

# Globalization, Work and Health

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UCLA Work and Health Course  
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# Overview

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- **Part I** – The Social Epidemiology of CVD
- **Part II** – The Global Economy and the Changing Nature of Work
- **Part III** – Research and Policy Directions

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# **PART 1:THE SOCIAL EPIDEMIOLOGY OF CVD**

# Cardiovascular Disease (CVD): A Worldwide Epidemic

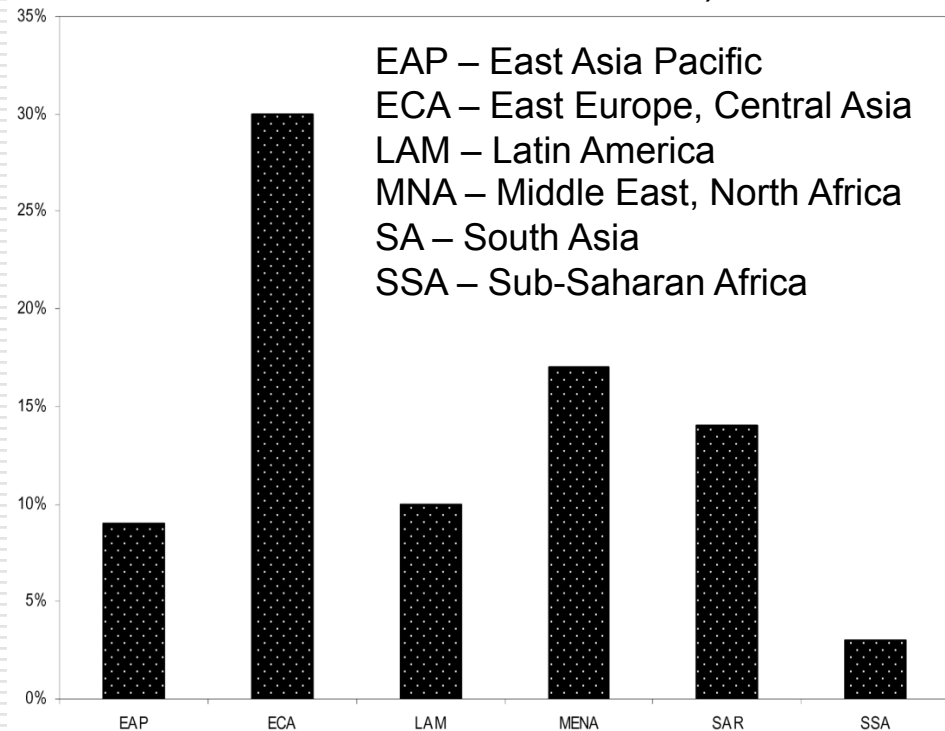
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- ❑ The major cause of morbidity & mortality in the industrialized world
- ❑ 30% of all deaths worldwide (33% by 2030)
- ❑ Trends towards lowered CVD mortality rates in North America & Western Europe but ...
- ❑ Still a **pandemic**, a significant public health problem

# Increases in CVD epidemic in developing countries

“CVD now causes the most deaths in all developing regions with the exception of sub-Saharan Africa where it leads causes of death in those older than 45 years. Between 1990 and 2001, of all deaths in low- and middle-income countries, deaths from CVD increased from 26% to 28% ...” (Gaziano & Gaziano, 2012)

Percentage of total mortality attributable to CHD in 2001 by developing region. (WHO Global Burden of Disease and Risk Factors 2006 )



Gaziano, TA., Bitton, A., Anand, S., Abrahams-Gessel, S., Murphy, A. Growing Epidemic of Coronary Heart Disease in Low- and Middle-Income Countries *Curr Probl Cardiol.* 2010 February ; 35(2): 72–115.

Gaziano, TA. and Gaziano, JM. Chapter 1: Global Burden of Cardiovascular Disease. In: Bonow RO., Mann DL., Zipes DP., Libby P. Brunwald's Heart Disease: A Textbook of Cardiovascular Medicine. Ninth Edition. Elsevier, Philadelphia PA, 2012.

# Rising prevalence of CVD/hypertension in developed countries during past 100-200 years

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- **Rising rates of CVD & hypertension parallel the transformation of society and work**
  - from agricultural & relatively autonomous craft-based work
  - to machine-based (including computer-based) labor, typical of assembly-line & mass production (Taylorism):
    - high workload demands + low control/autonomy (“job strain”)
    - long work hours

# CVD in China: An “Epidemiologic Crossroads”

- CVD as cause of death = 12.1% (1957); ↑40% (2012)
- Risk factors rapidly increasing
  - Smoking: 54% of men, 7% of women (2012) >350,000,000 smokers
  - Overweight: 33% of adults
  - Type II diabetes: prevalence ↗ 3 times (1980-1994)
    - From 6% in 2002 to nearly 10% in 2007
- Hypertension prevalence increasing
  - Age >15: 5.1% (1959), 13.6% (1991)
  - 153 million adults (20.5%, 2010), > in urban (25%) than rural (16%)
  - 2.3 million CVD deaths due to HTN in 2005



# Chronic Diseases & CVD Risk Factors Increasing in Developed and Developing Countries

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Diabetes



Obesity



Hypertension



Metabolic Syndrome



# The social nature of CVD risk factors

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## **Widespread exposure to standard risk factors is recent (occurring in the past 100-200 years)**

- Smoking ↑ →> mass production of cigarettes  
begins end 19<sup>th</sup> century
- Elevated Cholesterol ↑ →> diets rich in meat & dairy
- Obesity ↑ →> with sedentary labor and dietary changes
- Diabetes ↑ →> with obesity
- Hypertension ↑ →> with modern work & communities

# American Kidney Foundation announces hypertension is a disease of industrial society 2012

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- “... studies [suggest this is due to] to lifestyle changes related to industrialization and urbanization.”
- “...increased income...leads to...transition from traditional rural diets (high in fiber) to a diet rich in salt, saturated fat and poor-quality carbohydrates such as...in fast food.”
- “Urbanization....accompanied by reduced physical activity due to sedentary, desk-job, occupations that contribute to increased hypertension risk.”

# Global epidemics are not natural

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- ❑ CVD, stroke, obesity, diabetes are global epidemics ...but not the natural results of aging
- ❑ Products of industrialization, urbanization, chronic stress
- ❑ Medical model inadequate to *explain or contain* these epidemics
- ❑ These illnesses are Not caused by genes or individual behaviors, but have social causes:
  - social class differences
  - economic inequalities
  - unhealthy working & living conditions

# Hypertension: A case study of a social epidemiological approach

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- Leading cause of CVD worldwide
  - 54% of stroke and 47% of IHD
- Prevalence in 2000: 1 billion adults (26%)
- Projected prevalence by 2025: 1.56 billion adults (29%)
- Identified risk factors (obesity, sodium, alcohol, genetics, age):
  - These risk factors explain only a small part of the risk
  - some may be social/work-related.

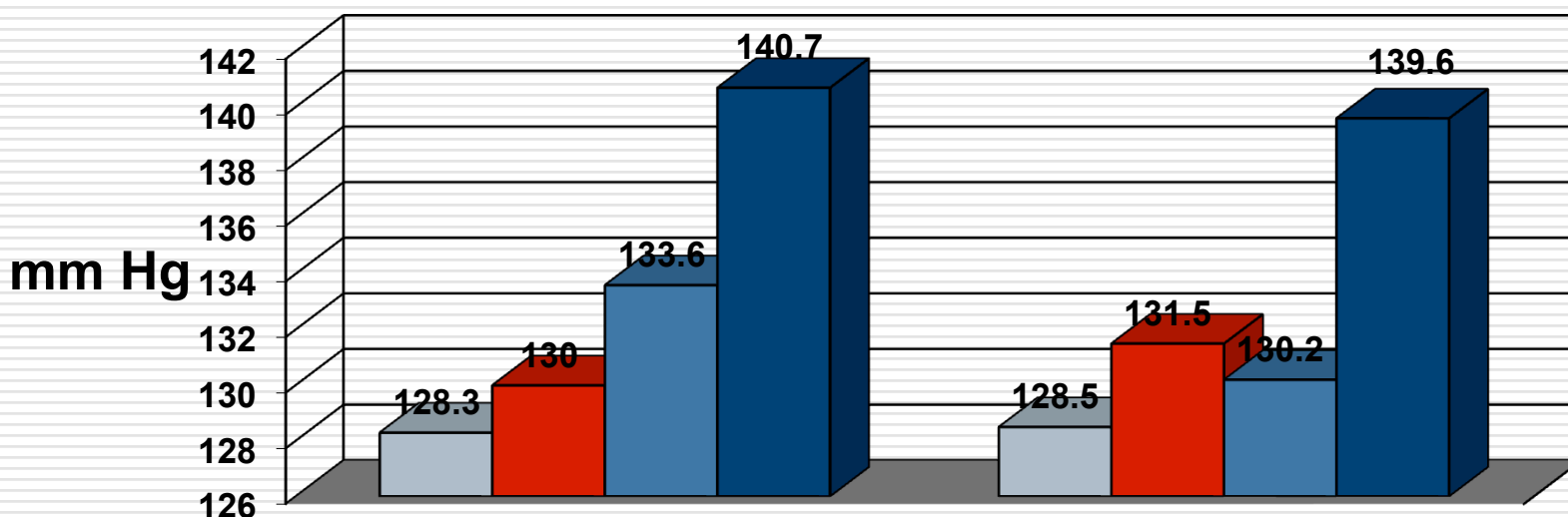
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Lawes CMM et al. *Lancet* 2008; 371: 1513–18.

Kearney P, Whelton M, Reynolds K, Muntner P, Whelton P, He J. *Lancet* 2005;365:217-223.

# Chronic job strain strongly associated with work systolic ambulatory BP (n=195 men)

<b>Strain-T1:</b>	no	no	yes	yes	no	no	yes	yes
<b>Strain-T2:</b>	no	yes	no	yes	no	yes	no	yes



**Time 1 (p=.0017)**

**Time 2 (p=.0015)**

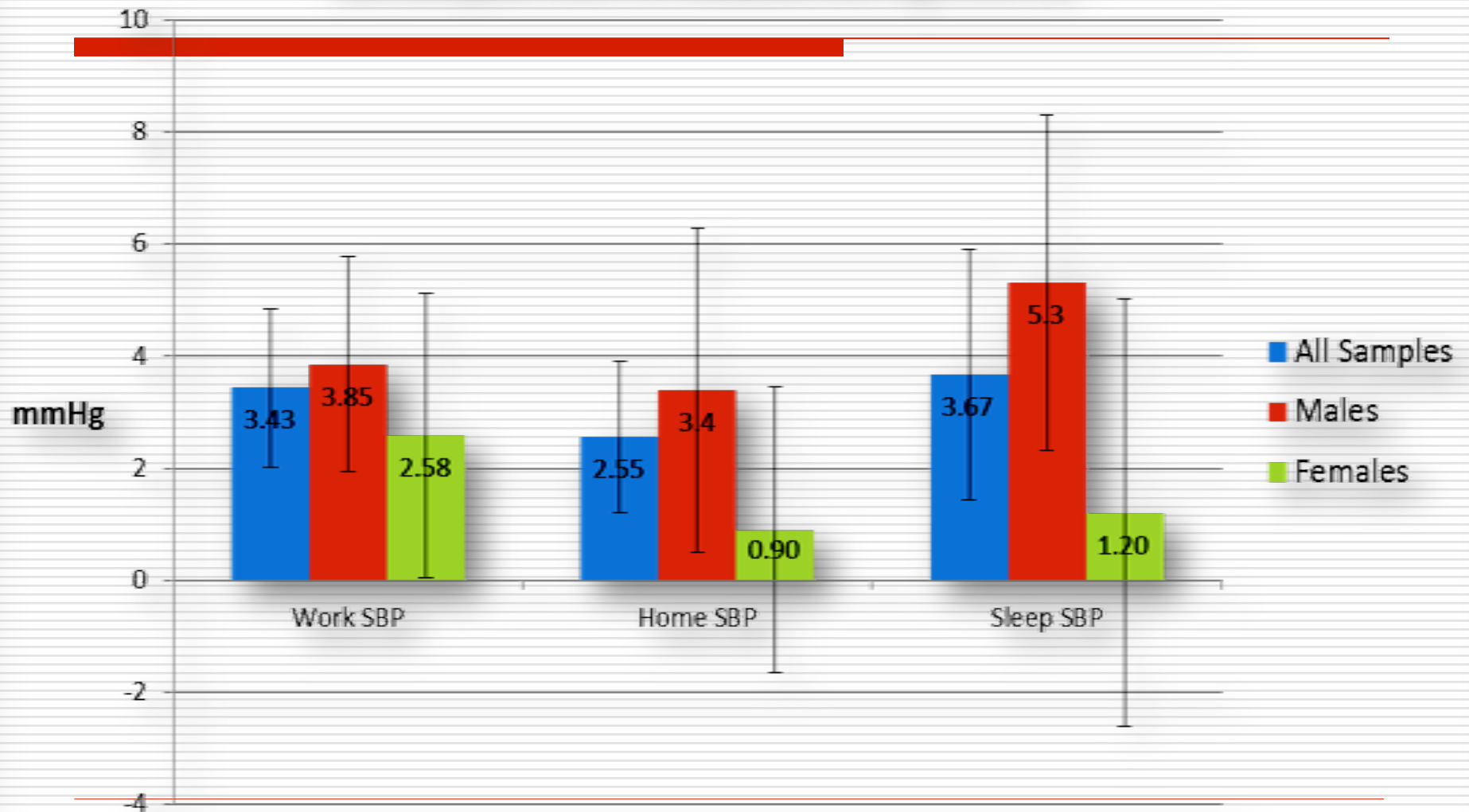
controlling for age, education, body mass index, race, smoking, alcohol use, work site

# Job strain and Ambulatory BP: A meta-analysis (2013 AJPH)

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- ❑ 34 studies considered
- ❑ Excluded (12):
  - 5: data unavailable (all x-sectional)
  - 3 longitudinal ABP change studies – variable time periods
  - 3 cumulative exposure studies
  - 1 case-control study
- ❑ Included: **22 cross-sectional studies**  
**(28 samples) of single exposure to job strain**
- ❑ Studies by Theorell, Clays, Melamed, Schnall, etc.

## Job strain & systolic ambulatory blood pressure (28 samples from 22 studies, mm Hg, 95% CI)



Landsbergis PA, Dobson M, Koutsouras G, Schnall P. Job strain and ambulatory blood pressure: a meta-analysis and systematic review. *American Journal of Public Health* 2013;103(3):e61-e71.

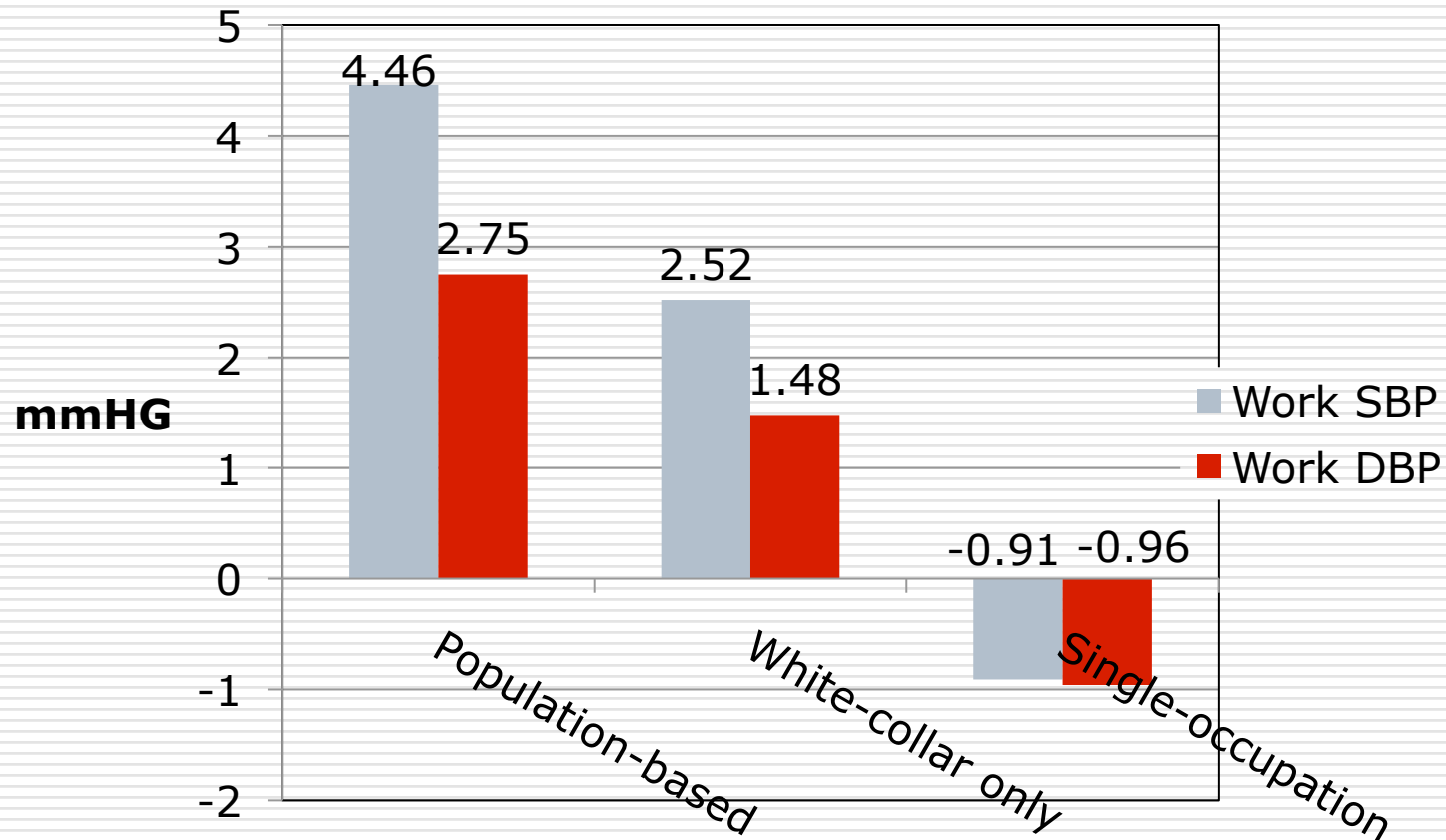
## Job strain & diastolic ambulatory blood pressure (28 samples from 22 studies, mm Hg, 95% CI)



Landsbergis PA, Dobson M, Koutsouras G, Schnall P. Job strain and ambulatory blood pressure: a meta-analysis and systematic review. *American Journal of Public Health* 2013;103(3):e61-e71.



# Stronger association in population-based studies



Landsbergis PA, Dobson M, Koutsouras G, Schnall P. Job strain and ambulatory blood pressure: a 17 meta-analysis and systematic review. American Journal of Public Health 2013;103(3):e61-e71.

**TABLE 2****Relationship of blood pressure to left ventricular mass index**

	n	Correlation coefficient with:	
		Systolic pressure	Diastolic pressure
Physician-measured	100	.24 <sup>A</sup>	.20 <sup>A</sup>
Automatic recorder			
Clinic	98	.33 <sup>C</sup>	.37 <sup>C</sup>
Work	60	.50 <sup>C</sup>	.39 <sup>C</sup>
Home	99	.31 <sup>B</sup>	.21 <sup>A</sup>
Sleep	67	.10	.24 <sup>A</sup>
Miscellaneous	74	.29 <sup>A</sup>	.30 <sup>B</sup>
Total	100	.38 <sup>C</sup>	.31 <sup>B</sup>

} p < .05

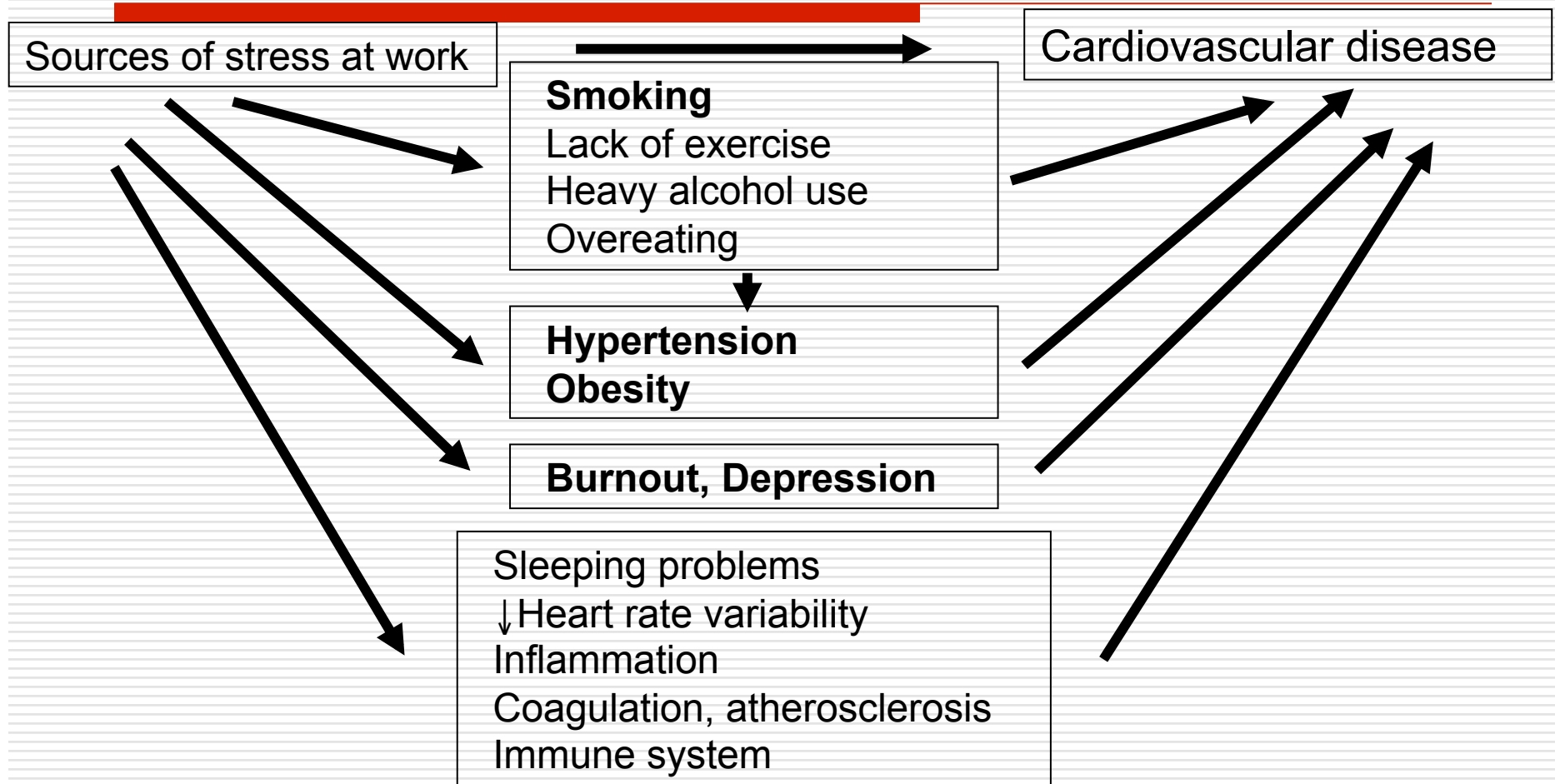
Statistical comparisons: <sup>A</sup>p < .05; <sup>B</sup>p < .01; <sup>C</sup>p < .001.

