

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

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Actions through Health and Food Equity

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HEALTH POLICY
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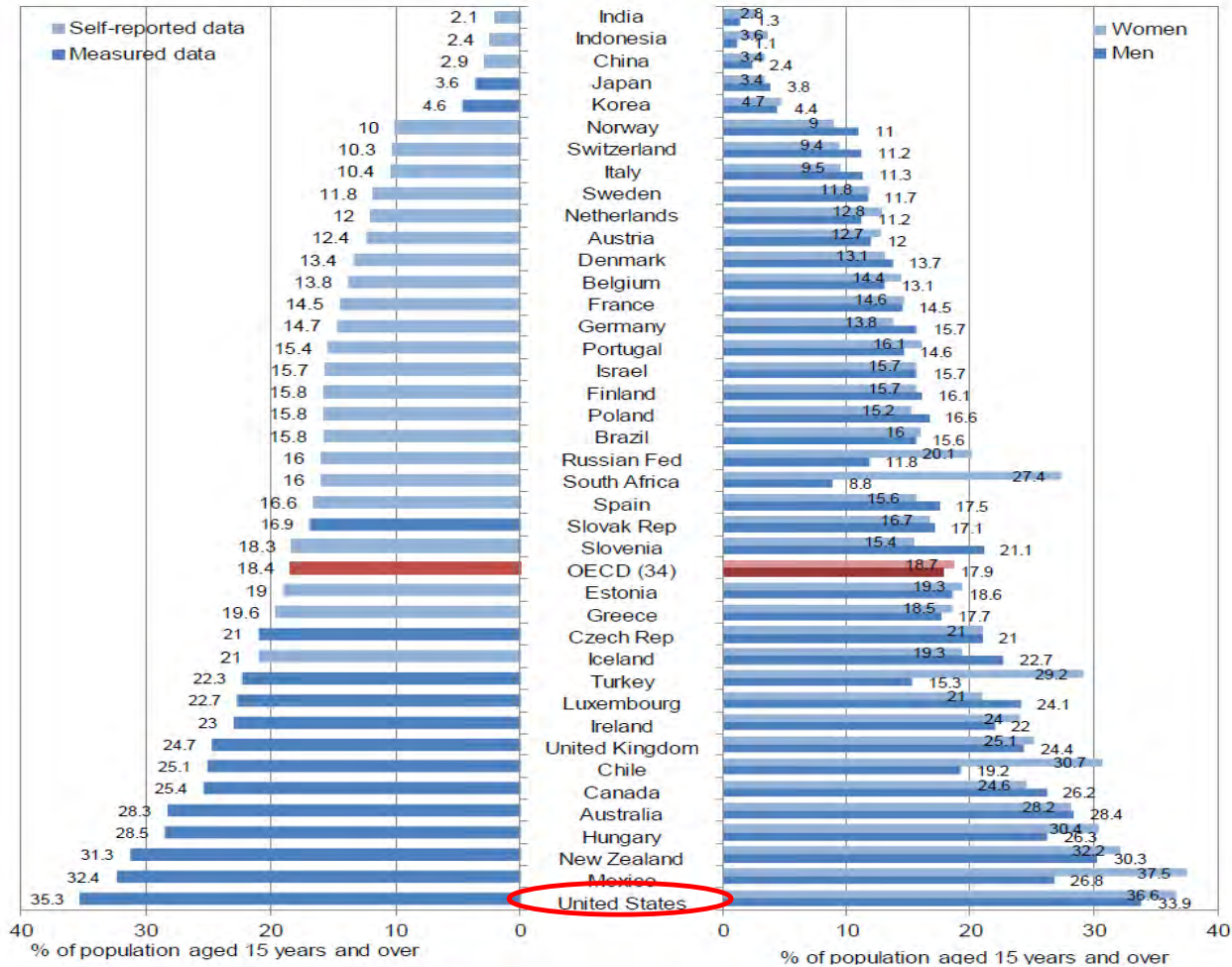


