

**The Impact of obesity on  
our health, the economy,  
and how to address it.**

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## American system

- A mixed public/private system.
- Largest public (and private) spender in the world but with major gaps in coverage.
- Employer based coverage for many.
- High administrative and legal costs.
- Federal government provides funding through Medicare, Medicaid, SCHIP, and the VA
- Fast adopters of new technology for those with good coverage.
- Pockets of excellence in health management.
- 2009 per capita spending was US \$7,960 (next closest Norway \$5352)
- **Life, liberty and the pursuit of happiness**

## Canadian System

- A mix of public (70%) and private (30%) funding
- Universal public coverage for hospital and physician services
- Employer based and supplemental gov't programs for other health services.
- Low admin and legal costs.
- Majority of health funding is provincial with some federal government providing some funding with conditions.
- Slower adopters of new technology.
- 2009 per capita spending was US \$4,363 (OECD average – \$3250).
- **Peace, order and good government**

The World Health Organization reports obesity will soon surpass infectious diseases as a world health threat, resulting in a significant burden on economies.



WHO (2003) *Diet, nutrition and the prevention of chronic diseases*. Report of a Joint WHO/FAO Expert Consultation. WHO technical reports series No 916. World Health Organization: Geneva.

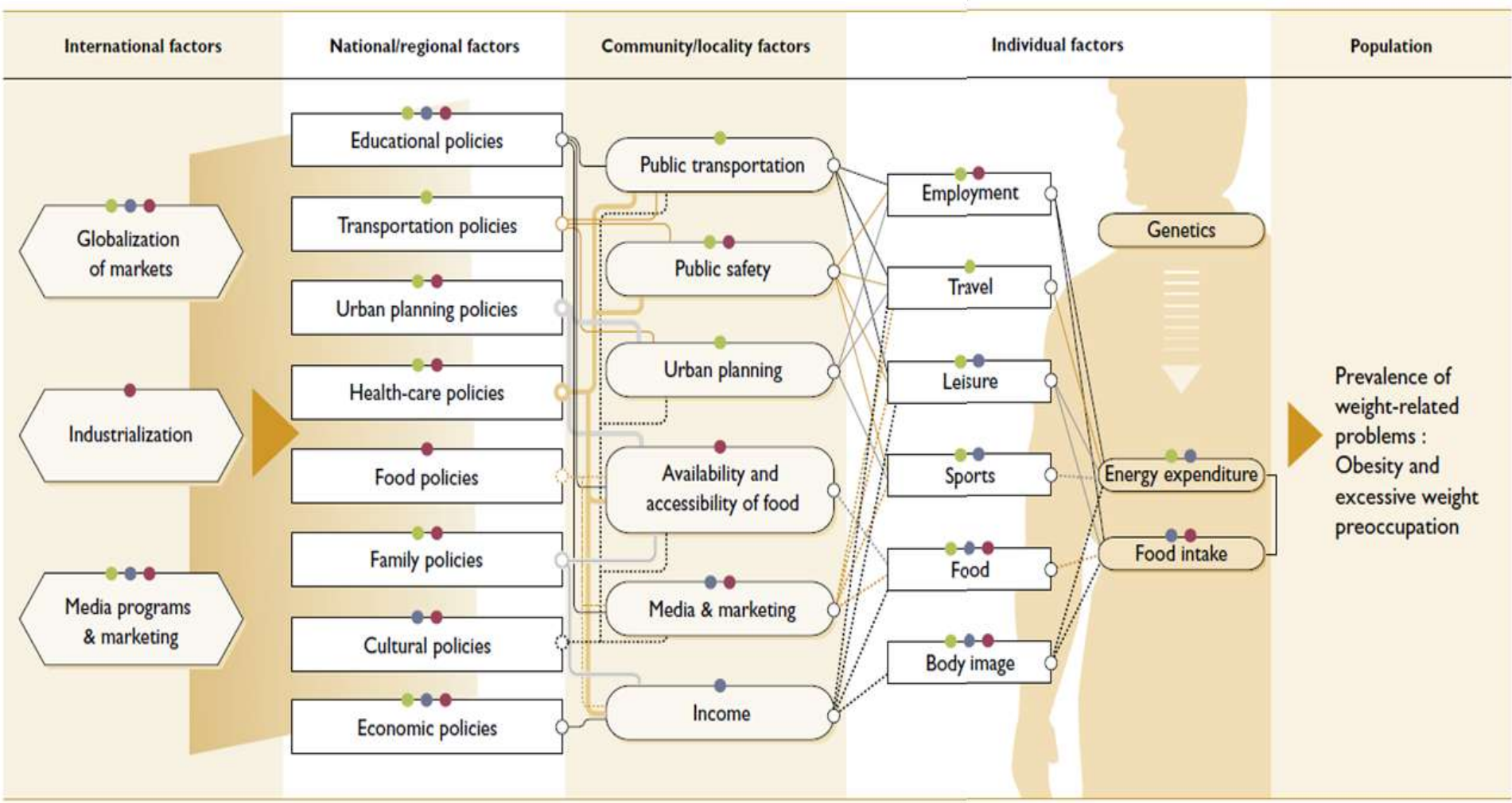
# OBESITY

- No one wants to be obese

# Why? - Obesity

- Character flaw
- Reckless food industry marketing
- A lifestyle choice
- A neuroendocrine disorder
- Unavoidable outcome of western lifestyle
- Decline in physical activity
- Genetically based

# Policy Factors Influencing Obesity



# Bottom line

- Treatment: Need affordable access to evidence-based treatments for individuals needing treatment.
- Prevention: Aggressive societal action to address root causes – need a call to action.
- Is a societal epidemic effecting health, families communities and the economy.

# Body Mass Index (BMI)

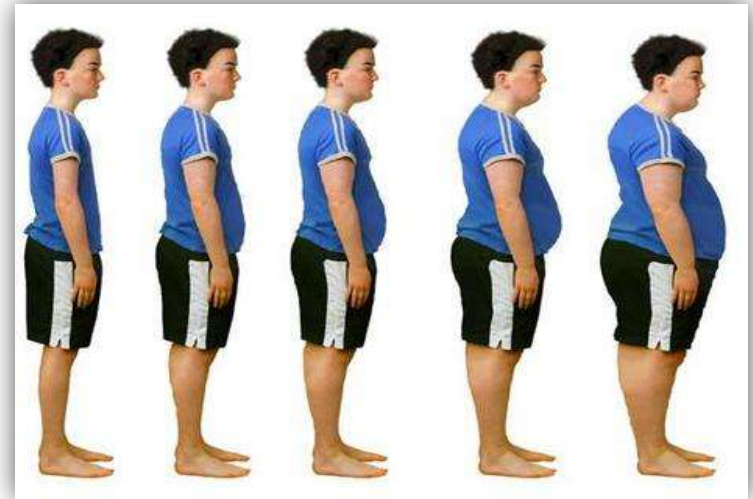
- Healthy: BMI <23
- Overweight: BMI >25, <30
- Obesity: BMI ≥30
- BMI =  $\text{kg/m}^2$  (weight in kilos/height x height)
  - Person 1.7m tall (5'8")
    - Weighs 70kg (154lbs): BMI is  $70/1.7^2 = 24$  (fit)
    - Weighs 80kg (176lbs): BMI is  $80/1.7^2 = 27$  (over)
    - Weighs 90kg (198lbs): BMI is  $90/1.7^2 = 31$  (obese)

