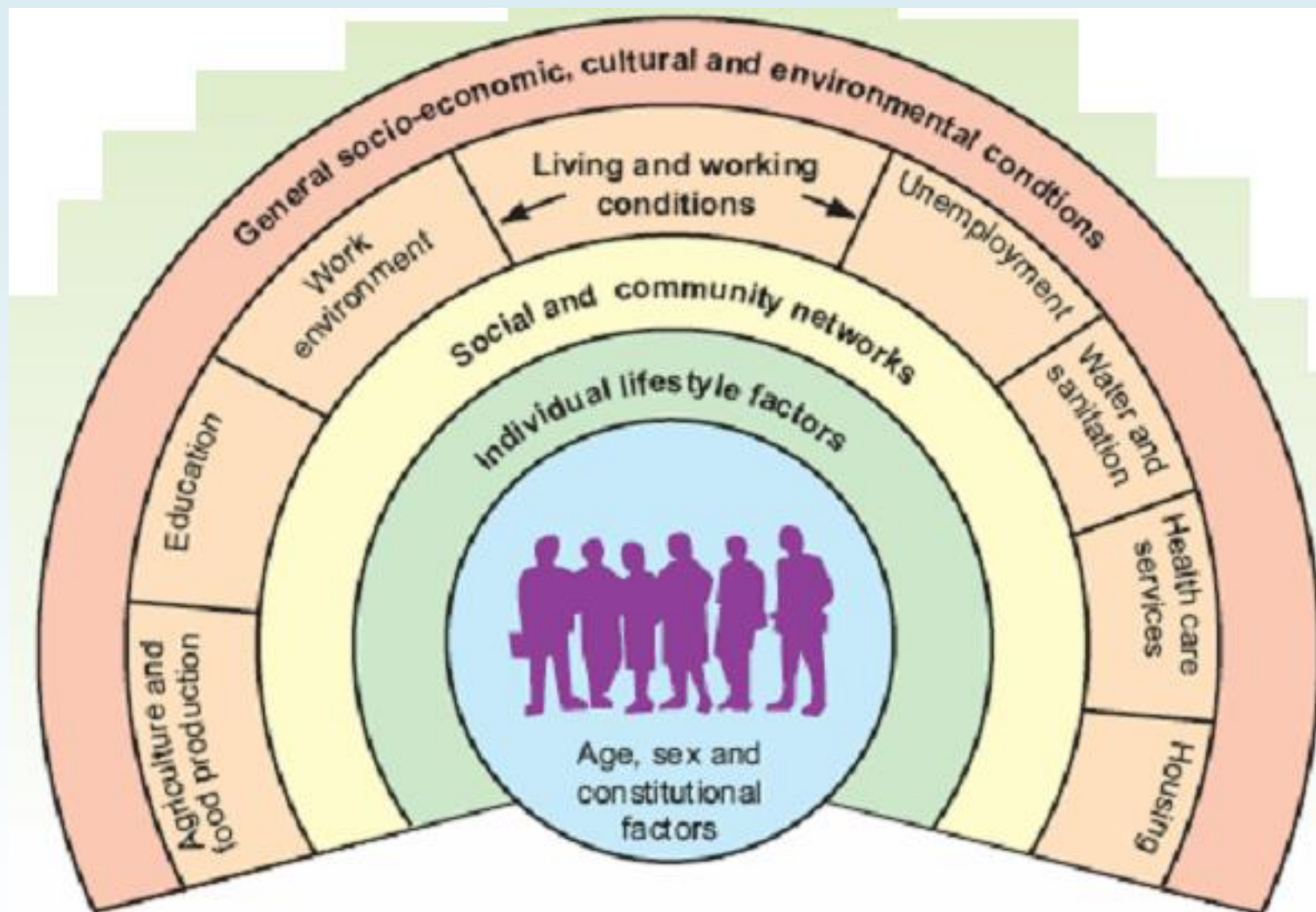


# Work and health

Hynek Pikhart

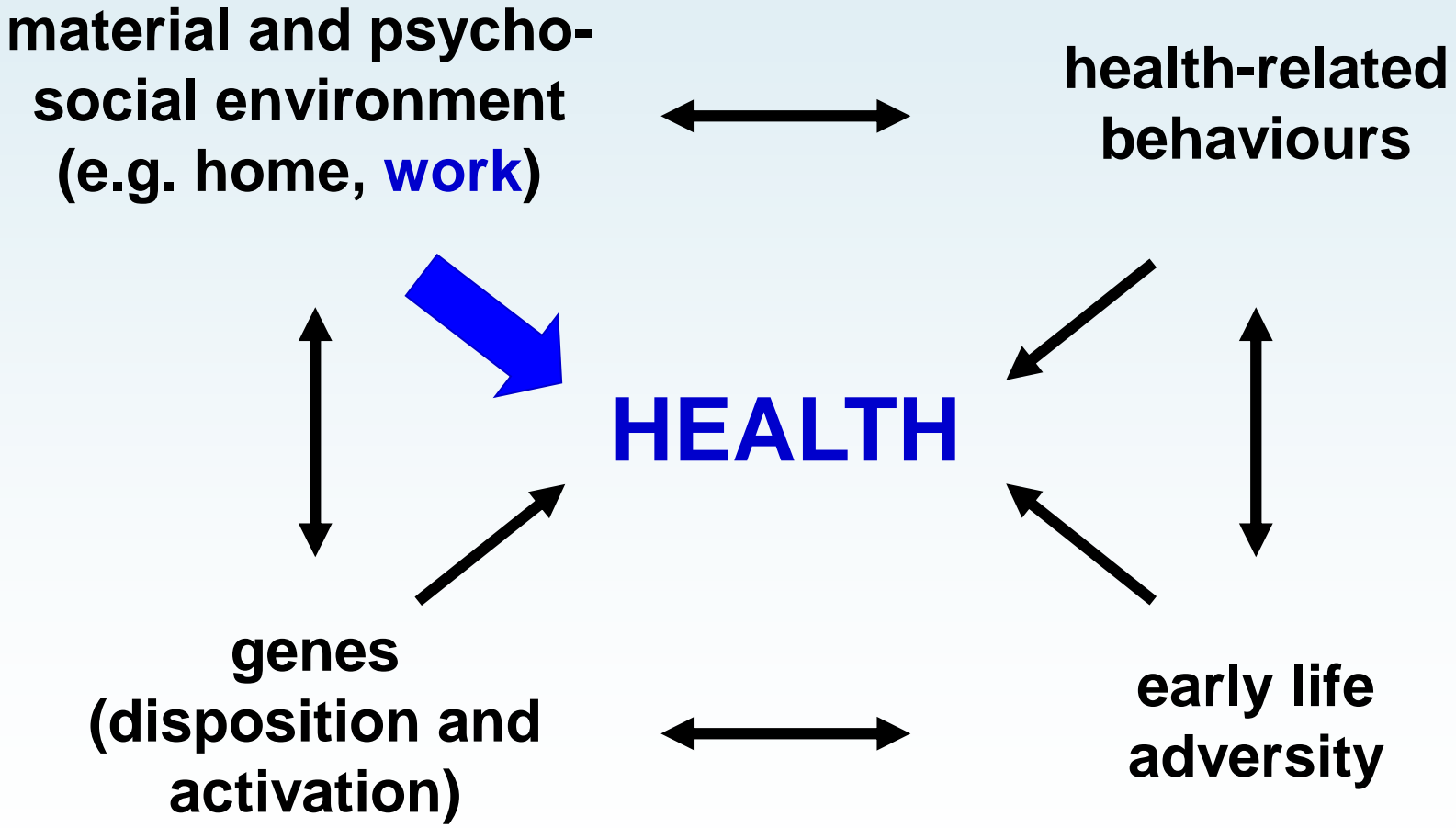
# How can society affect our health?



***Dahlgren and Whitehead "rainbow"***

Source: Dahlgren G and Whitehead M, Health Inequalities, London HMSO 1998

# Major determinants of health



# Importance of work for health

- Work is an important determinant of health
- It can influence health positively or negatively
- For most people work is essential for economic, social as well as physical wellbeing

# Work and health - the extent of the problem

- EU
  - approx. 10 million of the 150 million workers affected by incidents, accidents or diseases at work every year
  - direct compensation costs are estimated at 20 billion ECU per year
- UK
  - official statistics: every year about 2,000 lives lost through occupational disease or injury, about 20,000 major industrial injuries (e.g. skull fracture, loss of sight), and about 200,000 injuries resulting in a work disability of 3 days or more.
- Calculations based on the UK Labour Force Survey suggest that in a year at least one million people believed they had ill health caused by work and a further million believed they had ill health made worse by work