# Identified work-related risk factors for hypertension

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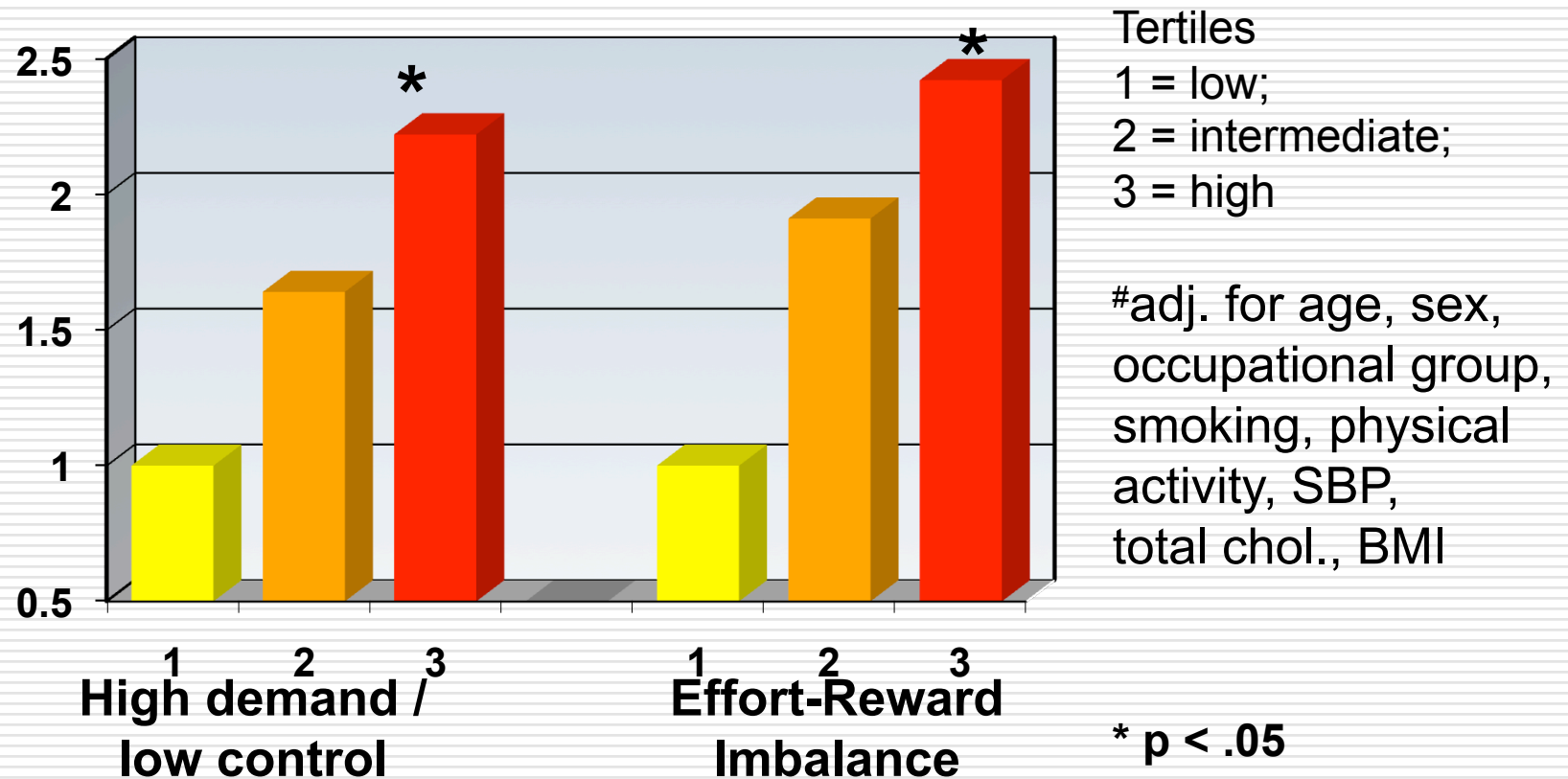
- Job strain**
  - -> evidence excellent
- Threat avoidant vigilant occupations (e.g., bus drivers)**
  - -> evidence excellent
  - 50% with hypertension by age 50
- ERI**
  - - > evidence good to excellent
- Long work hours**
  - --> some evidence
- Possible role for: social support, job insecurity, emotional labor, shiftwork, lack of sleep, heavy metals, noise**

# Job stressors & cardiovascular disease: Potential pathways



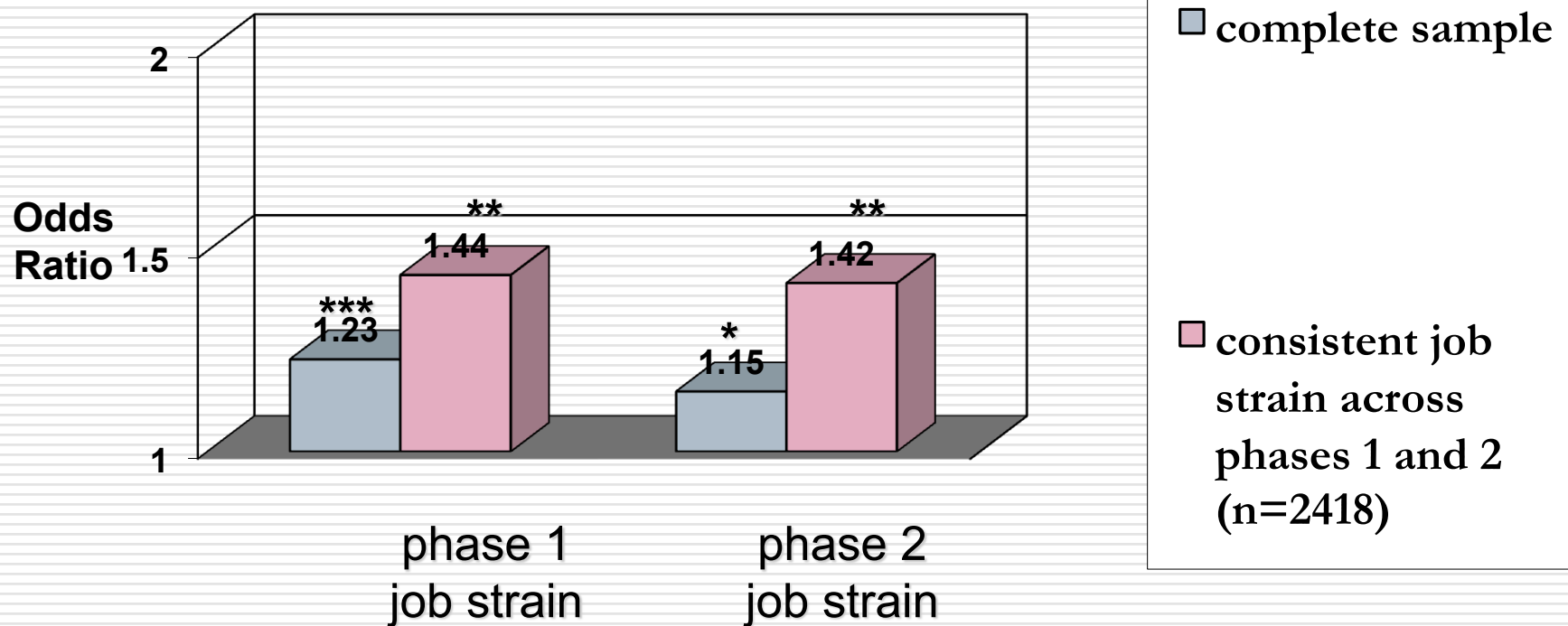
# Cardiovascular mortality associated with job strain and ERI

Nmax=812 (73 deaths); mean follow-up 25.6 years



# Chronic job strain: >CHD risk than single exposure

10.8-yr risk incident CHD (288 events) following assessment at phases 1 & 2 (3 yrs later) per 1 s.d. increase in job strain, 7,253 British civil servants



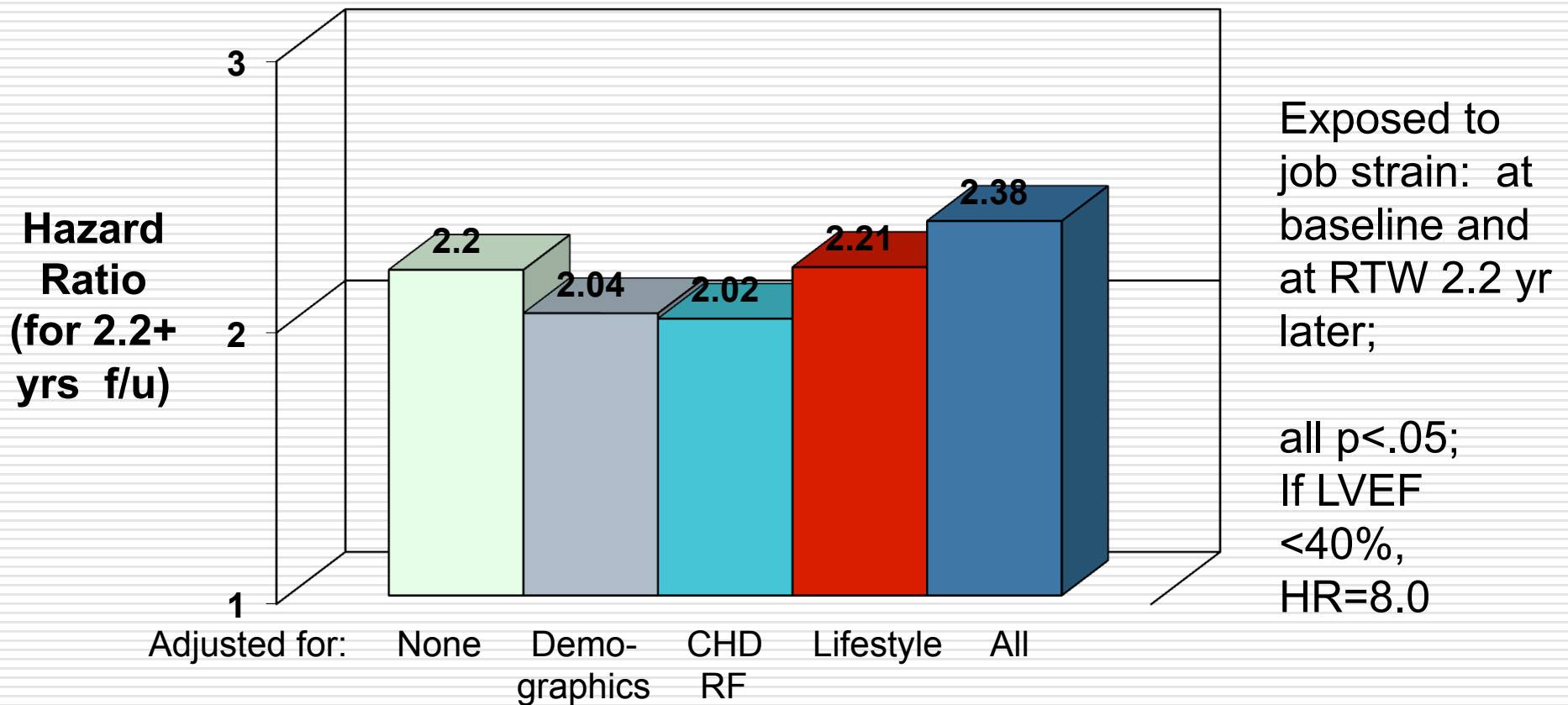
Controlling for age, sex, employment grade

\*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$

Kivimaki M, Head J, Ferrie J, Brunner E, Marmot M, Vahtera J, et al. Why is evidence on job strain and coronary heart disease mixed? Psychosomatic Medicine 2006;68:398-401.

# RTW to job strain predicts a 2<sup>nd</sup> heart attack

(Employed non-fatal AMI, 30 Quebec hospitals, age 35-59, 866 men, 106 women; 5.9 yr mean f/u (1996-2005): 206 cases fatal CHD, nonfatal AMI, unstable angina)



# Population attributable risk % for CVD due to Job Strain (one time exposure)

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<u>Study population</u>	<u>Study Years</u>	<u>Outcome</u>	<u>% Job Strain Exposure</u>	<u>RR</u>	<u>PAR%</u>
U.S. men - HES	1960-2	MI	21.8	2.48	24.4
U.S. men - HANES	1971-5	MI	23.2	3.28	34.6
Swedish men	1976-86	CVD	20	1.9	15.3
European men and women	1996	CVD	30	1.5-2.0	13-23
			<u>%exposed</u>		
Swedish men	1977-90	CVD	75 <sup>1</sup>	1.72	35
Danish men	1991	CVD	6 <sup>2</sup>	2	6
Danish women	1991	CVD	16 <sup>2</sup>	2	14

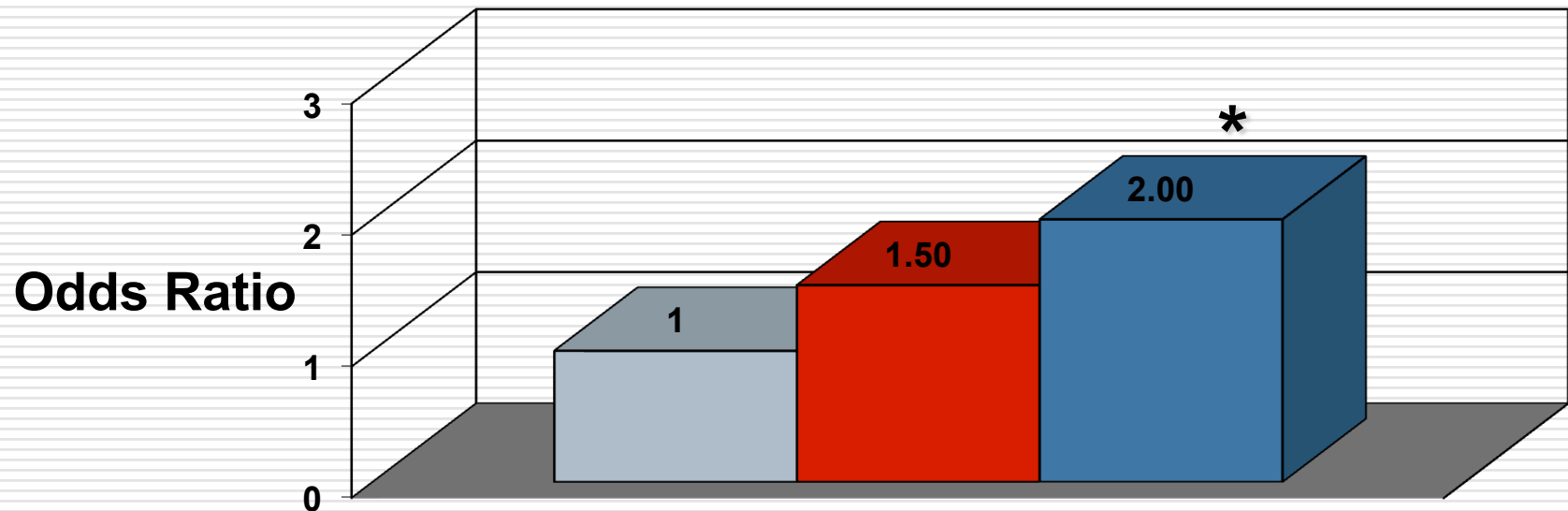
<sup>1</sup> exposed to medium and low work control

<sup>2</sup> exposed to monotonous high-paced work



# Downsizing increases CVD death rates

(22,430 Finnish municipal workers, age 19-62, in 4 cities, 7.5 yr follow-up)



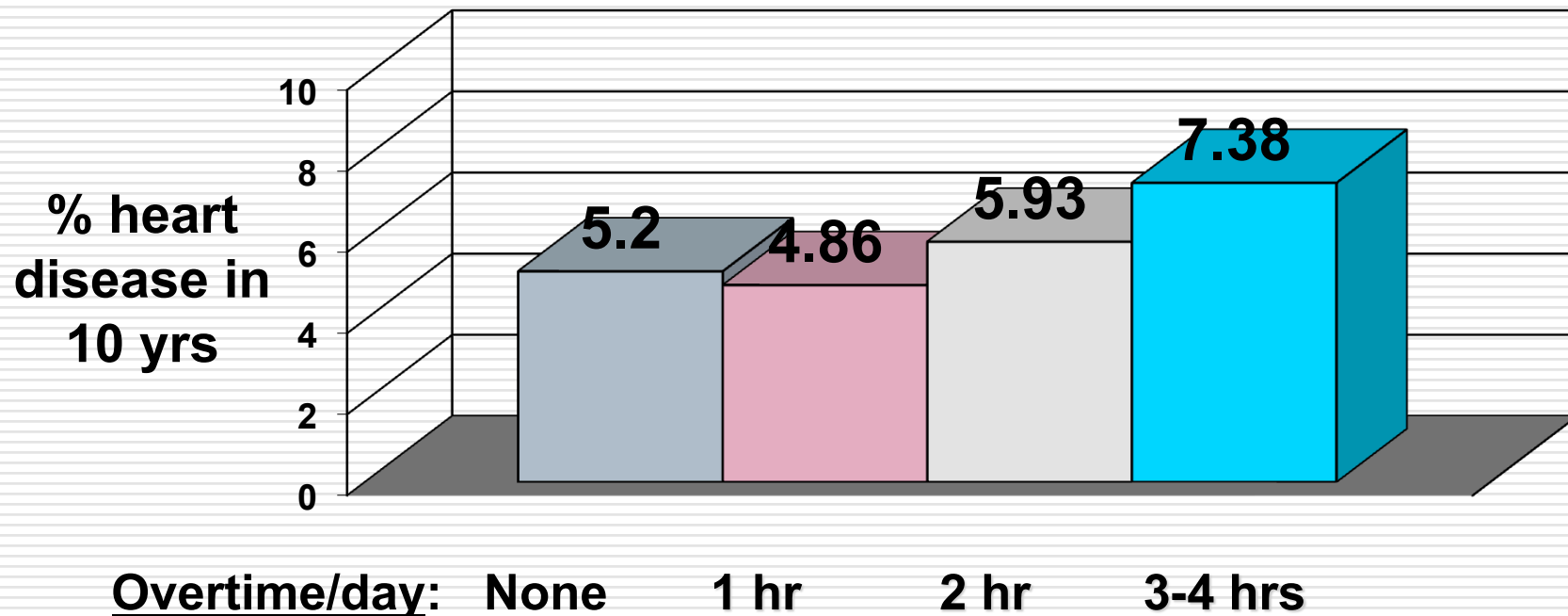
## Personnel decrease in each

occup. group in each city: <8% (ref)    8-18%    >18%

Adjusted for age, sex, SES, type of employment; \*p<.05; p(trend) =0.043

# Long work hours increase heart disease risk

(6,014 British govt workers, men & women, age 39-61, followed 11 yrs, 369 cases)



Similar pattern if control for age, gender, marital status, job status, diabetes, blood pressure, cholesterol, smoking, alcohol use, fruit and vegetable consumption, exercise, body mass index, sleeping hours

Virtanen M, Ferrie JE, Singh-Manoux A, Shipley MJ, Vahtera J, Marmot MG, Kivimaki M. Overtime work and incident coronary heart disease: the Whitehall II prospective cohort study. *European Heart Journal* 2010 ;31(14): 1737-44.

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## **PART II. GLOBALIZATION AND THE CHANGING NATURE OF WORK**



# A Good Society

Society has basic responsibilities to its citizens. A “good society” must ensure:

- good working conditions (healthy work)
- certain basic standards of living
- health care
- collective representation
- controls on income inequality
- social and racial justice
- good schools, housing and support for children and families
- a healthy physical environment.

**Social justice** generally refers to the idea of creating a society or institution that is based on the principles of [equality](#) and solidarity, that understands and values [human rights](#), and that recognizes the dignity of every human being. St. Thomas Aquinas, philosopher John Rawls

# ***What is Globalization?***

Globalization is a widely-used term that can be defined in a number of different ways. When used in an **economic** context, it refers to the reduction and removal of barriers between national borders in order to facilitate the flow of goods, capital, services and labor... although considerable barriers remain to the flow of labor.

Increasing inter-connectedness!!

Globalization is not a new phenomenon. It began before the distinct emergence of capitalism in the 16<sup>th</sup> or 17<sup>th</sup> century. But it has accelerated since end of 2<sup>nd</sup> World War

# Globalization and Health

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## Globalization impacts people's health in 3 inter-dependent ways:

- 1) Creates wealth and raises standard of living for some thereby improving health for those with rising living standards (*offset, in part, by exposure to new risk factors*)
- 2) Increases social inequality, creates disparities in resources between communities & groups, between developing & developed countries.
- 3) For some groups poverty is increased due to disruption of previous economic systems and food supplies.
- 4) Impacts (**transforms**) community & work environments
  - a) promotes toxic physical environments
  - b) creates slums
  - c) contributes to unhealthy work environments (chemical toxins, unsafe working conditions, psychosocial work stress)

# The global economy: neo-liberal policies

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## Liberalization

- Reduce trade barriers, eliminate subsidies

## Privatization

- Sale of state-owned industries
- Services: health, education, welfare: from govt → private sector

## De-regulation

- Reduce state control/barriers to mobility of capital, goods, services
- Reduce state control over labor market (social protections):
  - Minimum wage, overtime, job safety & health, job security

## Reduce social welfare transfer payments to population

- Social security, pensions, health insurance, unemployment insurance, progressive taxation

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Benach J, Muntaner C, Santana V (coords). Employment, work, and health inequalities: A worldwide perspective. Geneva: World Health Organization (forthcoming).

