

The Economic Impact of Prevention

Getting value for health spending, increasing productivity, and improving quality of life

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Health Policy Mission of the Center for Public Health and Health Policy

- Selected Projects
 - Universal Health Insurance
 - Hartford Insurance Task Force
 - Medical Liability Reform
 - Primary Care Research
 - ***Economic Impact of Prevention***

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Economic Evaluation

- Economic evaluation is the comparative analysis of alternative courses of action in terms of both their costs and consequences
- The basic tasks of any economic evaluation are to identify, measure, value, and compare the costs and consequences of the alternatives being considered

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Drummond et al. 2005

Economic Evaluation Methods

- Cost analysis
- Cost-effectiveness analysis
- Cost-utility analysis
- Cost-benefit analysis

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Cost-Effectiveness Ratio

$$\text{CE} = \frac{\text{Cost with intervention} - \text{Cost without intervention}}{\text{Outcome with intervention} - \text{Outcome without intervention}}$$

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Cost-effectiveness example

$$\text{CE} = \frac{\$1,000,000 - 0}{80 \text{ year survival} - 70 \text{ year survival}}$$

$$\text{CE} = \frac{\$1,000,000}{10}$$

$$\text{CE} = \$100,000/\text{life year gained}$$

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Cost-effectiveness/utility thresholds

- **Cost saving:** More \$ saved than spent
- **Bargain:** Less than \$50,000 per life year/qaly
- **Good value:** \$100,000 or less per life year/qaly
- **Poor value:** over \$100,000 per life year/qaly

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Cost-Benefit Analysis: Ergonomics Example



Fig. 2. A line worker crimping a compression connector with a manual compression press from a bucket (EPRI, 2001).

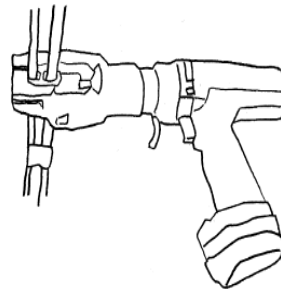


Fig. 3. A compression connector crimped with a battery-operated press (EPRI, 2001).

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Cost-benefit analysis

- Annual savings: \$184,000
- Annual cost of equipment: \$60,000

- The utility company invested \$300,000 in battery powered equipment.

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Prevention Dimensions

- Primary
- Secondary
- Tertiary

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Primary Prevention

- Seeks to avert disease or injury
 - Immunization
 - Water fluoridation
 - Occupational safety
 - Environmental interventions

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Example of Primary Prevention Intervention with Demonstrated Evidence of Effectiveness and Cost-Effectiveness

- Intervention: 4-year mass media program to prevent smoking among adolescents (age 15-18) in 4 US cities
- Costs: development and broadcasting the mass media campaign: \$796,436
- Consequences: 1023 smokers averted
- CE ratio: \$696/life-year gained

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Secker-Walker RH, Worden JK, Holland RR, et al. 1997. A mass media programme to prevent smoking among adolescents: costs and cost-effectiveness. *Tobacco Control* 6: 207-212.

Secondary Prevention

- Early detection of disease, e.g., “screening”
 - Cancers
 - High blood pressure
 - Tuberculosis
- Counseling
 - Smoking cessation
 - Diet and exercise

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Example of Secondary Prevention Intervention with Demonstrated Evidence of Effectiveness and Cost Utility

- **Intervention:** Expanded testing for primary HIV infection among persons with fever and other viral symptoms
- **Costs:** p24 antigen EIA testing: \$24.65 per
- **Consequences:** 17,054 cases identified; infection avoided in 435 partners
- **CU ratio:** \$30,800/quality adjusted life-year gained

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Coco, A. 2005. The cost-effectiveness of expanded testing for primary HIV infection. *Annals of Family Medicine* 3 (5): 391-399

Tertiary Prevention

- Intervention to limit disease progression
 - Chronic disease management
 - Rehabilitation

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Example of Tertiary Prevention Intervention with Demonstrated Evidence of Cost Savings (cost benefit)

- Intervention: Comprehensive asthma intervention program for Medicaid covered children
- Costs: \$800 per child
- Cost savings: Average asthma health care charges decreased by \$721 in one year.

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Kelly et al. 2000. Outcomes evaluation of a comprehensive intervention program for asthmatic children enrolled in Medicaid. Pediatrics 105: 1029-1035

Prevention risk-reduction continuum

- Individualized interventions and healthy behaviors
- Clinician directed activities
- Community based activities
- Employer based activities

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Prevention Challenges and Opportunities

- Imbalanced health spending
- Behaviors
- Chronic Disease

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Imbalanced health spending

- Health spending:
 - 20% during the last year of life
 - 3% for health promotion activities

Hoover et al. 2002. Health Services Research 37(6); Brown et al. 1992. MMWR 41(29)

- Only 49% of adults received preventive and screening tests according to guidelines for their age and sex

Commonwealth Fund, 2006

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Behaviors



- Leading “actual” causes of death in US
 - Smoking
 - Poor diet coupled with physical inactivity
 - Alcohol consumption

Mokdad et al. JAMA, 2004



- Only 3 percent of Americans follow all four healthy lifestyle recommendations:
 - nonsmoking
 - healthy weight
 - 5 or more servings of fruits and vegetables per day
 - regular physical activity

Reeves & Rafferty, Archives of Internal Medicine, 2000.

