World Health Organization
REGIONAL OFFICE FOR South-East Asia

WHO South-East Asia Region Sodium Benchmarks for Packaged Foods


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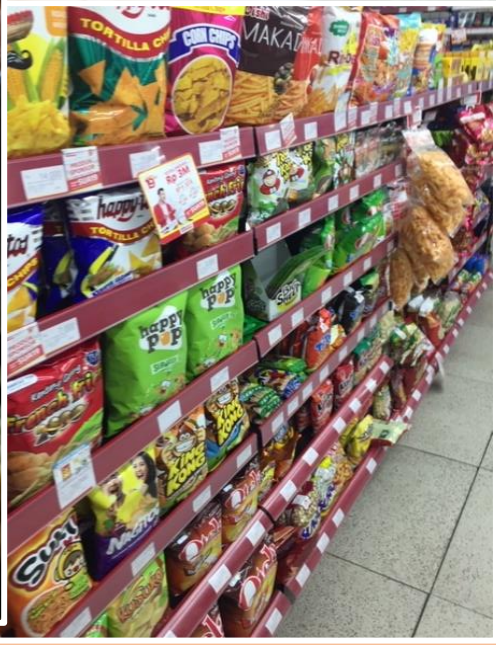

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1. Background

Across most countries in the world, including South-East Asia, adults consume more sodium than the recommended levels.[1] While the main source of sodium within the South-East Asia Region is discretionary salt use (salt added during cooking and at the table), the demographic and lifestyle changes are causing changes in the diet, to include salt intake from industrially produced packaged foods.[2] With the rise in consumption of packaged foods in the Region, there is an urgent need to introduce food policies which focus on reducing the sodium content of packaged foods, as well as other nutrients of concern.

In 2021, the World Health Organization (WHO) released global sodium benchmarks for 58 commonly consumed packaged food categories.[3] Benchmark sodium values for each food category were selected based on the lowest maximum value from existing national or regional targets. The global sodium benchmarks provide substantial guidance for countries to establish sodium targets for packaged foods. However, they do not include a comprehensive list of foods consumed in South-East Asia countries nor account for current sodium levels in packaged foods found in the Region.

Therefore, the global benchmarks were reviewed to assess if they included sources of packaged food sources of sodium in South-East Asia and if the benchmark levels were appropriate. The purpose of tailoring the WHO global sodium benchmarks to the South-East Asia is to support countries in the Region to adopt sodium reformulation targets and accelerate the target setting process and promote reformulation of products to lower sodium contents. Based on the information, adaptations were made, and additional benchmarks established where necessary. This will help ensure that any future targets implemented in countries in the South-East Asia Region are feasible to achieve and result in meaningful reductions in population sodium intakes.

The implementation of sodium reformulation targets for packaged foods should be considered within a broader suite of complementary policy actions to support healthy and sustainable diets. These include front of pack labelling (FoPL), fiscal policies, regulation of nutrition and health claims and reformulation of foods to a better profile with regard to nutrients of concern.[4] Salt reduction strategies should also be considered within the context of fortification strategies that rely on salt as a vehicle (e.g. iodine). Iodine fortification requirements may need to be adjusted upwards when significant population salt reduction is achieved.

The setting of global sodium benchmarks is, therefore, an important action to drive forward progress in sodium reduction. Setting sodium reformulation targets for packaged foods have several advantages over other policies, such as FoPL. FoPL focus on multiple nutrients, but sodium reformulation benchmarks specifically target sodium reduction and drive sodium reduction in specific food categories that have high sodium content and/or a high sodium contribution.

Additionally, unlike more generic sodium thresholds in many FoPLs that are not specific to an individual food category, different sodium targets can be set to reflect the varying sodium requirements for different food categories. Through being category-specific, this tailored approach can be a more effective way for motivating companies across the food supply to cut levels of sodium in their products down to targeted levels. Lastly, sodium reformulation benchmarks are likely to have a more equitable effect than other policies because they affect the whole food supply and therefore all consumers. FoPL or claims rely on consumers being

able to interpret the label or claim and be able to buy the healthier products, which may be less effective for people of lower education or lower socioeconomic group.

2. Methodology

The overall steps conducted to review the suitability of the WHO global sodium benchmarks and set benchmarks for packaged foods that are high contributors of sodium in the South-East Asia Region are outlined in Figure 1. Some of these steps could also be used to adapt sodium benchmarks for establishing country-specific sodium targets for packaged foods.

Step1

Using established search strategies, existing literature (peer-reviewed and grey) was comprehensively reviewed to identify data on sodium levels in packaged foods,[5] and the main food category sources of sodium in the diet across populations in the WHO South-East Asia Region.[2, 6] Data identifying the main food category sources of sodium considers both the quantity (amount) of food consumed by the population as well as the sodium content (or concentration) of these products. Some products such as seasoning powder, though taken in small quantities have very high levels of sodium, and other products such as bread, which may have lower sodium content tend to be consumed in larger volumes. Therefore, it is crucial to consider both of these components as they both influence and contribute population sodium intakes.[7] After extracting relevant information into a spreadsheet, the information captured was verified by experts and collaborators in the Region, and missing data identified. Opinions on priority packaged food categories that should be targeted for sodium reformulation were also gathered.

Step 2

Using the available information on sources of sodium, current sodium content in packaged foods and country feedback on priority food categories for which sodium benchmarks should be established were identified.

Step 3

All products (with sodium content) that were considered as the priority food categories were then categorised into
A) an existing food category in the WHO global sodium benchmarks, and all remaining products were then considered to be
B) not appropriately covered by the food categories in the WHO global benchmark.
For each product not covered by an existing food category, the most similar food category given in the WHO global sodium benchmarks was noted. The categorization was independently checked by a second researcher, and when necessary, discussed with other researchers including a food technologist. During this stage, the dataset was also cleaned by removing products with missing sodium content data, errors, and outlier products (products with implausibly high or low sodium content values).

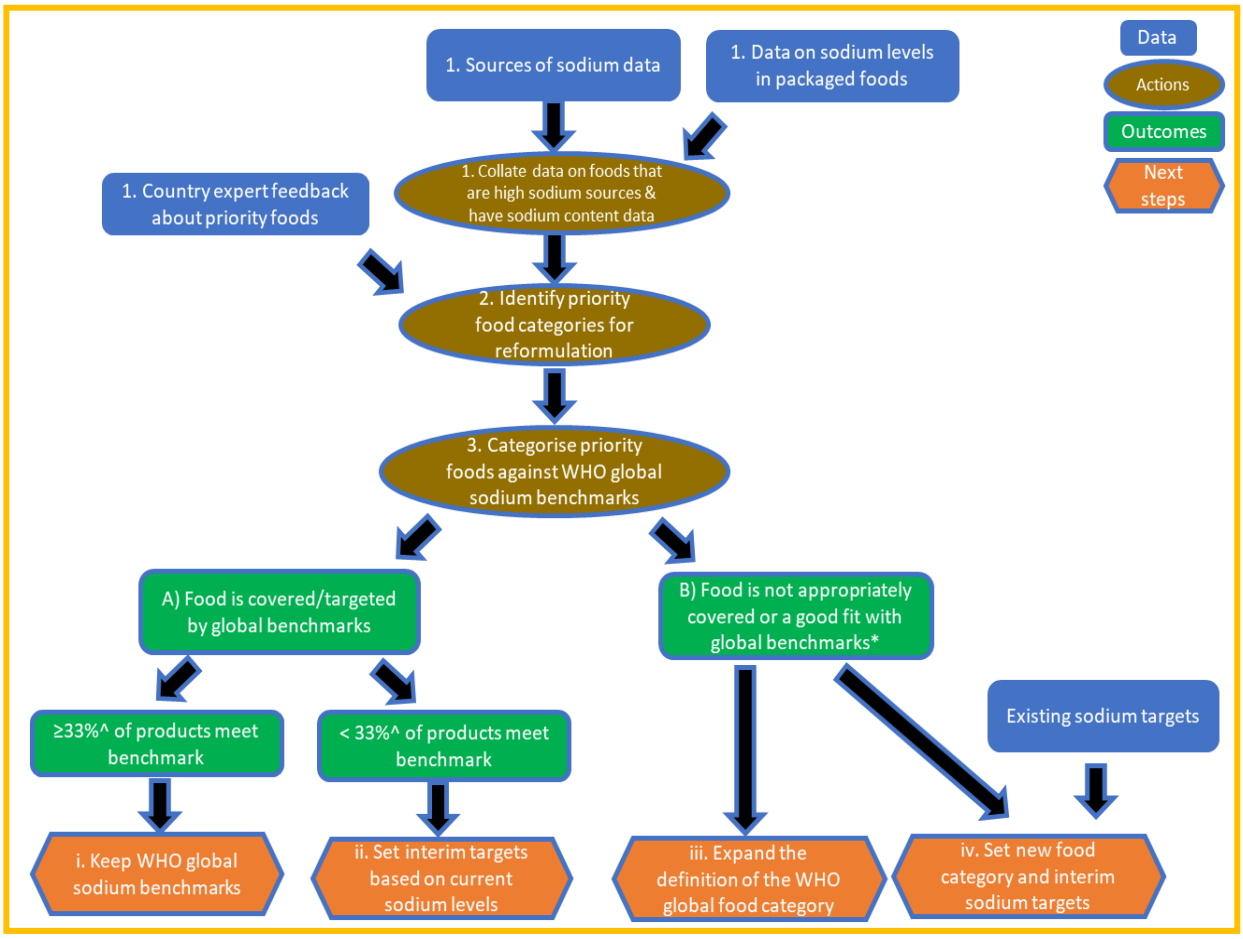


Figure 1. Steps to review the suitability of the WHO global sodium benchmarks and adapt the benchmarks for the South-East Asia Region.

