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Examining the impact of changes in job strain and its components on the risk of depression

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IWH Open Plenary

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Acknowledgements

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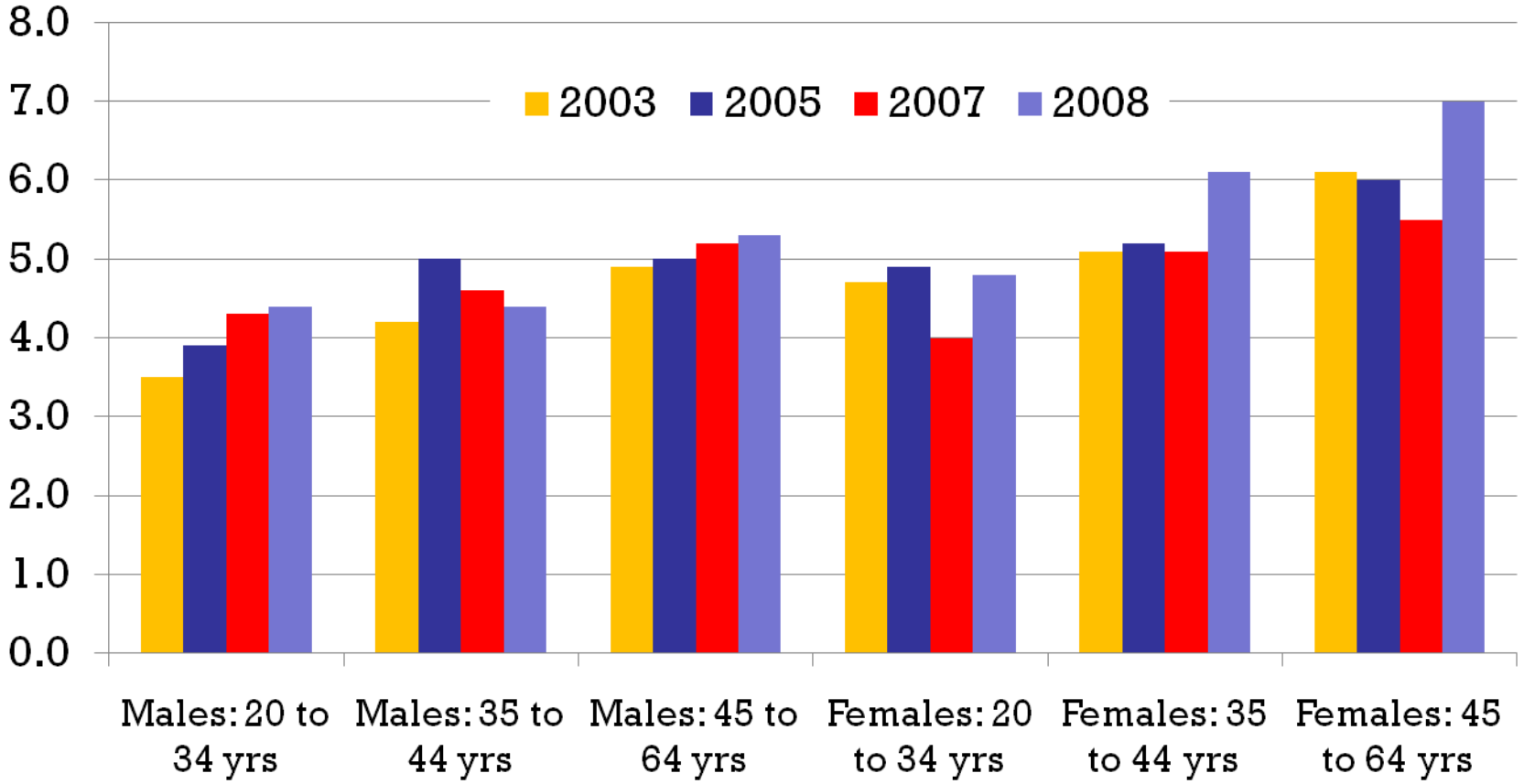
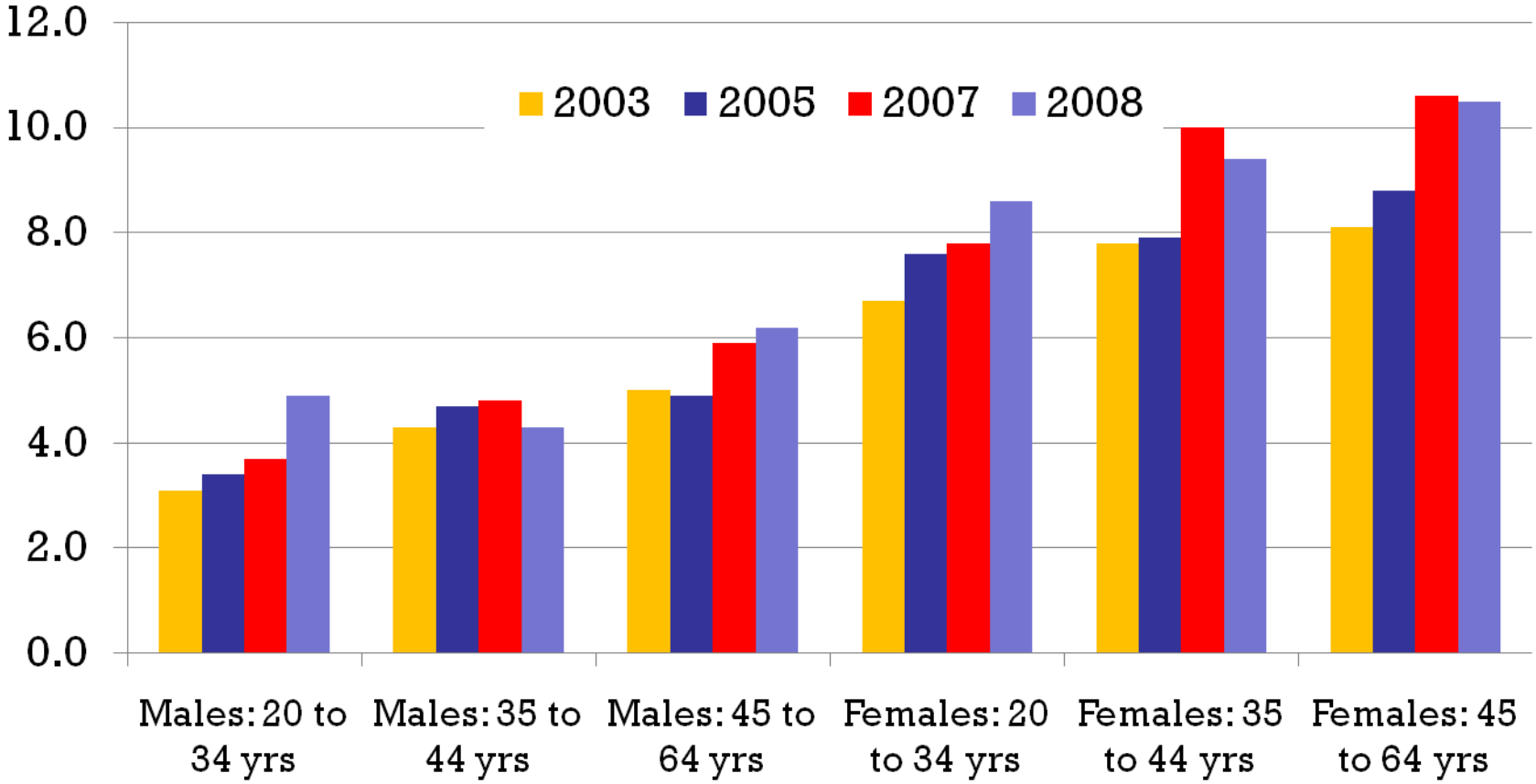
- Approval for this secondary data analyses was obtained through the University of Toronto, Health Sciences I Ethics committee

