



# Excess Dietary Sodium: Impact on Hypertension and Health Outcomes

Presenters name  
Institution

Updated 2014

# Overview

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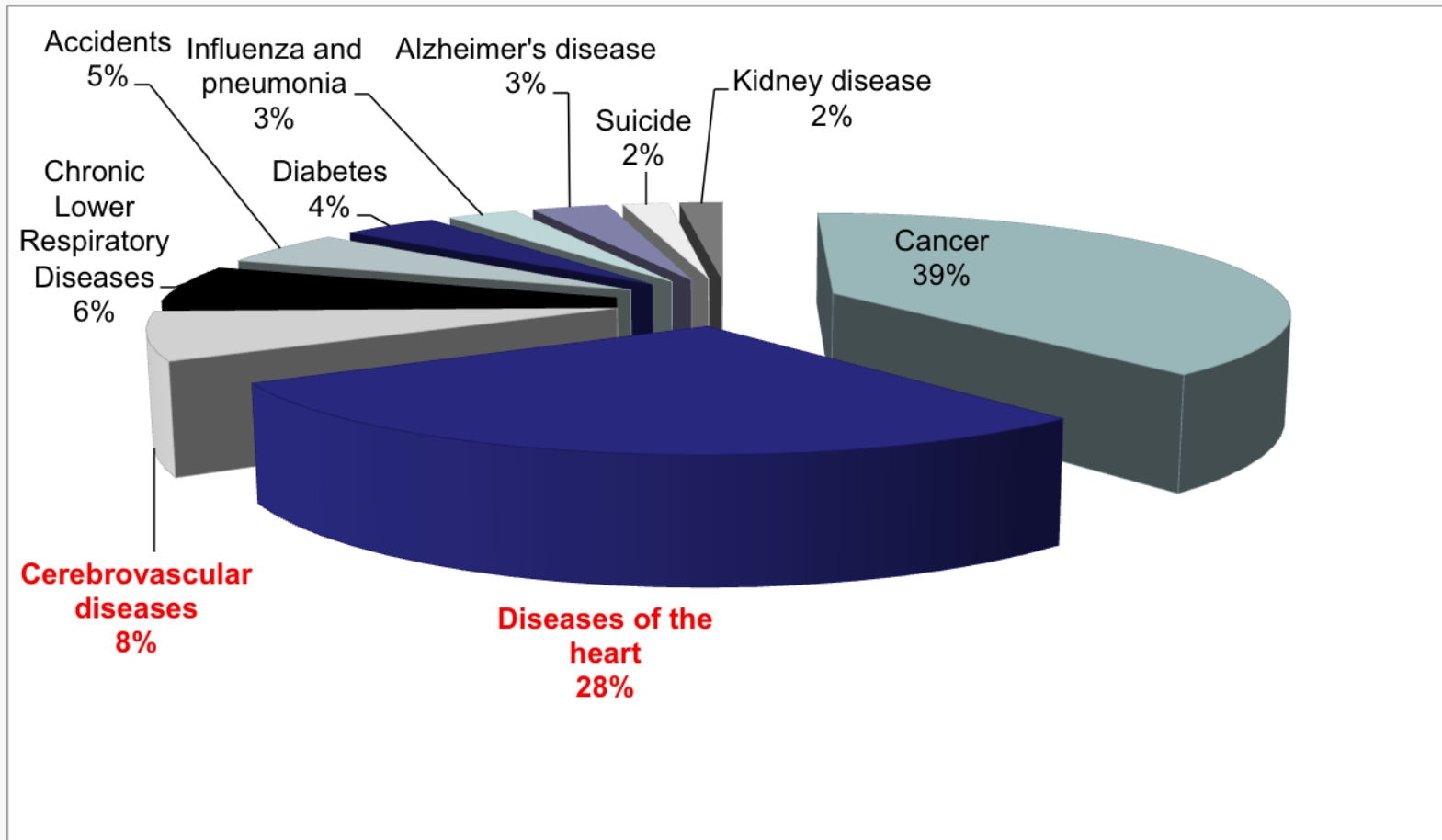
- Hypertension : a leading risk factor for death and disability
- High sodium intake is an important determinant of hypertension and hypertension-related complications
- How much sodium do we need?
- A reduction in dietary sodium intake reduces blood pressure and reduces hypertension-related complications

