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Review Article

India's tryst with salt: Dandi march to low sodium salts

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Salt plays a critical role in India's past as well as its present, from Dandi March to its role as a vehicle for micronutrient fortification. However, excess salt intake is a risk factor for high blood pressure and cardiovascular diseases (CVDs). Indians consume double the World Health Organization recommended daily salt (<5 g). India has committed to a 30 per cent reduction in sodium intake by 2025. Evidence based strategies for population sodium intake reduction require a moderate reduction in salt in – home cooked foods, packaged foods and outside-home foods. Reducing the sodium content in packaged food includes policy driven interventions such as front-of-package warning labels, food reformulation, marketing restrictions and taxation on high sodium foods. For foods outside of the home, setting standards for foods purchased and served by schemes like mid-day meals can have a moderate impact. For home cooked foods (the major source of sodium), strategies include advocacy for reducing salt intake. In addition to mass media campaigns for awareness generation, substituting regular salt with low sodium salt (LSS) has the potential to reduce salt intake even in the absence of a major shift in consumer behaviour. LSS substitution effectively lowers blood pressure and thus reduces the risk of CVDs. Further research is required on the effect of LSS substitutes on patients with chronic kidney disease. India needs an integrated approach to sodium reduction that uses evidence based strategies and can be implemented sustainably at scale. This will be possible only through scientific research, governmental leadership and a responsive evidence-to-action approach through a multi-stakeholder coalition.

Key words Dietary salt - India - low sodium salt substitutes - sodium reduction

Salt (sodium chloride) has long been one of the key essential commodities in the world. Globally, salt has played various important roles throughout human history. It has even served as a form of currency – often referred to as white gold. While salt has many industrial uses, we primarily consider how it is used in food. Since ancient times, salt has been used to preserve and flavour foods. In India, specifically, salt holds a significant position from the perspective of politics, culture and public health.

In terms of health, while salt is critical for survival, high salt intake leads to high blood pressure, cardiovascular diseases (CVD) and kidney diseases. CVD is estimated to be responsible for a third of deaths in India, and high blood pressure is the leading risk factor for CVD[1]. The estimated daily salt intake in

India is almost twice the World Health Organization's (WHO) recommendation of 5 g a day[2]. In this article, we present a state-of-the-art review of the historical importance of salt in politics and public health, the negative health impacts of salt, the current status of salt consumption and policies and potential salt reduction strategies in India.

The political and cultural importance of salt in India: The British Colonial Government in pre-independent India not only had a monopoly on the manufacturing and collection of salt but also levied taxes on the salt freely available on the coast. This tax on an item of daily use impacted all Indians, with the poorest most heavily affected. Despite repeated appeals by the Indian National Congress and its leader Mohandas Karamchand Gandhi, the then-British Indian Government maintained the salt tax. In March 1930, Gandhi and 78 Satyagrahis (thousands of others joining on the way) protested by marching by foot from Sabarmati Ashram to Dandi, a coastal village in the current State of Gujarat, a total of 385 km. This protest march, known as the Dandi March or Salt Satyagraha, received international attention and signalled the start of the decline of the British Empire in India.

Salt has major cultural significance across the Indian subcontinent. The indigenous inhabitants of India, a geography with high temperatures, consumed very large quantities of salt to avoid what they considered as, symptoms of salt deficiency[3]. In the present times, it is still considered auspicious to serve salt at the beginning of the meal at festivals, weddings and other celebrations. In addition, consuming food containing salt from a household indicates loyalty to that household. It also is an economic signifier, as the lack of salt in a house represents abject poverty.

Public health importance of salt in India: Salt is considered an ideal vehicle for micronutrient fortification as it is consumed daily in all households, with a little day-to-day variation. India was one of the first countries to develop a salt iodization programme to address iodine-deficiency disorders, causing impairment of early brain development, cognition and learning abilities of children. After the successful Kangra Valley Project in the 1960s, India embarked on the universal iodization of salt in 1992 and banned the sales of non-iodized salt in 1997[4]. Universal iodization of salt and control of iodine deficiency disorders is one of the country's most successful public health programmes.

