

2012 | Considering Sodium Intake Reduction Strategies in South Carolina



South Carolina Institute of
Medicine & Public Health



MOVERS & SHAKERS

Sodium Intake Reduction Advisory Committee

Goal Statement

The Movers & Shakers conducts analysis of evidence-based strategies and resources for population sodium intake reduction. Led by the South Carolina Department of Health and Environmental Control (DHEC), in partnership with local and statewide stakeholders and the South Carolina Institute of Medicine and Public Health, the Movers & Shakers will:

- 1) increase awareness of the relationship between sodium intake and high blood pressure (a risk factor for stroke and heart disease); and 2) outline potential opportunities, barriers, and strategies to reducing sodium intake in South Carolina.

Phyllis Allen, MS, RD, LD
State Director of Public Health Nutrition
South Carolina Department of Health
and Environmental Control

Jeanette Ball, MS
Research Associate
South Carolina Institute of
Medicine and Public Health

Joy Brooks, MHA
Director
Heart Disease and Stroke
Prevention Division
South Carolina Department of
Health and Environmental Control

Jay Daniels, MPH
South Carolina Healthy Schools
South Carolina Governor's
Council on Physical Fitness

Mary Graham
Director
School Food Services
Clarendon School District 2 and Member,
South Carolina School Food Service
Purchasing Alliance

Shauna Hicks, MHS, CHES
Director
Office of Health Equity
Promotion and Wellness Health Services
Department of Health
and Environmental Control

Teresa Hill, MS, RD, LD
Nutrition Coordinator
Division of Nutrition, Physical Activity,
and Obesity
South Carolina Department of Health
and Environmental Control

Erika Kirby, MBA, RD, LD
Director
Division of Nutrition, Physical Activity,
and Obesity
South Carolina Department of Health
and Environmental Control

Alexandra Lautenschlaeger, RD, LD
Manager
Clinical Nutrition and Informatics
Baptist Easley Hospital

Tony Lee, PhD
Evaluator
Heart Disease and Stroke
Prevention Division
South Carolina Department of
Health and Environmental Control

Angele McCrorey, RD
Director
Nutrition and Food Service
Chester County School District

Juanita Bowens Seabrook, PhD, RD, SNS
Education Associate
South Carolina Department of Education,
Office of School Health and Nutrition

Maya Pack, MS, MPA
*Associate Director of Research
and Strategic Initiatives*
South Carolina Institute of Medicine
and Public Health

Jennifer Read, MPA
Media & Communications Coordinator
Heart Disease and Stroke
Prevention Division
South Carolina Department of Health
and Environmental Control

Katy Smith, MSW
Executive Director
Piedmont Health Foundation

Amy Splittgerber, M.Ed.
Executive Director
Eat Smart Move More South Carolina

Yarley Steedly
*South Carolina
Government Relations Director*
American Heart Association/
American Stroke Association
Mid-Atlantic Affiliate

Carrie Whipper
Heart & Soul Program Manager
Palmetto Project

Susan White
Community Organizing Coordinator
Eat Smart, Move More South Carolina

Jen Wright
Manager, Working Well
South Carolina Hospital Association

Authors

Maya Pack, MS, MPA
Associate Director of Research and Strategic Initiatives
South Carolina Institute of Medicine and Public Health

Jeanette Ball, MS
Research Associate
South Carolina Institute of Medicine and Public Health



WHY SODIUM REDUCTION?

935,000 Heart Attacks
795,000 Strokes
Per year in the U.S.

Heart disease and stroke are the leading causes of death in the United States.

The Centers for Disease Control and Prevention (CDC) reports about 935,000 heart attacks and 795,000 strokes per year in the U.S. (CDC, 2010a). The risk of heart disease and stroke is increased in individuals with high blood pressure/hypertension, high cholesterol levels, and those who smoke. Recent reports from the CDC find that high blood pressure contributes to about 1,000 deaths a year by escalating risks of heart disease and stroke (Viebeck, Elise, 2012). Mortality due to heart disease and stroke is disproportionately higher in the African American community.

The basics of heart disease and stroke prevention are defined by the "ABCS," which include aspirin therapy, blood pressure control, cholesterol control, and smoking cessation (CDC, 2010a). Ingesting too much sodium can lead to a multitude of health problems, including hypertension, cardiovascular disease, and stroke; reducing salt intake is an important component to creating healthier eating habits and can lower blood pressure, which can lead to a decrease in the risk for hypertension (CDC, 2009a).

The Institute of Medicine reports that consuming excessive amounts of sodium is strongly associated with high blood pressure, which relates to an increased risk of cardiovascular disease and stroke (IOM, 2010). Consuming large amounts of sodium not only increase the risk of hypertension for adults but it also increases the risk of hypertension in children (Yang et al, 2012). An increase in salt intake leads to an increase in blood pressure, which leads to an increased risk of heart attack and stroke (New York City Department of Health and Mental Hygiene, 2011). In the United States, half of all adults consume more than twice the daily recommended level for sodium (Angell and Farley, 2012). Sixty-five percent of sodium consumed in this country is from the food that is sold in the grocery store and 25 percent of sodium we consume is from food that is served in restaurants (CDC, 2012).

There is clear evidence that a low sodium diet supports heart health. A study conducted by the National Heart, Lung, and Blood Institute (part of the U.S. National Institutes of Health) and Harvard Medical School demonstrated that a decrease in sodium intake dramatically lowered systolic and diastolic blood pressure. By decreasing sodium consumption from 140 mmol per day to 100 mmol per day a decrease in blood pressure and hypertension can be seen (Sacks et al, 2001). Another study demonstrated that restricting sodium intake to 1.8g per day can result in an average decrease in systolic blood pressure by 5 mmHg (or millimeters of mercury) in those who have hypertension and an average decrease of 2.02 mmHg in systolic readings in patients without hypertension (Padwal, 2005).

The Arnold School of Public Health at the University of South Carolina conducted a study of over 6,000 people, predominantly Caucasian adults ranging from ages twenty to eighty years old, that looked at the incidence of high blood pressure among family members. The study found that those who have a parent with high blood pressure can reduce their risk by 34% by engaging in high levels of fitness. Everyone studied (those with parents that have high blood pressure and those that do not) reduced their risk of hypertension by 42% by participating in high levels of fitness (ASPH, 2012). The CDC reports that almost one-third of adults in the U.S. have hypertension and another third are on their way to being hypertensive. For children, if they experience high blood pressure during their childhood, they are more inclined to develop hypertension when they become adults. Also, they will be at a higher risk for developing cardiovascular disease (Yang et al, 2012). As of 2002, 10 percent of American children were pre-hypertensive, with African American and Mexican children having the highest risk (AHA, 2012). In South Carolina, the average hypertension rate between 2005 and 2009 for adults was 31.5 percent (BRFSS, 2005-2009).