Percent of working-age population reporting poor or fair mental health. Canada. 2003 to 2008



Source: Canadian Community Health Surveys

Percent of working-age population with a medically diagnosed mood disorder. Canada. 2003 to 2008



Source: Canadian Community Health Surveys

TABLE 2
Economic burden of mental illness, Canada, 2003

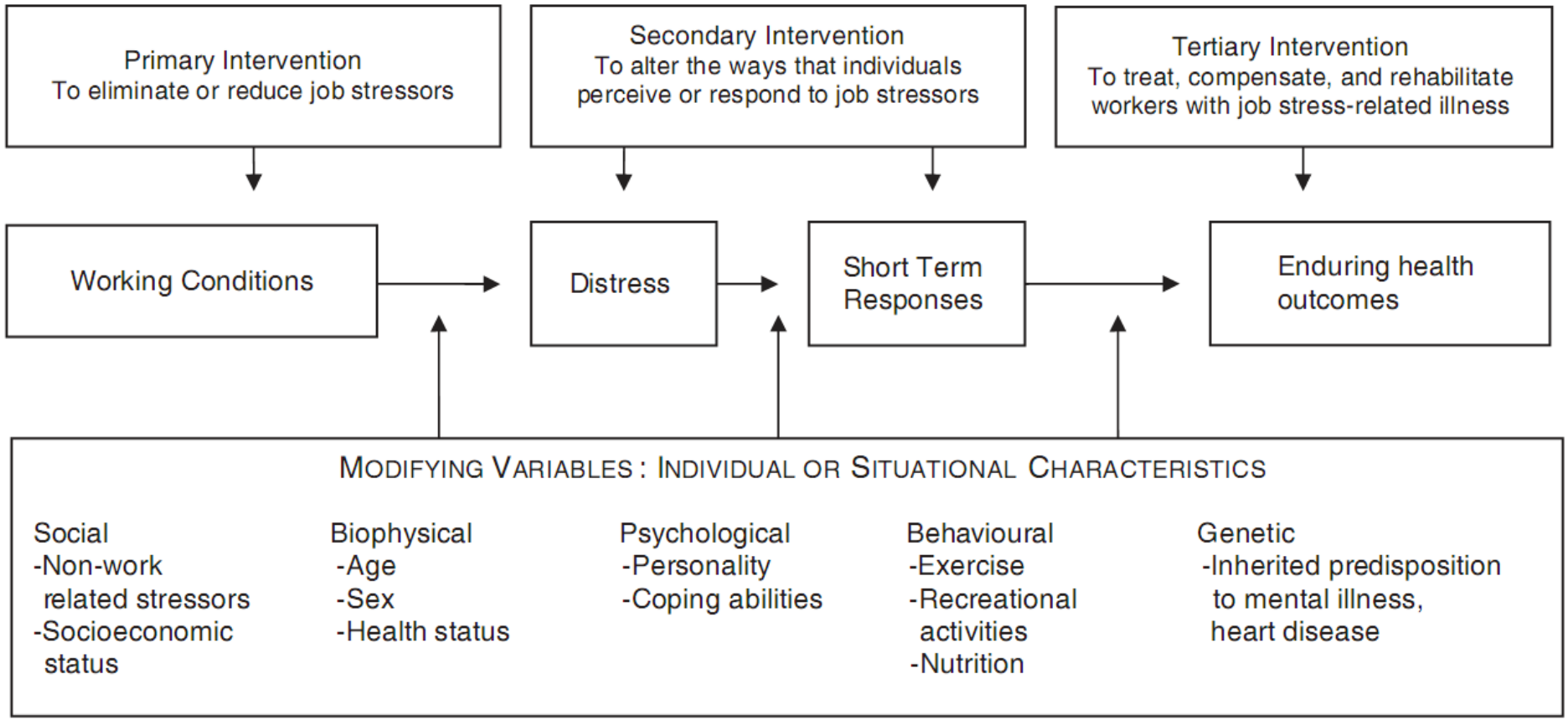
	Diagnosed (C$m)	Undiagnosed (C$m)	Total burden (C$m)	Per cent of total
Direct medical cost	3,518	1,447	4,965	9.8
Dollar value of work loss (long-term)	8,386	68	8,454	16.6
Dollar value of work loss (short-term)	5,724	3,551	9,275	18.2
Dollar value of loss in health unit	18,750	9,403	28,153	55.4
Total burden	36,378	14,469	50,847	100.0%

Lim et al 2008, CDIC

Examining the causal relationship between work stress and depression: levels of evidence (least to most convincing)

1. The relationship between higher work stress and depression seems biologically plausible
2. Simple (and adjusted) associations with cross-sectional data
3. Temporal associations between work stress and depression (requires longitudinal data and a population without depression at baseline)
4. Examine the impact of spontaneous changes in work stress on subsequent depression
5. Conduct a purposeful intervention to change work stress and examine impact on depression*