*Foods that are not included or culturally suited to the food categories as given in the WHO global sodium benchmarks. The 33 % percentile criteria comes from Australia's sodium target setting process whereby if more than 33% of products within a category are already achieving the targeted level, then it is considered feasible and if not, then consideration is given to setting a higher target.[8]

Step 4

For existing food categories as given by the global benchmarks, the suitability of the sodium benchmark levels were reviewed by comparing it against the current sodium content of products sold in South-East Asia. The sodium content distribution of products within categories, i.e the 25th, 33rd, median and 75th percentile were assessed and the proportion of products currently complying with the global sodium benchmark noted. Through this process, the following were determined for each priority food category:

i.Global sodium benchmark is suitable i.e., no changes required

If the WHO global sodium benchmark was considered feasible for most products within a category (as determined by a food technologist) AND if at least one-third i.e. ≥ 33 % (and less than two-thirds i.e. 66%) of existing products available in WHO South-East Asian countries met the WHO global sodium benchmark[8, 9], then the global sodium benchmark was deemed feasible and adopted without any changes.

ii. Global sodium benchmark not suitable and a higher interim sodium target required

If less than one-third of products were at or below the WHO global sodium benchmark, an exploration was done to assess if there were subtypes of products within the category that had a higher sodium content and would therefore require a separate benchmark. If not, higher interim sodium targets were developed and recommended to be achieved in a certain timeframe. Sodium levels would be gradually lowered until the WHO global sodium benchmark can be achieved.

The interim sodium targets were based on the 50th percentile (median) as suggested by the World Health Organization Pan American Health Organization guidelines for setting sodium targets.[10] In cases where the median sodium was not too different from the 75th percentile (i.e. many products had sodium levels just above the median level), the 33rd percentile (rather than median) was used as the interim sodium target to drive sodium reduction. The recommended time frame for achieving the interim sodium targets was based on past experience in Argentina[11] and the UK[12] where about a 10 % reduction each year was achieved,[13, 14] and the technical feasibility.

iii. Global sodium benchmark not suitable and a lower sodium target required

If more than two-thirds (> 66 %) of products were already at or below the WHO global sodium benchmarks, lower (stricter) sodium targets were planned to be set to drive further sodium reduction. However, this did not apply to any categories.

Lastly, through consensus among three researchers, products that did not appropriately fit within an existing food category definition as given in the WHO global sodium benchmarks were then further divided into:

iv. An existing food category as given in the WHO global sodium benchmarks with an expanded definition

If there were region-specific or local food products in the South-East Asia Region that were very similar to an existing food category but did not clearly fit the existing description as given by the global sodium benchmarks, modifications were made to the category description and region-specific examples added on based on Codex category descriptions.

v. A new food category with a new sodium target

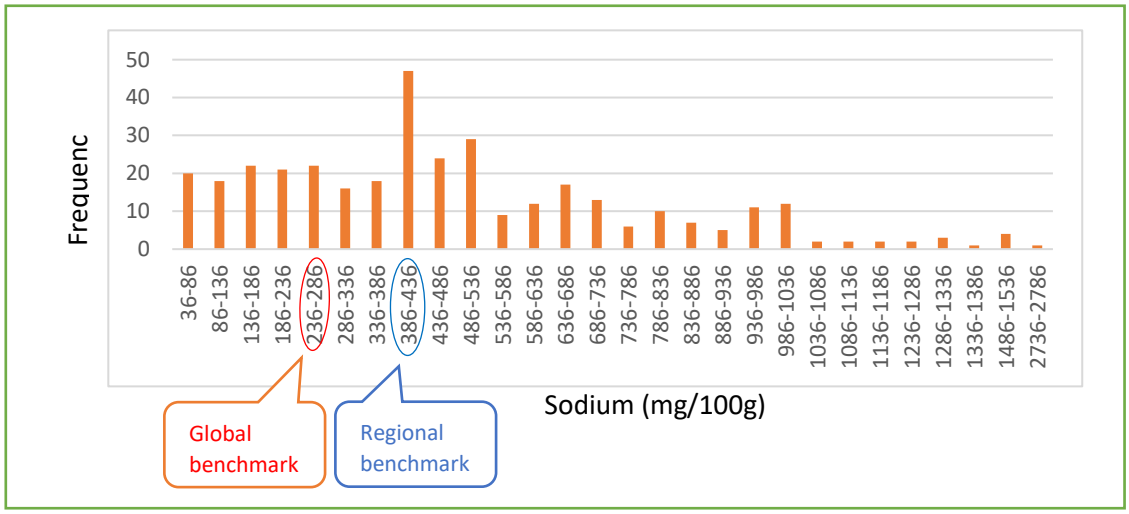
If food products in the region did not fit in any of the existing food categories, new categories and sodium targets were created. New categories and their description were informed by the codex food categories for relevant food category definitions,[15] and existing sodium targets from around the world.[5, 16]

New interim sodium targets were chosen based the sodium content levels of existing products in the South-East Asia Region and corroborated by existing sodium targets from other countries if available. Depending on the distribution of sodium content in products, new interim sodium targets were set at either the 33rd or 50th percentile (median) sodium content levels and with consideration on the technical feasibility.[10] (if many products had sodium contents just above the 50th percentile, the 33rd percentile was selected as the target).

The recommended timeframe (usually four years) for achieving the interim targets was set based on previous experience that suggested a 10 % reduction in sodium content per year is feasible.[11-14] A three or four year timeframe encourages gradual reformulation; this is critical for ensuring targets are feasible for food companies to achieve and acceptable to the public who are exposed to gradually lower sodium levels in the food supply. Following the timeframe set (i.e. three or four years), a review of compliance to the target should be conducted and the sodium target should be further lowered based on the revised sodium content levels in products.

However, in adopting the regional benchmarks for particular products, if countries wish to consider a shorter timeframe they could do so based on discussions with industry, and with food technologists and other stakeholders.

An illustration of how frequency plots of sodium levels were developed are provided for the category nut, seeds and kernels (Figure 2)



Nuts, seeds and kernels
- 356 products with sodium content data from 7 countries (Bangladesh, India, Indonesia, Maldives, Nepal, Sri Lanka, Thailand)

Sodium content (mg/100g)

- Average: 493,
- Median: 429
- 25th percentile: 268
- 75th percentile: 675

% compliance with global benchmark (280mg/100g): 27%

Interim target: 430mg/100g (in 4 years)
Rationale: Interim target set at the median level. Salt has no technical function in such products and is only used for flavour.

Current sodium content in packaged foods in WHO South-East Asia countries

Through a combination of a peer-reviewed, grey literature search and assistance from WHO, data on sodium content of almost 8914 packaged foods were identified from eight South-East Asia countries (Bangladesh, Bhutan, India, Indonesia (category level), Maldives, Nepal, Sri Lanka, and Thailand) (Table 1).

Table 1. Data on sodium content in packaged foods in WHO South-East Asia countries

Country	N	Year	Data collection method
Bangladesh	267	2011	Lab analysis and sodium labelling
Bhutan	23	2016	Sodium labelling on packaged foods
India	3475	2018	Sodium labelling on packaged foods
Indonesia	18 categories (n=3850)	2019/20	Database of sodium content of packaged foods[17]
Maldives	30	2020	Sodium labelling on packaged foods
Nepal	9	2021	Lab analysis
Sri Lanka	4239	2019/20	Database of Sodium labelling on packaged foods
Thailand	853	2020/21	Sodium labelling on packaged foods
TOTAL	**8914**		

Main sources of sodium in the WHO South-East Asia Region

Through the systematic review of peer-reviewed literature and assistance in country experts and information, estimates on the average salt intake contributed by different packaged foods categories in five South-East Asia countries (India, Indonesia, Nepal, Sri Lanka, and Thailand) were identified (Table 2).[18-21] Although discretionary salt added during cooking and eating remains the major source of sodium in these South-East Asian diets, sodium intake from packaged foods is increasing with rising packaged food consumption.

Common major categories that were sources of sodium in the South-East Asia Region include: fine bakery wares (biscuits and cakes); bread and ordinary bakery wares; cereals; ready-to-eat savouries (savoury snack foods); cheese and analogues; composite foods (prepared foods); fresh and frozen meat, poultry, game, fish and seafood products; processed meat, poultry and game products; processed fish and seafood products, processed fruits and vegetables; and sauces, dips and dressings (Table 2). Specific products such as instant noodles, which are generally considered a high source of sodium may not be included for some countries, since their contribution to daily salt intake of the population may not have been reported in the literature. Further, product categorization varied across publications and reports, and noodles may have been possibly included within another product category such as cereals. The sources of sodium may also not include certain novel products such as plant-based meats, which are becoming popular over the last 2 years or so since they were not mentioned in the publications.

Priority packaged food categories in the WHO South- East Asia Region

Based on the data on main sources of sodium, sodium content in packaged foods, WHO and country information (unpublished), six priority food categories that should be targeted for sodium reformulation were identified.

1) meat and meat products;
2) fish and fish products;
3) spices, sauces, and seasonings;
4) ready-to-eat savouries (snacks);
5) instant noodles;
6) breads and bakery wares.

Changes and modifications to the global sodium benchmarks

The six priority food categories were mapped to the food categories as given in the WHO global sodium benchmarks, reviewed for suitability and the following changes were made:

- Six new food subcategories with new sodium targets (Table 3)
    - Papads, papadums, appalam
    - Seafood or meat-based snacks
    - Seaweed based snacks
    - Instant noodles with sauce or seasoning (dry-mix, concentrated)
    - Spice blends, seasoning mixes, curry powder (dry mix, concentrated)
    - Chutneys (involving brining or fermentation)
- Modifications to four food category definitions (Table 3)
- Interim sodium targets with timelines established for nine existing food categories in the WHO global sodium benchmarks (Table 3).

The South- East Asia Region sodium benchmarks for priority food categories

The Regional sodium benchmarks are outlined in Table 3, and the detailed changes and justification for changes (including the current sodium content distribution for categories) are given in Supplementary file 1. The need for multiple sub categories of products can be explained by the fact that each of these would have varying levels of sodium, based on technological and taste considerations. Therefore, setting a single threshold for a category such as for all snacks and snack products is not feasible.

