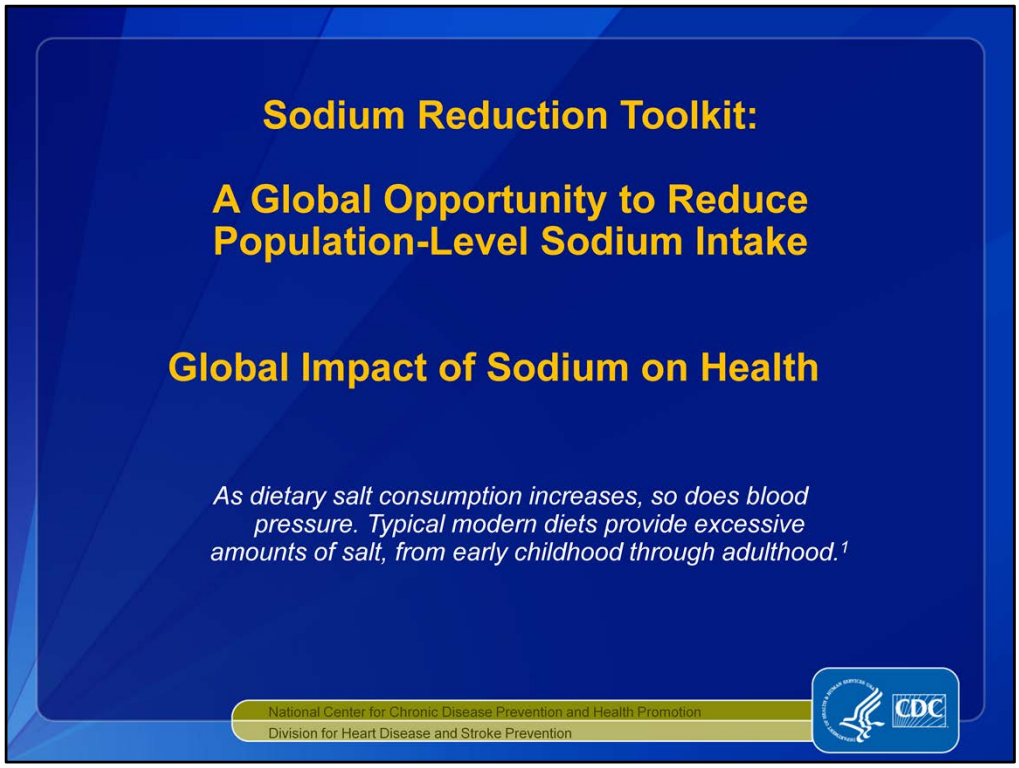
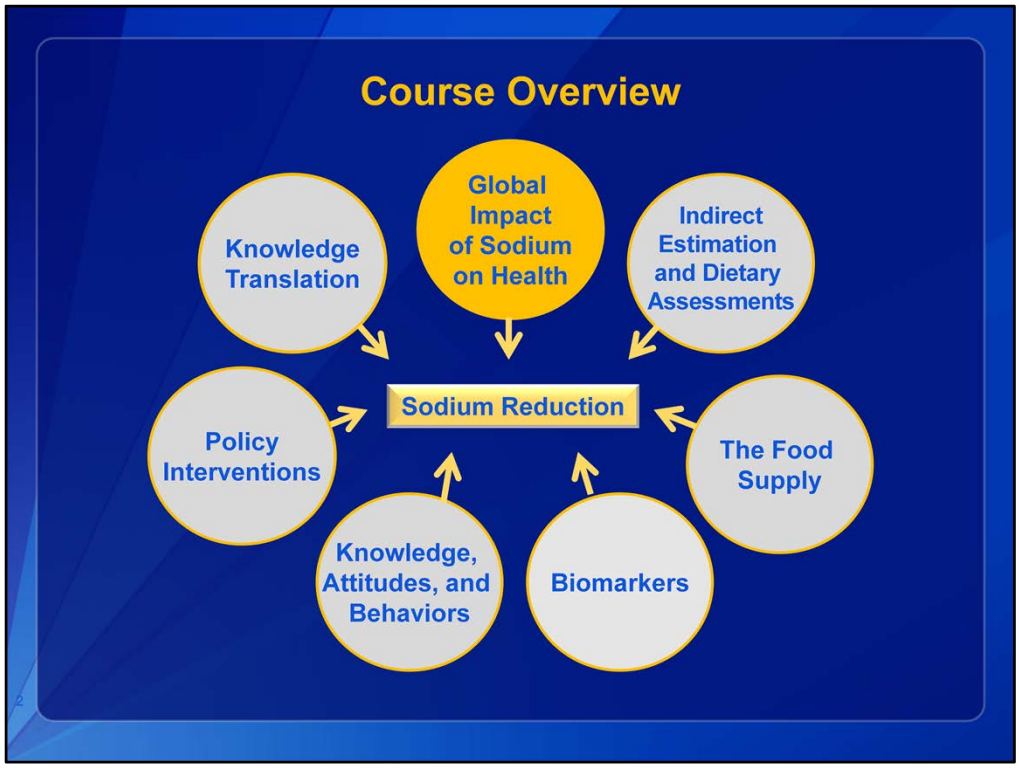


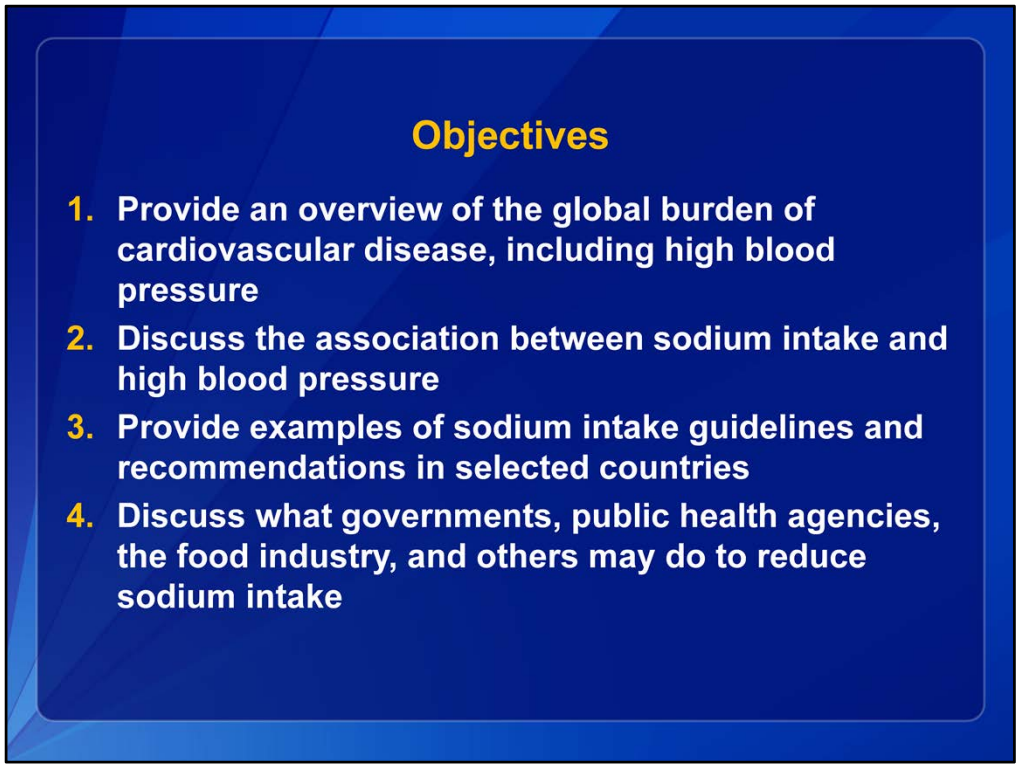
This module is part of the Centers for Disease Control and Prevention's Sodium Reduction Toolkit: A Global Opportunity to Reduce Population-Level Sodium Intake. The toolkit is designed to provide government agencies, international organizations, and other stakeholders with a brief overview, tools, and information necessary to inform strategies to reduce population-level sodium intake.

