.3945/jn.116.245027">https://doi.org/10.3945/jn.116.245027</a>).</td>
<td>To undertake a systematic review of simulation studies that model dietary strategies aiming to improve nutritional intake, body weight, and related chronic diseases, and to assess the methodologic and reporting quality of these models</td>
<td>For Option 1.1, Option 1.2, Option 1.3, Option 1.5, Option 2.1: Targeting a variety of unhealthy foods for reformulation, rather than individual foods or nutrients, theoretically appears to be most effective for improving dietary intake, particularly in reducing intake of saturated fatty acids, sodium, and added sugar. Reformulating sodium in processed foods or at-home cooking is predicted to reduce sodium intake in the range of 9.5–38.0%. A combination of strategies – such as moderation, substitution, reformulation, and promotion – could be used to deliver the best (theoretical) improvement in diet and health outcomes. Substituting non-iodized with iodized salt in bread theoretically improved the number of consumers meeting adequate iodine intake requirements.</td>
<td>Moderate AMSTAR 2</td>
<td>45 studies; 11 studies on salt-reduction interventions in European countries (23 studies in Europe on different nutritional intake strategies)</td>
</tr>
<tr>
<td>Sutton L., Karan A., Mahal A. Evidence for cost-effectiveness of lifestyle primary preventions for cardiovascular disease in the Asia-Pacific Region: a systematic review. Glob. Health 2014;10(79) (<a href="https://doi.org/10.1186/s12992-014-0079-3">https://doi.org/10.1186/s12992-014-0079-3</a>).</td>
<td>To assess the cost–effectiveness of interventions targeting modifiable behavioural risk factors for CVD</td>
<td>For Option 1.1, Option 1.2, Option 2.1, Option 2.2: Mandatory or voluntary salt reduction interventions in processed foods ranged from cost-effective to very cost-effective, relative to doing nothing. Reducing in salt intake through voluntary manufacturer limits and a mass-media campaign was very cost-effective. Food labelling was found to be a cost-effective intervention in reducing salt intake. Dietary advice on salt intake for individuals at high risk of CVD was not cost-effective.</td>
<td>Moderate 5/10 (AMSTAR rating from McMaster Health Forum)</td>
<td>28 studies were included, 8 of which were conducted in LMICs</td>
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### Reference Focus of systematic review Main findings Rating Proportion of studies conducted in Europe and/or in LMICs

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<th>Reference</th>
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<th>Main findings</th>
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<tbody>
<tr>
<td>Johnson C, Santos JA, McKenzie B, Thout SR, McLean R, et al. (2017). The science of salt: a regularly updated systematic review of the implementation of salt reduction interventions (September 2016–February 2017). J Clin Hypertens. 19(10):928–938.</td>
<td>To summarize and critically appraise the literature on the effectiveness of salt-reduction programmes published from September 2016 to February 2017</td>
<td>For Option 1.1, Option 1.5, Option 2.1, Option 2.2: Decreases were found in mean sodium density of packaged food products following a national salt-reduction initiative implementing voluntary, category-specific sodium targets for packaged food. Improvements were reported in nutrition behaviours relating to salt intake after consumer education through a pilot study and a community-based RCT.</td>
<td>Moderate 6/10 (AMSTAR rating from McMaster Health Forum)</td>
<td>7 studies were included, 3 of which were conducted in LMICs</td>
</tr>
<tr>
<td>Singh K, Chandrasekaran AM, Bhaumik S, Chattopadhyay K, Gamage AU, De Silva P, et al.</td>
<td>To summarize the incremental resource use, costs, consequences and cost-effectiveness of interventions versus comparators to control CVD and Type 2 diabetes (mellitus) in South Asia and to describe the quality of economic evaluations, considering key methodological issues.</td>
<td>For Option 1.1, Option 1.2, Option 2.2: Salt reduction by legislation alone or in combination with a campaign to educate the public was cost-effective in preventing CVD. The existing economic evidence base should motivate policy-makers to mobilize resource allocation towards the most cost-effective interventions to curb the CVD epidemic.</td>
<td>Strong 8/10 (AMSTAR rating from McMaster Health Forum)</td>
<td>42 studies; 42 in LMICs in South Asia</td>
</tr>
<tr>
<td>Hope SF, Webster J, Trieu K, Pillay A, Ieremia M, Bell C, et al.</td>
<td>To summarize evidence describing the cost–effectiveness of population-based interventions targeting sodium reduction</td>
