

Sodium/Salt and Health – Overview of Sodium needs and health effects of high sodium intake

*WHO Pre-CCNFSDU Workshop on
sodium/salt and sugars
Sunday, October 31, 2010, 9.00 – 17.00*

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Sodium/Salt and Health - Outline



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➤ Understand the issues;
sound scientific basis for
action

- What is sodium? Salt?
- Dietary requirements /
UL for sodium
- Sodium intakes
- The health context



Sodium/Salt – some basic facts

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- ❑ Sodium is an essential nutrient for human life
- ❑ The major source of sodium in the diet is sodium chloride (NaCl), better known as salt.
- ❑ Sodium also comes from sodium-based food additives such as baking powder, baking soda, nitrites, MSG etc.
- ❑ Salt plays several important roles in the taste, functional attributes, and preservation of food
- ❑ Historically, salt was traded as a valuable commodity and wars were fought over access to salt because of its ability to preserve food and store it for long periods



Salt – some facts and figures

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SOME SALT FACTS AND FIGURES

- salt is the common name for sodium chloride
- 1 g salt contains 393 mg or 17 mmol of sodium
- 1 g (1,000 mg) of sodium equals 43.5 mmol
- 1 mmol of sodium equals 23 mg
- 1 mmol of sodium equals 1 mEq
- 2,300 mg of sodium are present in about 1 teaspoon of salt

5g salt (NaCl) = 2,000 mg sodium

Dietary Requirements for sodium



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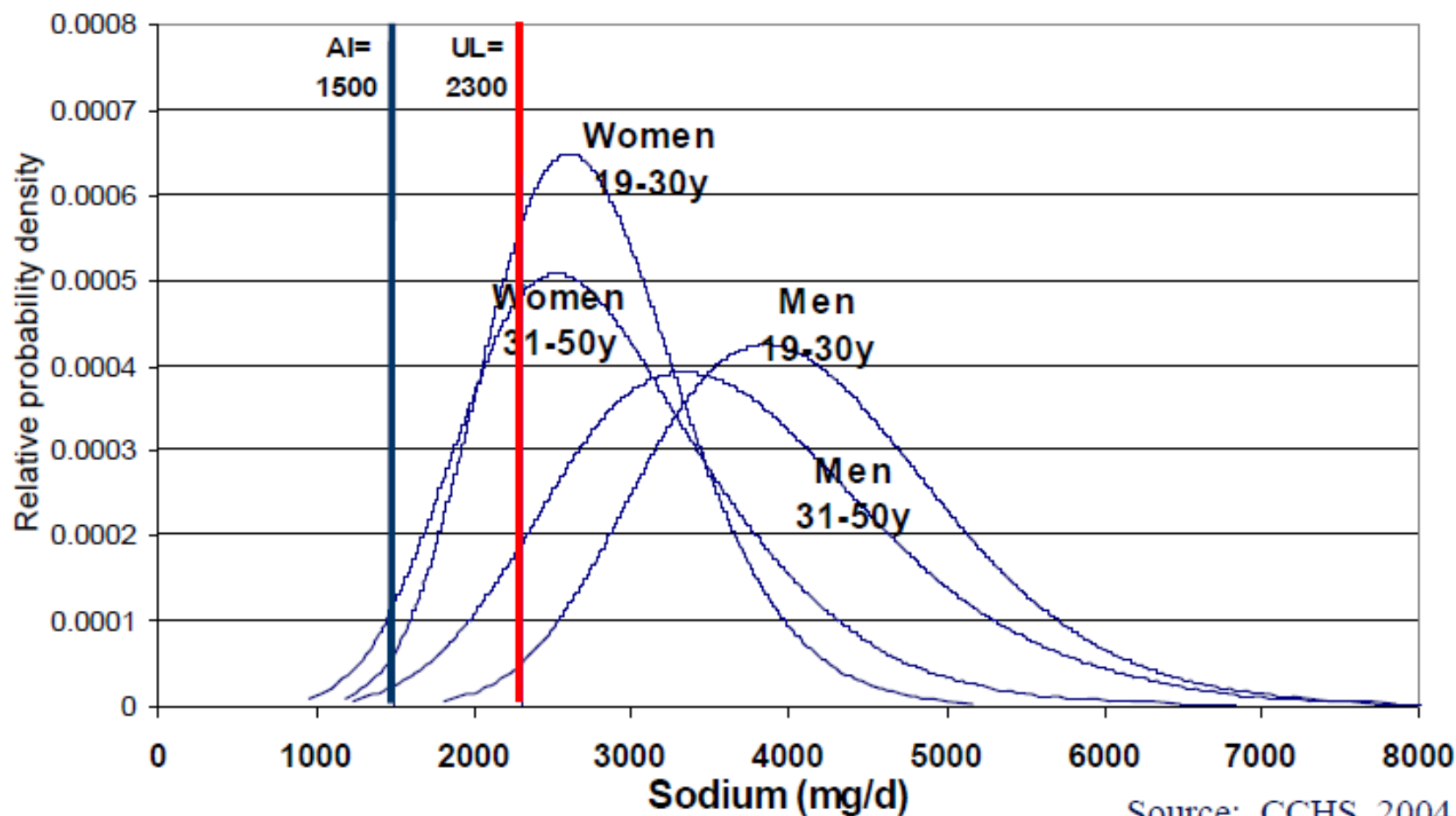
Age groups (y)	AI (mg/d)	UL (mg/d)
1 to 3	1000	1500
4 to 8	1200	1900
9 to 13	1500	2200
14 to 18	1500	2300
19 to 50	1500	2300
51 to 70	1300	2300
71+	1200	2300

