

COMPaRE-PHC



CENTRE FOR OBESITY MANAGEMENT & PREVENTION RESEARCH EXCELLENCE IN PRIMARY HEALTH CARE

A fully evaluated model for managing obesity in primary care
The Counterweight Programme

Professor J Broom
Chair of Counterweight Programme
CORE, The Robert Gordon University, Aberdeen
Australia 2014



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Agenda

- Counterweight model
- Phase 1 (2000-2005)
 - Summary of audit data
 - Weight change
 - Economic evaluation
- Continuous improvement
- Phase 2 (2006-2010)



- ☐ Aberdeen
- ☐ Bath
- ☐ Birmingham
- ☐ Glasgow
- ☐ Leeds
- ☐ London
- ☐ Luton

Counterweight Model



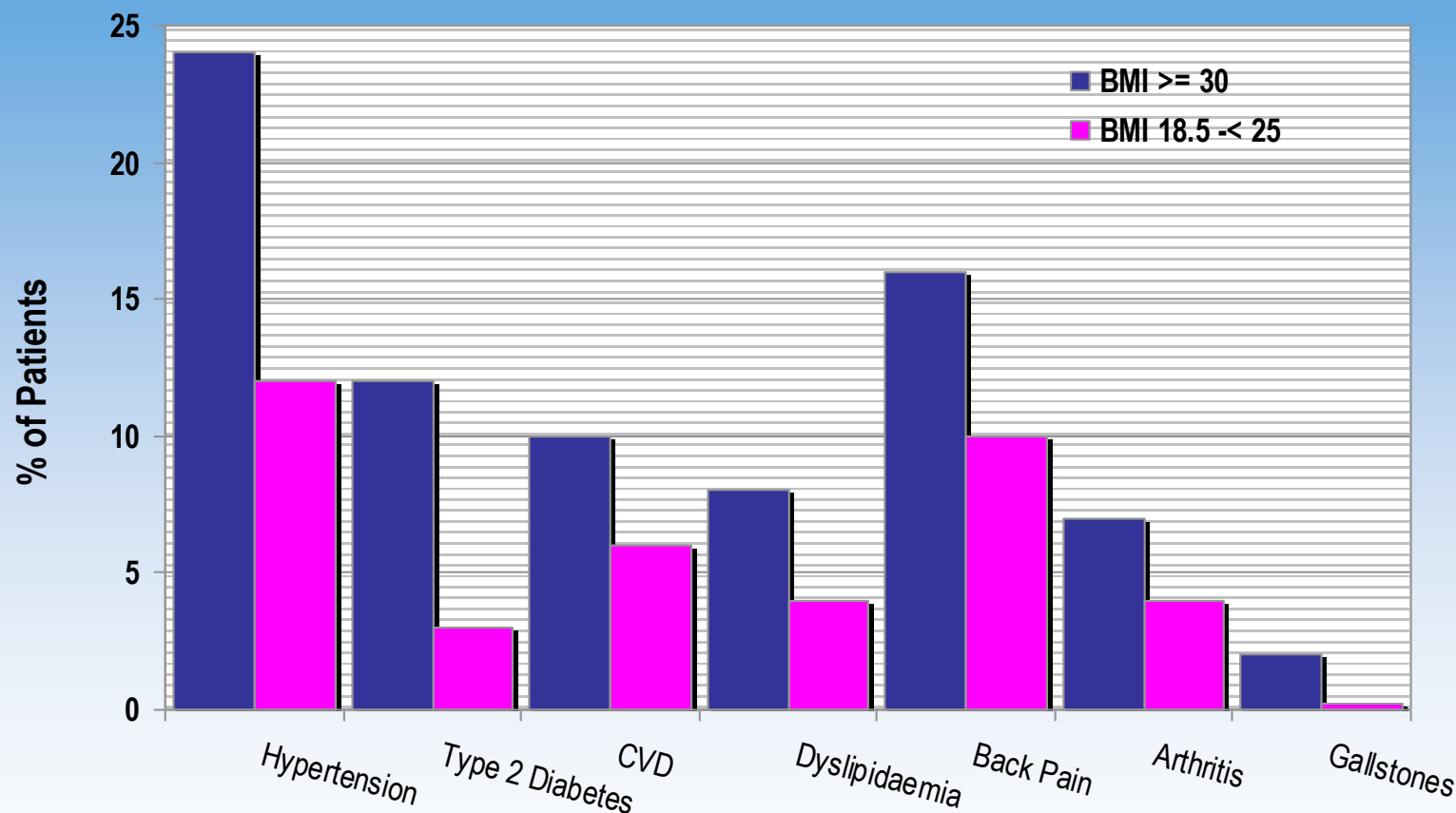
J Hum Nutr Dietet. 2004; 17: 191-208

Eur J Clin Nutr. 2005; 59 Suppl 1: S93-101

Detailed Patient Audit

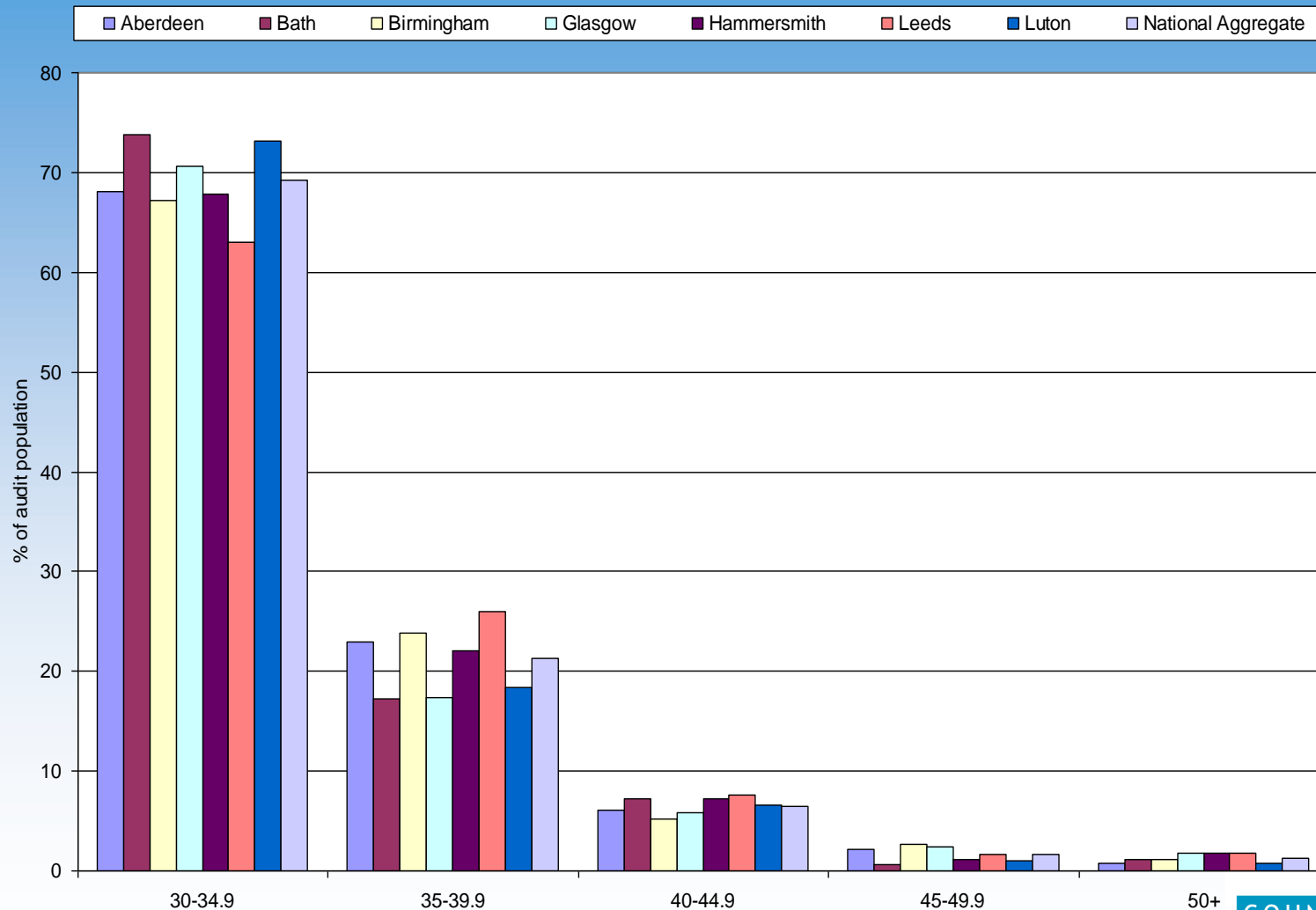
- 6000 obese ($\text{BMI} \geq 30$) adults
- 1150 overweight adults (age and sex matched)
- 1150 normal weight adults (age and sex matched)
- 18 month retrospective audit of medical records:
Co-morbidities : Prescribing : Primary and secondary care appointments
: Admissions : Obesity management practices

Prevalence of Co-morbidities

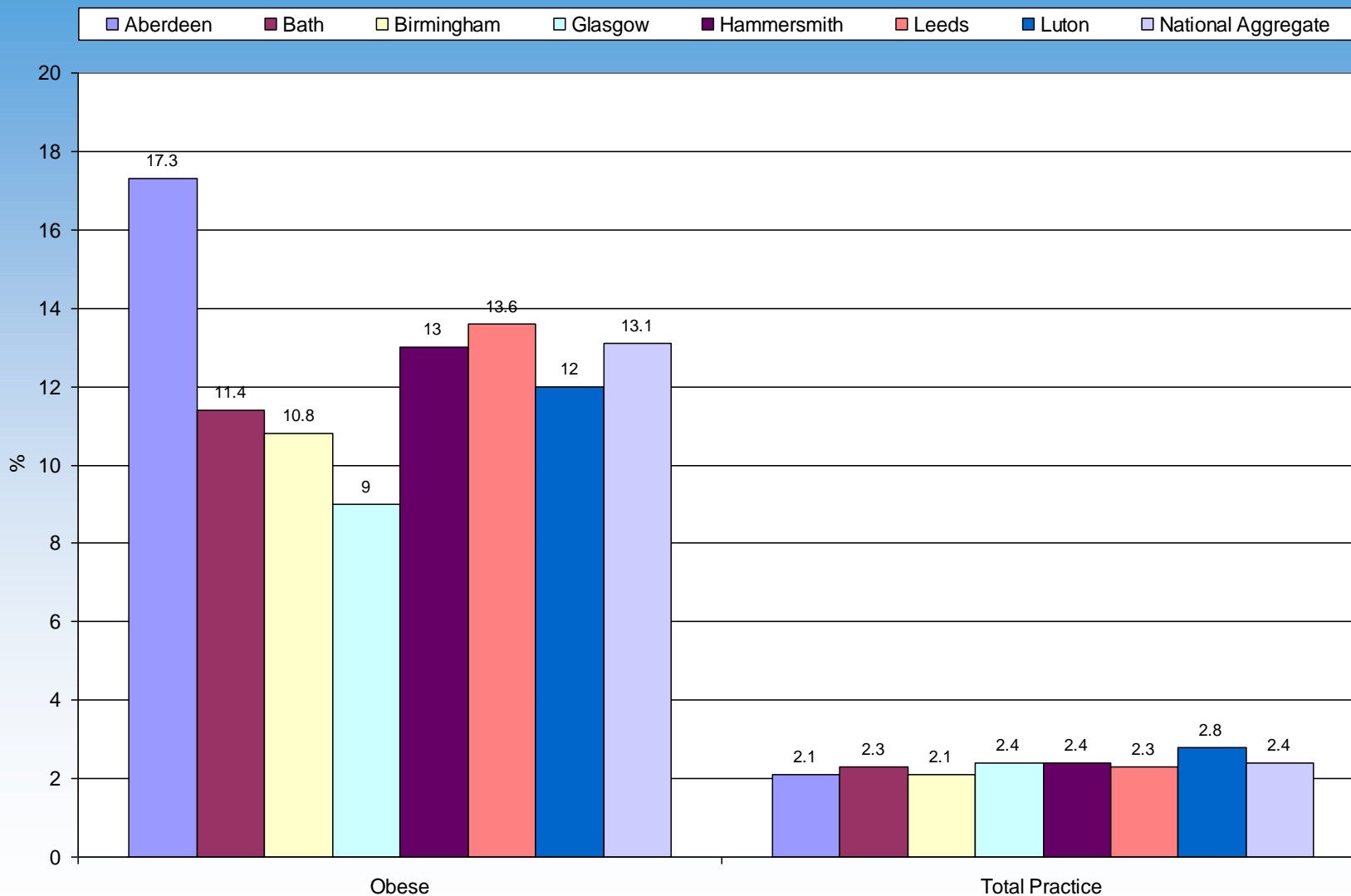


n=1150 Obese + 1150 Normal Weight Age and Sex Matched. All $p < 0.001$
Int J Obesity 2003; 27 (suppl 3): S83

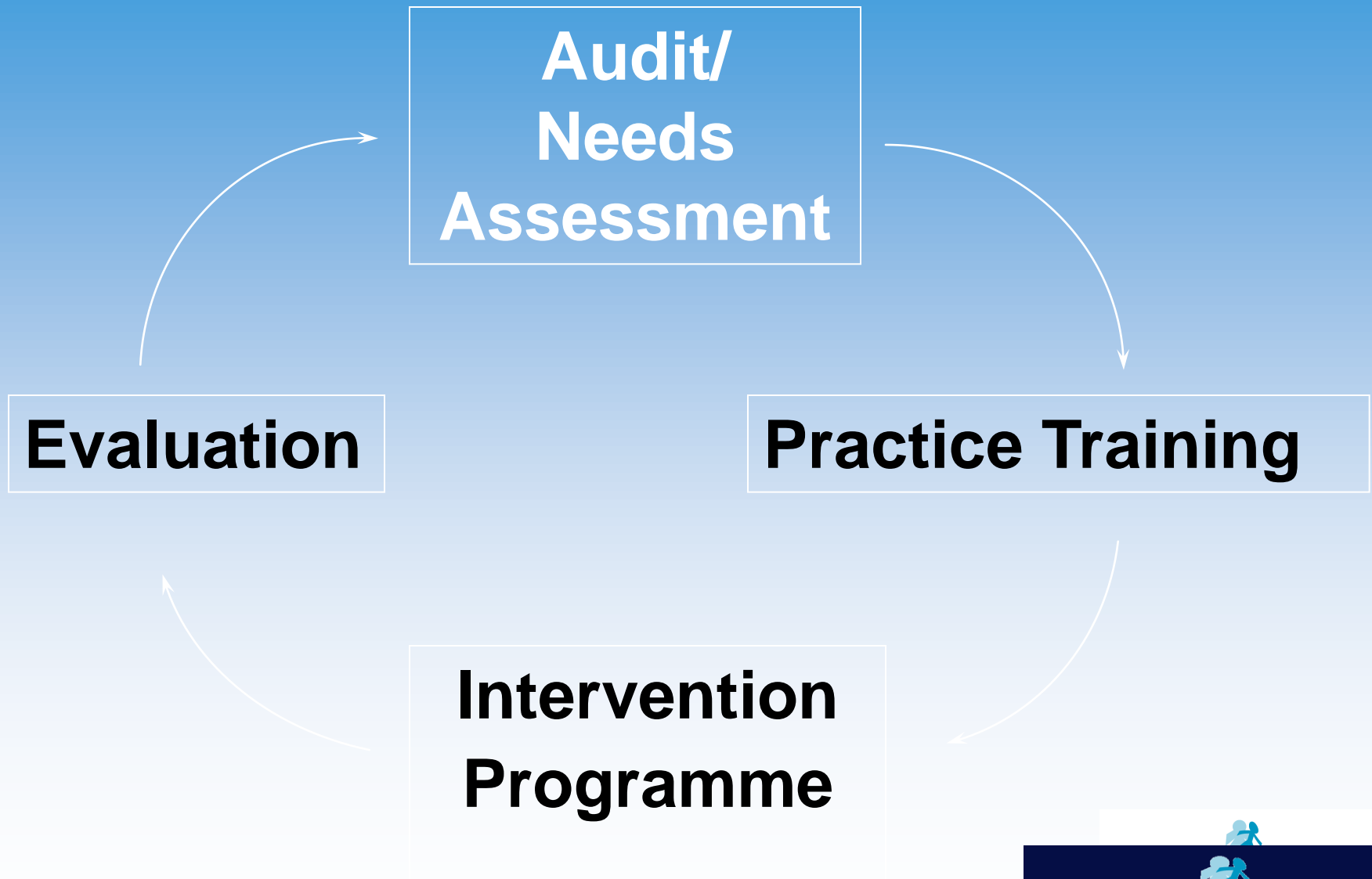
BMI distribution in obese sub sample compared across Counterweight regions



Prevalence of diabetes in obese sample compared to total practice population and across Counterweight regions



