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# Objectively measured work load, health status and sickness absence among Danish ambulance personnel.

A longitudinal study

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**Arbejdsmedicinsk Klinik**  
Hospitalsenheden Vest  
Regionshospitalet Herning

**MARS**  
MEN | ACCIDENTS | RISK | SAFETY

# Background

## Work related health problems among ambulance personnel

- Reviews show that ambulance personnel (AP) have an increased **risk of work-related health problems** (Sterud et al 2006; Broniecki et al 2010).
- This is especially true of **musculoskeletal disorders** where the rate of early retirement of ERS-workers is high compared to other occupations (Rodgers 1998).
- However, symptoms related to **post traumatic stress disorders** (such as flashback, nightmares etc) have also been found to be higher among ERS-workers than employees in other occupations (Johnsen et al 2003; Clohessy & Ehlers 1999) even if the ERS-workers' level of **mental health has been found to be better** than the general working population (Hansen et al 2012).

# Background

## Assessments of work environment for AP's

- Because of the unpredictable character of the AP's work environment, **standard measures of work environment exposures are imprecise.**
- Some efforts have been made to design **instruments specific to ERS-workers** that capture the daily stressors encountered for AP's (e.g. Sterud et al 2008)
- **Few studies have made use of company-based information to measure work load 'objectively'.** Rissén et al 2000 found an association between increasing levels of customers per hour and **blood pressure** for shop assistants and Repetti (1993) found an association between increasing levels of activity and **more negative moods** for air traffic controllers.
- The **aim of this presentation** is to examine the associations between **objectively measured work load** taken from the company register of the participants in the panel study MARS and their **self-rated health**, perceptions of their **work environment** and objectively measured **spells of sickness absence** in 1-year follow up period.

# Hypotheses

Increasing levels of work loads is associated with more negative evaluations of physical and psychosocial work environment, lower self-reported health status and more short and long-term sickness absence.

Specific hypotheses:

- 1) Higher mean work load per day →
  - 1) Higher levels of quantitative demands and work pace
  - 2) Worsening of self-rated health
  - 3) More low back pain
  - 4) Higher rate of sickness absence
- 2) More emergency ambulance tasks →
  - 1) Evaluations of emotional demands higher
  - 2) Bad mental health

# Methods and Materials (1)

## Cohort and outcome measures

Cohort study of emergency rescue workers in a Danish firm covering 85 % of all emergency dispatch calls in Denmark (N = 3,888)

62% (n = 2,426) completed questionnaires in autumn/winter 2010/11.

### Outcome measures:

1. Measures of physical work load using Dutch Musculoskeletal Questionnaire (DMQ) with response categories on a 5 point scale
2. Measure of psychosocial work load using the short version of the Copenhagen Psychosocial Questionnaire (COPSOQ)
3. Single item self-rated general health from SF-12, 4 items on musculoskeletal pain, mental health measured with 2 items from SF-12
4. Self-reported episodes of sickness absence
5. Long-term sickness absence (LTSA) from national register on transfer payments (DREAM)

# Methods and Materials (2)

## Exposure: measures of work load

Company register containing all work tasks from October 2009 to June 2012 divided into types, e.g. fire fighting, emergency ambulance work, patient transport (lying or sitting) etc with information of duration used for task.