A report by Angell and Farley (2012) stated that only one-tenth of sodium in food is added during cooking or after it has been served. Seventy-seven percent, is already in packaged or restaurant food at time of purchase (Angell and Farley, 2012). A recent CDC Vital Signs report indicates that more than 40 percent of the sodium we consume comes from only ten different foods. These include bread/rolls, cold cuts/cured meats, pizza, poultry, soup, sandwiches, cheese, pasta dishes, meat dishes, and snacks. The CDC projects that by reducing the sodium in these ten food sources by 25 percent, dietary sodium level would be reduced by more than 10 percent (CDC, 2012). Even the smallest effort to reduce sodium intake and blood pressure can reduce fatalities due to stroke and cardiovascular disease. Statistics show that reducing sodium intake could reduce hypertension cases by 11 million nationally; this could save approximately \$18 billion in health care costs (CDC, 2009a).

THE CONTEXT AND NEED FOR SODIUM REDUCTION INITIATIVES IN SOUTH CAROLINA

Sodium intake reduction is an important step in reducing the risk of heart disease, stroke, and hypertension. The need for sodium intake reduction initiatives in South Carolina is evident in reviewing the burden of morbidity and mortality related to heart disease and stroke (please see Appendix B). In South Carolina, heart disease is a leading killer for men and women in all racial groups (SCHA, 2010a). In general, two-thirds of individuals with diabetes die from heart disease or stroke, and in South Carolina, one out of every ten adults has diabetes (SC DHEC, 2009c). Chart 1 depicts the rise in the percentage of adults with diabetes over the last six years in South Carolina and the U.S.

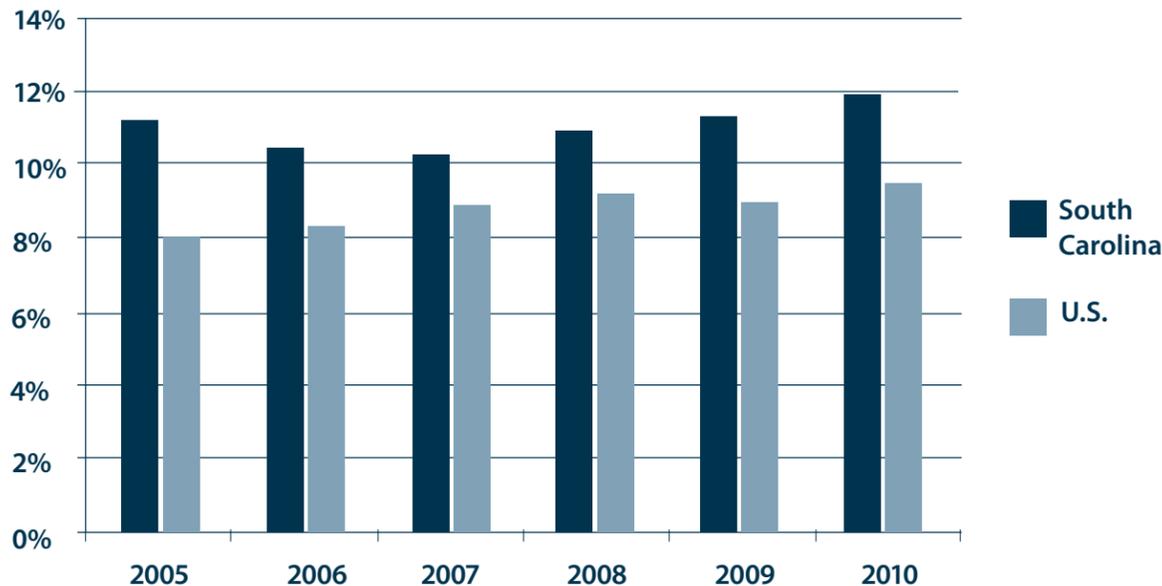
Also important to note is that **70 percent of adults in South Carolina with diabetes also have high blood pressure** (SC DHEC, 2009a). South Carolina's proportion of adults with high blood pressure increased from 28.8 percent in 2000 to 31.7 percent in 2009 (SC DHEC, 2009b). As with diabetes, South Carolina has a higher rate of adults with high blood pressure than the national average.

In 2007, South Carolina ranked 10th highest in the nation for percentage of residents with diabetes, and one in eight African Americans in South Carolina had diabetes. Additionally, South Carolina data show that African Americans have a higher proportion of adults with high blood pressure compared to the other racial groups (38.7 percent in 2009) (SC DHEC, 2009b). African Americans are 61 percent more likely than whites to die from a stroke (SC DHEC, 2009c).

While this information supports the need for sodium intake reduction in South Carolina due to the disease burden, this picture is not complete without understanding the lack of sodium awareness; most South Carolina residents are deficient in their awareness of the excess of sodium in average daily diets. Data provided by the 2011 BRFSS show that 80.8%, or 4 out of 5, South Carolina adult residents surveyed (sample size of 11,000) do not know the recommended guidelines for sodium consumption. Additionally, 45 percent of respondents did not know processed food has more sodium than non-processed food.

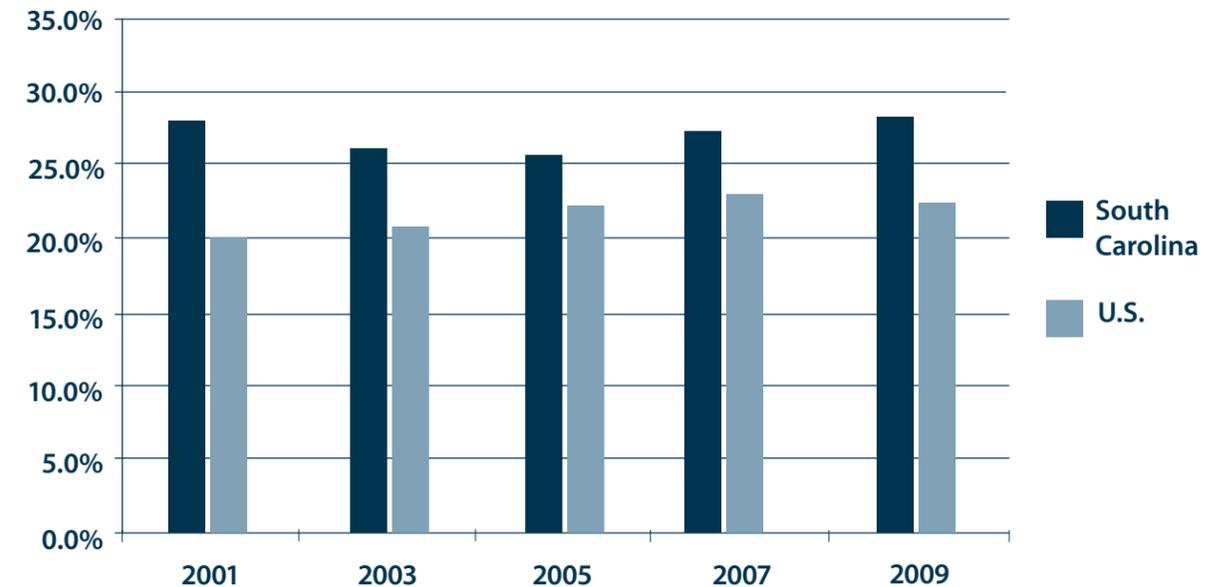
The "Stroke Systems of Care Study Committee Report," submitted to the governor and general assembly of South Carolina by DHEC, provides a platform for a sodium reduction initiative in our state (SC DHEC, 2010b). The report recommends supporting policies to promote stroke prevention, with the first recommendation stating, "Promote public policy which addresses reduction in sodium consumption" (SC DHEC, 2010b, p.20). This report supported the passage of the 2011 Stroke Systems of Care Act, which requires improvements in stroke care and changes in the way the health care system reacts to strokes. The legislation requires the identification of health care facilities capable of acute stroke care, establishes pre-hospital assessment procedures, standardizes Emergency Medical Services care for stroke patients, and creates a place for all stroke data to be collected and updated (SC DHEC, 2011).

