

WHO global sodium benchmarks for different food categories

Second edition



World Health Organization

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Management of conflicts of interest

According to the rules in the WHO Basic documents,¹ whenever an expert or an individual provides independent advice to WHO, including participating in WHO meetings, any financial and intellectual interests must be declared and assessed by the WHO Secretariat.

All external experts involved in the development of the global sodium benchmarks completed and submitted a Declaration of Interests. Declarations of Interests were reviewed by the WHO Secretariat in consultation with the WHO Department of Compliance and Risk Management and Ethics. WHO concluded that none could give rise to a potential or reasonably perceived conflict of interest related to the subject discussed. All contributing experts were acting in their individual capacity and not as institutional representatives.

¹ Basic documents. 49th edition. Geneva: World Health Organization; 2020. (<http://apps.who.int/gb/bd/>, accessed 8 February 2024).

1. Background

The World Health Organization (WHO) started to develop global benchmarks in the form of maximum limits for sodium levels in foods across different food categories in 2020. This builds on the work and experience of countries and regions in setting targets for sodium levels in different food categories, as part of national and regional efforts to reduce population salt intake. The aim is to reduce the burden of diet- and nutrition-related noncommunicable diseases (NCDs) and to achieve the global NCD target for a 30% relative reduction in mean population intake of salt, with the aim of achieving a target of less than 5 g of salt (i.e. < 2 g sodium) per day by 2025 (1). Furthermore, after a range of stakeholders came together to transform food systems through the United Nations Food Systems Summit (September 2021), there was an unprecedented opportunity to scale up these national and regional efforts to tackle unhealthy diets and to improve the global food environment, to ensure access to safe and nutritious food for all.

An estimated 8 million deaths globally are associated with poor diet; 2 million of these are attributable to high sodium intakes (2). Excess dietary sodium intake increases blood pressure and consequently increases the risk of cardiovascular diseases (3), which are the leading cause of NCD death worldwide. Reducing sodium intake is an effective way to lower blood pressure and thus reduce incidence of NCDs such as cardiovascular diseases; it also reduces other complications associated with high sodium intakes such as chronic kidney disease, obesity, gastric cancer and liver diseases. The importance of reducing sodium intake was highlighted in WHO's 2012 guideline on sodium intake for adults and children (4).

In many high-income countries, and increasingly in low- and middle-income countries, a significant proportion of sodium in the diet comes from manufactured foods such as bread, cereal and grains, processed meats and dairy products (5). An effective way to reduce population sodium intake is through lowering the sodium content of foods that are consumed frequently and which therefore contribute to increased sodium intake. Reducing sodium intake will not only contribute greatly to preventing cardiovascular diseases but also to accelerating progress towards achieving several global NCD targets and the Sustainable Development Goals target for reducing mortality from NCDs.

WHO recommends that individuals consume less than 5 g of salt (i.e. <2 g of sodium) per day, meaning that the population average intake should be well below that level (1). The World Health Assembly has recognized the importance of sodium reduction; in 2013 it adopted the target of a 30% reduction in mean population intake of salt/sodium, as part of the *Global Action Plan for the Prevention and Control of*

Noncommunicable Diseases 2013–2020 (6). However, global progress towards this target is insufficient and the world is not currently on track to meet that goal (7).

Clearly, strong, multipronged and multisectoral actions are now needed; thus, WHO included “reduction of salt intake through the reformulation of food products to contain less salt and the setting of target levels for the amount of salt in foods and meals” as a “best buy” in its menu of cost-effective interventions for reducing unhealthy diet to prevent NCDs¹ (8). The importance of salt reduction was also reinforced in WHO’s *General Programme of Work 2019–2023* (9). In general, current reformulation efforts have been inadequate, but country experience suggests that well-designed strategies with clear targets can lead to considerable progress (10, 11).

To drive progress on tackling unhealthy diet, WHO and Chatham House convened a roundtable in June 2018 on strengthening the role and contribution of the food and non-alcoholic beverage industry to respond to the 2011 *Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of NCDs* (12).

At that meeting, WHO set out its specific expectations for industry commitments on salt/sodium reductions. These were:

- *Reformulation of foods to lower sodium concentrations* – Adopt standardized targets for sodium levels for the food and beverage categories that are the highest contributors to sodium intake and implement them by 2025 (applicable across all food industries – manufactured, retail, out-of-home and food services). A global common set of targets will be established through a dialogue with WHO.
- *Sodium content labelling* – Provide the on-pack sodium data required by Codex (all food services and manufacturers in every jurisdiction). Food services and restaurant chains should also provide these data in store, on packaging or online.

In discussion, private sector representatives agreed that the development of it would be important to develop targets based on categories. WHO has been engaged in dialogue with the International Food and Beverage Alliance (IFBA) in relation to improving the nutritional quality of food and drink products. At a meeting in May 2019 between the Director-General of WHO and high-level representatives of IFBA member companies (which account for about 13% of global packaged food sales), the companies committed to not exceeding 2 g of industrially produced *trans*-fatty acids (iTFA) per 100 g of oils and fats in their products worldwide by 2023 (13). Independent evaluation by WHO found that the assessed IFBA companies seemed to have made progress towards reducing iTFA in products to levels in line with the WHO recommendation, reinforcing that reformulation and replacement of iTFA in food products is feasible (14).

At that meeting in May 2019, WHO indicated that sodium consumption is still high, that salt is the most important of the dietary risk factors and that commitment to reducing sodium content must be global. WHO also pointed out that it would be important to agree on benchmarks for product categories, and ensure that the products have the same sodium content across all countries. The industry representatives declared that

¹ WHO has expanded the list of “NCD Best Buys” and the updated list was approved at the 76th World Health Assembly held in May 2023; [who.int/news/item/26-05-2023-more-ways--to-save-more-lives--for-less-money---world-health-assembly-adopts-more-best-buys--to-tackle-noncommunicable-diseases](https://www.who.int/news/item/26-05-2023-more-ways--to-save-more-lives--for-less-money---world-health-assembly-adopts-more-best-buys--to-tackle-noncommunicable-diseases).

they are committed to reducing sodium contents in their products and have already reduced sodium content in most of their products; they also confirmed that they are ready to collaborate further with WHO and governments on sodium reduction.

