

Nutrition, activity and obesity - medical issues that can affect workplace health

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Learning Objectives

- 1. Describe the relationships between obesity and adverse health consequences.**
- 2. Understand how different medical conditions may affect productivity.**
- 3. Discuss the effects of lifestyle interventions on general and workplace health.**

Classification of Overweight/Obesity

Body mass index = weight (kg) ÷ height (m)²

normal weight – BMI 18.5 – 24.9

Overweight – BMI 25.0 – 29.9

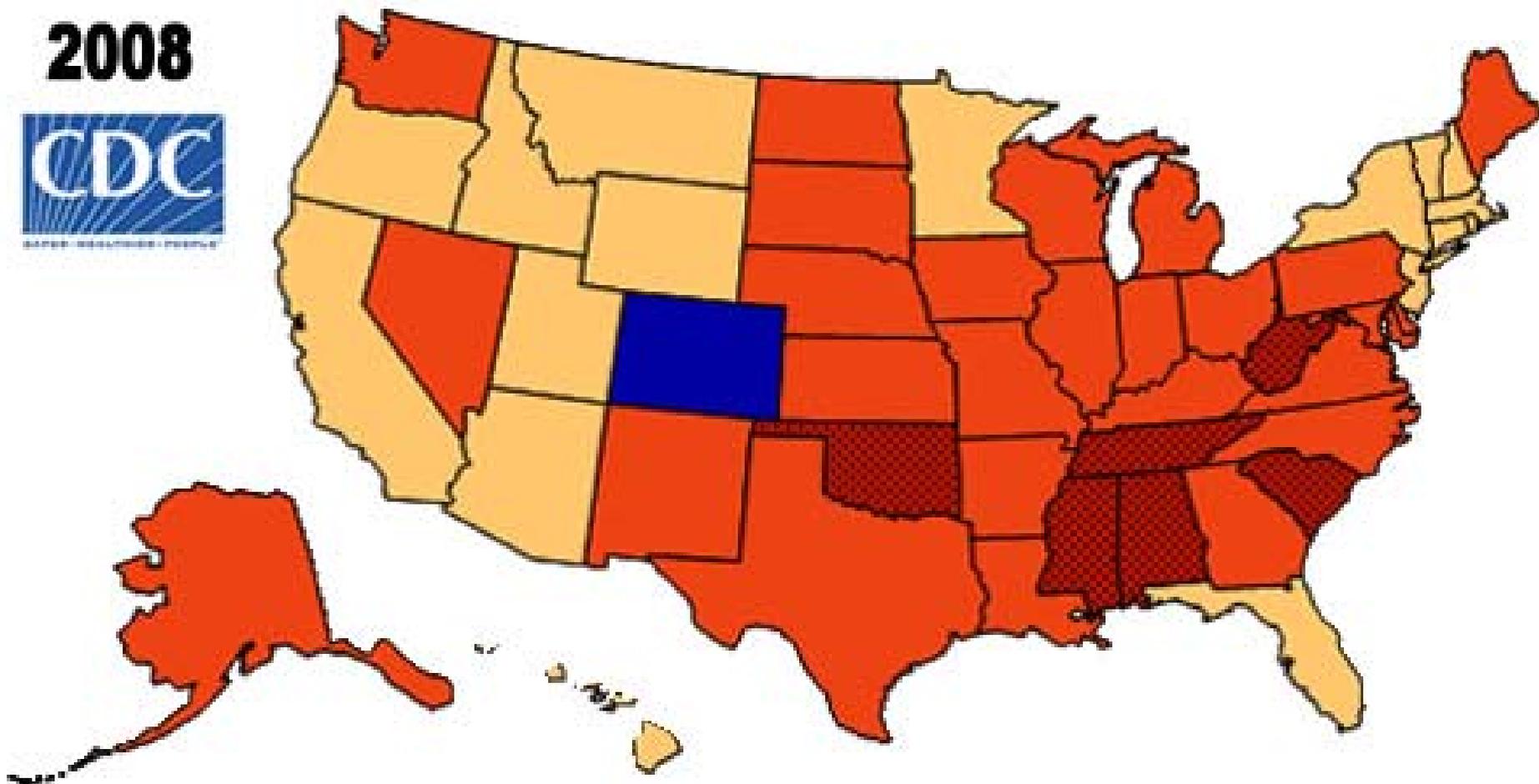
Class I obese – BMI 30.0 - 34.9

Class II obese – BMI 35.0 - 39.9

Class III obese – BMI ≥ 40 (extreme obesity)

