

# obesity and diabetes

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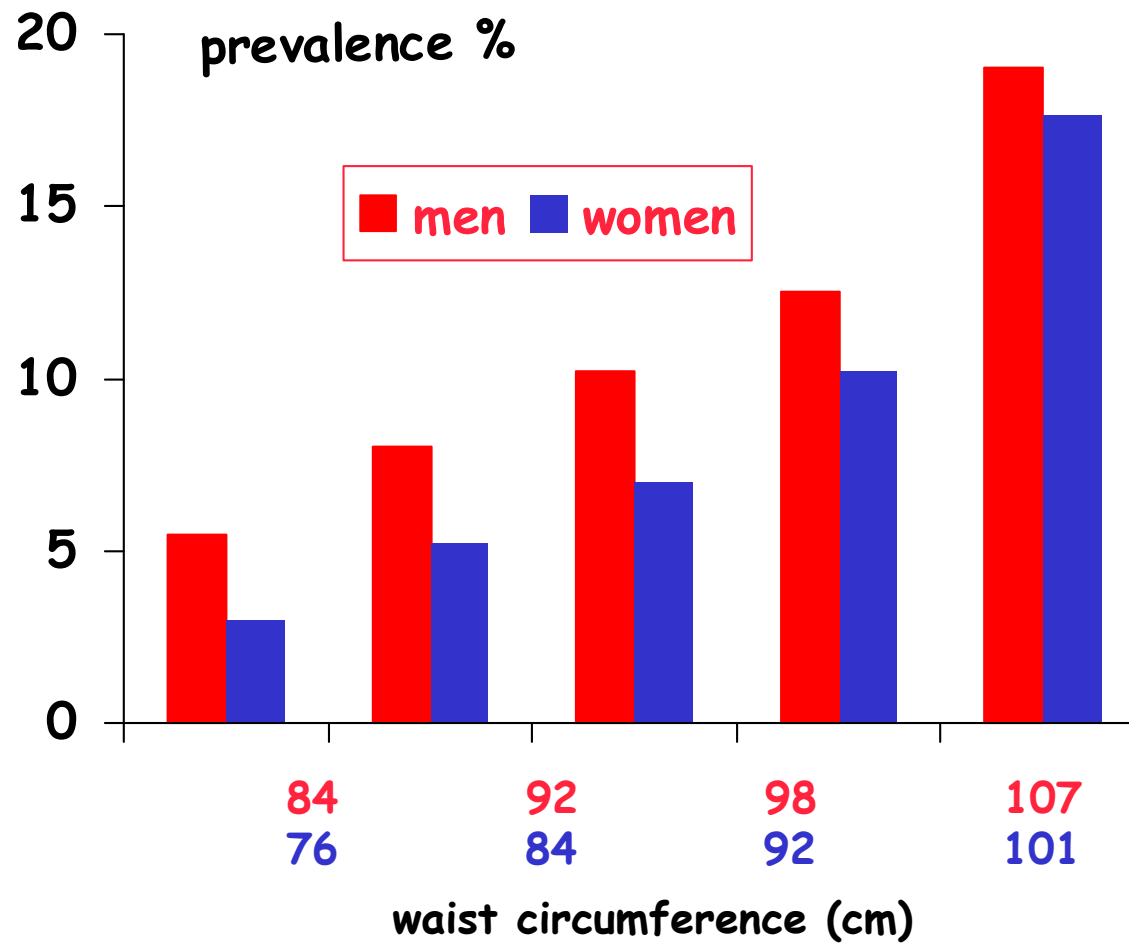
- obesity, abdominal adiposity and diabetes
  - associations
  - waist - a "predictor" of future diabetes
  - time correlations
- prevalence of obesity over time
  - France
  - France, Germany ... and other countries
  - by world regions, in primary practice
- the "timing" of adiposity and diabetes
- recent changes in obesity in France
- adolescent prevention program in France

# protocol - international IDEEA study

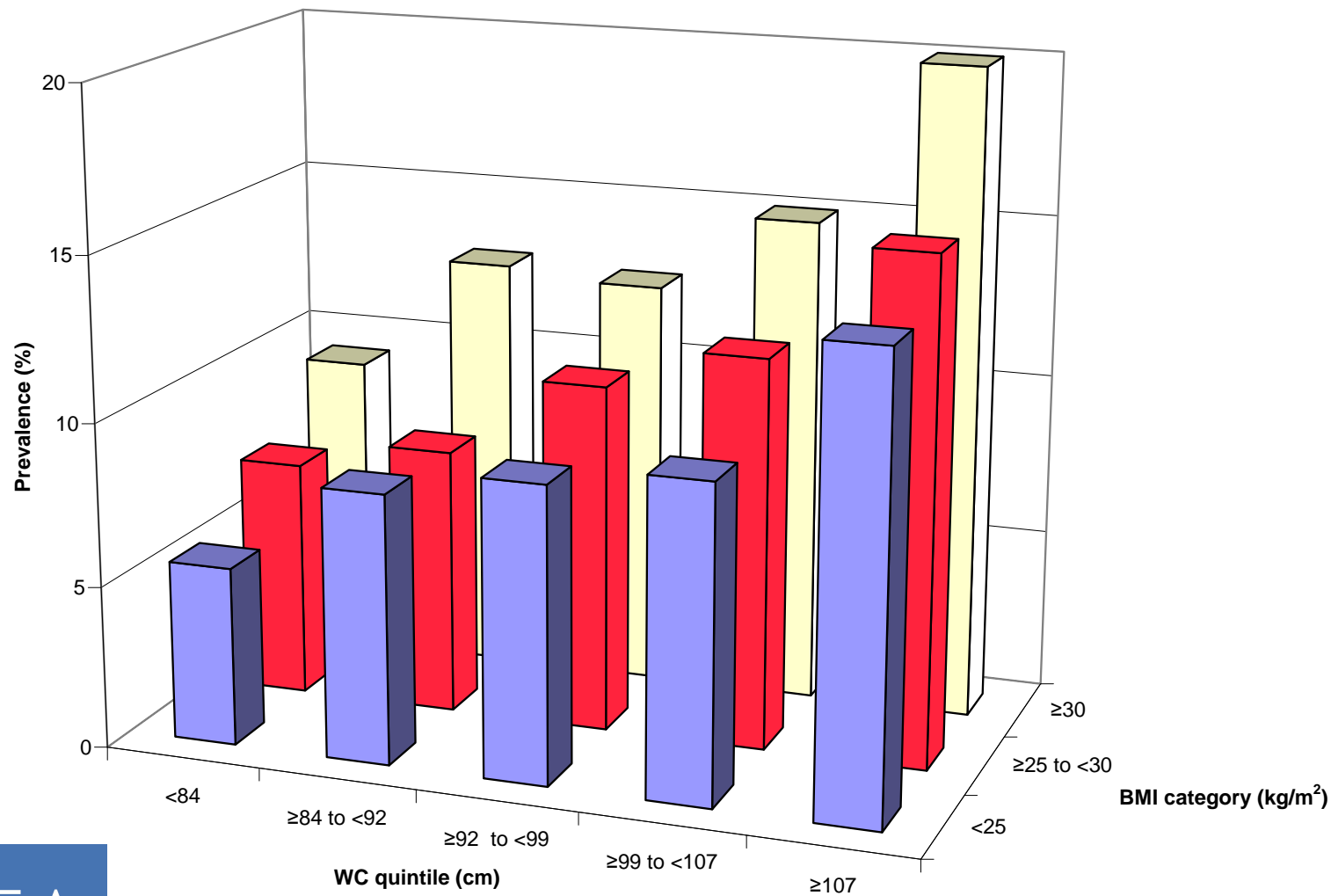
- random selection of primary care physicians in each region of each participating country
- physicians trained to
  - measure waist circumference, weight, height
  - complete a short form with
    - age
    - sex
    - presence of diabetes
    - presence of cardiovascular disease
- 170,000 patients in 63 countries