# Hypertension as a Risk Factor

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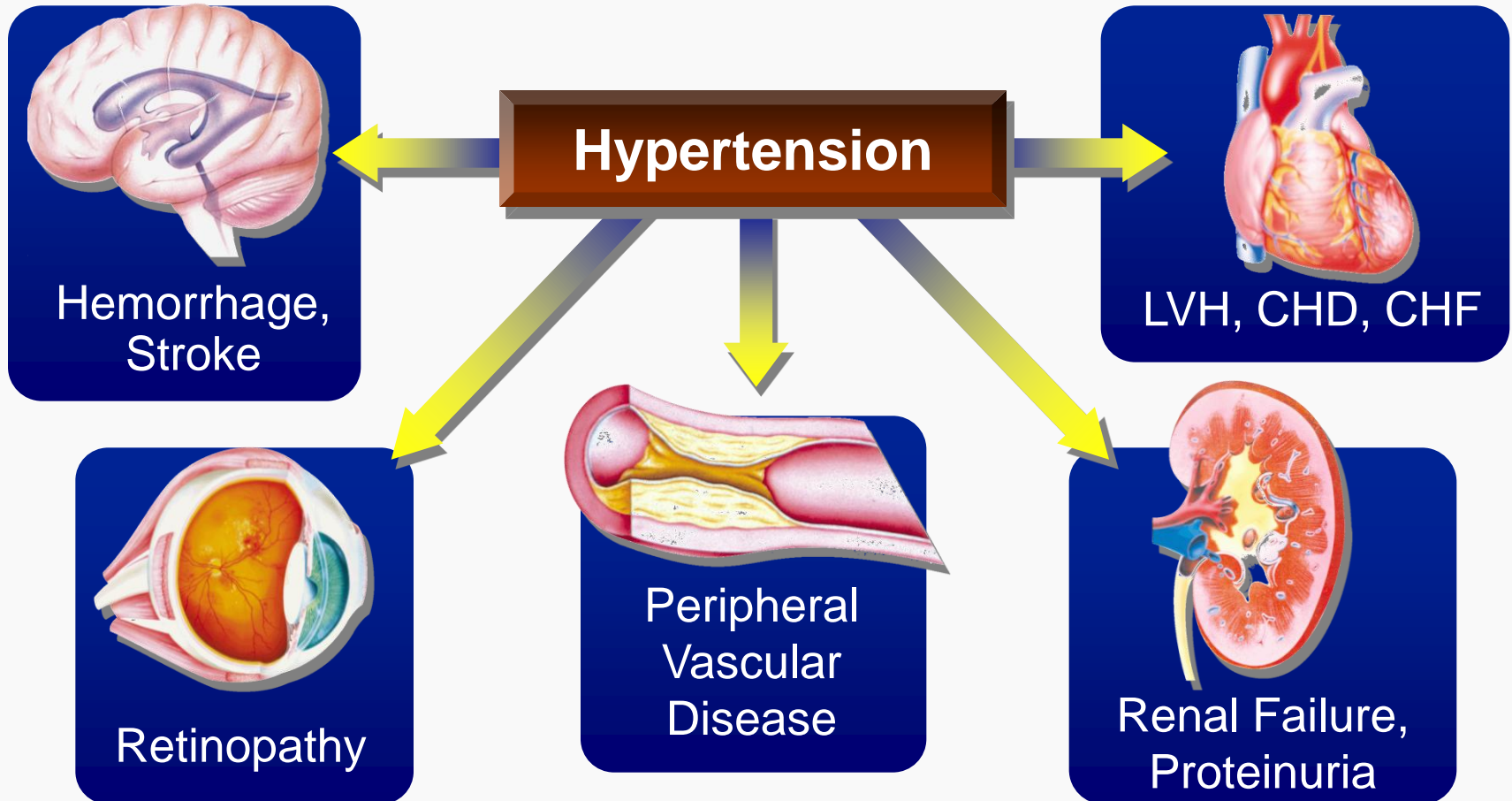
- Hypertension is a significant risk factor for:
  - cerebrovascular disease
  - coronary artery disease
  - **heart failure**
  - renal failure
  - **peripheral artery disease**
  - dementia
  - atrial fibrillation
  - retinopathy

# Leading causes of death, Canada, 2007, males and females combined



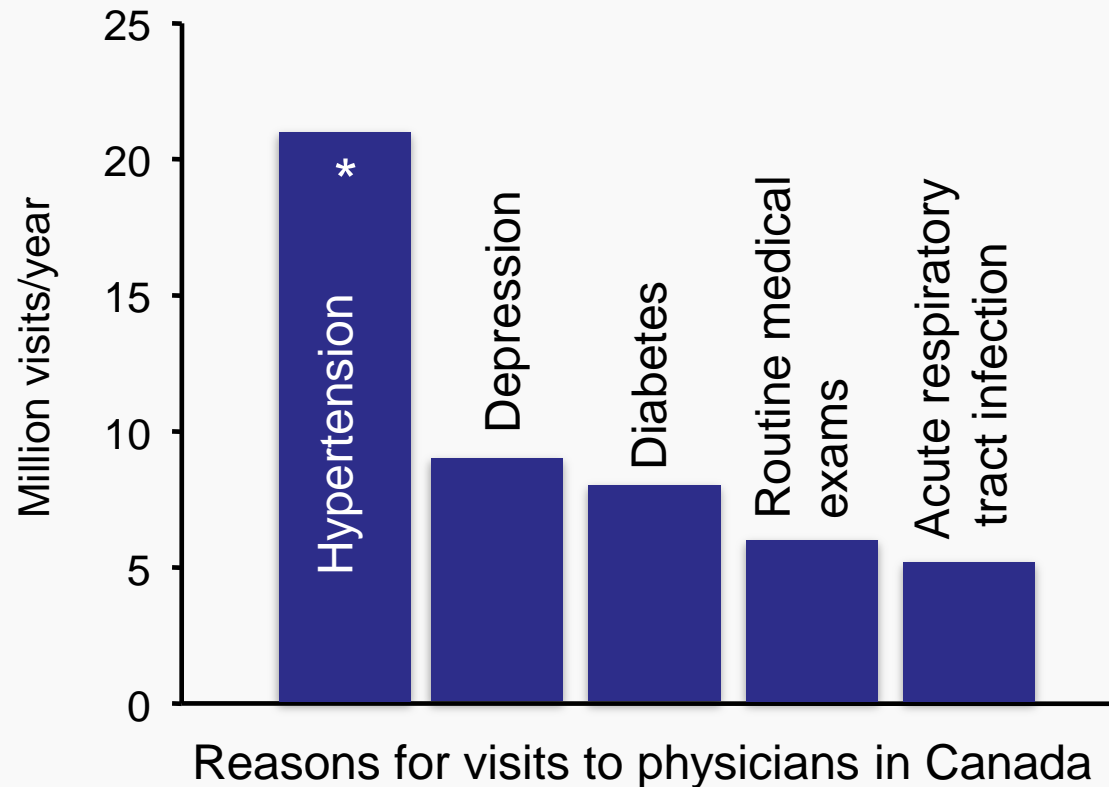
Adapted from: Ten leading causes of death, Canada, 2007. Statistics Canada