Setting sodium benchmarks is, therefore, an important step towards reducing sodium intake. Global sodium benchmarks, set in the form of maximum limits, serve as a guide for countries in setting national policies and strategies, and for the ongoing dialogue between WHO and the private sector at the global level.

- types of targets (maximum limits, simple averages, sales-weighted averages or percentage reductions);
- timelines to achieve targets;
- food categories for which targets were set;
- values of targets;
- dietary intake assessment (top five contributors of salt to the diet); and
- evaluation of changes of sodium levels in food.

In total, data were collected on sodium targets set in 40 countries, one area, one WHO region (the WHO Region of the Americas), and one WHO subregion (the Pacific Islands, a subregion of the WHO Western Pacific Region). The countries from which data were collected, by WHO region, were:

- **WHO African Region:** South Africa;
- **WHO Region of the Americas:** Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Mexico, Paraguay, the United States of America, and Uruguay;
- **WHO Eastern Mediterranean Region:** Bahrain, Iran (Islamic Republic of), Kuwait, Oman, occupied Palestinian territory, including east Jerusalem, Qatar, Saudi Arabia, Tunisia and United Arab Emirates;
- **WHO European Region:** Austria, Belgium, Bulgaria, Czechia, Germany, Greece, Hungary, Ireland, Italy, Netherlands (Kingdom of the), Montenegro, Norway, Portugal, Türkiye, Slovenia, Spain, Switzerland, and the United Kingdom of Great Britain and Northern Ireland; and
- **WHO Western Pacific Region:** Australia, Fiji and New Zealand.

The compilation of existing sodium targets was used to identify the most common food categories in which targets have been established. A food categorization system was then developed, building on the work undertaken to develop WHO regional nutrient profile models, supplemented with the subcategories that were used by the WHO Regional Office for the Americas/Pan American Health Organization for collecting information on sodium targets. The resulting categorization system comprised 18 overall food categories and 97 subcategories.

2.2 Methodology for defining global benchmarks

Based on the outcome of the technical consultation, and building on the WHO compilation and analysis of country data on existing sodium targets, the approach outlined below was used for development of the benchmarks.

2.2.1 Type of target

The benchmarks are in the form of *maximum limits* because this was considered to be the most feasible approach for global benchmarks. There is also a large amount of country experience and available data for maximum limits, compared with simple average, sales-weighted average or percentage reduction targets. The benchmarks are set as single values, rather than as a range of acceptable values, because it is considered important to be working towards a single, harmonized global goal.

2.2.2 Food categories

Benchmarks are set at the level of *subcategories* because the main food categories are too heterogeneous for meaningful targets to be set. Setting targets at the overall food category level would result in targets that are too high for some products in the category and too low for others – this would render the targets meaningless and could risk undermining country progress. It was acknowledged, however, that a workable set of global benchmarks requires the number of subcategories to be limited, with a focus on those that are the highest contributors to sodium intakes. The subcategories were selected from the list of 18 food categories and 97 subcategories identified through the compilation and analysis of existing national and regional sodium targets (as explained above). Initially, subcategories for which five or more countries had set a sodium target were selected, resulting in a list of 45 subcategories in 18 food categories. The experts considered this too limited, however, and it was decided to review all 18 categories and 97 subcategories to assess whether benchmarks are needed.

2.2.3 Global benchmark values

Benchmark values are based on the *lowest maximum value for each subcategory from existing national or regional targets*. Feasibility for these targets has been demonstrated in a number of countries, and it is appropriate that the WHO global benchmarks should reflect the lowest maximum value. Benchmarks are defined for products “concentrated” or “not concentrated”, rather than “as sold” or “as consumed”, because this is a more transparent approach and will be easier to monitor and evaluate.

2.2.4 Case-by-case review of the benchmarks and subcategories

The experts reviewed the subcategory definitions and the benchmarks on a case-by-case basis. This included verifying that the description of each benchmark subcategory is well matched to the description of the subcategory from which the proposed target is derived. This is important because of the potentially different product mixes between countries. When a mismatch was found, the next-lowest target that aligned well with the subcategory in question was selected. In addition, to deal with difficulties in setting appropriate benchmarks when subcategories remained too wide-ranging and diverse, subcategories were further reviewed and sometimes redefined.

For further details on the development of the first edition of the WHO global sodium benchmarks, please refer to the report on the WHO expert meetings (16).

3. Development of the second edition of the WHO global sodium benchmarks

3.1 Consultative process for developing the second edition of the global sodium benchmarks

To develop the second edition of the global benchmarks, WHO convened email-based online consultations with the experts. In April 2023, a first draft proposal was circulated and reviewed by the experts. Based on the feedback from the experts as well as additional information obtained on national targets, a revised proposal was developed and sent in December 2023 for further review by the experts.

The online consultations had the following aims:

- review the results of the analyses of the six pending subcategories as well as the updates to the remaining subcategories of global sodium benchmarks; and
- assess and finalize global sodium benchmarks for identified priority food categories.

The same principles utilized in the development of the first edition, as described in section 2, were applied in the development of the second edition.

3.2 Proposed benchmarks for the six pending subcategories

When developing the first edition, no appropriate benchmark was identified from existing country or regional targets for the following six subcategories:

- 1a. Granola and cereal-type bars;
- 1b. Nut butters;
- 2g. Dry-mixes for making cakes, sweet biscuits, pastries and other sweet bakery wares;
- 8d. Extra-hard ripened cheese;
- 8f. Mould ripened cheese, blue; and
- 8h. Brine-stored cheese.

There were no benchmarks because the existing lowest maximum levels were considered too high, especially since there were products that contained much less sodium already on the market. It was agreed that review of possible alternative benchmark-setting methods (including market data analysis) be carried out to explore the possibility of setting a global benchmark. While market data analysis has its limitations, it was considered the best alternative approach to using existing national or regional targets as basis for global benchmarks. Since then, the data on Stock

Keeping Unit (SKU)¹ have been purchased from Euromonitor International and their AI-powered SKU web-extraction tool, Via, to inform the development of benchmarks for the pending subcategories.