Johnson, JV. The Growing Imbalance. In Schnall PL, et. al. (eds) Unhealthy Work. Amityville, NY: Baywood 2009

# Impact of “Neo-liberalism”

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Regarding economic development lots of evidence it is not a success

Growth in Latin America fell under neo-liberalism in the 1980's (and elsewhere)

Real wages decreased in the top 13 countries of the OECD since 1970

Yes, trade increases prosperity but disproportionate share of wealth is attained by the very rich – increasing social inequality the consequence

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# Neoliberalism and trade imbalances

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- ❑ World trade has expanded rapidly over the past 3 decades. Since 1986, it has grown significantly faster than the world gross domestic product (GDP)
- ❑ During 1970's trade liberalization with framework of GATT (general agreement on tariffs and trade) modest and mostly in industrialized countries.
- ❑ Trade expansion not uniform and the 12 most developed countries accounted for lion's share. Majority of developing countries did not experience significant trade expansion
- ❑ Many of the least developed countries (LDCs), includes sub-saharan Africa, experienced a proportional decline in the share of world markets – despite liberalization of trade

# Economic globalization

Liberalization  
De-regulation

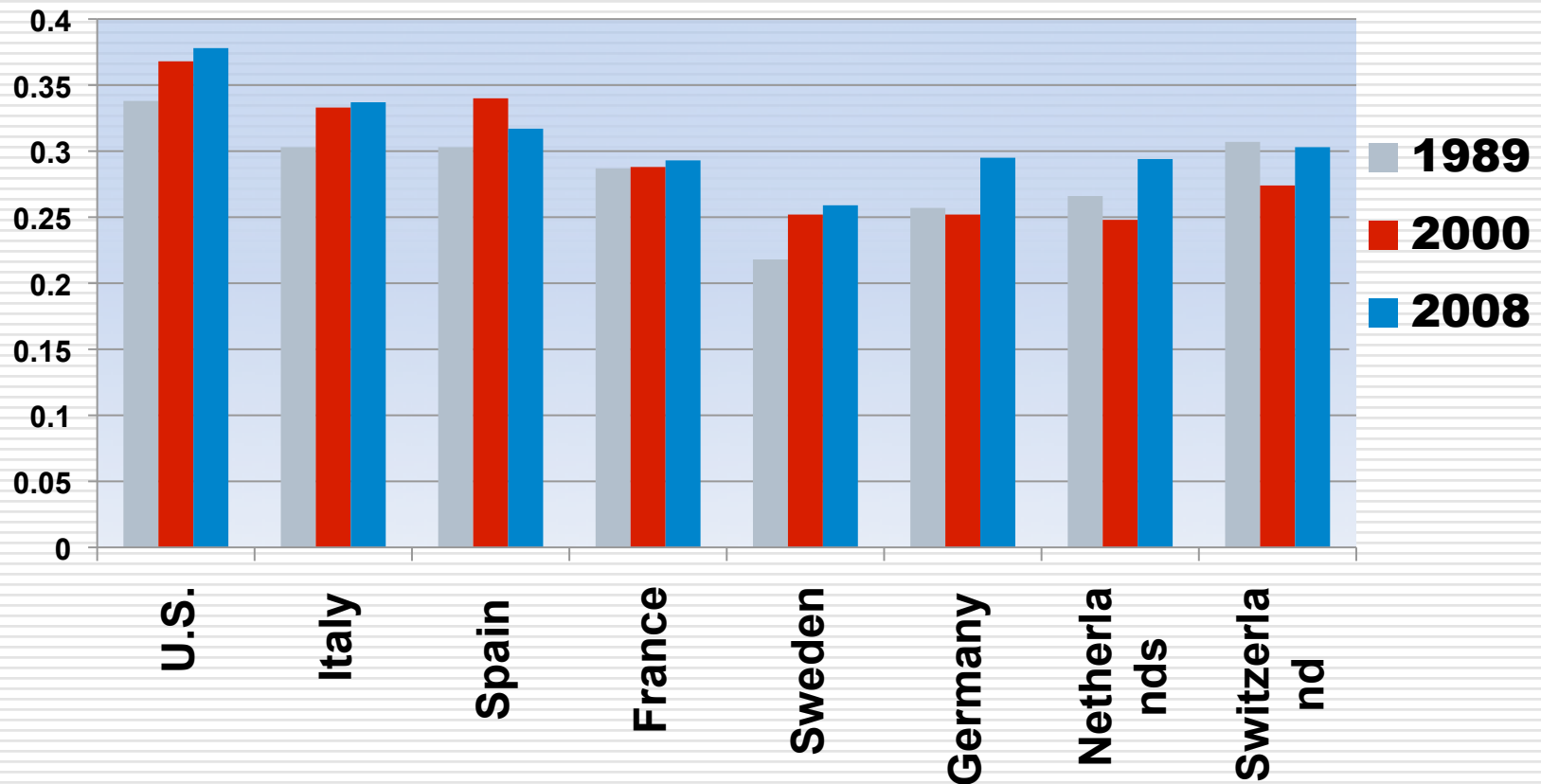
Privatization  
Reduce welfare state

## Labor market:

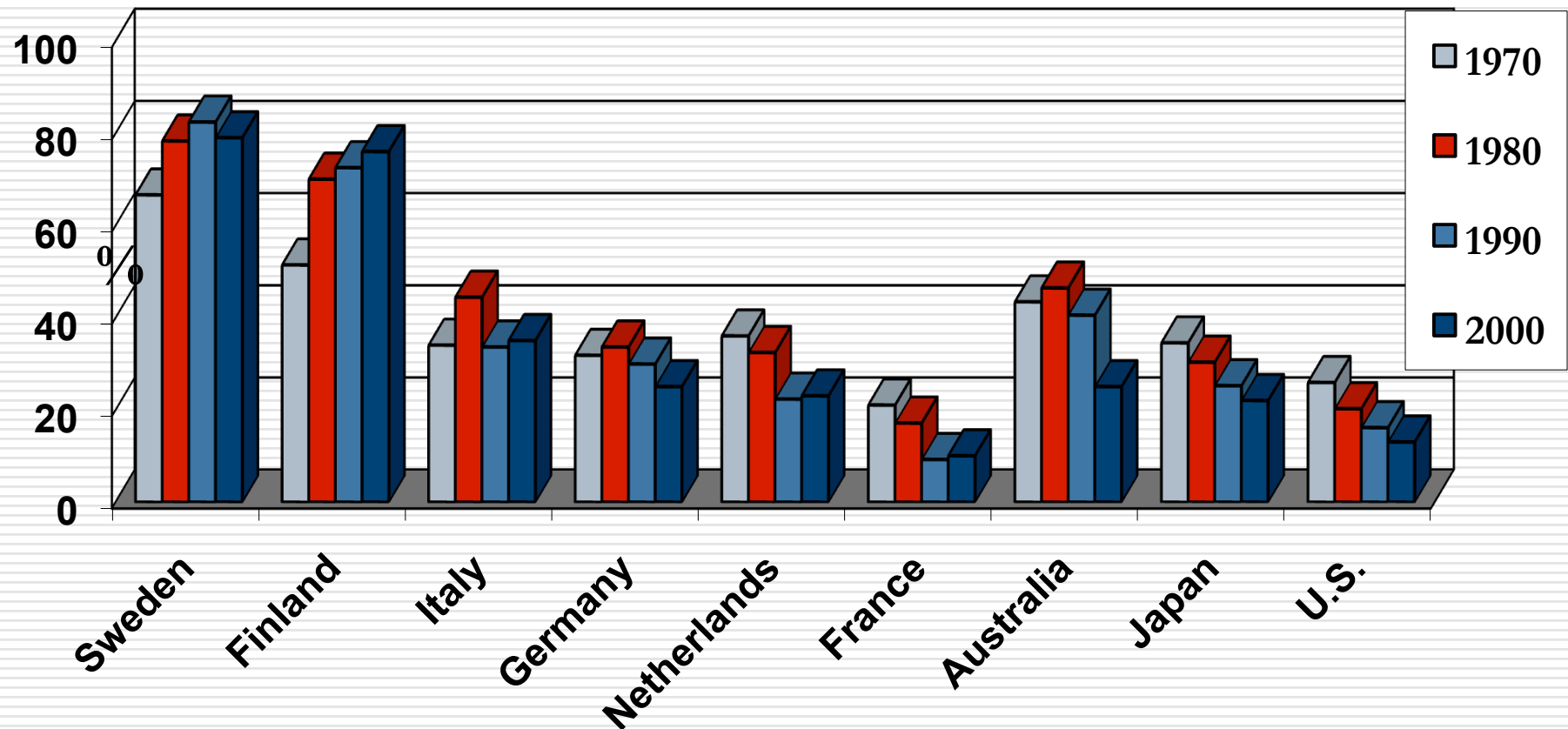
**Precarious work**  
(social/economic insecurity)  
**Income inequality**  
**Weaker unions**  
**Weaker public sector**  
Less social protection  
**Geographical flexibility**

## Organizational practices:

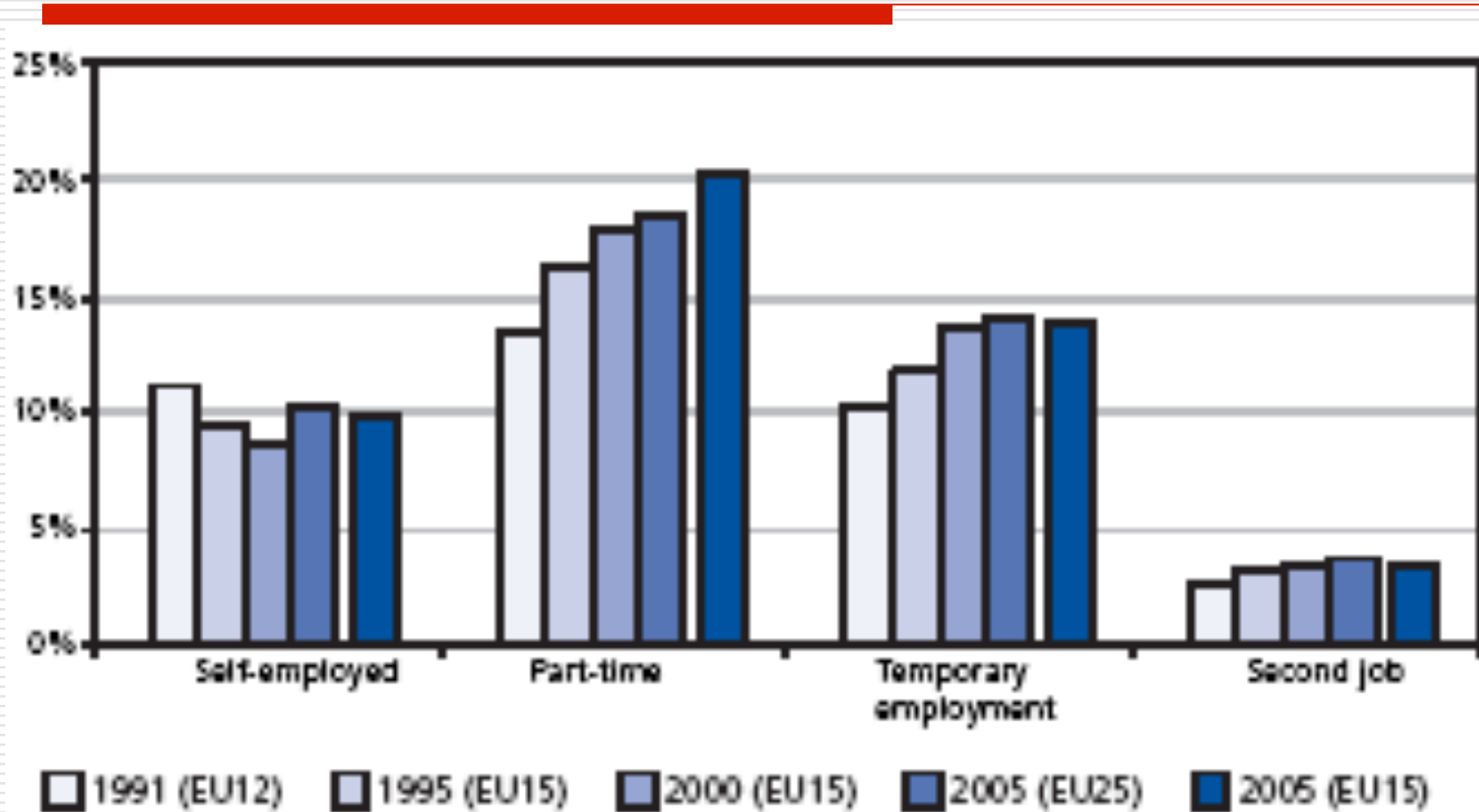
# Increase in Income Inequality in Developed Countries (GINI coefficient)



# Decline in trade union membership (as % of workforce)



# Increase in precarious/contingent work



# Privatization/reduction of government services

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## □ Health care

- Workforce reduction/flexibility, worse working conditions
- Worse quality of care
- Public health & disease prevention: lower priorities

## □ “Caring economy”: educ, health, social services

- Women are majority of this work force
- Reduction in paid workforce → Women absorb unmet burden of society by unpaid “invisible labor”

# Developing countries

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- ❑ **“Race to the bottom”** in working conditions to attract overseas capital (ongoing since at least the 1980s)
  - corporate-friendly, low regulatory export zones, despite effects on local economy, rural dislocation, social/environmental sustainability
- ❑ **Cuts in public sector budgets, social protections**
- ❑ Formal economy: downsizing, job insecurity
- ❑ Growth in (unregulated) **informal economy** (poorer health)

# In Chinese factories, lost fingers and low pay



- worker abuse still commonplace in many Chinese factories that supply Western companies
- in the Pearl River Delta region, factory workers lose or break about 40,000 fingers on the job every yr
- child labor
- 16-hour days on fast-moving assembly lines
- paying less than minimum wage



# Foxconn – A Case History

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## □ Demographic Changes in China

- Mass migration of 20 million Chinese farmers each year to urban setting
- Join working class in low income production centers
- Production Centers (Export processing zones) manufacture a range of products for export utilizing low paid workers
- Many factories employ hundreds of thousands of workers

# A cry for help at India's call centers

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**Those working nights answering calls from the U.S. and Europe face:**

- **musculoskeletal disorders**
- **sleep disorders**
- **heart disease**
- **depression**
- **family discord**

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Rajesh Mahapatra, The Associated Press, January 1, 2008

Jennifer Anderson, February 25, 2008, <http://www.ergoweb.com/news/detail.cfm?id=2198>

# Global epidemics are not natural

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- ❑ **CVD, stroke, obesity, diabetes, even most cancers, are global epidemics...but are not the natural result of aging.**
- ❑ Rather these are products of industrialization, urbanization, environmental and behaviors exposures as well as chronic stress
- ❑ Medical model explanations are inadequate to *explain or contain* these epidemics
- ❑ These epidemics are not caused (for the most part) by genes or individual behaviors - they involve social causes (e.g. social class differences, economic inequalities, unhealthy working & living conditions).

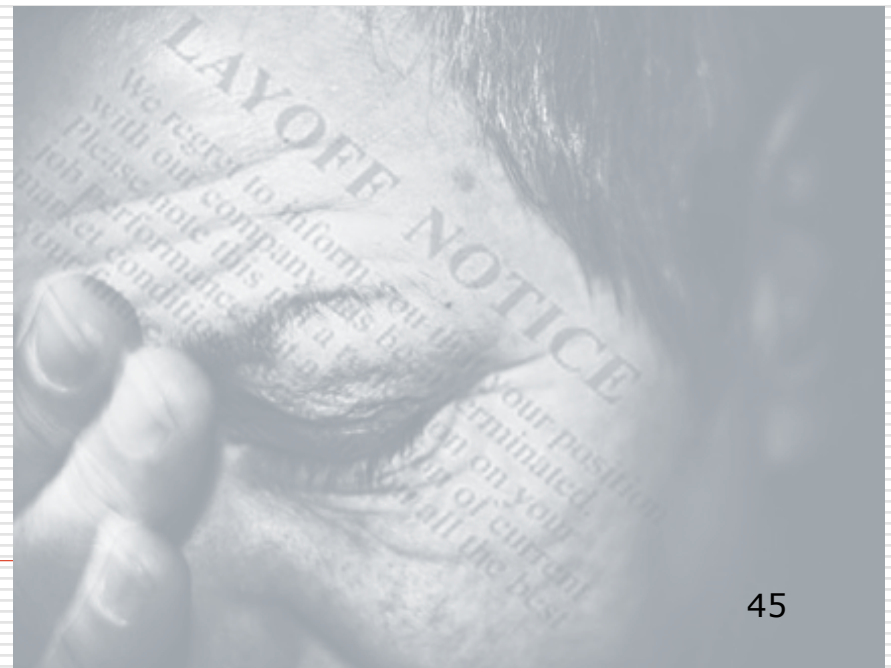
# How does work contribute to epidemics?

- ❑ Unhealthy work organization/working conditions include: employment insecurity; precarious employment, long work hours, dangerous work environments, noxious psychosocial working environments. All these factors also contribute to chronic stress at work.
- ❑ Exposure to chronic stress at work (& other environments) has cumulative impact & can lead to mental and physical illness.
- ❑ Ubiquitous appearance of stress suggests it is a social process with social causes (e.g, stressors in the work environment).
- ❑ Focusing on individual responsibility for “stress” removes focus from systemic causes, creating challenges in finding/presenting a “common language” about the causes of stress across stakeholders (e.g. businesses, labor unions and academics).

# Post 2008: the worsening global economic crisis

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- ❑ Stagnant global economy (post 2008)
- ❑ Austerity policies
- ❑ Increasing inequality
- ❑ Changes to labor market and work organization?



# Worldwide trends (2012)

## Income inequality (Gini)

	<b>GDP growth</b>	<b>Unemployment rate</b>	<b>Reducing public debt</b>
85 countries with <b>expansionary</b> fiscal & monetary policies	4.9%	7.3%	Greater success
47 countries with <b>restrictive</b> fiscal & monetary policies	0.8%	11.5%	

## how do these policies affect job characteristics & CVD?

# Economic “Recovery” Good for Profits, Bad for Jobs and Income

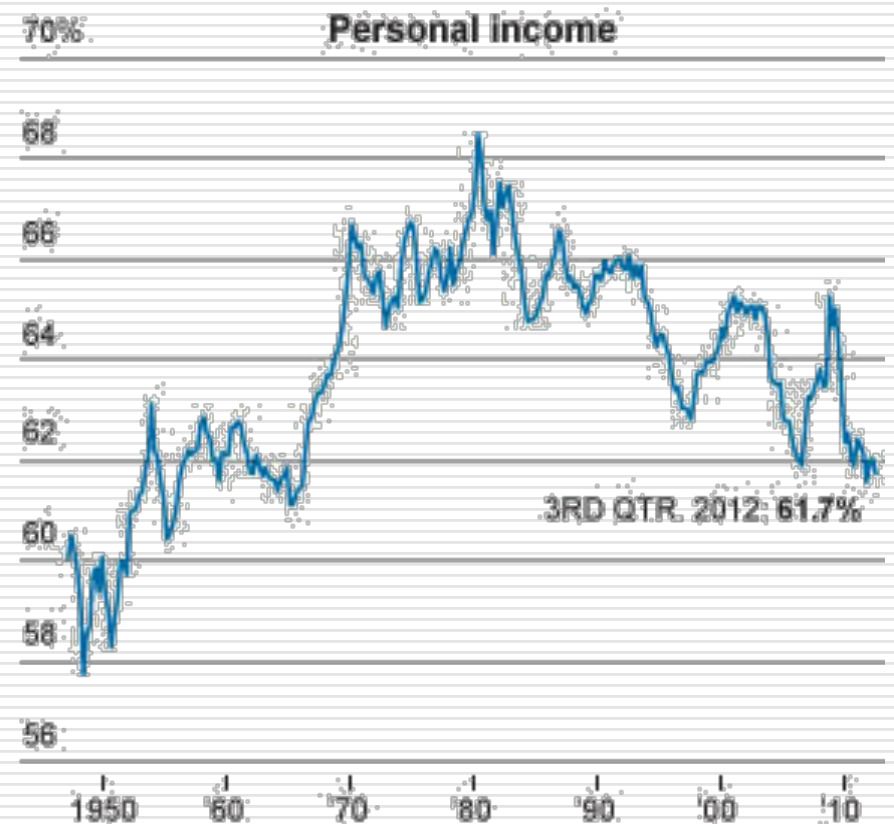
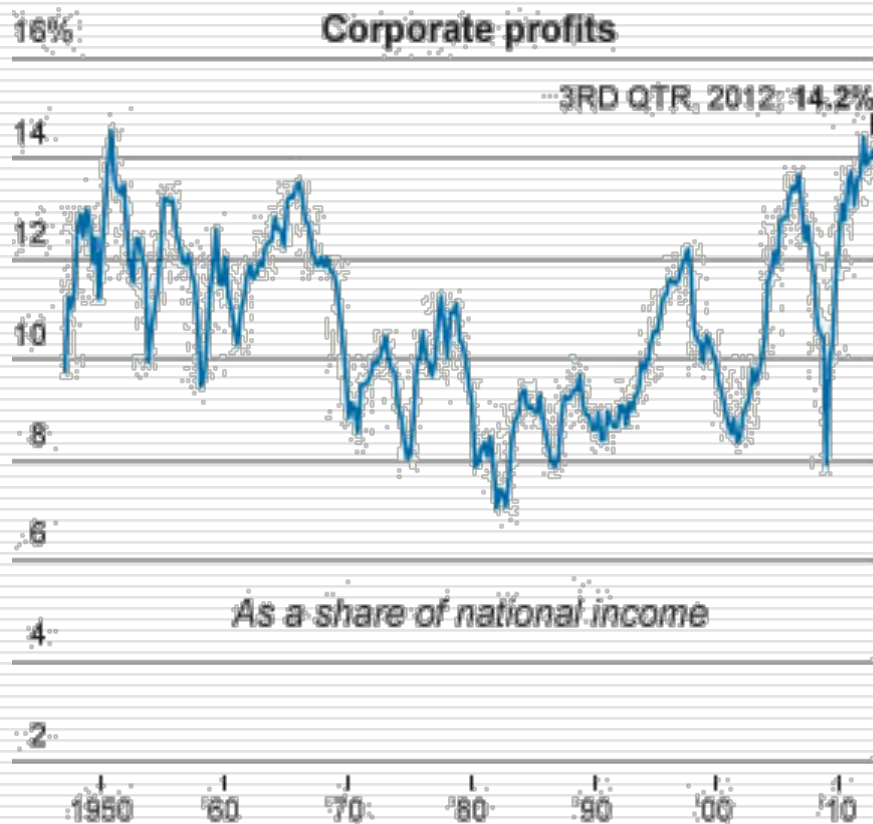
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With millions still out of work, companies face little pressure to raise salaries, while productivity gains allow them to increase sales without adding workers.

“So far in this recovery, corporations have captured an unusually high share of the income gains,” said Ethan Harris, co-head of global economics at Bank of America Merrill Lynch. “The U.S. corporate sector is in a lot better health than the overall economy. And until we get a full recovery in the labor market, this will persist.”

## Income Shifting to Businesses

The share of the national income going to corporations is at its highest level since 1950, and the portion going to individuals is near its lowest since 1966. Other parts of national income include proprietors and rental income.

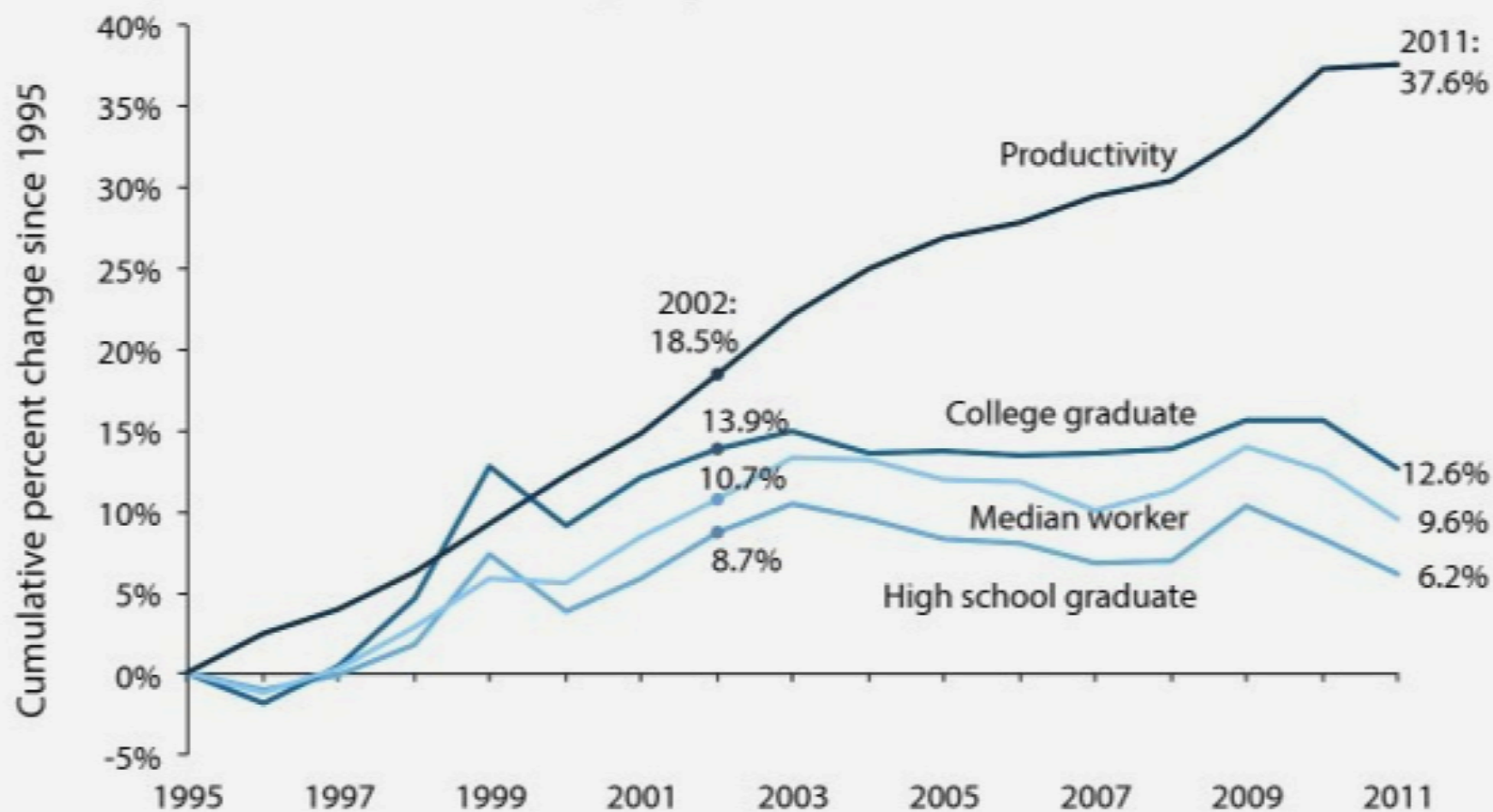


Source: Bureau of Economic Analysis

THE NEW YORK TIMES

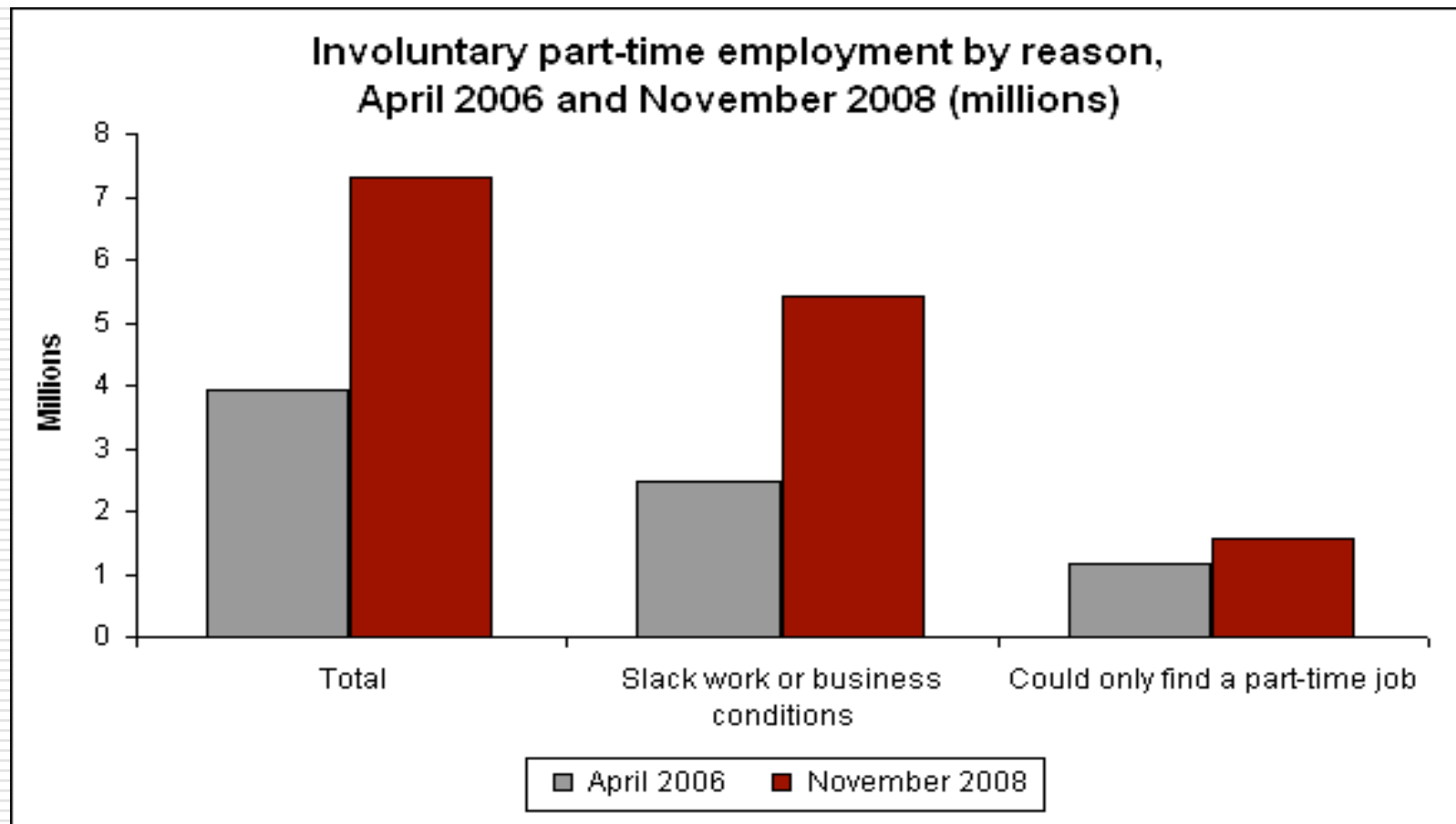


**Cumulative change in total economy productivity and real hourly compensation of selected groups of workers, 1995–2011**



