



ROYAL COLLEGE OF
PHYSICIANS OF IRELAND

PUBLIC MEETING SERIES
Promoting a healthy nation



FACULTY OF
PAEDIATRICS

Childhood Obesity
– A Sizeable Problem

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Prevalence of Childhood Obesity

- “global epidemic” *WHO, 1998*
- 22 million children under 5 years worldwide are overweight or obese

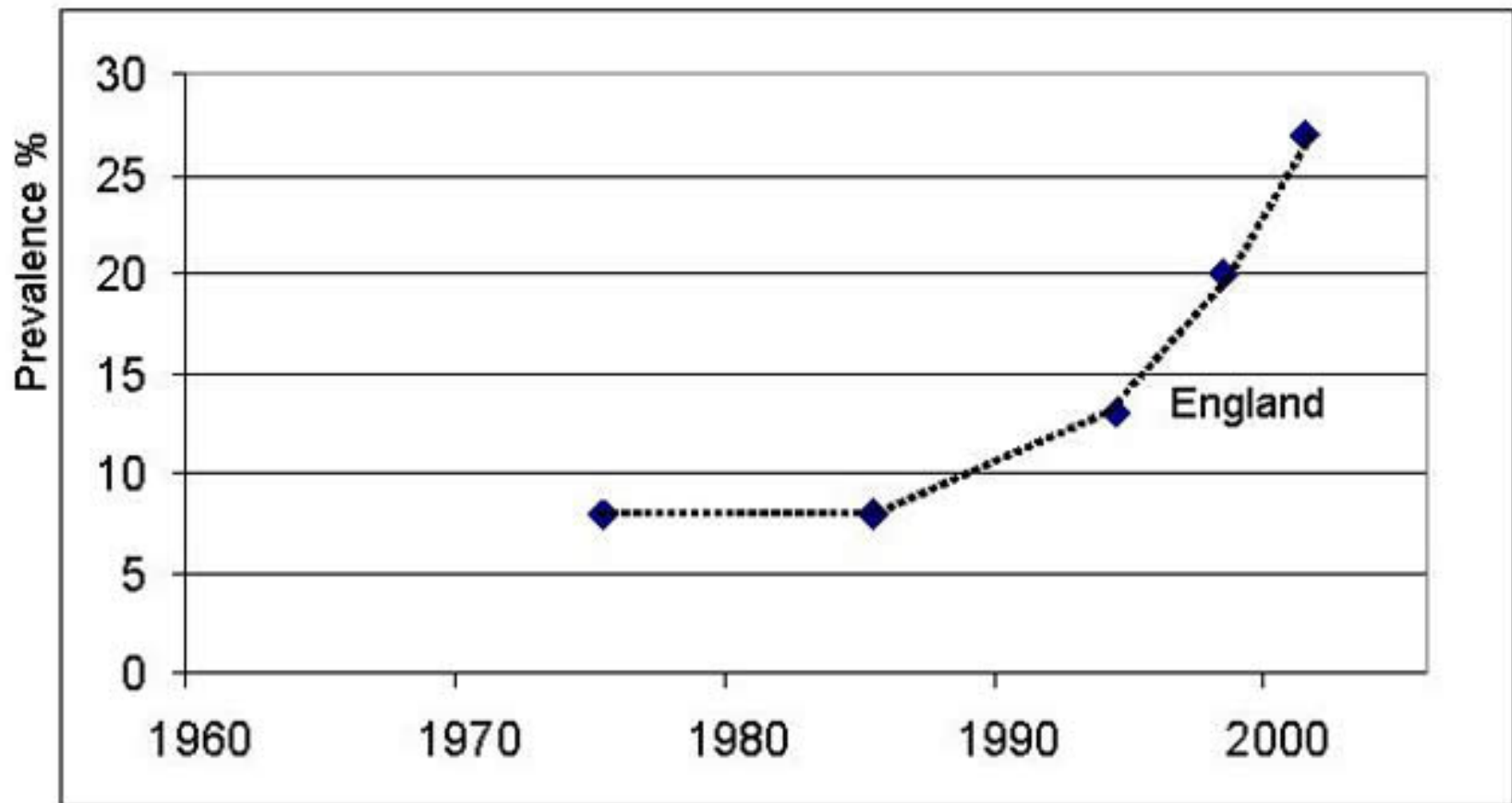
*Deckelbaum & Williams *Obes Res* 2001;9(S4):239S-243S*

- At least 155 million school-age children worldwide are overweight or obese and 30-45 million are obese