Outline of Presentation

- 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

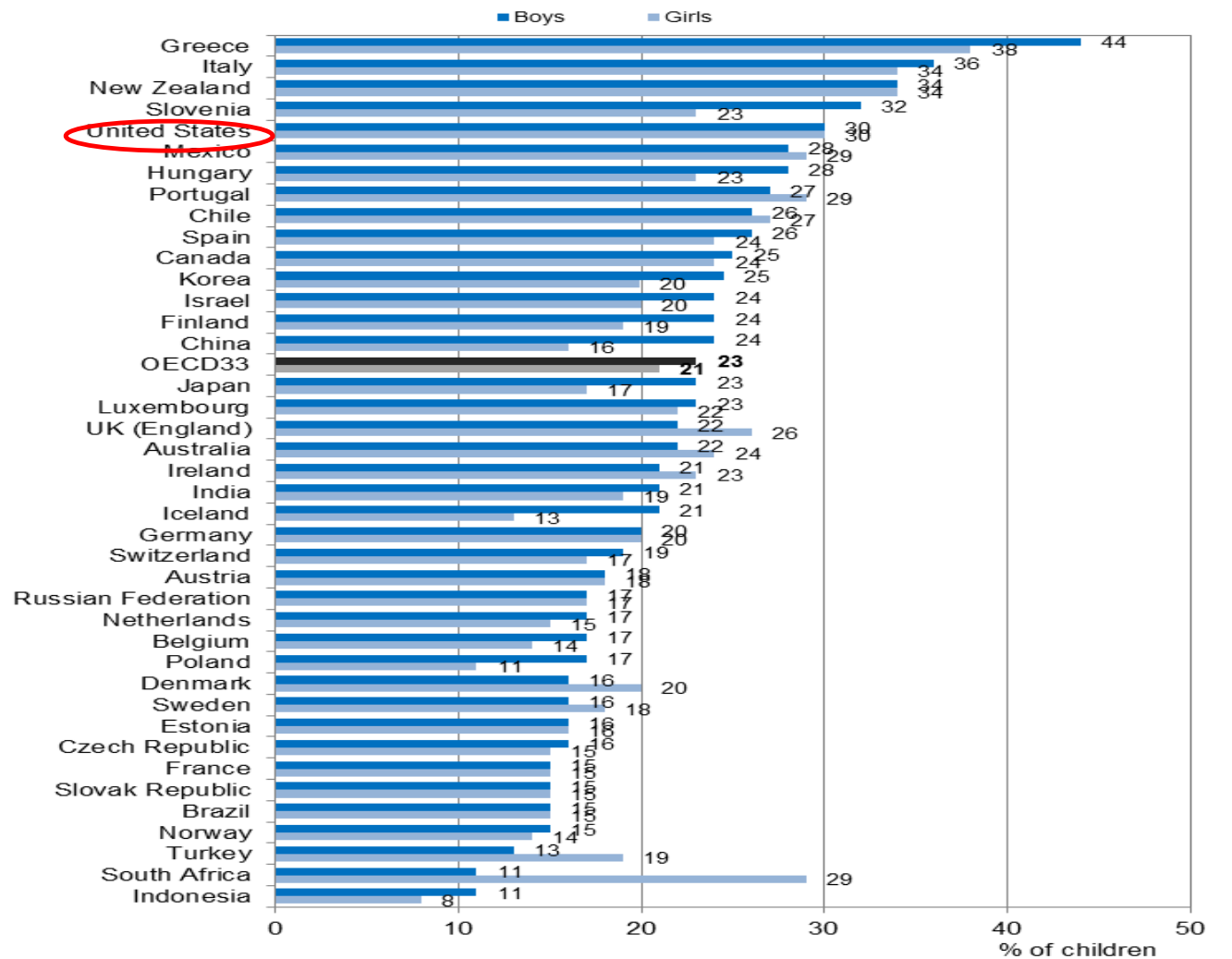
Obesity Rates among Adults

Figure 1. Obesity among adults, 2012 or nearest year



Source: OECD (2014), *OECD Health Statistics 2014*, www.oecd.org/health/healthdata;