- **Adequate Intakes** (AIs) for good health for people aged one year and over, range from 1000 mg/day to 1500 mg/day. [2.5-3.75 g salt]
- **Tolerable Upper Intake Level*** (UL) for sodium for people aged 14 and over is 2300 mg of sodium per day, (IOM, 2004).
- **WHO UL** – 5 g salt [2000 mg/d]



How are Canadians doing?

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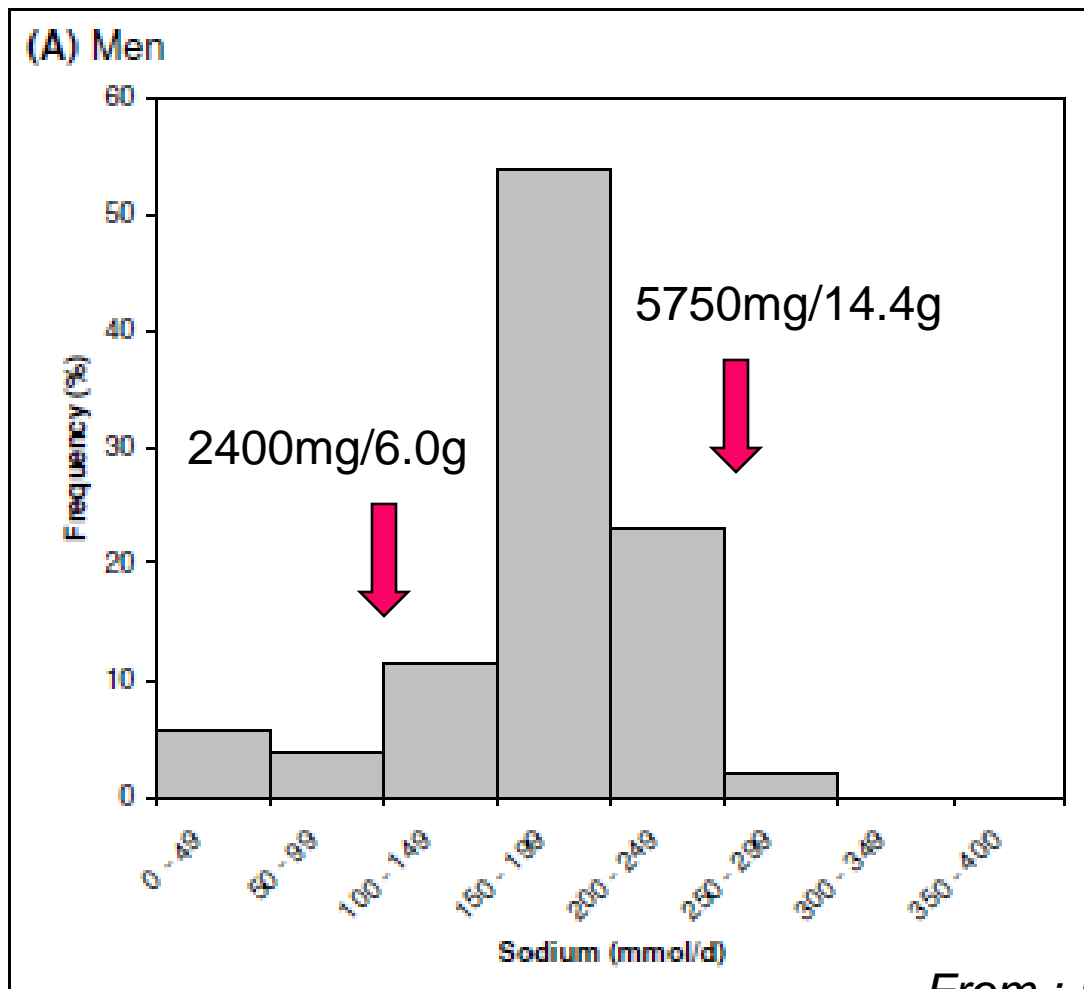


