Opinion

Reducing Salt Intake in Iran: Priorities and Challenges

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Introduction

In a recent United Nations High-Level meeting, world leaders unanimously adopted a political declaration on non-communicable diseases (NCDs) and stated that "*the global burden and threat of NCDs constitutes one of the major challenges for development in the twenty-first century, which undermines social and economic development throughout the world*".[1] "*This meeting has made the world sit up and take notice of the huge global burden that NCDs are placing on all countries. ... Countries now need to be urgently factoring NCDs into their longer term health planning alongside other pressing health challenges*".[1] At the same meeting, salt reduction, as a tool to reduce the burden of NCDs, received overwhelming support by the group of seventy-seven developing countries (G77) and the Caribbean Community and Common Market (CARICOM) countries.[2]

NCDs have become a major heath problem not only in developed countries but also in developing countries.[3,4] It is estimated that currently 79 percent of the deaths attributed to the NCDs occur in developing countries[5] and it has been predicted that by 2020, they will be causing 7 out of every 10 deaths in developing countries.[3] These rising trends follow the demographic and dietary transitions that accompany the globalization of economic processes. A large body of evidence show that unhealthy diet and physical inactivity as well as tobacco use are major global determinants of NCDs.[5]

Examples from several countries show that changing these determinants is possible and can have a strong effect on the trends in NCDs. There is strong evidence for a causal relationship between excess salt intake and raised blood pressure.[6–10] As a consequence, salt intake increases the risk of cardiovascular disease.[11,12] Also, there is substantive evidence from several large prospective studies suggesting a link between high salt intake and increased risk of stomach cancer.[13] Some studies have suggested a link between high salt intake and osteoporosis[14] and others have reported an association with progression of renal disease and proteinuria.[14] Dietary salt reduction has been identified as the simplest and most cost effective measure to reduce the burden of NCDs and is it more cost effective than tobacco control for both developed and developing countries.[15]

Iran, as a developing nation undergoing epidemiological transition, is facing a rapid increase in the burden of NCDs.[16] It has been estimated that the burden of "circulatory system diseases" contributed to about 1,500,000 Disability Adjusted Life Years Lost (DALYs) in Iran in 2003.[16] Compared to infectious diseases, chronic diseases have received much less attention in the Iranian health care system.[17] Fortunately, the Iranian ministry of health has now acknowledged tackling NCDs as one of its priorities[18]; it conducted its first national NCD risk factors surveillance in 2005.[19] This article suggests a road map for implementation of a national salt intake reduction program in Iran.

Salt intake in Iran: current status

The ideal case for the determination of salt intake of any population is the measurement of the salt intake in a representative sample of the population by using the most reliable measurement method. For dietary salt, measurement of 24-hour urinary sodium excretion with biomarker validation[20] is generally regarded as the gold standard. Such a study has not been carried out in Iran.

In one study on 912 randomly selected adults aged 20 – 60 years from the city of Isfahan, the mean excretion of salt based on 24-hour sodium excretion was 11.1 g/d in men and 9.6 g/d in women.[21] In another study on the adults of the city of Yazd, the equivalent amount of salt based on 24-hour urinary excretion of sodium was 9.1 g/d.[22] These values nearly match the high salt intake reported for many Western European countries: the salt equivalent based on average 24-hour urinary sodium excretion values were 10.6 g/d in Danish men and 7.1 g/d in Danish women[23]; 11.5 g/d in Spanish men and 8.3 g/d in Spanish women[24]; 9.7 g/d in British men and 7 g/d in British women.[25]

There have also been dietary sodium studies that used food frequency questionnaires to estimate the salt intake of the population in the cities of Rasht and Sari and in the province of Ilam. Even though dietary estimation of salt intake under-reports the salt intake of individuals, the data from these studies suggest that the salt intake of Iranians is high: the average intake for the population aged 2–79 were 7.2 g/d in Rasht, 7.7 g/d in Sari, and 10.3 g/d in Ilam province.[26,27] The average salt intake estimated by the same method has been reported to be 6.9 g/day in Malaysia,[28] 9.7 g/day in Chennai, India,[29] and 10.5 g/day in Northern Italy.[30]

Priorities for a national Iranian salt reduction program

The ideal scenario for a national salt intake reduction program in Iran would be one in which: i) the current level of salt intake of the nation is accurately estimated, ii) a time-bound target for the salt intake of the population is set out, iii) a salt reduction intervention program is devised and implemented, and iv) the success rate of the program is monitored and necessary modifications are implemented.