# Number of non-fatal and fatal accidents at work, 2012 (source: Eurostat)

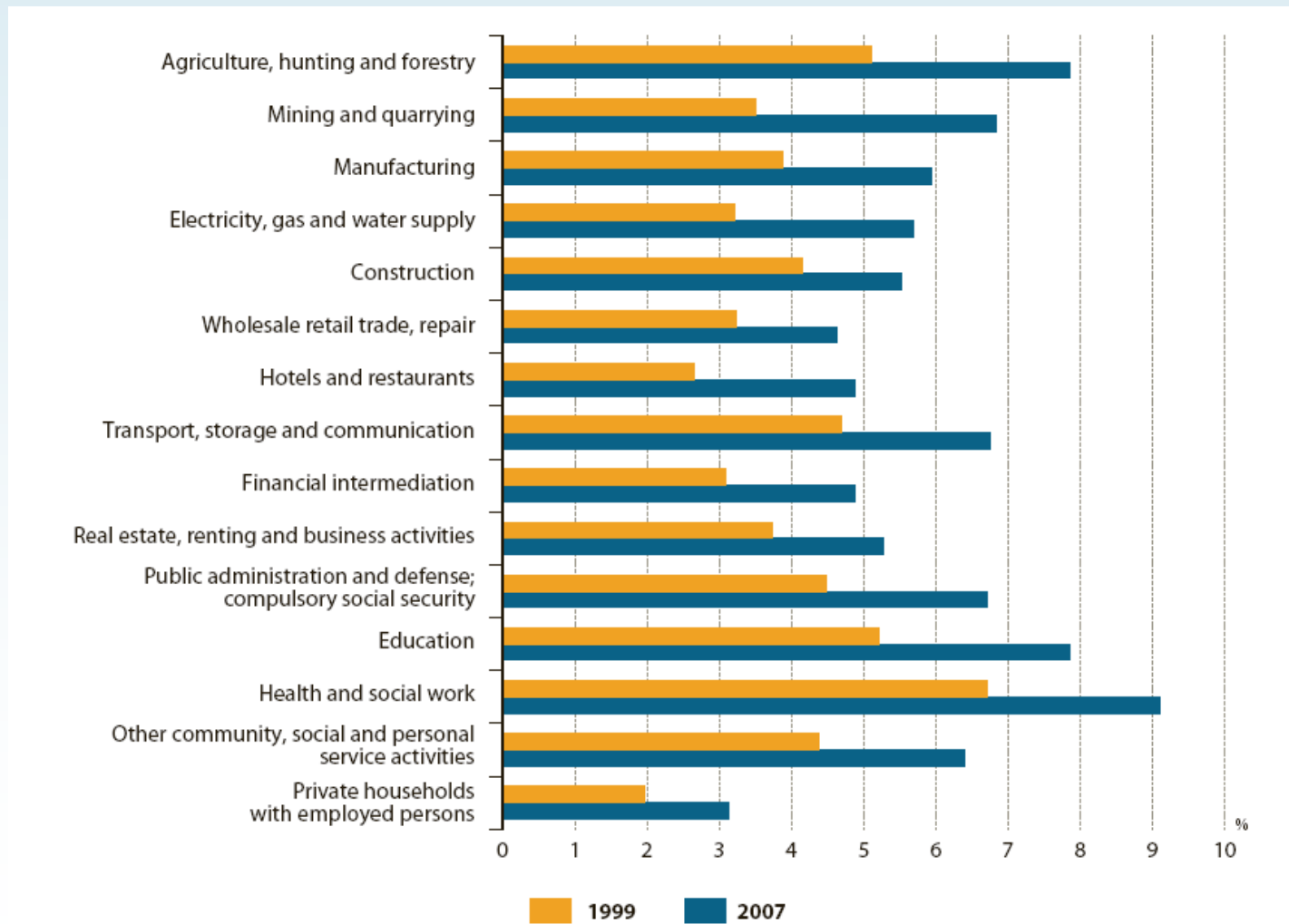
	Accidents at work involving at least four calendar days of absence from work			Fatal accidents at work		
	Total	Male	Female	Total	Male	Female
<b>EU-28</b>	<b>2 487 794</b>	<b>1 953 554</b>	<b>533 984</b>	<b>3 515</b>	<b>3 362</b>	<b>153</b>
Belgium	49 546	40 451	9 093	46	46	0
Bulgaria	1 768	1 353	415	90	82	8
Czech Republic	36 013	26 820	9 193	104	102	2
Denmark	34 245	26 825	7 292	43	42	1
Germany	709 940	578 076	131 794	473	452	21
Estonia	4 993	3 065	1 928	11	10	1
Ireland	9 794	6 828	2 921	42	42	0
Greece	11 926	9 446	2 480	37	34	3
Spain	281 045	212 968	68 077	273	266	7
France	461 376	353 980	107 396	524	494	30
Croatia	8 844	6 766	2 078	50	50	0
Italy	274 040	219 282	54 758	469	450	19
Cyprus	1 511	1 127	384	7	7	0
Latvia	1 213	875	338	33	30	3
Lithuania	2 303	1 698	605	55	54	1
Luxembourg	6 299	5 378	921	13	13	0
Hungary	16 717	11 879	4 838	60	58	2
Malta	2 190	1 978	212	7	7	0
Netherlands	116 029	89 307	26 722	31	31	0
Austria	56 299	46 731	9 568	137	128	9
Poland	67 472	50 290	17 182	303	284	19
Portugal	109 511	82 685	26 826	162	157	5
Romania	2 889	2 308	581	257	245	12
Slovenia	11 505	9 318	2 187	21	21	0
Slovakia	7 469	5 405	2 064	49	49	0
Finland	34 821	28 042	6 779	32	30	2
Sweden	24 864	18 674	6 189	37	34	3
United Kingdom	143 171	111 998	31 162	149	144	5
Norway (*)	14 855	12 335	2 520	34	32	2
Switzerland	72 106	60 352	11 754	60	57	3

(\*) NACE Rev. 2 Section A and Sections C to N. Non-fatal accidents reported in the framework of ESAW are accidents that imply at least four full calendar days of absence from work (serious accidents).

(\*) 2011.

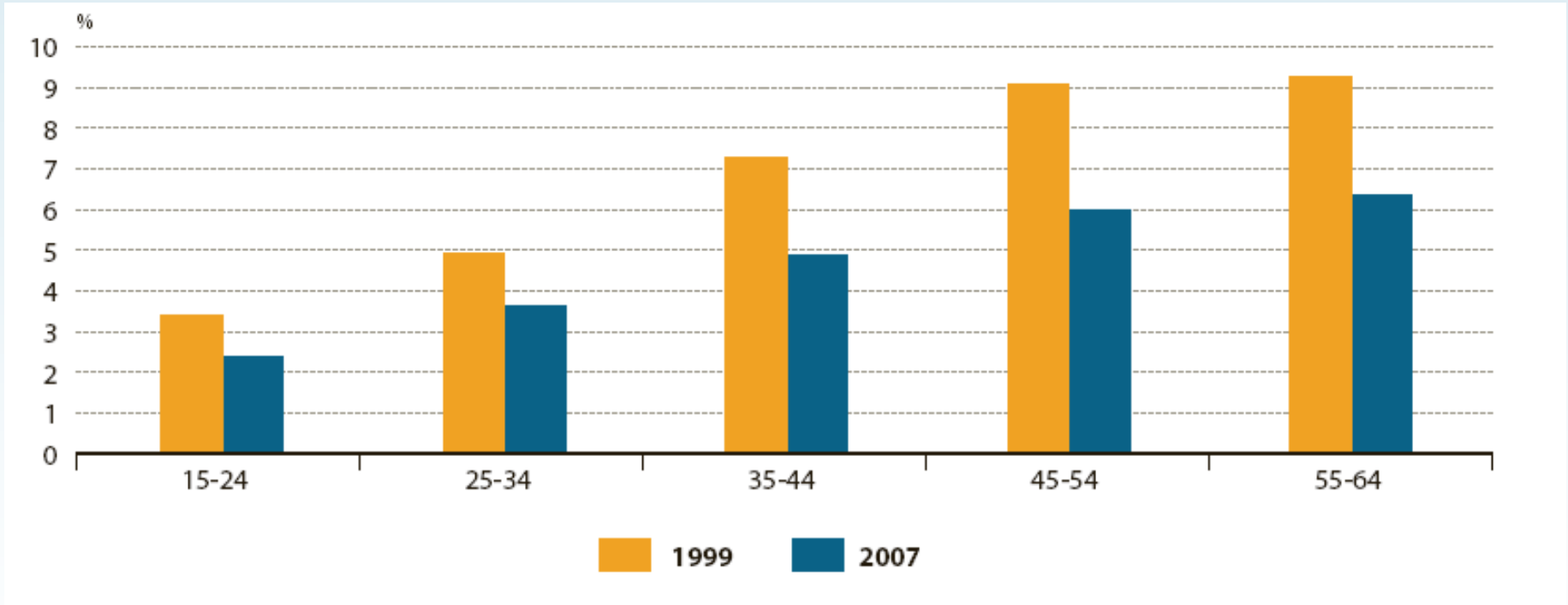
Source: Eurostat (online data code: hsw\_mi01)

# Occurrence of one or more work-related health problems in the past 12 months in different sectors



Source: Eurostat; Health and safety at work 1999-2007

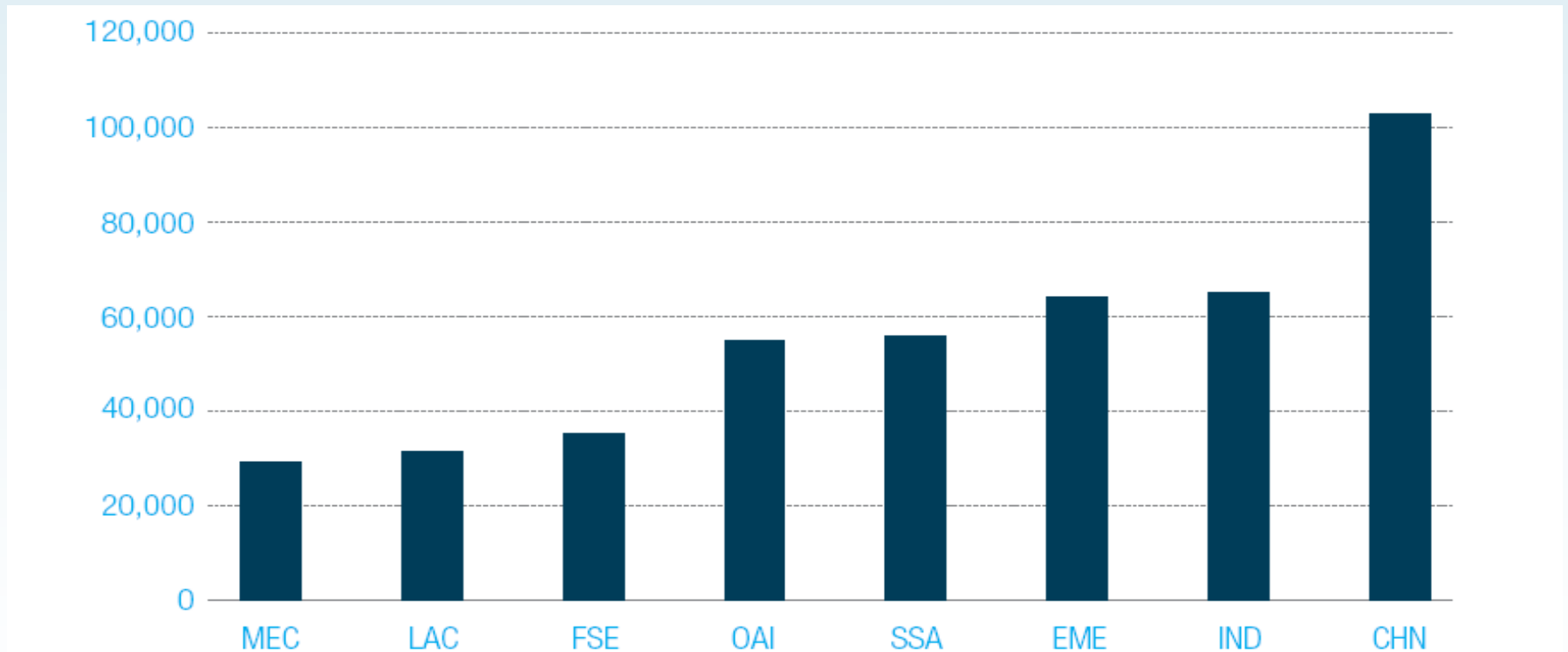
# Occurrence of work-related health problems in different age groups



Source: Eurostat; Health and safety at work 1999-2007



# Adverse conditions exposing individuals to a range of health hazards - Number of deaths from workplace exposure to dangerous substances in different countries and regions



MEC = Middle East Crescent; LAC = Latin America and the Caribbean; FSE = Formerly Socialist Economies; OAI = Other Asia and Islands; SSA = sub-Saharan Africa; EME = Established Market Economies; IND = India; CHN = China.

