The Economic Causes and Consequences of Obesity

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The Economic Causes and Consequences of Obesity (outline)

- Why the Increase in Obesity Rates
- Adverse Health Consequences
- Adverse Financial Consequences
- Intervention Options
- Conclusion

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The Economic Causes and Consequences of Obesity

- An Annual Review of Public Health article by Finkelstein, Ruhm, and Kosa contains a more detailed discussion of this subject
- Available at:
  - http://arjournals.annualreviews.org/doi/pdf/10.1146/annurev.publhealth.26.021304.144628
  - Or email me a request at finkelse@rti.org

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Facts

- 2/3rds of American adults are overweight or obese
- Represents a 12% (overweight) and a 70% (obese) increase over the last decade alone
- 16 percent of children and adolescents ages 6-19 years are overweight (including obese)
- Represents a 45 percent increase over the last decade
- Increase occurred for all population subsets, including children, the elderly, and all racial/ethnic groups

Why the Increase In Obesity

- Rising obesity rates result from increases in caloric intake and/or decreases in caloric expenditure
- The rise in obesity rates could be explained by as little as an average net increase of 50-100 calories per day
  - Less than half the calories in a 16-oz. carbonated beverage

Changes in Caloric Intake

- Caloric intake changes from NHANES I (1971-74) to NHANES (1999-2000):
  - Men 2,450 to 2,618 kcal/day (7% ↑)
  - Women 1,542 to 1,877 kcal/day (22% ↑)

- Carbohydrate changes from (1976-80 to 1999-00)
  - Men 1,039 to 1,283 kcal/day (24% ↑)
  - Women 700 to 969 kcal/day (38% ↑)

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Changes in Caloric Intake

- Consumption of food away from home increased from 18% to 32% of total calories between 1977-78 and 1994-96
- In 1997, the average American consumed 53 gallons of soft drinks and 17 gallons of fruit juices or drinks
  - Represents a 51% and a 40% increase since 1980

Why the Increase In Caloric Intake

- Food costs (both money and time) have been steadily declining
- Monetary price of food relative to other goods fell 14% since 1980
  - Food prices had been rising from 1960-1980
- Largest declines are for calorie dense foods
  - Between 1985 and 2000, the nominal price of fresh fruits and vegetables, fish, and dairy products increased by 118%, 77%, and 56%, respectively
  - Nominal price of sugar and sweets, fats and oils, and carbonated beverages increased at lower rates—46%, 35%, and 20%, respectively

Why the Increase In Caloric Intake

- Opportunity cost of prepared foods continues to decrease as a result of technology (e.g., microwave)
- Increased prevalence of fast-food and restaurants lowers acquisition costs
- **Increases in caloric consumption could be enough to explain the rise in obesity rates even if there were no changes in caloric expenditure**

Changes in Caloric Expenditure

- Non-leisure time physical activity has likely been declining
  - Although very hard to measure
  - Declines occur at work, at home, and in between
    - 'Accidental exercise' is almost non-existent
    - Association between commute time and obesity
- The costs of being inactive have gone down
  - Due to technology, you can accomplish the same activities with less effort
- The benefits of being inactive have gone up
  - Internet, computer games, cable TV, …
  - No more evident than with respect to entertainment for kids

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Changes in Caloric Expenditure

- Leisure-time physical activity among adults has remained largely unchanged, but at low levels
  - 1 in 4 get no exercise at all
- Note: A 30 minute jog followed by 8 hours on the computer falls short of the '10,000 Steps' recommendation
- Adolescents and Young Adults (from S.G. report)
  - One-fourth of U.S. young people (ages 12-21 years) report no vigorous physical activity.
  - About 14 percent of young people report no recent vigorous or light to moderate physical activity.
  - Participation in all types of physical activity declines strikingly as age or grade in school increases.

