



Developing a measure of OHS vulnerability

Peter Smith

IWH Open Plenary
January 20th 2015



Research Team

Investigators:

Ron Saunders, Curtis Breslin, Tony LaMontagne, Emile Tompa

Research Coordinator:

Marni Lifshen

Analyst:

Morgan Lay



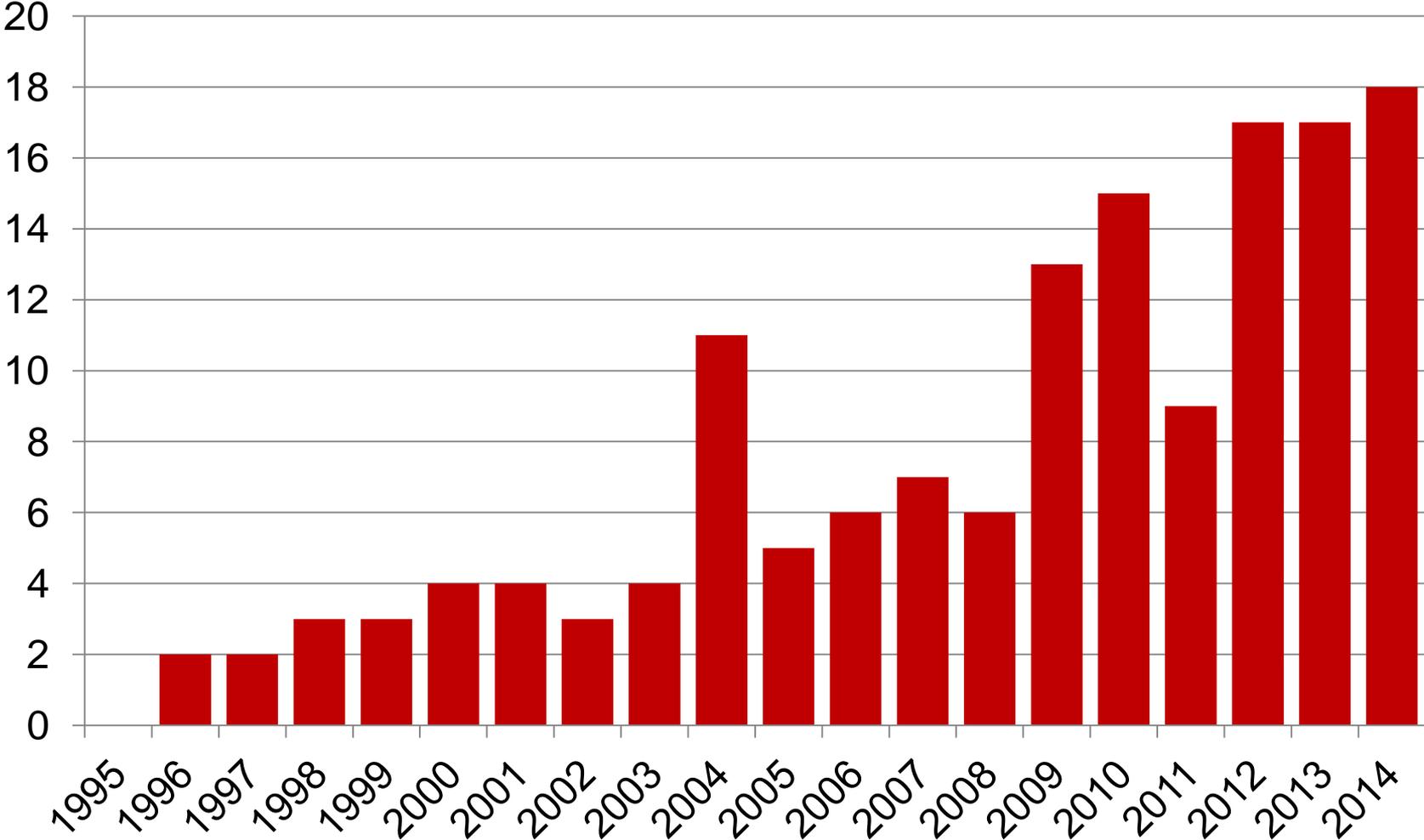
Vulnerability – what is it?

vul·ner·a·ble (*adj*): vəl-n(ə-)rə-bəl,

- capable of being physically or emotionally wounded
- open to attack or damage: assailable

Source: <http://www.merriam-webster.com/dictionary/vulnerable>

Numbers of articles with “vulnerable workers” in title or abstract: 1995 through 2014