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Smoking US Average: 20.1%



Bottom Five

Kentucky (28.5%)
 West Virginia (25.7%)
 Oklahoma (25.1%)
 Mississippi (25.1%)
 Indiana (24.1%)

Top Five

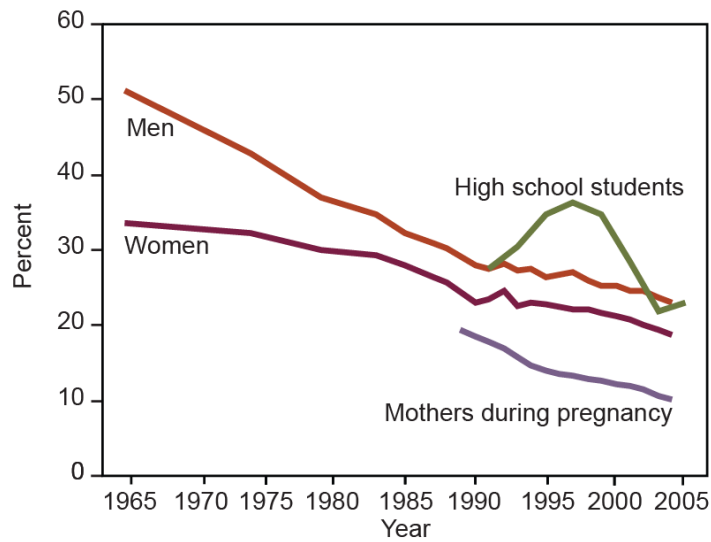
Utah (9.8%)
 California (14.9%)
 Idaho (16.8%)
Connecticut (17.0%)
 Washington (17.1%)

Massachusetts (17.8%) ranked 8th.

BRFSS, 2006

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Cigarette smoking



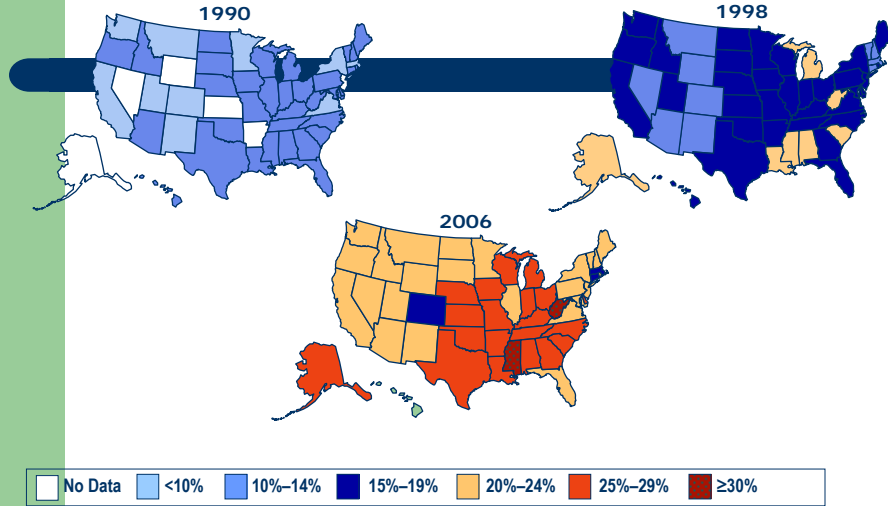
SOURCES: Centers for Disease Control and Prevention, National Center for Health Statistics, *Health, United States, 2006*, Figure 10. Data from the National Health Interview Survey, Youth Risk Behavior Survey, National Vital Statistics System.

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Obesity Trends* Among U.S. Adults

BRFSS, 1990, 1998, 2006

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



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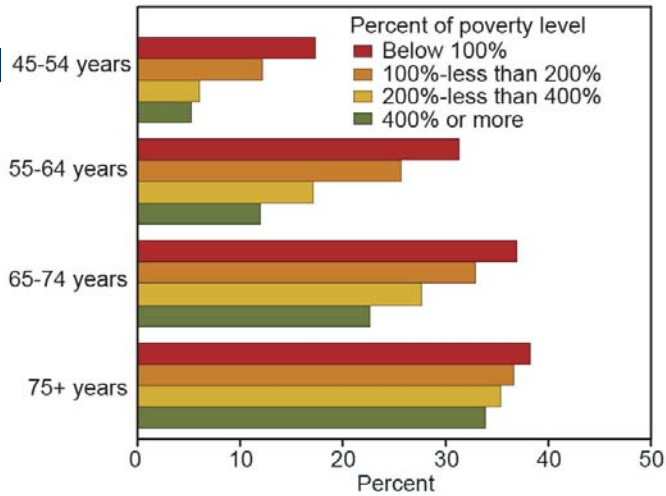
Adult Obesity in CT and MA

