Financial hardship, weight gain & obesity: Rethinking economic determinants

Annalijn Conklin

CEDAR/ MRC Epidemiology Unit
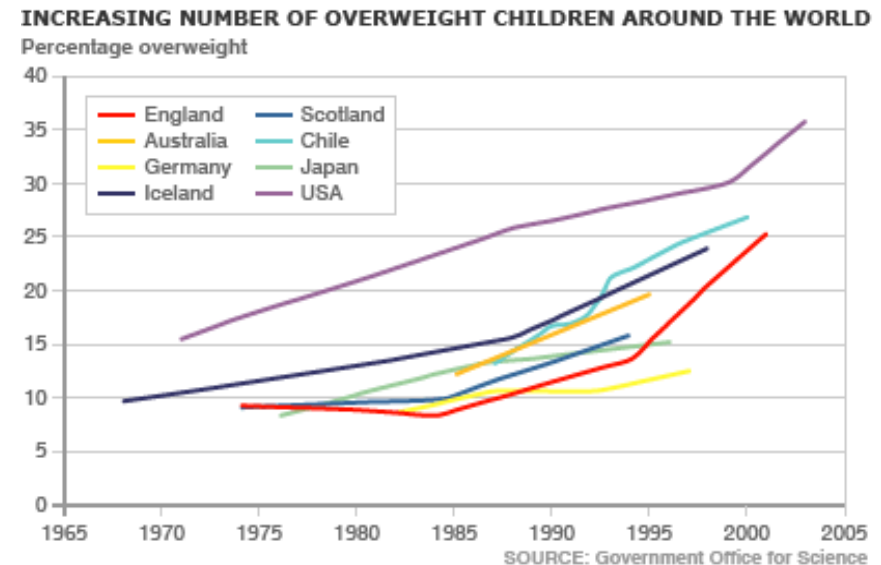
21 November 2013

A common problem rising fast – concern for prevention

60% of adults & 20% of children overweight or obese in UK in 2011

Prevalence doubled over 2 decades in UK & globally

Serious concern for prevention

- Leading cause of death & disability

- Large economic & social costs

INCREASING NUMBER OF OVERWEIGHT CHILDREN AROUND THE WORLD
Percentage overweight

England   Scotland
Australia Chile
Germany   Japan
Iceland   USA

SOURCE: Government Office for Science
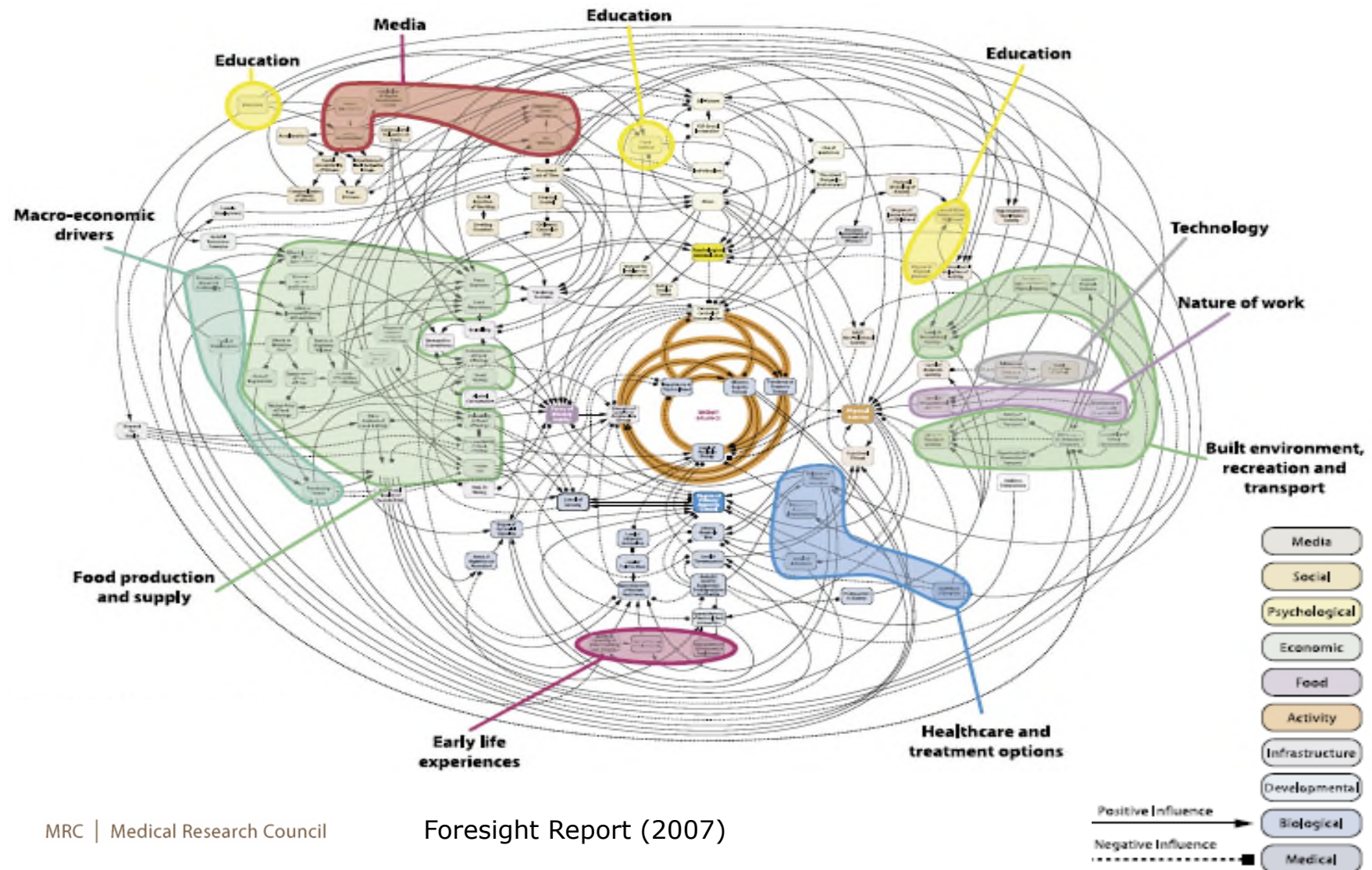
Obesity is a prime example of inequalities in health

Differences in obesity patterned by:

- Socioeconomic status (SES)/ socioeconomic position (SEP)