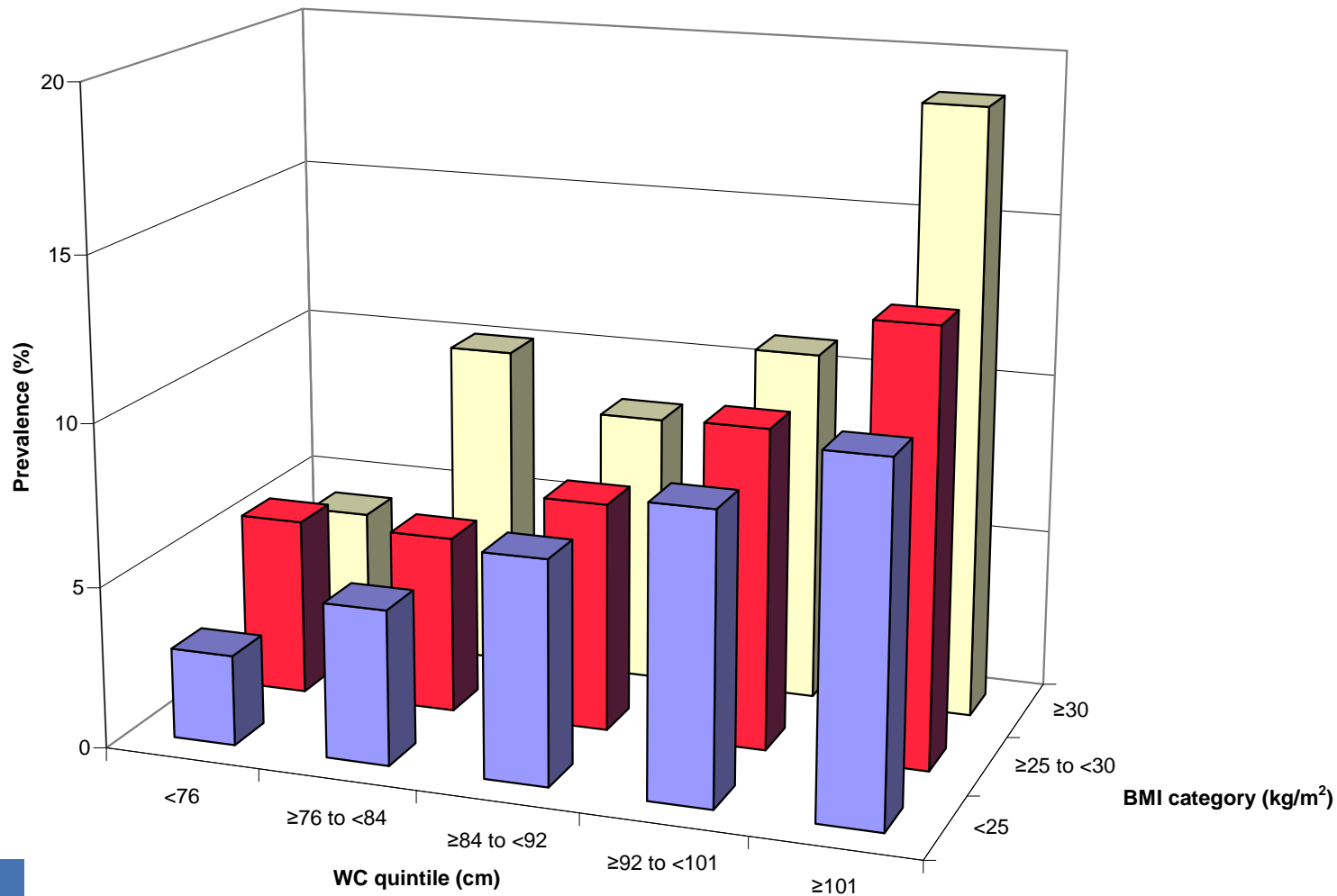
# diabetes & waist



# diabetes prevalence, BMI, waist men



# diabetes prevalence, BMI, waist women



# odds ratios for diabetes for a 1 SD increase in waist and BMI

	waist	BMI
men	1.6 (1.5-1.7) 14 cm	1.5 (1.4-1.6) 4.9 kg/m <sup>2</sup>
women	1.8 (1.7-1.9) 15 cm	1.7 (1.6-1.8) 5.9 kg/m <sup>2</sup>

