An economic perspective on investment targeting childhood obesity prevention:

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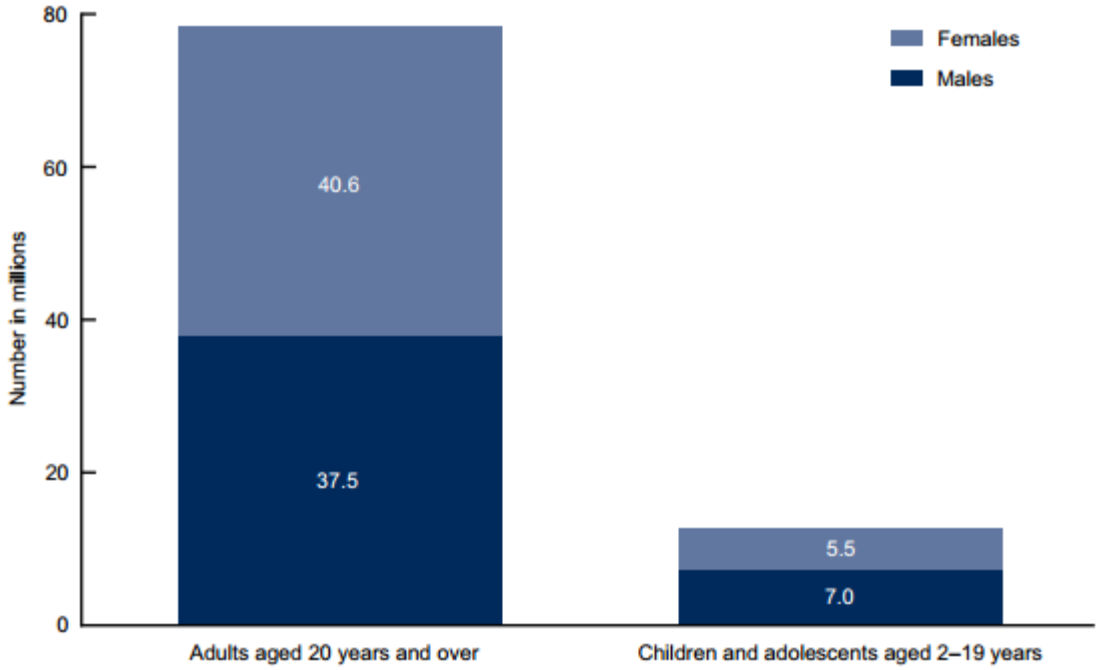
Background

- According to Ogden (2012) 35.7% of U.S adults are obese and 16.9% US children and adolescents were obese.

- Childhood obesity is associated with a host of diseases such as :
- Diabetes, obstructive sleep apnea, gallbladder disease, among other conditions.



- Source: CDC/NCHS,National and Nutrition Examination Survey,2009-2010

Medical costs of childhood obesity

- Childhood obesity not only contributes to today's costs but is problematic for the future given that obese adolescents are more likely to be obese adults.

- Trasande and Chatterjee(2009) find that childhood obesity is associated with an estimated 14.1 billion in additional prescription drug, emergency room and outpatient medical services annually.

- When we think of an economic impact it usually entails direct and indirect effects
- Similarly when we think of an economic burden we need to account for direct and indirect costs. For example Lightwood et al (2009) find that the indirect costs due to lost productivity are about 4.5 times larger than the direct ones.
- Interventions can aim to either prevent or deal with emergent consequences like diabetes.

- Even if we have yet to identify the most effective interventions:
- Estimating benefits from potential reductions are not premature as they provide policy makers with the level of investment worth considering.

Persistence?

- Consistent findings regarding the persistence of obesity from childhood, adolescence into adulthood.
- -Correlation between early obesity and later obesity increases as baseline age rises.