As dietary salt consumption increases, so does blood pressure. Typical modern diets provide excessive amounts of salt, from early childhood through adulthood.[1]



This module in the Sodium Reduction Toolkit covers the global impact of sodium on health. Other modules in the toolkit provide information about methods to evaluate sodium intake through biomarkers, indirect estimation, and dietary assessments; analysis of sodium in the food supply, including how to create a database to assess sodium in the processed food supply; knowledge, attitudes, and behaviors related to sodium intake and health; strategies for using sodium-reduction policy interventions to reduce sodium intake; and the process of translating and sharing evidence-based research. Each module also includes examples and a list of top 10 resources.

Please note that throughout this module, the term “salt,” also known as sodium chloride, is not synonymous with the term “sodium.” Modules in this series use the term “salt” when referring to sodium chloride and sodium when referring to sodium. A list of conversions for salt and sodium is available on the toolkit web page.



The objectives of the Global Impact of Sodium on Health module are to:

1. Provide an overview of the global burden of cardiovascular disease, including high blood pressure.
2. Discuss the association between sodium intake and high blood pressure.
3. Provide examples of sodium intake guidelines and recommendations in selected countries.
4. Discuss what governments, public health agencies, the food industry, and others may do to reduce sodium intake.

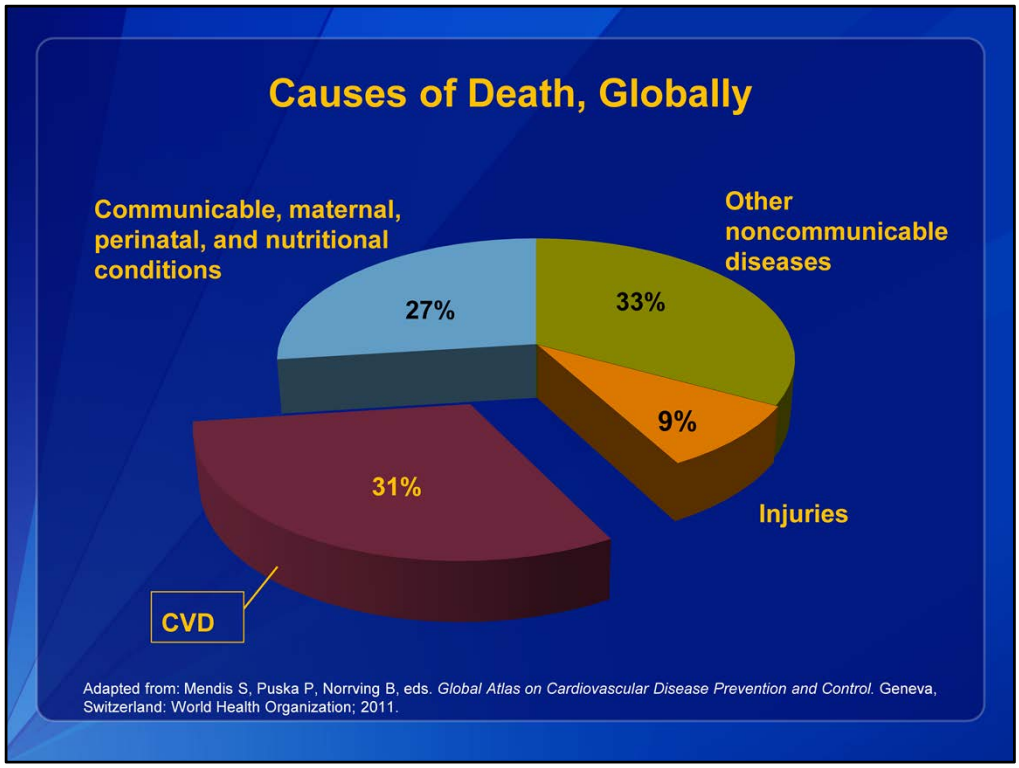
Please note that the examples and recommendations provided should be used for training purposes only and do not necessarily imply that they are appropriate for use in your country.

Background: Burden of CVD

- CVD, including high blood pressure, is the leading cause of preventable death worldwide.[2]
- In 2008, approximately 17.3 million people died from CVD, accounting for 30% of all deaths worldwide.[2]
- In the United States, more than 2 million adults have a heart attack or stroke each year; of those, more than 800,000 do not survive.[3]
- By 2030, an estimated 23.3 million people globally will die from CVD, mainly from heart disease and stroke.[4]

Cardiovascular disease, including hypertension, is the leading cause of preventable death worldwide.[2] In 2008, an estimated 17.3 million people died from cardiovascular disease, accounting for 30 percent of all deaths globally.[2] Of those deaths, approximately 7.3 million—or 42 percent—were caused by coronary heart disease, and 6.2 million—or 34 percent—were caused by stroke.[2]

In the United States, more than 2 million adults have a heart attack or stroke each year, and of those, more than 800,000 do not survive.[3] By 2030, an estimated 23.3 million people worldwide will die from cardiovascular disease, primarily from heart disease and stroke.[4]



This pie chart shows the distribution of causes of death worldwide in 2008. More than 60 percent of the world's leading causes of death were noncommunicable diseases in 2008.[5] These diseases include cardiovascular disease, such as heart disease, stroke, and hypertension; diabetes; cancers; chronic respiratory diseases; and mental disorders.

Blood Pressure Values[6,7]

Systolic mmHg (top number)		Diastolic mmHg (bottom number)	Category
Below 120	and	Below 80	Normal
120–139	or	80–89	Prehypertension
140–159	or	90–99	Stage 1 hypertension
160+	or	100+	Stage 2 hypertension

For the purposes of this module, blood pressure values are defined according to the National Heart, Lung, and Blood Institute's Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure and the clinical guidelines from the National Institute for Health and Clinical Excellence.

High blood pressure, or stage 1 hypertension, is defined as systolic blood pressure greater than or equal to 140 millimeters of mercury or diastolic blood pressure greater than or equal to 90 millimeters of mercury.[6,7]

Hypertension is caused by various risk factors; some are modifiable, and some are not.[8] Although genetics and family history cannot be changed, food- and physical activity–related behaviors and obesity are modifiable.

Despite the clinical definition for diagnosing hypertension, the relative risk for ischemic heart disease, stroke, and other cardiovascular diseases begins to rise when systolic blood pressure rises above 115 millimeters of mercury.[1] This points to the need to lower and control blood pressure even among individuals with "normal" blood pressure levels.

High Blood Pressure as a Risk Factor

Globally, hypertension is the leading risk factor for CVD mortality and morbidity.[9,10]

- **Heart disease**
- **Stroke**
- **Chronic kidney disease**
- **Neuropathy**

Globally, high blood pressure is the most important and preventable risk factor for cardiovascular disease death and disability. Hypertension is the largest risk factor for cardiovascular disease mortality, causing 47 percent of all heart disease deaths and 54 percent of all stroke deaths, accounting for nearly 14 percent of total mortality worldwide.[9,10]

High Blood Pressure Prevalence

- In 2008, the global prevalence of high blood pressure for adults over 25 years of age was around 40%.[5]
- Country- or region-specific prevalence of high blood pressure varies:
  - Canada: 22.7%[13]
  - China: 27%[14]
  - United States: 31%[11]
  - Latin America: 26%–42%[15–18]

From 1980 to 2008, the number of people worldwide with high blood pressure rose from 600 million to almost 1 billion; in 2008, the global prevalence of high blood pressure was nearly 40 percent among adults older than age 25.[5]

Although the same risk factors are important throughout the world, the reported prevalence and control of hypertension varies considerably among countries and geographic regions, with low- and middle-income countries having a greater risk of death due to high blood pressure than high-income countries.[9]

In the United States, nearly one in three adults has high blood pressure, and approximately 70 percent of adults who have had a first heart attack or stroke or who have heart failure also have hypertension.[11,12] Prevalence is similar in Canada and China.[13,14]

It is important to note that across Latin America, the prevalence of hypertension among adults ranges from 26 percent to 42 percent.[15–18] In most but not all countries, the risk for hypertension increases with age.[19] Without proper treatment and control of high blood pressure, this silent disease will continue causing preventable death and disability, worldwide.

