

**“When it comes to obesity,
nothing is as straightforward as
it may appear.”**

Gina Kolata

New York Times

April 16, 2002

Epidemiological Principles

1. **Statistical Association**
2. **Temporal Sequence**
3. **Consistency**
4. **Persistence**
5. **Independence**
6. **Dose-response**
7. **Specificity**
8. **Alterability**
9. **Repeatability**
10. **Confirmation**

Paffenbarger, *Med. Sci. Sports Exerc.*, 20: 426-438, 1988

Key Points

- Health risks of “overweight” and “obesity” have been exaggerated
- Health benefits of weight loss have been overstated...and risks underestimated
- Hazards of weight fluctuation (yo-yo dieting) may be more significant than generally acknowledged
- Most “weight-related” health problems can be improved independently of weight loss
- Easier to get fat people fit (“physically” and “metabolically) than to get fat people thin

Fat can be Fit

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It's okay to be fat

Overweight/Obesity

- **Bona Fide Disease?**
- **Natural Physiological State?**
- **Proxy for an Imprudent Lifestyle?**

Assertion: Obesity “kills” (contributes to the deaths of) ~300,000 Americans each year.

Epidemiological “Evidence”:

- McGinnis and Foege, *JAMA*, 1993
- Allison et al. *JAMA*, 1999

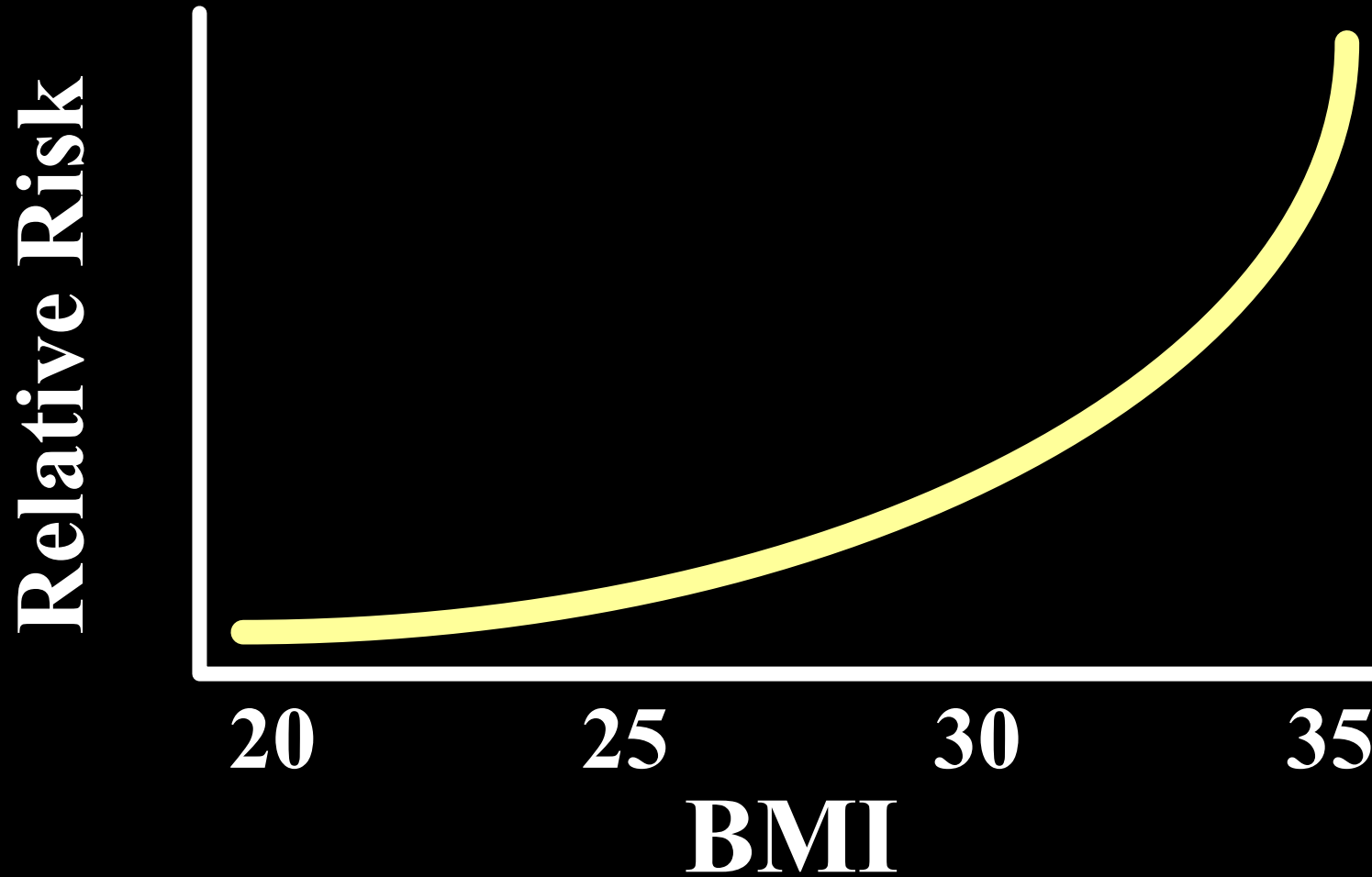
**“Diet/activity patterns”
linked to 300,000 deaths
in the United States in 1990**

**JM McGinnis and WH Foege
JAMA 270: 2207-2212, 1993**

“...assumed that all excess mortality among obese persons is attributable to their obesity.”