Percent of Population that is Obese

2008



Medical Conditions due to Obesity

Type 2 (formerly adult onset) diabetes

Musculoskeletal disabilities

Hypertension

Dyslipidemia

Obstructive sleep apnea

Potential Ways Obesity May Affect Workplace Health

Increased time away from work due to illness

Reduced productivity while at work due to effects of illness on work capacity

Greater expenses related to use of health care resources

Obesity and Sick Leave

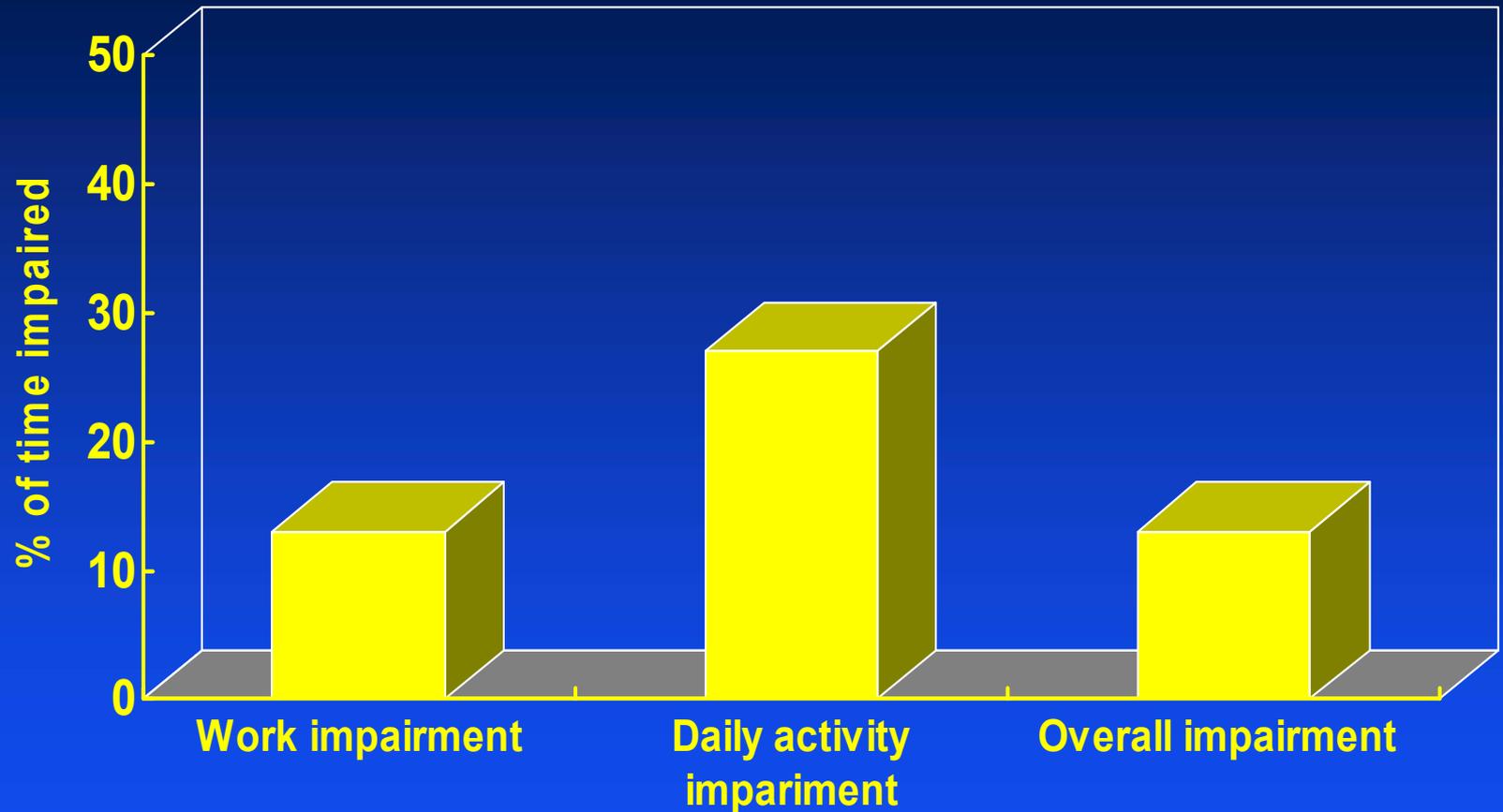
Frequency of sick leave

- **Virtually studies report increased number of sick leave events with obesity (1.3 – 2.1 fold increase)**

Work time lost due to sick leave

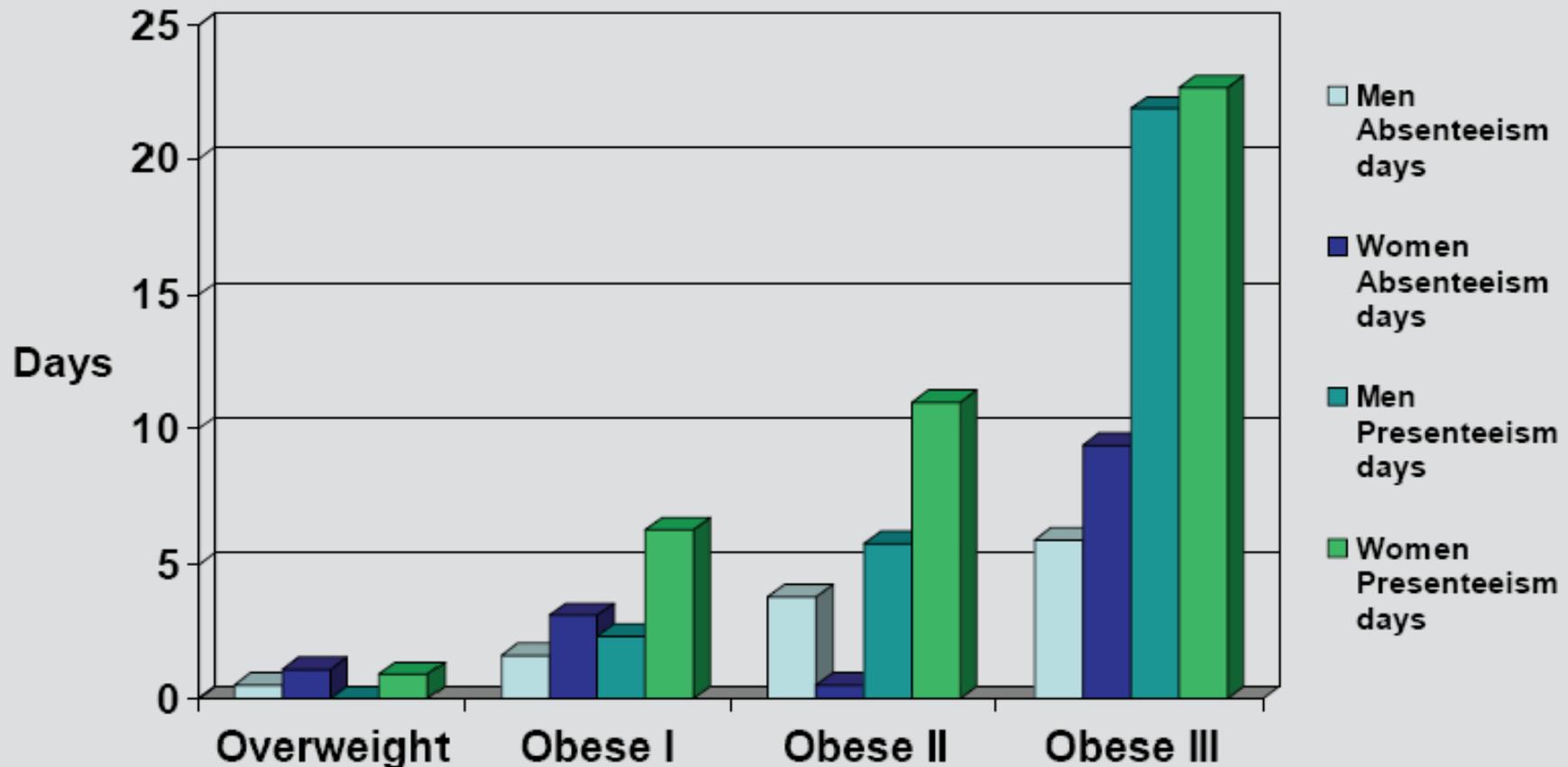
- **“Obesity” – twice as many days lost**
- **Not so much in class I obese men**
- **Most pronounced with class III obesity**