Cost to Treat and Control High Blood Pressure

- In 2001, the cost to treat and control non-optimal blood pressure accounted for nearly 10% of the world's total health care expenditures.[20]
- The direct and indirect costs of high blood pressure are estimated to consume 5%–15% of the gross domestic product in high-income countries.[20]
- The largest cost burden falls to Eastern Europe and Central Asia, where treatment costs $25 billion, or nearly 23% of the region's total health care expenditures.[20]

In 2001, treatment of non-optimal blood pressure consumed at least 10 percent of the world's total health care expenditures.[20] Non-optimal blood pressure was defined as having a systolic blood pressure greater than 115 millimeters of mercury.[20]

It is projected that if high blood pressure remains untreated, the cost over 10 years could potentially be as high as $10 trillion U.S. dollars.[20] The direct and indirect costs of high blood pressure are estimated to consume 5 percent to 15 percent of the gross domestic product in high-income countries and 2.5 percent to 8 percent in low- and middle-income countries of Latin America and the Caribbean.[20] However, the largest economic cost burden falls on Eastern Europe and Central Asia, where the cost of hypertension is roughly $25 billion dollars—nearly 23 percent of the region's total health care expenditures.[20] Reducing sodium intake worldwide is estimated to cost between $0.04 cents and $0.32 cents per person per year in U.S. dollars.[21]

Cost to Treat and Control High Blood Pressure

- The United States spends an estimated $131 billion in direct medical costs each year to treat high blood pressure.[22]
- In 2007, the estimated direct and indirect costs to treat hypertension in Latin America were roughly $1.2 billion and $1.3 billion, respectively.[25]
- In China, medical costs make up between 4%–8% of the country's economy.[26]

The United States spends an estimated $131 billion dollars in direct medical expenses related to hypertension each year. Lost productivity from morbidity and premature mortality caused by high blood pressure costs an additional $25 billion dollars each year.[22]

With an estimated 1 in 3 U.S. adults with hypertension[12] and more than half of those cases not under control, total costs of cardiovascular disease in the United States are approximately $444 billion dollars each year.[22,23] A 2010 study suggested that a 10 percent increase in clinical preventive treatment of hypertension could prevent 14,000 premature deaths each year in U.S. adults aged 18 to 79 years.[24]

In Latin America, the estimated direct and indirect costs to treat hypertension in 2007 were approximately $1.2 billion and $1.3 billion dollars, respectively.[25]

Sodium Intake and Health

- Excessive sodium intake is a major cause of high blood pressure and causes more deaths than any other single dietary factor.[5,20,27–38]
- People are unaware of how much sodium they consume every day.[39]
- In the United States, 75% of sodium consumed comes from processed and restaurant foods.[39]
- In China and Japan, 75% of sodium consumed comes from cooking with high-sodium products.[27]

Nutrition Facts
Serving Size about 1/3 cup dry (57g)
1 cup prepared
Servings Per Container about 4

Amount Per Serving
Calories 190 Calories from Fat 0

	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 1190mg	50%
Total Carbohydrate 40g	13%
Dietary Fiber 5g	18%
Sugars less than 1g	
Protein 8g	

Vitamin A 4% • Vitamin C 10%
Calcium 4% • Iron 10%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Excessive sodium intake, through high blood pressure, is a major cause of cardiovascular disease death and disability worldwide.[5,20,27–38] Ten percent of cardiovascular disease is caused by consuming too much sodium.[20] When compared to other dietary risk factors, such as high intake of trans fatty acids, alcohol use, and low intake of fruits and vegetables, sodium causes more deaths than any other single dietary factor.[28]

Reducing average sodium intake is challenging because many people are unaware of how much sodium they consume each day.[39] More than 75 percent of sodium in the food supply has already been added to processed and restaurant foods.[39] In fact, foods that otherwise seem healthy may have high levels of sodium, such as cottage cheese and turkey breast deli meat. Some foods that you eat several times a day, such as bread, add up to a lot of sodium, even though each serving is not high in sodium.[39]

In some countries, such as China and Japan, approximately 75 percent of sodium intake comes from cooking with high-sodium products, such as soy sauce, miso, and fish sauce.[27] Sodium intakes also vary by region. For example, people living in the northern and northwestern areas of China consume significantly more sodium than do people from the southern regions.[40]

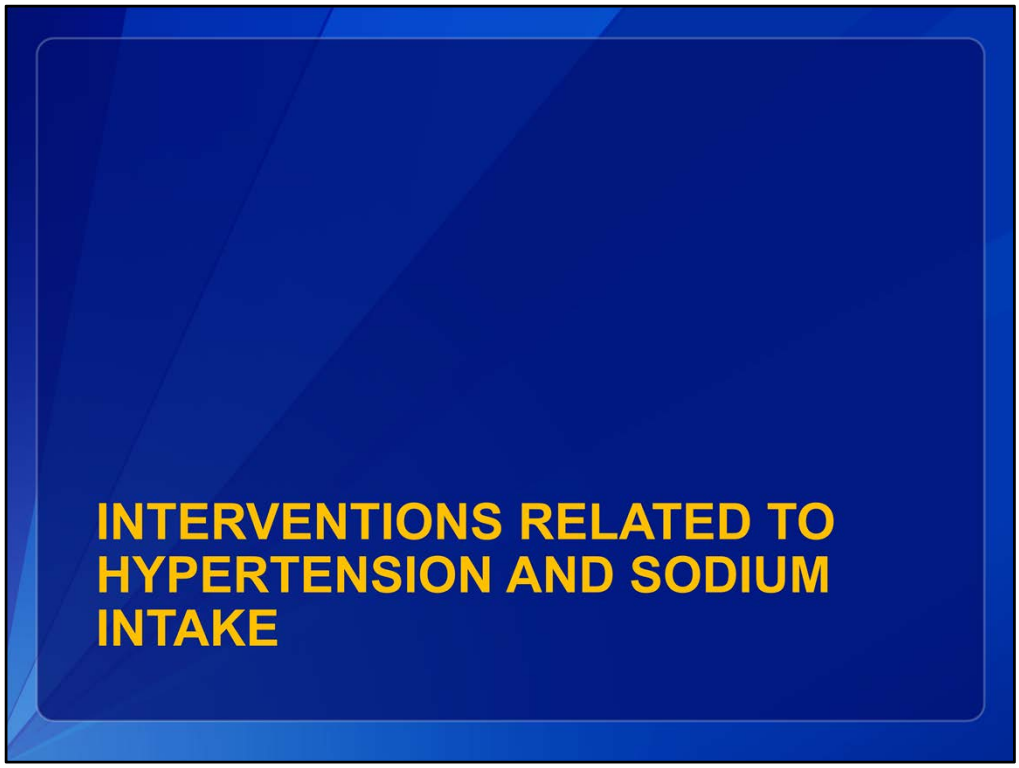
Estimated Savings with Reduced Sodium Intake

- **8.5 million deaths could be prevented over 10 years if sodium intake were reduced by 15%.[21]**
- **Reducing the average American's sodium intake to 2,300 mg per day by 2020 can result in[41]:**
  - A reduction of 11 million cases of hypertension.
  - A savings of $18 billion in annual health care spending.
  - A gain of 312,000 quality-adjusted life years.
- **In 18 Latin American countries, decreasing sodium intake by 10% could result in[43]:**
  - 593,000 fewer CVD events.
  - 54,000 fewer deaths.