Source: Authors' analysis of unpublished Total Economy Productivity data from the Bureau of Labor Statistics Labor Productivity and Costs program, Bureau of Economic Analysis National Income and Product Accounts data, and Current Population Survey Outgoing Rotation Group microdata

# Increase in part-time work (U.S., 2006-8)



These data are from the [Current Population Survey](#) and are seasonally adjusted. To learn more, see "Involuntary part-time work on the rise" ([PDF](#)), *Issues in Labor Statistics*, summary 08-08, December 2008.

# Policies of economic globalization

Trade liberalization  
De-regulation

Privatization  
Reduce welfare state

## Labor market:

Precarious work  
(social/economic insecurity)  
Income inequality  
Weaker unions  
Weaker public sector  
Less social protection  
Geographical flexibility

## Organizational practices:

Downsizing, restructuring  
Irregular, long hours  
Involvement, flexibility  
Union avoidance  
Electronic monitoring  
Lean production  
Intensification of labor

# Lean work increases stress, MSDs in manufacturing *(1999 literature review)*

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- Studies of auto manufacturing plants in U.S. & Canada, lean production →
  - Increased musculoskeletal Sx
  - Intensified work pace & demands, overtime
  - Modest, temporary increases in job control, skill use



**RECENT HEADLINES:**  
**Lean principles have  
spread to the health  
care industry**

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# Lean Sigma— Will It Work for Healthcare?

*James A. Babensky, MS, Janet Roe, and Romy Bolton*

*Journal of Healthcare Information Management — Vol. 19, No. 1*

# Going Lean in Health Care

**Institute for Healthcare Improvement** Cambridge, Massachusetts

# Lean thinking for the NHS

Daniel Jones and Alan Mitchell, Lean Enterprise Academy UK

# New Public Management (NPM):

Lean production principles applied to public sector  
& to emotional labor

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## ❑ Variety of features in different settings

- **Downsizing, restructuring, privatization, contracting out**
- **More flexible (temporary, contract, part-time) employees**
- Focus on customers, “quality”
- Teams
- Software to increase work pace, volume, monitor productivity
- De-skilled, standardized work, SOPs, partial task fragmentation
- **Strict performance goals, hourly output targets, white boards, peer pressure, work intensification**
- Value stream maps, time & motion study, continuous workflow
- More formal performance evaluation

## ❑ Only 4 studies of NPM & job characteristics & health

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# 2013 update: Lean work increases stress, health risks in manufacturing & other industries

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- ❑ 20 published studies since 1999: 11 countries, 13 in manufacturing, 4 NPM
- ❑ Similar findings as in previous reviews
  - Increased psychological distress
  - Increased or high job demands
  - Low or reduced levels of job autonomy, authority or participation
  
- ❑ Studies not being done by people in our field!

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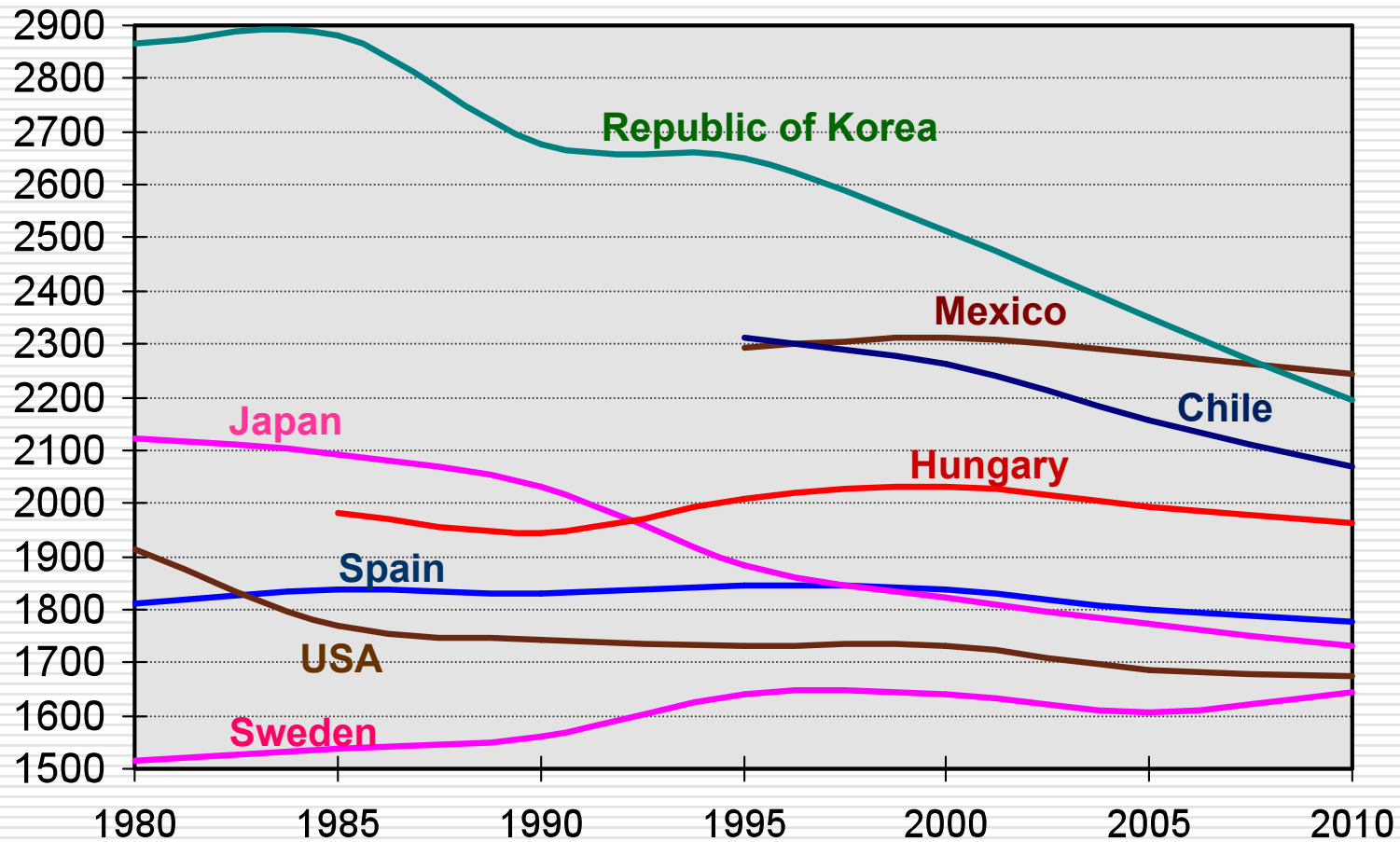
Downsizing, restructuring  
Irregular, long hours  
Involvement, flexibility  
Lean production  
Intensification of labor  
Electronic monitoring  
Union avoidance

## Job characteristics:

Job demands ↑      Job control?  
Work hours ↑      Social support?  
Job insecurity ↑      Rewards?



# HOURS WORKED PER YEAR



Key Indicators of the Labour Market (KILM). Geneva, International Labour Office, 2007.

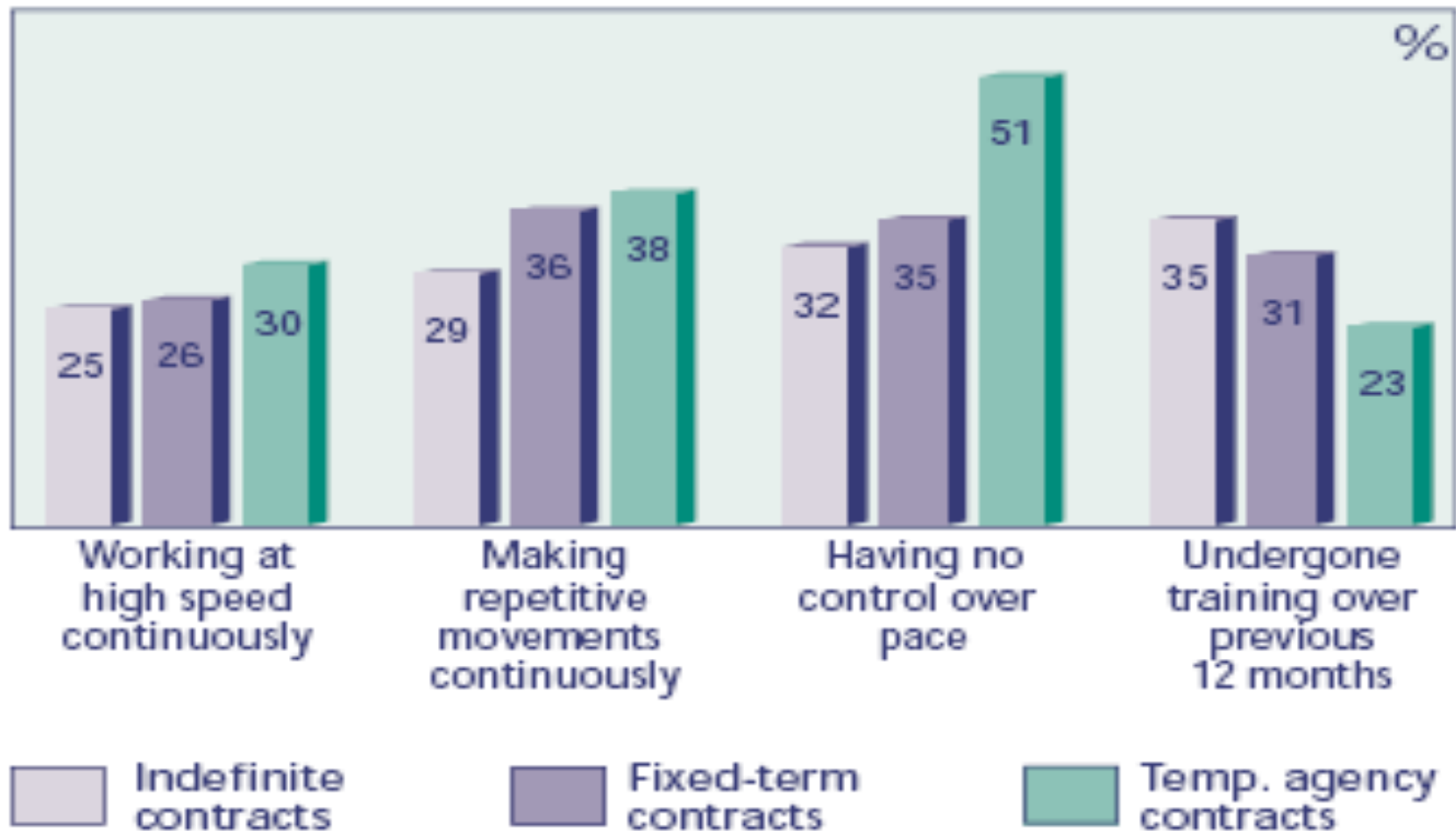
# Precarious Employment: a new form of highly stressful work

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- ❑ Crucial adjunct to Taylorism
- ❑ Precarious workers:
  - More exposed to high demand/low control
  - Have limited decision latitude
- ❑ Apparent task control vanishes when overriding economic pressures force workers to work harder & longer
- ❑ Their desperation undermines permanent workers' resistance to work intensification

# Precarious work means more job stress

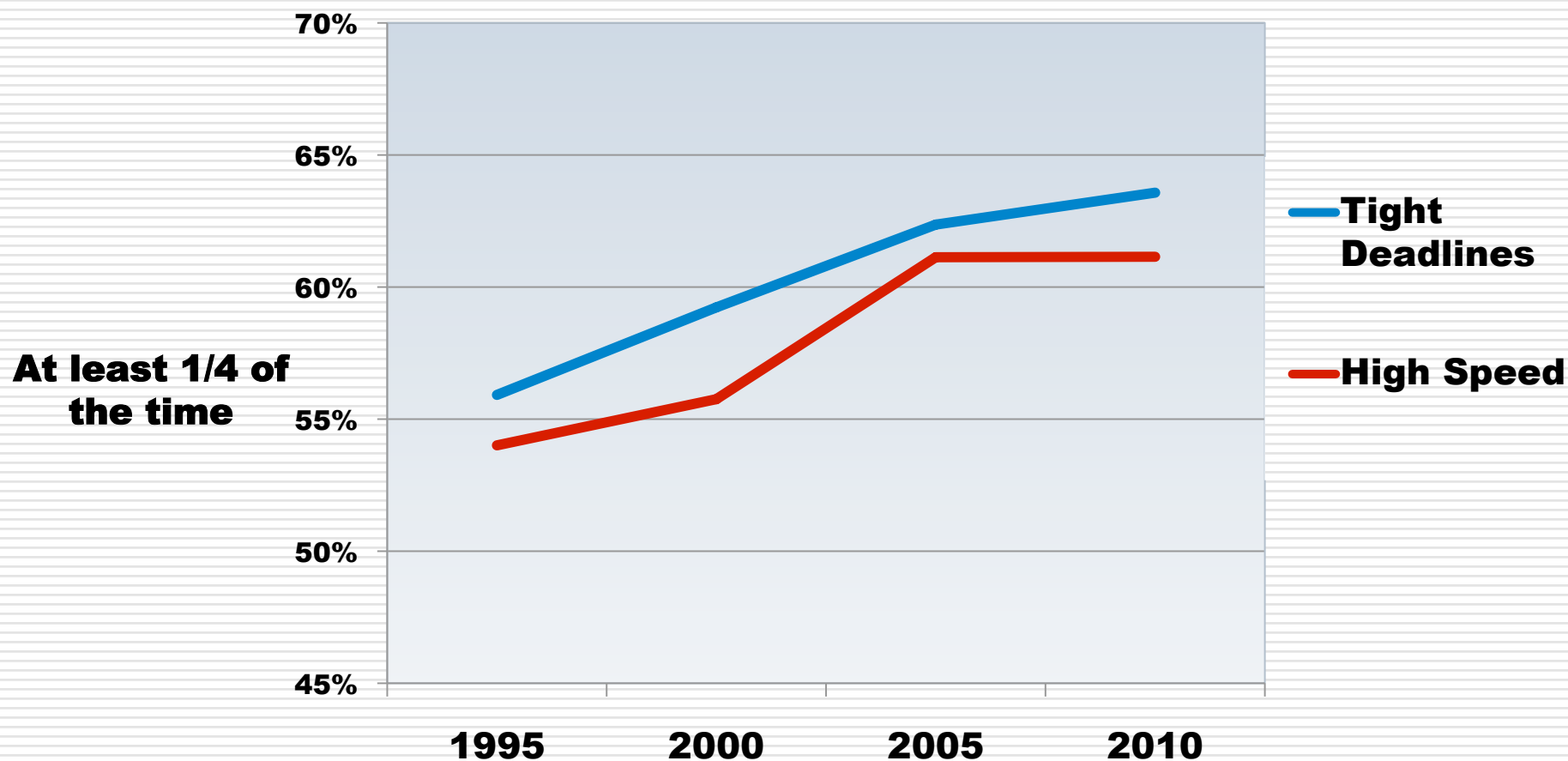
European Union surveys (2000)



Paoli P, Merlié D. Third European Survey on Working Conditions. European Foundation for the Improvement of Living and Working Conditions, Dublin, Ireland, 2001.

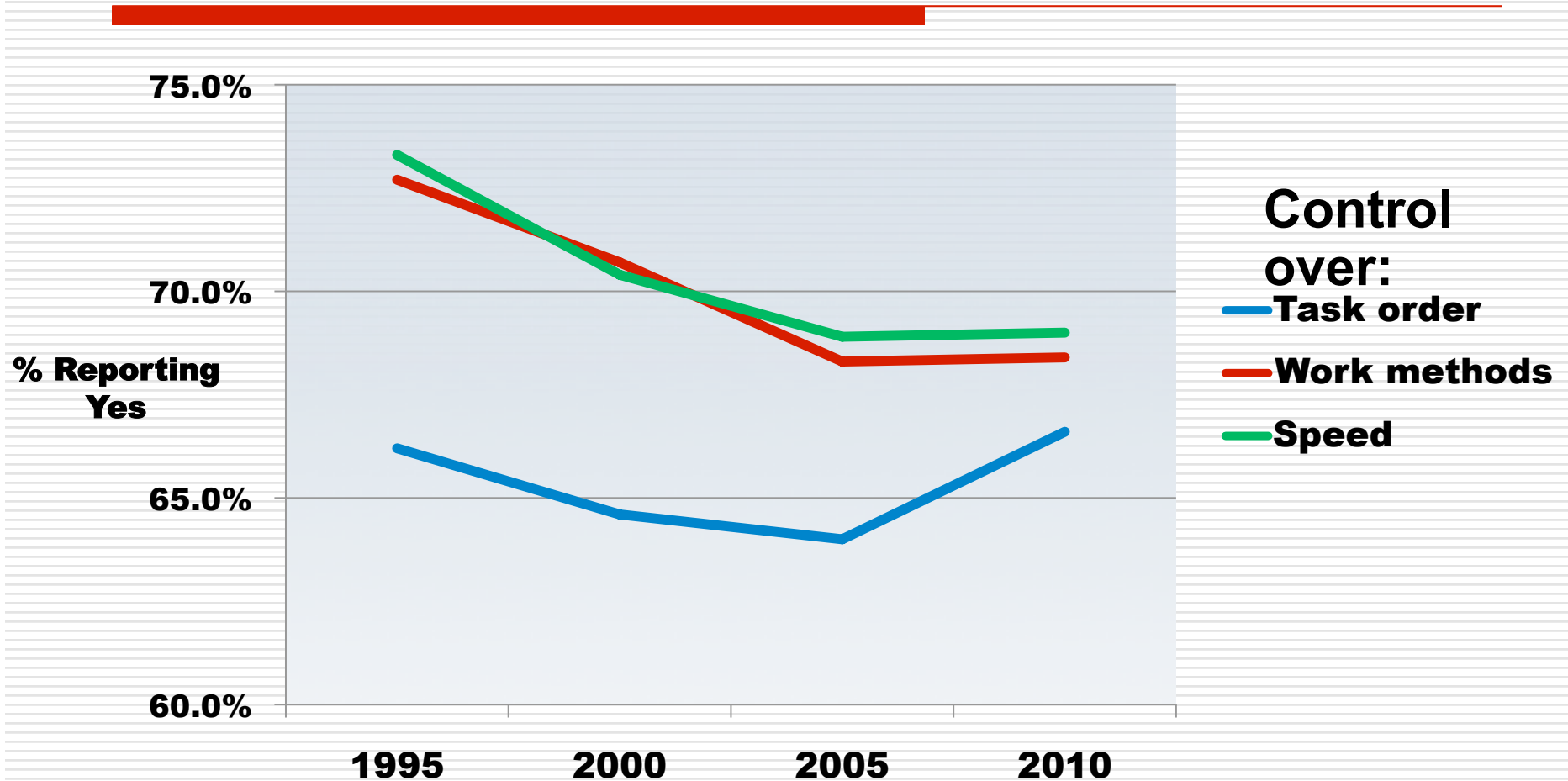
# Increase in work intensity, job demands

## European Union surveys, 1995-2010



# Decrease/leveling in Job Control (autonomy)

European Union Surveys 1995-2010



# Workplace Psychosocial Factors

---

1. Long Work Hours
2. Shift work
3. TAV
4. Job Strain
5. ERI (effort reward imbalance)
6. Social Isolation
7. Low Social Support (from co-workers and supervisors)
8. Emotional Labor
9. Organizational Justice (fairness)
10. Bullying
11. Job insecurity (precarious labor)
12. Work family imbalance

---



# **PART III: RESEARCH AND POLICY DIRECTIONS**

# Need Better National Surveillance of Job Characteristics

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- ❑ European working conditions surveys 1990-2010
- ❑ U.S. NIOSH quality of work life surveys 2002-2010
- ❑ Other countries/regions
- ❑ To determine impact of global recession & austerity policies!
- ❑ Need to overcome problems:
  - Work & health data not in same studies (in U.S.)
  - Recent data not publicized (in US)
  - *Trends in job strain, ERI not provided!*
  - Are they reaching undocumented immigrants, precarious workers, domestic workers, informal sector workers?
  - Expensive, not available in most developing regions/countries



# Need Better National Surveillance of CVD Incidence, Mortality & Risk Factors by

---

- ❑ Labor market indicators
  - Precarious work
  - Immigrant status
  - Income inequality
- ❑ Organizational practices
- ❑ Occupation
  - Can be linked to job characteristics
- ❑ Education & income (SES)

# More research needed on:

---

- To what extent do these factors lead to stressful jobs?
    - Age
    - Gender
    - Race/ethnicity
    - Immigration status
    - SES
  - To what extent do they interact with job stressors?
    - stronger effect of job strain on BP in manual workers
  - Taken collectively the key variables above reflect social inequality → a major contributor to negative health
  - To what extent are job stressors causes of **occupational health inequalities**, thru what mechanisms?
-

# Globalization and work

---

- Globalization contributes to the changing nature of work in industrial and industrializing societies.
  