SKU-level data were obtained from Euromonitor International about the amount of salt/sodium per 100 g of food products that were sold on the market in 2021 and which were in the six subcategories that global sodium benchmarks were not initially set for. The purchased data included information from up to 40 countries and territories (as classified by Euromonitor International).² Euromonitor International has their own food categorization taxonomy, which is different from that of the WHO global sodium benchmarks. Subcategory definitions were compared, and adjustments were made to match the subcategories used by Euromonitor to those of WHO. The Via database surfaces all of the daily web-extracted information across 1500 e-retailers, who are selected by Euromonitor International. For each subcategory, the subcategory description was used as the search string. Individual products/SKUs included in each of the subcategories were reviewed manually to spot misclassification and identify outliers in terms of the sodium content. The e-retailer listings have been checked for outliers and wherever the analysts could not confirm the salt content, the products have been removed from the data set. Two rounds of quality control were conducted by Euromonitor International's data science analysts on each of the six subcategories.

There was a need to examine individual entries (products) included in the SKU data basket to make sure that the data were appropriate. For example, individual products/SKUs collected for each subcategory were checked to ensure they fit the subcategory definition, that the correct information was scraped from the e-retailers product pages with regard to the nutrient and units/portion sizes (e.g. per 100 g of food), and that the conversion from salt to sodium was correctly done. In case of a misclassification into a wrong subcategory, the product was removed from the data after ascertaining the nature of the product. In case an error was found (e.g. unit, conversion), the data were manually corrected to the extent possible.

Even though data were collected from up to 40 countries and territories, depending on subcategory, the data per subcategory were limited to certain types of food that would fall under the subcategory definition. This was particularly the case with “8f. Mould ripened cheese, blue”, in which a wide variety of products that exist within the subcategory may not have been captured by the market data obtained. For 8f, efforts were made to minimize this limitation through an additional approach by conducting literature review to supplement the effort.

¹ An SKU is a unique code or number assigned to a specific product in a retailer's inventory management system, which is used to identify and categorize products within the database of Euromonitor International.

² Countries and territories included in the analysis – as classified by Euromonitor International – were:

Australasia: Australia; New Zealand;

Asia Pacific: China; China, Hong Kong SAR; India; Indonesia; Japan; South Korea; Singapore; Taiwan, China; Thailand;

Latin America: Argentina; Brazil; Chile; Mexico;

Middle East and North Africa: Israel; Saudi Arabia; United Arab Emirates; South Africa;

North America: the United States of America; Canada;

Western Europe: Austria; Belgium; Denmark; Finland; France; Germany; Greece; Ireland; Italy;

Netherlands (Kingdom of the); Norway; Spain; Sweden; Switzerland; Türkiye; the United Kingdom; and

Eastern Europe: Czechia; Poland; Russia.

Analysis of the SKU data was conducted to assess the distribution and basic statistics (e.g. mean, median, range, minimum, maximum, number of peaks and clusters) of the actual sodium content of food products in respective food subcategories that were sold in 2021. The median was chosen as the global benchmark because it is both achievable and ambitious (i.e. 50% of products on the market already below the level while the other 50% still above), and because it is less skewed than the mean by outliers. The **Annex** presents the proposed global benchmarks for the pending subcategories based on this market data analysis. An overview of the analysis and benchmarks for each of the six categories is below.

1. Chocolate and sugar confectionery, energy bars, and sweet toppings and desserts

1a. Granola and cereal-type bars

This was originally one of the six subcategories whose target was going to be set based on the market data analysis. However, since the publication of the first edition, the WHO Regional Office for the Americas released regional sodium targets that included this category (150 mg/100 g). This has since been chosen as the sodium benchmark. See section 3.3 for further details.

1b. Nut butters

For this subcategory, 1473 products from 32 countries and territories were identified. Data points with a value of 5 mg/100 g were removed as they were considered as errors (either manufacturers' mistakes or glitches in data scraping) or types of foods without any sodium addition. Additionally, data points that are high extremes were checked and either fixed or removed if they were identified as errors. The final sample size was 1010.

The median of the remaining data points – 200 mg/100 g – was chosen as the global sodium benchmark.

2. Cakes, sweet biscuits and pastries; other sweet bakery wares; and dry-mixes for making such

2g. Dry-mixes for making cakes, sweet biscuits, pastries and other sweet bakery wares

For this subcategory, 1333 products from 31 countries and territories were identified. Data points with a value of 0 mg/100 g were removed as they were identified to be misclassifications (e.g. lemon zest, vanilla extract). Additionally, data points with a value <75 mg/100 g were removed because those products were considered not representative of the products included in the subgroup. Additionally, data points that were high extremes were checked and fixed or removed if they were identified as errors. The final sample size was 1031.

The median of the remaining data points – 320 mg/100 g – was chosen as the global sodium benchmark. Considering the required reconstitution with water or other liquids before consumption, this value is similar to the global benchmarks set for subcategories such as cookies/sweet biscuits (2a), cakes and sponges (2b), which confirms the appropriateness of the benchmark for these dry-mixes.

8. Cheese

8d. Extra-hard ripened cheese

For this subcategory, 181 products from 21 countries and territories were identified. There were various peaks observed in this subcategory between 500 and 2300 mg/100 g. Some of the data points around 500–600 mg/100 g were identified to be misclassifications (e.g. soft processed cheese containing parmesan), and were omitted from the data set.

Products around 600–1000 mg/100 g contained mostly parmesans in various ages ($n = 104$). Products around 1200 mg/100 g were mostly mixes that contain parmesan or pecorino ($n = 22$). The highest group was around 1700–2300 mg/100 g, which contained highly salted sheep cheese such as pecorino ($n = 43$).

It was considered appropriate to split this subcategory into two. Medians were calculated for two distinct groups: the median of the group around 600–1000 mg/100 g was 640 mg/100 g, and that of the other group around 1700–2300 mg/100 g was 1880 mg/100 g. Therefore, the suggested global sodium benchmark for “8di. Cow milk extra-hard ripened cheese” such as Grana Padano and parmesan is 640 mg/100 g; and that for “8dii. Sheep milk extra-hard cheese” such as pecorino and pecorino Romano is 1880 mg/100 g.