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Why the Increase In Obesity

- Many other potential factors have been suggested
  - Fast food prevalence (demand or supply driven?)
  - Supersizing (marginal cost pricing)
  - Increase in real wages/income
  - Women in the workplace
  - Reductions in smoking rates
  - Advertising
  - Drug side effects
  - Built environment
  - Unsafe neighborhoods
  - and others
- Technology may be responsible for (or exacerbate) many of these as well

Adverse Health Consequences

- Obesity increases the likelihood of:
  - type 2 diabetes (majority are obesity-related)
  - cardiovascular diseases (CHD, MI, and stroke)
  - several types of cancer
  - gallbladder disease
  - sleep apnea
  - osteoarthritis
  - perhaps others (e.g., Alzheimer's, depression, back pain)
- Responsible for a bunch of deaths each year

Adverse Financial Consequences for the U.S.

Finkelstein, E.A., I.C. Fiebelkorn, G. Wang. May 14, 2003. "National Medical Expenditures Attributable to Overweight and Obesity: How Much and Who's Paying?" *Health Affairs* (Web Exclusive):W3-219—W3-226.

- Medical costs for overweight and obesity are over $90 Billion per year
- About 9% of aggregate medical spending goes to treating obesity related diseases
- Costs now rival those for smoking
- *Approximately half of obesity-attributable $ paid by Medicare and Medicaid*
- Each taxpayer responsible for about $180/yr for obesity-related medical costs for public sector health plans

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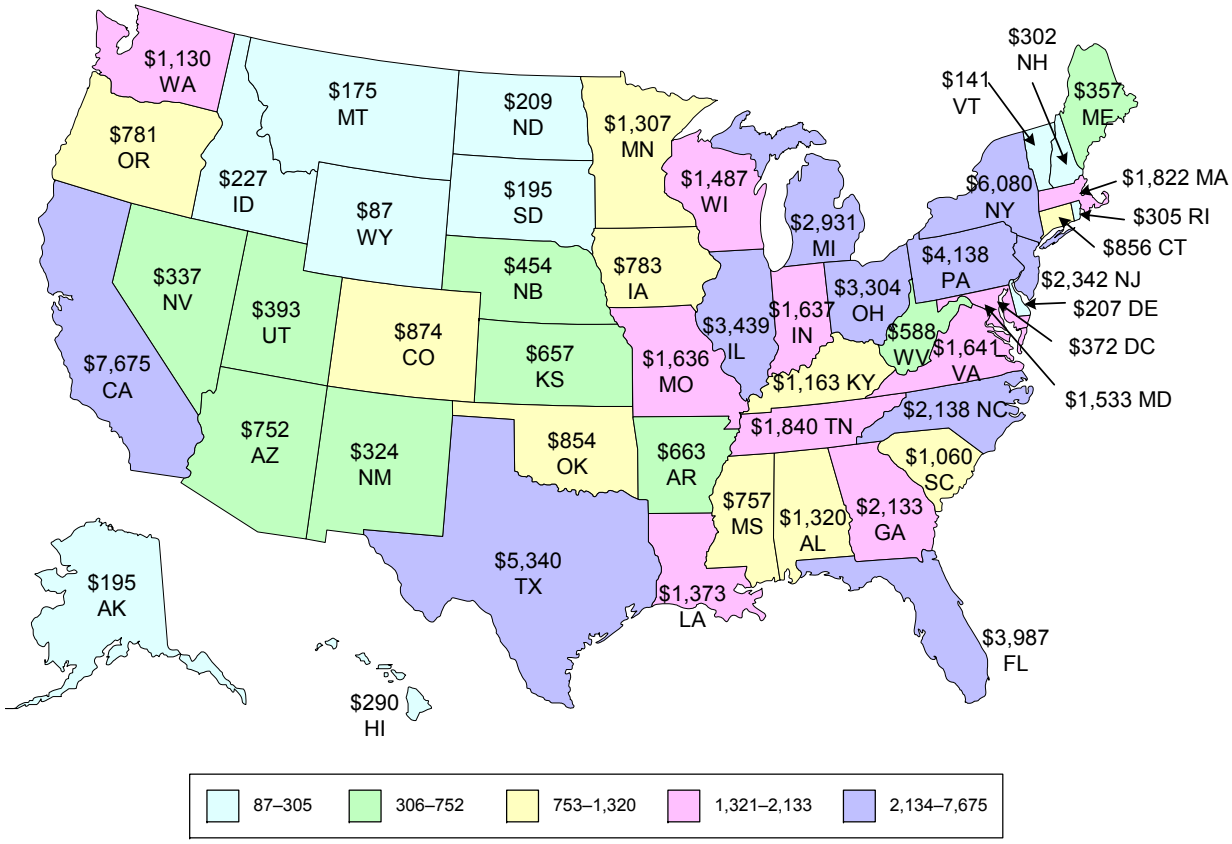
Adverse Financial Consequences for States

Finkelstein, E.A., I.C. Fiebelkorn, G. Wang. 2004. "State-Level Estimates of Annual Medical Expenditures Attributable to Obesity." *Obesity Research* 12(1):18-24.