Chart 1: South Carolina and U.S. Adult Diabetes Prevalence and Trend Data: 2005-2010



Data Source: BRFSS

Chart 2: South Carolina and U.S. Adult High Blood Pressure Prevalence and Trend Data: 2001-2009



Data Source: Behavioral Risk Factor Surveillance System (BRFSS)

SOUTH CAROLINA SUCCESS STORIES



There are many programs and initiatives around our state already working to promote healthier communities through improved nutrition. Highlighting the success of three such initiatives, will help showcase that change is possible and collaborative action towards population sodium intake reduction can be successful if designated as a key public health priority.

Working Well

The Working Well initiative was first supported by Eat Smart Move More South Carolina in 2009, and in 2010 they received a three-year grant from The Duke Endowment and established a partnership with North Carolina Prevention Partners to provide support (SCHA, 2012). The initiative was established to create and implement wellness policies and promote better health in work environments. There are currently 50 hospitals, representing over 65,000 employees, that implement Working Well practices in South Carolina.

Working Well focuses on three specific pillars to aid in establishing effective wellness environments: tobacco-free people and places, access to delicious and affordable healthy food environments, and providing access and opportunity for physical activity during the work day (SCHA, 2010b). Within each pillar there are different recognition levels with Gold representing the highest standards of excellence (Gold Star-Tobacco, Gold Apple-Nutrition and Gold Medal-Physical Activity). In order to attain Gold level recognition, a hospital must encompass policy implementation, comprehensive system strategies, and environmental change all to create a culture where the healthy choice is the easy choice.

Specifically for nutrition, Working Well focuses on healthy food policies such as implementing nutrition criteria, providing access to healthy and affordable food choices (including cafeteria and vending), product placement, pricing strategies, nutrition labeling, and stickers at point of decision to educate consumers. Working Well supports hospital programming by recommending the use of evidence-based programming efforts. For example, Working Well recommends that sodium consumption guidelines be considered as part of the nutrition criteria for healthy food policies and that sodium should be listed in the nutrition label that is seen at point of decision.

Among the hospitals that are apart of Working Well program, there are currently 11 Gold Stars, 9 Gold Apples and 4 Gold Medals. Working Well aims to increase productivity and decrease absence for hospital staff, reduce health care and health insurance costs, increase healthy competition among peers, and increase positive media awareness of healthy lifestyles (SCHA, 2010b).

Palmetto Project

The Palmetto Project was established in 1984 and consists of community leaders, academic institutions, businesses, and government agencies. As a whole, Palmetto Project strives to identify and put into action new approaches to social and economic challenges in South Carolina. With support from the Robert Wood Johnson Foundation and William Edwards Murray, the Palmetto Project created the Heart & Soul initiative in 1997, which is now the largest faith-based health initiative in the state (Palmetto Project, 2011). This initiative, which was volunteer driven and congregation centered, focuses on preventing cardiovascular disease, stroke, and kidney failure through a statewide network of African American churches. The three main objectives are: (1) decrease the risks, incidence, and complications of hypertension, diabetes, and related chronic conditions; (2) employ patient navigation and education to increase use of primary care providers for non-emergency health

services; and (3) develop a replicable patient navigation and health literacy model (Palmetto Project, 2012). The initiative provides training to volunteer teams from churches to ensure that they have the materials they need to educate, screen, and monitor their members. Included in these materials is information concerning recommended standards for blood pressure, blood glucose levels, kidney function, physical activity, and daily sodium consumption.

Several years ago, the Heart & Soul merged with Palmetto Projects' clinic-based patient navigation program. This hybrid model is delivered at food distribution sites which are most often faith-based. The nature of the food pantry service provided is outwardly-focused, meaning that participants are very often not members of the church congregation but come from the community-at-large.

An evaluation of the new Heart & Soul program demonstrated a 15% decrease in uninsured program participants utilizing the emergency room and a 17% decrease in hospital admission. Heart & Soul has just begun a three year pilot study that will evaluate changes in knowledge, attitude, and behavior; success towards achieving healthy behavior lifestyle changes and reduced blood pressure; changes in emergency room and inpatient care utilization; and usage of medical homes.

Greenville County Schools

Greenville County Schools (GCS) have begun work to transform its cafeterias by introducing healthy menus and salad bars in 11 elementary schools in 2011-2012, 18 more in 2012-2013 and the final 21 slated for 2013-2014. Key to the transition is a "culinary training camp" at the Culinary Institute of the Carolinas at Greenville Technical College. At the training camp, cafeteria workers learn scratch cooking techniques such as roasting, use of herbs and seasonings in place of salt, and knife skills, so they can prepare foods fresh in the cafeteria rather than use highly processed foods. The curriculum was developed by chefs at the Culinary Institute of the Carolinas in partnership with GCS culinary specialist Chef Ron Jones and focuses on cooking skills, health and nutrition, and school food policy. Thus far, students have shown an average 50% gain in knowledge in these areas based on a pre- and post-test. As a result of the training, Culinary Creations schools meet the USDA Healthier US Schools Challenge Gold Level of Distinction.

The training program is funded by Blue Cross Blue Shield of South Carolina and the Piedmont Health Foundation, and LiveWell Greenville supports implementation by coaching school Parent Teacher Associations (PTAs), School Improvement Councils (SICs), and administration in creating an overall healthier school environment to complement the cafeteria improvements.



FEDERAL INITIATIVES TO REDUCE SODIUM INTAKE

Million Hearts Initiative

The Million Hearts Initiative was established in September 2011 and is a five-year national initiative that aims to prevent one million strokes and heart attacks that includes a component related to population sodium intake reduction. The initiative includes a number of activities. The first is a set of campaigns created to educate the public about heart disease and prevention strategies that help people take control of their health. Another set of activities will coalesce around the use of health technology to help control elevated blood pressure and cholesterol among patients who have high blood pressure and cholesterol. The adoption of new health technology will help to regulate and improve the quality of care that a patient receives. The final strategy will be to initiate community efforts that encourage smoke-free policies and decrease the amount of sodium in food (Million Hearts, 2011).

In order to reach the goal of preventing one million strokes and heart attacks, Million Hearts will bring together different stakeholders implementing various programs and policies that focus on heart health. Support for this initiative includes, but is not limited to, the U.S. Department of Health and Human Services (US DHHS), the CDC, the Center for Medicare and Medicaid Services, the National Institute of Health, and the Substance Abuse and Mental Health Services Administration (Million Hearts, 2011).

