Anxiety and depression disorders among workers with musculoskeletal injury: Investigating work disability outcomes using linked health data

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Musculoskeletal conditions and mental disorders

- Highly prevalent
- Leading causes of global disability

- In BC each year approximately
  - 37,500 lost-time strain/sprain claims
    - 20-25% of all lost-time claims
    - $425 million in direct disability costs

Anxiety and depression among workers with lost-time work injury

- High prevalence after injury (Casey 2017; Dersh 2002, 2006, 2007; Franche 2009; O'Hagan 2012)
  - Depression - yes
  - Anxiety - yes
- Injury a suggested stimulus (Casey 2017; Dersh 2002, 2007; O'Hagan 2012)
  - Depression - yes
  - Anxiety - mixed
- Impacts on return to work (Clay 2010; Franche 2009; Iles 2008; Kent 2008; Kuijer 2006; Shaw 2001; Steenstra 2005)
  - Mixed, insufficient evidence, no impact

How might anxiety and depression impact return to work after lost-time musculoskeletal injury?

Potential mechanisms

- Increased pain (Han 2015; Peolsson 2004; Symreng 2004; Theunissen 2012)
- Activity disruption (Sullivan 2011)
- Resistance to treatment (Slepian 2014)
- Beliefs regarding return to work (Cole 2002; Petrie 1996)
- Greater need for work accommodation (Loukine 2016; Wang 2011)
- Stigmatization (Carnide 2015)

Rationale for further research…

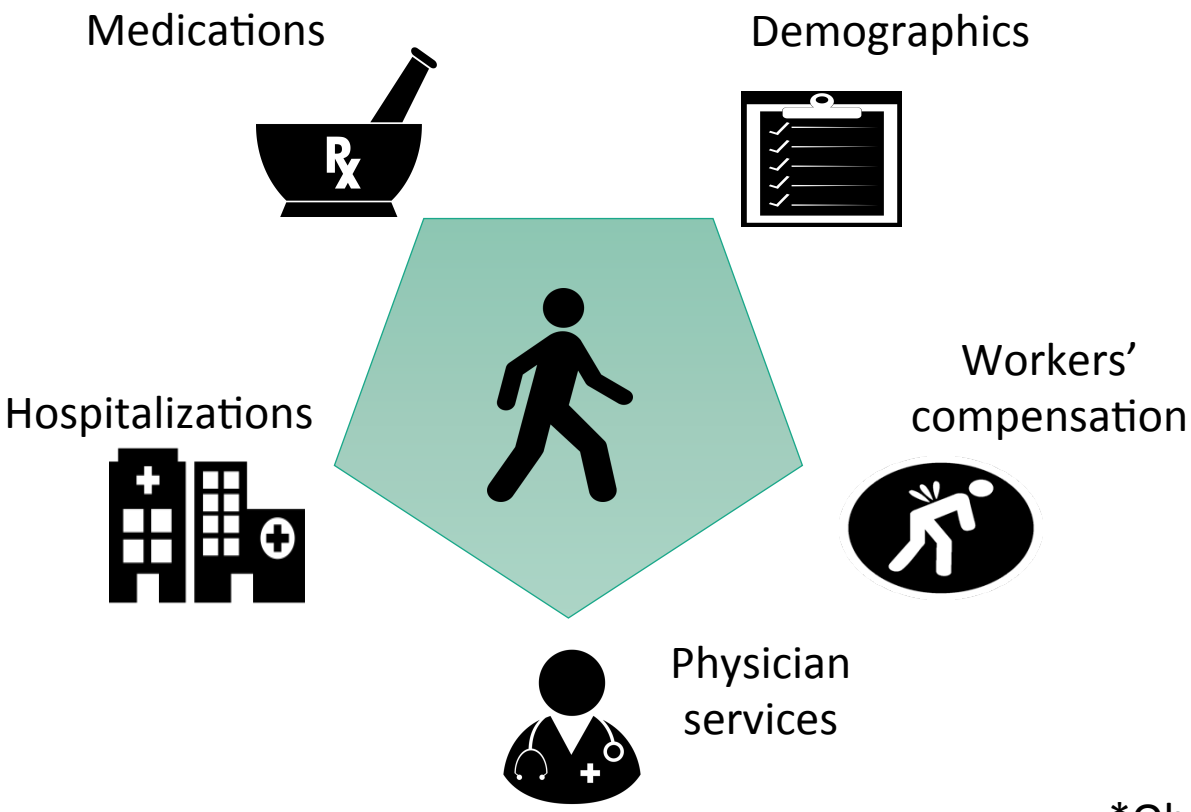
- Potential to improve work disability outcomes
- Limitations of prior research
  - Small clinical samples
    - Chronic work disability/ permanent impairment
  - Self reported mental symptoms and timing
  - Short follow up
  - Limited focus on:
    - Anxiety
    - Gender
    - Recurrence
    - Interventions

