

EU-OSHA Seminar on psychosocial risks in Europe *Brussels, 16-17 October 2014*

Managing stress and psychosocial risks at work

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Main Questions

- Can we reliably define and measure ,stress at work‘?
 - Does stress at work matter for health and productivity?
 - How can the impact of stress at work be separated from other sources of stress?
 - Are there examples of effective interventions of stress reduction at work?
 - How can national policies support actions at company level?
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Effects of economic globalisation: Labour market consequences in developed countries

Increased pressure of rationalisation
(mainly due to wage competition)

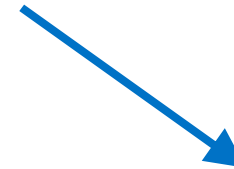
Downsizing, Merging, Outsourcing



Work
intensification



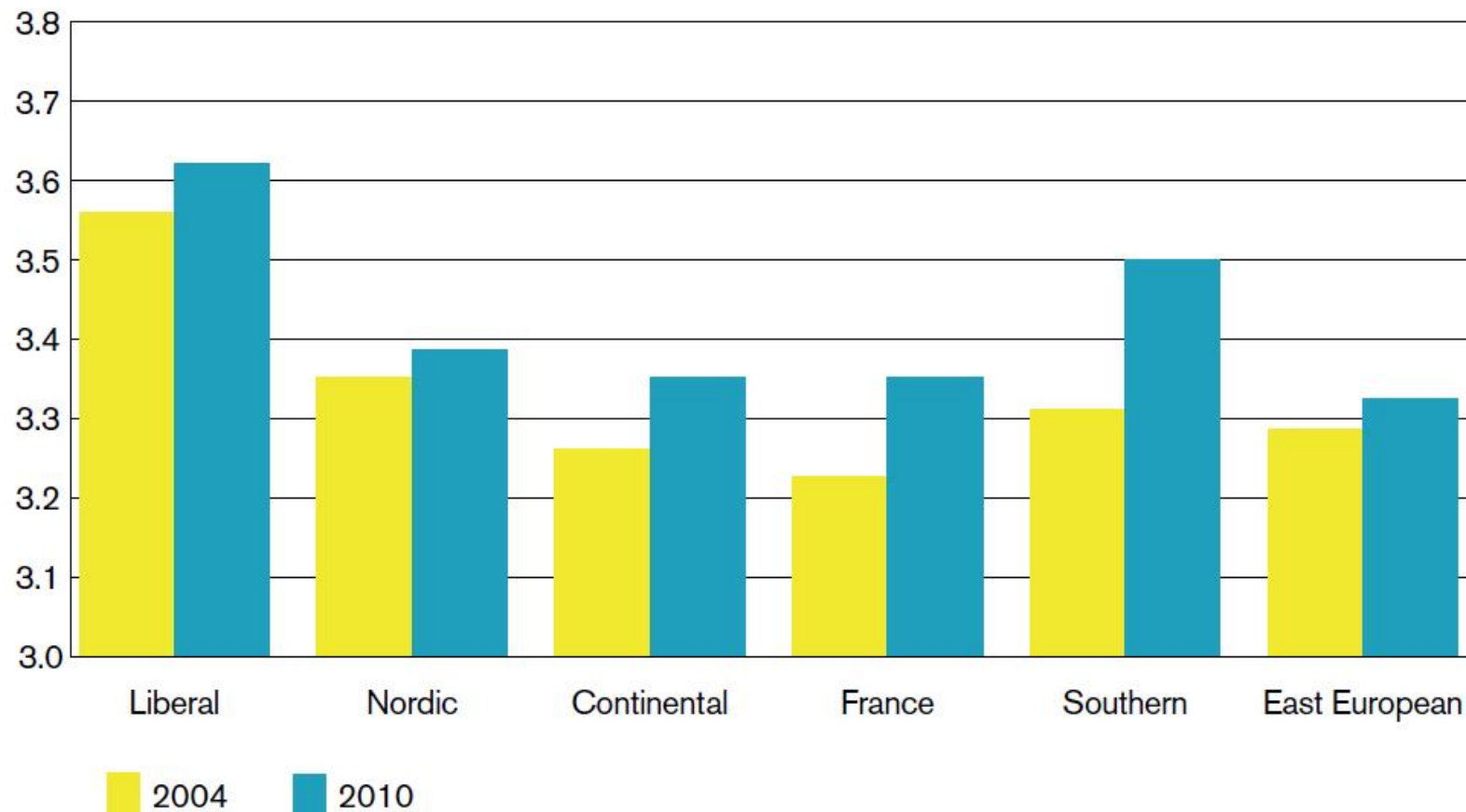
Job
insecurity



Low wage /
salary

Increase in work intensity 2004-2010: European Social Survey, 19 EU countries

Work Intensity Scores (0-5) 2004-2010

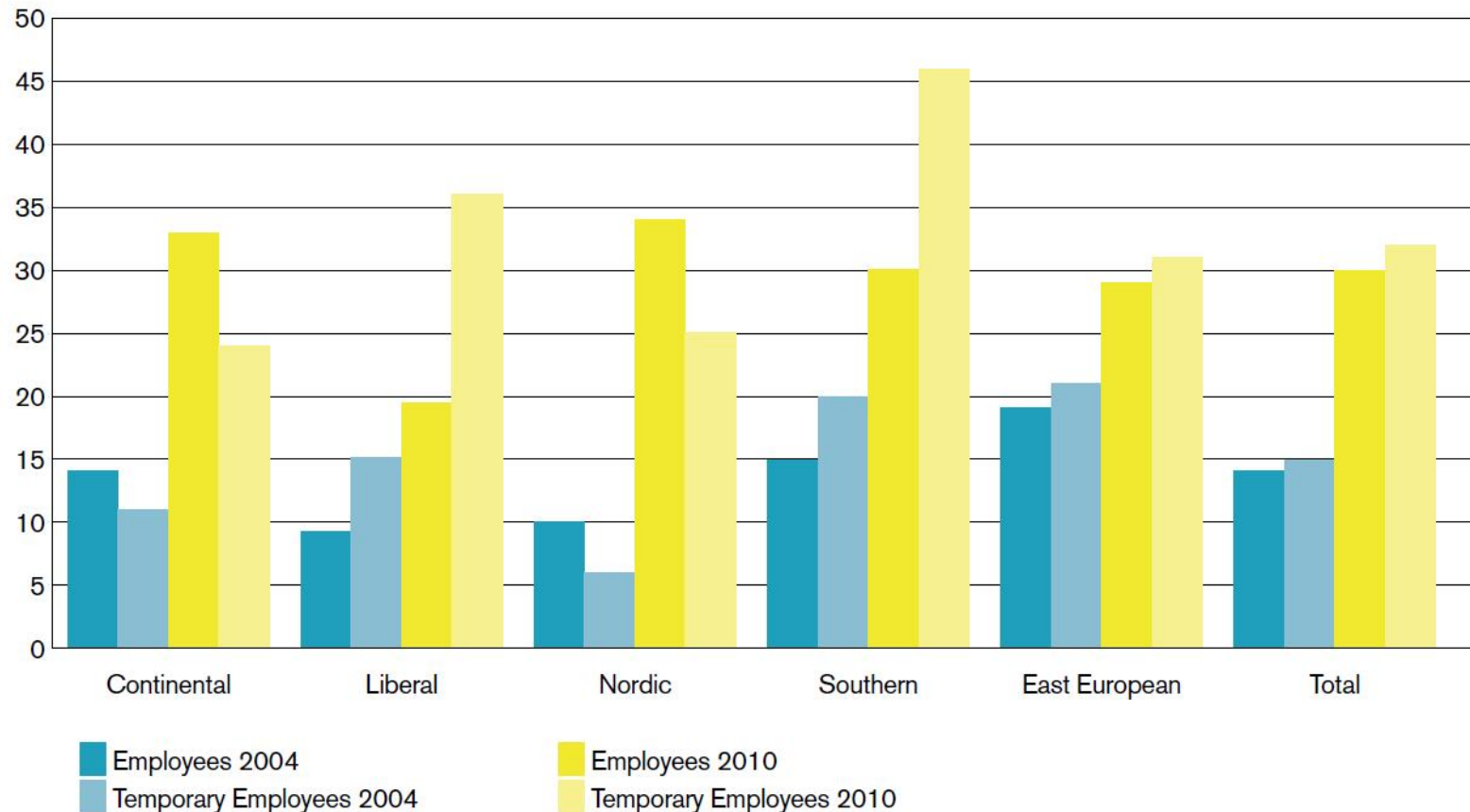


Source: Gallie D (Ed.) (2013) ESS Topline Results Series 3, European Social Survey