<td>For Option 1.1, Option 1.2, Option 2.2: The studies universally showed that population-based salt-reduction strategies are likely to be cost-effective or cost-saving. However, there is a need for the effectiveness of new interventions to be evaluated in the field using strong study designs and parallel economic evaluations.</td>
<td>Strong 9/10 (AMSTAR rating from McMaster Health Forum)</td>
<td>14 studies were included, 4 of which were conducted in Europe and 4 studies in LMICs</td>
</tr>
<tr>
<td>Aminde LN, Takah NF, Zapata-Diomed B, Veerman JL.</td>
<td>To identify, via a comprehensive synthesis, those interventions that are cost-effective in the prevention of CVD in LMICs in order to inform and guide health policy in these countries in curbing the growing CVD burden</td>
<td>For Option 1.1, Option 1.2, Option 2.2: Population-based interventions, especially those targeting reduction in salt intake and tobacco control, were found to be very cost-effective in LMICs, with potential to generate economic gains that can be reinvested for improvements in health and/or other sectors. While this evidence is relevant for policy across these areas, decision-makers should also take into account other multisectoral perspectives, including considerations in budget impact, fairness, affordability and implementation while setting priorities for resource allocation.</td>
<td>High AMSTAR 2</td>
<td>50 studies; 8 studies on salt-reduction interventions in LMICs, of which 1 was conducted in Europe</td>
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<tr>
<td>de Mestral C, Mayén AL, Petrovic D, Marques-Vidal P, Bochud M, Stringhini S.</td>
<td>To conduct a systematic review and a meta-analysis of the evidence on the association between SES and sodium intake in healthy adult populations of HICs</td>
<td><strong>For Option 1.1, Option 2.1:</strong> People of low SES consume more sodium than people of high SES, confirming the current evidence on socioeconomic disparities in diet, which may influence the disproportionate NCD burden among disadvantaged socioeconomic groups. It is necessary to focus on disadvantaged populations to achieve an equitable reduction in sodium intake to a population mean of 2 g per day as part of the WHO target to achieve a 25% relative reduction in NCD mortality by 2025.</td>
<td>High</td>
<td>AMSTAR 2</td>
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<td>51 studies were included, 20 of which were conducted in Europe</td>
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<tr>
<td>Jaenke R, Barzi F, McMahon E, Webster J, Brimblecombe J.</td>
<td>To systematically review the literature on consumer acceptance of reformulated food products with a focus on salt reduction, and to determine the extent to which salt can be reduced while maintaining comparable acceptability</td>
<td><strong>For Option 1.1, Option 2.2:</strong> Salt could be reduced by approximately 40% in breads and approximately 70% in processed meats – two of the highest contributors to population salt intake – without significantly impacting consumer acceptability. Most importantly, to ensure that consumers adapt to diets substantially lower in salt, a whole-of-industry approach needs to be adopted, which is likely to require strong strategic focus and direction from governments and other leaders, and may be achieved more effectively through regulation. In addition, educational campaigns and product labelling should be implemented in parallel in order to raise awareness and shift consumer perceptions regarding the health benefits, creating increased demand for low-salt products.</td>
<td>High</td>
<td>AMSTAR 2</td>
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<td>50 studies were included, 21 of which were conducted in Europe; 9 studies in LMICs</td>
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<tr>
<td>Rodriguez-Fernandez R, Siopa M, Simpson S, Amiya R, Breda J, Cappuccio F.</td>
<td>To assess current salt-reduction policies in countries of the WHO European Region against the backdrop of varying levels of human development, adjusted for income, education and health (longevity) inequalities</td>
<td><strong>For Option 1.1, Option 2.2:</strong> IHDI values among countries with no existing salt-reduction initiatives (mean 0.643) were significantly lower than for those with either partially implemented/ planned salt initiatives (mean 0.766) or fully implemented salt initiatives (mean 0.780). To enable improved population coverage and impact, it is important that national salt-reduction initiatives are designed, implemented and monitored with regard to their differential impact on different socioeconomic groups in the population.</td>
<td>Moderate</td>
<td>AMSTAR 2</td>
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<td>53 policy papers from 53 WHO European Region Member States; 36 European countries with operational salt policies in place</td>