Source: CCHS, 2004

Global Urinary Sodium Excretion INTERSALT Study



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From : Elliott and Brown 2006

Understand the health issues: Sound scientific basis for action



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High Blood Pressure and Sodium Intake

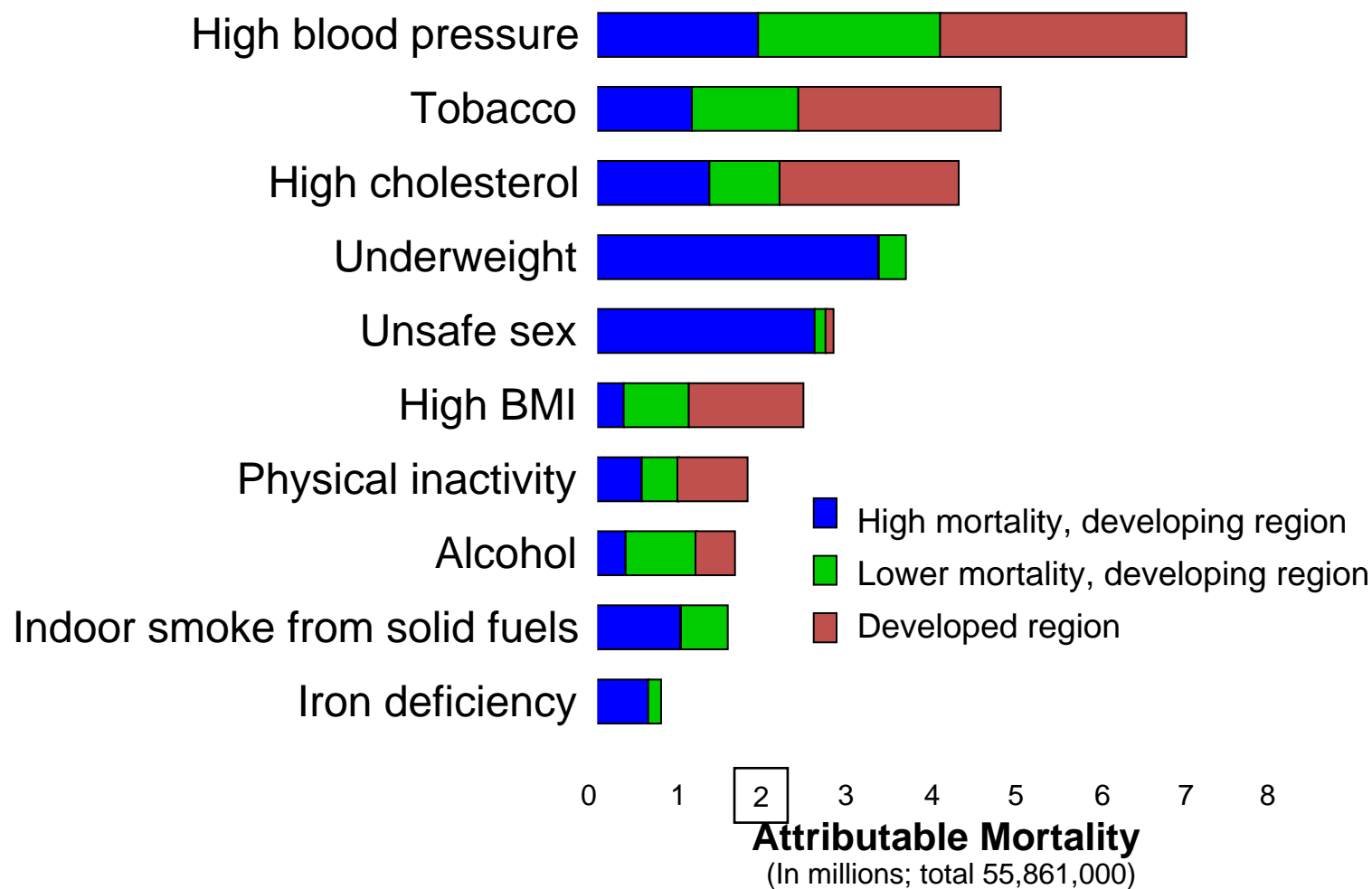


- ❑ Increases in sodium intake are associated with increased blood pressure
- ❑ high blood pressure is estimated by the WHO to be the leading risk factor for death in the world (Lopez et al., 2006)
