

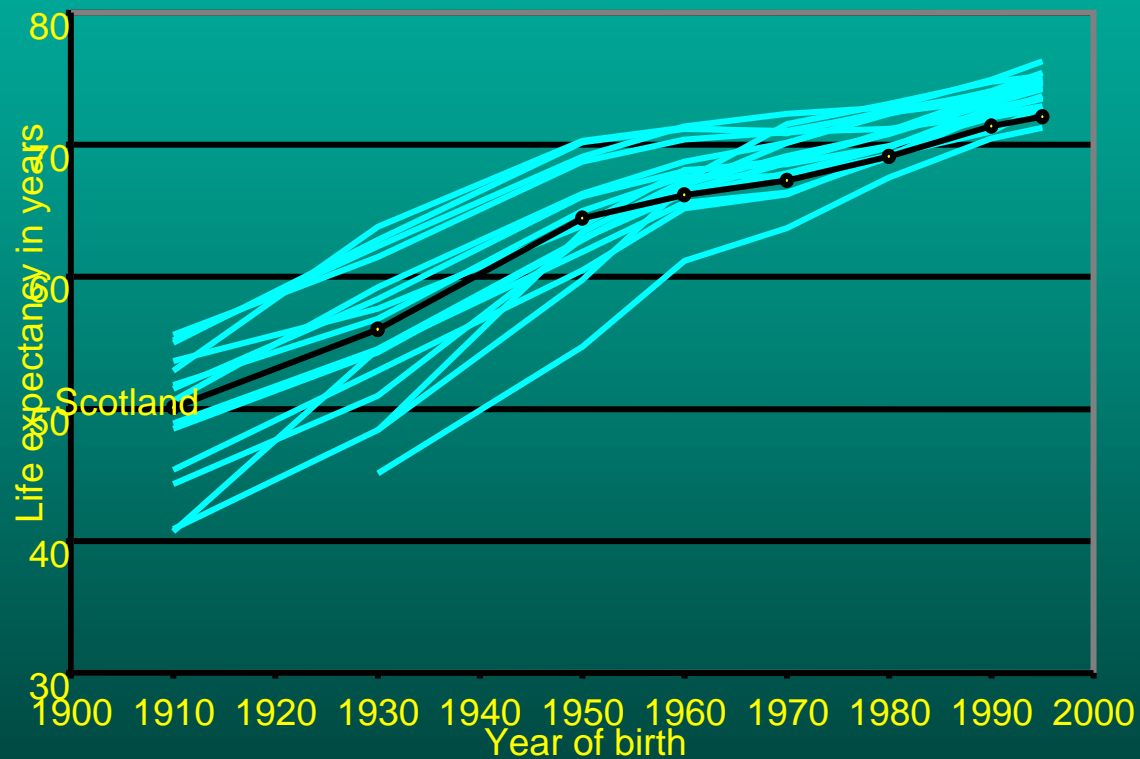
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**The biology of poverty.....**  
**implications for an ethical approach to**  
**population health improvement**

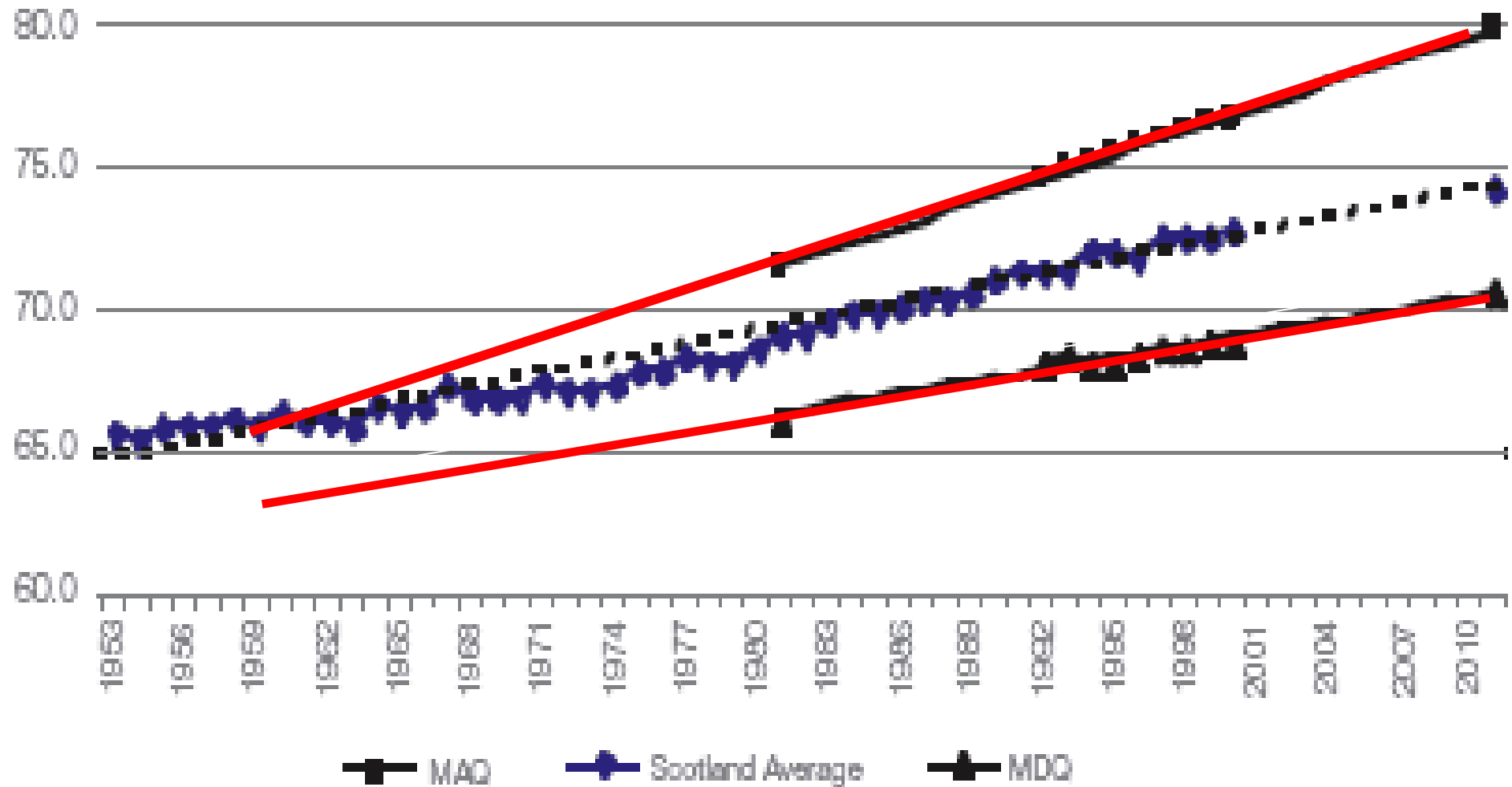
Reykjavik 31<sup>st</sup> August 2010

# 20<sup>th</sup> century trends in life expectancy in Scotland and 16 other Western European countries

Males



# Trends in life expectancy - males



# Ethical decision-making

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- We have to make decisions about what to do (or recommend) to improve population health and reduce health inequalities in acceptable and desirable ways
- In making these decisions we should apply principles that reflect our purpose and values
- In applying these principles we should make appropriate use of available evidence and plausible theory

# Health improvement fantasy

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- Health improvement policy and practice can and should be purely evidence-driven and evidence-based
- Above all, we should only act evidence on effectiveness

# Health improvement reality (1)

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- The demand for evidence is more or less infinite
- Substantial gaps in available effectiveness evidence are inevitable
- Available effectiveness evidence is skewed
- Lack of evidence of effectiveness may reflect true ineffectiveness – or lack of evaluation, inadequate evaluation or implementation failure

## Health improvement reality (2)

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- 'Best evidence' does not necessarily imply 'best action'
- Some actions based on theoretical plausibility will be more effective than others with a strong evidence base
- Purely evidence-based action may mean little action – and will mean less effective action than a fuller package of actions