Allison et al. *JAMA*, 1999

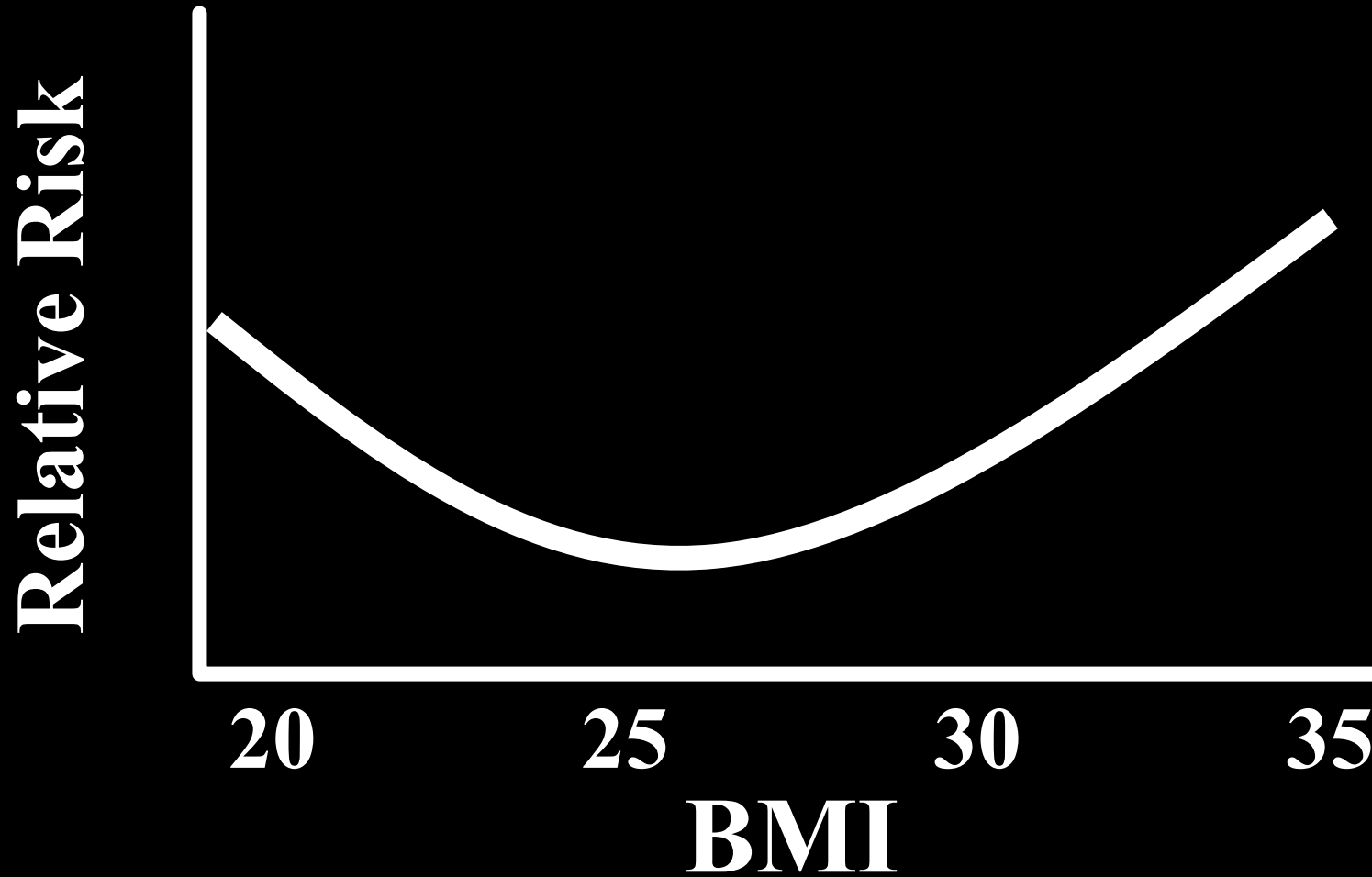
BMI and Relative Risk of Premature Death



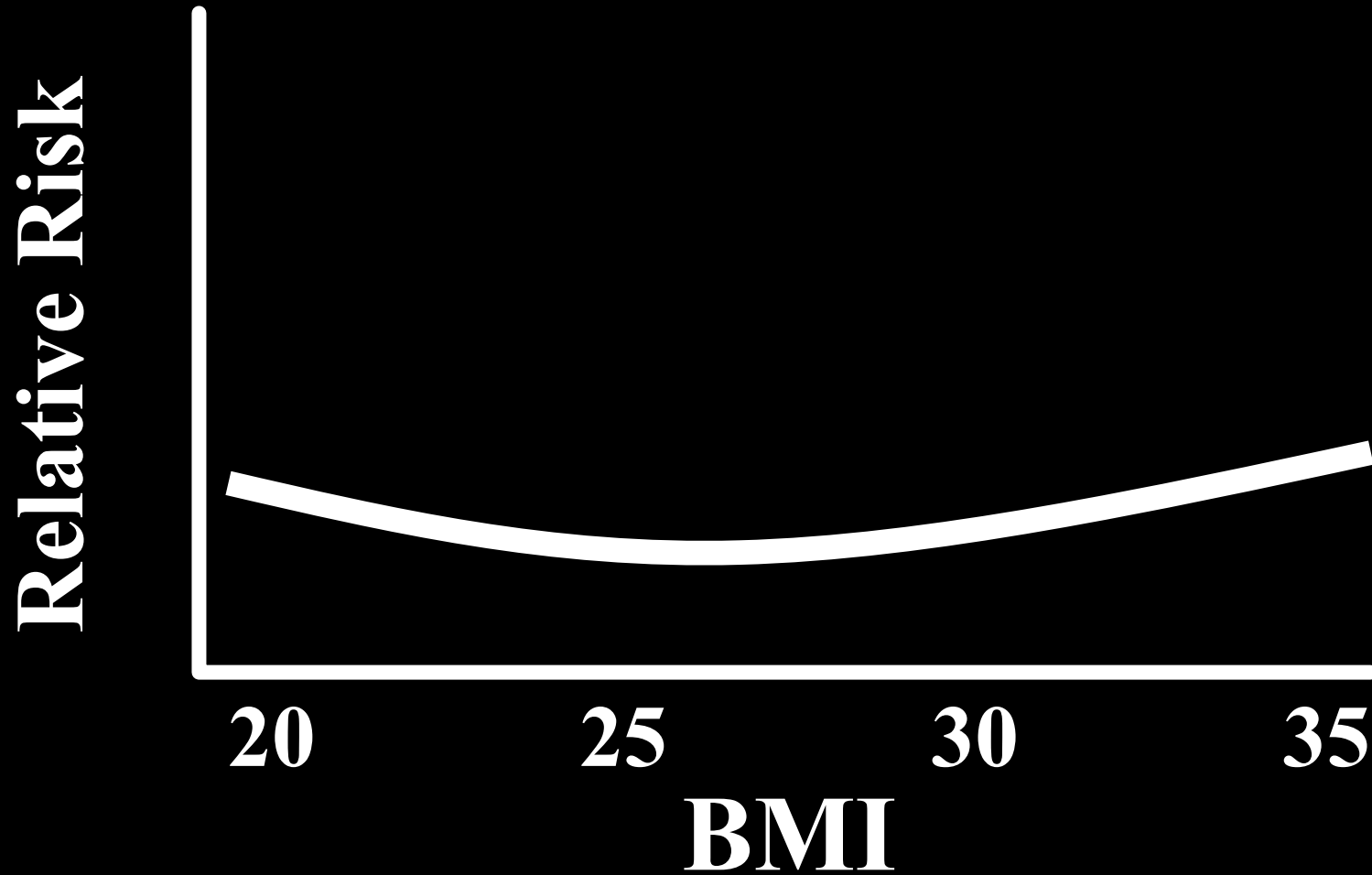
BMI and Premature Death Risk: Alternative Relationships