- Ethnic group

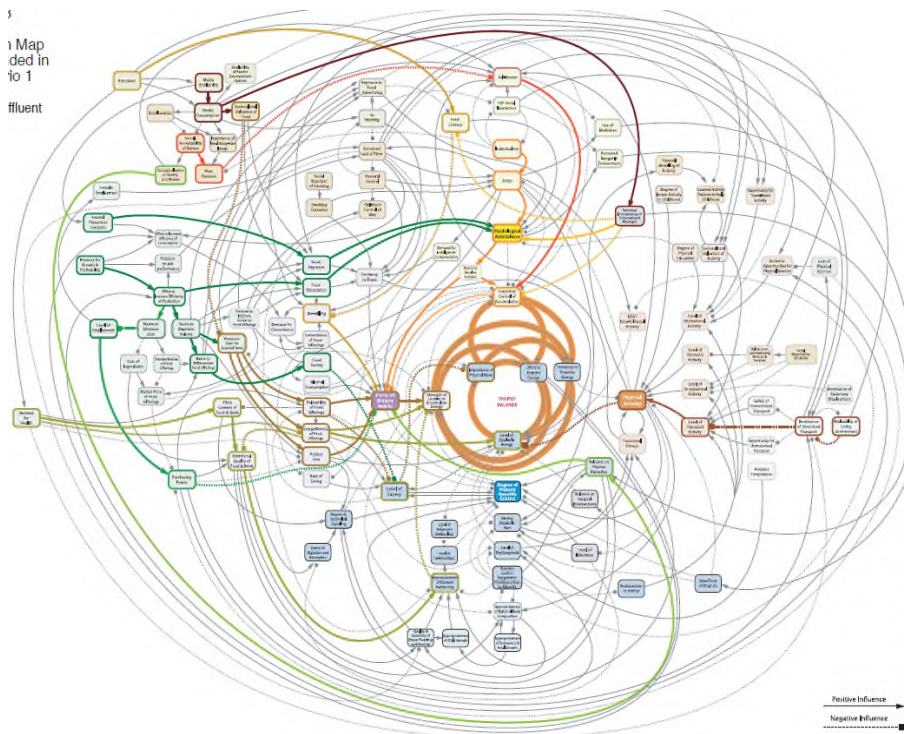- Gender: Social gradients stronger in women

Obesity prevalence & Education
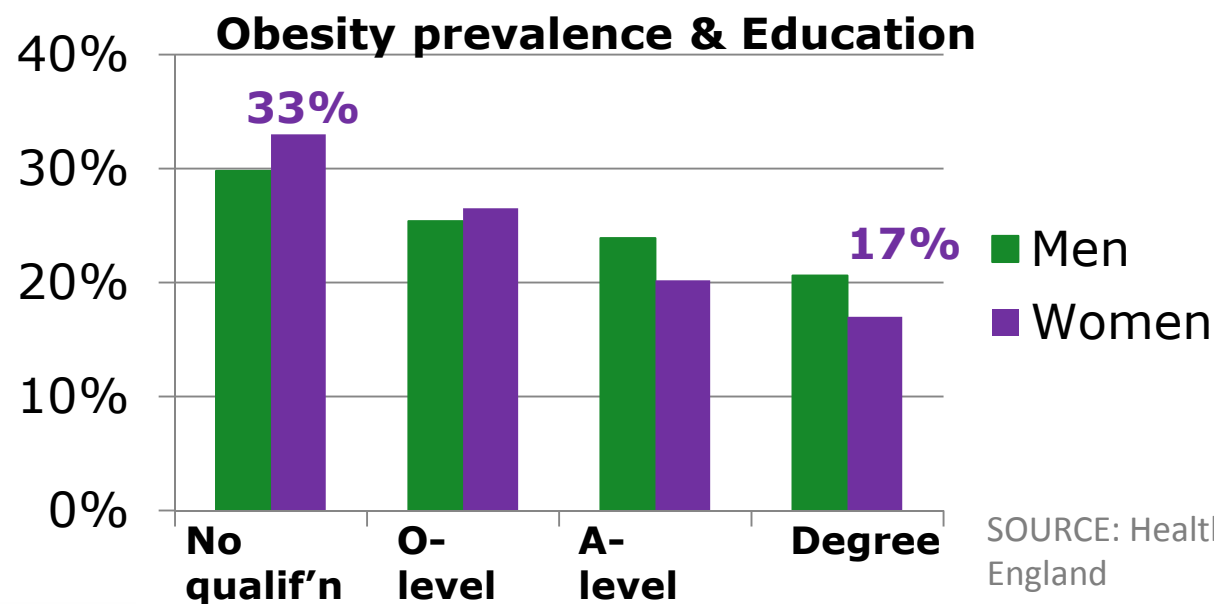
Multiple social determinants of obesity – OPPOSING & SYNERGISTIC

Foresight Report (2007)

Causes & pathways differ across affluence

The affluent

The less affluent

Foresight Report (2007)
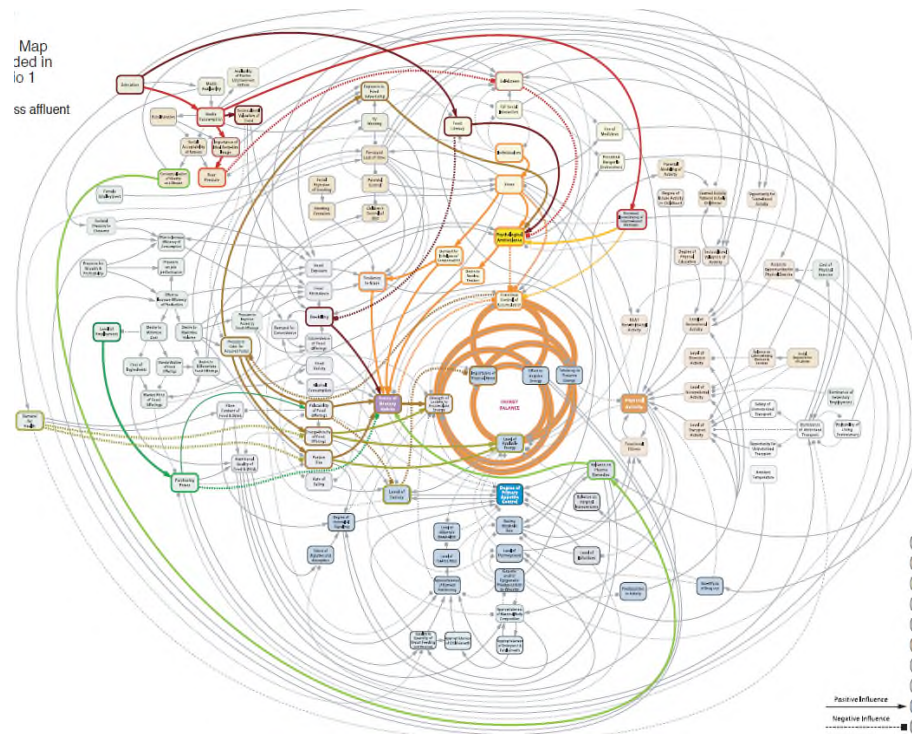
Beyond SES: financial hardship & obesity

SES is a broad determinant commonly measured by:

- Income, education, social class, and/or wealth

Everyday financial troubles might better reflect a person's contemporaneous economic circumstances

- Hardship differences found among high-income people

Financial hardship is strongly associated with health, independent of SES

- Physical functioning, mental health, heart attacks, BMI & weight gain

What is unknown about financial hardship & obesity?