The potential societal, economic, and medical savings for reducing hypertension and related cardiovascular disease through population-based sodium reduction strategies has been estimated.[20,21,41–43] Approximately 8.5 million deaths worldwide could be prevented over 10 years if sodium intake were reduced by 15 percent.[21]

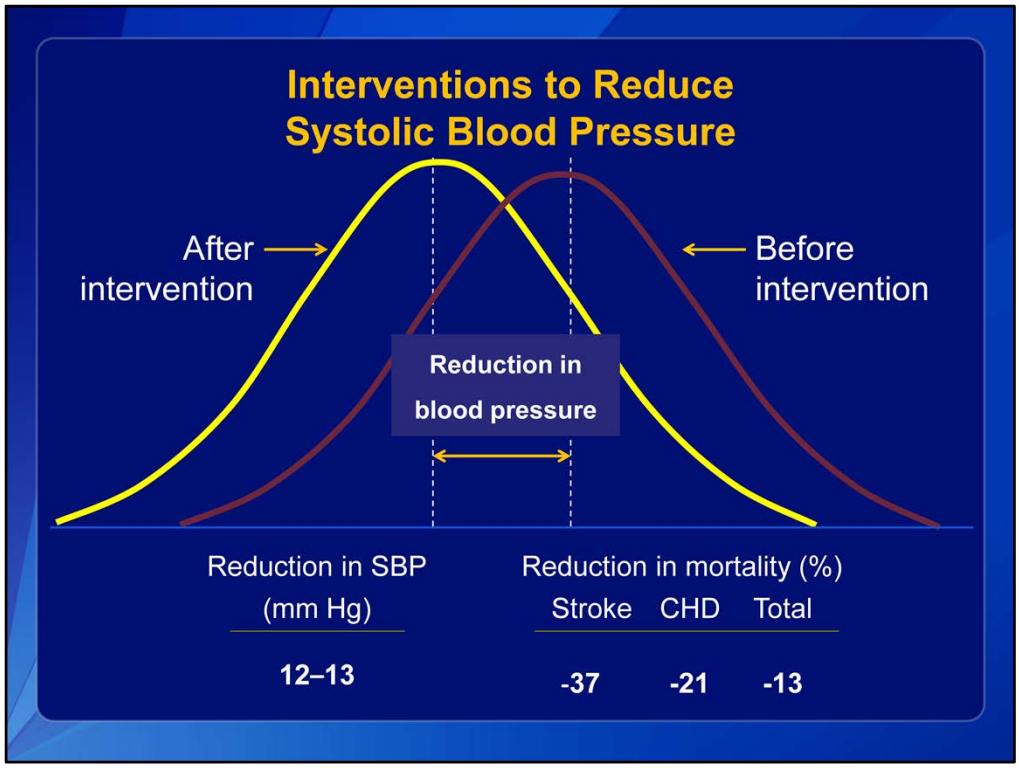
In the United States, adults consume about 3,300 milligrams of sodium per day.[41] Various trials and studies reveal that if the population reduced sodium intake to the recommended guidelines of no more than 2,300 milligrams per day, it could potentially prevent 11 million cases of hypertension, save $18 billion health care dollars, and gain 312,000 quality-adjusted life years annually.[41] Even fewer cases of hypertension and more health care dollars could be saved if sodium intake were further reduced to 1,500 milligrams per day.[41]

The following example underscores the public and economic impact that small reductions in sodium intake can have: If the average U.S. population intake of sodium were reduced by just 400 milligrams per day, it could prevent up to 28,000 deaths from any cause and save $7 billion health care dollars annually.[42] In 18 Latin American countries, decreasing sodium intake by 10 percent each year could prevent 593,000 cardiovascular events and save nearly 54,000 lives.[43]



Because sodium intake is directly related to high blood pressure, reducing dietary sodium consumption worldwide has the potential to be one of the most cost-effective, cost-saving strategies available to public health professionals.[21,44] A modest reduction in sodium intake has a significant effect on blood pressure among individuals with high or normal blood pressure levels.[21,44]

The next few slides will provide evidence of the association between high blood pressure and cardiovascular disease mortality, the association between high blood pressure and sodium intake, and interventions that can help reduce high blood pressure.

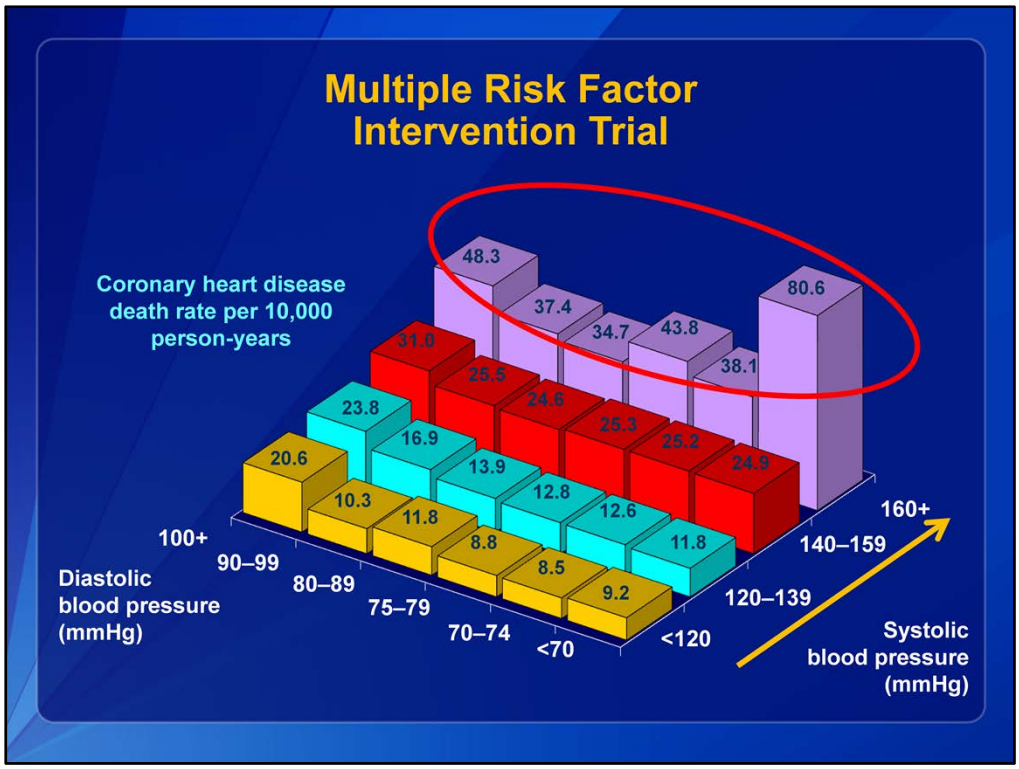


Population-based interventions can lower the overall distribution of systolic blood pressure.[45] This slide shows the impact that these interventions can have on blood pressure, which, in turn, reduces the rate of cardiovascular disease mortality.[45]

Reducing average population systolic blood pressure by only 12 to 13 millimeters of mercury could reduce stroke by 37 percent, coronary heart disease by 21 percent, cardiovascular disease mortality by 25 percent, and all-cause mortality by 13 percent.