Across Studies

Age		Persistence of Obesity†			
Baseline	Follow-up	Women, No. (%)	Men, No. (%)	Data Source and Population	Study
2–5	22.4–32.5	15 (73)	14 (93)	Bogalusa Heart Study, LA	Freedman et al, 2005 USA[16]
6–8	22.4–32.5	54 (83)	32 (78)		
9–11	22.4–32.5	72 (78)	51 (76)		
12–14	22.4–32.5	64 (83)	59 (88)		
15–17	22.4–32.5	31 (90)	36 (86)		
6.4–12.9	21–32	841 (65), W‡	691 (71), W	Bogalusa Heart Study, LA	Freedman et al, 2005, USA[17]
6.4–12.9	21–32	477 (84), B§	383 (82), B		
13–20	19–26	269 (91), W	385 (77), W	National Longitudinal Study of Adolescent Health, Wave II & III	Gordon-Larson et al, 2004, USA[14]
13–20	19–26	199 (89), B	128 (84), B		
13–20	19–26	100 (88), HII	109 (77), H		
5	35	N/A (37), W	N/A (31), W	Fels Longitudinal Study, OH	Guo et al, 2002, USA[18]
8	35	N/A (46), W	N/A (22), W		
11	35	N/A (59), W	N/A (28), W		
14	35	N/A (64), W	N/A (40), W		
17	35	N/A (77), W	N/A (52), W		
20	35	N/A (99), W	N/A (98), W		
16–17	37/38	16 (92)	29 (80)	National Longitudinal Survey of Youth 1979	Wang et al, 2008, USA[15]

*Childhood obesity, BMI ≥ 95th percentile of Centers for Disease Control and Prevention charts; adult obesity, BMI ≥ 30.
†Sample size.
‡W = white.
§B = black.
IIH = Hispanic.

What do we know?

- Only as recently as 2006 have there been efforts to quantify costs of childhood obesity.

- Assume a given decrease in childhood obesity and simulate its effects forward.

What do we need to know?

- The persistence of childhood obesity
- The degree to which interventions are likely to be adopted by the children, their families.
- The potential return on investment.