## Health improvement reality (3)

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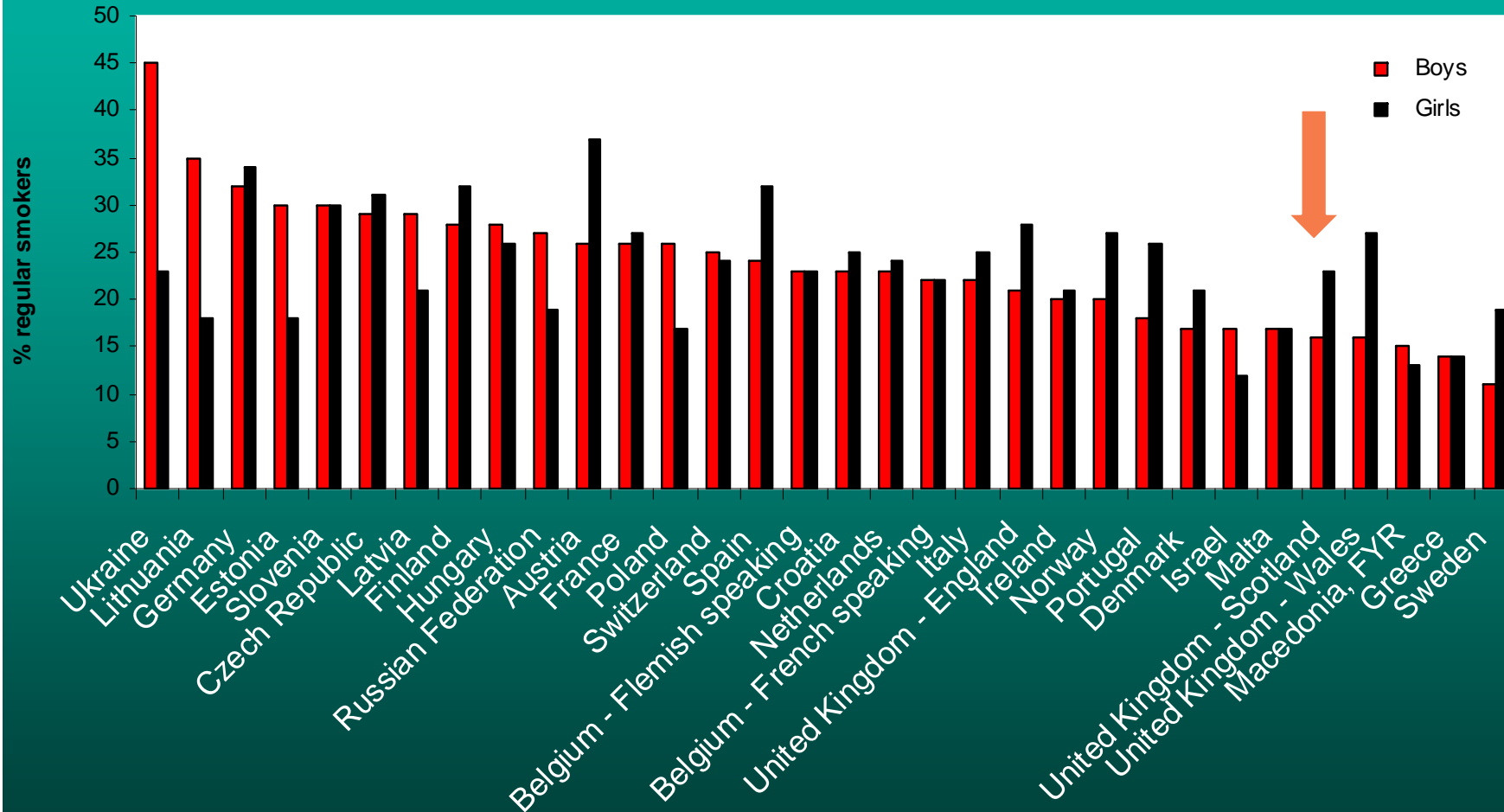
- Evaluations of single interventions in isolation are of limited value in informing the design of comprehensive packages of interacting interventions
- Scotland has urgent health problems, some worsening – we need to innovate
- When it comes to making decisions, considerations other than narrow effectiveness are relevant and important

# Social circumstances and health

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# Prevalence of smoking by country, in 15 year olds by sex, 2000/01, Europe

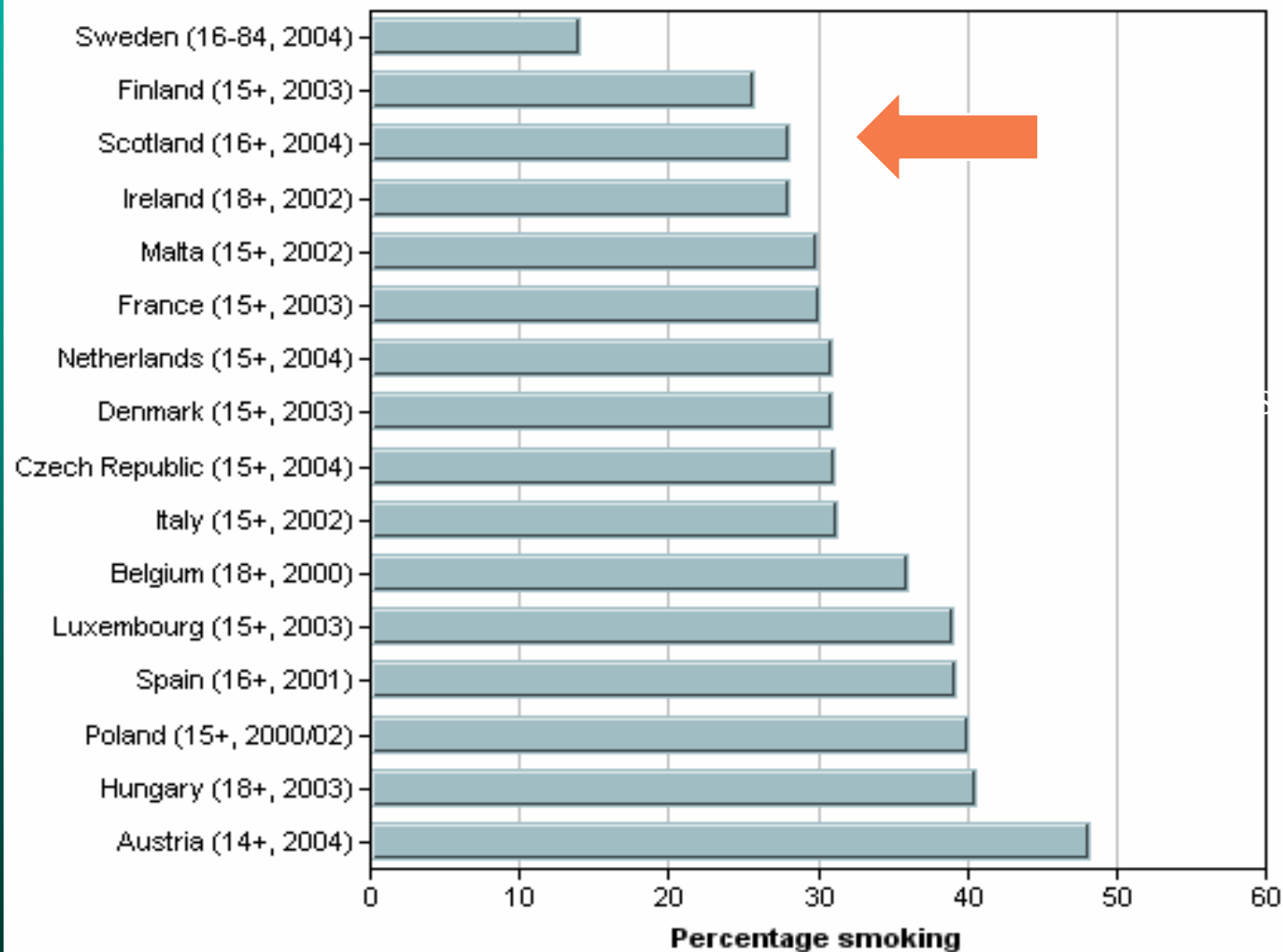


World Health Organization (1997 and 2003)

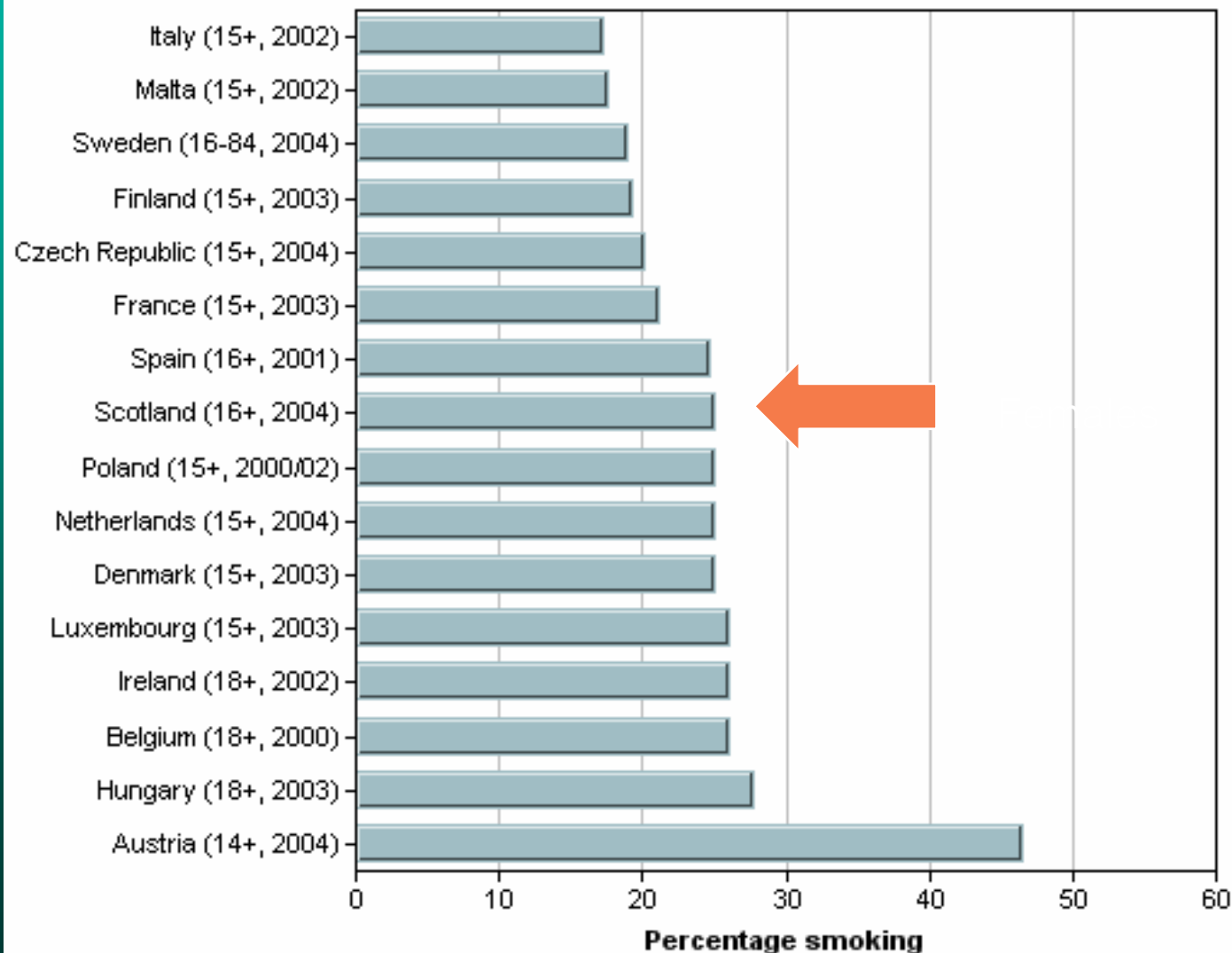
[www.heartstats.org](http://www.heartstats.org)