Objective weight status more reliable than self-report

General population may differ from occupational cohorts

Hardship has different dimensions & may accumulate over time

Older adults may be disproportionately affected (& income has less meaning as a determinant for this group)

Is hardship independently related to obesity?

EPIC (Diet & Cancer Study)

FH — 1993-97 → 1998-02 — General & central obesity ♀ ♂

WHITEHALL SW1 CITY OF WESTMINSTER

(Stress & Health Study)

Cumulative FH — 1985-88 → 1997-99 — 10-year weight gain ♀ ♂

How can we quantify financial hardship (FH)?

Pearlin's list of chronic strains used in self-reported questionnaires:

1. Sufficiency of money for needs

   - *More than enough, just enough, less than enough*

2. Frequency of insufficient money for adequate food/ clothing

   - *Never, seldom, sometimes, (often, always)*

3. Difficulty paying bills

   - *None, very little, slight, some, (great, very great)*

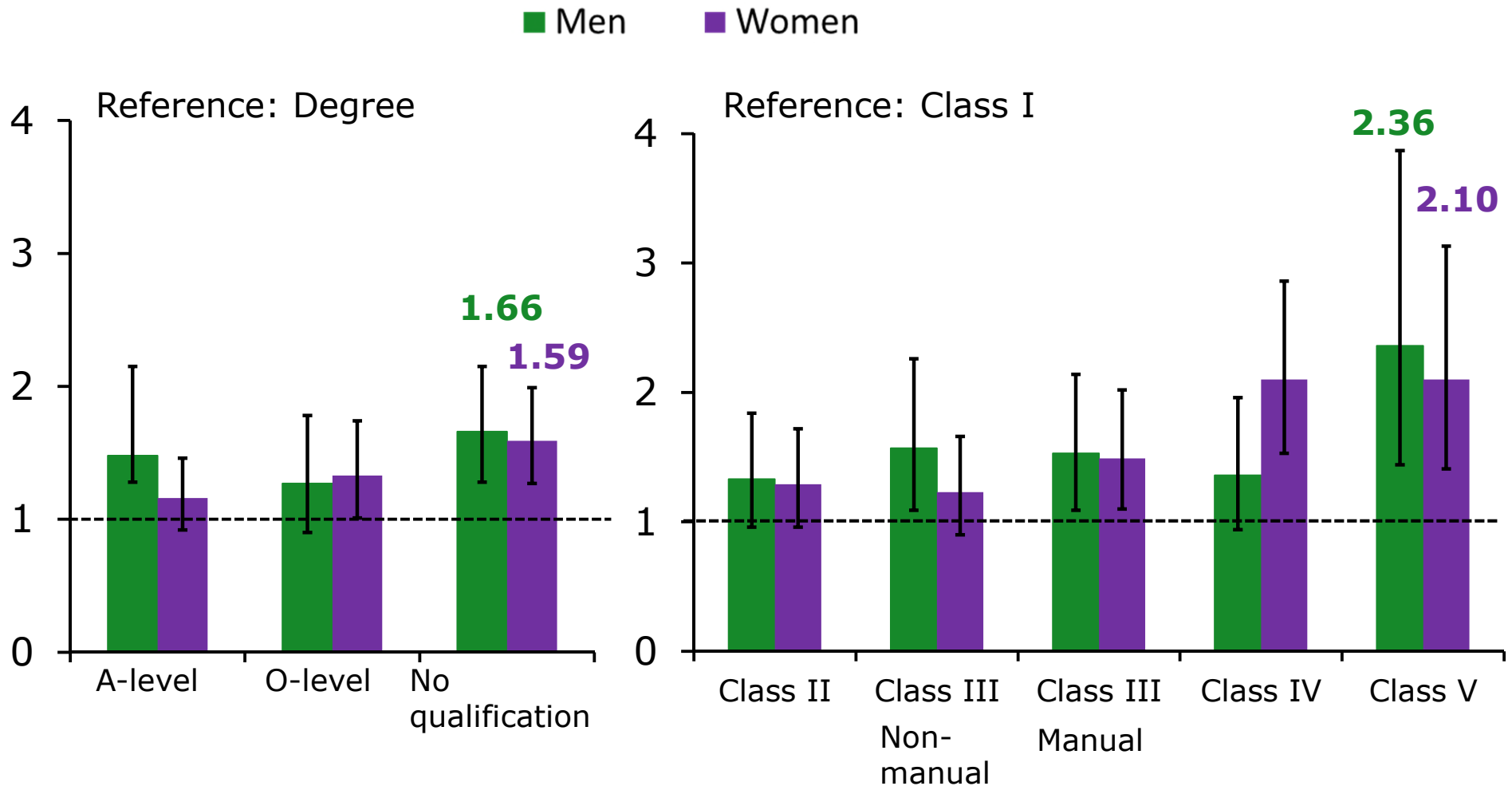# Overview of my EPIC study