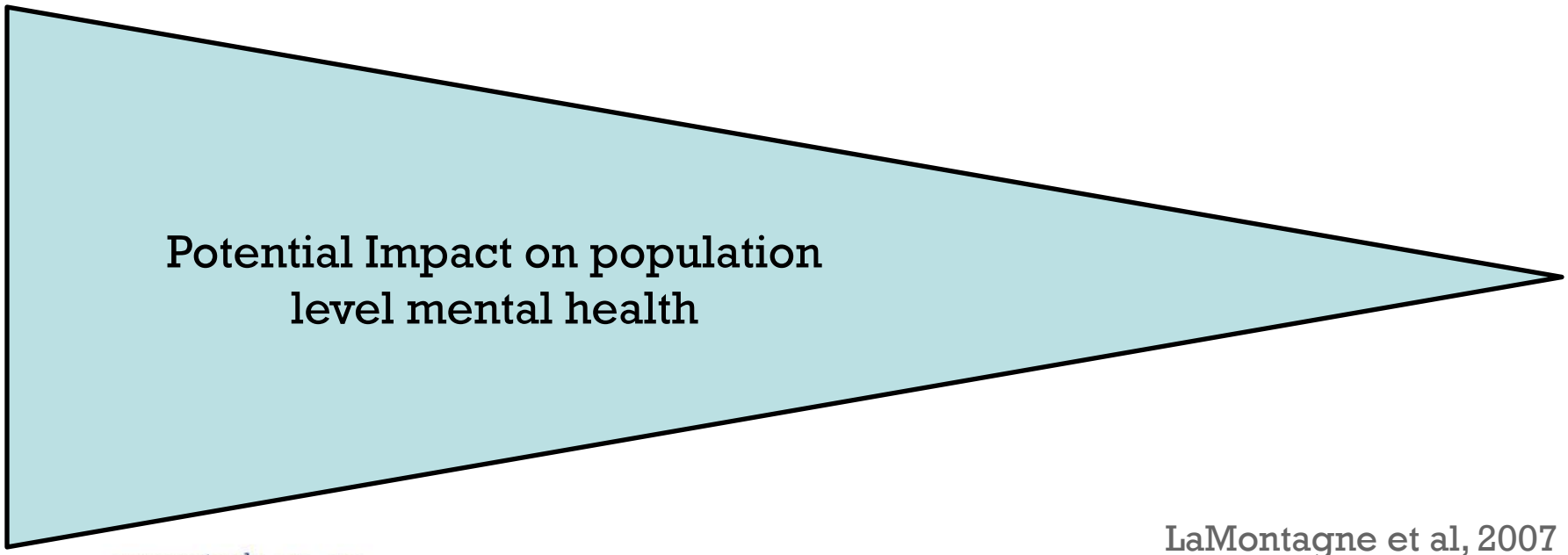
The job stress process, modifying variables and intervention points.



LaMontagne et al, 2007

General Principles of Prevention: Hierarchy of controls

Primary Prevention: modifying the work environment	**Secondary Prevention:** modifying and individuals reaction to the work environment	**Tertiary Prevention :** treating mental health problems



LaMontagne et al, 2007

The demand-control job stress model

Skill discretion: The breadth of skills that a person can utilise in their job

- your job requires you learn new things;
- your job requires a high level of skill;
- your job requires that you do things over and over (r)

Decision Authority: The social authority a person has to make decisions over the way they work

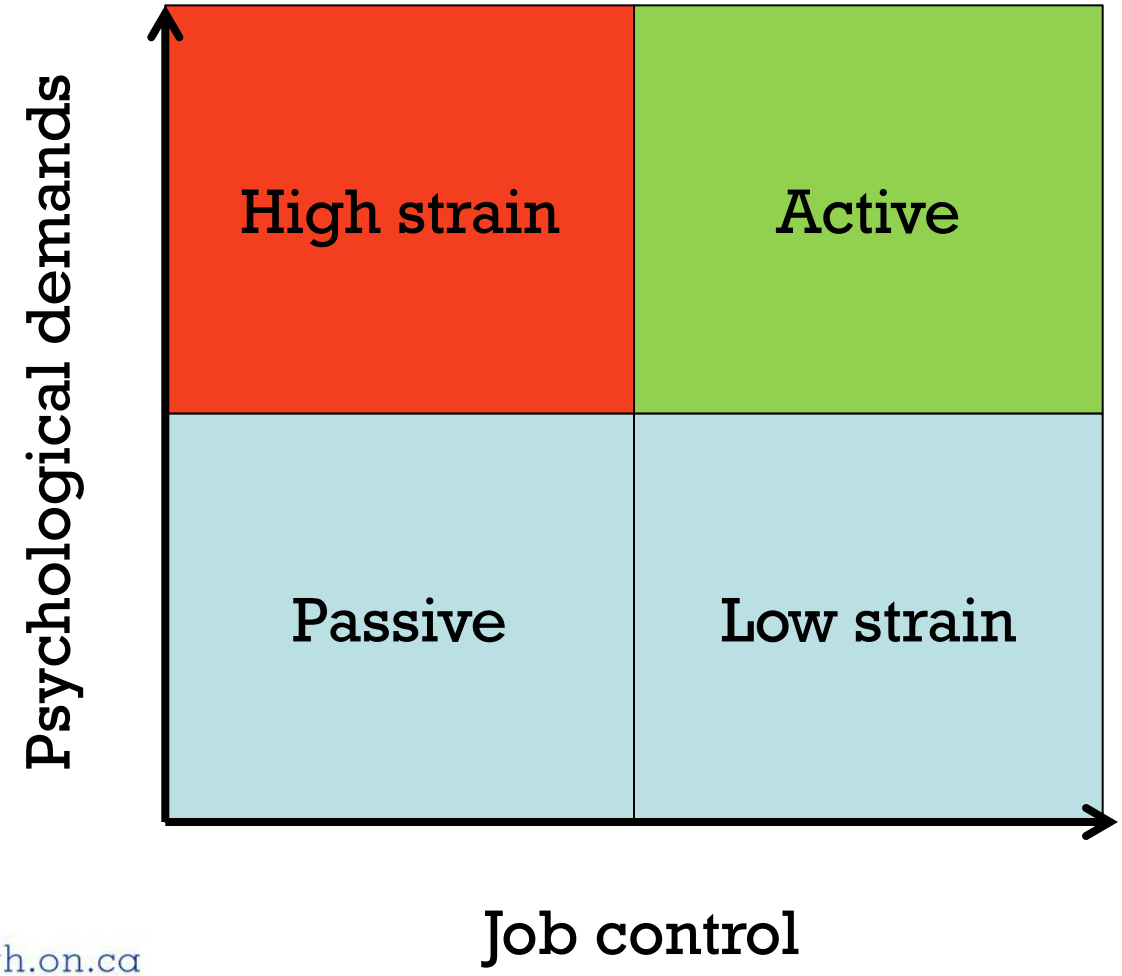
- your job allows you freedom to decide how you do your job
- you have a lot to say about what happens in your job