# Organ damage related to hypertension



CHD = coronary heart disease ; CHF = congestive heart failure; LVH = left ventricular hypertrophy

# Hypertension is prevalent and costly



\* Antihypertensives are one of the most expensive drug categories

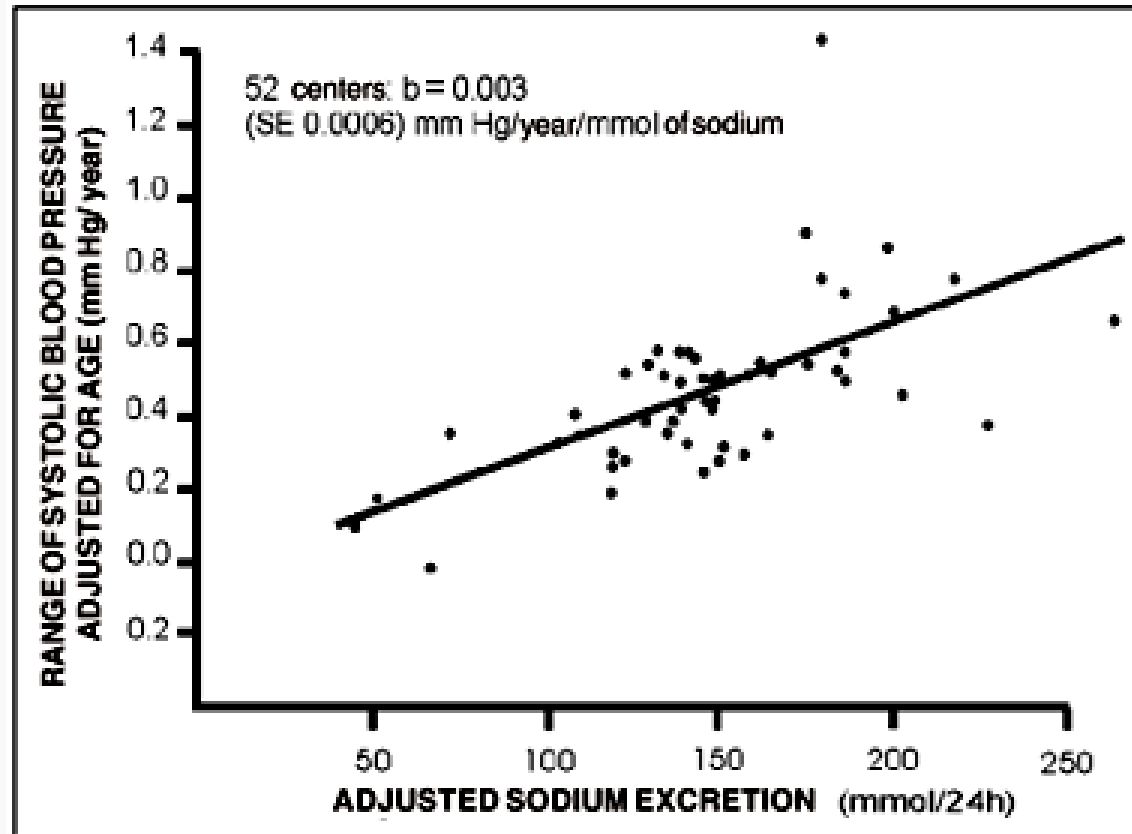
# Risk factors for hypertension

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- **High dietary sodium intake**
- Obesity
- High alcohol intake
- Sedentary **lifestyle**
- Smoking
- Inadequate vegetable and fruit intake
- Inadequate milk product intake