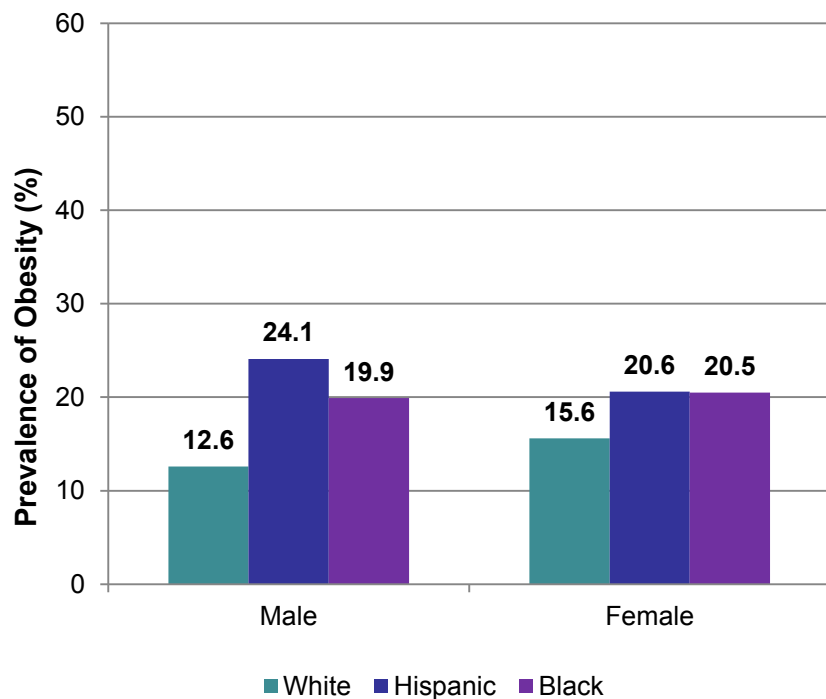
Overweight Rates among Children



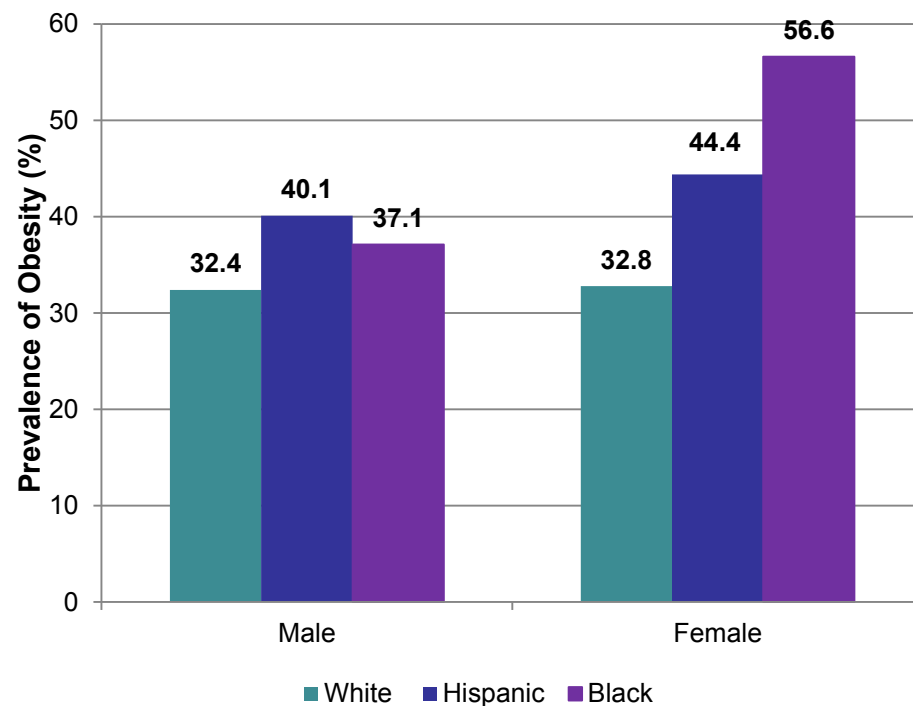
Source: International Association for the Study of Obesity, 2013; Bös et al. (2004), Universität Karlsruhe and Ministères de l'Education nationale et de la Santé for Luxembourg; and KNHANES 2011 for Korea.

Gender & Racial/Ethnic Disparities in Obesity in the U.S.