Unfortunately, the variety covered by the dataset for extra-hard ripened cheese was limited (i.e. only Grana padano, parmesan, pecorino, pecorino Romano); however, setting benchmarks for these two categories of cheese (8di and 8dii) was considered a good starting point because they are the two most common types of extra-hard ripened cheese and their sodium contents are extremes (relatively low for 8di and relatively high for 8dii).

8f. Mould ripened cheese, blue

For this subcategory, 114 products from 16 countries and territories were identified. As the variety covered by the data set for this subcategory, “Mould ripened cheese, blue”, was limited, information from the literature and national targets was used to support the benchmark-setting process.

There were several peaks observed in this subcategory. Data points that clustered around the lowest group, about 200–400 mg/100 g, were identified to be misclassifications (e.g. containing mascarpone), and were omitted from the data set. The final sample size was 108.

The second group was located around 500–560 mg/100 g and only contained Gorgonzolas, mostly mild ones. The third group – around 620–860 mg/100 g – also still contained only Gorgonzolas, mostly stronger ones. The fourth and highest group started at 1240 mg/100 g (lowest sodium Roquefort) and went up to 1480 mg/100 g (and probably could be higher, but this is not captured by the data), contained Roquefort.

According to the literature (17), the sodium chloride content of Danablu (3.0–3.9%) could be considered to be close to that of Roquefort (4.1%), which is distinctly higher than that of other blue cheeses such as Gorgonzola (1.6–2.9%) and Stilton (2.2–2.7%). Therefore, it was considered a good starting point to split this subcategory into two.

For low-sodium blue cheeses, the median of data points representing Gorgonzola type was 640 mg/100 g ($n = 65$). This was chosen as the global sodium benchmark for “8fi. Mould ripened cheese, blue – low sodium containing”. For “8fii. Mould ripened cheese, blue – high sodium containing”, the newly identified Danish national target of 1240 mg/100 g for Danablu was considered appropriate as a benchmark (see section 3.3). For reference, the median of data points representing Roquefort type is 1480 mg/100 g ($n = 41$).

Other blue cheeses with different sodium contents are expected to fall between these two. However, setting benchmarks for Gorgonzola and Roquefort was considered a good starting point as they are two of the most common types of cheese in this subcategory and their sodium contents are extremes (very low and very high).

8h. Brine-stored cheese

For this subcategory, 240 products from 21 countries and territories were identified. Data points with a value below 600 mg/100 g were removed as they were identified to be errors or misclassifications. The lowest genuine feta was at 600 mg/100 g, which was a diet (50% less salt) product. Additionally, data points that are high extremes were checked and either fixed or removed if they were identified as errors. The final sample size was 228.

The median of the remaining data points – 1000 mg/100 g – was chosen as the global sodium benchmark.

3.3 Updates to the remaining subcategories of global sodium benchmarks

As more countries and regions develop and update their sodium/salt targets, there is a need to continuously update the WHO global sodium benchmarks. In the past few years, some countries and regions updated or established their targets, which were also incorporated in the second edition. In addition, the WHO learned of several countries whose salt targets had not been included in the development of the first edition. The second edition of the WHO Benchmarks updates the benchmark values based on the new information, creates several new subcategories, and provides expanded examples and descriptions for food subcategories. The aim is to better reflect regional variability in foods that are available around the world to make the sodium benchmarks more globally applicable.

The following changes were made (note that the subcategory numbering is from the second edition):

- Data were obtained from an additional nine countries (Belarus, Croatia, Denmark, Kiribati, Latvia, Malaysia, Serbia, Slovakia, Uzbekistan) whose data had not been captured in the first edition. National targets from some of these countries were used in updating the global benchmarks – Denmark (6a, 8c, 8fii and 10a) and Kiribati (14h).
- Benchmark values were revised based on the updated national targets of New Zealand and the United States, and the regional targets of the WHO Regional Office for the Americas, which were made available after May 2021. Affected subcategories are 1a, 2a, 3a, 3c, 6a, 8c, 8e, 9bii, 9d, 9gi, 11a, 11b, 14a, 14d, 16bi, 16bii, 16c, 16d, 16e, 16f, 16g and 18ai.

- New subcategories were created to reflect regional variability in foods available on the global market. The creation of the new subcategories 3e, 3f and 18i was prompted by the regional targets recently developed by the WHO South-East Asia Regional Office.
- Some subcategories were split into two to reduce within-subcategory heterogeneity. Affected subcategories are 14d and 14e; and 16bi and 16bii.
- Two subcategories were merged into one. The affected subcategory is 3c. This was prompted by the updated regional target of the WHO Regional Office for the Americas.
- Mismatches and errors were corrected. Affected subcategories are 11b, 14i and 18aii.
- Examples and descriptions of foods were expanded for many subcategories.

The proposed food categories, subcategories and global benchmarks (second edition) are shown in the [Annex](#), along with the basis for the benchmark setting (i.e. national or regional lowest maximum limit on which each benchmark is based, or market data analysis). These global benchmarks are intended to complement national and regional efforts to set sodium targets. Countries and regions are encouraged to set targets for other products that are not included in these global benchmarks but that are important sources of sodium in their context.

4. How to set up national sodium targets using global benchmarks

When countries set up national sodium targets, it is recommended to set up mandatory targets in the form of maximum limits. Mandatory targets are recommended as they drive larger reduction in sodium intake than do voluntary targets (11). In some cases, it may make sense to start with a short list of food subcategories that are the major contributors of salt intake of the population. Overtime, as implementation progresses, more subcategories can be added to cover a broader range of food products. To be effective, mandatory targets must be supported by robust enforcement. Voluntary targets can still be useful, especially if the country is setting targets for a large number of subcategories including those with high degrees of within-subcategory heterogeneity. For voluntary targets to be effective, there is a need for commitment from industry, strong government leadership, accountability, and clear government-led monitoring and publication of results. Countries may also want to pursue a hybrid approach by setting mandatory targets for certain subcategories and voluntary targets for others.