Job insecurity 2004-2010

European Social Survey, 19 EU countries

Figure 4 Job Insecurity among All Employees and Temporary Workers 2004-2010



Source: Gallie D (Ed.) (2013) ESS Topline Results Series 3, European Social Survey

Main work stressors and their consequences

- Work pressure, overtime work
- Job insecurity
- Monotony, low control
- Poor leadership
- Discrimination, bullying
- Unfair pay
- Disrupted work-life balance



- **Productivity losses**
- **Absenteism**
- **Stress-related disorders**

1. Can we reliably define and measure 'stress at work'?

Stress occurs if a person is exposed to a threatening demand (stressor) that taxes or exceeds her/his capacity of successful response → risk of loss of control and reward

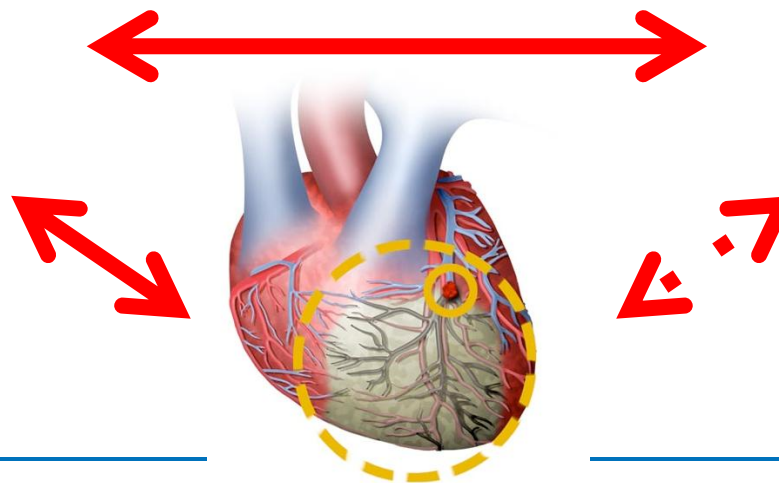
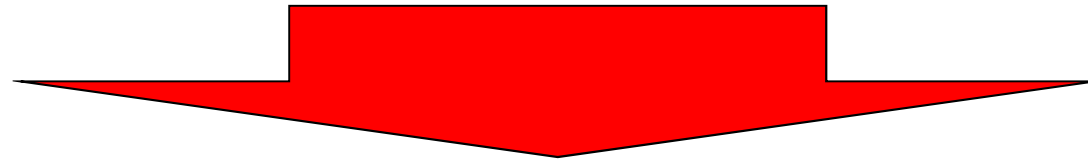
Dimensions of stress reactions:

- Cognitive evaluation of threat
- Negative emotions (anxiety, anger)
- Activation of stress axes in organism (SAM, HPA)
- Behavioural reaction (fight or flight) (*restricted option!*)

Critical for health:

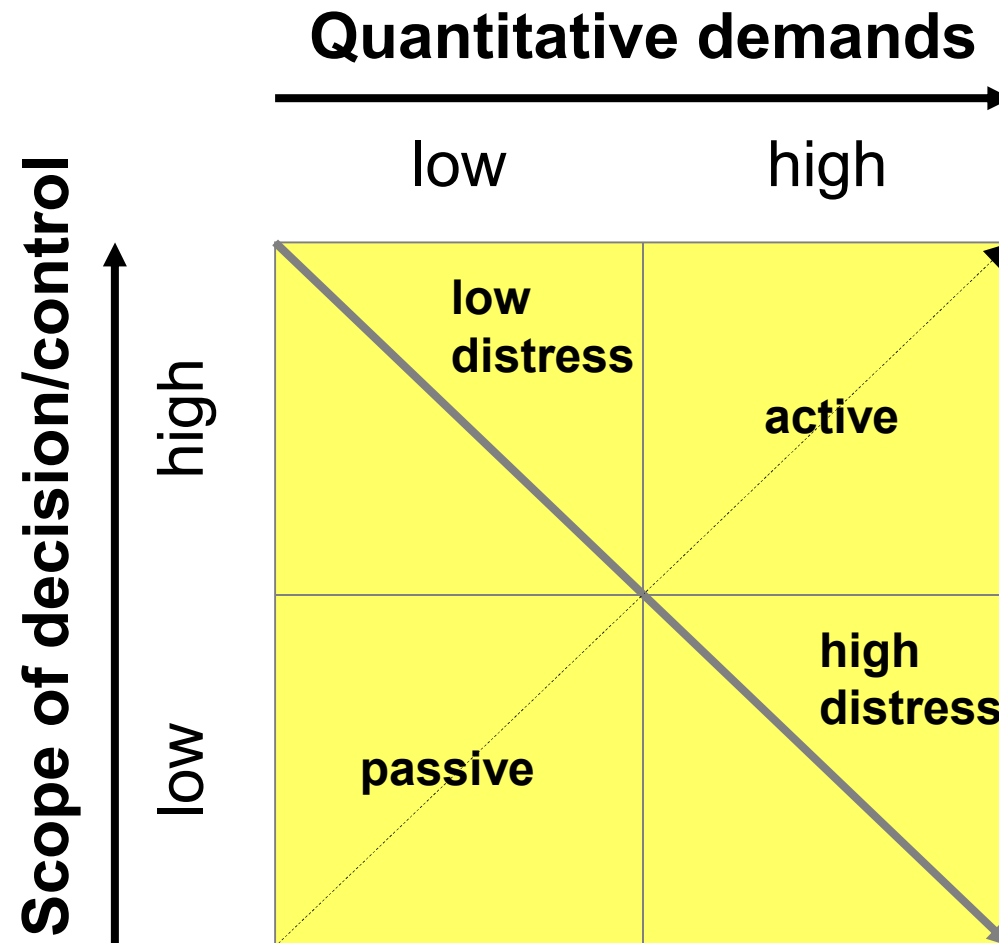
- Chronic stressors requiring active coping → allostatic load;
→ risk of stress-related disorders (depression, CHD)
-

Theoretical models of work stress and evidence of adverse health effects



The demand-control model

(R. Karasek 1979; R. Karasek & T. Theorell 1990)