- ❑ 1 in 4 of adult Canadians have high blood pressure, and more than 90% of the adult population will develop hypertension during an average lifespan (Joffres et al., 2007)
- ❑ High blood pressure is a major risk factor for cardiovascular diseases
- ❑ Cardiovascular diseases are the number one cause of death and disability in Canada



Leading risk factor for death worldwide

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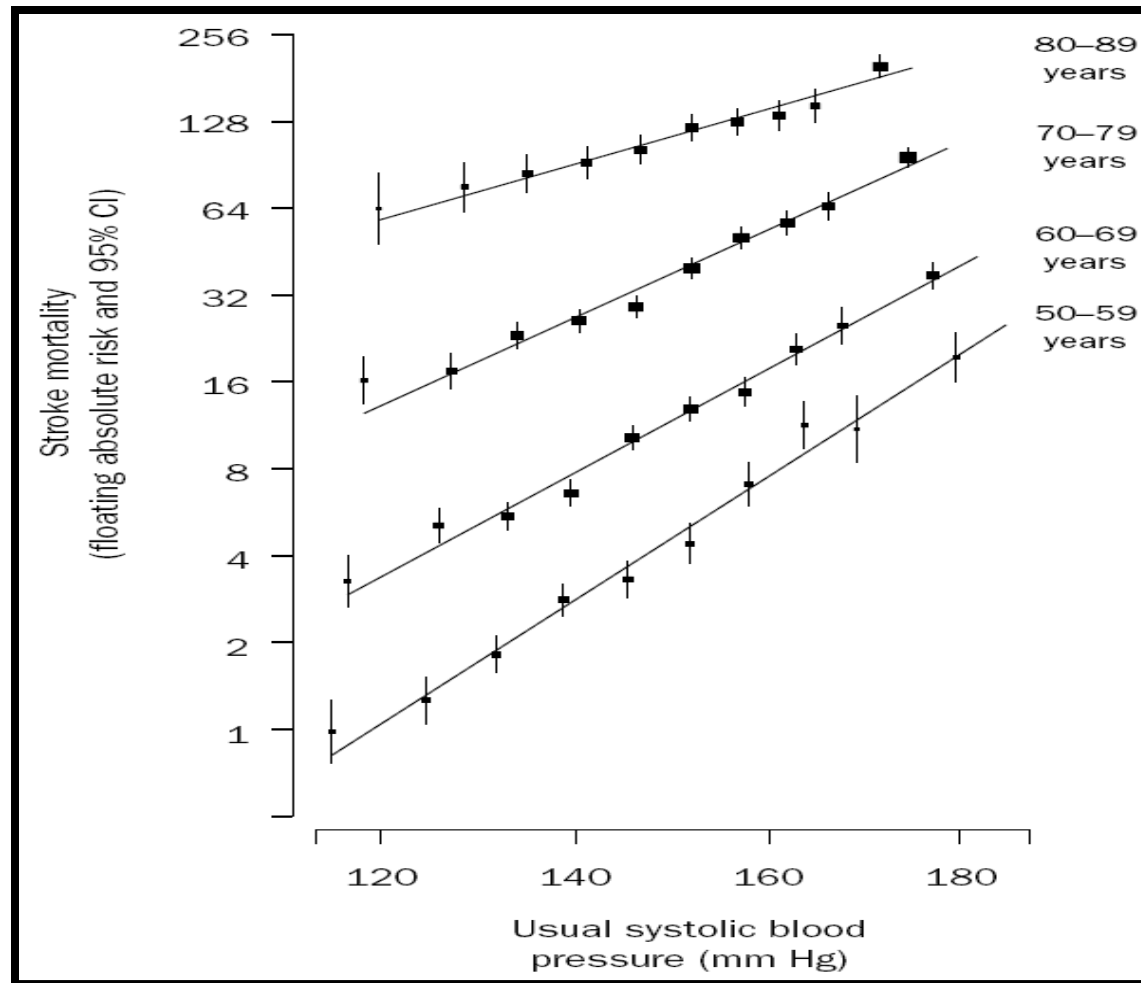