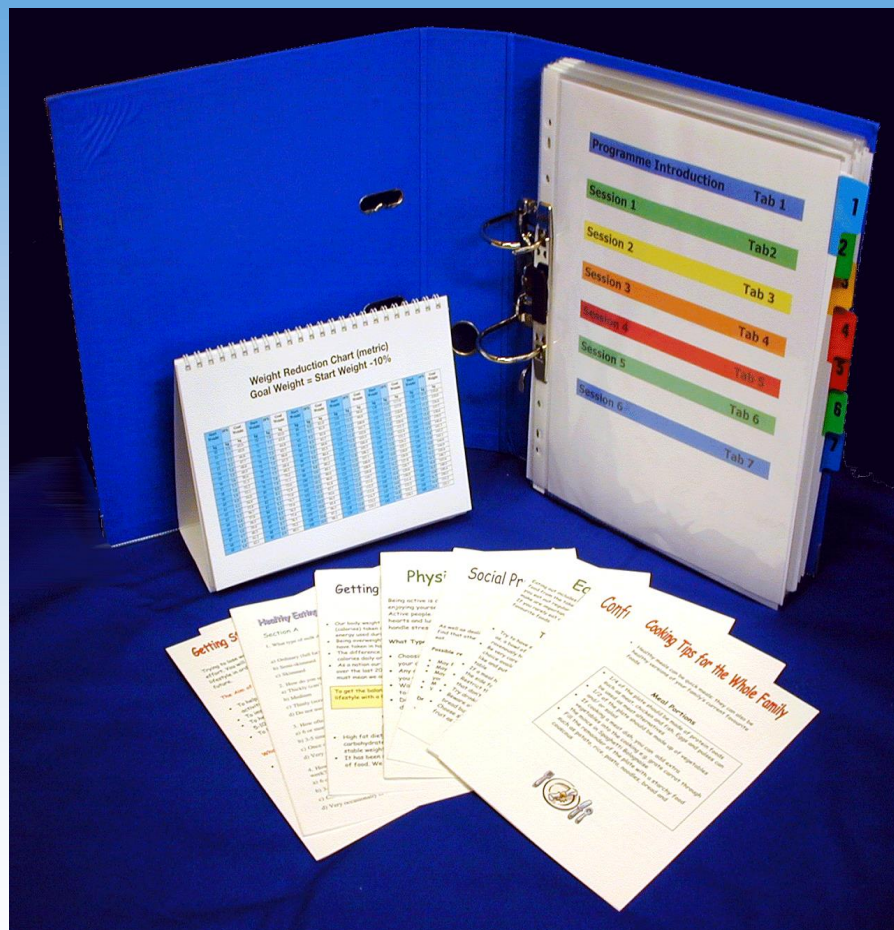
The Counterweight Model



Training & Support In Practice

- 6 hours of practice nurse training
- 1-2 meetings each month for 6/12
 - clinical support
- On-going support after 6/12
 - to support data collection
 - provide patient education materials
 - provide up-skilling as required

Programme Materials



- Patient Information Leaflets: ongoing supply
- Desk flip chart for practices
- CHANGE Group Programme

AUDIT

- Preparation of combined audit database (7300 patients)

	Normal weight	Obese	No. of Practices
Phase I	-	4000	40
Phase II (not Aberdeen)	1150	1150	23
Phase II (Aberdeen)	-	1000	10
Total	1150	6150	

- Development of a drugs database

BMI BANDS - Numbers of patients

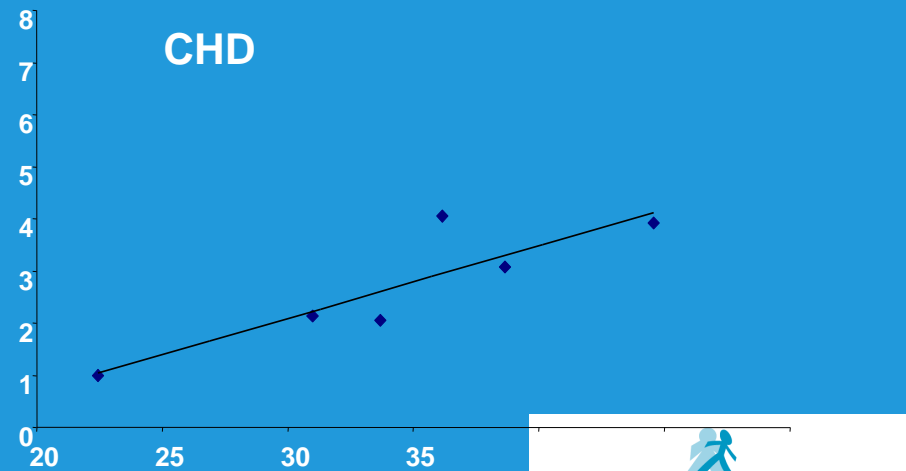
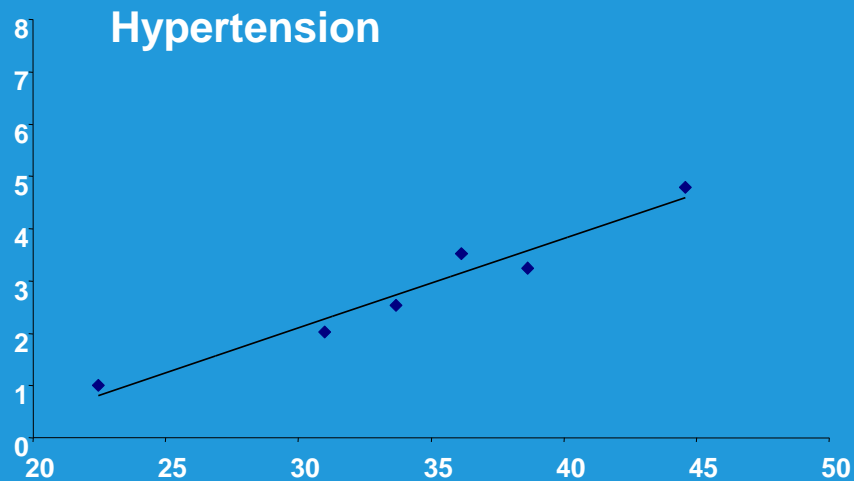
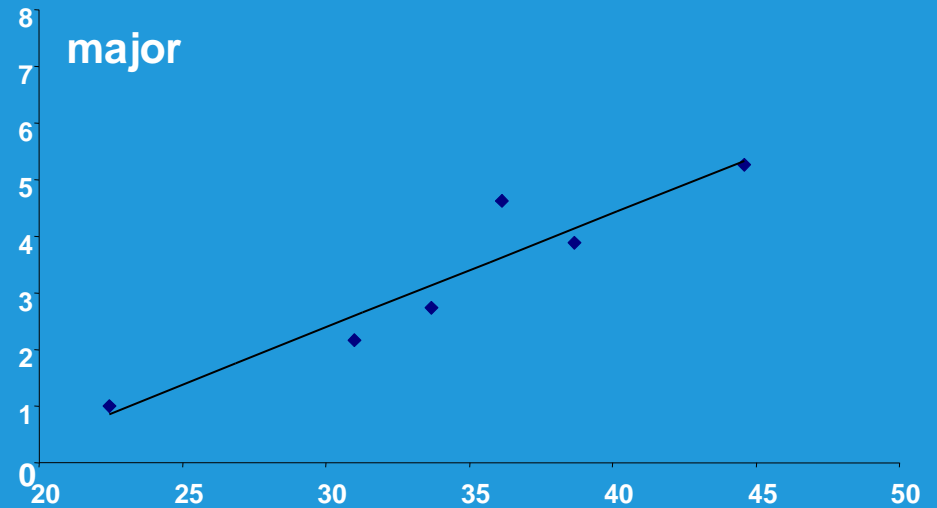
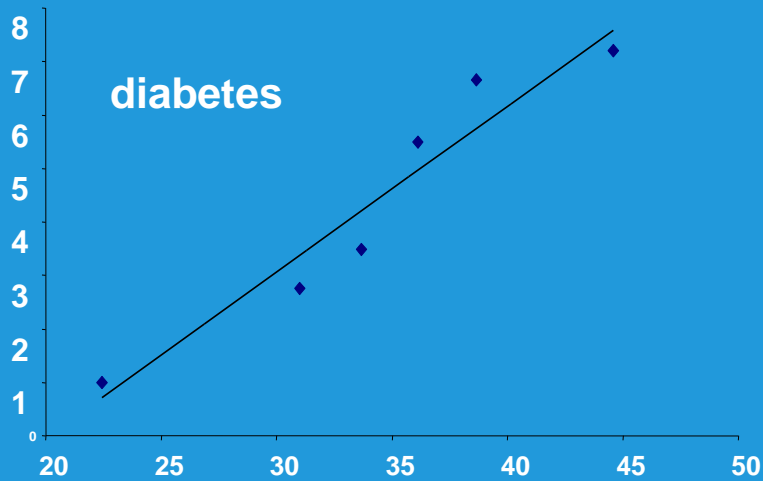
Normal weight	1150
30.0 -	2804
32.5 -	1425
35.0 -	875
37.5 -	442
40.0 -	595

Compare with JAMA (Must et al) who had 2512, 922 & 545 in WHO obesity classes 1, 2 & 3 spread across 4 heterogeneous racial

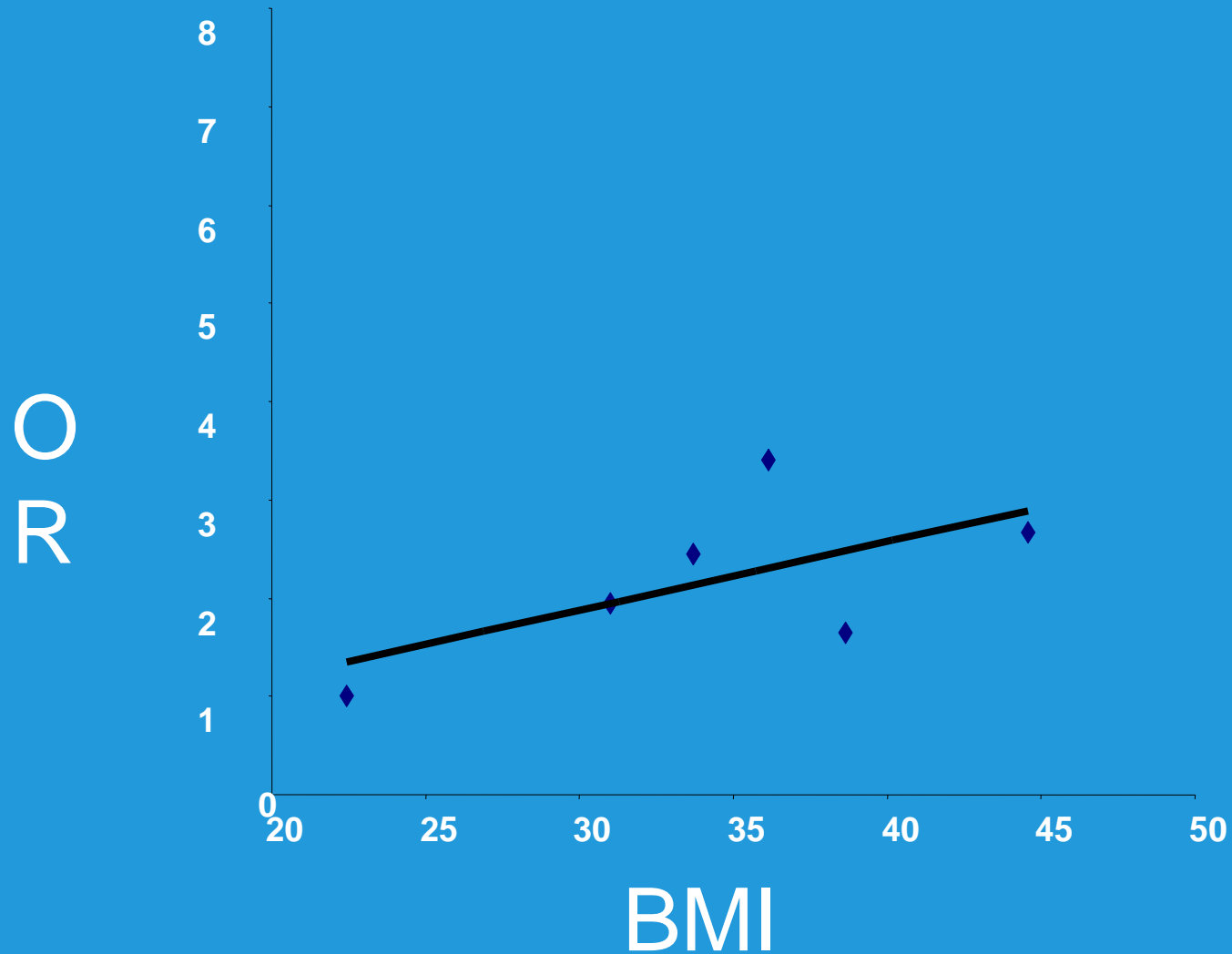
CO-MORBIDITIES

- **Largest contemporary study of obesity in UK**
- **Wide range of co-morbidities**
- **Precise estimates of prevalence with increasing obesity**
- **Able to test for linear/non-linear trends**
- **Ability to project trends in co-morbidity prevalence consequent on changes in levels of obesity with very good precision**

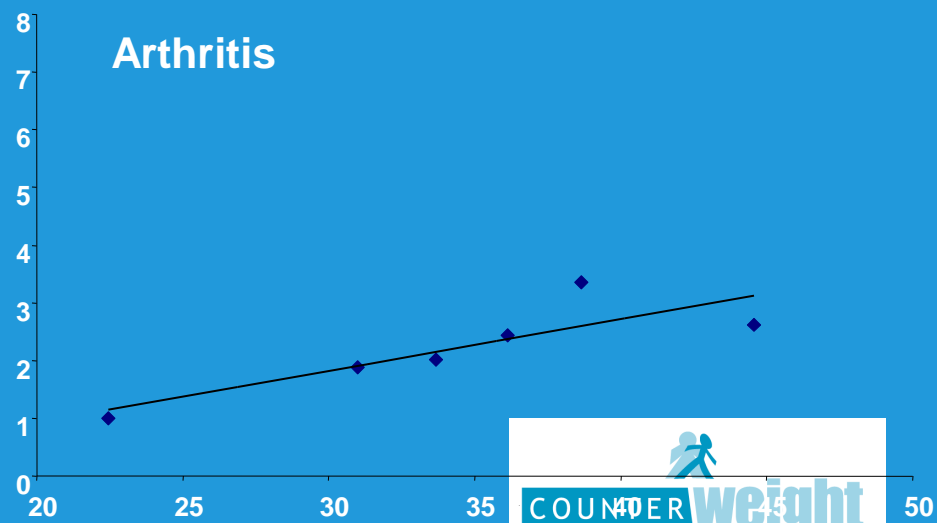
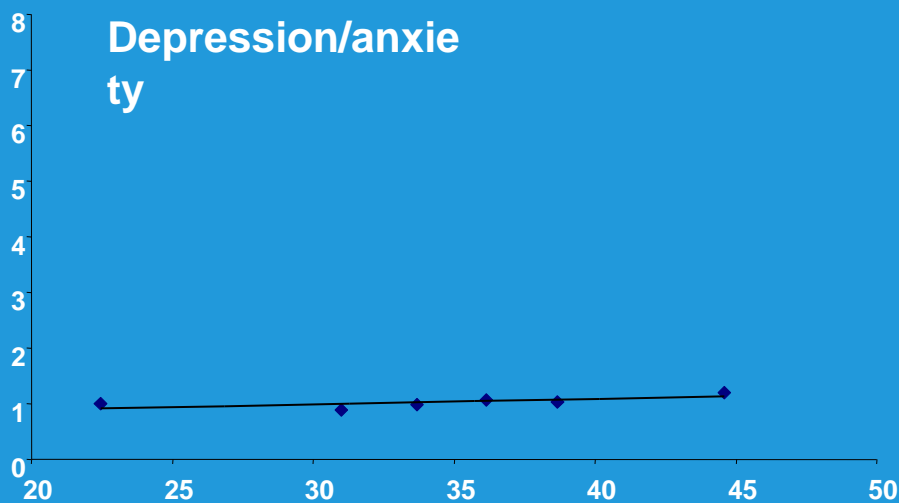
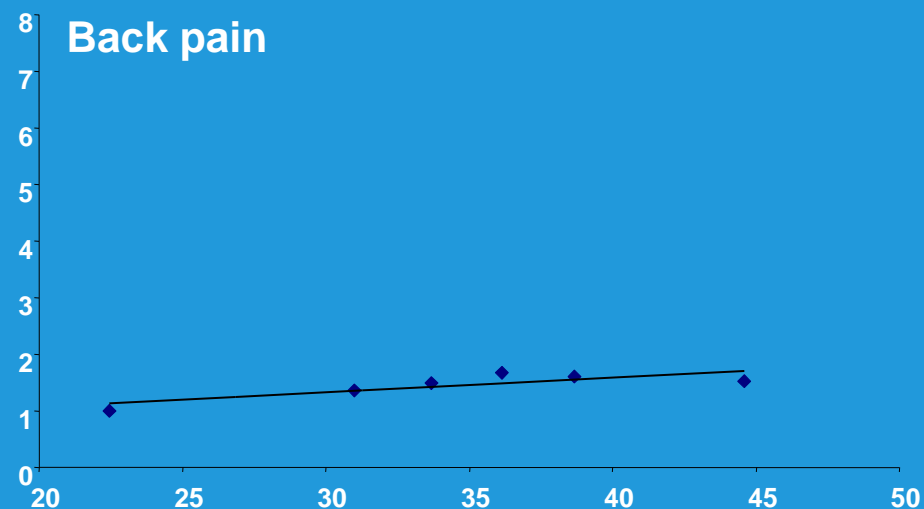
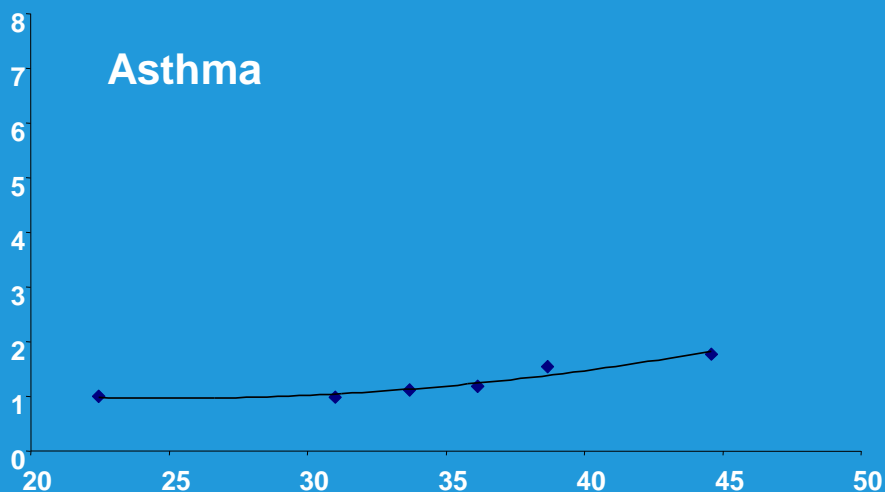
CO-MORBIDITIES