The global sodium benchmarks provide a good starting point for the creation of either mandatory or voluntary targets. Below are key steps to follow to adapt them to a specific country. These steps may change depending on country differences and available data:

1. Collect data and determine the contribution of processed food to overall sodium intake and on which categories of processed food contribute the most sodium to the diet.
2. Determine key food categories to target (highest in sodium, biggest contributors to sodium intake), using the categories defined by the global sodium benchmarks as a starting place but adjusting as needed.
3. Collect product-level data and analyse what products are included in selected categories and their sodium levels.
4. Set targets and timeline:
 - i. Review the global benchmarks and compare to collected data; apply corresponding global benchmark values as target levels. Adjust food categories as needed and set target levels as appropriate.
 - ii. Set the timeline, taking into account the country's overall sodium reduction goals. Consider taking a stepwise approach and setting interim targets if helpful and a longer timeline if sodium levels in country are a lot higher.
 - iii. Assess technical feasibility of targets and timeline through scientific evidence and open, transparent consultations with key stakeholders.
5. Develop plans for monitoring, evaluation and updating the targets over time (e.g. increasing food subcategories to target, reducing the target levels once sodium reduction has been achieved).

Adaptation of the global sodium benchmarks is an important step (step 4). While the global benchmarks have the benefit of providing the harmonized global goal to support product reformulation, it may not be feasible to apply the same target universally across all products and countries.

First of all, it is important to note that the benchmarks are established for general and wide food categories to represent all foods around the world. In this generalization, not every product can be well covered by the food subcategories of the global benchmarks. The sodium content of specific foods can vary due to factors such as geography, food culture, taste preferences, traditions, manufacturing techniques and practices, product reformulation efforts, technology available, and other food and nutrition policies in place. All of these factors could contribute to variations, which could pose a challenge to the direct implementation of the global benchmarks.

The WHO global benchmark levels are feasible maximum sodium levels for these broad food categories, but within these categories, exceptions will occur for specific food types that need a more considered maximum sodium limit to ensure food quality and safety. Countries therefore need to tailor the targets to ensure they are suitable for their local market situation. This may be done by, for example, comparing the product categorization and the WHO benchmark values to the current food products and their sodium levels and distribution in the market. This can confirm that the benchmark values are challenging but can be realized within a certain time window. If some important products cannot meet the targets, it is advised to split the subcategory and/or modify the subcategory definition. It is important to make sure each subcategory is well defined so that the targets are achievable but still challenging for all product types covered by the subcategory.

WHO is currently developing a detailed guide on how to set national sodium targets including adapting the global benchmarks.

5. Conclusion

Reducing sodium intake is an effective way to reduce the burden of cardiovascular diseases and other diet- and nutrition-related NCDs. However, accelerated progress is needed to meet the globally agreed goals for reducing sodium intakes and NCD burden. There is now a great opportunity to boost progress towards achievement of the Sustainable Development Goals and the global sodium reduction target by setting global benchmarks for sodium in a wide range of food categories. The efforts of Member States and several WHO regional offices have shown that it is feasible to reduce sodium levels in processed foods by setting national or regional sodium targets for food product reformulation. Building on this work, the first set of global sodium benchmarks was established in May 2021, and the updated version is published as a second edition.

These benchmarks are intended to serve as a basis for dialogue with the food and beverage industry to improve the food environment at the global level, following on from the constructive dialogue on reduction of iTFA.

The global benchmarks are also developed to call for accelerated action from Member States in scaling up their efforts to reduce their populations' sodium intake. They are designed to be complementary to existing and ongoing national and regional efforts and initiatives, and are intended to serve as a reference for such initiatives, where needed.

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Annex: WHO global sodium benchmarks (second edition)

Main food category	Subcategory	Subcategory description	Global benchmark (mg / 100 g)	Lowest maximum limit on which the benchmark is based	Changes between the first edition and the second edition
1. Chocolate and sugar confectionery, energy bars, and sweet toppings and desserts	1a. Granola and cereal-type bars	Granola bars (plain and coated), fruit filled bars.	150	WHO Regional Office for the Americas: Granola, cereal and energy bars, 150 mg	Benchmark was established Subcategory description was modified
	1b. Nut butters	Nut butters (e.g. peanut, almond, cashew and soy). Excludes unsalted nut butters and tahini.	200	Derived based on the analysis of the sodium content of existing products on the market	Benchmark was established
2. Cakes, sweet biscuits and pastries; other sweet bakery wares; and dry-mixes for making such	2a. Cookies/sweet biscuits	Shelf-stable, frozen and refrigerated products. Sweet cookies, biscuits, tea biscuits and dough. Includes filled and coated cookies and biscuits. Excludes crackers/savoury biscuits (see 3a). Excludes dry-mixes (see 2g).	200	WHO Regional Office for the Americas: Cookies and sweet biscuits, 200 mg	Benchmark was updated Subcategory description was modified
	2b. Cakes and sponges	Shelf-stable, frozen and refrigerated products. Cakes, snack cakes, doughnuts (yeast and cake types), brownies and squares, muffins and pastry dough. Excludes dry-mixes (see 2g).	205	Brazil: Cake rolls (<i>Rocamboles</i>), 204 mg (benchmark is rounded up to the nearest 5 mg)	
	2c. Pies and pastries	Shelf-stable, frozen and refrigerated products. Pies, fruit crisps, pastries, toaster pastries with fruit or other fillings, Danish pastry, cinnamon rolls and pastry dough. Excludes dry-mixes (see 2g).	120	United Kingdom: Sweet pies and other shortcrust or choux pastry-based desserts, 120 mg	
	2d. Baked and cooked desserts	Shelf-stable, frozen and refrigerated products. Puddings, custards, crème brûlée, flans and cheesecakes. Includes non-baked cheesecakes. Excludes dry-mixes (see 2g).	100	United Kingdom: All other processed puddings, 100 mg	