Research objectives

To examine anxiety and depression disorders among workers with loss-time work-related upper extremity or spine strain or sprain including:

1. prevalence, timing, and risk factors
2. impacts on sustained return to work
3. impacts on entry to non-modified work and time-loss recurrence
4. differences between men and women for the above measures and relationships

Linked administrative data*



*Obtained from Population Data BC

Study cohort

- Lost-time claims (unit of analysis)
- Back or upper extremity strain or sprain
- Age 19-64

- 2000 to 2013: N = 292,165.
  - Men (60.1%)
  - Ages 30 to 59 (>70%)
  - Prior claims (>50%)
  - Men more likely to have
    - high income
    - no somatic comorbidities
    - trades or manufacturing/utilities based occupations
  - Women more likely to have
    - low income
    - high number of somatic comorbidities
    - sales/service or health occupations

- 2009 to 2013: N= 84,865

Case definitions

- Anxiety health system contact events
  - Anxiety diagnosis: hospitalization (ICD-10)
  - Anxiety diagnosis: physician visit (ICD-9, 50b)
  - Anxiolytic or anti-depressant
- Depression health system contact events
  - Depression diagnosis: hospitalization (ICD-10)
  - Depression diagnosis: physician visit (ICD-9, 50b)
  - Anti-depressant
- Criteria
  - 1 inpatient diagnosis in 365 days
  - 2 outpatient diagnoses in 365 days
  - 1 outpatient diagnosis and 1 prescription in 365 days

None

Anxiety only

Depression only

Anxiety/ depression

Objective 1 study variables and analyses

Stratified by gender

Anxiety and depression disorder prevalence

- Year before injury
- Year after injury

} Compared

Risk factors

- Risk factors:
  - Socio-demographic: gender, age, income, dependents, location
  - Injury: body part, incident type
  - Clinical: somatic and mental co-morbidity, prior claims
  - Work: firm size, shift type, occupation
- Outcomes = pre-existing and new onset disorders (separate models)
- Multinomial regression models