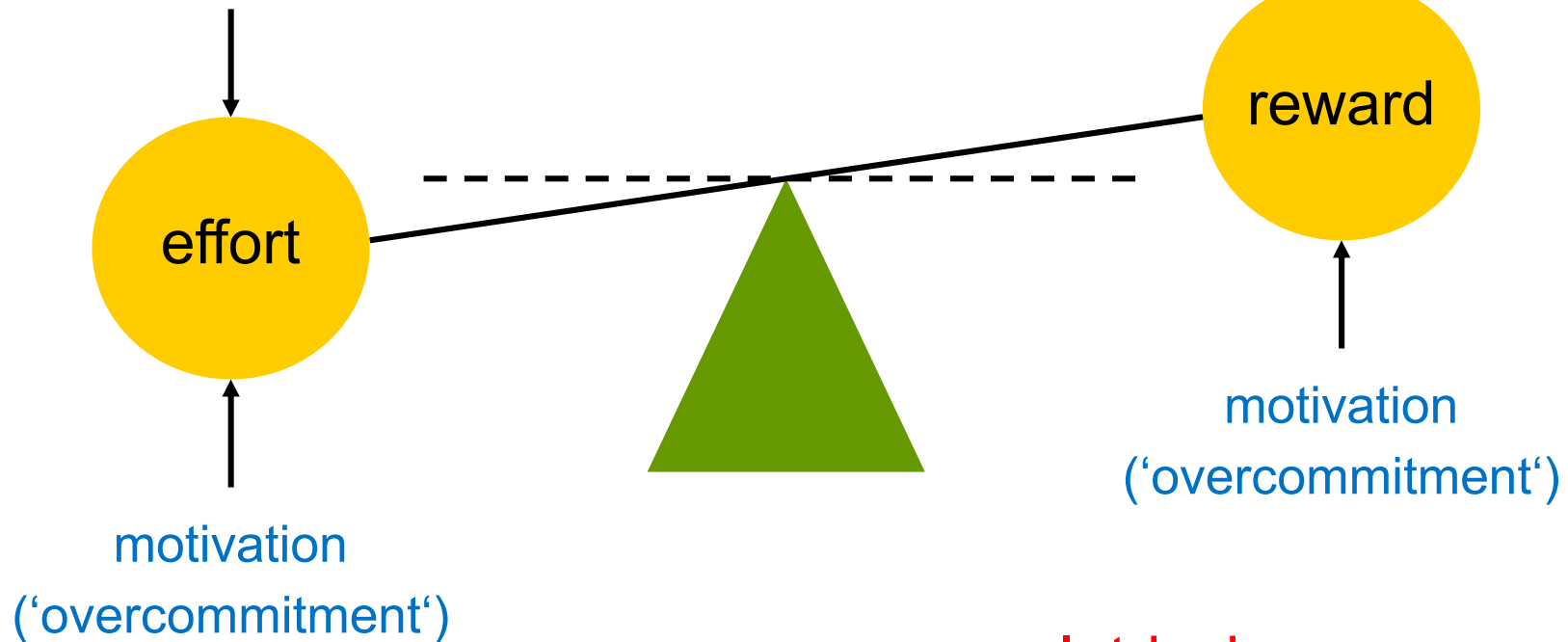
Psychometric scale of demand-control model: www.jcqcenter.org

The model of effort-reward imbalance (J. Siegrist 1996)

Extrinsic components

- labour income
- career mobility / job security
- esteem, respect

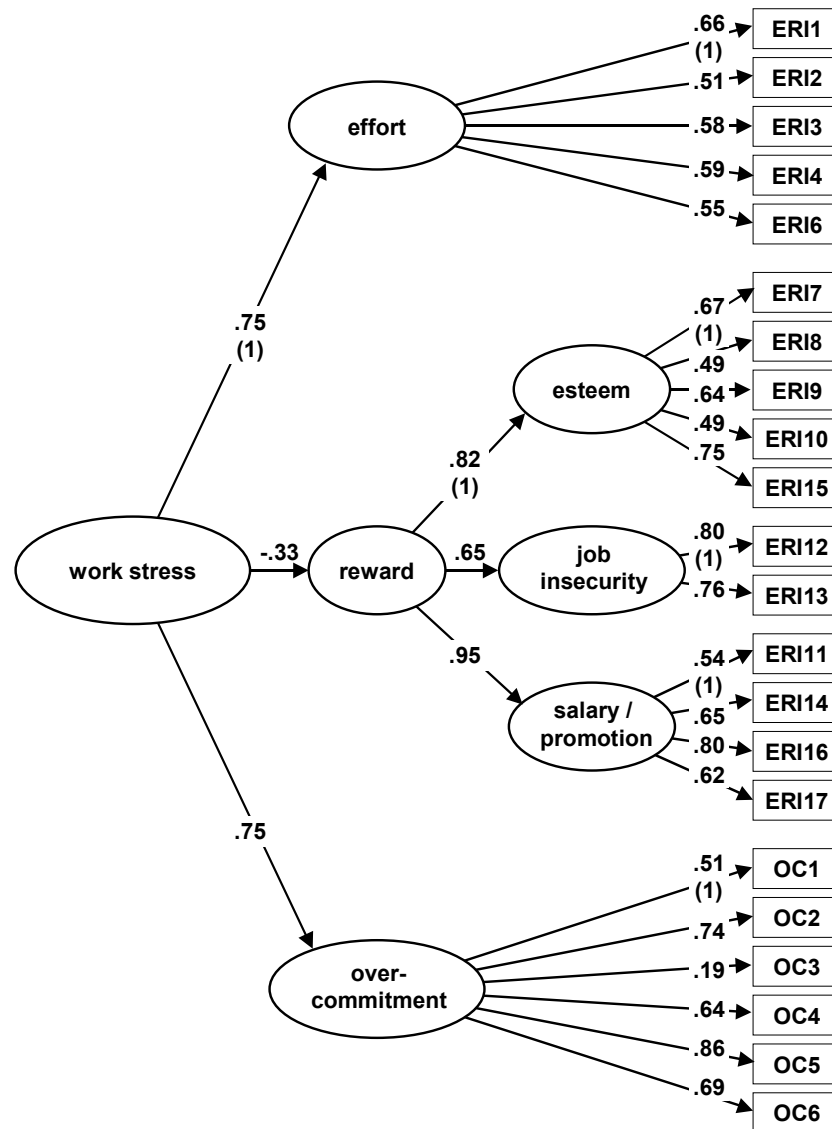
demands / obligations



Intrinsic component

Psychometric scale of effort-reward model: www.uniklinik-duesseldorf.de/med-soziologie

Confirmatory factor analysis: Replication of the theoretical model (effort-reward imbalance)