From ILO 2005, and CSDH Final Report 2008

# Importance of work for health

## Traditionally...

- Production process may have impact (both physical and environmental) that would affect workers and physical environment surrounding the workplace
- Studies on coal miners, asbestos workers, radiation workers – diseases related to chemical and physical exposures
- The occupational exposures are important but probably not the main cause of ill health related to work

# Importance of work for health

- CHD, mental health, other causes of ill health may be influenced by other aspects of work
- Wider social and economic context important

# Importance of work for health

## Work

- is a source of regular income and related opportunities
- is a source of personal growth and training opportunities
- defines social identity, social status and related rewards
- gives access to social networks beyond primary groups
- influences a person's self efficacy and self esteem



Work has prominent position among social determinants of health

# Good Work

**Employment and working conditions have powerful effects on health and health equity**

**When these are **good** they can provide:-**

- **financial security**
- **paid holiday**
- **social protection benefits such as sick pay, maternity leave, pensions**
- **social status**
- **personal development**
- **social relations**
- **self-esteem**
- **protection from physical and psychosocial hazards**

**(CSDH Final Report, WHO 2008)**

# Psychosocial work environment

## Environment providing options / barriers to meet basic psychological needs of working people:

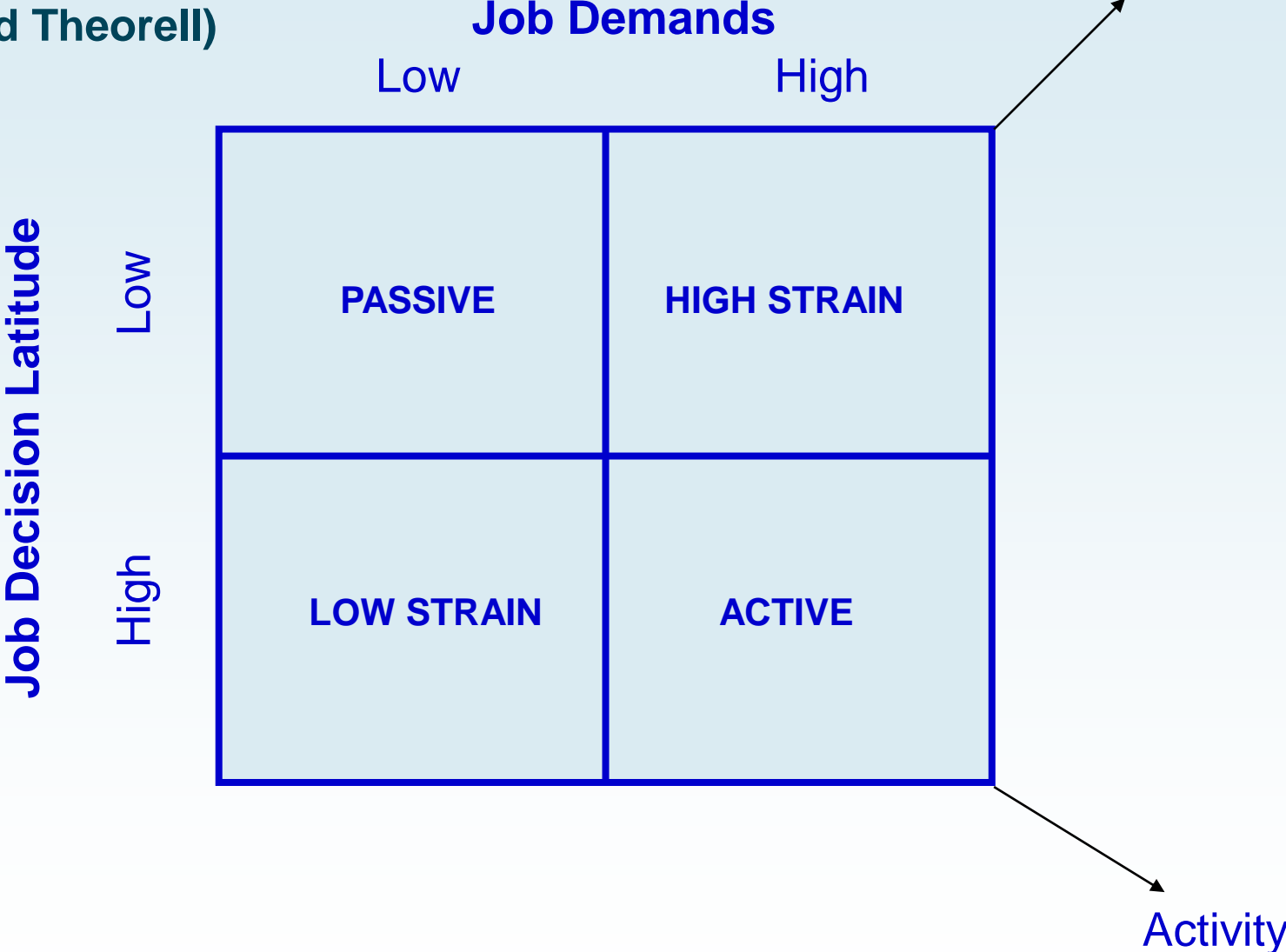
- sense of belonging  
(membership role; social identity)
- sense of control  
(task accomplishment; self-efficacy)
- experience of reward  
(contractual reciprocity; self-esteem)

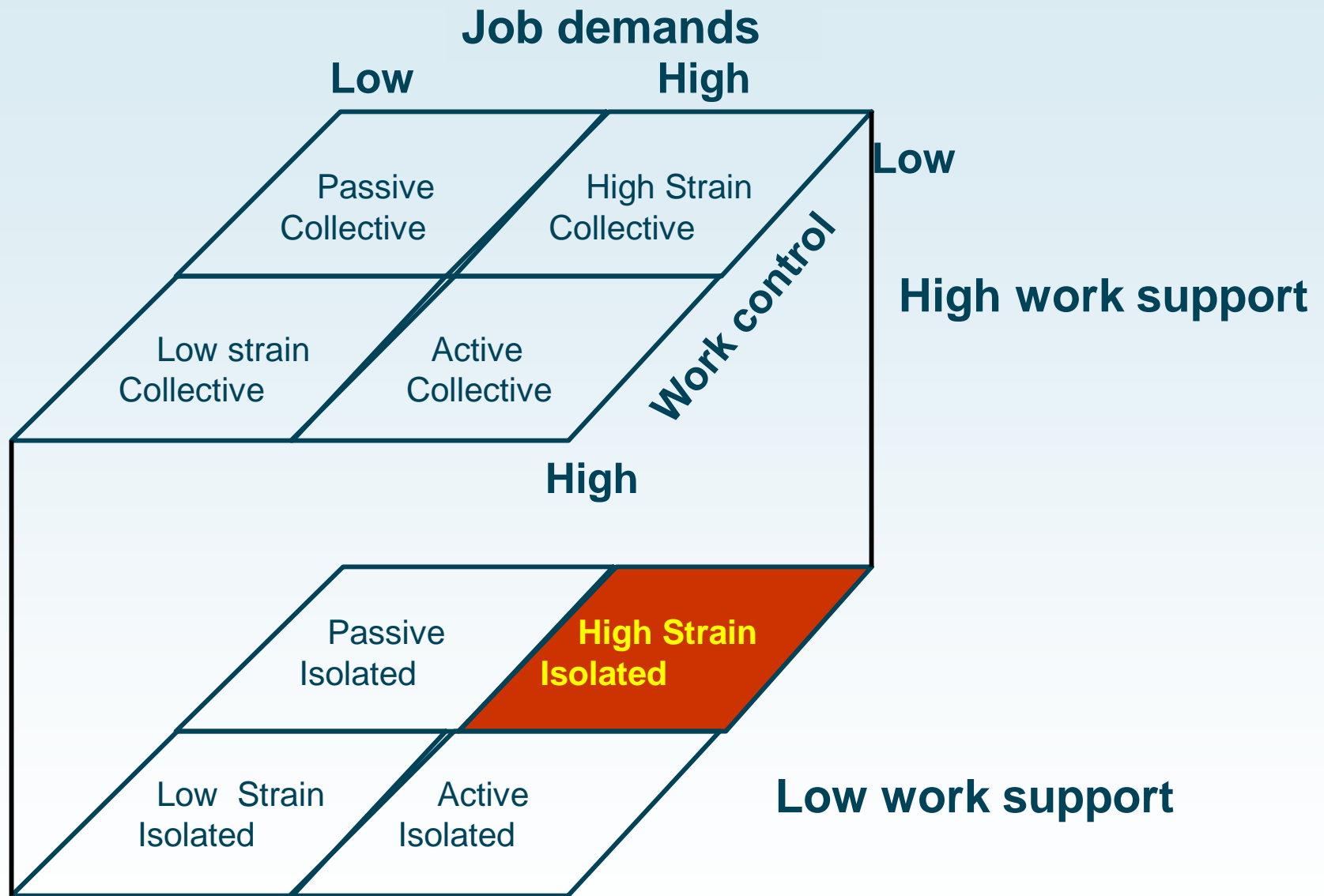
## Theoretical models with a focus on these needs:

- social support at work
- demand-control
- effort-reward imbalance

# Job demand control model

(Karasek and Theorell)