Source: Medline



Think of some examples of vulnerable workers

Immigrants

Workers in small
business

Older workers

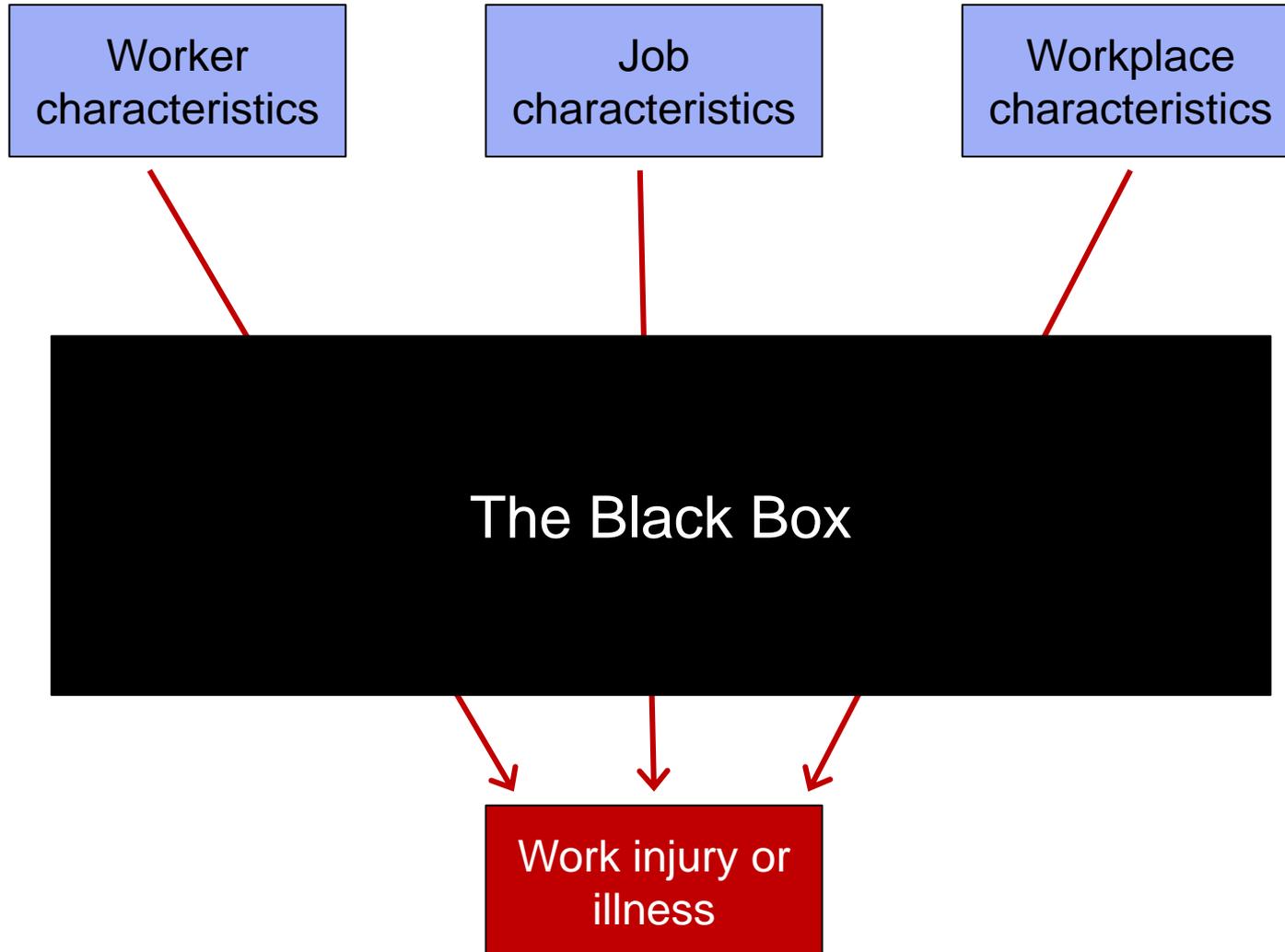
Young workers

Construction workers

Visible minorities

Temporary workers

Female workers





Issues with using demographic/occupation/industry categories to define “vulnerable” workers

1. Leads to perception that injury risk is inherent to a particular group
2. Reduces attention to the broader conditions that lead to increased risk of injury
3. Provides no mechanism to measure increases or decreases in vulnerability to injury risk (e.g. In response to interventions)