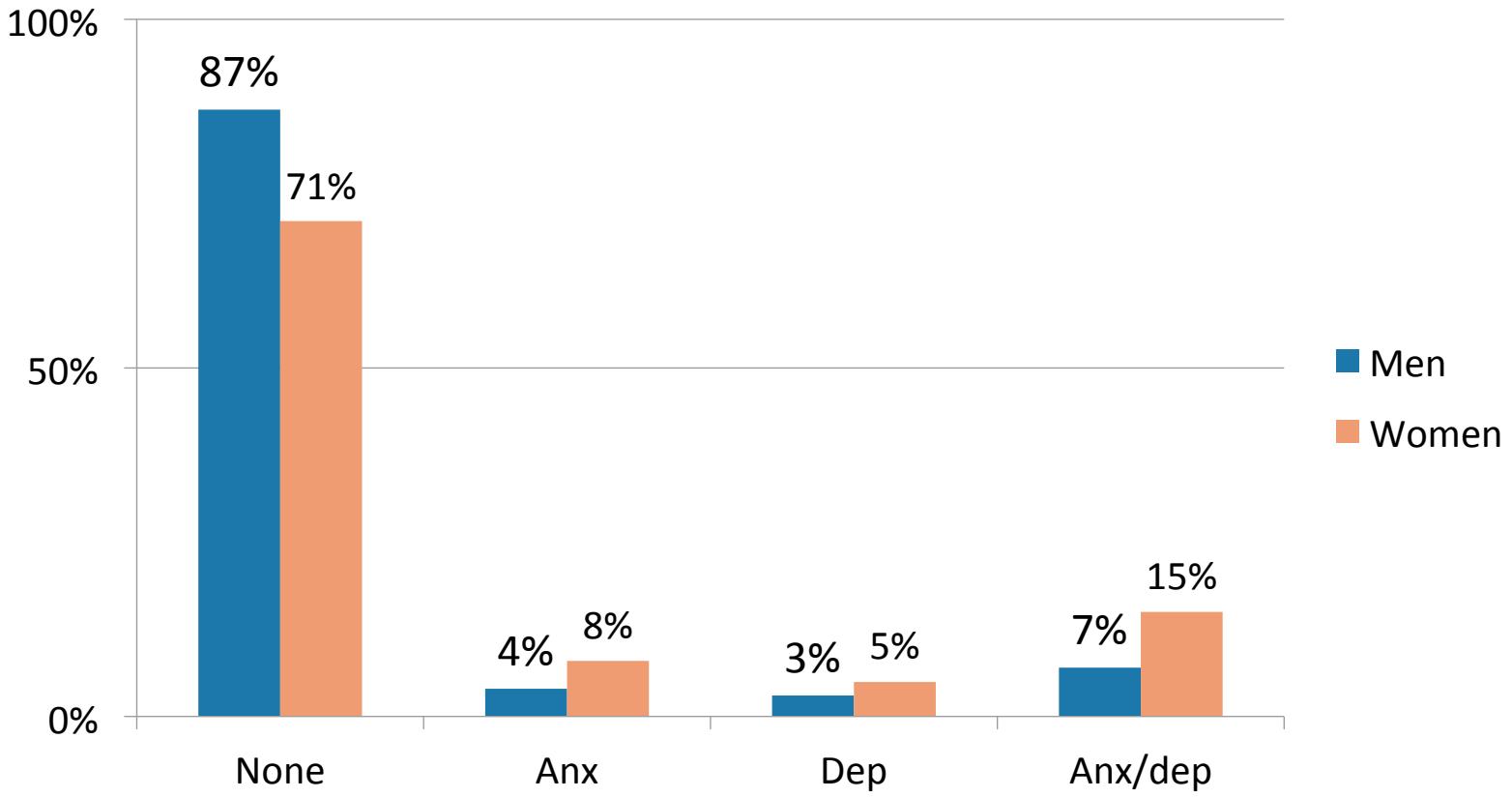
Objective 2 study variables and analyses

- Explanatory variable = pre-existing disorders
  - Multiplicative Cox models
  - Additive direct adjusted survival curves
- Explanatory variable = new onset disorders
  - Multiplicative Cox models with time varying exposure
- Outcome = sustained return to work
  - Days from injury to non-modified return to work and no further wage loss or modified work days measured using two years of follow up
  - Censored at 365 days
- Potential confounders
  - Socio-demographic: gender, age, income, dependents, location
  - Injury: body part, incident type
  - Clinical: somatic and mental co-morbidity, prior claims
  - Work: firm size, shift type, occupation