Hyperlipidaemia



CO-MORBIDITIES



RESOURCE USAGE

GP Appointments

PN appointments

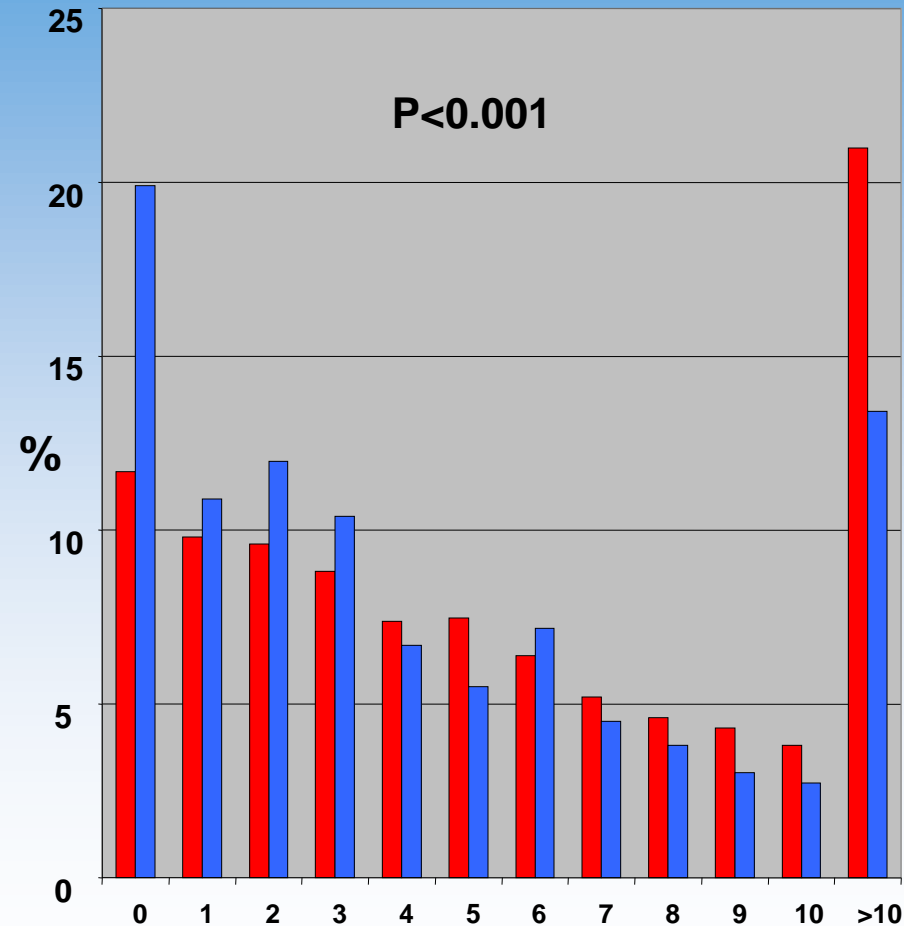
O/P visits

I/P admissions

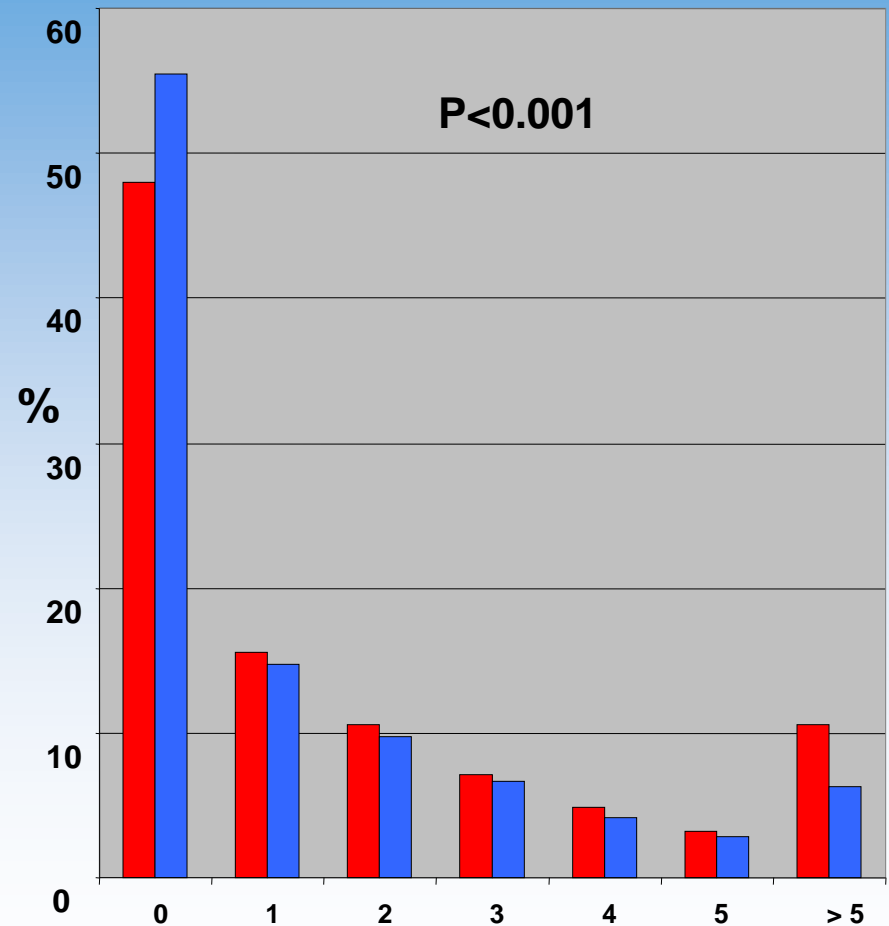
Dietary counselling & Obesity centre referral

Number of appointments for obese & normal subjects (based on 6150 obese & 1150 normal patients)

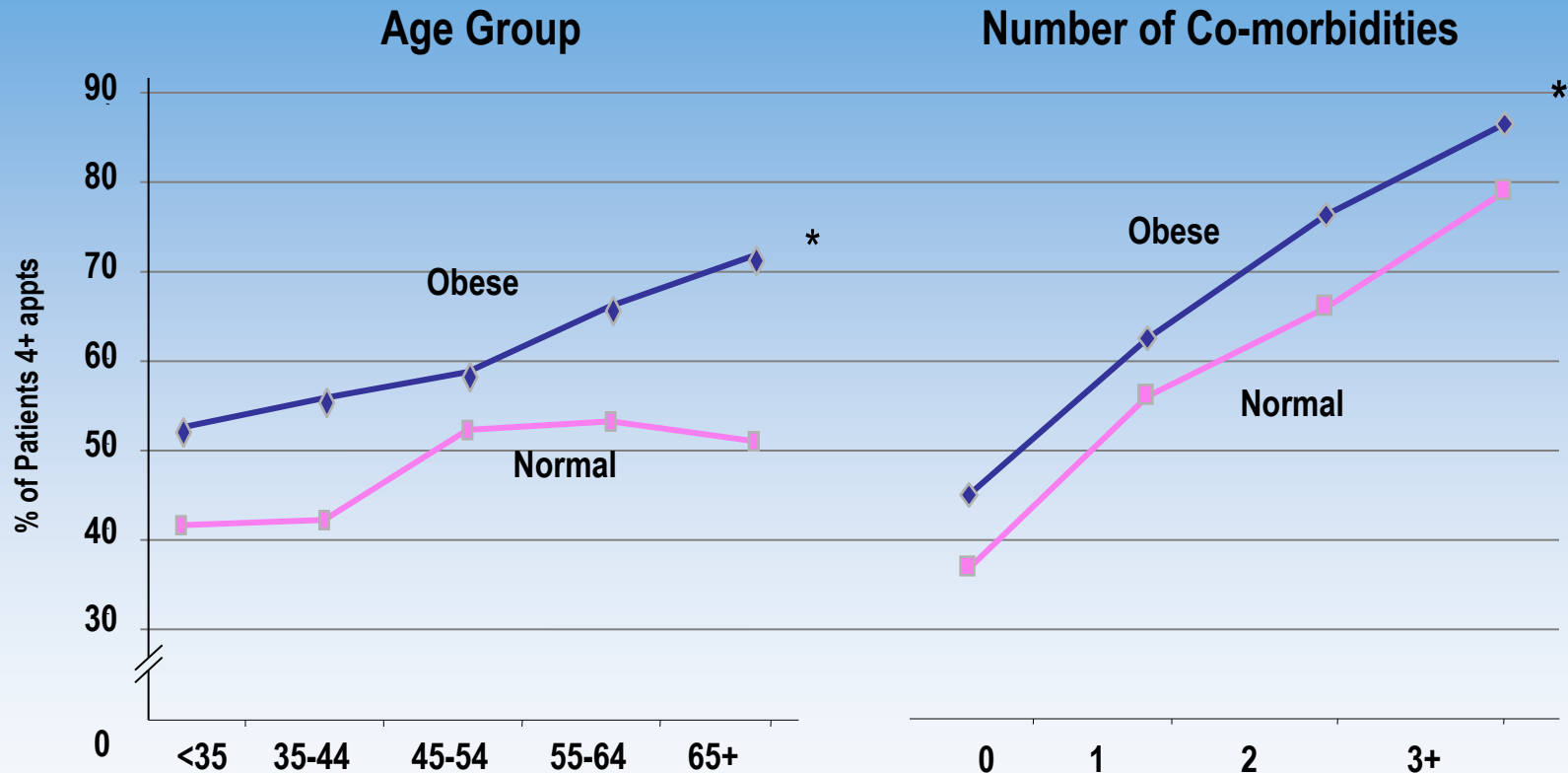
GP appointments



PN appointments

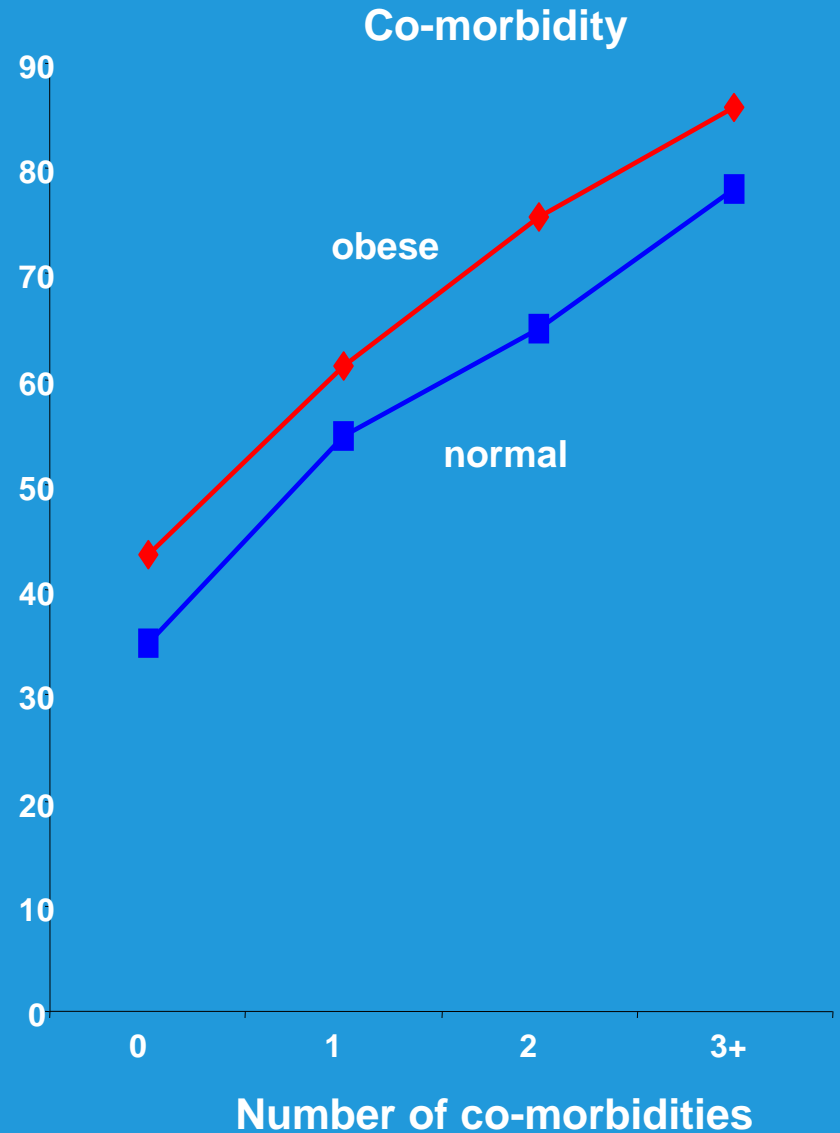
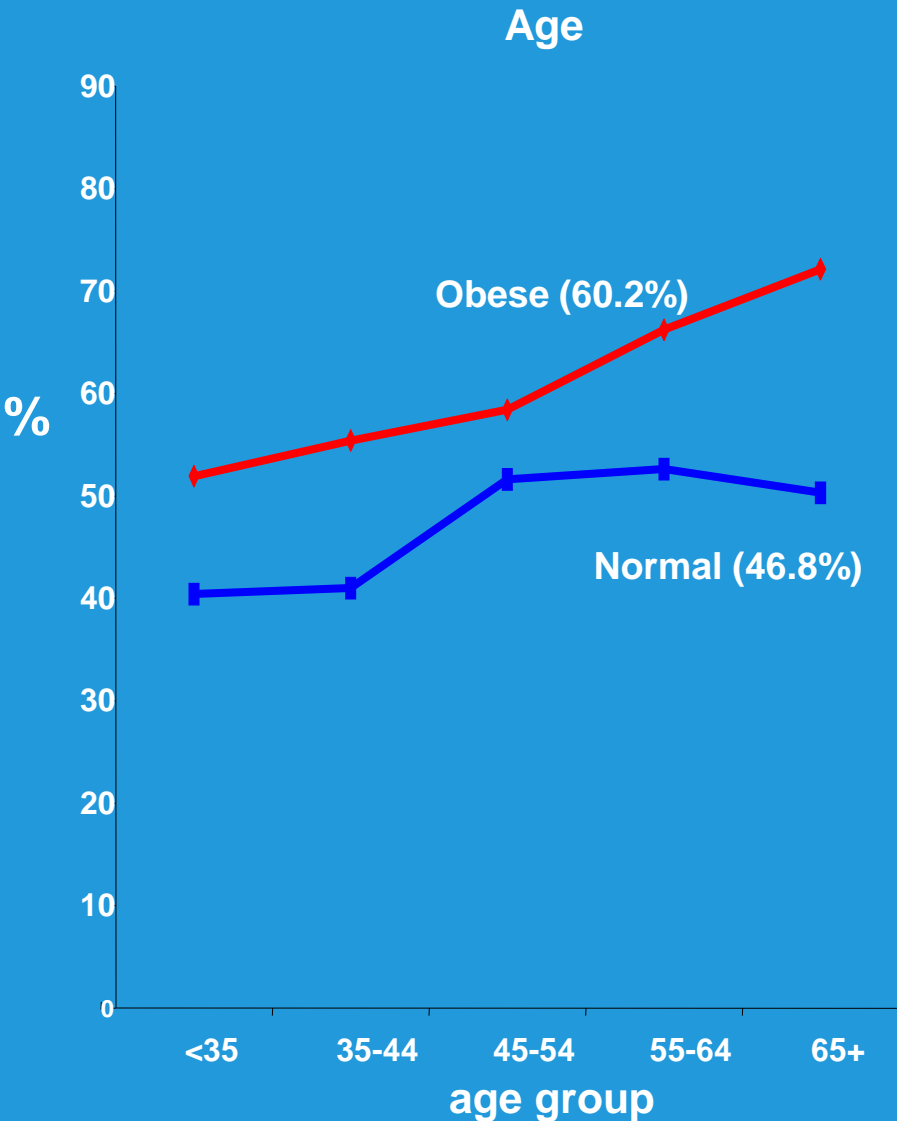


Obesity increases primary care attendance over and above increasing age and co-morbidity