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<th>Main findings</th>
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<tr>
<td>Federici C, Detzel P, Petracca F, Dainelli L, Fattore G.</td>
<td>To explore the impact of reformulation on nutrient intakes, health outcomes and quality of life; and to evaluate the quality of modelling studies on reformulation interventions</td>
<td>For Option 1.1: There is strong evidence that reformulation policies to reduce salt in foods have the potential to improve diets and population health. The beneficial effect of a mandatory reformulation policy would remain even if the use of discretionary salt increased by 15%. Consumers gradually adapt to changes in the salt content of foods; small reductions in certain products cannot be detected and do not affect acceptability or consumption.</td>
<td>High AMSTAR 2</td>
<td>33 modelling studies, 20 studies addressing sodium and 5 studies addressing multiple nutrients; 12 studies in Europe; 5 studies in LMICs (1 study includes a European country)</td>
</tr>
<tr>
<td>Crockett RA, King SE, Marteau TM, Prevost AT, Bignardi G, Roberts NW, et al.</td>
<td>To assess the impact of nutritional labelling for food and non-alcoholic drinks on purchasing and consumption of healthier items. The secondary objective was to explore possible effect moderators of nutritional labelling on purchasing and consumption</td>
<td>For Option 1.2: Nutritional labelling on menus in restaurants could be used as part of a broader range of interventions to increase the impact of efforts to support healthier food consumption across populations. High-quality studies are needed to address the dearth of evidence from grocery stores and vending machines and to assess the impact of nutritional labels varying in content and format on purchasing and consumption.</td>
<td>Strong 9/10 (AMSTAR rating from McMaster Health Forum)</td>
<td>28 studies included, 3 of which were conducted in Europe</td>
</tr>
<tr>
<td>Hersey JC, Wohlgenant KC, Arsenault JE, Kosa KM, Muth MK.</td>
<td>To inform policy-makers about the effects of FOP labelling systems on consumer response (attention, processing and perception, understanding, use and likely purchase and consumption behaviours)</td>
<td>For Option 1.2: Consumers more easily identified healthier foods with nutrient-specific FOP labels featuring text, symbols and colours indicating nutrient levels, compared to labels that display only numeric information such as GDA, expressed as percentages and/or grams. Summary systems (using single or multiple icons or a TL system) may influence consumers to purchase healthier products. More research is needed to assess the influence of nutrient-specific labels on consumers’ purchases.</td>
<td>Moderate AMSTAR 2</td>
<td>38 studies were included, 18 of which were conducted in Europe</td>
</tr>
<tr>
<td>Trieu K, McLean R, Johnson C, Santos JA, Thout SR; Norm RC, et al.</td>
<td>To identify, summarize and appraise studies on the implementation of salt-reduction strategies, retrieved between November 2015 and February 2016</td>
<td>For Option 1.3, Option 2.1, Option 2.2: Setting-based structural interventions to improve the nutritional composition of foods was found to be effective in reducing salt intake. Introducing voluntary nutrition standards to improve the healthiness of food provided in hospitals and schools, as well as reducing sodium in canteen lunches lowered daily salt intake.</td>
<td>High AMSTAR 2</td>
<td>7 studies were included, 1 of which was conducted in Europe, 1 study was conducted in an LMIC</td>
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<th>Main findings</th>
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<tbody>
<tr>
<td>Adler AJ, Taylor F, Martin N, Gottlieb S, Taylor RS, Ebrahim S.</td>
<td>Reduced dietary salt for the prevention of cardiovascular disease.</td>
<td>To assess the long-term effects of advice and salt substitution aimed at reducing dietary salt on mortality and cardiovascular morbidity, and to investigate whether a reduction in blood pressure is an explanatory factor in the effect of such dietary interventions on mortality and cardiovascular outcomes</td>
<td>Strong 8/10 (AMSTAR rating from McMaster Health Forum)</td>
<td>8 studies were included</td>
</tr>
</tbody>
</table>

  - For Option 1.3, Option 2.1: Salt substitution was found to be modestly effective at reducing salt intake and could be relatively easy to implement in institutional and workplace kitchens. There is insufficient strength of evidence to confirm clinically important effects of dietary advice and salt substitution on cardiovascular mortality in normotensive or hypertensive populations. Findings do not support individual dietary advice as a means of restricting salt intake. It is possible that alternative strategies that do not require individual behaviour change may be effective and merit further trials. |