Using only work tasks that occur

- 1) in the year prior to baseline
- 2) inbetween the two questionnaire rounds

Derived variables used in this presentation

Mean number of work tasks / work day

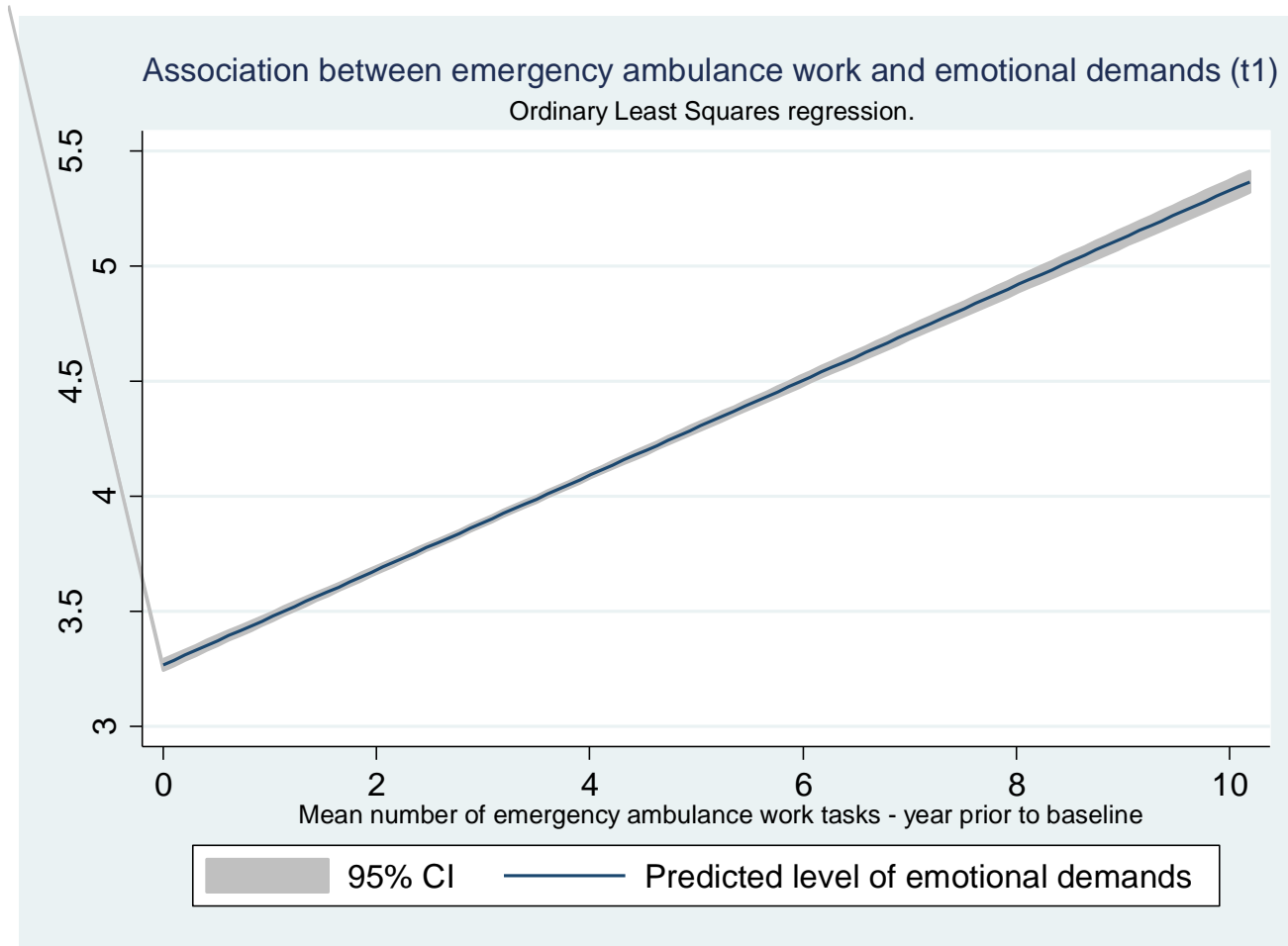
Total number of work tasks

Mean number of emergency ambulance work tasks

*Work in progress* → using the data in analyses of work accidents (suggestions and criticism very welcome!)

# Results (1)

## Work load and psychosocial work environment



Increasing mean number of emergency ambulance work in the year leading up to baseline increases the level of emotional demands reported at t1 ( $p = 0.001$ ).