	1990	2007
Connecticut	15.1	20.6
Massachusetts	10.1	20.3

United Health Foundation, 2007

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Three or more chronic conditions among adults 45+ years, 2004



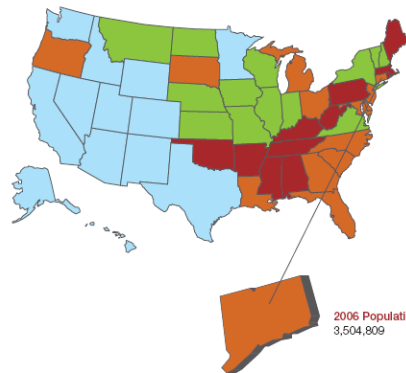
SOURCES: Centers for Disease Control and Prevention, National Center for Health Statistics, *Health, United States, 2006*, Figure 15. Data from the National Health Interview Survey.

Chronic Disease in Connecticut

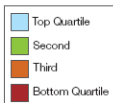
Reported Cases in Connecticut, 2003 (and as % of population*)

Cancers:	136,000	(4.0%)
Diabetes:	147,000	(4.4%)
Heart Disease:	224,000	(6.6%)
Hypertension:	434,000	(12.9%)
Stroke:	30,000	(0.9%)
Mental Disorders:	408,000	(12.1%)
Pulmonary Conditions:	611,000	(18.1%)

* As % of non-institutionalized population. Number of treated cases based on patient self-reported data from 2003 MEPS. Exclude untreated and undiagnosed cases.



2006 Population
3,504,809



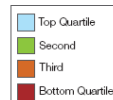
Milken Institute State Chronic Disease Index
States in the top quartile have the lowest rates of seven common chronic diseases.

Chronic Disease in Massachusetts

Reported Cases in Massachusetts, 2003 (and as % of population*)

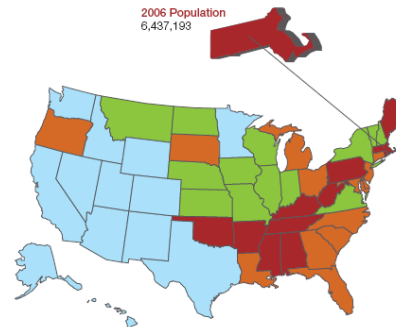
Cancers:	257,000	(4.1%)
Diabetes:	285,000	(4.6%)
Heart Disease:	391,000	(6.3%)
Hypertension:	762,000	(12.3%)
Stroke:	56,000	(0.9%)
Mental Disorders:	1,089,000	(17.5%)
Pulmonary Conditions:	1,342,000	(21.6%)

* As % of non-institutionalized population. Number of treated cases based on patient self-reported data from 2003 MEPS. Excludes untreated and undiagnosed cases.



Milken Institute State Chronic Disease Index

States in the top quartile have the lowest rates of seven common chronic diseases.



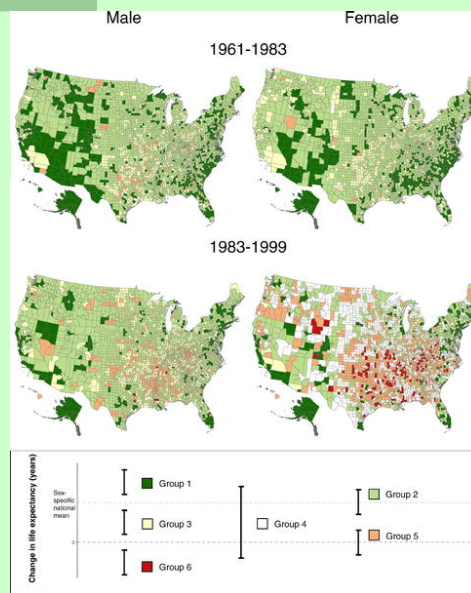
2006 Population
6,437,193

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Costs of Chronic Disease and Potential Savings in Connecticut

- Costs in 2003: **\$16.2 billion**
- “Business as usual” costs in 2023: **\$44.5 billion**
- Cost reduction in 2023 with improved prevention and management of chronic disease: **\$11.9 billion**

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Ezzati et al. 2008. The Reversal of Fortunes: Trends in County Mortality and Cross County Mortality in the United States. PLoS Medicine.

Economic Benefits of Prevention and Health Promotion for Connecticut Employers and State Government

- Healthier, more productive employees
- May foster more equitable access to the health system
- Getting better value for current health spending

Summary

- Evidence clearly demonstrates the health benefits and economic value of prevention and health promotion.
- There are challenges that limit full implementation of prevention in the current health system.
- There are opportunities to improve health outcomes through prevention even within current health system constraints.

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Why is this important now?

- The expected development of health system reform to increase insurance coverage at the federal and/or state level provides opportunities to shift the focus of our health system towards prevention and health promotion.

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- Hygieia
 - Greek goddess of prevention