- **U-Shaped (steep; shallow)**
- **Zero-slope (no relationship)**
- **Inverse (heavier better than thinner)**

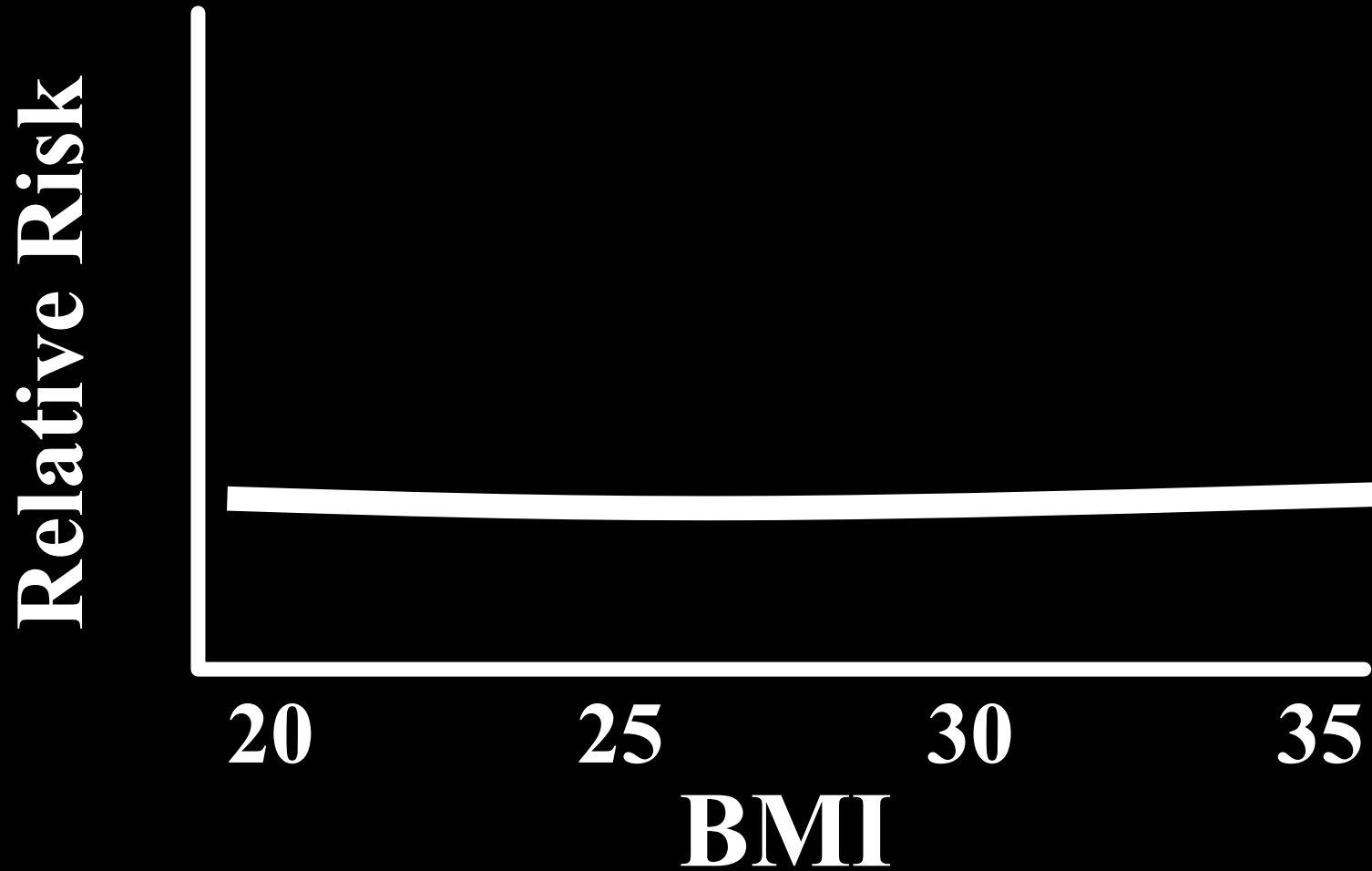
BMI and Relative Risk of Premature Death