Impact of obesity on work productivity



Rodbard et al, Am J Health Promot. 2009

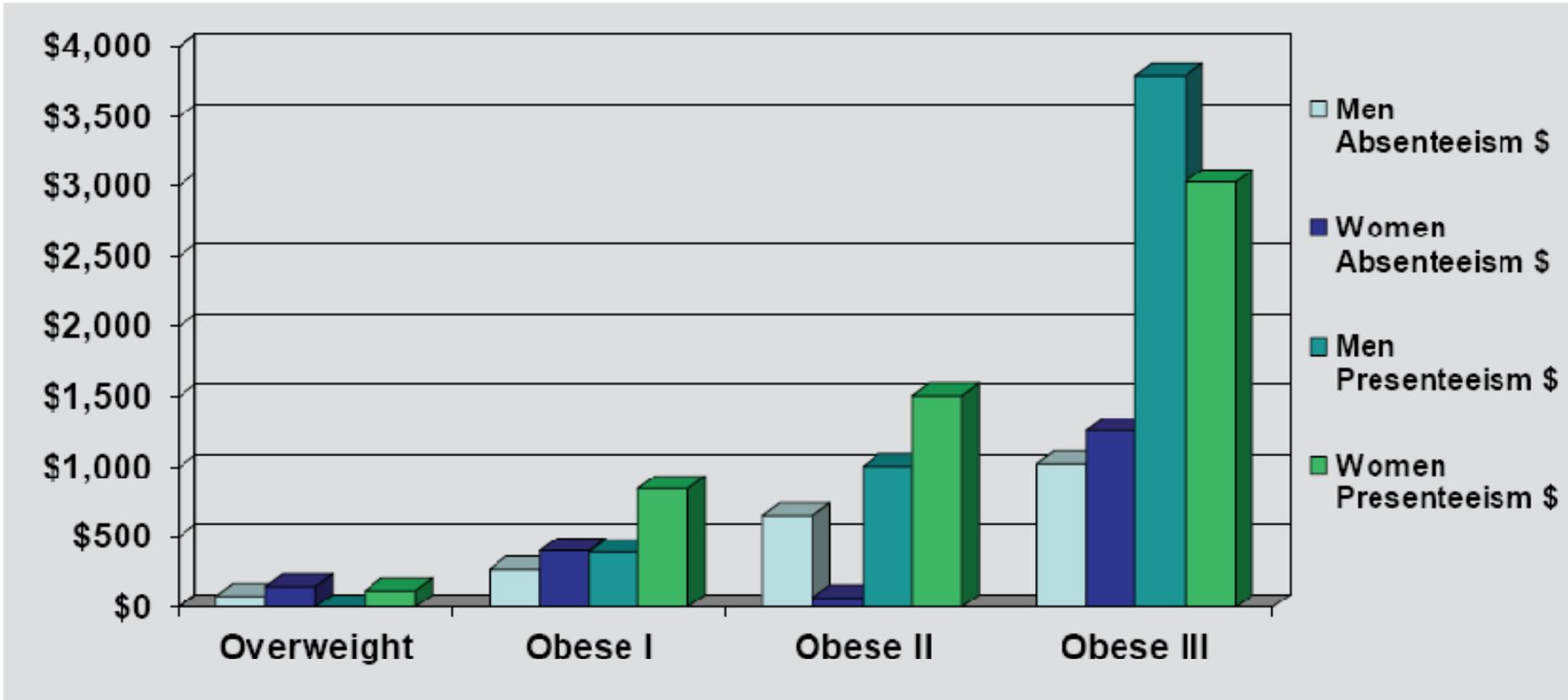
OBESITY AND PRODUCTIVITY LOSS



2008 US National Health and Wellness Survey