Main food category	Subcategory	Subcategory description	Global benchmark (mg / 100 g)	Lowest maximum limit on which the benchmark is based	Changes between the first edition and the second edition
2. Cakes, sweet biscuits and pastries; other sweet bakery wares; and dry-mixes for making such	2e. Pancakes, waffles and French toast	Shelf-stable, frozen and refrigerated products. Includes crumpets. Excludes dry-mixes (see 2g).	330	United States: Prepared breakfast bakery products, 330 mg	
	2f. Scones and soda bread	Shelf-stable, frozen and refrigerated products. Scones (referred to in the United States as biscuits), soda bread and dough. Excludes dry-mixes (see 2g).	475	United Kingdom: Morning goods – powder raised, 475 mg	
	2g. Dry-mixes for making cakes, sweet biscuits, pastries and other sweet bakery wares	Dry-mixes for cookies/sweet biscuits, cakes, sponges, pies, pastries, baked and cooked desserts, pancakes, waffles, French toast, scones and soda bread. Excludes ready-made products (see 2a–2f).	320	Derived based on the analysis of the sodium content of existing products on the market	Benchmark was established
3. Savoury snacks	3a. Crackers/savoury biscuits	Plain (i.e. flavoured only with salt) or flavoured crackers, sandwich crackers, puffed cakes, and graham crackers (e.g. cheese crackers, soda crackers and rice cakes). Includes dry breads such as Melba toast, rusks, breadsticks, pita or baguette chips, croutons and other crisp breads. Includes poppadoms. Excludes unsalted products. Includes snack mixes (e.g. trail mix, gorp, scroggin, nuts and bolts, mezcla de frutos secos, namkeens, bhujas) where crackers/savoury biscuits are the main component (e.g. mixed rice crackers with nuts).	580	WHO Regional Office for the Americas: Savoury biscuits and crackers, 580 mg	Benchmark was updated Subcategory description was modified
	3b. Nuts, seeds and kernels	Nuts, peanuts and seeds (seasoned with salt or flavour). Excludes unsalted products. Includes seasoned/flavoured pulses (such as chickpeas, peas, and mung bean snacks), and mixed snacks (e.g. trail mix, gorp, scroggin, nuts and bolts, mezcla de frutos secos, namkeens, bhujas) where nuts, seeds, or kernels are the main component (e.g. nut mixtures with dried fruit). Excludes popcorn (see 3c).	280	Colombia: Light peanuts (Mani light – reduced sodium), 279 mg (benchmark is rounded up to the nearest 5 mg)	Subcategory description was modified

3. Savoury snacks	3c. Potato, vegetable and grain chips, popcorn and extruded snacks	Chips made of potato, vegetables and grains (e.g. corn, wheat, multigrain and rice). Includes all flavours (including salt and vinegar flavours). Includes both reformed chips/crisps and sliced chips. Sheeted, reformed, puffed or pelleted snacks made from starch-rich materials (e.g. corn, maize, wheat, rice or potato flour) or legume flours. Includes all flavours (including salt and vinegar flavours). Excludes pretzels (3d). Includes popcorn (including microwave and stovetop ready popcorn, seasoned or candied ready-to-eat popcorn). Includes snack mixes (e.g. trail mix, gorp, scroggin, nuts and bolts, mezcla de frutos secos, namkeens, bhujas) where extruded snacks (made from starch-rich flours or legume flours) are the main component.	470	WHO Regional Office for the Americas: Chips, popcorn, and/or extruded snacks, 470 mg	New subcategory was created by combining two subcategories (old 3c and 3d) and benchmark was established
	3d. Pretzels	Salted hard pretzels. Includes sweet and savoury flavoured, filled and unfilled pretzel snacks (e.g. chocolate-covered pretzels and pretzels filled with cheese).	760	United Kingdom: Extruded, sheeted snacks, 760 mg	Subcategory was renumbered (previously 3e)
	3e. Seafood or meat-based snacks	Seafood-based or seafood-flavoured snacks (such as fish or squid) that are baked or dried, or meat-based (such as pork). Excludes processed seafood and meat products that require preparation or cooking and are not specifically consumed as a snack.	1090	United Kingdom: Pelleted snacks, 1090 mg	New subcategory was created and benchmark was established
	3f. Seaweed-based snack	Seaweed-based snacks include snacks whereby seaweed is a major component (e.g. battered or tempura seaweed) or fried seaweed with salt or other flavouring.	575	WHO Regional Office for South-East Asia: Seaweed-based snack, 575 mg	New subcategory was created and Benchmark was established
4. Beverages	No global benchmarks to be established at this stage				
5. Edible ices	No global benchmarks to be established at this stage				

Main food category	Subcategory	Subcategory description	Global benchmark (mg / 100 g)	Lowest maximum limit on which the benchmark is based	Changes between the first edition and the second edition
6. Breakfast cereals	6a. Minimally processed breakfast cereals (includes all types – prepared, ready-made and dry-mixes)	Prepared, ready-made or dry-mix minimally processed cereals, such as steel-cut, rolled or instant oats for preparing oatmeal, and muesli (i.e. made with oats and a mixture of unsalted nuts and seeds and/or dried fruit). May or may not require cooking. Includes porridge mix and hot instant cereals. Excludes highly processed cereals including granola (see 6b).	120	Denmark: Muesli, 120 mg	Benchmark was updated Subcategory description was modified
	6b. Highly processed breakfast cereals	Highly processed, ready-to-eat breakfast cereals including shredded, flaked, puffed or extruded cereals, and cereals with added nutrients such as sodium, fat, sugars (or non-sugar sweeteners), fibre or various vitamins and minerals. Includes granola.	280	Slovenia: Breakfast cereals (e.g. cornflakes), 280 mg	
7. Yoghurt, sour milk, cream and other similar foods					
No global benchmarks to be established at this stage					
8. Cheese	8a. Fresh unripened cheese	Unripened cheese (e.g. cream cheese, mozzarella, ricotta and cottage cheese).	190	United Kingdom: Cottage cheese – plain and flavoured (fresh cheeses), 190 mg Canada: Swiss, 520 mg	
	8b. Soft to medium ripened cheese	All soft to medium firm textured ripened cheese, often with a relatively short ripening period (e.g. Emmental, colby, Monterey Jack, young Gouda and mild cheddar).	520		
	8c. Semi-hard ripened cheese	All semi-hard to hard-textured ripened cheese, often with a relatively long ripening period (e.g. matured Gouda, matured cheddar, Gruyère and provolone).	600	Denmark: Hard cheeses, 600 mg	Benchmark was updated
	8di. Cow milk extra-hard ripened cheese	Cow milk extra-hard-textured ripened cheese (e.g. Grana Padano, parmesan).	640	Derived based on the analysis of the sodium content of existing products on the market	Benchmark was established