The success of the Universal Salt Iodization Programme has led to significant interest in the double fortification of salt with both iodine and iron to address ubiquitous iron deficiency anaemia. The Indian Council of Medical Research (ICMR)-National Institute of Nutrition (NIN), Hyderabad, India, pioneered the technology of double fortification of salt[5]. Double fortified salt (DFS) is increasingly included in social safety net programmes such as the public distribution system (PDS), mid-day meals and Integrated Child Development Services. The efforts are being led by the Food Safety and Standards Authority of India (FSSAI), the Ministry of Women and Child Development, the Ministry of Education and the Ministry of Consumer Affairs and Food and Public Distribution at the central level. Many state governments have also started, including DFS in these programmes. Madhya Pradesh and Gujarat have made DFS available in their PDS since 2018; Tamil Nadu has been using DFS in the mid-day meal programme for school children since 2004. Pilot projects have been launched in Rajasthan, Uttar Pradesh and Jharkhand[6]. Furthermore, an ongoing trial is testing the effectiveness of quintuple fortified salt with iodine, iron, vitamin B12 and zinc[7]. In addition to the micronutrients, there have been pilot studies in India to fortify salt with a low dose of diethylcarbamazine citrate, an antifilarial drug, as a replacement for mass drug administration[8].

The current DFS formulations in India aim to provide 100 per cent of the daily dietary requirement of iodine and ~30-60 per cent daily dietary iron requirement (0.8-1.1 mg of iron is added to a gram of salt)[9]. This would require the consumption of 10 g of salt per day[10], twice the recommendation from the WHO and the ICMR-NIN and contradict the goal of lowering salt intake at the population level by 30 per cent. The WHO suggests that the amount of iodine to fortify salt should be adjusted based on the population's salt intake, indicating that policies to reduce iodine deficiency disorder and sodium reduction are compatible but require coordination between the programmes[11].

<u>Negative health impacts of salt</u>: High salt intake is responsible for an estimated 0.175 million deaths per year in India, primarily due to the relationship between salt intake and blood pressure. Incontrovertible evidence exists on the relationship between salt intake and blood pressure. Randomized clinical trials have demonstrated a direct, dose–response relationship between higher salt intake and higher blood pressure[12,13].

Higher salt intake is also associated with higher risk of stroke and stroke deaths[14]. Research also shows that reduced salt intake reduces CVD; in a 10-15 yr of follow up study, Trials of Hypertension Prevention[15], CVD was reduced by 30 per cent and mortality by 20 per cent in the participants initially randomized to receive a reduced sodium diet.

Sodium intake in India

The WHO, the National Programme for Prevention and Control of Non-communicable diseases (NP-NCD), and the ICMR-NIN all recommend consumption of <5 g of salt a day (equivalence 2000 mg of sodium a day). While no nationally representative gold standard (24 h urine collection) surveys of sodium intake have been conducted in India, the existing isolated surveys indicate that Indian adults consume between eight and 11 g of salt per day or approximately twice the recommended intake (Table I). A meta-analysis of published data, describing salt intake levels in the Indian population, showed an overall mean weighted salt intake of 10.98 g/day [95% confidence interval (CI) 8.57-13.40]. The intake appears higher in rural than urban areas, although the difference is not large[21].

The three major sources of dietary sodium are (*i*) salt added to the food while cooking or eating at home; (*ii*) foods that are prepared outside of the home, such as restaurant food, street food and food provided at schools or other government institutions; and (*iii*) processed or packaged foods such as instant noodles, chips and savoury snacks. While data are limited, the few surveys in India indicate that salt added at home during cooking or at the table is the main source of sodium, responsible for approximately 80 per cent of adult salt intake (Table II). However, given India's diverse food culture, sources may vary by region. For instance, in Ladakh and Assam tea gardens, salt added to tea is a major contributor to dietary sodium[26,27].

At the same time, packaged food is increasing rapidly in India, from a retail value of US$ 1 billion in 2006 to US$ 38 billion in 2016[28]. It is likely that in urban areas, packaged and processed food may be an important source of dietary sodium for children and young adults. Many packaged foods contain elevated levels of sodium as indicated by the recent analysis of labels of packaged foods in India. Furthermore, there has recently been a rapid expansion of out-of-home foods with the advent of food delivery applications[29].

Sodium reduction strategies: At the 66th World Health Assembly in 2013, member states, including India, set a voluntary global target of a 30 per cent relative reduction in the mean population sodium intake. The WHO recommends several sodium reduction interventions as 'best buys' and estimates a US$ 13 return on every US dollar invested in these interventions[30].