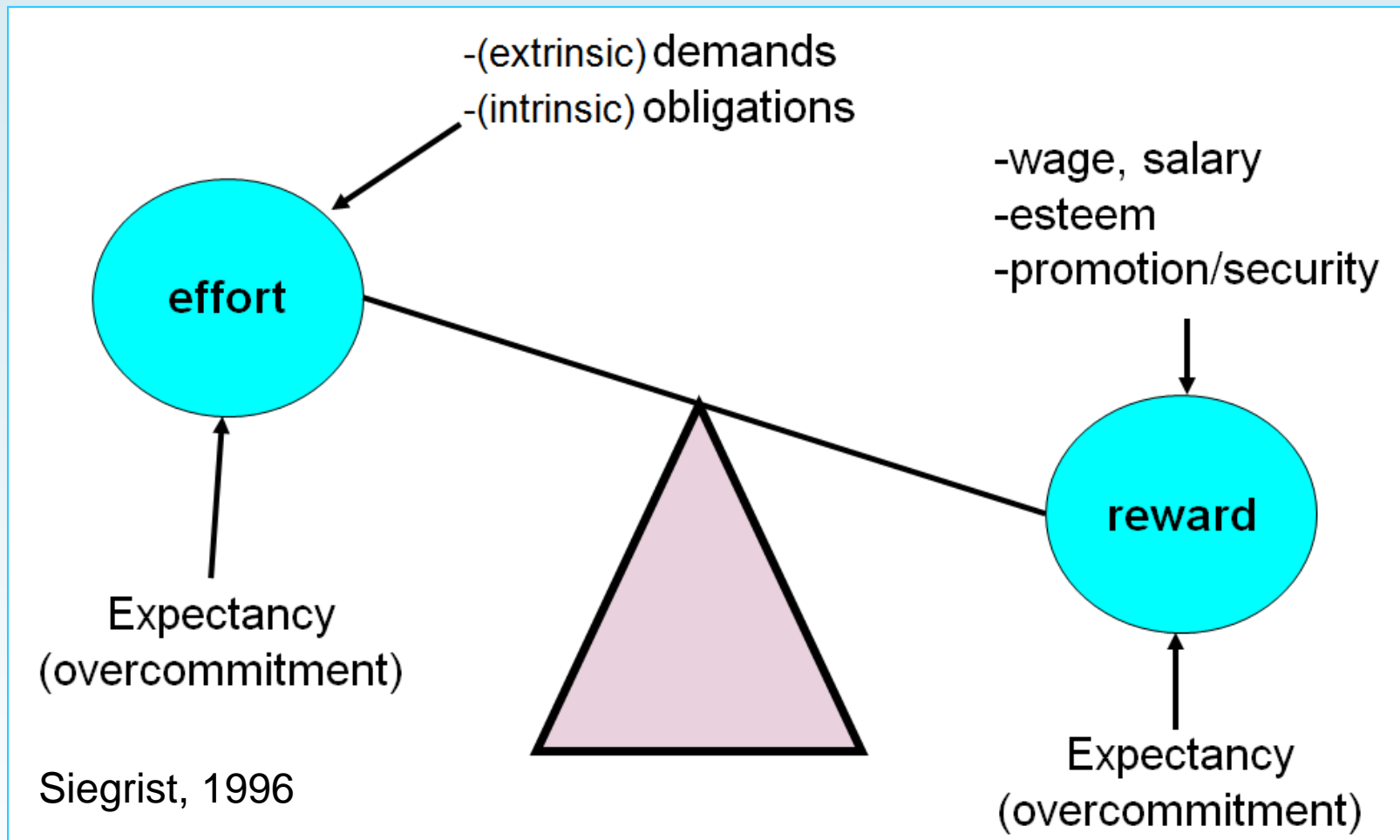
# How to measure JD-C-S

- “internal”/personal/subjective – questionnaire
- “external”
  - Supervisor – personal or ecological
  - External researcher,... - personal or ecological
  - National classification of professions - ecological

# The model of effort-reward imbalance at work

- Focus on employment contract (salary, esteem, status)
- Rooted in general principle of cooperative exchange: social reciprocity
- Combines aspects of the work environment ('extrinsic') and the working person ('intrinsic')
- Has policy implications for health promotion through contractual fairness
- Can be applied to other types of role-related cooperative exchange

# Effort-reward imbalance at work



- Imbalance is maintained if
  - There is no alternative choice available
  - It is accepted for strategic reasons
  - Presence of personal style of coping (overcommitment)

Psychosocial factors at work have been found to predict a range of health outcomes

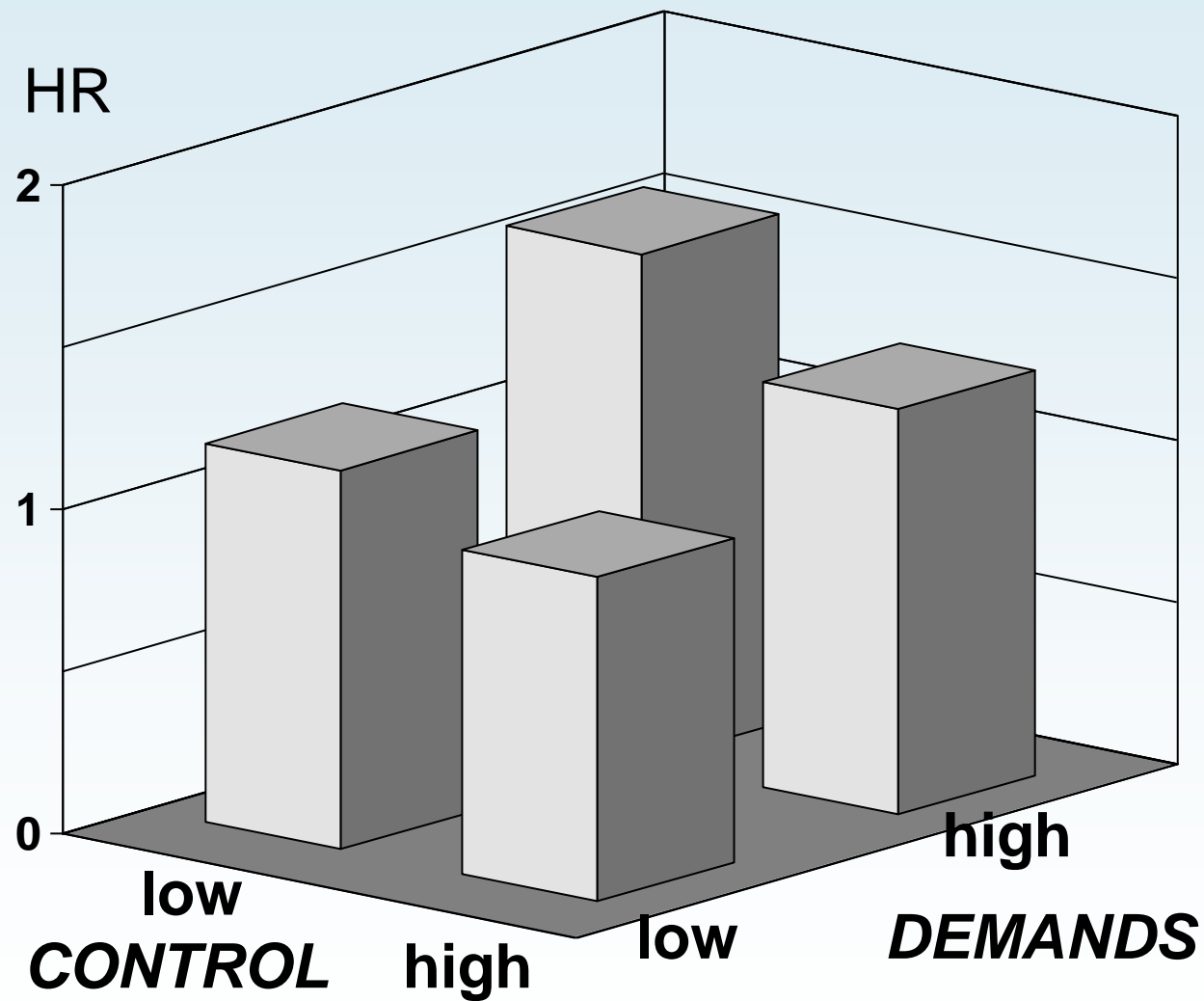
- Both mortality and morbidity
- CHD, CVD, hypertension, MI
- sickness absence
- self-rated health
- neck pain and low back pain
- depression

## Job strain in health studies

- Karasek, 1981 – Swedish workforce
  - Prevalence of CHD indicator assoc. with higher demand and lower decision latitude
  - C-C CVD deaths: OR 4.0 (1.1-14.4) when low latitude combined with high demands
- Karasek, 1988 – HES and HANES data
  - PS exposures estimated ecologically
  - Myocardial infarction
  - Top decile of strain: 3.80 (p=0.017) in HES and 4.79 (p=0.022) in HANES