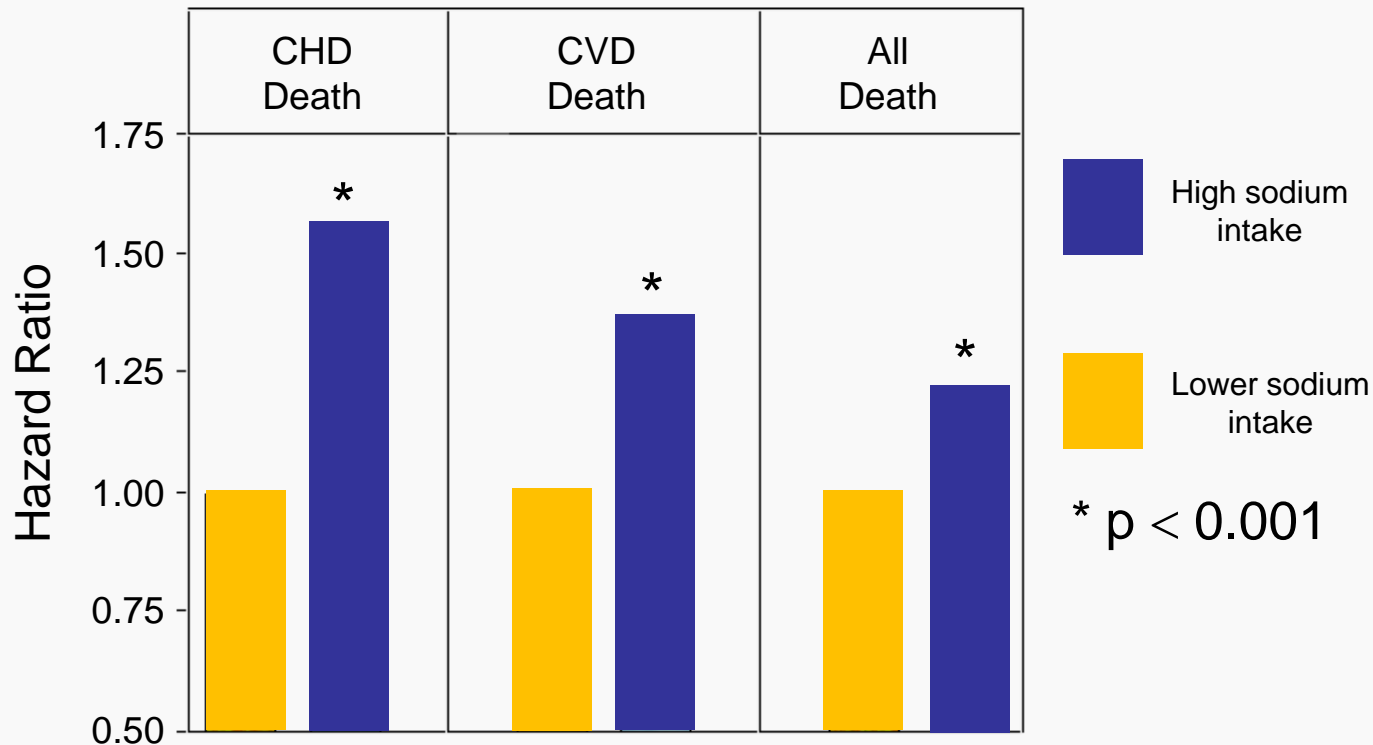
# Systolic blood pressure and urinary sodium excretion

## The INTERSALT Study





# High sodium intake increases risk of complications in hypertensive patients



# In summary

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- High dietary sodium intake has significant effects on blood pressure and on blood pressure-related complications
- Hypertension is a leading risk factor for death and disability
- Hypertension is a major cardiovascular risk factor
- Hypertension is very prevalent and has a large impact on health care resource use

# Dietary sodium intake for adults

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- **In Canada** ,1500 mg/day (age dependant) is estimated to be adequate (Adequate Intake or AI)
  - 2300 mg/day is above the upper limit recommended for health (Upper limit; UL)

# Recommendations for daily sodium intake

## The 2014 Canadian Hypertension Education Program (CHEP) recommends:

To decrease blood pressure, consider reducing sodium intake towards 2,000 mg (5g of salt or 87mmol of sodium) per day