Evidence based sodium reduction strategies target at least one of the main sources of sodium intake. Often, a multi-component approach is adopted. A recent review listed sodium reduction strategies that were scalable, sustainable and effective and had the potential to lead to a meaningful decrease in the population-level sodium intake (Box I). These strategies can be adapted to the Indian context to reduce sodium intake at population level. For instance, the FSSAI is currently working on developing front-of-package labels for foods high in salt, sugar and fat and has put out a regulation limiting the sale, marketing and advertising of these foods in and around schools[32,33].

Multifaceted strategies for salt reduction resulted in a decrease of salt consumption by 1.3 to 4 g/day in Finland, Japan and the United Kingdom, whereas single interventions have reduced salt consumption by 0.1 g/day (health education campaigns) to 1.45 g/day (mandatory product reformulation)[34].

While strategies targeting the sodium content of packaged foods and standards for sodium in public procurement programmes will be essential to change the food environment, reducing salt added in the home is critical as it is the major source of dietary sodium in India. Of the two high-impact strategies to reduce sodium in home-cooked food, mass media campaigns can disseminate information, generate awareness and may subsequently lead to changes in attitudes and behaviours. Although research suggests that nutrition campaigns have positive impacts on dietary behaviour[35,36], short-term mass media campaigns in isolation contribute to very small changes in sodium consumption. These campaigns will require long-term investment commitment from the government to reach the target audience repeatedly. The wide diversity in culinary practices in Indian households and the cultural significance of salt in Indian households make these media public education campaigns even more challenging. Furthermore, changes in behaviours or practices also require an enabling environment in addition to improved knowledge and awareness.

Given the challenges around the reliance on mass media and behaviour change approaches to address home-cooked sources of salt, increasing the use of low

Table I. Salt consumption in India*

Author (year)	Region covered	n	Methodology	Salt/day/person in g (95% CI)
Mathur *et al*[16] 2021	National	2266	Spot urine – Intersalt equation	8 (7.8-8.2)
Johnson *et al*[2], 2017	North (Delhi) and South (Andhra Pradesh)	1395	24 h urinary sodium	Delhi and Haryana: 8.59 (7.68-9.51); Andhra Pradesh: 9.46 (9.06-9.85)
Chidambaram *et al*[17], 2014	Tamil Nadu	168	24 h urinary sodium excretion	13.20 (13.03-13.37)
Dash *et al*[18], 1994	'Oraon' tribal community, India	298	24 h urinary sodium excretion	5.22 (4.86-5.58)
Jan *et al*[19], 2006	Kashmir	270	24 h urinary sodium excretion	21.88 (20.95-22.81)
Intersalt study[20], 1988	Ladakh, Delhi	399	24 h urinary sodium excretion	Ladakh: 12; Delhi: 9

*Studies on salt consumption from different regions in India, using urinary sodium excretion methods (n≥100). CI, confidence interval; NNMS, National Non-communicable Disease Monitoring Survey

Table II. Sources of sodium/salt consumption in Indian diets

Author (year)	Region covered	Sample size	Age (yr)	Methodology	Source of salt/sodium intake
Johnson *et al*[22], 2019	North India (Delhi/ Haryana); south India (Andhra Pradesh)	1283	≥20	24 h dietary recall	Salt added during cooking/at the table contributed to >80% (south India: 87.7%; north India: 83.5%) of the total salt intake
Aparna *et al*[23], 2019	North India (Delhi)	426	20-59	24 h dietary recall	90% of the daily salt intake was through foods prepared at home
Nair & Bandyopadhyay[24] 2018	West India (Gujarat)	219	35-55	24 h dietary recall (3 days) and Food frequency questionnaire	The major source of dietary sodium was from salt added during cooking or at the table (2.6±0.1-3.1±0.2 g sodium/day)
Ravi *et al*[25], 2016	South India (Tamil Nadu)	6876	>20	24 h dietary recall	The predominant source of dietary sodium in the population (semi-urban/urban and rural) was from salt added during cooking home-made foods where salt is part of the traditional recipe

sodium salt (LSS) rather than regular salt (sodium chloride) can be an effective strategy to achieve sodium reduction at the population level, particularly as it requires minimal consumer action and behaviour change.

Low sodium salt (LSS)

In LSS, a certain percentage of sodium chloride in the salt is replaced with another mineral, most commonly potassium chloride. In a study to assess the availability, formulation, labelling and price of LSS, it was found that the proportion of sodium chloride ranges from zero per cent (sodium free) to 88 per cent of sodium in LSS available to consumers worldwide[37]. LSS in India is sold by different brands and has 15 per cent reduced sodium, and the most recent ones have 30 per cent lower sodium. Most branded low sodium salt substitutes in India are fortified with iodine and, therefore, marketed as low sodium iodized salt.