Country expert feedback

An online webinar held to consult national experts on the proposed sodium benchmarks was attended by over 30 experts from the Region. A summary of the discussion, revisions suggested, and feedback are detailed in Supplementary file 2.

Table 2. Average daily salt intake contributed from different packaged foods in five South-East Asia countries

Nepal	Salt intake (g/d)	India	Salt intake (g/d)	Indonesia	Salt intake (g/d)	Thailand	Salt intake (g/d)	Sri Lanka	Salt intake (g/d)
Egg	1.42	Meat, poultry and eggs	0.29	Cereals and cereal products	2.15	Fish sauce	3.81	Dried fish	1.6
Pickles	0.85	Dairy and dairy products	0.29	Legumes and legume products	0.67	Seasoning powder	1.88	Bread	0.3
Meat and Meat products	0.85	Fruits and vegetables	0.11	Vegetables and vegetable products	0.66	Meatball (pork, chicken, beef)	0.8	Biscuits	0.1
Pulses and Legumes	0.17	Bread and bakery products	0.11	Chicken and poultry products	0.58	Shrimp paste	0.51		
Salty snacks	0.16	Fish and seafood	0.07	Fish and fish products	0.56	Soy sauce	0.48		
Bakery items	0.15	Snack foods	0.06	Snacks	0.48	Instant noodles	0.37		
Ready to eat food	0.13	Cereal, grains and products	0.06	Eggs and egg products	0.35	Sausage (sausage, bologna, ham)	0.2		
Biscuits, cookies and puffin	0.09	Fats and edible oils	0.006	Bakery products	0.16	Seasoning sauce	0.17		
Cereals and cereals products	0.07	Beverage (non-alcoholic)	0.006	Meat and meat products	0.14	Oyster sauce	0.17		
Dairy products	0.049	Beverage (alcoholic)	0.001	Beverages	0.08	Processed seafood	0.1		
Fish and Fish product	0.02	Sugar, honey & product	0.001	Fruits and fruit products	0.02	Chili sauce	0.06		
Sweets	0.003			Milk and dairy products	0.01	Canned fish	0.06		
Vegetable product	0.001			*Instant noodles were cross referenced as contributing significantly to daily salt intake (17) but the original reference (Prihatini et al. 2016), couldn't be accessed		Sweet chili sauce	0.03		
						Ketchup	0.03		
						Suki Sauce	0.03		
						Wheat snack	0.03		
						Rice/tapioca snack	0.03		
						Nuts	0.03		
						Potato chips	0.02		
						Seasoned seaweed	0.01		
						Fish snack	0.01		
						Potato snack	0.01		

g/d – grams/day. Note that different countries use different food categorisation systems, so we have used colours to highlight similar food categories across the 5 countries

The expert discussion also suggested that instant noodles contribute to high daily salt intake.

3. Applications of Regional benchmarks country considerations

While these sodium benchmarks have been developed based on data from countries in the Region, it is highly recommended that individual countries adapt the benchmarks to ensure they are further tailored to each country. To do this, countries should aim to

- obtain sales volume data (if available) to help identify commonly consumed products which would have the greatest population impact if sodium levels are reduced to target levels.
- develop or obtain access to sodium content data on food and beverage products that are representative of what are commonly consumed, to ensure the regional sodium benchmarks are relevant for the food supply of the country. While commonly consumed products should inform the development of the targets, targets should apply to all products within a food category. This creates an equal playing field for all food manufacturers (ensuring no manufacturer is disadvantaged by reducing sodium levels) and benefits the population by lowering their sodium consumption regardless of the types of food within the food category that would be purchased and consumed.

Countries must consider the most appropriate mechanism for how the sodium reformulation intervention is implemented (e.g. voluntary vs mandatory sodium targets). For mandatory implementation, considerations may include:

- identifying which food categories from the Regional benchmarks are applicable to the country in question and assessing the sodium benchmark level against the sodium levels in existing products consumed in the country to ensure the mandatory maximum level is feasible. In some instances, it may also involve creating additional subcategories that are more refined and relevant for the particular country to ensure that mandatory implementation is feasible for food companies to achieve. Moreover, if mandatory targets are implemented, additional support and leniencies should be provided to support small and medium enterprises to achieve the sodium target levels in their food products. This may include providing technical assistance and longer timeframes for compliance.

The South-East Asia Region benchmarks are a living document and will be reviewed and revised over time. As more countries in the Region reduce sodium levels in products and as sources of sodium in the diet change over time, it is important that the benchmarks reflect these changes and are revised to drive further progress.

4. The South-East Asia Regional sodium benchmarks

Table 3. South-East Asian Regional Sodium Benchmarks for priority food categories with variations shown in blue*

Codex food category	Subcategory as given in WHO global sodium benchmarks	Subcategory description (Modifications for South-East Asia Region benchmarks in blue)	Sodium benchmark (mg/100g)	Regional variation from global sodium benchmarks and rationale
Ready-to-eat savouries	3a. Crackers/savoury biscuits	Plain (i.e. flavoured only with salt) or flavoured crackers, sandwich crackers, puffed cakes (e.g. cheese crackers, soda crackers and rice cakes). Includes dry breads such as Melba toast, rusks, breadsticks, pita or baguette chips, and other crisp breads. Excludes unsalted products. Include mixed snacks where crackers/savoury biscuits are the main component e.g. mixed rice crackers with nuts.	**600**	**Expanded definition to include mixed snacks where crackers are the main component.** The mean sodium levels of mixed snacks are comparable to other products in this category, so no changes have been made to sodium benchmark.
	3b. Nuts, seeds and kernels	Popcorn, 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 where nuts, seeds, or kernels are the main component (e.g. nut mixtures with dried fruit).	**280** **Interim target: 430 (in 4 years)**	**Established an interim target based on the current median sodium content to be achieved in 4 years followed by a further reduction towards the global benchmark.** However, the global sodium benchmark is technically feasible as salt has no technical function in such products (only flavour), thus the global target of 280mg/100g can be achieved. **Expanded definition to include pulses and mixed snacks where popcorn, nuts, peanuts, seeds, and pulses are the main component**. The mean sodium levels of such products are comparable to the other products within this category.
	3c. Potato, vegetable and grain chips	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.	**500**	
	3d. Extruded snacks	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 chips (see 3c) and pretzels (3e). Include mixed snacks (e.g. bhujias) where extruded snacks (made from starch-rich flours or legume flours) are the main component	**520**	**Expanded definition to include mixed snacks where extruded snacks are the main component**. The mean sodium levels of mixed snacks are comparable to other products in this category so therefore no changes to the benchmark are made.
	3e. 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**	

	3f. Papads, papadums, appalam	Papads, papadums and appalam plain (i.e. flavoured with salt only) or flavoured (e.g. chilli or masala). In the form of balls or flat cakes.	**Interim target: 1390 (in 4 years)**	**Established a new subcategory and sodium benchmark for papads and papadum based on the current median sodium content to be achieved within 4 years, followed by a further reduction after a review of compliance.** These products are commonly consumed but do not fit within the existing categories (e.g. different from flat breads and dry breads).
	3g. Seafood or meat-based snacks	Seafood based or seafood-flavoured snacks (such as fish, squid or other) 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 (category 14).	**Interim target: 1540 (in 4 years)**	**Established a new subcategory and sodium benchmark for seafood and meat-based snacks based on the current 33rd percentile to be achieved within 4 years, followed by a further reduction after a review of compliance**. These are commonly consumed snacks in Thailand and other Asian countries, and often contain high levels of sodium. Fish-based snack is a food category in the Codex food category system. Such products are different from processed fish products because they are often consumed in the form of a snack and do not require cooking or preparation.
	3h. 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	**Interim target: 575 (in 4 years)**	**Established a new subcategory and sodium benchmark for seafood and meat-based snacks based on the current 33rd percentile to be achieved with 4 years, followed by a further reduction after a review of compliance**. These are commonly consumed snacks in Thailand and other Asian countries, and often contain high levels of sodium. Such products are consumed as snacks but do not fit within any existing WHO snack food categories.
Pasta and noodles and like products	9biii. Instant noodles with sauce or seasoning (dry-mix, concentrated)	Instant noodles with sauce or seasoning (dry- mix, concentrated). The sodium benchmark is reported "as sold" rather than "as prepared" according to manufacturer's instructions.	**Interim target: 1730 as sold (in 4 years)**	**Established a new subcategory and sodium benchmark for instant noodles with sauce or seasoning (dry-mix, concentrated) based on the current median to be achieved within 4 years, followed by a further reduction after a review of compliance.** There are several instant noodle products in the South-East Asia region.