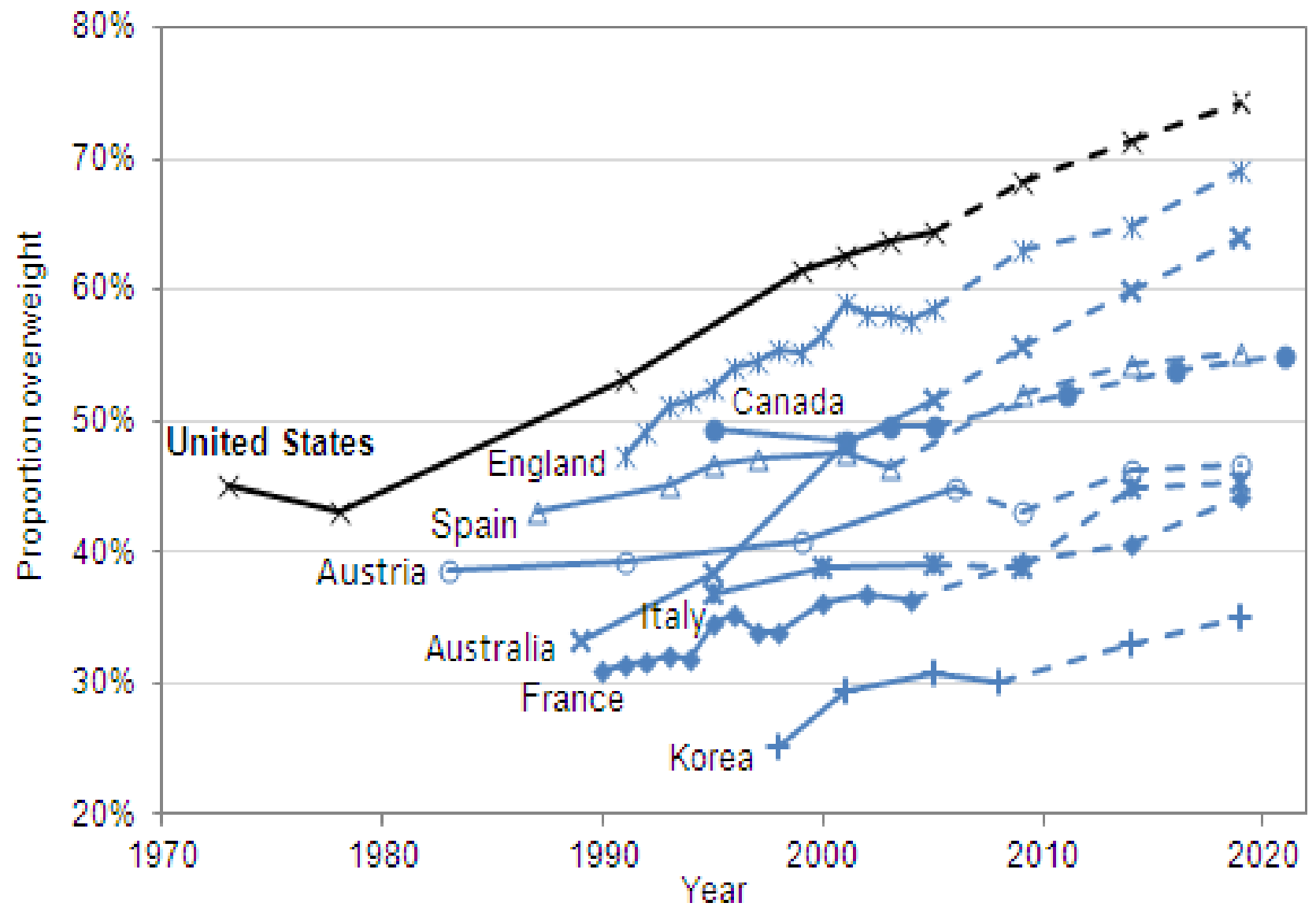
## Body Weight Classification for Adults

Body Mass Index (in kg/m <sup>2</sup> )	Classification	Risk of Developing Health Problems
< 18.5	Underweight	Increased risk
18.5 to 24.9	Normal weight	Least risk
25.0 to 29.9	Overweight	Increased risk
≥ 30.0: 30.0 to 34.9 35.0 to 39.9 ≥ 40.0	Obese: Obese Class I Obese Class II Obese Class III	High risk Very high risk Extremely high risk

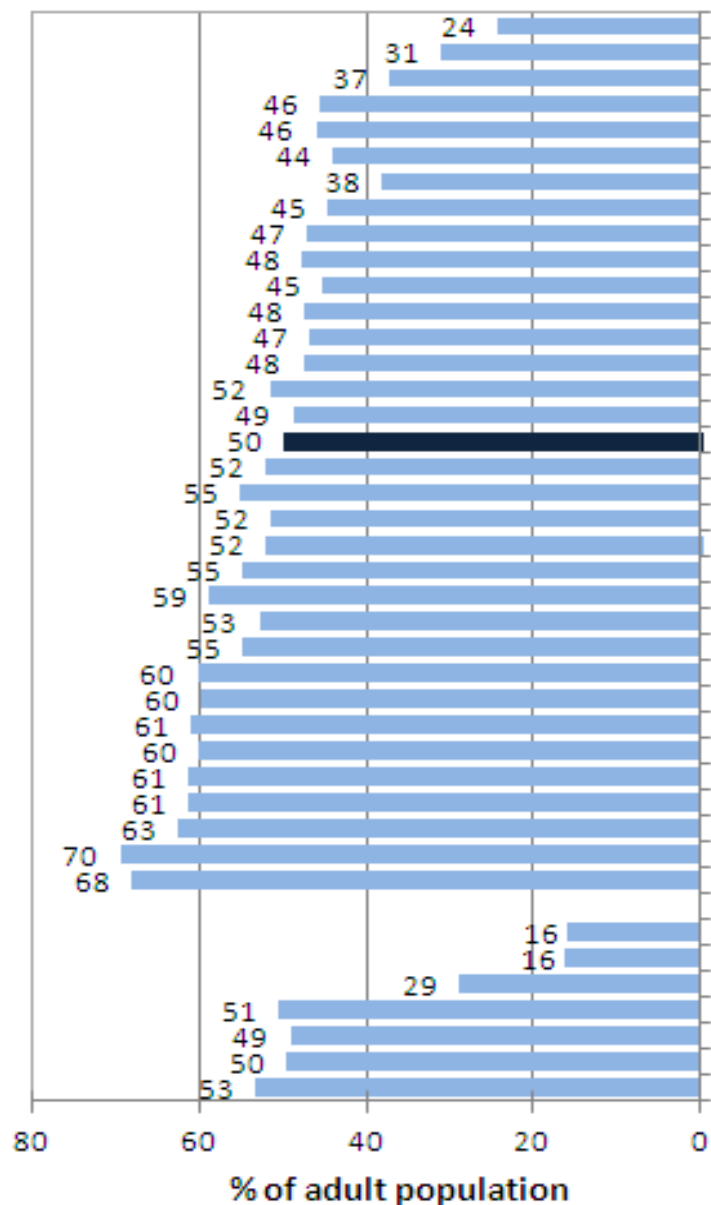
# In the last 30 years...

- Obesity rates have increased in
  - Both sexes
  - All age groups
  - All races/ethnic groups
- However those at the lowest income levels have increased the most