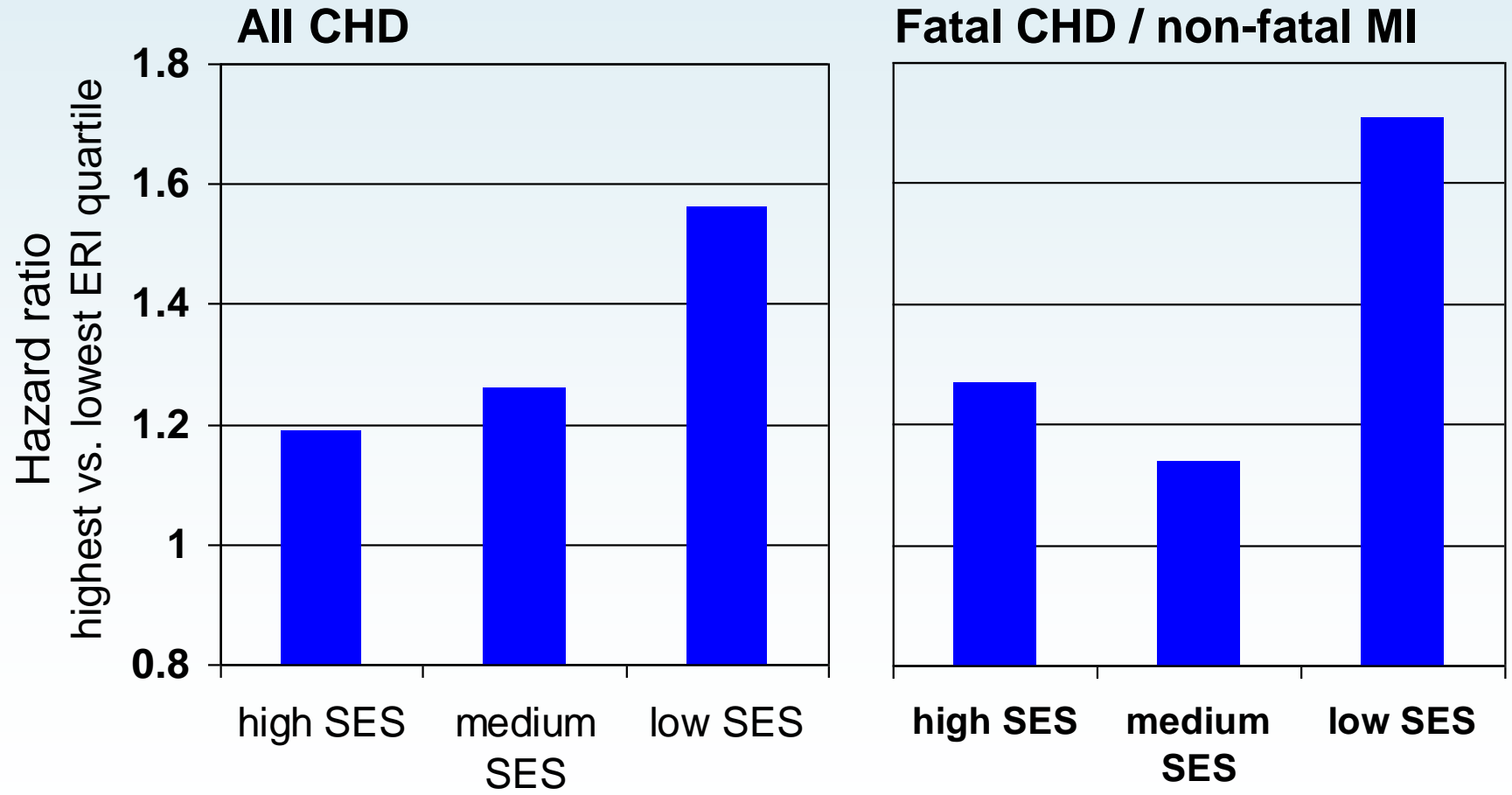
# Job strain and verified CHD

Whitehall II study, men and women, 11 years follow-up



# Effect modification of the association between the effort-reward ratio and CHD by SES

Whitehall II-Study; 11 year follow-up



Source: H. Kuper et al. (2002), Occ Environ Med, 59: 777-784.

# Reviews of evidence

- Hemingway and Marmot, BMJ 1999
  - Evidence based cardiology: Psychosocial factors in the aetiology and prognosis of coronary heart disease: systematic review of prospective cohort studies
    - In healthy populations, prospective cohort studies show a possible aetiological role for psychosocial work characteristics in 6/10 studies
    - In populations of patients with coronary heart disease, prospective studies show a prognostic role for psychosocial work characteristics in 1/2 studies
  - Most of reported studies use JD/C but also hectic work, job satisfaction, job variety,...



# Kivimaki et al - Association of job strain with incident coronary heart disease – a collaborative meta-analysis of individual participant data

The Lancet, 2012; 380: 1491–97

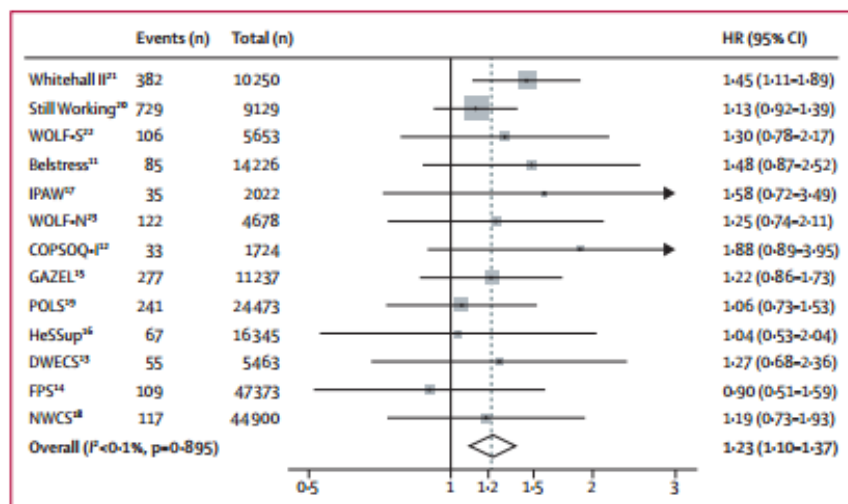
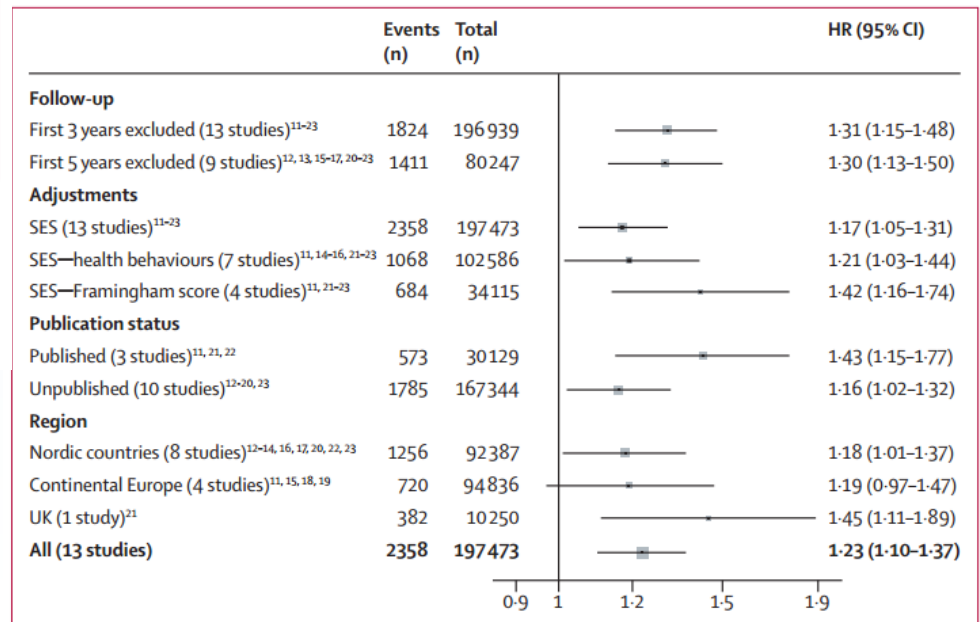


Figure 1: Random-effects meta-analysis of the association between job strain and incident coronary heart disease

Estimates are adjusted for age and sex. WOLF-S=Work, Lipids, Fibrinogen-Stockholm. IPAW=Intervention Project on Absence and Well-being. WOLF-N=Work, Lipids, Fibrinogen-Norrland. COPSOQ-I=Copenhagen Psychosocial Questionnaire version I. GAZEL=Electricité De France-Gaz De France. POLS=Permanent Onderzoek Leefsituatie. HeSSup=Health and Social Support. DWECS=Danish Work Environment Cohort Study. FPS=Finnish Public Sector Study. NWCS=Netherlands Working Conditions Survey.

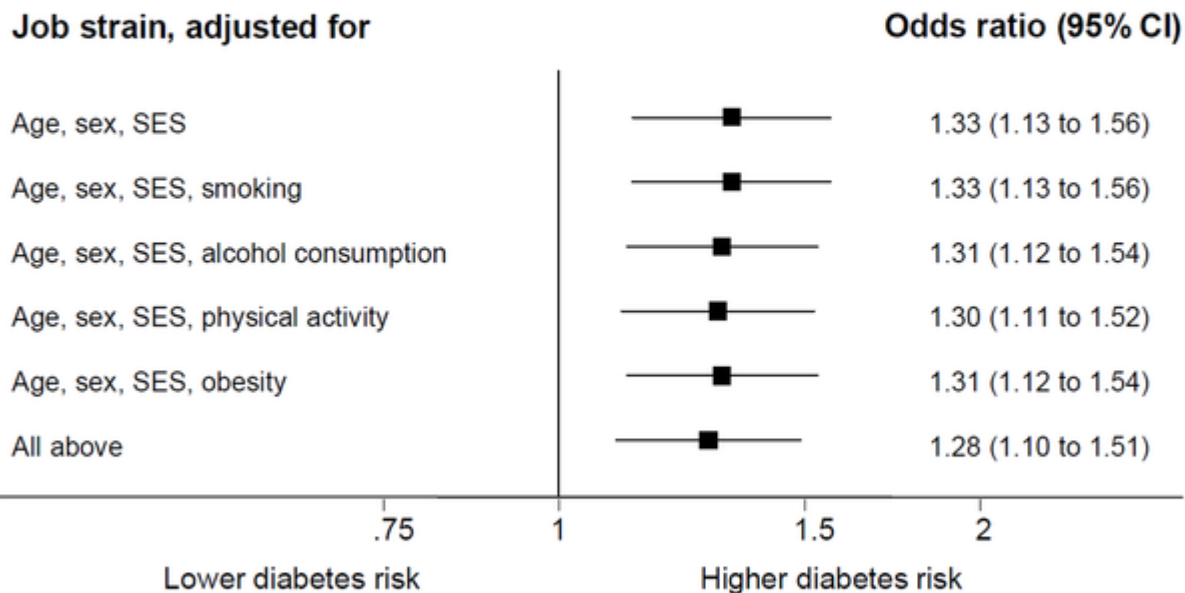
IPD-Work Consortium



RESEARCH ARTICLE

**Job Strain and Cardiovascular Disease Risk Factors: Meta-Analysis of Individual-Participant Dat...**

Solja T. Nyberg, Eleonor I. Fransson, Katriina Heikkilä, Lars Alfredsson, Annalisa ...



# Summary: Work stress and health

High job strain and/or High ERI

have adverse effects on all stages of the disease process...