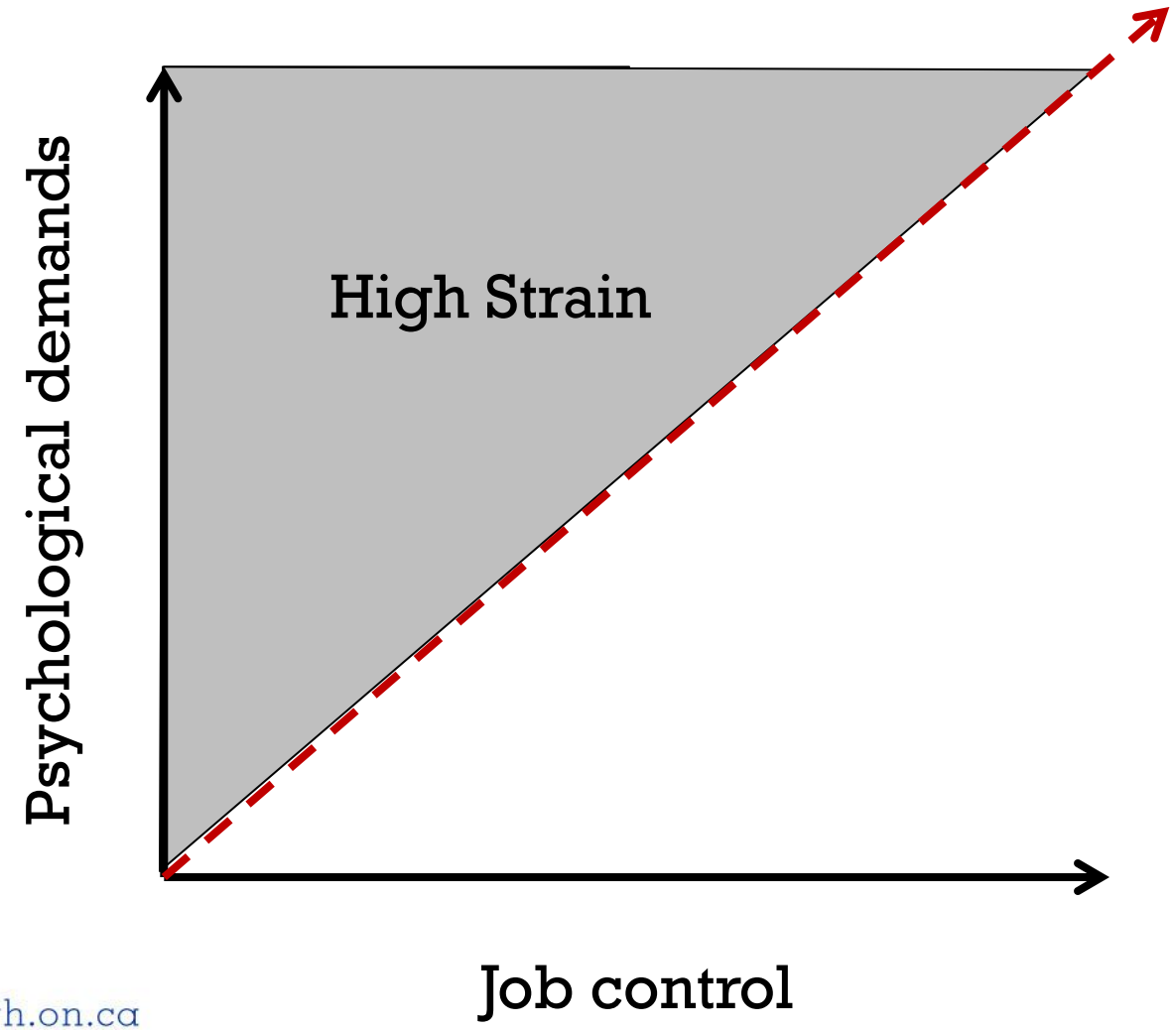
Measures are combined to form **job control**

The demand-control job stress model (cont)

Psychological demands: The pace and mental intensity of work (how hard a person has to work)

- Your job is very hectic
- You are free from conflicting demands that others make (r)


High strain
Active
Passive
Low strain
Psychological demands
Job control


High Strain
Psychological demands
Job control

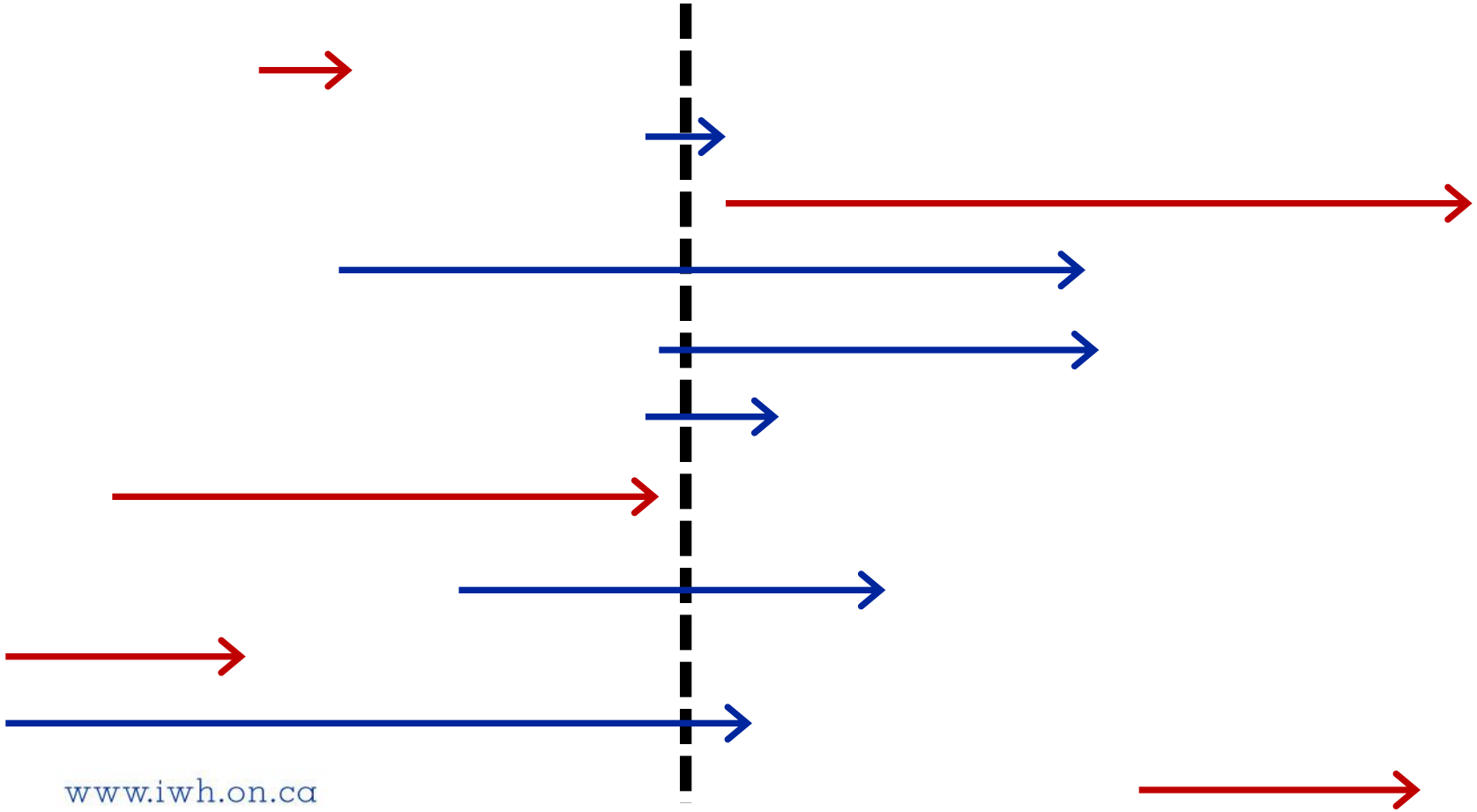
Previous studies examining change in job strain and depression and/or psychological distress

