

The Impact of Reducing Excess **SODIUM** Consumption in Indiana



How much **SODIUM** do Most Americans Consume?

Most people in the U.S. consume much higher amounts of sodium than they should. Average daily sodium consumption during 2007-2008 was 3,266 mg among persons aged 2 years and older. This is well above the *Dietary Guidelines for Americans* recommendation of less than 2,300 mg a day. Some high risk individuals should consume only 1,500 mg a day. This group includes individuals who are 51 years and older and those of any age, including children, who are African American or have high blood pressure, diabetes, or chronic kidney disease.¹

The words “salt” and “sodium” are not the same, yet they are often used interchangeably. Sodium is an essential mineral and is found in many foods. Sodium makes up 40 percent of salt. Food packages can often say “low salt” and “no salt added” — but still contain sodium.² Ninety percent of the sodium we consume is in the form of table salt or sodium chloride.³ Excess dietary sodium (or salt) can increase blood pressure and lead to heart disease, stroke and kidney complications.⁴

Over the past 30 years, sodium consumption in the population has increased dramatically. Americans consume approximately 55% more sodium today than they did a generation ago (Figure 1).⁵ Presently, most of the sodium that Americans consume comes from processed and restaurant foods (Figure 2).⁶

Figure 1. Mean dietary sodium intake among U.S. men and women ages 18-74 years - NHANES 1971-2010

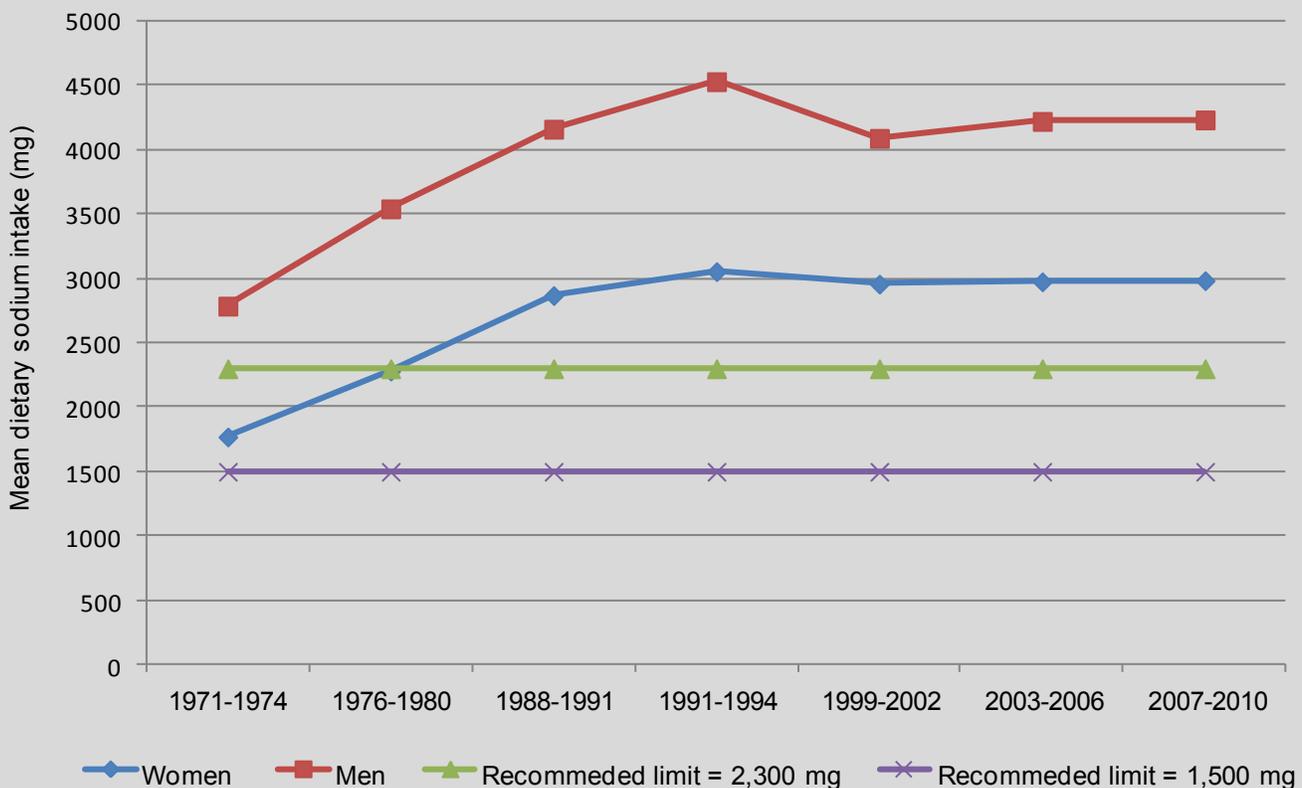
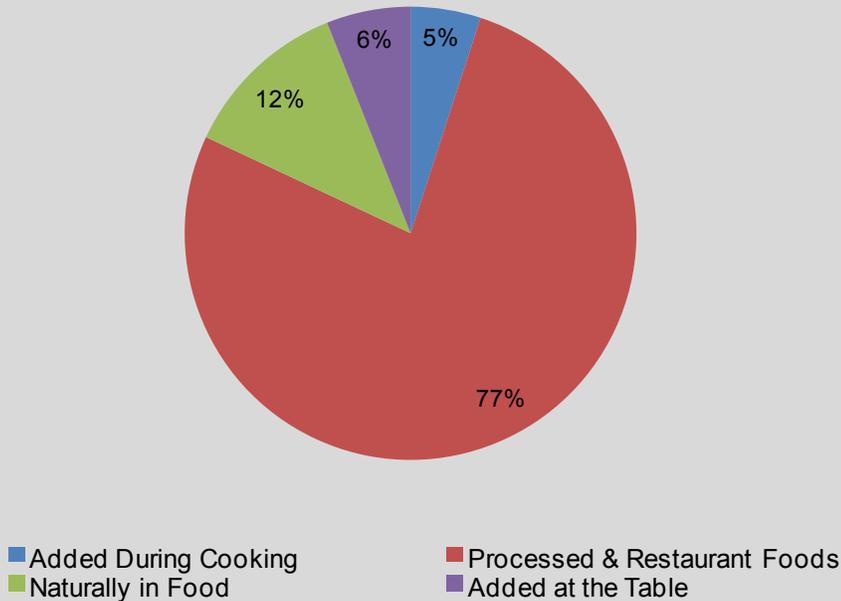


