

The US Obesity Epidemic: Time Trends and Health Care Costs ("Where Are we Headed & What Will it Cost?")

Youfa Wang, MD, PhD
Associate Professor
Center for Human Nutrition
Department of International Health
Department of Epidemiology
ywang@jhsph.edu

Hill 5/14/09

Outline

- I. Introduction
 - The global obesity epidemic
- II. The US obesity epidemic
 - Observed trends in adults
 - Observed trends in children
 - Projections of future trend in obesity
 - Projection of financial costs

Selected key references

Wang Y, Beydoun MA, Liang L, Caballero B, Kumanyika SK. Will all Americans become overweight or obese? Estimating the progression and cost of the US obesity epidemic. *Obesity* 2008;16(10):2323-30.

Wang Y, Beydoun MA. The obesity epidemic in the United States--gender, age, socioeconomic, racial/ethnic, and geographic characteristics: a systematic review and meta-regression analysis. *Epidemiol Rev.* 2007;29:6-28.

Beydoun MA, Wang Y. Gender-ethnic Disparity in BMI and Waist Circumference Distribution Shifts in US Adults. *Obesity* 2009;17(1):169-76.

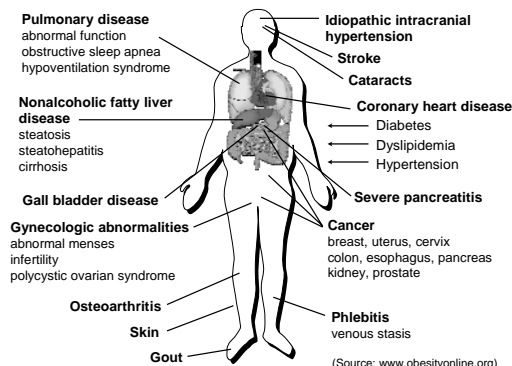
I. Introduction

The global obesity epidemic



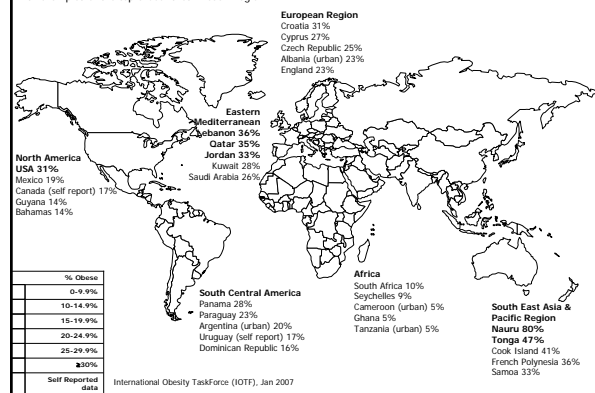
Why do we care about obesity?

