

Salt intake in South Africa: a current perspective

Introduction

South Africans carry an unacceptably high burden of hypertension [high blood pressure (BP)]. Up to 30% of adults are known to be hypertensive.¹ It was estimated to have caused 46 888 deaths and 390 860 disability-adjusted life years in 2000.² Hypertension is the most common reason for attending primary health care and also the most common diagnosis (13.1%) in South Africa.³ High salt consumption is a key driver of hypertension, and there is strong evidence to indicate that South Africans consume up to 2-3 times the recommended daily allowance of 5 g. The sources of this dietary salt intake are split between salt from processed food and discretionary salt, which is salt that is added at home during cooking and at the table.⁴ The National Department of Health recently legislated salt reduction in certain processed foods.⁵ While this will reduce one source of salt in the diet, it does not deal with discretionary salt use. Global experience shows that the best means of reducing salt consumption is a combined approach of lowering salt levels in processed food, together with a parallel public education and consumer awareness campaign. Whereas other countries have attempted to reduce salt through voluntary participation from industry, South Africa is the first country to embark on the legislated route on a basket of food products. Salt Watch, an initiative established by a multisectoral coalition group, is South Africa's national salt reduction education and awareness campaign. The Heart and Stroke Foundation South Africa (HSFSA) was nominated as the implementing body of the campaign, which is supported by the National Department of Health.

Context

Noncommunicable diseases

Noncommunicable diseases (NCDs), a collective term for cardiovascular disease (CVD), diabetes, cancer, chronic respiratory diseases and mental disorders, are the leading cause of deaths worldwide, and currently cause over 60% of global deaths, 80% of which occur in developing countries. CVD, a significant component of NCDs, is the leading cause of disabilities and death worldwide, killing 17 million people annually.⁶ The burden of NCDs continues to grow worldwide, particularly in developing countries. By 2030, in Africa, NCDs are anticipated to overtake mortality from communicable, e.g. human immunodeficiency virus and tuberculosis, maternal, perinatal and nutritional, diseases. The majority of premature (in people aged 60 years and younger) NCD-related deaths are preventable through the adoption of a healthy lifestyle.

This include 80% of premature deaths due to CVD, up to 60% due to cancer, and up to 40% due to diabetes.⁷

Global

In September 2011, a United Nations (UN) high-level meeting recognised the scale of the NCD problem, the socio-economic impact, and the link to unhealthy lifestyles. Subsequently, NCDs were placed on the global health agenda and the World Health Organization (WHO) was tasked to develop the Global NCD Action Plan for the prevention and control of NCDs. The plan proposed two targets pertinent to this paper, firstly that of reducing the prevalence of raised BP by 25%, and secondly, that of reducing salt consumption by 30%, and aiming for the WHO recommendation of less than 5 g of salt per day.⁷

The WHO identifies raised BP as one of the leading causes of mortality worldwide, contributing 7% to the disease burden and 13% to mortality.⁶ A reduction in elevated BP has been proven to reduce the incidence of strokes and heart failure, as well as cardiovascular and total mortality.⁸ The parallel reduction in BP and coronary heart disease between 2000 and 2007 in the UK is an excellent illustration at population level.⁹

South Africa

In 2000, NCDs were responsible for approximately 40% of deaths, excluding injury, and roughly 35% of the burden of disease in South Africa.¹⁰ Statistics South Africa reported that NCDs once again surpassed infectious diseases as the main cause of death from 2010 onwards.¹¹ Worryingly, the prevalence of obesity, inactivity, diabetes and hypertension are all increasing.¹²⁻¹⁴ It seems probable that we are yet to experience the surge in morbidity and mortality that will inevitably result from the rise in these risk factors.

Within this group, CVD is the leading cause of disabilities and death. In 2013, cardiovascular diseases accounted for 16% of deaths in South Africa, a figure that is set to rise as mortality from infectious diseases continue to decline.¹¹ Of the various contributing risk factors, hypertension has the largest impact on CVD.⁷ Norman et al estimated that hypertension was responsible for 50% of strokes, 42% of ischaemic heart disease, 72% of hypertensive heart disease and 22% of other cardiovascular burden.² Therefore, hypertension is a health and economic burden to South Africans by virtue of its costly complications, and because it results in early death.

South Africans carry a massive burden of hypertension, which has been increasing over the last two decades.¹⁵ The most recent national survey reports the prevalence of hypertension to be 31% in men and 36% in women over the age of 15 years, with a stepwise increase along the age categories.¹ A recent international study on adults aged 55 years and older found that 78% of South African participants were hypertensive, with the highest prevalence in the six surveyed developing countries.¹⁶ Given this high prevalence, hypertension is arguably the main risk factor for cardiovascular mortality in South Africa.