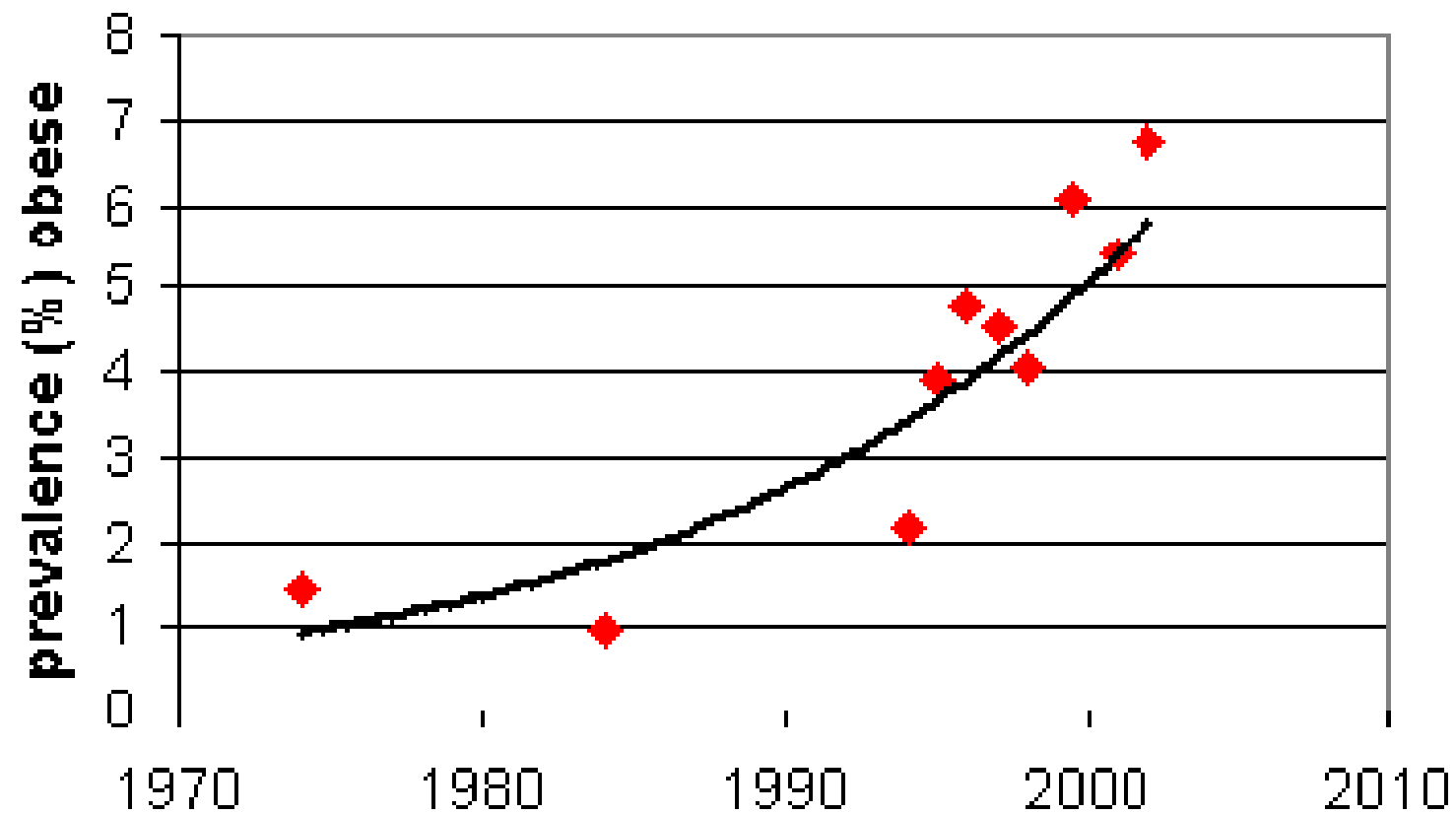
*International Obesity Task Force, *Obesity Reviews**

Overweight children

Trends in the last three decades



Obesity in children 2-15 in England (IOTF definition of obese)