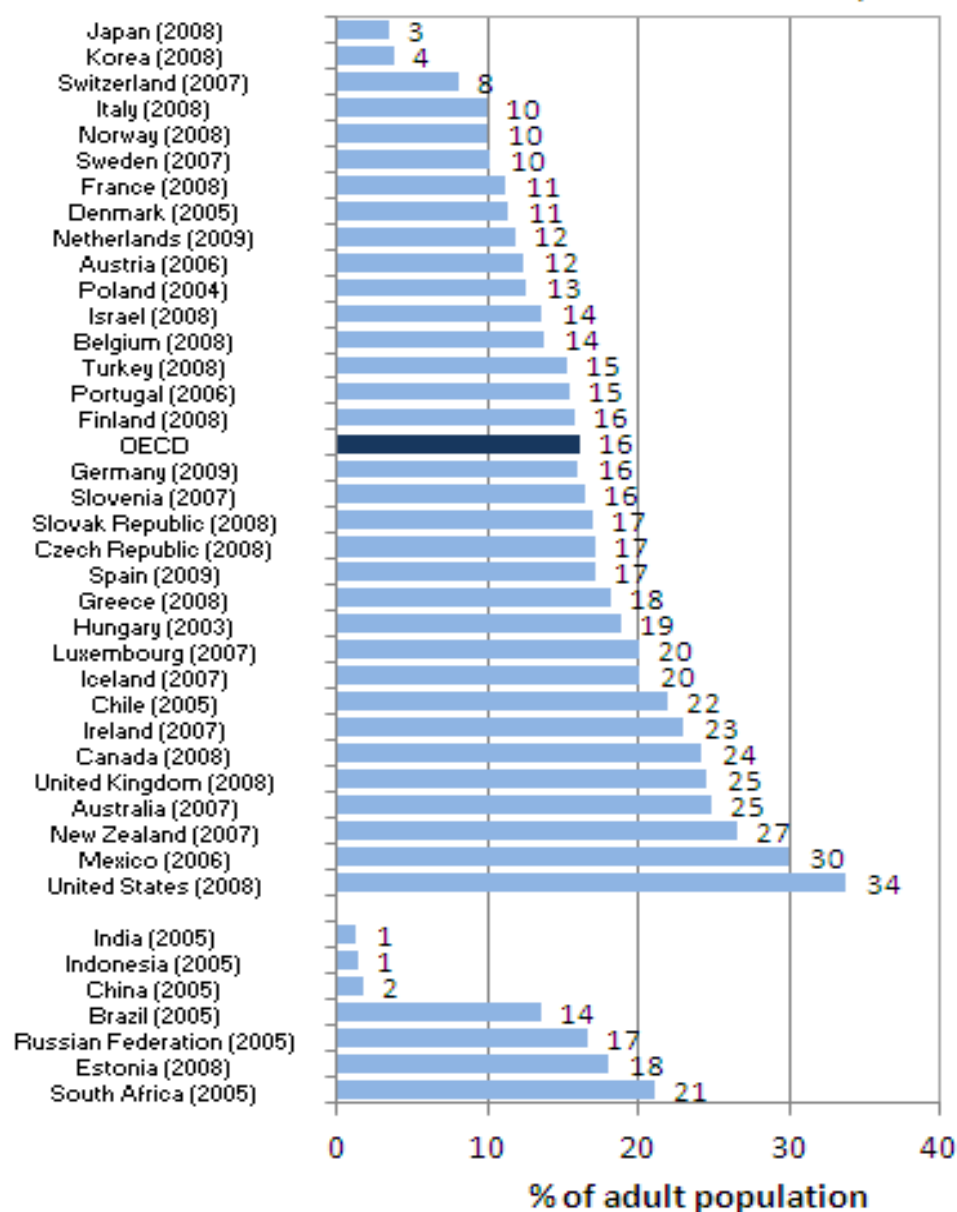




## Overweight

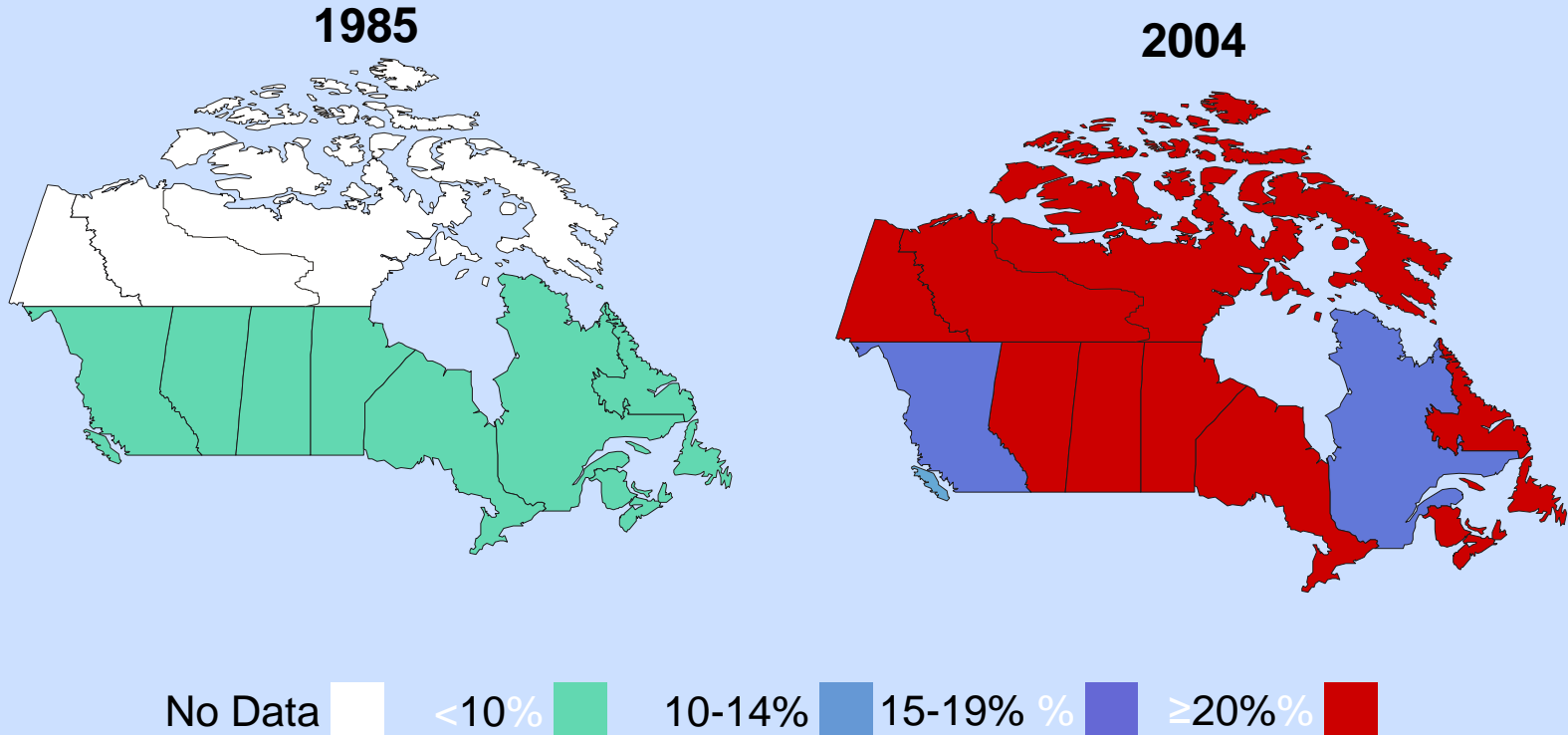


## Obesity



# Obesity Epidemic in Canada

(Obese: BMI  $\geq 30$ , or  $\sim 30$  lbs overweight for 5'4" woman)

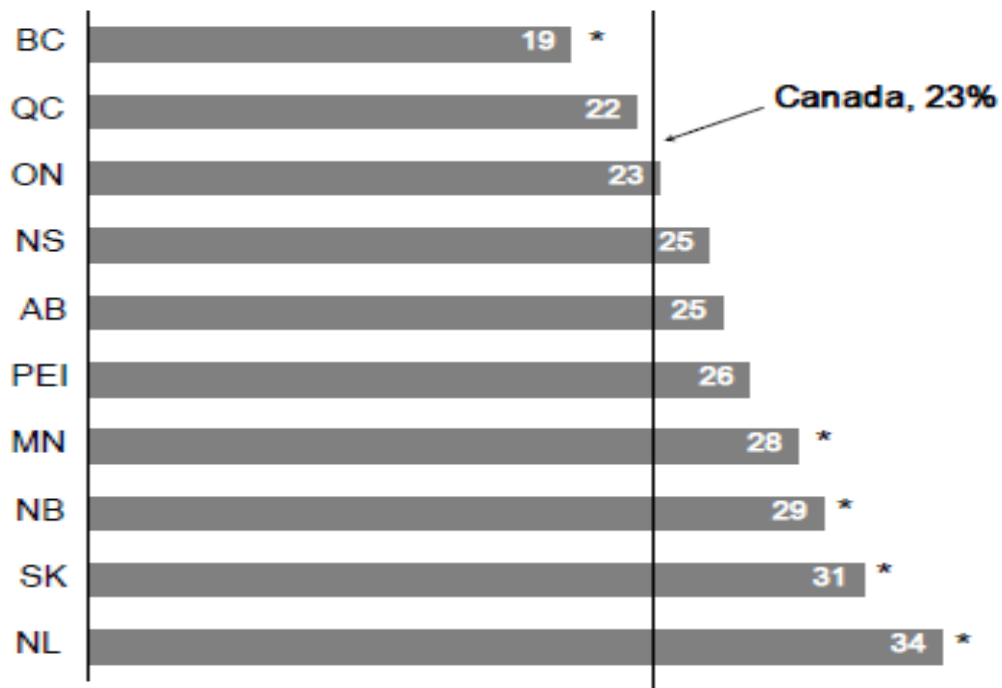


Katzmarzyk PT, *Can Med Assoc J* 2002;166:1039-1040.

Statistics Canada. Canadian Community Health Survey on Obesity. Health Reports, Vol 17, No. 3, August 2006.

# Rate of Obesity by Province

Percentage obese, by province, household population aged 18 or older, Canada excluding territories, 2004