1993-97	1996-2000	1998-2002

over-50s   FH – 3 types   Anthropometry
20,274   17,998   12,000

♀

55%

General obesity: **BMI ≥30 kg/m²**
Central obesity for **women**: waist ≥ 88 cm
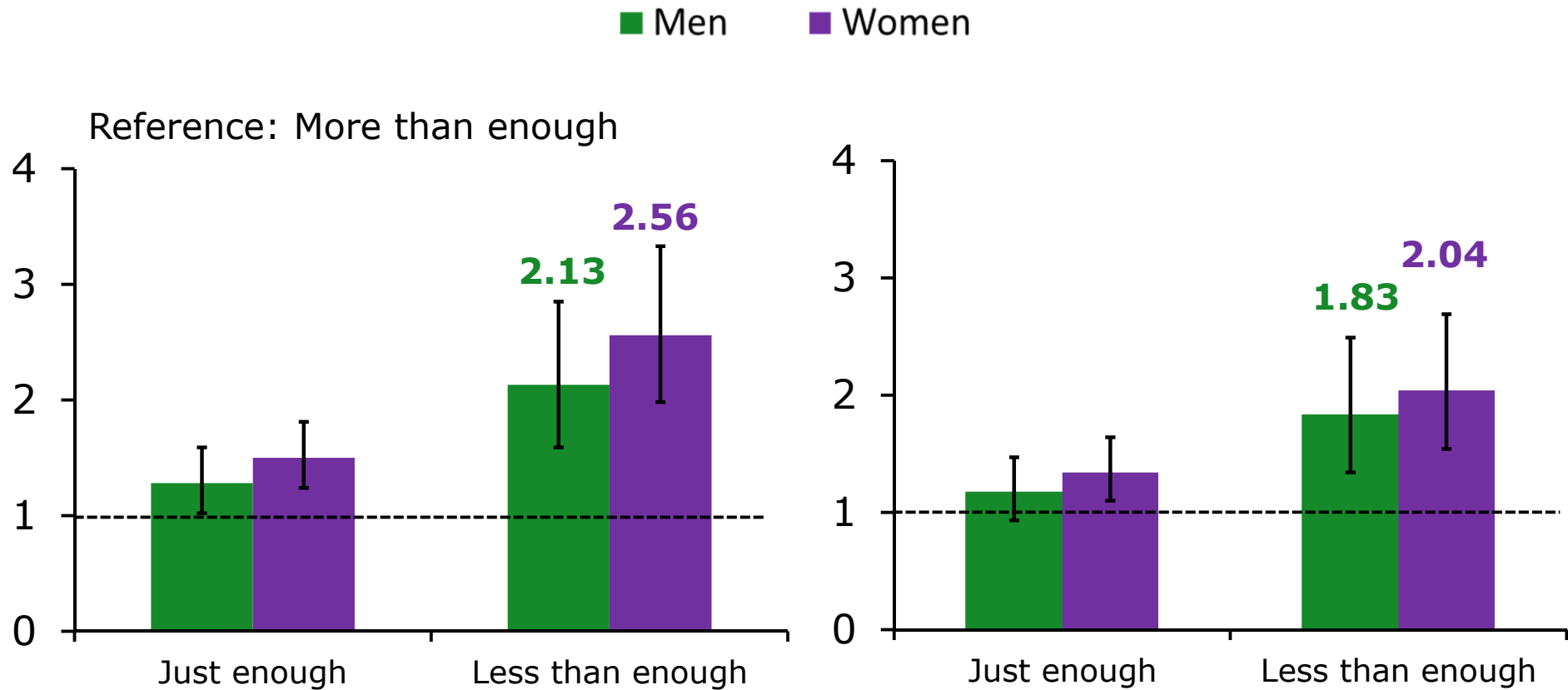Central obesity for **men**: waist ≥ 102 cm

Clear SES pattern in general obesity

BMI ≥30 kg/m²

■ Men   ■ Women

Reference: Degree

Reference: Class I

2.36
2.10

1.66
1.59

Odds ratios, 95% CIs adjusted for age, smoking and marital status

epic

Obesity more likely with having less than enough money for needs

Reference: More than enough

Men **Women**

2.13 2.56

Just enough   Less than enough

Odds ratios, 95% CIs adjusted for age, smoking and marital status

1.83 2.04

Just enough   Less than enough

*Odds ratios, 95% CIs adjusted for age, smoking, marital status, **education, class & home-ownership***

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Obesity more likely with always/often not having enough money for food/clothing
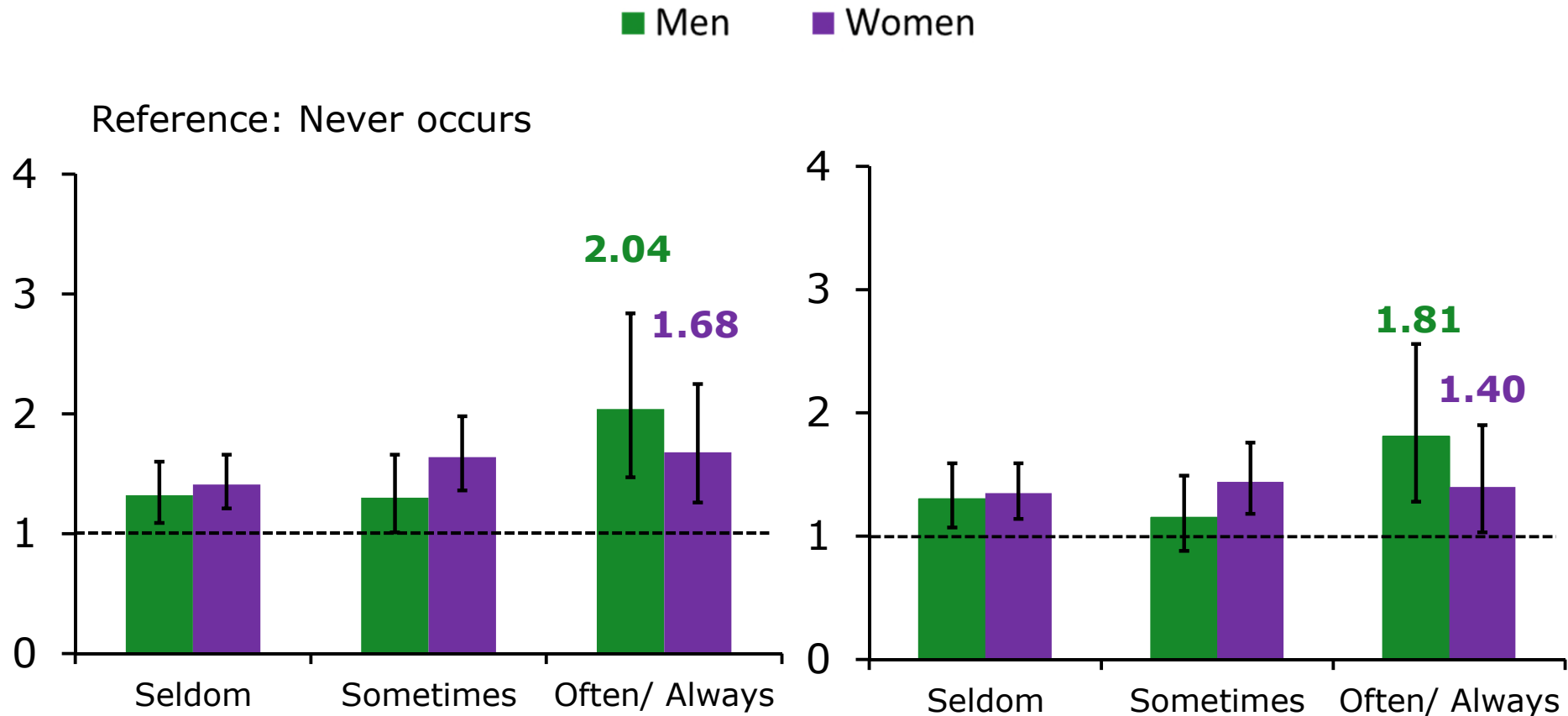
epic