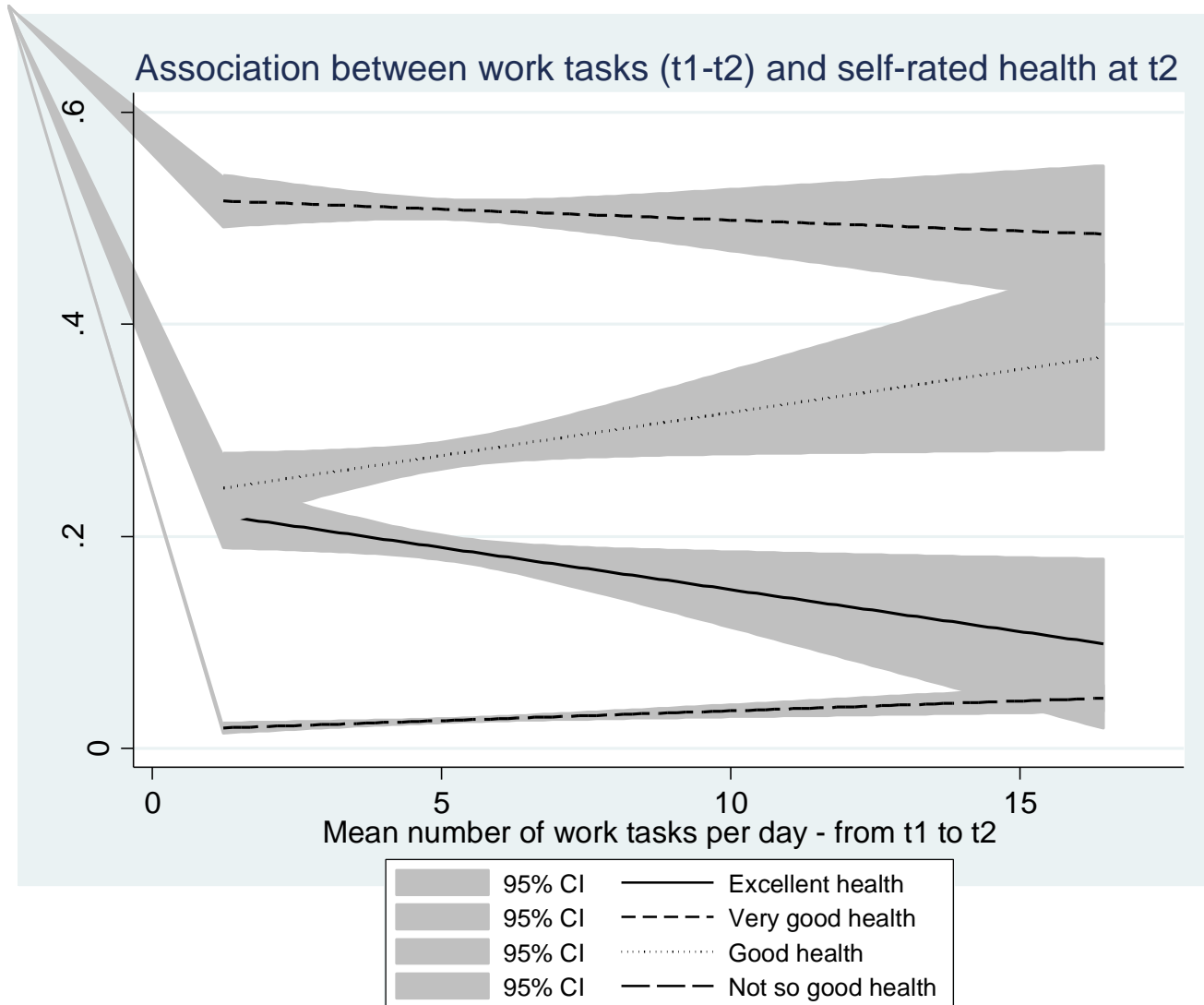
Analysis based on full sample of rescue workers participating at at t1 ( $n = 2,083$ ).

Adjusted for age, gender mental health, neuroticism and working as emergency ambulance worker at t1.



