



CHRONIC DISEASE BURDEN UPDATE

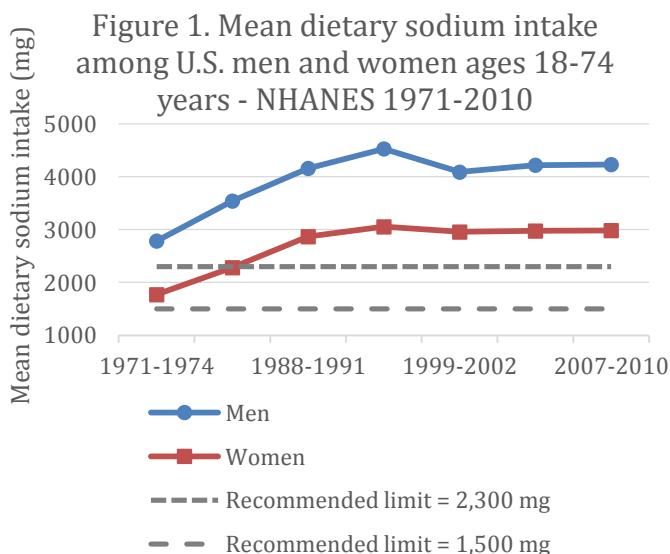
This update focuses on reducing sodium consumption in Illinois.

MOST AMERICANS CONSUME TOO MUCH SODIUM

Most people in the United States consume much higher amounts of sodium than they should. Average daily sodium consumption during 2007–2008 was 3,266 mg among persons 2 years of age and older, well above the current *Dietary Guidelines for Americans* recommendations of less than 2,300 mg a day. Some high risk individuals should consume only 1,500 mg a day; about half of the population are part of this group, which includes individuals 51 years of age and older and those of any age, including children, who are African American or have high blood pressure, diabetes or chronic kidney disease.¹

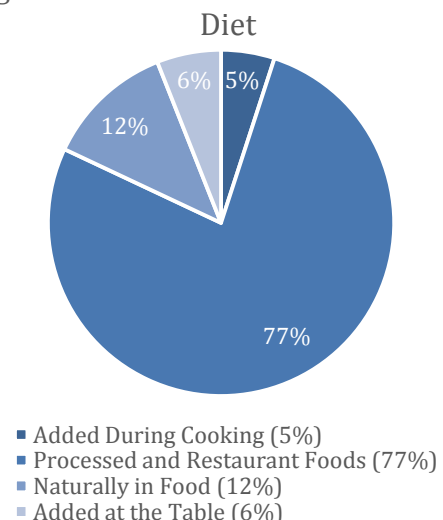
The words salt and sodium are not exactly the same, yet these words are often used in place of each other. For example, the Nutrition Facts food label uses “sodium,” whereas the front of the package may say “low salt.”² Ninety percent of the sodium we consume is in the form of salt.³ Excess dietary sodium (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 percent more sodium today than they did a generation ago (Figure 1).⁵ Presently, most of the sodium Americans consume comes from processed and restaurant foods (Figure 2).⁶ Over the past 25 years, Americans have increased the number of meals eaten 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 contained in a variety of restaurant foods.⁸ Even when sodium information is provided, it may be difficult for consumers to make sense of the information. In addition, lower calorie meals or food options can sometimes be misleading as low calorie foods, processed or at restaurants, are frequently high in sodium. 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



Source: National Health and Nutrition Examination Survey (NHANES). Mean based on single 24-hr dietary recall.