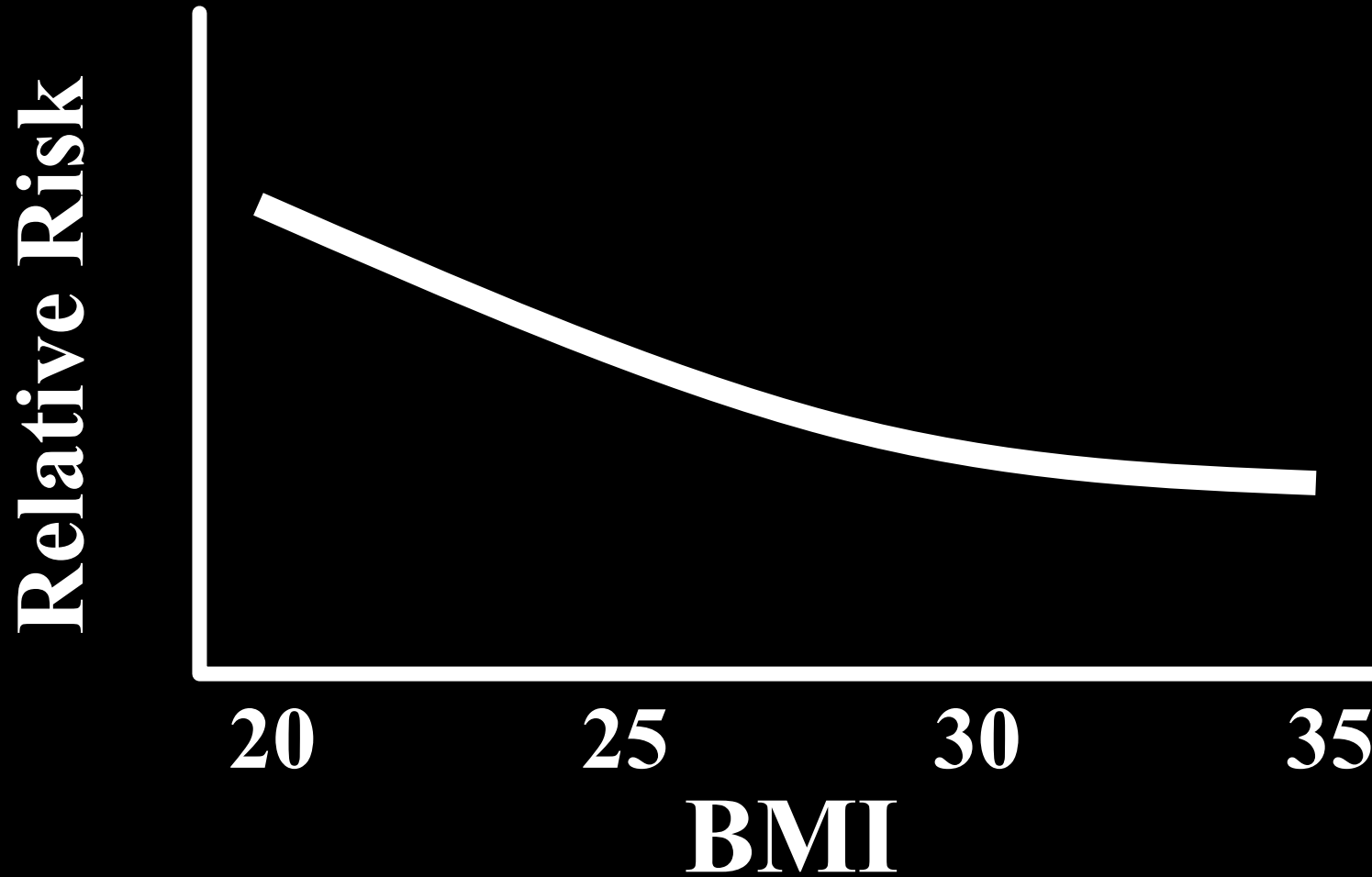
BMI and Relative Risk of Premature Death