- 1/2 tsp of salt has about 1,150 mg of sodium



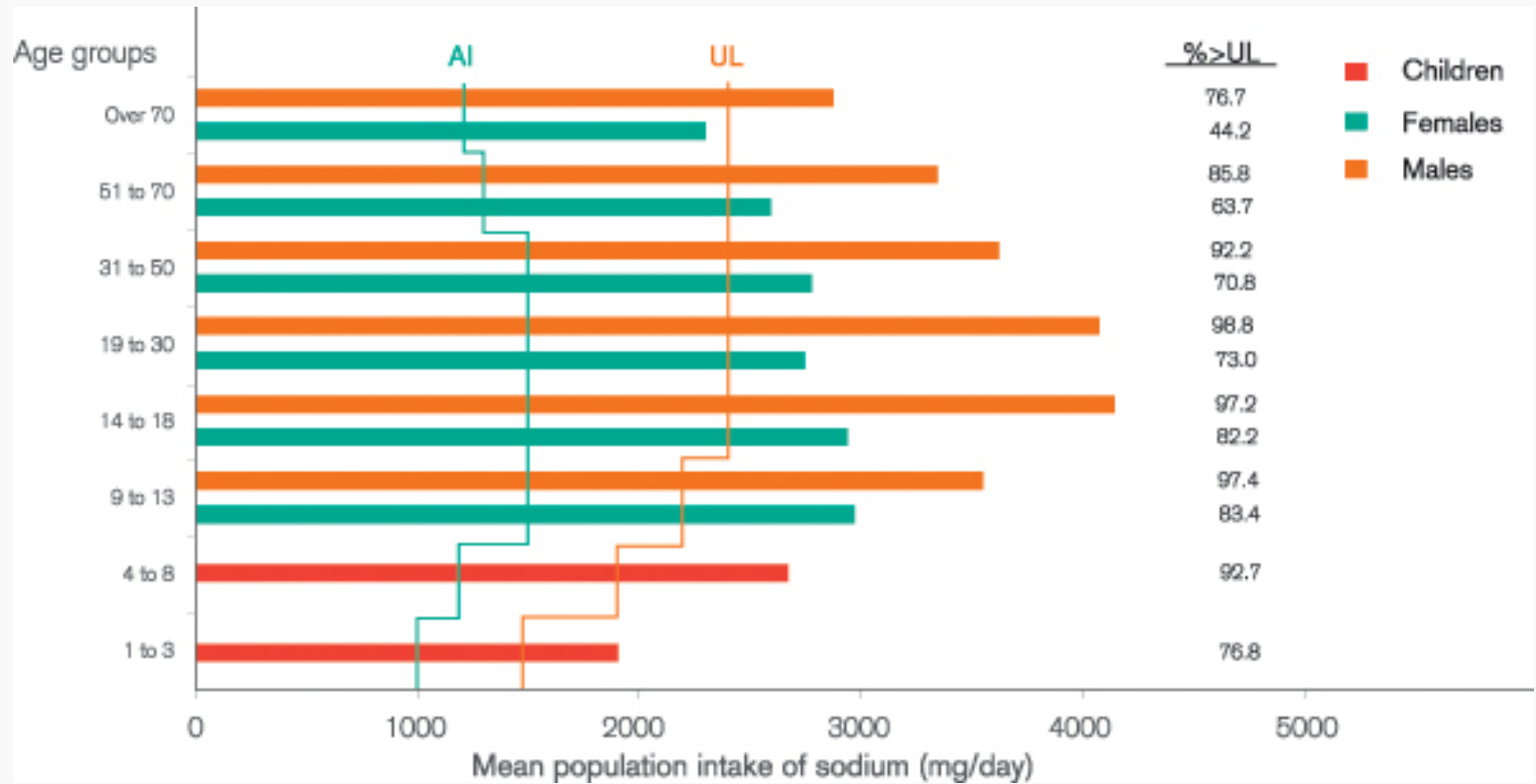
- 80% of average sodium intake is in processed foods
- Only 10% is added at the table or in cooking

# Sodium intake of Canadian adults

	<b>Age Group (years)</b>	<b>Average daily sodium intake (mg)</b>
<b>Adults</b>	20 to 39	3,370
	40 to 59	3,128
	>60	2,688
<b>Men</b>	20 to 39	3,906
	40 to 59	3,544
	>60	3,039
<b>Women</b>	20 to 39	2,845
	40 to 59	2,700
	>60	2,398

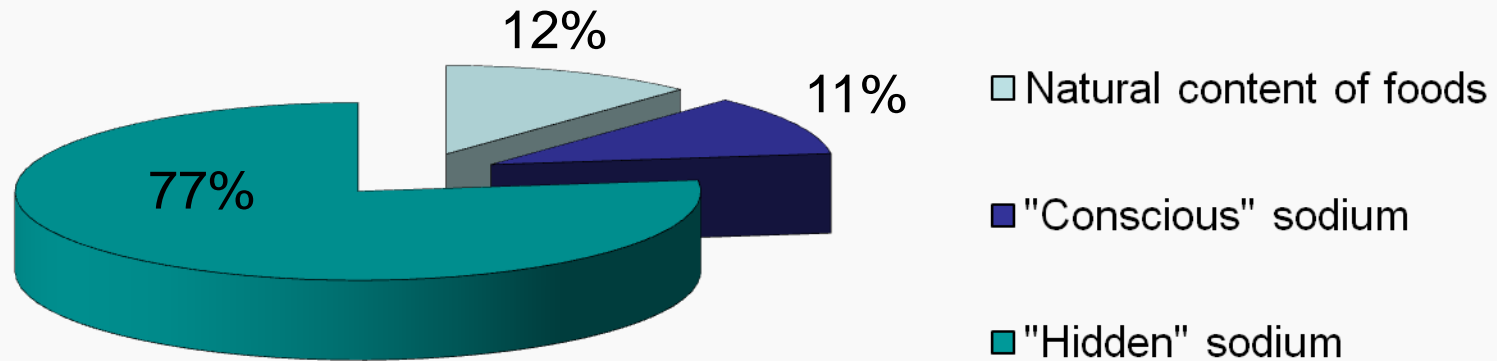
Underestimate of 10-20% as based on questionnaire  
and does not include sodium added in cooking or at the table

