The Urgency of the Situation: The Cost of Childhood Obesity for Society

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Uppsala Health Summit
Ending Childhood Obesity: Actions through Health and Food Equity

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Uppsala, Sweden
U.S. Context on Obesity and Health Care Expenditures
- Obesity rates
- Health care expenditures

Costs of Obesity
- Direct medical costs for children and adults
- Incremental lifetime costs of childhood obesity
- Mental health
- Human capital costs in childhood
- Productivity costs for adult workers
  - Absenteeism
  - Presenteeism
- Wage penalties
- Environmental costs
Obesity Rates among Adults

Figure 1. Obesity among adults, 2012 or nearest year

Overweight Rates among Children

Source: International Association for the Study of Obesity, 2013; Bös et al. (2004), Universität Karlsruhe and Ministères de l’Education nationale et de la Santé for Luxembourg; and KNHANES 2011 for Korea.
Gender & Racial/Ethnic Disparities in Obesity in the U.S.

**Children Aged 2-19**

- Male: Green (White 12.6, Hispanic 24.1, Black 19.9)
- Female: Green (White 15.6, Hispanic 20.6, Black 20.5)

**Adults Aged 20+**

- Male: Purple (White 32.4, Hispanic 40.1, Black 37.1)
- Female: Purple (White 32.8, Hispanic 56.6, Black 44.4)

Source: Ogden et al., *JAMA*, 2014.
Regional Disparities in Obesity in the U.S.

Leanest State
Colorado

Fattest State
Mississippi

Percentage of Obese Adult Population
(3-year average from 2011-13 CDC Behavioral Risk Factor Surveillance System data)

Source: Calorie Lab
U.S. Health Expenditure Shares, 1960-2025

Health Expenditures as a % of GDP in Selected OECD Countries

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* 2015 estimated or provisional value

Health Expenditure Per Capita, 2013

1. Includes investments.
2. Data refers to 2012.

Overall Medical Expenditures/Costs of Obesity

Examples from the U.S:

- **Children**: $14.3 billion annually ($14.1B for prescription drugs, ER and outpatient + $237.6M from inpatient costs)

- **Adults**: $209.7 billion annually (20.6% of national health expenditures)

- Incremental lifetime direct medical costs of an obese versus a normal weight 10 y old child (accounting for the reality of eventual weight gain among normal weight youth): $12,660
  - **Cost for one cohort of 10 y olds**: $9.4 billion

Medical Expenditures/Costs of Obesity for Children

- Compared to normal weight children, overweight and obese children have higher health care expenditures/costs, respectively, by:
  - $180 and $220 in U.S.
  - €66 and €266 in Germany

- Health care costs of obese versus normal weight children:
  - 1.2 times higher in Canada
  - 1.6 times higher in Australia

Sources: Finlestein and Trogdon, AJPH, 2008; Breifelder et al., Econ Human Biology, 2011; Kuhle et al., Int J. Pediatr Obesity, 2011; Hayes et al., Obesity, 2016
Medical Expenditures Due to Obesity for Adults

- Estimates of incremental per capita medical expenditures among U.S. full-time employees aged ≥ 18 by obesity grade and gender:
  - Grade 1 obese (30.0 ≤ BMI ≤ 34.9): Men: $475  Women: $1274
  - Grade 2 obese (35.0 ≤ BMI ≤ 39.9): Men: $824  Women: $2532
  - Grade 3 obese (BMI>= 40.0): Men: $1269  Women: $2395

Source: Finkelstein et al., JOEM, 2010
Obesity Mental Health and Risky Behaviors

• Reviews found self-esteem was significantly lower among obese children and adolescents; although some mixed results

• Among school aged children aged 11-17, obesity versus normal weight associated with:
  - Increased smoking among girls
  - Younger boys more likely to be victims of bullying
  - Older boys more likely to carry a weapon

• Perception of being overweight significantly raises suicide ideation and attempts for girls

• Among adults, a recent review revealed and inverse relationship between BMI and the risk of completed suicide; although positively associated with suicide attempts among women

Youth Obesity and Human Capital Accumulation

- Among young (2-3y) German children obesity is associated with reduced verbal, social and motor skills and daily activity living skills for boys and reduced verbal skills for girls.

