

# Chronic Disease Data Brief

Number 1308

## The Potential Health Impact of Reducing Sodium Consumption

New York State Adults, 2011

### Key Findings

**Small reductions in sodium consumption over time can lead to a decrease in hypertension cases and costs.**

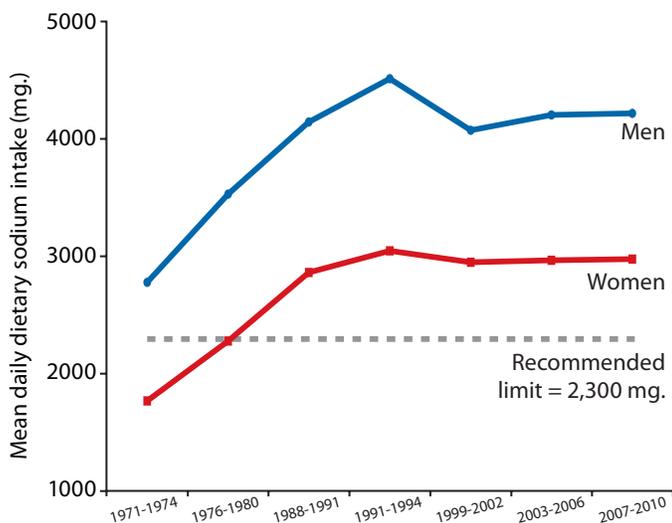
Even a modest, long-term reduction in sodium consumption can have a beneficial impact on blood pressure and lead to the reduction of preventable cardiovascular events.<sup>1</sup>

### Introduction and Background

Excessive sodium consumption is associated with elevated blood pressure levels and increased risk for heart attack or stroke.<sup>2</sup> In the United States (U.S.), sodium consumption levels are much higher than the current Dietary Guidelines for Americans recommendation of less than 2,300 mg. per day. Average daily sodium consumption during 2007 to 2008 in the U.S. was 3,266 mg. among persons 2 years and older.<sup>3</sup>

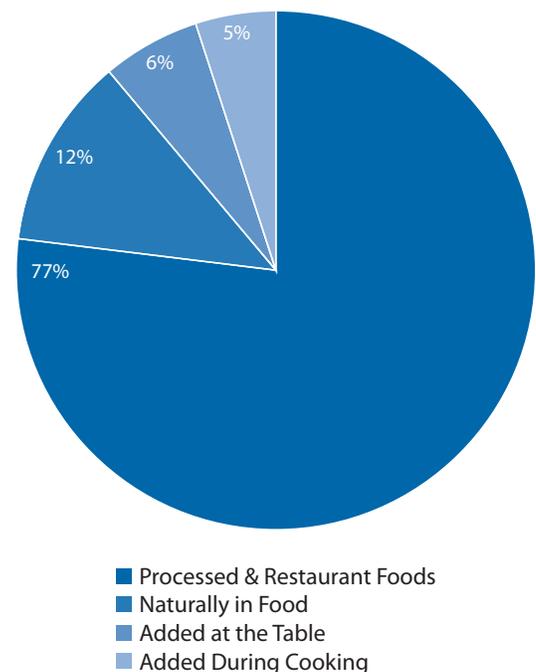
Sodium consumption among adults in the U.S. has increased over the past 30 years and Americans consume approximately 55% more sodium today than they did a generation ago (Figure 1).<sup>4</sup> Presently, most of the sodium that Americans consume comes from processed and restaurant foods (Figure 2).<sup>5</sup>

