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Research Article

SALT INTAKE IN INDIA – AN ALARMING SITUATION

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ABSTRACT
There are many narrative review of the literature linking dietary salt intake with cardiovascular health outcomes in humans and list the tools and strategies to reduce salt intake at the population level. There is a strong agreement among experts that dietary salt intake should be reduced, targeting average population levels less than 5 g per day. The main aim of this reduction is a decline in cardiovascular morbidity and mortality. The total dietary salt consumed is an important determinant of blood pressure levels and of hypertension risk. This relationship is direct and progressive with no apparent threshold. Salt reduction in individuals is an important intervention in reducing blood pressure, increasing the efficiency of pharmacological therapies and reducing the global risk of cardiovascular disease. In India, salt consumption was reported to be higher than the recommended values in different states and predicted to be reported high all over the nation because of diversity in food culture. Despite the wealth of evidence all over the world regarding unfavorable effects of excessive salt consumption on blood pressure and cardiovascular health, public health efforts to decrease sodium consumption have been limited in the nation. Individuals are often unaware about the amount of sodium they are consuming and of course the detrimental effect of salt on health. India too hasn't set itself a target. Sustained and concerted efforts should be made to raise public awareness regarding the harmful effects of excessive salt intake. Modest reduction in dietary salt could substantially reduce cardiovascular events and medical costs and should be a public health target in present scenario of the nation.

Keywords: *Sodium, Salt, Hypertension, Reduction, Cardiovascular Disease*

INTRODUCTION
Effects of Excessive Sodium Consumption
Sodium intake of different populations around the world were first brought to the attention of the researchers by publication of Louis Dahl's famous graph in 1960, showing a positive linear relationship between prevalence of hypertension and mean sodium intake across five populations (Brown *et al.*, 2009). Sodium chloride was initially discovered by the Chinese to preserve food about 5000 years ago and habitually came to be used as a medium to enhance the palatability of food as well. Salt in the form of sodium chloride is added to food mostly as table salt which is the refined and powdered form. The crude forms available include sea salt (obtained by evaporation of sea water) and rock salt (halite, which occurs in dried up deposits in river or lake beds or underground). The concentration of sodium chloride in sea salt, rock salt and refined salt is almost the same. However, it is the dietary intake of sodium in the form of sodium chloride which is of prime consequence (Kotchen, 2005). While sodium is an essential nutrient in man, physiological need in acclimatized adults is only of the order of 8-10 mmol/day i.e.184-230 mg/day (Elliott and Brown, 2007). In contrast, most adult populations around the world have average daily salt intakes higher than 6 gram/day and for many in Eastern Europe and Asia higher than 12 grams. International recommendations suggest that average population salt intake should be less than 5 gram/day (WHO, 2007). There is clear evidence that too much sodium, mainly in the form of salt (sodium chloride), has adverse implication for health. Salt also causes renal and cardiovascular injury by non-hypertensive mechanisms. Sodium is postulated to result in stimulation of tissue renin-angiotensin-aldosterone system resulting in hypertrophy of smooth muscles, promotion of collagen deposits and fibrosis in the heart as well as the media of the blood vessels. Plasma sodium reduces endothelial nitric oxide synthase activity and sodium reduction was found to improve flow mediated vasodilatation in healthy non-hypertensive volunteers (Dickinson *et al.*, 2009). All these result in alteration of cardiovascular hemodynamics – resulting in enhanced preload or increased after load because of increase

or decrease in sodium, ventricular diastolic dysfunction, reduced coronary flow reserve and myocardial ischemia. The sodium and chloride components of NaCl are supposedly required for these salt sensitive effects and other salts of sodium like sodium bicarbonate, sodium citrate or sodium phosphate do not result in hypertensive effects (Boegehold and Kotchen, 1991). Sodium intake is associated with elevated blood pressure, which is a leading risk for cardiovascular disease, a major risk factor for premature deaths globally.