Salt reduction

While a multipronged approach is clearly needed to address the high burden of hypertension, reducing dietary salt intake has been identified as one of the most cost-effective measures of improving population health and BP, in particular.¹⁷ The association of increased salt intake with increasing BP, gastric cancer, osteoporosis, increased asthma severity, renal stones, and the progression of renal disease and obesity, is well documented.^{17,18} The effect of excess dietary salt intake on hypertension alone is estimated to contribute to 1.7 million annual deaths from CVD.¹⁹ Reducing salt intake has a comparatively low cost of implementation, but could have a large impact on morbidity and mortality. The WHO recommends a daily salt intake of no more than 5 g from all sources (2 000 mg sodium), and has set a global target of a 30% reduction in sodium intake by 2025.

National campaigns that have been successful in reducing population salt intake, even modestly, have shown significant reductions in cardiovascular morbidity and mortality. The nationwide fall in BP from 2003-2011 in the UK was largely attributed to a 15% decrease in population salt intake during the same period.²⁰ Similarly, a 23% reduction in salt intake in Finland from 1979-2002 resulted in marked improvements in hypertension prevalence and contributed significantly to an 80% decline in coronary mortality.^{21,22}

Salt intake in South Africa

The mean per capita salt intake in South Africa is estimated to be between 6 g and 11 g per day.⁴ This estimation is based on limited studies, and the standard deviations are large, suggesting that a substantial portion of the population consumes in excess of 10 g salt daily. Earlier studies reported a comparatively lower mean salt intake in subjects of African descent, i.e. 6.04-7.8 g.^{23,24} A mean dietary salt intake of 10.2 g (standard deviation 3.05 g) was reported in the most recent study on subjects of African descent.²⁵ Although reported in different study populations, the higher salt intake could reflect a transition to the Westernised dietary pattern which includes more

salted, processed foods. Despite the limited data, it is clear that South Africans are consuming salt far in excess of the recommendations, and that this may escalate in the future if more South Africans adopt an unhealthy Western diet. South Africa's massive burden of hypertension provides a strong rationale for the reduction of dietary sodium, in order to decrease BP. Bertram et al recently predicted that even a modest reduction in the South African population's salt intake, i.e. of 0.85 g per day, could result in a yearly reduction of 7 400 cardiovascular deaths and 4 300 non-fatal strokes, with an annual saving of R300 million.²⁶

The genetic phenomenon of salt sensitivity, whereby some individuals show a marked elevation in BP in response to dietary salt loading, is another factor to consider.^{27,28} It is present in up to 80% of African people, including South Africans, underscoring the importance of dietary salt reduction as an important strategy in reducing the prevalence of hypertension.^{29,30}

Subsequent to the UN political declaration, the South African Health Ministry established a strategic framework to address NCDs, with pertinent targets, including a reduction in the mean population intake of salt to less than 5 g per day by 2020, and a reduction in the prevalence of people with raised BP by 20%, by 2020, through lifestyle and medication.³¹ To meet these targets, South Africa opted for a strategy that involves a combination of legislation and public education. Considering the current level of intake, South Africa's salt reduction target is challenging, if not optimistic. A clear strategy that addresses salt intake is required for there to be progress in achieving this goal.

A salt reduction strategy

Identifying sources of salt in the diet

When formulating a salt reduction strategy, it is important to identify the different sources of salt in the South African diet. Salt intake can be roughly divided into salt that is naturally present in food, salt from processed food (salt in the food that is purchased), and salt that is added during cooking and at the table, also termed discretionary salt. Salt from processed food makes up as much as 75% of total salt intake³² in high-income countries.¹ Charlton et al reported that on average, 55% of salt intake in South Africa is from processed food, and that 40% is added in the household, with considerable variation between the population groups. The main food sources of salt include bread, processed meat and meat sausages, seasoning such as soup powder and stock cubes, hard margarine, breakfast cereal and savoury snacks. Most people add salt to food during preparation, and approximately a third sprinkle salt on their food during the meal, purely from habit.²⁴ Both salt in the food supply and discretionary salt need to be reduced in order to substantially reduce salt intake.