OBESITY AND PRODUCTIVITY LOSS

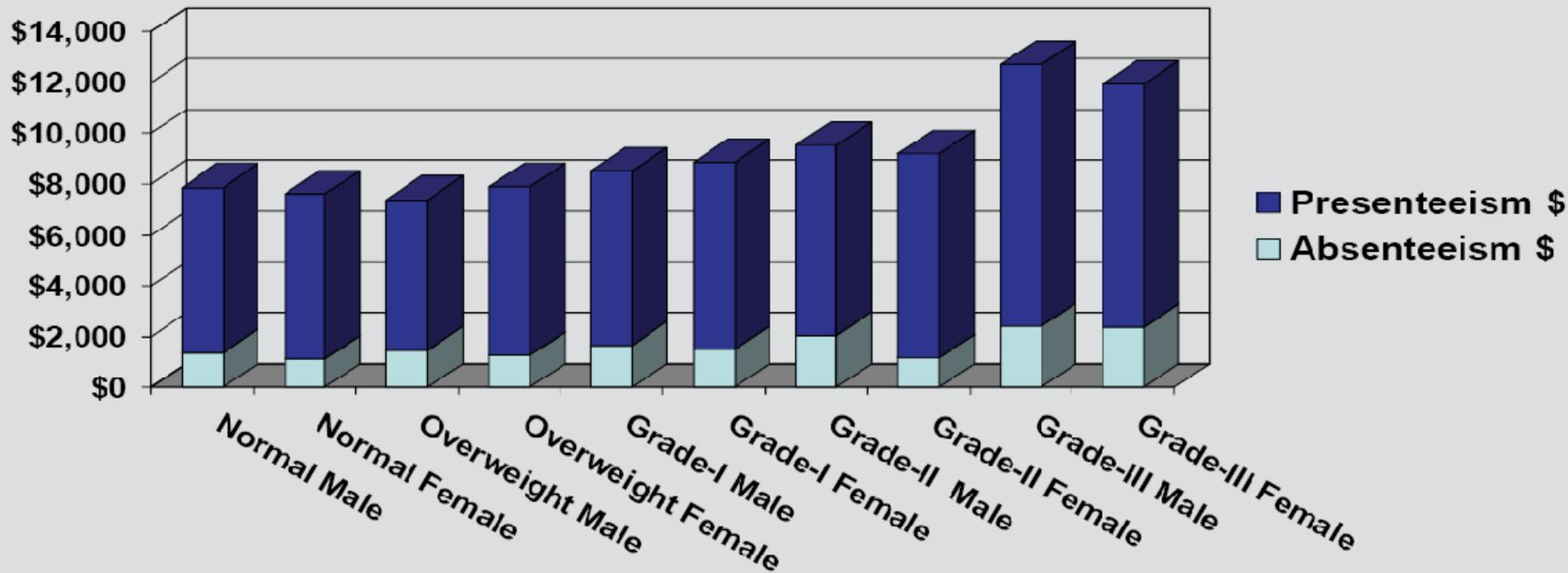
Figure 2. Monetized Absenteeism and Presenteeism Losses Relative to the Normal-BMI Category