Author	Measurement of change	Results	Time b/w change in JS and outcome
Bourbonnais et al 1999	Exp to HS at T1/T2 (YY, YN, NY, NN)	Mean Psych Dist NN = 19.3; YN = 19.8 NY = 22.3*; YY = 23.7*	Distress measured at same time as work stress
Stansfeld et al 1999	Movement b/w tertiles of JC or PD	Psychiatric Disorder: Neg Ch JC = 1.2* (men); 0.84 (women) Neg Ch PD = 1.62* (men); 1.16 (women)	2 to 7 years
De Lange et al 2002	Stable or change using JC quadrants	Movement from low strain to high strain increased risk of depression	Timing of change in JS and outcome not clear
Wang et al 2009	Exp to JS at T1/T2 (YY, YN, NY, NN)	Adj OR for depression YN = 0.97, NY = 1.60*, YY = 1.52*	1 to 10 years

Methodological challenges in previous studies

- Assessing change in job strain taking into account day-to-day variability in measure
- Potential differential impacts of components of job strain (only assessed in Stansfeld et al 1999)
- Time lag between first and second job strain measurements
- Time lag between change in job strain and assessment of mental health outcome
- Adjustment for personal or family history of depression

Measuring change: problems with a threshold model



Accounting for day-to-day variability

Minimum Detectable Change: the amount of change in scores between time one and time two that can be assumed (at a given level of confidence) to be greater than measurement error in the instrument

$$x_2 - x_1 = 1.96 \times \sqrt{2} \times \sigma_{t1}\sqrt{1-\rho}$$

Christensen and Mendoza, 1986; Jacobson and Traux, 1991; Jacobson et al, 1996

Objectives

To assess the impact of changes in dimensions of the psychosocial work environment on risk of depression in a longitudinal cohort of Canadian workers free of depression when work conditions were reported

Data and Methods

National Population Health Survey (1994/95 to 2006/07): We focused on responses to three specific cycles (2000/01, 2002/03 and 2004/05):

- the 2000/01 and 2002/03 cycles were the first consecutive cycles in the NPHS to measure job strain, and
- the 2004/05 cycle of the NPHS contains information on personal history of depression and family history of depression which are important covariates in our analysis

Main outcome: depression

Defined two ways:

1. Based on responses to the Composite International Diagnostic Interview-Short Form for Major Depression
2. Respondents who reported being *first* medically diagnosed with major depression, 13 to 24 months before the 2004/05 survey

2002/03	2003/04	2004/05
Not depressed	?	Depressed/not depressed

Main independent variables: change in job control, psychological demands, and job strain

Job Control: 5 questions (range 0 to 20)

Psychological Demands: 2 questions (0 to 8)

- Changes in each psychosocial work dimension were assessed by classifying changes greater than the minimal detectable change
- $MDC_{95} = \pm 3$ for both job control and psychological demands
- Also examined change in social support (3 questions)

Covariates

- gender
- age
- marital status
- the presence of children under 12 years of age in the household
- highest level of education
- presence of chronic conditions (excluding allergies)
- change in occupations between 2000/01 and 2002/03
- **family history of depression as of the 2004/05**
- **personal history of depression (diagnosed by a health professional) prior to the 2000/01 survey**
- sub-clinical depression in the 2000/01 or 2002/03 survey cycles

Analyses

- 4,608 respondents were aged 25 to 60 years of age in 2000/01 and worked at some point in both 2000/01 and 2002/03
- We removed respondents who:
  - were depressed (SR) in 2000/01 or 2002/03 (N = 388; 9% of working sample);
  - did not respond to questions on depression during these cycles (N = 100); or
  - reported being first diagnosed with depression (based on questions on personal history in the 2004 survey) between the 2000-01 survey cycle and the 2002-03 cycle (N = 68)

Analyses (2)

- Remaining sample free of depression and working in both 2000/01 and 2002/03 totalled 4,052