Child Obesity in Ireland

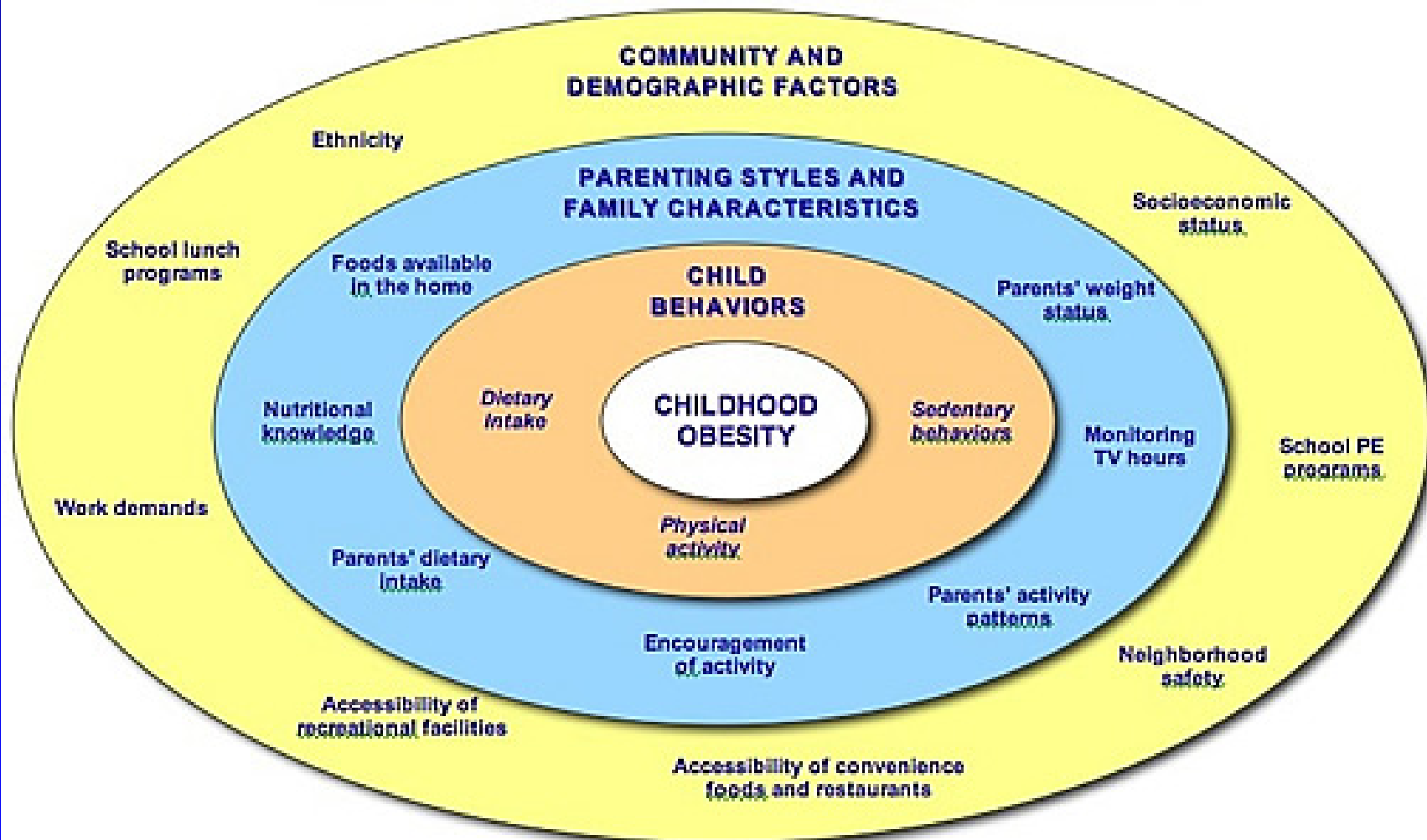
Aged 4- 16 years

- 23% boys overweight or obese
- 6% boys obese

- 28% girls overweight or obese
- 7% girls obese

Whelton et al., BMC Public Health 2007, 7: 187

Contextual Influences on the Development of Childhood Obesity



Adapted from Davison & Birch (2001), *Obesity Reviews*, 2, 159-171

Why are we becoming obese

- Busy lives, changing social structure, commuting
- Sedentary behaviours
- Sedentary pursuits tv/video or computer games
- Opportunities for physical activity
- Safety issues –walk to school/play
- Eating practices – on the go, in front of tv, outside home, grazing, constant supply, high energy foods, high energy drinks

Does child and Adolescent
obesity matter?