8. Cheese							
8dii. Sheep milk extra-hard ripened cheese	Sheep milk extra-hard ripened cheese (e.g. pecorino, pecorino Romano).	1880	Derived based on the analysis of the sodium content of existing products on the market	Benchmark was established			
8e. Mould ripened cheese, white and red	All white and red mould cheese such as white and red surface-mould cheese (e.g. Brie, Camembert and Munster).	600	Canada: Brie and camembert, 600 mg	Benchmark was updated Subcategory description was modified			
8fi. Mould ripened cheese, blue – low sodium containing	Low sodium-containing blue mould cheese (e.g. Gorgonzola and Stilton).	640	Derived based on the analysis of the sodium content of existing products on the market	Benchmark was established			
8fi. Mould ripened cheese, blue – high sodium containing	High sodium containing blue mould cheese (e.g. Roquefort and Danablu).	1240	Denmark: Danablu, 1240 mg	Benchmark was established			
8g. Processed cheese	All processed and melt cheese, cheese spreads, blocks and slices with or without added ingredients, cheese analogues (including plant-based), dairy-free cheese and spreads.	720	United Kingdom: Cheese spreads, 720 mg	Subcategory description was modified			
8h. Brine-stored cheese	Cheese stored in brine (e.g. feta and halloumi).	1000	Derived based on the analysis of the sodium content of existing products on the market	Benchmark was established			
9. Ready-made and convenience foods and composite dishes							
9a. Canned foods	Shelf-stable vegetarian and meat chilli, stew, meatballs and curries; and baked beans and refried beans. Excludes canned vegetables and legumes (see 16a).	225	United Kingdom: Baked beans in tomato sauce without accompaniments, 225 mg				
9bi. Pasta, noodles, and rice or grains with sauce or seasoned (prepared)	Shelf-stable, frozen and refrigerated products. Ready-to-serve pasta, noodles, and rice or grain mixes with sauce or seasonings (e.g. macaroni with cheese sauce, noodles in tomato sauce and teriyaki noodles).	230	United Kingdom: Pasta and noodles, plain and flavoured, 230 mg				

Main food category	Subcategory	Subcategory description	Global benchmark (mg / 100 g)	Lowest maximum limit on which the benchmark is based	Changes between the first edition and the second edition
11. Bread and bread products	11c. Flatbreads	All types of leavened and non-leavened flat breads. Fresh baked, refrigerated and shelf-stable plain (i.e. flavoured only with salt) or flavoured tortillas, wraps, pita, Greek flatbreads or naan. Includes refrigerated and frozen dough. Excludes pancakes (see 2e). Excludes dry breads and crisp flatbreads (see 3a).	320 ¹	Qatar: Bread, 320 mg	Subcategory description was modified
	12. Fresh or dried pasta, noodles, rice and grains			No global benchmark to be established at this stage	
13. Fresh and frozen meat, poultry, game, fish and similar				No global benchmarks to be established at this stage	
14. Processed meat, poultry, game, fish and similar	14a. Canned fish	Canned tuna, canned salmon, water and oil-packed fish, sauce-packed fish, fish/seafood salad and shellfish (e.g. sardines, mackerel, shrimp, crab, clams and smoked oysters). Includes retort-packed products. Excludes canned anchovies (see 14c).	280	WHO Regional Office for the Americas: Canned fish, 280 mg	Benchmark was updated
	14b. Processed fish and seafood products, raw	Unprepared fish and seafood products, cakes and burgers; and seasoned (with sauce or seasoning), breaded, battered and stuffed fish. Includes restructured, simulated or imitation seafoods such as surimi. Also includes fish and seafood-based mousse, spread and dips.	270	Australia: Seafood (crumbed and battered proteins), 270 mg	
	14c. Processed fish and seafood products, non-heat-treated	Fish and seafood products with non-heat preservation methods, such as brining, fermenting and air drying (e.g. smoked fish, kippered fish, salmon jerky, anchovies and dried fish).	800	Canada: Smoked fish, 800 mg	

¹ The target of 200 mg/100 g product is used in countries such as Bahrain, Oman and United Arab Emirates. It was considered too low and not applicable to flatbreads in general that are consumed worldwide. However, wherever and whenever possible, countries must strive to lower their target for this subcategory as much as possible to the level of 200 mg/100 g, especially in countries where the product contributes greatly to the population sodium intake.

14. Processed meat, poultry, game, fish and similar	14d. Raw meat products and preparations	Unprepared, not heat treated, raw meat products and burgers. Includes minced, formed, marinated, flavoured, moisture-enhanced and breaded meat products. Excludes emulsion meat sausages (see 14e).	300	Fiji: Meat burger, 300 mg	Benchmark was updated Subcategory description was modified
	14e. Fresh sausages	Includes all emulsion-based raw meat products like – bologna, frankfurters, meat sausages, liver sausages and chipolatas – sold in raw form, either chilled or frozen. The sausages can be made from any animal meat source like beef, lamb, pork, chicken and turkey, including mechanically recovered meat.	525	United Kingdom: Sausages (Includes all fresh, chilled and frozen meat sausages), 525 mg	Subcategory was split from 14d Benchmark was established
	14f. Whole muscle meat products, heat treated (frozen and canned products)	Frozen and canned whole muscle (e.g. beef, lamb, pork, chicken and turkey).	270	United Kingdom: Whole muscle, 270 mg	Subcategory description was modified Subcategory was renumbered (previously 14ei)
	14fii. Whole muscle meat products, heat treated (refrigerated products)	Refrigerated whole muscle (e.g. beef, lamb, pork, chicken and turkey).	600	Ireland: Uncured cooked meat products –typically poultry and some beef products, 600 mg	Subcategory description was modified Subcategory was renumbered (previously 14eii)
	14g. Whole muscle meat products, non-heat preservation	Air-dried, cured, entire meat pieces (e.g. prosciutto, Parma and serrano ham). Brined meat products (e.g. pastrami and bacon).	950	Canada: Preserved meat – uncooked, 950 mg	Subcategory description was modified Subcategory was renumbered (previously 14f)
	14h. Comminuted meat products, heat treated (cooked)	Cooked sausages (including hotdogs), cooked meatloaf balls, corned beef, luncheon meats and pâté. Includes canned sausages and luncheon meats.	540	United Kingdom: Comminuted or chopped reformed meat, 540 mg Kiribati: Canned corn beef and canned luncheon meat, 540 mg	A national target (lowest tie) was added as a basis for the benchmark Subcategory was renumbered (previously 14g)