N=666 employed men and women

χ^2/df

GFI

AGFI

CFI

RMSEA

2,99

.91

.89

.90

.06

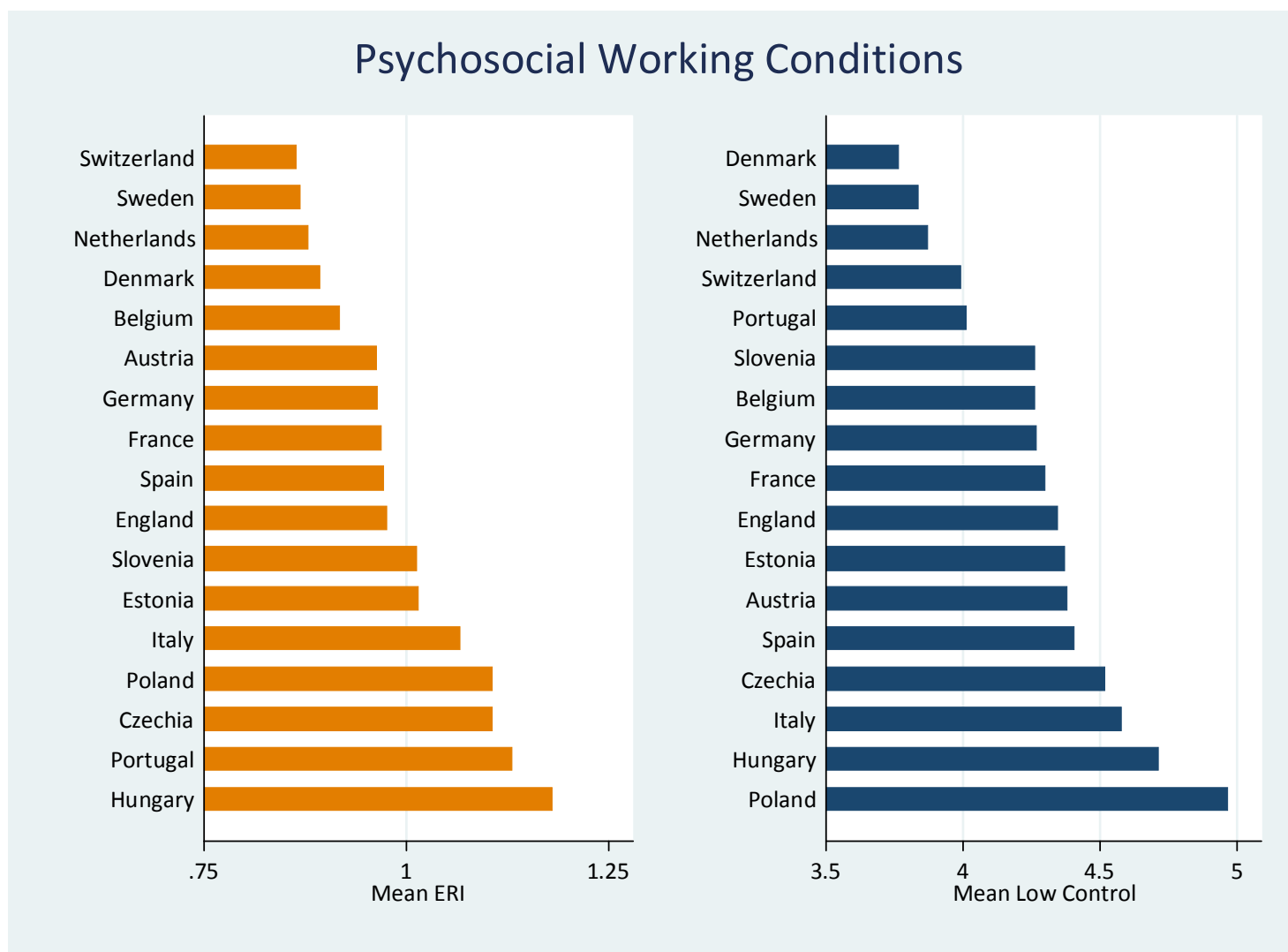
Source: A. Rödel et al. (2004) Z
diff diagn Psychol 25: 227-238

Measurement of work stress models

Standardized self-administered questionnaires, available in main languages across EU

- **Psychometrically validated scales**
 - > reliability, sensitivity to change
 - > discriminant validity
 - > criterion validity
 - > specificity and sensitivity of thresholds
 - Partial validation by **observational / administrative data**
 - Construction of **job exposure matrices** (DC model)
 - **More information** on measurement:
 - DC model: www.jcqcenter.org
 - ERI model: www.uniklinik-duesseldorf.de/med-soziologie
 - COPSOQ model: www.arbejdsmiljoforskning.dk
-

Mean level of work stress in 17 European countries (SHARE, ELSA, n = 14 254, aged 50-64)



Source: T. Lunau et al. (2013): Unpublished results

Sensitivity and specificity of ERI scales: Cut-point of the ER-ratio

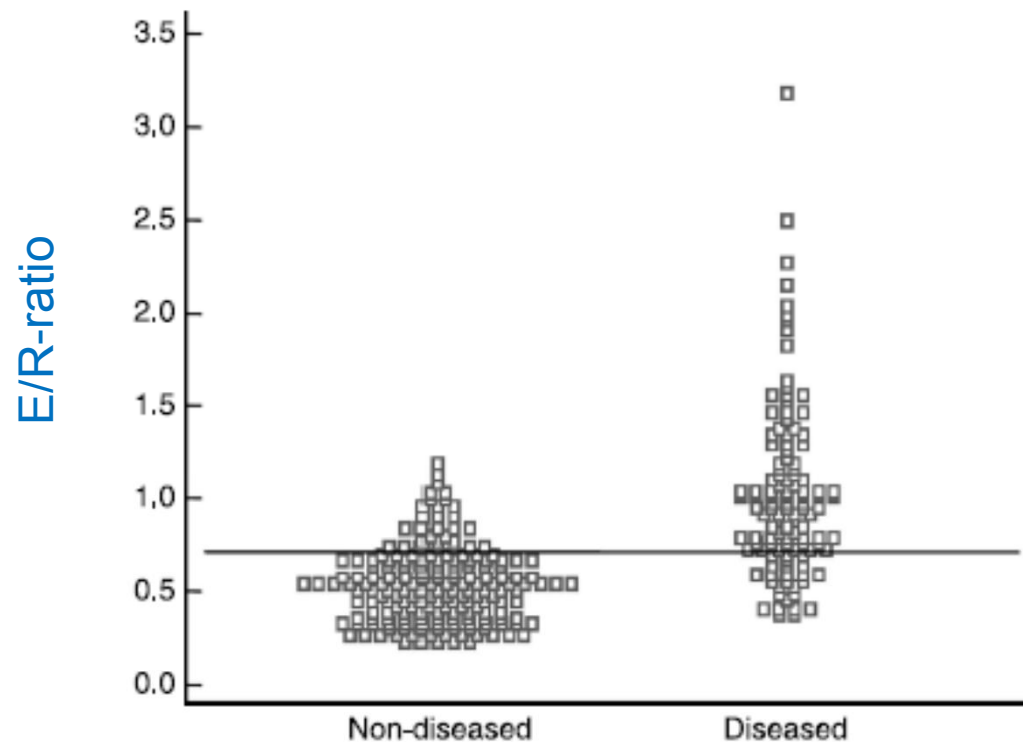


Figure 1. Distribution of ERI ratio in the diseased and non-diseased group ($N = 115$ vs. $N = 187$). The horizontal line indicates the cut-off point $ERI > 0.75$. It can easily be seen from the figure that a higher cut-off point would lead to a higher rate of misclassifications of diseased subjects, meaning a loss in sensitivity.

Source: D. Lehr et al. (2010) J Occup Organizat Psychol 83: 251-261

2. Does stress at work matter for health and productivity?

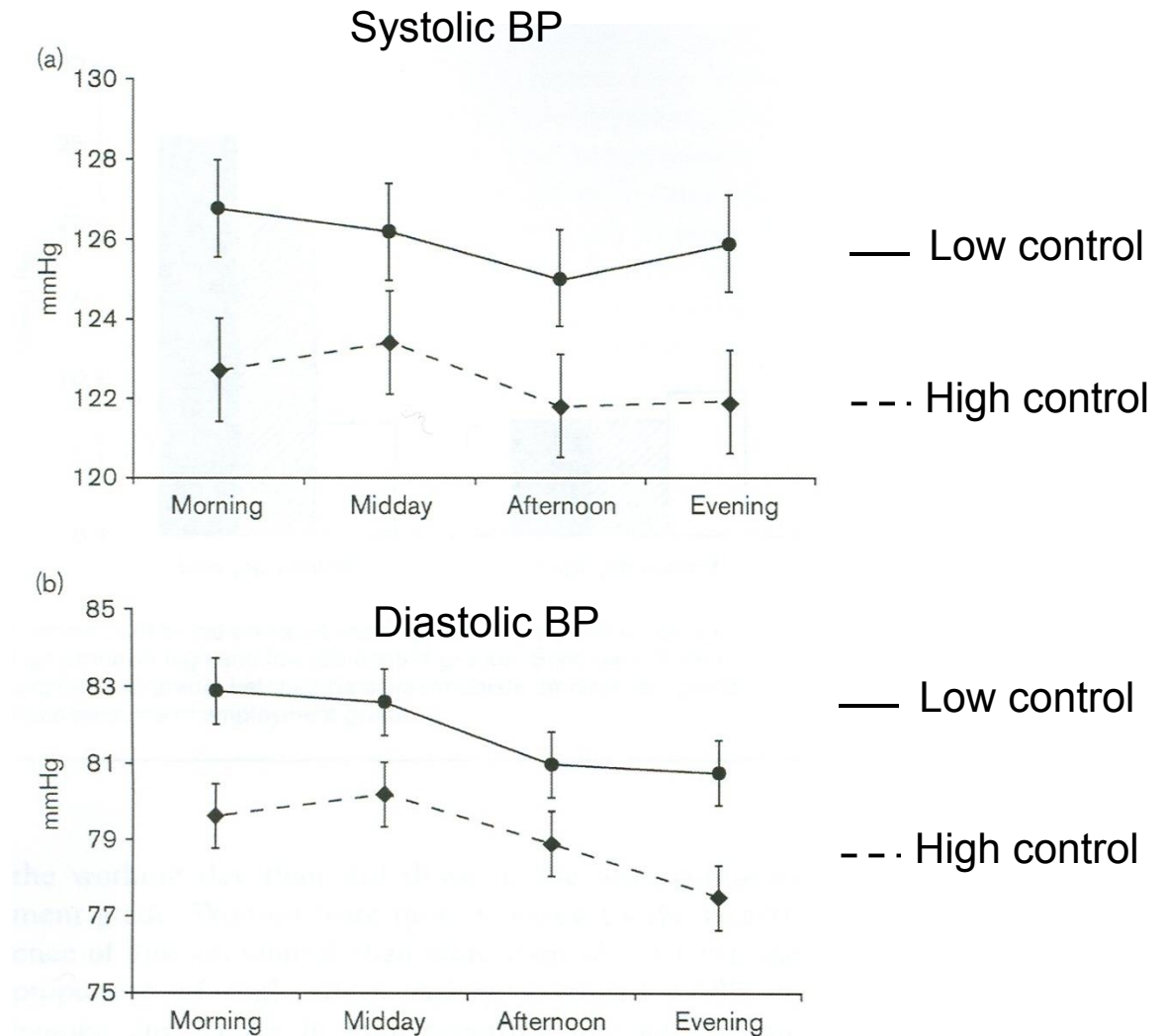
Three sources of evidence:

- Experimental and naturalistic studies: monitoring stressful situations and physiological reactions
 - Epidemiological cohort studies of initially healthy employees: exposure to stress > elevated relative risk of stress-related disease
 - Intervention studies: Reducing stress at work and evaluating effects on health and wellbeing
-

Control at work and blood pressure

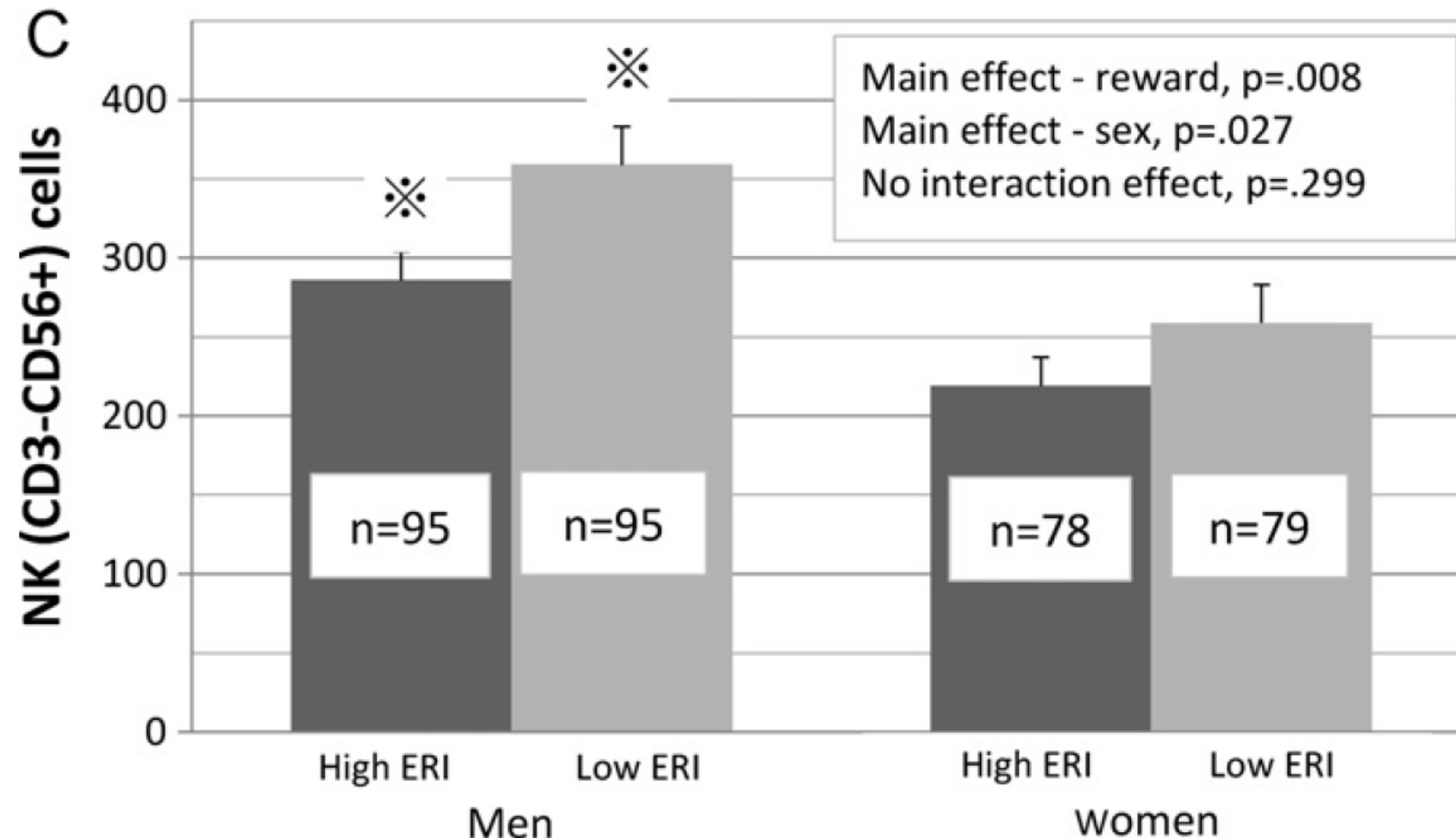
Mean ambulatory blood pressure (low control vs. high control).