# Average usual intakes from food - Canada



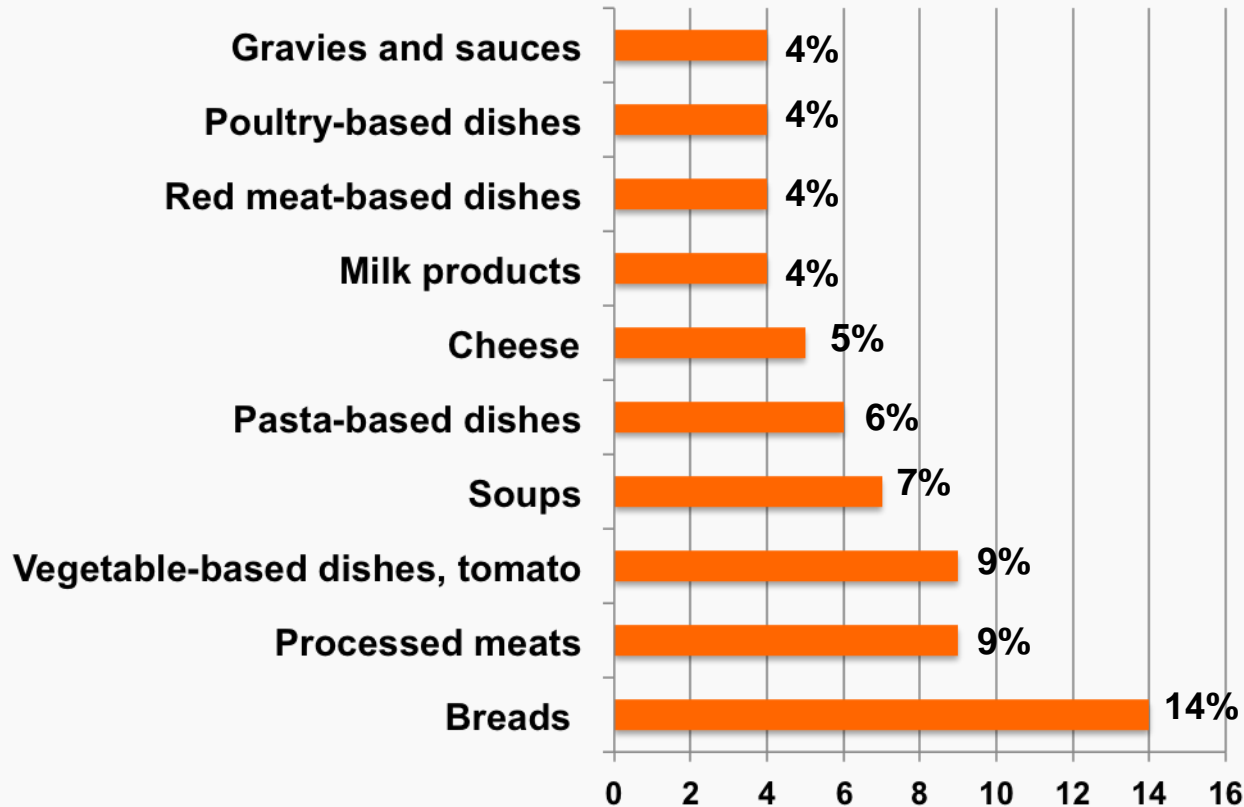
The majority of Canadian adults exceeds the tolerable limit of 2300 mg/d

# Most of the sodium in our diet comes from processed food!



- 12% natural content of foods
- “Hidden“ sodium: 77% from processing of food –manufacturing and restaurants
- “Conscious“ sodium: 11% added at the table (5%) and in cooking (6%)

# Major food group contributors to sodium intake



Some of these foods are high in sodium but consumed in lower amounts, like processed meats and gravies and sauces, while others are lower in sodium but are eaten in higher amounts, like breads.