Bread and ordinary Bakery wares	11a. Sweet and raisin Breads	All types of sweetened bread (e.g. brioche, sweet buns, and raisin breads/toast – i.e. breads with dried fruit and/or nut inclusions). Includes refrigerated and frozen dough.	**310**	
	11b. Leavened bread	All types of yeast-leavened breads, including sourdough breads. Includes breads made with all types of cereal flours (e.g. white or whole grain wheat, spelt and rye). Includes all types of shapes and baking traditions (e.g. pan baked, hearth baked, large loafs, baguettes, rolls and buns). Includes all types of artisanal, pre-packaged sliced breads, par-baked bread and rolls, bagels, English muffins, pizza crusts, and diet or low-calorie breads. Includes breads with and without additions (e.g. herbs, nuts, olives, onion and cheese). Also includes refrigerated and frozen dough. Excludes dough for cookies (see 2a), cakes and sponges (see 2b), pastries (see 2c) and scones (see 2f). Excludes leavened flatbreads such as naan (see 11c).	**330** **Interim target: 445 (in 4 years)**	**Established an interim target based on the current median sodium content to be achieved in 4 years followed by a further reduction towards the global benchmark.**
	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).	**320**	
Fish and seafood products, including mollusks, crustaceans, and echinoderms	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).	**360**	
	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** **Interim target: 450 (in 4 years)**	**Established an interim target based on the current median sodium content to be achieved in 4 years followed by a further reduction towards the global benchmark.**
	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**	Variations unable to be assessed due to limited data
Meat and meat products, including poultry and game	14d. Raw meat products and preparations	Unprepared meat products and burgers, and fresh sausages. Includes marinated, flavoured, moisture enhanced and breaded meat products.	230 **Interim target: 485 (in 4 years)**	**Established an interim target based on the current median sodium content to be achieved in 4 years followed by a further reduction towards the global benchmark.**
	14ei. Whole muscle meat products, heat treated (frozen and canned products)	Frozen and canned whole muscle (e.g. beef, lamb, chicken and turkey).	**270**	Variations unable to be assessed due to limited data

	14eii. Whole muscle meat products, heat treated (refrigerated products)	Refrigerated whole muscle (e.g. beef, lamb, chicken and turkey).	**600**	Variations unable to be assessed due to limited data
	14f. Whole muscle meat products, non-heat preservation	Air-dried, cured, entire meat pieces (e.g. Parma and Serrano ham). Brined meat products (e.g. pastrami and bacon).	**950**	Variations unable to be assessed due to limited data
	14g. 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**	
	14h. Comminuted meat products, non-heat preservation	Air-dried, cured and/or fermented sausages (e.g. salami, jerky and biltong).	**830**	Variations unable to be assessed due to limited data
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).	**350**	Variations unable to be assessed due to limited data
	18aii. Bouillon and soup stock (concentrated)	Bouillon cubes and soup stock powders. Includes gravy stock. Excludes concentrated, dry soups (see 9gii).	**15000**	Variations unable to be assessed due to limited data
	18b. Cooking sauces including pasta sauces and tomato sauces (not concentrated)	All cooking sauces (e.g. pasta sauce, curry and Mexican). These are major characterizing components of a meal and are designed to be added to foods during preparation, rather than at the table. Also includes gravies and finishing sauce products which are designed to be added to food upon serving or as food finishes cooking. Products in this category do not require reconstitution or the addition of liquids. Excludes condiments including pesto (see 18e), soy sauce and fish sauce (see 18f), other Asian- style cooking sauces (see 18g), and marinades and thick pastes (see 18h).	**330** **Interim target: 370 (in 3 years)**	**Established an interim target based on the current median sodium content to be achieved in 3 years followed by a further reduction towards the global benchmark.**
	18bii Spice blends, seasoning mixes, curry powder (dry mix, concentrated)	Spice blends/mix, seasoning mixes, or curry powders that contain salt that are in a dry-mix or concentrated form including masala, barbeque seasoning, biryani mix and other sauce mixes.	**Interim target: 7210 (in 4 years)**	**Established a new subcategory and sodium benchmark for spice blends, seasonings, powders that contain salt in their dry-mix, or concentrated form based on the current median sodium levels and existing national sodium targets, to be achieved in 4 years.**
	18c. Dips and dipping sauces	All dips (e.g. salsa, chutney and guacamole, bean-based dips such as hummus, and sweet sauces such as plum sauce, cherry sauce and pineapple sauce). Excludes cream- and cheese-based dips (see 18d) and fish and seafood-based mousse, spread and dips (see 14b). Excludes chutneys where brining and fermentation is involved	**360**	**Modified the description to exclude chutneys that are made through brining or fermentation and are commonly consumed in South-East Asia countries**.

	18ci.Chutneys (involving brining or fermentation)	Chutneys where the fruit or vegetable is undergoes brining or fermentation as a preservation technique for ambient stability. This includes mango chutneys.	Interim target: 1000 (in 4 years)	**Established a new subcategory and sodium benchmark for chutneys where brining or fermentation is undertaken based on the current median sodium levels and existing national sodium targets, to be achieved within 4 years.**
	18d. Emulsion-based dips, sauces and dressings	Cream or cheese dips and sauces, standardized salad dressing (including mayonnaise-based dressing, refrigerated and shelf-stable oil and vinegar-based dressings, and creamy dressings), and mayonnaise. Includes mayo-type spreads. Includes low-fat and fat-free versions.	**500**	
	18e. Condiments	Tomato ketchup, brown sauce (e.g. BBQ sauce, Worcestershire sauce, steak sauce and curry-flavoured sauces), chilli sauce including Sriracha chilli sauce, sweet chilli sauce and mustard. Also includes pesto.	**650** **Interim target: 1005 (in 4 years)**	**Established an interim target based on the current median sodium content to be achieved in 4 years followed by a further reduction towards the global benchmark.**
	18f. Soy sauce and fish sauce	Soy sauce, fish sauce and other fermented sauces.	**4840** **Interim target: 6325 (in 4 years)**	**Established an interim target based on the current 33rd percentile sodium content to be achieved in 4 years followed by a further reduction towards the global benchmark.**
	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** **Interim target: 2600 (in 4 years)**	**Established an interim target based on the current median sodium content to be achieved in 4 years followed by a further reduction towards the global benchmark.**
	18h. Marinades and thick pastes	Shelf-stable marinades, and thick pastes such as curry pastes (e.g. Thai and Indian).	**1425** **Interim target: 3065 (in 4 years)**	**Established an interim target based on the current median sodium content to be achieved in 3 years followed by a further reduction towards the global benchmark.**

*Text in black font represents the existing Global Sodium Benchmarks and text in blue font indicates variations made for the South East Asian Regional Sodium Benchmarks

5. References

1. Powles J, Fahimi S, Micha R, et al. Global, regional and national sodium intakes in 1990 and 2010: a systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide. *BMJ Open*. 2013;3(12):e003733. doi:10.1136/bmjopen-2013-003733
2. Bhat S, Marklund M, Henry ME, et al. A Systematic Review of the Sources of Dietary Salt Around the World. *Adv Nutr,*. 2020;11(3):677-686. doi:10.1093/advances/nmz134 %J Advances in Nutrition
3. The World Health Organization. WHO global sodium benchmarks for different food categories. The World Health Organization,. Accessed 1 June, 2021. https://www.who.int/publications/i/item/9789240025097
4. Ide N, Ajenikoko A, Steele L, et al. Priority Actions to Advance Population Sodium Reduction. *Nutrients*. Aug 22 2020;12(9)doi:10.3390/nu12092543
5. Santos JA, Tekle D, Rosewarne E, et al. A Systematic Review of Salt Reduction Initiatives Around the World: A Midterm Evaluation of Progress Towards the 2025 Global Non-Communicable Diseases Salt Reduction Target. *Adv Nutr,*. 2021;doi:10.1093/advances/nmab008
6. Amarra S, Khor GL. *Sodium Consumption in Southeast Asia: An Updated Review of Intake Levels and Dietary Sources in Six Countries*. Humana Press; 2015:765-792.
7. Trieu K, Webster J, Jewell J. Using dietary intake modelling to achieve population salt reduction: a guide to developing a country-specific salt reduction model. World Health Organization. Accessed 14 August, 2018. http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/publications/2018/using-dietary-intake-modelling-to-achieve-population-salt-reduction-a-guide-to-developing-a-country-specific-salt-reduction-model-2018
8. Healthy Food Partnership. Healthy Food Partnership Reformulation Program: Evidence Informing the Approach, Draft Targets and Modelling Outcomes. Australian Government Department of Health Australia. Accessed 17 December, 2020. https://www.health.gov.au/resources/publications/partnership-reformulation-program-rationale-paper?language=en
9. Rosewarne E, Huang L, Farrand C, et al. Assessing the Healthy Food Partnership's Proposed Nutrient Reformulation Targets for Foods and Beverages in Australia. *Nutrients*. May 8 2020;12(5)doi:10.3390/nu12051346
10. WHO/PAHO Regional Expert Group for Cardiovascular Disease Prevention through Population-wide Dietary Salt Reduction. A guide for setting targets and timelines to reduce the salt content of food. Accessed 14 August, 2022. https://www.paho.org/hq/dmdocuments/2013/Guide-setting-targets-timelines-Eng.pdf
11. Allemandi L, Tiscornia MV, Guarnieri L, Castronuovo L, Martins E. Monitoring Sodium Content in Processed Foods in Argentina 2017–2018: Compliance with National Legislation and Regional Targets. *Nutrients*. 2019;11(7):1474.
12. He FJ, Brinsden HC, MacGregor GA. Salt reduction in the United Kingdom: a successful experiment in public health. *J Hum Hypertens*. Jun 2014;28(6):345-52. doi:10.1038/jhh.2013.105
13. Downs SM, Christoforou A, Snowdon W, et al. Setting targets for salt levels in foods: A five-step approach for low- and middle-income countries. *Food Policy*. 2015/08/01/ 2015;55:101-108. doi:https://doi.org/10.1016/j.foodpol.2015.06.003
14. Wyness LA, Butriss JL, Stanner SA. Reducing the population's sodium intake: the UK Food Standards Agency's salt reduction programme. *Public Health Nutr*. Feb 2012;15(2):254-61. doi:10.1017/s1368980011000966
15. WHO Nutrient Profile Model for South-East Asia Region. To implement the set of recommendations on the marketing of foods and non-alcoholic beverages to children. World Health Organization, Regional Office for South-East Asia. Accessed 1 July, 2022. https://apps.who.int/iris/handle/10665/253459
16. Rosewarne E, Santos JA, Trieu K, et al. A Global Review of National Strategies to Reduce Sodium Levels in Packaged Foods. *Adv Nutr,*. Apr 29 2022;doi:10.1093/advances/nmac048
17. Istiqomah N, Astawan M, Palupi NS. Assessment of Sodium Content of Processed Food Available in Indonesia. *Indonesian Journal of Nutrition and Food*. 2021;16(3)doi:https://doi.org/10.25182/jgp.2021.16.3.129-138
18. Johnson C, Santos JA, Sparks E, et al. Sources of Dietary Salt in North and South India Estimated from 24 Hour Dietary Recall. *Nutrients*. 2019;11(2):318.
19. Andarwulan N, Madanijah S, Briawan D, et al. Food Consumption Pattern and the Intake of Sugar, Salt, and Fat in the South Jakarta City—Indonesia. *Nutrients*. 2021;13(4):1289.
20. Jayatissa R, Haturusinghe C, Knowles J, Codling K, Gorstein J. Estimated contribution of most commonly consumed industrialized processed foods to salt intake and iodine intakes in Sri Lanka. *PLOS ONE*. 2021;16(9):e0257488. doi:10.1371/journal.pone.0257488
21. Chotivichien S, Chongchaithet N, Aksornchu P, et al. Assessment of the contribution of industrially processed foods to salt and iodine intake in Thailand. *PLoS One*. 2021;16(7):e0253590. doi:10.1371/journal.pone.0253590
22. Government of Canada. Voluntary sodium reduction targets for processed foods 2020-2025. https://www.canada.ca/en/health-canada/services/publications/food-nutrition/sodium-reduced-targets-2020-2025.html
23. Ministry of Health Brazil. Reduction targets agreed in the Terms of Commitment. http://189.28.128.100/dab/docs/portaldab/documentos/promocao/lista_categorias_metas_reducao_sodio.pdf

Supplementary file 1. South-East Asia Regional sodium benchmarks for priority food categories and justification for modifications to the WHO global sodium benchmarks.