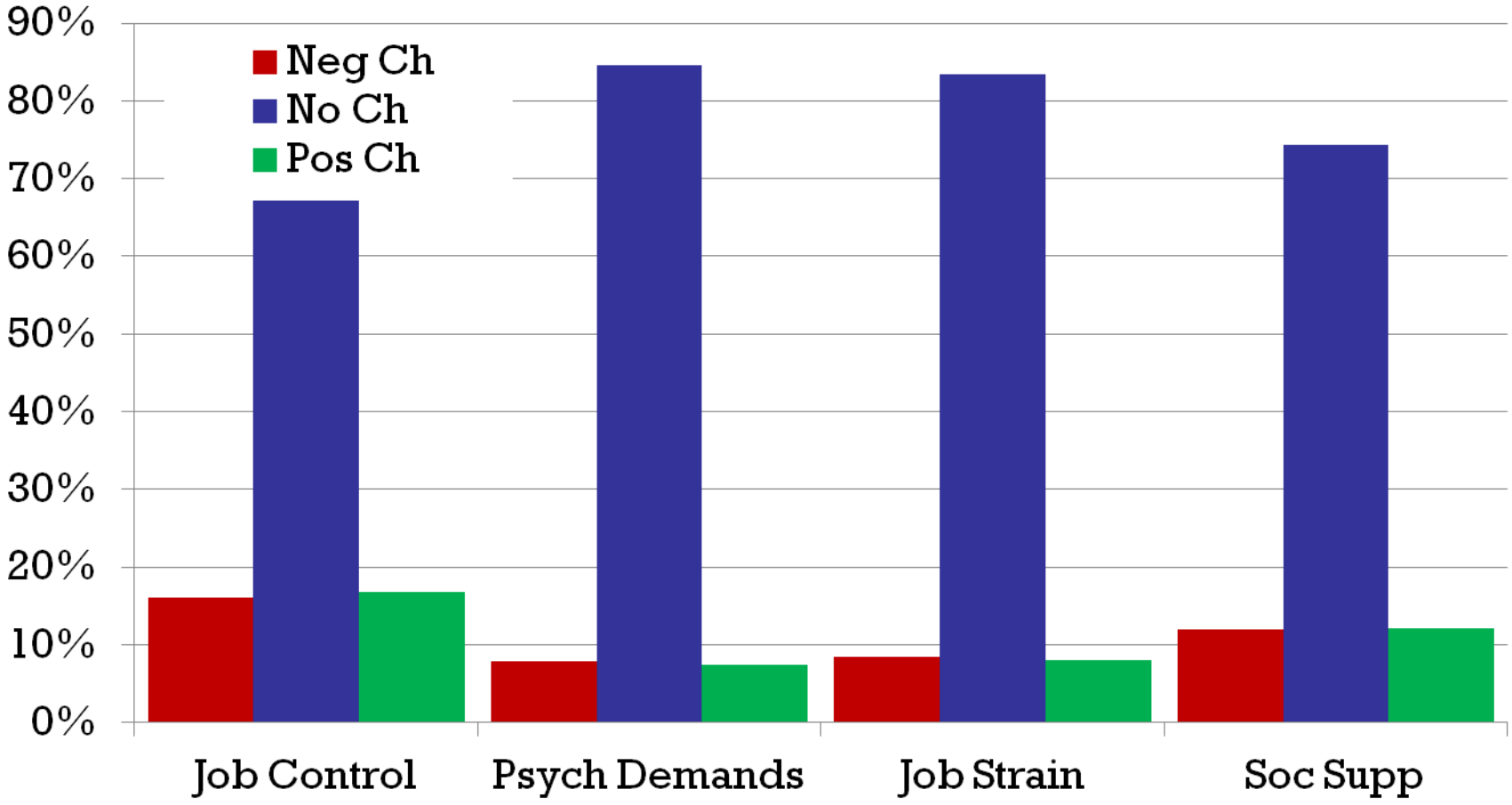
- Of this sample, 66 respondents (2% of sample) were missing information on depression in 2004, with another 251 respondents (6%) missing information on job strain or covariates, leaving a final sample of 3,735

- Respondents with missing information had lower levels of education and were younger

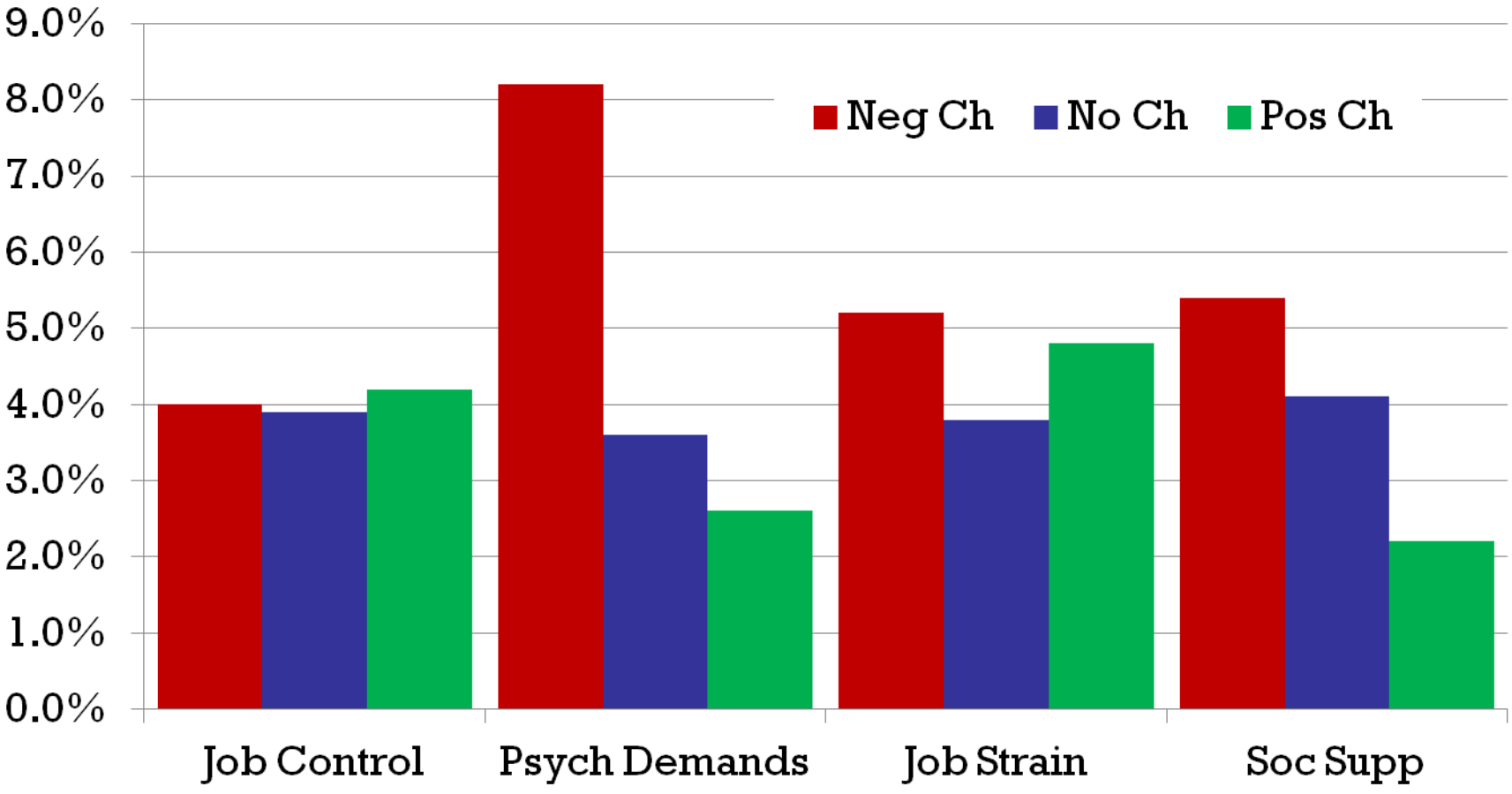
Analyses (3)

- Logistic regression was used to examine the risk of depression associated with a change in each dimension of the psychosocial work environment, using no change as the reference group
- We explored the possibility of differences in the impact of changes in each dimension of work on depression by gender, education and occupation groups.
- To account for the complex sample design of the NPHS the confidence intervals around each point estimate have been adjusted using a bootstrap technique
- All analyses were weighted to account for the probability of selection into the original sample and non-response.