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Thus, carefully conducted surveys to estimate salt intake using 24-hour urinary sodium excretion in a sample representative of the Iranian population would be an important first step in the implementation of a national program for salt intake reduction. Such surveys would provide the baseline data to inform both the setting of targets and for the monitoring of progress toward achieving the target.

Another vital step would be to set time-bound targets for either reaching a lower level (e.g. 5 g/d) of salt intake or to achieve a percentage reduction (e.g. 20% reduction) in the average salt intake. These targets should be time-bound to ensure that real progress is made and ideally the target should be both challenging and achievable. The process to establish such a target is complex, but is likely to be informed by the recommendations from international agencies such as the World Health Organization (WHO) and the international salt reduction campaign group, "World Action on Salt and Health", and the experiences of successful national salt reduction programs such as that of the United Kingdom.

A joint WHO/FAO technical report on *Diet, Nutrition, and the Prevention of Chronic Disease* recommended a salt intake of 5.0 g/d.[31] In the USA, it is recommended that sodium intake should be reduced to less than 2.3 g/d (i.e., approximately 6 g/d salt) for adults, with a further reduction to 1.5 g/d (i.e., approximately 4 g/d salt) for about half the population at high risk of adverse effects including African Americans, all adults 51 years old and older, and those with hypertension, diabetes, or chronic kidney disease.[32]

The experience of countries that are now pioneering national salt reduction programs, such as the UK, suggests that possibly the best strategy would be to set two sets of salt reduction targets: one which is less ambitious and can be achieved in years, the other which is more challenging and would be achievable over a longer period. In the UK, both COMA (1994) and the Scientific Advisory Committee on Nutrition recommended a salt intake of 6 g/d in the UK adult population.[33] The National Institute for Health and Clinical Excellence (NICE) has recommended more recently a reduction in the population's salt consumption to 3 g/d by the year 2025.[34]

The next step should be devising a comprehensive strategic action plan in order to translate the salt reduction target into public health policy. This can only be achieved by academic institutions, legislative authorities, the food industry, and the media working in partnership possibly through the formation of a specific non-governmental organization. Such a comprehensive policy requires an approach that comprises:

• Communication- Raising public awareness through engagement with the media and formation of salt reduction campaigns.

• Reformulation- Engaging with the food industry, particularly those who are major contributor to the salt intake of the population (e.g., bread making industry in an Iranian context) to reformulate existing processed food formulations.

• Regulation- Implementing legislative changes that will reward complying industries and penalizes the non-compliant ones.[35]

Effective monitoring and evaluation is a key to success in any public health policy. This should be achieved by the measurement of the salt intake of the population at pre-defined time points (e.g., biennially) in a representative sample of the general population. Based on the success rate of the salt reduction program, the changes to the strategy may need to be devised and implemented.

Iodine deficiency goiter has been endemic in Iran and iodized salt has been successfully used to prevent iodine deficiency in the population. It will be important that any strategy to reduce salt intake does not result in dietary iodine deficiency. This can be easily achieved by modifying the iodine content of the iodized salt according to the altered salt intake level of the population.

Considering the increasing burden of NCDs in Iran and the cost-effectiveness and feasibility of salt intake reduction programs, the establishment of an effective national salt intake reduction program would be an important step towards reducing the burden of NCDs. Iran has got a very good track record for implementation of successful public health policy programs including creating of an effective primary health care network,[36] establishment of one of the world's most successful family planning and birth control programs,[37] and implementing an extensive program of immunization.[38] The establishment of an effective salt reduction program seems to be an achievable target.

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