BMI and Relative Risk of Premature Death



BMI and Relative Risk of Premature Death

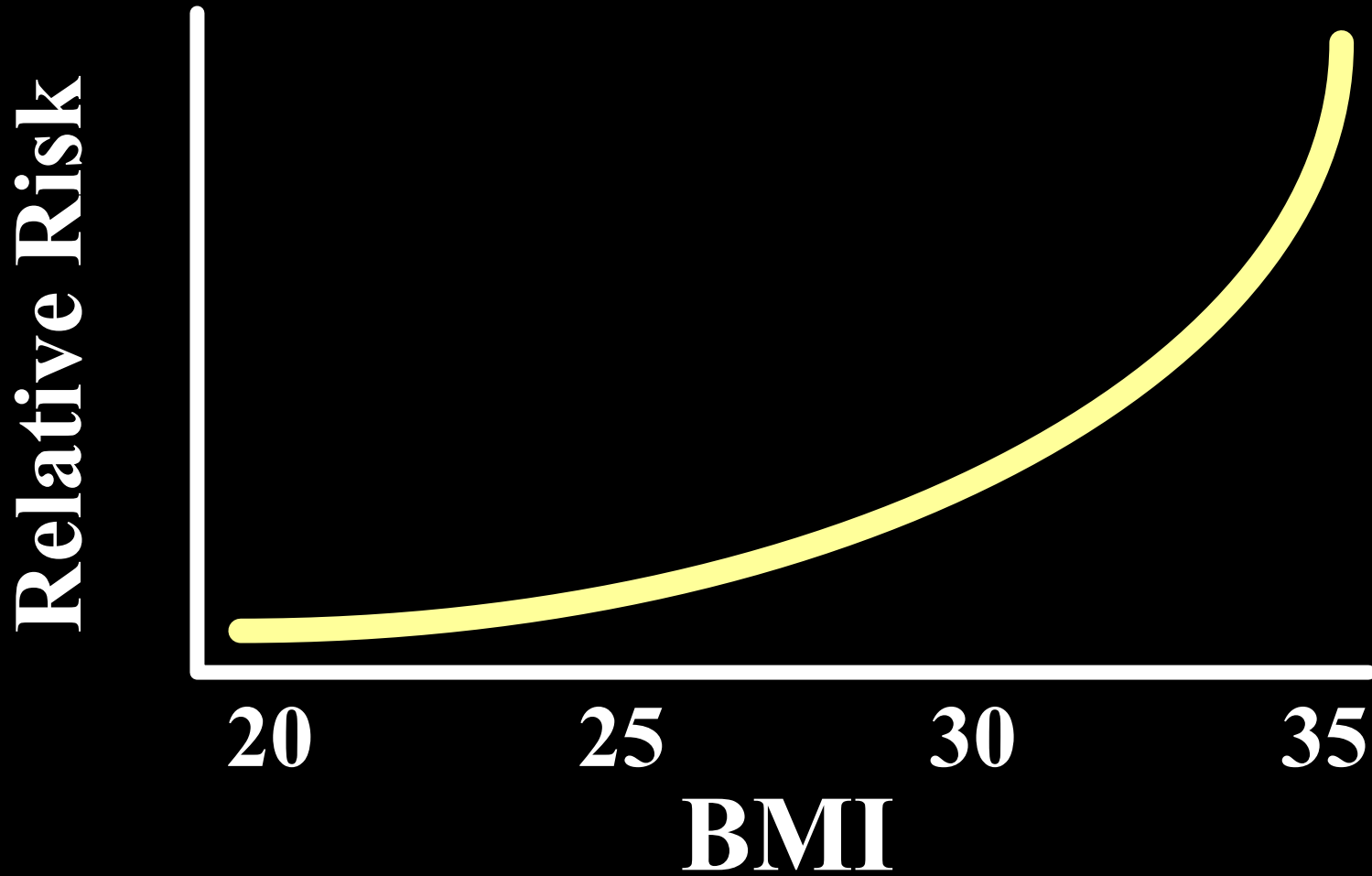


Epidemiological Principles