Health Implications

Health implications of Obesity

- Premature death
- Cardiovascular disease
- Stroke
- Hypertension
- Diabetes, IGT
- Liver disease
- Gallbladder disease
- GORD
- Sleep apnoea- breathing problems
- High cholesterol
- Menstrual problems, PCOS
- Complications in pregnancy
- Hirsutism
- Stress incontinence
- Osteoarthritis
- Gait abnormalities, joint pains, SUFE
- Cancer –endometrial, colon, kidney, gb, breast
- Surgical risk
- Psychological difficulties

Health implications of Obesity

Psychological

Poor self-esteem

social isolation

under-performance

Bullying

behavioural problems

anxiety

depression

current and future morbidity

Cardiovascular changes

fatty streaks, raised lesions and calcifications aorta & coronary arteries increases with age
Berensen, NEJM, 1998;338:1650-6

Cardiovascular risk factors for later life

65% obese 5-10 yo min 1 cardiovascular risk factor

25% obese 5-10 yo \geq 2 risk factors

Freedman et al, The Bogalusa Heart Study, Paediatrics, 1999

Impaired glucose tolerance – type 2 diabetes rising

8-45% of child diabetes population

Metabolic syndrome

US up to 50%

UK 30%

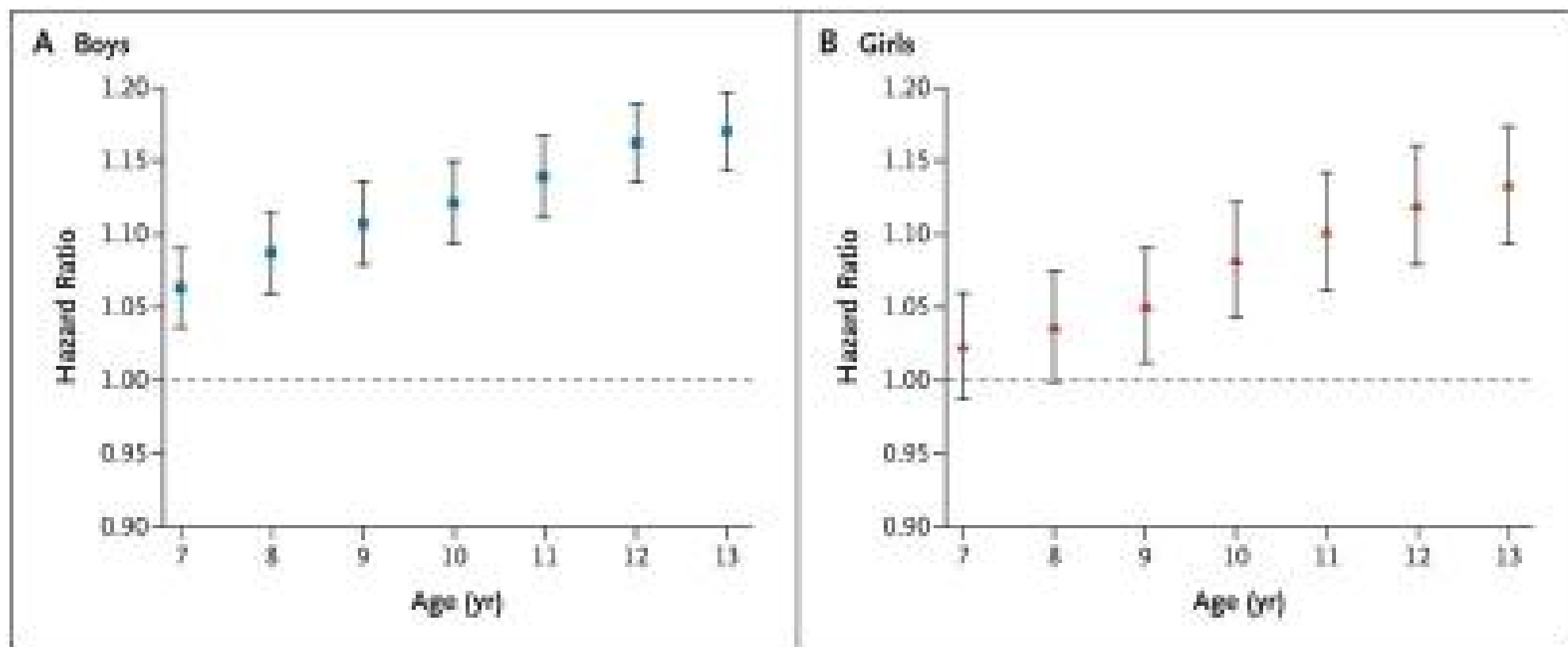
AMNCH 9%

Weiss et al; NEJM 2004; 350:23:2362-74

Viner et al, Arch Dis Child 2004

Roche et al, in press

Childhood Body-Mass Index and the Risk of Coronary Heart Disease in Adulthood



Baker JL, Olsen LW, Sørensen T. NEJM 2007; 357(23): 2329

Childhood Body-Mass Index and the Risk of Coronary Heart Disease in Adulthood

Adjusted Hazard Ratio for the Risk of a Fatal or a Nonfatal CHD Event in Adulthood in Relation to a 1-Unit Increase in BMI z Score in a Cohort of 276,835 Children.

