Fitness Vs Fatness:

What's More Important to Your Health?

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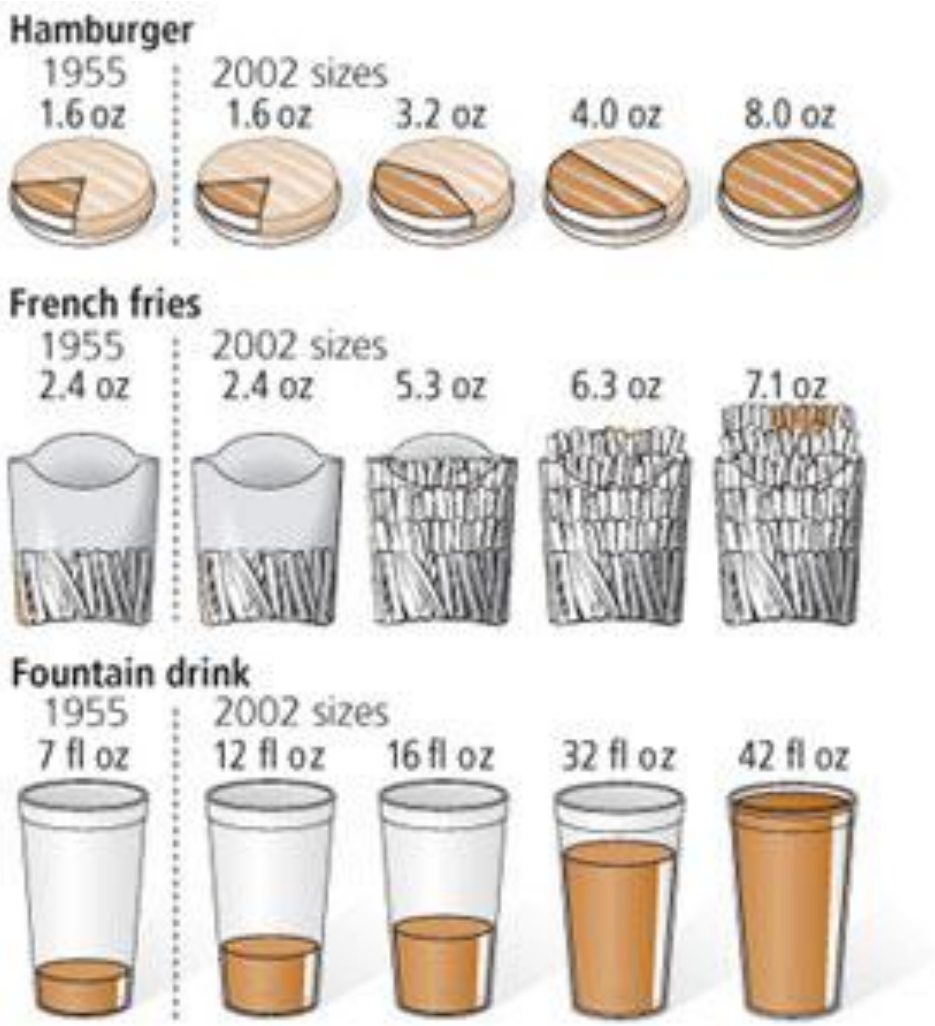
Past century has seen paradigm shift in our diet and activity level

- Over the same period of time;
  - Portion sizes have dramatically increased.
  - Activity levels have dramatically decreased
- Resulting in unintended, but predictable, consequences that are gravely affecting our health and longevity.

The Growth of Fast Food Portion Sizes Over 60+ yrs

- Between 1971 and 2019:
  - Average man added 168 calories to his daily diet.
  - Average woman added 335 calories a day.



Harvard Health Newsletter, 2019
Weigh Less, Live Longer: Strategies for successful weight loss

The Growth of Portion Sizes; 40 years & 210 calories later

- The Average Bagel:

3-inch diameter 140 calories

6-inch diameter 350 calories

The Growth of Portion Sizes; 40 years & 360 calories later

- The Average Large Size Theatre Popcorn:

5 cups
270 calories

11 cups
630 calories

The Growth of Portion Sizes; 40 years & 270 calories later

- The Average Hamburger:

333 calories

590 calories

Changes to the US Labor Force

- Over past century, shift from industries dominated by primary production
- 1900 Most Common Occupations:
  - Farm workers
  - Forest workers
  - Mine workers
- 2000 Most Common Occupations:
  - Professional workers
  - Technical workers
  - Service workers