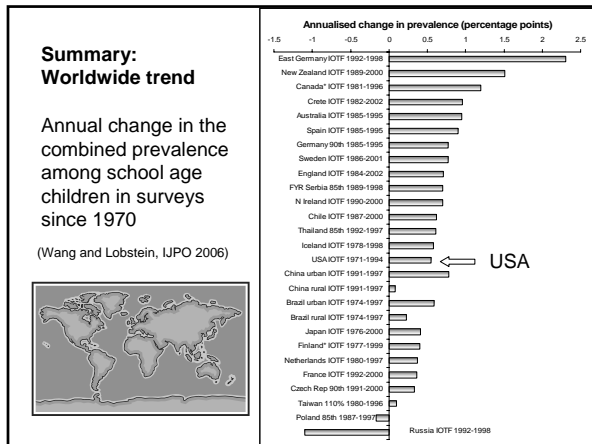
Medical Complications of Obesity



Global Prevalence of Obesity (BMI ≥30) in Adult Males

With examples of the top 5 Countries in each Region





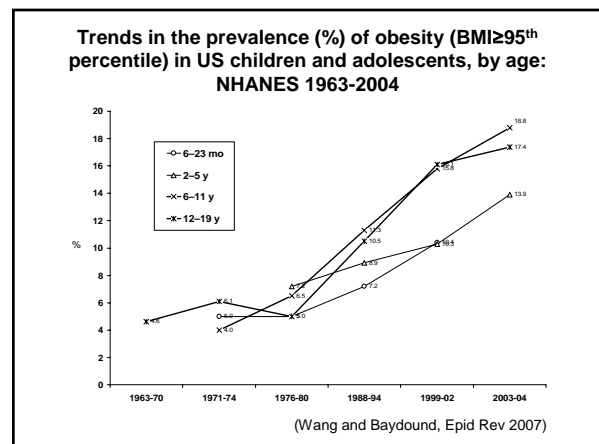
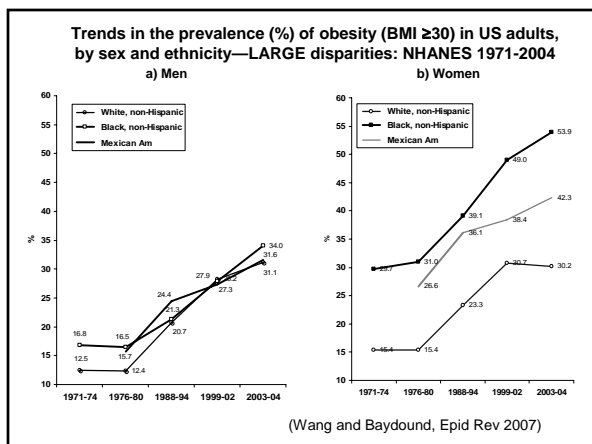
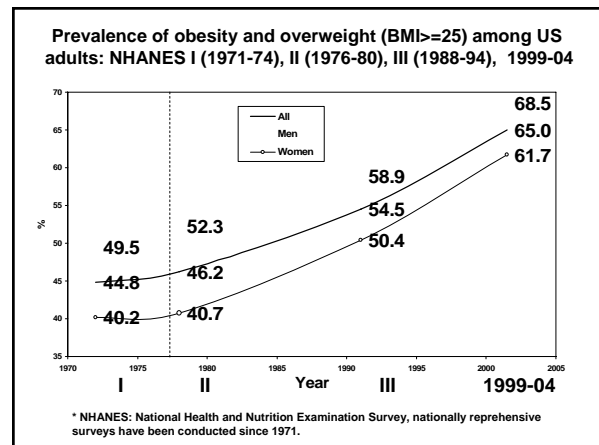
Projections, for world region
Prevalence of overweight and obesity in school-age children based on latest available data and the IOTF criteria

WHO Region (dates of recent surveys)	Recent surveys		Projected 2006		Projected 2010	
	Combined %	Obese %	Combined %	Obese %	Combined %	Obese %
Africa (1987-03)	1.6	0.2	*	*	*	*
Am. (1988-02)	27.7	9.6	40.0	13.2	46.4	15.2
Eastern Med (1992-01)	23.5	5.9	35.3	9.4	41.7	11.5
Europe (1992-03)	25.5	5.4	31.8	7.9	38.2	10.0
South East Asia (1997-02)	10.6	1.5	16.6	3.3	22.9	5.3
West Pacific (1993-00)	12.0	2.3	20.8	5.0	27.2	7.0

* Estimated for 2006 and 2010 based on population-weighted annual increases in prevalence (Wang and Lobstein, IJPO 2006)

II. The US obesity epidemic

1. Time trends

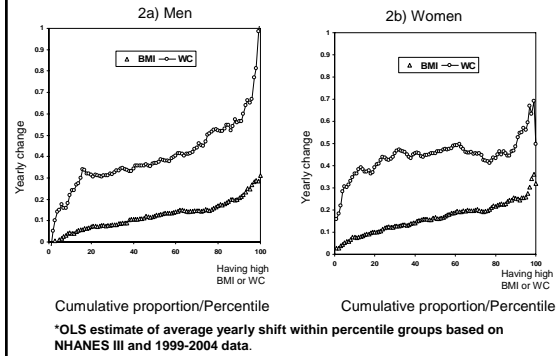


What's even worse:

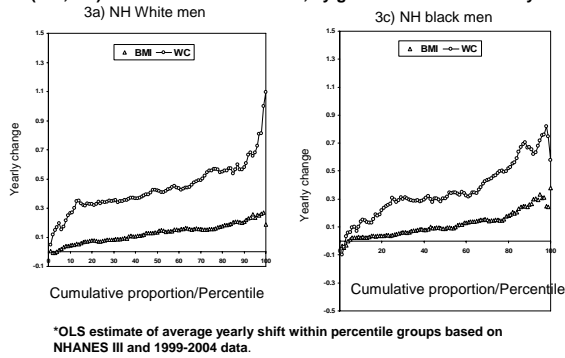
Heavy Americans have become heavier!

Beydoun MA, Wang Y. Gender-ethnic Disparity in BMI and Waist Circumference Distribution Shifts in US Adults. *Obesity* 2009;17(1):169-76.

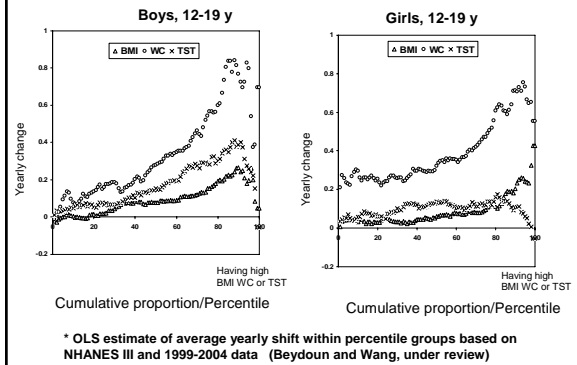
Have heavy Americans become heavier over time? Yearly average increase in BMI (kg/m²) and waist circumference (WC, cm) across their distributions



Between group differences: Yearly average change in BMI (kg/m²) and waist circumference (WC, cm) across their distributions, by gender and race/ethnicity



Yearly average change in BMI (kg/m²), WC (cm) and TST (mm) by their percentile distributions in US adolescents: 1988-94 to 1999-04



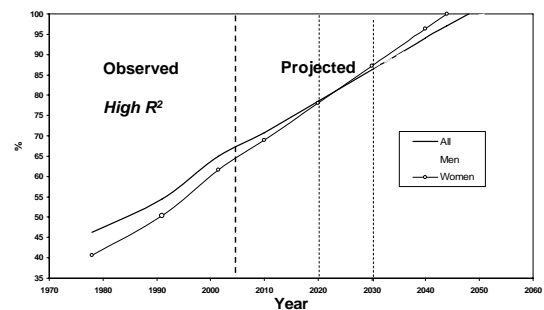
The future trends?

Projections based on NHANES data 1976 - 2004

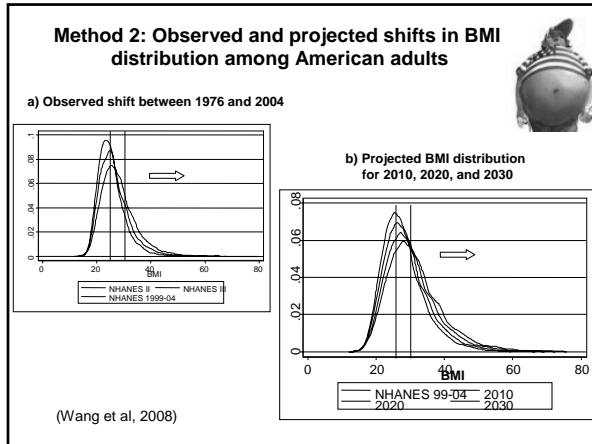
Wang Y, Beydoun MA, Liang L, Caballero B, Kumanyika SK. Will all Americans become overweight or obese? Estimating the progression and cost of the US obesity epidemic. *Obesity* 2008;16(10):2323-30.