Legislation

In March 2013, the Department of Health gazetted salt reduction targets for commonly consumed food that is high in sodium.⁵ Although this is in step with the global trend to set voluntary or mandatory sodium targets for the food industry, South Africa is one of the first countries to legislate salt reduction in a basket of goods. Stepwise reduction targets have been set for 2016 and 2019, to allow manufacturers time for product reformulation. For example, a loaf of bread typically contains 400-600 mg sodium per 100 g. By 2016 and 2019, levels will need to be less than 400 mg and 380 mg, respectively. Once fully implemented by 2019, the expected reduction in salt intake should translate to vast health and economic benefits. It was estimated in a modelling study by Watkins et al that the legislated salt reduction targets could avert 5 500 deaths and 23 000 cases of CVD, thereby saving the government R 51.2 million in health subsidies.³³

Identifying barriers to behaviour change

Because of South Africa's high discretionary salt intake, legislation will not be sufficient to reduce salt intake to target level. Discretionary salt intake alone contributes approximately 4 g of salt per day to the typical South African diet.²⁴ The intake of salt is further influenced by beliefs, attitudes and behaviour. An international online survey reported that most South African participants were unaware of the recommended salt intake level, as well as whether or not their salt intake was too high. Nearly half of the surveyed subjects were not interested in reducing their salt intake.³⁴ Given that this sample reflected only a particular segment of our society with Internet access and ability, it is likely that the results overestimate the level of knowledge on salt use. A more representative survey showed that only one in five participants with hypertension avoided salt and salty foods as part of disease management.²⁴ It is thought that individuals may even compensate for a sodium reduction in processed food by increasing discretionary salt.^{35,36}

Cultural and spiritual beliefs and practices that encourage salt use are another concern in South Africa. Although little research is available on this subject, salt is used liberally to preserve meat, particularly by roadside vendors when on-site cooling facilities are not available. Salt consumption for spiritual or religious reasons is also a common practice. Although knowledge on the link between salt and BP is slowly filtering down to more rural communities, this message is often in contrast with traditional beliefs, and is therefore distrusted.

Finally, consumers may be resistant to reducing the use of salt, salted spices and high-salt food choices, owing to concerns around lack of taste, affordability of alternatives,

and the impact this may have on their cooking methods. These are issues that need to be addressed as part of a salt reduction strategy. The high discretionary use of salt and insufficient knowledge on salt and health highlight the need for public awareness to motivate dietary salt reduction at individual, household and community level.

Changing behaviour

The National Department of Health and the Salt Watch working group agreed that a massive public awareness campaign was required in order to achieve a greater impact of the legislation on public health. The key objective of Salt Watch is to reduce population salt intake levels through national awareness programmes and behaviour modification. Members include the HSFA, North West University, Nutrition Society South Africa, Association for Dietetics in South Africa, Consumer Goods Council of South Africa, the South African Medical Research Council and the University of Pretoria. There are plans for the membership to be extended to include professional healthcare groups, media and non-government organisations to ensure the implementation of a comprehensive approach and reach.

The objectives of Salt Watch are:

- To conduct a national awareness and education campaign to encourage behaviour modification around salt consumption. A two-phased approach will be used; firstly to increase awareness of the association between high salt consumption and effects on health, especially hypertension; and secondly, to encourage and support behaviour modification to facilitate the use of less discretionary salt and the choice of products with a lower salt content.
- To lobby key stakeholders for support and the dissemination of messages via the catering industry, hospital groups, health-related training institutions and the media.

Methodology and activities to date

Consumer market analysis was conducted, and revealed the following key consumer insights that are to be used to inform the campaign's model:

- Healthcare professionals are the most trusted source of health information.
- Many unique barriers to behaviour change exist in South Africa, including religious practices, and national, cultural and economic realities.
- There is little awareness of the link between a high salt intake and ill health.
- Consumers living in peri-urban and rural areas hold beliefs about, and engage in behaviour around, salt, that are potential barriers, which must be considered when counselling and disseminating messages.

The receptive audience are women as they make the purchasing and household decisions, and particularly those identified by Living Standards Measures (LSMs) 3-7.

A campaign model was created following a review of the literature, global initiatives to identify successful strategies and a local market analysis. The Salt Watch programme was created in consultation with national and international experts, a research advisory group and multisectoral stakeholders attending a high-level summit. It was agreed that the public education and awareness campaign requires a multisectoral, collaborative approach, one that is innovative and takes into consideration South Africa's diverse socio-economic and cultural differences. The dissemination of basic, clear and consistent messages, and using healthcare workers to directly engage with members of the public, are other key strategies of the campaign.

The Salt Watch campaign aims to target various sectors, described previously, to meet these goals. The focus is on reaching the majority of adult South Africans within the LSM groups 3-7, and those who make the purchasing and cooking decisions. Public awareness is created by using media networks, including television, radio, print and social media. Recently, a four-month advertising campaign was conducted nationally using popular television and radio channels. Resources such as consumer leaflets and cookbooks are being produced and distributed through various distribution channels and partners. A baseline survey was recently completed to assess the level of knowledge on and attitudes towards salt intake. A repeat survey is being planned as part of the post-advertising evaluation.

