

WEIGHT, EXERCISE AND HEALTH

Fitness and mortality
 Physical activity and mortality
 Fatness and health
 Changes in weight: relation to fitness and health
 Public Health Recommendations

TRENDS IN DIET AND OBESITY

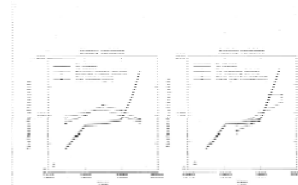
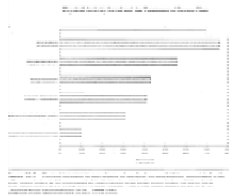


Figure 11.4. Available trends in fat and carbohydrate intake in relation to obesity in Britain. Both graphs point to the presence of the same trend of all data being 1970 to 1990, trends in all data being 1970 to 1990. 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BMI AND RELATION TO DISEASE

- Morbid obesity is clearly related to chronic disease and disability



FITNESS VS FATNESS AND RISK FACTORS

TABLE 2. Independent Relation of Aerobic Fitness and Fatness to Metabolic Risk Factors

	BMI (kg/m ²)		1998-2000 1st Wave		1998-2000 2nd Wave	
	Women, n=10,000	Men, n=10,000	Women, n=10,000	Men, n=10,000	Women, n=10,000	Men, n=10,000
Total cholesterol, mmol/L	NS	0.015	NS	0.006	NS	NS
LDL cholesterol, mmol/L	NS	-0.017	NS	-0.017	NS	0.014
HDL cholesterol, mmol/L	NS	0.021	NS	0.017	NS	0.017
Ratio of total to HDL cholesterol	NS	0.004	NS	0.004	NS	0.004
Triglycerides, mmol/L	-0.018*	0.001	NS	0.002	NS	0.002
Fasting insulin, pmol/L	-0.014*	0.001	NS	0.002	NS	0.002
Insulin sensitivity, $\times 10^4 \text{ min}^{-1} \text{ pmol}^{-1} \text{ m}^2$	0.10*	-0.002	NS	-0.002	NS	-0.002

*Values are partial correlation coefficients adjusted for multiple linear regression analysis. The 1998-2000 1st wave included women, men, and age as independent variables; the 2nd wave included women, men, percent body fat, and age; and the 2nd wave included women, men, percent body fat, and age.

WEIGHT GAIN AND MORTALITY

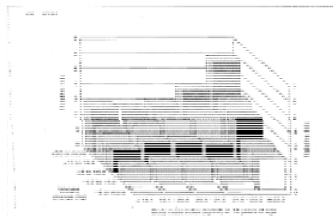


Figure 3.7. Effect of weight gain since age 18 on risk of death. The 1998-2000 1st wave included women, men, and age as independent variables; the 2nd wave included women, men, percent body fat, and age; and the 2nd wave included women, men, percent body fat, and age.

MORTALITY AND FITNESS

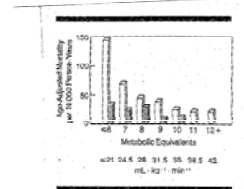
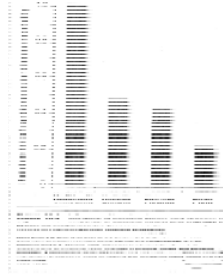
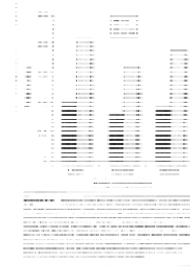


Fig. 4. Age-adjusted, all-cause mortality rates per 10,000 person-years of follow-up by physical fitness categories in 3120 women and 10,224 men in the Aerobics Center Longitudinal Study. Physical fitness categories are expressed here as metabolic equivalents (MET) metabolic rate/weighting metabolic rate achieved during the maximal treadmill exercise test. One metabolic equivalent equals 3.5 ml/kg^{1.75}/min^{1.75}. The estimated maximal oxygen uptake for each category is shown.

CHANGES IN FITNESS AND RISK OF CV MORTALITY



THE RELATION OF FITNESS, FATNESS AND CV MORTALITY



RISK OF ALL-CAUSE MORTALITY AND CANCER BY PHYSICAL FITNESS

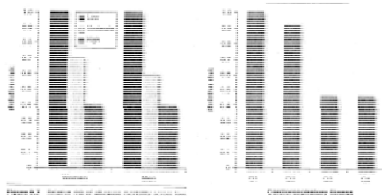


Figure 9.1 Relative risk of all-cause mortality (total mortality) and cardiovascular disease (CVD) mortality for men aged 40-69 years in the British Civil Service, according to their fitness level. Data from: Lloyd-Davies P, et al. (1996) 'Physical fitness and mortality in middle-aged men and women: the British Civil Service Study'. *British Medical Journal*, 313, 1145-1151.