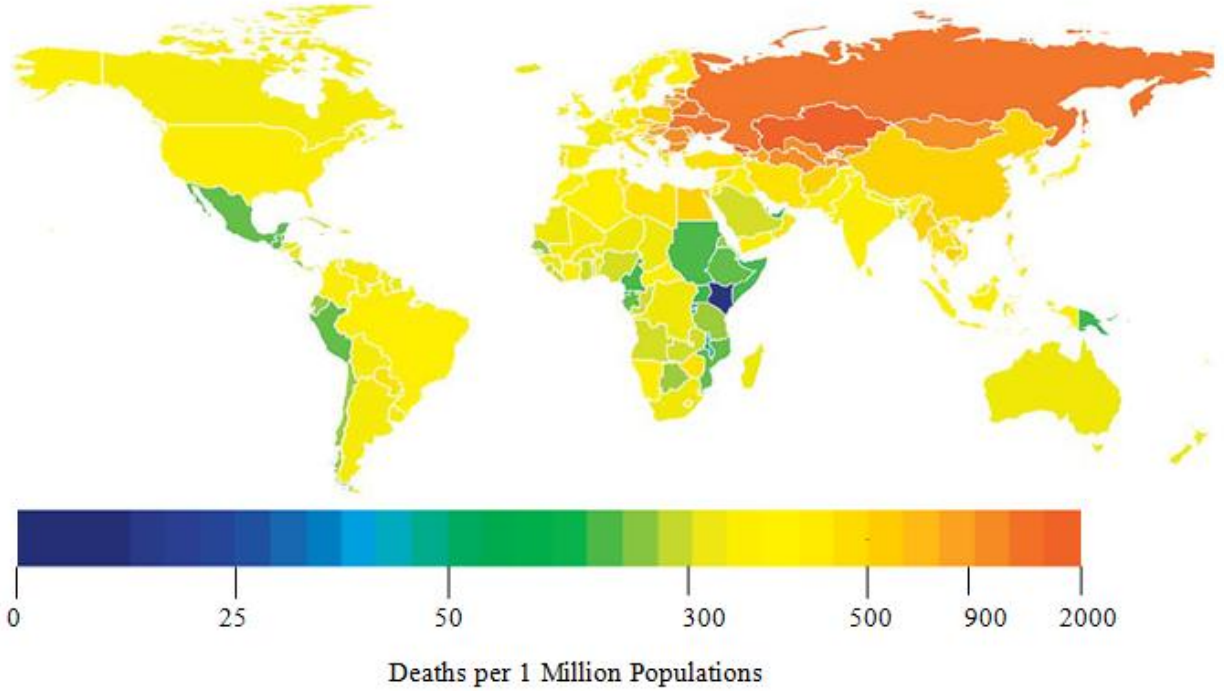

Figure 1: Absolute Cardiovascular Mortality Attributed to Sodium Consumption of More than 2.0 g per Day in 2010, According to Nation. The scale is based on the number of deaths from cardiovascular causes (per 1 million persons) in 2010 that were attributed to sodium consumption of more than 2.0 g per day (Mozaffarian *et al.*, 2014)

The situation in India is more alarming. It was reported that of a total of 9.4 million deaths in India in1990, cardiovascular diseases caused 2.3 million deaths (25%). A total of 1.2 million deaths were due to coronary heart disease and 0.5 million due to stroke. It has been predicted that by 2020, there would be a 111% increase in cardiovascular deaths in India (Gupta, 2004). In India, hypertension is the leading NCD risk and estimated to be attributable for nearly 10 per cent of all deaths. Adult hypertension prevalence has risen dramatically over the past three decades from 5 per cent to between 20-40 per cent in urban areas and 12-17 per cent in rural areas The number of hypertensive individuals is anticipated to nearly double from 118 million in 2000 to 213 million by 2025. It is estimated that 16 per cent of ischaemic heart disease, 21 per cent of peripheral vascular disease, 24 per cent of acute myocardial infarctions and 29 per cent of strokes are attributable to hypertension underlining the huge impact effective hypertension prevention and control can have on reducing the rising burden of cardiovascular disease (CVD).The recent global burden of disease study reports excess salt intake to be the 7th leading cause of mortality in South East Asia Region which is much higher than in rest of the world (11th globally), highlighting the adverse impact of high intake in countries like India (Lim *et al.*, 2012). Recently, Mozaffarian *et al.*, (2014) reported that 1.65 million deaths from cardiovascular causes that occurred in 2010 were attributed to sodium consumption above a reference level of 2.0 g per day (Fig.1). These deaths accounted for nearly 1 of every 10 deaths from cardiovascular causes (9.5%). Four of every 5 deaths (84.3%) occurred in low- and middle-income countries, and 2 of every 5 deaths (40.4%) were premature (before 70 years of