Ezzati et al. WHO 2000 Report. *Lancet*. 2002;360:1347-1360.

Blood Pressure and Risk of Stroke Mortality



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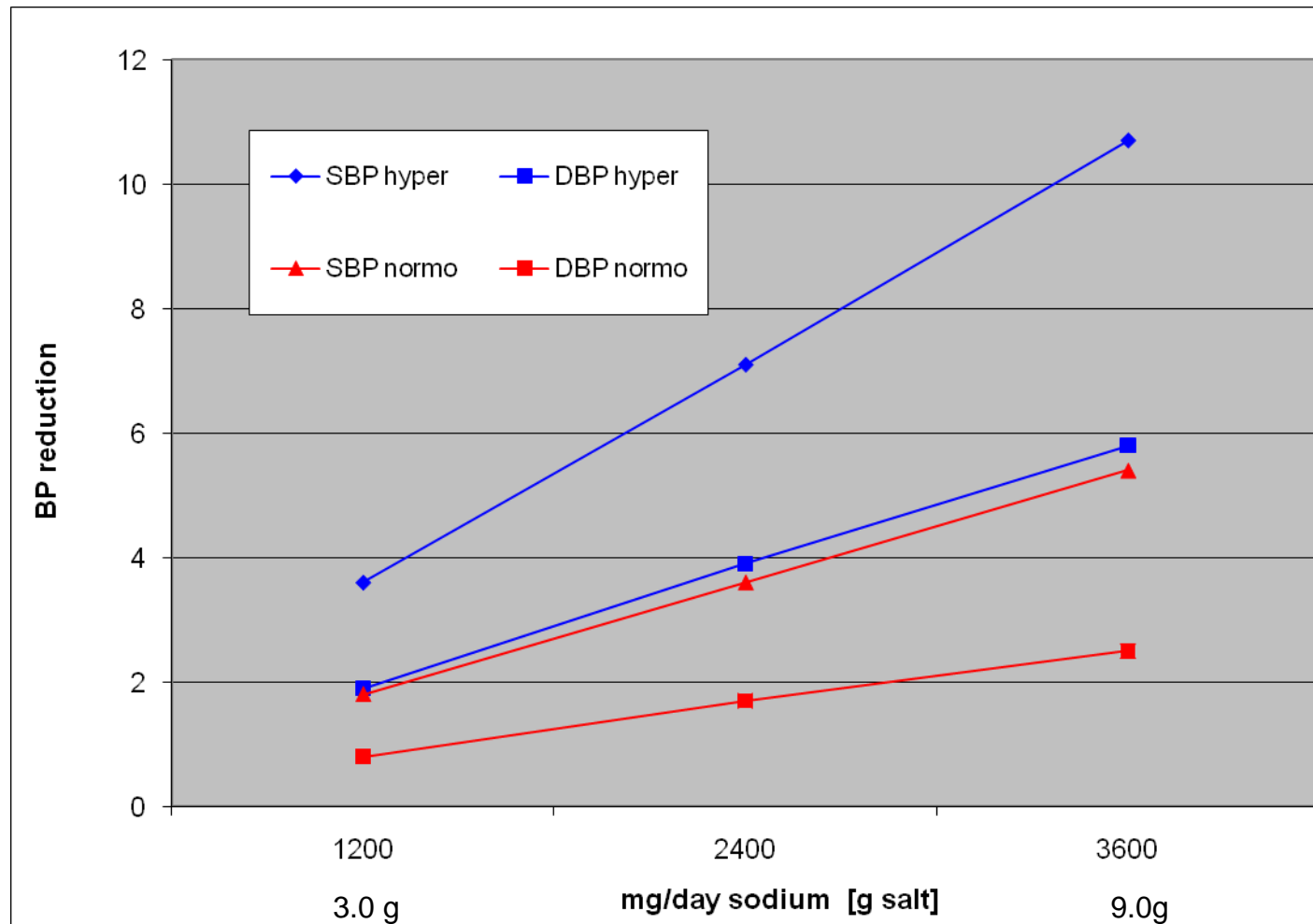


