Noncommunicable Diseases

A Compendium

Edited by **Nick Banatvala and Pascal Bovet**

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Noncommunicable Diseases: A Compendium introduces readers to noncommunicable diseases (NCDs) – what they are, their burden, their determinants and how they can be prevented and controlled.

Focusing on cardiovascular disease, diabetes, cancer and chronic respiratory disease and their five shared main risk factors (tobacco use, harmful use of alcohol, unhealthy diet, physical inactivity and air pollution) as defined by the United Nations, this book provides a synopsis of one of the world's biggest challenges of the 21st century. NCDs prematurely claim the lives of millions of people across the world every year, with untold suffering to hundreds of millions more, trapping many people in poverty and curtailing economic growth and sustainable development. While resources between and within countries largely differ, the key principles of surveillance, prevention and management apply to all countries, as does the need to focus resources on the most cost-effective and affordable interventions and the need for strong political will, sufficient resources, and sustained and broad partnerships. This compendium consists of 59 short and accessible chapters in six sections: (i) describing and measuring the burden and impact of NCDs; (ii) the burden, epidemiology and priority interventions for individual NCDs; (iii) social determinants and risk factors for NCDs and priority interventions; (iv) global policy; (v) cross-cutting issues; and (vi) stakeholder action.

Drawing on the expertise of a large and diverse team of internationally renowned policy and academic experts, the book describes the key epidemiologic features of NCDs and evidence-based interventions in a concise manner that will be useful for policymakers across all parts of society, as well as for public health and clinical practitioners.

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23 Food reformulation for NCD prevention and control

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Product improvement through reformulation is an important tool to improve the food environment to promote healthy diets and reduce the risks of NCDs. This chapter outlines the characteristics of successful reformulation programmes, along with three examples: industrially produced trans fat elimination from the food supply, reduction of salt/sodium in manufactured food and reduction in the content of sugars in food and beverages.

Reformulation is the process of changing the ingredients or recipe to affect the nutrient composition of a food or beverage product with the objective of making it healthier, usually while trying to minimize the impact on taste and flavour, as well as affordability. If unhealthy food products that are frequently consumed are reformulated toward healthier products (e.g. reduced levels of salt in bread), this can result in improvement in people's diets without individuals having to make a conscious effort to seek out healthier options or being health literate.

An increasing number of countries are introducing legislation to eliminate industrially produced trans fat,[1] and there is growing momentum for implementing reformulation policies and programmes to reduce dietary intake of salt/sodium,[2] sugars, saturated fat and energy both at the individual and population levels. A recent systematic review showed positive impacts of food reformulation on food choices, nutrient intake and health status for reformulation policies on salt/sodium and trans fat and that reformulated products were generally well accepted and purchased by consumers.[3] For example, sodium intakes were lower by 0.57 g/day and trans fat was reduced by 38–85% after reformulation.

Successful reformulation programmes are characterized by:

- Using scientific evidence on the relationship between diet, nutrition and health outcomes.
- Having strong political will from governments, with strong support and advocacy from civil society, professional organizations and academics.
- Focusing on reformulating the main food and beverage sources of the target nutrients or energy in the diet. Dietary surveys and food purchase data can provide information on such food and beverage sources.

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- Setting stretching but achievable time-bound targets for specific nutrients (e.g. sodium, sugars, saturated fat) or reductions in energy levels. Insights into what is achievable can be obtained by considering the range of nutrient levels across similar foods (this requires food composition information) or by comparing levels in similar products on the market in countries with established reformulation programmes (e.g. sugar levels in cookies). A balance must be struck between:
  - The socio-economic and public health impact of improving diet.
  - Acceptability of changes in taste or palatability to consumers. For example, experience suggests that a 5–10% reduction in levels of salt or sugar is not detected. Where larger changes are required, incremental steps or other changes, such as recipe improvement through the use of herbs or spices, may be required.
  - Technical constraints associated with the functionality of the nutrient within the food, e.g. the use of salt as a preservative in processed meat. While the food industry will provide advice on functional constraints, their views should always be tested through the involvement of consumer groups and insights from countries that have implemented reformulation programmes as well as, in the case of sodium reduction, regional and international benchmarks such as those established by WHO.[4]

Different countries have used different approaches for setting targets, for example using maximum or average levels of target nutrients per 100 g or 100 ml product. Product categories may be widely or narrowly defined (e.g. all cookies or a particular type of cookies, or all or specific sugar-sweetened beverages [SSBs]). Some countries have set a maximum level per serving which can be particularly useful for restaurants, take-away and food deliveries.