Codex food category	Subcategory as given in WHO global sodium benchmarks	Subcategory description (Modifications for South-East Asia Region benchmarks in blue)	Sodium benchmark (mg/100g)	Summary data (Average, median and percentiles reported for sodium – mg/100g)*	Recommendations and justification for changes
Ready-to-eat savouries	3a. Crackers/ savoury biscuits	Plain (i.e. flavoured only with salt) or flavoured crackers, sandwich crackers, puffed cakes (e.g. cheese crackers, soda crackers and rice cakes). Includes dry breads such as Melba toast, rusks, breadsticks, pita or baguette chips, and other crisp breads. Excludes unsalted products. Include mixed snacks where crackers/savoury biscuits are the main component e.g. mixed rice crackers with nuts.	600	# of countries with data: 7 (Bangladesh, India, Indonesia, Maldives, Nepal, Sri Lanka, Thailand) N products: 154 Average: 680, Median: 512, Percentile: 25th: 282, 75th: 757 % compliance: 58%	1. **Adopt WHO global sodium benchmark** > 1/3 of products already meet the global benchmark. 2. **Expand the definition to include mixed snacks where crackers are the main component.** The mean sodium levels of mixed snacks are comparable to other products in this category, so no changes have been made to sodium benchmark.
	3b. Nuts, seeds and kernels	Popcorn, 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. where nuts, seeds, or kernels are the main component (e.g. nut mixtures with dried fruit).	280 Interim target: 430 (in 4 years)	# of countries with data: 7 (Bangladesh, India, Indonesia, Maldives, Nepal, Sri Lanka, Thailand) N products: 356 Average: 493, Median: 429, Percentile: 25$^{th:}$ 268, 75th: 675, % compliance: 27%	1. **Keep the global sodium benchmark to drive reformulation or set interim targets of max 430mg/100g (50th percentile) to be achieved in 4 years, followed by a further reduction in the sodium target based on a review of compliance.** While < 1/3 of products currently meet the WHO benchmark, salt has no technical function in such products (only flavour), thus the global target of 280mg/100g can be achieved. 2. **Expand the definition to include pulses and mixed snacks where popcorn, nuts, peanuts, seeds, and pulses are the main component**. The mean sodium levels of such products are comparable to the other products within this category.
	3c. Potato, vegetable and grain chips	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.	500	# of countries with data: 7 (Bangladesh, India, Indonesia, Maldives, Nepal, Sri Lanka, Thailand) N products: 295 Average: 639, Median: 610, Percentile: 25$^{th:}$ 469, 75th: 780, % compliance: 33%	1. **Adopt WHO global sodium benchmark** 1/3 of products already meet the global benchmark.

	3d. Extruded snacks	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 chips (see 3c) and pretzels (3e). Include mixed snacks (e.g. bhujias) where extruded snacks (made from starch-rich flours or legume flours) are the main component	520	# of countries with data: 8 (Bangladesh, Bhutan India, Indonesia, Maldives, Nepal, Sri Lanka, Thailand) N products: 366 Average: 696, Median: 671, Percentile: 25th: 461, 75th: 898, % compliance: 33%	1. **Adopt WHO global sodium benchmark** 1/3 of products already meet the global benchmark. 2. **Expand the definition to include mixed snacks where extruded snacks are the main component**. The mean sodium levels of mixed snacks are comparable to other products in this category so therefore no changes to the benchmark are made.
	3e. 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	# of countries with data: 1 (Thailand) N products: 8 Average: 693, Median: 768, Percentile: 25th: 263, 75th: 935, % compliance: 50%	1. **Adopt WHO global sodium benchmark** > 1/3 of products already meet the global benchmark.
	3f. Papads, papadums, appalam	Papads, papadums and appalam plain (i.e. flavoured with salt only) or flavoured (e.g. chilli or masala). In the form of balls or flat cakes.	Interim target: 1390 (in 4 years)	# of countries with data: 2 (India, Sri Lanka) N products: 66 Average: 1496, Median: 1390, Percentile: 25th: 986, 75th: 2000	2. **Establish a separate subcategory and sodium benchmark for papads and papadums**. There are several papads or papadum products in the South-East Asia region, and currently 12% meet the benchmark category 3a (600mg/100g) which includes similar products such as dry breads or crisp breads. An interim sodium target of 1390mg/100g (50th percentile) is recommended to be achieved within 4 years, followed by a further reduction in the sodium target towards 600mg/100g (in line with dry breads) after a review of compliance.
	3g. Seafood or meat-based snacks	Seafood based or seafood-flavoured snacks (such as fish, squid or other) 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 (category 14).	Interim target: 1540 (in 4 years) (33rd percentile chosen)	# of countries with data: 1 (Thailand) N products: 26 Average: 1913, Median: 2028, Percentile: 25th: 1460, 75th: 2343,	1. **Establish a separate category and sodium benchmark for seafood and meat-based snacks**. These are commonly consumed snacks in Thailand and other Asian countries, and often contain high levels of sodium. Fish-based snack is a food category in the Codex food category system. Such products are different from processed fish products because they are often consumed in the form of a snack and do not require cooking or preparation. An interim sodium target of 1540mg/100g (33rd percentile) is recommended to be achieved within 4 years, followed by a further reduction after a review of compliance. This is to align more closely with sodium benchmarks in other snack categories and drive sodium reformulation.

	3h. 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	Interim target: 575 (in 4 years) (33rd percentile chosen)	# of countries with data: 1 (Thailand) N products: 11 Average: 711, Median: 700, Percentile: 25th: 543, 75th: 875	1. **Establish a separate category and sodium benchmark for seafood and meat-based snacks**. These are commonly consumed snacks in Thailand and other Asian countries, and often contain high levels of sodium. Such products are consumed as snacks but do not fit within any existing WHO snack food categories. An interim sodium target of 575mg/100g (33rd percentile) is recommended to be achieved within 4 years, followed by a further reduction after a review of compliance. This is to drive sodium reformulation in snack products.
Pasta and noodles and like products	9biii. Instant noodles with sauce or seasoning (dry-mix, concentrated)	Instant noodles with sauce or seasoning (dry- mix, concentrated). The sodium benchmark is reported "as sold" rather than "as prepared" according to manufacturer's instructions.	Interim target: 1730 as sold (in 4 years)	# of countries with data: 6 (Bangladesh, Bhutan, India, Indonesia, Sri Lanka, Thailand) N products: 307 Average: 1915, Median: 1733, Percentile: 25th: 1300, 75th: 2254, % compliance: 2% (<770 mg/100g)	1. **Establish a separate category and sodium benchmark for instant noodles with sauce or seasoning (dry-mix, concentrated)** While instant noodles are currently categorised in category *9bii Pasta, noodles, and rice or grains with sauce or seasoned (dry mix, concentrated),* only 2% of products comply with the global sodium benchmark of <770mg/100. There are several instant noodle products in the South-East Asia region. An interim sodium target of 1730mg/100g (50th percentile) is recommended to be achieved within 4 years, followed by a further reduction in the sodium target after a review of compliance towards the global target of 770mg/100g.
Bread and ordinary Bakery wares	11a. Sweet and raisin breads	All types of sweetened bread (e.g. brioche, sweet buns, and raisin breads/toast – i.e. breads with dried fruit and/or nut inclusions). Includes refrigerated and frozen dough.	310	# of countries with data: 2 (India, Indonesia) N products: 3 Average: 325, Median: 314, Percentile: 25th: 289, 75th: 354, % compliance: 33%	1. **Adopt WHO global sodium benchmark** 1/3 of products already meet the global benchmark.
	11b. Leavened bread	All types of yeast-leavened breads, including sourdough breads. Includes breads made with all types of cereal flours (e.g. white or whole grain wheat, spelt and rye). Includes all types of shapes and baking traditions (e.g. pan baked, hearth baked, large loafs, baguettes, rolls and buns). Includes all types of artisanal, pre-packaged sliced	330 Interim target: 445 (in 4 years)	# of countries with data: 3 (India, Indonesia, Sri Lanka) N products: 29 Average: 450, Median: 446, Percentile: 25th: 360, 75th: 492, % compliance: 24%	1. **Set interim targets of max 445mg/100g (50th percentile) to be achieved in 4 years, followed by a further reduction in the max target based on a review of compliance.** < 1/3 of products currently meet the WHO benchmark. The global benchmark of 330mg/100g is feasible in time, however in the short term, it is mainly challenging for flavoured breads (e.g. garlic bread).