- New and changing working conditions impact the health of many working people.
  - E.g., 40,000 reportable occupational health injuries each day in China

# Research evidence

---

- Throughout the course we will examine data from industrialized countries relating working conditions to health outcomes.
- More data are available from western countries than developing nations (though U.S. data on work & health is less available than European data).
- Data are inadequate in all countries on the health impact of recent changes in work organization (downsizing, mergers, outsourcing, off-shoring, informal labor sectors).

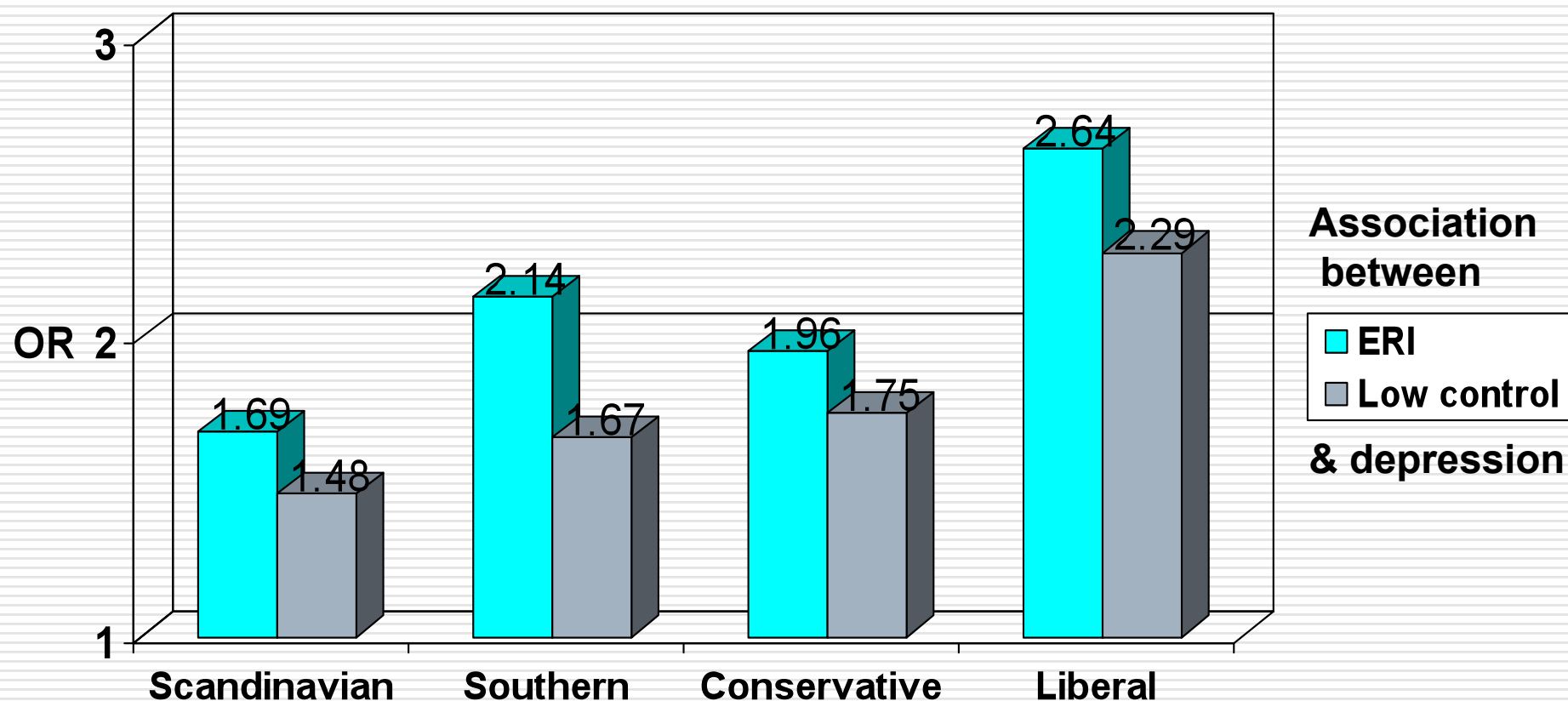
# More research needed on:

---

- ❑ National and regional differences in health & job characteristics
  - ❑ To what extent do national policies affect →
    - Income Inequality
    - Precarious work
    - Labor protections
    - Unionization
    - Prevalence of job stressors
    - Differences in the *strength of association* between job characteristics & health (Dragano, 2011)
-

# Association between job stressors & depression varies by type of government

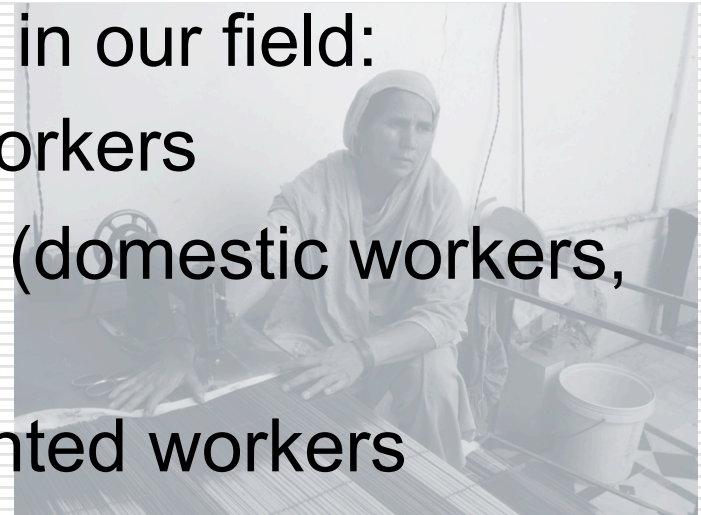
(5383 men, 4534 women, age 50-64, 12 European countries, 2004)



# More research needed on:

---

- Workers typically excluded from research studies (national datasets) in our field:
  - temporary/contingent workers
  - informal sector workers (domestic workers, sweatshops etc.)
  - immigrant & undocumented workers
  - workers in developing countries
- **How to study?** Community-based participatory action research and qualitative approaches?



July 2007

# GOHNET



World Health  
Organization

## The Global Occupational Health Network

### *GOHNET Special*

*Addressing psychosocial risks and work-related stress in countries in economic transition, in newly industrialized countries, and in developing countries*

Dear Reader,

This issue of GOHNET aims at raising awareness of psychosocial risks and work-related stress through a variety of articles which describe national situations and the state-of-the-art with respect to the impact/influence of these risks to mental and physical health. Contributions received cover five of the six WHO Regions.

This topic has either not or only scarcely been addressed in countries in economic transition, in newly industrialized countries, and in developing countries (afterwards referred to as: target countries). There is ample research from developed countries outlining the relationship between workers' health and consequences of work-related stress originating from psychosocial risks. However, we have little knowledge about assessment methodologies, risk management and interventions from the target countries. The lack of research in this field and

that even though specific programmes or initiatives can be implemented at country level, little is done to address the problem.

The WHO is working on several processes addressing the health of workers in an integrated and comprehensive manner. Firstly, the 60th WHO World

#### TABLE OF CONTENTS

##### Articles

**WHO headquarters:** Work-related stress and psychosocial risks: trends in developing and newly industrialized countries



# More research needed on systems of work organization

---

Lean production systems  
(including New Public Management)

Worker cooperatives  
(such as Mondragon)

→ job characteristics, worker health

# More Intervention Research Needed

---

- ❑ To demonstrate
  - Health benefits
  - Processes for reducing job stressors
- ❑ Need for community-based participatory action research & qualitative research approaches

# Participatory action research (PAR): Hotel room cleaners: San Francisco & Las Vegas

---

- PAR: effective methodology to describe problems, apply systems view, uncover physical & psychosocial stress factors, improve work organization, measure results
- Hotel room cleaners, San Francisco, 1998: union initiated partnership with Univ., defined priorities
- Results presented to union-mgmt contract committee
  - 1999 contract: daily room quota from 15 → 14 or 13
  - 2007 contract reached further improvements



---

Lee PT, Krause N. The impact of a worker health study on working conditions. *J Public Health Policy* 2002;23:268-285. Creating Luxury, Enduring Pain. UNITE-HERE, April 2006; Casey M, Roskam E. Organizing and collaborating to reduce hotel workers' injuries. In Schnall P et al (eds.) *Unhealthy Work* Baywood, 2009

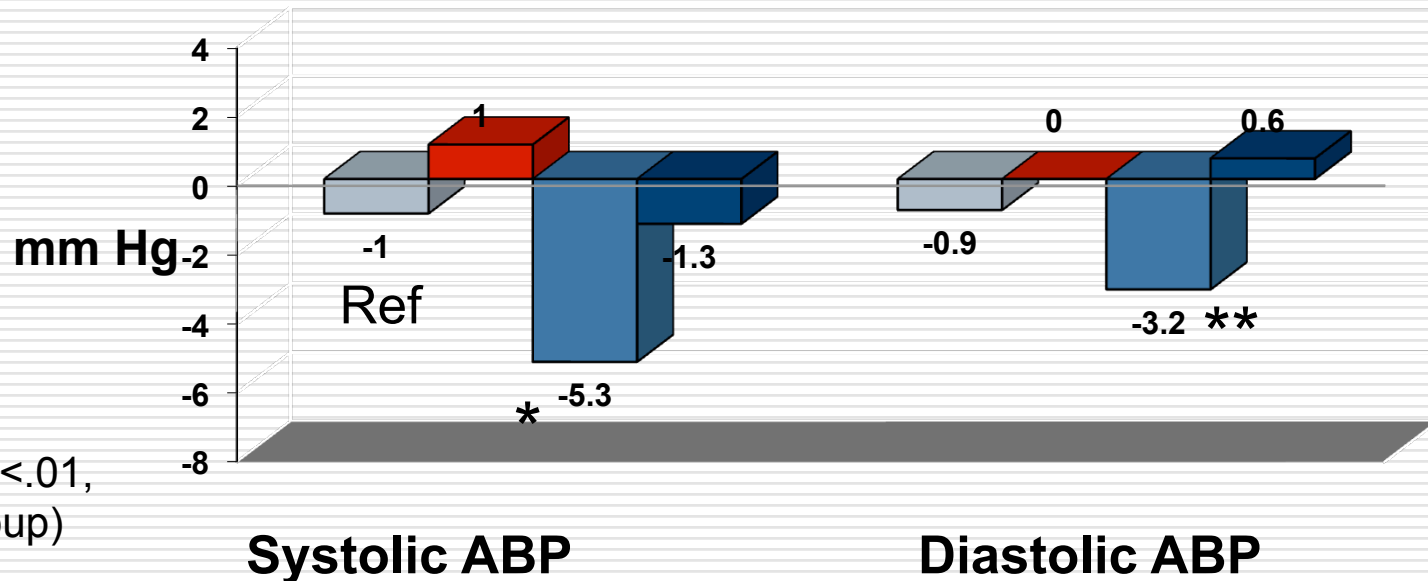
# Some evidence for health benefits of increasing worker control/participation

---

- ❑ work re-organization → increased employee job control → improved mental health, sickness absence, performance (Bond & Bunce, 2001, UK)
- ❑ high employee participation → decreases in work demands, improved social support, decreases in stress levels (Eklof et al 2004, Sweden)
- ❑ a collaborative/participatory approach in the intervention → led to improved co-worker relations, job security (Lindstrom 2000, Finland)

# Leaving Job Strain Leads to Decrease in Work Ambulatory BP

Strain-T1:	no	no	yes	yes	no	no	yes	yes
Strain-T2:	no	yes	no	yes	no	yes	no	yes



\*p<.05, \*\*p<.01,  
(vs Ref group)

N=195 men, controlling for age, race, body mass index, smoking, alcohol use, work site

# Why Improve Work? Why Not the Medical Approach to CVD Risk Factors?

## Medication or Individual Behavior Change

---

- CVD Epidemic is Global:
  - Soon to be 3 billion with HTN or CVD
  - 80% of burden of CVD in developing countries
- Medical approach to CVD Epidemic is COSTLY:
  - 1 in 6 U.S. health dollars spent on CVD
  - U.S. health care costs for CVD: triple to \$818 billion by 2030
  - U.S. spends only 3% of health care dollars on prevention

# Why Improve Work?

## Why Not the Medical Approach to CVD Risk Factors?

---

### A. **Medical management of standard CVD risk factors means:**

- Potentially medicating 100s of millions
- \$\$Costly (especially developing countries)
- Many side-effects and even deaths from medications
- 40-50% of CVD risk due to BP among people with “normal” BP (120-140/80-90)

# Why Improve Work?

## Why Not the Individual Behavior Change Approach to CVD Risk Factors?

---

### **B. Feasibility of behavioral interventions on millions at risk globally?**

- How effective are individual level interventions?
- How to include most at-risk populations – those in informal sectors/developing countries?
- Profits people in the behavioral modification business



# Tokyo Declaration: Emphasis on Prevention

---

*on Work-Related Stress and Health. In Three Postindustrial Settings -  
The European Union, Japan and the United States as adopted at a  
"triangular" Conference at the Tokyo Medical University, Nov. 1998.*

- *Implementation of ... prevention measures to reduce stress related illness and injury in the workplace and ... to bridge the gap between current knowledge and implementation of that knowledge at all levels - international, national, regional, local and individual. The role of agencies such as NGO's, labor organizations and health services will be critical in facilitating the closing of these gaps.*

# NIOSH: TOTAL WORKER HEALTH™

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Integrating:  
Health Protection (Occupational Health) &  
Health Promotion



# Conclusions

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- ❑ **Epidemics of globalization increasing** at dramatic pace
  - ❑ Working conditions deteriorating for many worldwide
  - ❑ **European working conditions most likely better** due to stronger unions & work laws, so cannot be generalized
  - ❑ Research is “**behind the curve**” in assessing effects of global economic changes on work processes (esp. outside of high income countries) contributing to the world epidemics
  - ❑ **Beyond Job Strain?** Need comprehensive studies of work stressors (ex: 15 different risk factors in COPSOQ)
  - ❑ **Change** needed at workplace level & government level to make work safe and improve economic security
-

# Conclusions

---

- We know enough to justify implementing national standards for:
  - Surveillance of occupations & workplaces to identify elevated levels of hazardous work characteristics
  - Regulations & laws limiting psychosocial stressors at the workplace
  - Limiting the workday to 8 hours
  - Limiting the workweek to 40 hours
  - Minimum vacation time of 3-4 wks/yr
  - And much much more

# UNHEALTHY WORK

CAUSES, CONSEQUENCES, CURES



EDITORS  
Peter L. Schnall  
Marnie Dobson  
Ellen Roskam

CRITICAL APPROACHES IN THE HEALTH SOCIAL SCIENCES SERIES  
SERIES EDITOR: RAY H. ELLING

 BAYWOOD PUBLISHING COMPANY, INC.  
AMITYVILLE, NEW YORK

For further  
information

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Unhealthy Work:  
Causes, Consequences, Cures  
[http://www.baywood.com/books/  
previewbook.asp?  
id=978-0-89503-335-2](http://www.baywood.com/books/previewbook.asp?id=978-0-89503-335-2)

Center for Social Epidemiology  
<http://www.workhealth.org>  
<http://unhealthywork.org/>

# Healthy Work

---

❑ Healthy work requires more than the absence of noxious workplace psychosocial stressors or shorter work weeks...

❑ **People need:**

- to perceive their skills are being used on the job
- to have a say in how their job is done
- reasonable & fair work demands
- to be treated with respect and not as objects
- their interests & needs taken into account in decision-making

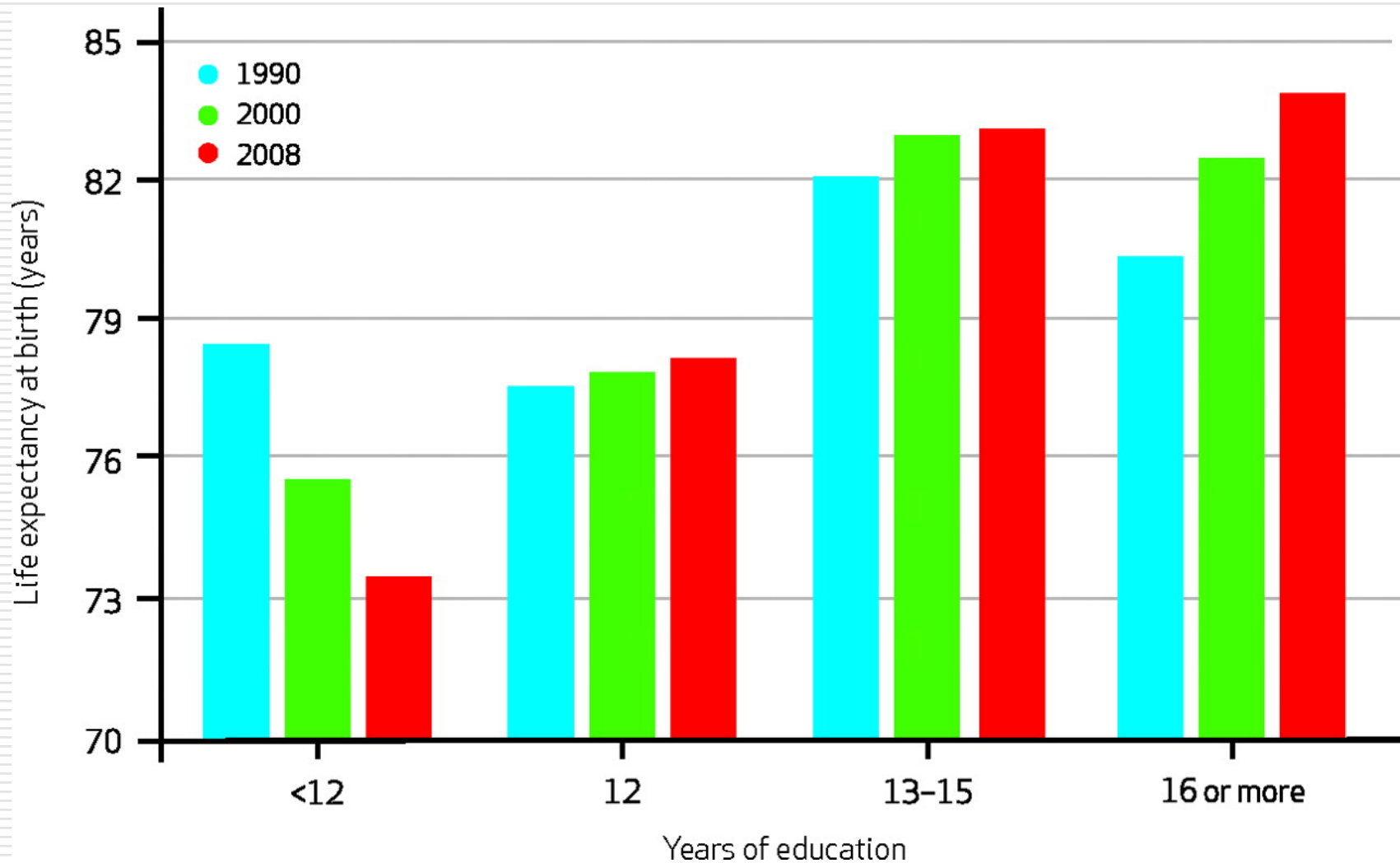
# Global epidemics

---

The global epidemics we face in advanced industrialized countries as well as in those undergoing industrialization are considered to be the ordinary diseases of everyday life: e.g., hypertension, heart disease, stroke, diabetes and depression

In most parts of the world, these illnesses have replaced infectious diseases as the major causes of chronic illness and death.

## Life Expectancy At Birth Declining for U.S. Females with less than High School Education, 1990–2008.





# SOME CHANGES IN THE ORGANIZATION OF WORK IN MODERN TIMES

---

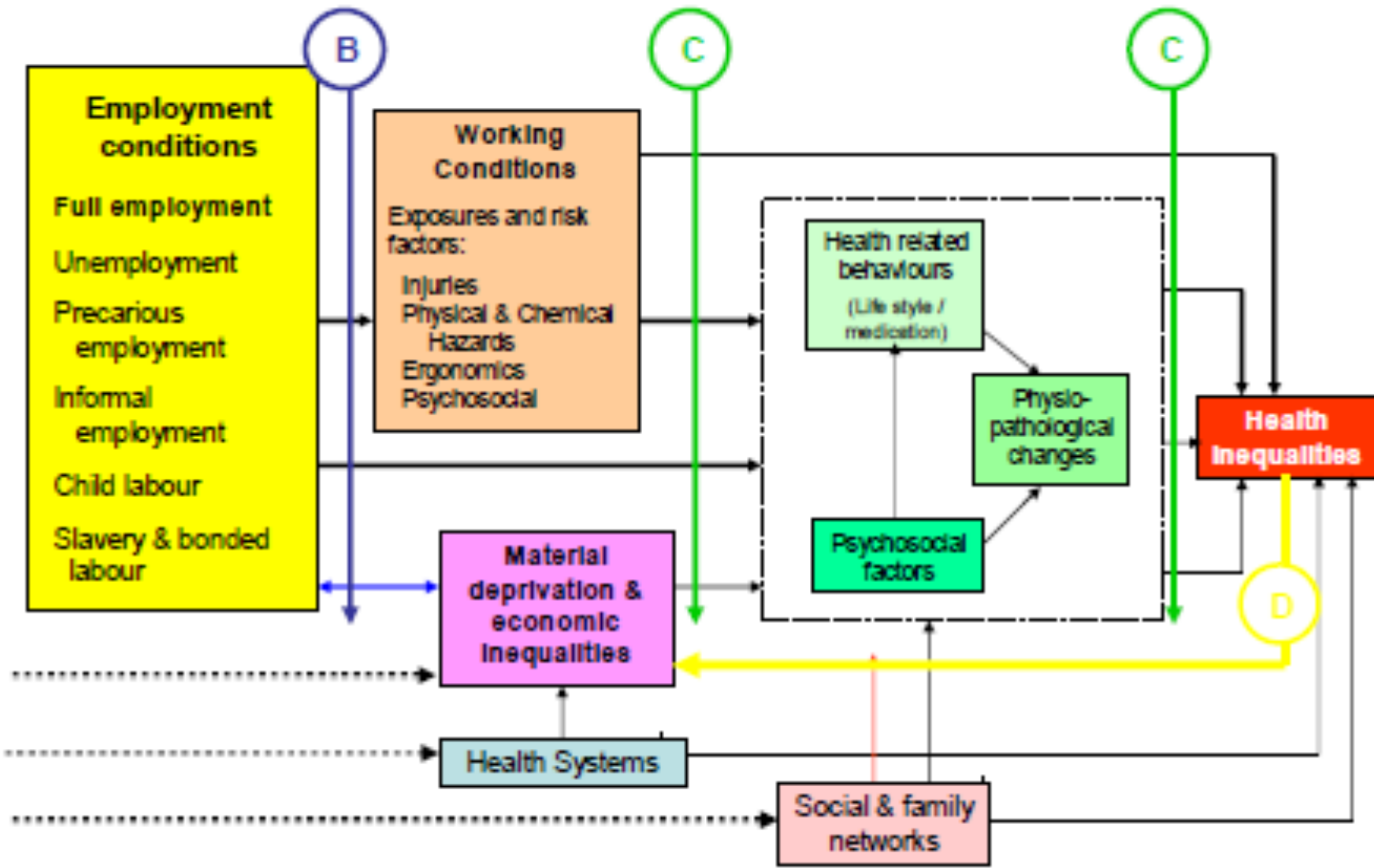
- ❑ With the development of industrial society, profound changes have occurred in the way in which work is organized during the past two hundred years.
- ❑ Craftwork was largely replaced by the industrial revolution.
- ❑ Skilled workers, who had exercised substantial control over their work processes, were replaced by lower -skilled labor in new machine-based production technologies (Karasek, 1990: pp19-20).

## CHANGES IN THE ORGANIZATION OF WORK IN MODERN TIMES cont:

---

- ❑ In the 20th century, Taylorism reshaped the workplace with its emphasis on narrow performance and efficiency using the technique of the assembly line, at the expense of employee collectivity and broader employee expertise and knowledge of the work process.
- ❑ Even lower-level white collar work, through office automation, has been shaped by the principles of the assembly line.
- ❑ More and more small businesses have been replaced by large centralized multinational organizations.