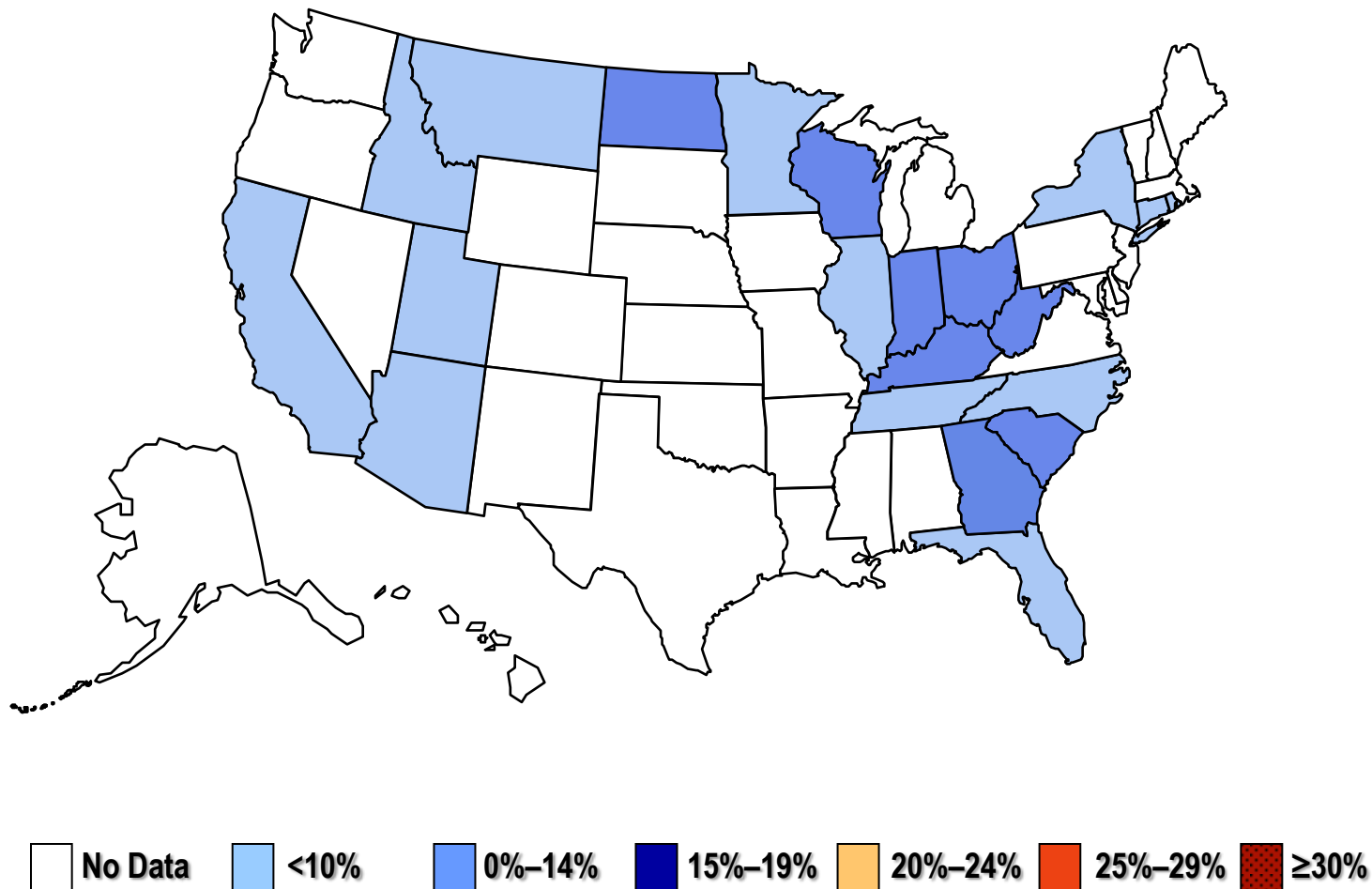


*Data source: 2004 Canadian Community Health Survey: Nutrition*

*\* Significantly different from estimate for Canada ( $p < 0.05$ )*

# Obesity Trends\* Among U.S. Adults

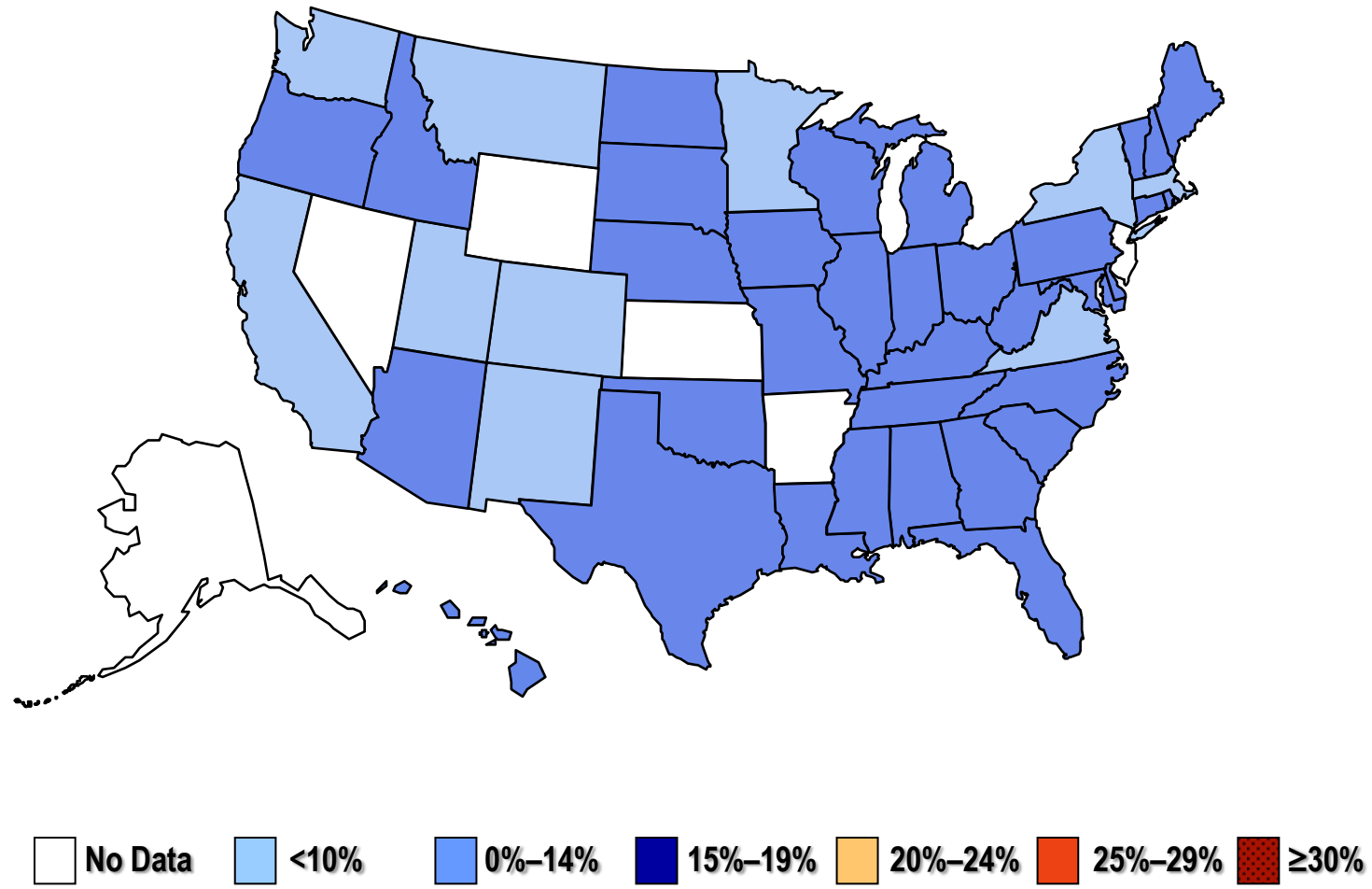
## BRFSS, 1985



(\*BMI ≥30, or about 30 lbs. overweight for 5'4" person)

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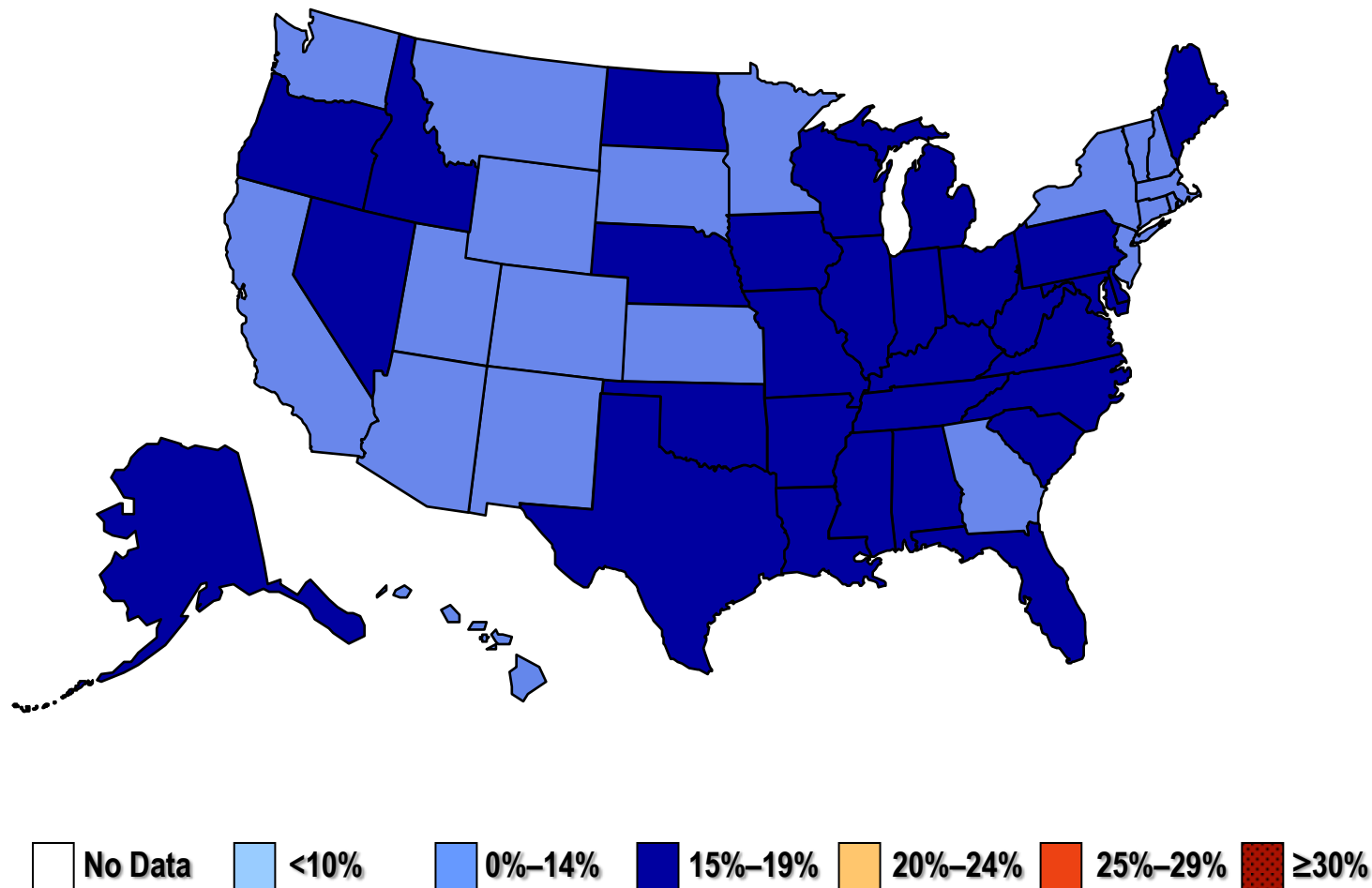
## BRFSS, 1990