The Institute of Medicine

The Institute of Medicine (IOM) released a report in April 2010 that outlines policy recommendations to support sodium intake reduction efforts in the United States. The IOM recommends that national initiatives for reducing sodium begin at the Food and Drug Administration (FDA) with efforts to decrease salt levels in processed foods and items sold by food service organizations. There is a need for a standard that defines safe levels of sodium in food. By creating this standard, food manufacturers, purchasers, and distributors would have to adhere to stricter regulations related to the amount of sodium in food products.

The second strategy recommended by the IOM in reducing sodium intake levels is to promote voluntary cooperation from the food industry to reduce sodium levels in food. The IOM encourages restaurants and other food producers to implement sodium reduction strategies before mandatory standards are put in place. Working to promote voluntary sodium reduction participation within the food industry, government agencies, and restaurants can aid in sodium intake reduction.

The third recommendation encourages those involved with different areas of sodium reduction to work together to encourage sodium reduction on the part of food supply companies. The initiatives created by the FDA should be implemented and tailored to fit all areas of food production, purchasing, and dissemination. This recommendation also encourages Congress to remove all exemptions for nutrition labeling and require all food organizations to follow sodium content regulations.

The fourth IOM recommendation is to increase nationwide awareness about sodium and the need for sodium intake reduction. This education will encourage individuals to change their diets in order to meet the guidelines for sodium limits.

The fifth recommendation addresses the need for continuing sodium intake reduction. Involved agencies should continue to maintain initiatives to reduce sodium and disseminate information from surveys and other forms of data collection in a manner that is accessible to the public (IOM, 2010).

National School Lunch Program

The National School Lunch Program (NSLP) is a federally supported program that was created for school children to have the ability to receive healthy lunches at school. The lunches must follow the recommendations set by the Dietary Guidelines for Americans, which includes limiting the number of calories from fat (no more than 30 percent) and saturated fat (less than 10 percent) (Food Research and Action Center, 2010). The guidelines also require lunches to provide one-third of the recommended daily allowance of protein, iron, calcium, and Vitamins A and C and include designated amounts of fruits, vegetables, meats, grains, and milk. There is no set target for sodium levels; the goal is to simply reduce the amount of salt in the foods provided to children (USDA, 2010; School Nutrition Association, 2012).

Public and private schools can participate in NSLP and all children in the participating schools can purchase a healthy meal. The family income level determines whether the child qualifies for free or reduced priced meals; however even those who pay full price are still receiving the meal at a subsidized price (USDA, 2010). As part of participation in NSLP, the participating school district must implement a school wellness policy, address obesity issues, and encourage healthy eating and physical activity in school environments (Food Research and Action Center, 2010).

Menu Labeling Requirements

Menu labeling requires certain classes of restaurants with 20 or more locations and vending machine companies with 20 or more machines to display the nutritional content of the food offered (CDC, 2010b; US FDA, 2011). The nutritional content must include the number of calories and the amount of cholesterol, sodium, saturated fats, carbohydrates, sugars, fiber, and protein per item (CDC, 2010b; US FDA, 2011). Encouraging healthier decisions by making nutritional information available through menu labeling is a significant strategy for improving nutrition and controlling weight.

The 2008 Health and Diet Survey found that 54 percent of respondents read nutritional labels the first time they purchase an item. Two-thirds of respondents “often” read nutritional labels to determine the amount of calories, salt, vitamins, and fat in a food item (FDA, 2010). Research demonstrates that the consumer’s inclination to eat items high in calories and fat decreases when nutritional information is made available (Robert Wood Johnson Foundation, 2009).

Food Purchasing Guidelines

The IOM reports current sodium levels in our food supply are too high to be deemed safe for consumers (IOM, 2010). The food procurement policy was created to regulate the food purchased by state and local government agencies, potentially affecting many different settings including schools, work sites, hospitals, assisted living communities, colleges/universities, and child care facilities. The policy requires that food the government purchases, provides, and/or makes available must contain nutrients deemed necessary by public health officials. While the standards may differ depending on the agency involved, there are several minimum standards outlined by US DHHS (CDC, 2011a). For example, packaged fruit should be in water or unsweetened juice, vegetables should contain less than 230mg of sodium per serving, whole grains should always be offered and contain less than 230mg of sodium per serving, and at least 50 percent of all available beverages (not including 100 percent juice or unsweetened milk) may not have more than 40 calories per serving.

CDC Sodium Reduction Grants

In order to encourage sodium reduction initiatives, the CDC provided three-year grants to support the implementation of sodium reduction initiatives, such as policy strategies and increased availability of healthier food options for communities. For more information about community sodium reduction initiatives, including a list of the states and communities that received the grant, please visit the CDC’s website at: http://www.cdc.gov/media/pressrel/2010/r101001.html?scid=mediarel_r101001

SODIUM REDUCTION LEGISLATION AND POLICY IN OTHER STATES

In order to develop and encourage sodium intake reduction initiatives in South Carolina, it is beneficial to look at other states successful in their strategies to promote improved nutrition for their residents.

New York

New York is a leader in sodium reduction. The state is credited with leading The National Salt Reduction Initiative (NSRI), which was established in 2008 as a guide for restaurants and food packaging companies to reduce the sodium levels in their food. Since its creation, the NSRI has developed partnership with more than 80 national, local, and state health organizations (Angell and Farley, 2012). National food manufacturers are voluntarily complying with gradual sodium reduction benchmarks set nationally, with the goal of reducing sodium intake of Americans by 25 percent, over a five-year period concluding in January 2014.

NSRI has elicited the commitment of food packaging organizations across 62 categories, such as cereal and canned vegetables, and restaurants across 25 categories, including soup and sandwiches with lunch meat, to reduce their sodium content in their food (Johnson, 2011; New York City Department of Health and Mental Hygiene, 2011; O’Callaghan, 2010). Since July 2011, 28 companies have committed to reducing sodium in their food products. These companies include superstores, grocery stores, family owned businesses, transnational corporations, restaurant chains and restaurant suppliers (Angell and Farley, 2012).

Massachusetts

Massachusetts has made a significant effort to reduce sodium intake by utilizing a multi-faceted approach. The approach includes a call to action for participation in sodium reduction activities, a new food purchasing policy, public information campaigns, and wellness grants. Executive Order 509 requires state agencies to comply with specific nutritional standards when buying food and beverages. The nutritional standards are based on the Dietary Guidelines for Americans and require that food have no more than 480mg of sodium per serving (Smith, 2010).