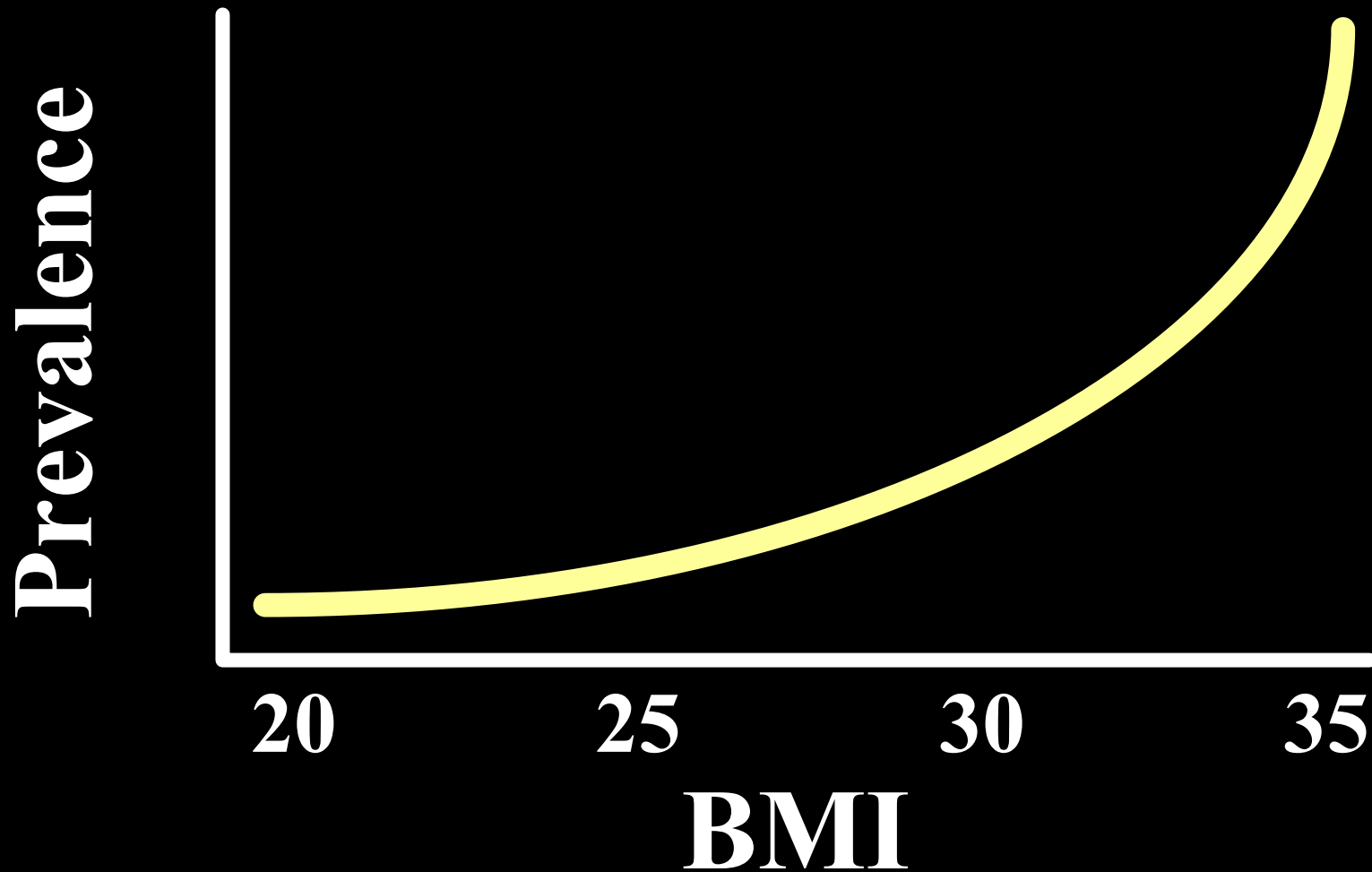
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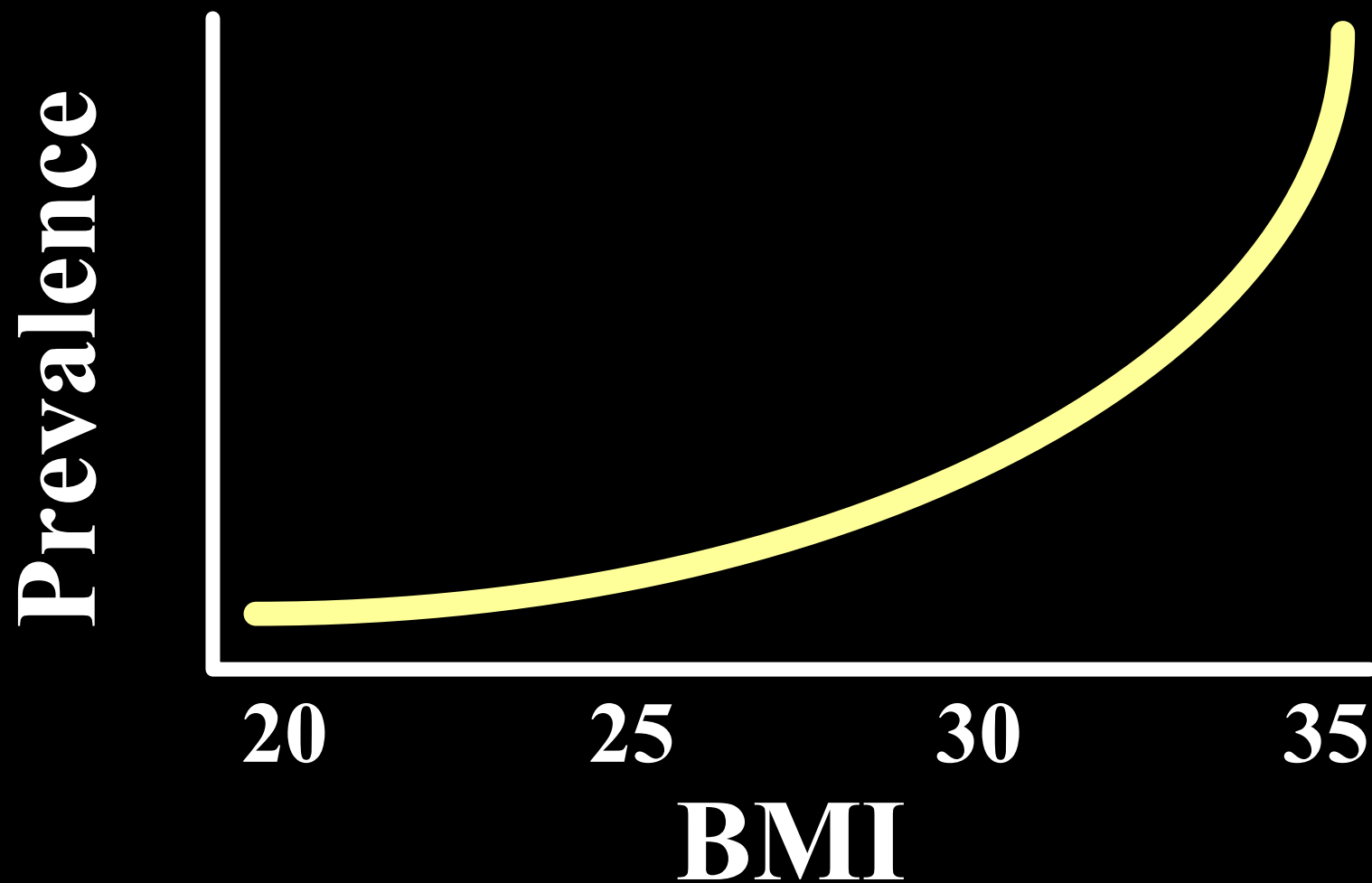
BMI and Relative Risk of Premature Death



