

# Promoting populationwide salt reduction in the South-East Asia Region: current status and future directions

Sailesh Mohan<sup>i</sup>, D. Prabhakaran<sup>ii</sup> and Anand Krishnan<sup>iii</sup>

## Abstract

High blood pressure or hypertension is a key modifiable risk factor for cardiovascular disease. In the South-East Asia Region, about a third of the adult population has hypertension, which causes 1.5 million deaths annually or 9.4% of all deaths in the Region. The Global Burden of Disease Study has found excess dietary salt intake to be the eleventh leading cause of mortality globally, accounting for 4 million deaths, while in the South-East Asia Region it is the seventh leading cause of mortality. Evidence indicates that reducing dietary salt/sodium consumption in the population will reduce the mean population blood pressure and associated risk of cardiovascular events in both hypertensive and normotensive individuals. We reviewed the available data on salt consumption by the population in the Region, which showed a paucity of contemporary, nationally representative data. However, available information indicates that salt intake is very high in many countries of the Region and exceeds the World Health Organization (WHO) recommended daily intake of 5 g/day or less. Recently, some initiatives towards population-level salt reduction have been undertaken in India, Indonesia, Thailand and Sri Lanka. This paper highlights key actions that countries can take to reduce salt intake as a population-based strategy to prevent and control hypertension and associated cardiovascular disease. The WHO Regional Office for South-East Asia convened an Expert Group Meeting on population-level salt/sodium reduction to review the global and regional evidence on salt/sodium and health, and to discuss regional strategies to reduce population-level salt/sodium intake and the methods to monitor population intake. The participants agreed that reducing population-level salt/sodium intake is a high-priority intervention, and that the paucity of data should not be a deterrent for initiating salt/sodium reduction programmes. The participants also affirmed that a salt reduction strategy can be combined with the salt iodization programme. The participants agreed to set a regional target of 10% relative reduction in population-level salt intake over the next five years and successive reductions thereafter, with the aim of achieving 30% relative reduction in population-level salt/sodium intake by 2025, in consonance with the set WHO–United Nations global targets. In order to achieve the target, the meeting formulated recommendations for Member States and WHO.

## Introduction

Noncommunicable diseases (NCDs) such as cardiovascular diseases (CVD) are increasing in the South-East Asia Region (SEAR). In 2008, of the 7.9 million NCD-related deaths in SEAR, 3.6 million were due to CVD alone. This is anticipated to increase to 12.5 million by 2030.<sup>1,2</sup> High blood

<sup>i</sup> Senior Research Scientist and Associate Professor, Public Health Foundation of India, New Delhi, India

<sup>ii</sup> Executive Director, Centre for Chronic Disease Control (CCDC) and Professor, Public Health Foundation of India, Director, Center of Excellence in Cardio-metabolic Risk Reduction in South Asia (CoE-CARRS), New Delhi, India

<sup>iii</sup> Additional Professor, Head, WHO Collaborating Centre for Capacity Development and Research in Community-based NCDPC, Centre for Community Medicine, All India Institute of Medical Sciences, New Delhi, India

pressure (HBP) or hypertension is the most important risk factor for CVD, accounting for about 9.4 million global deaths in 2010.<sup>3</sup> In SEAR, about a third of the adult population has hypertension and, not surprisingly, it accounts for 1.5 million deaths annually or 9.4% of all deaths.<sup>1</sup>

## High dietary sodium/salt intake and health

Sodium is the main cation in the extracellular fluid of the human body and plays an important part in maintaining fluid balance (sodium causes the body to retain water), nerve transmission and cell function. Its homeostasis is largely regulated by the kidneys. Though hypertension has a complex etiology, the inability of the kidneys to excrete excess sodium fully is one of the major mechanisms by which the blood pressure rises.<sup>4</sup>

Excess dietary sodium or salt intake is a well-established risk factor for hypertension through multiple investigations across animal, epidemiological, migration and population intervention studies done worldwide.<sup>4-6</sup> Further, many convincing scientific reviews have critically examined this association and confirmed the harmful health impact of excessive salt intake, particularly on cardiovascular health, and have recommended salt reduction.<sup>7-9</sup> Diets high in salt substantially increase the risk of blood pressure-related CVD events, even among those whose blood pressure is in the normal or high-normal range, and are associated with direct vascular and cardiac damage, obesity, stomach cancer, osteoporosis, kidney stones and increased severity of asthma symptoms.<sup>7-9</sup> Foods with a high salt content increase thirst and lead to increased consumption of calorie-dense soft drinks, thus indirectly contributing to childhood obesity.<sup>7,8</sup> On the basis of the harm caused to human health, the World Health Organization (WHO) recommends a daily salt intake of less than 5 g, which is equivalent to 2 g of sodium.<sup>7,9</sup> Many other national and international health-related organizations as well as guidelines on CVD prevention and control also recommend dietary salt reduction as an effective population-based public health strategy to prevent CVD.