# odds ratios for diabetes

for a 1 SD increase in waist by BMI categories

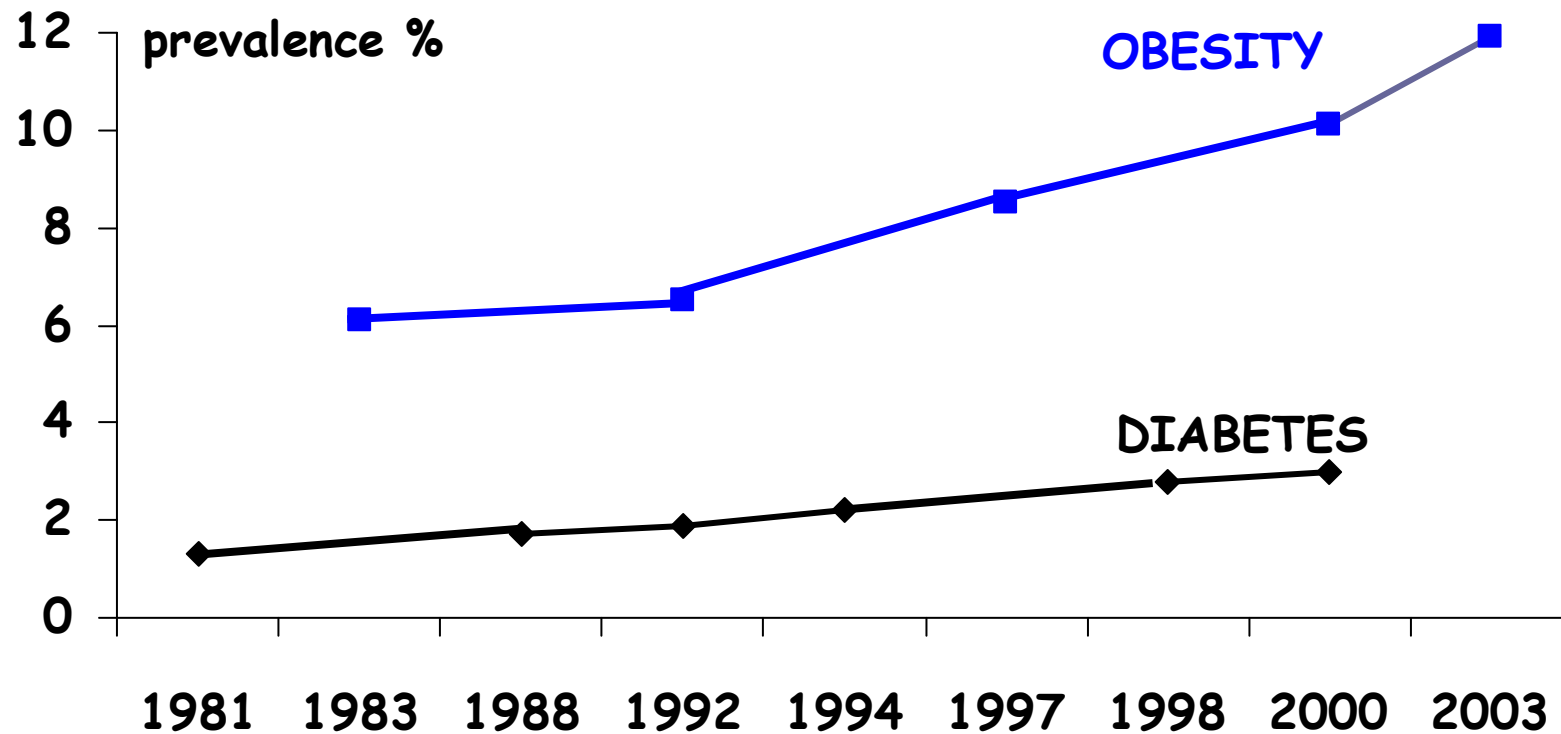
	men	women
< 25 kg/m <sup>2</sup>	1.3 (1.2-1.4)	1.4 (1.3-1.5)
25-30 kg/m <sup>2</sup>	1.2 (1.1-1.3)	1.3 (1.2-1.4)
> 30 kg/m <sup>2</sup>	1.3 (1.2-1.4)	1.4 (1.3-1.5)
overall	1.6 (1.5-1.7)	1.8 (1.7-1.9)

# diabetes risk score D.E.S.I.R.

4000 men & women, 30-65 years, followed 9 years

	men	women
waist		
70-79 cm		1
80-89 cm	1	2
90-99 cm	2	3
$\geq 100$ cm	3	3
smoker	1	
hypertension	1	1
diabetes in family		1

# treated diabetes and obesity: time trends in France



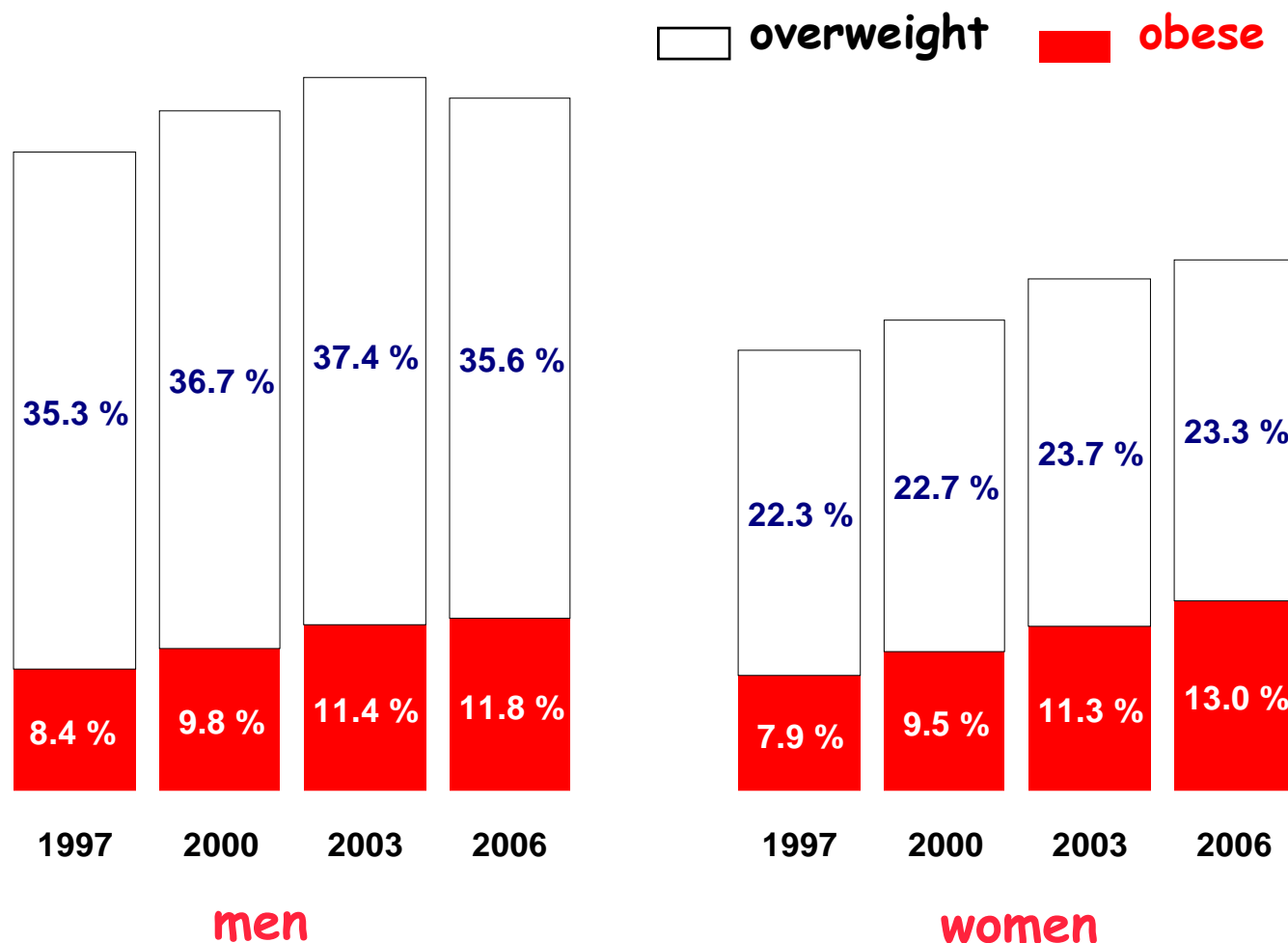
# obesity prevalences

## French ObEpi studies

- postal survey with the same methodology in
  - 1997
  - 2000
  - 2003
  - 2006 .... and 2009
- representative of the French population
- mailed questionnaires and self measures of
  - waist circumference, weight, height