# Results (2)

## Work load and self-rated health status



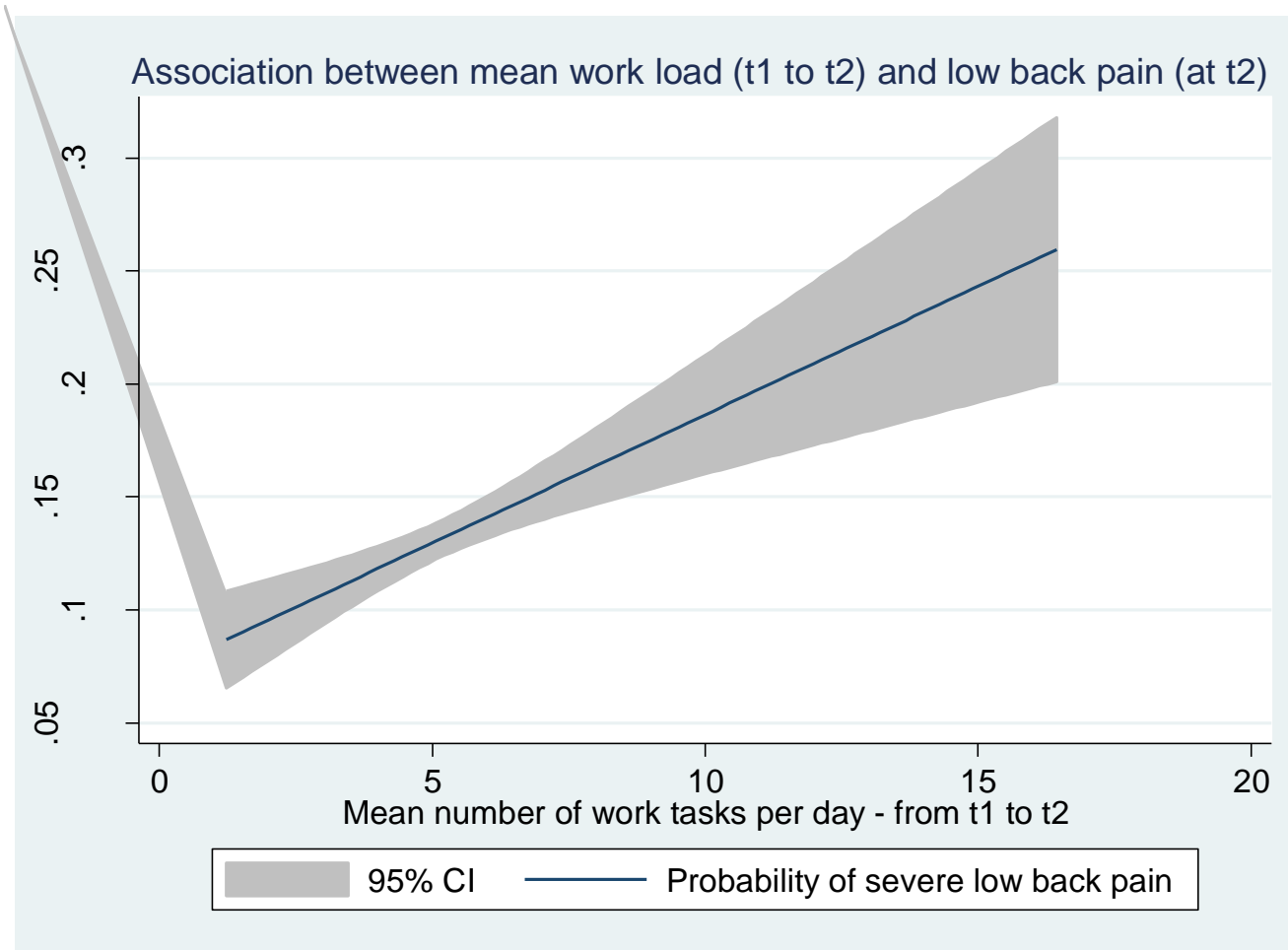
Increasing mean number of work tasks per day inbetween baseline and follow-up increases the probability of worse self-rated health ( $p = 0.03$ ).

Analysis based on 'healthy' ambulance workers, i.e those reporting excellent, very good or good health at t1 ( $n = 1,040$ ).

Adjusted for age, gender and self-rated health at t1.

# Results (3)

## Work load and low back pain



Increasing mean number of work tasks per day inbetween baseline and follow-up increases the probability of more low back pain ( $p = 0.035$ ).

