to 21 g/day) [2]. However, a few population-based studies have been conducted after our survey was done in 2009. They have reported an intake as low as 3.4 g/day [4]. This is quite a bit lower than the salt intake values of countries (such as the United Kingdom), where it is known to be very low. An Indian 13-state study reported an intake of 13.8 g/day using household salt weighing method [5]. This approach is somewhat similar to our household salt purchase data (13.4 g/day).

It is well known that Bangladeshi people have a strong preference for salty taste and a habit of adding salt during meals. Use of salted pickles is very popular. Many people eat sour seasonal fruit with salts. Preservation of food items such as fish in salt is another popular dietary practice in Bangladesh.

Salt that is being taken during meals constitutes a substantial proportion of total salt intake in Bangladesh. This is true even for educated health and medical professionals. Therefore, the added salt on the table should be the primary target of salt reduction in Bangladesh. Policy support is necessary for reducing salt content of the processed food. Advocacy is necessary for voluntary engagement of restaurant industry. Doctors and nurses can counsel their patients to minimize consumption of salt from various sources.

The limitation of method that we used, spot urine to estimate 24-h sodium excretion, is well known. This does not give a stable estimate for individual values but provides a relatively reliable estimate of population mean. In absence of data using a 24-h urine samples, the gold standard in this case, our findings could be used as a basis for setting the baseline values for reporting progress of the NCD monitoring framework indicator. Further validation of the formula that we used for 24-h sodium excretion is necessary.

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## Salt Intake, Overweight, and High Blood Pressure, With Special Reference to Sex Difference

Laatikainen et al. [1] summarized the association between sodium intake and blood pressure in Finland in the past 4 decades for the purpose of preventing hypertension. By conducting the salt intake reduction intervention in late 1970s, remarkable improvements have been observed both in blood pressure levels and in treatment and control of hypertension. Namely, the mean systolic blood pressure among 30- to 59-year-old men and women has decreased from 149 mm Hg to 135 mm Hg and from 153 mm Hg to 129 mm Hg, respectively. The decreases in mean diastolic blood pressure have been from 92 mm Hg to 84 mm Hg among Finnish men and from 92 mm Hg to 79 mm Hg among Finnish women. I present here the trend of sodium intake and blood pressure by using ecological data from Japan's National Health and Nutrition Survey [2] in combination of the trend in the percentage of overweight.

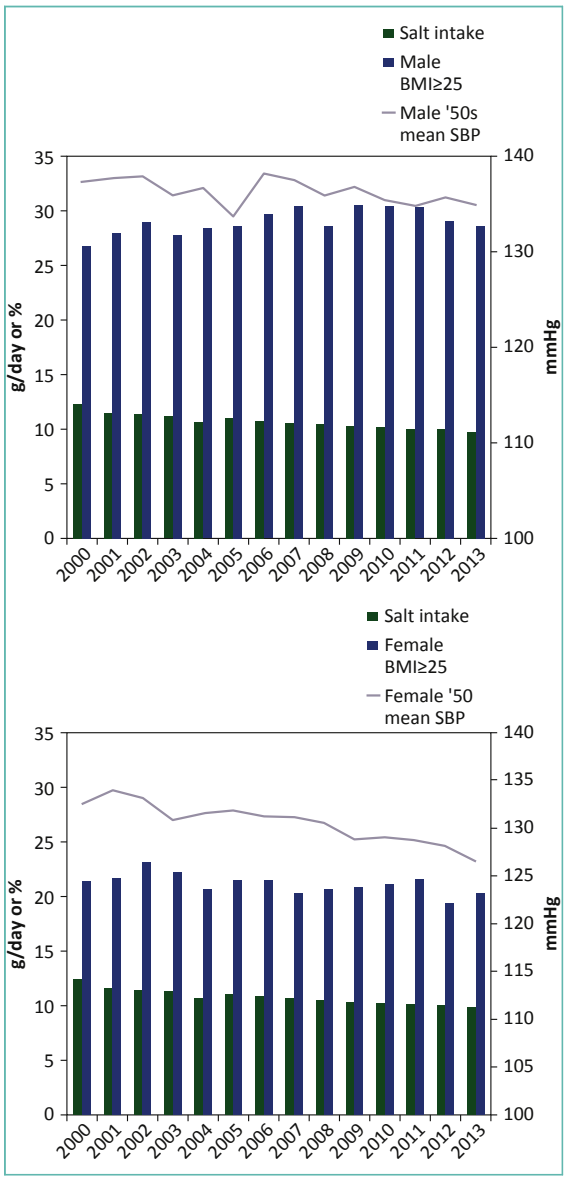


**FIGURE 1. Time trend of salt intake per day, prevalence of overweight, and mean systolic blood pressure in men (upper) and women (lower)**. BMI, body mass index; SBP, systolic blood pressure.

The decrease in mean blood pressure in Japan from the late 1980s to the early 2000s may be attributed to the increased use of antihypertensive medication and reduced dietary salt intake [3,4]. Subsequently, there was a clear sex difference in the mean systolic blood pressure (Figure 1). The percentage of overweight, expressed by body mass index $\geq$25, gradually increased in men. In contrast, it was fluctuated or slightly decreased in women. Salt intake was gradually decreased in the past decade, and I suppose that blood pressure may be affected by the overweight.

By the trend analysis of National Health and Nutrition Survey in Japan, not only salt intake but also overweight contributed clearly to high blood pressure or hypertension, which was observed differently by sex. This is an ecological analysis of trends, and one cannot draw causal inferences from ecological data. But the lifestyles such as alcohol intake, exercise habit, and medication would contribute to blood pressure. Wide varieties of trend analyses are required to determine the factors related to hypertension.

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