		breads, par-baked bread and rolls, bagels, English muffins, pizza crusts, and diet or low-calorie breads. Includes breads with and without additions (e.g. herbs, nuts, olives, onion and cheese). Also includes refrigerated and frozen dough. Excludes dough for cookies (see 2a), cakes and sponges (see 2b), pastries (see 2c) and scones (see 2f). Excludes leavened flatbreads such as naan (see 11c).			
	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).	320	# of countries with data: 4 (Bangladesh, India, Indonesia, Sri Lanka) N products: 32 Average: 299, Median: 274, Percentile: 25$^{th:}$ 144, 75th: 357, % compliance: 66%	**1. Adopt WHO global sodium benchmark** Although 2/3 products meet the global sodium benchmark, a stricter regional sodium benchmark has not been set given there are only 32 products with sodium content data within this flatbread category. Countries may want to consider setting lower (stricter) sodium targets if >66% of flat breads are below the 320mg/100g.
Fish and seafood products, including mollusks, crustaceans, and echinoderms	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).	360	# of countries with data: 3 (Bhutan, India, Sri Lanka) N products: 55 Average: 449, Median: 340, Percentile: 25$^{th:}$ 188, 75th: 480, % compliance: 51%	**1. Adopt WHO global sodium benchmark** More than 1/3 of products already meet the global benchmark.
	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 Interim target: 450 (in 4 years)	# of countries with data: 4 (Bangladesh, India, Indonesia, Sri Lanka) N products: 21 Average: 522, Median: 448, Percentile: 25$^{th:}$ 399, 75th: 630, % compliance: 14%	1. **Set interim targets of max 450mg/100g to be achieved in 4 years, followed by a further reduction in the target based on a review of compliance.** < 1/3 of products currently meet the WHO benchmark. This interim target and timeline are reasonable because for the majority of non-compliant products, less than 10% reduction is needed each year to achieve the interim target.
	14c. Processed fish and seafood	Fish and seafood products with non-heat preservation methods, such as brining, fermenting and air drying (e.g.	800	# of countries with data: 3 (Bhutan, India, Nepal) N products: 7	Unable to make recommendations about changes to this food category and the sodium benchmark level due to limited data.

	products, non-heat-treated	smoked fish, kippered fish, salmon jerky, anchovies and dried fish).		Average: 2167, Median: 2251, Percentile: 25th: 1248, 75th: 3120, % compliance: 14%	Currently 1 of 7 of products meet the global sodium benchmark. Many of these products in South-East Asia include pickled fish or seafood, and dried fish. Should interim targets be set based on the data available although limited?
Meat and meat products, including poultry and game	14d. Raw meat products and preparations	Unprepared meat products and burgers, and fresh sausages. Includes marinated, flavoured, moisture enhanced and breaded meat products.	230 Interim target: 485 (in 4 years)	# of countries with data: 3 (Bangladesh, India, Sri Lanka) N products: 32 Average: 504, Median: 483, Percentile: 25th: 308, 75th: 562, % compliance: 19%	1. **Set interim targets of max 485mg/100g to be achieved in 4 years, followed by a further reduction in the target based on a review of compliance.** < 1/3 of products currently meet the WHO benchmark. This interim target and timeline are reasonable because for most non-compliant products, less than 10% reduction is needed each year to achieve the interim target.
	14ei. Whole muscle meat products, heat treated (frozen and canned products)	Frozen and canned whole muscle (e.g. beef, lamb, chicken and turkey).	270	# of countries with data: 1 (India) N products: 1 Sodium content: 500mg/100g	Unable to make recommendations about this food category and the sodium benchmark level due to limited data.
	14eii. Whole muscle meat products, heat treated (refrigerated products)	Refrigerated whole muscle (e.g. beef, lamb, chicken and turkey).	600	No products with sodium content data fit within this category	Unable to make recommendations about this food category and the sodium benchmark level due to no data.
	14f. Whole muscle meat products, non-heat preservation	Air-dried, cured, entire meat pieces (e.g. Parma and Serrano ham). Brined meat products (e.g. pastrami and bacon).	950	# of countries with data: 1 (Sri Lanka) N products: 2 % compliance: 100%	Unable to make recommendations about changes to this food category and the sodium benchmark level due to limited data. Two bacon products had sodium content levels under the sodium benchmarks.
	14g. 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	# of countries with data: 3 (India, Indonesia, Sri Lanka) N products: 13 Average: 544, Median: 585, Percentile: 25th: 300, 75th: 712, % compliance: 38%	1. **Adopt WHO global sodium benchmark** More than 1/3 of products already meet the global benchmark.
	14h. Comminuted	Air-dried, cured and/or fermented sausages (e.g. salami, jerky and biltong).	830	# of countries with data: 1 (India)	Unable to make recommendations about changes to this food category and the sodium benchmark level due to limited data.

	meat products, non-heat preservation			N products: 2 % compliance: 100%	Two salami products had sodium content levels under the sodium benchmarks.
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).	350	# of countries with data: 2 (India, Thailand) N products: 5 Average: 699, Median: 675, Percentile: 25$^{th:}$ 663, 75th: 713, % compliance: 0%	Unable to make recommendations about changes to this food category and the sodium benchmark level due to limited data. 4 (of 5) are from Thailand and are ready to cook soup stocks that exceed the benchmark.
	18aii. Bouillon and soup stock (concentrated)	Bouillon cubes and soup stock powders. Includes gravy stock. Excludes concentrated, dry soups (see 9gii).	15000	# of countries with data: 2 (India, Sri Lanka) N products: 6 Average: 9120, Median: 6401, Percentile: 25$^{th:}$ 4912, 75th: 7802, % compliance: 83%	Unable to make recommendations about changes to this food category and the sodium benchmark level due to limited data. 5 of 6 products (mostly gravy granules and chicken cubes) already meet the global benchmark level.
	18b. Cooking sauces including pasta sauces and tomato sauces (not concentrated)	All cooking sauces (e.g. pasta sauce, curry and Mexican). These are major characterizing components of a meal and are designed to be added to foods during preparation, rather than at the table. Also includes gravies and finishing sauce products which are designed to be added to food upon serving or as food finishes cooking. Products in this category do not require reconstitution or the addition of liquids. Excludes condiments including pesto (see 18e), soy sauce and fish sauce (see 18f), other Asian- style cooking sauces (see 18g), and marinades and thick pastes (see 18h).	330 Interim target: 370 (in 3 years)	# of countries with data: 2 (India, Sri Lanka) N products: 94 Average: 390, Median: 373, Percentile: 25$^{th:}$ 355, 75th: 400, % compliance: 14%	1. **Set interim target of max 370mg/100g to be achieved in 3 years, followed by a further reduction in the target based on a review of compliance.** While < 1/3 of products currently meet the WHO benchmark, this global benchmark is feasible as most products have sodium content levels just above the benchmark. It is recommended an interim target at the 50th percentile is achieved within 3 years because for most non-compliant products, less than 10% reduction is needed each year to achieve the interim target. Following this, a further reduction in the sodium target after a review of compliance towards the global target of 330mg/100g is recommended
	18bii Spice blends, seasoning mixes, curry powder (dry	Spice blends/mix, seasoning mixes, or curry powders that contain salt that are in a dry-mix or concentrated form including masala, barbeque seasoning, biryani mix and other sauce mixes.	Interim target: 7210 (in 4 years)	# of countries with data: 2 (India, Sri Lanka) N products: 60 Average: 8105, Median: 7210, Percentile: 25$^{th:}$ 1732, 75th: 12467	**1. Establish a separate category and sodium benchmark for spice blends, seasonings, powders that contain salt in their dry-mix, or concentrated form.** These products are different from *18aii bouillon and soup stocks* as they may not necessary be used to create a soup or liquid consistency. They are also different from *18h marinades and thick pastes*

	mix, concentrated)				as they may not be used for marinading, nor be in a paste form but rather a powder form. An interim sodium target of 7210mg/100g is recommended to be achieved within 4 years, followed by a further reduction in the sodium target after a review of compliance. This interim target and timeline may be difficult for about 20% of products with high sodium contents where more than 10% reduction each year will be required to achieve the interim target within 4 years. Canada has maximum targets of 9100mg/100g by 2025 for dry seasoning mixes[22] and Brazil has maximum sodium targets for seasonings of 32,076mg/100g in 2015, however all current sodium levels are already below this target. [23]
	18c. Dips and dipping sauces	All dips (e.g. salsa, chutney and guacamole, bean-based dips such as hummus, and sweet sauces such as plum sauce, cherry sauce and pineapple sauce). Excludes cream- and cheese-based dips (see 18d) and fish and seafood-based mousse, spread and dips (see 14b). Excludes chutneys where brining and fermentation is involved	360	# of countries with data: 2 (Bangladesh, India) N products: 15 Average: 659, Median: 500, Percentile: 25th: 279, 75th: 670, % compliance: 33%	1. **Adopt WHO global sodium benchmark** 1/3 of products already meet the global benchmark **Change the description to exclude chutneys that are made through brining or fermentation**. Western chutneys compared to chutneys commonly consumed in South-East Asia countries are very different and therefore need to be clarified in the description of 18c. The mean sodium levels of mixed snacks are comparable to other products in this category so therefore no changes to the benchmark are made.
	18ci.Chutneys (involving brining or fermentation)	Chutneys where the fruit or vegetable is undergoes brining or fermentation as a preservation technique for ambient stability. This includes mango chutneys	Interim target: 1000 (in 4 years)	# of countries with data: 3 (Bangladesh, India, Sri Lanka) N products: 25 Average: 2060, Median: 1002, Percentile: 25th: 400, 75th: 3400	1. **Establish a separate category and sodium benchmark for chutneys where brining or fermentation is undertaken.** A separate category is needed for such products because salt added in products is needed for food safety. An interim sodium target of 1000mg/100g is recommended to be achieved within 4 years, followed by a further reduction in the sodium target after a review of compliance. This interim target and timeline may be difficult for about a large portion of products with high sodium contents where more than 10% reduction each year will be required to achieve the interim target within 4 years. Canada has targets for sour pickles of 900mg/100g.
	18d. Emulsion-based dips, sauces and dressings	Cream or cheese dips and sauces, standardized salad dressing (including mayonnaise-based dressing, refrigerated and shelf-stable oil and vinegar-based dressings, and creamy dressings), and mayonnaise. Includes mayo-type	500	# of countries with data: 3 (India, Maldives, Sri Lanka) N products: 73	2. **Adopt WHO global sodium benchmark** 1/3 of products already meet the global benchmark