■ Men ■ Women

Reference: Never occurs

Left chart (y-axis 0 to 4):

Often/ Always: Men **2.04**, Women **1.68**

Categories: Seldom, Sometimes, Often/ Always

Odds ratios, 95% CIs adjusted for age, smoking and marital status

Right chart (y-axis 0 to 4):

Often/ Always: Men **1.81**, Women **1.40**

Categories: Seldom, Sometimes, Often/ Always

*Odds ratios, 95% CIs adjusted for age, smoking, marital status, **education, class & home-ownership***

Obesity more likely with great/very great difficulty paying bills
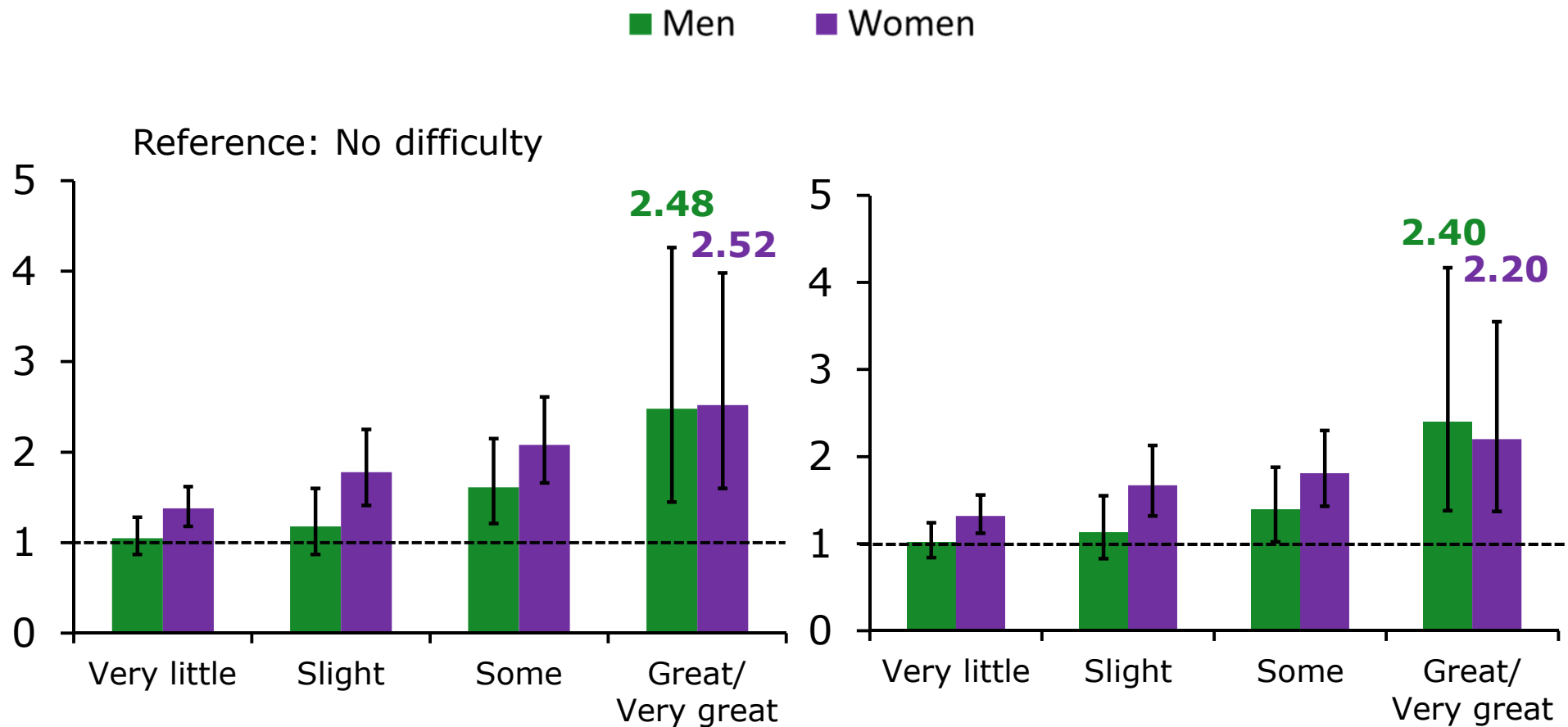
epic

■ Men ■ Women

Reference: No difficulty

Left chart:

2.48 (Men), 2.52 (Women) at Great/Very great

y-axis: 0, 1, 2, 3, 4, 5

x-axis: Very little, Slight, Some, Great/Very great

Odds ratios, 95% CIs adjusted for age, smoking, marital status

Right chart:

2.40 (Men), 2.20 (Women) at Great/Very great

y-axis: 0, 1, 2, 3, 4, 5

x-axis: Very little, Slight, Some, Great/Very great

*Odds ratios, 95% CIs adjusted for age, smoking, marital status, **education, class & home-ownership***

Financial hardship was strongly associated with obesity in both sexes

British over-50s reporting greater hardship levels were more likely to carry excess weight

- Stronger associations seen than for SES

- Associations independent of SES

3 hardship measures provided additional explanation for differences in obesity prevalence

- Difficulty paying bills strongest indicator

Sex differences depended on which measure of hardship and obesity examined

Overview of my Whitehall II study

♀
30%

- 10,308 adults aged 35-55 from 20 departments

- 2 hardship questions asked 4 times

- Weight measured twice about 10 years apart

1985-88	1988-90	1991-93	1997-99
FH	FH	FH	FH
Kg			Kg

ΔKg ➡ ≥5 Kg

3701

Overview of my Whitehall II study

Transform the scale into yes/no variable for both hardship questions at each time-point

Determine cumulative experience of hardship across time

- No history ('no' at all times)

- Occasional history ('yes' at any time)

- Persistent history ('yes' at 2+ times)