Table 2. Adjusted Hazard Ratio for the Risk of a Fatal or a Nonfatal CHD Event in Adulthood in Relation to a 1-Unit Increase in BMI z Score in a Cohort of 276,835 Children.*

Age	Nonfatal Event		Fatal Event	
	Boys	Girls	Boys	Girls
	<i>relative risk (95% confidence interval) †</i>			
7 yr	1.05 (1.03–1.08)	1.02 (0.98–1.06)	1.10 (1.06–1.15)	1.07 (0.99–1.15)
8 yr	1.08 (1.05–1.11)	1.02 (0.98–1.06)	1.14 (1.09–1.19)	1.08 (1.01–1.17)
9 yr	1.10 (1.07–1.12)	1.03 (0.99–1.07)	1.16 (1.11–1.21)	1.10 (1.02–1.19)
10 yr	1.11 (1.08–1.14)	1.06 (1.02–1.10)	1.18 (1.13–1.23)	1.12 (1.04–1.20)
11 yr	1.13 (1.10–1.16)	1.07 (1.03–1.12)	1.22 (1.17–1.27)	1.18 (1.10–1.27)
12 yr	1.15 (1.13–1.18)	1.10 (1.06–1.14)	1.23 (1.18–1.28)	1.20 (1.11–1.29)
13 yr	1.17 (1.14–1.20)	1.11 (1.07–1.15)	1.24 (1.19–1.29)	1.23 (1.15–1.32)

* Analyses were stratified according to birth cohort.

† Trend tests led to the rejection of the alternative of nonlinearity modeled as a restricted cubic spline with five knots (all P values >0.10).

Childhood onset obesity

worse prognosis in adult life

- increased all cause and cardiovascular mortality

Gunnell et al, *Am J Clin Nut*, 1998

- increased risk for metabolic syndrome

Vanhala et al, *BMJ* 1998

- increased morbidity and mortality if overweight in adolescence even if extra weight lost in adulthood

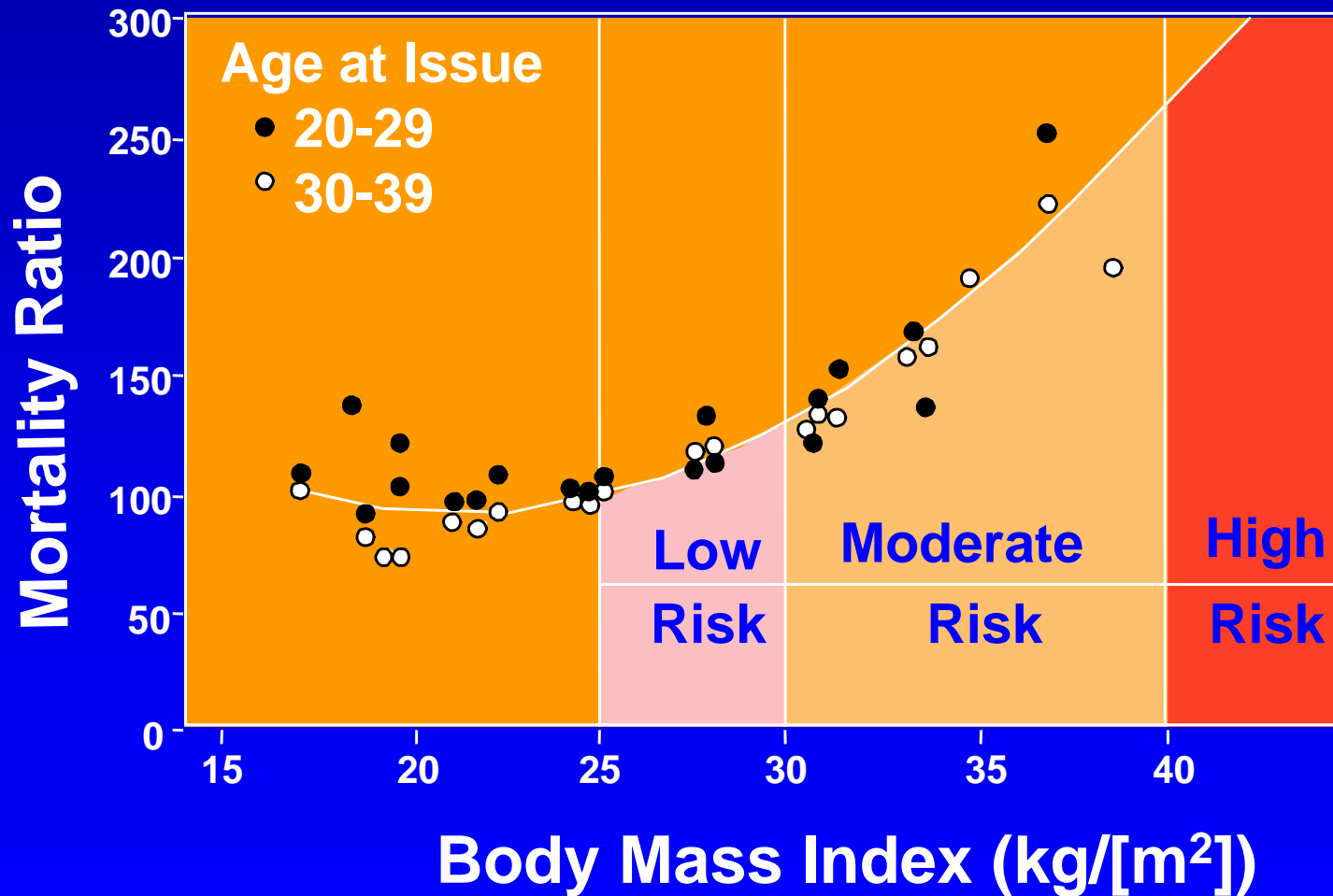
Must, Dietz et al, *NEJM* 1992;327:1350-5.