		spreads. Includes low-fat and fat-free versions.		Average: 699, Median: 669, Percentile: 25th: 464, 75th: 800, % compliance: 33%	
	18e. Condiments	Tomato ketchup, brown sauce (e.g. BBQ sauce, Worcestershire sauce, steak sauce and curry-flavoured sauces), chilli sauce including Sriracha chilli sauce, sweet chilli sauce and mustard. Also includes pesto.	650 Interim target: 1005 (in 4 years)	# of countries with data: 6 (Bangladesh, India, Indonesia, Maldives, Sri Lanka, Thailand) N products: 212 Average: 1106, Median: 1006, Percentile: 25th: 700, 75th: 1234, % compliance: 18%	1. **Set interim targets of max 1005mg/100g to be achieved in 4 years, followed by a further reduction in the target based on a review of compliance.** < 1/3 of products currently meet the WHO benchmark. This interim target and timeline may be difficult for about 15% of products with very high sodium contents where more than 10% reduction each year will be required to achieve the interim target within 4 years.
	18f. Soy sauce and fish sauce	Soy sauce, fish sauce and other fermented sauces.	4840 Interim target: 6325 (in 4 years) (33rd percentile chosen)	# of countries with data: 3 (India, Indonesia, Thailand) N products: 70 Average: 6929, Median: 7000, Percentile: 25th: 5715, 75th: 8117, % compliance: 16%	1. **Set interim targets of max 6325mg/100g (33rd percentile) to be achieved in 4 years, followed by a further reduction in the target based on a review of compliance.** < 1/3 of products currently meet the WHO benchmark. The 33rd percentile was chosen as the interim target to drive more substantial sodium reformulation in high sodium content products. Several products have sodium contents just above the median, thus setting the target at the median would not drive substantial reformulation for many products.
	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 Interim target: 2600 (in 4 years)	# of countries with data: 3 (India, Sri Lanka, Thailand) N products: 27 Average: 2848, Median: 2600, Percentile: 25th: 1527, 75th: 3970, % compliance: 4%	1. **Set interim targets of max 2600mg/100g to be achieved in 4 years, followed by a further reduction in the target based on a review of compliance.** One of 27 products currently meet the WHO benchmark. This interim target and timeline may be difficult for about 19% of products with high sodium contents where more than 10% reduction each year will be required to achieve the interim target within 4 years.
	18h. Marinades and thick pastes	Shelf-stable marinades, and thick pastes such as curry pastes (e.g. Thai and Indian).	1425 Interim target: 3065 (in 4 years)	# of countries with data: 3 (India, Sri Lanka, Thailand) N products: 71 Average: 3380, Median: 3066, Percentile: 25th: 1555, 75th: 4454, % compliance: 24%	1. **Set interim targets of max 3065mg/100g to be achieved in 4 years, followed by a further reduction in the target based on a review of compliance.** < 1/3 products currently meet the WHO benchmark. This interim target and timeline may be difficult for about 15% of products with very high sodium contents where more than 10% reduction each year will be required to achieve the interim target within 4 years.

* The interquartile range (25th – 75th percentile), instead of range, was used as the measure of variability to demonstrate the distrubtion of sodium levels across food categories; as unlike the range, the interquartile range is not affected by extreme values/outlier products.

Supplementary file 2. Response to country experts and revisions to report

Reviewer's comment	Authors' response	Changes made to the report
1) Why are the target is set for 4yrs for those foods where salt has no technological function. Can't we reduce the time period for such foods.	Addressed during the webinar	Page 6 – additional explanation "A three- or four-year timeframe encourages gradual reformulation; this is critical for ensuring targets are feasible for food companies to achieve and acceptable to the public who are exposed to gradually lower sodium levels in the food supply."
2) Can we add Karuvadam to the pappadam/appalam category	Karuvadam is a type of papad so the pappadam sodium benchmark would apply to Karuvadam as well. For the Regional sodium benchmark food category descriptions, it is preferable not to list Karuvadam because there are several other specific products that would fall under the pappadam category. Thus, it would be a long list, and missing any specific products in the description might cause some confusion. However, we do recommend that when countries adapt the Regional benchmarks for their own country, these country-specific products could be included in the category description.	No changes made Changes made to the report
3) This is a timely approach to cover South Asian food culture. Sri Lanka developed traffic light labels on beverages using the same method. Food producers shifted quickly to sweeteners and shifted to amber colour. With experience, when the median is set up, very high-level food should not be included, which will give wrong estimation. It all depends on number of very high salt containing food versus total number.	Addressed during the webinar	Page 4 – additional explanation "During this stage, the dataset was also cleaned by removing products with missing sodium content data, errors and outlier products (products with implausibly high or low sodium content values)."
4) Why not use 33% or lowest tercile as the cut-off for new interim targets rather than median or 50%. It is consistent with the 33% cut-off used to keep the same interim target and is ambitious as well.	Addressed during the webinar	Page 6 – additional explanation "New interim sodium targets were chosen based the sodium content levels of existing products in the South-East Asia region and corroborated by existing sodium targets from other countries if available. Depending on the distribution of sodium content in products, new interim sodium targets were set at either the 33rd or 50th percentile (median) sodium

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		content levels with consideration about the technical feasibility…. A three- or four-year timeframe encourages gradual reformulation; this is critical for ensuring targets are feasible for food companies to achieve and acceptable to the public who are exposed to gradually lower sodium levels in the food supply."
5) Was the quantity of a food consumed per category considered when setting the benchmarks. i.e. based on intake of sodium per person rather than only how much is currently found in these foods? As the impact from instant noodles will be different from spices for example	The quantity of food consumed per category when setting the benchmarks was included. In the initial systematic search for data on food sources of sodium in South-East Asia populations, the data considered the quantity of food consumed across the population. Data on foods that are high sources of sodium in a population's diet is calculated based on data on the quantity/amount of food consumed across the population and each day, as well as data on the sodium content (or concentration) in products. The example of noodles is a good one. While the quantity/amount of spice consumed may be little, since it has high sodium content levels (conc), the overall sodium intake contributed by the spice is important and thus should be targeted for reformulation. On the other hand, products which may have lower sodium contents like instant noodles (or bread) but are consumed at a greater quantity, are also high contributors of sodium intake, and thus should also be targeted. It should be noted that while we did try to include data on quantity of foods consumed and sodium intake contributed by foods across the population, in some countries the data were limited by its representativeness of the population and/or a little outdated.	Page 3 – additional explanation "Data identifying the main food category sources of sodium considers both the quantity (amount) of food consumed across the population as well as the sodium content (or concentration) of these products. It is crucial to consider both of these components as they both influence and contribute population sodium intakes."
6) It is also difficult to comment on the levels without knowing the range of sodium levels seen per category, currently	In the Supplementary file of the report (Supplementary file 1), we have provided data about the distribution of sodium levels (e.g. 25th and 75th percentile, median, and mean) for each category.	Page 25 Please see footnote at the end of supp fig 1. "The interquartile range (25th – 75th percentile), instead of range, was used as the measure of variability to demonstrate the distribution of sodium levels across food categories; as unlike the range, the interquartile range is not affected by extreme values/outlier products."
7) Spice blends and seasoning mixes are used not as foods but food additives. Hence they are added to the food only in required amounts to obtain	This is a complex category. In the South-East Asia region, spice blends and seasoning mixes were commonly used and had high sodium levels-they are high sources of sodium. Therefore, it is necessary to include such products in the Regional sodium benchmarks. In the report, it should that there are a huge number of such products	No changes made.

Reviewer's comment	Authors' response	Changes made to the report
the required taste. Hence it is not practical to select these food additives to set salt targets.	with varying sodium content levels, which demonstrate the feasibility and acceptability of lower sodium varieties of spice blends and seasoning mixes. The sodium content at the 25th percentile is 1732mg/100g and the 75th percentile is 12,467mg/100g demonstrating the huge range but also demonstrating that is possible to have spice blends and seasoning mixes with lower sodium levels.	
8) `	Hummus is typically referred to as a puree of boiled chickpeas and not being fermented.	No changes made.
9) This is a complex issue and hope this interim target is going to benefit the region. It is important to understand the methodology adopted is similar to different from that adopted by WHO for developing Golden standard level for sodium.	Addressed during the webinar	Page 2 – additional explanation "Benchmark sodium values for each food category were selected based on the lowest maximum value from existing national or regional targets.
10) Will the sodium benchmark be changed overtime eg. Next 4 and 8 years?	Yes, it is advisable that the Regional Sodium benchmarks will be reviewed and changed over time. For example, as more countries in the South-East Asia region reduce sodium levels in products over time, it is important to revise the Regional benchmarks to reflect this, and drive further progress. Similarly, the WHO global benchmarks will be revisited and edited, and considered a living document. WHO is currently preparing a second edition of the global sodium benchmarks.	Page 9 – additional explanation "It should be noted that these South-East Asia region benchmarks are considered a living document and should be reviewed and revised over time…….. Similarly, the WHO global sodium benchmarks will be revisited and edited and considered a living document."
11) Should this benchmark be mandatory	Ideally, countries should set mandatory sodium content targets for packaged foods. However, they should review and adapt the Regional benchmarks for their country before making it mandatory. Some considerations include identifying which food categories from the Regional benchmarks apply to the country (e.g. the new benchmarks for pappadums may not be needed for Thailand), and assessing the sodium benchmark level against the sodium levels in existing products consumed in the particular country to ensure the mandatory maximum level is feasible for products in that category. In some instances, this may involve creating small subcategories that are more refined/ precise foods.	Page 9 – additional text related to the Application of Regional benchmarks within countries.
12) There are large difference in the intake of sodium. The data presented shows the range is 0.29-0.001 g/100g. was it checked if interim levels are lower than the country average for the categories developed?	There are large differences in sodium content in packaged foods. The interim targets were set at the median or 33rd percentile sodium content within a food category. It is more appropriate to use the median than the average because the average is often be skewed by outliers. In almost all cases, the interim benchmarks set are lower (stricter) than the average sodium levels in the categories because the average is influenced by high sodium products that may be outliers.	No changes made.