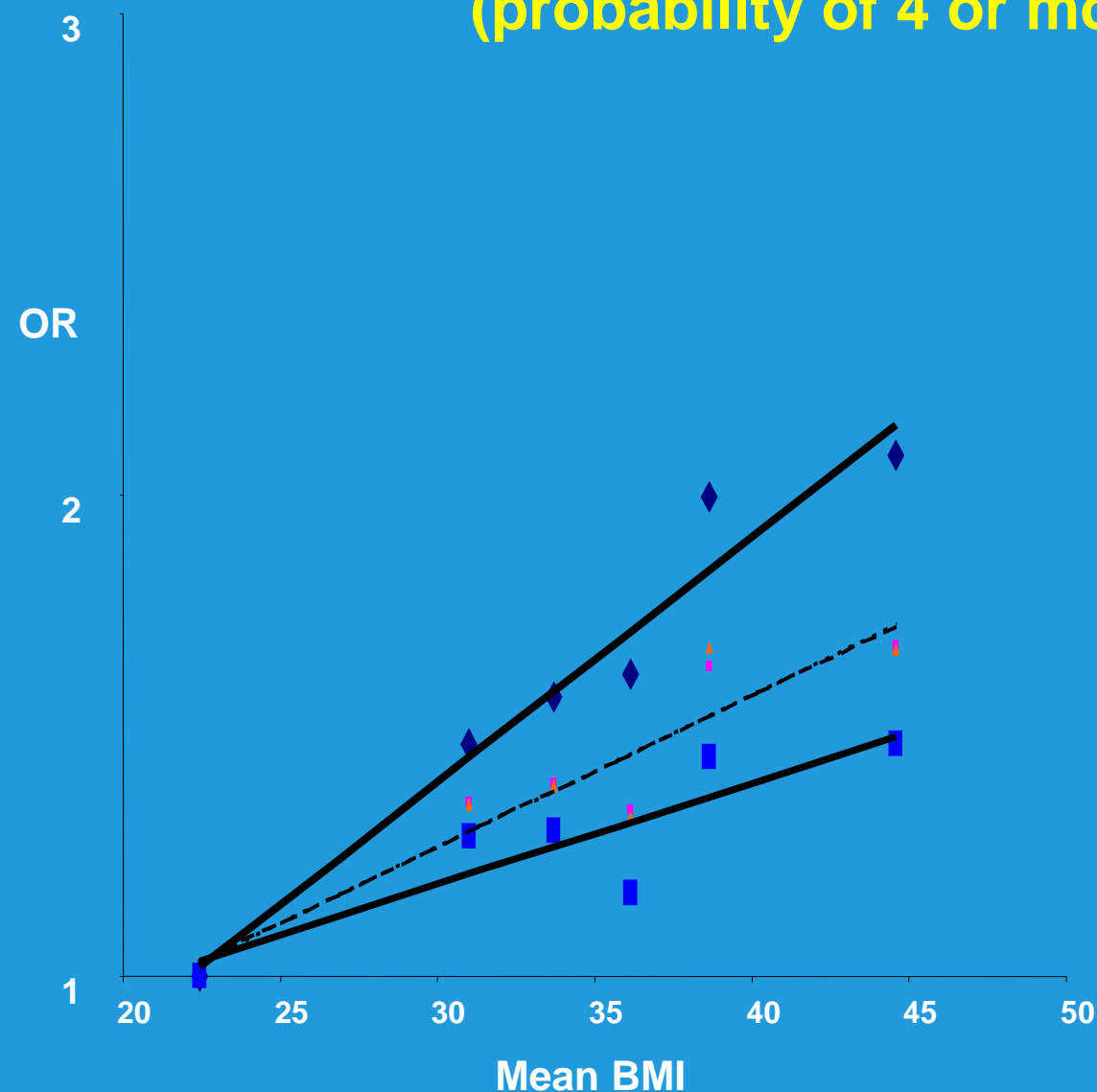
n=1150 Obese + 1150 Normal Weight Age and Sex Matched * p < 0.001
Int. J Obesity, 2004; 28 (suppl. 1): S116

Regular GP attendance by age group, number of co-morbidities and obesity



GP visits – effect of adjustments

(probability of 4 or more visits)



Adjusted for:

Age group, sex, deprivation,
country, phase

(standard set). OR=1.62,
p<0.001; trend p<0.001

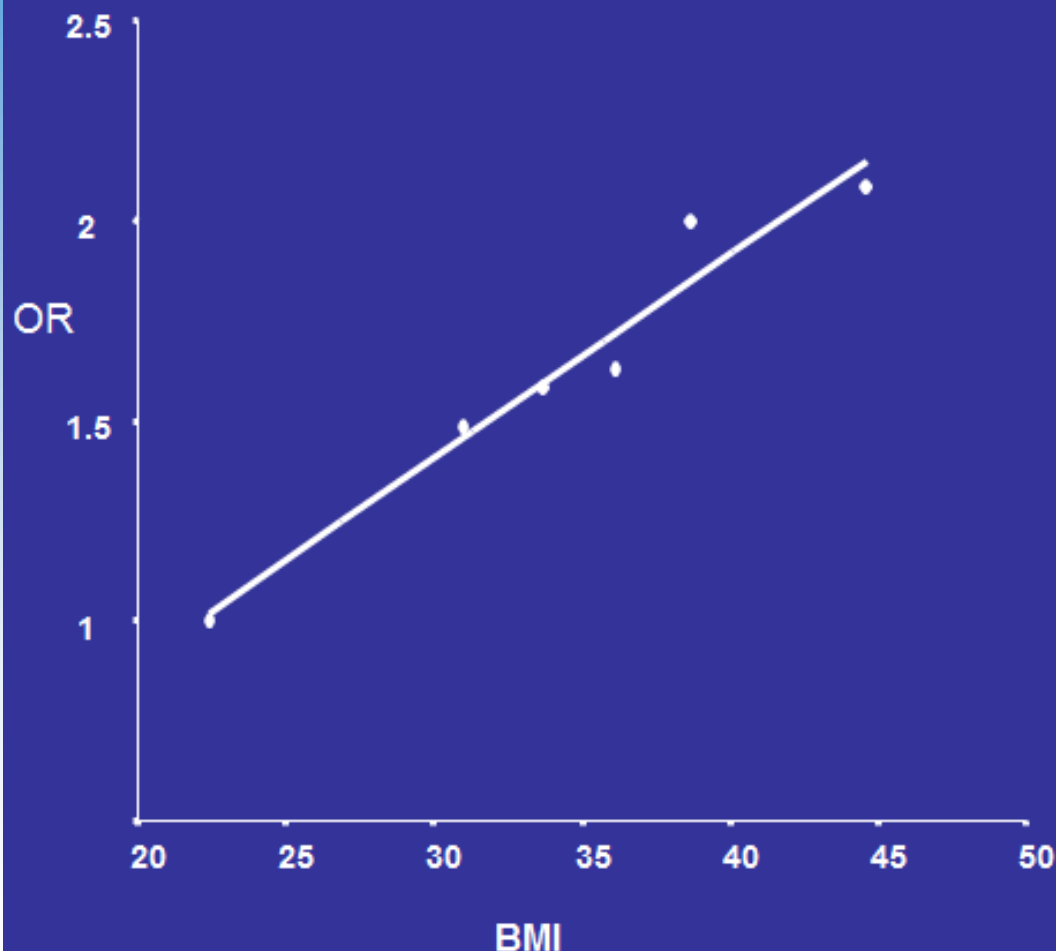
+ any co-morbidity, + major
comorbidity

OR=1.42, p<0.001; trend
p=0.022

+ number of co-morbidities

OR=1.31, p=0.003; trend
p=0.235

Frequent GP attendance



Odds ratio for
BMI 40+

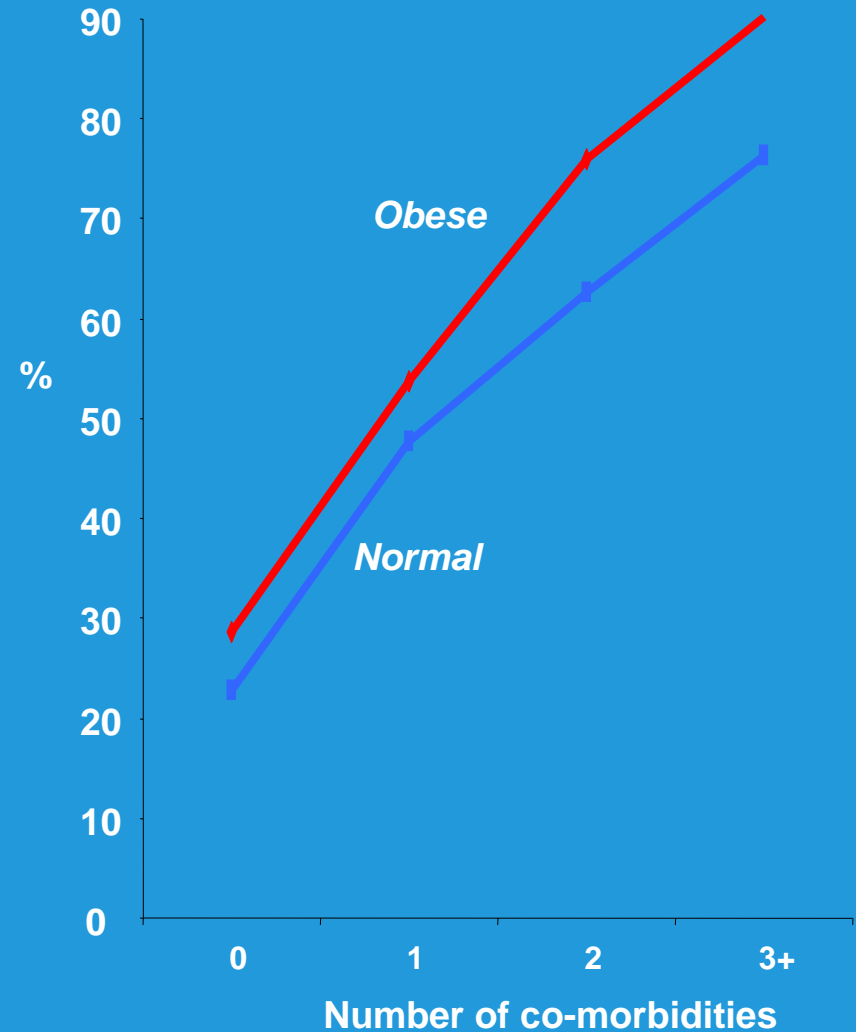
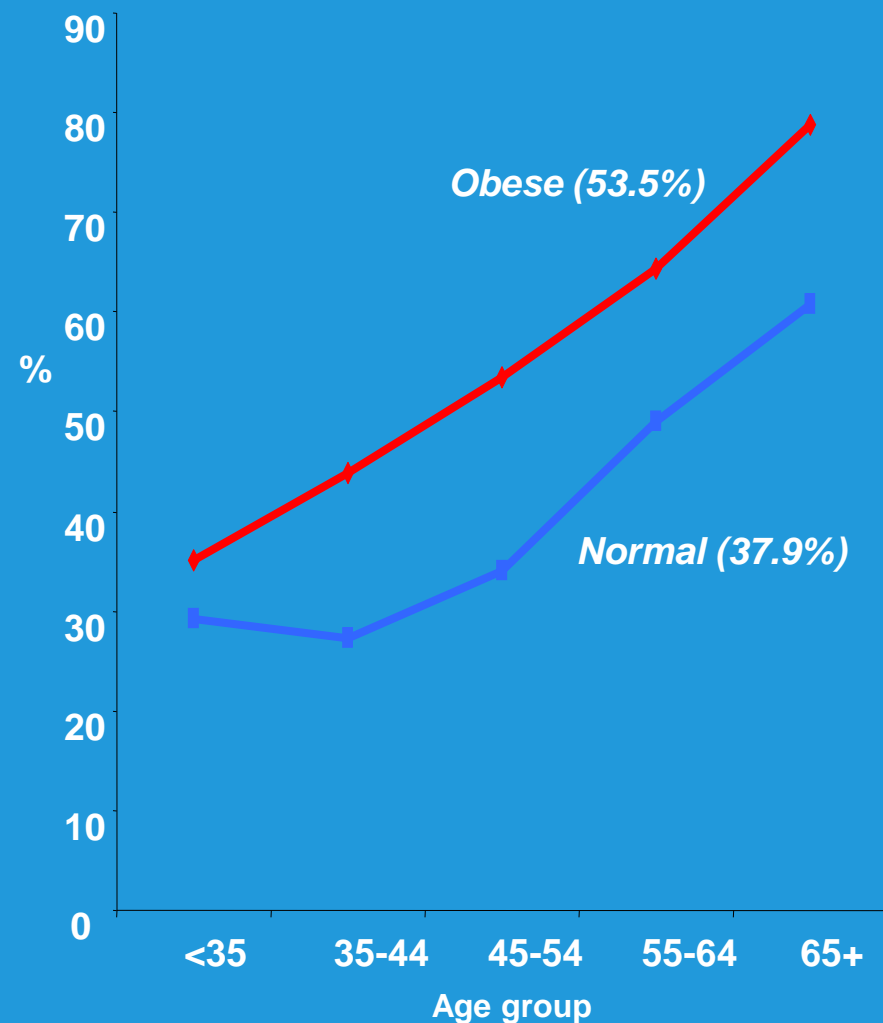
2.08 (1.64-2.65)

After adjustment for co-
morbidities

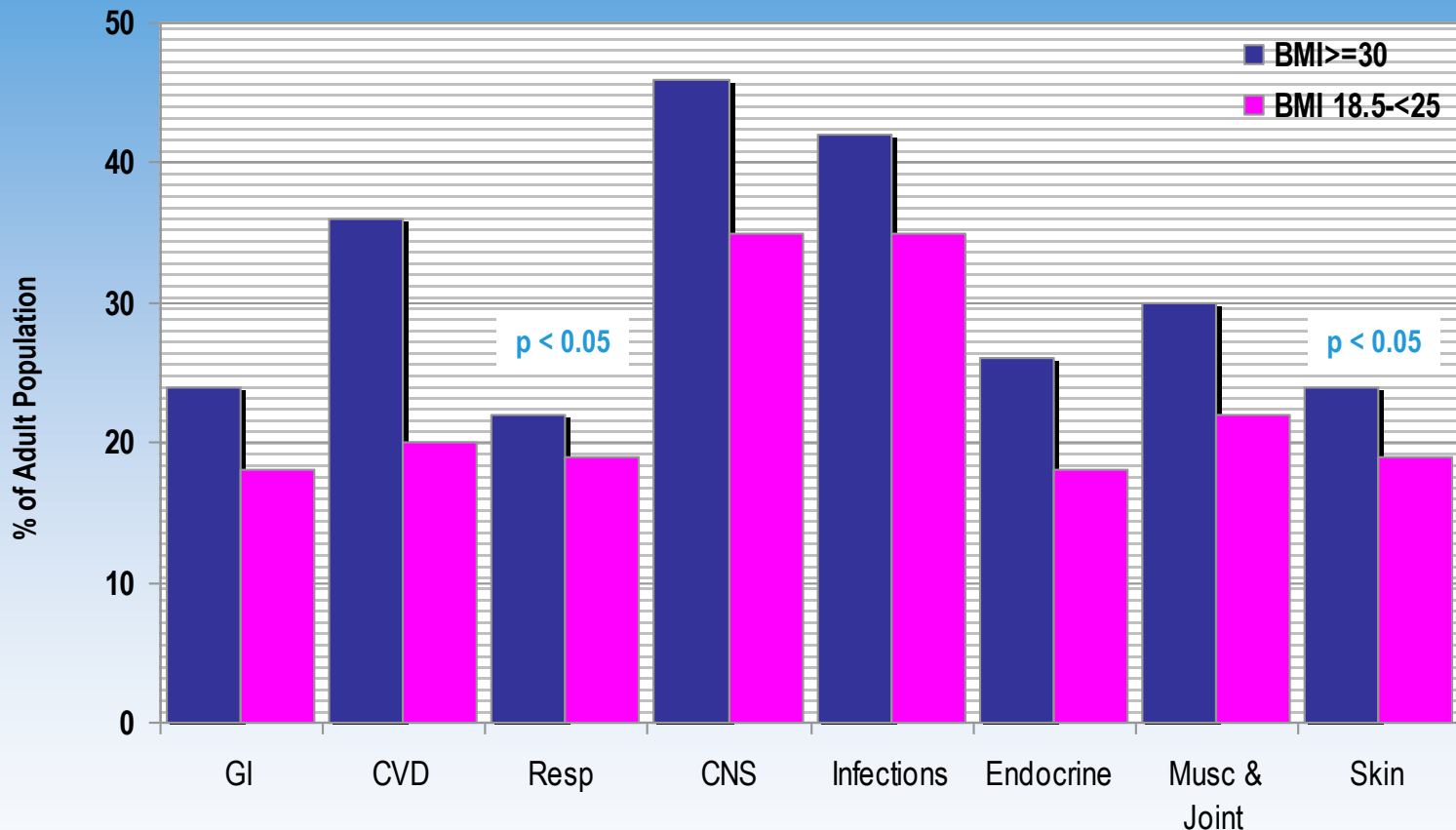
1.48 (1.15-1.90)

Approx ½ of additional
attendances are due to
presence of co-
morbidities

Prevalence of polypharmacy (4+ drug types) by BMI status, age group & number of co-morbidities