2008 US National Health and Wellness Survey

Worksite Costs by Obesity Category

Figure 3. Total Monetized Absenteeism and Presenteeism Losses for Each BMI Category



Impact of BMI on Medical Utilization and Worker Productivity



Cross-sectional study of 10,026 employees in multiple professions and worksites across the U.S.

Goetzel et al, J Occup Environ Med. 2010

Medical Conditions due to Obesity

Type 2 (formerly adult onset) diabetes

Musculoskeletal disabilities

Hypertension

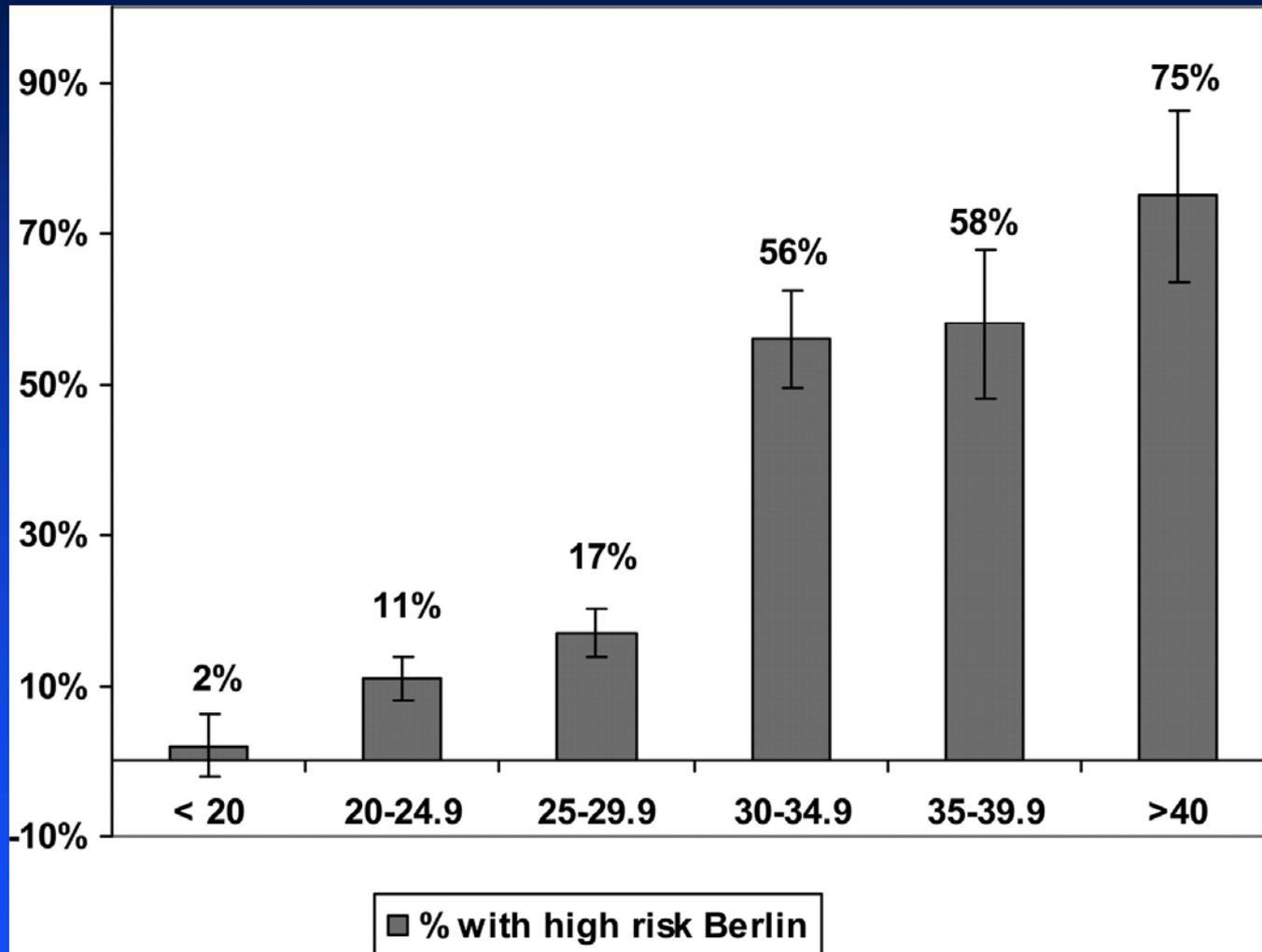
Dyslipidemia

Obstructive sleep apnea

What is Sleep Apnea?

- **Temporary, often repeated, cessation of breathing during sleep**
- **A common disorder in which breathing stops during sleep for 10 seconds or more, sometimes more than 300 times a night. Symptoms include excessive daytime sleepiness, forgetfulness, irritability, and loss of energy.**
- **A serious, potentially life-threatening disorder characterized by repeated cessation of breathing due to either collapse of the upper airway during sleep or absence of respiratory effect**

Risk of Sleep Apnea Symptoms with Increasing Weight



What is Sleep Apnea Like?

- Tired all the time
- No energy
- Fall asleep during the day unwillingly
- Continuous weight despite efforts to lose weight
- Snoring
- Treatment – CPAP, weight loss if obese



Impact of excessive sleepiness on work productivity

Work Productivity and the Activity Impairment Scale, Short Form-12, Medical Outcomes study 6-item Cognitive Function Scale, and the Toronto Hospital Alertness Test

1758 adults with sleep apnea or other cognitive issues, including or shift work (group A) and 1977 adults without these conditions (group B)