age). The rate of death from cardiovascular causes associated with sodium intake above the reference level was highest in the country of Georgia and lowest in Kenya. Even though research on the association between excess salt consumption and various health issues is limited in Indian scenario, some existing studies indicates the association between effect of high salt intake and high blood pressure. Radhika *et al.*, (2007) in their study conducted in Chennai city on 1902 subjects reported the significantly higher prevalence of hyper tension in subjects with highest quintile of salt intake. Both systolic and diastolic blood pressure significantly increased with increase in total dietary salt among hypertensive and normotensive subjects. Wardener and MacGregor (2002) evaluated the harmful effects of dietary salt and they found that in addition to raising the blood pressure salt is responsible for several other harmful effects. They stated that apart from its effect on the cardiovascular system dietary salt has an effect on calcium and bone metabolism, which underlies the finding that in post-menopausal women salt intake controls bone density of the upper femur and pelvis. Further, they added that dietary salt controls the incidence of carcinoma of the stomach and there is some evidence which suggests that salt is associated with the severity of asthma in male asthmatic subjects. Heaney (2006) added that sodium, in the form of sodium chloride, elevates urinary calcium excretion and at prevailing calcium intakes, evokes compensatory responses that may lead to increased bone remodeling and bone loss. The calciuria is partly due to salt-induced volume expansion, with an increase in GFR, and partly to competition between sodium and calcium ions in the renal tubule.

Apart from health implications it has huge societal, developmental and economic costs. There is also noteworthy income loss to families affected by hypertension not only due to illness but also due to care giving and premature death (Mohan *et al.*, 2013).

The focus of the World Health Day the year 2013 was also one of the main non-communicable disease (NCD) risk factor, hypertension. It is currently the leading risk resulting in considerable death and disability worldwide and accounted for 9.4 million deaths and 7 percent of disability adjusted life years (DALYs) in 2010 (Lim *et al.,* 2012). Cardiovascular diseases caused 2.3 million deaths in India in the year 1990; this is projected to double by the year 2020. Hypertension is responsible for 57 percent of all stroke deaths and 24 percent of all coronary heart disease death in India (Rodgers *et al.*, 2000). Evidence from animal studies, epidemiological studies, clinical trials and meta-analysis suggests that with increase in dietary salt (sodium chloride) intake, blood pressure rises. In addition to raising the blood pressure dietary salt is responsible for several other harmful effects. A high salt intake increases the mass of the left ventricle, thickens and narrows resistance arteries, including the coronary and renal arteries. It also increases the number of strokes, the severity of cardiac failure and tendency for platelets to aggregate. In renal disease, a high salt intake accelerates the rate of renal functional deterioration. Apart from its effect on the cardiovascular system dietary salt has an effect on calcium and bone metabolism, which underlies the finding that in post- menopausal women salt intake controls bone density of the upper femur and pelvis. Of all the factors that relate to cancer of the stomach, the second most common cancer in the world, the relationship to salt is the strongest. Carcinoma of the stomach is strongly related to dietary sodium intake. There is some evidence which suggests that salt is associated with the severity of the asthma in male asthmatic subjects (Wardener and MacGregor, 2002).

Apart from health implications it has huge societal, developmental and economic costs. There is also noteworthy income loss to families affected by hypertension not only due to illness but also due to care giving and premature death (Mohan *et al.*, 2013). Salt consumption in developing countries is increasing in parallel with increasing urbanization. That's why researchers and policy makers around the world stress on reducing salt intake to control hypertension because its key triggers – stress and faulty lifestyle- are difficult to control. In countries like Japan, China and many developing nations, it is the salt added during cooking and the seasonings which form the bulk of daily salt consumption. However, data regarding the pattern of salt consumption in India is not available and is likely to vary markedly within the country. In the recently concluded Cardiological Society of India Kerala Chapter Coronary Artery Disease and its Risk factor Prevalence study (CSIK-CRP), about 20% of the screened >5100 individuals in Kerala were verified to be already on treatment for hypertension. About 28% of these hypertensive