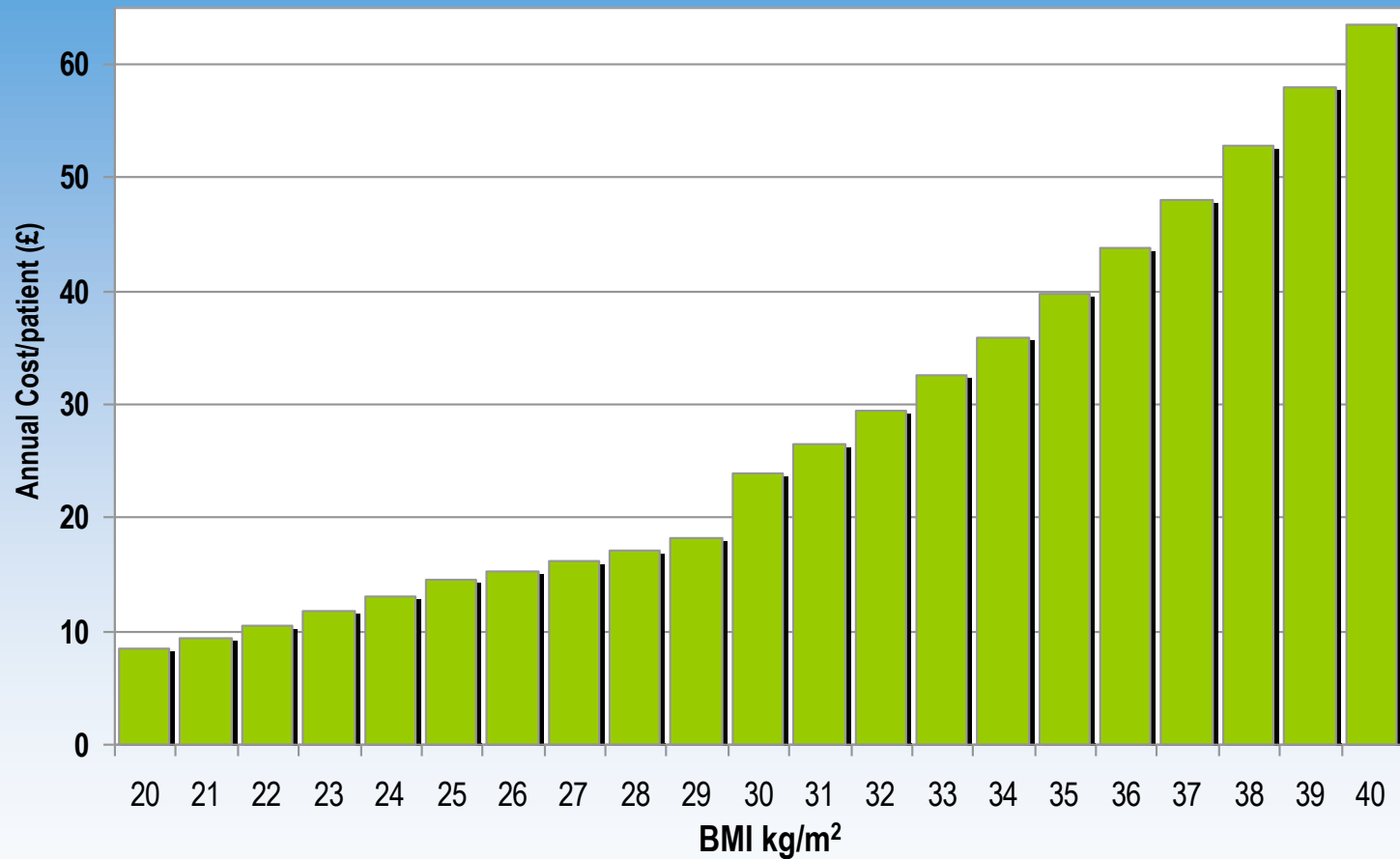


Prescribing per BNF Category



n=1150 Obese + 1150 Normal Weight Age and Sex Matched All $p < 0.001$ except = $p < 0.05$
Int. J Obesity, 2003; 25 (suppl. 2): S27
Br J Gen Pract (In Press)

Impact of BMI on Cost of 'Top Ten' Drugs (males)



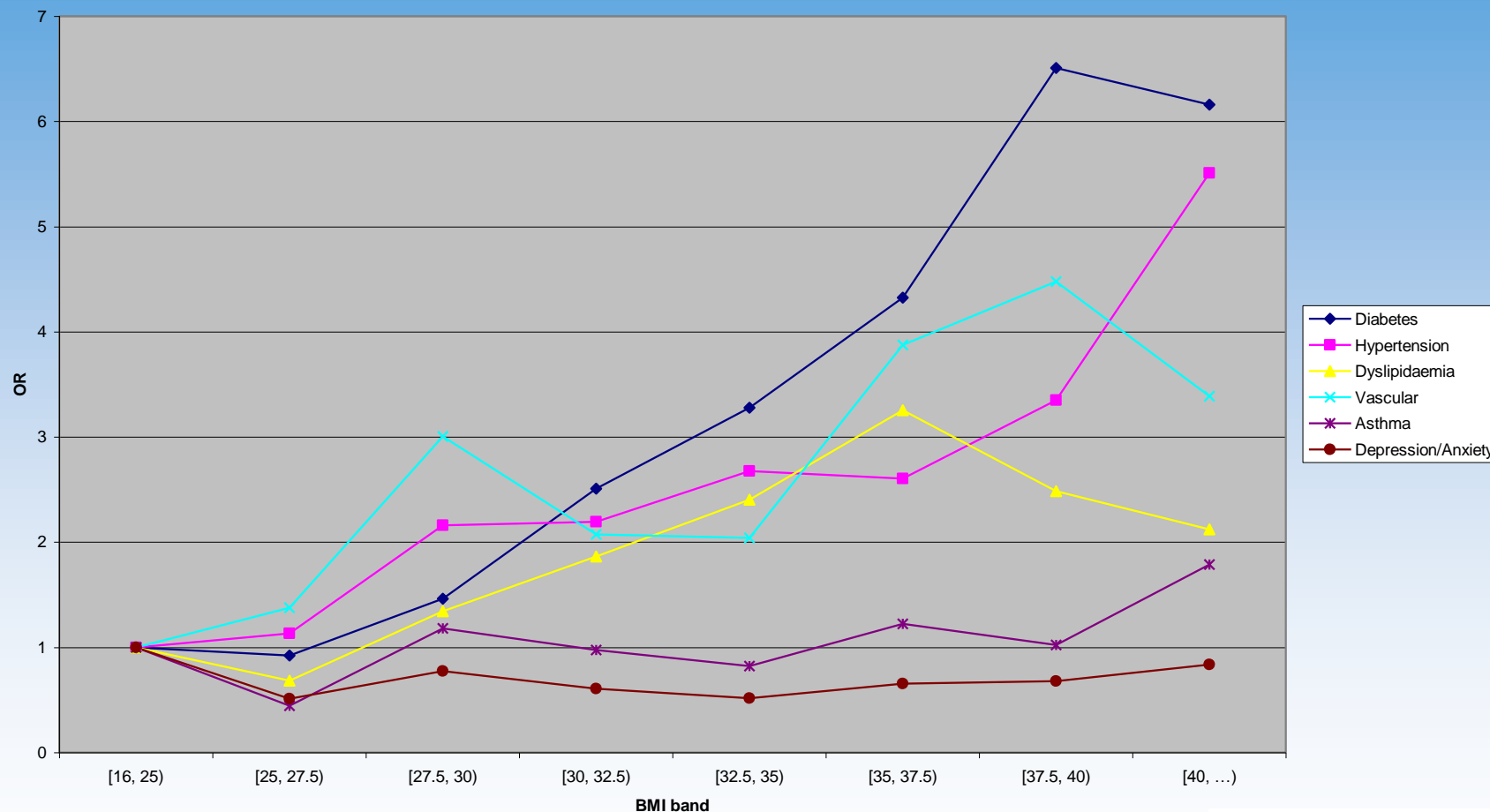
Journal of Health Services Research & Policy. 2008;Vol 13 No 3: 158–166

Summary of audit results

- ☐ 58% of males and 71% of females had a BMI recorded
- ☐ Obese patients were twice as likely to suffer from hypertension, CVD, dyslipidaemia and arthritis, and four times more likely to suffer diabetes
- ☐ Obese patients had higher rates of prescribing
- ☐ Obese patients attended general practice more frequently than normal weight patients

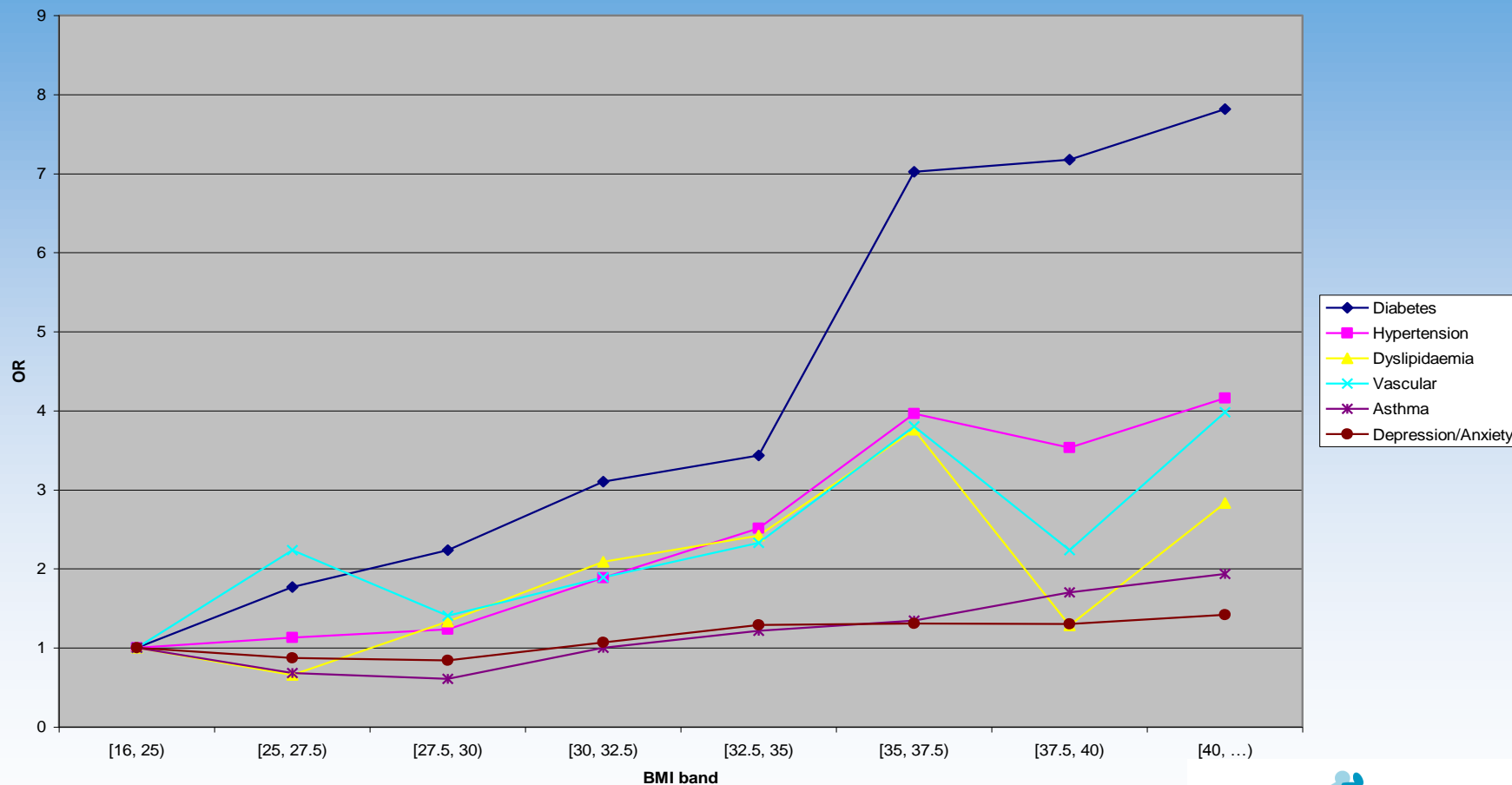
Risk of obesity related comorbidity by BMI for Males

Odds Ratio vs BMI (males)

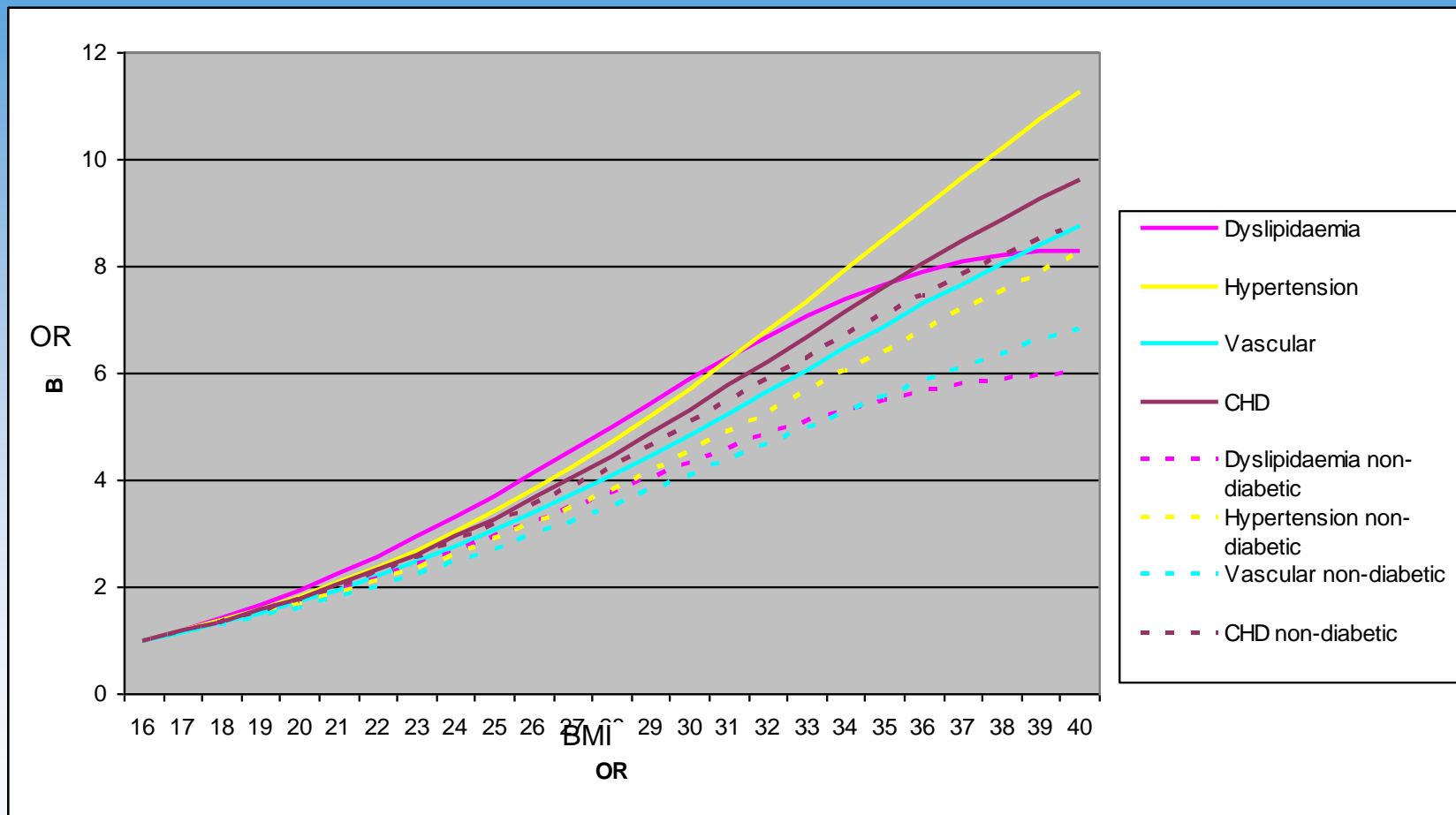


Risk of obesity related comorbidity by BMI for Females

Odds Ratio vs BMI (females)

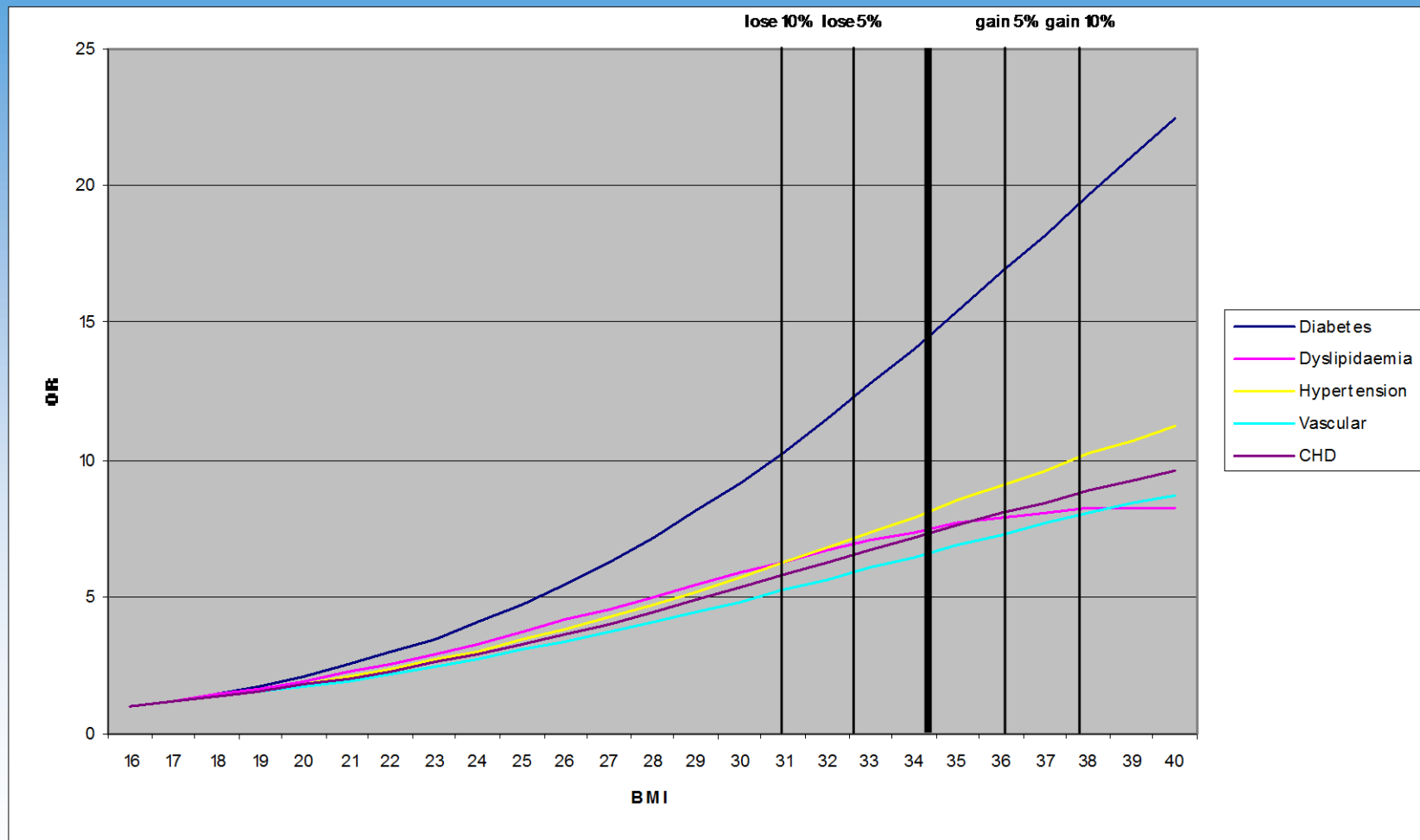


Odds Ratios of obesity related comorbidity for all patients with and without diabetes