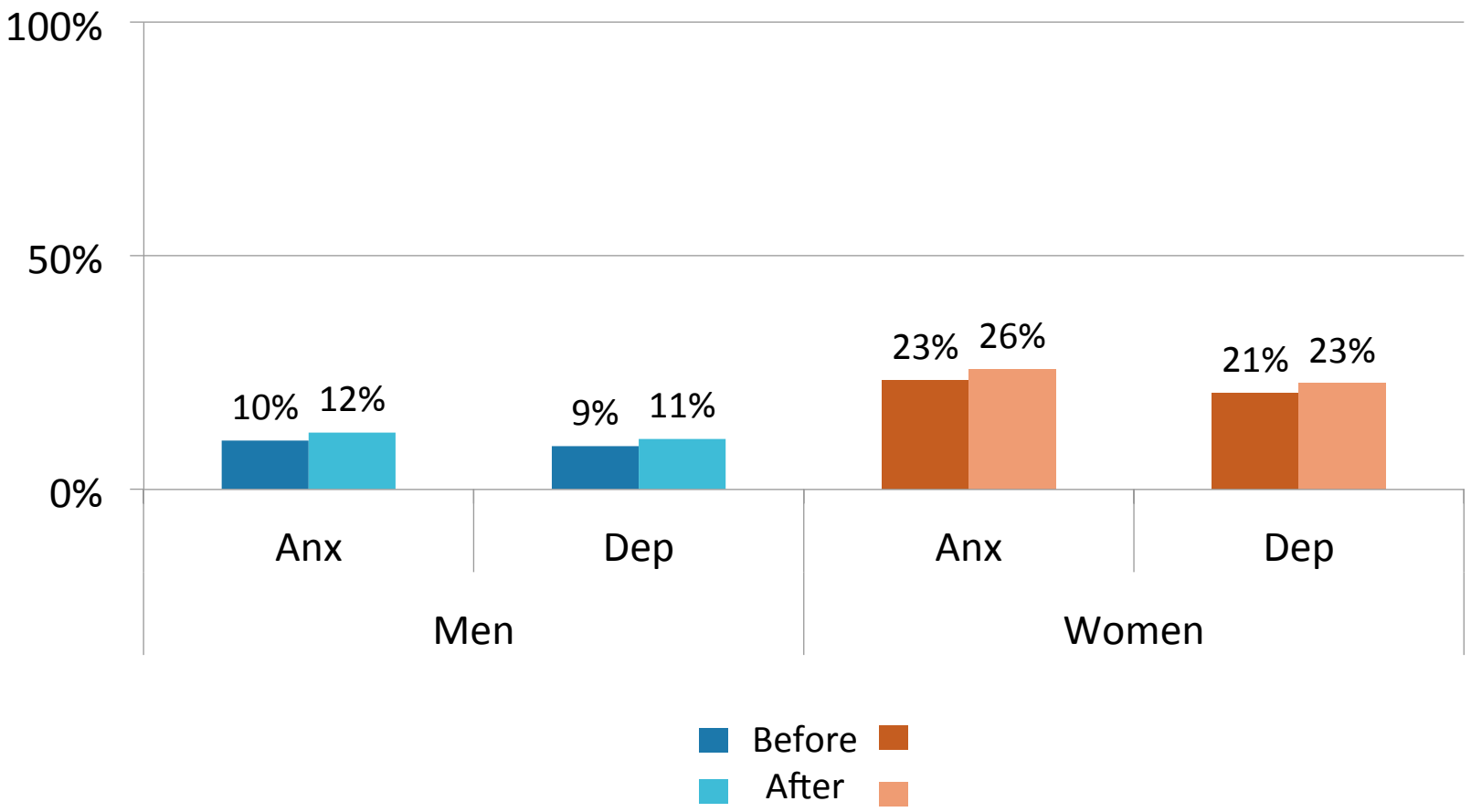
Objective 3 study variables and analyses

- Explanatory variables = pre-existing anxiety and depression disorders
- Outcomes (separate models)
  - Return to non-modified work (from time-loss)
  - Time loss recurrence (after initial return to work)
- Two years of follow up
- Prentice Williams Peterson Cox models for recurrent events
  - Adjusted for confounders

Objective 1: Prevalence one year pre-injury



Objective 1: Prevalence in the year before versus the year after injury (timing)