A follow-up of the Harvard Growth Study 1922-1935.

Do obese children become obese adults?

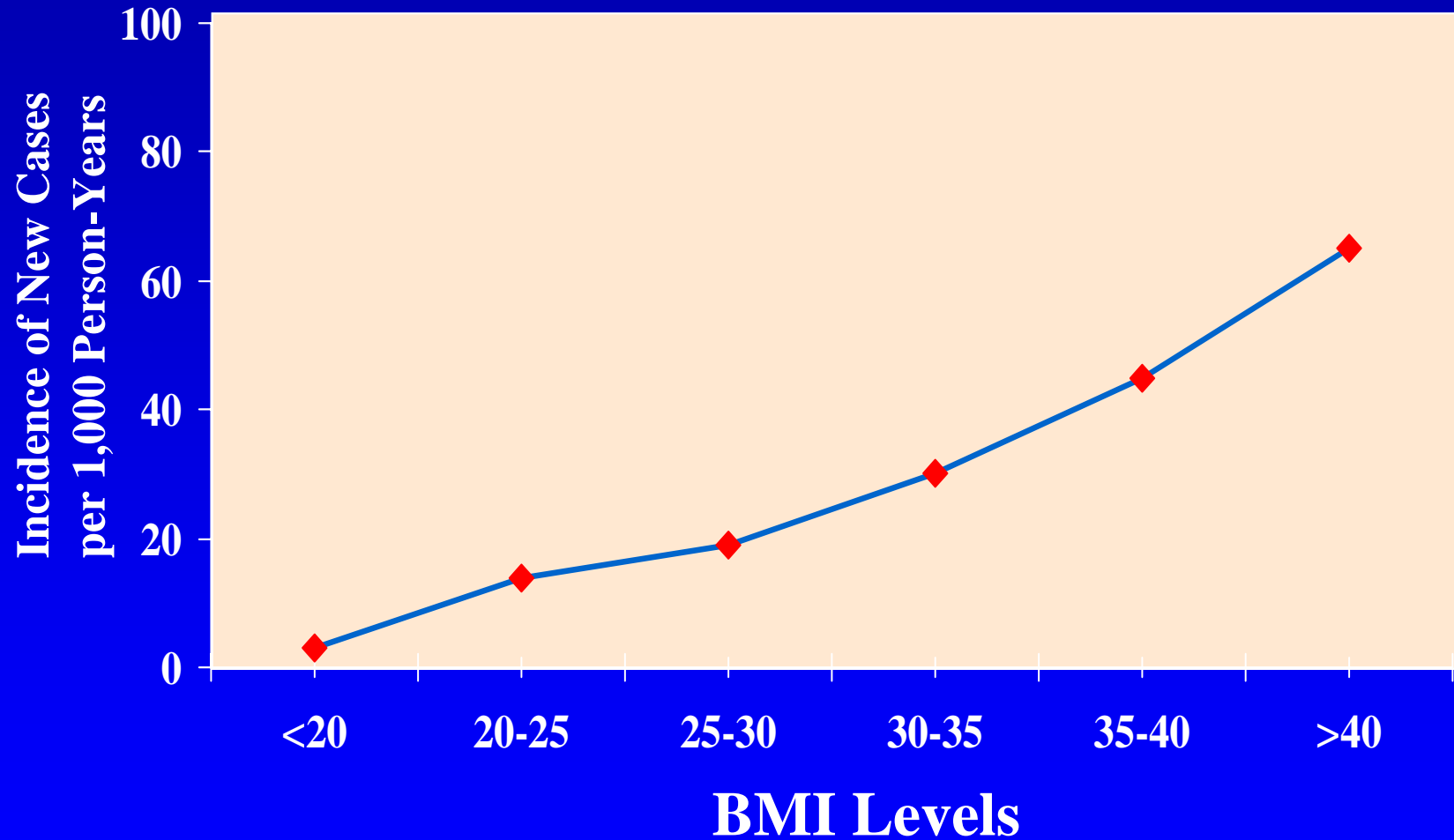
- 30% of adult obesity begins in childhood so many adults were not obese children and not all obese children will stay obese
- 1/3 obese preschoolers = obese adults (26-41%)
- half (42-63%) obese school age = obese adults
- Predictive value increases with age
- All ages risk twice as high for obese as non-obese (range 2-6.5 fold risk)
Serdula et al, Preventative Medicine 1993;22;167-177
- Parental obesity > doubles the risk of adult obesity in both obese and non-obese children < 10 years
Whittaker NEJM 1997;337(13):869-73