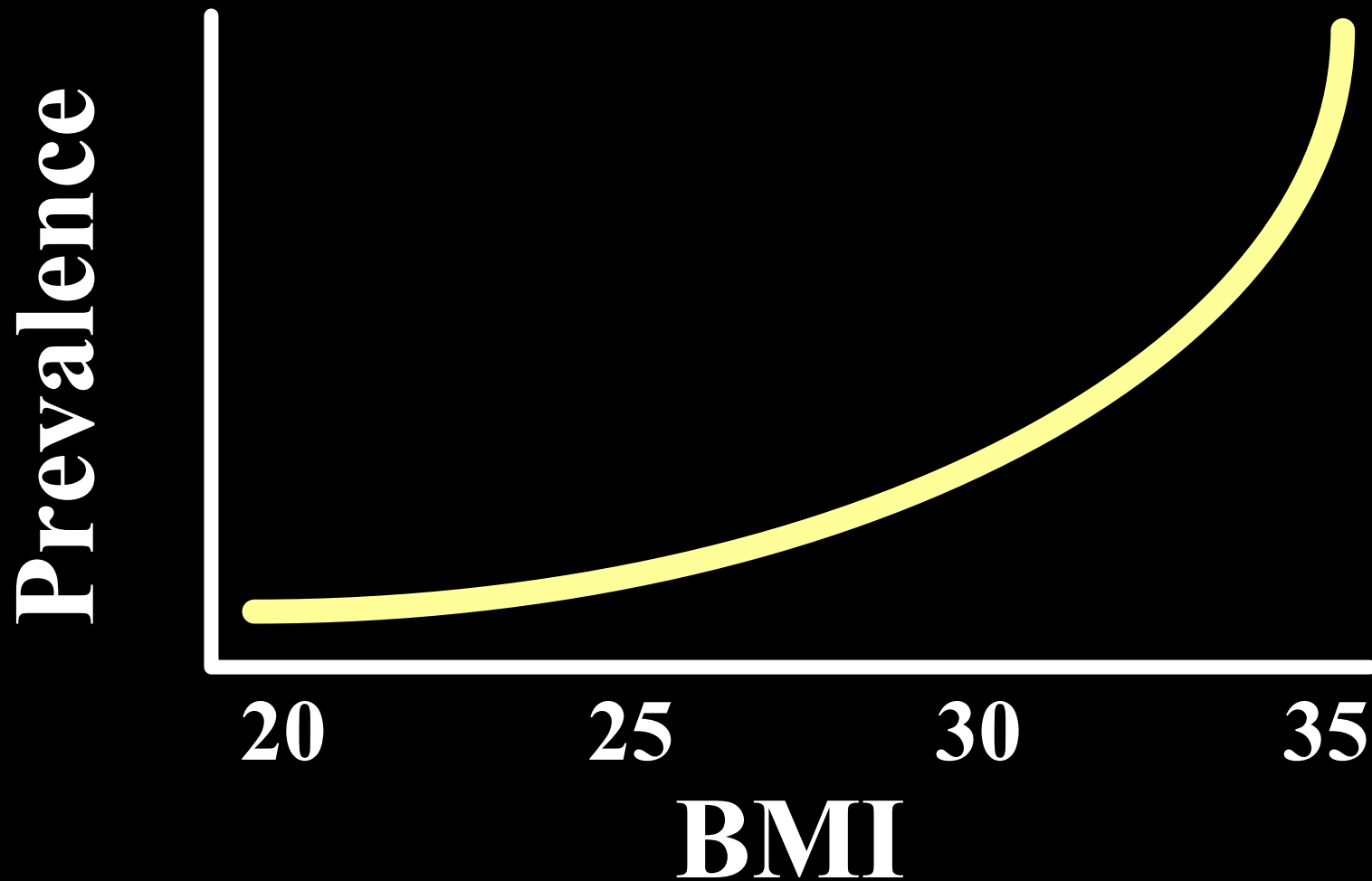
BMI and Dieting/Weight Fluctuation



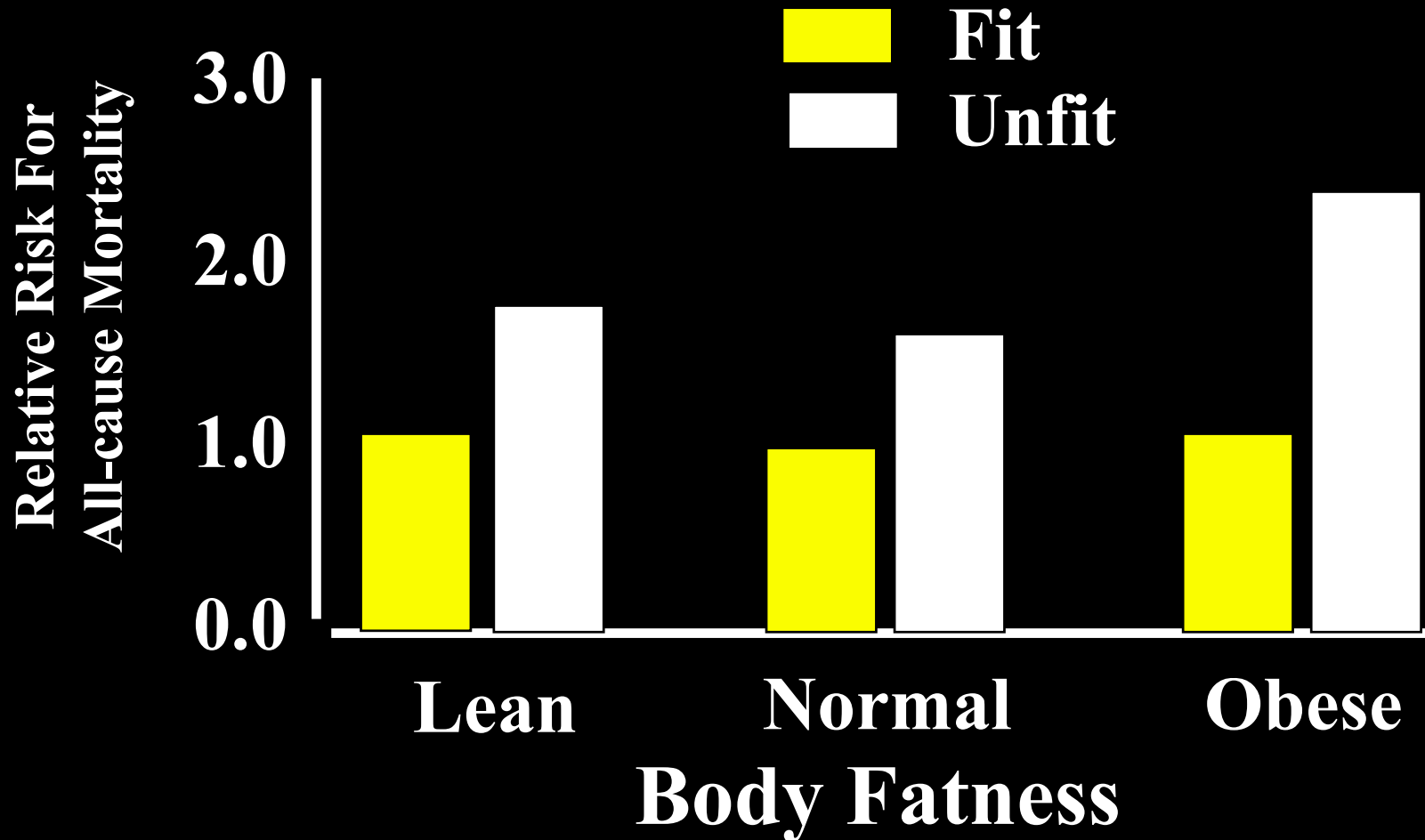
BMI and Weight Loss Drugs



BMI and Physical Inactivity/Low Fitness



Aerobics Center Longitudinal Study



Lee et al. *Am. J. Clin. Nutr.* 69: 373-380, 1999.

**“Healthy bodies come in all shapes.
We need to stop hounding people
about their weight and encourage
them to eat a healthful diet and
exercise.”**

Steven Blair

Cooper Institute

**Senior Scientific Editor, Surgeon General’s Report
on Physical Activity and Health**

Support for “Health at Every Size” Paradigm

- Epidemiological Studies**
- Intervention Studies**

Weight Loss vs. Lifestyle Changes: Epidemiological Evidence

- **Increased Fitness and/or physical activity...*Independent of BMI or changes in BMI:***
~20-70% reduction in All-cause mortality
- **Intentional weight loss: Equivocal Findings...**
 - No clear benefit if otherwise healthy
 - No dose response relationship

Most “weight-related” health problems can be improved independently of weight loss

- ***Blood pressure, dyslipidemias, glucose tolerance and insulin action*** can be improved rapidly via exercise and improved quality of diet...without restrictive eating
- **Correlations between weight changes and health markers are usually quite low**
- **Easier to “move more” than “eat less”**