North Carolina

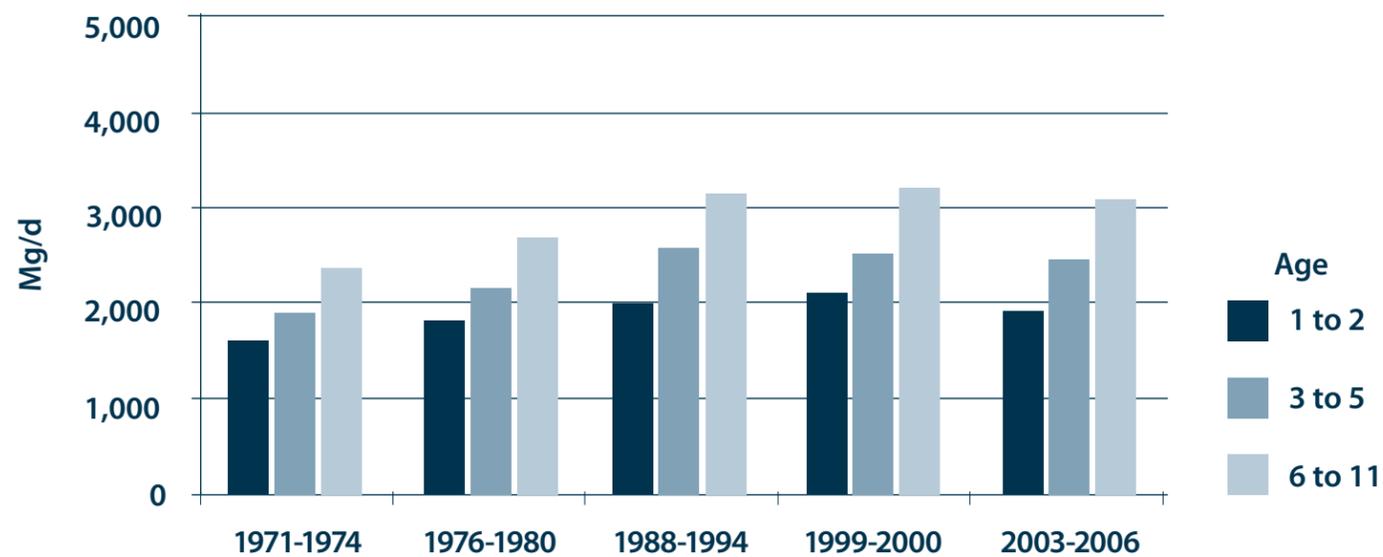
North Carolina House Resolution 670, “A Resolution Creating Awareness about the Benefits of Reducing Dietary Sodium Intake to Address a Serious Public Health Concern Related to Increased Risk of Heart Disease and Stroke” (Appendix A), was presented to the General Assembly of North Carolina and adopted in May 2011. This resolution supports initiatives that center on reducing heart disease and stroke in North Carolina by supporting efforts to reduce sodium intake (North Carolina General Assembly, 2011).

SODIUM INTAKE: RECOMMENDED GUIDELINES VERSUS POPULATION CONSUMPTION

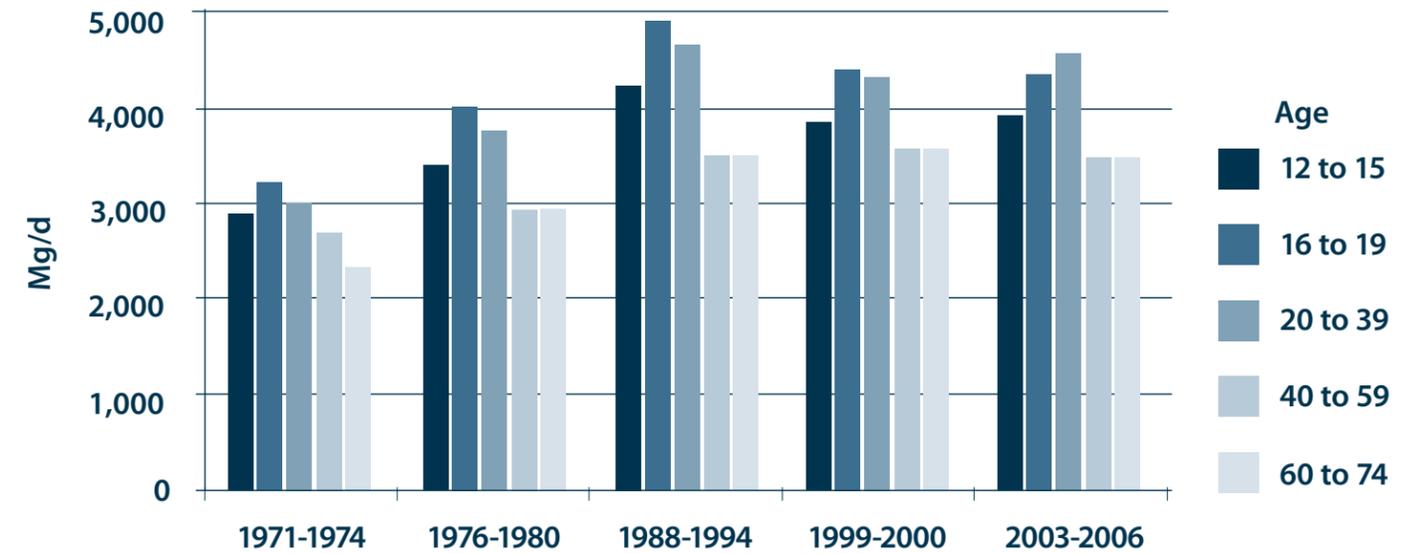
CDC and the 2010 Dietary Guidelines for Americans recommend that adults consume no more than 2,300mg of sodium per day and people who have one or more of the following characteristics should not consume more than 1,500mg of sodium per day: those age 51 years or older, African Americans, and people with high blood pressure, diabetes, and/or kidney disease (CDC, 2011b; CDC, 2011d; US HHS and USDA, 2010). This restriction of 1,500mg of sodium per day applies to about half of the United States population (CDC, 2011b; CDC, 2011d). The American Heart Association (AHA) suggests that since about 90 percent of people will develop high blood pressure as they age, everyone should follow the restriction of 1,500mg per day of sodium (AHA, 2011). The AHA also recommends that children consume less than 1,500mg of sodium per day.

The CDC reports that on average, Americans two years and older consume more than 3,400mg of sodium per day (CDC, 2009b). Charts 1, 2, and 3 depict the increase in sodium consumption for males and females in the U.S. since 1971.