There are several medical and nonmedical treatment options to control high blood pressure, including any combination of prescription medications, physical activity, and healthy diet, such as reduced sodium consumption and increased intake of fruits and vegetables.[8]

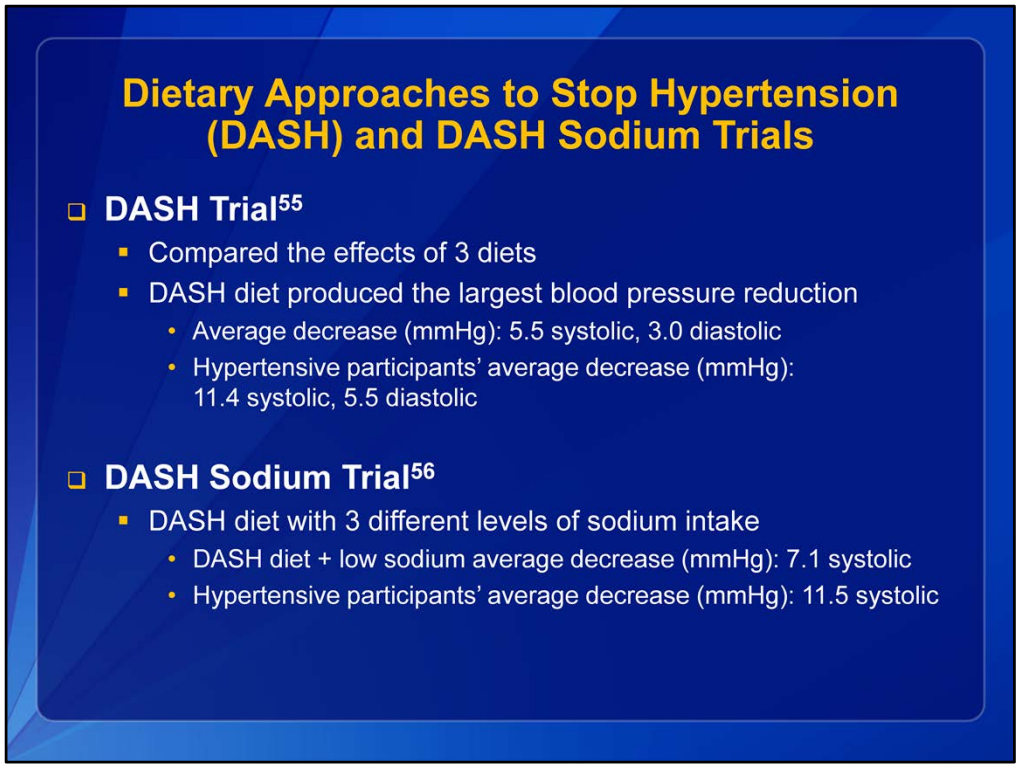
The United States, the United Kingdom, Finland, and the Asia-Pacific region have reported successful population-based interventions to lower systolic blood pressure.[5,8,45,46] In 2007, more than half of U.S. adults with self-reported hypertension said that they had been advised to reduce sodium intake; among those advised, the vast majority reported that they were currently reducing sodium intake.[47]



In the Multiple Risk Factor Intervention Trial, the effects of systolic and diastolic blood pressure levels on coronary heart disease and stroke mortality were examined among 316,099 non-Hispanic white men between the ages of 35 and 57 years. None of the participants had a history of previous heart attack.[48]

As you can see, systolic blood pressure was a stronger predictor of heart disease death than was diastolic blood pressure in all age groups. The highest risk was observed among men with the highest systolic blood pressure and the lowest diastolic blood pressure.

Similar results were reported for stroke-related deaths. During the nearly 12 years of follow-up, there were 733 stroke-related deaths. The risk for stroke increased as systolic blood pressure increased, including among men diagnosed with prehypertension.[45,49]



Interventions to reduce sodium intake are one of the most cost-effective public health strategies to prevent and control cardiovascular disease and high blood pressure.[21,28,44]

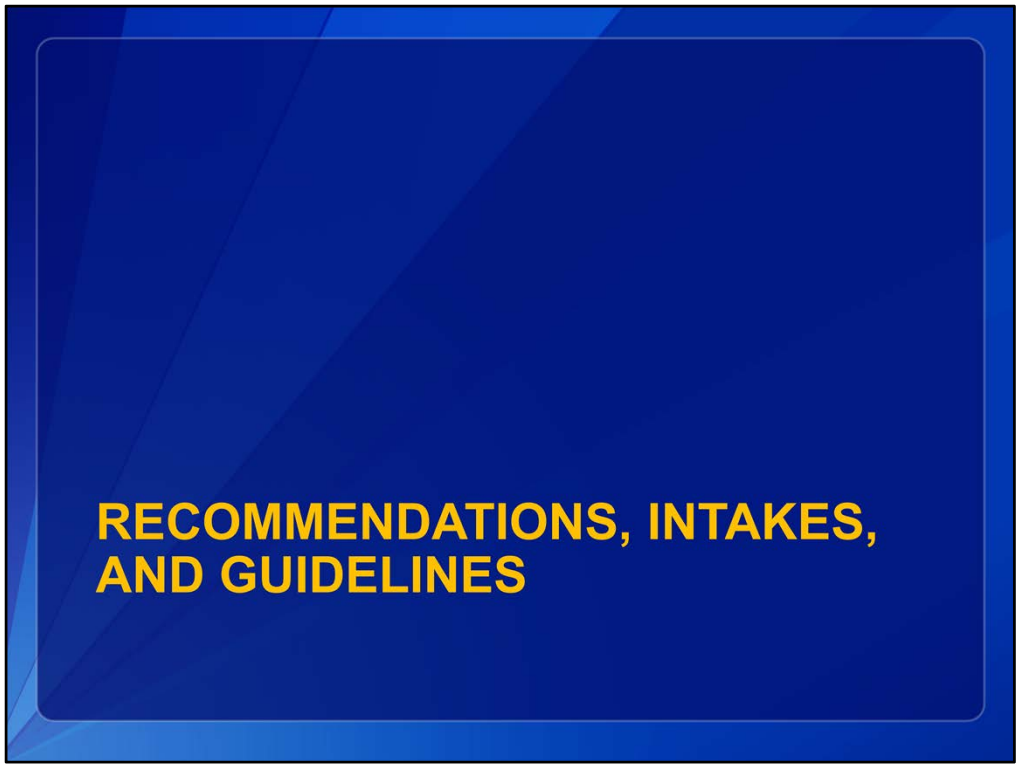
In Canada, it was reported that reducing intake of sodium to the current recommendations of 2,300 milligrams of sodium per day could reduce the prevalence of high blood pressure by 30 percent. The study showed that people with high blood pressure could improve or have normal blood pressure levels if they reduced their intake of sodium.[50]

The results of this study were comparable to other studies reporting on the effect of dietary improvements, such as sodium reduction, on blood pressure.[51–56] Two examples are the Dietary Approaches to Stop Hypertension, or DASH, Trial and DASH Sodium Trial.[55,56]

The DASH Trial evaluated the effects of three different diets: a Western diet; a fruits and vegetables diet; and a DASH diet rich in low-fat dairy, fruits, and vegetables and low in saturated fat, total fat, and cholesterol. Unlike the Western diet, which is lower in key nutrients like potassium, magnesium, and calcium, the DASH diet provides close to the 75th percentile of U.S. consumption of these nutrients as well as high amounts of fiber and protein. After 8 weeks, the DASH diet produced the largest average reduction of 5.5 millimeters of mercury for systolic blood pressure and 3.0 millimeters of mercury for diastolic blood pressure. Participants with hypertension experienced an average reduction of 11.4 millimeters of mercury for systolic blood pressure and 5.5 millimeters of mercury for diastolic blood pressure.[55]