Greater weight change from cumulative hardship, independent of SES
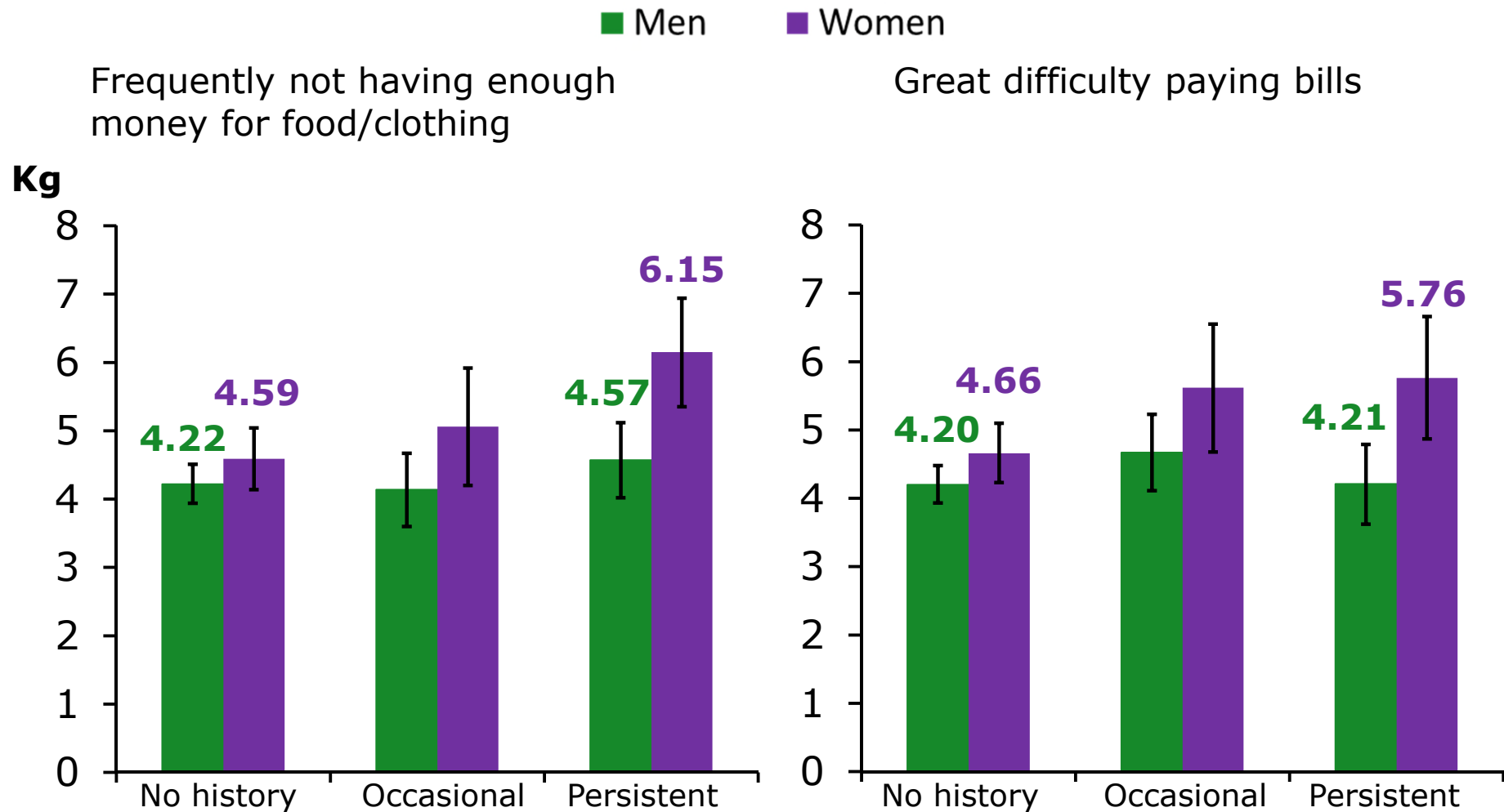
Means, 95% CIs adjusted for age, ethnicity, time, weight, smoking, marital status & SES

Higher odds of gaining ≥5 Kg from cumulative hardship, independent of SES

■ Men ■ Women

Frequently not having enough money for food/clothing

Great difficulty paying bills
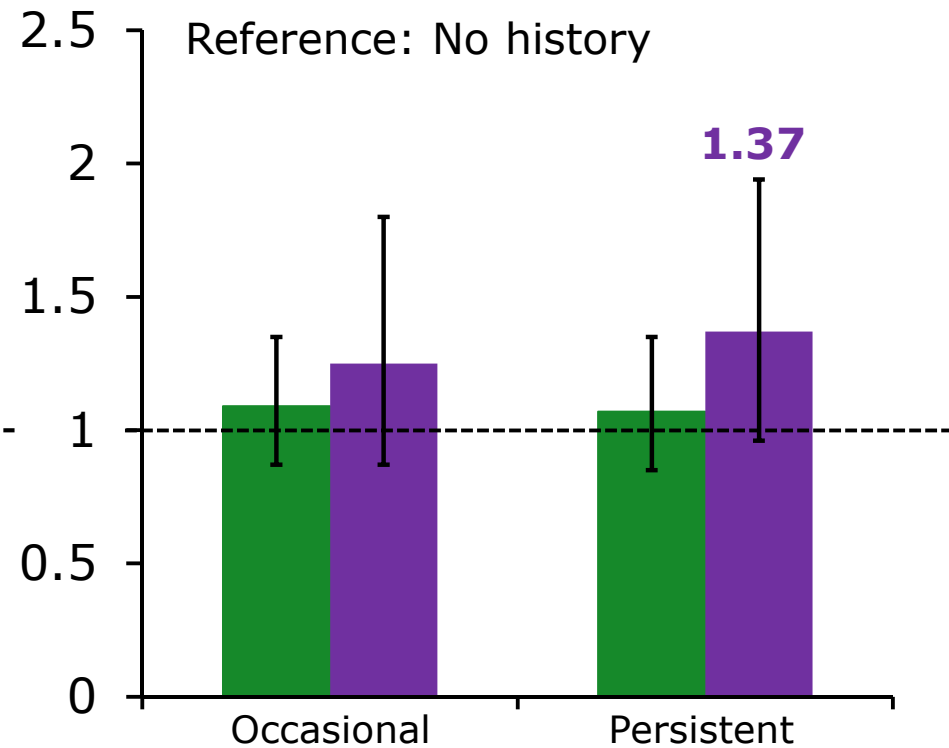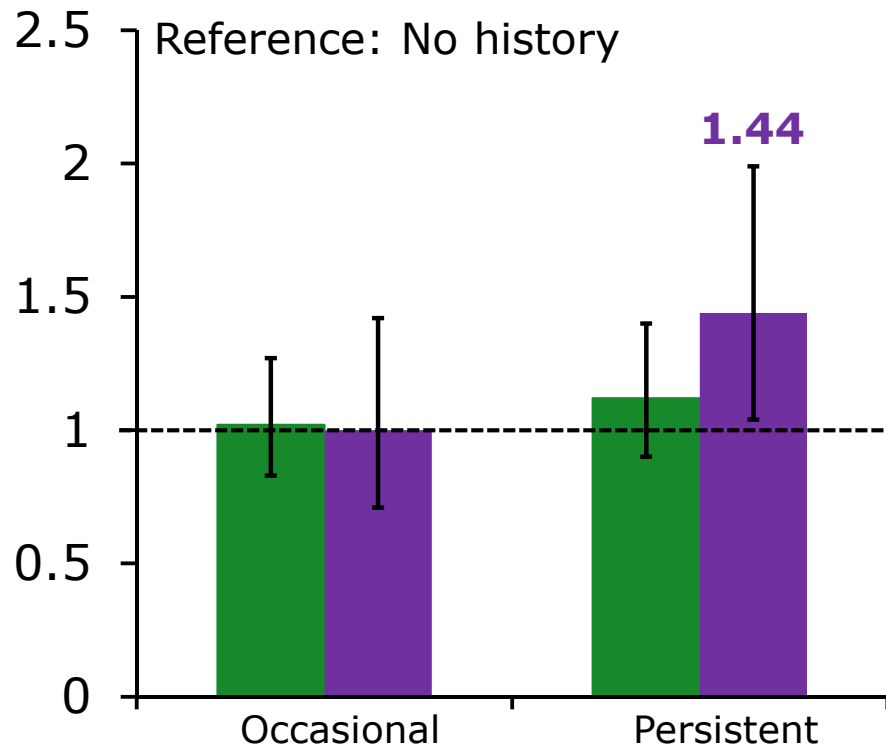
Odds ratios, 95% CIs adjusted for age, ethnicity, time, weight, smoking, marital status & SES