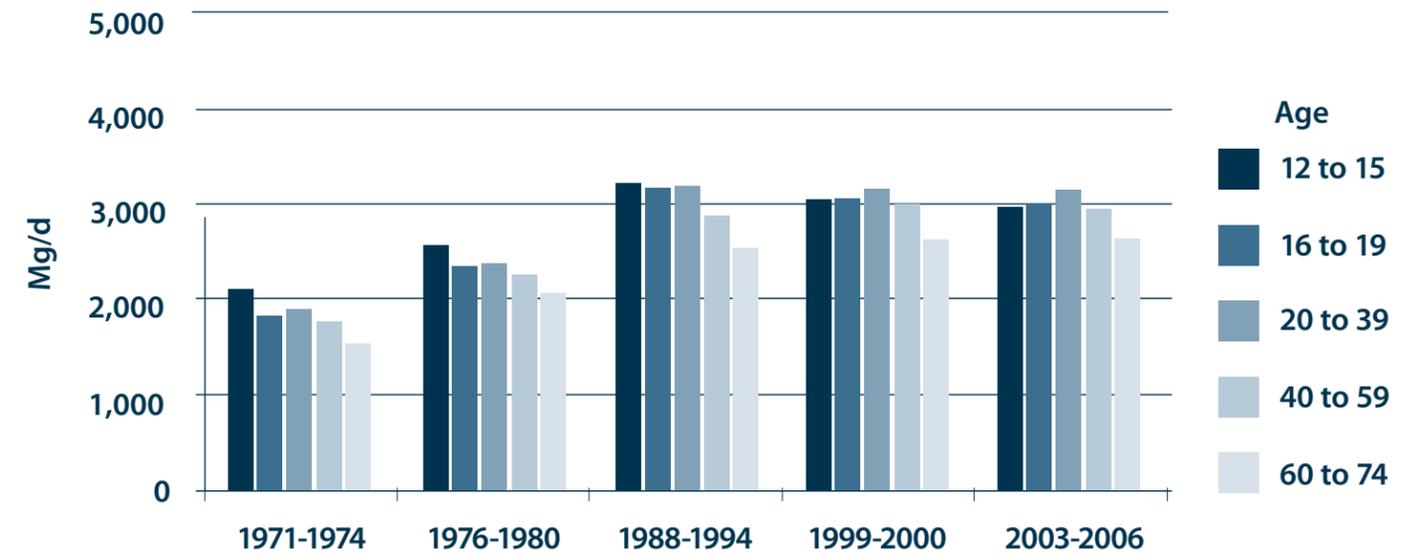
**Chart 3: National Mean Daily Sodium Intake
Ages 1-11; 1971-2006**



**Chart 4: National Mean Daily Sodium Intake
Males Ages 12-74; 1971-2006**



**Chart 5: National Mean Daily Sodium Intake
Females Ages 12-74; 1971-2006**



Data Sources: Briefel and Johnson (2004); National Health and Nutrition Examination Survey (NHANES)

RECOMMENDED STRATEGIES TO REDUCE POPULATION SODIUM INTAKE

Individual Dietary Approaches

A change in individual dietary habits can have an impact on the amount of sodium a person ingests. A notable diet to consider is the Dietary Approach to Stop Hypertension (DASH), which has been proven to not only reduce blood pressure but to also reduce cholesterol and insulin intake. This diet plan encourages individuals to eat fruits, vegetables, whole grains, and low or non-fat dairy products. The DASH diet design can be used in many different lifestyles and incorporates a multitude of food choices to ensure that individual food preference can be met. The diet provides meal plans, recipes, and guidance on what to select from restaurants and fast food menus. By choosing to eat healthier food, the individual is automatically reducing the amount of sodium they consume (DASH Diet, 2012).

Engaging Stakeholders

To begin development of a sodium intake reduction strategy, the CDC suggests forming a committee of interested stakeholders (CDC, 2010c). These committee members should be educated on different sodium reduction policies and participate in health impact assessments of policies. A health impact assessment is a research approach that can be used to anticipate and predict the different health effects of a proposed policy or program on a particular population, and it is also an engagement tool used to increase input of a variety of stakeholders into decisions that impact them (CDC, 2010c; CDC, 2011). Through this tool, the committee will bring attention to health issues related to sodium intake levels. Once awareness has begun and relationships have developed among government agencies, public health agencies, and other stakeholders, interventions can be designed and policies can be drafted. For example, a food purchasing policy can be established, outlining a standard for sodium levels and other nutritional indicators that must be followed by all who sell, purchase, and/or distribute food (CDC, 2010c). These standards can then be used to educate the public about sodium and its positive and negative effects.

Informing the Public

Informing and educating the public about the need for sodium intake reduction can be a challenge. One way to reach a multitude of people at once is through the utilization of mass media. The CDC has created informational videos (available online) about the need for salt intake reduction for improved health and the need to read food labels in order to facilitate healthier food choices.

Sodium Awareness and Food Quality in Schools

Another important avenue to disseminate information about sodium intake reduction is in the school system. Schools have the ability to provide healthy food and beverage choices for children and can teach children about healthy eating habits (CDC, 2011c). By maintaining and expanding the National School Lunch Program, which requires participating schools to create meals following the standards set by the Dietary Guidelines for Americans, schools could incorporate lower sodium items. The CDC article “Under Pressure: Strategies for Sodium Reduction in the School Environment” also suggests incorporating sodium reduction education into classroom curriculums, creating and implementing nutritional standards for meals served at school, and incorporating adults connected to the students, such as teachers and parents, in sodium intake reduction campaigns (CDC, 2011c).

Encouraging healthy foods in schools can also be reinforced by providing healthy food options in vending machines. Data produced by a survey about school vending machines found that in middle-school vending machines across the nation, 73 percent of beverage choices and 83 percent of snack choices are poor in nutrition, meaning they are high in saturated fats, sodium, and refined sugars (Center for Science in the Public Interest, 2004). In high-school vending machines, 74 percent of beverage choices and 85 percent of snacks have poor nutritional content. By offering healthier food options in schools, healthy values are reinforced and students are more encouraged to lead a healthier lifestyle (Center for Science in the Public Interest, 2004).

Monitoring and Evaluating Progress

The World Health Organization (WHO) recommends that those involved in sodium reduction strategies should create and identify particular tools and/or procedures that will evaluate the success of sodium intake reduction initiatives. It is suggested that a plan be developed to monitor and evaluate policies that have been implemented to ensure that they are reaching the goals that were originally set for them (WHO, 2010). Monitoring sodium reduction not only includes evaluation of policies but also monitoring the changes made in sodium intake, amount of sodium in food, sodium preferences, and consumer readiness to reduce sodium intake (IOM, 2010).

The American Heart Association recently stated that “Americans deserve the freedom to choose how much sodium they eat – and with the levels of sodium currently so high in the food supply, that choice has been taken away” (AHA, 2011).



NEXT STEPS FOR SOUTH CAROLINA

A clear need exists for sodium reduction initiatives in the state of South Carolina.

Short Term Goals

Recommended by the Movers & Shakers
Sodium Intake Reduction Advisory Committee

- Involve a wide spectrum of government agencies and other stakeholders in the planning process to ensure strong, ongoing support of sodium intake reduction.
- Continue to look to surrounding states for ideas on how to successfully implement sodium reduction initiatives.
- Introduce a resolution similar to that of North Carolina during the beginning of the next legislative session to the South Carolina General Assembly (2013).
- Encourage and educate communities on dietary approaches that improve overall nutrition and reduce sodium intake.
- Develop approaches to promote the DASH diet in a way that is acceptable to the southern palette.

Long Term Goals

Recommended by the Movers & Shakers
Sodium Intake Reduction Advisory Committee

- Develop specific recommendations for food products purchased by state agencies that include specific nutritional requirements.
- Develop legislative approaches and stronger recommendations for food products sold in the state.