| Micha R, Karageorgou D, Bakogianni I, Trichia E, Whitsel LP, Story M, et al. | Effectiveness of school food environment policies on children's dietary behaviors: a systematic review and meta-analysis. | To systematically review and quantify the impact of school food environment policies on dietary habits, adiposity, and metabolic risk in children | Strong 9/10 (AMSTAR rating from McMaster Health Forum) | 39 studies were included, 10 of which were conducted in Europe |

  - For Option 1.3: Specific school food-environment policies can improve targeted dietary behaviours. School meal standards for sodium decreased habitual intake, in-school lunch intake, and in-school overall meal intake. These findings inform ongoing policy discussions and debates on best practices to improve childhood dietary habits and health. |

| Williams J, Scarborough P, Matthews A, Cowburn G, Foster C, Roberts N, et al. | A systematic review of the influence of the retail food environment around schools on obesity-related outcomes. Retailing around schools. | Investigation of the associations between food outlets near schools and children's food purchases, consumption and body weight | Moderate AMSTAR 2 | 30 studies were included, 7 of which were conducted in Europe |

  - For Option 1.3: High density of fast-food outlets was found to be significantly positively correlated with students reporting fast-food purchases in the past week. Food outlets were associated with increased consumption of HFSS foods. Unhealthy food consumption was negatively correlated with the minimum distance to grocery shops and takeaways (within 800 m). Future interventions targeting the food environment around schools need careful evaluation. |
## Chambers SA, Freeman R, Anderson AS, MacGillivray S.
Reducing the volume, exposure and negative impacts of advertising for foods high in fat, sugar and salt to children: a systematic review of the evidence from statutory and self-regulatory actions and educational measures.

*Reference Focus of systematic review Main findings Rating Proportion of studies conducted in Europe and/or in LMICs*

<table>
<thead>
<tr>
<th>Reference</th>
<th>Focus of systematic review</th>
<th>Main findings</th>
<th>Rating</th>
<th>Proportion of studies conducted in Europe and/or in LMICs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chambers SA, Freeman R, Anderson AS, MacGillivray S.</td>
<td>To identify and review evidence on (i) the effectiveness of statutory and self-regulatory actions to reduce the volume of, exposure to, or wider impact of advertising of HFSS foods to children; and (ii) the role of educational measures</td>
<td>For Option 1.4: Statutory regulation could reduce the volume of and children's exposure to advertising of HFSS foods, and had potential for a wider impact. Self-regulatory approaches showed varied results in reducing children's exposure. There was some limited support for educational measures. Advertising of HFSS foods is a policy that can be justified as a precautionary measure, and one which serves to help change the social norms around dietary behaviour and appropriate nutrition for children.</td>
<td>Moderate 7/10</td>
<td>47 studies were included, 10 of which were conducted in Europe</td>
</tr>
<tr>
<td>Sadeghirad B, Duhaney T, Motaghipsheh S, Campbell NRC, Johnston BC.</td>
<td>To assess the effects of unhealthy food and beverage marketing on dietary intake and dietary preference among children aged 2–18 years.</td>
<td>For Option 1.4: Unhealthy food and beverage marketing was found to increase dietary intake and influence dietary preference for low-nutrition products in children during or shortly after exposure to advertisements. This puts children at risk for diet-related diseases later in life. Younger children might be more vulnerable to the influence of advertisements and associate the marketed products with positive features. Voluntary self-monitoring by the industry, inadequate nutritional standards for defining healthy/unhealthy dietary products, and the lack of government monitoring and oversight remain key flaws underlying recent initiatives and likely account for the lack of reduction in child-targeted marketing of unhealthy foods and beverages.</td>
<td>High</td>
<td>29 studies were included, 6 of which were conducted in Europe</td>
</tr>
<tr>
<td>Russell SJ, Croker H, Viner RM.</td>
<td>To estimate the quantitative effect of screen advertising on children's dietary intake: a systematic review and meta-analysis.</td>