## Micro - Theoretical framework of Employment Conditions and Health Inequalities



### MODEL OF DYNAMIC LIFE-COURSE INTERACTIONS

Country/regional/locally influenced by social class, gender, race/ethnicity, age, migration

# *Globalization and CVD*

---

- Spread of CVD globally implicates globalization
- Globalization is a widely-used term with multiple definitions
- When used in an **economic** context, it refers to the reduction and removal of barriers between national borders in order to facilitate the flow of goods, capital, services and labor.
- Barriers remain to the flow of labor.
- Globalization is not a new phenomenon. It began centuries ago (? When)

# Hypertension as a disease of industrialized society

---

## **Hypertension as an epidemic seems likely to be of relatively recent historical origins**

- ❑ Minimal hypertension disease burden among hunter-gatherers, non-market agricultural communities & other non-industrialized societies. (Waldron, 1982)
- ❑ Industrial society: hypertension socially patterned by class, race, ethnicity, urbanicity & gender.
- ❑ Evidence implicates the “unidentified” causes of essential hypertension as likely including ubiquitous exposures.
- ❑ Need to examine diet, lifestyle, work or community.
- ❑ Adequate explanatory risk factor needs to incorporate the above-mentioned social patterning of the disease.

# How do these work changes contribute to epidemics?

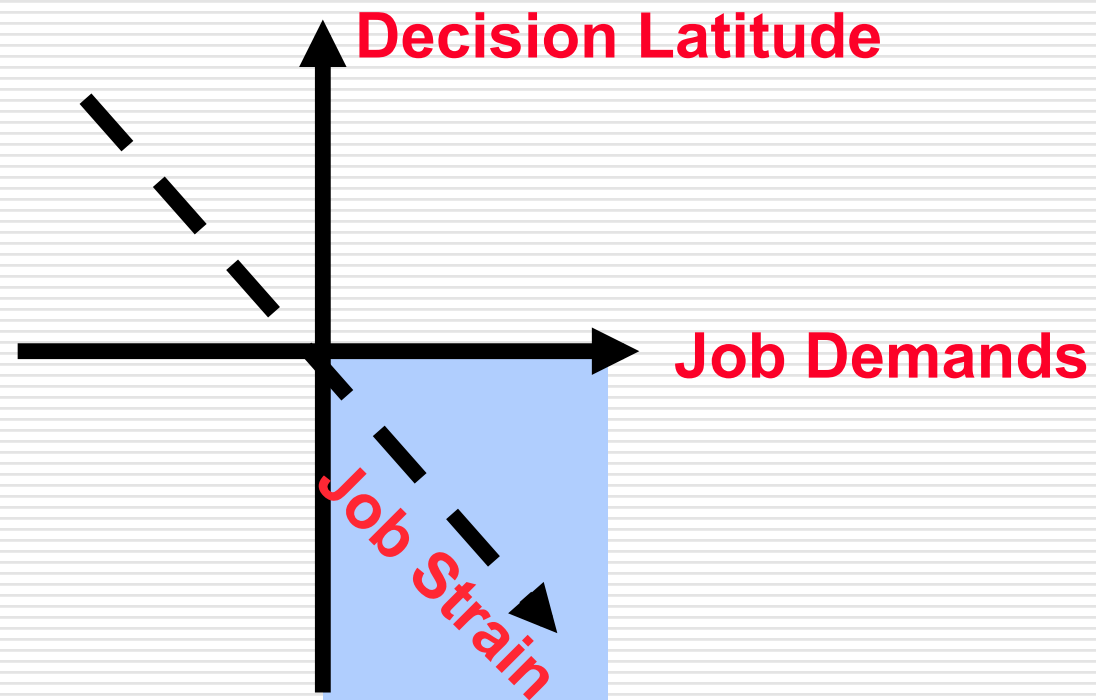
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- ❑ These changes lead to longer hours, work intensification, more psychosocial stressors such as job strain, ERI, TAV, emotional labor, social isolation, inter alia.
- ❑ Exposure to chronic stress at work (& other environments) has cumulative impact & can lead to physical and mental illness.
- ❑ Ubiquitous appearance of stress shows it is a social process with social causes (e.g, stressors in the work environment).
- ❑ Focusing on individual responsibility for “stress” removes focus from systemic causes, creating challenges in finding/presenting a “common language” about the causes of stress across stakeholders (e.g. businesses, labor unions and academics).

# Job Strain

HIGH psychological job demands and LOW job decision latitude

---



# Work and blood pressure

---

- ❑ The work environment is where adults now spend majority of waking hours.
- ❑ Work activities increasingly characterized as demanding, constraining & in other ways highly stressful.
- ❑ **Blood pressure (BP) is elevated during working hours.**
- ❑ Performing demanding, constraining & otherwise mentally stressful activity **provokes sharp rises in BP.**
- ❑ Specific features of work are implicated as important causes of hypertension, as well as CVD., e.g. Job strain



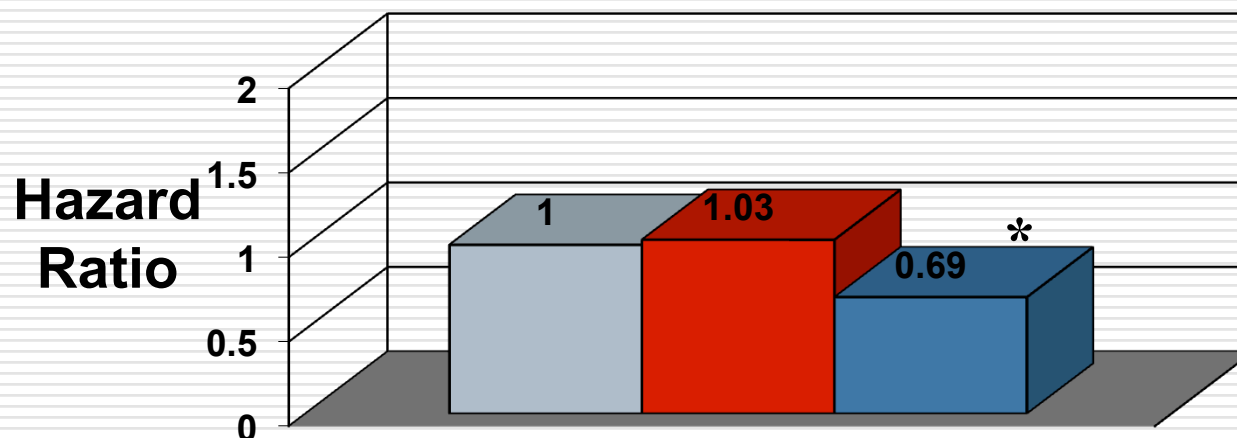
# Taylorism reshaped the workplace In the 20th century

---

- ❑ emphasis on narrow performance and efficiency using the technique of the assembly line
- ❑ at the expense of employee collectivity and broader employee expertise and knowledge of the work process.

# Relational justice (fair treatment by supervisors) decreases risk of heart disease

(Whitehall II study, 6,442 men, age 35-55, 8.7 yr follow-up)



**Relational  
justice**

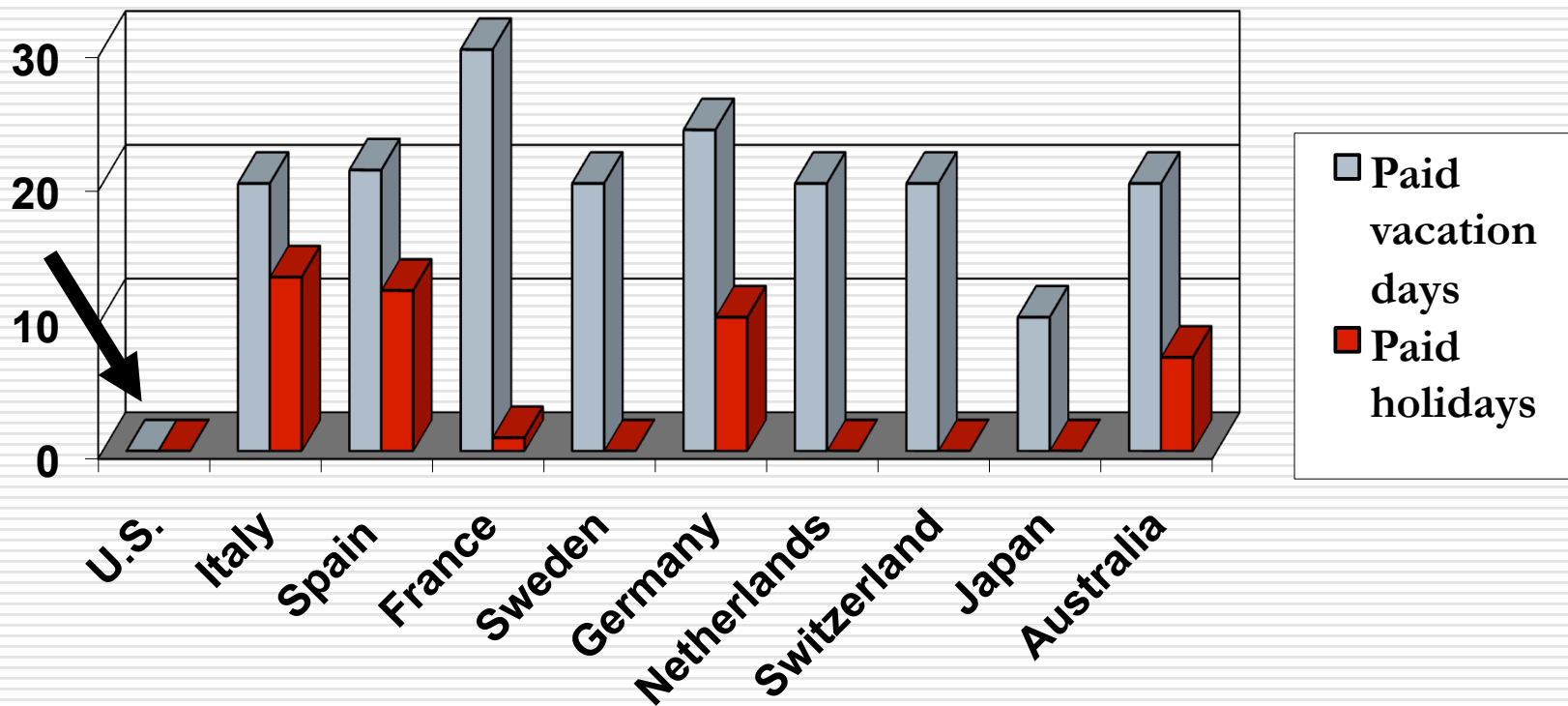
■ Low ■ Intermediate ■ High

\* $p < .05$

Controlling for age, occupational status, BMI, cholesterol, smoking, hypertension, alcohol, physical activity, job strain, effort-reward imbalance

Kivimaki M, Ferrie J, Brunner E, Head J, Shipley M, Vahtera J, et al. Justice at work and reduced risk of coronary heart disease among employees: the Whitehall II Study. Archives of Internal Medicine. 2005;165:2245-51.

# Legal minimum paid vacation days and holidays



# Swedish Work Environment Act, 1977

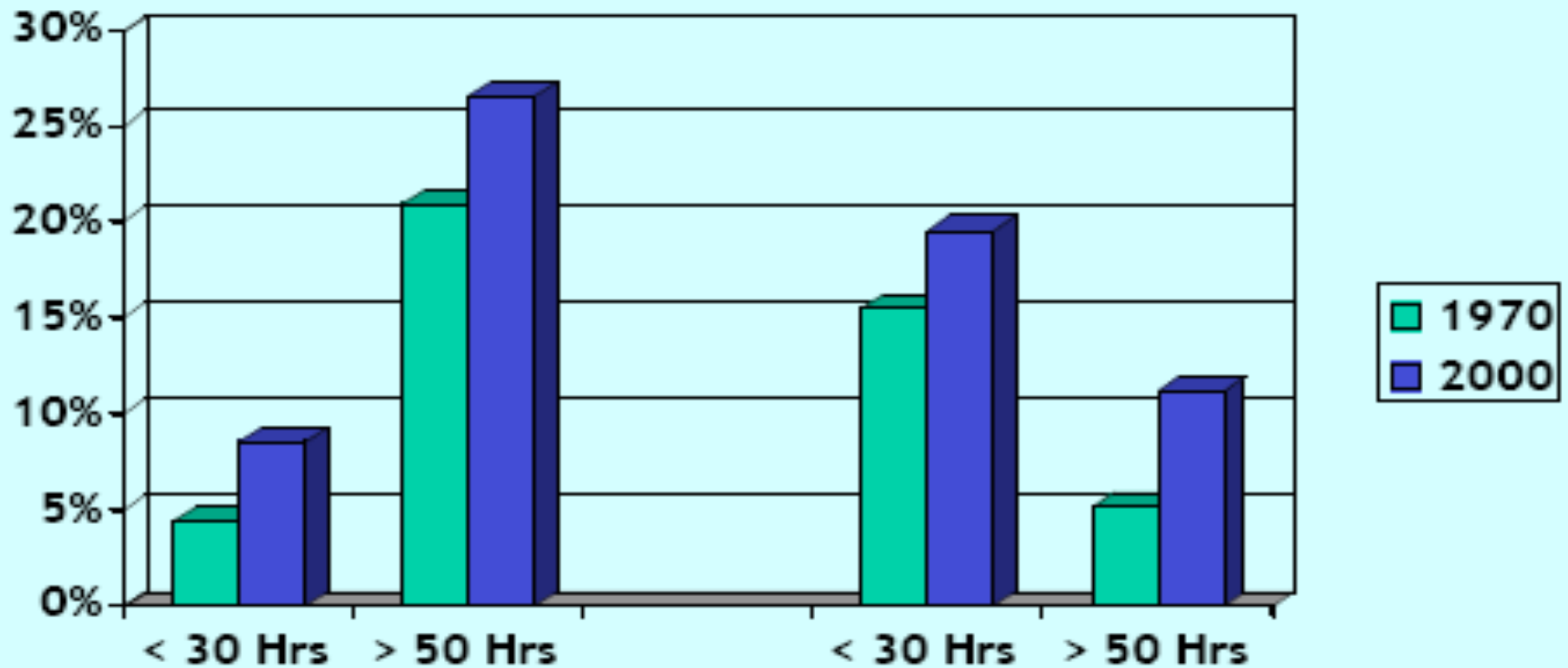
(amended May 30, 1991, chapter 2, section 1)

- 
- The employee shall be given the opportunity of participating in the design of his/her own working situation
  - Technology, work organization & job content shall be designed in such a way that the employee is not subjected to physical or mental strains which can lead to illness or accidents
  - Ensure that work provides opportunities for:
    - variety, social contact & co-operation
    - personal & professional development

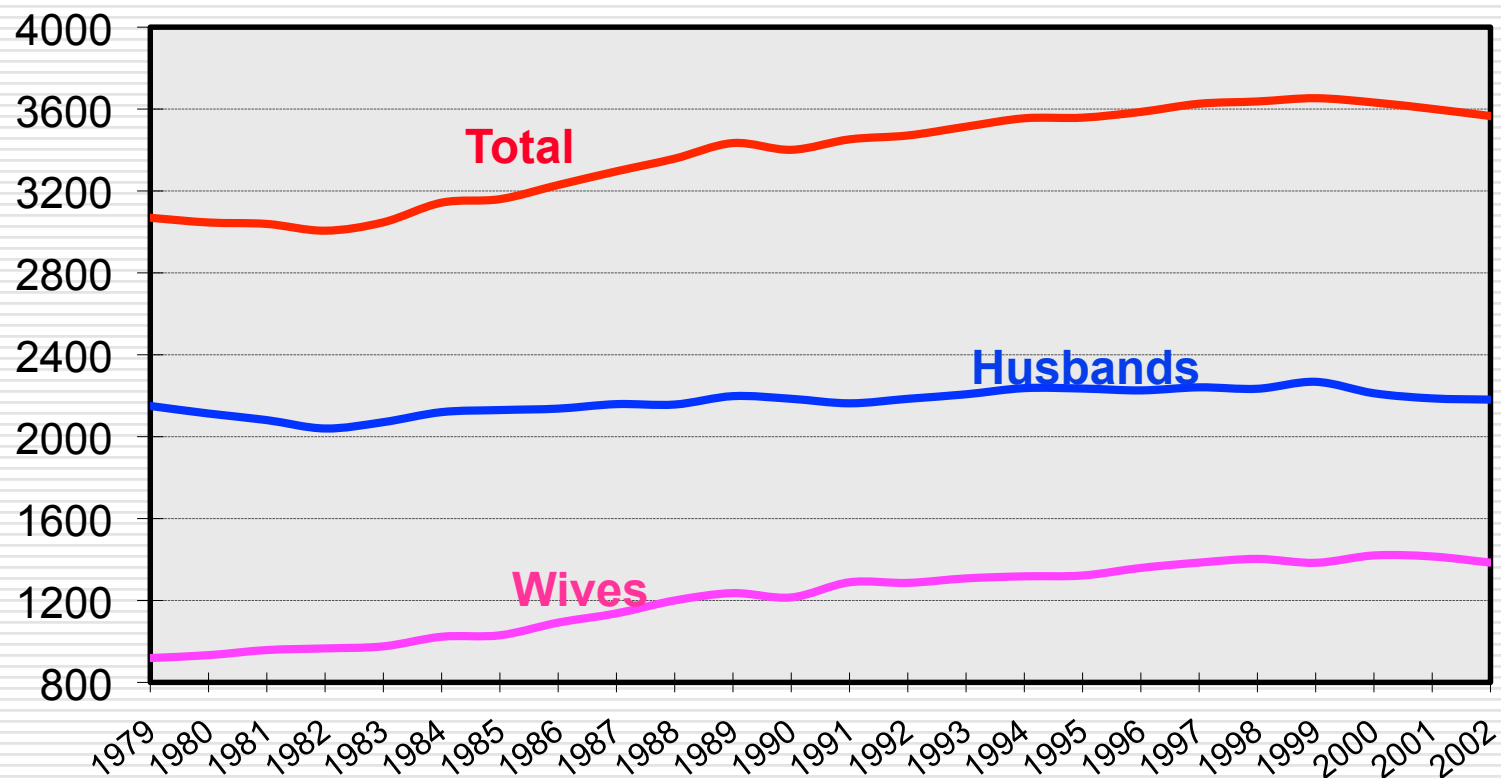
# Beyond "The Average Worker": Trends in Long and Short Workweeks 1970 and 1990, by Gender

**MEN**

**WOMEN**



# Increase in family hours worked/year, U.S. (middle-income husbands + wives with children, age 25-54)

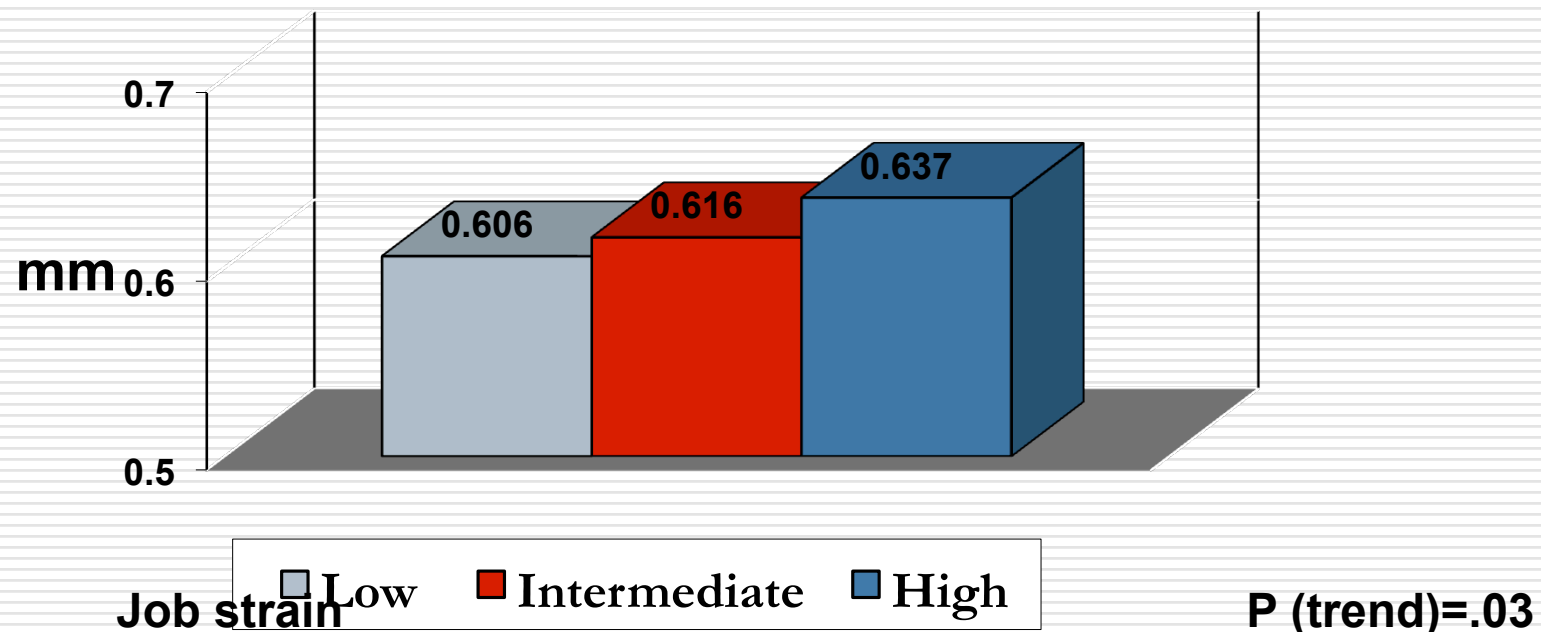


# The New York City Work Site Blood Pressure (BP) Study

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- ❑ At Weill Medical College, Cornell University-NY Hospital
- ❑ Began in 1985 as a case-control study
- ❑ 283 men initially enrolled at 8 large NYC work sites
- ❑ Funding became available (after studying 7 sites) to:
  - conduct a prospective study (evaluate Ss every 3-4 yrs)
  - enroll women
- ❑ Currently, 472 subjects enrolled at 10 sites (38% women)
  - maximum of 4 evaluations & 10 years of follow-up

# Job strain and carotid artery intima-media thickness (IMT), controlling for pre-employment risk factors, Finnish men, age 33-39

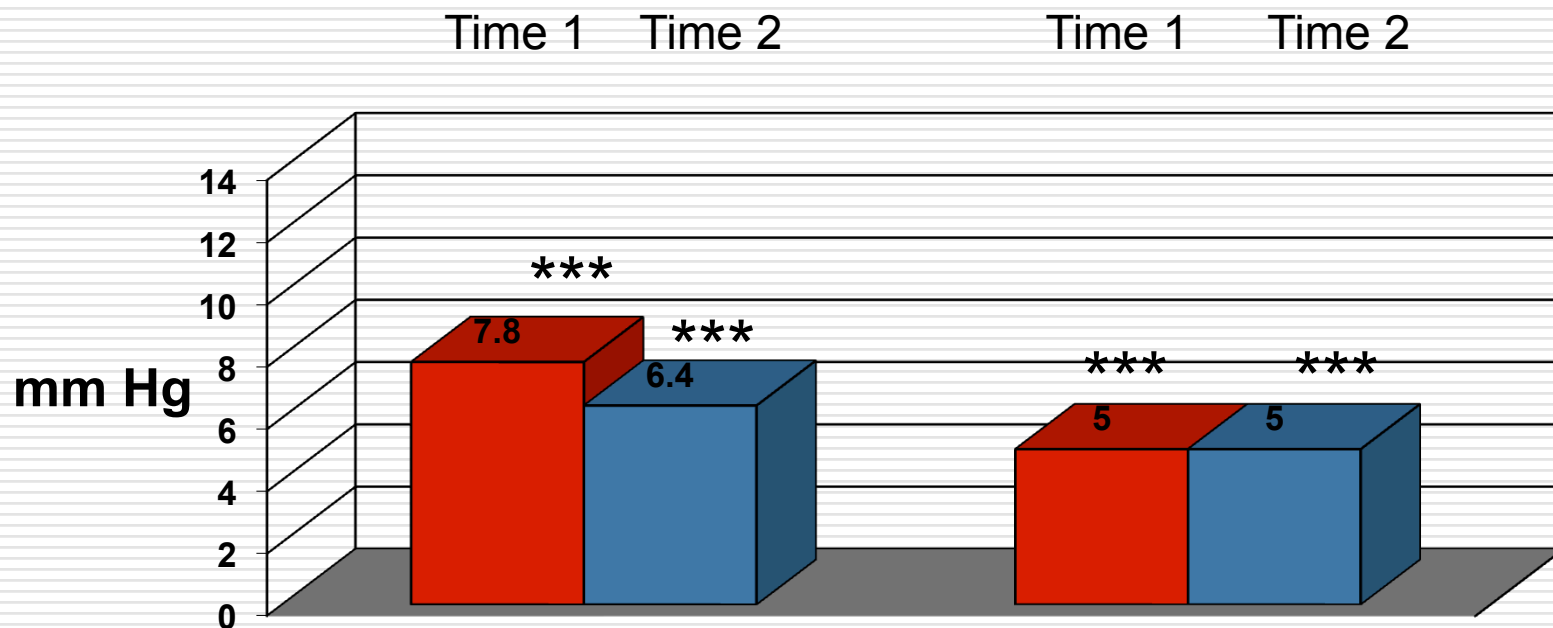


**Controlling for age and risk factors assessed at age 12-18: BMI, HDL and LDL cholesterol, triglycerides, systolic BP, smoking, family history of CHD, parents occupational position**

Kivimäki M, Hintsanen M, Keltikangas-Järvinen L, Elovainio M, Pulkki-Råback L, Vahtera J, Viikari JSA, Raitakari OT. Early risk factors, job strain, and atherosclerosis among men in their 30s: The Cardiovascular Risk in Young Finns Study. *American Journal of Public Health* 2007;97:450–452.