(\*BMI ≥30, or about 30 lbs. overweight for 5'4" person)

# Obesity Trends\* Among U.S. Adults

## BRFSS, 1996

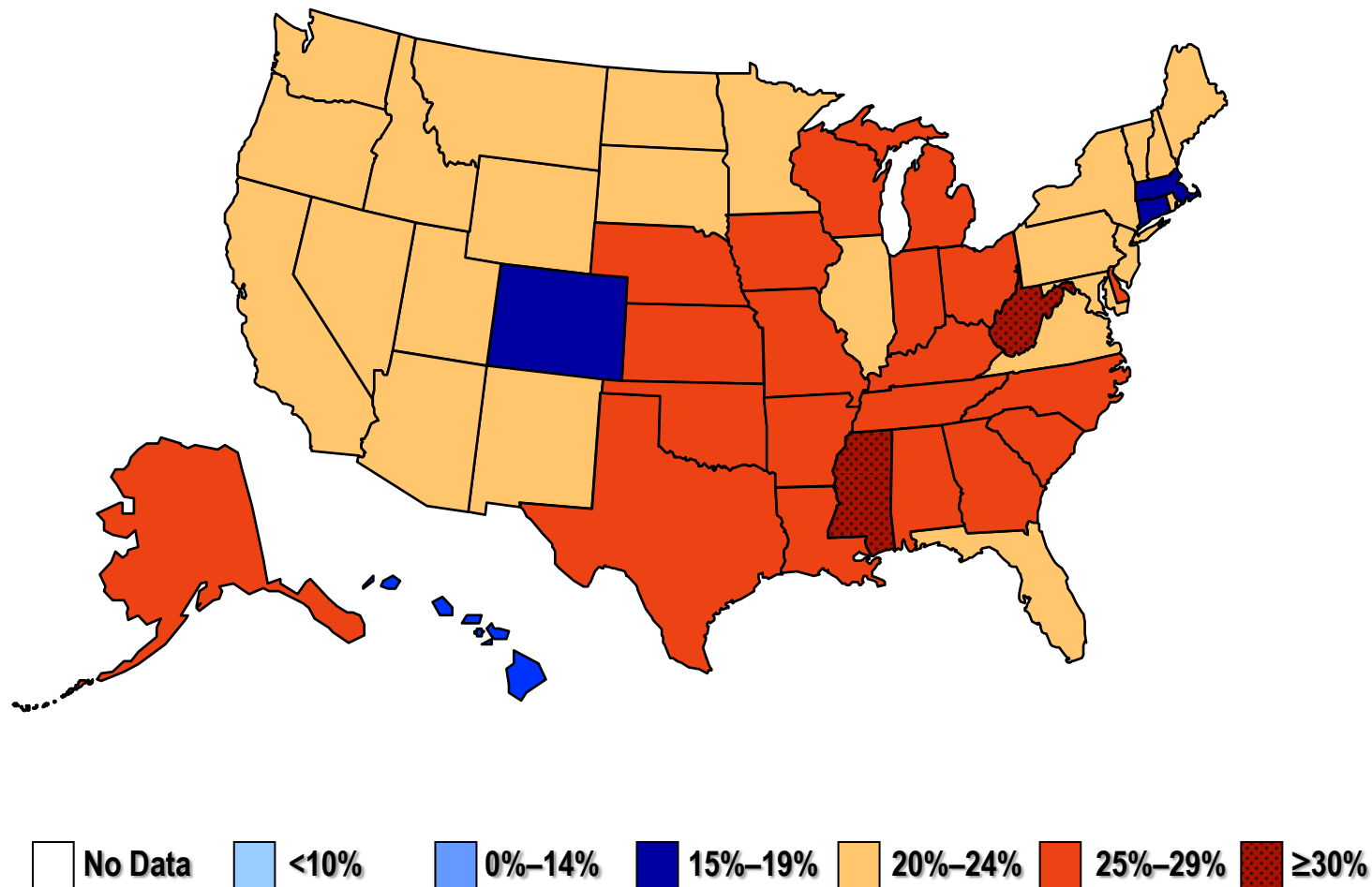


(\*BMI  $\geq 30$ , or about 30 lbs. overweight for 5'4" person)



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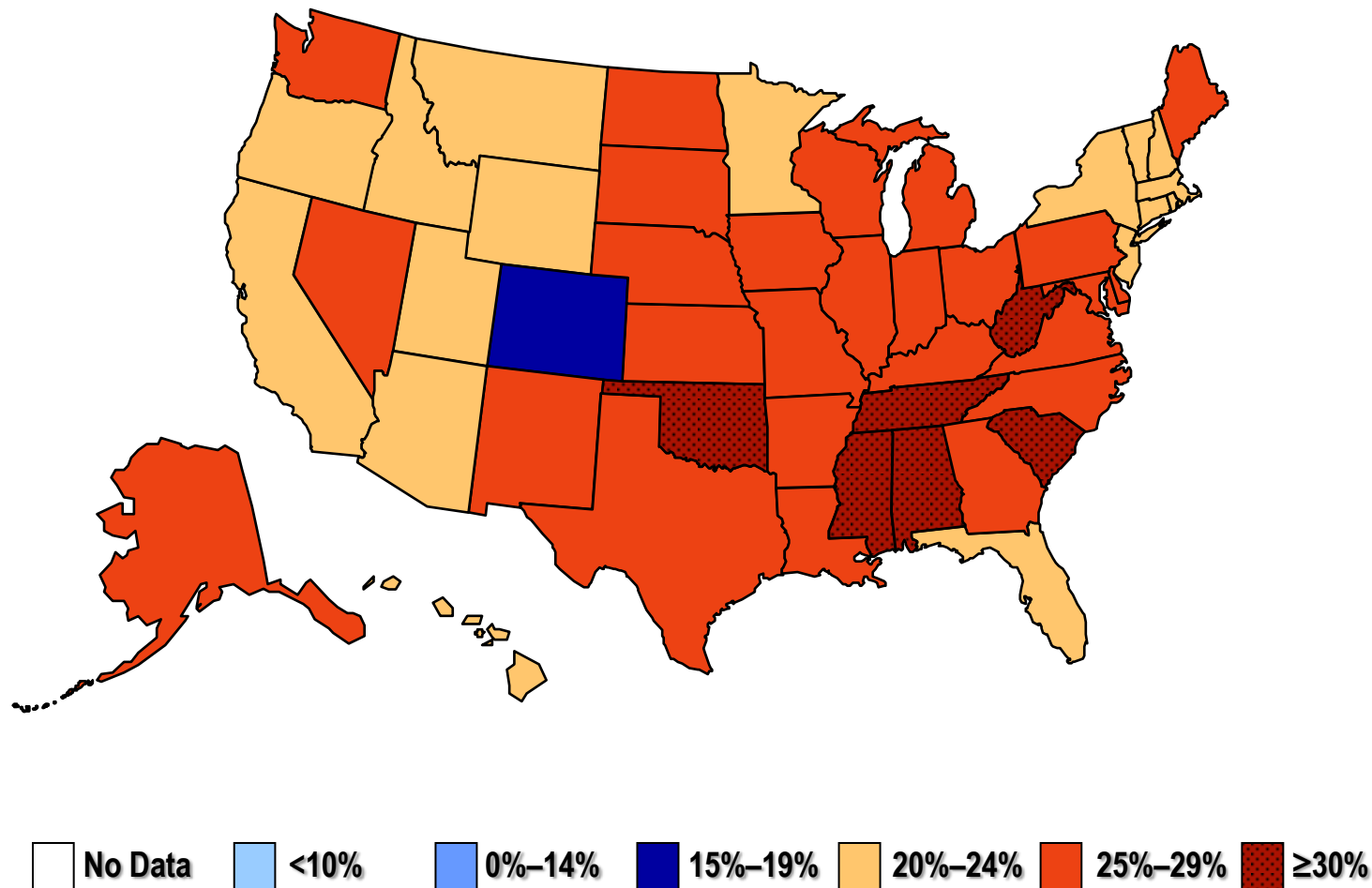
## BRFSS, 2006