Then Exercise Didn't Matter

Lumberjack;
Then

Now Exercise Matters:
Unintended Consequences of Technology

Lumberjack;
Now

Then Exercise Didn't Matter

Farmer;
Then

Now Exercise Matters:
Unintended Consequences of Technology

Farmer;
Now

Then Exercise Didn't Matter

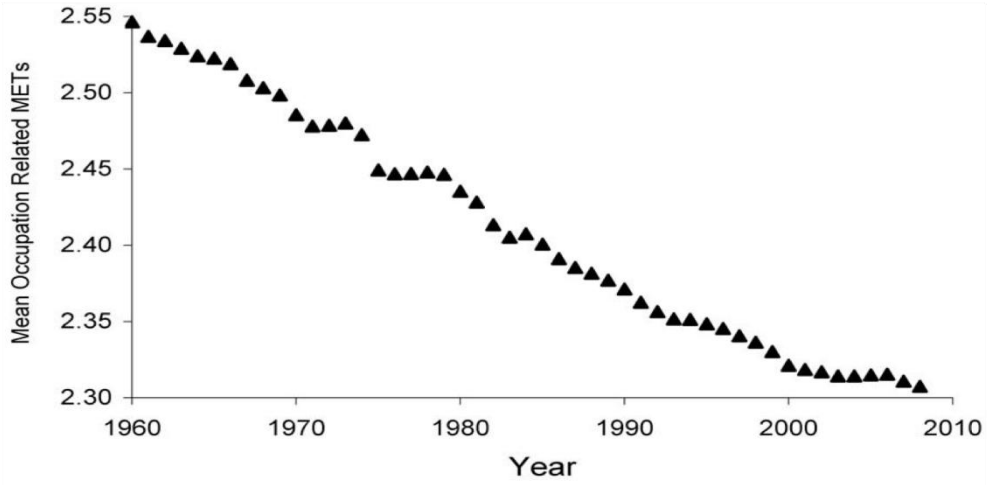
Play time;
Then

Now Exercise Matters:
Unintended Consequences of Technology

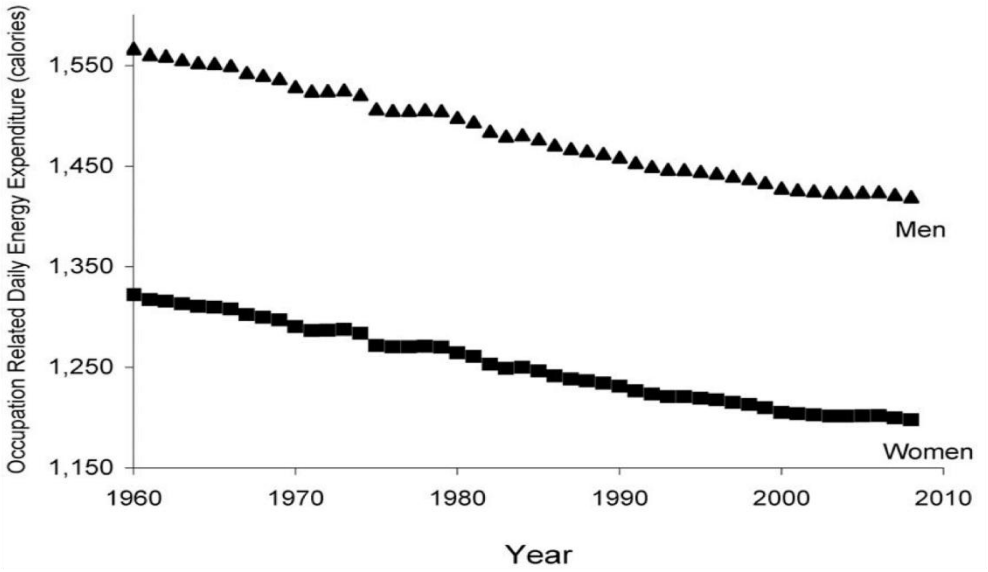
Play time;
Now

Energy Expenditure at Work Over 5 Decades

METs Expended



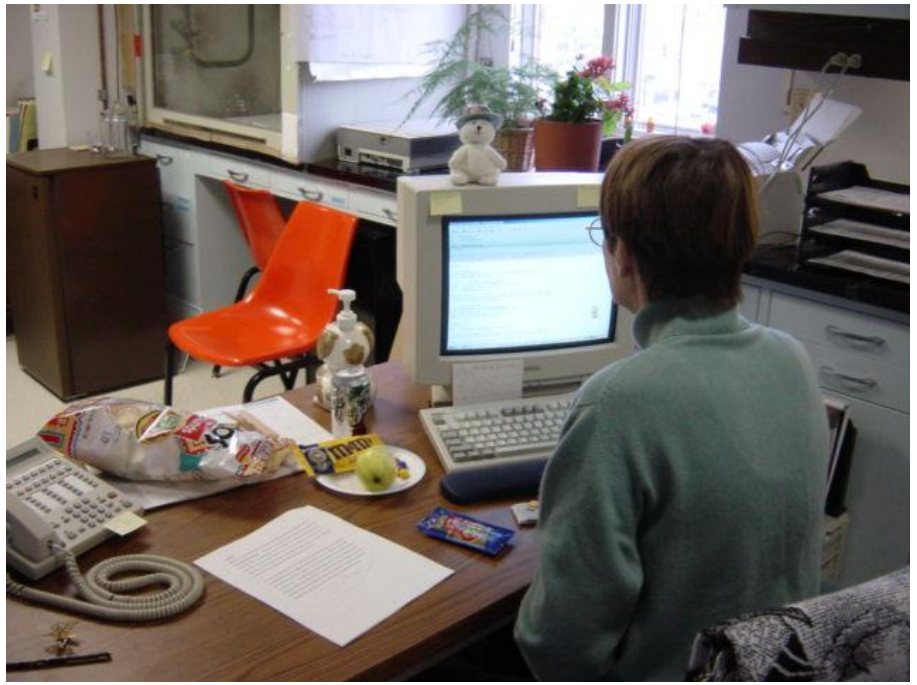
Calories Burned



Church TS et al. PLOS ONE 2011;6(5): e19657

Now, Everywhere We Look
At home and at work

Exercise Matters!



Bottom Line – We have systematically engineered PA out of our daily routine

The results have been catastrophic

- Can you guess the occupation of these people from the early 1900's?
  - They are circus performers.
  - Often called "fat folks", who were so unusually large that people actually paid to see them!

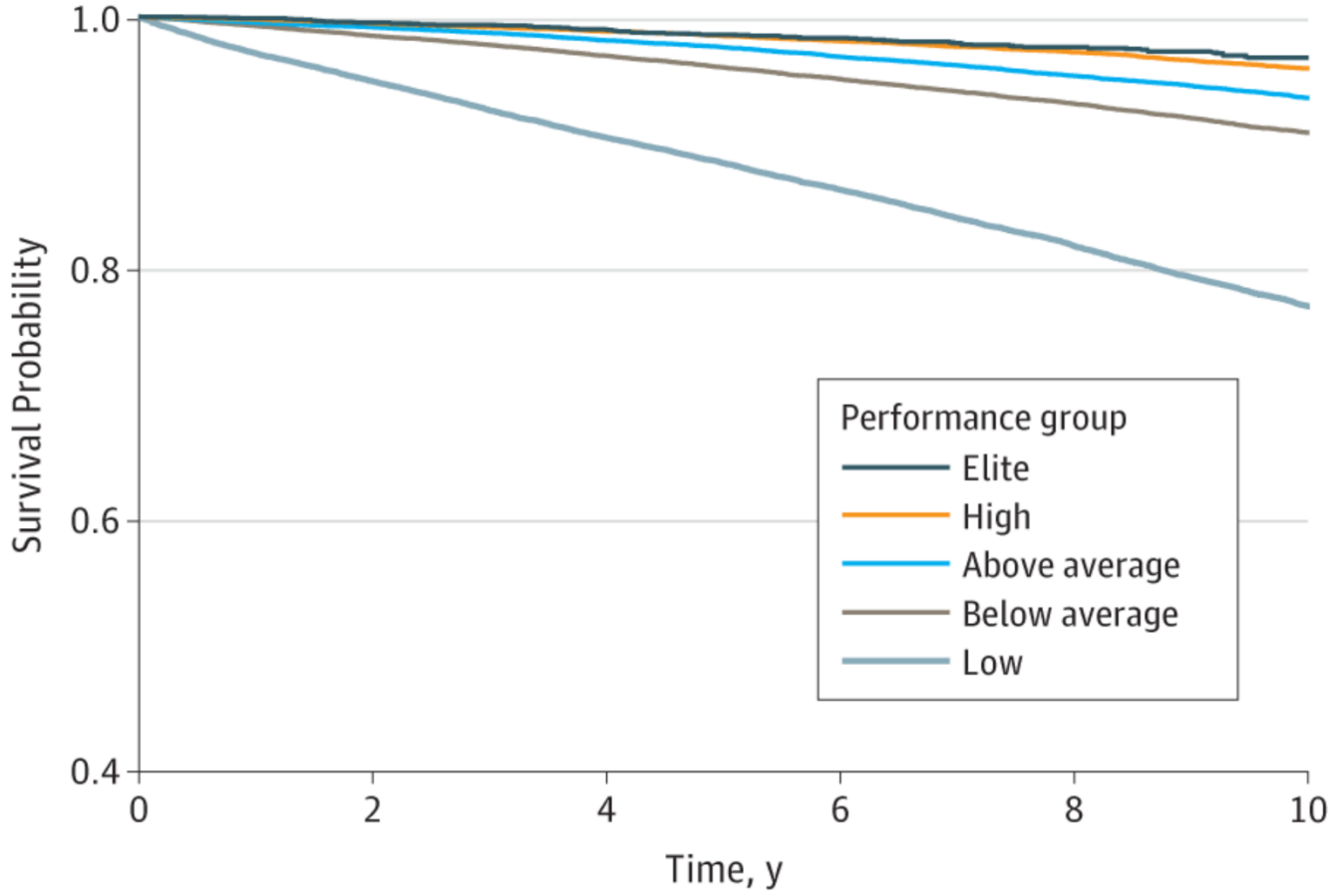
Are you kidding?
Compare with today's standards

Look at Old Pictures; What has Changed?

The case for physical activity vs weight loss to improve health and reduce mortality

Exercise is Medicine

Association of Fitness With Mortality in Adults Undergoing Ex Treadmill Testing



-122,007 adults with ETT at Cleveland Clinic

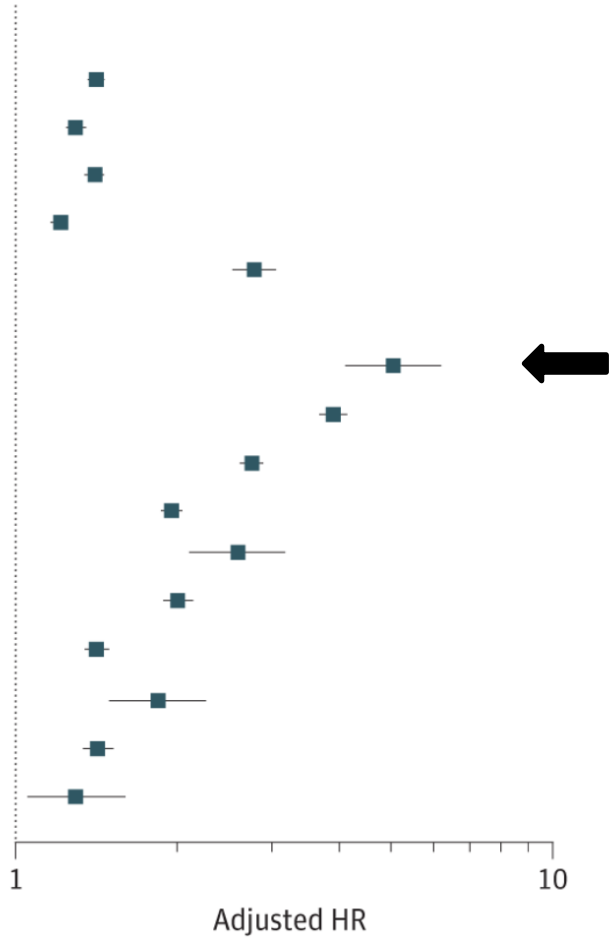
-1991-2014 (23 yrs)