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



Source: Mattes & Donnelly, J Am Coll Nutr 1991:1

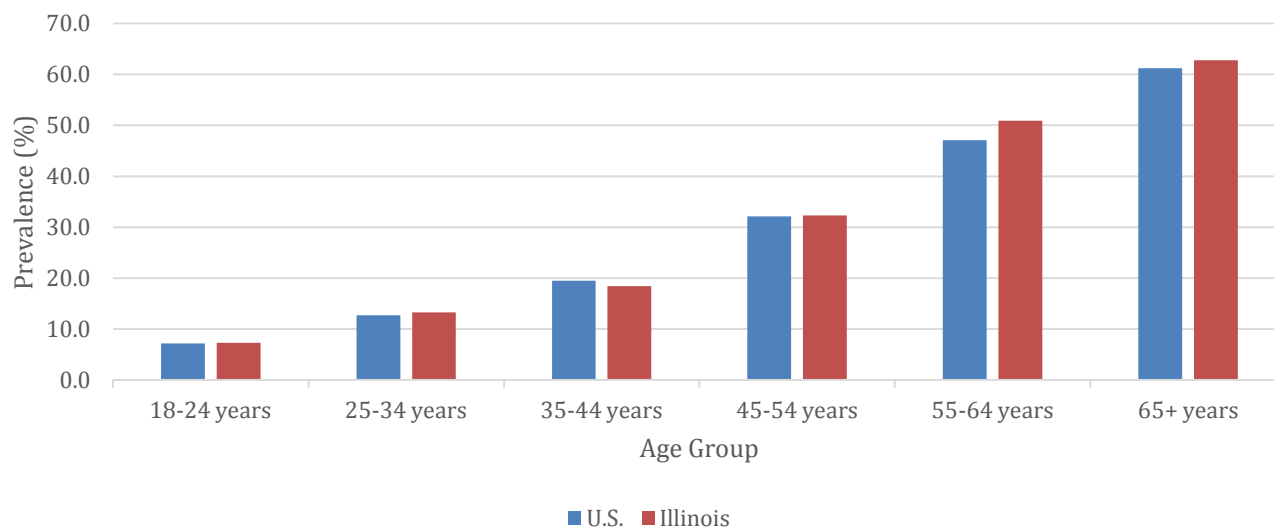
HEALTH AND ECONOMIC CONSEQUENCES OF EXCESS SODIUM

In the U.S., the burden of hypertension is considerable. The residual lifetime risks of developing hypertension for middle-aged adults (ages 55 to 65 years) is nearly 85 percent.¹⁰ Additionally, the lifetime likelihood of receiving anti-hypertension medications for individuals ages 55 years and older is approximately 60 percent.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

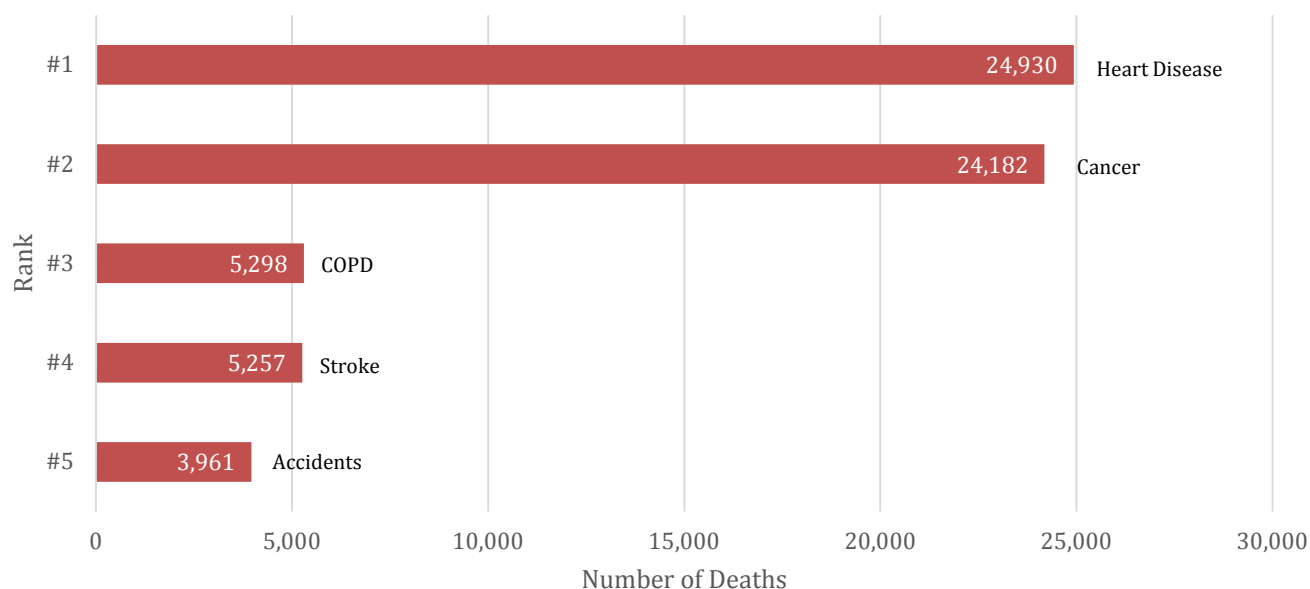
In Illinois, the prevalence of hypertension mirrors the general U.S. population with 41 percent of adults age 45 to 64 and 63 percent of adults age 65 and older having hypertension (Figure 3). Hypertension-related health conditions account for more than 200,000 hospitalizations a year in Illinois at a cost of more than \$9 billion. Despite advances in medical technology and treatment, heart disease and stroke remain the first and fourth leading causes of death in Illinois. These two conditions account for slightly more than 32,000 deaths a year and nearly 158,000 years of potential life lost. (Figure 4)