# Job Strain associated with Work Ambulatory BP (n=195 New York City men)



\*\*\*p<.001

**Systolic ABP**

**Diastolic ABP**

controlling for age, education, body mass index, race, smoking, alcohol use, work site

# Job strain associated with Ambulatory BP

(n=178 Belgian workers)

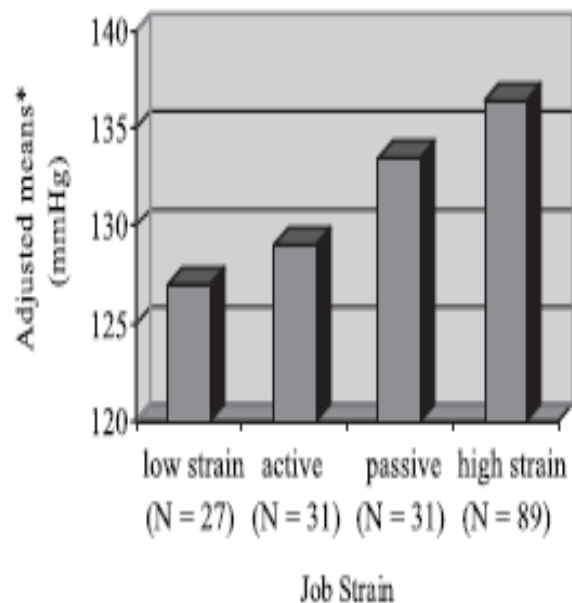


Fig. 1. Adjusted association between quadrant groups of job strain and mean systolic blood pressure at work (mm Hg). \*Adjusted for gender, age, body mass index, smoking, high physical demands of the job, high stress outside work, mean level of physical activity prior to blood pressure measurements, and occupation.

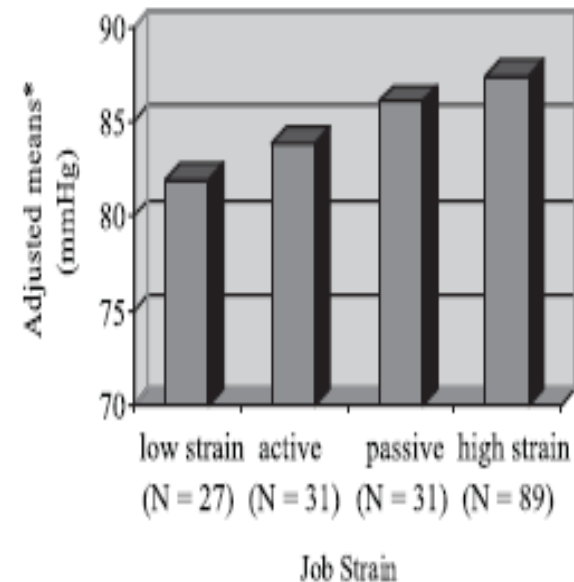


Fig. 2. Adjusted association between quadrant groups of job strain and mean diastolic blood pressure at work (mm Hg). \*Adjusted for gender, age, body mass index, smoking, high physical demands of the job, high stress outside work, mean level of physical activity prior to blood pressure measurements, and occupation.

# Workplace risk factors for hypertension

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## □ **Direct effects**

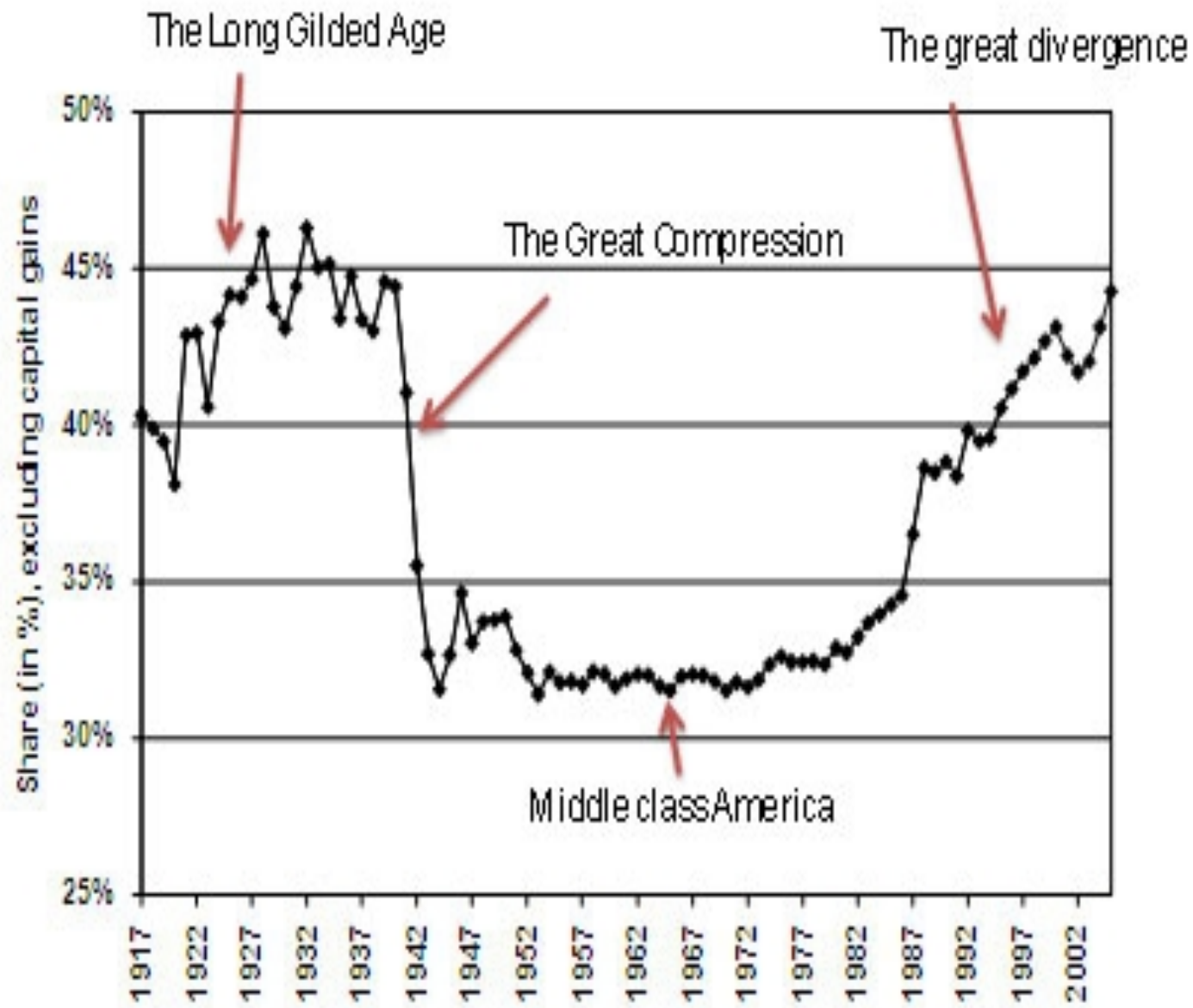
- BP is higher at work than home (on work day)
- BP is lower on non-workday
- Job strain (most widely studied) with Ambulatory BP
- Long work hours
- Effort-reward imbalance
- Threat-avoidant vigilant work (professional drivers)
- Shift work (mixed evidence)
- Noise, lead, arsenic (some evidence)

## □ **Risk factors influenced by working conditions (mediation)**

- Work stressors → smoking behavior, overweight, alcohol → HTN
- Low SES → ↑ work stressors → HTN

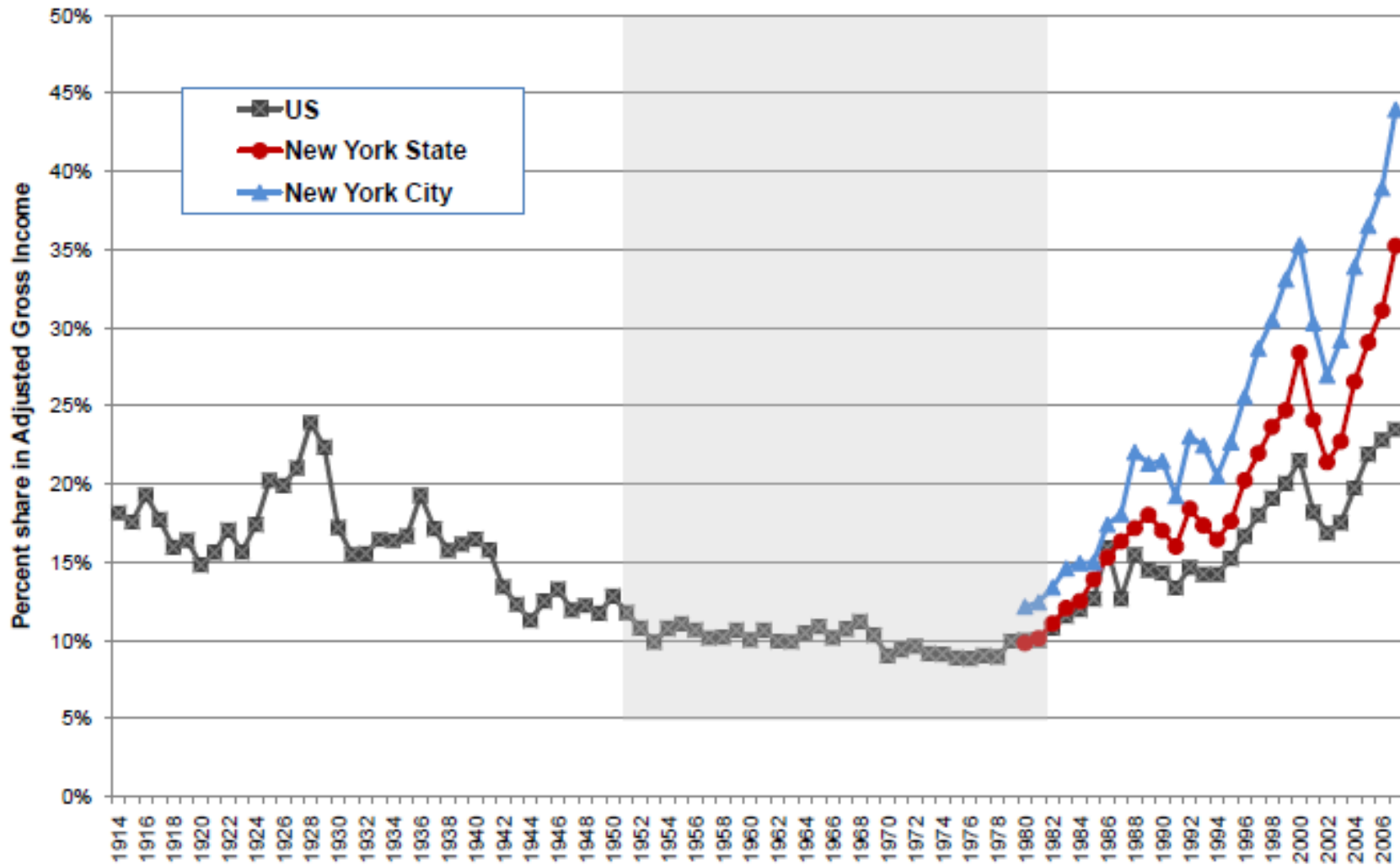
## □ **Interaction**

- ~~low SES x work stressors → HTN; gender, race, economic~~  
<sup>107</sup> development



The share of total income held by the richest 10% of Americans (an indicator closely related to other measures of economic inequality). Paul Krugman, The Conscience of a Liberal, 2007.

**During the heyday of America's middle class (1950-80), the wealthiest 1% had about 10% of total income. Now, it is back up to 23.5%. Concentration at the top is even more extreme in NYS and NYC.**



Grow Together or Pull Further Apart? Income Concentration Trends in New York. A Fiscal Policy Institute Report, [www.fiscalpolicy.org](http://www.fiscalpolicy.org), December 13, 2010

# Lean Manufacturing Comes to China: A Case Study of Its Impact on Workplace Health and Safety

---



# Organizational practices: Increased Flexibility

---

## Numerical flexibility

- External: Staff reductions thru downsizing, short-term contracts, P/T work (precarious employment)
- Internal: Irregular hrs, mandatory overtime, 24/7 operations

## Structural flexibility

- Teamwork, flatter hierarchies, teleworking

## Functional or task flexibility

- Greater involvement/multiskilling for some
- Job assignment/rotation based on employers' needs
- Lean production (Japanese production management)

### Intensification of labor

# Precarious Employment has Adverse Impact on Work Community

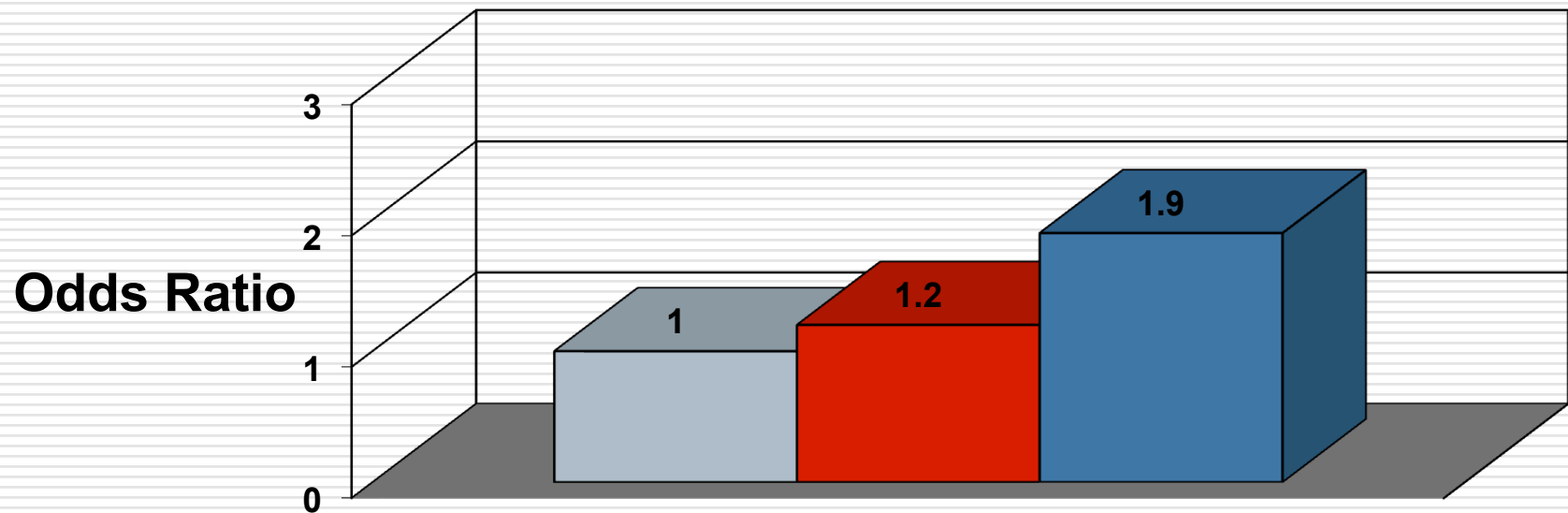
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- ❑ Temporary workers can be ‘desperate to achieve targets that would secure future work or permanent employment’
- ❑ Often fulfill role of rate busters
- ❑ Undermine resistance of permanent workers to work intensification
- ❑ “precarious employment can act as a crucial adjunct to the introduction of Taylorist work practices”



# Long work hours increase heart attack risk

(men, Fukuoka, Japan, 260 cases, 445 controls, 1996-1998)

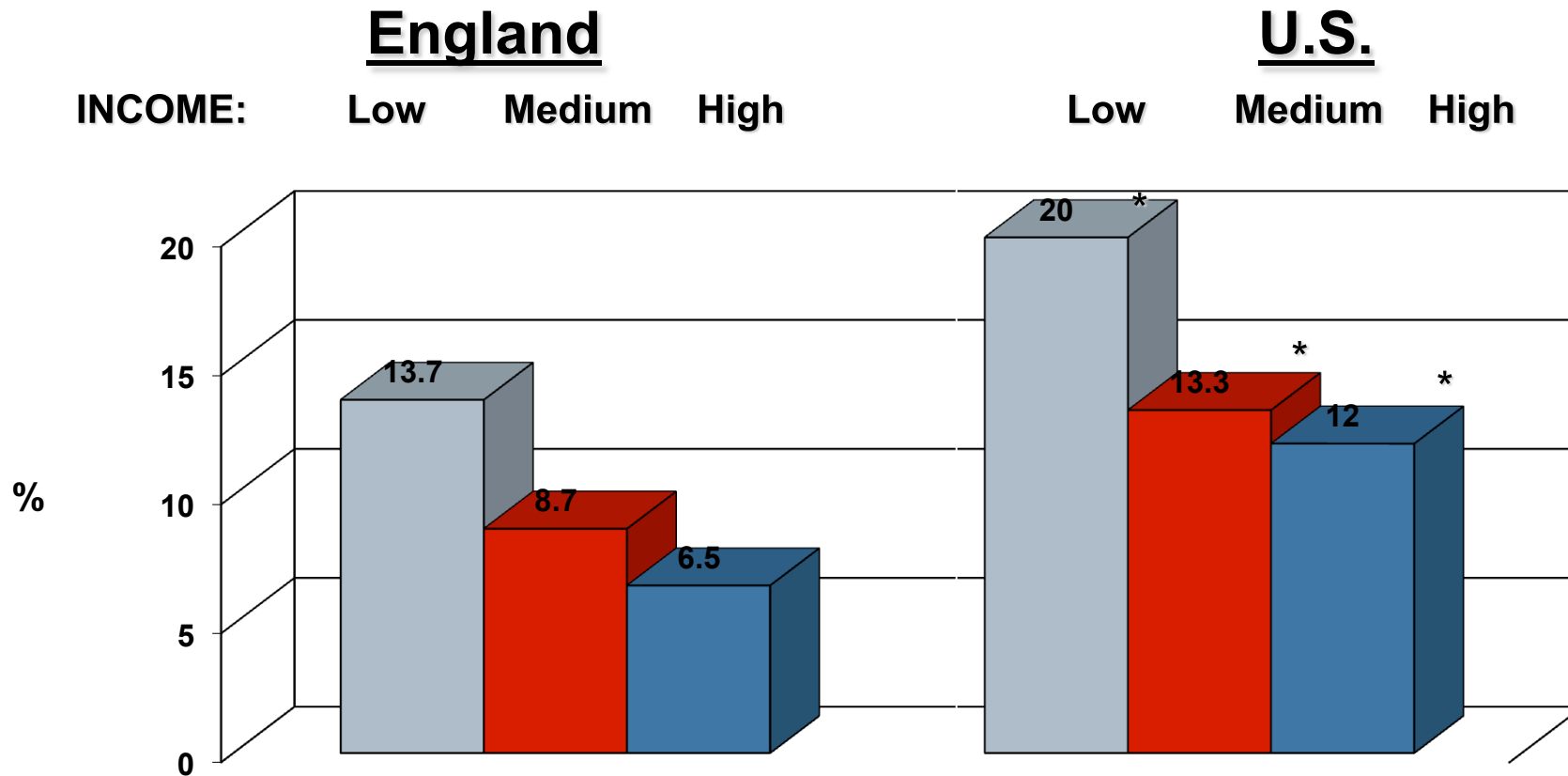


**Past week:   <41 hrs   41-60 hrs   >60 hrs**

Controlling for smoking, alcohol, overweight, hypertension, diabetes, hyperlipidemia, parental heart disease, job type, sedentary job

# Greater prevalence of heart disease in U.S. vs. Britain

(age 55-64 yrs)