Experiences in implementing reformulation policies in different countries also indicate the following:

- Voluntary reformulation programmes are unlikely to be successful without planned actions to implement legislation, taxation, or other measures if targets are not achieved.
- Where reformulation programmes are not mandatory, engagement should be sought from all food companies including retailers, manufacturers, restaurants, take-away and food delivery chains. Small businesses are unlikely to have the resources for reformulation so may require additional or specific measures. In addition, supportive marketing to promote reformulated products may help encourage reformulation efforts by the food industry.
- Gradual reformulation is often more effective than an abrupt approach especially for sodium and sugar in order to ensure the product remains acceptable to consumers over the course of reformulation.[5] Likewise, targets need refreshing and moving downwards every few years.

- Clear guidance should be available on what could and should be used as alternatives to replace the target nutrient, if needed (e.g. unsaturated fats for trans fat). It is important to provide technical support to those with limited resources and experience such as small and medium-sized enterprises.
- Monitoring and reporting should be undertaken on the progress made by businesses. This is best done independently and transparently. More detail on this is provided at the end of this chapter.

Watch points for reformulation policies include:

- Potential detrimental effects on the nutrient profile of a product can result from reformulation, e.g. where trans fat is replaced with excessive amounts of saturated fat. This can be guarded against through guidance to the food industry and by monitoring. Similarly, it is important that reformulation does not increase the energy density of a product, for example by replacing sugars with fats with a resulting net positive caloric content.
- Government should set clear rules of engagement with food manufacturers to ensure that decisions are made in the interest of public health. Engagement with the food industry should be transparent. Canada, for example, has set a mechanism to ensure transparency of all communications with stakeholders in relation to healthy eating initiatives, including trans fat elimination and salt/sodium reduction; this includes a registry of all meetings and correspondence with officials and a commitment that no correspondence is treated as confidential. Mechanisms to hold food companies accountable for their commitments are also key. For example, an agreement between the Norwegian health authorities and the food industry are evaluated by an independent research body, with results publicly available.
- Other interventions should be undertaken alongside reformulation to contribute to the improvement of the food environment. These include fiscal policies (i.e. taxation, subsidy), policies to restrict marketing, and nutrition labelling policies (including front-of-pack labelling). A good example of implementing a package of comprehensive policy measures can be observed in Chile where a combined programme of marketing restrictions, warning logos on the front-of-pack, and public food procurement, such as in schools are used.

Food fortification alongside reformulation

Fortification is an important tool in reducing micronutrient deficiencies. For example, WHO recommends the iodization of salt to help eliminate iodine deficiency disorders.[6,7] At the same time WHO recommends reducing the intake of sodium (salt) to reduce blood pressure and risk of cardiovascular diseases (CVD), stroke and ischemic heart disease (IHD).[8] These seemingly

contradicting policies are in fact compatible, provided that there is a full implementation of universal salt iodization and effective implementation of sodium reduction policies including reformulation and the ability to monitor and adjust iodine concentrations in table/cooking salt in response to any decrease in population sodium intake.

However, food manufacturers may use foods fortified with micronutrients for promotional purposes, which can contribute to excess intake of macronutrients, energy, and salt/sodium, when fortified foods contain high levels of sugars, fats and sodium. Food fortification alone cannot, therefore, be a substitute for diet- and nutrition-related policy actions to address NCDs, and fortified foods should also be included in reformulation policies.

Examples of reformulation policies

Eliminating industrially produced trans fat from the food supply

Industrially produced trans fat is partially hydrogenated unsaturated fats that largely result from the industrial transformation of unsaturated oils to harden them and increase their shelf life. Industrially produced trans fat is strongly associated with an increased risk of CHD (Chapter 20 on cholesterol, fat and trans fat). Elimination of industrially produced trans fat is feasible and achievable and over the last 20 years, governments have successfully used both mandatory and voluntary measures to encourage industry to eliminate industry-produced trans fat, in order to reduce an individual's intake of trans fat to <1% of total energy intake with trans fat being replaced by unsaturated fatty acids.[9] WHO recommends that countries introduce a mandatory national limit of 2 g of industrially produced trans fat per 100 g of total fat in all foods; and a mandatory national ban on the production or use of partially hydrogenated oils as an ingredient in all foods. These best-practice policies can remove virtually all industrially produced trans fat from the food supply.[10,11,12]

In 2021, best-practice trans-fat policies have been implemented in 40 countries (covering 1.4 billion people) and best-practice trans-fat policies in six additional countries (covering an additional 1.7 billion people) will come into effect over the next two years.[13]

REPLACE is a WHO step-by-step guide for the elimination of industrially-produced trans-fatty acids from the global food supply. It provides six areas of action:

- **Re**view dietary sources of industrially produced trans-fat and the landscape for required policy change.
- **P**romote the replacement of industrially produced fat with healthier fats and oils.
- **L**egislate or enact regulatory actions to eliminate industrially produced trans-fat.

- **A**ssess and monitor trans-fat content in the food supply and changes in trans-fat consumption in the population.
- **C**reate awareness of the negative health impact of fats among policy-makers, producers, suppliers and the public.
- **E**nforce compliance with policies and regulations.