# Smoking prevalence - Europe

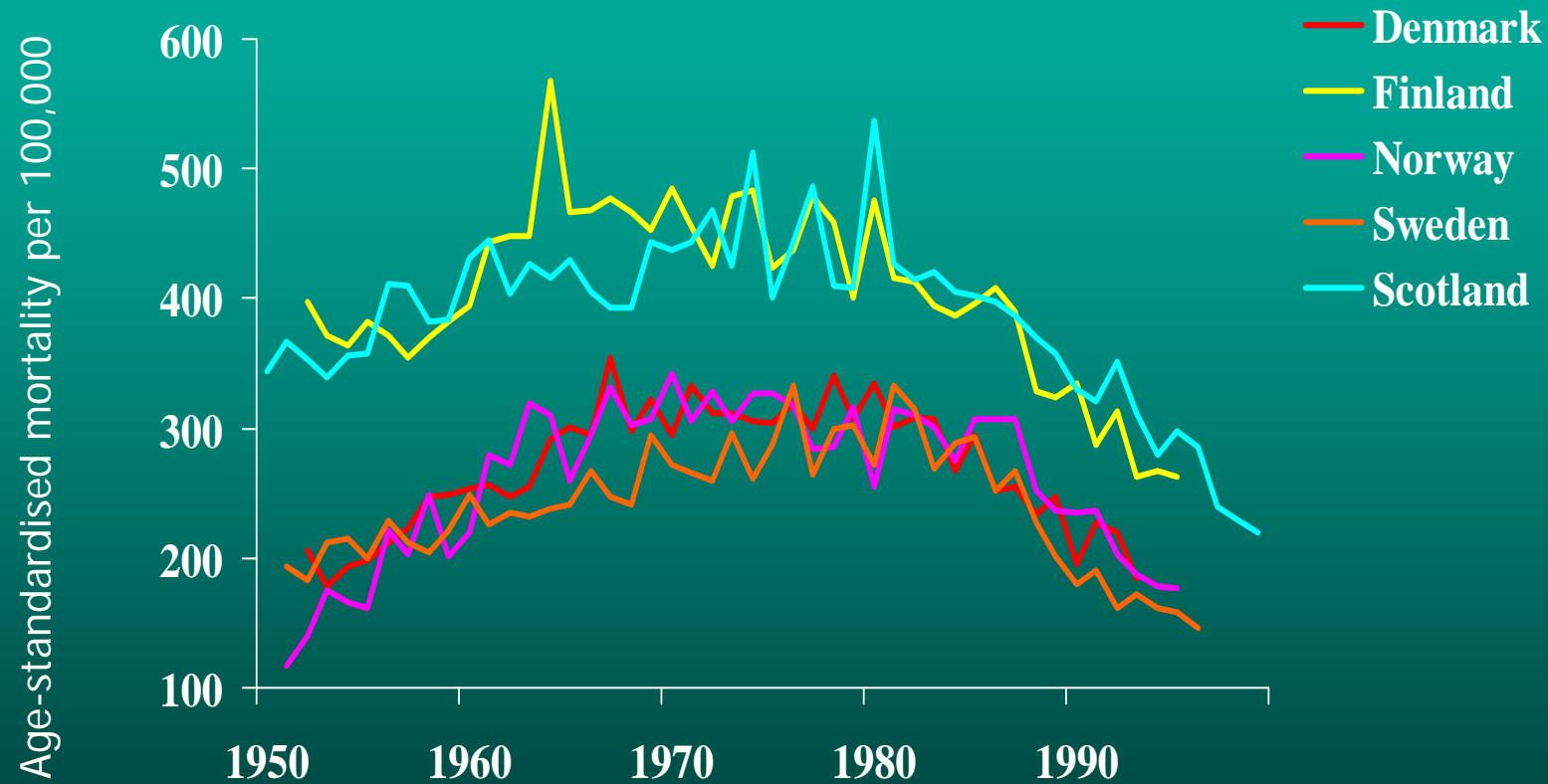


# Smoking prevalence - Europe



# Coronary heart disease mortality

## Men aged 15-74 years



# Aaron Antonovsky 1923-1994

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# Sense of coherence....

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“.....expresses the extent to which one has a feeling of confidence that the stimuli deriving from one's internal and external environments in the course of living are **structured, predictable and explicable**, that one has the **internal resources** to meet the demands posed by these stimuli and, finally, that these demands are seen as **challenges, worthy of investment and engagement.**”

# Salutogenesis....

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- u Highlights factors which create and support human health rather than those which cause disease
- u It focuses on resources and capacities which impact positively on health and aims to explain why, in adverse circumstances, some stay healthy and others don't.

# For the creation of health....

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...the social and physical environment must be:

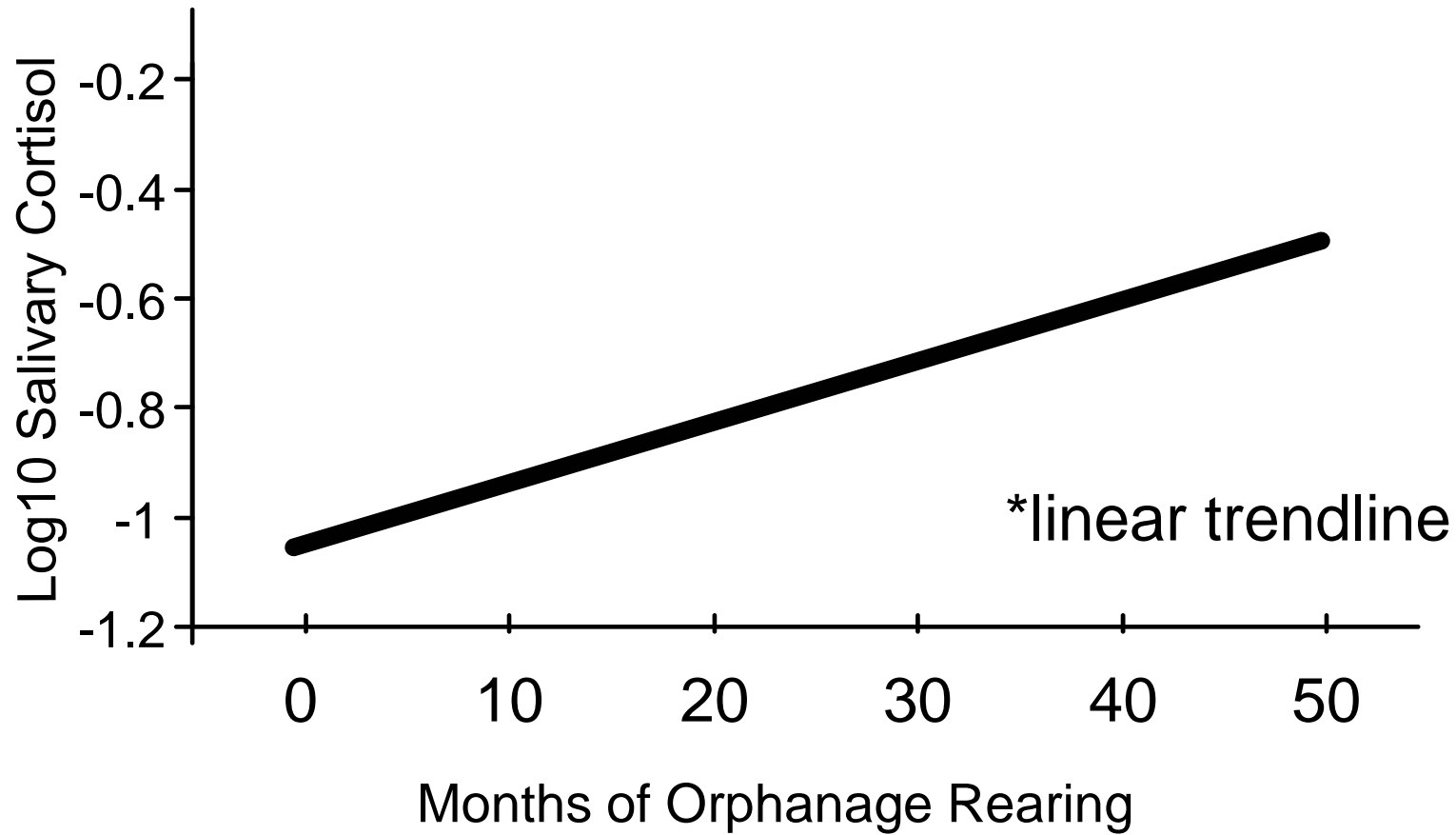
- u Comprehensible

- u Manageable

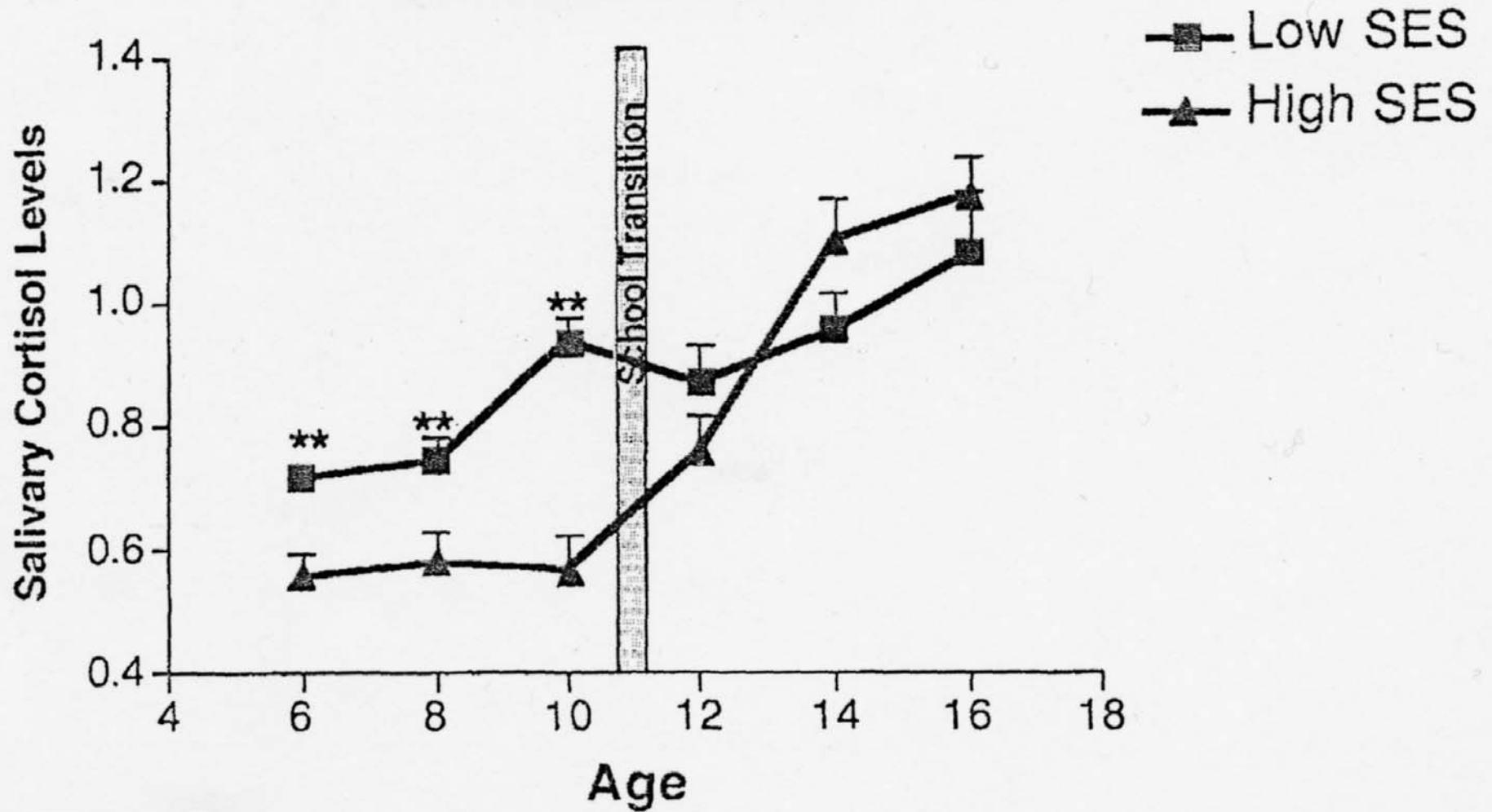
- u Meaningful

- u .....or the individual would experience chronic stress

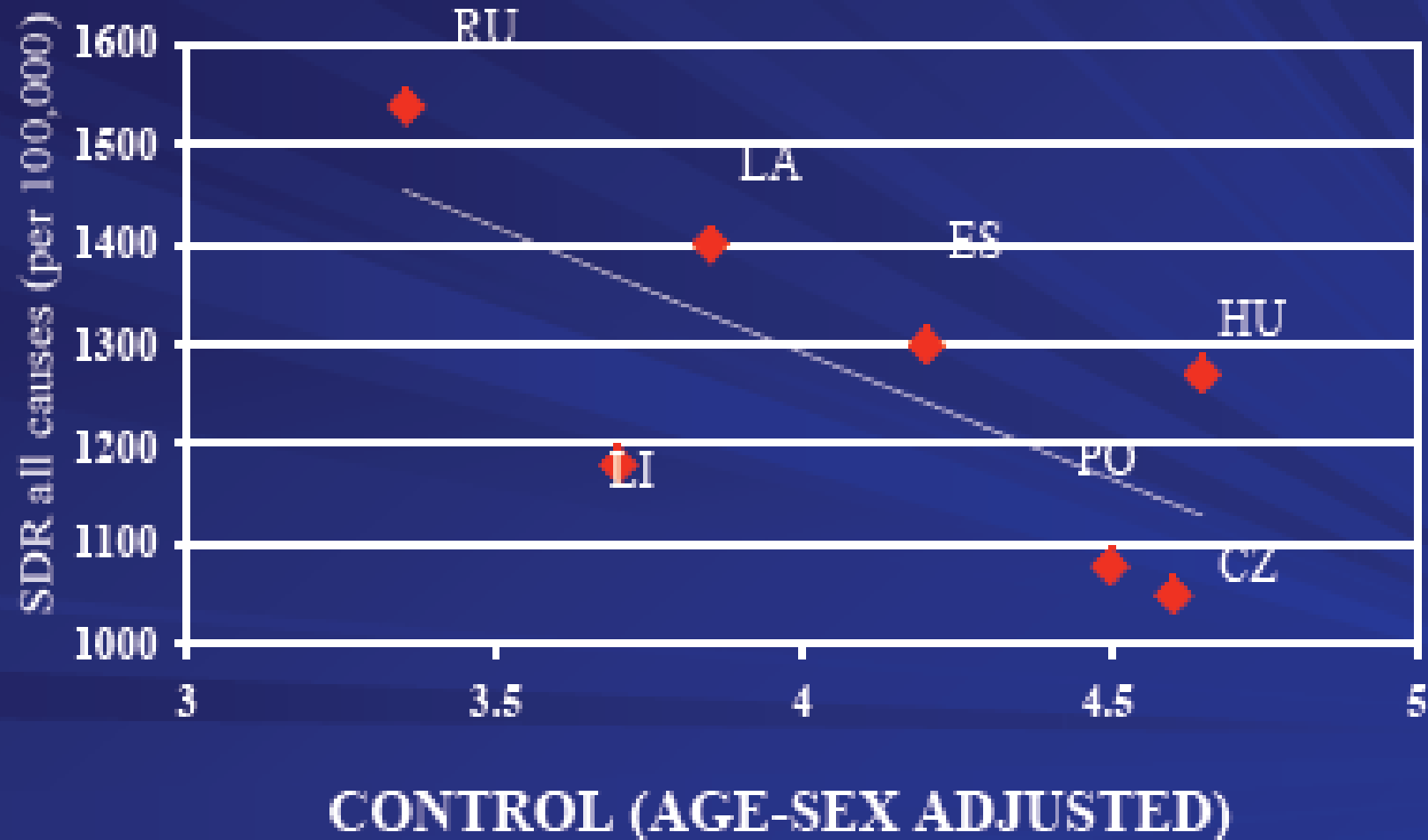
# Evening Cortisol Levels Increase with Months of Orphanage Rearing \*