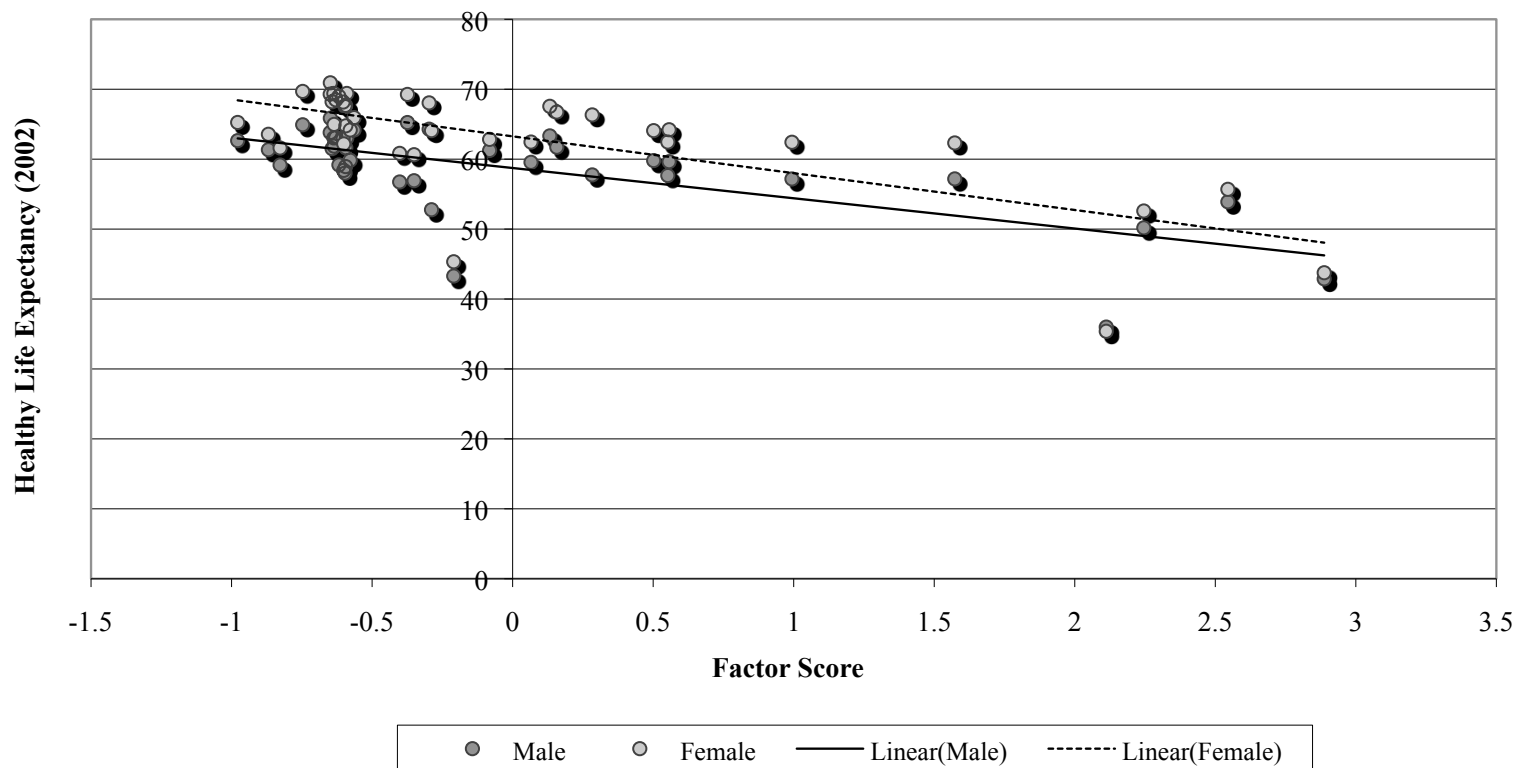


\*p<.05 (England vs U.S.), based on national surveys in 2002

# Lower healthy life expectancy if greater labor market inequality (larger informal economy)

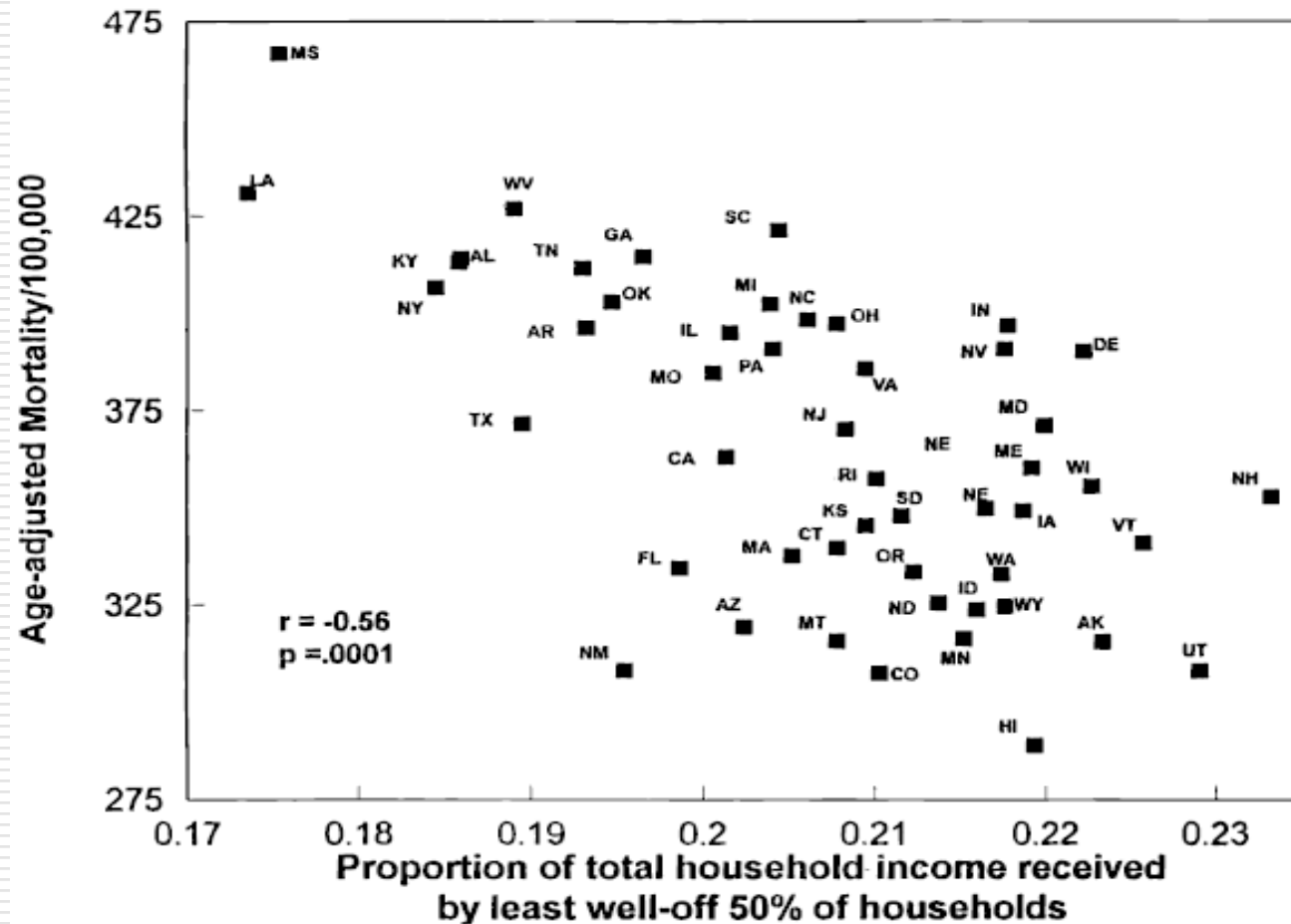
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Low & middle income countries:



# Higher cardiovascular death rates if higher income inequality

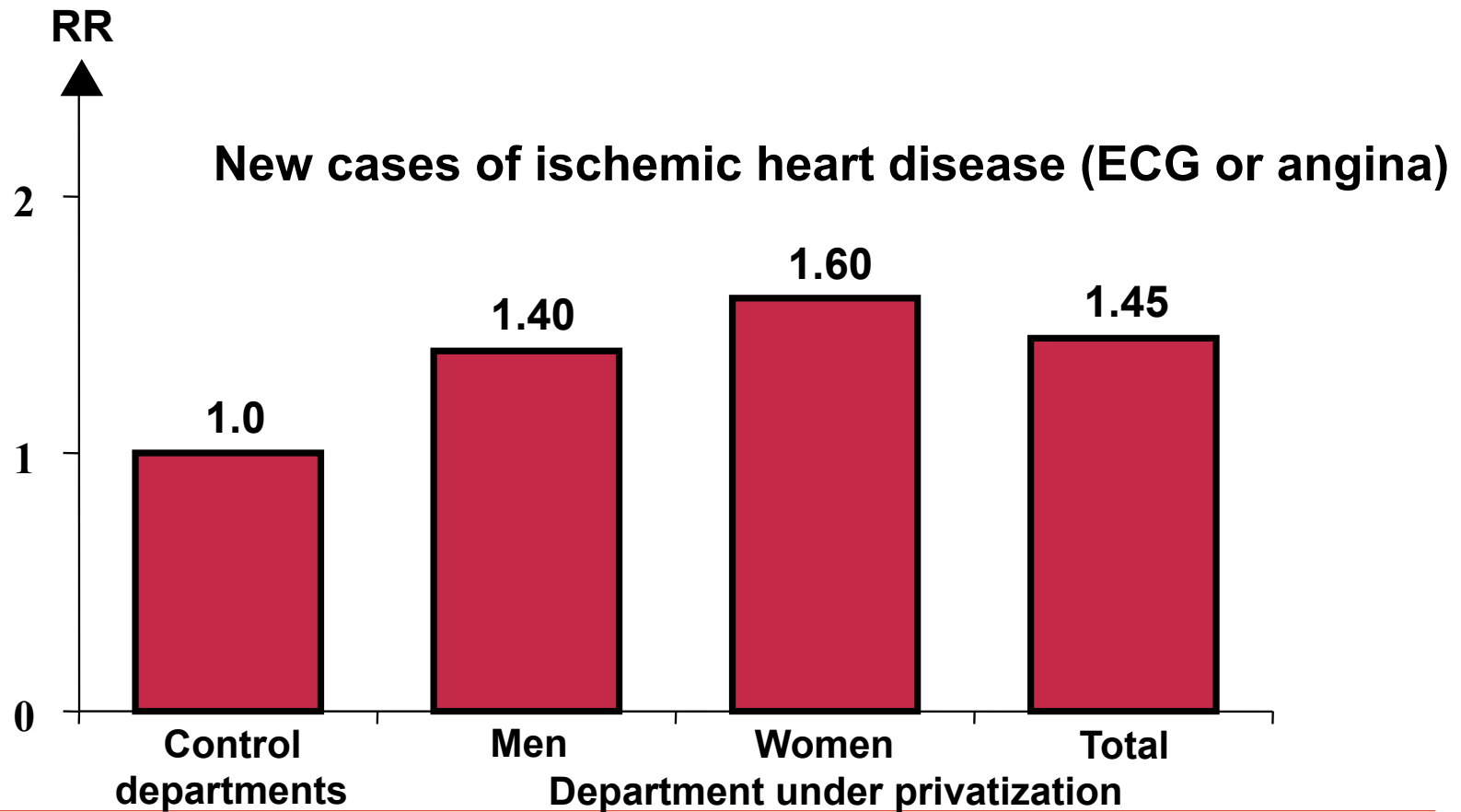
(U.S. states, 1990)



Kaplan GA, Lynch JW. Socioeconomic considerations in the primordial prevention of cardiovascular disease. Preventive Medicine 1999;29:S30-S35.

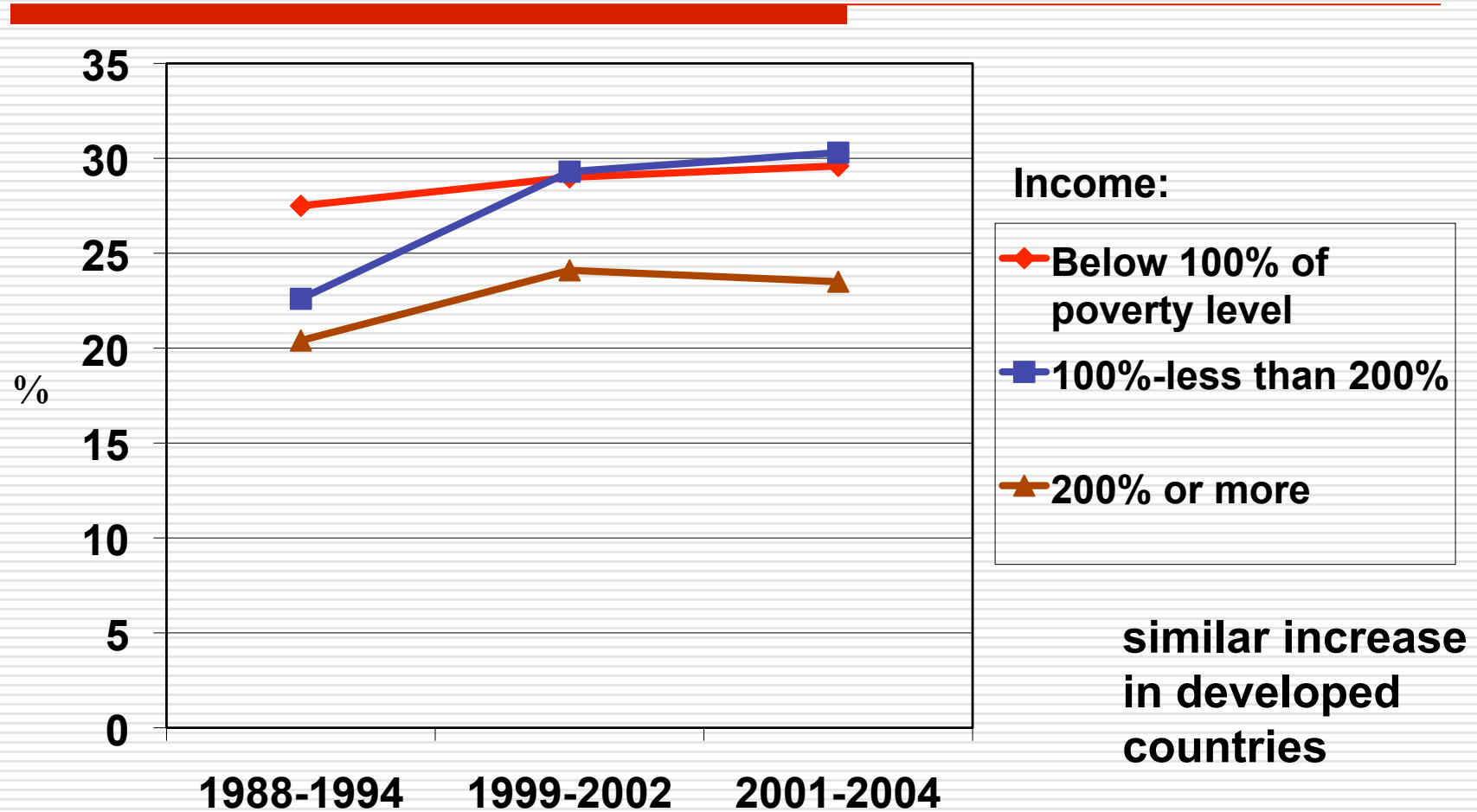
# Increase in heart disease rates in British civil servants undergoing privatization

(5 yr follow-up, n=8,354)



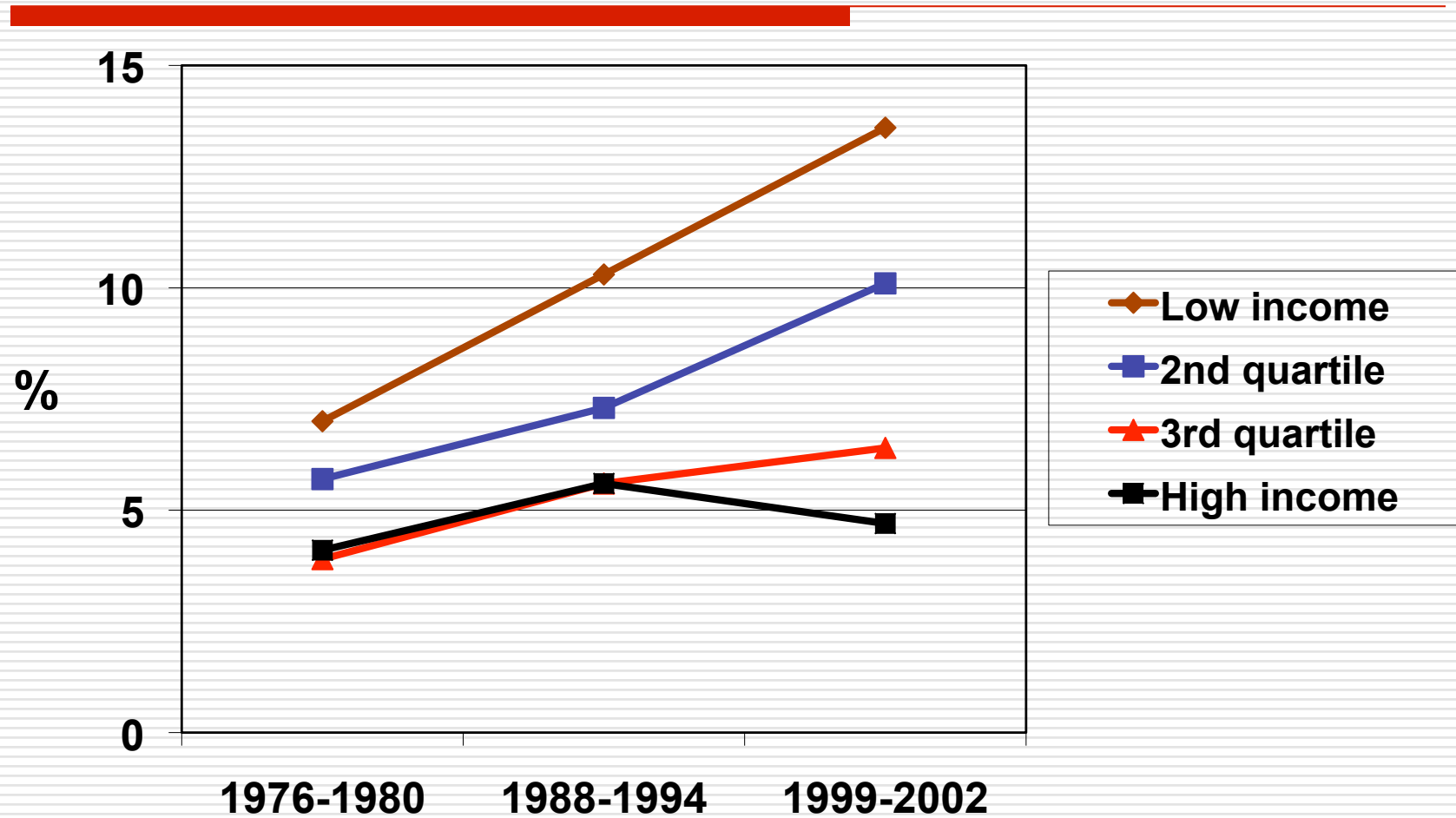
# Increase in hypertension prevalence, U.S.

age 20-74,  $\geq 140/90$  or HTN meds



Based on average of blood pressure readings. In 2001–2004, 77% of participants had three blood pressure readings. 18  
National Center for Health Statistics. Health, United States, 2006. Hyattsville, MD: 2006

# Increase in diabetes prevalence, U.S. age 25-74



# Economic globalization

Liberalization  
De-regulation

Privatization  
Reduce welfare state

Labor market:

Organizational practices:

## Job characteristics:

Job demands ↑  
Work hours ↑  
Job insecurity ↑

Job control?  
Social support?  
Rewards?

## Ill health:

Cardiovascular disease  
Sickness absence  
Injuries

Psychological disorders  
Musculoskeletal disorders



# Why improve work?

---

Why don't we just manage standard CVD risk factors with medication?

What's wrong with behavioral interventions targeting standard risk factors?

# Legislation & Regulation (Europe)

---

- ❑ Scandinavian Work Environment Acts (1970s)
  - ❑ European Union directive (12 June 1989)
    - Less monotonous work at predetermined pace to improve health
  - ❑ European Council directive (1996)
    - Right to refuse >48 hrs/wk
  - ❑ European Commission Guidance on work-related stress (2000)
  - ❑ European labor-management (8 October 2004)
    - Framework agreement on work-related stress
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# Legislative efforts needed in US

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- Legislation to reduce workplace stressors (as in Europe)
- Increased minimum wage, fair taxation
- Job protection & social benefits (e.g. pensions)
- Comprehensive, prevention-focused national health care
- Paid sick leave, family leave, vacation time
- Limits on legal hours of work per week
- Workers' compensation laws that recognize illnesses are related to work stressors
- Support for collective bargaining to improve work environment, including legal protection for joining unions

A question then is how different is global capitalism in various parts of the world and how this impacts on type of jobs?

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- And we may need to ask in addition “what jobs” are we referring to.
  - Jobs in factories vs. White/pink collar jobs (clerical)
  - Contingent work
  - Immigrant labor
  - Domestic labor
  
- All of the above suggests the disease burden for any given set of psychosocial factors will vary a great deal by group and location and perhaps a great deal from country to country depending on the makeup of the employed/unemployed workforce
  
- On the other hand, job strain has been validated against mental health and CVD outcomes for many occupations in many countries!!!!

# Cumulative Job Strain Exposure

(High Strain at 2 time points (HS-HS) and Ever Exposed vs. Never Exposed (NHS))

	Sample	Yrs between JS measures	Working SBP/DBP mmHg (Mean Differences - Exposed vs. Never Exposed)	
			Repeated Exposure (HS-HS)	Ever Exposed (HS-NHS, NHS-HS)
Schnall 1998	New York City: 8 employers	3	+11/+9	+2.4/+2
Fauvel 2003	France: Chemical Factory	5	-3/-1	+2/+4
Riese 2004	Netherlands: Nurses	1	+2.5/-1	0/-1

Landsbergis PA, Dobson M, Koutsouras G, Schnall P. Job strain and ambulatory blood pressure: a meta-analysis and systematic review. American Journal of Public Health 2013;103(3):e61-e71.

# New Public Management (NPM):

Lean production principles applied to public sector  
& to emotional labor

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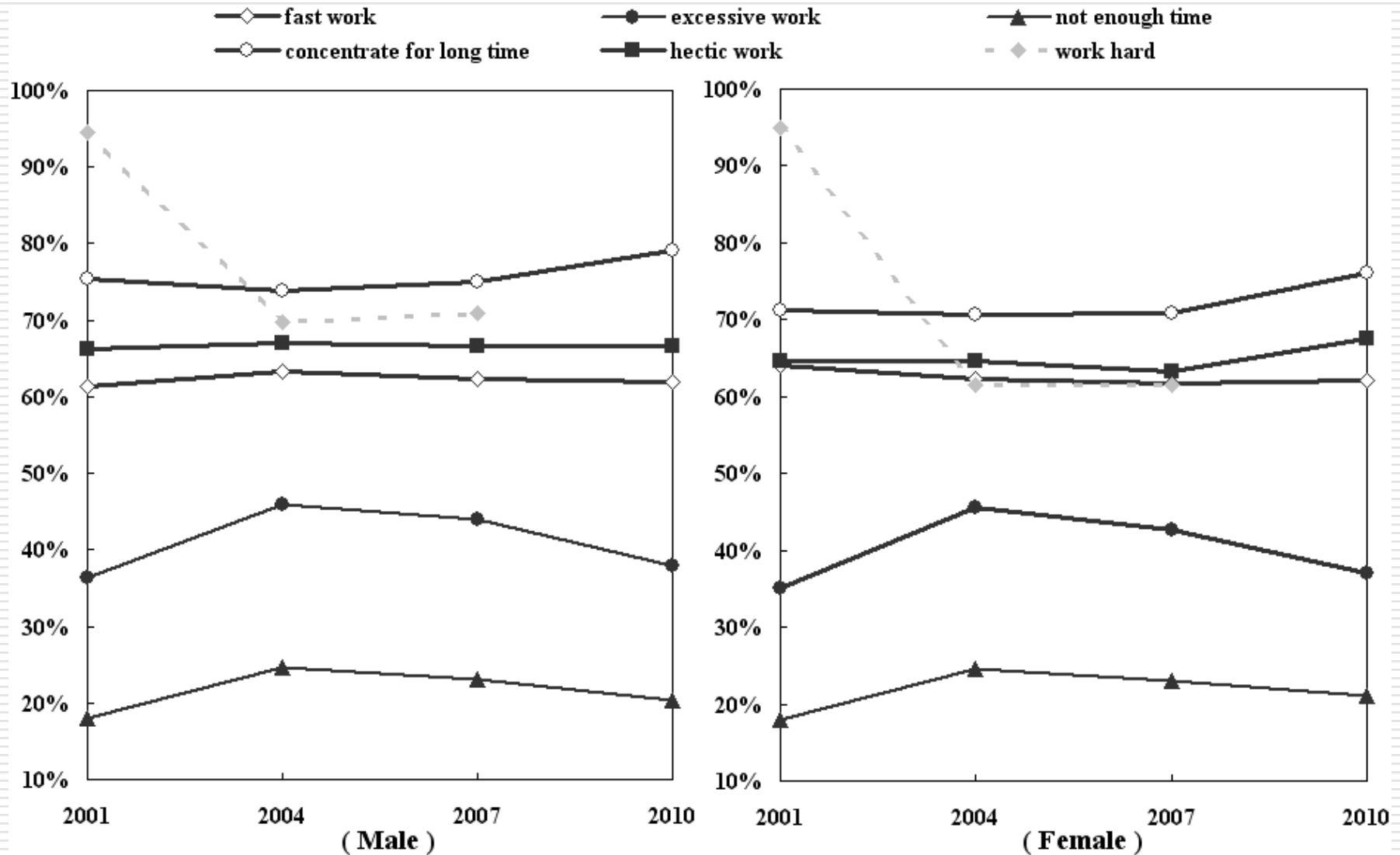
- ❑ Many articles on NPM in employment relations, personnel, management, sociology journals
  - ❑ BUT, only 4 studies found on impact of NPM on job characteristics or on worker health!
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# Updates to 1999 lean production literature review

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- 2012 review by Branmark & Håkansson
  - included 12 unpublished Swedish studies, 1996-2010
  - 9 showed mixed results, 2 showed mostly positive results
  - lean → increased stress, work pace, workload intensification  
→ WMSD risk, if not accompanied by ergonomic program
  - context and implementation likely affect results:  
Sweden: socio-technical context, employee participation in implementation
  
- Book by Sederblad & Abrahamsson (eds.), Lean i arbetslivet. Stockholm: Liber, 2013.
  - Experience of lean implementation in Scandinavia

# Changes in Job Demands (Taiwan, 2001-2010)





# Changes in Job Control (Taiwan, 2001-2010)

- ◇— Learn new things
- ◆ - Allow own decisions
- Variety
- Work not repetitive
- ▲— High skill level
- ● - Freedom to make decision
- △— Requires creative
- ▲ - Opinions influential
- Develop own abilities