APPENDIX A: North Carolina Sodium Resolution
Serious Public Health Concern Related to Increased Risk of Heart Disease and Stroke

WHEREAS, one in three American adults has high blood pressure and an estimated 99 percent of middle-aged adults will develop high blood pressure in their lifetime; and

WHEREAS, high blood pressure, also known as hypertension, is a major and modifiable risk factor for heart disease and stroke; and

WHEREAS, heart disease and stroke are the second and third leading causes of death in North Carolina; and

WHEREAS, in 2009, 31.5 percent of all North Carolina adults had been told by a healthcare provider that they had high blood pressure; and

WHEREAS, a high amount of sodium in the diet has been linked to high blood pressure which can lead to other harmful effects on health, including increased risk for stroke, heart disease, heart attack, heart failure, vision loss, and kidney disease; and

WHEREAS, the 2010 U.S. Dietary Guidelines for Americans recommends consuming less than 2,300mg of dietary sodium per day and further reducing intake to 1,500mg among persons who are 51 and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease.

WHEREAS, Americans age 20 and older consume an average of 3,466 milligrams per day, which is about 131 percent above AHA's recommended level of 1,500 milligrams per day and far exceeds the amount needed for good health; and

WHEREAS, the American Heart Association and others in the public health community strongly recommend a more aggressive standard of less than 1,500 milligrams per day of dietary sodium intake for all Americans; and

WHEREAS, the American Heart Association advocates for a stepwise reduction of sodium in the American diet to 1,500 milligrams per day by the year 2020; and

WHEREAS, it is estimated that if the population of the United States moved to an average intake of 1,500 milligrams of sodium per day there would be a 25.6 percent overall decrease in high blood pressure and \$26.2 billion in health care savings; and

WHEREAS, the Stroke Advisory Council of the Justus-Warren Heart Disease and Stroke Prevention Task Force has developed recommendations to support initiatives that advance public awareness of stroke risk factors such as high blood pressure; assist individuals in identifying their own risks; and move them to action to build healthier lifestyles, including reducing excessive sodium consumption; and

WHEREAS, the state's heart disease and stroke prevention program is planning to expand efforts to support consumers in making behavior changes to reduce sodium intake in a manner consistent with the national and AHA dietary guidelines;

Be it resolved by the House of Representatives:

SECTION 1: The House of Representatives supports measures aimed at decreasing heart disease and stroke in North Carolina and encourages the State's citizens to reduce sodium in their diets.

SECTION 2: This resolution is effective upon adoption.

APPENDIX B: South Carolina Mortality Rates for Stroke and Heart Disease
 (Data Source: South Carolina Community Assessment Network (SCAN) Community Profile, 2005-2009)

South Carolina 2000-2009: Stroke Deaths by Gender

Gender	2005		2006		2007		2008		2009	
	Death Total	Mortality Rate								
Male	1,004	23.5	914	21.1	1,023	23.2	979	21.8	966	21.1
Female	1,444	33.9	1,370	31.7	1,437	32.6	1,408	31.4	1,420	31.1

*Mortality Rate per 100,000 people

South Carolina 2000-2009: Coronary Heart Disease by Gender

Gender	2005		2006		2007		2008		2009	
	Death Total	Mortality Rate								
Male	3,325	78.1	3,297	76.2	3,142	71.2	3,204	71.5	3,337	73.1
Female	2,655	62.3	2,469	57.1	2,470	56.0	2,425	54.1	2,290	50.2

*Mortality Rate per 100,000 people

South Carolina 2000-2009: Stroke Deaths by Race

Race	2005		2006		2007		2008		2009	
	Death Total	Mortality Rate								
White	1,694	39.8	1,546	35.7	1,660	37.6	1,646	36.7	1,636	35.8
African American	747	17.5	716	16.5	783	17.7	713	15.9	723	15.8
Other	7	0.16	22	0.50	13	0.29	17	0.37	13	0.28

*Mortality Rate per 100,000 people

South Carolina 2000-2009: Coronary Heart Disease by Race

Race	2005		2006		2007		2008		2009	
	Death Total	Mortality Rate								
White	4,434	104.2	4,208	97.3	4,136	93.8	4,145	92.5	4,168	91.3
African American	1,527	35.8	1,533	35.4	1,443	32.7	1,434	32.0	1,400	30.6
Other	18	0.42	20	0.46	29	0.65	27	0.60	30	0.65