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



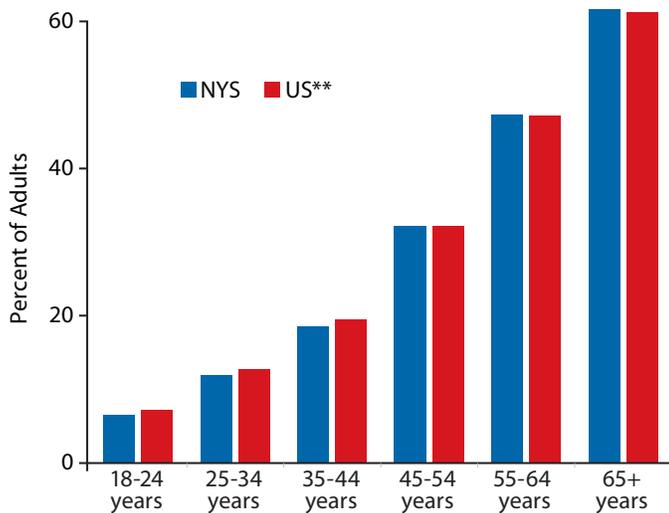
\* Data Source: National Health and Nutrition Examination Survey (N.H.A.N.E.S.), 1971-2010

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



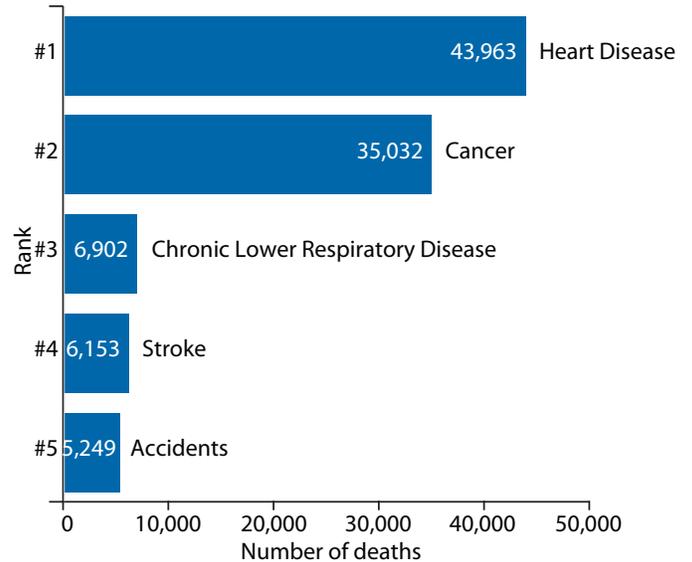
In New York State (N.Y.S.) and the U.S., the prevalence of hypertension increases with age (Figure 3).<sup>6</sup> In 2011, hypertension-related health conditions accounted for over 203,000 hospitalizations in N.Y.S.<sup>7</sup> Despite advances in medical technology and treatment, heart disease and stroke, two diseases associated with hypertension, remain the first and fourth leading causes of death in N.Y.S. (Figure 4).<sup>8</sup>

**Figure 3. Hypertension\* by age group in N.Y.S. and the U.S., Behavioral Risk Factor Surveillance System 2011**



\* Adults who have been told they have high blood pressure  
 \*\* Median percent; includes data from all 50 states and the District of Columbia

**Figure 4. Leading causes of death in N.Y.S., 2011\***



\*Data source: N.Y.S. Vital Statistics, 2011

## Potential impact of sodium reduction on the burden of hypertension

Several recent studies have estimated the decreases in hypertension and cost savings from hypertension-related illness and treatment resulting from reductions in sodium consumption in the population.<sup>3,9,10,11</sup> In N.Y.S., reducing the average daily sodium consumption by 10% (337 mg. per day) could prevent nearly 80,000 cases of hypertension and result in cost savings of \$151 million (Table 1).<sup>3,9,10,11</sup> This level of reduction in sodium consumption could be achieved with simple dietary changes, such as making a sandwich with two slices of lower sodium bread and two ounces of lower sodium turkey instead of regular bread and turkey.<sup>12</sup>

**Table 1. Potential decrease in cases of hypertension and annual savings in hypertension treatment costs from reducing sodium consumption**