Lancet 2002;360: 1903-13

Meta analysis of different reductions



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Hypertension 2003;42:1093-1099

Meta-analysis (2006)

Cochrane Library 3: 1-41.



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A - Hypertensive Median age 50 (range 24-73)

Reduction of BP 5.1 (5.8 – 4.3) / 2.7 (3.2-2.2) mmHg;

- Reduction of 1800 mg sodium/day [4.5 g salt]
- Baseline sodium intake 2800 mg – 4400 mg [7-11g salt/day]
- Treatment sodium intake 1300 mg – 2875 mg [3.25-7.2 g salt]

B - Normotensive Median age 47 (range 22-67)

Reduction of BP 2.0 (2.6 –1.5) / 1.0 (1.4-0.6) mmHg;

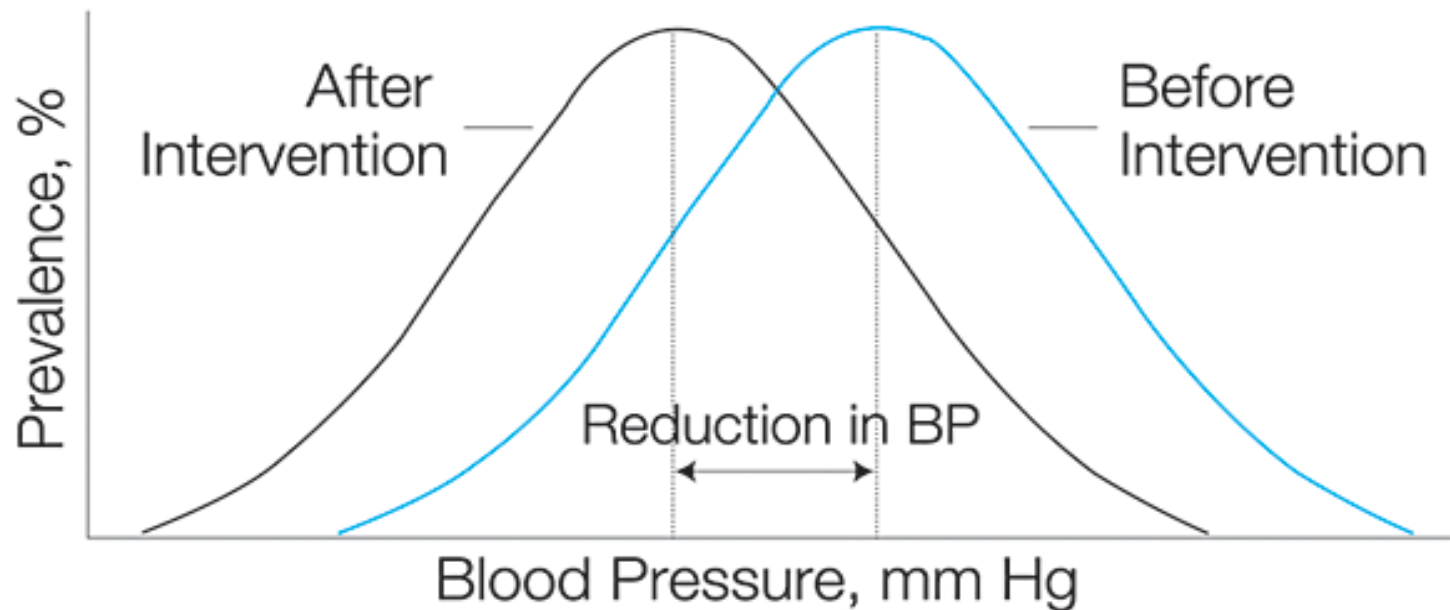
- Reduction of sodium 1700 mg/day [4.25 g salt]]
- Baseline sodium intake 2900 mg – 4600 mg [7.25-11.5]
- Treatment sodium intake 1300 mg – 3100 mg [3.25-7.75]