-Fitness inversely a/w all-cause mortality in 5 quintiles of fitness

Mandsager, *JAMA,* 2018

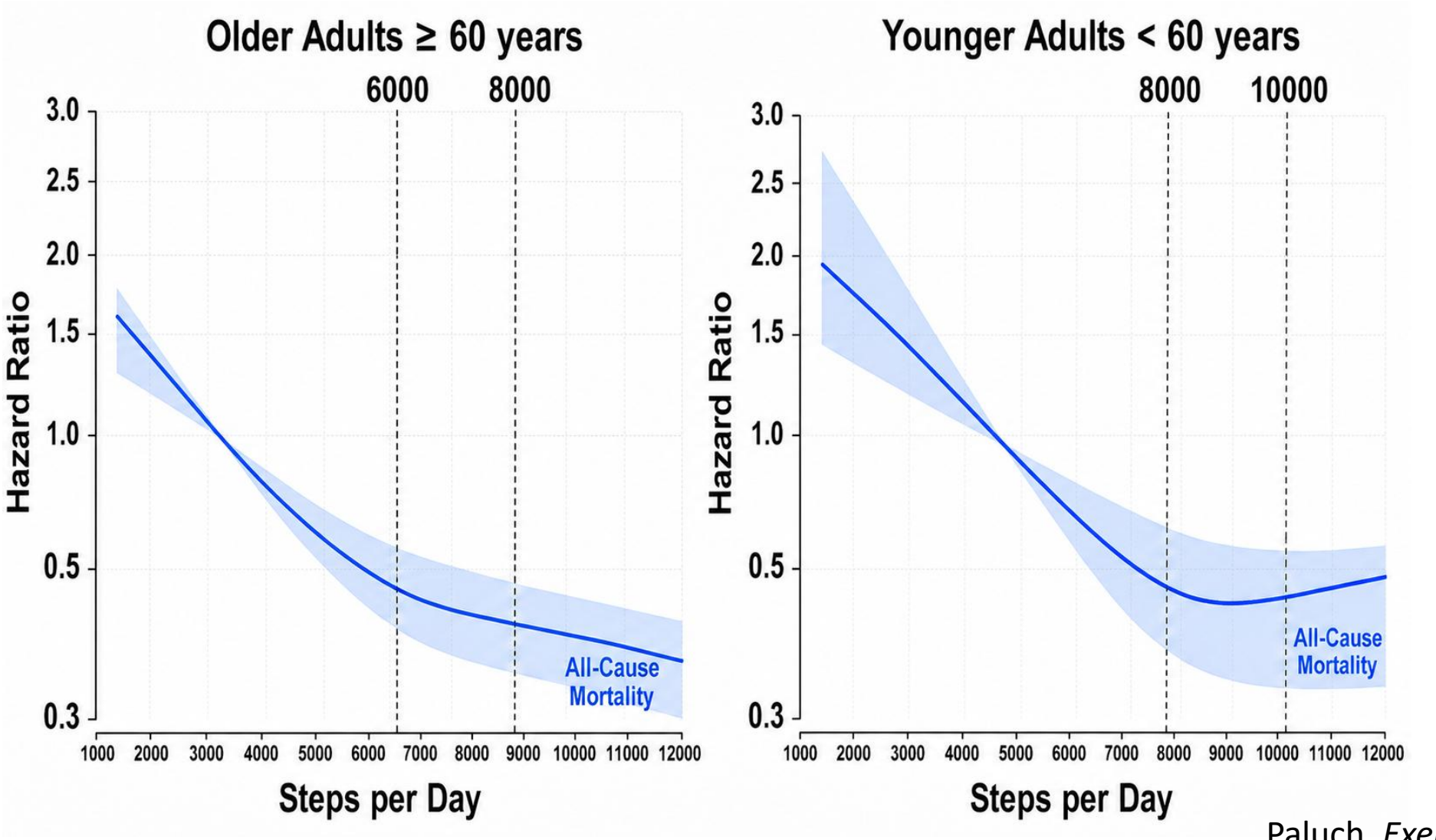
Low Fitness is a Bigger Mortality Risk than Hypertension, Diabetes, CAD or *Smoking*

Variable	HR (95% CI)	*P* Value
Comorbidity		
Smoking	1.41 (1.36-1.46)	<.001
CAD	1.29 (1.24-1.35)	<.001
Diabetes	1.40 (1.34-1.46)	<.001
Hypertension	1.21 (1.16-1.25)	<.001
ESRD	2.78 (2.53-3.05)	<.001
Group comparison		
Low vs Elite	5.04 (4.10-6.20)	<.001
Low vs High	3.90 (3.67-4.14)	<.001
Low vs Above Average	2.75 (2.61-2.89)	<.001
Low vs Below Average	1.95 (1.86-2.04)	<.001
Below Average vs Elite	2.59 (2.10-3.19)	<.001
Below Average vs High	2.00 (1.88-2.14)	<.001
Below Average vs Above Average	1.41 (1.34-1.49)	<.001
Above Average vs Elite	1.84 (1.49-2.26)	<.001
Above Average vs High	1.42 (1.33-1.52)	<.001
High vs Elite	1.29 (1.05-1.60)	.02



Mandsager, *JAMA,* 2018

Association of Daily Step Counts and All Cause Mortality



-Meta-analysis of 17 studies

-Over 127,000 Adults

-Mean age 57y

-7.4 yrs f/u

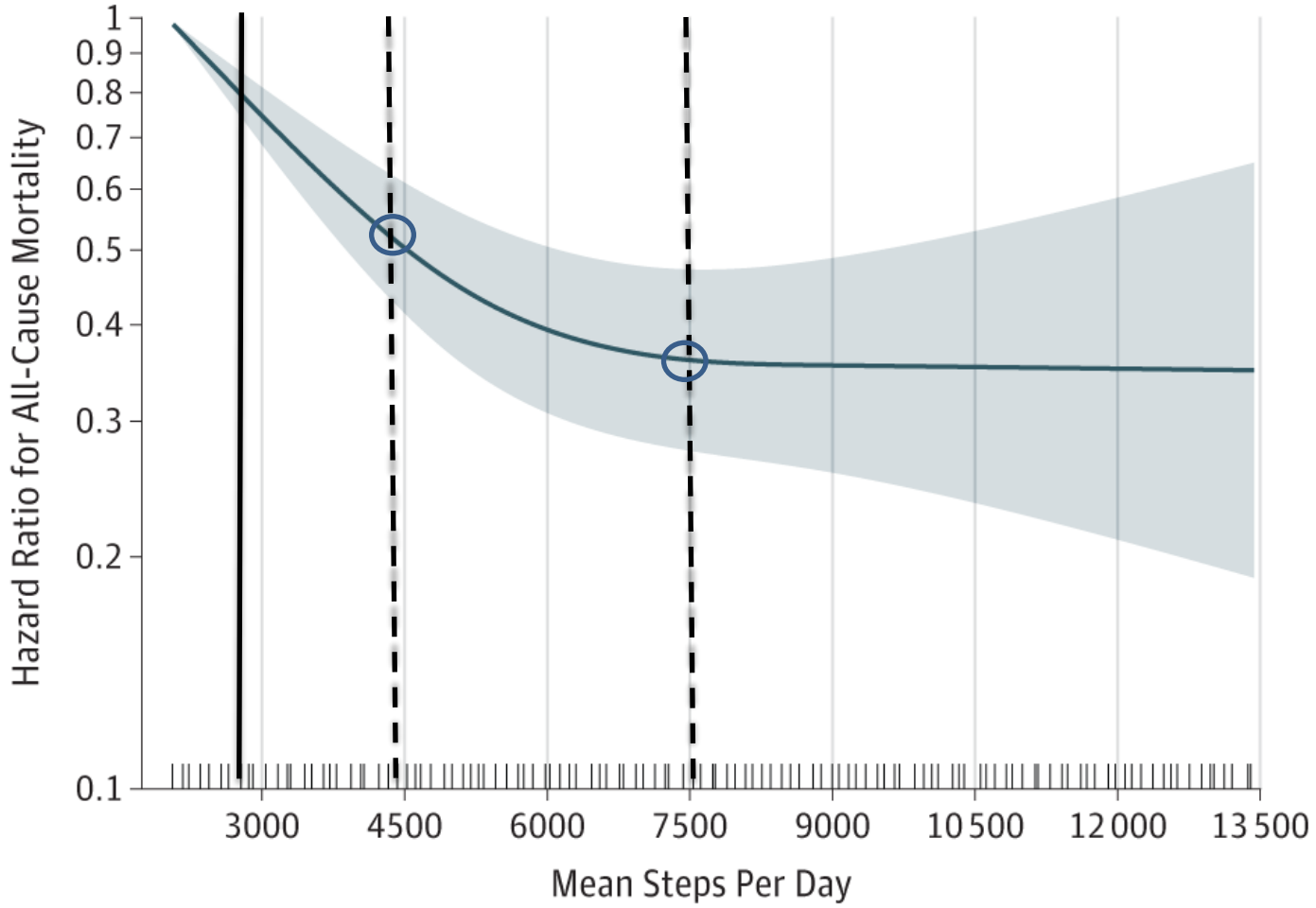
-Dose-response curve starts to level at 6-8K steps in ≥60 & 8-10K steps in <60

-No clear association btw intensity & mortality

Paluch, *Exerc Sport Sci Rev,* 2026

Daily Steps and All Cause Mortality

Women's Health Study



- 16,741 women
- Mean age of 72 yrs followed 4.3 yrs.
- Those averaging ***~4400 steps/d*** had significantly lower mortality compared to ***~2700 steps/d***
- Mortality rates progressively decreased before leveling at approx ***7500 steps/d.***
- Step Intensity not related to mortality
- Adjusted for diet