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



Source: Behavioral Risk Factor Surveillance System

Figure 4. Leading Causes of Death in Illinois, 2009



Source: National Center for Health Statistics, data release April 2012

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

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)	0.69	1.7%	51,023	\$98,728,586
20% (674 mg)	1.38	2.8%	84,037	\$162,611,789
30% (1,011 mg)	2.07	4.2%	126,056	\$243,917,683
40% (1,348 mg)	2.76	5.3%	159,070	\$307,800,885
50% (1,685 mg)	3.45	6.8%	204,090	\$394,914,344

Note: For key formulas used in the above analysis (columns a-e), see page 6.

REDUCE POPULATION 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 percent to 30 percent.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 Illinois Department of Public Health, have expressed support for local interventions (e.g., food purchasing policies) to augment the national effort.

NATIONAL, STATE, AND LOCAL STRATEGIES

Activities at the national, state and local levels can play an important role in reducing the population's sodium consumption. For example, food retailers, governments, businesses, institutions and other large-scale organizations that purchase or distribute food can establish food policies that specify sodium limits for the foods they purchase and/or the food service operations they oversee.⁴

Policymakers can work nationally to reduce the amount of sodium in the food supply. More specifically, policymakers can work to reduce the amount of sodium found in processed and restaurant foods, since more than 75 percent of the sodium consumed by Americans is found in these sources. Policymakers should:

- Support the national collaborative effort, the NSRI, to engage food manufacturers and restaurants in voluntarily reducing the amount of sodium in their products.¹⁷
- Support the removal of sodium and other sodium-containing compounds from the Generally Regarded As Safe (GRAS) list or restriction of sodium's GRAS status in a step-wise manner. This will allow for the Food and Drug Administration (FDA) to set limits on the amount of sodium food manufacturers can add to the food supply.⁴

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 CDC funded Illinois Cardiovascular Health Program provides a grant to the Illinois Hospital Association to reduce sodium in small and rural hospitals.

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- ⁵ National Center for Health Statistics. (2005). *The National Health and Nutrition Examination Survey (NHANES)*. National data from 1971-2006.
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Key Formulas Used in Analysis

- a. Formula 1: Change in the amount of sodium consumed per day = targeted percent reduction x average daily sodium consumption in the U.S. (3,372 mg from 2007-2008 NHANES).²¹
- 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.²² 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.²³
- d. Formula 4: Decrease in the number of cases of hypertension = percent decrease in hypertension frequency (Formula 3) x population in XX REGION with hypertension, based on data from BRFSS 2011.
- e. Formula 5: Annual savings in treatment costs = Formula 4 x \$1,935 per person per year (using 2010 dollars).^{24, **}
** Treatment costs of hypertension were derived from published data in Trogdon et al.²⁴ 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, this estimate can be used until 2014.