Children Aged 2-19

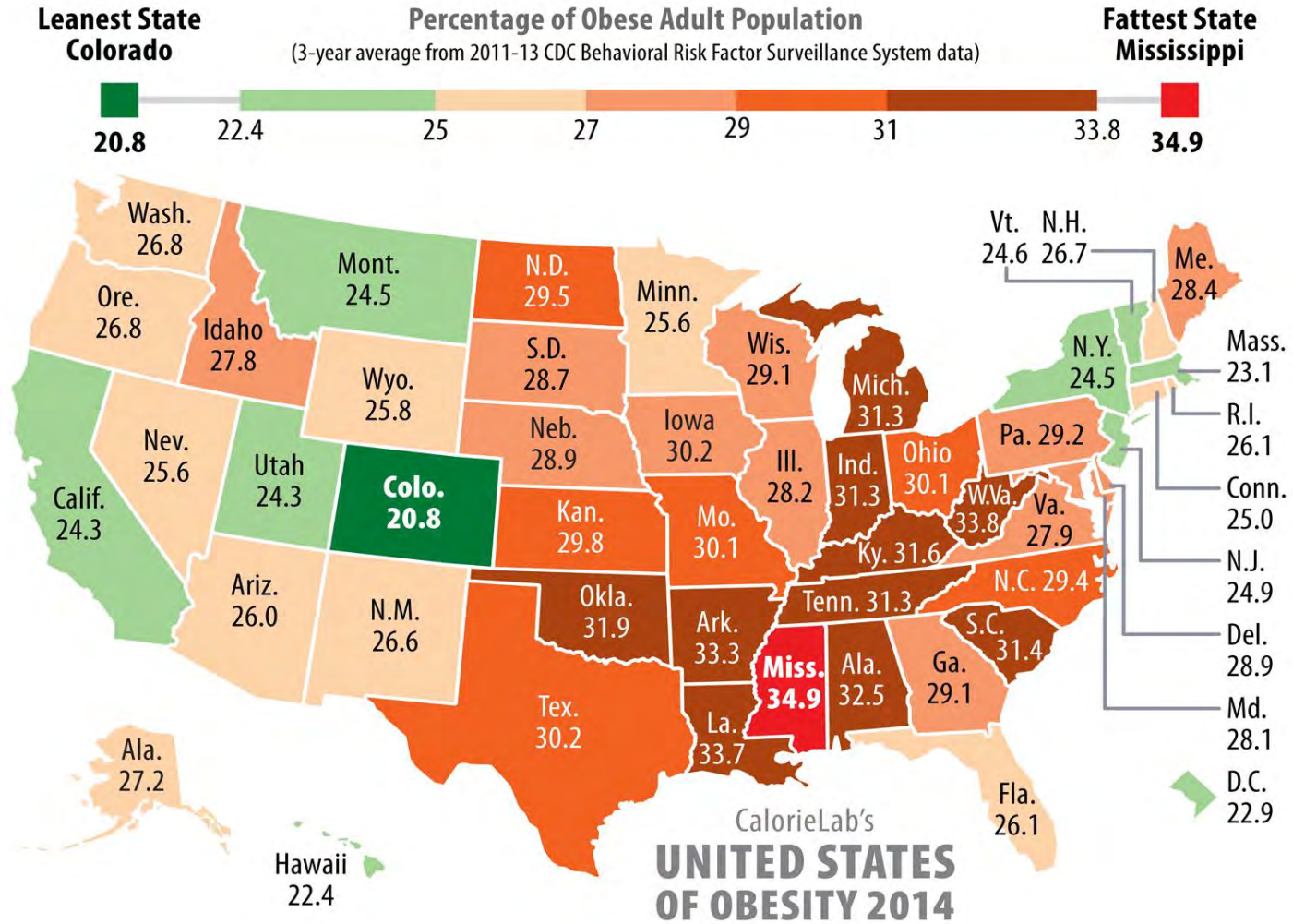


Adults Aged 20+

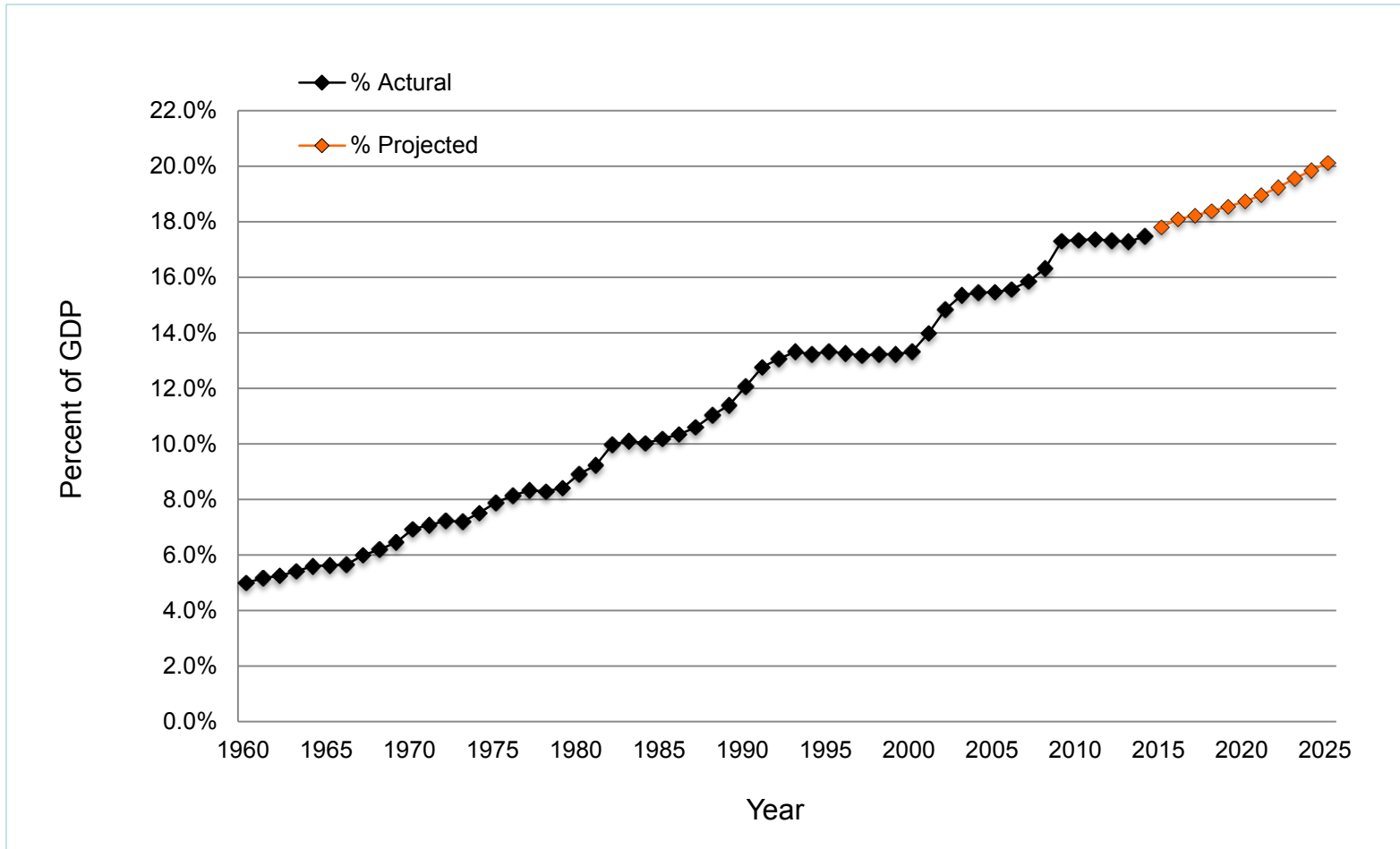


Source: Ogden et al., JAMA, 2014.

Regional Disparities in Obesity in the U.S.



U.S. Health Expenditure Shares, 1960-2025



Source: Centers for Medicare and Medicaid Services: http://www.cms.gov/NationalHealthExpendData/25_NHE_Fact_Sheet.asp , September 2016