Figure 2. Sources of Sodium in the U.S. Diet



Over the past 25 years, Americans have increased the number of meals they eat away from home, making restaurant foods an important source of dietary sodium.⁷ Frequently, consumers are not provided with information about sodium content for menu items in restaurants, and will typically underestimate the amount of sodium that is contained in a variety of restaurant foods.⁸ Even when sodium information is provided, it may be difficult for consumers to understand. In addition, processed or restaurant lower calorie meals or foods can be misleading. These foods may be higher in sodium regardless of caloric content. Although public health messages regarding fat intake and high-energy diets are more widespread, the harmful effects of excess sodium consumption have received considerably less attention.⁹

What are the Health & Economic Consequences of Excess **SODIUM** Consumption?

In the U.S., the burden of hypertension is considerable. The residual lifetime risks of developing hypertension for middle-aged adults (ages 55-65 years) is nearly 85%.¹⁰ Additionally, the lifetime likelihood of receiving anti-hypertension medications for individuals ages 55 years and older is approximately 60%.¹⁰ Compared with whites, African Americans experience higher rates of hypertension. In this group, the condition often begins at an earlier age and is usually more severe.¹¹ Elevated blood pressure is increasingly becoming a problem among children. From 1993 to 2003, the average systolic blood pressure (the top number of a blood pressure reading) among children ages 8 to 17 years has increased by 1.4 mm Hg, with greater increases seen among Hispanic and African American children.¹²

Hypertension has significant health and economic consequences. This chronic condition greatly increases the risk of medical complications and death from cardiovascular and kidney diseases, such as heart attack, stroke, heart failure, and end-stage kidney failure.¹³ Cardiovascular diseases are costly to society; direct and indirect costs of cardiovascular diseases in the U.S. are estimated to be approximately \$312 billion per year.¹⁴