- Disease risk factors, such as smoking and obesity
  - Preclinical disease, such as carotid IMT
  - Disease, such as diabetes and CHD
  - Premature death
- 
- Also measures of ill-health, such as sickness absence, mental health and well-being

## Other work-related factors

- Focus of presentation so far on work-related PS factors
- Nothing said about the role of unemployment or job insecurity
- Unemployment or job insecurity affected much more by broader economy

# Unemployment

## Unemployment figures

In 2006 there were about 195 million unemployed in the world (6.3%)

In many non-industrialized countries the rate is approx. 30%, in developed countries 4-12%

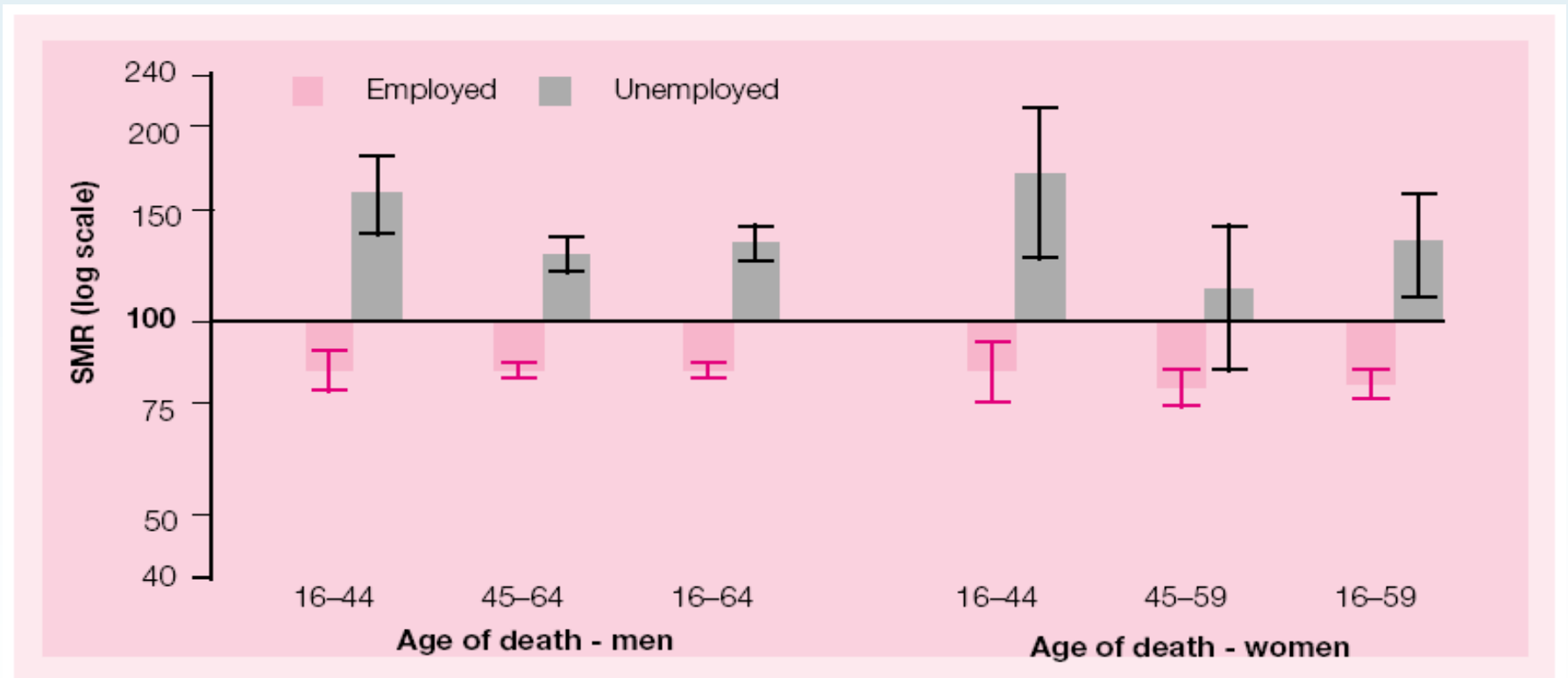
## Distribution of unemployment

Women more likely to be unemployed than men (6.6 vs. 6.1%)

Over 85 million (44%) of the unemployed are youth aged 15 to 24, although they are only 25% of the working age population

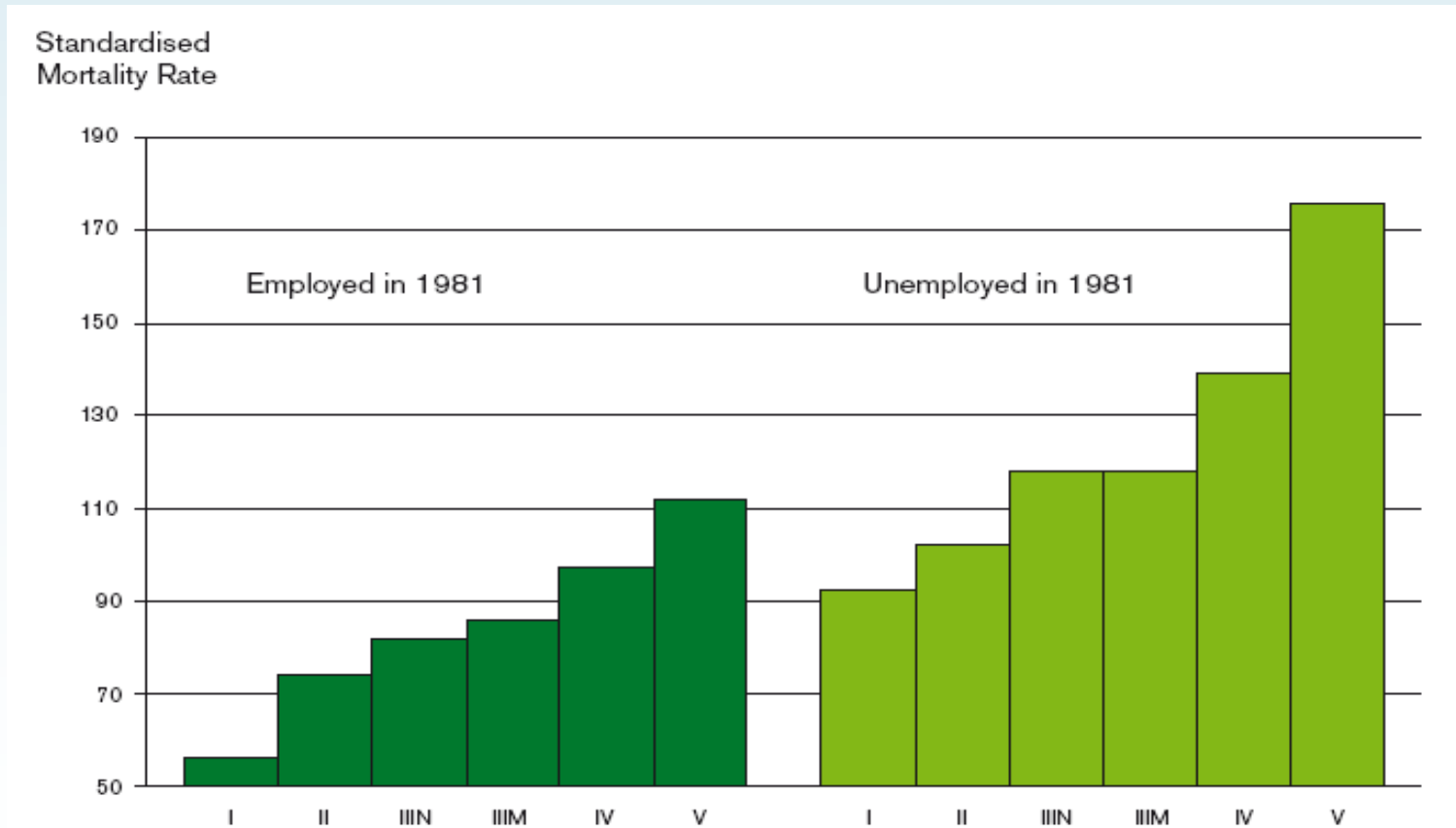
Unemployment is more concentrated among all underprivileged groups, such as ethnic minorities, immigrants and the least skilled and educated. For example, in 2003, a person in the developed economies with only primary education was 3x as likely to be unemployed as a person with tertiary education

# SMRs 1981-1992 by employment status at the 1981 Census, men and women by age at death



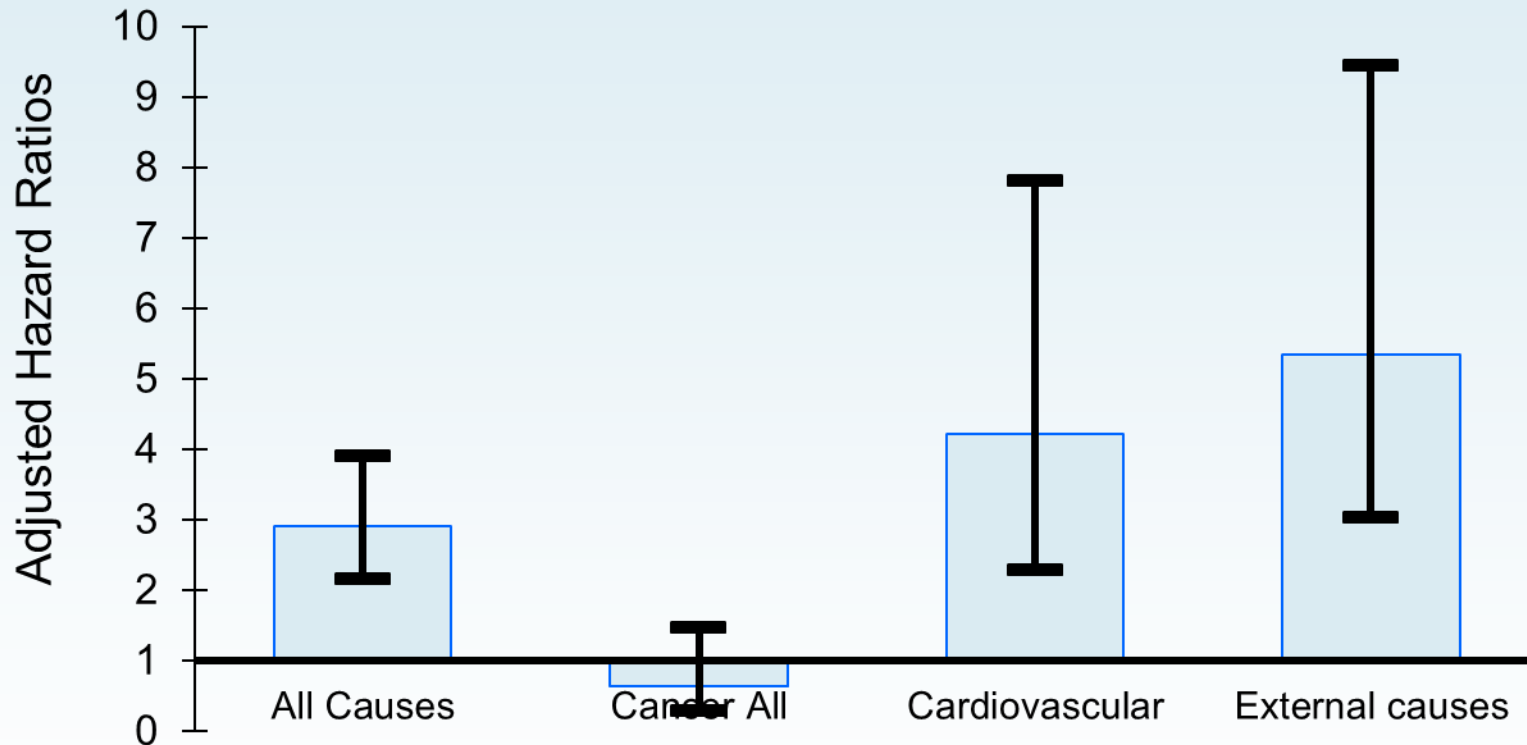
Bethune A. in Drever and Whitehead (eds) *Health Inequality* (1997)