The DASH Sodium Trial assessed the impact on blood pressure of the DASH diet with three different levels of daily sodium intake: 1,150 milligrams, 2,300 milligrams, and 3,450 milligrams. Greater blood pressure reductions were seen when the DASH diet was paired with reduced sodium compared to the DASH diet alone. The DASH diet along with a low level of sodium reduced average systolic blood pressure by 7.1 millimeters of mercury. Participants with hypertension experienced an average systolic blood pressure reduction of 11.5 millimeters of mercury.[56]

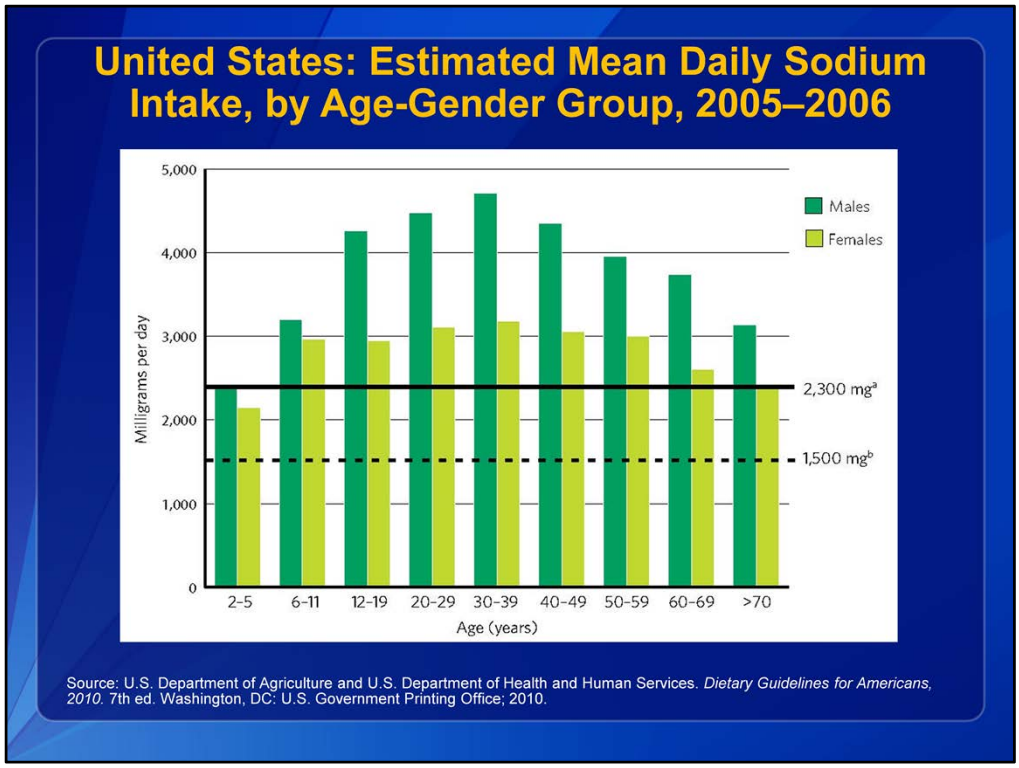
These data show that improving dietary patterns can help reduce blood pressure, and greater effects are observed when sodium reduction is part of a healthy diet.



Although specific recommendations and sodium intakes vary by country, excessive sodium intake is prevalent worldwide. To help reduce excessive sodium intake, recommendations have been set by various international and national governments as well as public health organizations.

Since 2002, the World Health Organization has recommended that populations reduce sodium intake.[57] To prevent cardiovascular disease, the World Health Organization's most current recommendation is that the global population limit intake to less than 2,000 milligrams of sodium, or 5 grams of salt, per person per day.[57,58]

This policy goal is directed to countries that already have national targets in place as well as to those countries needing guidance for setting sodium intake recommendations.[57,58] However, the latest global data show that average sodium intake varies from 2,000 milligrams to 7,200 milligrams per person per day.[59]



The average daily sodium intake for U.S. adults is 3,266 milligrams per person per day. The *2010 Dietary Guidelines for Americans* recommends that people aged 2 years and older reduce daily sodium intake to less than 2,300 milligrams. Persons who are 51 and older and those of any age who are African American or who have hypertension, diabetes, or chronic kidney disease should further reduce sodium intake to 1,500 milligrams. This lower limit applies to about half the U.S. population, including children, and the majority of adults.[60]

Despite these recommendations, about 9 out of 10 persons who should consume no more than 2,300 milligrams of sodium daily and virtually all persons who should consume 1,500 milligrams daily continue to consume more than the these levels. Even among children, the vast majority consume more sodium than recommended.

This chart shows that average intakes of sodium are well above 2,300 milligrams for all ages under 50 years, except the very youngest children, and far above 1,500 milligrams for all age groups, including adults older than 50 years who should consume no more than this level.

Recommendations and Actual Intakes: Canada and United Kingdom

Canada[61]

- **Recommendation:** People aged 14 years and older should consume no more than 2,300 mg of sodium per day.
- **Actual Intake:** Mean population intake is 3,400 mg of sodium per day.

United Kingdom[62]

- **Recommendation:** Sodium intake should be gradually reduced to a daily average of 2,400 mg of sodium (6 g of salt) per day.
- **Actual Intake:** Mean sodium intake for adults aged 19–64 years is approximately 3,240 mg per day.

Health Canada recommends people aged 14 years and older consume no more than 2,300 milligrams of sodium per day. Yet the average intake of sodium in the Canadian population is 3,400 milligrams.[61]

Similar data are seen in the United Kingdom. Despite the Department of Health's recommendation to reduce sodium intake to no more than 2,400 milligrams of sodium per day, approximately 7 out of 10 British adults consume an average of 3,240 milligrams per day—a similar average to that in the United States.[62]

Recommendations and Actual Intakes: Latin America and China

Latin America

- **Recommendations:** Vary between 2,000 mg and 2,400 mg of sodium per day.[63]
- **Actual intakes:**
  - Chile: 3,920 mg[64]
  - Brazil: 4,400 mg[65]
  - Argentina: 4,800 mg[66]

China

- **Recommendation:** Based on the WHO guideline of 2,000 mg of sodium per person per day.
- **Actual intakes:** Between 4,800 mg and 5,600 mg of sodium per day, depending on region.[67]

In Latin America and China, sodium consumption is well above the World Health Organization's recommendation of 2,000 milligrams per day per person.[63–67] In May 2012, China's Ministry of Health and other government departments called for reducing the country's per capita daily salt consumption to less than 9 grams as part of chronic disease prevention and control efforts. Additional examples of actions to reduce sodium in select countries and regions follow.[67]

A modest reduction in population sodium intake is one of the most cost-effective strategies to reduce the burden of high blood pressure and related cardiovascular disease death and disability worldwide.[28,68] Countries can monitor and evaluate population-based strategies aimed at reducing sodium intake as well as share best practices on monitoring and evaluating such strategies.