The role of healthcare practitioners

Newson et al showed that healthcare providers, and in particular, physicians, are the public's preferred and trusted source of information on salt and health.³⁴ Other studies have also reported that patients regard their general practitioner as a trusted source of information.^{37,38} Newson further illustrates that while many individuals are not interested in reducing their salt intake, the majority would value more information on salt and health, dietary sources of salt, and how to reduce their salt intake.³⁴ Therefore, it is important that health professionals and healthcare workers use opportunities to engage and educate patients on salt reduction as part of the primary and secondary prevention of NCDs. We hope to motivate and mobilise healthcare professionals to form part of this campaign by including salt reduction as part of their patient education, but also by sharing knowledge on salt and health with other healthcare providers within their network. We encourage healthcare professionals to familiarise themselves with the Salt Watch resources on salt

intake which they can employ to provide their patients with clear, practical advice.

Conclusion

In summary, the incidence of hypertension in South Africa is rising, and will contribute heavily to the increasing burden of NCDs. Reducing excess salt intake plays a key role in reducing the prevalence of hypertension, and thereby cardiovascular morbidity and mortality. A multipronged campaign, like Salt Watch, should address salt levels within the food supply, as well as food choices, discretionary salt intake, and perceptions and attitudes towards salt use. Healthcare professionals can play a pivotal role in disseminating this message to the public.

Declaration

Salt Watch is a national initiative and multisectoral partnership, coordinated by the HSFA. The views expressed in the article are aligned to the official position of the HSFA. The HSFA is a non-governmental, non-profit organisation.

Conflict of interest

The Salt Watch campaign is supported by grants from the National Department of Health, the National Lotteries Board of South Africa, Unilever, Kellogg's, the South African Sugar Association, Lucky Star and Sea Harvest.

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References

1. Ardington C, Case A. National Income Dynamics Study: Health: analysis of the NIDS Wave 1 dataset. Cape Town: Southern African Labour and Development Research Unit, University of Cape Town, 2009.
2. Norman R, Gaziano T, Laubscher R, et al. Estimating the burden of disease attributable to high BP in South Africa. *S Afr Med J*. 2007;97(8):692-698.
3. Mash B, Fairall L, Adejayan O, et al. A morbidity survey of South African primary care. *PLoS One*. 2012;7(3):e32358.
4. Wentzel-Vijoen E, Steyn K, et al. "Use salt and foods high in salt sparingly": a food-based dietary guideline for South Africa. *S Afr J Clin Nutr*. 2013;26(3) (Suppl):S105-S113.
5. Department of Health South Africa. Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972): Regulations relating to the reduction in certain foodstuffs and related matters. Pretoria: Government Gazette, 2013.
6. World Health Organization. Global status report on noncommunicable diseases 2014. Geneva: WHO, 2014.
7. World Health Organization. Global status report on noncommunicable diseases 2010. Geneva: WHO, 2011.
8. Thomopoulos CI, Parati G, Zanchetti A. Effects of blood pressure lowering on outcome incidence in hypertension. Overview, meta-analyses, and meta-regression analyses of randomized trials. *J Hypertens*. 2014;32(12):2285-2295.
9. Guzman-Castillo M, Ahmed R, Hawkins N, et al. The contribution of primary prevention medication and dietary change in coronary mortality reduction in England between 2000 and 2007: a modelling study. *BMJ Open*. 2015;5(1):e006070.
10. Bradshaw D, Groenewald P, Laubscher R, et al. Initial burden of disease estimates for South Africa, 2000. Cape Town: South African Medical Research Council, 2003.