Scenario: Percent Reduction in Daily Population Sodium Consumption (decrease in sodium intake in mg.) <sup>a</sup>	Average Systolic Blood Pressure Reduction (mm. Hg.) <sup>b</sup>	Percent Decrease in the Frequency of Hypertension <sup>c</sup>	Decrease in the Number of Cases of Hypertension <sup>d</sup>	Potential Annual Cost Savings [in 2010 dollars] (\$) <sup>e</sup>
10% (337 mg.)	0.68	1.7%	78,077	\$151 million
30% (1,011 mg.)	2.04	4.2%	192,896	\$373 million

Note: For key formulas used in the above analysis (columns a-e), see page 3

## Strategies to reduce sodium consumption

A gradual 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.<sup>13</sup> Since most of the sodium in the American diet comes from packaged and restaurant foods, strategies to reduce overall sodium consumption must focus on changes in the food supply.

- Encourage food manufacturers and restaurants to gradually lower the amount of sodium in their products and menu items.
- Hospitals, state and local food programs, institutions and employers should adopt nutrition standards, including sodium limits, on food purchased, served or sold.<sup>14</sup>
- Public health and nutrition educators should encourage consumers to request lower sodium foods.
- Food outlets, including supermarkets and restaurants, should make it easy for consumers to identify lower sodium food choices.

For more information, see the Centers for Disease Control and Prevention (CDC) Sodium Reduction Toolkit: A Global Opportunity to Reduce Population-Level Sodium Intake for information on implementing food standards in different venues, which can be accessed at [http://www.cdc.gov/salt/sodium\\_toolkit.htm](http://www.cdc.gov/salt/sodium_toolkit.htm).<sup>15</sup>

## Key formulas used in data analysis

- 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 N.H.A.N.E.S.).<sup>3</sup>
- Formula 2\*:** Average systolic blood pressure (S.B.P.) reduction = decrease in S.B.P. among proportion of population with normal blood pressure (B.P.) + decrease in S.B.P. 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 B.P.] + [(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 S.B.P. among individuals with hypertension.<sup>10</sup> The proportions of the population with and without hypertension used in the calculations were based on 2011 B.R.F.S.S. data.
- Formula 3<sup>§</sup>:** 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.  

<sup>§</sup> These extrapolations assumed that hypertensive individuals were not taking antihypertensive medications for the long-term.<sup>11</sup>
- Formula 4:** Decrease in the number of cases of hypertension = percent decrease in hypertension frequency (Formula 3) x population in N.Y.S. with hypertension, based on data from B.R.F.S.S., 2011.
- Formula 5:** Annual savings in treatment costs = Formula 4 x \$1,935 per person per year (using 2010 dollars).<sup>9,\*\*</sup>  

\*\* Treatment costs of hypertension were derived from published data in Trogon et al.<sup>9</sup> In the study, the estimated treatment costs for hypertension were estimated to be \$1,598 per person per year (in 2005 dollars); for the 2010 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.

## References

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- 6 Data Source: *Behavioral Risk Factor Surveillance System (B.R.F.S.S.)*, 2011. New York State Hypertension Awareness 2011, percent of adults who have been told they have high blood pressure, grouped by age. Available at <http://apps.nccd.cdc.gov/BRFSS/age.asp?cat=HA&yr=2011&qkey=8051&state=NY>. Accessed April 8, 2013. United States and District of Columbia Hypertension Awareness 2011, median percent grouped by age. Available at <http://apps.nccd.cdc.gov/BRFSS/age.asp?state=UB&cat=HA&yr=2011&qkey=8051&grp=0>. Accessed April 8, 2013.
- 7 Data Source: *Statewide Planning and Research Cooperative System (SPARCS)*, 2011. Hypertension-related health conditions included are acute myocardial infarction also known as heart attack (ICD-9-CM code of 410), coronary heart disease (ICD-9-CM code of 402, 410-414, 429), congestive heart failure (ICD-9-CM code of 428), stroke (ICD-9-CM code of 430-438) and chronic kidney disease/end-stage renal disease (ICD-9-CM code of 585-586).
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## Program Contributions

New York State Department of Health  
Bureau of Chronic Disease Evaluation and Research  
Bureau of Community Chronic Disease Prevention

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