(\*BMI  $\geq 30$ , or about 30 lbs. overweight for 5'4" person)

# Obesity Trends\* Among U.S. Adults

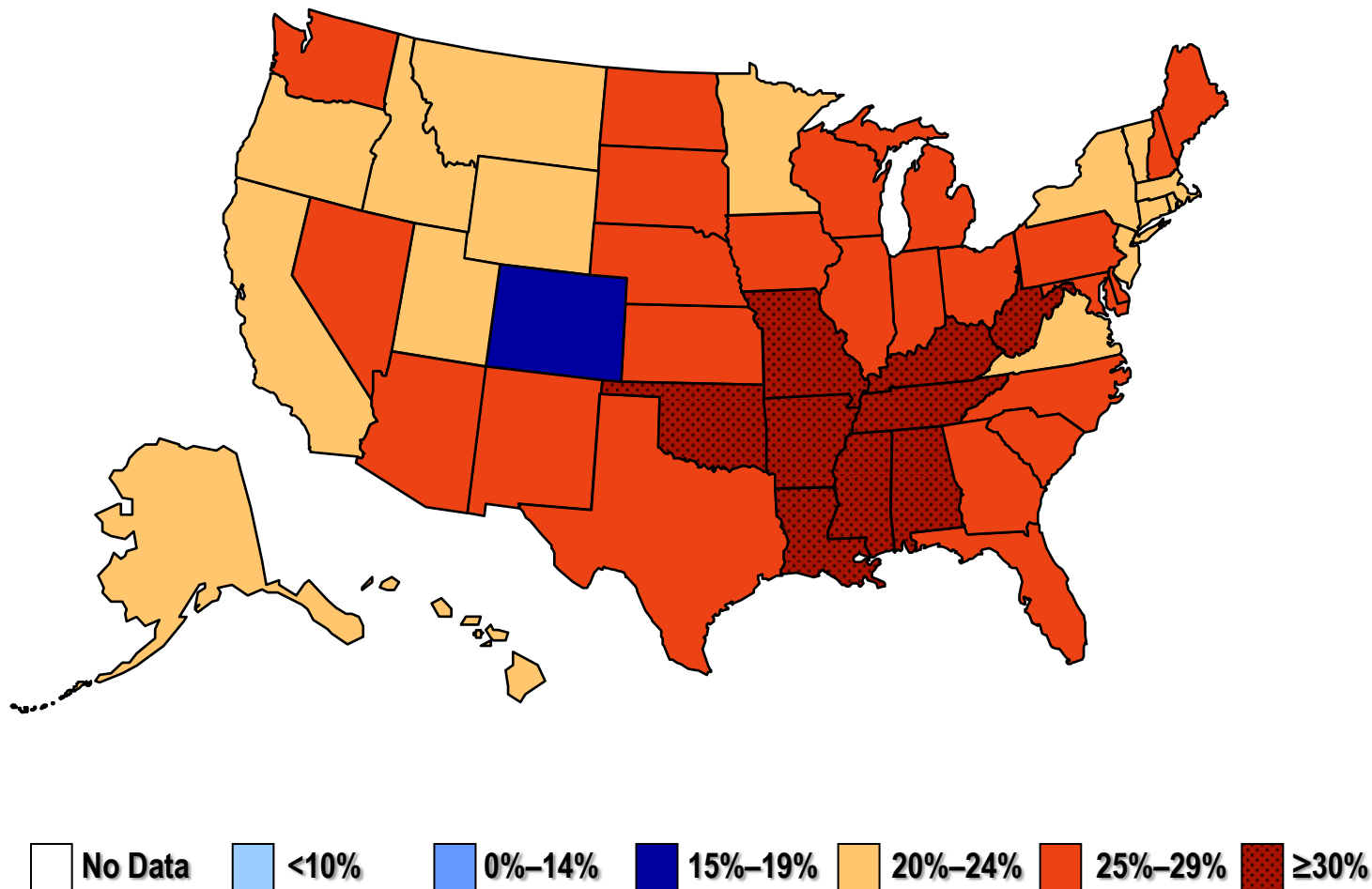
## BRFSS, 2008



(\*BMI ≥30, or about 30 lbs. overweight for 5'4" person)

# Obesity Trends\* Among U.S. Adults

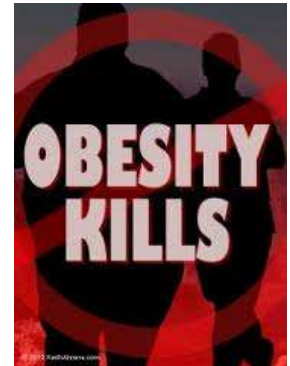
## BRFSS, 2009



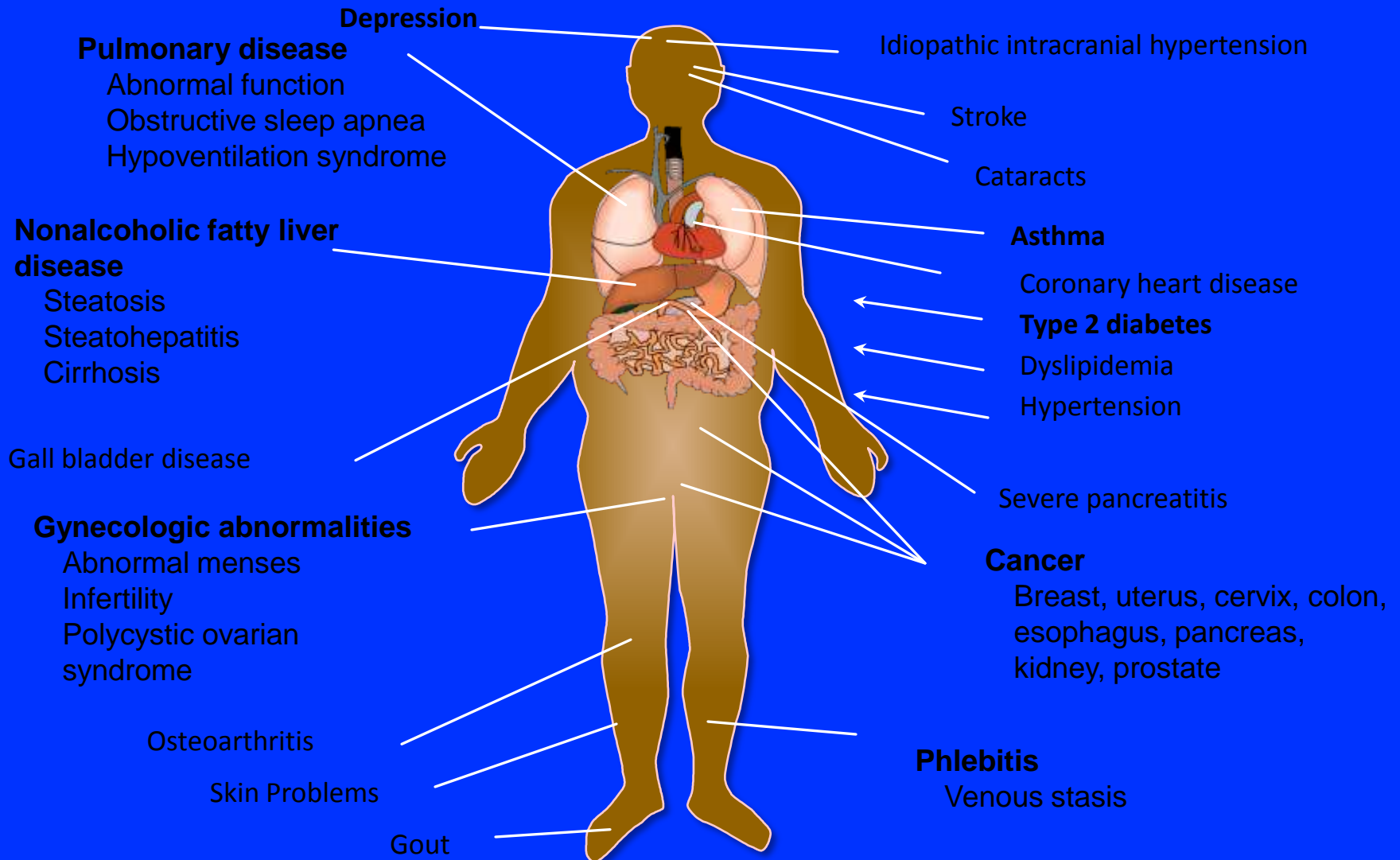
(\*BMI  $\geq 30$ , or about 30 lbs. overweight for 5'4" person)

# Health Impact of Obesity

- 2 x more hypertension (high blood pressure)
- 3 x more type-2 diabetes
- 2 – 3 x more coronary heart disease
- Significant increase in hypercholesterolemia (high blood cholesterol and triglycerides)
- Significantly greater chance for a stroke
- Elevated levels of asthma, infertility, cancer
- Strong co-morbidity with depression