Lee, JAMA Intern Med, 2019

Physical activity, obesity and health

It is time to bust the myth of physical inactivity and obesity: you cannot outrun a bad diet

A Malhotra, T Noakes and S Phinney

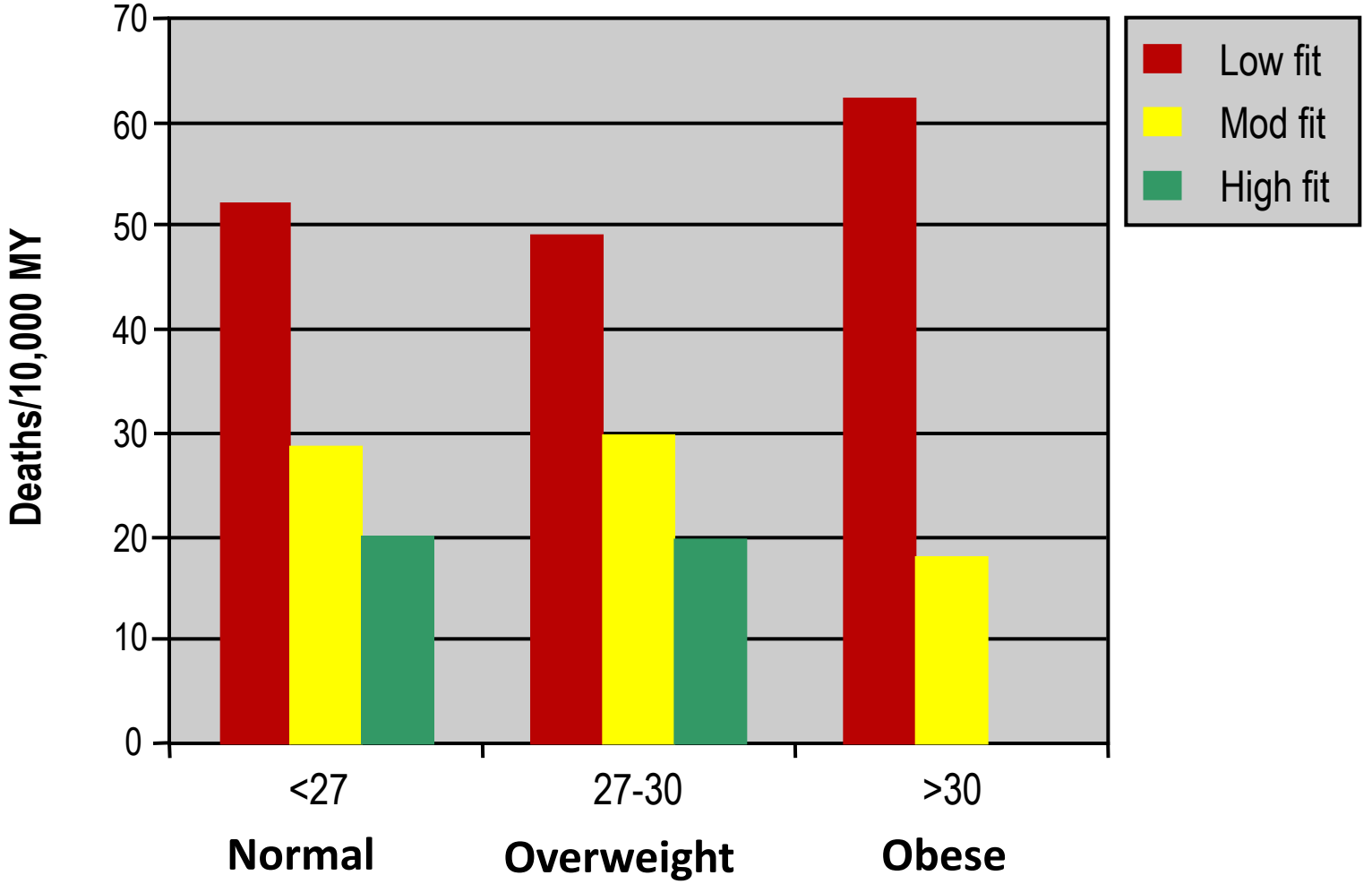
Br J Sports Med 2015 49: 967-968 originally published online April 22, 2015
doi: 10.1136/bjsports-2015-094911

- Written by folks trying to sell diet books about virtues of a low carb – high fat diet
- Their conclusion: “It is time to wind back the harms caused by the junk food industry’s Public Relations machinery. Let us bust the myth of physical inactivity and obesity. You cannot outrun a bad diet”
- ***It is time to bust the myth: you cannot diet away the risks of being sedentary!***

Aerobics Center Longitudinal Study (ACLS)

- Prospective cohort study at the at the Cooper Institute in Dallas, Texas
- Involving over 80,000 adults followed for over 50 years
- Objective cardiorespiratory fitness (CRF) via treadmill testing
- Steve Blair was the key scientific architect and driving force behind its most influential findings

Death Rates by Fitness & BMI Categories



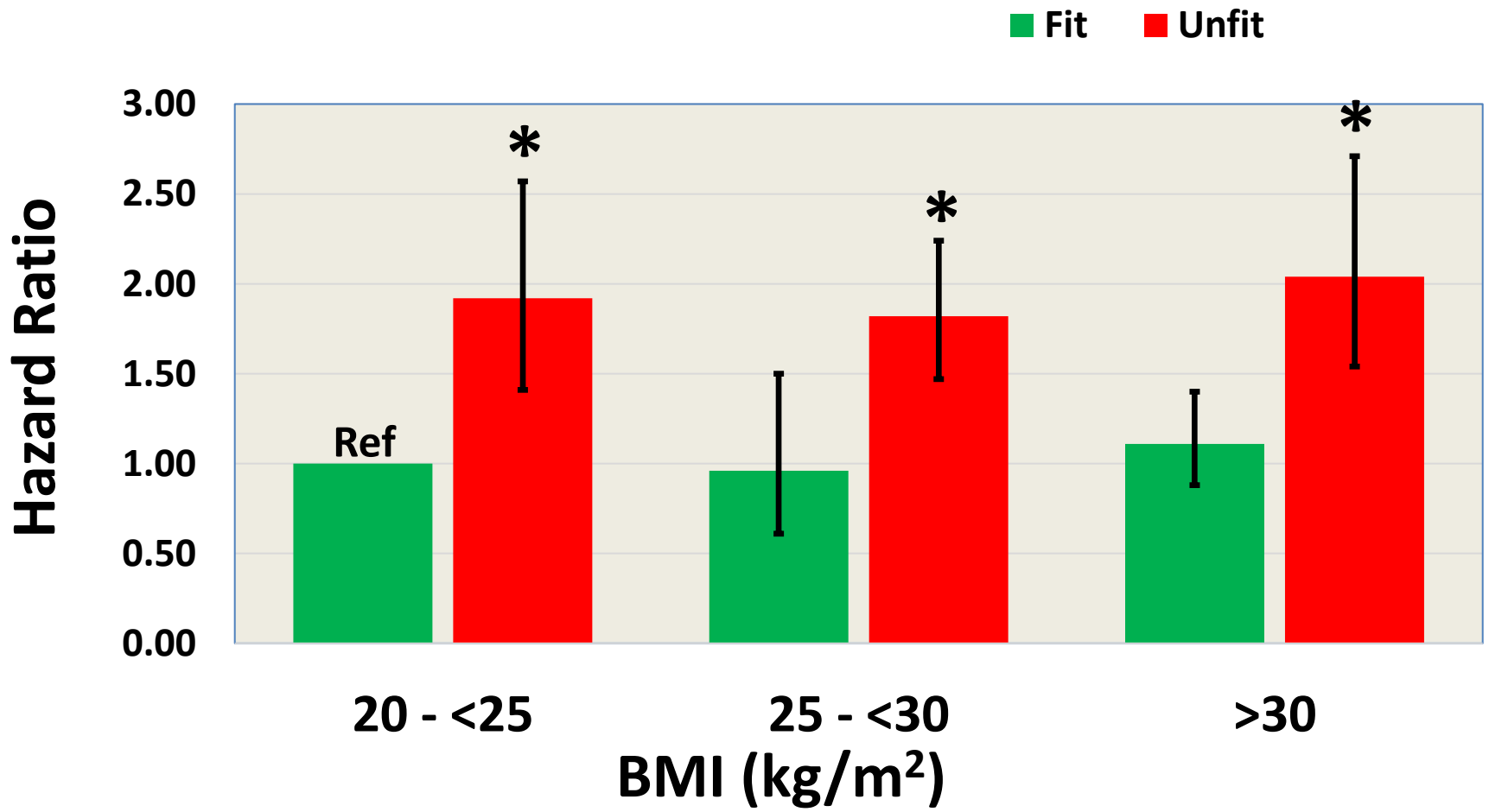
Barlow, *Int J Obes, 1995*

Dietary indices, CV risk factors and mortality:
Findings from the Aerobics Center Longitudinal Study