16. Processed fruit, vegetables and legumes	16e. Frozen and seasoned vegetables and legumes	Frozen vegetables and legumes in sauce and/or seasoning. Excludes frozen French fries and other potato products (see 16f).	300	United States: Frozen vegetables and legumes, 300 mg	Benchmark was updated Subcategory description was modified
	16f. Frozen potatoes and other potato products (ready-to-eat)	Plain (i.e. flavoured only with salt) and seasoned French fries/chips, sweet potato fries, hash browns, potato patties, green plantain, and tropical tubers such as cassava (yuca).	140	WHO Regional Office for the Americas: Frozen potatoes and similar products, 140 mg	Benchmark was updated Subcategory description was modified
	16g. Battered or breaded vegetables	Fried or baked vegetables (e.g. onion rings, fried jalapeños and fried green beans).	580	Canada: Refrigerated or frozen breaded and/or battered cheese and vegetables, 580 mg	Benchmark was updated
17. Plant-based food/meat analogues	17a. Tofu and tempeh	Savoury, marinated and seasoned tofu and tempeh. Excludes plain tofu, tofu-based desserts and plain tempeh.	280	Canada: Seasoned tofu and tempeh, 280 mg	
	17b. Meat analogues	Frozen and refrigerated meat analogues (e.g. veggie patties, burgers, veggie dogs, meatballs and deli-style slices). Excludes dairy-free cheese (see 8g).	250	United Kingdom: Plain meat alternatives, 250 mg	
18. Sauces, dips and dressings	18ai. Bouillon and soup stock (not concentrated)	Liquid broth and soup stock. Includes gravy stock. Excludes soups (ready-to-serve, canned and refrigerated soups) (see 9gi).	340	United States: Broth and stock, 340 mg	Benchmark was updated
	18aii. Bouillon and soup stock (concentrated)	Bouillon cubes and soup stock powders. Includes gravy stock. Excludes concentrated dry soups (see 9gii).	13 000	South Africa: Stock cubes, stock powders, stock granules, stock emulsions, stock pastes or stock jellies, 13 000 mg	Benchmark was updated

18. Sauces, dips and dressings	18f. Soy sauce and fish sauce	Soy sauce, fish sauce and other fermented sauces.	4840	Fiji: Asian sauces, 4840 mg	
	18g. Other Asian-style sauces	Asian-style sauces and condiments (e.g. teriyaki, black bean, hoisin, stir-fry, duck and oyster sauces). Excludes sweet sauces (see 18c) and chilli sauce including sriracha chilli sauce and sweet chilli sauce (see 18e) and soy sauce and fish sauce (see 18f).	680	Australia/New Zealand: Asian-style cooking sauces/Asian sauces, 680 mg	
	18h. Marinades and thick pastes	Shelf-stable marinades, and thick pastes such as curry pastes (e.g. Thai and Indian) and other Asian pastes (e.g. miso, doubanjiang and gochujang).	1425	United Kingdom: Thick pastes, 1425 mg	Subcategory description was modified
18i. Spice blends, seasoning mixes, curry powder (dry-mix, concentrated)	Dry seasoning/spice mixes and curry powders for side and main dishes (e.g. chilli, stew, fajita, masala, barbeque seasoning). Dry seasoning for meat and fish (e.g. steak spice).	6000	Norway: Other spice mixes, 6000 mg	New subcategory was created and benchmark was established	

BBQ: barbecue; United Kingdom: United Kingdom of Great Britain and Northern Ireland; United States: United States of America; WHO: World Health Organization

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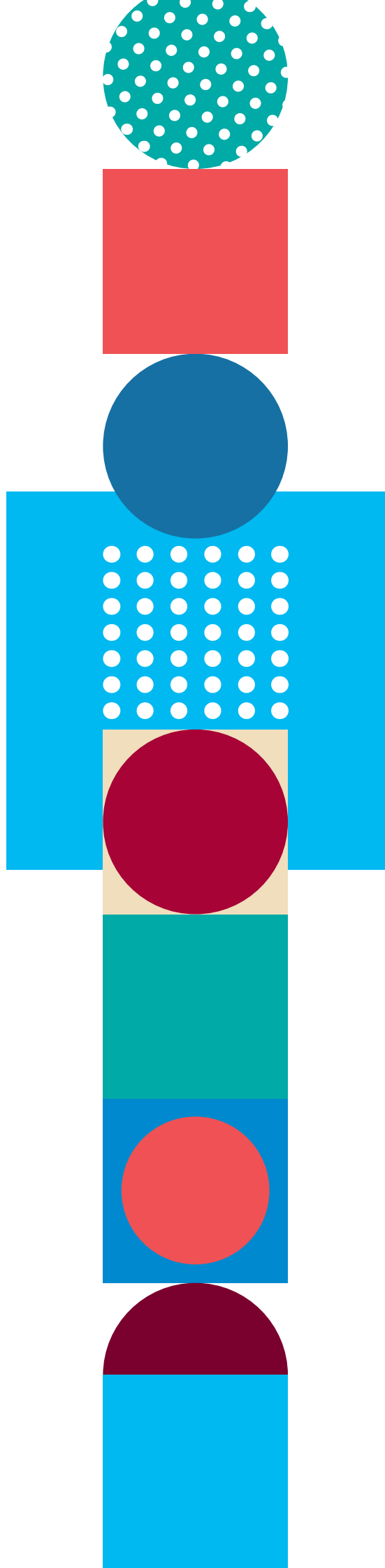
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