# Medical Implications of Obesity



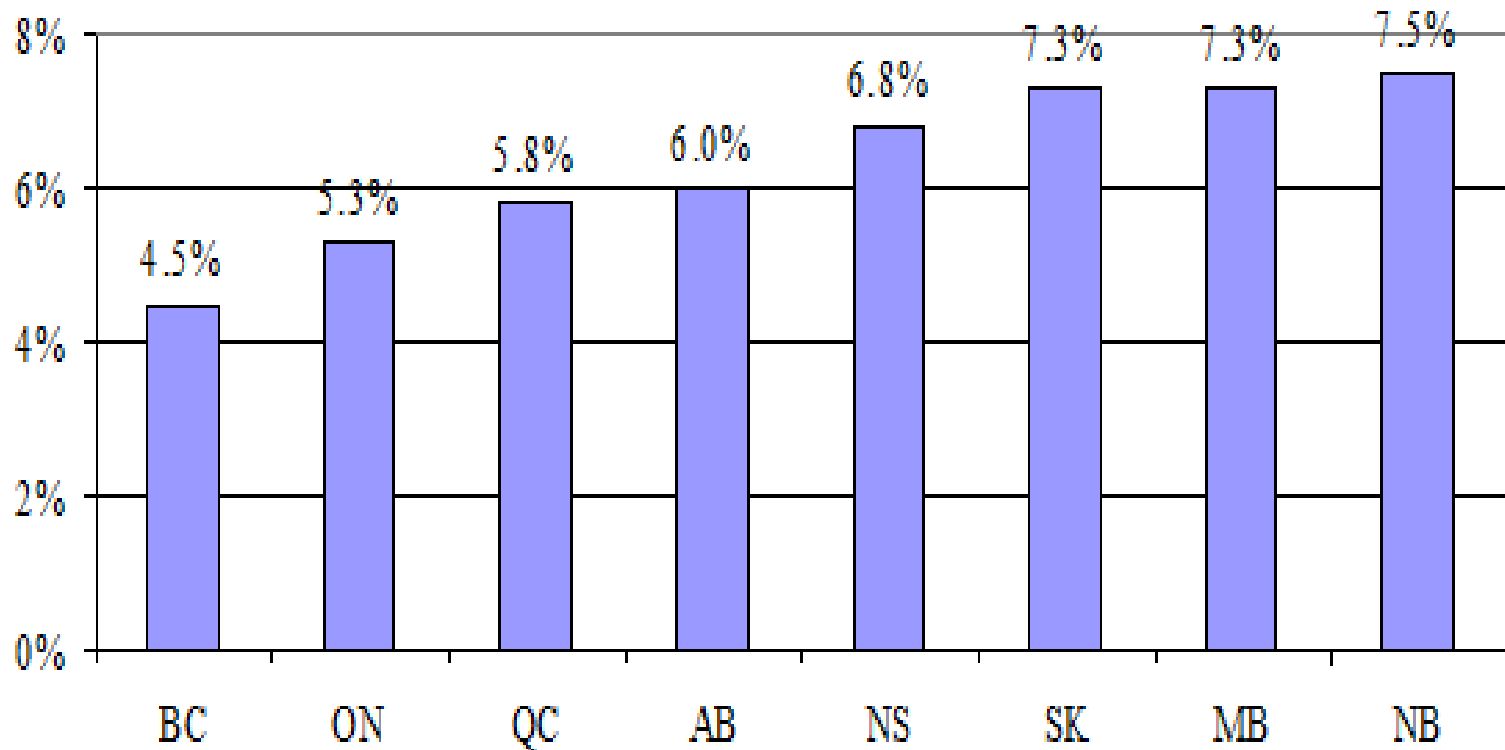
1. Bhojru S., Lashock J. The Physical and Fiscal Impact of the Obesity Epidemic: The Impact of Comorbid Conditions on Patients and Payers. *JMCM*. 2008 :11(4): 10-17.

# Economic Burden: Canada & USA

- Total economic cost of obesity & overweight in Canada & USA is ~\$300 billion (2009)
  - \$127 billion in direct medical costs
  - \$164 billion in loss of productivity



# Direct cost of obesity as a percentage of provincial health care budget



# Costs - breakdown

- Direct medical costs - \$160 billion
- Productivity costs – \$66 billion
  - Absenteeism
  - Presenteeism
  - Disability
  - Premature mortality
- Transportation costs – (excess fuel costs)
- Environmental costs – (CO2 omissions attributable to excess fuel costs)
- Human Capital accumulation costs (grade completed, days away from school)

The economic impact of obesity in the United States, Hammond, Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy 2010:3 285–295

# Health Costs (US)

- Greater medical costs for obese children
  - \$14.3 billion annually
    - This is just when they are children
  - Additional costs as adults → obese children typically become obese adults

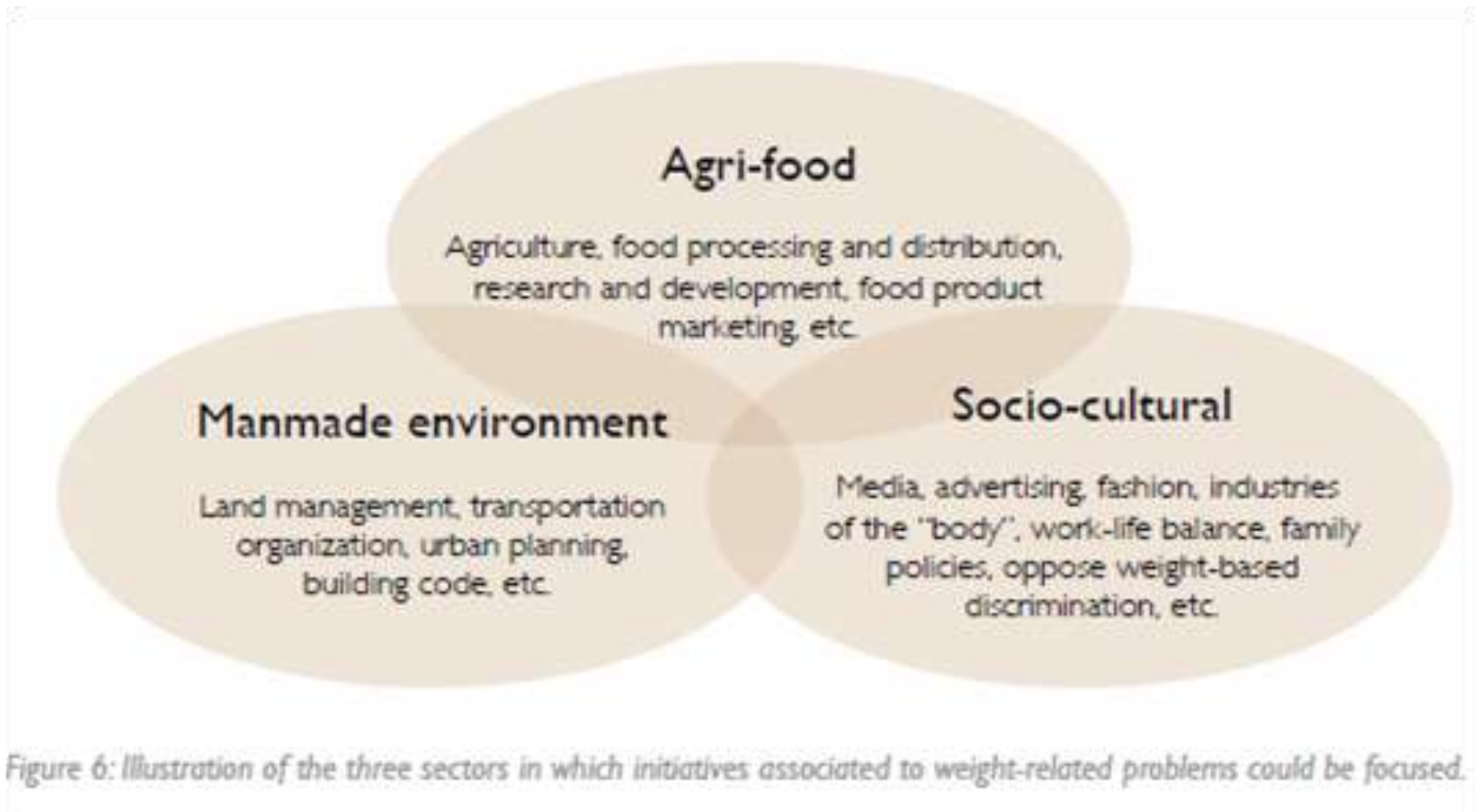
\* Cawley J. *The economics of childhood obesity*. *Health Aff (Millwood)*. 2010;29(3):364–371.