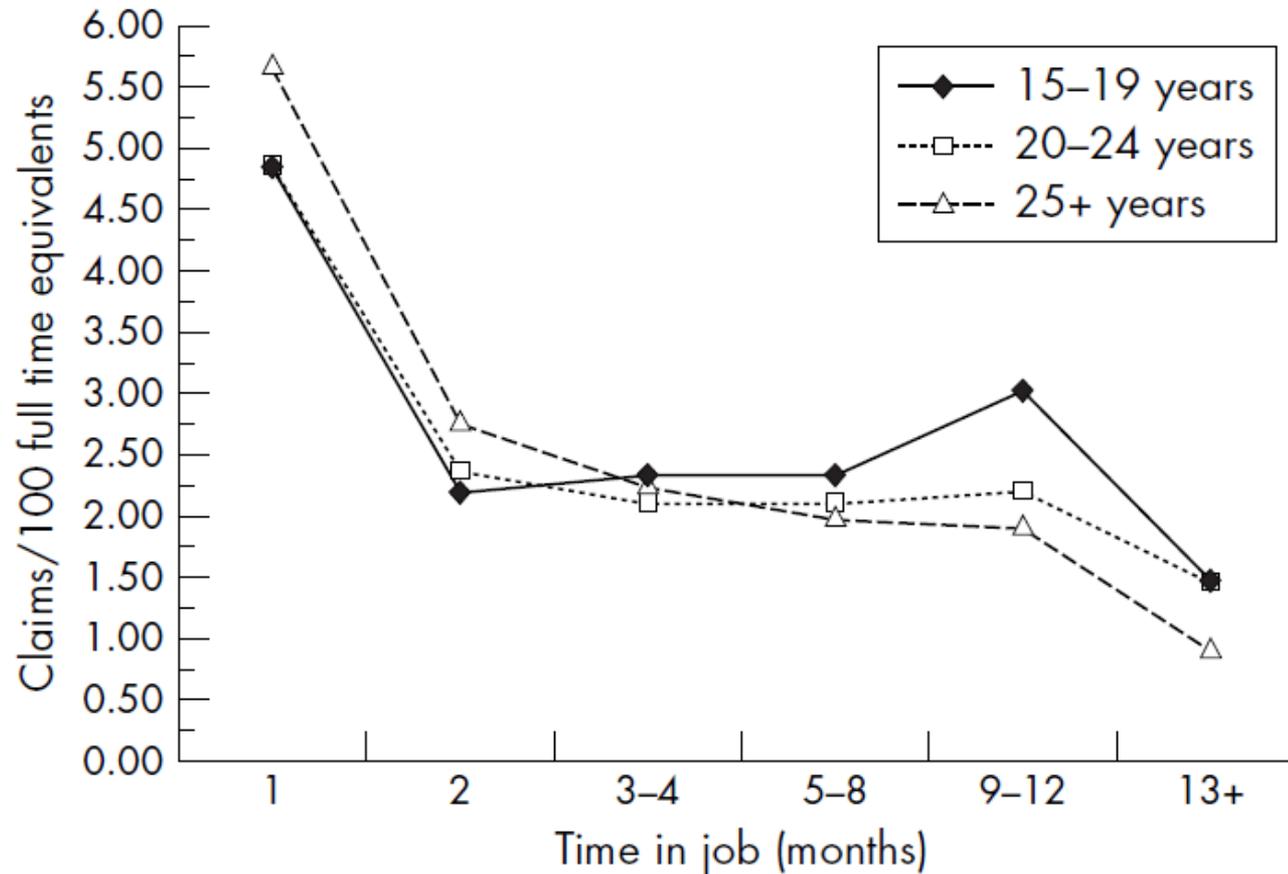
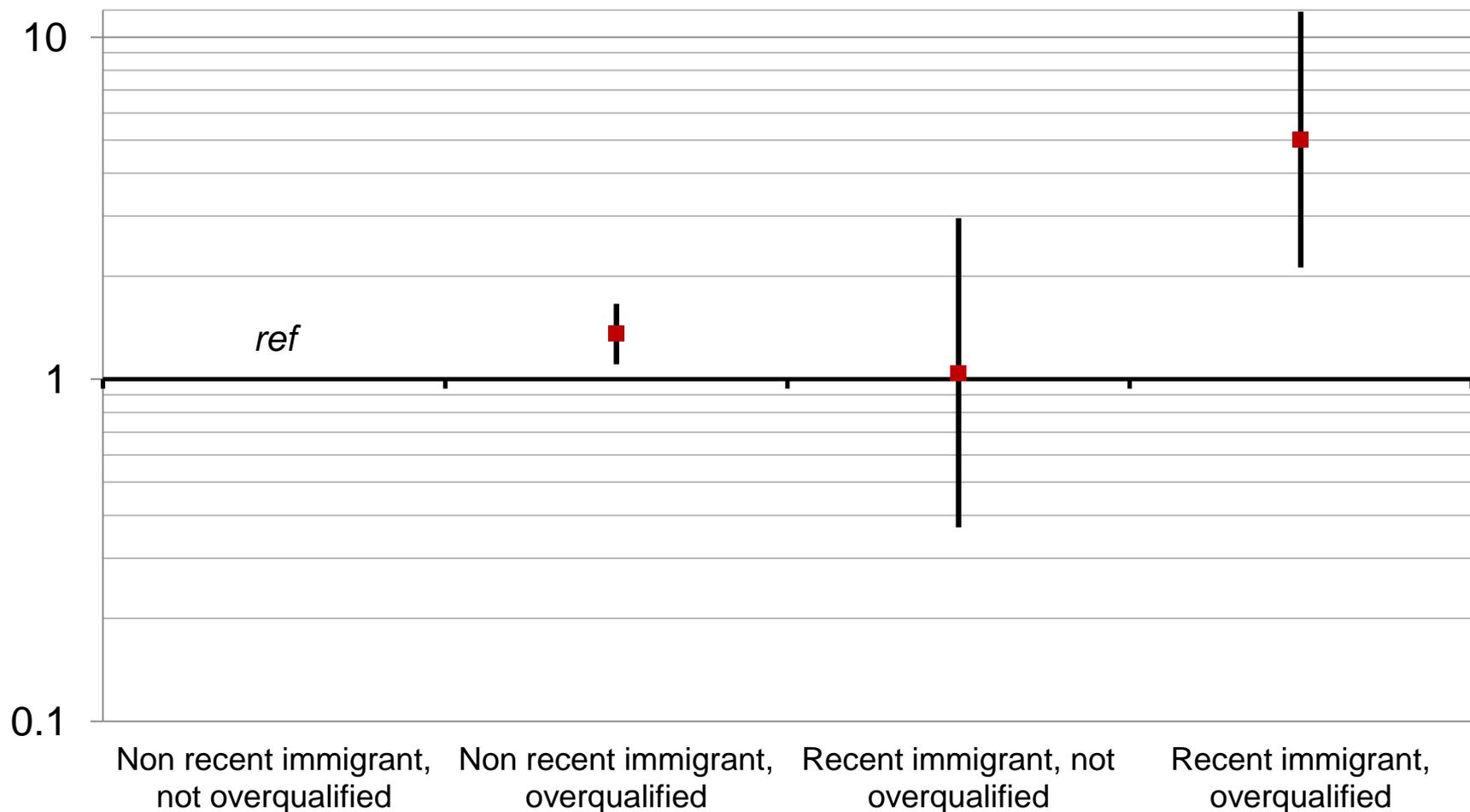