Figure 9.2 Relative risk of cardiovascular disease (CVD) mortality for men aged 40-69 years in the British Civil Service, according to their fitness level. Data from: Lloyd-Davies P, et al. (1996) 'Physical fitness and mortality in middle-aged men and women: the British Civil Service Study'. *British Medical Journal*, 313, 1145-1151.

FITNESS AND CV MORTALITY

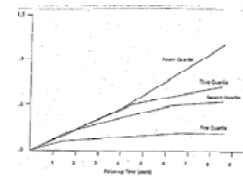


Figure 2 Cumulative Rate of Death from Cardiovascular Disease in Healthy Men, According to Quartiles of Stage 2 Exercise. Data from: Lloyd-Davies P, et al. (1996) 'Physical fitness and mortality in middle-aged men and women: the British Civil Service Study'. *British Medical Journal*, 313, 1145-1151.

VIGOROUS PHYSICAL ACTIVITY AND CHD MORTALITY

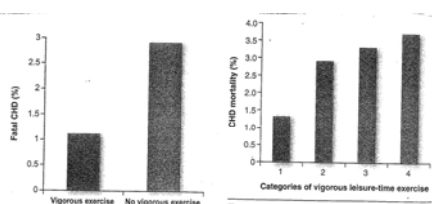


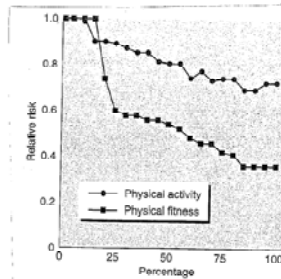
Figure 9.1 Fatal coronary heart disease (CHD) in 17,944 men in the British Civil Service for those reporting vigorous exercise, requiring at least 31.5 kJ/min (24 deaths), and those who did not report vigorous exercise (411 deaths). Data from: Lloyd-Davies P, et al. (1996) 'Physical fitness and mortality in middle-aged men and women: the British Civil Service Study'. *British Medical Journal*, 313, 1145-1151.

Figure 9.2 Coronary heart disease (CHD) deaths (n = 289) in male British civil servants by categories of vigorous exercise (VE) requiring at least 31.5 kJ/min. Category 1 = VE at least twice per week; category 2 = VE at least once but less than twice per week; category 3 = VE one to three times in 4 weeks; and category 4 = no VE. Data from: Lloyd-Davies P, et al. (1996) 'Physical fitness and mortality in middle-aged men and women: the British Civil Service Study'. *British Medical Journal*, 313, 1145-1151.

COMPARISON OF FITNESS AND PHYSICAL ACTIVITY TO CV MORTALITY



WHICH IS MORE IMPORTANT: PHYSICAL ACTIVITY VS PHYSICAL FITNESS



RELATIONSHIP OF PHYSICAL FITNESS CHANGES TO WEIGHT CHANGES

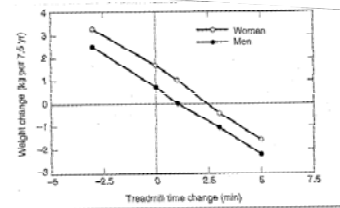


Figure 12.8 Plot of change in weight against change in time spent on a treadmill, showing the relationship between change in fitness and weight gain in the Atherosclerosis Coronary Longitudinal Study. Results are derived from multiple linear regression coefficients adjusted for possible confounding variables. Data from DiFurio et al. (8).

ROLE OF PHYSICAL ACTIVITY AFTER WEIGHT LOSS ON SUBSEQUENT RE-GAIN

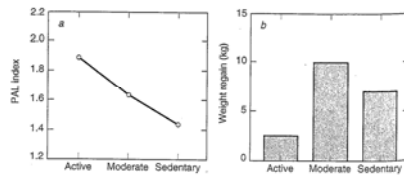


Figure 12.9 Influence of physical activity level on post-dieting weight regain. (a) Physical activity level (PAL) measured by doubly labeled water in 32 women immediately after profound weight loss (23 ± 9 kg). (b) 12-month weight regain in relation to physical activity. Data from Schoeller et al. (29).

PUBLIC HEALTH RECOMMENDATIONS

- 1.obesity and weight gain increase risk of chronic disease and pre-mature mortality
- 2.physical fitness and improvement in physical fitness has repeatedly been shown to have an inverse relationship to mortality
- 3.while not definitively proven, physical fitness seems to be protective against pre-mature mortality even in obese subjects.
- 4.physical fitness appears to be more important than physical activity in prevention of pre-mature mortality. This may partly be explained by the difficulty in measuring physical activity.
- 5.It appears that level of activity seems to be high to prevent weight re-gain after weight loss.