# prevalences 1997-→ 2006

## overweight, obesity France



*Charles Obesity 2008; ObÉpi - Roche 2006*

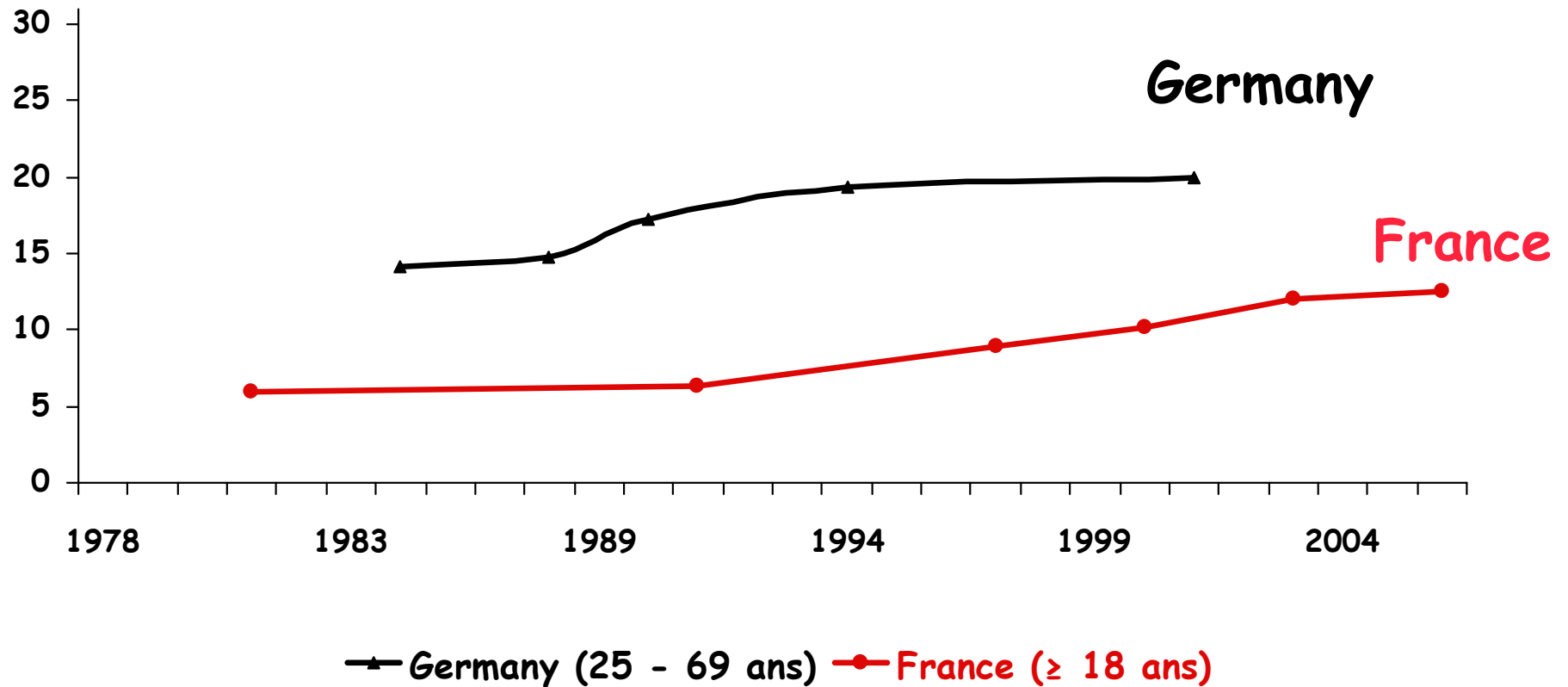
# mean waist circumference 1997-→ 2006 France

	men		women	
1997	90.5 cm	+ 1.2 cm	79.2 cm	+ 1.9 cm
2000	91.7 cm		81.1 cm	
2003	92.5 cm	+ 0.8 cm	82.3 cm	+ 1.2 cm
2006	92.9 cm	+ 0.4 cm	83.7 cm	+ 1.4 cm