Box I. High impact sodium reduction strategies

Sodium from the added salt at home
Mass media campaigns (may not be sustainable due to recurrent cost)
Increase uptake of LSS (promotion, distribution and subsidies)
Sodium from packaged foods
Front-of-package warning labels
Food reformulation targets for packaged food (voluntary or mandatory)
Regulation of marketing of foods and non-alcoholic beverages to children
Fiscal policies: taxation on high sodium foods
Sodium from food prepared outside the home
Standards for sodium as part of food procurement policies for public institutions
Source: Ref 31 (adapted with permission). LSS, low sodium salt

Impact of LSS on blood pressure and CVDs: High levels of potassium intake are associated with lower levels of blood pressure[38]. The evidence suggests that the sodium/potassium ratio may be more important than either sodium or potassium alone for the reduction of blood pressure and CVD[39-41]. The WHO recommends an increase in potassium intake from food to reduce blood pressure and risk of CVD, stroke and coronary heart disease in adults and to control blood pressure in children[41]. For the general adult population, the WHO and ICMR-NIN India recommend a daily potassium intake of at least 3510 mg per day and a sodium-potassium intake ratio of <1 to prevent hypertension and related diseases[42,43]. While data on potassium intake in India are limited, one study from the National Capital Region of Delhi found that only 2.9 per cent of adults in rural areas and 6.6 per cent in urban areas meet the recommended sodium-potassium ratio[44].

LSS have been shown to reduce blood pressure and CVD. A global systematic review and meta-analysis of 21 randomized controlled trials found that LSS decreased systolic blood pressure (SBP; −4.61 mmHg) and diastolic blood pressure (DBP; −1.61 mmHg); the effects were seen across hypertensive, normotensive and mixed populations[45]. A randomized, double-blind, controlled study from India amongst 502 hypertensive rural individuals found that a salt substitute (30% replacement with potassium) intervention for three months led to a significant decrease in the average SBP by 4.6 mmHg and DBP by 1.1 mmHg[46]. The effect size is comparable to the reduction achieved by the angiotensin-converting enzyme (ACE) inhibitors. LSSs can also prevent CVD and pre-mature mortality. The Salt Substitute and Stroke Study (SSaSS) trial conducted in rural China with participants, who had a history of stroke or were 60 yr of age or older and had poorly controlled blood pressure, found that participants in the LSS arm had a 14 per cent reduction in stroke, a 13 per cent reduction in major cardiovascular events and a 12 per cent reduction in deaths. The study also found that the rate of adverse events related to hyperkalaemia was not significantly higher amongst those using LSS[47].

In addition, studies in various countries found that LSS containing up to 30 per cent potassium is well accepted by consumers[48]. Similar studies on the taste and acceptability of LSS are needed in India. LSS is also cost-effective. An economic evaluation, undertaken as part of the SSaSS (Salt Substitute and Stroke Study) trial, estimated that the intervention not only was cost-effective but it was also cost-saving. The average total costs, including healthcare services cost and regular salt and salt substitute cost, were lower in the salt substitute group (~US$ 16)[49].

LSS and hyperkalaemia: High dietary consumption of potassium is considered safe for the general population. Increasing potassium intake through LSSs is likely to be beneficial given the low intake of potassium in India[43]. One common concern associated with LSSs that are enriched with potassium is the possible risk of hyperkalaemia and its adverse consequences, increased risk of arrhythmias and sudden cardiac death, in people who may have difficulty excreting potassium fully, such as those with advanced chronic kidney disease (CKD) or taking potassium sparing diuretics[48].

The Global Burden of Disease study estimated that there were 115 million CKD cases in India in 2015[50]. The prevalence of CKD stages 3, 4 and 5 in India is estimated to be 4.3, 0.8 and 0.8 per cent, respectively[51]. The current guidelines recommend a low potassium diet for patients with advanced CKD (stages 4 or 5)[52-55]. However, evidence suggests that increased potassium intake may also benefit patients with CKD by reducing blood pressure[56] and may slow CKD progression[57,58]. Furthermore, in the studies evaluating the effect of LSS, even in large-scale pragmatic trials where people were excluded based

Box II. Benefits and possible risks of replacing regular salt with low sodium salt