individuals in the study were not aware about the importance of salt restriction in the management of high blood pressure (Ganapathi, 2013).The large and growing burden of diseases, despite improved medical therapies and increased awareness that dietary salt reduction can help prevent and treat hypertension reinforce the urgent need for dietary change. It has been predicted that by 2020, there would be a 111% increase in cardiovascular deaths in India. Control of the predicted increase in cardiovascular disease will require modification of risk factors (Gupta, 2004). The recent global burden of disease study reports excess salt intake to be the 7th leading cause of mortality in South East Asia Region which is much higher than in rest of the world (11th globally), highlighting the adverse impact of high intake in countries like India (Lim *et al.*, 2012). Given the rising burden of hypertension and high salt consumption, the priority intervention of choice for hypertension prevention and control is population-wide salt reduction. However, its potential has yet to be tapped in India with efforts being initiated only recently (Mohan *et al.*, 2013). Sodium shows up in canned soups, salad dressings, and even products that don't immediately come to mind when we think of 'salty' foods, such as pasta, bread and cereals. Manufacturers use salt to preserve foods and modify flavor, and it's included in additives that affect the texture or color of foods. India has a diverse dietary culture where salt and spices are used extensively but up-to-date figures on population salt consumption are very limited. Public health studies worldwide have found excess salt intake to be associated with increased risk of high blood pressure (hypertension), an important risk factor for cardiovascular disease. Projections indicate that from 2000 to 2025 the number of Indians suffering with hypertension will almost double from 118 million to 213 million.

Sodium/salt Consumption in India

The existing available data indicates that population salt intake is very high across different regions of India with the average daily intake ranging between 9 and 12 grams daily. This is extremely high compared to the World Health Organization (WHO) recommended intake level of 5 grams daily. The intake is reported to be higher in urban settings compared to rural settings. Figures showed that India consumes 55-58 lacs tons of edible salt annually and can reduce incidence of stroke by 25% and heart attacks by 10% by cutting down on salt consumption (Dobe, 2013). Taste is one of the most important factors in food choice and has a liking for salt taste. The urban Indian's routine diet, pickled with takeaways from fast-food joints and instant foods that are ready in a jiffy at the end of a long working day, could worsen the present epidemic of hypertension due to its high proportion of salt. Fast food marketers eyeing on the susceptible segment, exploit many innovative practices and use unethical deeds and techniques to promote their brands. The utilities of sodium have made it a crucial ingredient for many processed foods. It not only sustains the "life" of the food but it also provides a more economical approach to most companies. . Sodium chloride (salt) can prevent the development of food-borne pathogens. This is specifically beneficial in foods such as cheese products, fermented foods, luncheon meats and even salad dressings. Because food manufacturers and producers often want to prolong the shelf life of their products, the amount of sodium in many processed foods is increased to certain levels. Aside from their preservation properties, sodium also helps bind ingredients. It enhances the colour of the food, improves taste and function as a stabilizer. There are also regional and geographical differences in processed and packaged foods and in the country, because of nutritional transition, have dual sources of salt. Reasons why hypertension and heart disease have increased so dramatically in recent years are numerous and significantly include lifestyle, the amount of food eaten as well as changes in food consumption habits leading to high sodium consumption. Indian's love of salt, changing to more western along with traditional, has continued unabated in 21st centaury also, putting people at risk for high blood pressure, the leading cause of heart diseases. Lifestyle diseases are expected to cost the Indian economy USD 6 trillion, in output losses between 2012 and 2035. This figure is nearly nine times India's total health expenditure of USD 710 billion from 1993 to 2011 (Mukherjee *et al.*, 2013). While these diseases are typically associated with the higher income classes and the urban demographic, India is seeing increasing penetration in rural areas as well with a rapid increase in sodium in the diet and this excess sodium intake can be a major driver of higher risk to cardiovascular diseases. In a nation where every fourth adult is believed to have hypertension, the focus should be on reducing salt intake in the daily diet

(medical express, 2013). Reducing salt intake has never been more relevant than it is today (Dobe, 2013). It is time for us to highlight the right approach to remain healthy in an environment of excess salt intake prevailing amongst the current generation of Indians and to close ranks against the growing threat of hypertension in India (Kalra, 2013). However, there is very limited contemporary data on population salt intake. Some of the challenges for salt intake assessment include: high costs of measuring, limited national health surveys, paucity of food tables, food composition databases, ensuring completeness, lack of measure for added salt, lack of suitable tracking and accountability for local/ethnic foods, restaurants foods, foods from street vendors. While salt consumption pattern is available for many nations, such estimates are not available in most of the regions of India. Before proceeding with public health efforts to reduce salt intake, it is essential to assess the actual salt consumption in normal population. Then only strict yet practical targets and timelines need to be set and adequately monitored and evaluated with defined or inferred consequences as sodium consumption is predicted to being towards higher side because of the diversity of the Indian cuisines. Education and knowledge translation needs to be given to policy makers, health care professionals, and general public and the food industry.