# prevalence of obesity - men

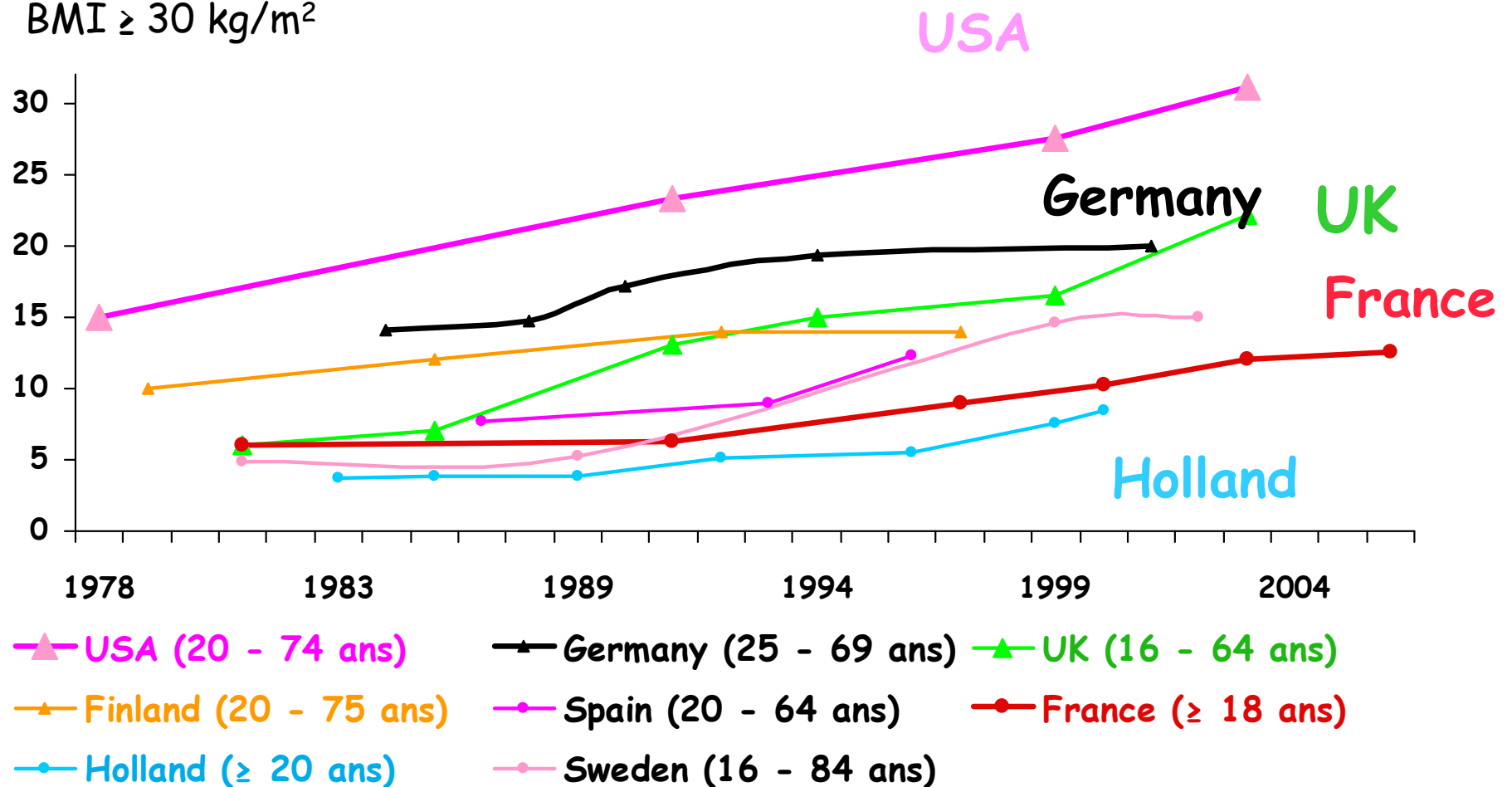
## France and Germany

prevalence, %  
BMI  $\geq 30$  kg/m<sup>2</sup>

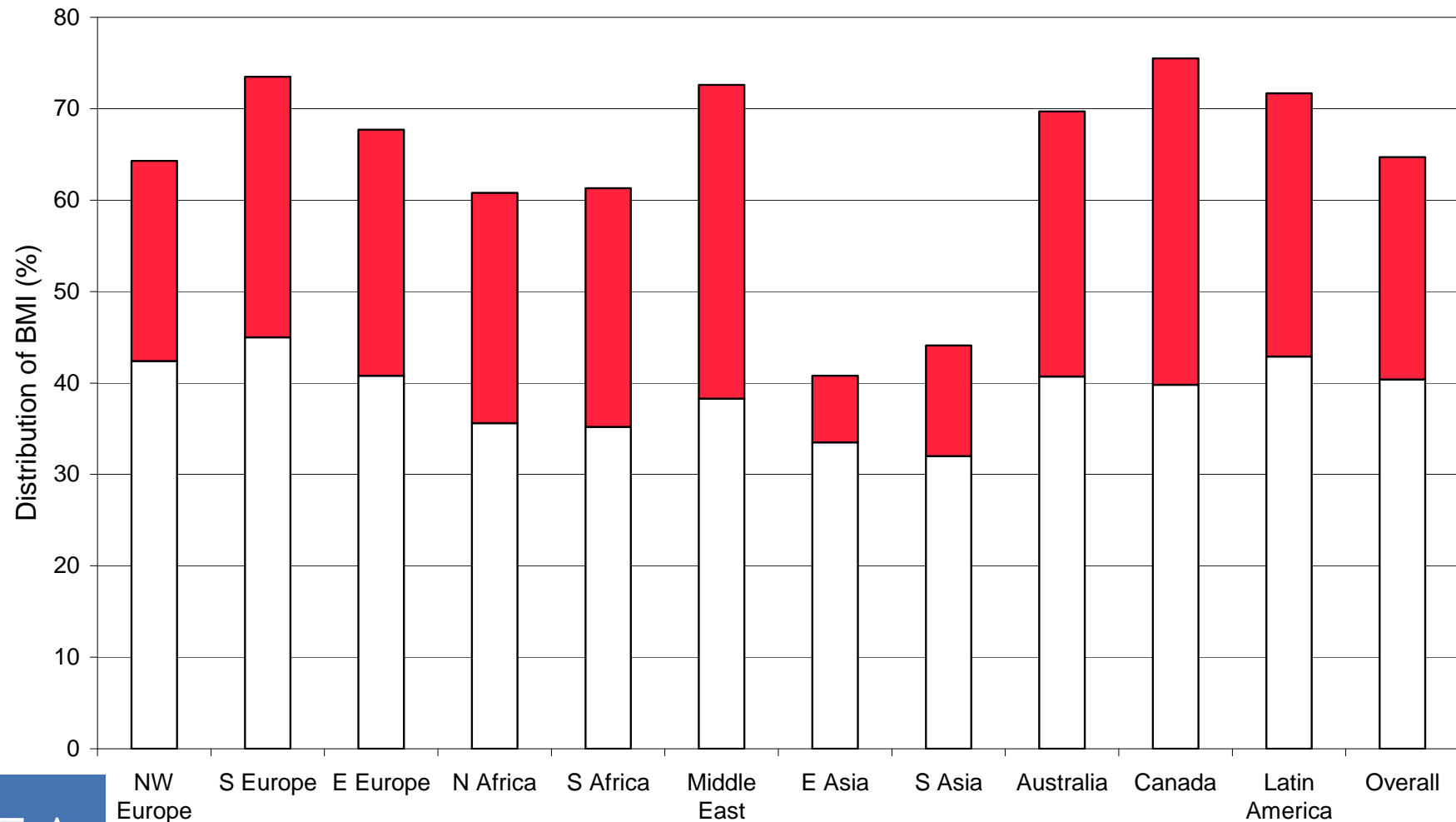


# prevalence of obesity - men

prevalence, %  
BMI  $\geq 30$  kg/m<sup>2</sup>

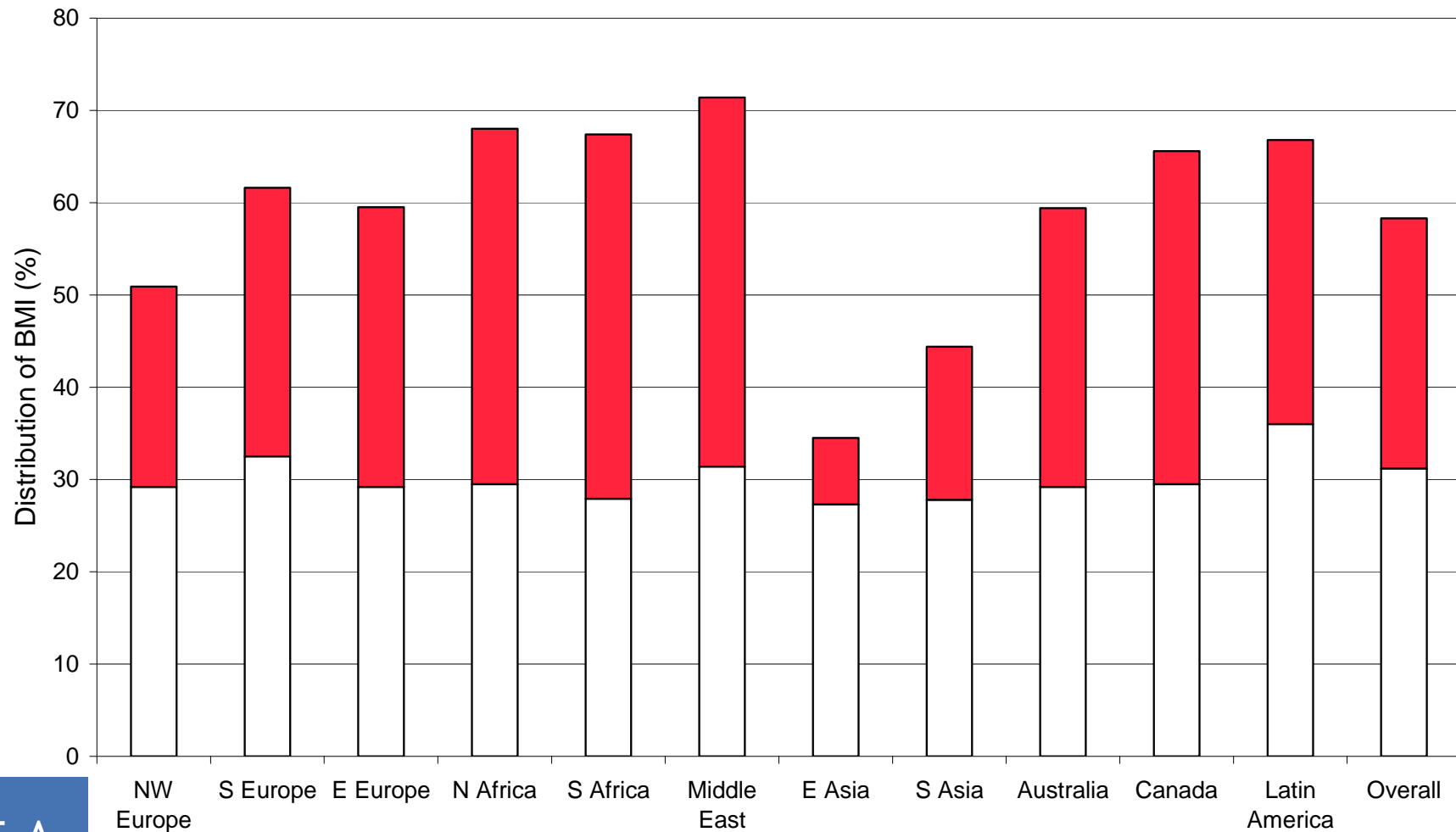


# obesity, overweight in primary care practice **men**



□ Overweight (≥25 to <30 kg/m<sup>2</sup>)   ■ Obese (≥30 kg/m<sup>2</sup>)