*Mortality Rate per 100,000 people

- American Heart Association (AHA). (2011). "CDC Report on Unusual Intake Compared With Dietary Recommendation." From <http://newsroom.heart.org/pr/aha/cdc-report-on-usual-sodium-intake-217757.aspx>.
- American Heart Association (AHA). (2012). "Reducing Sodium in the Diets of American Children." From http://www.heart.org/idc/groups/heart-public/@wcm/@adv/documents/downloadable/ucm_433027.pdf.
- Angell, Sonia Y. and Thomas A. Farley. (2012). "Can We Finally Make Progress on Sodium Intake?" *American Journal of Public Health*, 102(9):1625-1627.
- Association of Schools of Public Health (ASPH). (2012). "South Carolina Finds Family History of Hypertension Can Be Counteracted with Exercise." From http://fridayletter.asph.org/article_view.cfm?FLE_Index=18332&FL_Index=1726.
- Centers for Disease Control and Prevention (CDC). (2009a). "2010 Public Health Law Summit on Sodium Reduction Planning Committee Meeting."
- Centers for Disease Control and Prevention (CDC). (2009b). "Sodium: The Facts." From http://www.cdc.gov/salt/pdfs/Sodium_Fact_Sheet.pdf.
- Centers for Disease Control and Prevention (CDC). (2010a). "Heart Disease and Stroke Prevention." From <http://www.cdc.gov/chronicdisease/resources/publications/AAG/dhds.htm>.
- Centers for Disease Control and Prevention (CDC). (2010b). "Legal and Policy Resources on Public Health 'Winnable Battles': Menu Labeling." From http://www2.cdc.gov/phlp/winnable/menu_labeling.asp.
- Centers for Disease Control and Prevention (CDC). (2010c). "Sodium Reduction Opportunities."
- Centers for Disease Control and Prevention (CDC). (2011). "Health Impact Assessment." From <http://www.cdc.gov/healthyplaces/hia.htm>.
- Centers for Disease Control and Prevention (CDC). (2011a). "Improving the Food Environment through Nutrition Standards: A Guide for Government Procurement." From http://www.cdc.gov/salt/pdfs/DHDSProcurement_Guide.pdf.
- Centers for Disease Control and Prevention (CDC). (2011b). "Most Americans Should Consume Less Sodium." From <http://www.cdc.gov/salt/>.
- Centers for Disease Control and Prevention (CDC). (2011c). "Under Pressure: Strategies for Sodium Reduction in the School Environment." From http://www.cdc.gov/salt/pdfs/sodium_reduction_in_schools.pdf.
- Centers for Disease Control and Prevention (CDC). (2011d). "Usual Sodium Intakes Compared with Current Dietary Guide United States, 2005-2008." From http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6041a1.htm?s_cid=mm6041a1_e&source=govdelivery.
- Center for Disease Control and Prevention (CDC). (2012). "Where's the Sodium?." From <http://www.cdc.gov/vitalsigns/Sodium/index.html>.
- Center for Science in the Public Interest (CSPI). (2004). "Dispensing Junk: How School Vending Undermines Efforts to Feed Children Well." From http://www.cspinet.org/new/pdf/dispensing_junk.pdf.
- DASH Diet. (2012). "The DASH Diet Eating Plan." From <http://dashdiet.org/default.asp>.
- Food Research and Action Center. (2010). "National School Lunch Program." From <http://frac.org/federal-foodnutrition-programs/school-breakfast-and-lunch/national-school-lunch-program/>.
- Greenville County Schools. (2011). "Welcome to Food Nutrition Services!" From <http://www.schoolnutritionandfitness.com/index.php?sid=0511081654589176>.
- HealthCare.gov. (2011). "The Community Transformation Grants Program." From <http://www.healthcare.gov/news/factsheets/2011/09/community09272011a.html>.
- Institute of Medicine (IOM). (2010). "Strategies to Reduce Sodium Intake in the United States." Washington, DC: The National Academies Press.
- Johnson, Christine. (2011) "National Salt Reduction Initiative: A Voluntary Framework to Reduce Population Sodium Intake." From <http://www.cdc.gov/about/grandrounds/resources/PHGRSodRed5FINAL.pdf>
- LiveWell Greenville. (2012). "Healthier Schools Are on the Menu." From <http://livewellgreenville.org/community-action/at-school/news-updates-schools/>.
- Million Hearts. (2011). "Million Hearts: About the Campaign." From <http://millionhearts.hhs.gov/index.shtml>.
- New York City Department of Health and Mental Hygiene. (2011). "Reducing Salt Intake in the U.S. Could Save Tens of Thousands of Lives Each Year." From <http://www.nyc.gov/html/doh/downloads/pdf/cardio/cardio-salt-factsheet.pdf>.
- North Carolina General Assembly. (2011). "Sodium Resolution." From <http://www.ncga.state.nc.us/gascripts/billlookup/billlookup.pl?Session=2011&BillIDH670>.
- O'Callaghan, Tiffany. (2010). "Subway, Boar's Head join voluntary salt reduction initiative." From <http://healthland.time.com/2010/04/28/subway-boars-head-join-voluntary-salt-reduction-initiative/>.
- Padwal, R., Campbell N. & Touyz, R.M. (2005). "Applying the 2005 Canadian hypertension education program recommendations: 3. Lifestyle modifications to prevent and treat hypertension." *Canadian Medical Association Journal*, 173:749-751.
- Palmetto Project. (2011). "Heart & Soul." From <http://palmettoproject.org/heart-soul/>.
- Palmetto Project. (2012). "Heart & Soul AccessNet." From <http://academicdepartments.musc.edu/reach/presentations/Palmetto%20Project%20Abstract.pdf>.
- Piedmont Health Foundation. (2012). "Grant Support." From <http://www.phcfdn.org/our-focus.php>.
- Robert Wood Johnson Foundation (RWJF). (2009). "Menu Labeling: Does Providing Nutrition Information at the Point of Purchase Affect Consumer Behavior?." From <http://www.rwjf.org/files/research/20090630hermenulabeling.pdf>.
- Sacks, F.M., Svetkey, L.P., Vollmer, W.M., Appel, L.J et al. (2001). "Effects on blood pressure of reduced dietary sodium and the dietary approaches to stop hypertension (DASH) diet." *The New England Journal of Medicine*, 344 (1): 1-13.
- School Nutrition Association. (2012). "Comparison of Current and New Regulatory Requirements under Final Rule." From http://www.schoolnutrition.org/uploadedFiles/School_Nutrition/105_Meetings/CurrentandPastMeetings/CurrentMeetingPages/LegislativeActionConference/Presentations/1-Comparison%20of%20Current%20and%20New%20Regulatory%20Requirements%20under%20Final%20Rule.pdf?n=9218.
- Smith, L. (2010). "Promoting Salt Reduction through State Agency Food Standards: The Massachusetts Experience." From <http://www.ncsl.org/portals/1/documents/health/LSmithFF10.pdf>.
- South Carolina Department of Health and Environmental Control (SC DHEC). (2009a). "Fact Sheet: Diabetes in South Carolina." From <http://www.scdhec.gov/health/epidata/docs/Diabetes%20Fact%20sheet.pdf>.
- South Carolina Department of Health and Environmental Control (SC DHEC). (2009b). "Focus Area: Heart Disease and Stroke." From <http://www.scdhec.gov/health/chcdp/cdee/docs/hp2010/12-9.pdf>.
- South Carolina Department of Health and Environmental Control (SC DHEC). (2009c). "State of the Heart: Heart Disease in South Carolina." From <http://www.scdhec.gov/administration/library/ML-002149.pdf>.
- South Carolina Department of Health and Environmental Control (SC DHEC). (2010d). "Stroke Systems of Care Study Committee Report (S*26)." From <http://www.scdhec.gov/health/chcdp/cvh/docs/Stroke%20Systems%20of%20Care%20Study%20Committee%20Report%20%28S%2026%29.pdf>.
- South Carolina Department of Health and Environmental Control (SC DHEC). (2011). "Heart Disease and Stroke Prevention Policy." From http://www.scdhec.gov/health/chcdp/cvh/policy_changes.htm.
- South Carolina Hospital Association (SCHA). (2010a). "Cardiovascular Care." From <http://www.scha.org/sc-missionlifeline>.
- South Carolina Hospital Association (SCHA). (2010). "Working Well." From <http://www.scha.org/working-well>.
- South Carolina Hospital Association (SCHA). (2012). "Working Well." From http://www.scha.org/files/documents/workingwellflyer_12_04_03.pdf.
- Tennessee Secretary of State. (2010). "Governor Bredesen: Executive Orders." From <http://www.tn.gov/sos/pub/execorders/bredesenindex.htm>.
- U.S. Department of Agriculture (USDA). (2010). "National School Lunch Program." From <http://www.fns.usda.gov/cnd/lunch/aboutlunch/NSLPFactSheet.pdf>.
- U.S. Department of Health and Human Services (US HSS) and U.S. Department of Agriculture (USDA). (2005). "Dietary Guidelines for Americans." From <http://www.health.gov/dietaryguidelines/dga2005/document/pdf/DGA2005.pdf>.
- U.S. Food and Drug Administration (FDA). (2010). "Survey Shows Gains in Food-Label Use, Health/Diet Awareness: 2008 Health and Diet Survey." From <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm202611.htm>.
- U.S. Food and Drug Administration (FDA). (2011). "New Menu and Vending Labeling." From <http://www.fda.gov/food/labelingnutrition/ucm217762.htm>.
- Viebeck, Elise. (2012). "CDC: Americans' high blood pressure 'out of control'." From <http://thehill.com/blogs/healthwatch/public-global-health/247377-cdc-americans-high-blood-pressure-out-of-control>.
- World Health Organization (WHO). (2010). "Population Sodium Reduction Strategies." From <http://www.who.int/dietphysicalactivity/reducingsalt/en/>.
- Yang, Quanhe, Zefeng Zhang, Elena V. Kuklina, Jing Fang, Carma Ayala, Yuling Hong, Fleetwood Loustalot, Shifan Dai, Janelle P. Gunn, Niu Tian, Mary E. Cogswell and Robert Merritt. (2012). "Sodium Intake and Blood Pressure Among US children and Adolescents." *Pediatrics*, 130(4)