Excessive sleepiness associated with impairments in health status, daily activities, and work productivity for all measures ($P < 0.0001$), except for absenteeism ($P = 0.0400$ for group A, $P = 0.8360$ for group B).

Obstructive sleep apnea: a risk factor for work disability

183 patients (83 with obstructive sleep apnea) surveyed to assess work disability due to sleep problems, occupational characteristics and excessive daytime sleepiness (EDS)

Those with both OSA and excessive daytime sleepiness at greater risk of recent work disability (adjusted odds ratio = 13.7 and longer-term work duty modification (odds ratio = 3.6)

The combination of OSA and excessive daytime sleepiness contributes to work disability

What is Type 2 Diabetes Like?

Test blood sugar by pricking finger with needle

Oral medications that frequently cause more weight gain

Reduced ability to enjoy exercise

Risk of kidney failure, blindness, amputation of feet and legs

Insulin injections if oral medications don't work

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Work Productivity and Type 2 Diabetes

Sampled claims data records of 472 employed New York residents for absences from work and the value of any lost work time subjects

Telephone survey - productivity at work, absences, diabetes history, comorbidities, job characteristics, employment history, demographics and healthcare utilization

Results - type 2 diabetes was associated with a reduction in productivity at work and losses increased with duration of diabetes, however, productivity costs offset by lower wages

Can Intervention for Obesity Improve Outcomes?