What might explain the FH-weight link?

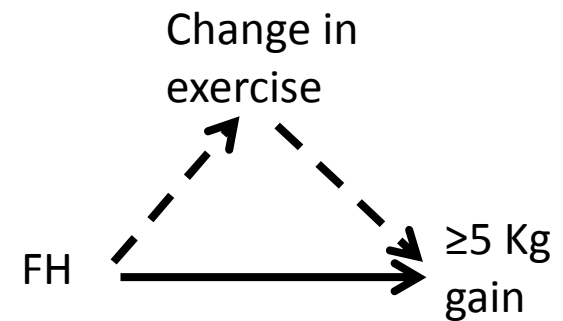Smoking is associated with economic strain (e.g. job loss)
    & also with keeping weight down
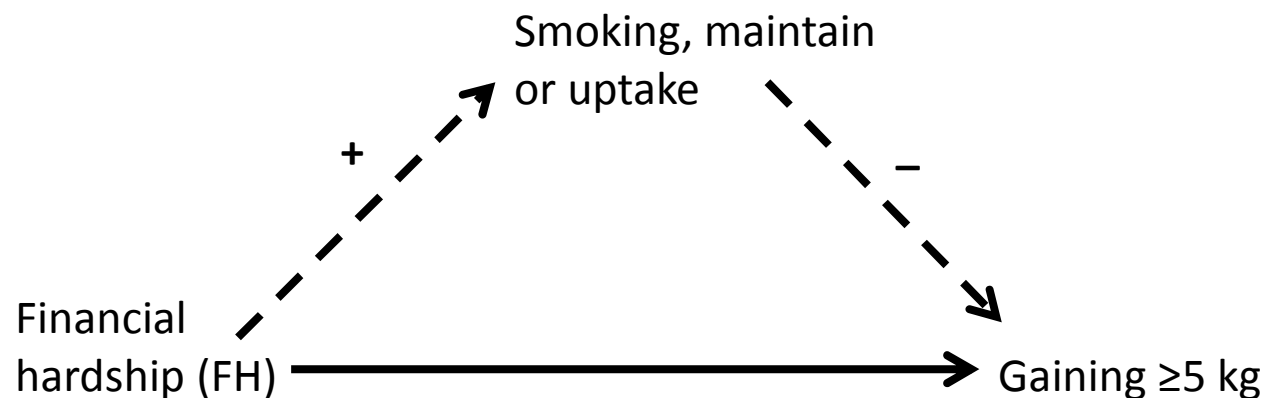
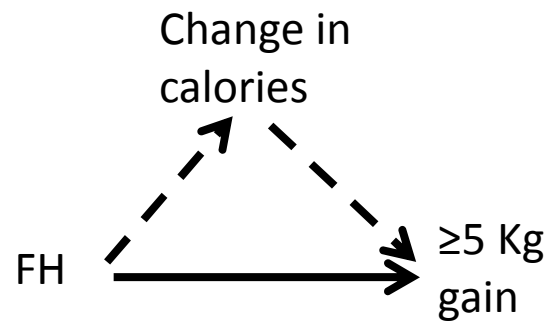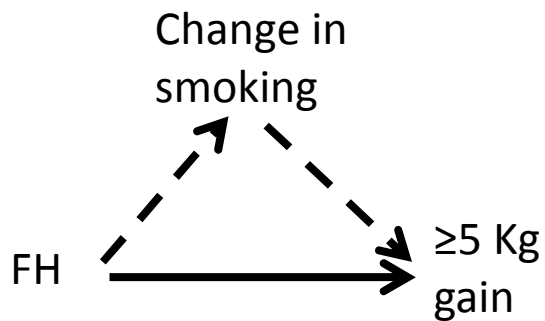
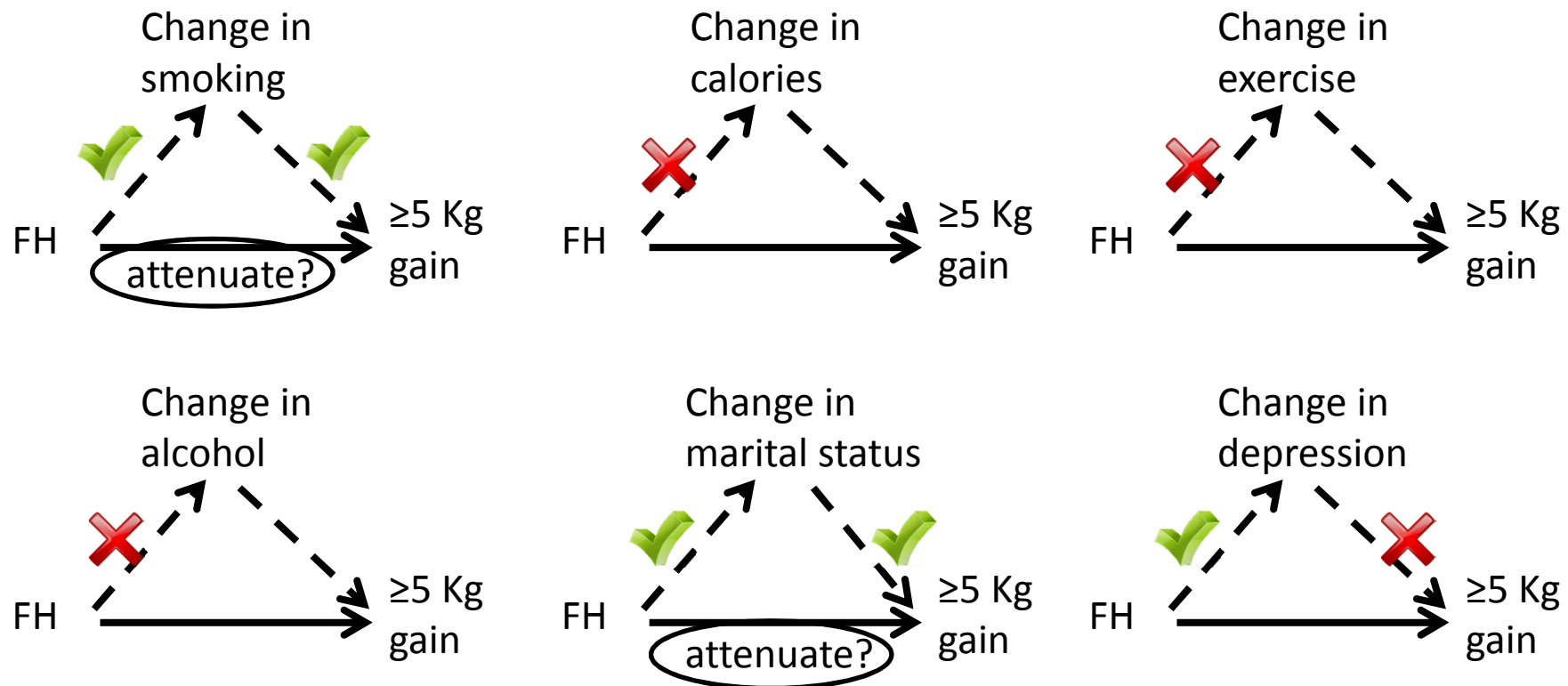
Change in other health behaviours might also be mediators