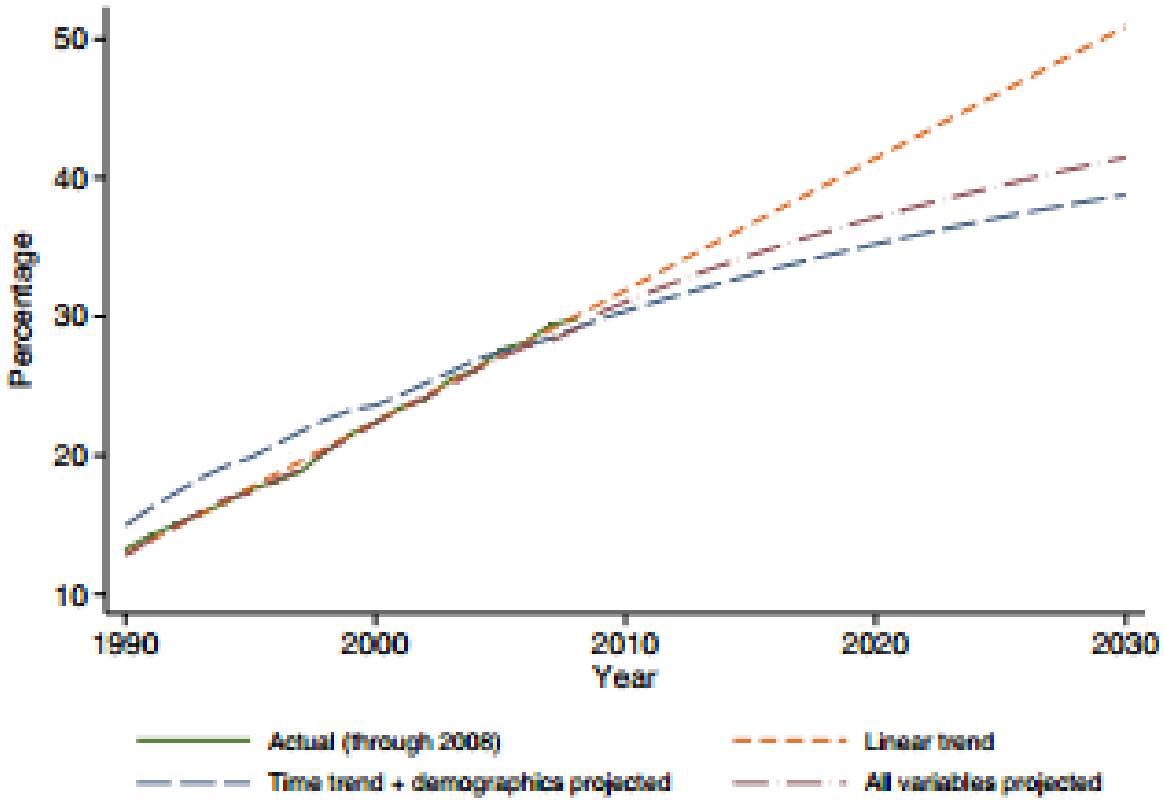
Adult obesity costs

- Adult Per Capita Medical Spending Attributable to Obesity (Compared to Normal Weight),1998 and 2006 (in 2008 Dollars)

Year	Spending difference compared to normal weight ($)	Percent difference compared to normal weight
2006	1429(156)	41.5(4.9)
1998	1145(270)	36.5(8.9)
1998(original)	930(438)	37.4(17.4)

Source: Finkelstein,E.A,Trodgon,J.G, 2009.Annual Medical spending attributable to obesity: payer and service specific estimates. Health Affairs, Web Exclusive. July 27,2009

Actual and predicted prevalence of obesity



Select Findings

- Wang et al(2009) use a BMI progression model along with MEPS data:

Scenario	16-17 year olds
1 % reduction in both overweight and adolescents ages	-52,821 reduction in the number of obese adults -Lifetime medical costs after 40 would decrease by 586 million -QALYs increase by 47,138

At What level of effectiveness and costs would an early intervention be affordable?

- Ma et al (2011) find that obese adults in 2006 spent 1548 dollars and obese children (6-17 years) spent 264 dollars more on annual medical expenditure than normal weight adults or children.