Objective 1: Risk factors

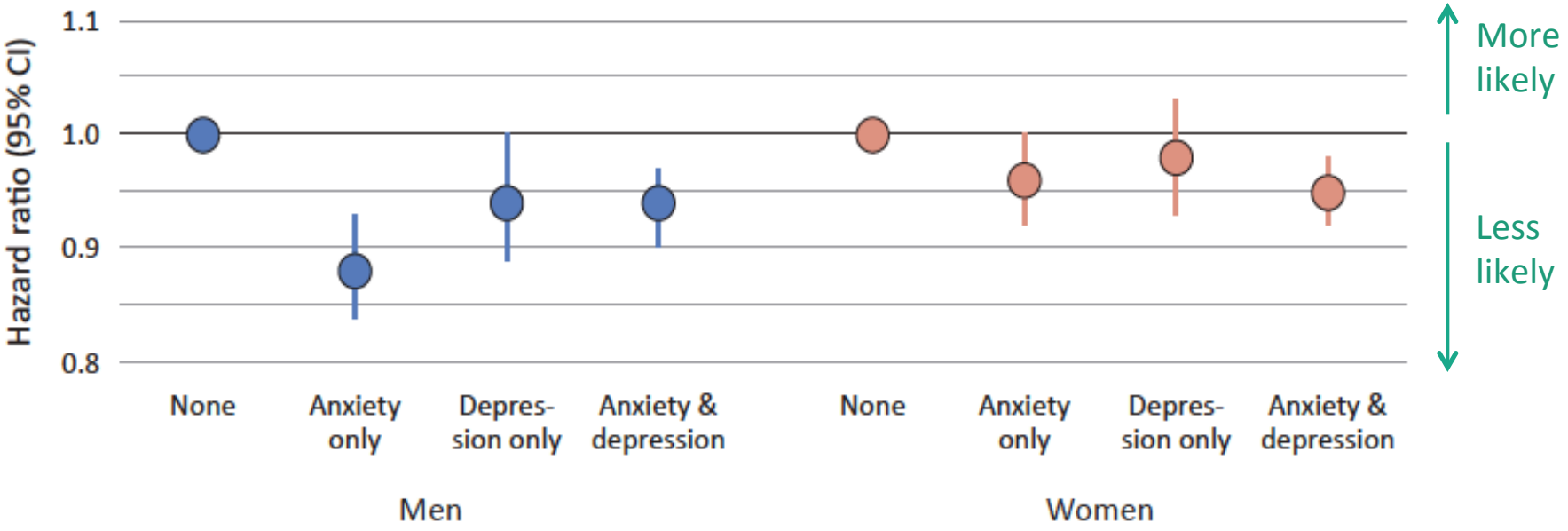
Pre-existing anxiety and depression

Men and women	• Older age (A, D, co-AD) • Lower income (A, D, co-AD) • Physical comorbidity (A, D, co-AD) • Other mental disorders (A, D, co-AD) • Prior claims (A, D, co-AD) • Health, social science, education, government occupations (A, D, co-AD)
Men only	• Multi-site injury (A, co-AD) • Employed by large firm (A, D, co-AD) • Urban area (A, co-AD)
Women only	• Having a dependent (A) • Rural area (D, co-AD) • Business occupations (A, D, co-AD)