- Three dietary indices (3-day records)
  - Ideal Diet Index (adapted from DASH)
  - Diet Quality Index
  - Mediterranean Diet Score
- Dietary indices were associated with lower BMI, cholesterol, glucose, diastolic BP, and higher CRF…**but were not significantly related to all-cause, CVD, or cancer mortality**
- No associations were observed in fully-adjusted models, which controlled for CRF
- Unlikely that "fit-fat" findings of earlier ACLS study (Barlow et al) were significantly confounded by diet

Cuenca-Garcia, *Ann Epi,* 2014

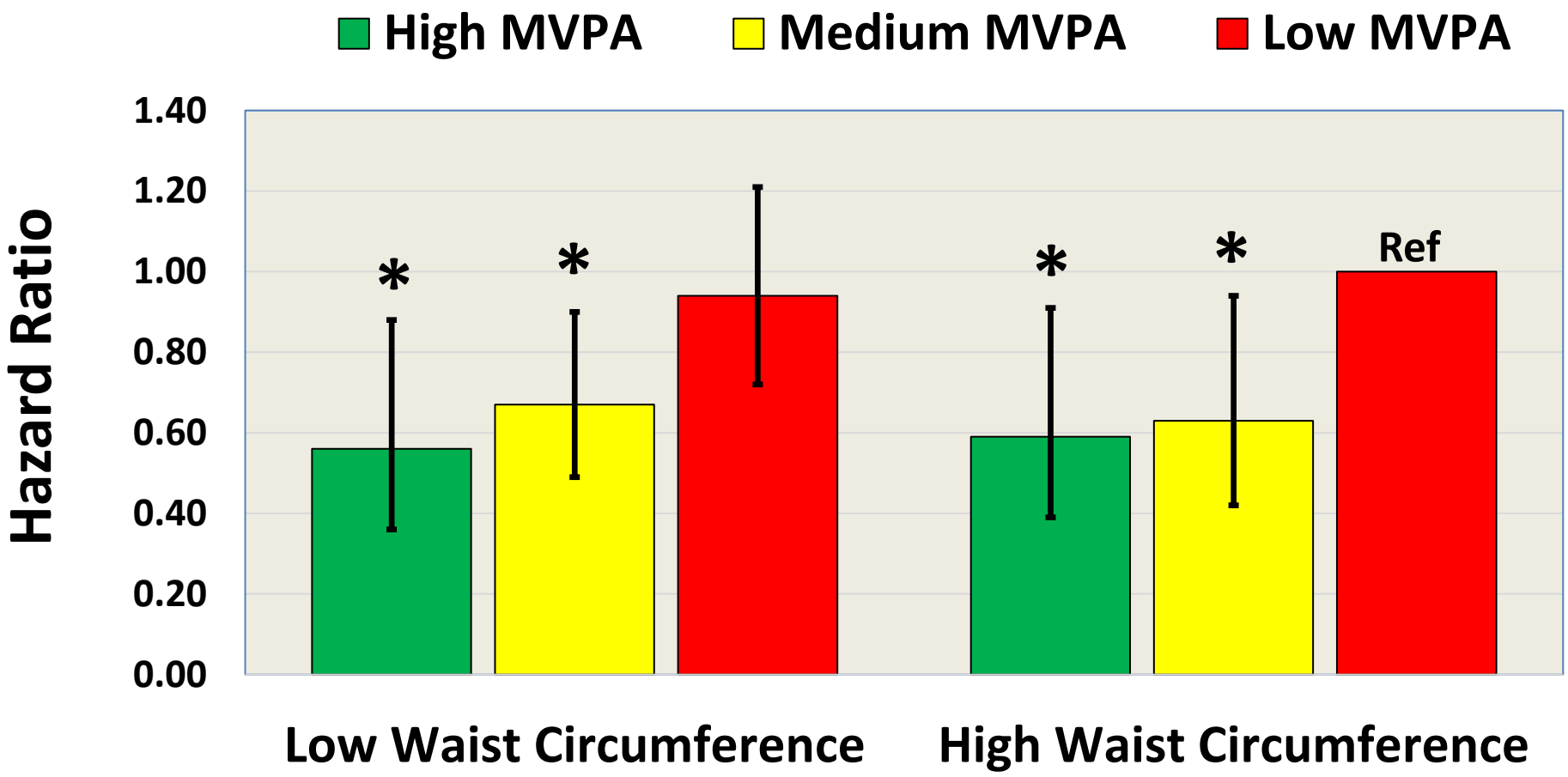
Most Recent “Fit-fat” Meta-analysis - All Cause Mortality Risk
(20 studies; 398,716 participants)



Weeldreyer, *Brit J Sports Med,* 2024

MVPA and Waist Circumference - All Cause Mortality Risk

(meta-analysis of 5 studies; 9,136 never smokers)



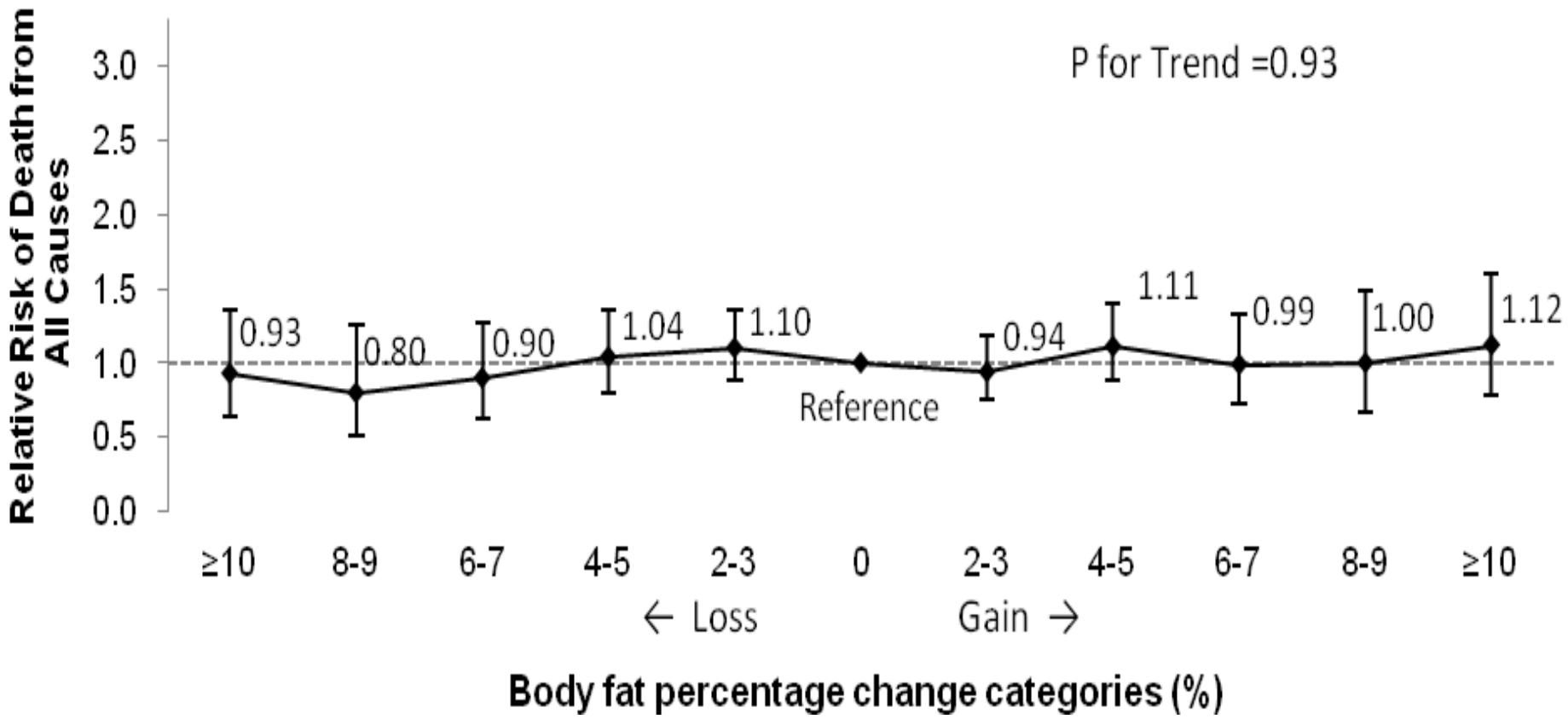
Tarp, *Br J Sports Med* 2022

Is Mortality Risk Reduced More by Decreasing Body Fat or Increasing Fitness?