Recently, the Global Burden of Disease Study has found excess dietary salt intake to be the eleventh leading cause of mortality globally accounting for 4 million deaths, while in the SEA Region it is the seventh leading cause of mortality.<sup>3</sup> These data underline the potential impact that effective population-level salt reduction can have on reducing the morbidity and mortality associated with HBP in this populous region of the world.

WHO, in the follow-up to the landmark United Nations (UN) High-Level Meeting on noncommunicable diseases held in New York in 2011, has mandated hypertension prevention and control by population-level salt reduction to be one of the most urgent, cost-effective and immediate high-priority interventions to reduce CVD worldwide. It has now set an ambitious goal of 25% reduction in avoidable mortality due to NCDs by 2025 through a range of multi-stakeholder driven actions, and establishment of a global monitoring framework to measure progress. This framework includes targets and indicators for hypertension as well as salt reduction, and proposes a 25% relative reduction in the population-level prevalence of hypertension and 30% relative reduction in mean salt intake.<sup>10</sup> This provides an excellent opportunity and the necessary impetus to drive and monitor national salt reduction efforts within the SEA Region as a public health strategy to reduce the increasing burden of hypertension, CVD and NCDs. This paper summarizes the information available in the SEA Region on salt intake and highlights key actions that countries can undertake to promote salt reduction as a population-based strategy for the prevention and control of HBP and associated CVD.

## Salt intake in countries of the SEA Region

Profound changes in lifestyles are occurring across the SEA Region. These have an adverse impact on food environments and consumption of unhealthy diets high in salt, fats and sugars, and deficient in fruits and vegetables. Almost 80% of the people do not consume the recommended quantities of fruits and vegetables, which are good sources of potassium and can reduce the impact of sodium on blood pressure.<sup>1</sup> Our review indicates a paucity of contemporary data on population-level salt consumption and the sources of salt intake. In most studies, data were obtained from non-representative samples and based on dietary data instead of the gold standard 24-hour urinary sodium assessment, which points to the possible underestimation of actual salt intake. Further, data are limited on the public's knowledge about the deleterious health impact of excessive salt intake and attitudes to salt reduction.<sup>11</sup> However, available information indicates that salt intake is very high in many countries of the Region and exceeds the WHO-recommended daily dietary salt intake of 5 g or less (Table 1).

**Table 1. Salt intake in countries of the SEA Region**

Country	Estimates of individual daily salt intake (95% CI or SD) <sup>a</sup>	Comments
Bangladesh <sup>12</sup>	17 g (95% CI: 16.4–17.5 g/day)	Subnational, urban and rural adults in Dhaka aged 20–60 years
India <sup>13</sup>	13.8 g Ranged between 7 g and 26 g salt in different states	Household surveys in 13 states
India <sup>14</sup>	12 g in Ladakh (SD ± 4.4 g/day) 9 g in Delhi (SD ± 3.4 g/day)	Subnational, adults aged 20–59 years
Indonesia <sup>15</sup>	5 g salt	National household survey
Nepal <sup>16</sup>	10–13 g	Subnational, suburban adults in Kotyang, Bhadrakali
Sri Lanka <sup>b</sup>	8 g (SD ± 4.1 g/day): 9 g in men and 7.7 g in women	Subnational, urban and rural adults in western province aged 30–59 years
Thailand <sup>17</sup>	10.8 g (SD ± 2.6 g/day)	National household survey

<sup>a</sup> Confidence interval/standard deviation, where available

<sup>b</sup> Jayatissa R, Yamori Y, De Silva AH, Mori M, Gunawardana S, De Silva U, Ranbanda JM, 2012 (unpublished data)

## Benefits of population-based salt reduction strategies for hypertension control

Current scientific evidence indicates that reducing dietary salt will reduce the mean population-level blood pressure and associated risk of cardiovascular events in both hypertensive and normotensive individuals.<sup>7</sup> A modelling exercise was undertaken in selected countries of the Region to assess the effect on systolic blood pressure of a 15% reduction in salt intake by voluntary reduction of the salt

content in processed foods by the food industry, and consumer education to encourage a change in dietary habits, using the mass media. The results of this exercise are shown in Table 2.<sup>18</sup>