11. Statistics South Africa. Mortality and causes of death in South Africa, 2013: findings from death notification. Pretoria: Statistics South Africa, 2014.
12. Mayosi BM, Flisher AJ, Lalloo UG, et al. The burden of non-communicable diseases in South Africa. *Lancet*. 2009;374(9693):934-947.
13. Peer N, Lombard C, Steyn K, Levitt N. High prevalence of metabolic syndrome in the Black population of Cape Town: the Cardiovascular Risk in Black South Africans (CRIBSA) study. *Eur J Prev Cardiol*. 2014. pii: 2047487314549744 [Epub ahead of print].
14. Bradshaw D, Steyn S, Levitt N, Nojilana B. Non-communicable diseases: a race against time. Cape Town: South African Medical Research Council, 2011.
15. Day C, Groenewald P, Laubscher R, et al. Monitoring of non-communicable diseases such as hypertension in South Africa: challenges for the post-2015 global development agenda. *S Afr Med J*. 2014;104(10):680-687.
16. Lloyd-Sherlock P, Beard J, Minicuci N, et al. Hypertension among older adults in low- and middle-income countries: prevalence, awareness and control. *Int J Epidemiol*. 2014;43(1):116-128.
17. World Health Organization. Guideline: sodium intake for adults and children. Geneva: WHO, 2012.
18. De Wardener H, MacGregor G. Harmful effects of dietary salt in addition to hypertension. *J Hum Hypertens*. 2002;16(4):213-223.
19. Mozaffarian D, Fahimi S, Singh GM, et al. Global sodium consumption and death from cardiovascular causes. *N Engl J Med*. 2014;371(7):624-634.
20. He FJ, Pombo-Rodriguez S, Macgregor GA. Salt reduction in England from 2003 to 2011: its relationship to blood pressure, stroke and ischaemic heart disease mortality. *BMJ Open*. 2014;4(4):e004549.
21. Vartiainen E, Laatikainen T, Peltonen M, et al. Thirty-five-year trends in cardiovascular risk factors in Finland. *Int J Epidemiol*. 2010;39(2):504-518.
22. Laatikainen T, Pietinen P, Valsta L, et al. Sodium in the Finnish diet: 20-year trends in urinary sodium excretion among the adult population. *Eur J Clin Nutr*. 2006;60(8):965-970.
23. Norton GR, Woodiwiss AJ. Hypertension in Africa: redressing the burden of cardiovascular disease using cost-effective non-pharmacological approaches. *SA Heart*. 2011;8:28-36.
24. Charlton KE, Steyn K, Levitt NS, et al. Diet and BP in South Africa: intake of foods containing sodium, potassium, calcium, and magnesium in three ethnic groups. *Nutrition*. 2005;21(1):39-50.
25. Lategan R. The association of body weight, 25-hydroxy vitamin D, sodium intake, physical activity levels and genetic factors with the prevalence of hypertension in a low income, black urban community in Mangaung, Free State, South Africa. [PhD thesis]. Bloemfontein: University of the Free State; 2011.
26. Bertram MYI, Steyn K, Wentzel-Vijljoen E, et al. Reducing the sodium content of high-salt foods: effect on cardiovascular disease in South Africa. *S Afr Med J*. 2012;102(9):743-745.
27. Weder AB, Gleiberman L, Sachdeva A. Whites excrete a water load more rapidly than blacks. *Hypertension*. 2009;53(4):715-718.
28. Schmidlin O, Forman A, Sebastian A, Morris RC Jr. Sodium-selective salt sensitivity: its occurrence in blacks. *Hypertension*. 2007;50(6):1085-1092.
29. Morris RC Jr, Sebastian A, Forman A, et al. Normotensive salt sensitivity: effects of race and dietary potassium. *Hypertension*. 1999;33(1):18-23.
30. Rayner BL, Myers JE, Opie LH, et al. Screening for primary aldosteronism: normal ranges for aldosterone and renin in three South African population groups. *S Afr Med J*. 2001;91(7):594-599.
31. National Department of Health, South Africa. Strategic plan for the prevention and control of non-communicable diseases 2013-2017. Pretoria: Department of Health, 2013.
32. Mattes RD, Donnelly D. Relative contributions of dietary sodium sources. *J Am Coll Nutr*. 1991;10(4):383-393.
33. Watkins D, Olson Z, Verguet S, et al. Cardiovascular disease and impoverishment averted due to a salt reduction program in South Africa: an extended cost-effectiveness analysis. *Global Heart*. 2014;9(1):Suppl.e31-e32.
34. Newson S, Elmadfa I, Biro G, et al. Barriers for progress in salt reduction in the general population. An international study. *Appetite*. 2013;71:22-31.
35. De Kock R, Zandstra L, Sayed N, Wentzel-Vijljoen E. Liking, salt taste perception and use of table salt for reduced-salt chicken stews in light of South Africa's new salt regulations. *Appetite*. 2015.
36. Liem DG1, Miremadi F, Zandstra EH, Keast RS. Health labelling can influence taste perception and use of table salt for reduced-sodium products. *Public Health Nutr*. 2012;15(12):2340-2347.
37. Tarrant C, Stokes T, Baker R. Factors associated with patients' trust in their general practitioner: a cross-sectional survey. *Br J Gen Pract*. 2003;53(495):798-800.
38. Kochen MM, Hasford JC, Jäger H, et al. How do patients with HIV perceive their general practitioners? *BMJ*. 1991;303(6814):1365-1368.