- 14,345 mostly middle-aged men; All had 2 or more exams at the Cooper Clinic
- Over 11.4 years of follow-up (165,186 person-years) 914 all cause deaths
- Excluded those with chronic disease, <1 year of follow-up, or BMI <18.5 BMI
- Evaluated changes in fitness and body fat in relation to all-cause mortality

Lee DC, *Circulation, 2011*

Is Mortality Risk Reduced More by Decreasing Body Fat or Increasing Fitness?



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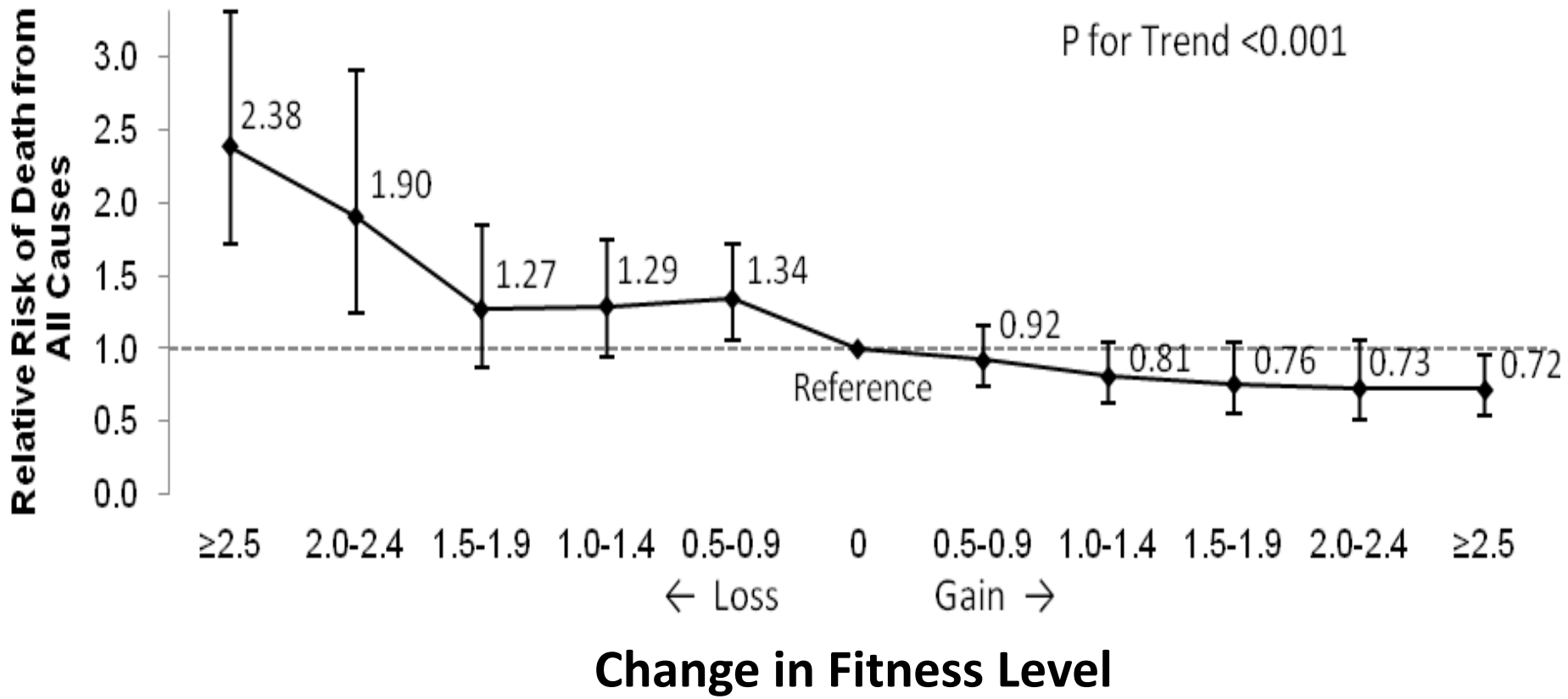


Lee DC; *Circulation, 2011*

Physical Inactivity and SevereCOVID-19 Risk

Original research

Physical inactivity is associated with a higher risk for severe COVID-19 outcomes: a study in 48 440 adult patients

Robert Sallis ,[1] Deborah Rohm Young,[2] Sara Y Tartof,[2] James F Sallis,[3] Jeevan Sall,[1] Qiaowu Li,[2] Gary N Smith,[4] Deborah A Cohen[2]

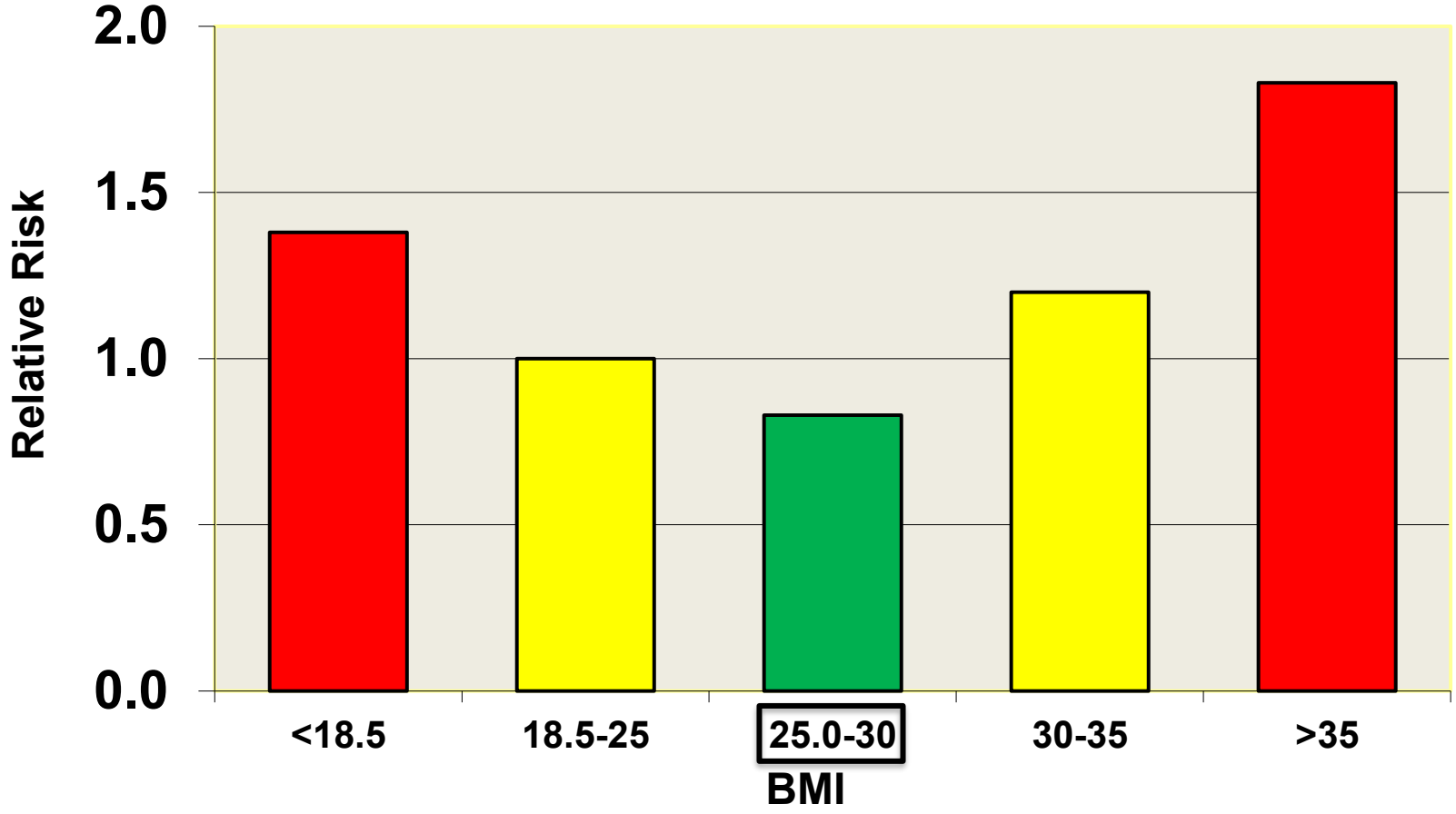
First published April 13, 2021

British Journal of Sports Medicine

Odds Ratios for COVID 19 *Deaths*
Obese were patients less likely to die!