<td>For Option 1.4: TV and advergame on-screen advertising of unhealthy foods was found to increase immediate dietary intake in children. Food advertising was found to increase dietary intake among children in experimental conditions for TV advertising and advergames. Findings from non-experimental studies revealed that exposure to TV food advertising was positively associated with, and predictive of, dietary intake in children.</td>
<td>Moderate 7/10</td>
<td>39 studies were included, 17 of which were conducted in Europe</td>
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<tr>
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<tr>
<td>Galbraith-Emami S, Lobstein T.</td>
<td>To examine the data available on children’s exposure levels to the advertising of less healthy foods since the introduction of the statutory and voluntary codes</td>
<td>For Option 1.4: The results indicate a sharp division in the evidence, with scientific, peer-reviewed papers showing that high levels of advertising of less healthy foods continue to be found in several different countries worldwide. In contrast, the evidence provided in industry-sponsored reports indicates a remarkably high adherence to voluntary codes. Adherence to voluntary codes may not sufficiently reduce the advertising of foods which undermine healthy diets, or reduce children’s exposure to such advertising.</td>
<td>Moderate AMSTAR 2</td>
<td>21 policy papers from 21 countries or regions were included, 57% of which were conducted in Europe</td>
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<tr>
<td>Niebylski ML, Redburn KA, Duhaney T, Campbell NR.</td>
<td>To assess the effect of healthy food subsidies and unhealthy food taxation</td>
<td>For Option 1.5: Taxation and subsidy policies can be effective for improving population dietary behaviours; these have led to improvements in health outcomes such as blood pressure. To maximize success and effect, food taxes and subsidies should be a minimum of 10 to 15% and preferably used in tandem. It is recommended to implement and evaluate healthy food subsidies and unhealthy food taxation in a variety of populations and settings, especially where food is purchased by government agencies or NGOs, and to introduce them alongside nutritional education and healthy eating promotion initiatives.</td>
<td>Moderate AMSTAR 2</td>
<td>78 studies were included, conducted in western Europe, Canada, United States, Australia, and New Zealand</td>
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<tr>
<td>Wright A, Smith KE, Hellowell M.</td>
<td>To generate insights into how health taxes can: (i) reduce consumption of targeted products and related harms; (ii) generate revenues for health objectives and distribute the tax burden across income groups in an efficient and equitable manner; and (iii) be made politically sustainable</td>
<td>For Option 1.5: If the primary policy goal of a health tax is to reduce consumption of unhealthy products, then evidence supports the implementation of taxes that increase the price of products by 20% or more. However, where taxes are effective in changing health behaviours, the predictability of the revenue stream is reduced. In addition, commitments to earmarking the revenue from health taxes for specific purposes, such as funding health system improvement, can increase public and political support for taxes.</td>
<td>Moderate AMSTAR 2</td>
<td>102 studies were included, of which 34 were conducted in Europe</td>
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<tr>
<td>Trieu K, McMahon E, Santos JA, Bauman A, Jolly K-A, Bolam B, et al.</td>
<td>Review of behaviour change interventions to reduce population salt intake. Int J Behav Nutr Phys Act. 2017;14(17):1–15 (<a href="https://doi.org/10.1186/s12966-017-0467-1">https://doi.org/10.1186/s12966-017-0467-1</a>).</td>
<td>To investigate the impact of population-level behaviour-change interventions that aim to reduce salt intake.</td>
<td>For Option 2.1, Option 2.2: Population-level behaviour-change interventions can improve salt-related behaviours and/or reduce salt intake. Education and awareness-raising interventions alone are unlikely to be adequate in reducing population salt intake to the recommended levels, so they should be implemented in combination with structural interventions.</td>
<td>Strong 8/10 (AMSTAR rating from McMaster Health Forum)</td>
</tr>
<tr>
<td>Rees K, Dyakova M, Ward K, Thorogood M, Brunner E.</td>
<td>Dietary advice for reducing cardiovascular risk. Cochrane Database Syst Rev. 2013(3):CD002128 (<a href="https://doi.org/10.1002/14651858.CD002128.pub4">https://doi.org/10.1002/14651858.CD002128.pub4</a>).</td>
<td>To assess the effects of providing dietary advice to achieve sustained dietary changes or improved cardiovascular risk profile among healthy adults.</td>