WHO has also developed a technical framework and a set of online implementation resources[14] as well as a global laboratory protocol for measuring trans fat in foods.[15] WHO also provides technical support to countries to accelerate best-practice policy development, implementation and enforcement as well as laboratory capacity-building and training.

Reformulation to reduce the amount of salt/sodium in processed food

Excessive intake of salt/sodium increases blood pressure and CVD risk and was accountable for 1.9 million deaths globally in 2019 (IHME). WHO recommends a reduction to <2 g/day sodium consumption (<5 g/day salt) in adults. A 30% reduction in mean population intake of salt/sodium by 2025 (vs 2010) is a global target to be achieved by 2030.

In many high-income countries, and increasingly in low- and middle-income countries, a significant proportion of dietary salt/sodium comes from manufactured foods such as bread, processed meats, cheese, cookies, breakfast cereals, snacks and ready-to-eat products. A cost-effective way to reduce population salt/sodium intake can therefore be through lowering the sodium content of food products that are consumed frequently.[16] Many countries have introduced national reformulation strategies and targets to reduce sodium in manufactured foods.[17] Depending on the foods consumed and the political situation in the country, there is a variation in measures adopted, the food products targeted, and the targets adopted. However, a priority component of a successful reformulation plan is for countries to set time-bound limits for salt/sodium levels in foods and meals for the food industry to implement. In 2021, WHO issued the global sodium benchmarks for various food categories to drive progress in reducing sodium content in foods.

At least 17 countries have reported reductions in population salt intake since 2014, through a variety of policy interventions to reduce salt/sodium intake in their populations including through reformulation, with 12 countries reporting a substantial (>2 g/day) or moderate (1–2 g/day) reduction.[18]

Reformulation to reduce levels of sugars in food and beverages

WHO recommends limiting the intake of free sugars to <10% of total energy intake, and suggests a further reduction in the intake of free sugars to <5% of total energy intake for added health benefits (Chapter 22). A growing number of national authorities have set targets for sugar levels in different food and beverage categories. In the UK, reports show evidence of success in reducing

sugar content in some food groups including breakfast cereals, yogurts and ice creams.[19] Randomised controlled studies in children suggest that reductions in the sugar content of SSBs are associated with lower total energy intake and reduced body weight.[20] Chapter 22 provides more detail.

One should be mindful that reducing sugar content in products (e.g. SSBs) will only lead to overall reductions in sugar in the diet if sales and consumption of reformulated products do not change. If sales of reformulated products increase then sugar intake may increase. For example, if cookies are reformulated to contain less sugars, but more cookies are sold, or if individuals consume more other (liquid or solid) products high in sugar, then the total amount of dietary sugars may not decrease or even increase. This can be guarded against by other supportive policies, such as policies to restrict marketing and/or taxation of less healthy products.

Taxation has been used to support the reduction of sugar content in food. For example, following the introduction of a soft drink industry levy in the UK, the proportion of potentially taxable drinks with sugar levels above the lower levy threshold (5 g sugar/100 mL) fell by 43.7%, suggesting that the levy had incentivized manufacturers to reformulate their products.[21] Importantly, all socio-economic groups are likely to accrue the health benefits linked to lower levels of sugars in the diet.

Monitoring

Monitoring the progress of reformulation programmes is important to demonstrate impact and its contribution to broader efforts to prevent and control NCDs, as well as to encourage continued and enhanced action. Data on fats, sugars, and salt/sodium levels in foods are needed in order to monitor progress. They can be obtained from sales, surveys on population intakes, surveys of shop and restaurant declared levels (on labels or menus), and extraction of nutrition data from retail websites. Nutrient information on products is particularly important.

Monitoring is more likely to be meaningful if it is independently done. Involving civil society (e.g. the academia and NGOs) in monitoring is a way of encouraging transparency and maintaining pressure on the food industry. Different countries have taken different approaches. For example, in the UK, Public Health England has reported progress on sugar reduction according to food category, food sector, business, and product level, and found reductions of 13.3% and 12.9% in sugar levels in breakfast cereals and yogurt[23] but no change for confectionery. Brazil has also reported progress in sodium reduction at the food category and product level (8–34% reduction in the average sodium content of over half of food categories).[22]

Impact evaluation (e.g. the impact of reformulation on diet and health outcomes) is important, and needs considering. The impact of sodium reduction through food reformulation has been studied directly and through modelling methodologies in countries including the UK, USA, Australia and Brazil, for

example, to assess changes in sodium intake, blood pressure and hypertension and CVD.[23,24,25,26]

Disseminating reports that describe the results of such monitoring and evaluation is also important. The WHO progress report on trans fat elimination describes the global, regional and national situations and progress made over the past year with regard to trans fat reformulation in countries and discusses challenges and opportunities for future action. The report is published annually in a countdown to the 2023 goal of global elimination of industrially produced trans fat. WHO is also planning to issue biannual progress reports on sodium reduction starting in 2022.[13]

Notes

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