Relationship of BMI to Excess Mortality



Bray GA. Overweight is risking fate. Definition, classification, prevalence and risks. *Ann NY Acad Sci* 1987;499:14-28.

Obesity and Diabetes Risk



The Cost of Obesity

Type 2 Diabetes

- Rise parallels rise in Obesity
- 3.9% prevalence Cork/Kerry

Perry et al, IMJ 2002:95(10).

- 6% estimated prevalence of diagnosed and undiagnosed diabetes
- Estimate cost € 377.2m (€580.2m) or 4.1 and 6.4% total healthcare expenditure

Nolan et al, IMJ 2006; 99(10):307-10

- 1.4 million in the UK diagnosed (3%) and possible 1 million undiagnosed
- 15 million diagnosed with T2DM in the US

The Cost of Obesity & Diabetes

- Type 2 Diabetes reduces life expectancy 10 years
- Mortality from CHD increased 5-fold in DM
- Associated complications
 - amputations
 - blindness
 - renal failure

Hospital Obesity related conditions

Obesity Related Conditions	1997	2004
Discharge frequency adults	1.14%	1.49%
Discharge frequency children	0.81%	1.37%
Annual Hospital cost	€4.4 m	€13.3m

Length of stay and associated costs of obesity related hospital admissions in Ireland, Vellinga A, O'Donovan D, DelaHarpe D, *BMC Health Services Research* 2008, 8:88

How effective is treatment?

Combined Behavioural Therapy

- Long-term benefits

[Epstein et al, *Health Psychol*, 1994, Nuutinen & Knip *Int J Obes* 1992, Braet & Van Winckel *Behav Ther* 2000]

- Children more successful than adults

[Epstein et al, *Obes Res*, 1995]

- Parent and child interventions best

[Epstein et al, *Paediatrics*, 1998]

- Parent alone better than child alone

[Epstein et al, *JAMA*, 1990]