Adverse Financial Consequences for Employers

- Summarized from ***"A Cost-Benefit Simulation Model of Coverage for Bariatric Surgery among Full-Time Employees"***
  - by Eric A. Finkelstein and Derek S. Brown
  - Currently under review

Consequences for Employers (Prevalence)

Full-Time Employees:

- Surgery non-eligible (SNE)

  BMI of 30-35 or 35-40 without evidence of angina, osteoarthritis, diabetes, hypertension, or asthma

- Surgery eligible (SE)

  BMI of 40+ or 35-40 with comorbidities

	SNE	SE
Overall	22%	9%
Males	20%	6%
Females	24%	12%

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Consequences for Employers (Annual Medical $)

Obesity-Attributable Medical Expenditures (2003 dollars)

	Surgery Non-Eligible (95% CI)	Surgery Eligible (95% CI)
Overall	$550 ($390-$720)	$2,230 ($1,770-$2,700)
Men	$310 ($65-$560)	$2,020 ($1,230-$2,800)
Women	$890 ($640-$1,130)	$2,360 ($1,790-$2,920)

Note - does not include costs for bariatric surgery

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Consequences for Employers (Annual Absenteeism)

Obesity-Attributable Absenteeism

	Surgery Non-Eligible (95% CI)	Surgery Eligible (95% CI)
Overall	0.8 (0.4-1.3)	5.1 (3.3-6.9)
Men	0.4 (-0.2-0.9)	4.1 (1.2-7.1)
Women	1.8 (1.0-2.7)	5.5 (3.4-7.5)

Obesity-attributable days missed due to illness or injury

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Consequences for Employers ($ Value of Annual Absenteeism)

	Surgery Non-Eligible	Surgery Eligible
Overall	$179	$1,003
Men	$106	$1,082
Women	$317	$968

Consequences for Employers (Annual $ value of Medical and Absenteeism)

	Surgery Non-Eligible	Surgery Eligible
Overall	$710	$3,150
Men	$410	$3,020
Women	$1,170	$3,230

Adverse Financial Consequences for Employers

- Based on RTI's 'Obesity Cost Calculator' a 1,000 person firm spends over $400K annually on obesity-attributable medical expenditures and absenteeism
  - Excludes costs for bariatric surgery
  - 65% ($296K) results from the surgery eligible group
- Other costs may include presenteeism, life insurance, retraining, and disability costs

Lifetime Medical Costs of Obesity (Currently Under Review)

- How does the cost of obesity vary over the lifecycle?
- What is the cost of obesity in children?
  - Zero?
- Does obesity really cost $ over the lifetime given differential mortality rates?
  - Increased mortality implies fewer years on Medicare
  - But annual medical costs are significantly higher, and increase with age
- Some researchers report that the net medical costs of smoking are negative

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Lifetime Medical Costs of Obesity (cont)

Fig. 1: Annual per-person medical costs, not adjusted for survival

Lifetime Medical Costs of Obesity (cont)

Fig. 2: Annual per-person medical costs, survival adjusted

Lifetime Medical Costs of Obesity (cont)

Group	Obese I (BMI 30-35)	Obese 2/3 (BMI 35+)
White males	**$28,040**	**$46,410**
White females	**$41,970**	**$72,520**
Black males	**$16,520**	**$34,790**
Black females	**$28,000**	**$74,460**

Medical costs, discounted at 3%.