One year randomized controlled trial of health plan members (n = 147) with type 2 diabetes and obesity

Modest-cost lifestyle intervention or usual care

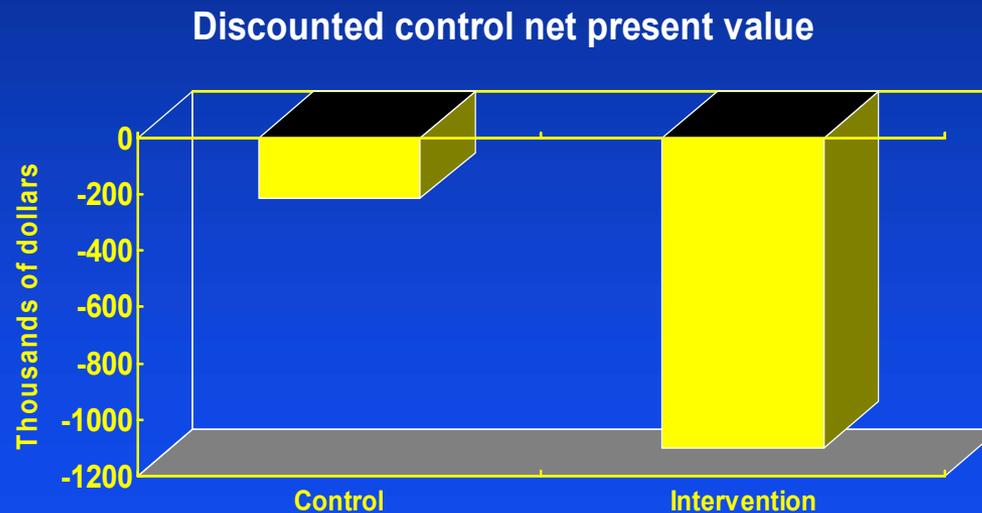
Lifestyle intervention reduced the risk of workdays lost by 64.3% (P \leq 0.001)

Lifestyle intervention decreased the risk of disability days by 87.2%

Can Intervention for Obesity Improve Outcomes?

Work, Weight, and Wellness, a 2-year randomized weight loss program trial delivered through Hawaii hotel work sites

Control program cost \$222K to implement over 24 months (\$61 per participant), intervention program cost \$1.12M (\$334)



Modest cost savings were observed in the trial's second year

Workplace Obesity Issues

- **Adverse effects of obesity – linked to duration of obesity (younger age onset = more time for deleterious effects)**
- **Adverse effects of obesity – less if mild and in older workers (optimal BMI increases with age)**
- **Not all obese adults develop disabling conditions**

Workplace Obesity Issues

- Do most of the productivity losses come from a small number of “sick” obese employees or do a lot of obese employees have slightly reduced productivity?
- Is it better to focus intensive efforts on those with identifiable conditions or develop intervention approaches that help everyone a little?
- Not all obese adults develop disabling conditions

A return-on-investment simulation model of workplace obesity interventions

**Estimated annual savings in medical
expenditures and absenteeism costs**

**Across all overweight and obese
employees, 5% weight loss would result in
a reduction in total annual costs (medical
plus absenteeism) of \$90 per person.**

A return-on-investment simulation model of workplace obesity interventions

Result suggest that low-cost policy or environmental change interventions in worksites may be more likely to be cost saving than high cost, individually targeted behavioral change interventions unless they result in substantial weight loss.

How Effective are Worksite Interventions?

Systematic review of 54 studies (78 papers)

**12 studies report % weight loss @ 12 months
vs. control group – pooled effect = 1% (- 0.5
BMI units)**

Nutrition Facts and Myths

Myth – weight loss with diet and exercise is a matter of will power

Fact – environmental changes (food availability, need for physical activity) seem to account for most of America's weight gain

Implications – control over environment most likely to \Rightarrow permanent weight loss

Control Over Environment?

Approaches:

Actually change the environment (food, need for activity)

Cognitive behavioral therapy – teach the individual to recognize and avoid environmental cues that promote excess food intake and sedentary behavior

Summary and Conclusions

Numerous ways that obesity can affect workplace health and productivity

Sleep apnea, diabetes and degenerative joint disease probably most significant

It is not clear whether large scale, broad interventions with small effects or targeted interventions with large effects are better