# Reading the Nutrition Fact Label

## Nutrition Facts

Serving Size: 1 cup

### Amount Per Serving

**Calories** 70      **Calories from Fat** 18

**% Daily Value\***

**Total Fat** 2 g      **3%**

Saturated Fat 0.5 g      **2%**

Trans Fat 0 g

**Cholesterol** 15 mg      **5%**

**Sodium** 870 mg      **36%**

### Potassium

**Total Carbohydrate** 10 g      **3%**

Dietary Fiber 1 g      **4%**

Sugars 0 g

Sugar Alcohols

**Protein** 4 g

**Vitamin A** 500 IU      10%

**Vitamin C** 0 mg      0%

**Calcium** 0 mg      0%

**Iron** 0.72 mg      4%

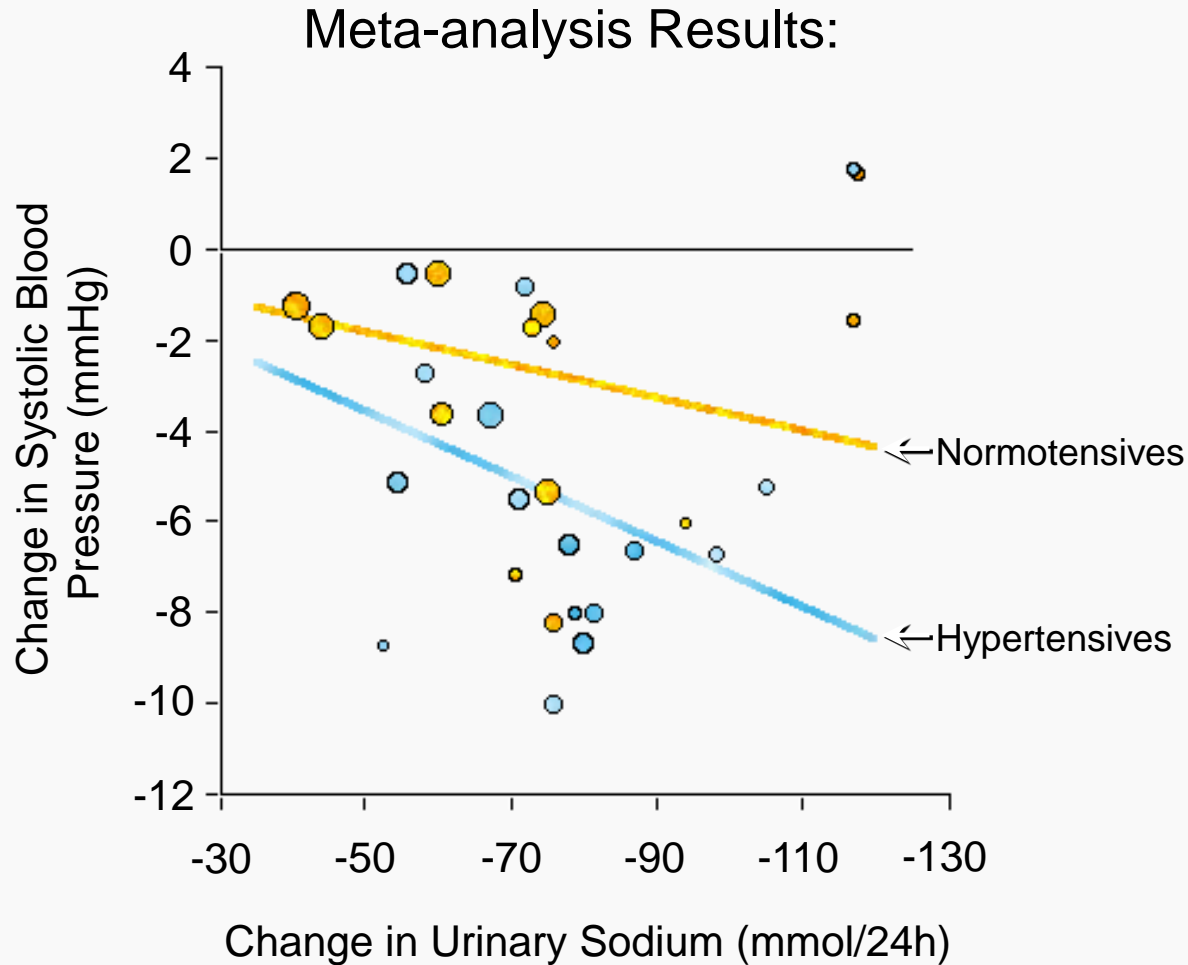
Example:

## CampbellsMicrowavable Bowls Chicken Noodle Soup

### Read the information on food packages

- Buy unsalted and lower sodium foods whenever possible. Look for words such as “sodium-free”, “low sodium”, “reduced sodium,” or “no added salt” on the package.
- Compare food labels. Buy the products with the lowest amounts of sodium.
- Look for foods that contain less than 360 mg of sodium per serving.

# Lower sodium reduces SBP



# Sodium: Meta-analyses

## Average Reduction of sodium in mg/day

1800 mg/day

2300 mg/day

## Hypertensives Reduction of BP

5.1 / 2.7 mmHg

7.2/3.8 mmHg

## Average Reduction of sodium in mg/day

1700 mg/day

2300 mg/day

## Normotensives Reduction of BP

2.0 / 1.0 mmHg

3.6/1.7 mmHg

# Health care cost savings in Canada by reducing dietary sodium

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Using the Cochrane review data:  
a reduction in average dietary sodium intake by  
1800 mg/d (from 3500 mg to 1700 mg in Can.)  
would result in:

- 1 million fewer hypertensive Canadians
- Almost double the BP treatment and control rate
- Hypertension care cost savings of \$430 to 538 million /yr

# Impact of reducing BP through dietary sodium in Canada

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## Modelling Results:

- Annual Reduction in incidence of
  - Myocardial infarction (5%)
  - Strokes (13%)
  - Heart Failure (17%)
- Reduction in health care costs associated with the overall predicted 8.6% reduction CVD
  - \$1.7 billion per year (1998 costs)