Lifetime Medical Costs of Obesity (cont)

- Does obesity really cost $ over the lifetime given differential mortality rates?
  - Yes – in all cases
  - But costs of obesity are very small (or even negative) for youth and young adults
- Medicare bears a significant burden of the total
  - 41-56% for obese I (BMI 30-35)
  - 33-51% for obesity II/III (BMI 35+)
- Cost shifting suggests that even cost-saving interventions will not be implemented, especially among youth

Take-away Points

- Largely due to technology, food is cheap and 'unintentional' physical activity is almost non-existent
- Obesity is a side effect of our own success
- Insurance and advances in medicine have reduced the personal cost of obesity but increased the societal cost (to employers and government)
- Costs increase almost exponentially with age
- Costs for youth are small
- U.S. health insurance system blunts the financial incentives to prevent and treat obesity
  - Ultimately obesity becomes someone else's problem

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Intervention Options

- What should we do?
- Depends on the target population:
  - At least four types of overweight adults (perhaps not mutually exclusive)
    - Lifestyle-driven
    - Uninformed Consumers
    - Addictive Tendencies
    - Genetic Predisposition
  - Youth present an additional challenge because of their myopia
- Interventions will need to be tailored to each subgroup

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Lifestyle-driven Overweight

- Given the changes that occurred over the last 30+ years, a greater fraction of the population will engage in a lifestyle that leads to excess weight
  - Even with full information on the adverse consequences of obesity
  - These individuals could weigh less, but it's too costly in the current environment
  - RTI survey data show that obese adults think they are more likely to get obesity related diseases (i.e., diabetes, heart disease, cancer) and die sooner than normal weight adults

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Lifestyle-driven Overweight

- Because the costs of obesity are financed by others, this level of obesity is not optimal from a societal perspective
  - Individuals do not bear the full financial cost of their decisions
  - Provides a motivation for employers and government to reduce these costs
- Interventions that do not affect the costs or benefits of obesity related behaviors are unlikely to be effective for this group

The Uninformed Consumer

- This subset lacks information on the costs and benefits of their food consumption and physical activity decisions
- Increasing access to information will allow this group to make better choices
- But lots of information is already available
  - Why are consumers still uninformed?
  - How effective do we think this strategy will be?

Those with Addictive Tendencies

- Suboptimal outcomes will be obtained by individuals with "self-control" problems
  - Even with full information some individuals may eat more than they would like
- The $40+B per year diet industry currently serving 55 million Americans lends credibility to the existence of this group

Those with Addictive Tendencies (cont.)

- For these individuals, provision of additional information will not be effective, but other intervention strategies may be desirable
  - Mandated smaller portion sizes in restaurants, for example

Genetic Predisposition

- For some individuals, diet and exercise are not sufficient to deter weight gain
- For them, neither incentive-based nor information-based interventions will be effective
- Medical and surgical interventions may be their only option
  - May also be the low 'cost' solution for the other types of obese individuals
- May be cost-effective for government to subsidize these interventions

Economist's View of Obesity Interventions

- Interventions that do not change marginal (incremental) costs and/or benefits are least likely to be successful
  - Explains why most diets fail
- Interventions that change marginal costs and benefits are likely to be followed by changes in behavior
- Information provision may have an impact, but likely to be limited

Evaluating Intervention Options

- Prior to implementation, need to consider:
  - What are the intended consequences?
    - Is it weight loss or something else?
  - What might be the unintended consequences?
  - How will we know if the intervention is successful?
  - Are there better alternatives?
    - May require cost-effectiveness analysis
  - Is it economically feasible
  - Is it politically feasible

Example - Eliminate Soft Drink Vending Machines in Schools

- What are the intended consequences?
  - Reduce consumption of carbonated beverages?
- Other intended consequences?
  - Improve health and reduce obesity rates
- Unintended Consequences
  - Loss of revenue
  - Kids find another way to consume unhealthy food
- How will we know if it works?
  - Evaluation should be a critical component of all obesity interventions

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Conclusion

- Obesity is a side-effect of our own success
- Our current health care system is not properly structured to prevent or treat obesity
- Without interventions, obesity rates will not improve and are likely to get worse
- Interventions will need to be multi-faceted to be successful
- Those that change costs and benefits of behaviors related to obesity are most likely to result in changes in behavior
- Information provision may have an impact, but likely to be limited
- Interventions should be evaluated to ensure they represent the low 'cost' approach for reducing rates of obesity

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