# obesity, overweight in primary care practice **women**



□ Overweight (≥25 to <30 kg/m<sup>2</sup>)    ■ Obese (≥30 kg/m<sup>2</sup>)

*Balkau Circulation 2007*

# the "timing" of adiposity

Early weight growth velocity and overweight in  
adolescence

*Botton Am J Clin Nutr 2008*

# early weight growth velocity and overweight in adolescence

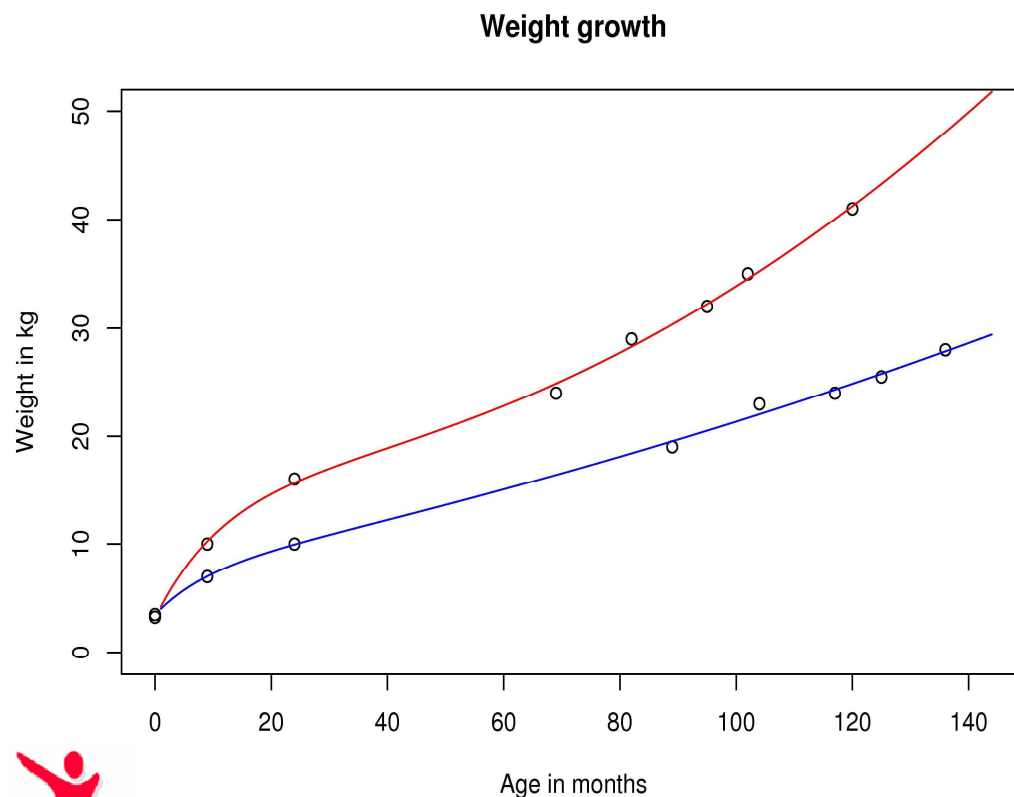
## Fleurbaix-Laventie Ville Santé study

440 boys and girls

weight and height measured from birth to adolescence

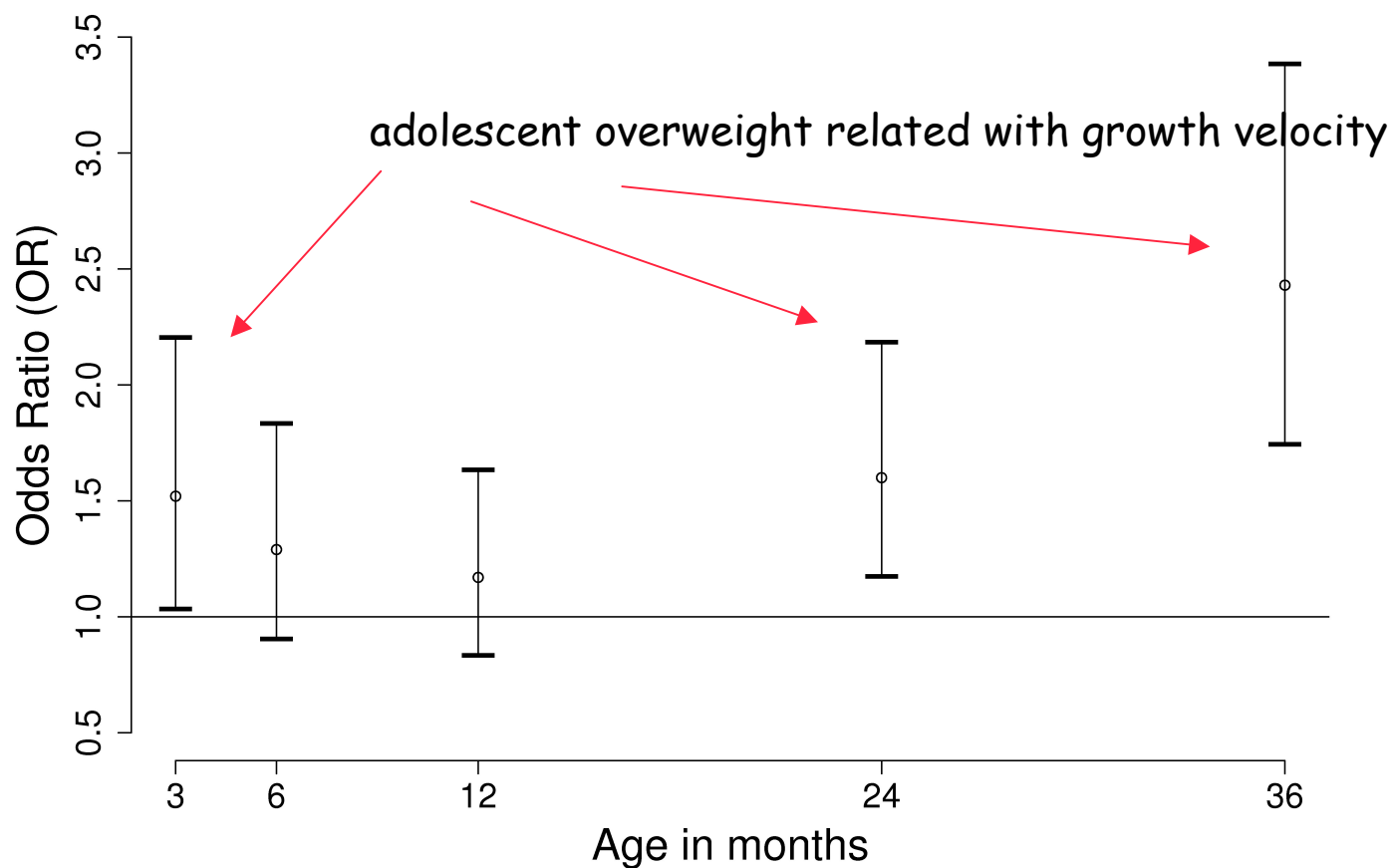
modeling of weight growth:

Example: for 2 children with different weight growth profile



# early weight growth velocity and overweight in adolescence

OR for overweight, for a one SD difference of in weight growth velocity



# is the increase in obesity relenting ?

Trends in the prevalence of obesity 1995-2005  
*Czernichow, Prev Med, 2009*

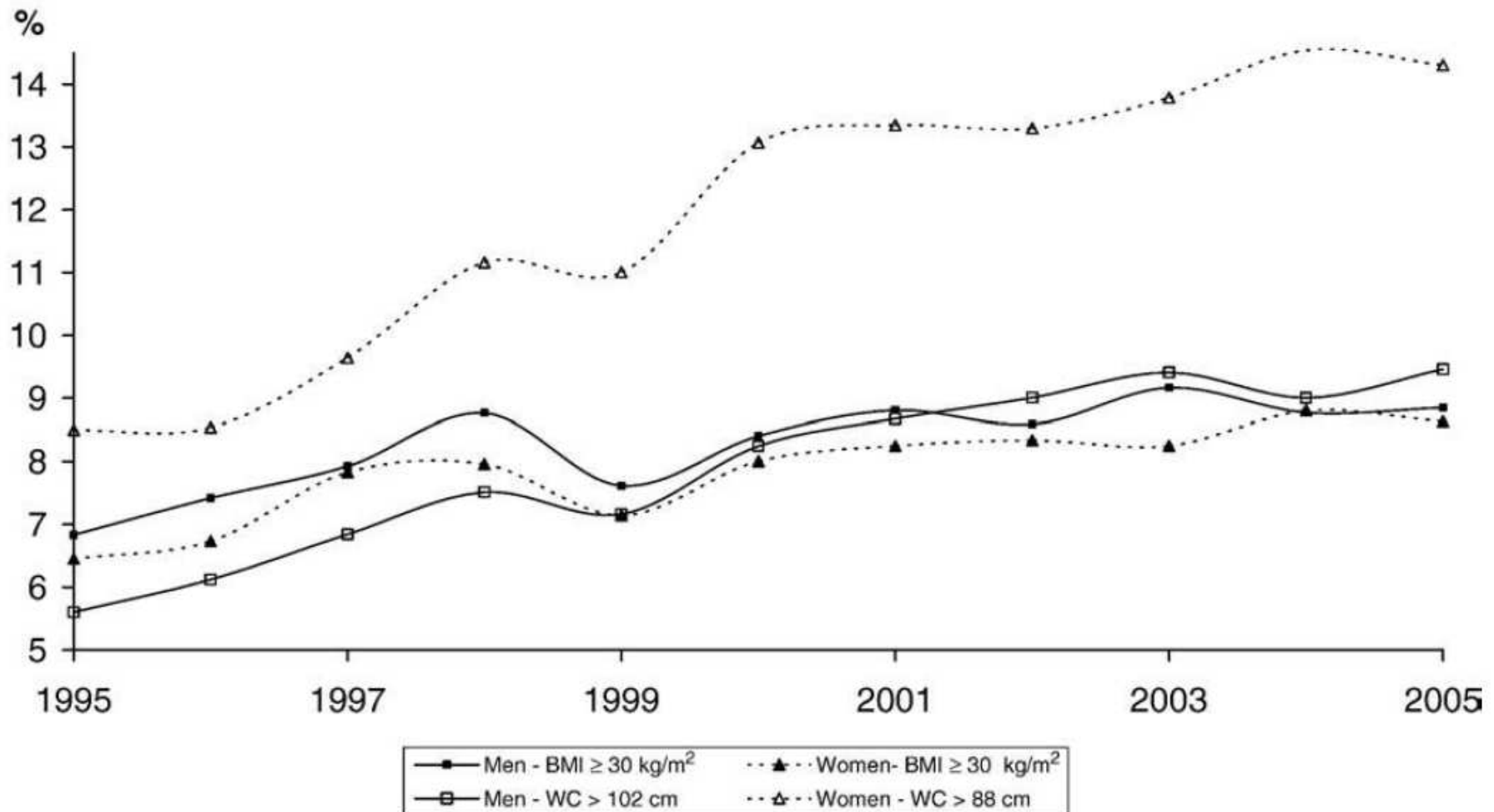
Downward trend in prevalence of childhood overweight  
*Romon, Pub Health Nutr, 2009*

Stabilization of overweight prevalence in French children  
between 2000 and 2007.  
*Salanave, Int J Pediatr Obes 2009*

Successful overweight prevention in adolescents by increasing  
physical activity: a 4-year randomized controlled intervention  
*Simon, Int J Obesity 2008*