- Lifestyle exercise superior to structured aerobic exercise

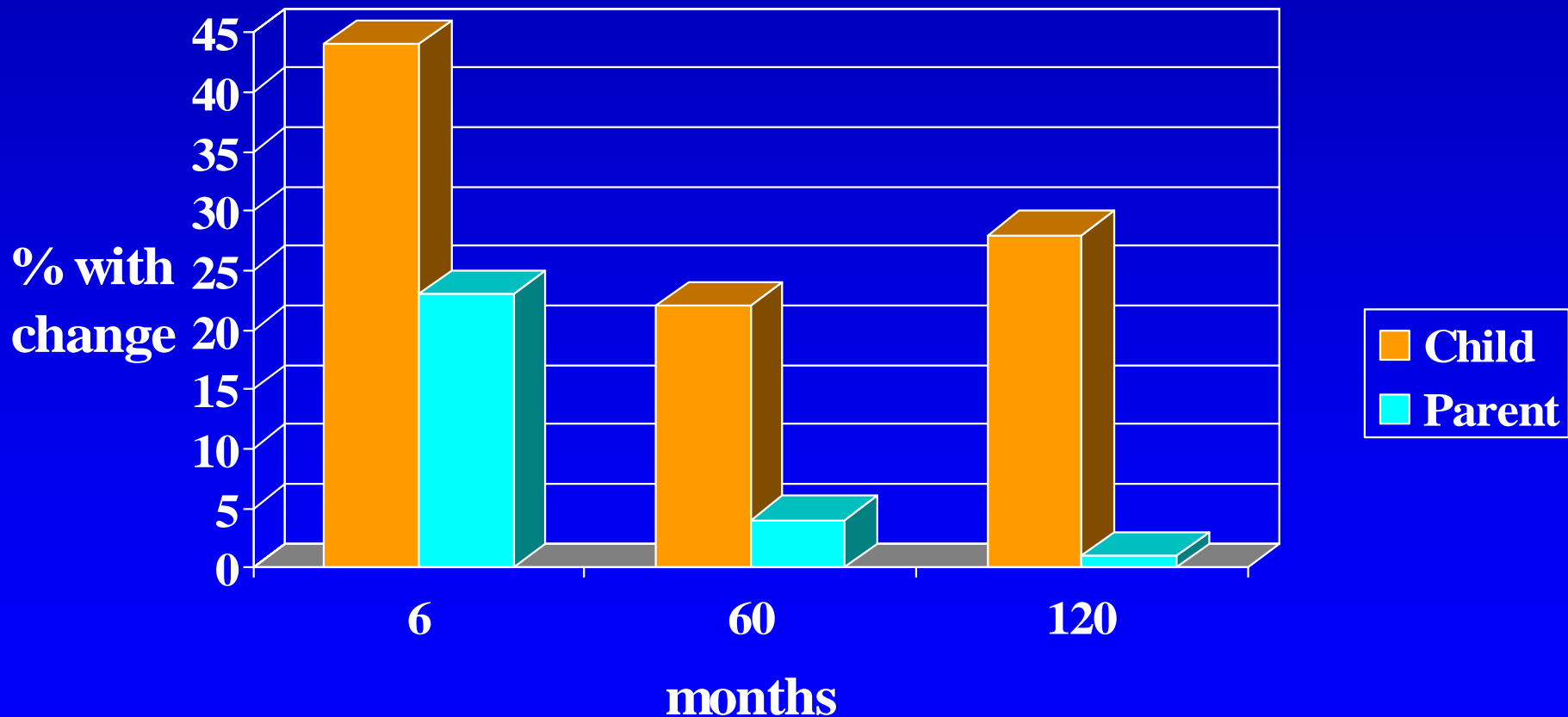
[Epstein et al, *Health Psychol*, 1994]

- Multidisciplinary team approach vital

Do Children Lose and Maintain Weight Easier than Adults ?

Epstein et al, *Obesity Research* 1995

Change in % overweight of at least -20%



$P < 0.001$ at 6, 60 & 120 months

Parent and child interventions best

	5 years	10 years
Child & Parent	-11.2%	-7.5%
non-specific	+ 7.9%	+14.3%
Child	+ 2.7%	+ 4.5%

Epstein et al, *JAMA*, 1990

Lifestyle exercise v structured aerobic exercise

Lifestyle exercise	-19.7%,	
aerobic exercise	-10.9%,	
calisthenics	+12.2%	at 10 years

[Epstein et al, *Health Psychol*, 1994]

Turning the Tide

Promote

awareness of obesity as a health issue
healthy lifestyle practices

Primary prevention

healthy eating & exercise for all

Secondary Prevention

early detection
early intervention (before obesity)
long term treatment and maintenance
regular monitoring for complications

Treatment for Obesity

- Initiate Early intervention
- Engage the patient
- Realistic Treatment goals - weight maintenance v loss
- Focus on Behavioural change
 - Healthy eating
 - Reducing sedentary behaviour, lifestyle exercise
 - Self-esteem
- Provide Ongoing treatment and support

Thank You