## Cortisol Levels



# PERCEIVED CONTROL IN NATIONAL SAMPLES AND ALL CAUSE MORTALITY

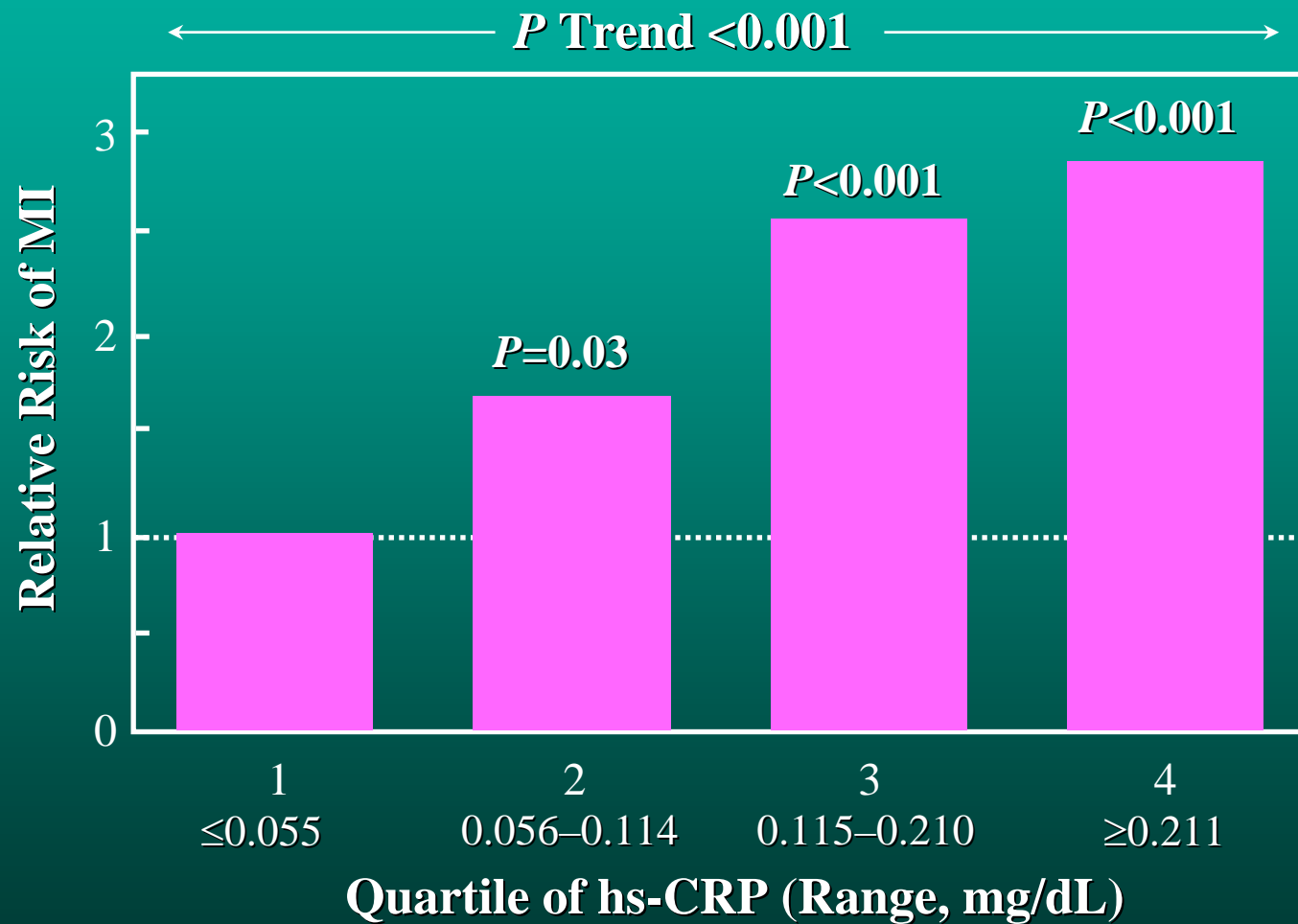


Pikhart, Bobak et al 2000

# Environmental determinants of inflammatory status

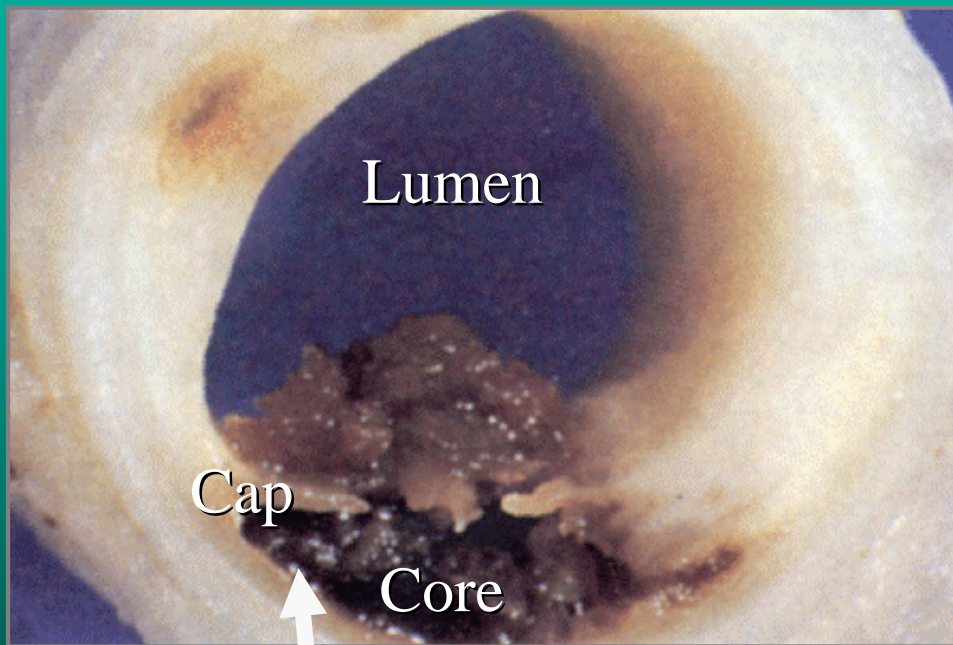
	Depcat	% smokers	CRP (median) mg/dl	
			Never-smokers	Smokers
affluent	1	36.8	0.71	1.42
	2	35.9	1.00	2.34
	3	39.1	1.11	2.25
	4	44.1	1.21	2.44
	5	46.6	1.13	2.53
	6	49.3	1.25	3.07
deprived	7	55.5	1.48	3.29

# hs-CRP and Risk of Future MI in Apparently Healthy Men



Ridker. *N Engl J Med.* 1997;336:973–979.