Benefits	Risks
• Reduces BP by between−6.07 and−3.14 mmHg SBP and−2.42 and−0.79 mmHg DBP[45] • Reduces risk of stroke, coronary heart disease and death[47] • Cost-saving – when considering healthcare costs and the costs of both the purchase and promotion of LSS[50]	• High levels of serum potassium (hyperkalaemia) can lead to arrhythmia and sudden death, especially in individuals with impaired renal function[48] • LSS has the potential to increase the risk of hyperkalaemia in patients with reduced kidney function, although the evidence is low • LSS can increase levels of serum potassium[63] • Case reports of harm exist[64] • Studies of LSSs have not shown evidence of harm to date; while most exclude patients potentially at risk, larger trials like SSaSS have been 'pragmatic' and excluded only those who self-report having kidney disease or taking potassium-sparing diuretics[46,47,63]

BP, blood pressure; SBP, systolic BP, DBP, diastolic BP, LSSs, low sodium salt substitute; SSaSS, salt substitute and stroke study

only on self reported CKD or taking potassium-sparing diuretics, there were no reports of excess risk of adverse events, including severe hyperkalaemia[59,60]. While people with advanced CKD have the highest risk of hyperkalaemia in general, those on ACE inhibitors or angiotensin receptor blockers to treat hypertension and those with heart disease are all at slightly elevated risk in general[61], although it is not known how LSS and these drugs will interact.

A recent modelling study estimating the benefits and risks of LSS in India found that in a conservative scenario, using LSSs nationwide would prevent around 214,000 cardiovascular deaths each year. Even among those with advanced CKD, approximately 30,000 deaths would be prevented[62]. It should be noted that the risks in the modelling study are not based on direct evidence from the trial but are based on several assumptions using data from other cohort studies.

The current evidence indicates that increased potassium intake from LSSs helps reduce blood pressure and the risk of CVDs (Box II). It benefits people with CKD in the initial stages of the disease, slowing its progression[57,58]. However, in the absence of more evidence regarding the effects of LSS on the occurrence of hyperkalaemia in people with advanced kidney disease, LSS should carry advisories that clearly indicate the risk to patients with advanced kidney disease or those told by a doctor to limit potassium. However, they should not be prohibitive for the general population who could benefit from LSS.

LSS substitutes in India: LSSs available in the Indian market usually have 10, 15 or 30 per cent of sodium replaced with potassium and are iodized. These salts are generally regarded as safe by the US Food and Drug Administration[65] and are often sold as niche products at a price around two times higher than regular iodized salt[37]. The availability of LSS outside big cities is limited.

In 2021, the FSSAI released a draft notification[66], defining LSS, specifying that it has between 60 and 75 per cent of sodium chloride and requiring the following advisory statement on the label:

'To be consumed under medical supervision. There is a risk of hyperkalaemia on consumption of a high potassium containing salt when there is renal or cardiac dysfunction, diabetes, or in case of consumption along with certain drugs that can substantially impair potassium excretion'.

Based on the evidence discussed previously in this article, while it may be helpful to provide adequate caution for people at risk of hyperkalaemia, the suggested text has the potential to indicate to the general population that medical supervision is required for the use of this salt. This may dissuade many who would benefit from LSS substitutes.

LSS as a population level public health intervention in India

Globally, challenges to increase the uptake of LSS include limited availability, low awareness, higher price, concerns about taste, low demand and higher cost[67]. In the Indian context, low awareness amongst the public and medical community[68], low availability, especially outside of big cities, and high prices have resulted in a lack of demand for LSS.

While there is little awareness of LSS, other types of salts such as pink Himalayan salt, black salt and sea salt are growing in popularity. Aggressive marketing

Table III. Improving uptake of low sodium salt (LSS) in India

Objectives and strategy	Potential impact	Key partners	Duration
Improved advocacy by creating a coalition of medical professionals, civil society and policy experts	LSS is recognized as a key intervention for reducing population-level sodium intake	Medical professionals and researchers	Short term
Increased availability and accessibility by strengthening production (access of potassium, technology and infrastructure), supply chains and devising effective regulatory policies	Adequate availability of LSS outside of large metropolitan cities	Industry and regulators	Medium to long term
Increased awareness through education and social marketing campaigns	Increased demand of LSS due to a high level of awareness in the general population	Government and public health community	Short to medium term
Improved affordability through direct or indirect subsidies and other fiscal policy instruments	LSS is cheaper and is considered a feasible substitute to regular edible salt by households	Policymakers	Long term

of these non-iodized specialized salts is now common, and non-evidence based health benefits are widely promoted. These salts have sodium similar to regular common salt with minute levels of other minerals[69]. Little evidence exists to show that these salts are better for health.