A = anxiety only
D = depression only
co-AD = comorbid anxiety and depression

Objective 2: Impacts on sustained return to work

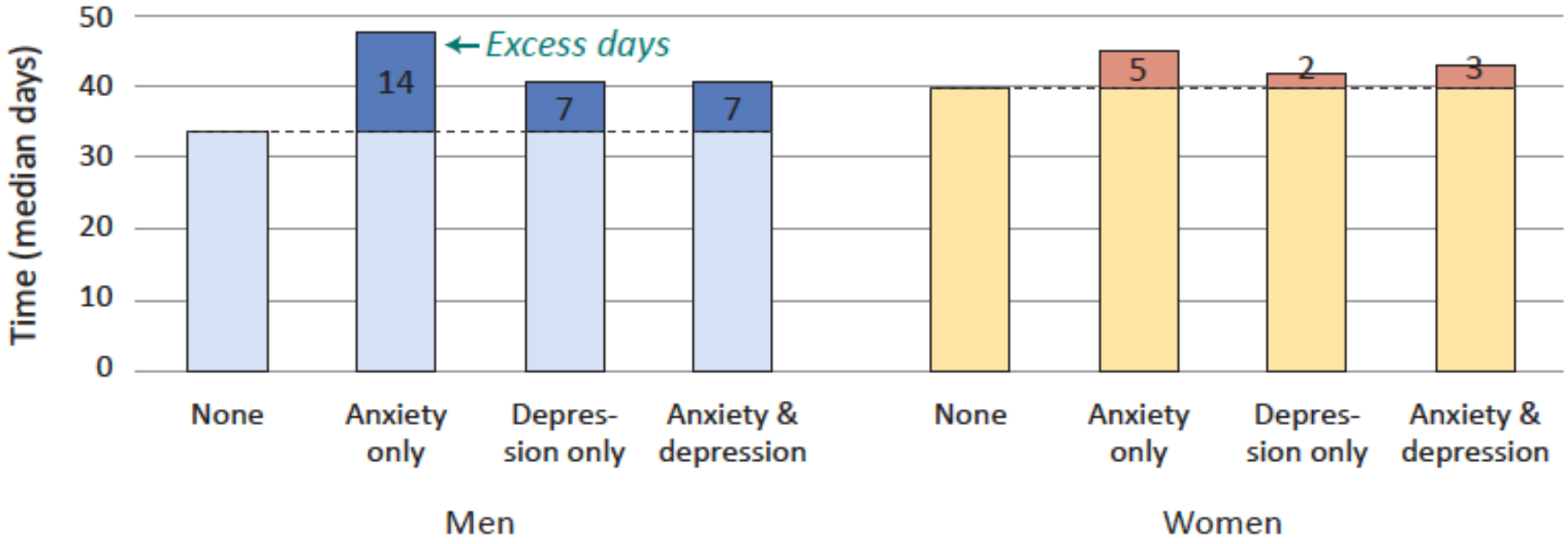
Pre-existing anxiety and depression



*Adjusted for confounders

Objective 2: Impacts on sustained return to work

Pre-existing anxiety and depression



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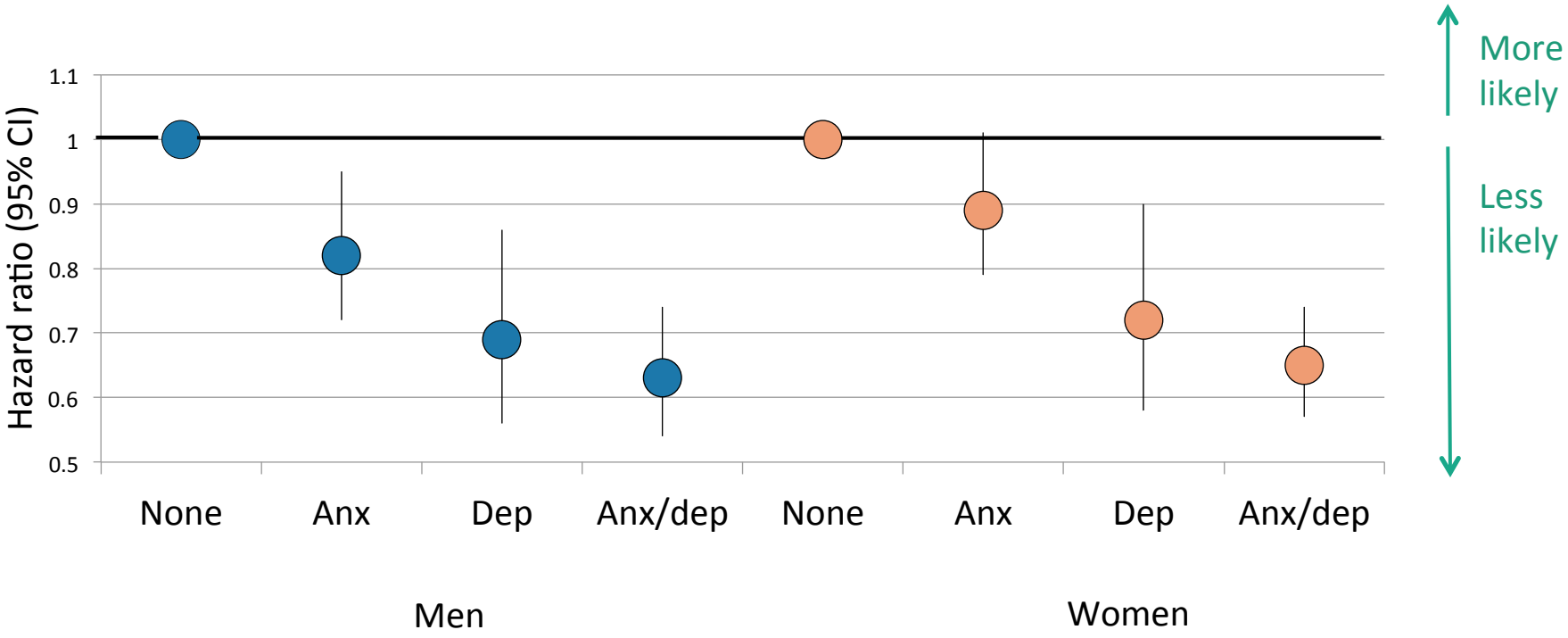
Objective 2: Impacts on sustained return to work