Criteria: random allocation; >920 mg/day [2.3g salt] reduction in sodium; >4 weeks duration; isolated intervention

Effect of 'small' reductions in systolic blood pressure on cardiovascular and total death



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Reduction in BP, mm Hg	% Reduction in Mortality		
	Stroke	CHD	Total
2	-6	-4	-3
3	-8	-5	-4
5	-14	-9	-7

From Whelton, P. K. et al. JAMA 2002;288:1882-1888

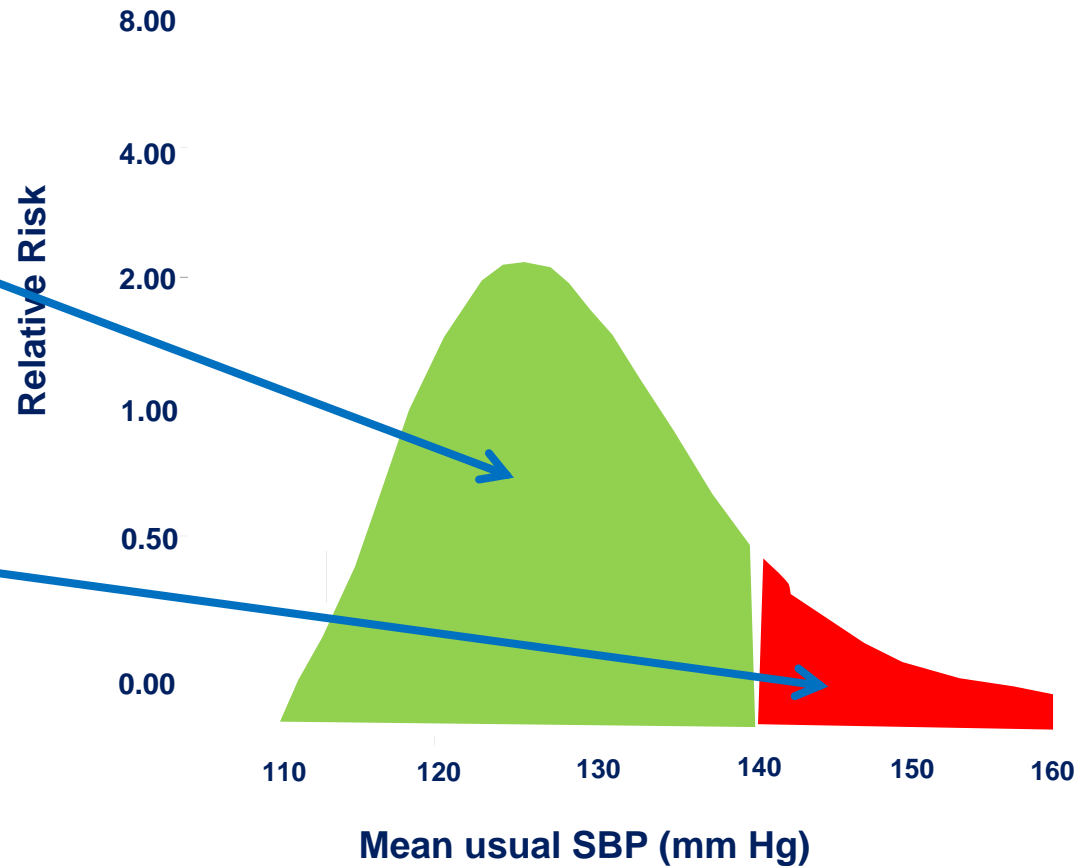
Who get the strokes and the heart attacks?