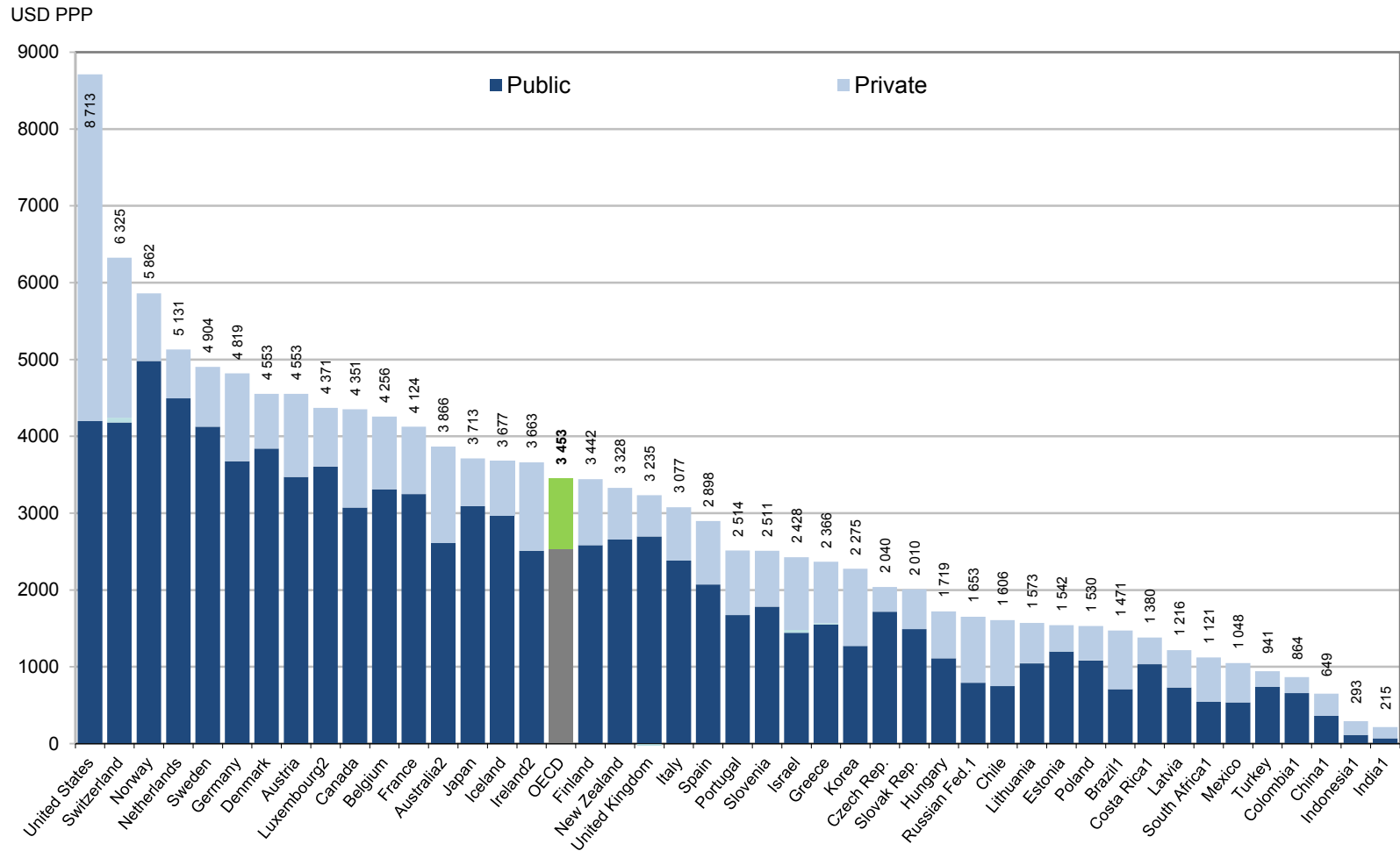
Health Expenditures as a % of GDP in Selected OECD Countries

Country	1970	1980	1990	2000	2010	2015 ^a
Australia	..	5.8	6.5	7.6	8.5	9.3
Austria	4.9	7.0	7.7	9.2	10.1	10.3
Belgium	3.8	6.1	7.1	7.9	9.9	10.4
Canada	6.4	6.6	8.4	8.3	10.7	10.2
Chile	..	..	..	6.4	6.7	7.8
Czech Republic	..	..	3.8	5.7	6.9	7.6
Denmark	..	8.4	8.0	8.1	10.4	10.6
Estonia	..	..	..	5.2	6.3	6.3
Finland	5.0	5.9	7.2	6.9	8.9	9.6
France	5.2	6.7	8.0	9.5	10.7	11.0
Germany	5.7	8.1	8.0	9.8	11.0	11.1
Greece	..	..	6.1	7.2	9.9	8.2
Hungary	..	..	..	6.8	7.6	7.0
Iceland	4.6	5.9	7.4	9.0	8.8	8.8
Ireland	4.9	7.5	5.6	5.9	10.6	9.4
Israel	..	7.0	6.5	6.8	7.0	7.4
Italy	..	..	7.0	7.6	9.0	9.1
Japan	4.4	6.4	5.8	7.4	9.5	11.2
Korea	2.7	3.5	3.7	4.0	6.4	7.2
Latvia	..	..	..	5.9	6.2	5.6
Luxembourg	..	4.6	5.1	5.9	7.1	7.2
Mexico	..	..	4.3	4.9	6.2	5.9
Netherlands	..	6.6	7.1	7.1	10.4	10.8
New Zealand	5.2	5.7	6.7	7.5	9.7	9.4
Norway	4.0	5.4	7.1	7.7	8.9	9.9
Poland	..	..	4.3	5.3	6.4	6.3
Portugal	2.3	4.8	5.5	8.4	9.8	8.9
Slovak Republic	..	..	..	5.3	7.8	7.0
Slovenia	..	..	..	8.1	8.6	8.4
Spain	3.1	5.0	6.1	6.8	9.0	9.0
Sweden	5.5	7.8	7.3	7.4	8.5	11.1
Switzerland	4.9	6.6	7.4	9.3	10.5	11.5
Turkey	..	2.4	2.5	4.7	5.3	5.2
United Kingdom	4.0	5.1	5.1	6.3	8.5	9.8
United States	6.2	8.2	11.3	12.5	16.4	16.9

a. 2015 estimated or provisional value

Source: OECD Health Statistics 2016: http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT

Health Expenditure Per Capita, 2013



1. Includes investments.

2. Data refers to 2012.

Source: Organization for Economic Cooperation and Development, *OECD Health Statistics 2015*, http://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-2015/health-expenditure-per-capita_health_glance-2015-59-en;jsessionid=9g0j81s7mrt2s.x-oecd-live-03

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**

Source: Trasande & Chatterjee, *Obesity*, 2009; Trasande et al., *Health Affairs*, 2009; Cawley & Meyerhoefer, *JHE*, 2012; Finkelstein et al., *Pediatrics*, 2014.