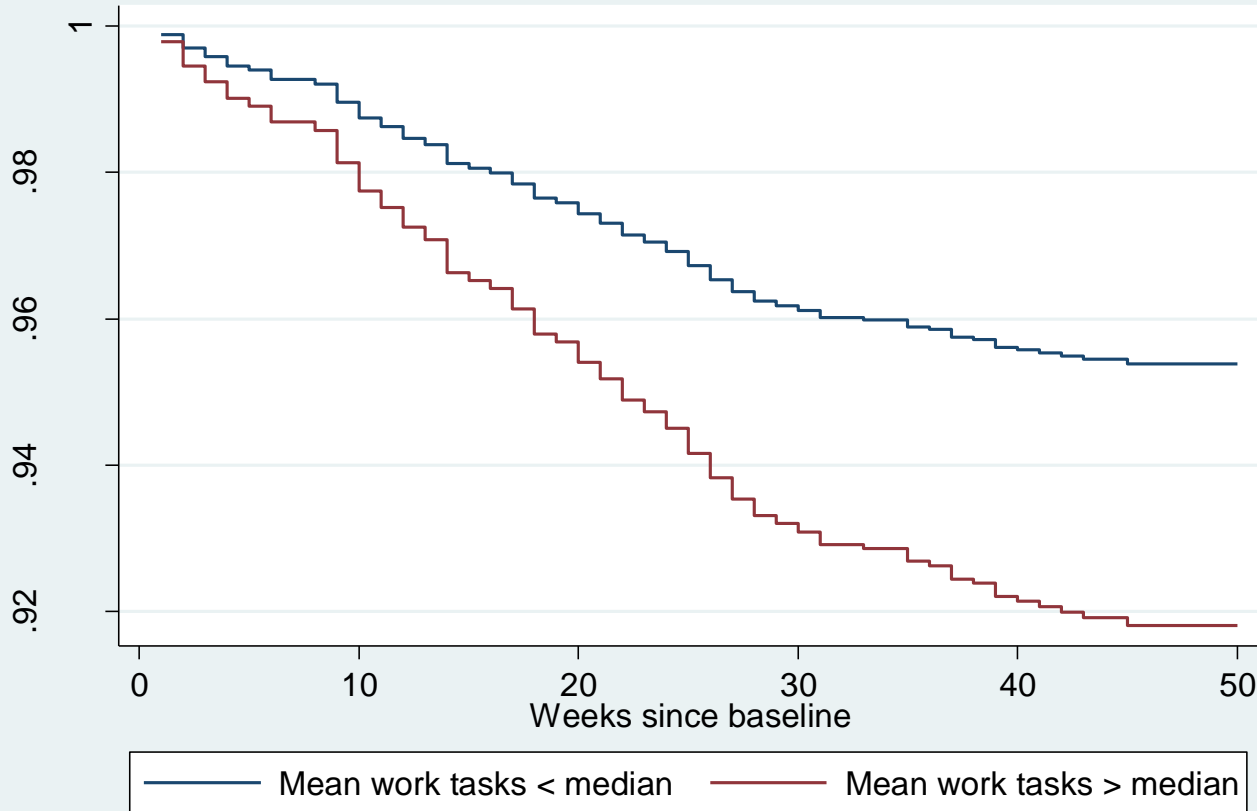
Analysis based on 'healthy' ambulance workers, i.e those reporting low levels of low pack pain at t1 ( $n = 836$ ).

Adjusted for age, gender, low back pain at t1 and mean work load year prior to baseline.

# Results (4)

## Work load and long-term sickness absence

Cox proportional hazards regression



Those having a higher mean work task per day above the median has a greater risk of being sick-listed in the 1 year follow-up period from baseline (HR: 1.81; 95%CI (1.23-2.66)).

Analysis based on based on full sample of rescue workers participating at at t1 (n = 1,998).

Adjusted for age, gender, low back pain, self-rated health, total number of work tasks year prior to baseline and working as emergency ambulance worker at t1.

# Conclusions

This presentation has argued that:

- 1) ...increasing work load was associated with higher levels of emotional demands, work pace and evaluations of more demanding physical work environment (measured using DMQ) (p-values in all cases < 0.001).
- 2) ...mean number of work tasks was associated with worse self-rated health (OR: 1.09), higher levels of low back pain (OR: 1.13) but was unrelated to mental health.
- 3) ...the objective measure of work load was associated with self-reported sickness absence and LTSA even when adjusting for baseline health. 7 % of the participants were sick-listed for at least 4 consecutive weeks in the follow up period.

# Implications of the study

1. How valuable are the 'objective' measures of work load? Can similar measures be derived in other contexts where work load data is gathered on a routine basis for production purposes? (retail stores and slaughterhouses might be two examples?)
2. Can the results be generalised beyond the (narrow) context of Danish ambulance personnel?
3. Should the results initiate discussions of maximum work load among AP's in order to prevent work-related health problems and sickness absence in this group?