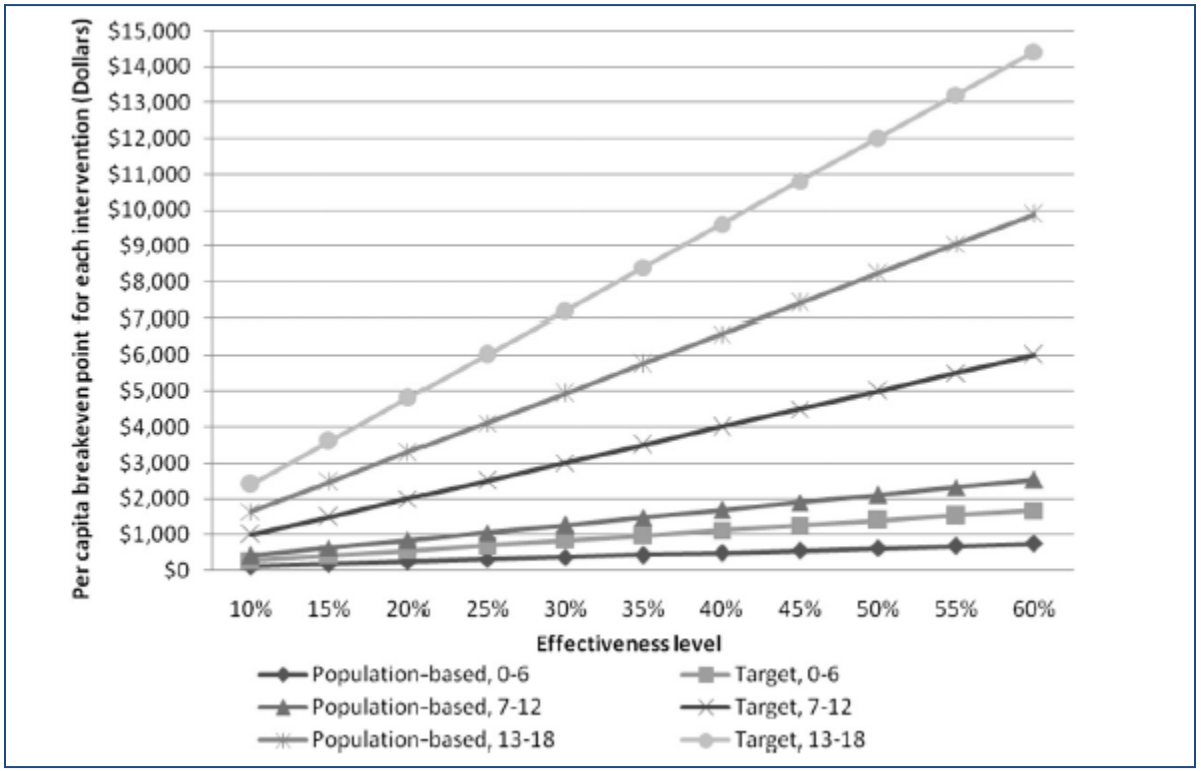
Example of Parameters

Parameter	Base Model Value
Current Prevalence of obesity	
Age 0-6 years	12.4%
Age 7-12 years	17%
Age 13-18 years	17.6%
Lifetime medical expenditures attributable to obesity (life expectancy at age 18 years	
Nonsmoking white female	40,874
Smoking black female	33,782

Cont.’

- Breakeven point :
- 1 percent reduction in the prevalence of obesity would result in approximately 1.7 billion dollars for (0-6 year olds).
- 1 percent reduction in the prevalence of obesity would result in approximately 1.4 billion dollars for (7-12 year olds).
- 1 percent reduction in the prevalence of obesity would result in approximately nearly 1.7 billion dollars for (13-18 year olds).

Role of Effectiveness



- Source: Ma S, Frick KD.A simulation of Affordability and Effectiveness of Childhood Obesity Interventions. Cad Pediatr 2011;46:467-73

- Trasande (2011) looked at obese and overweight twelve year olds and applied a :

costs of illness approach by projecting:
Additional health care expenses during childhood.
Additional adult health care expenses that can be attributed to childhood obesity/overweight
QALYs lost by obese/overweight adults who were obese/overweight as children

Cost Effective Investment

Intervention age group			
Scenario	6 year olds	12 year olds	19 year olds
1 percentage point reduction in obesity	1.15 billion(326 million – 13.9 billion	2.3 billion(572 million-21 billion)	3.32 billion(915 million-33.3 billion)
1 percentage point reduction in overweight	311 million (103 million -3.35 billion	601 million (204 million-5.66 billion)	907 million(251 million-9.13 billion)
1 percentage point reduction in obesity And 1 percentage point increase in overweight	835 million (193 million-10.5 billion)	1.43 billion(348 million-15.3 billion)	2.41 billion(664 million-24.2 billion)

Source :Trasande L. How much should we invest in preventing childhood obesity? Health Affairs (Millwood). 2010;29:372–378.

What about indirect effects?

- Indirect costs stem from the loss of productivity that is caused by the mortality or morbidity from the disease or risk factor under consideration.
- A proper and thorough accounting of indirect effect renders previous estimates lower bounds.

Long run view

- Preventing children from becoming obese or reversing already obese children to normal weight could save significant future medical expenditures.

- Prevention at an early stage is key to reversing the obesity trends as well as decreasing obesity related expenditures.

- Although prevention programs may be more expensive than the immediate costs saved, the long term benefits obtained through prevention of adult diseases are considerable and should be taken into account.
- A full cost/benefit analysis that takes both short and long term benefit is necessary in determining the viability of interventions.

Thank you

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