Counterweight data (obes.res.&clin.pract. 2: 15-27)

Change in Risk following 5 and 10% weight gain and loss (Counterweight data 2008)



Counterweight Model

- Patient Intervention

- BMI $\geq 28\text{kg/m}^2$ with co-morbidity or BMI $\geq 30\text{kg/m}^2$
- Evidence-based pathways*
- 6 sessions over 3-months
- Quarterly follow up for 1 year
- Annual review



*J Hum Nutr Dietet. 2004; 17: 191-208

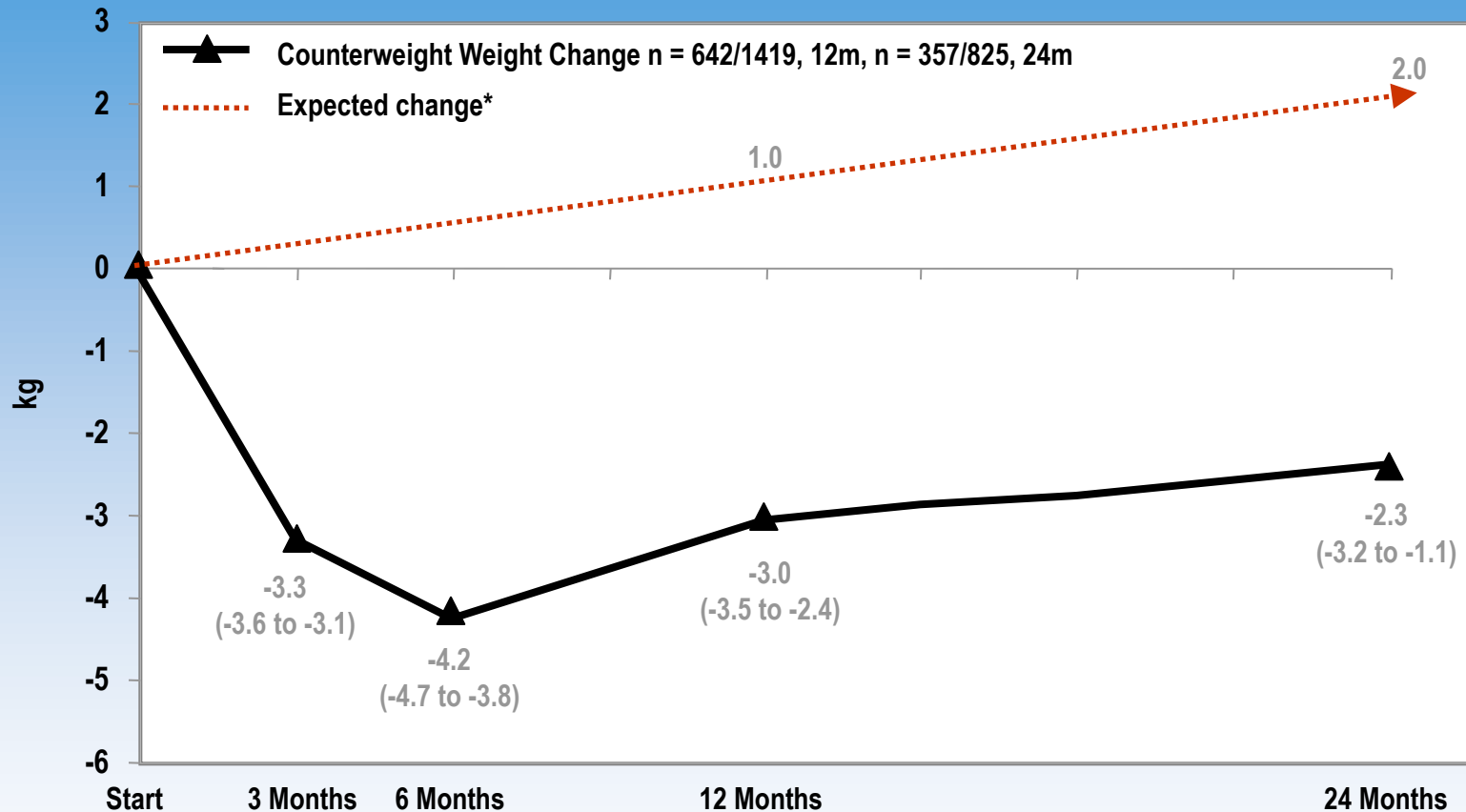
Counterweight Model - Programme Materials



Phase 1

- 56 practices
- 1906 eligible patients
- Mean BMI = 37
- Mean age 49 years
- 77% patients female
- 25% patients had BMI > 40
- 74% patients had at least one co-morbidity

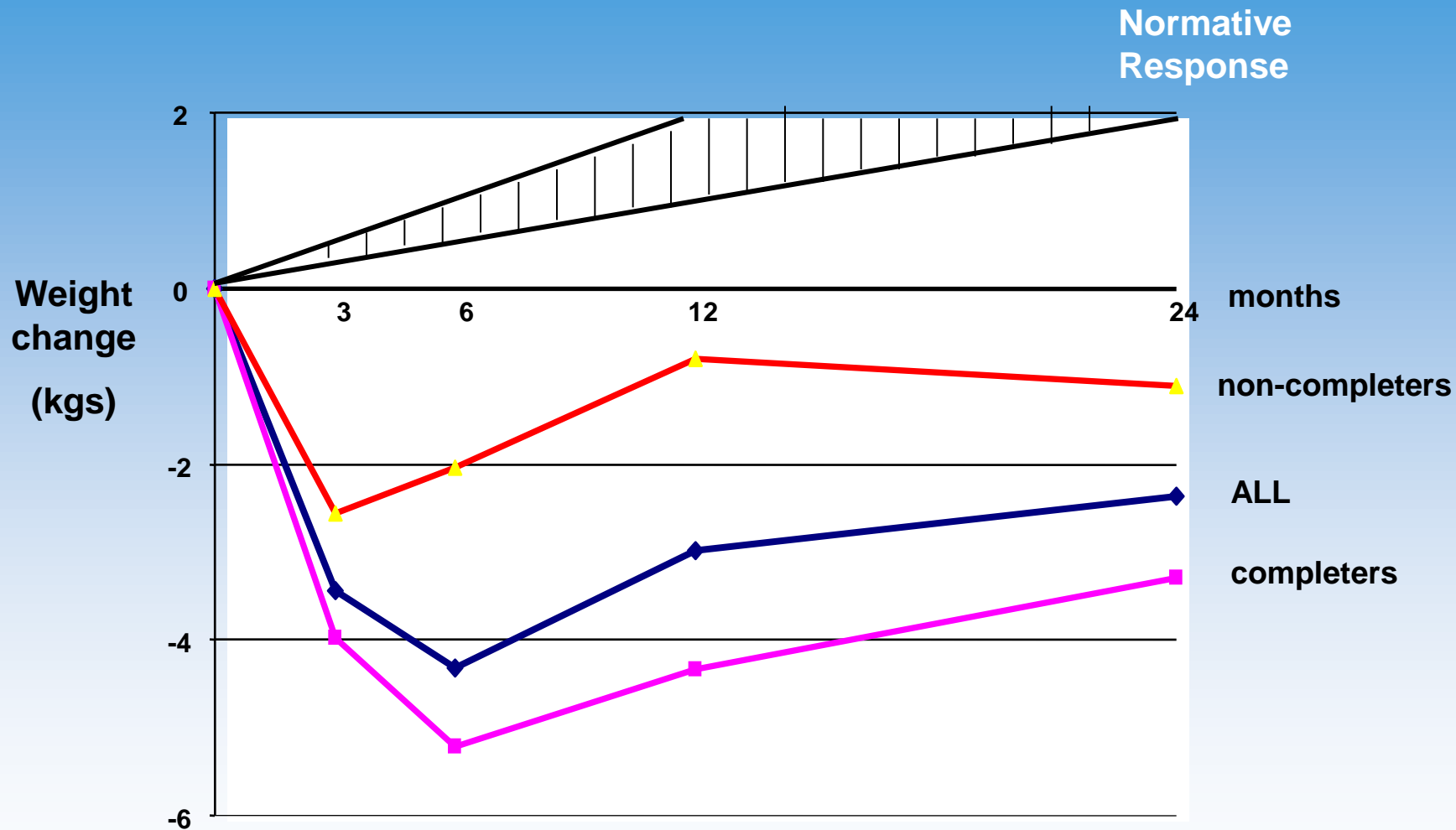
Mean Weight Change (95% CI) in Attending Population



Br J Gen Pract. 2008; 58: 548-554.

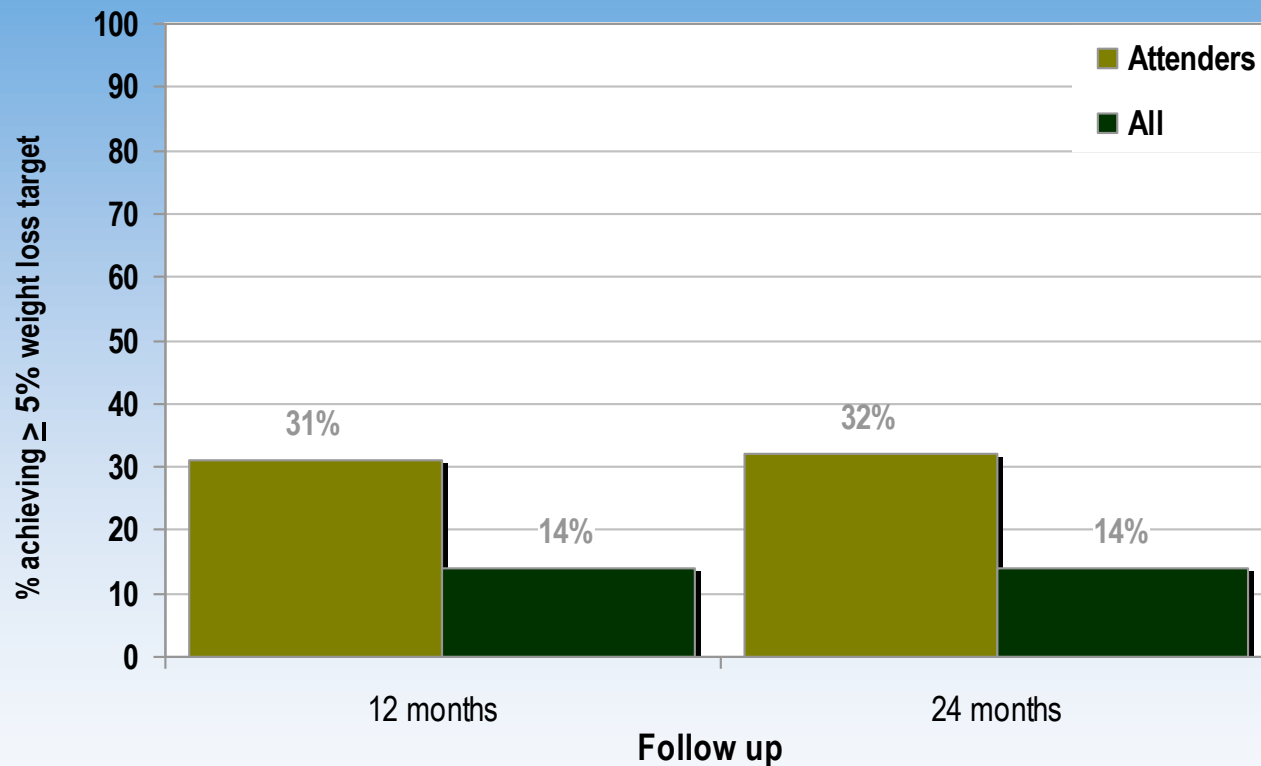
*Heitman BL & Garby L (1999) *Int J Obes Relat Metab Disord*

Weight change over time



Number of patients

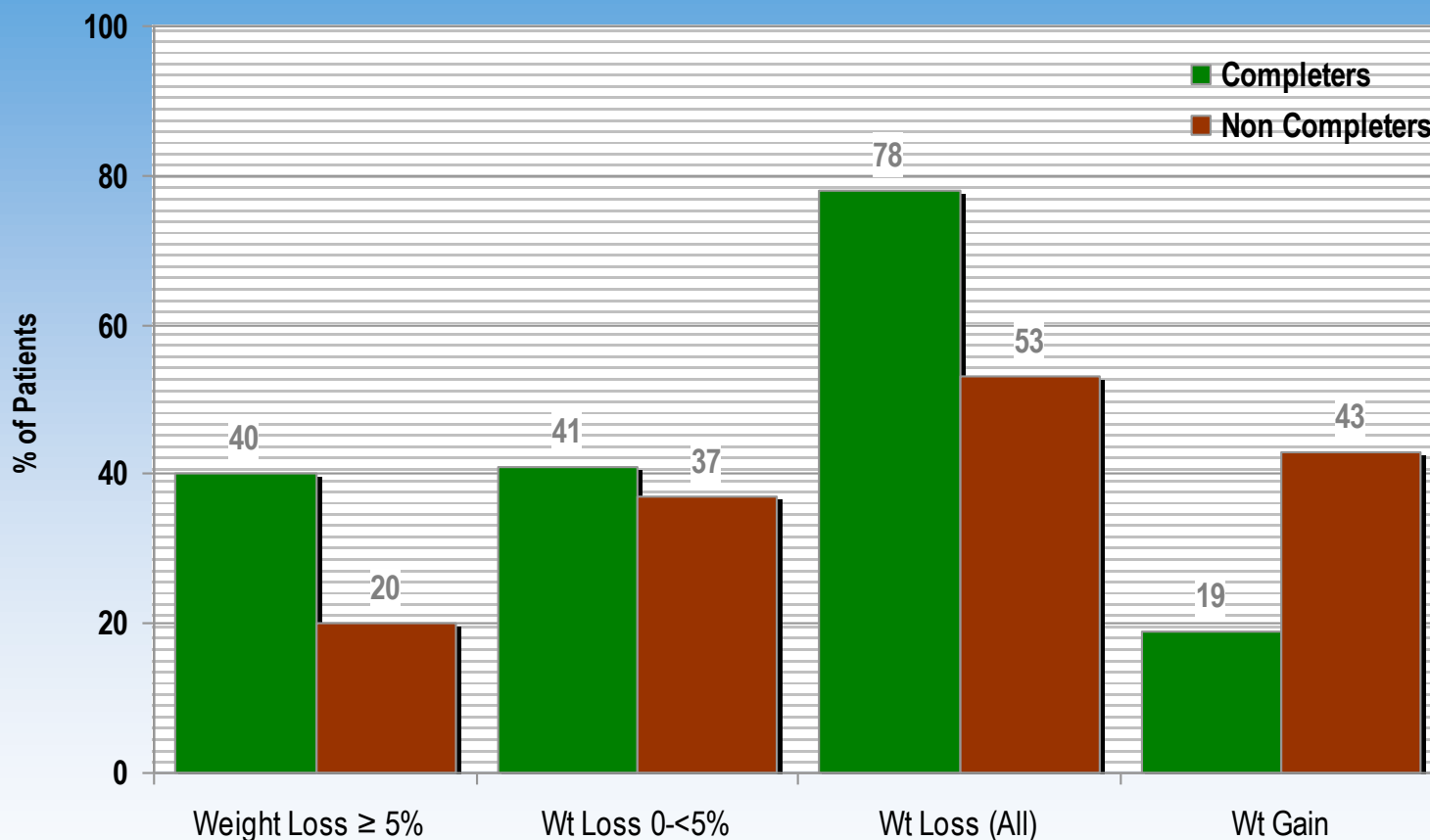
% Achieving $\geq 5\%$ Weight Loss from Baseline