Non-diet vs. Diet

	<u>Diet</u>	<u>Non-diet</u>
Caloric restriction	Yes	No
Physical activity	Yes	Yes
Body acceptance	No	Yes
Internal (hunger) cues	No	Yes
Counselor facilitated	Yes	Yes

Bacon et al. *Int. J. Obes.* 26: 854-865, 2002

Non-diet vs. Diet (at 52 weeks)

	<u>Diet</u>	<u>Non-diet</u>
Weight change	-5.9 kg	-0.1 kg
Cholesterol	-33 mg/dl	-32 mg/dl
LDL-C	-12 mg/dl	-9 mg/dl
TG	-45 mg/dl	-41 mg/dl
Systolic BP	-8.2 mmHg	-4.5 mmHg
Dropout Rate	41%	8%

Bacon et al. *Int. J. Obes.* 26: 854-865, 2002

Easier to “move more” than “eat less”

Approximately twice as many subjects met physical activity goal as compared to weight loss goal

- **Finnish Diabetes Prevention Study (*NEJM* 2001; 344: 1343-50)**
- **Diabetes Prevention Program (*NEJM* 2002; 346: 393-403)**

Overweight/Obesity

- **Bona Fide Disease?**
(Yes, at extreme “dangerous” weights)
- **Natural Physiological State?**
(Yes, for “Metabolically Normal” Obese)
- **Proxy for an Imprudent Lifestyle?**
(Yes, for most with BMIs > 25)

Key Points

- Health risks of “overweight” and “obesity” have been exaggerated
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- Easier to get fat people fit (“physically” and “metabolically) than to get fat people thin

**“People should be very, very
careful in thinking about
obesity and health.”**

Dr. Rudolph Leibel

New York Times

April 16, 2002

Most recent “Obesity Kills” Study:

“Overweight, obesity, and mortality from cancer in a prospectively studied cohort of U.S. adults”

Calle et al. *New England Journal of Medicine*, April 24, 2003

“Increased body weight was associated with increased death rates for all cancers combined and for cancers at multiple specific sites.”

Calle et al. New England Journal of Medicine, April 24, 2003

“More than 90,000 deaths per year from cancer might be avoided if everyone in the adult population could maintain a body-mass index under 25.0 throughout life.”

***Calle et al. New England Journal of
Medicine, April 24, 2003***

Media Coverage

**“Losing Weight May Prevent
Cancer Deaths”**

**Associated Press story,
New York Times, April 24, 2003**

“Losing weight could prevent one of every six cancer deaths in the United States—more than 90,000 each year, according to a sweeping study that experts say links fat and cancer more convincingly than ever before.”

“...results are irrefutable.” (obesity expert)

Associated Press, *New York Times*, April 24, 2003

A Closer Scrutiny of the Study

- **Lowest cancer risk was observed in OVERWEIGHT men (BMI 25.0 – 29.9)**
- **Cancer risk in obese men (BMI 30.0 – 34.9) and overweight women relatively low (8-9% higher than BMI 18.5 – 24.9)**
- **Risk for lung cancer (most common site) was INVERSELY associated with BMI**
- **No data on weight change during 16 years**
- **Other Unknowns**

**Even if obesity is the problem,
is weight loss the cure?**

Data on *intentional* weight loss and cancer mortality risk from previous ACS Prevention I Study

- **Prospective study of intentional weight loss and mortality in never-smoking overweight US white women aged 40-64. Williamson et al, *Am. J. Epidemiol.* 1995; 141: 1128-41.**
- **Prospective study of intentional weight loss and mortality in overweight white men aged 40-64 years. Williamson et al, *Am. J. Epidemiol.* 1999; 149: 491-503.**

Results from the ACS Prevention I study on intentional weight loss

- **Women w/o health problems: either *increased* cancer mortality risk, or no benefit**
- **Women with health problems: reduced risk, but *no dose-response relationship***
- **Men w/o health problems: no benefit**
- **Men with health problems: no benefit**

Health benefits of dieting have been overstated...and risks underestimated

- **“Lose weight – live longer” not well supported**
- **Long-term efficacy of dieting—induced weight loss not well established**
- **Chronic weight fluctuation may increase disease/mortality risk**
- **Psychological consequences of restrained eating**
- **Increased risk for future weight gain**

Epidemiological Studies of Intentional Weight Loss

- *ACS Cancer Prevention Study I*
- *Iowa Women's Health Study*
- *Cardiovascular Health Study*
- *National Health Interview Survey*

Intentional Weight Loss:

Recent revelations on the “lose weight – live longer” axiom
(National Health Interview Survey – 1989 –1997)

- **Trying to lose weight, lost weight (~15 lb): death rate reduced by ~24-29%**
- **Trying to lose weight, did not lose any: death rate reduced by ~18-20%**
- **Not trying to lose weight, actually gained (~9 lb): death rate reduced by ~25-38%**

Gregg, et al., *Ann. Int. Med.* 138: 383-389, 2003.

Hazards of weight fluctuation (yo-yo dieting) may be more significant than generally acknowledged

- **Elevated blood pressure/vascular lesions**
- **Depletion of omega-3 fats**
- **Reduced PUFA/SFA**
- **Increased CVD mortality**
- **Gallbladder disease**
- **Oxidative DNA damage in mammary tissue**
- **Renal cancer**
- **Psychological burden (false hope syndrome)**

“....Until we have better data about the risks of being overweight and the benefits and risks of trying to lose weight, we should remember that the cure for obesity may be worse than the condition.”

Editors, *New Engl. J. Med.* 338, No. 1: 52-54, 1998

Metabolically Normal Obese

“...Important to identify the healthy subgroup:
(1) in clinical work to avoid blame and inappropriate treatment;
(2) in research studies to avoid confounding statistical analyses;
(3) in medical education to emphasize the need for better characterization of patients.”

Ethan Sims. *Metabolism* 50: 1499-1504, 2001

*Takes on the fat phobia that permeates
so much of the research about obesity and health.*

BIG FAT LIES

*Updated
Edition*

Learn the astonishing facts.

**THE TRUTH ABOUT
YOUR WEIGHT
AND
YOUR HEALTH**

GLENN A. GAESSER, PH.D.