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 Trogon, *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 ($30.0 \leq \text{BMI} \leq 34.9$): Men: \$475 Women: \$1274
 - Grade 2 obese ($35.0 \leq \text{BMI} \leq 39.9$): Men: \$824 Women: \$2532
 - Grade 3 obese ($\text{BMI} \geq 40.0$): Men: \$1269 Women: \$2395

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 an inverse relationship between BMI and the risk of completed suicide; although positively associated with suicide attempts among women

Sources: Griffiths, Parsons & Hill, *Int J. of Pediatr Obesity*, 2010; Russel-Mayher et al., *J. Obesity* 2012; Farhat et al., *Am J Prev Med* 2010; Dave & Rashad, *Soc Sci & Med*, 2009; Zhang et al., *J Aff Dis*, 2013

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

Sources: Cawley and Spiess , *Econ & Hum Bio*, 2008; Geier et al., *Obesity*, 2007; Sabia, *Southern Econ J*, 2007

Productivity Costs of Adult Obesity

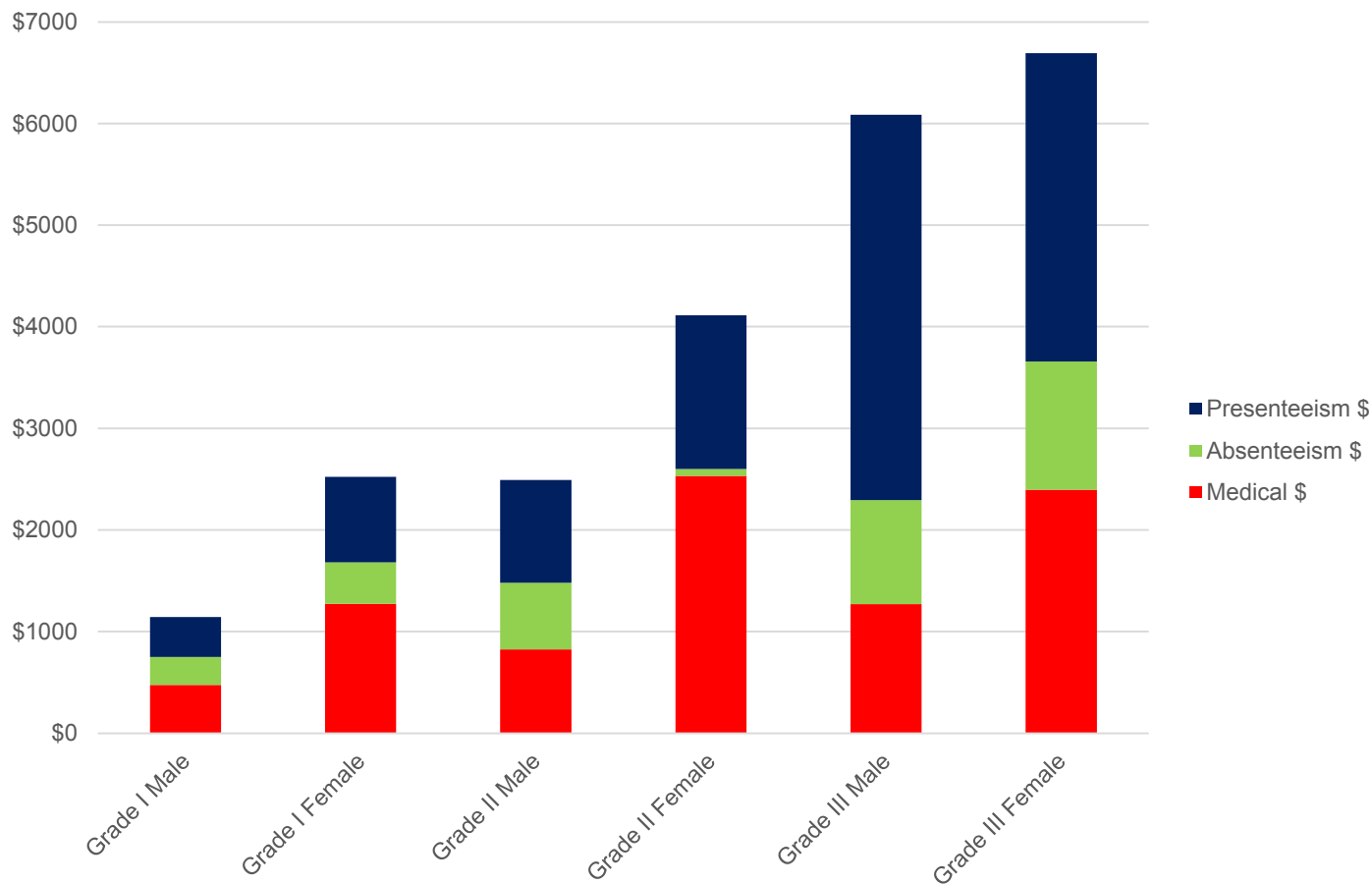
- Obesity, as compared to normal weight status, is associated with 1.1 to 1.7 additional days missed from work annually: a financial burden on U.S. states ranging from 6.5% to 12.6% of total absenteeism costs in the workplace
- Individuals with a BMI ≥ 30 , as compared to those with BMI ≤ 27 , has 69% 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