# Mortality of men in England and Wales in 1981–92, by social class and employment status at the 1981 Census



# Mortality 1990-2001 in women: 10-town study, Finland

Unemployed women vs women in permanent employment

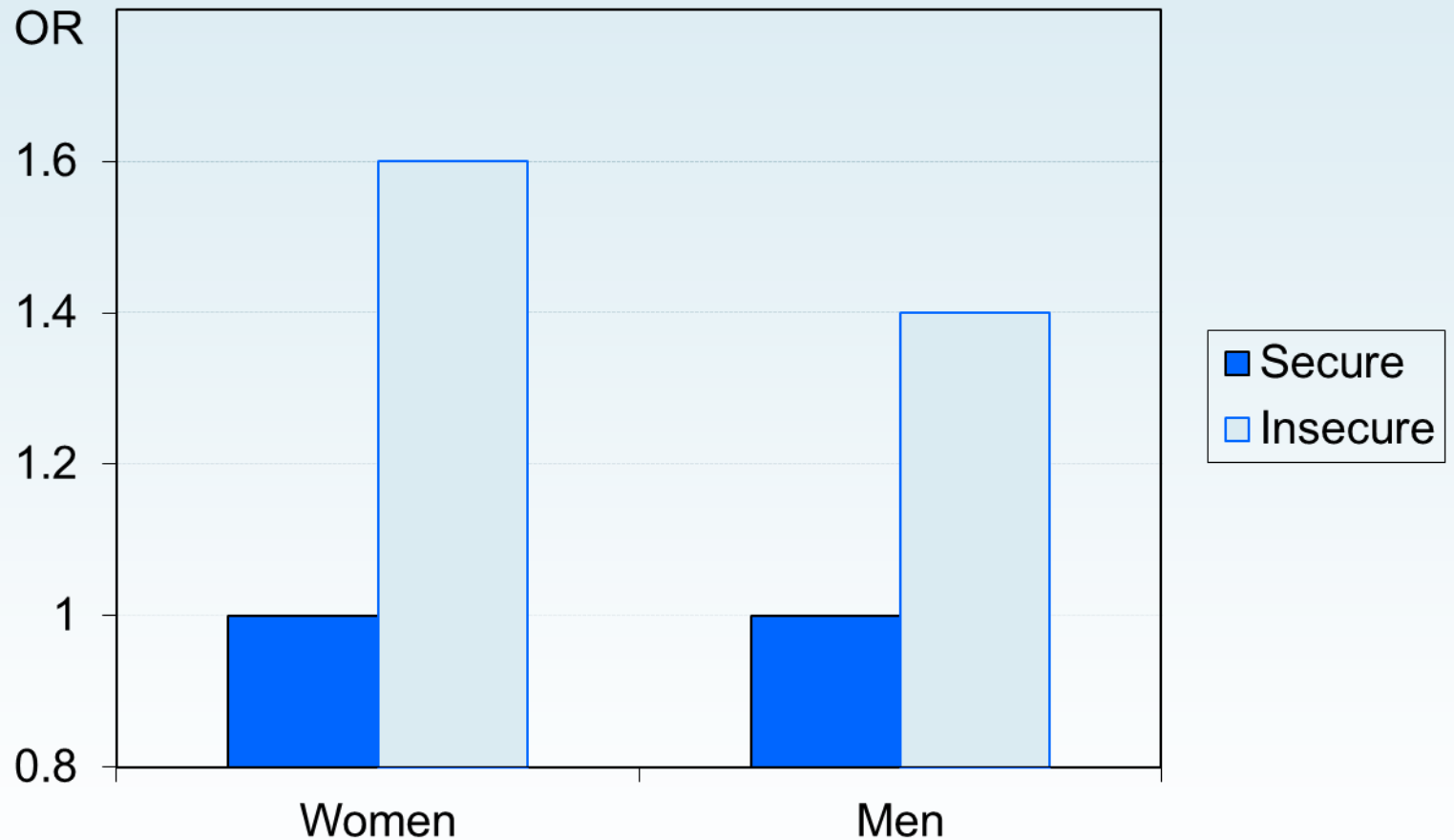




# Unemployment and health

- Short- and long-term effects on health
- Duration of unemployment affects health
- Ways how unemployment may affect health:
  - Unempl → Financial problems → Worse living standards → Lower self-esteem
  - Unempl → distress, depression (of unemployed, partners, children)
  - Unempl → health behaviours

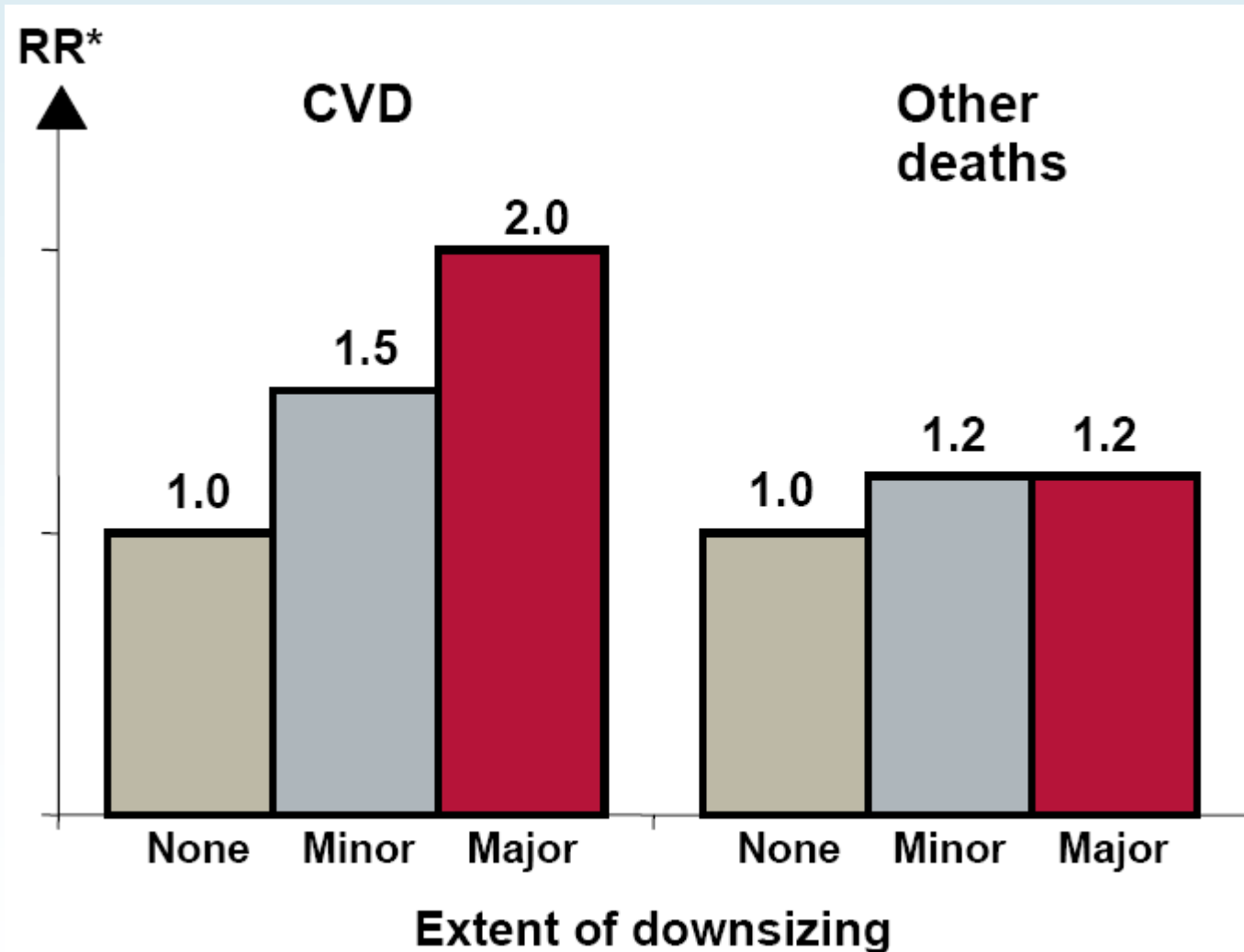
# Job insecurity and risk of ischaemia



adjusted for age, grade and ischaemia before jobs were threatened

# Organisational downsizing and mortality

7.5 years follow-up of 22,430 public employees



# Unemployment and mortality—a longitudinal prospective study on selection and causation in 49321 Swedish middle-aged men

Lundin et al; J Epidemiol Community Health 2010

	All-cause mortality (n = 222)	Violent death (n = 66)	Suicide (n = 45)	Violent death other than suicide (n = 21)	Non-violent death (n = 156)	CVD (n = 61)
Follow-up 1995–8	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)
<b>Crude</b>	<b>2.39</b> (1.76 to 3.26)	<b>3.56</b> (2.12 to 5.97)	<b>3.1</b> (1.63 to 5.9)	<b>4.69</b> (1.94 to 11.31)	<b>1.97</b> (1.33 to 2.90)	<b>1.68</b> (0.87 to 3.22)
<b>Adjusted*</b>	<b>1.57</b> (1.13 to 2.18)	<b>2.16</b> (1.24 to 3.78)	<b>1.76</b> (0.89 to 3.50)	<b>3.46</b> (1.33 to 9.00)	<b>1.34</b> (0.88 to 2.01)	<b>1.10</b> (0.56 to 2.18)
% reduction of HR	<b>60</b>	<b>55</b>	<b>65</b>	<b>33</b>	<b>64</b>	<b>85</b>
Follow-up 1999 to 2003	(n = 449)	(n = 64)	(n = 40)	(n = 24)	(n = 385)	(n = 163)
<b>Crude</b>	<b>1.69</b> (1.33 to 2.15)	<b>1.42</b> (0.72 to 2.79)	<b>1.36</b> (0.57 to 3.23)	<b>1.54</b> (0.53 to 4.50)	<b>1.74</b> (1.34 to 2.25)	<b>1.73</b> (1.17 to 2.58)
<b>Adjusted*</b>	<b>1.17</b> (0.91 to 1.50)	<b>1.00</b> (0.5 to 2.03)	<b>1.02</b> (0.42 to 2.53)	<b>0.98</b> (0.32 to 2.99)	<b>1.19</b> (0.91 to 1.56)	<b>1.07</b> (0.71 to 1.62)
% reduction of HR	<b>76</b>	<b>99</b>	<b>94</b>	<b>100</b>	<b>72</b>	<b>90</b>

Crude and fully adjusted hazard ratios (HR) with 95% CIs.