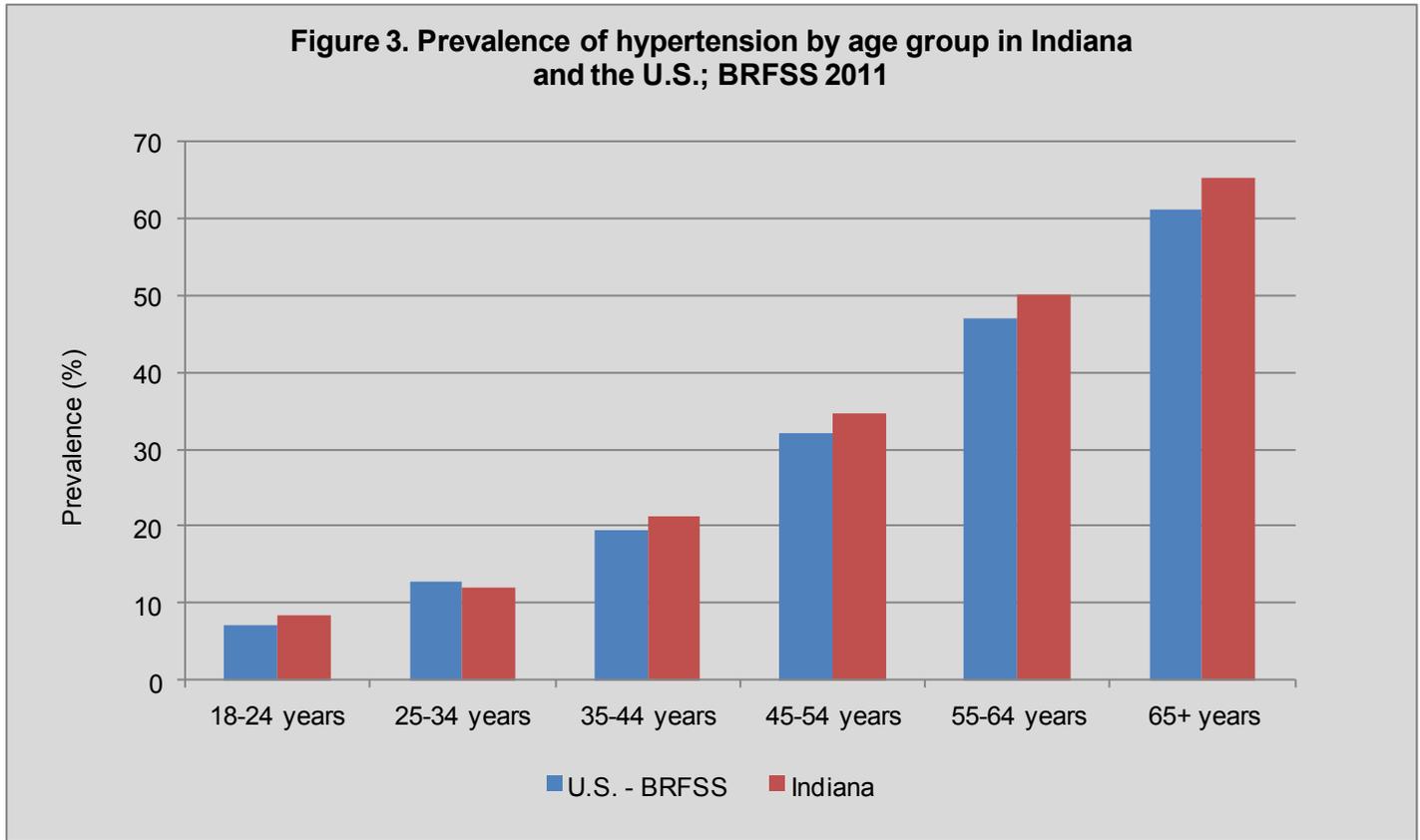


Nearly 33% of Indiana adults reported having high blood pressure in 2011.



In Indiana, the prevalence of hypertension closely resembles the general U.S. population (Figure 3). Approximately a third of Indiana adults—individuals 18 years of age and older—(32.8%) reported having hypertension in 2011, which is slightly above the U.S. estimate of 30.8%. Despite advances in medical technology and treatment, heart disease and stroke remain the 1st and 4th leading causes of death in Indiana.

Figure 3. Prevalence of hypertension by age group in Indiana and the U.S.; BRFSS 2011



Even a modest, long-term reduction in sodium consumption can have a beneficial impact on blood pressure control and can lead to the reduction in preventable cardiovascular events.¹⁵

Reducing sodium consumption in the population to 2,300 mg per day (as recommended by the Dietary Guidelines for Americans), could reduce the number of hypertension cases in the U.S. by 11 million and save \$18 billion in health care costs.¹⁶ (Table 1)

Table 1. Potential Decrease in Cases of Hypertension and Annual Savings in Hypertension Treatment Costs from Reducing Sodium Consumption.

Scenario: Percent Reduction in Population Sodium Consumption (decrease in sodium intake in mg) ^a	Average Systolic Blood Pressure Reduction (mm Hg) ^b	Percent Decrease in the Frequency of Hypertension ^c	Decrease in the Number of Cases of Hypertension ^d	Potential Annual Cost Savings [in 2010 dollars] (\$) ^e
10% (337 mg)	70.05	1.7%	27272.25	\$52,771,804
20% (674 mg)	140.10	2.8%	44919	\$86,918,265
30% (1,011 mg)	210.15	4.2%	67378.5	\$130,377,398
40% (1,348 mg)	280.20	5.3%	85025.25	\$164,523,859
50% (1,685 mg)	350.25	6.8%	109089	\$211,087,215

a. Formula 1: Change in the amount of sodium consumed per day = targeted percent reduction x average daily sodium consumption in the US (3,372 mg from 2007-2008 NHANES).¹

b. Formula 2*: Average systolic blood pressure (SBP) reduction = decrease in SBP among proportion of population with normal BP + decrease in SBP among proportion of population with hypertension = [(decrease in population sodium intake in mg/2,300 mg) x 3.6 mm Hg x proportion of population with normal BP] + [(decrease in population sodium intake in mg / 2,300 mg) x 7.2 mm Hg x proportion of population with hypertension].