**Table 2. Estimated effect of 15% reduction in salt intake in selected SEAR countries of the SEA Region**

Mean systolic blood pressure reduction by 2015 (mmHg)										
Age (years)	Bangladesh		India		Indonesia		Myanmar		Thailand	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
30–44	1.3	1.1	1.6	1.4	1.5	1.3	1.4	1.0	1.2	1.0
45–59	1.7	1.6	2.0	1.7	2.0	1.9	1.8	1.4	1.8	1.5
60–69	2.3	2.2	2.5	2.3	2.6	2.5	2.5	1.9	2.4	2.1
70–79	2.8	2.8	3.1	2.8	3.1	3.0	3.0	2.5	2.9	2.6
≥80	3.5	3.5	3.8	3.5	3.9	3.6	3.9	3.2	3.6	3.2

Source: Asaria P et al. Chronic disease prevention: health effects and financial costs of strategies to reduce salt intake and control tobacco use. *Lancet*, 2007, 370:2044–2053.

A decrease of 2 mmHg diastolic blood pressure in the whole population, which is achievable by modest salt reduction, is estimated to reduce the prevalence of hypertension by 17%, coronary artery disease by 6% and the risk of stroke by 15%, with many of the benefits occurring among persons with normal blood pressure. This underlines the huge potential of salt reduction to improve population health.<sup>19</sup> The estimated cost (in 2005) of implementing salt reduction strategies in select countries was between US\$ 0.04 and US\$ 0.06 per person per year.<sup>18</sup>

Thus, populationwide salt reduction is potentially one of the most cost-effective strategies to prevent CVD. In addition, it is also cost saving, as it has the potential to improve hypertension control rates, reduce the need for antihypertensive medications and consequently curb associated health-care costs.<sup>4,7,8</sup> Countries such as Finland, the United Kingdom and Japan have implemented effective salt reduction programmes and reported benefits in terms of lowering of blood pressure in the population and subsequent reduction in CVD.<sup>4–7,20</sup> Other countries are implementing or planning to implement salt reduction programmes. Against the backdrop of a high and increasing burden of uncontrolled hypertension and resource-constrained health systems in the SEA Region, promoting and implementing salt reduction programmes offers an effective pathway for better prevention and control of hypertension and associated CVD.

## Strategies for salt reduction: insights from developed countries

Experience from developed countries that have successfully reduced salt consumption at the population level indicates that some of the key strategies are (i) partnerships with the food industry along with regulation, particularly in the absence of voluntary action; (ii) reformulating processed foods that are high in salt and account for a large percentage of intake; (iii) implementing effective consumer education programmes on the effects of excess salt consumption on health; (iv) implementing mandatory, easy-to-understand, consumer-friendly food labelling to identify low-salt products; and (v) creating an enabling environment for making healthy dietary choices easier by increasing the access to and availability of low-salt as well as healthy foods.<sup>4–7,11,20</sup>

## Salt reduction initiatives in the SEA Region

A recent global review of population-level salt reduction efforts reported no initiatives in the SEA Region.<sup>21</sup> However, limited initiatives are in place or are being planned as hypertension rates increase and policies for NCD prevention and control prioritize population-based measures for greater health gains at lower costs. Available information on ongoing or planned initiatives is given below.

Thailand is implementing a national NCD prevention campaign that has salt reduction as a focus area. Besides, the Royal College of Physicians of Thailand and Thai Health are jointly planning to advance reformulation of food products and food labelling, conduct an evaluation of the NCD campaign vis-à-vis salt reduction, and develop a food composition database to monitor the salt content in foods.<sup>11</sup>

In India, the National Institute of Nutrition has recently released new recommended dietary allowances for Indians, which recommend salt reduction.<sup>11</sup> However, no concerted action has been taken nationally to implement this guideline. The Public Health Foundation of India recently conducted a national research consultation to identify salt reduction strategies for India and, as a follow-up, initiated studies to gather current evidence on population-level salt intake to facilitate policy development for national salt reduction.<sup>11</sup>

In Indonesia, as part of an NCD control strategy, the government is considering regulating the food industry to mandate labelling of the salt, sugar and fat content in restaurant foods and on ready-to-eat foods. The regulation is expected to come into effect soon.<sup>11</sup>

As part of efforts to advance NCD control in Sri Lanka, the Ministry of Health has prepared a major plan to implement a salt reduction programme that includes collaborating with the food industry to reduce population-level salt intake to 6 g/day by reducing salt in meat, bread and bakery products, as well as setting reduction targets for other products. Furthermore, a monitoring system to determine salt intake and likely reductions, development of a databank of processed foods, and implementation of public education campaigns are planned over the next few years.<sup>11</sup>