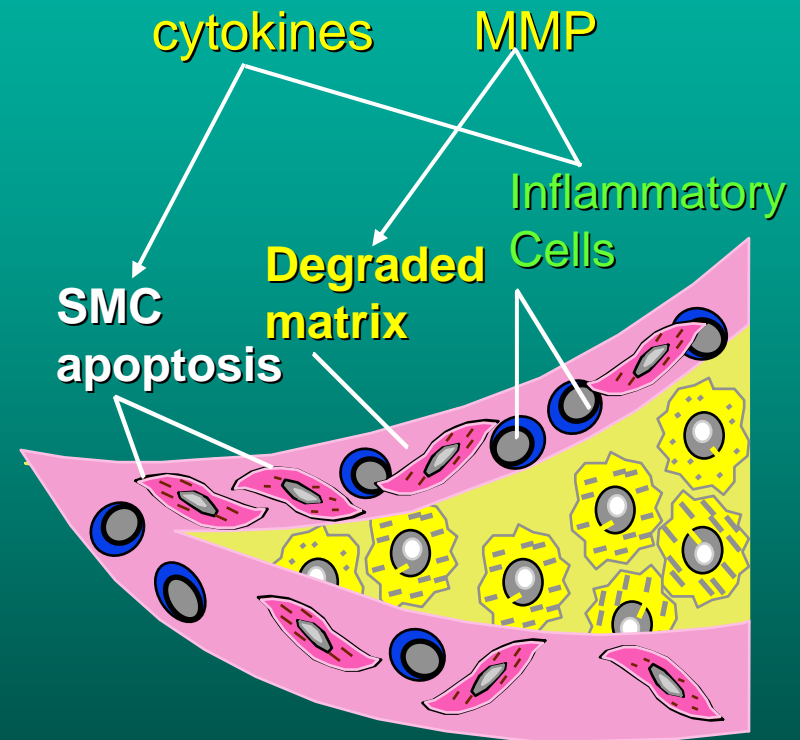
# Inflammation in plaques



Inflammatory cells



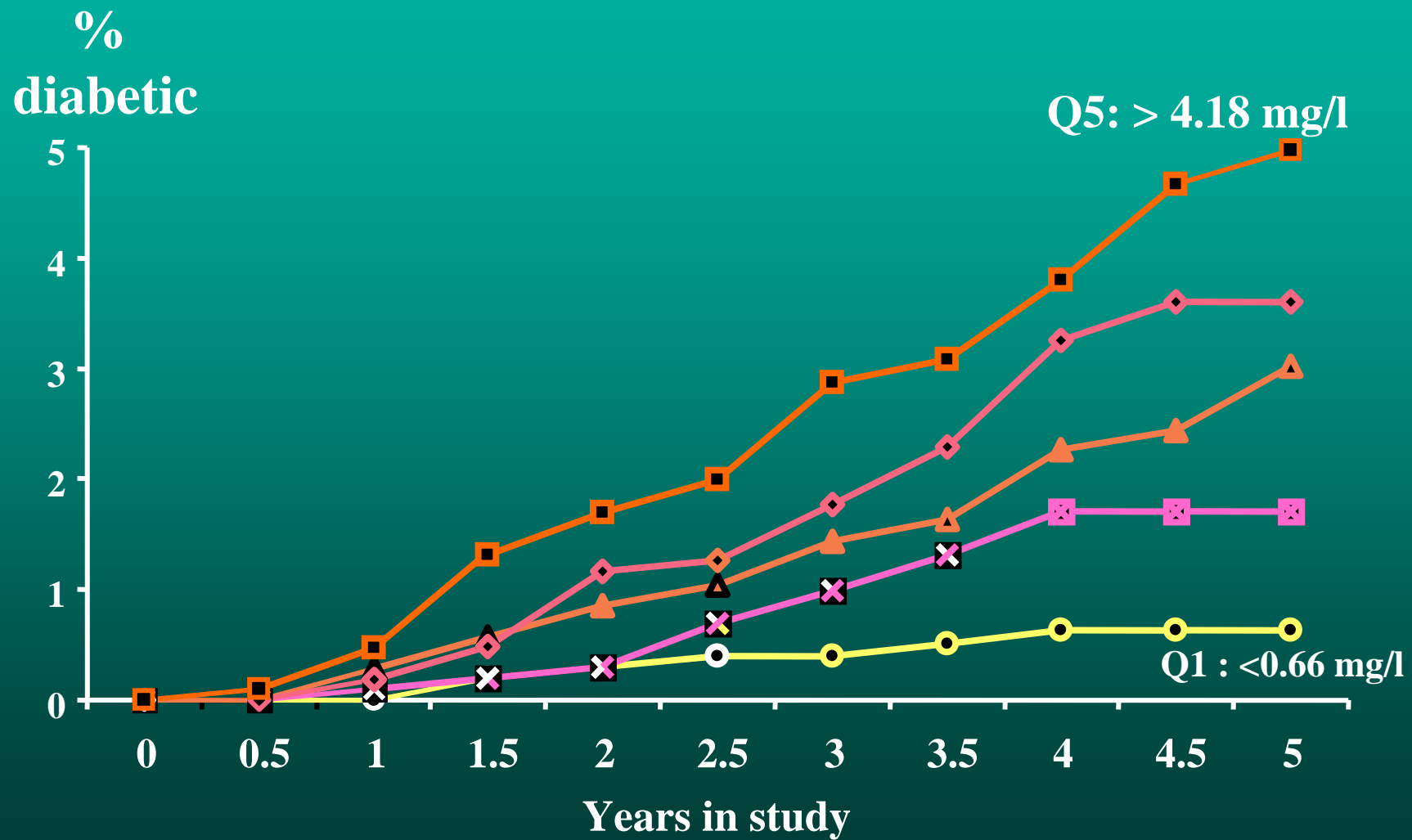
MMPs, IL-6,  
IL-15, IL-18, CRP



Unstable

Thin  
Fibrous Cap

# CRP and cumulative risk of type 2 diabetes



# Adipocyte programming

## insulin resistance, inflammation and ALP

**skeletal muscle**

Insulin resistance

NEFAs

triglyceride↑

Atherogenic  
Lipoprotein  
Phenotype

Low HDL  
small LDL

liver

Adipose  
stores

IL-6/IL-6sR

TNF- $\alpha$ /  
TNF- $\alpha$  sR-I

CRP↑  
SAA

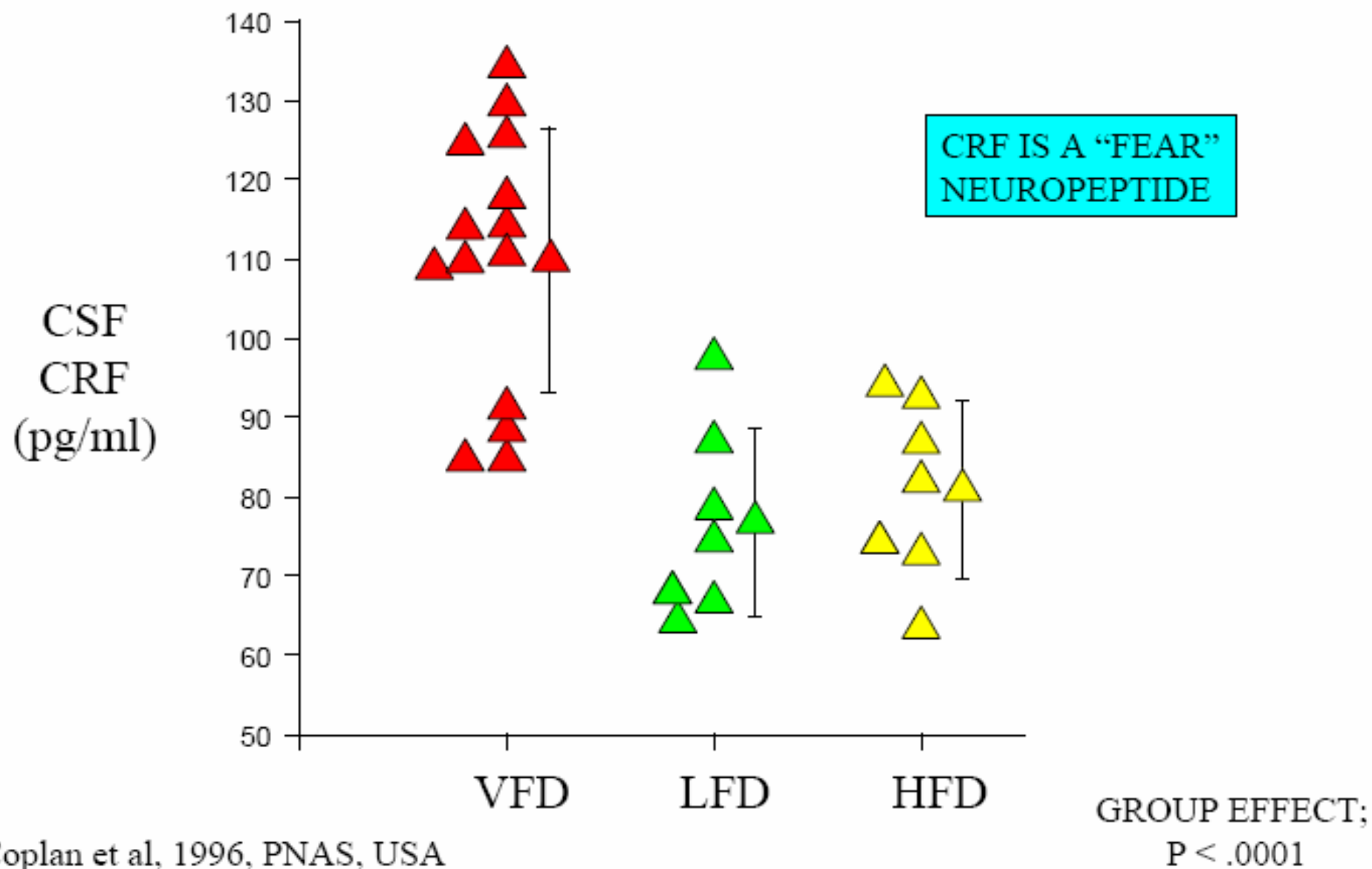
Pro-inflammatory  
state







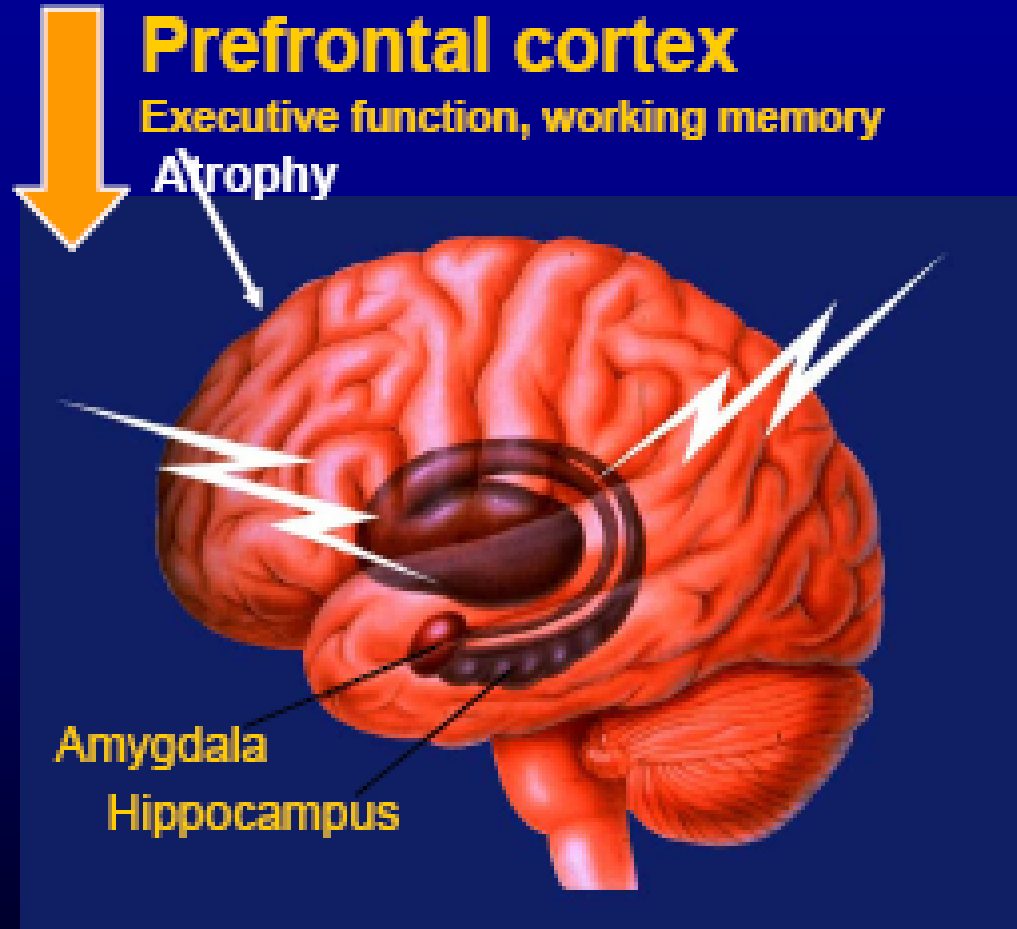
# CSF CRF CONCENTRATIONS IN DIFFERENTIALLY-REARED JUVENILE PRIMATES:



Coplan et al, 1996, PNAS, USA



# The Human Brain Under Stress: key brain regions



**Hippocampus**  
Contextual, episodic, spatial  
memory  
Atrophy

**Amygdala**  
Emotion, fear, anxiety  
Hypertrophy,  
later atrophy

# Attachment theory

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- u Ainsworth

- Deep emotional connection that infant develops with primary caregiver
- Reflects an “internal working model” expressing the infant’s expectations of parental behaviour in meaningful situations
- Basis for development of later relationships

- u Increasingly recognised as determinant of later emotional, cognitive and social outcomes

# The stressed brain

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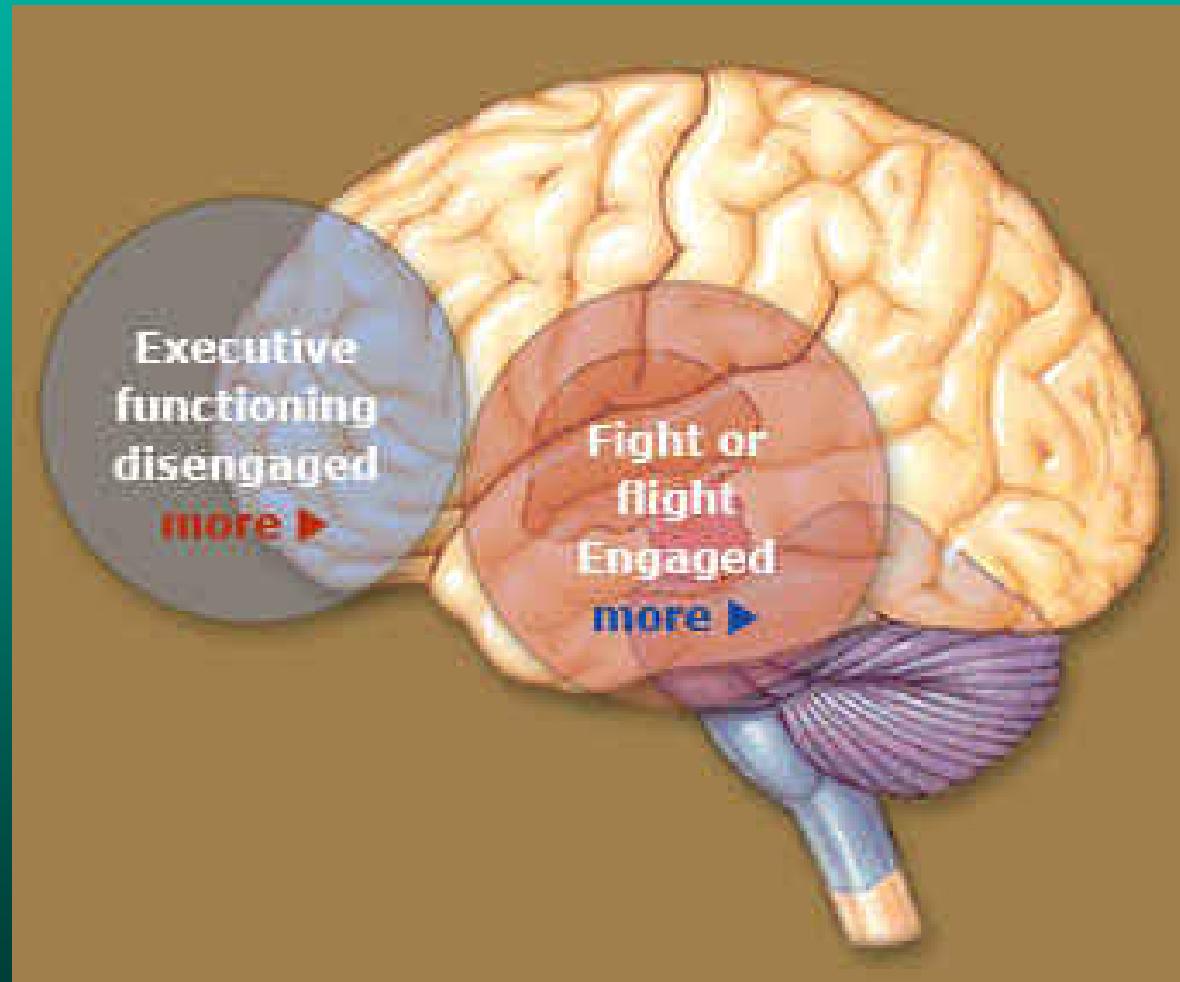
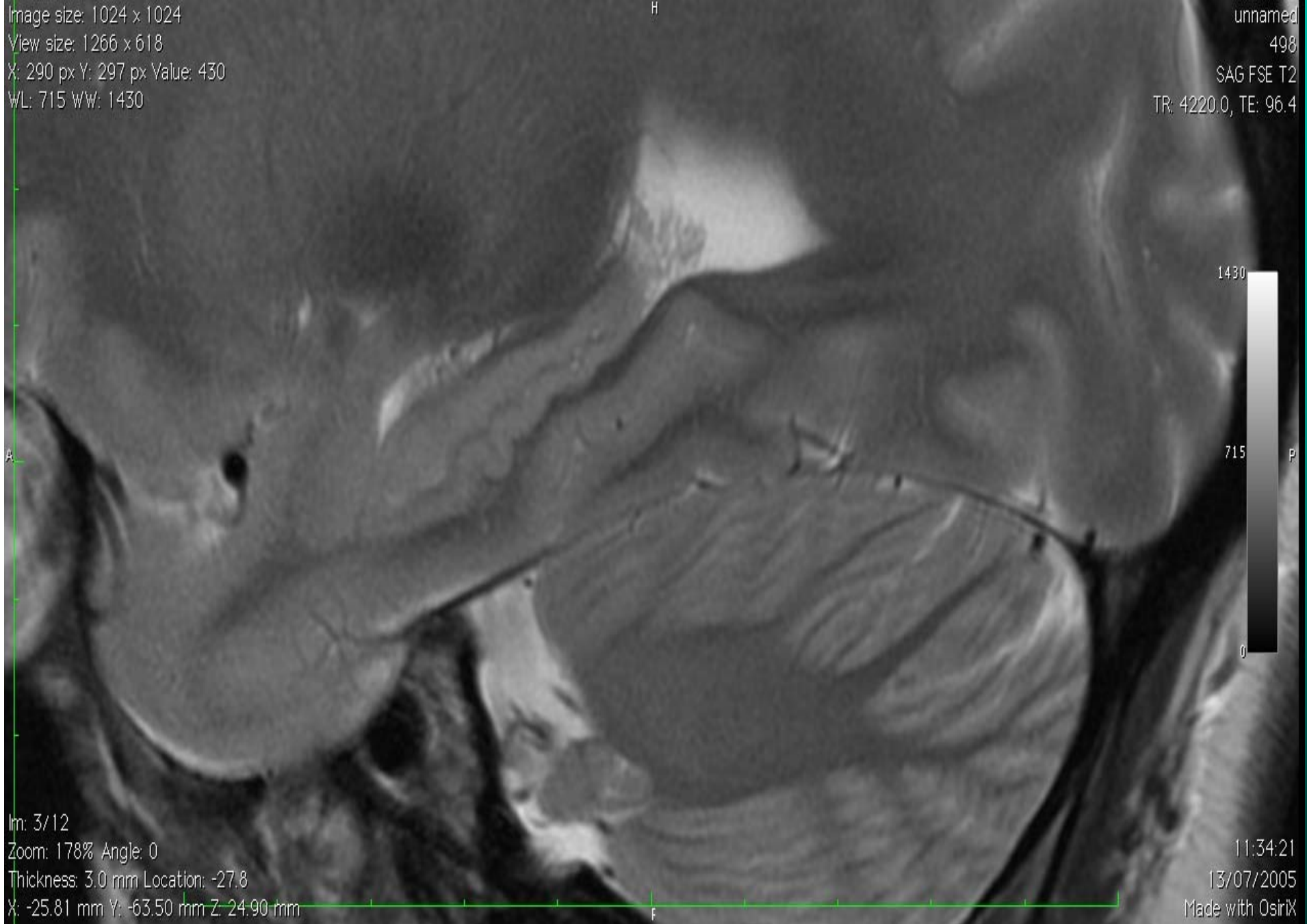


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View size: 1266 x 618  
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WL: 715 WW: 1430