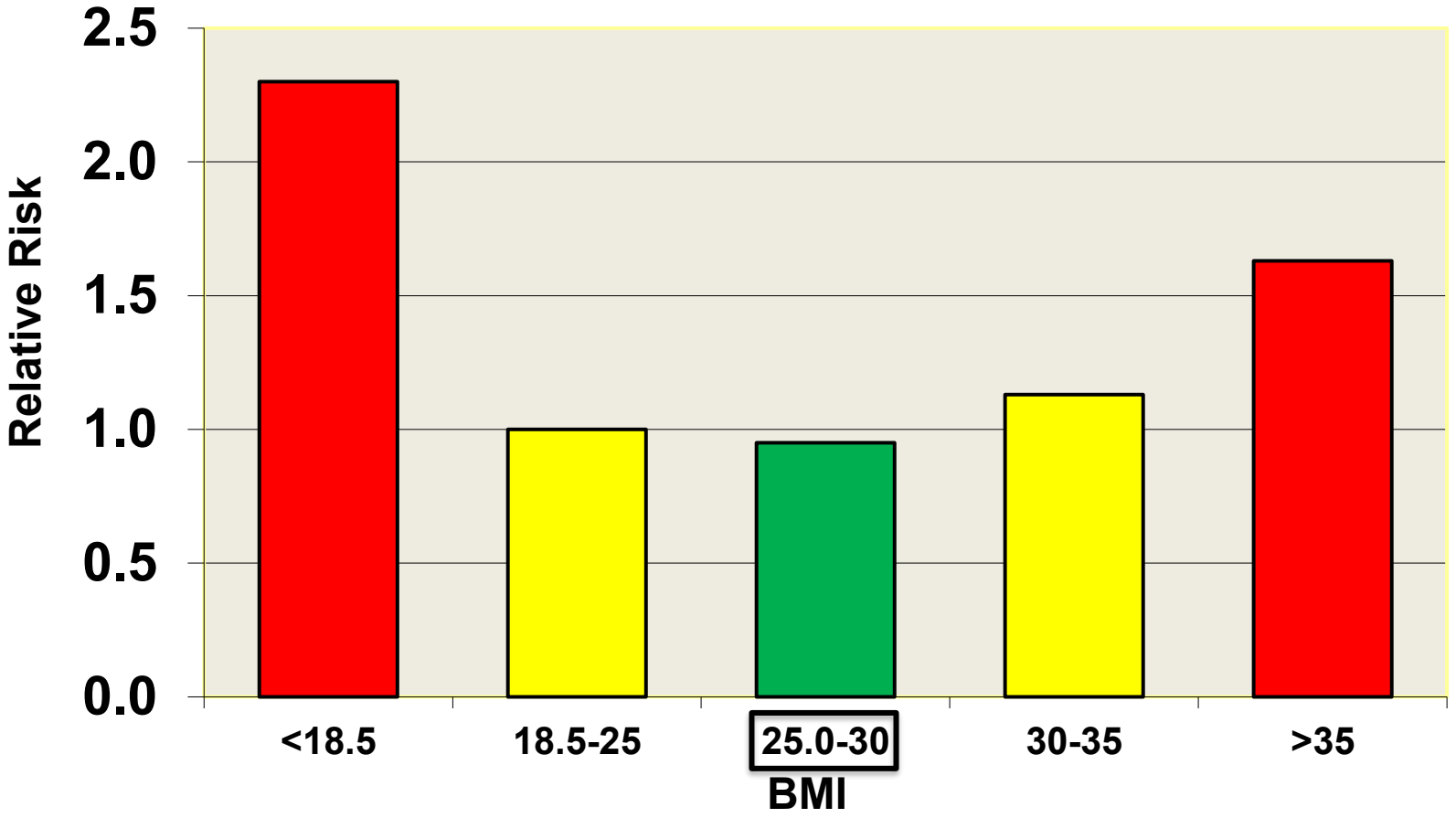
Effect	Odds Ratio	95% CI
Age >60	4.01	3.06 - 5.25
Gender M vs F	1.72	1.46 - 2.01
Hx of Organ Transplant	4.25	2.37 – 7.62
Race (B vs W)	1.18	0.91 - 1.54
A1C >= 8%	1.64	1.27 - 2.12
BMI 30-40	0.89	0.72 - 1.10
BMI >40	1.90	1.43 - 2.54
Smoker	1.24	1.05 - 1.47
COPD	1.28	1.06 - 1.53
Kidney Disease	1.50	1.24 - 1.81
Cancer	1.04	0.75 - 1.44
Hypertension	1.30	1.06 - 1.60
Inactive vs Active	2.49	1.33 - 4.67
Inactive vs Some Activity	1.32	1.09 - 1.60

All-Cause Mortality, Relative Risk, Age *25-59*
NHANES Data



Flegal; *JAMA*, 2005

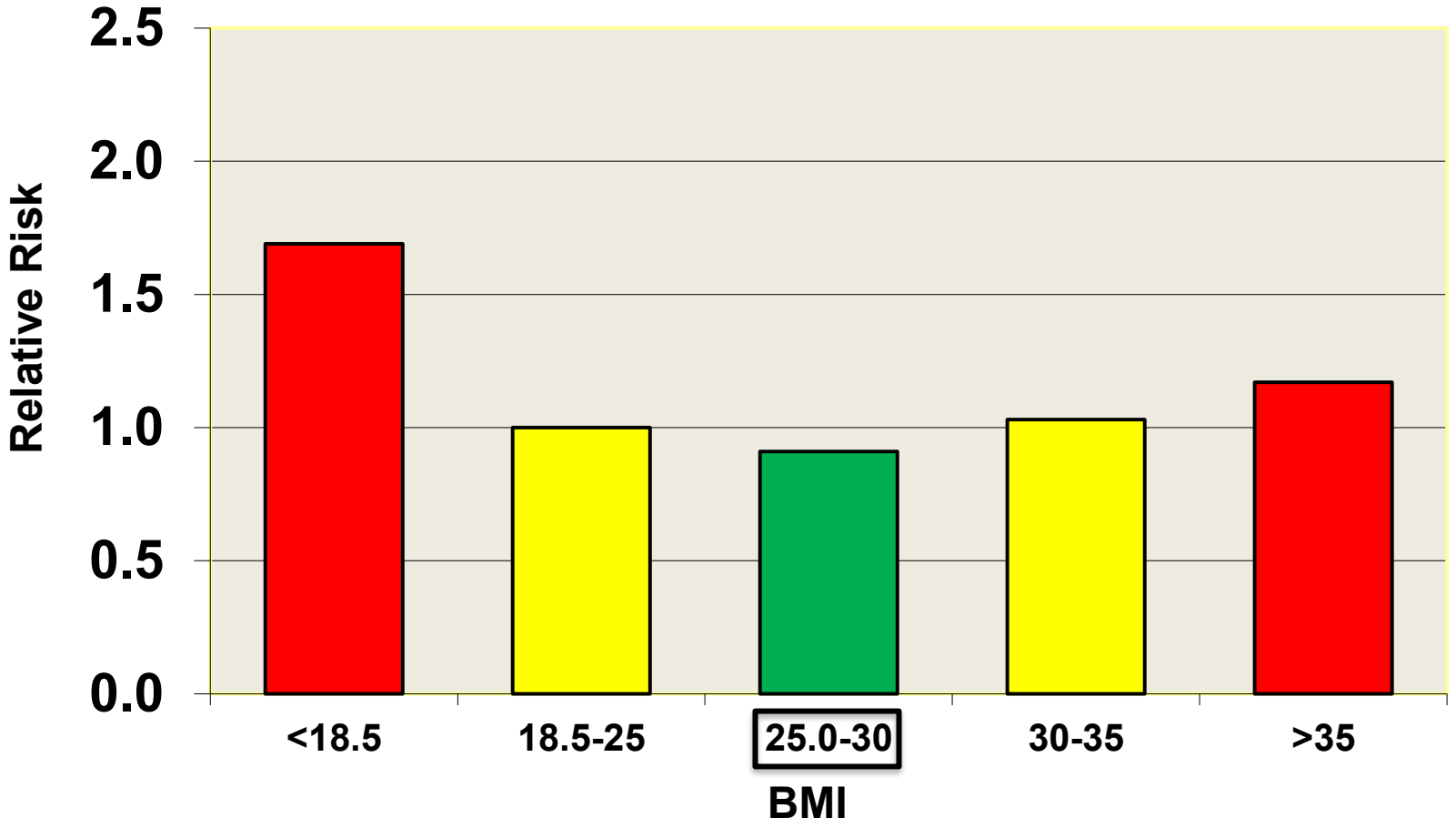
All-Cause Mortality, Relative Risk, Age 60-69
NHANES Data



Flegal; *JAMA*, 2005

All-Cause Mortality, Relative Risk, Age ≥70

NHANES Data



Flegal; *JAMA*, 2005

Where should our Focus be to Lower Mortality? Fitness vs BMI vs Smoking

- Fit and normal BMI (non-smoker)
- Fit and elevated BMI (non-smoker)
- Fit, normal BMI, & smoker
- Unfit and normal BMI (non-smoker)
- Unfit and abnormal BMI (non-smoker)
- Unfit, abnormal BMI, & smoker

Blair; Aerobics Center Data

A Tale of 2 Male Patients;
Which one will likely die from Heart Disease?