Br J Gen Pract. 2008; 58: 548-554

1:7 patients achieved $>5\%$ weight loss at 12/24m

12 month Intervention Outcomes

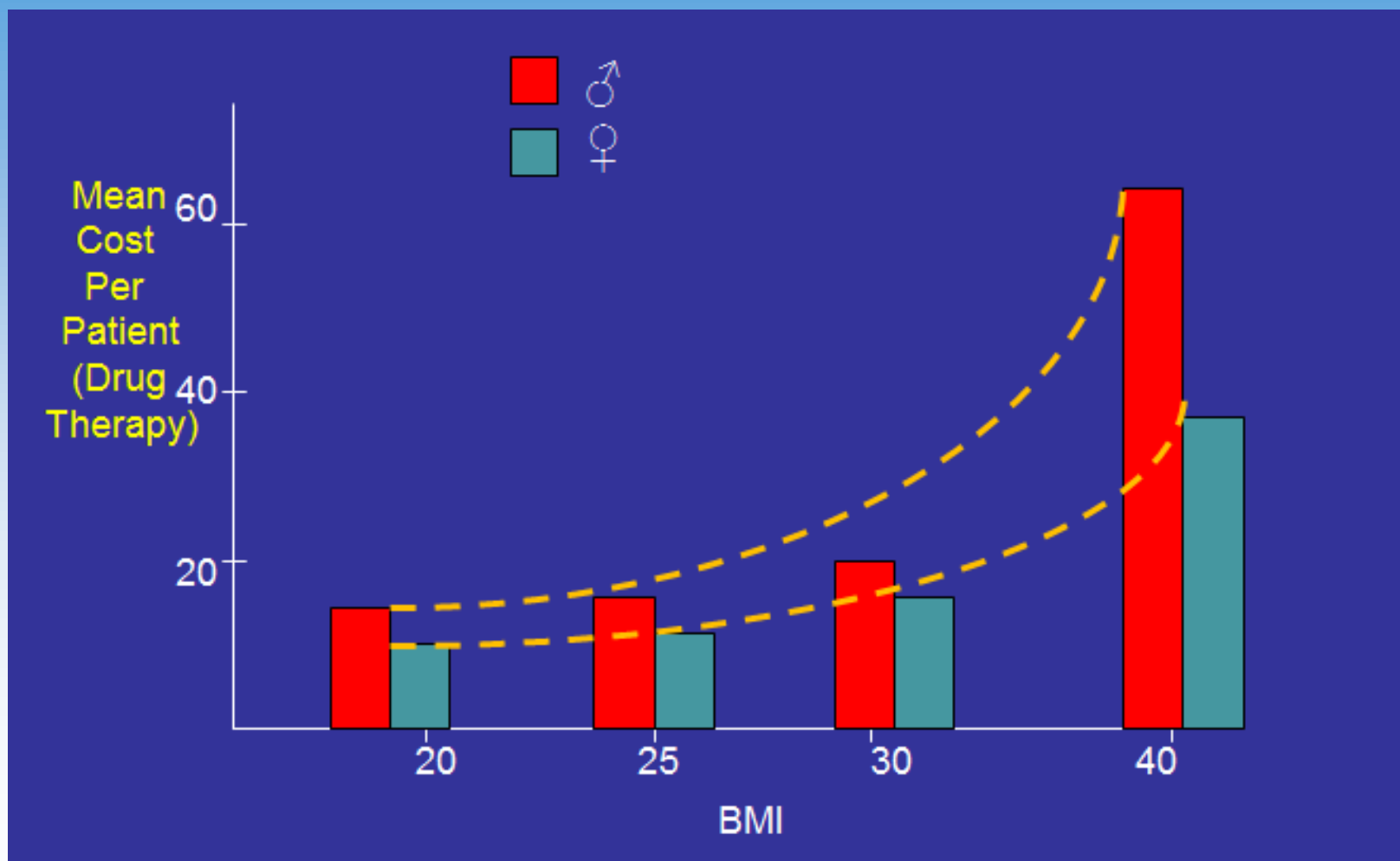


n=446 All p < 0.001

n=446 All patients entered the program and achieved $\geq 5\%$ weight loss at 12 months

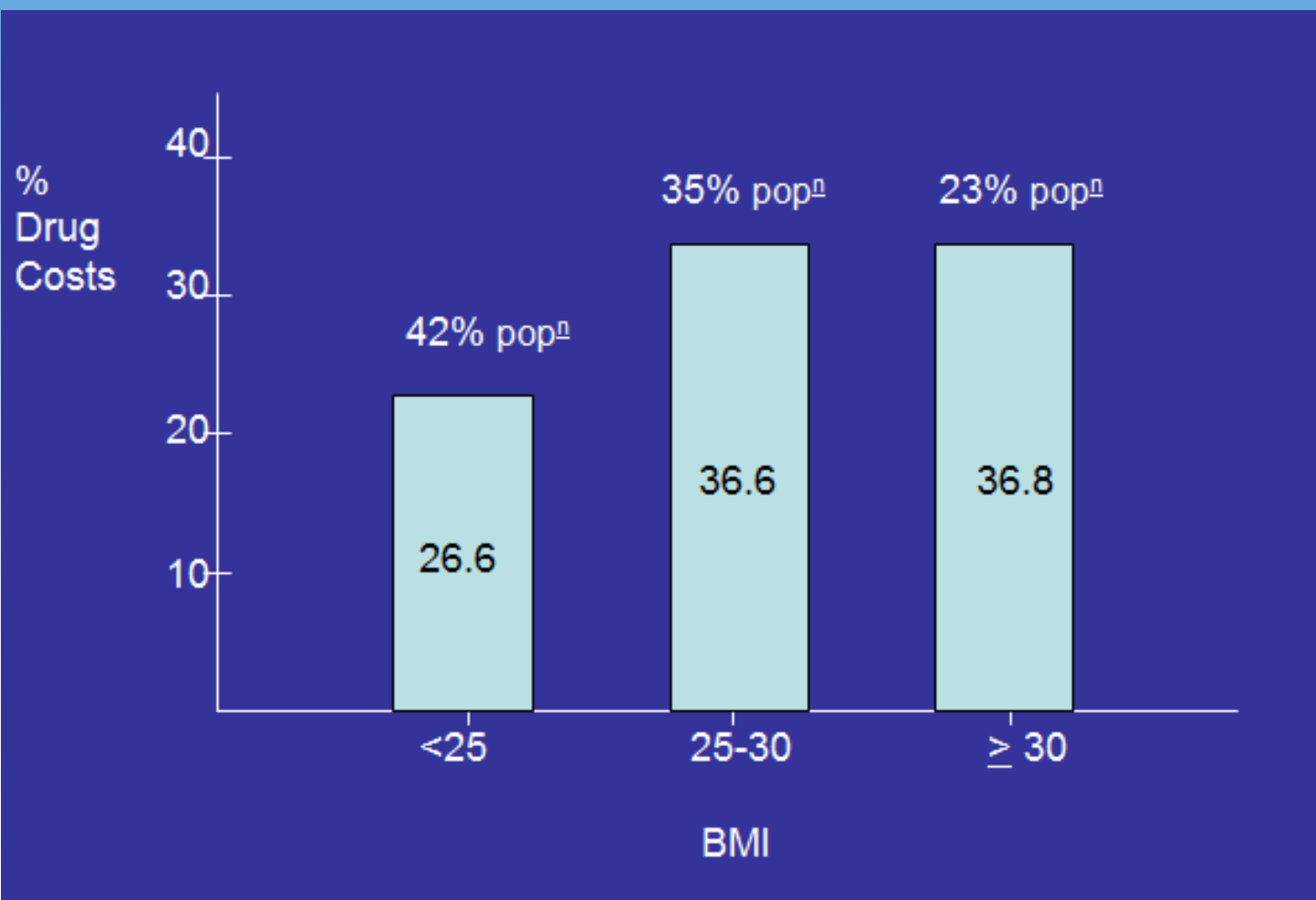
Counterweight Outcomes

Health Economics I



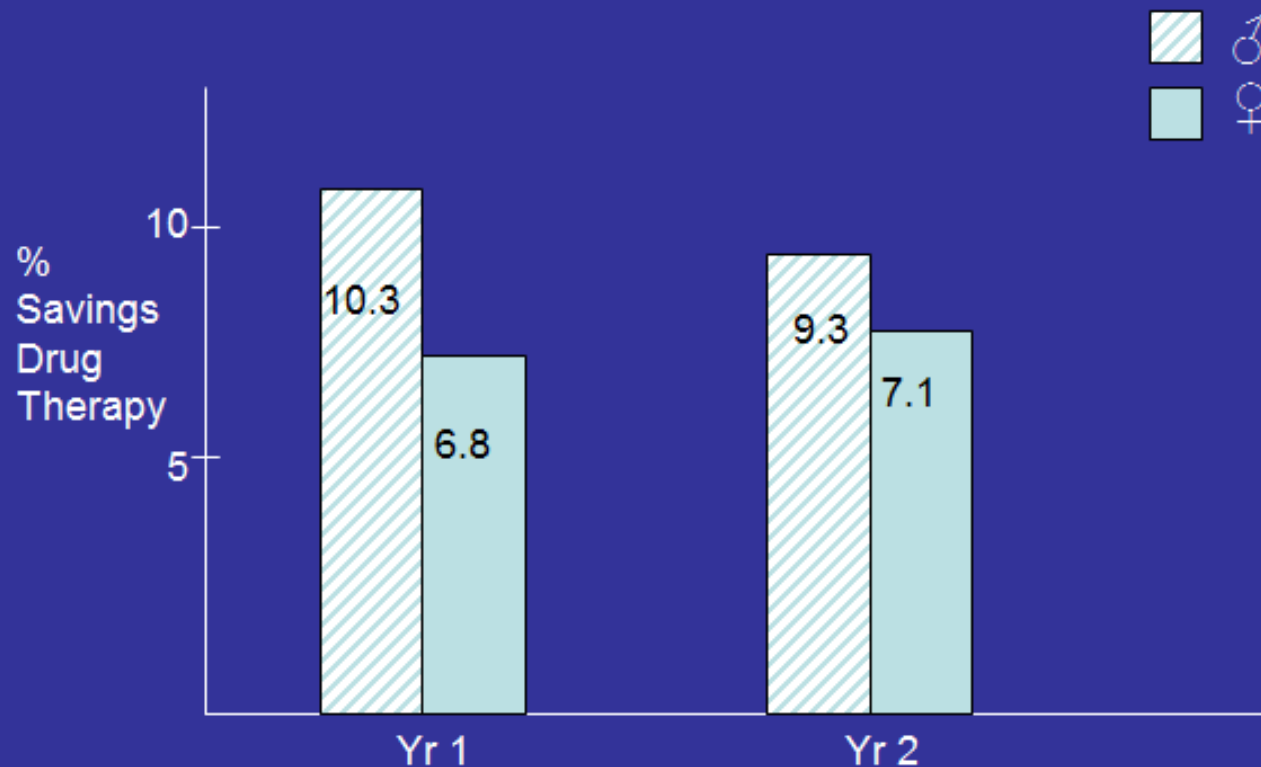
Counterweight Outcomes

Health Economics II



Counterweight Outcomes

Health Economics III



Note UK 'Top Ten' Drugs spend 2001 → £1.55 Billion

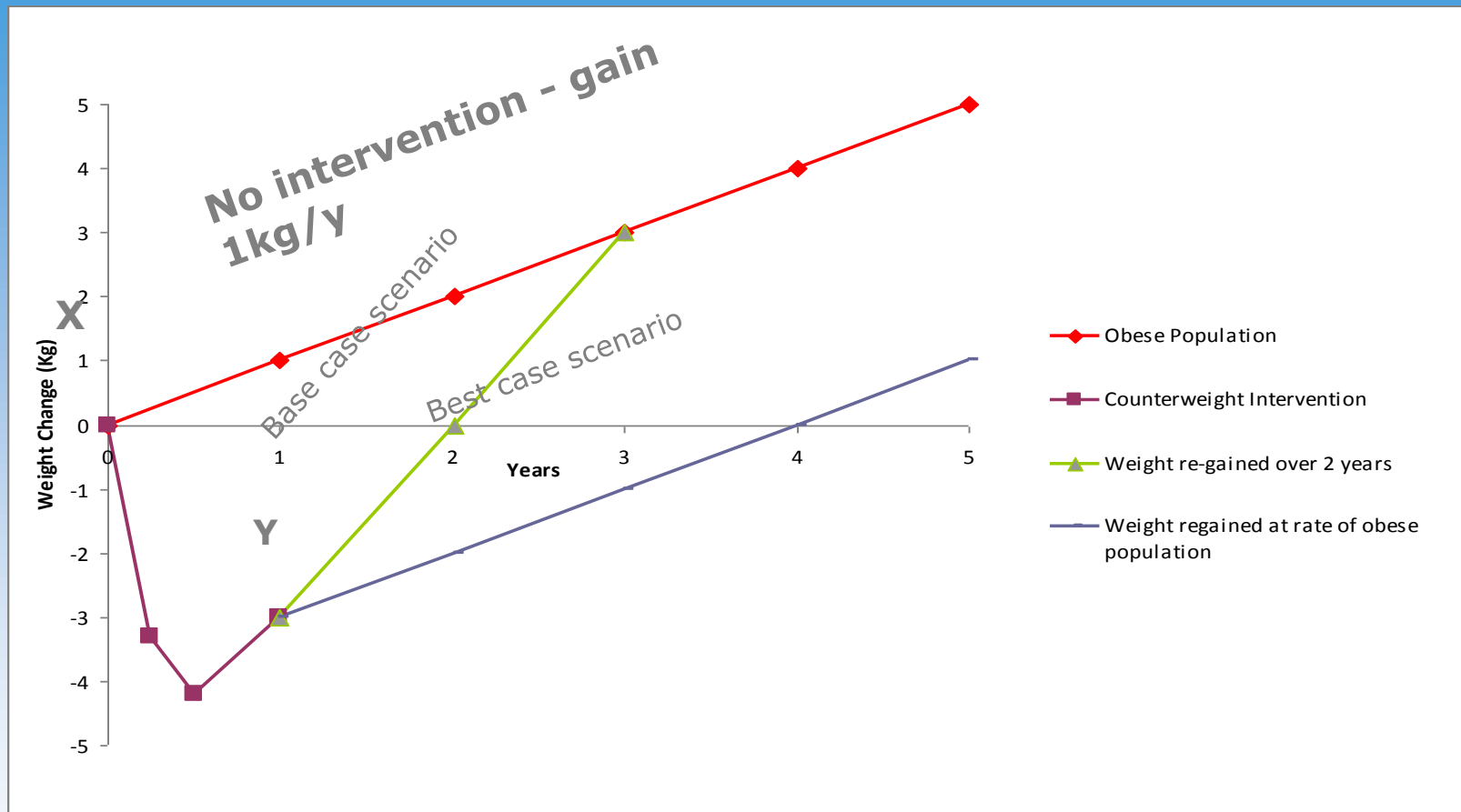
Factors Affecting Weight Change (kg)

Diabetes	<i>n</i>	Mean (SD) weight change, kg	95% CI
Not present	510	-3.30 (6.98)	-3.91 to -2.70
Present	132	-1.63 (4.91)	-2.47 to -0.78*

Factors Affecting Weight Change (kg)

No. Visits	<i>n</i>	Mean (SD) weight change, kg	95% CI
0-5	212	-0.65 (5.37)	-1.38 to -0.07*
6-9	200	-2.60 (6.06)	-3.45 to -1.76*
10-15	148	-4.67 (6.13)	-5.66 to -3.67
16-20	49	-5.95 (6.74)	-7.88 to -4.01
>20	33	-7.82 (11.62)	-11.94 to -3.70

Illustration of Scenarios

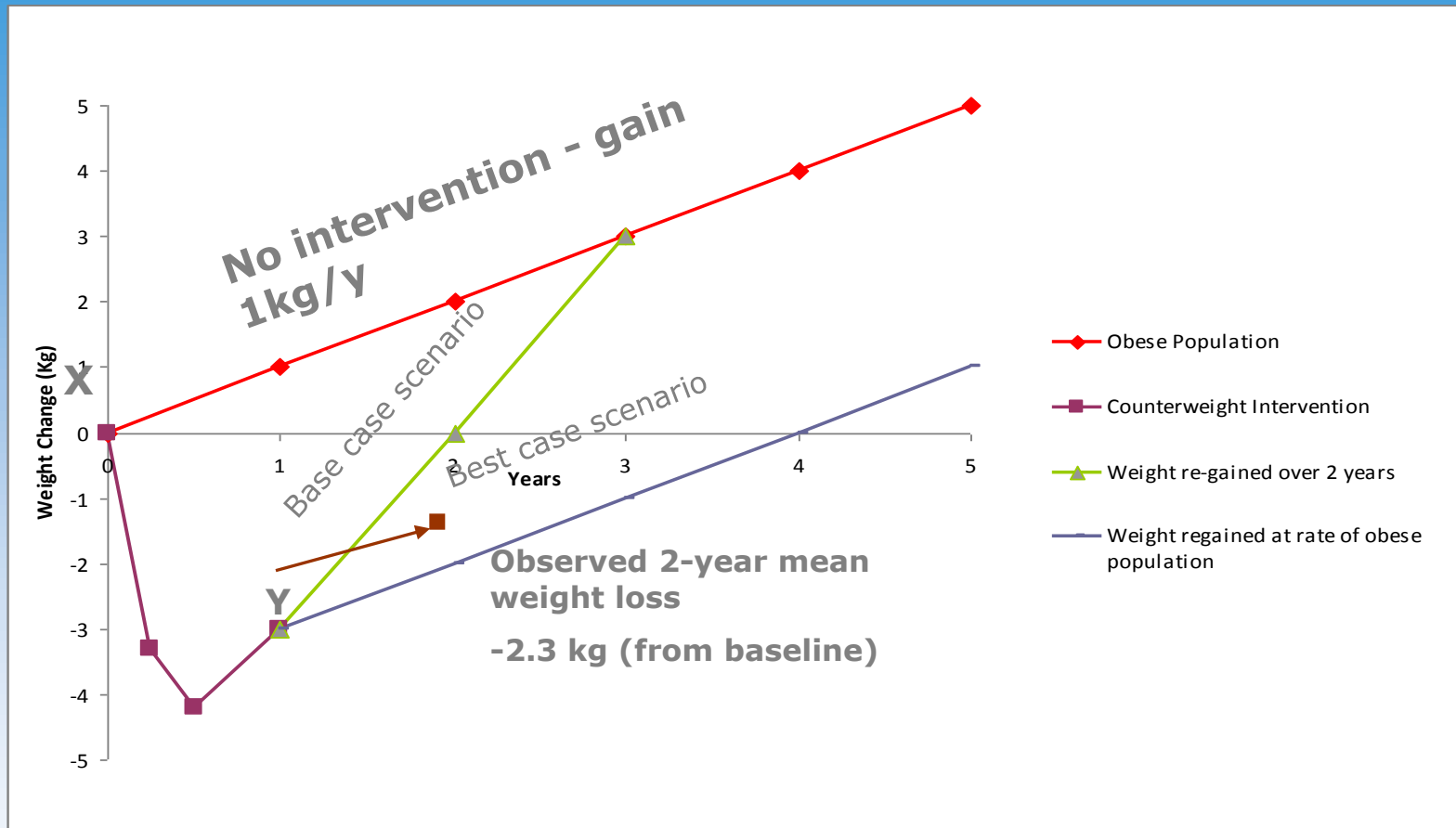


X = Baseline. Y= 12 months with Counterweight intervention

Base case scenario = **Regain all 4 kg weight difference effect in 2 yrs**

Best case scenario = **Life-long maintenance of 4 kg weight difference**

Illustration of Scenarios



X = Baseline. Y = 12 months with Counterweight intervention

Base case scenario = **Regain all 4 kg weight difference effect in 2 yrs**

Best case scenario = **Life-long maintenance of 4 kg weight difference**

Long-term Results

	Average weight loss at 1 year (kg)	Duration of weight loss (years)	Incremental cost per QALY
Scenario 1	3	2	Dominant*
Scenario 2	3	Lifetime	Dominant*
Scenario 3	3	0.5	£57.21