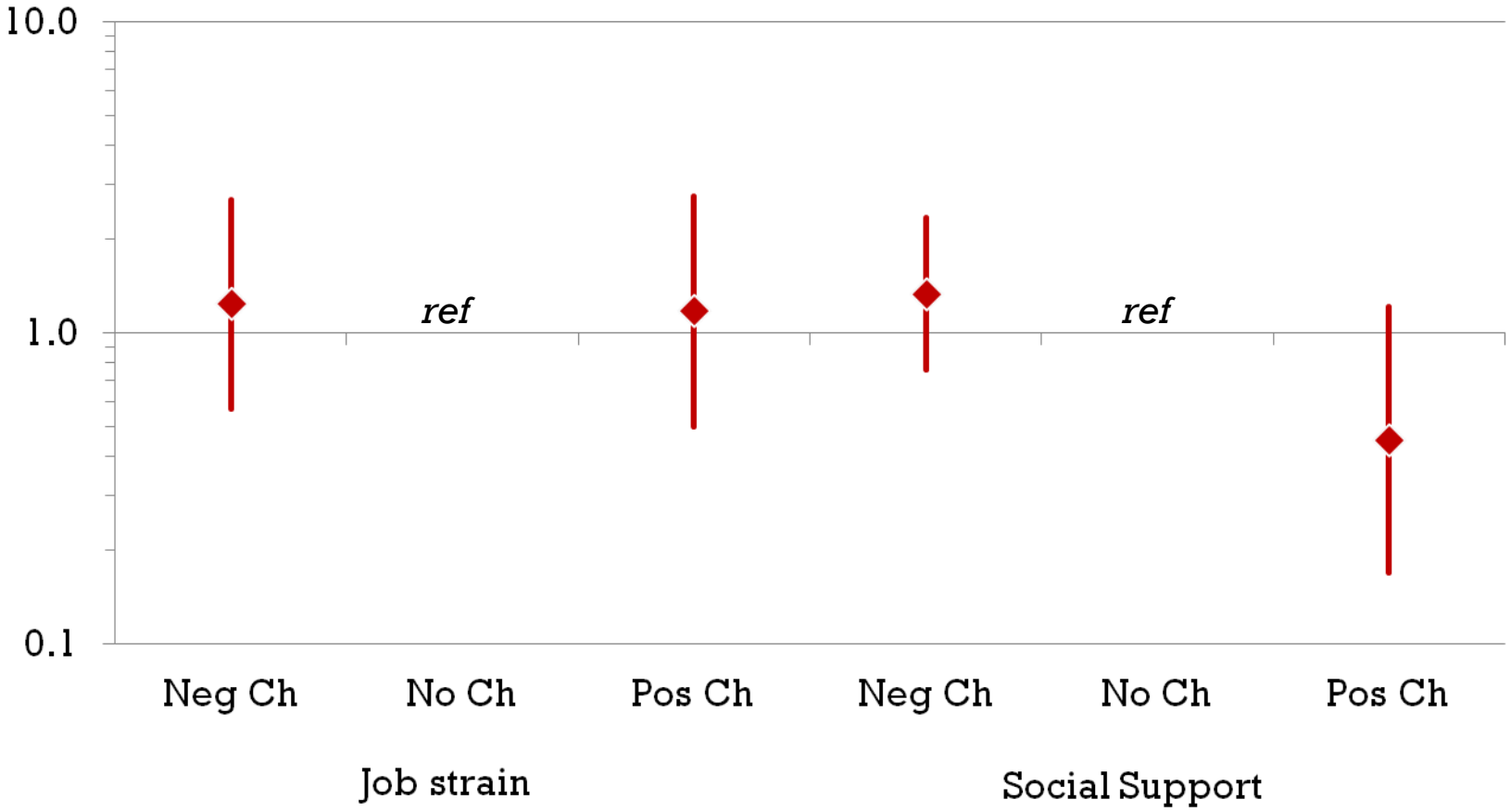
Percentage of respondents changing in work stress dimensions between 2000/1 and 2002/3 (N = 3,735)



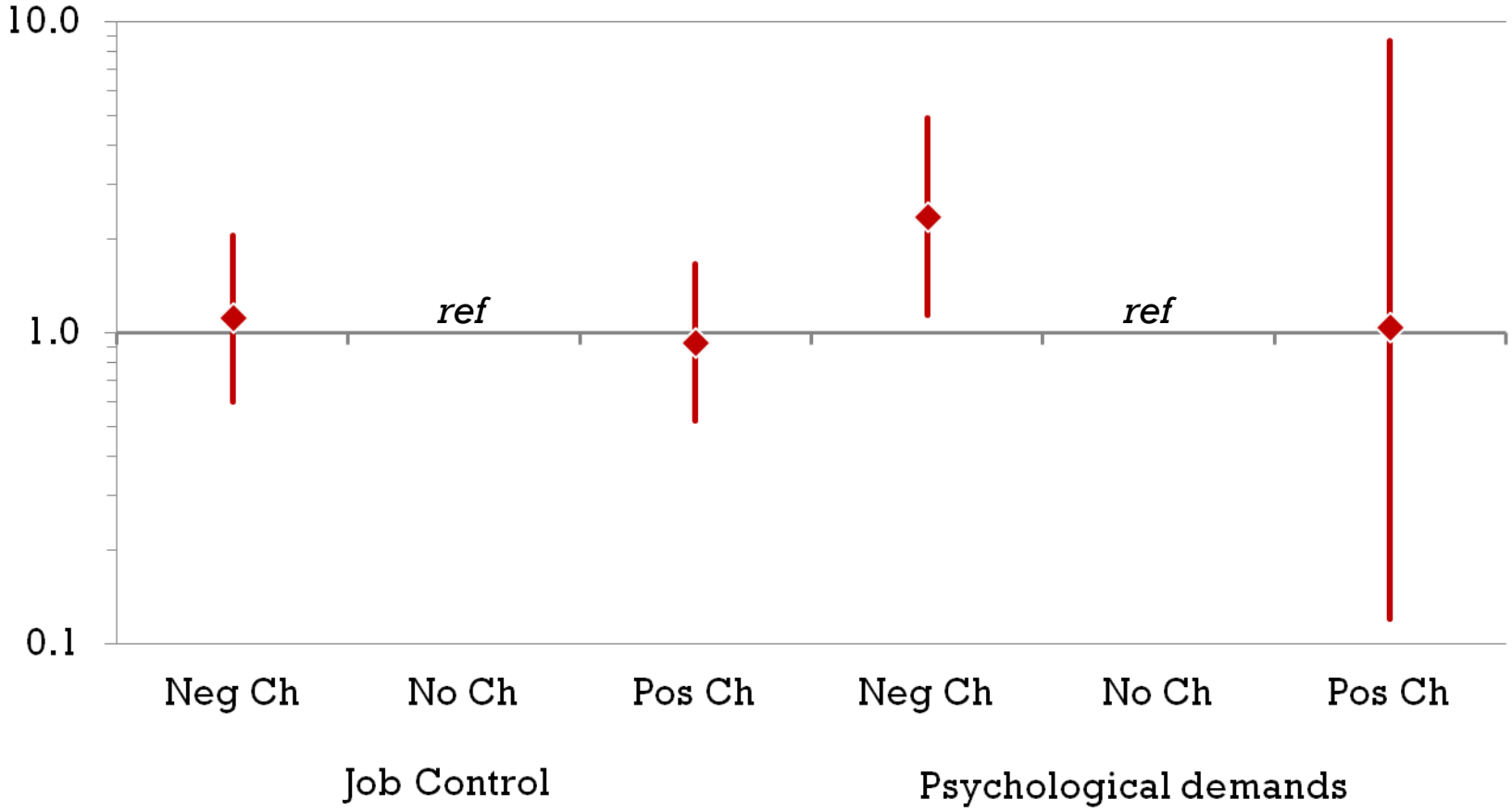
Incidence of depression in 2004 across change in work stress dimensions two years previous (N = 3,735)