# French adults - BMI & waist

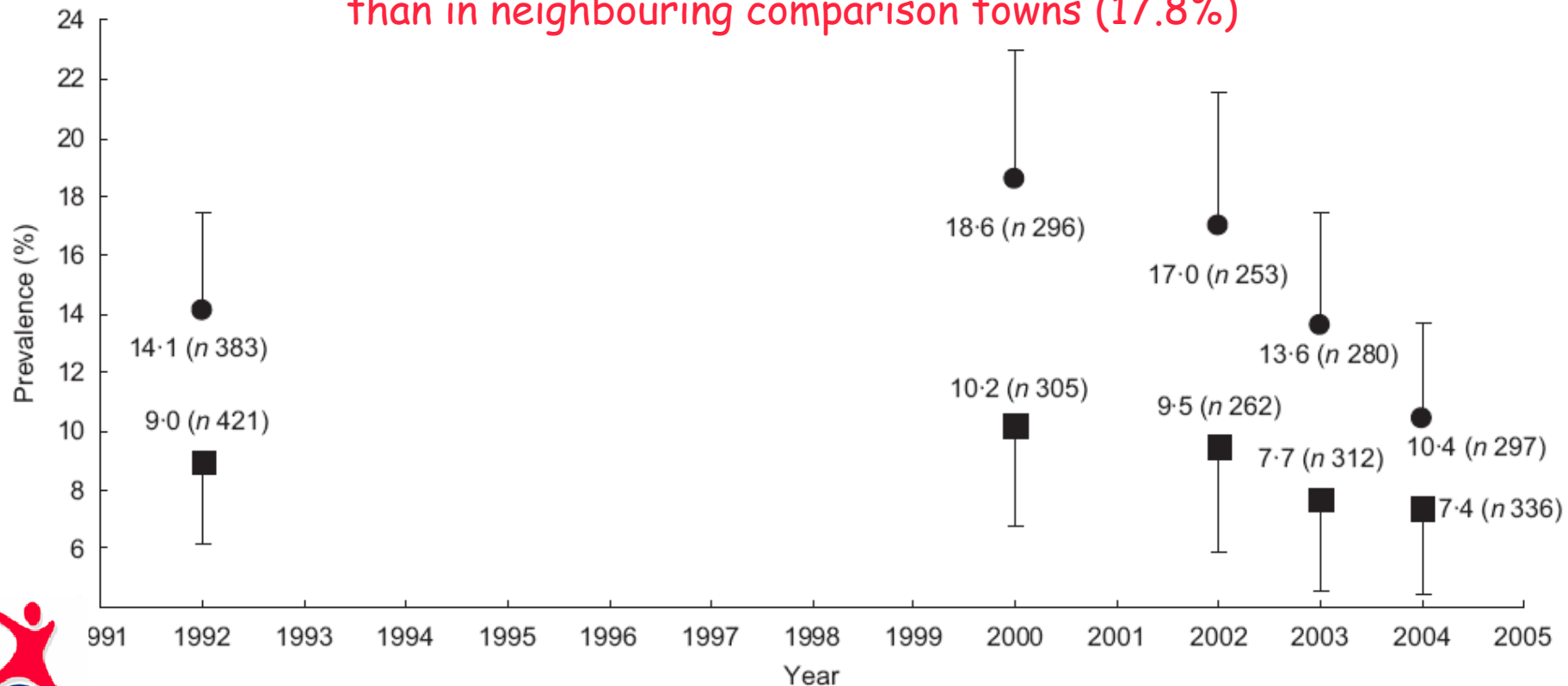
340,000 men and women, 20-85 years



# children 5-12 years from the French Fleurbaix-Laventie study

overweight (including obesity) prevalence in boys (■) and girls (●)

significantly lower prevalence of overweight/obesity in Fleurbaix-Laventie (8.8%)  
than in neighbouring comparison towns (17.8%)



# 7-9 year old children 2000 and 2007 surveys

- prevalences of overweight, (including obesity) & obesity
  - 2000: 18.1% and 3.8%
  - 2007: 15.8% and 2.8%
  - differences not statistically significant
  - stabilization of prevalences
- 2001: implementation of National Nutrition and Health Program (PNNS)
- the PNNS may be partly responsible

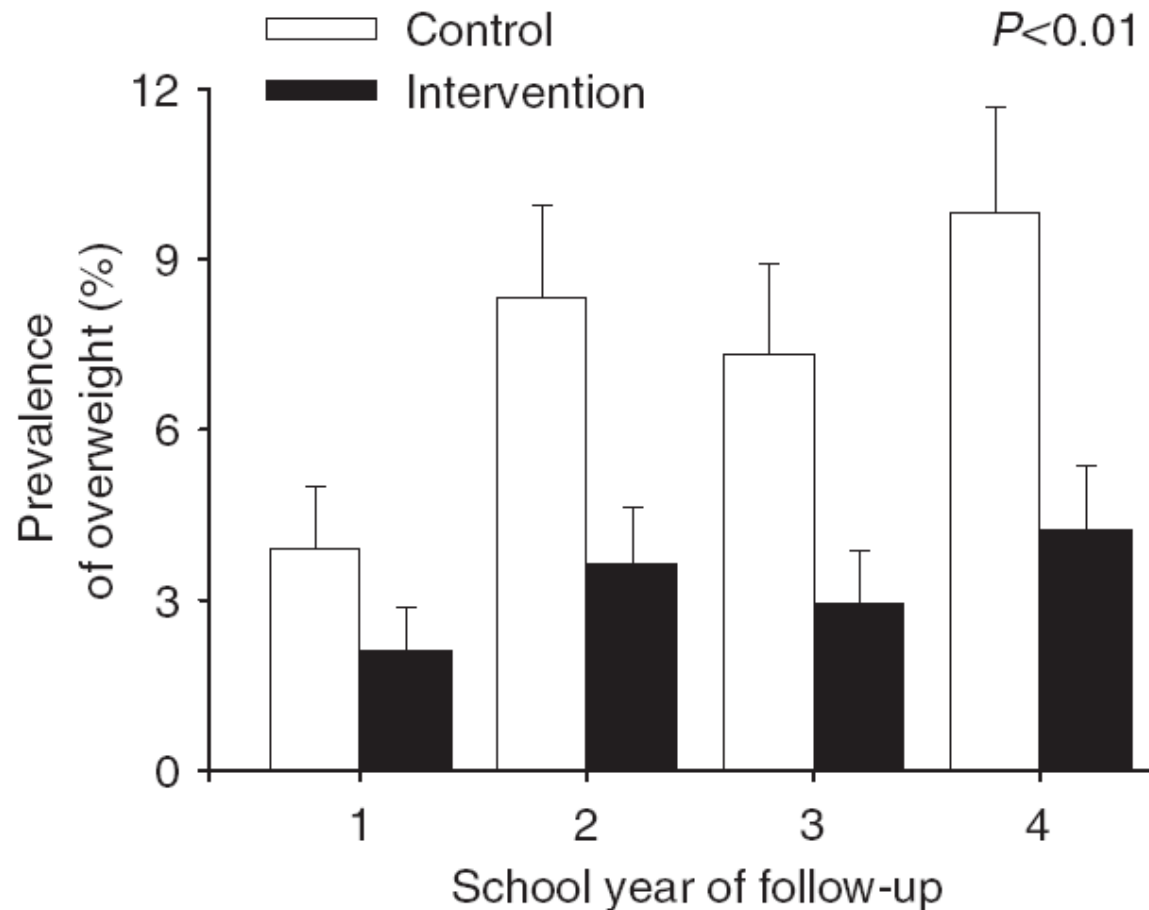
# overweight prevention

French adolescents, age 12 years - 4 year randomized trial

- usual program:
  - three 50 min physical education lessons
- 4 year school intervention program:
  - new opportunities for physical activities offered
  - education on physical activity & sedentarity
  - activities, formal and less formal during breaks
  - help to less confident children
  - promote social support by parents, teachers and sporting educators
  - sporting events ... cycle to school days
- eight schools randomized
- 479 intervention, 475 control

# overweight prevention

French adolescents, age 12 years - 4 year randomised trial



Change in weight:  
intervention - control

Non-overweight: -0.33 kg  $P < 0.01$

Overweight: 0.20 kg  $P = 0.6$

# in conclusion

- overweight, obesity, abdominal adiposity are common
- they are generally increasing in all parts of the world
- obesity associated with and precursor of
  - diabetes
  - ... many other health problems
- reducing obesity/abdominal adiposity **very likely** will reduce diabetes prevalence
- there may be critical times when prevention is particularly effective