N = 227 men and women (47-59 years); Whitehall Cohort Study



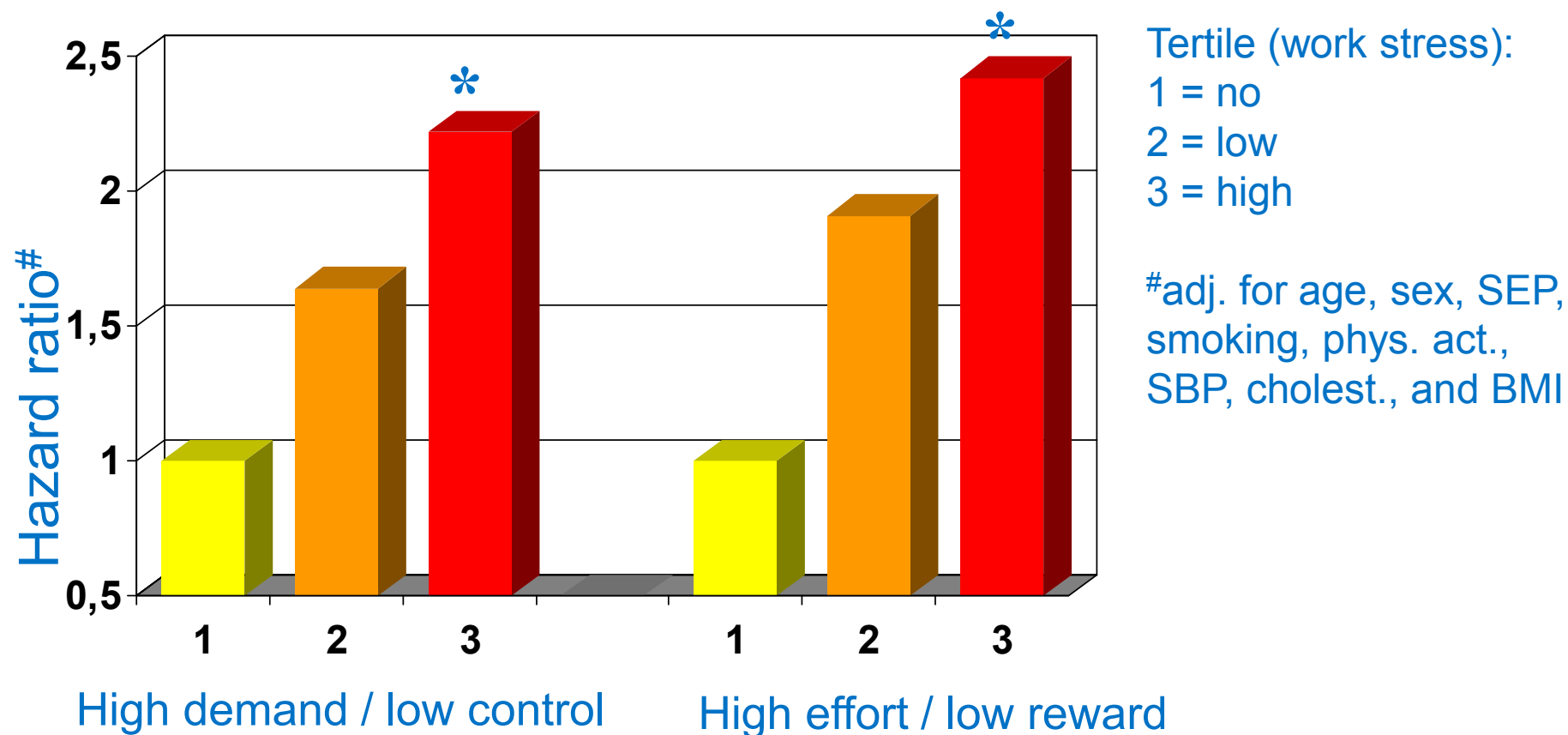
Source: Based on Steptoe, A, et al. (2004), *Journal of Hypertension*, 22(5): 915-920.

Work stress (ERI) and natural killer cells in 347 Japanese employees



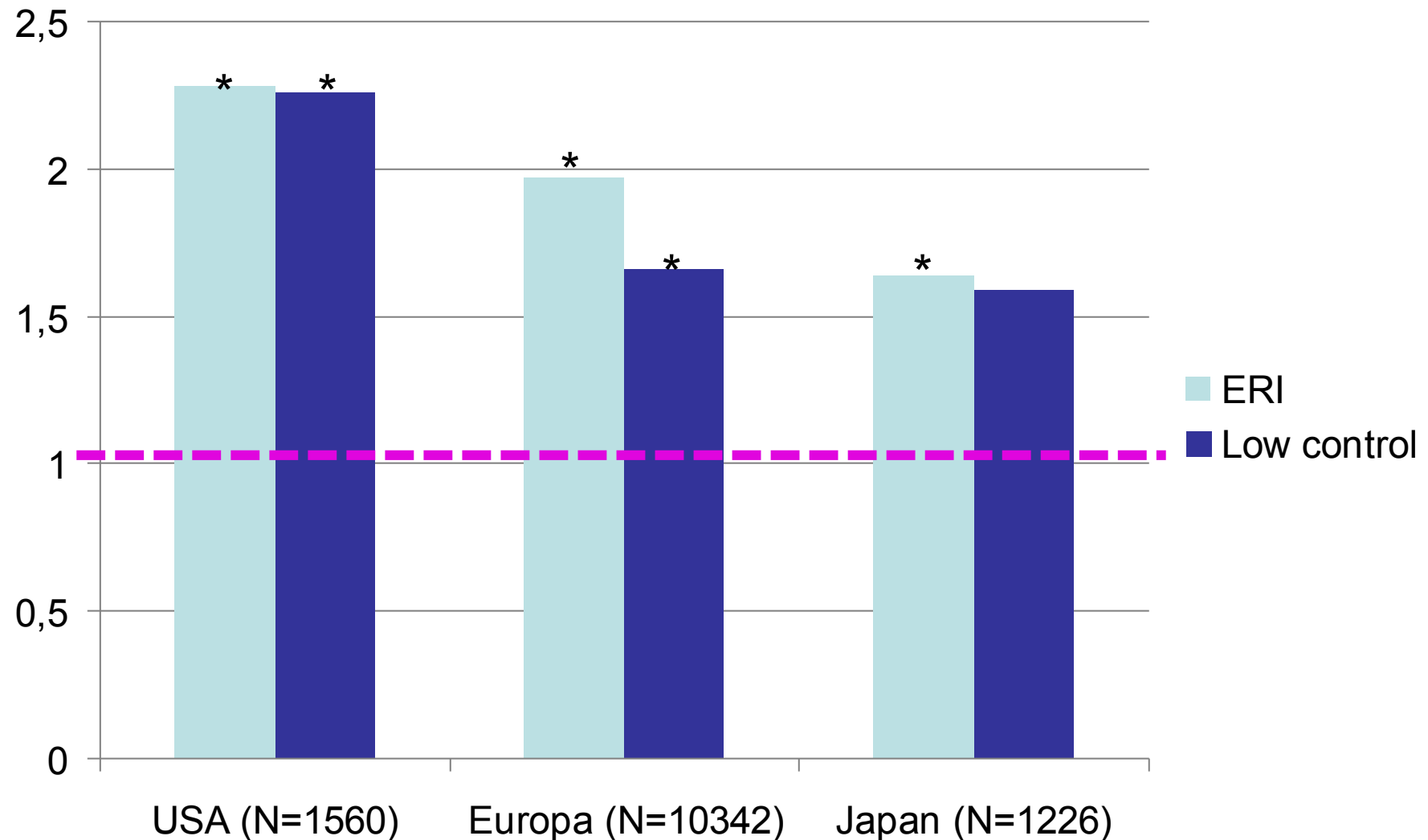
Source: Nakata A et al (2011), Biol Psychol 88:270-279, (p. 277).

Work stress and cardiovascular mortality: Finnish Cohort Study, n = 812 employees