A lot of people
with a low risk

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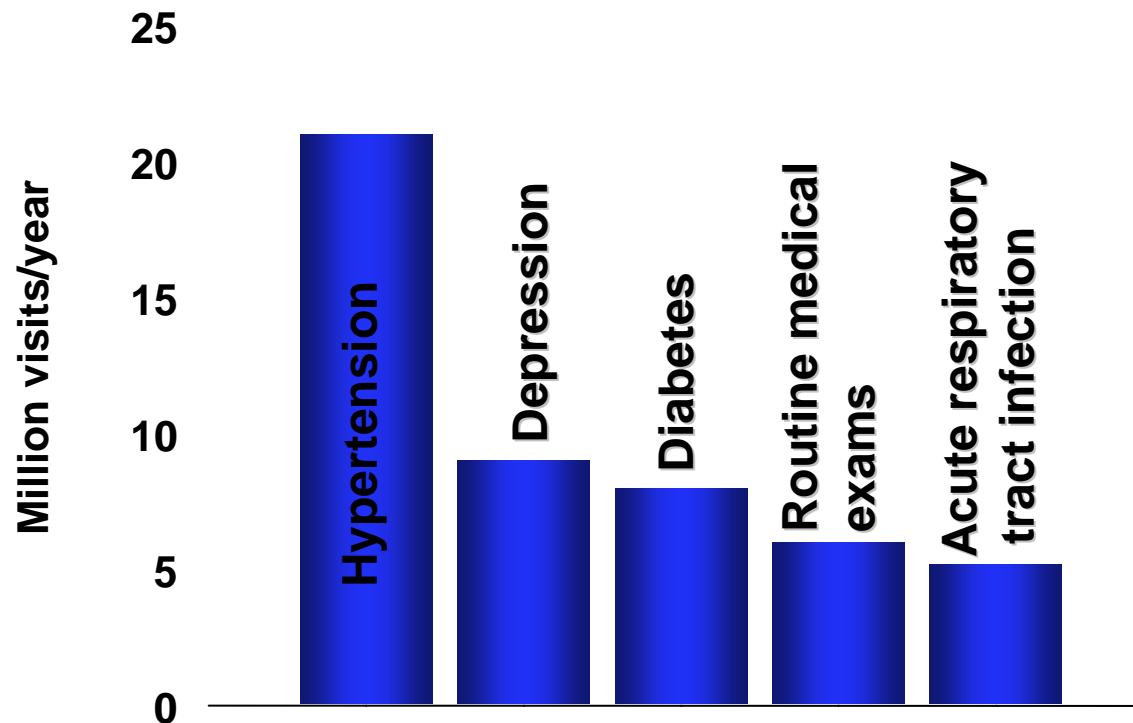
A few people with
a high risk



Leading diagnoses resulting in visits to physician offices in Canada



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- Most frequent reason for an adult patient to see a physician
- Antihypertensive drugs are one of the most expensive therapeutic categories

Source: IMS HEALTH Canada 2002. <http://www.imshealthcanada.com/>

Estimated effects on cardiovascular disease by lowering of blood pressure



❑ Annual reduction in

- Myocardial infarction 3706 (5%) / year
- Strokes 6213 (13%) / year
- Heart Failure 1631 (17%) /year

❑ Reduction in health care costs associated with the overall predicted 8.6% reduction CVD in 1998

- \$1.4 billion per year



Sodium and other health issues

- ❑ Direct (non BP related) vascular and cardiac damage
- ❑ Obesity and related diseases (e.g. diabetes)
- ❑ Asthma
- ❑ Kidney stones
- ❑ Osteoporosis
- ❑ Gastric Cancer (promoter)



Summary

1. **↓ Salt intake → ↓ BP →**
 - ↓ Stroke**
 - ↓ Heart Attacks**
 - ↓ Heart Failure**

↓ Other health conditions
2. **↓ Salt – cost effective public health intervention**



Thank You !



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