# What determinants are involved?

- Individual/ Behavioral
  - Diet choices; Physical Inactivity
- Environmental
  - Schools; Availability of grocery stores; Marketing & advertising
- Physical Activity
  - Built environment; Occupational activity
- Social
  - Socio-economic Status (SES); Poverty

# PHAC's Three sectors associated with weight-related problems



# What can we do?



## Cost-saving and very cost-effective interventions



### 1. Large health impact

- Tax alcohol, tobacco and 'unhealthy food'
- Regulation of salt content in bread, cereals and margarine
- Treat blood pressure and cholesterol more efficiently
- Gastric banding for the very obese

Ref. ACE study on Cost-effectiveness of Prevention, 2010

## 2. **Moderate** health impact

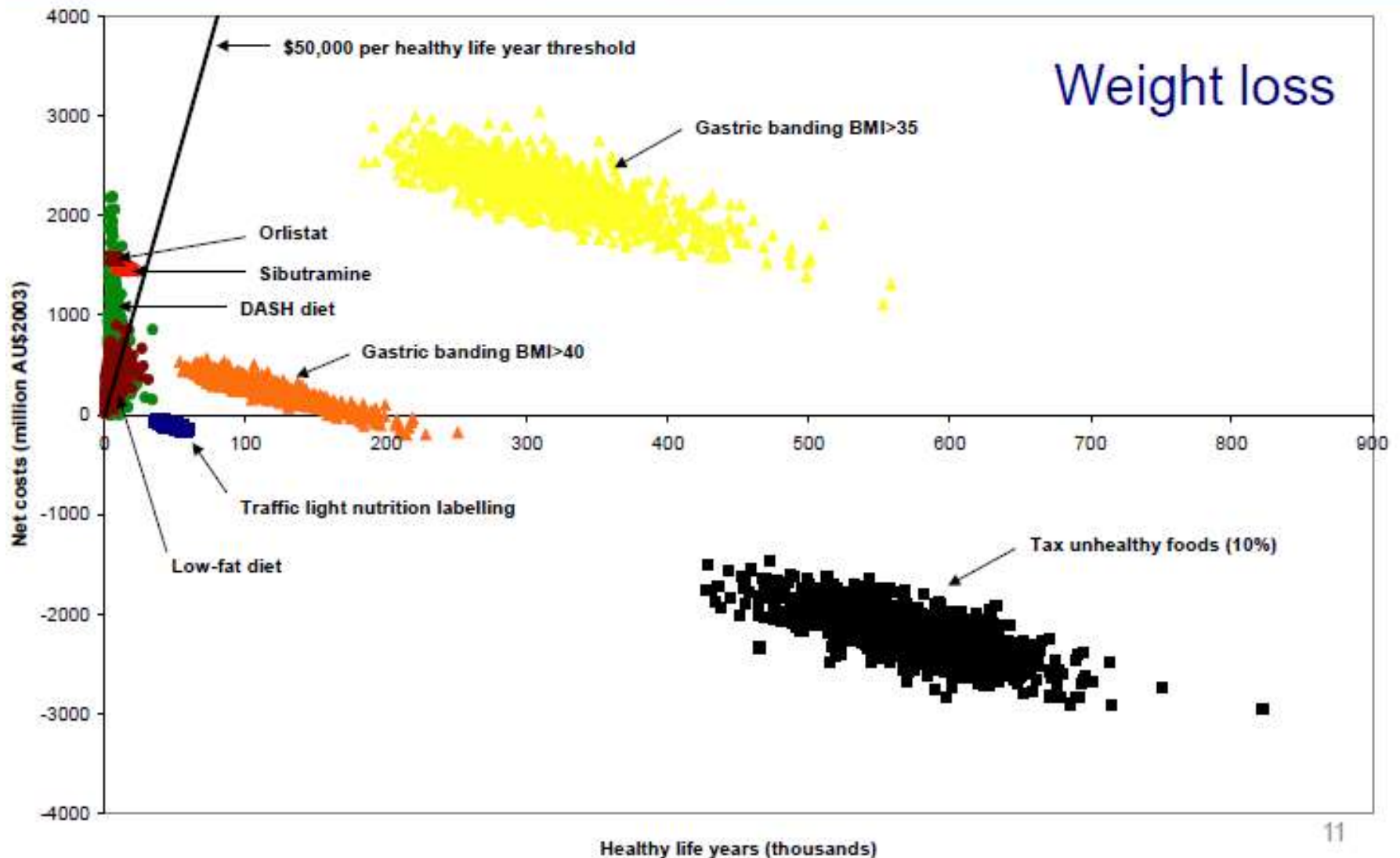
- Physical activity: pedometers & mass media
- Smoking cessation drugs
- Screen elderly women for osteoporosis & alendronate
- Screen diabetics for chronic kidney disease

## 3. **More modest** health impact

- Fluoride drinking water
- Hepatitis B vaccination
- A range of 7 measures to prevent mental disorders or suicide

Ref. ACE study on Cost-effectiveness of Prevention, 2010

## ASSESSING COST-EFFECTIVENESS IN PREVENTION



## Treatments used in obesity

- Dietary counseling
- VLCD
- Carbohydrate-rich diets
- Protein-rich diets
- Lactovegetarian diets
- Dietary fiber supplements
- Starvation
- Behavioral therapy
- Physical exercise
- Pharmacotherapy
- Surgery
- Acupuncture
- Aromatherapy
- Caffeine
- Hypnosis
- Chromium
- Vinegar

Behavioral therapy, surgery and hypnosis had the best evidence - 2004

# Bariatric Surgery Can Pay for Itself

A 2010 United States study found it takes 2 years for laparoscopic adjustable gastric banding to pay for itself in diabetes patients and 4 years in non-diabetes patients.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
With Type 2 Diabetes		<i>Cost savings</i>					
Estimated Cumulative Cost Savings per Patient			(\$10,000)	(\$20,000)	(\$30,000)	(\$40,000)	(\$50,000)
Without Type 2 Diabetes				<i>Cost savings</i>			
Estimated Cumulative Cost Savings per Patient					(\$5,000)	(\$10,000)	(\$15,000)

Finkelstein E. *et al.* Financial implications of coverage for laparoscopic adjustable gastric banding. *Surgery for Obesity and Related Diseases* 2010.

# Policy Directed at the Individual

- Behaviour modification training or therapy
- Policies which encourage healthy eating and/or regular physical activity
- Bariatric surgery and prescription medications which are supported by evidence
- Financing can be direct or tax credits or other mechanisms.

# Community-Based Policy

- Programs delivered through workplaces or schools
- Social marketing delivered by multiple sources
- Workplaces or school policy supporting better food/beverage choices in vending machines and cafeterias
- Comprehensive worksite programs
  - Include counselling, education, incentives and access to supportive locker rooms, gyms, etc.

# Environmental Policy

- Policy to support healthy built environment
  - Mandatory park space, community gardens
- Policy to support walkability of neighbourhood
  - Safety, construction of street lights, ext
- Access to grocery stores & nutritious foods

# Socio-economic Policy

- Policy to limit food insecurities
  - Subsidies for nutritious foods
- Policy to encourage physical activities
  - Tax incentives for sport and recreation involvement
- School-based interventions to target at-risk children

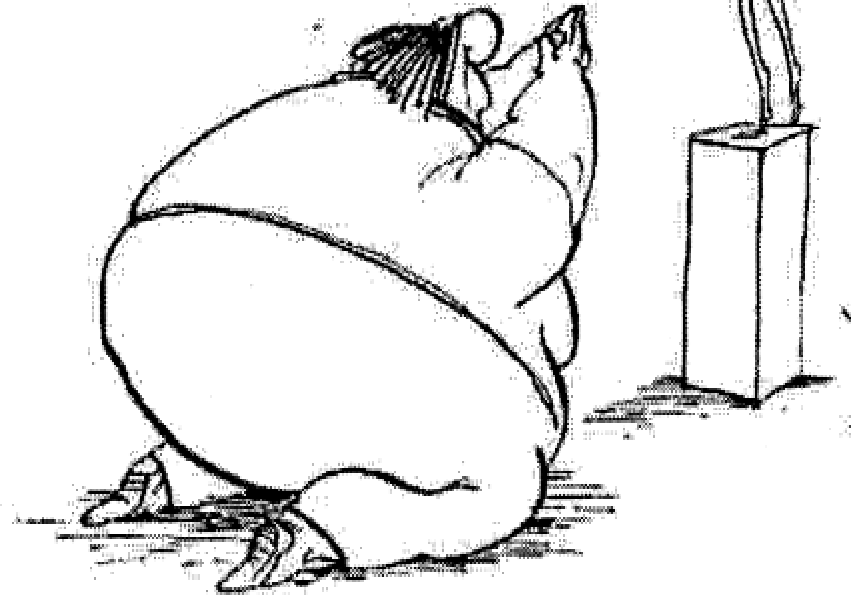
# Conclusions

- Significant increases in overweight/obese children, youth, and adults over past 30+ years
- Obesity management will likely require a multi-sector, multi-point, integrated strategy targeting
  - Individuals
  - Communities
  - Environment
  - Socio-economic determinants

2000 v. Chr...



2000 n. Chr...



H. Swartz '97

EVOLUTION...