To address these constraints, a recently proposed strategic framework to promote LSS substitutes[70] should be adapted to India through a multi-stakeholder comprehensive approach (Table III). This framework focuses on the 4 A's – (*i*) advocacy, (*ii*) availability and accessibility, (*iii*) awareness and demand generation, and (*iv*) affordability.

Research studies suggest that scaling up LSSs is potentially an important intervention to help reduce sodium intake at the population level, especially given the high proportion of salt added in the home in India. However, despite its effectiveness in reducing blood pressure and risk of CVDs, safety and cost-effectiveness, some research gaps must be addressed, especially in the Indian context. A better understanding of the various barriers could help devise strategies to improve the uptake of LSS in India. Some broad areas of further research include:

(*i*) Impact of potassium enriched LSS with different proportions of potassium on hyperkalaemia among people suffering from advanced CKD and those on potassium-sparing diuretics and antihypertensive drugs
(*ii*) Manufacturing and distribution landscape of LSS in India – technology gaps, potassium chloride availability, the overall cost of production, supply chain, market share and associated challenges
(*iii*) Effect and cost of subsidies or other fiscal instruments for LSS
(*iv*) Feasibility and impact of including LSS in public procurement programmes (PDS and mid-day meal)
(*v*) Feasibility of multi-fortified LSS, given the recent interest in DFS (iron and iodine).

Way forward

Sodium reduction strategies need to be mainstreamed and scaled up sustainably in India to address the growing burden of hypertension and other CVDs. This will require a comprehensive approach focussing on the major sources of sodium intake. Strategies such as front-of-pack labelling, food reformulation (including mandatory salt targets or incentivizing food manufacturers to produce food containing low levels of sodium, sugar and fat, taxation of HFSS foods and restricting marketing of HFSS foods to children can reduce the amount of sodium in packaged foods. These require action by policymakers.

In addition, India also has a massive footprint of public procurement programmes such as the Midday Meal Programme and Integrated Child Development Services; these programmes can also contribute to the goal of reducing sodium intake by setting standards and ensuring less salt is added to cooked meals being provided to children and women. Other large scale public catering and vending services that contribute to food consumed outside of the home, like those by the railways, armed forces, hospitals and office canteens, can also be utilized to reduce sodium intake at a population level. This would comprise a much needed "no missed opportunity" approach to salt reduction for foods consumed outside of the home. In addition, engaging chefs and restaurants in efforts to reduce sodium intake could also prove beneficial in reducing salt in foods eaten outside of the home.

At the same time, particular focus should be placed on addressing salt added in the home, as this is the major source of sodium in Indian diets. Scaling up the uptake of LSSs is the most likely way to achieve this goal. A multipronged approach to LSS supported by a multi-stakeholder coalition of researchers, policymakers, public health experts, medical professionals and salt manufacturers is needed to address research gaps, develop and strengthen evidence-based policies, create sustainable implementation plans with integrated monitoring mechanisms and advocate for LSS as a key component of India's sodium reduction efforts. India should consider taking advantage of PDSs and approaches to reduce the costs of LSS through subsidies or other means. To successfully scale LSS, India will likely need to revisit the proposed advisory text to ensure that the public is not fearful of using them. This can also be supplemented by culturally relevant mass awareness campaigns designed to provide information on salt intake and its linkage to hypertension and CVDs, methods to reduce salt added while cooking gradually and using LSS.

India is focused on building an agile public health policy environment that adapts and responds to changes in science. Addressing the key research questions on LSS, including its impact on hyperkalaemia, potential affordability and the manufacturing landscape in India, is critical. Furthermore, as other salt reduction strategies, such as front-of-pack labels, are implemented, they need to be evaluated, and if not found to be successful, modified.

A key component of our efforts to reduce salt consumption should be to develop and implement policies and programmes that are aligned with India's diverse culinary practices and are sensitive to varied rural, urban and regional food environments, including supporting local farmers and agriculture, promoting traditional Indian herbs and spices such as turmeric, cumin and coriander that enhance the flavour of food without adding excessive sodium.

India has come a long way from the Dandi March to universal salt iodization and DFS, adapting to the changing needs of the Indian population. Thus, comprehensive policies and programmes focussing on sodium reduction strategies, including LSS substitution, are the next steps in India's salt journey. This would help us respond to high-sodium intake and the rising burden of CVDs.

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