North America

United States	❑ U.S. Departments of Agriculture and Health and Human Services are working to assess the sodium content of the U.S. food supply.[69] ❑ New York City's National Salt Reduction Initiative is aiming to lower U.S. population sodium intake by 20% by 2014 through a 25% reduction in sodium in packaged, processed, and restaurant foods. ❑ Million Hearts™ is aiming to reduce population sodium intake by 20% through procurement policies to increase access to low-sodium foods and increased public and professional education about the health effects of excess sodium.
Canada	❑ The Codex Food Labeling Committee, a United Nations subsidiary group, proposed a global standard for mandatory nutrition labeling for adoption by the Codex Alimentarius Commission. [69]

In the United States, researchers from the U.S. Departments of Agriculture and Health and Human Services are working to assess the sodium content of the food supply in an effort to monitor changes in sodium content of foods and changes in population-level sodium intake over time.[69]

As of July 2011, public health authorities in Mexico, Canada, and the United States have set or are in the process of negotiating voluntary targets and timelines with the food industry in those countries. The food categories currently being addressed in each country can be divided into packaged and unpackaged foods.[70]

The National Salt Reduction Initiative, which began in New York City, is an initiative aimed to lower U.S. population sodium intake by 20 percent by 2014 through a 25 percent reduction in sodium in packaged, processed, and restaurant foods.

Million Hearts™ is a national initiative that aims to prevent 1 million heart attacks and strokes in the United States by 2017. It is co-led by the Centers for Disease Control and Prevention and Centers for Medicare and Medicaid Services within the U.S. Department of Health and Human Services, along with other government agencies and public- and private-sector partners. One of the goals of Million Hearts™ is to reduce population sodium intake by 20 percent through developing food procurement policies, increasing awareness and knowledge about the negative health effects of excess sodium intake, and sharing best practices for reducing sodium intake.

United Kingdom and Ireland

United Kingdom	❑ To help consumers in the United Kingdom reach the target of 2,400 mg of sodium per day, the government implemented a sodium reduction program that focused on[28]: ▪ Voluntary action by the food industry to reduce sodium in foods. ▪ Voluntary nutrition labeling on the front of food packages to inform consumers about the amount of sodium and other nutrients in foods. ▪ A public education campaign to increase awareness of the health effects of a high-sodium diet and provide information on how to reduce intake.
Ireland	❑ The Irish Heart Foundation recommends no more than 2,400 mg of sodium per day.[71]

To help consumers in the United Kingdom reach their target of 2,400 milligrams of sodium per day, the government implemented a sodium reduction program that focused on three areas[28]:

1. Voluntary action by the food industry to reduce sodium in foods,
2. Voluntary nutrition labeling on the front of food packages to inform consumers about the amount of sodium and other nutrients in foods, and
3. A public education campaign to increase awareness of the health effects of a high-sodium diet and provide information on how to reduce intake.

Latin America

Argentina	❑ In addition to the 2010 Menos sal, más vida (less salt, more life) campaign that focused on CVD prevention and the National Strategy for the Prevention and Control of Noncommunicable Diseases, the Ministry of Health already has successfully reduced the salt content of French bread and other bakery products by 25%.[72]
Chile	❑ The Ministry of Health developed a strategy to reduce sodium consumption and designed mass media campaigns to help the public understand the importance of reducing sodium intake. ❑ The country is working with the food industry to voluntarily reduce sodium content in packaged sausages and cheeses, artisanal bakery bread, and private label supermarket breads.[73]
Brazil	❑ The Ministry of Health developed a national plan for reducing salt consumption to help Brazilians achieve the recommended intake of 5 g of salt (2,000 mg of sodium) per day. ❑ As a result, mass media campaigns and a website about salt reduction are available to the Brazilian population.[74]

Across parts of Latin America, national governments are working to reduce sodium intake by developing strategies to reduce sodium consumption as well as mass media campaigns to address the importance of sodium reduction. They are also working with the food industry to reduce sodium content in foods.

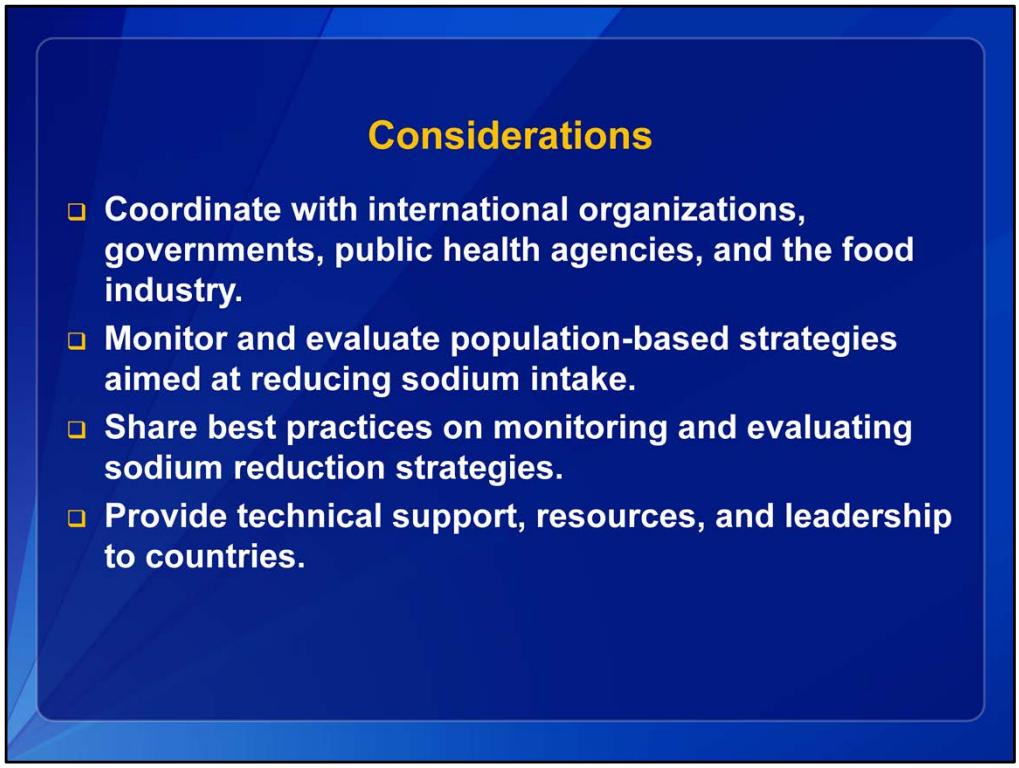
As of July 2011, national public health authorities in Argentina, Chile, and Brazil have set or are in the process of negotiating national voluntary targets and timelines with the food industry in those countries.[72–74]

China and Japan

China	❑ In 2008, voluntary nutrition labeling guidelines for packaged foods included levels of sodium per 100 g, per 100 ml, or per serving. ❑ Nutrition labeling also included sodium content as a percentage of the nutrient reference value. ❑ In 2007, the Beijing Municipal Health Bureau provided measuring teaspoons so residents could see the maximum recommendation for sodium intake.[75]
Japan	❑ The Japanese Hypertension Society published new recommendations to reduce average sodium intake from 2,800 mg of sodium per day to 2,400 mg. ❑ The Society has published booklets, such as "How to measure salt intake in clinic," "What is the rationale behind recommending hypertensive patients to reduce their salt intake?" and "Cooking booklet to maintain 6g salt per day."[76]

Because the majority of sodium intake in China comes from adding salt during cooking and from food products high in sodium, the country's focus has been on strategies to reduce sodium intake at home, including promotion of salt substitutes and a calibrated measuring spoon to help consumers recognize how much sodium is added to their meals.[75]

Japan is focusing on lowering sodium intake by educating the public through informational booklets, including the following titles: "How to measure salt intake in clinic," "What is the rationale behind recommending hypertensive patients to reduce their salt intake?" and "Cooking booklet to maintain 6g salt per day."[76]



Countries can monitor and evaluate population-based strategies aimed at reducing sodium intake as well as share best practices on monitoring and evaluating such strategies.

Coordination among international organizations, governments, public health agencies, and the food industry can be critical to effectively reducing sodium intake among populations. For example, the World Health Organization, its regional offices, such as the Pan American Health Organization, and national governments can provide technical support, resources, and leadership to countries that want to advance sodium reduction strategies. Public health agencies and academia can support sodium reduction efforts as well as facilitate and increase public awareness of the need to reformulate products with lower sodium.