- Obesity among 4th-6th graders found to be positively associated with school absenteeism: 12.2 days versus 10.1 days for normal weight children.

- Among 14-17 y olds, higher BMI associated with lower GPA among white females but less consistent evidence for nonwhite females and males.

Productivity Costs of Adult Obesity

• Obesity, as compared to normal weight status, is associated with 1.1 to 1.7 additional days missed from work annually: a financial burden on U.S. states ranging from 6.5% to 12.6% of total absenteeism costs in the workplace.

• Individuals with a BMI ≥ 30, as compared to those with BMI ≤ 27, has 69% more total days absent from work.

• Absenteeism cost estimates range from $4.3B, $8.65B, $12.8B /year.

• Presenteeism cost estimated at $30B /year.

• Short-term disability in workplace: overweight and obesity 1.3 and 1.8 higher odds of short-term disability.

Sources: Andreyeva et al., JOEM, 2014; Kleinman et al., JOEM, 2014; Finkelstein, et al., JOEM, 2010; Cawley et al., JOEM, 2007; Arena et al., JOEM, 2006.
### Productivity Losses Attributable to Obesity: Absenteeism & Presenteeism

#### Absenteeism

- **Grade 1 obese (30.0 ≤ BMI ≤ 34.9):**
  - Men: $277 & 1.6 days
  - Women: $407 & 3.1 days
- **Grade 2 obese (35.0 ≤ BMI ≤ 39.9):**
  - Men: $657 & 3.8 days
  - Women: $67 & 0.5 days
- **Grade 3 obese (BMI ≥ 40.0):**
  - Men: $1026 & 5.9 days
  - Women: $1261 & 9.4 days

#### Presenteeism

- **Grade 1 obese (30.0 ≤ BMI ≤ 34.9):**
  - Men: $391 & 2.3 days
  - Women: $843 & 6.3 days
- **Grade 2 obese (35.0 ≤ BMI ≤ 39.9):**
  - Men: $1010 & 5.8 days
  - Women: $1513 & 11.0 days
- **Grade 3 obese (BMI ≥ 40.0):**
  - Men: $3792 & 21.9 days
  - Women: $3037 & 22.7 days

Source: Finkelstein et al., JOEM, 2010
Per Capita Incremental Medical Expenditures, Absenteeism and Presenteeism Costs, by Obesity Status and Gender

Source: Data drawn from Table 2. Finkelstein et al., JOEM, 2010
Obesity and Wages

Obesity is associated with lower wages

- In the U.S., obesity wage penalty of about 1-3% for men and 2-6% for women
- In Europe, 10% higher BMI associated with earnings penalty of 3% for men and 2% for women
- Effect found more consistently for women in U.S., particularly white women (e.g., 2 sd increase in weight associated with 9% lower wages)
- Obesity wage penalties are found in Germany for women in white-collar jobs
- Wage penalties are larger in the U.S. in occupations requiring interpersonal skills

Environmental Costs

- Overweight and obesity are related to one billion additional gallons of gasoline consumed each year in the U.S. (0.8% of the annual fuel consumption) = $2.7B
  - Adds 20 billion pounds of CO\(_2\) emissions (0.5% of annual CO\(_2\) transport emissions)

- Study of OECD, estimates that a population wide 5kg weight reduction would lower CO\(_2\) emission from transportation by 10 million tons.


Summary: Costs of Obesity

Childhood Obesity
- Poorer physical health
- Poorer mental health
- Greater direct medical costs
- Greater school absenteeism
- Delayed skill acquisition
- Lower test results

Adult Obesity
- Poorer physical health
- Poorer mental health
- Greater direct medical costs
- Greater work absenteeism
- Greater work presenteeism
- Lower wages
- Greater environmental costs

Lower Utility
(Direct health effects and due to increased financial constraints)

Health and Wellbeing Disparities

Gender, race/ethnicity, SES, region
Next steps: "Actions” to Reduce Obesity and Costs
Thank you!

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