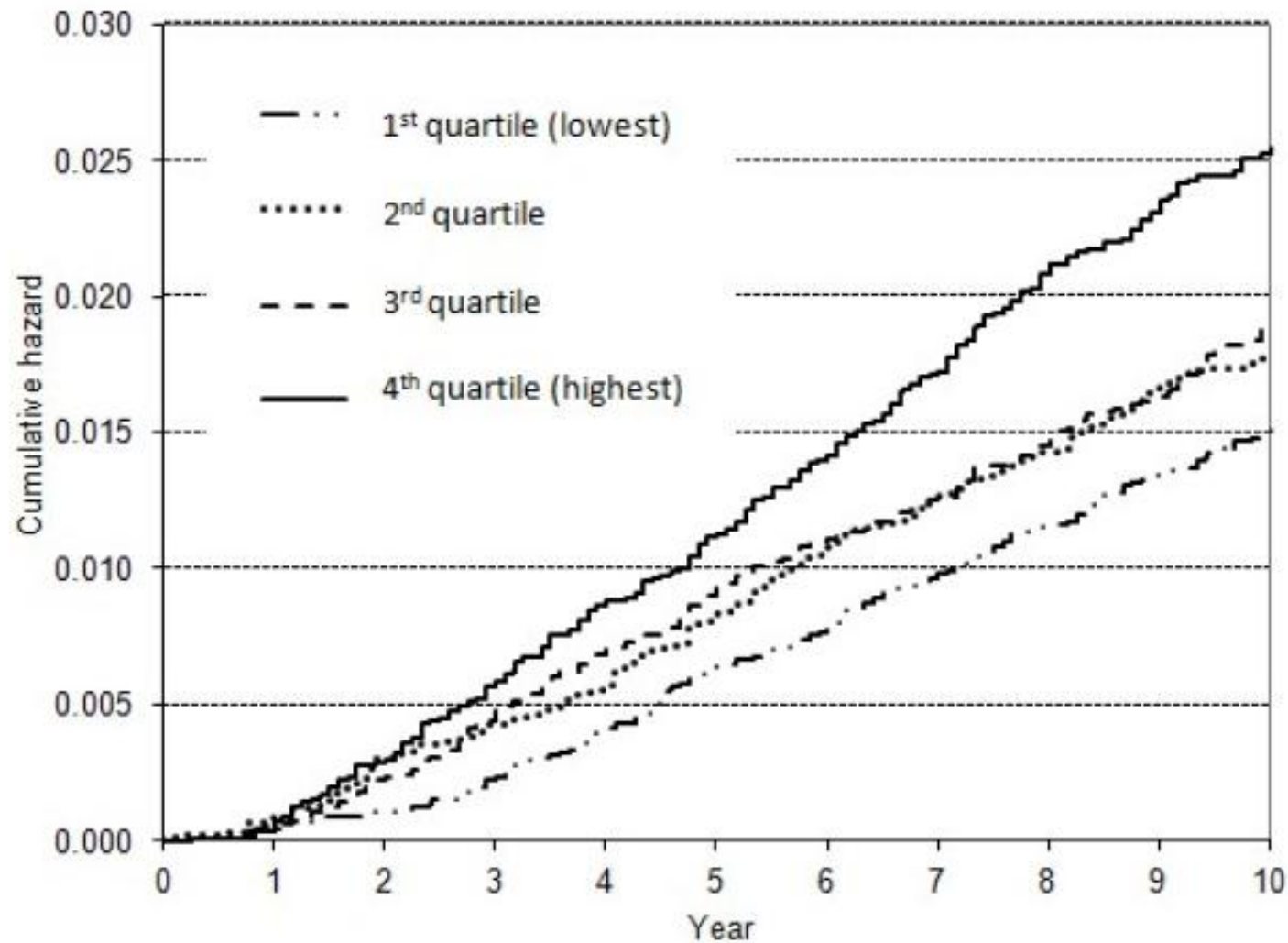
Source: Based on Kivimäki, M, et al. (2002), BMJ, 325: 857, doi:/10.1136/bmj.325.7369.857.

Psychosocial stress at work and depressive symptoms: 13.128 employed men and women 50-64 yrs. from 17 countries in three continents (SHARE, ELSA, HRS, JSTAR)



Source: J. Siegrist et al (2012) Globalization and Health 8:27.

Cumulative hazard curves of disability pension due to depression by quartile of work stress (ERI) (n =51.874)



Source: Juvani A et al. (2014): Scand J Work Environ Health, 40: 266-277.

3. How can the impact of stress at work be separated from other sources of stress?

Population- attributable risk (PAR):

Answer to the question:

What proportion of all cases of a specific disease occurring in a population can be attributed to work stress?

Data base:

Prevalence of the disease (e.g. depression: 8 %)

Prevalence of exposure (work stress) (e.g. 25%) (P_e)

Relative risk (DC or ERI) (e.g. $RR=2.0$ for depression)

Population-attributable risk: $PAR = P_e (RR-1) / (1 + P_e (RR-1))$

for depression: 15 – 20 %

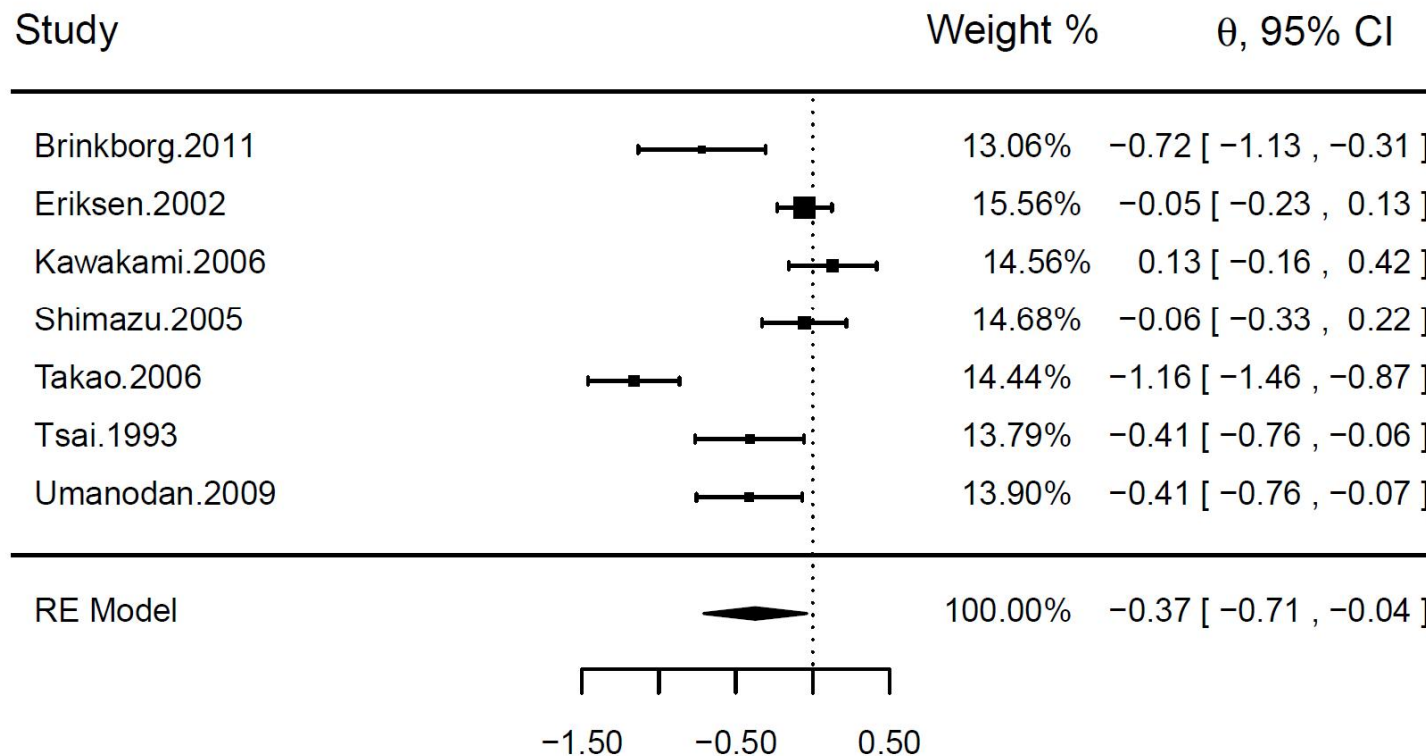
for coronary heart disease: 5-10 %

4. Are there examples of effective interventions of stress reduction at work?

- **Personal level:** Stress prevention programs
 - **Interpersonal level:** Leadership training; communication skills;
 - **Structural level:** Organizational/personnel development (based on work stress models)
 - Job enrichment/ enlargement (autonomy, control, responsibility)
 - Skill utilization / active learning
 - Participation / team work and social support
 - Culture of recognition
 - Fair wages/ gain-sharing
 - Continued qualification/ promotion prospects
-

Personal level: Effects of worksite stress prevention programs: Meta-analysis

Perceived stress



Interpersonal level: Leadership training of managers and stress hormone excretion in subordinates

	Intervention group			Control group	
	Baseline	After 1 year		Baseline	After 1 year
Mean Cortisol (nmol/l)	387.2	 345.2	*	390.4	 391.3
Mean decision latitude (range 2-8)	6.0	 6.1	**	6.2	 5.7

Interaction group X time: *p = .05, **p = .02

Source: T. Theorell et al. (2001), Psychosom Med, 63: 724-733.