Method 1: Prevalence of obesity and overweight (BMI ≥ 25) among US adults: observed during 1976 - 2004 and projected



* The projected prevalence presented here are those based on our linear regression models.



Average annual increase in the combined prevalence and future projection: among US adults ≥ 20 y

Gender	Ethnicity	Ann. Inc.	Year when prev will reach		
			80%	90%	100%
All	All	0.77	2022	2035	2048
Men	All	0.65	2020	2035	2051
Women	All	0.91	2022	2033	2044
Men	NH White	0.65	2018	2033	2049
	NH Black	0.42	2047	2071	2095
	Mex Am	0.60	2011	2028	2045
Women	NH White	0.86	2027	2039	2051
	NH Black	0.69	2006	2020	2034
	Mex Am	0.48	2016	2037	2058

Based on NHANES 1976-2004.

Average annual increase in prevalence of obesity and future projection: US children 6-11 y

		Ann. Inc.	Year when prev reach		
			30%	40%	50%
All	All	0.46	2031	2052	2074
Boys	All	0.49	2029	2049	2069
Girls	All	0.41	2035	2060	2084
Boys	NH White	0.40	2036	2061	2086
	NH Black	0.44	2029	2052	2075
	Mex Am	0.55	2010	2028	2046
Girls	NH White	0.40	2042	2067	2092
	NH Black	0.56	2013	2031	2049
	Mex Am	0.31	2041	2073	2105

Based on NHANES 1976-2004.

The financial consequences?

Health care costs attributable to obesity / overweight

- Thorpe et al (2004): in 2001, the average health care costs for the obese group was \$1,069 higher than for the normal weight group; and for the overweight ($25 \leq \text{BMI} < 30$) group, by \$340.
- Finkenstein et al (2003): in 1998, the annual excess health care costs attributable to obesity were \$732 per person; and \$247 for overweight.

Projected Direct Health Care Costs Attributable to Overweight and Obesity for US Adults: 2000 to 2030

	Billions	in 2000 \$	% of total HCC*
Overweight and obesity, BMI ≥ 25			
2000	\$81.5	\$81.5	13.0%
2010	\$194.3	\$151.1	13.5%
2020	\$437.6	\$276.0	15.6%
2030	\$956.9	\$507.5	17.6%
Obesity, BMI ≥ 30			
2000	\$60.9	\$60.9	9.7%
2010	\$151.3	\$117.7	10.5%
2020	\$351.1	\$221.4	12.5%
2030	\$784.8	\$416.2	14.4%

* Projections are based on per capita excess health care costs attributable to obesity and overweight estimated by Thorpe et al. 2004, and the Medical Expenditure Panel Survey (MEPS) data.
 **Total HCC, total health care cost, estimated based on MEPS

Exaggeration or underestimation?

Likely, underestimated!

- Assumed obesity-related per capita health care costs grow at the same rate as the per capita total health care costs
- Heavy Americans become heavier
- Earlier onset of obesity and complications
- More advanced and expensive health care services

What do we hope regarding our projections for the U.S.?



Conclusions

- The prevalence of overweight and obesity has reached a high level both in adults and children in the U.S.
- We are far away from achieving the 2010 Healthy People goals
- Multiple factors have contributed to the growing obesity epidemic in the U.S. and worldwide
- Vigorous, effective, sustainable national and regional policies and programs are needed

Do we want our children to live shorter lives than us?

What should be done?

Should obesity be considered in health care reform?

??



Acknowledgement

Key collaborators:

- Dr May A. Beydoun, Hopkins (now with NIA)
- Dr Lan Liang, Center for Financing, Access and Cost Trends; Agency for Healthcare Research and Quality
- Dr Benjamin Caballero, Hopkins
- Dr Shiriki K. Kumanyika, University of Pennsylvania

Funding: NIH, USDA and other research grants