Table 1: Epidemiological studies in India related to salt intake

Study area	Investigator and Year	Sample	Salt/Sodium Intake	Method Used
13 states	ICMR, 198688	107 864	13.8 g salt/day on Ranged between 7-26 g/day/ person in different states	Household salt Weigh ing
Chennai	Radhika *et al.*, (2007)	1902 aged ≥20 years	8.5 g salt per day	Food frequency questi onnaire
Kashmir	Jan *et al.*, (2006)	135 hypertensive 135 normotensive	424±150.50 mmol/day 337±121.50 mmol/day	24 hrs urinary sodium excretion
Ladakh & Delhi	INTERSALT Cooperative group (1988)	399 aged 20–59 years	12 g salt / day in Ladakh 9 g salt / day in Delhi	24 hour urinary sodium excretion
Rural Andhra Pradesh	Thrift *et al.*, (2011)	1429 aged ≥18 years	42.3 g salt / day	Household salt Weigh ing
Tamilnadu	Chidambaram *et al.*, (2012) (unpublished)	NA	12 g/day (initial results)	NA

It is important to engage and empower NGOs, civil society and health care organizations. Guidelines for the food industry should be in place for reduction in sodium additives to foods (packaged, restaurant, street food, or even home cooking) during processing/preparation. For an effective programme, monitoring and evaluation of dietary salt intake, sources of salt in the diet, amounts of salt in food, amount of salt added to food at home as well as knowledge of attitudes and behaviors (of policy makers, key opinion leaders, food sector, public) are required. There is currently no national policy or strategy on salt reduction. India plans to use WHO's Three Pillars of product reformulation, consumer awareness and education campaigns and environmental changes to reduce salt intake in the population. The plan is to gradually reduce salt in the population, especially among hypertensives; to undertake studies to provide

evidence of cost effectiveness of the wide range of interventions in the country and undertake the analysis at the sub-national level too. There are very few recent epidemiological studies in India looking at dietary salt intake in relation to prevalence of hypertension in urban India (Table 1). The Indian Council of Medical Research–India Diabetes (ICMR–INDIAB) study is a community based survey conceived with the aim of obtaining the prevalence rates of diabetes in India as a whole, covering all 28 states, the National Capital Territory of Delhi, and two of the union territories in the mainland of India, with a total sample size of 124,000 individuals. Recently, INDIAB Study also reported the average intake of 7.6 gm of salt among the subjects (Times of India, 2014). Such types of studies are extremely important in view of the rapid urbanization with the consequent epidemiological and nutritional transition.

The human body requires very little sodium, which is sourced mainly from salt. High salt intake can cause blood pressure to shoot up and lead to cardiovascular diseases. According to WHO, there is enough evidence that reducing salt intake can minimize the risk of hypertension and cardiovascular diseases. The National Institute of Nutrition (NIN) recommends not more than six grams salt per person per day. People around the world eat a lot more salt than is required. Most countries in SEAR (South -East Asia Region) consume more than 10 g/day of salt; Bangladesh 17 g/day; Indonesia 15 g/day; Nepal 10–13 g/day; Sri Lanka 9-11 g/day; Thailand 10.8 g/day. No data are available from Bhutan, Democratic People's Republic of Korea, Maldives and Timor-Leste. Majority of the salt in the Region is from added salt, either while cooking or on the table and processed foods. The potential impact of 15% salt reduction in the Region is reduction of population systolic blood pressure by 1-3 mmHg in10 years depending on age (WHO, 2012). The sub-study of CARRS Surveillance Study and the ICMR Urban-Rural Study seeks to provide contemporary data on salt consumption levels and sources of dietary salt in Delhi and Haryana, which will reflect recent dietary changes that are occurring in India. The three main objectives are 1) to determine the mean daily salt consumption through the collection of 24- hour urinary sodium excretion samples, 2) to determine the main sources of salt in the diets using 24-hour dietary recall method and 3) to assess knowledge, attitudes and behaviors with regard to salt consumption and its impact on health by a questionnaire. The total duration of the proposed project is two years and survey will include 1400 participants with roughly half each residing in urban Delhi and rural Haryana. PHFI and Welcome Trust-UK Universities Consortium are funding these ongoing projects (CCDC India, 2014). Radhika *et al.,* (2007) conducted a study on a representative population of Chennai city in Southern India. They conducted the study on 1902 subjects aged $\geq$ 20 years. Dietary salt was measured using a validated semi-quantitative food frequency questionnaire. The mean dietary salt intake in the population found to be 8.5 g/d which was higher than the value recommended by World Health Organization. i.e. 5 g/d. Intake of dietary salt ranged from 4.9 g /d in the lowest quartile to 13.8 g /d in highest quartile. Mean daily salt (9.9 v/s 8.0 g, $p<0.0001$) and dietary sodium (4357 ± 1570 mg v/s 3607 ± 1209 mg, $p<0.0001$) intake were found to be significantly higher among hypertensive subjects. A study was conducted by Jan *et al.,* (2006) on one hundred thirty five hypertensives and same number of normotensive residing in Kashmir for studying the relationship of 24 hour urinary sodium and potassium excretion, sodium potassium molar ratio and the body mass index (BMI) with blood pressure. The results depicted that the average 24 hour urinary sodium excretion in hypertensive group was higher as compared to controls which was statistically significant. The mean levels of sodium excretion were found to be ranging from 424±150.50 mmmol/l in hypertensive and 337±121.50 mmol/l in normotensive. They concluded that sodium and potassium excretion, sodium-potassium molar ratio and BMI has direct bearing in perpetuation causation of hypertension in Kashmir which may be related to intake of salt tea.