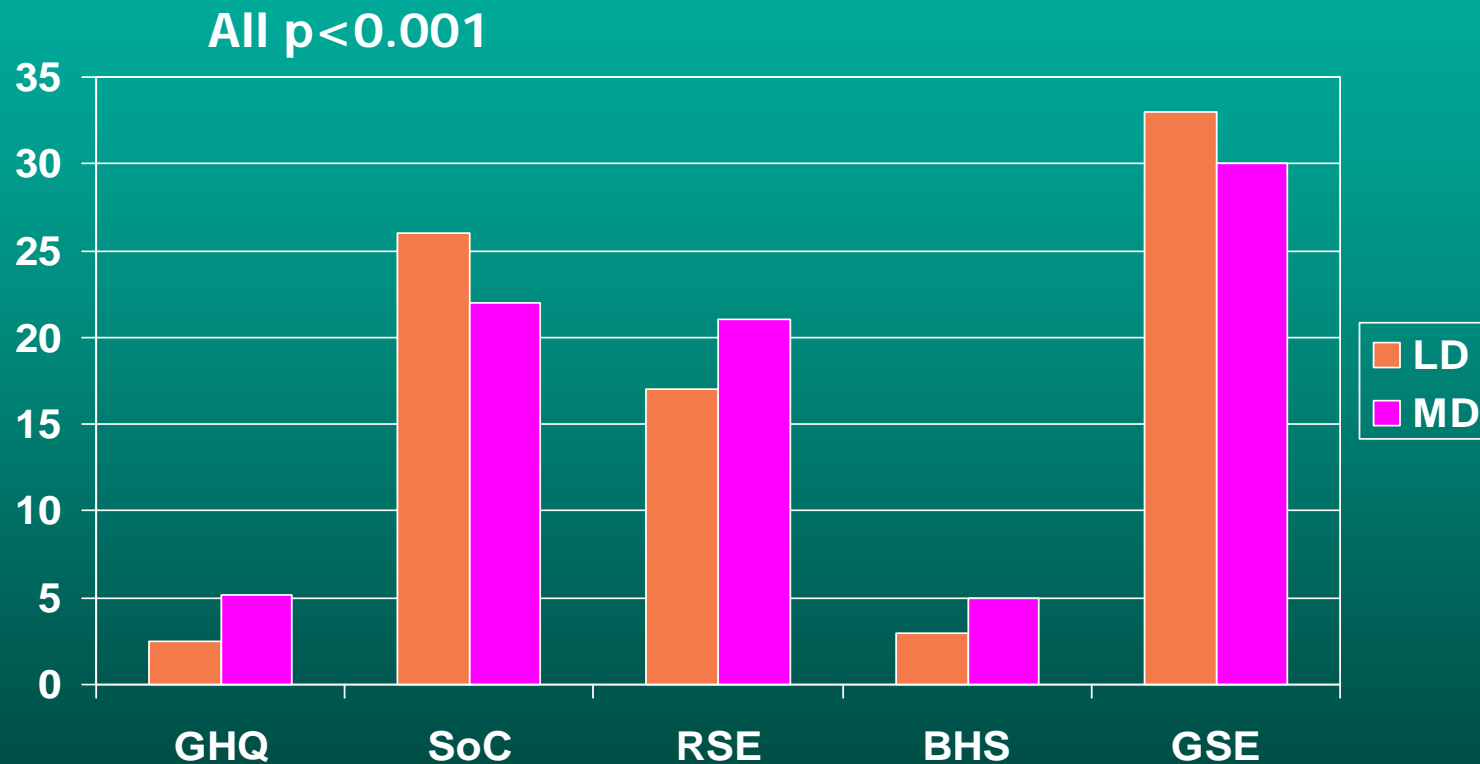
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TR: 4220.0, TE: 96.4



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Zoom: 178% Angle: 0  
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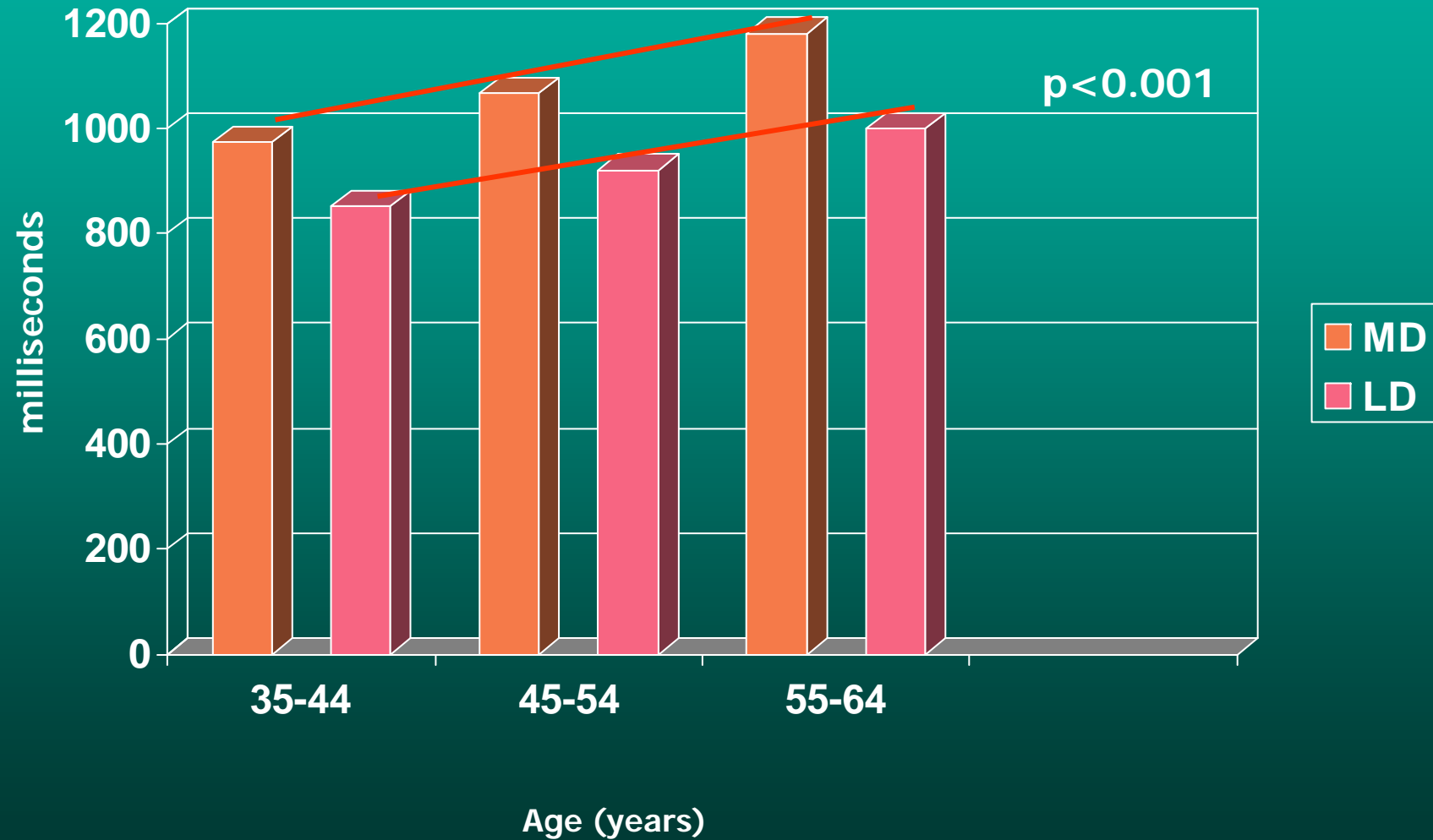
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# pSoBid: psychological state



GHQ = General Health Questionnaire; SoC = Sense of Coherence; RSE = Rosenberg Self-Esteem Scale; BHS = Beck Hopelessness Scale; GSE = Generalised Self-Efficacy Scale

# pSoBid: Choice reaction time



# pSoBid: Verbal Learning



# The Dunedin cohort

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- 1000 children recruited in late 1972/3
- At age 3, “at risk” children identified on the basis of chaotic circumstances, emotional behaviour, negativity and poor attentiveness
- As adults, those “at risk” were more likely to :
  - be unemployed
  - have criminal convictions (especially for violence)
  - been pregnant as a teenager
  - have a substance abuse problem
  - exhibit signs of insulin resistance and metabolic syndrome

# Health Deficits approach

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- u Focuses on problems, needs and deficiencies in a community such as deprivation, illness and health damaging behaviours. It designs services to fill the gaps and fix the problems. As a result, communities can feel disempowered. People become passive recipients of services rather than active agents in their own lives

# Health Assets

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- A health asset is any factor or resource which enhances the ability of individuals, communities and populations to maintain their health and sustain wellbeing. The assets can operate...as protective and promoting factors to buffer against life's stresses

Morgan and Ziglio 2009

# Management of complex systems

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- The importance of instability
- Order generating rules
- Emergence of solutions
- “Deep structures and archetypes”
- Living with paradox and contradiction

# The Asset Approach

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- u Identifies and makes viable the health assets in a community
- u Sees citizens as co-producers of their own health rather than passive recipients of services
- u Supports individuals health and wellbeing through enhancing skills for resilience, relationships, knowledge and self esteem
- u Promotes community networks that can provide caring and empowerment

# The asset model in practice

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- Map the assets in the area
- Build relationships and connections between residents and between residents and agencies
- Mobilise by sharing knowledge and resources
- Allow the inspiring vision to emerge
- Leverage in outside resource only to do what residents cannot do for themselves

Health related  
behaviours

Opportunity to escape  
poverty, decent housing,  
social networks, self esteem  
and sense of control

Consistent parenting, safe,  
nurturing early years,  
supportive education

Health related behaviours

Worthwhile

Opportunity, decent housing, social networks, self esteem and sense of control

Manageable

Consistent parenting, safe, nurturing early years, supportive education

Comprehensible

# When people care enough to act

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- There are unrecognised capacities in every community. Find them and provide opportunities for people to offer them
- Relationships build a community. See them, build them and utilise them
- Citizens are at the centre. Engage them as actors, not recipients

# When people care enough to act

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- Leaders involve others as active members
- People care about something. Find out what motivates individuals
- A listening conversation is the way to discover what motivates people
- Asking questions rather than giving answers invites stronger participation

# When people care enough to act

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- Institutions have reached the limit of their problem solving potential. They are stretched thin and need more skilful engagement with communities
- They are servants. Ask what people need, offer help, step back, create opportunity for action