Formal assessment of 6 factors as potential mediators
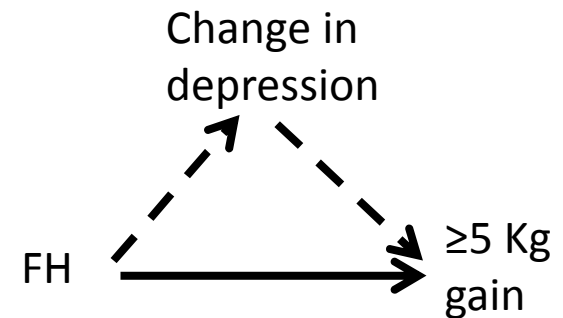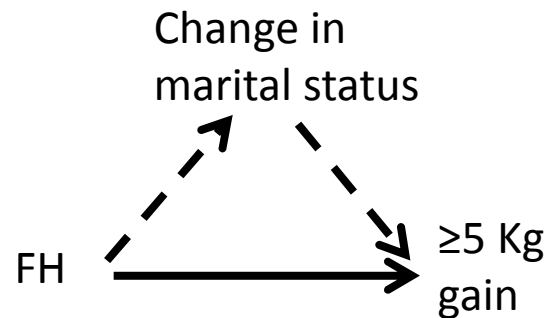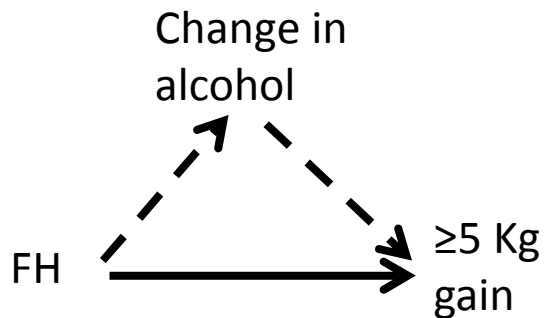
Two factors met criteria for being a potential mediator but did not mediate link

Change in smoking

FH — attenuate? — ≥5 Kg gain

Change in calories

FH — ≥5 Kg gain

Change in exercise

FH — ≥5 Kg gain

Change in alcohol

FH — ≥5 Kg gain

Change in marital status

FH — attenuate? — ≥5 Kg gain

Change in depression

FH — ≥5 Kg gain

Change in smoking and marital status met criteria but did NOT show expected attenuation of observed associations!

Cumulative hardship increased women's 10-year weight gain

Women civil servants reporting greater cumulative hardship had more weight change

Excess weight gain was also more likely in women having persistent hardship

- 44% greater odds from frequently insufficient £ for food/clothing

- 37% greater odds from difficulty paying bills (non-significant)

6 factors examined as potential mediators

- Only 2 met criteria: change in smoking; change in marital status

- Expected reduction in associations was not found!

Bridging findings from the 2 studies

	Population cohort 1993 to 2002 epic	Occupational cohort 1985 - 1999 WHITEHALL SW1
Age at entry	50—79 (mean 63)	35—55 (mean 44)
Women no., %	6600, 55%	1110, 30%
Type of study	Cross-sectional	Longitudinal
EXPOSURE: Self-reported financial hardship	Single exposure 3 types measured 1 time	Cumulative exposure 2 types measured 4 times
OUTCOME: Objectively measured data on weight, height & waist	1. Odds of high BMI 2. Odds of high waist circumference (sex-specific)	1. Weight change 2. Odds of ≥5kg gain
Socioeconomic status	Education, class, ownership	Education, class, ownership
Enough £ for needs	Significant association (both sexes)	n/a
Frequency of not enough £ for food/clothing	Significant association (both sexes)	Significant association (women)
Difficulty paying bills	Significant association (both sexes)	Marginal association (women)
Potential mechanisms	n/a	Not found – change in marital status as a confounder

ACKNOWLEDGEMENT

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How might we interpret lack of mediation?

Inaccurate measurement of health behaviours, especially diet

Lack of nuance in the change construct – transitions and fluctuations over 10 years not captured

Other physiological factors?

- Sleep

- Stress response

Depression as a moderator?