Adjusted odds ratios for depression across change in job strain and social support categories



Adjusted odds ratios for depression across change in job control and psychological demand categories



Discussion

- increases in psychological demands increased the risk of depression over the two years following the change
- the size of this risk was similar to the size of the risks associated with family and personal histories of depression, two major, but non-modifiable, risk factors
- finding suggests that organisational changes that result in increased psychological demands at work may have a deleterious impact on the mental health of workers over a relatively short period

Discussion (2)

- The differential impact of psychological demands and job control highlights the importance of not assuming an interaction between these two components a priori when assessing health outcomes
- Unlike previous investigators we did not find that positive changes in the psychosocial work environment reduced the risk for depression

Limitations

- Common method bias
- Missed cases of depression due to NPHS design
- Abbreviated measures of work stress using a instrument with unknown qualities of responsiveness

Strengths

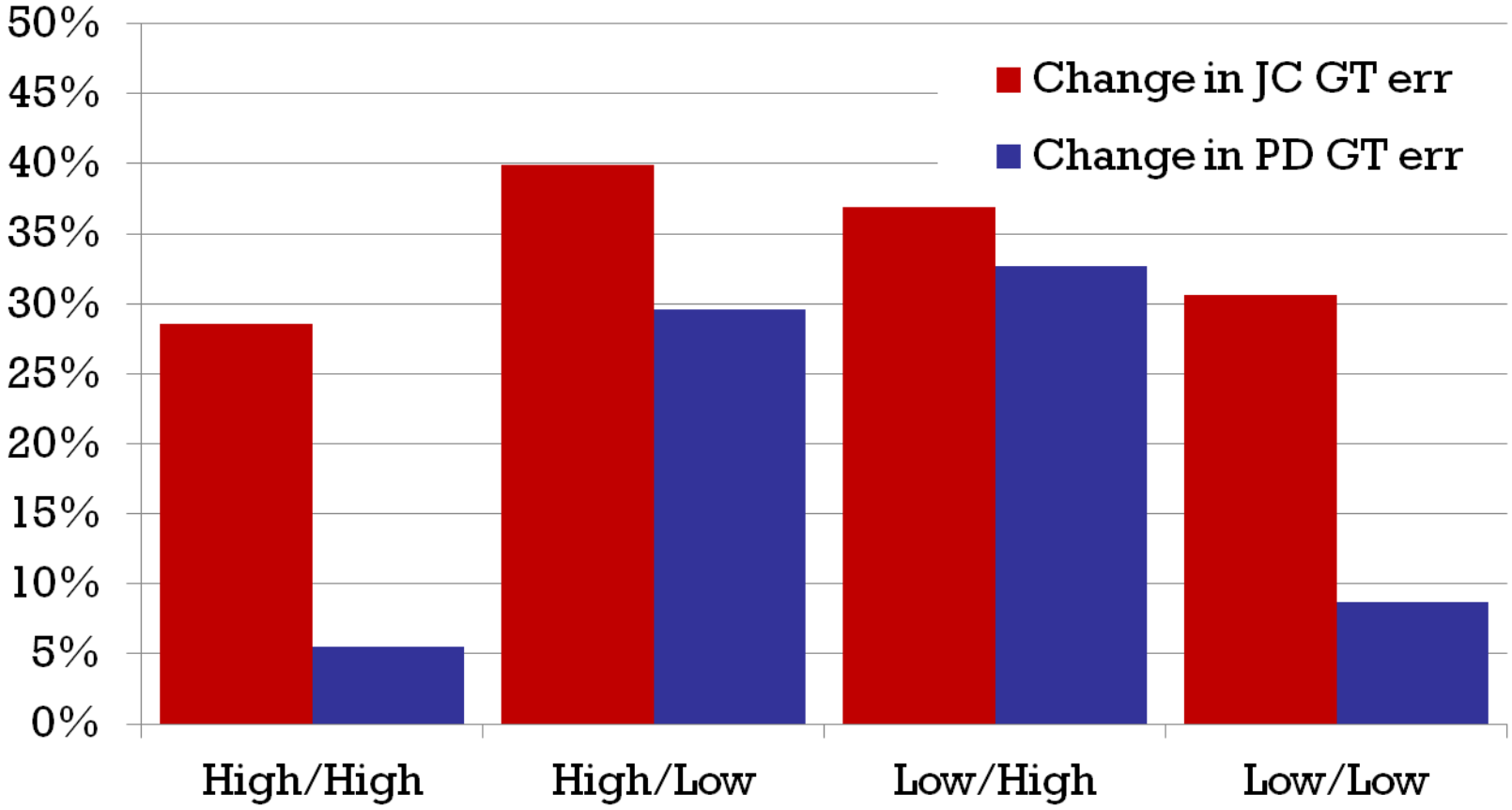
- Assessment of work stress in respondents free of depression
- Ability to adjust for personal and family history of depression
- Short time period between work stress assessments
- Short time period between change in work stress on depression assessment

Measuring psychological demands

- Your job is very hectic
- You are free from conflicting demands that others make

- Need to distinguish between working harder (intensification) and working longer (extensification), and mismatch between work demands and time
- Requires more questions (and better questions)

Importance of measuring change greater than error rather than using the crossing of a threshold



Job strain at T1 and T2 (ratio GT 1)

Conclusion

Given the potential importance of increasing psychological demands in the aetiology of depression we need to

- better understand this relationship using better measures
- monitor psychological demands and other work stressors routinely at the population level
- regularly assess how the changes in nature of work impact the mental health of workers

For further information

Smith PM and Bielecky A Examining the impact of changes in job strain and its components on the risk of depression (in press) American Journal of Public Health

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