# Observed effect of lower sodium intake on cardiovascular events in Trials of Hypertension Prevention (TOHP trials)

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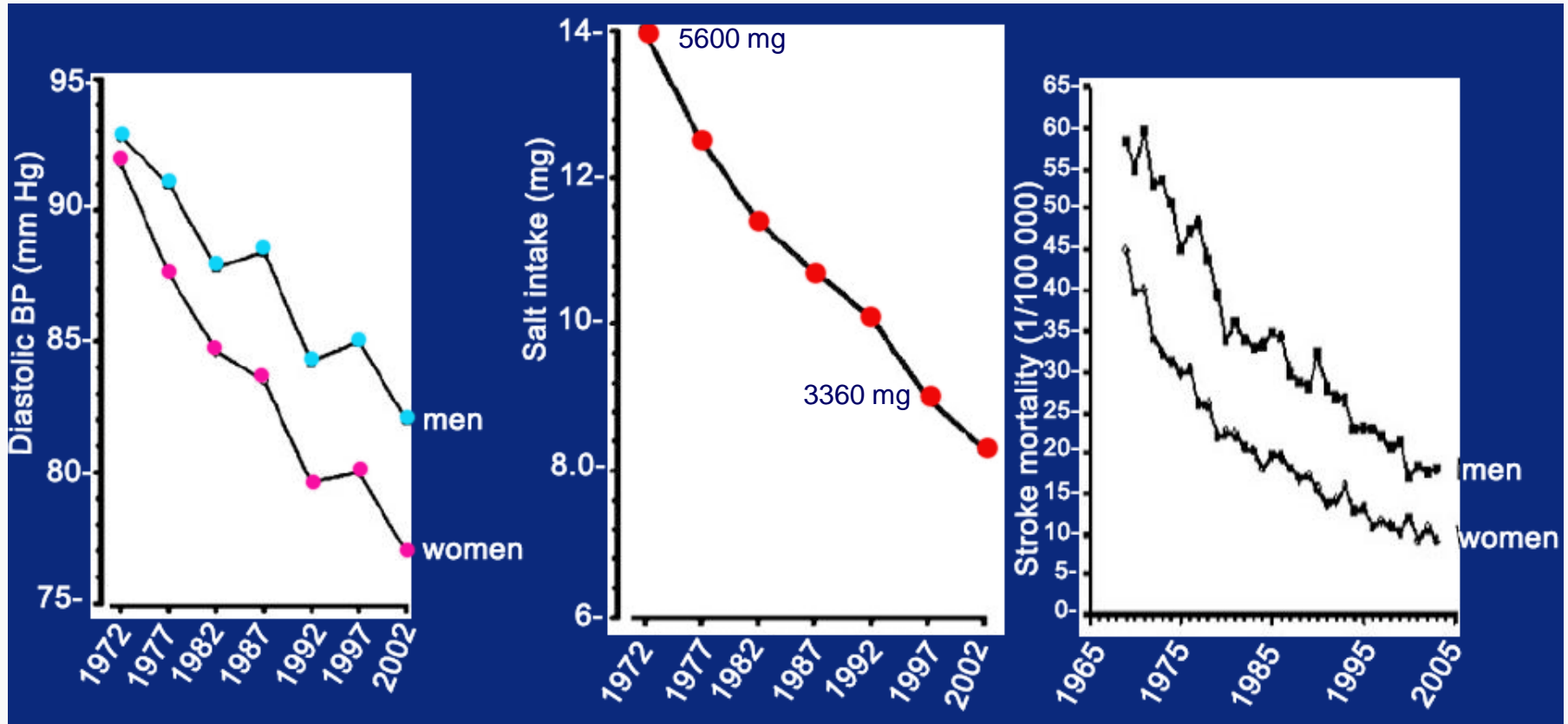
- 25-30% lower risk of cardiovascular events in those who had been in the low sodium groups (pre-hypertensive patients)
- 759-1012 mg/day reduction in dietary sodium during intervention

# Success stories for reducing dietary sodium

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- Finland (1970)
- UK (1996)
  - Food Standard Agency
  - CASH – Consensus action on salt and health
- WASH (2005) – World Action on Salt and Health

# Changes in DBP, sodium intake and stroke deaths in Finland



DBP

Sodium

Stroke



# Global initiatives

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- Success of **World Action on Salt and Health (WASH)** raising public, political and manufacturers' awareness.
- WHO's statement on *“Reducing salt intake in populations”*.
- Major global food and beverage manufacturers agreed to cut salt in their foods products.
- World Hypertension Day 2009. Theme: *“Salt and Hypertension”* – a massive global public health campaign to reduce dietary salt through a variety of initiatives including food sector and other stakeholders' participation.

# In summary

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- Lower sodium consumption decreases blood pressure
- Lower sodium consumption decreases hypertension-related complication rates

# Key messages

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- Sodium is an important contributor to high blood pressure
- Reducing sodium reduces blood pressure and prevents cardiovascular disease
- Canadian sodium intake is higher than the recommended levels for health
- Policies to reduce population sodium intake can be effective

# Where can I get resources?

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- [www.sodium101.ca](http://www.sodium101.ca)
  - Hypertension website
  - [www.hypertension.ca](http://www.hypertension.ca)
  - Dial a dietitian
  - [www.dialadietitian.org](http://www.dialadietitian.org)
  - Dietitians of Canada
  - [www.dietitians.ca](http://www.dietitians.ca)
  - Consensus Action on Salt & Health (CASH)
  - [www.actiononsalt.org.uk](http://www.actiononsalt.org.uk)
  - World Action on Salt & Health (WASH)
  - [www.worldactiononsalt.com/](http://www.worldactiononsalt.com/)
  - World Health Organization (WHO)
  - [www.who.int/dietphysicalactivity/reducingsalt/en](http://www.who.int/dietphysicalactivity/reducingsalt/en)
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