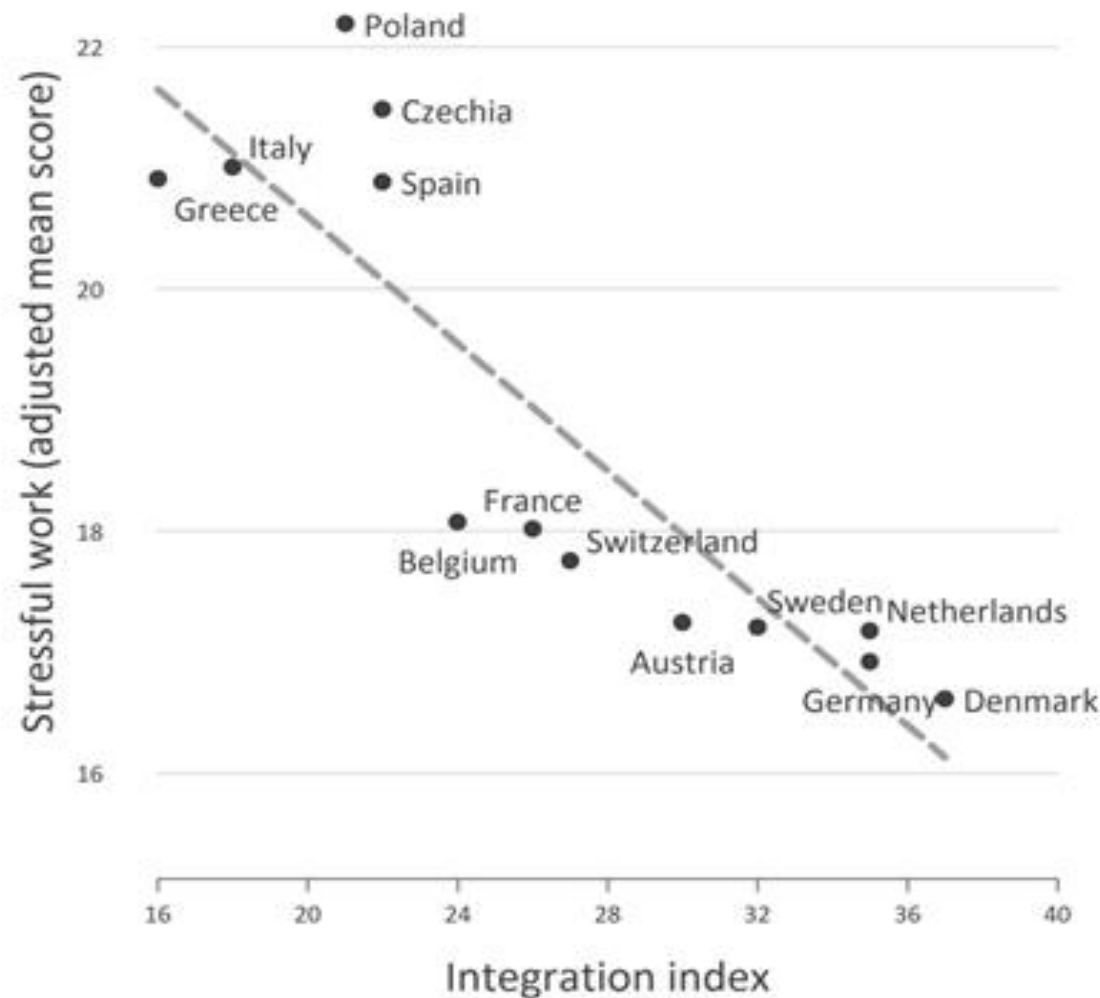
Structural – level: Organizational intervention in a Canadian hospital vs. control hospital*

Variable	Means at t2 adj. for t0		p
	experimental	- control hospital	
Demand	11.9	12.6	.008
Control	70.0	68.7	.051
Social support	23.7	23.0	.011
Reward	31.2	30.2	.003
Effort-reward imbal.	1.0	1.1	.001
Work-rel. burnout	43.2	48.3	.003

*36 month-follow-up, two Canadian hospitals, N=248 (intervention) vs. 240 (control hospital) (ANCOVA, adj. for baseline values)

Source: R. Bourbonnais et al. (2011), Occup Environ Med, 68: 479-486.

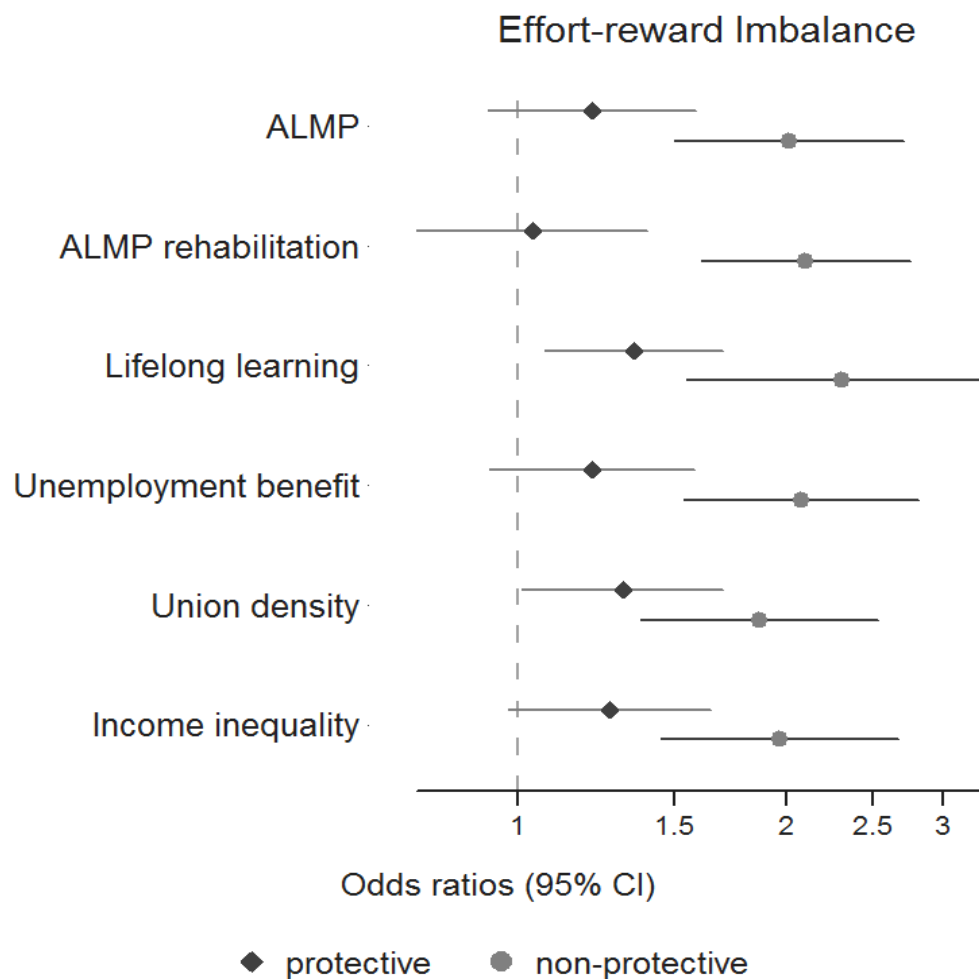
5. How can national policies support company action? Association of work stress with national ALMP



Source: Wahrendorf M, Siegrist J. (2014) BMC Public Health 14:849

Odds ratios of depressive symptoms by work stress according to labour protection policies

Based on
SHARE, HRS,
ELSA; n =
5650, m/w
aged 50-64.
13 countries



Source: Lunau T. et al. (2013), BMC Public Health, doi:10.1186/1471-2458-13-1086



Thank you!