- Estimates of incremental per capita productivity losses from “**Absenteeism**” by obesity grade and gender:
 - Grade 1 obese ($30.0 \leq \text{BMI} \leq 34.9$): Men: \$277 & 1.6 days Women: \$407 & 3.1 days
 - Grade 2 obese ($35.0 \leq \text{BMI} \leq 39.9$): Men: \$657 & 3.8 days Women: \$67 & 0.5 days
 - Grade 3 obese ($\text{BMI} \geq 40.0$): Men: \$1026 & 5.9 days Women: \$1261 & 9.4 days
- Estimates of incremental per capita productivity losses from “**Presenteeism**” by obesity grade and gender:
 - Grade 1 obese ($30.0 \leq \text{BMI} \leq 34.9$): Men: \$391 & 2.3 days Women: \$843 & 6.3 days
 - Grade 2 obese ($35.0 \leq \text{BMI} \leq 39.9$): Men: \$1010 & 5.8 days Women: \$1513 & 11.0 days
 - Grade 3 obese ($\text{BMI} \geq 40.0$): Men: \$3792 & 21.9 days Women: \$3037 & 22.7 days

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

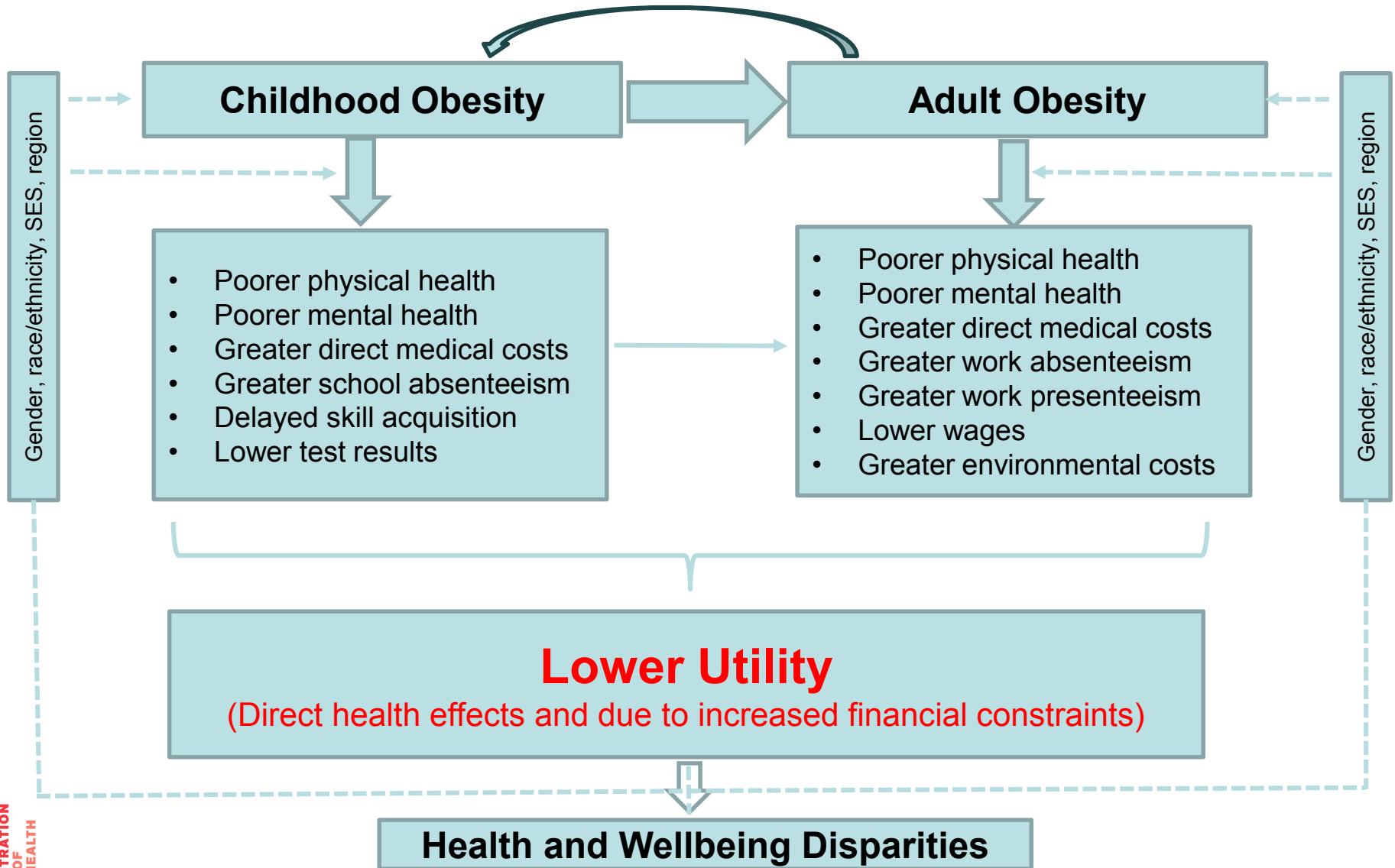
Sources: Baum & Ford, *Health Econ*, 2004; Brunello and D'Hombres, *Econ & Hum Bio*, 2006; Cawley, *JHR*, 2004; Caliendo & Gehrsitz, *IZA*, 2014; Han et al., *Health Econ*, 2009.