A Tale of 2 Male Patients;
Which one will likely die from Heart Disease?

Patient #1

- **5’8” Tall**
- **158 lbs.**
- **Never drank alcohol**
- **Low Fat/High Fiber Diet**
- **Marathon Runner**
- **Former smoker**

Patient #2

- **5’8” Tall**
- **270 lbs.**
- **Heavy drinker**
- **High Fat/Low Fiber Diet**
- **Sedentary**
- **Heavy cigarette and cigar smoker**

Jim Fixx; died age 52 while jogging

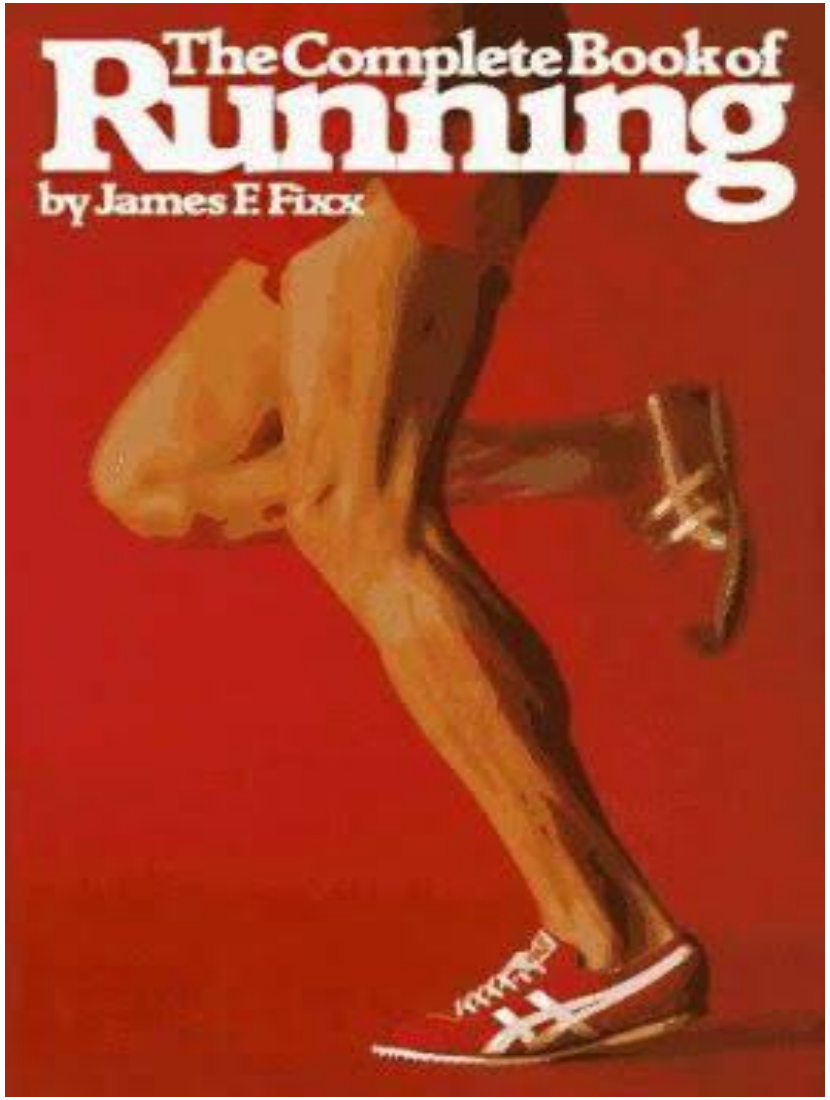
- **5’8” Tall**
- **158 lbs.**
- **Never drank alcohol**
- **Low Fat/High Fiber Diet**
- **Marathon Runner**
- **Former smoker**

Winton Churchill; died age 90 at home

- **5’8” Tall**
- **270 lbs.**
- **Heavy drinker**
- **High Fat/Low Fiber Diet**
- **Sedentary**
- **Heavy cigarette and cigar smoker**

Jim Fixx

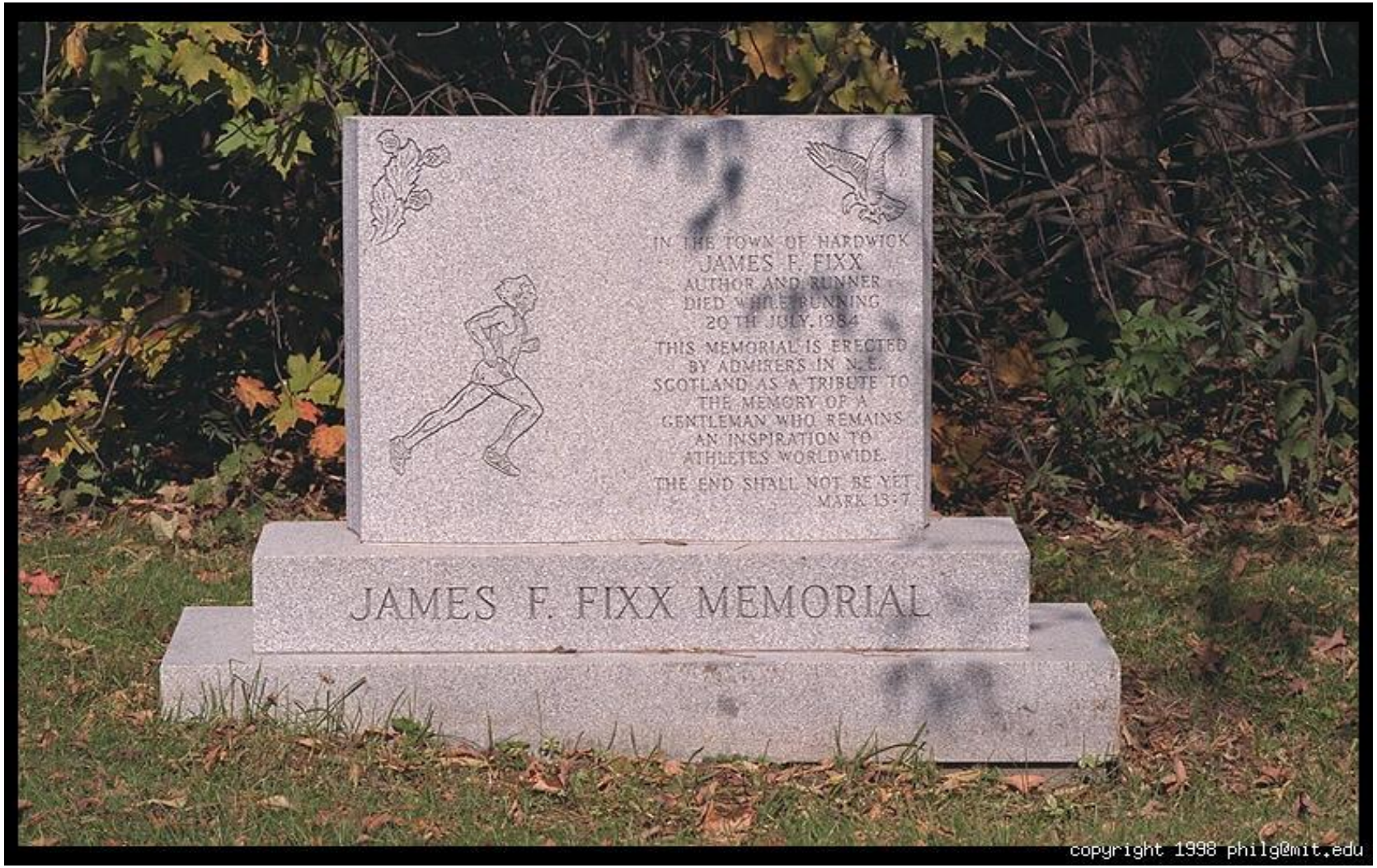
Author and Marathon Runner



The Truth About Jim Fixx

- Former 2 pack per day smoker.
- Overweight much of his life (lost 70 lbs. in his late 30's).
- Strong family history of heart disease (father died of heart attack at age 43).
- Died of triple vessel coronary artery disease.

Sometimes you cannot outrun (or out-diet) your genes!



Summary

- Strong evidence suggests you CAN outrun a bad diet and it doesn’t take a lot of effort to do this
- Multiple studies have proven that you are better off being “Fat & Fit” than “Skinny & Unfit”
- For this reason, the promotion of PA should be placed on at least equal footing with weight management
- Healthcare providers should assess their patients PA level, inform them of the risks of being sedentary and prescribe a proper exercise regimen