Population-based strategies regarding sodium consumption are necessary given the high prevalence and growing burden of hypertension and its inadequate management in India. Therefore it's imperative to determine current consumption levels so that appropriate evidence-based preventative public health action can be initiated. Such data is critical in facilitating development and implementation of an India-specific salt reduction programmed, to translate the existing scientific evidence into the population health gains, and also to subsequently monitor and evaluate such a programmed (Medical, 2013). To reiterate the importance of the advantages of reduced salt intake, India can reduce incidents of stroke by 25% and

heart attacks by 10% by cutting down on salt consumption. It is also noteworthy that the sodium potassium ratio in our body is important for stroke mortality. Potassium is gained through the consumption of fruits and vegetables mostly. Therefore in case of the Indians who consume less of potassium and more of salt, the risk for stroke is higher. A 15-year study has found that sticking to a diet low on salt reduces the risk of cardiac arrest and stroke by 25% and chances of premature death by 20%. The study also suggests that if everyone consumed half a teaspoon less salt per day, there would be between 54,000 and 99,000 fewer heart attacks each year and between 44,000 and 92,000 fewer deaths. As examples a three-decade-long effort by Finland to reduce sodium levels by about 30% has resulted in 75% reduction in cardiovascular disease in those under 65 years and stroke rates have fallen by more than 70% in Japan (Indus health plus).

DISCUSSION

India, land of colorful cultures, has a diverse dietary culture where salt and spices are used extensively. As per their social practices, they do consume diets rich in salt. Traditional cuisine like samosa, kachori, bhujia , other namkeens etc are found to be rich in their salt content and consumed very frequently owing to large number of social or cultural events and even their day to day life. Salt is ubiquitous much more in our curries, salads, biryanis etc and along with all these, large quantity of salt consumed is hidden in processed foods. Most of the people used to consume few more very high salty foods like soy sauce, tomato sauce, soup mixes, curry pastes, curry masalas etc. besides their regular meals. Addition of salt during and after cooking, use of seasoned foods is likely to be the main contributor of daily salt burden in India. Along with these frequent or regular use of chutneys, papads and pickles in our regular meals makes the situation more alarming. This extreme saltiness means that even small quantities can deliver a significant proportion of sodium in the diet. Fast food has become a defining symbol of the modern age. As the pace of life has increased so has our hunger for fast, convenient and takeaway foods. Super markets are flooded with foods of varied types, natural, processed, and ready to eat. With the increasing urbanization, consumption of fast food and eating outside has also increased among the people of the nation and is a trend that is agitatedly on with the present generation. Meals eaten outside the home typically contribute to more sodium along with calories and fat. No guidelines for nutrition labelling exist for foods served in restaurant. But unfortunately by doing this they are ignoring their health. Health is not on the radar of fast food companies. Companies can get away with serving high amounts of salt because India has no regulation regarding to salt or sodium addition in processed foods. It comes under the category of food which is only expected to declare their composition or nature of food and comply with general regulations under the Food Safety and Standards Act in India. The situation in India is approaching critical levels and it could worsen the present epidemic of hypertension due to the high proportion of salt. Foods that you would never think of, such as breads and many breakfast cereals, which the people prefer most to have in their busy life, are found to be very high in salt content. We all are still unaware that how much sodium/salt we are actually consuming. Up-to-date figures or information regarding their salt consumption are still lacking in our country. Salt, sugar and fat are items that need to be regulated which are present in fast foods in plenty. Diets high in salt are now recognized as one of the leading risks to cardiovascular health in the world as they increase blood pressure. For an individual with hypertension it is important to get their blood pressure to as low as the possible tolerable level and at the minimum it should be less than 140/90 mmHg (WHO, 2012). Sodium reduction is probably the most feasible lifestyle intervention, in part because it can be implemented without substantive change in societal structure or consumer behavior. Population based intervention studies and randomized controlled clinical trials have been shown that it is possible to achieve significant reductions in blood pressure with reduced salt intake in people with and without hypertension. . The components of the strategy should be population survey, stakeholder analysis and setting up a nutrient database. The population survey should include estimated mean daily salt consumption among adults using 24 hour urine samples as in individuals with no illness (e.g. diahorrea, or on diuretic therapy etc.), more than 90% of sodium ingested is excreted by the kidneys hence assessment of urinary sodium is a good proxy for salt ingestion in such