Environmental Costs

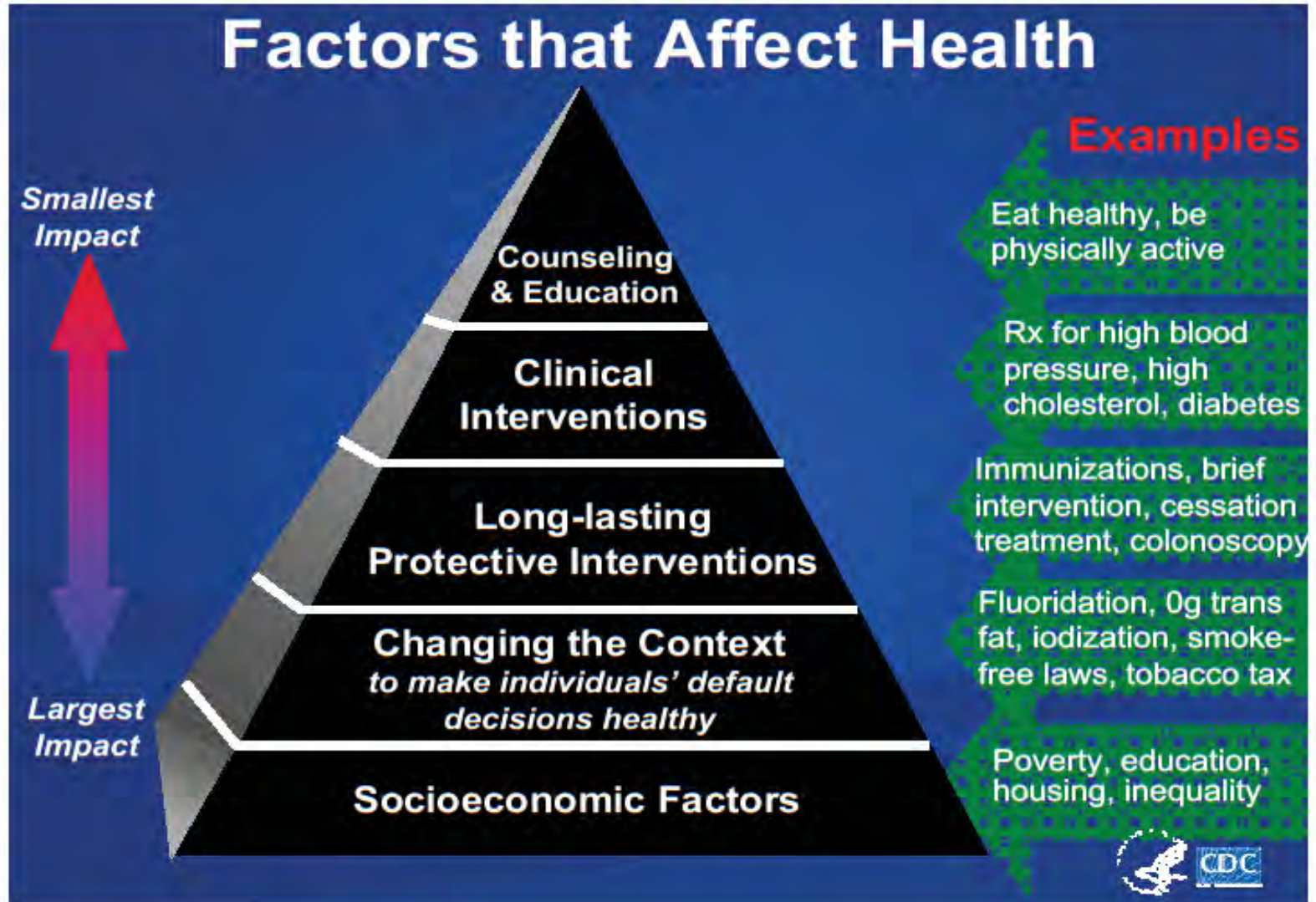
- Overweight and obesity are related to one billion additional gallons of gasoline consumed each year in the U.S. (0.8% of the annual fuel consumption) = **\$2.7B**
 - Adds 20 billion pounds of CO₂ emissions (0.5% of annual CO₂ transport emissions)
- Study of OECD, estimates that a population wide 5kg weight reduction would lower CO₂ emission from transportation by 10 million tons.
- Increased obesity in the U.S. between 1990 and 2000 associated with \$275 M in jet fuel costs in 2000.

Sources: Jacobson and King, *Trans Res Part D*, 2008. Michaelowa and Dransfield, *Ecolog Econ*, 2008; Dannenberg et al. *AJPM*, 2004.

Summary: Costs of Obesity



Next steps: “Actions” to Reduce Obesity and Costs



Thank you!

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