## Recent initiatives on salt reduction in the SEA Region

The WHO Regional Office for South-East Asia convened an Expert Group Meeting on population salt/sodium reduction in the Region from 11 to 13 December 2012, New Delhi, India with the aim of reviewing the global and regional evidence on salt/sodium and health, and to discuss regional strategies to reduce population-level salt/sodium intake and the methods to monitor population intake. The participants agreed that reducing population-level salt/sodium intake is a high-priority intervention for Member States of the Region to prevent and control hypertension and CVD, and that the paucity of data should not be a deterrent for initiating salt/sodium reduction programmes. Thus, it was decided that countries should start implementing salt reduction interventions along with efforts to collect data on population-level salt/sodium intake. The participants reaffirmed that a salt reduction strategy is compatible with the salt iodization programme and the two programmes stand to mutually benefit from each other. The participants agreed on setting a regional target of 10% relative reduction in population-level salt intake over the next five years and successive reductions thereafter, with the aim of achieving 30% relative reduction in population-level salt/sodium intake by 2025, in consonance with the global targets. In order to achieve the target, the meeting formulated the following recommendations for Member States and WHO.

## Recommendations for Member States

- (1) Advocate to policy-makers and other national stakeholders to raise the priority of salt/sodium reduction interventions for the prevention and control of CVD and other NCDs.
- (2) Engage with a wide range of stakeholders (government, private sector, media, civil society, academia) and establish a national salt group with clear terms of reference to develop, implement and oversee national salt/sodium reduction programmes.
- (3) Establish settings-based salt/sodium reduction programmes at government-owned institutions and workplaces (corporate sector), as well as in schools and the armed forces.
- (4) Conduct targeted public awareness campaigns for salt/sodium reduction.
- (5) Introduce voluntary regulation for the food industry to reformulate lower salt/sodium products; monitor compliance and, if needed, introduce mandatory regulation.
- (6) Explore the possibility of substituting salt with locally available lower sodium substitutes by evaluating their composition, effectiveness and acceptability.
- (7) Consider food labelling for salt/sodium using a colour-coding system.
- (8) Implement the *Codex Alimentarius*.
- (9) Increase collaboration between salt/sodium reduction programmes and salt iodization programmes for increased public health gains and higher efficiency.
- (10) Collect data to establish baseline population-level salt/sodium intake by the end of 2015 using a range of available methods, including 24-hour urine analyses and spot urine analyses, in conjunction with dietary and behavioural surveys; perform repeat surveys every five years.
- (11) Integrate salt/sodium surveys with existing NCD risk factor surveys such as STEPs and national health surveys.
- (12) Conduct operations research on priority topics to identify locally appropriate salt/sodium monitoring methods and locally relevant strategies for salt/sodium reduction.

## Recommendations for WHO

- (1) Advocate to Member States to give high priority to salt/sodium reduction programmes for the prevention and control of CVD and other NCDs.
- (2) Advocate to UN agencies, international nongovernmental organizations and other partners to raise the priority of salt/sodium reduction within existing health and developmental programmes.
- (3) Provide technical assistance to Member States for setting up and implementing national salt/sodium reduction programmes.
- (4) Strengthen national capacity for conducting monitoring and evaluation, as well as surveillance and operations research studies on population-level salt/sodium intake.
- (5) Facilitate networking and sharing of expertise among Member States for implementing salt/sodium reduction programmes and monitoring population-level salt/sodium intake.

- (6) Facilitate standardized data collection on salt/sodium consumption.
- (7) Periodically publish regional data on salt/sodium as part of NCD reports and disseminate information and best practices through various channels including websites, policy briefs, aide memoires, newsletters, research publications.
- (8) Organize periodic regional and national consultative meetings on population-level salt/sodium reduction to review progress in reaching the sodium/salt reduction goal and devise new strategies, as needed.

## Conclusion

Available data, though limited, indicate high salt intake by the population in the SEA Region. However, the paucity of current data should not impede the initiation of context-specific salt/sodium reduction programmes. Countries should start implementing salt reduction interventions along with efforts to collect contemporary data on population-level salt/sodium intake. Against the background of a high and increasing burden of uncontrolled hypertension, CVD and NCDs, and resource-constrained health systems in the Region, promoting and implementing salt reduction programmes offers an effective pathway to better prevent and control hypertension and reduce associated CVD.

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