Circulation. 207;116:II_882

Some Context

- approx. costs/QALY for comparison

- Smoking cessation £250-500
- Hip replacement £5,000-6,000
- Breast cancer screening £15,000-20,000
- Renal dialysis £30,000-50,000
- β Interferon > £50,000
- **Counterweight** (worst case scenario) **£57**

Circulation. 207;116:II_882

Continuous Improvement

- 8 hours training classroom based
- Increased focus on realistic goals for weight change
- Additional 4 hours training
- Lapse management moved session 5 to session 1
- New processes for patient recall
- Buddy Dietitian

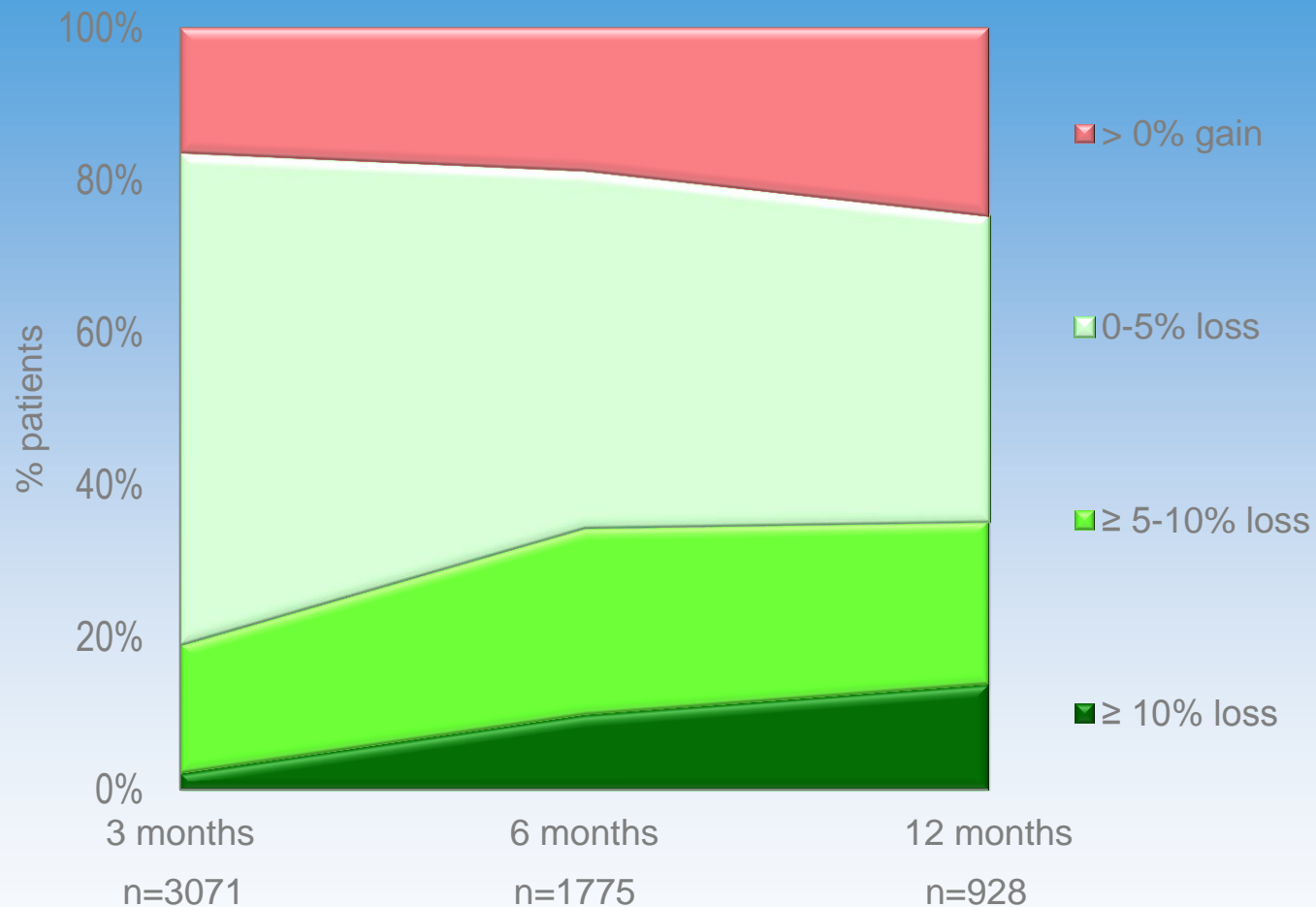
Phase 2

- Scotland - 8 Health Boards 2006-2010
- England - 20 Primary Care Trusts each year
- Evaluation on-going

Patient characteristics

	Established practice 2006-2010		Original evaluation 2000-2005	
Practices	184		56	
Number of patients	6715		1906	
Mean BMI (kg/m ²), (s.d.)	37.0	(6.2)	37.1	(6.0)
Mean age, (s.d)	53.0	(10.4)	49.0	(13.5)
% Women	74.3		77.0	
% BMI>40 kg/m ²	25.8		25.4	
% BMI>50 kg/m ²	3.9		3.0	

Weight loss in Attenders



Counterweight Funding

- **Research phase 2000-2006**
Unencumbered grant from Roche Products Ltd
- **Scotland 2006 onwards**
Scottish Government
- **England 2006 onwards**
Primary Care Trusts
Unencumbered grant from Sanofi Aventis (2006)

Summary

- Clinically significant weight loss and maintenance achievable in primary care
- Counterweight shown to be clinically beneficial and cost effective
- Continuous Improvement Methodology enables on-going programme development

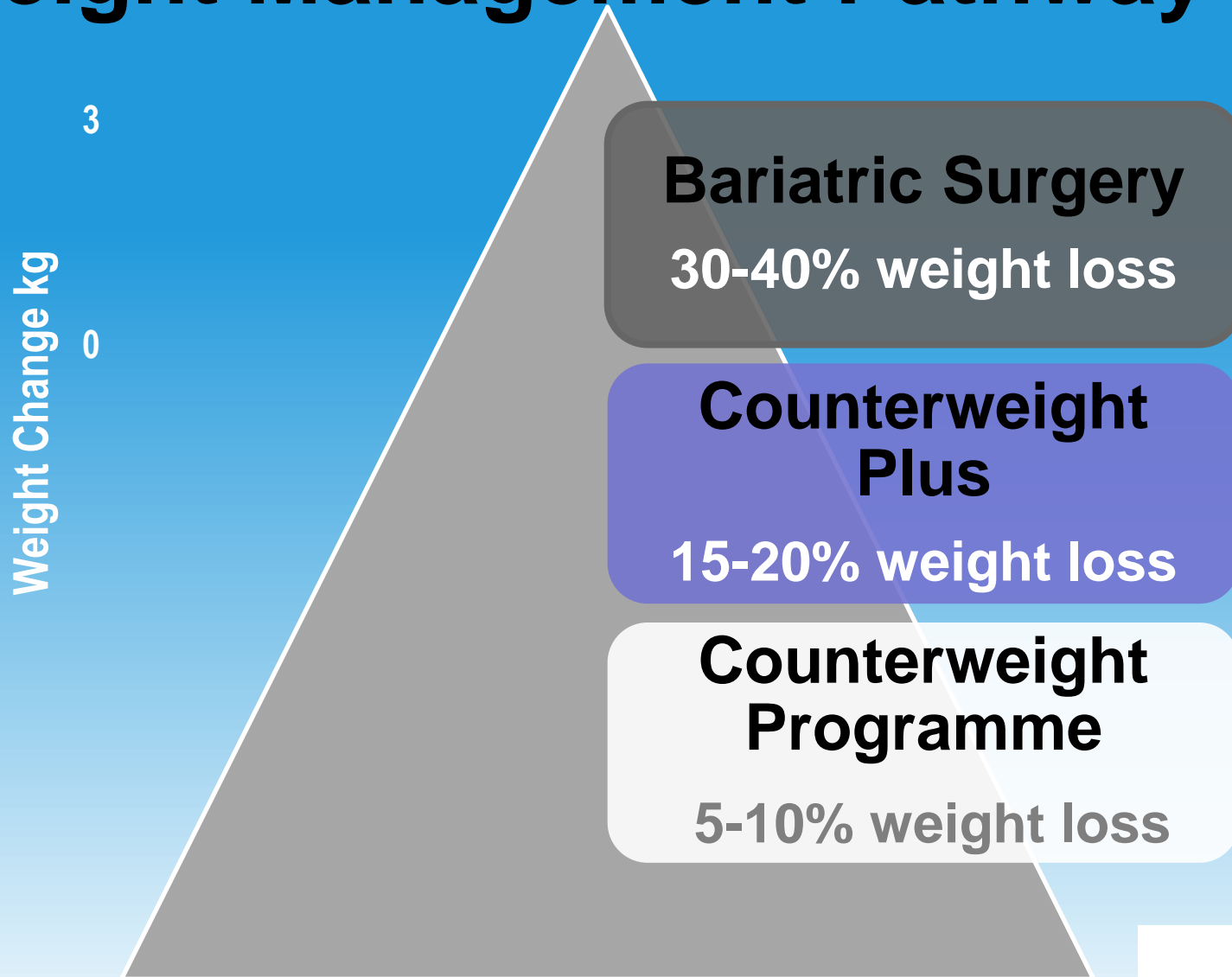
www.counterweight.org

Rationale for Counterweight Plus

- 5-10% weight loss target achieved for at least 24m by 30% attenders (1:6 all patients enrolled)
- Mean BMI = 37 kg/m²
- 25% had BMI \geq 40 kg/m²
- Clinical requirement for greater weight loss
- Counterweight Plus aimed \geq 15kg loss at 12m

Br J Gen Pract. 2008; 58: 548-554
Family Practice 2012; 29:i139–i144

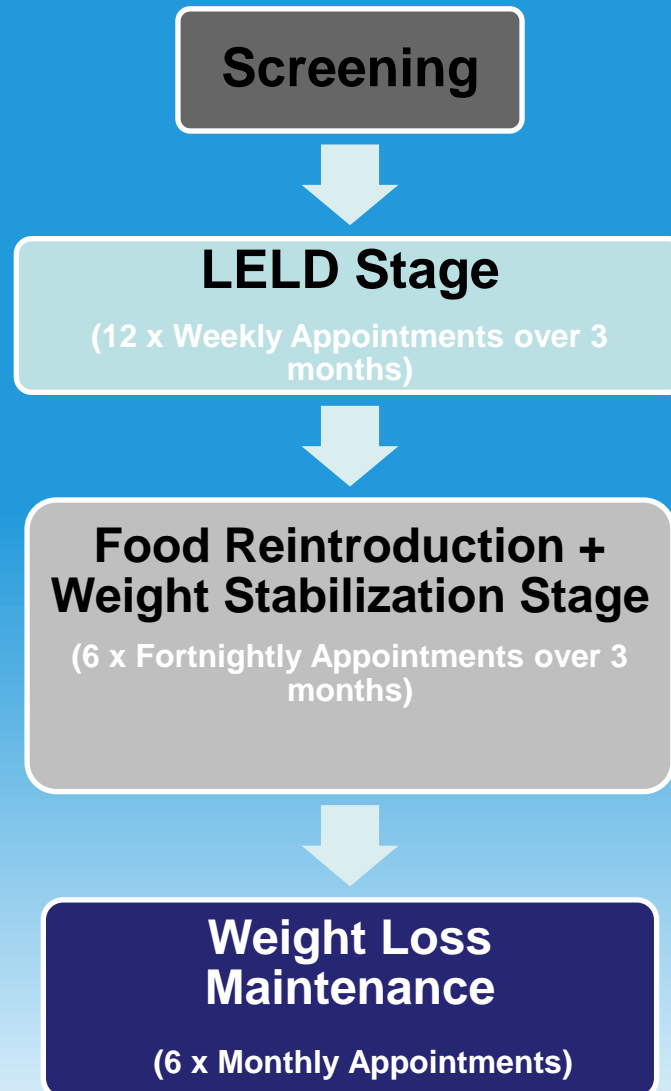
Weight Management Pathway



Counterweight low energy liquid diet in primary care

- Scottish Government funded
- Developed from Counterweight original programme
- Primary care delivered
- Practice nurse trained
- Practice nurse led
- Inner city, semi-rural and rural populations

Programme Structure



Counterweight LELD-Results

NHS Feasibility Study- Background

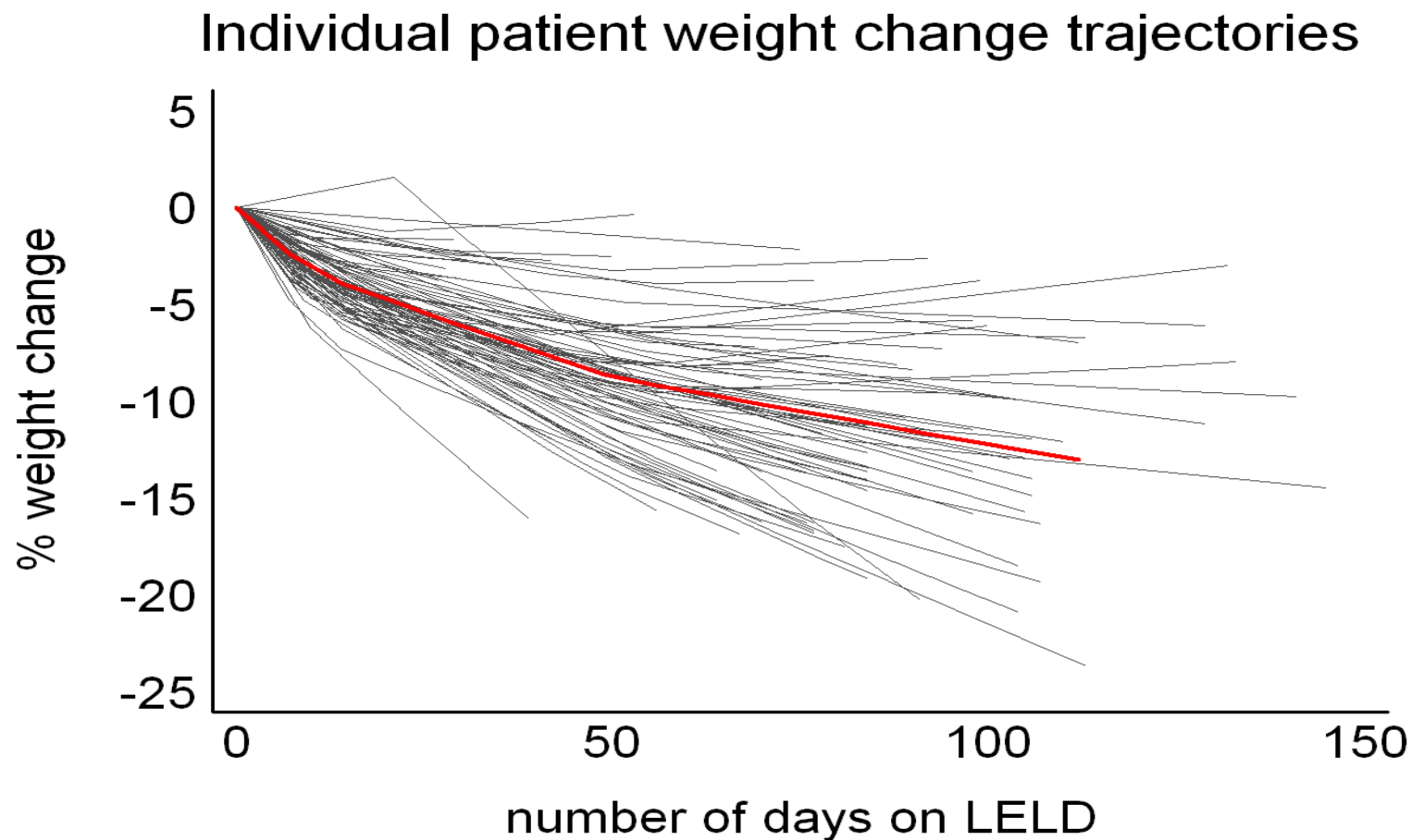
- 91 patients
- $\text{BMI} \geq 40 \text{ kg/m}^2$
- 78% women
- Mean weight 131kg
- Quantitative and qualitative evaluation

Counterweight LELD-Results

NHS Feasibility Study- 12weeks

- Mean duration of diet 12 weeks
- Mean weight loss was 13.3kg (10.1%)
- Mean weight loss completers 17.4kg (13%)
- 38% dropout rate

Counterweight LELD-Results



Cost Implications for Practice

- Cost per patient £861 entered or £2611 achieving $\geq 15\text{kg}$ weight loss at 12 months (64% cost is total diet replacement product)
- £1m will treat 1161 patients with CWT Plus, for 383 to achieve $\geq 15\text{kg}$ weight loss
- £1m will treat 133 with laparoscopic banding (assuming £7500/patient) for 110 to achieve $\geq 15\text{kg}$ weight loss

Counterweight Project Team

Counterweight Team

Hazel Ross, Louise McCombie, Sarah Haynes,
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Marney Quinn, Frances Thompson, Adri Vermeulen, Anna Bell-
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National Counterweight Board

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Dr David Haslam, Prof. Sudhesh Kumar, Prof. Mike Lean,
Dr John Reckless, Dr Julian Hamilton-Shield

IT and Statistics

Billy Sloan, Dr David Morrison

Health Economics

Dr Paul Trueman