individuals.; determine main sources of dietary salt- most accurately by using 24 hour dietary recall; and current population knowledge of effect of salt on health. In addition to research, dissemination of research is also important with publications in scientific journals, roundtable discussions with policy makers and broadcasting through media. A meaningful strategy to reduce salt intake must involve public education to change consumption. Modest reduction in dietary salt could substantially reduce cardiovascular events and medical costs and should be a public health target. Population-wide reduction in salt intake is the most cost effective means to reduce hypertension with WHO promoting salt reduction as a "Best Buy" and encouraging all countries to reduce average individual salt intake to <5 g/day through the development of national salt reduction strategies. So it should be necessary to initiate the efforts associated with the reduction of salt consumption because >75 percent of consumed salt in India comes from home cooked food. To improve public health, we must reduce the salt from our food. Gradual reduction of daily salt intake at home could provide one practical strategy for modifying this salt preference. Salt substitutes, seasoning with other tastes, being aware of foods high and low on salt content, depending on homemade food than on convenience food, etc. are some of the measures. The Nutrition Facts Label on food and beverage packages is a useful tool for making healthful dietary choices and monitoring how much sodium is contained in a food you are considering. In many nations, food labels mentioning the content of sodium are mandatory.

A concerted effort involving the individual, health care providers, governments, various organizations as well as the food processing industry can help to overcome the health hazards posed by excess salt consumption, as is being demonstrated in some of the European nations. For instance, a recent study in the USA showed that even a very modest reduction in salt intake of only 10% which could be easily achieved would prevent hundreds of thousands of strokes and heart attacks over the lifetimes of adults aged 40-80 years who are alive today, and could save >$32 billion in medical expenses in the USA alone. A larger decrease in salt intake would result in a larger health improvement and greater cost savings (He *et al.,* 2011). Eating is not merely a material pleasure. Eating well gives a spectacular joy to life and contributes immensely to good health and happiness. Learning to eat nutritiously is not hard. Just go easy on the salt, sugar and fat. Use herbs and spices instead of salt to add flavor to your foods. Try rosemary, oregano, basil, mint, curry leaves, pepper, fresh ginger and garlic, black pepper, vinegar or lemon juice, and no-salt seasoning blends**.** Prepare food at home of course with less salt. Too many of us have the habit of reaching for the salt shaker as soon as our plates are put in front of us. Limit salt shaker use at the table and making it available "upon request only". And in the kitchen, add salt late in the cooking process. Foods release their flavors during the cooking process, and on the part of the cook can cause over-salting if this is undertaken too early. So fight against excessive salt consumption should be initiated to makes the nation free from hypertension and associated risk factors. And for this public health campaigns are needed to encourage consumers to use less salt. Some of these measures can help to overcome the health hazards posed by excess salt/sodium consumption. But this work will be partial without public awareness and education activities to assist individuals so they can make informed food choices, guidance to the food industry about ways to reduce sodium in processed foods, and research to learn more about sodium reduction in the areas of food science and health.

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