<td>For option 2.1: Dietary advice appears to be effective in bringing about modest beneficial changes in diet and cardiovascular risk factors over a period of 12 months, but longer term effects are not known. The extent of dietary change is influenced by the intensity and duration of intervention, and by perceived disease risk. There appears to be little if any gain in effectiveness by locating health promotion within PHC in contrast to workplaces and other non-health settings.</td>
<td>Strong 9/10 (AMSTAR rating from McMaster Health Forum)</td>
</tr>
<tr>
<td>Price HC, Nicholls A.</td>
<td>Primary prevention of CVD: diet. BMJ Clin Evid. 2014;0219 (<a href="https://pubmed.ncbi.nlm.nih.gov/25268779/">https://pubmed.ncbi.nlm.nih.gov/25268779/</a>).</td>
<td>To evaluate the effects of dietary advice in generally healthy adults without existing CVD or increased CVD risk factors to improve cardiovascular outcomes (mortality, cardiovascular events, and cardiovascular risk factors).</td>
<td>For Option 2.1: Intensive advice to reduce sodium intake is more effective than no advice at reducing sodium intake in people with blood pressure just below the definition of hypertension, but it is not clear whether the intensive intervention used in some studies is practical in routine clinical practice. It is unclear whether advice to reduce sodium intake reduces mortality or cardiovascular events.</td>
<td>Moderate 6/10 (AMSTAR rating from McMaster Health Forum)</td>
</tr>
<tr>
<td>Kalyoncu ZB, Pars H, Bora-Günes N, Karabuluty E, Aslan D.</td>
<td>A systematic review of nutrition-based practices in prevention of hypertension among healthy youth. Turk J Pediatr. 2014;56:335–346 (<a href="https://pubmed.ncbi.nlm.nih.gov/25818951/">https://pubmed.ncbi.nlm.nih.gov/25818951/</a>).</td>
<td>To analyse the results of observational and interventional research/studies on nutrition-based practices in the prevention of hypertension among healthy youth.</td>
<td>For Option 2.1: Decreased consumption of dietary sodium was found to have preventive effects against high blood pressure in later years of life. Nutritional practices – using the Dietary Approaches to Stop Hypertension dietary pattern – starting as early as possible are recommended to prevent hypertension among adolescents. Individualized web-based, low-cost programmes that involve parents seem to be the most promising approach, preferably with a duration long enough (at least eight months) for habit formation.</td>
<td>Moderate 6/10 (AMSTAR rating from McMaster Health Forum)</td>
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<td>Cajita MI, Cajita TR, Han HR. Health literacy and heart failure: a systematic review. J Cardiovasc Nurs. 2016;31(2):121–130 (<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4577469/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4577469/</a>).</td>
<td>Exploration of the health literacy role among patients with heart failure</td>
<td><strong>For Option 2.1:</strong> Adequate health literacy was consistently correlated with higher knowledge about heart failure and about salt. An average of 39% of heart failure patients were found to have low health literacy. Age, race/ethnicity, years of education, and cognitive function are predictors of health literacy. Patients who are older, have fewer years of education, and have cognitive impairment are more likely to have low health literacy levels.</td>
<td>Moderate AMSTAR 2</td>
<td>23 studies were included</td>
</tr>
<tr>
<td>Ali SH, Luo R, Li Y, Liu X, Tang C, Zhang P. Application of mobile health technologies aimed at salt reduction: systematic review. JMIR Mhealth Uhealth 2019;7(4):e13250 (<a href="https://mhealth.jmir.org/2019/4/e13250/">https://mhealth.jmir.org/2019/4/e13250/</a>).</td>
<td>To identify, characterize, and evaluate mHealth interventions aimed at salt reduction across the world</td>
<td><strong>For Option 2.1:</strong> mHealth was found to be a potentially effective intervention method in salt reduction. The use of mHealth interventions has generally led to improvements in salt-reduction outcomes (notably changes in sodium from spot-urine sampling and dietary salt intake records). Countries with high salt consumption will use mHealth as an intervention measure to reduce salt consumption for hypertension and CVD prevention and control in the coming years. Likewise, mHealth interventions that can target consumers of salt may particularly benefit countries in which the use of large quantities of salt in cooking plays a larger role in population salt intake.</td>
<td>Moderate AMSTAR 2</td>
<td>11 studies were included</td>
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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.

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