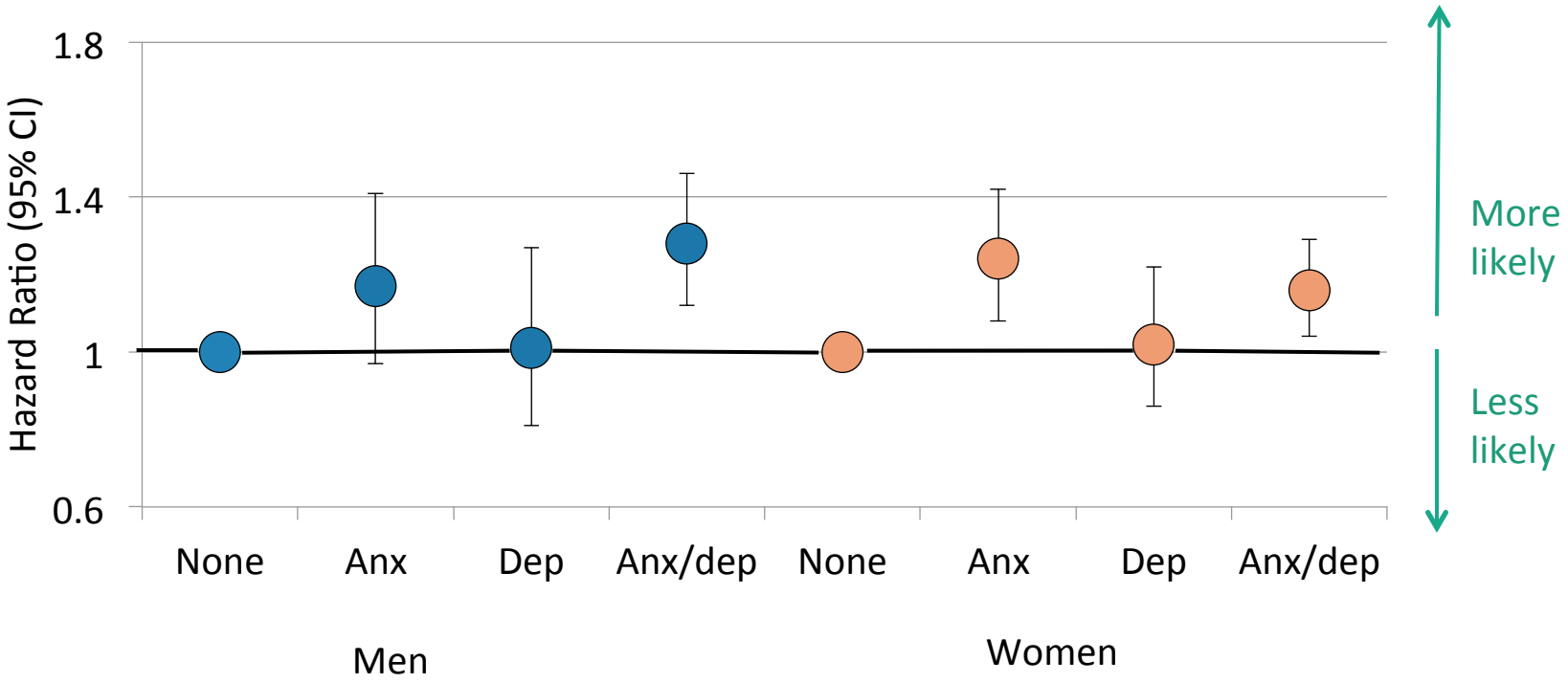
New onset anxiety and depression



*Adjusted for confounders

Objective 3: Impact on time-loss recurrence

Pre-existing anxiety and depression



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Summary of findings

- High prevalence of recent/current episodes at injury
  - 29% women, 13% men
- Injury not a major stimulus for new onset clinically diagnosed disorders
- Impacts on
  - Sustained return to work
    - Pre-existing
    - New onset disorders
  - Risk of recurrence
    - Anxiety only and comorbid anxiety and depression

Discussion

- Definition of the return to work outcome
- Limitations
  - Anxiety and depression measurement
  - External generalizability
- Gender differences
- Pre-existing disorders: larger impacts for anxiety

Considerations for policy, practice and future research

- Large subgroup
- Pre-existing and new onset conditions
- Timing of support or treatment
- Gender sensitive approaches

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