\*Crowded housing 1960, parental class 1960 Risk use of alcohol 1969, smoking 1969, psychiatric diagnosis 1969, emotional control 1969 and contact with police 1969, psychiatric diagnosis 1973–91, education 1990, socioeconomic position 1990, income 1990–1 and insured sickness absence 1990–1.

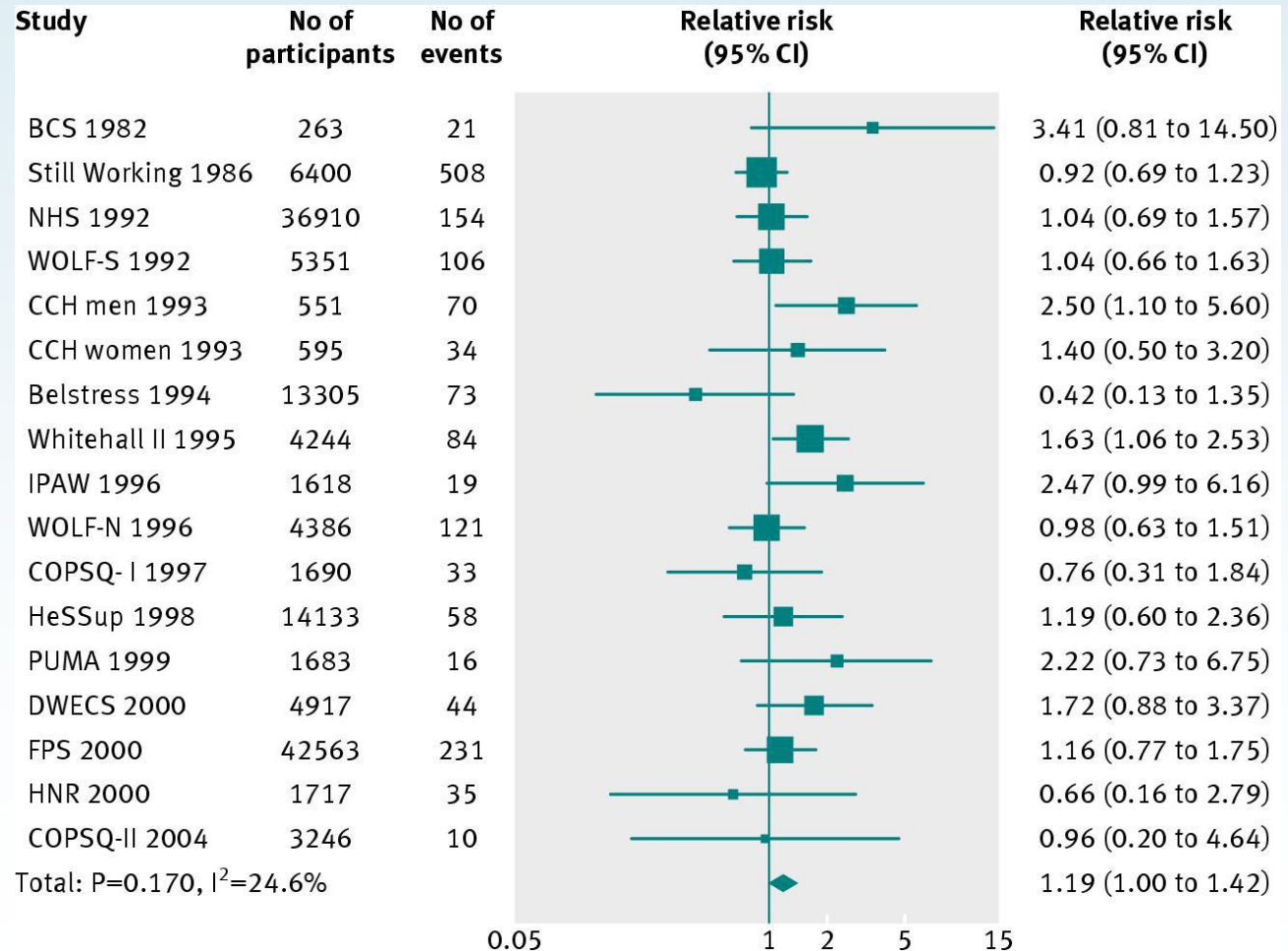
Values in bold and italic represent the attenuation of the hazard ratio.

“The results suggest that a substantial part of the increased relative risk of mortality associated with unemployment may be attributable to confounding by individual risk factors.”

# Virtanen et al: Perceived job insecurity as a risk factor for incident CHD: systematic review and meta-analysis

BMJ 2013; 347: f4746

17 studies



# Job loss and lower healthcare utilisation due to COVID-19 among older adults across 27 European countries

Gabriela Ksinan Jiskrova, Martin Bobák, Hynek Pikhart, Albert J Ksinan

	Lost job due to COVID-19 n=10 958	
	OR	95% CI
Age (per 10 years)		
In men	1.02	0.88 to 1.18
In women	1.44	1.26 to 1.65
Sex (at centred age)		
Men	1 (ref)	
Women	1.27	1.14 to 1.41
Partner in household		
No	1 (ref)	
Yes	0.98	0.86 to 1.12
Education		
Tertiary	1 (ref)	
Secondary	1.60	1.40 to 1.82
Primary	1.89	1.59 to 2.26

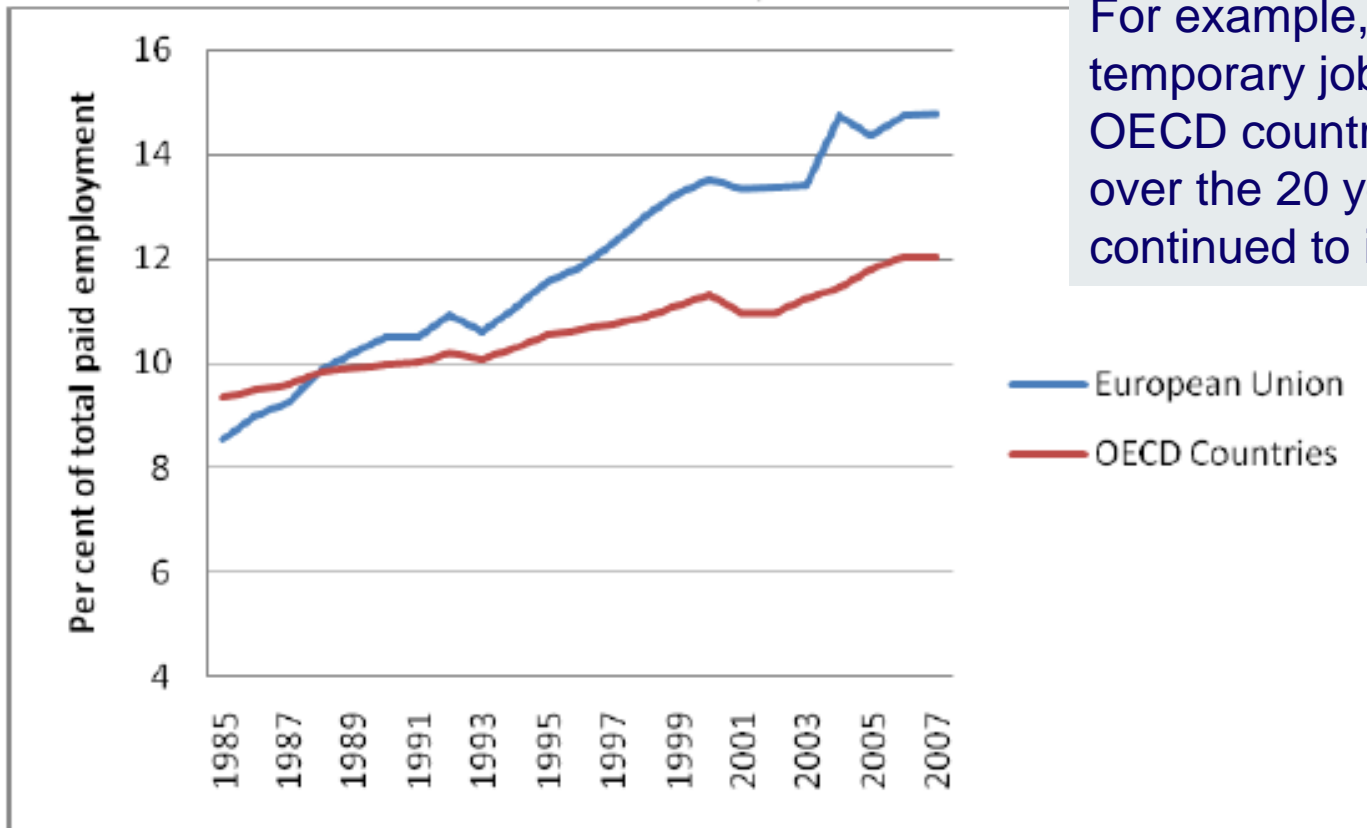
# Economy in current period of globalization:

Major impact on work and employment

- Increased job instability and unemployment (mergers, downsizing, outsourcing)
- Segmentation of labour market (disparities in quality of work and income)
- Increased competition (reduced social support and solidarity)
- De-standardization of work contracts (flexible work, fixed-term contracts, homework etc.)

# Increase in temporary employment

Figure 1 Growing prevalence of temporary work in OECD countries, 1987--2007.



For example, the proportion of temporary jobs in European and OECD countries steadily increased over the 20 years to 2007 and has continued to increase since.



# Summary

- There is large evidence supporting important role of work in health
- This presentation has focused mostly on risk associated with some PS factors (and work stress in particular) but there is much larger evidence for the role of work-related factors on health
- Psychosocial and social factors and health is a dynamic area of research, with a need for new large studies and possibly new study designs

# Policy implications – (more) interventions needed

Potential actions may be taken in several levels

- Personal level:  
Coping as strengthening of the individual's competence of problem solving
- Group level:  
Cooperation and handling of conflicts, collective assertion, leadership training
- Organizational level:  
Changes at the level of work organization (organizational and personnel development) including training/qualification

# DRIVERS FOR HEALTH EQUITY (FP-7 FUNDED PROJECT

- <http://health-gradient.eu/home/publications/english/>
- Montano D, Hoven H & Siegrist J (2013). A meta-analysis of health effects of randomized controlled worksite interventions: Does social stratification matter? In: *Scand J Work Environ Health*. DOI: 10.5271/sjweh.3412.
- Montano D, Hoven H & Siegrist J (2014). Effects of organisational-level interventions at work on employees' health: a systematic review. In: *BMC Public Health* 14, S. 135. DOI: 10.1186/1471-2458-14-135.

**THANK YOU!**