* According to data from a meta-analysis of 31 long-running clinical trials, a 2,300 mg reduction in sodium consumption per day is associated with a 3.6 mm Hg decrease in SBP among individuals with normal blood pressure and a 7.2 mm Hg decrease in SBP among individuals with hypertension.² The proportions of the population with and without hypertension used in the calculations were based on the 2011 BRFSS data.

c. Formula 3[§]: The estimated percent decrease in the frequency of hypertension for each scenario was based on extrapolations of published data and accounts for the number of individuals who would no longer be considered hypertensive if the reduction in sodium consumption occurred at the population level beginning in 2005.

[§] These extrapolations assumed that hypertensive individuals were not taking antihypertensive medications for the long-term.³

d. Formula 4: Decrease in the number of cases of hypertension = percent decrease in hypertension frequency (Formula 3) x population in Indiana with hypertension, based on data from the 2011 BRFSS.

e. Formula 5: Annual savings in treatment costs = Formula 4 x \$1,935 per person per year (using 2010 dollars).^{4,**}

** Treatment costs of hypertension were derived from published data in Trogon et al.⁴ In the study, the estimated treatment costs for hypertension were estimated to be \$1,958 per person per year (in 2005 dollars); for the 2013 estimate, the present analysis adjusted for inflation using the Medical Care Consumer Price Index. Hypertension treatment costs included prescription expenditures and a portion of the costs attributed to treatment of hypertension-related chronic diseases. Per a conversation with Guijing Wang, health economist at CDC DHDSP, we can use this estimate until 2014.

References:

¹ "Vital Signs: Food Categories Contributing the Most to Sodium Consumption — United States, 2007–2008." MMWR. Centers for Disease Control and Prevention. Vol 61. Feb 7, 2012.

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³ Palar K and Sturm R. (2009). Potential societal savings from reduced sodium consumption in the US adult population. American Journal of Health Promotion, 24(1), 49-57.

⁴ Trogon JG, Finkelstein EA, Nwaise IA, Tangka FK, and Orenstein D. (2007). The economic burden of chronic cardiovascular disease for major insurers. Health Promotion Practice, 8(3),234-42.



What Can Be Done to Reduce **SODIUM** Consumption?

Reduction in sodium consumption can be accomplished with minimal impact on taste. Research suggests that most people would adapt to or not detect a decrease in sodium content in food when done gradually over time. Reducing sodium consumption at the population level is possible. Many countries, including the United Kingdom and Finland, have ongoing national programs that address this public health problem and have effectively reduced the sodium content in their food supply. The United Kingdom has used a complementary, multi-strategy approach to:

- Increase the percentage of people who are aware of the recommended daily sodium limit.
- Increase the percentage of people trying to lower their daily sodium intake.
- Reduce the amount of sodium in most processed foods by 20% to 30%.¹⁵

In 2008, a coalition of health organizations and public health agencies led by the New York City Department of Health and Mental Hygiene, established the National Salt Reduction Initiative (NSRI) and began exploring strategies for reducing population sodium consumption in the U.S. This has launched discussions with food industry leaders to develop a voluntary framework for substantive, gradual reductions in sodium content across a range of foods.¹⁷ Concurrently, several public health departments, including the Indiana State Department of Health, have expressed support for local interventions (e.g., increasing the supply of reduced sodium foods) to augment the national effort.



What Can Be Done at the **STATE** and **LOCAL** Level?

Several strategies can be implemented at the state and local levels to complement national sodium reduction efforts.^{17,18,19} Local action can help increase consumer demand for low sodium products from food manufacturers by:

- Increasing awareness through public education about the recommended daily sodium limit and the health benefits of lowering sodium consumption.
- Implementing venue-based or venue-specific food policies that set nutrition standards, including sodium limits, on all food purchased, served, or sold by an institution or employer. These policies could help drive product reformulation, given the purchasing power of many states, counties, cities, and large businesses.²⁰
- Taking advantage of funding to support sodium reduction efforts. For example, the Indiana State Department of Health has funded local sodium reduction efforts in multiple counties around the state to provide education and training for lower sodium food procurement and preparation to local food service personnel in selected schools, restaurants, and grocery stores, particularly those targeting minority populations; influence food purchasing choices through shelf and menu labeling; and create vending machine procurement policies for county government agencies to purchase low sodium foods.



Resources

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