

## Salt intake reduction efforts: advances and challenges

The articles in this special issue of *Cardiovascular Diagnosis and Therapy* describe the efforts to reduce salt intake in different parts of the world, including South America, Africa, the Middle East, the Far East (China and Mongolia) and Australia, in addition to an overview of the work of the World Hypertension League in this domain. Sharing experiences from diverse regions and countries, these data will contribute to better understanding the challenges and opportunities encountered by the groups working in the field.

The alarming increase in cardiovascular diseases (CVD) in the world has led to numerous calls for preventive measures. One of the cost effective measures, identified as a 'best-buy', by the WHO, is salt intake reduction (1). Accordingly, local governmental and non-governmental bodies are working together to develop programs to lower salt intake at the population level by 30% towards the WHO guideline of <5 g/day (2).

The evidence linking salt intake to hypertension and data demonstrating a decrease in blood pressure with salt intake reduction is widely available in the medical literature (3-5). It is based on observational data and also well designed clinical trials. However, ascertaining that salt intake reduction leads to a decrease in hard cardiovascular outcomes (death, stroke, or myocardial infarction) remains a contentious issue. On the one hand, there are members of the scientific community, who continue to demand more rigorous scientific evidence for effectiveness of salt reduction in reducing hard CVD outcomes (6,7). On the other hand, are the majority of pragmatic public health experts who find the existing evidence is strong enough to warrant action and are already advancing. Of note, the latter group is not only supported by the WHO, but also by many other respectable scientific bodies (8-10). These opposing stands were noted by the editorial team during the preparation of this issue, having being raised by several reviewers of the articles presented here. Whilst the impact on blood pressure is undisputed, the question of clinical effectiveness (impact on CVD) of salt reduction is still unanswered in some scientists' minds and therefore merits continued attention.

On the ground, tremendous progress has been made in relation to the development and implementation of salt reduction strategies. Several regional organizations, such as the World Health Organization Collaborating Centre on Population Salt Reduction at the George Institute in Sydney, the World Hypertension League and the World Action on Salt and Health, have remits to support salt reduction. Previous recent reviews have identified 75 national strategies with programs existing in all regions of the world (11). Most programs include work with the industry to reduce salt in foods, in parallel with initiatives (consumer campaigns and labeling) to influence consumer behavior. Many also include programs to influence food in public institutional settings such as public procurement policies or incorporating nutrition education into school curricula. Establishing targets for salt levels in foods and meals that the food industry had to achieve is a fundamental aspect of many programs. And whilst most programs are voluntary, an increasing number of initiatives such as South Africa, and Argentina, include legislation.

The UK and Finland are examples of national government programs that have already had a significant impact on population salt intake (12,13) (The UK program was initiated in 2003 and in 2012 reported a 15% (1.4 g/day) reduction in salt, and more recently has reported parallel reductions in blood pressure in England estimated to be reducing mortality from stroke or ischemic heart disease by 36% (14). Many other countries are already reporting reductions in salt levels in foods or changes in consumer knowledge, attitudes and behavior which, in time, are expected to result in reductions in salt intake.

The range of articles featured here adds further insights to the growing body of literature on the implementation of salt reduction initiatives. Globally, the brief review from the World Hypertension League highlights how the organization has made advocacy for salt reduction a strategic priority and provides an overview of existing and planned work, including agreed nomenclature for salt, development of fact sheets and the establishment of standards for salt research. From Africa, the review of WHO's supported interventions shows that, whilst overall progress is slow, countries are in various stages of implementation. South Africa has already established legislation which requires the food industry reduce the salt content of a number of its products, but several other countries are just embarking studies to measure population salt intake.

From the Western Pacific Region, the review from Mongolia shows how the findings from a national stakeholder consultation, baseline monitoring and a series of pilot intervention projects have been used to inform the proposed National

Salt Reduction Strategy from Mongolia (2015-20). It identifies the importance of a strengthened legislative framework and robust monitoring linked to a national stroke surveillance program moving forwards. From China the authors inform us of different policies and community interventions aiming to reduce salt intake and explain regional differences within China. From Australia, we learn about the importance of national NGO and advocacy organizations, and a new State level partnership on salt in Victoria, in encouraging more sustained and comprehensive action to reduce salt.

From the Middle East we observe countries at different stages of implementing salt reduction programs. The majority are targeting salt reduction in bread, which has been identified as one of the major sources of salt intake. The salt content of various types of bread (pita, markouk and others) and commonly consumed cheese products in the area is described in the Lebanese experience. In Kuwait, Qatar and Bahrain local authorities are collaborating with major bakeries to reduce salt in bread products by 10%. This goal has been achieved in Kuwait and ongoing efforts are underway to achieve lower salt levels.

From Latin America, the Brazilian experience describes a setting where one of the largest school meal programs in the world, which reaches up to 42.2 million students, has been modified to promote a healthier more nutritive diet with lower salt content. Interestingly, this is conducted while promoting consumption of products from local farms i.e., strengthening the link between economic success and promotion of healthier diets. A similar large scale intervention aiming to improve the meals of the industry workers is also described. The Argentinian contribution to this issue shows the compliance of the food industry to a national law limiting salt content of their products with more than 84% of products achieving a salt level below the maximum permitted level.

Taken together, the information from these diverse international experiences provides a rich source of inspiration and learning for others working in the field. We anticipate that this focus issue will contribute significantly to the global discussion and exchange of experiences about salt reduction and hypertension control over the next decade.

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