By making lower sodium products more widely available in high-, middle-, and low-income countries, the food industry, including food manufacturers and restaurants, can improve population health worldwide. Voluntary agreements made by the food industry to gradually reduce the sodium content in packaged and restaurant foods can have a tremendous impact on reducing population-based sodium intake.

Potential actions include:

- Joining voluntary initiatives to reduce sodium, such as New York City's National Salt Reduction Initiative.[77]
- Providing choices to consumers to help them reduce sodium intake. For example, increase the amount and availability of lower sodium foods, ask food manufacturers to reformulate foods with reduced sodium content, and gradually reduce the amount of sodium added to packaged and restaurant foods.
- Provide nutrition labels, including sodium content, for packaged and restaurant foods.

Top 10 Resources

1. Roger VL, Go AS, Lloyd-Jones DM, Adams RJ, Berry JD, Brown TM, et al. Heart disease and stroke statistics—2011 update: a report from the American Heart Association. Circulation. 2011;123:e18–209.
2. Health Canada. Sodium in Canada Web site. www.hc-sc.gc.ca/fn-an/nutrition/sodium/index-eng.php. Accessed February 4, 2013.
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4. National Heart, Lung, and Blood Institute. High Blood Pressure Web site. www.nhlbi.nih.gov/health/health-topics/topics/hbp/atrisk.html. Accessed February 4, 2013.
5. New York City Department of Health and Mental Hygiene. National Salt Reduction Initiative Web site. www.nyc.gov/html/doh/html/diseases/salt.shtml. Accessed February 12, 2013.

The resources included here provide additional background about sodium's impact on health.

Top 10 Resources

6. World Health Organization and Pan American Health Organization. *Expert Group for Cardiovascular Disease Prevention Through Population-wide Dietary Salt Reduction: Final Report*. Pan American Health Organization Web site. 2011. http://new.paho.org/hq/index.php?option=com_content&task=view&id=2015&Itemid=1757. Accessed February 4, 2013.
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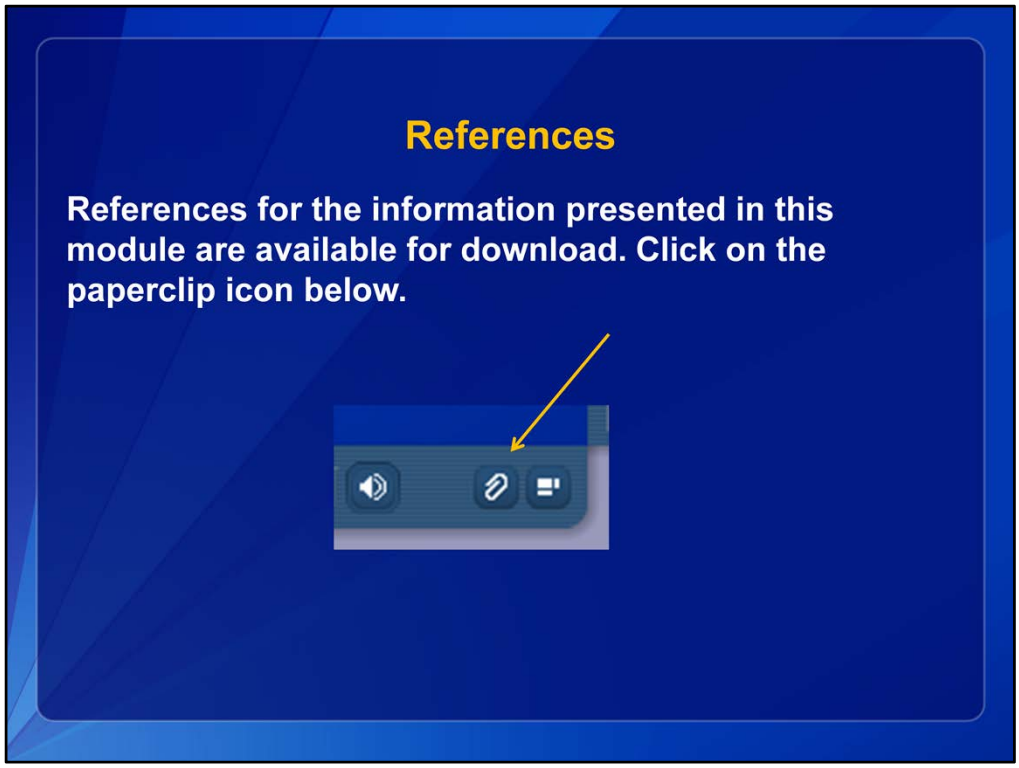
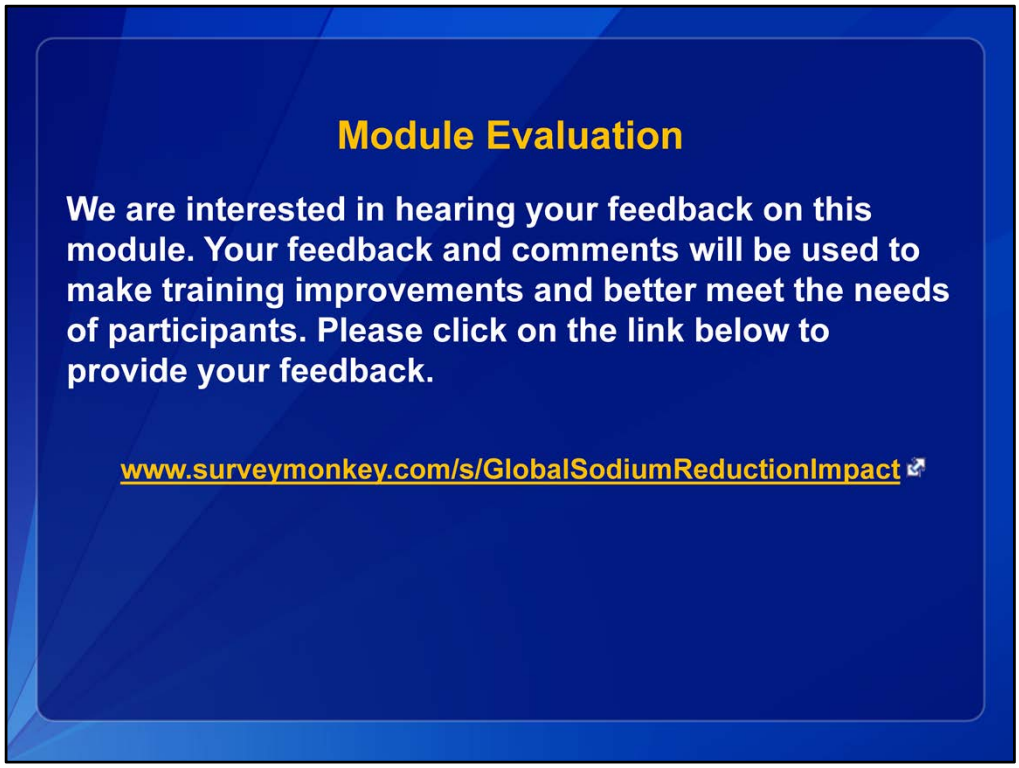


References for the information presented in this module are available for download. Click on the paperclip icon below.



This concludes the Global Impact of Sodium on Health module. Please review the other modules to learn more about strategies for reducing sodium intake in your country.

We are interested in hearing your feedback on this module. Your feedback and comments will be used to make training improvements and better meet the needs of participants. Please click on the link below to provide your feedback.

Global Impact of Sodium on Health: References

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