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13) Three functionalities: Can targets be set for three functionalities separately and do they overlap ?	Adding salt addresses all three functionalities simultaneously. Dependent on the food product a certain level of salt may be sufficient for flavour and technical functionality, but not sufficient for preservation for example. Hence, understanding the different functionalities of salt is important when evaluating the reduction levels feasible, as well as to identify solutions to overcome salt reduction defects. The feasibility of these Regional benchmark levels took these aspects into account on product group level.	No changes made.
14) The interim targets set for some of the product categories are at insignificant level when you consider portion size for example curry powder. But for some like instant noodles sodium is almost 90% of daily needs (1730 mg/100g). There is need to focus more than such categories.	As mentioned in response to comment 5, the quantity or portion size of products has been considered when determining what are the foods that are top contributors of sodium intake in South- East Asian population diets. While curry powder mixes are consumed in small quantities, they tend to have high sodium content (concentration levels), and they are commonly consumed across the population. Therefore, when taking this all into account, and comparing it against other products, curry mixes are a high contributor of sodium in the population's diet, and therefore it is important to set targets for such products. It should be noted for instant noodles, the interim sodium content target (1730mg/100g) set is for the dry-mix, concentrated product, i.e. the product as sold before water is added to cook the noodles. After adding water, the sodium content (mg/100g) is therefore lowered i.e. diluted. Then as you mentioned earlier, taking into account the portion size or amount consumed, then you are able to work out the sodium consumed in mg/day. The sodium target is expressed 'as sold' rather than 'as prepared' according to manufacturer's instructions to allow for more standardisation.	Changes made as per comment 5
15) Salt reduction strategies should also consider titrating the doses of iodine and iron and other fortificants as well in fortified salt	It is a very important to consider that fortification levels may require adjustment when salt reduction is effectively achieved on population level. E.g. in EU the K-iodine levels in salts are raised in the last years. Salt reduction and iodine fortification strategies should work in synergy.	Page 2- additional text "Salt reduction strategies should also be considered within the context of fortification strategies that rely on salt as a vehicle (e.g. iodine), and nutrient fortification requirements may need to be adjusted when salt reduction is achieved on a population level."
16) How do benchmarks compliment the FoPL?	Setting sodium targets to encourage reformulation will complement Front of Pack nutrition labelling (FoPNL) schemes. While threshold levels set for FoPL may encourage some reformulation, setting sodium content benchmarks can drive further reformulation because they are category specific. For example, the threshold for displaying a FoPL may be 600mg sodium/100g, however most of the existing nut, seeds and kernels products already have sodium levels less than 600mg/100g, and	Page 2 – additional explanation "The implementation of sodium reformulation targets for packaged foods should be considered within a broader suite of complementary policy actions to support healthy and sustainable diets,

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	thus FoPL threshold would not drive reformulation. By setting an interim sodium target at the median sodium content level at 430mg/100g, this will drive further reformulation.	including front of pack labelling (FoPL), taxes and regulation of nutrition and health claims and reformulation of foods with other nutrients of concern."
17) Can the strategies also address HH level processes in salt reduction viz, the amount of salt required to be added in a recipes may be influenced by the time at which the salt is added during cooking, i.e., at beginning, in the middle or at the end of cooking without changing the taste and flavor hopefully	The strategy of setting sodium targets/benchmarks applies to processed and packaged foods, which are a growing source of sodium in most countries. In cases where salty condiments such as soy sauce, maggi sauce, or seasonings etc are used in household cooking, setting sodium targets for such products will reduce the amount of salt coming into household cooking. If sodium reformulation is done gradually without consumers knowing or tasting any differences, then consumers will be eating less sodium without any behaviour change. At home, salt addition or use of salty condiments during cooking should be reduced, and some literature suggests one is more likely to taste the salty flavour when salt is added at the end of cooking compared to when salt is added during cooking, so, that lesser amount of salt maybe added at the end of cooking to achieve the same taste.	No changes made.
18) With reference to potassium salt (likely to be less salty), the feedback from field and salt industry is people tend to add double the amount of potassium-based salt vis a vis sodium-based salt to obtain the desired salty taste	While it is not ideal that people may use a greater amount of potassium enriched salt compared to regular salt, and potassium enriched salt manufacturers aim to create the right formulation so that potassium enriched salt tastes exactly like salt, and a one-to-one replacement can provide the same salty taste. However, potassium-enriched salt not only has lower sodium, but the added benefit of potassium, which also lowers blood pressure. In several studies in China, Peru and India, people provided with potassium-enriched salt to use, as they wish, had decreased blood pressure, and reduced risk of stroke, CVD events and mortality, compared to those using regular salt. We recommend reducing salt/sodium without replacement as the primary strategy, which will also help consumers adjust their taste preference to lower saltiness levels. However, when taste/flavour becomes a barrier to reducing salt or sodium, potassium enriched salt can be used.	No changes made.
If any country wants to revise the benchmark specific for them, how many proportion of a food category should be analyzed for defining percentiles and setting the level?	While there is no specific proportion or number of products needed within a food category before adapting the benchmark levels for a country, have sodium content data of popular (high market share) products within a category or good representation of products that are commonly consumed should be gathered if available. The Regional sodium benchmarks were reviewed and adapted if there were at least 10 products within a food category.	Page 9 – additional text about the Application of Regional benchmarks within countries "To do this, countries should aim to obtain sales volume data (if available) to help identify what products are commonly consumed and will have the greatest population impact if sodium levels are reduced to target levels. Countries should also develop or obtain access to sodium content data on food and beverage products that are representative of what are commonly consumed, to ensure the

Reviewer's comment	Authors' response	Changes made to the report
		regional sodium benchmarks are relevant for the food supply of the country."
20) Capture the methological aspect in the report	The methods are captured in detail in the report, and the decision for each Regional sodium benchmark is detailed in Supplementary file 1.	Additional text and clarifications to the methodology have been included in the report
21) SMEs will require some centralized technical support to achieve this at first.	SMEs will require some technical support to gradually reduce sodium levels in their products. The WHO is working on a manual to support food companies reduce sodium levels in processed and packaged food products. Some countries also provide small and medium sized enterprises a longer time to achieve the sodium targets/benchmarks compared to large, multinational companies.	Page 9 – Additional text "Moreover, if mandatory targets are implemented, additional support and leniencies should be provided to support small and medium enterprises to achieve the sodium target levels in their food products. This may include providing technical assistance and longer timeframes for compliance."
22) Four years for industry compliance is reasonable.	It is important to set achievable timelines for achieving the sodium target/benchmark. From experience from countries around the world, allowing up to 4 years is sufficient time for food producers to gradually lower the sodium content levels towards the target level. At 4 years, compliance should be reviewed.	Please see changes made in response to comment 4.
23) If some weighting can be incorporated for the foods that are consumed in larger portion sizes, it would have more population effect.	As mentioned in response to comment 5, the portion size or amount of food consumed across the population is taken into account when determining what products should have lower sodium levels and are priority categories for reformulation. While we were limited by the available data, we identified 5 WHO South-East Asia countries that estimated salt/sodium contributed by each food. This data relies on understanding the amount or portion size that is consumed each day on a population level and the sodium content in the product. It is necessary to reduce sodium levels in products that are highly consumed or consumed in large amounts (e.g. bread) but have relatively lower sodium levels, as well as products that are less commonly consumed or consumed in smaller amounts but are relatively high in sodium levels (e.g. salty condiments), to have a large population effect. If available, data on sales volume of products can also help identify what products are commonly consumed and will have the largest population effect if sodium levels are reformulated/reduced. However, by setting targets for all products within a food category to achieve lower sodium content creates an equal playing field for all food manufacturers, so that no manufacturer is disadvantaged, and the population will benefit from lower sodium intake regardless of what products they buy.	Please see changes to text made in response to comment 5. Page 9 – additional text "To do this, countries should aim to obtain sales volume data (if available) to help identify what products are commonly consumed and will have the greatest population impact if sodium levels are reduced to target levels. Countries should also develop or obtain access to sodium content data on food and beverage products that are representative of what are commonly consumed, to ensure the regional sodium benchmarks are relevant for the food supply of the country."
24) The methodology of the process followed to develop the benchmarks needs to be made very clear.	The methodology for developing the benchmarks is detailed in the report, and the information used to develop each of the Regional benchmarks are detailed in the Supplementary file 1.	Additional text and clarifications to the methodology have been included in the report

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25) Provide the sodium ranges for product categories, at least as an annex and any graphs, plots to show the sodium levels of key products. This would enable countries to adapt the benchmarks easily	We have provided the distribution/range of sodium through presenting the 25th , median and 75th percentile sodium levels. The 25th percentile value is the sodium content at which 25% of products lie below, and the 75th percentile value is the sodium content at which 75% of the products lie below. We believe this is more appropriate than providing the lowest and highest sodium levels in a category because at times these can be sodium labelling errors or unique products within a category. We advise that, where possible, countries use sodium content data from products for sale in their own food supply when adapting the Regional benchmarks to ensure that targets are set at a level that is appropriate for the country. Therefore, we don't think that providing sodium content data plots gathered from different South-East Asia countries in this report will be beneficial to countries adapting these targets for their country. To illustrate how frequency plots were used, an example of the sodium levels for the category nut, seeds and kernels are shown in the methodology	Please see response to comment 6 regarding use of interquartile range instead of range. We have also provided a set of summary statistics for each food category within supplementary table 1 (mean, median, 25th percentile, 75th percentile).