Figure 1 First-time claim rates per 100 full time equivalents by age and job tenure adjusting for occupation, industry, and sex.

Risk of self-reported injury by recent immigration status and overqualification. Males only. Canada 2003-05





Developing a concept of OH&S vulnerability (1)

Starting point is that OH&S vulnerability is more than just the hazards a worker is exposed to



Developing a concept of OH&S vulnerability (2)

Dimensions that lead to increased risk of injury at work

1. Level of hazards faced by the worker
2. Workplace/organisation-level protections and policies
3. Worker awareness of occupational hazards and rights and responsibilities
4. Worker empowerment to participate in injury prevention



Our definition of OH&S vulnerability

Where workers are exposed to hazards in combination with inadequate workplace policies and procedures and/or low OH&S awareness and/or a workplace culture that discourages workers participation in injury prevention



Developing a measure of OH&S vulnerability

Developing a pool of potential items

- Literature search
- Focus groups with relevant OH&S stakeholder groups

Reducing the list of items to a feasible survey instrument

- Item review
- Data analysis
- Stakeholder and investigator input



Developing a pool of potential items: literature search

1. Originally identified 9,771 articles
2. After abstract and title review N = 688
3. After full-text review N = 83 articles
4. Items were extracted from 58 articles
 - 26 articles on hazards
 - 28 organisational policies and procedures
 - 19 awareness
 - 29 empowerment

Additionally supplemented with other measures known to investigator team or OH&S stakeholders



Developing a pool or potential items (2): Focus Groups

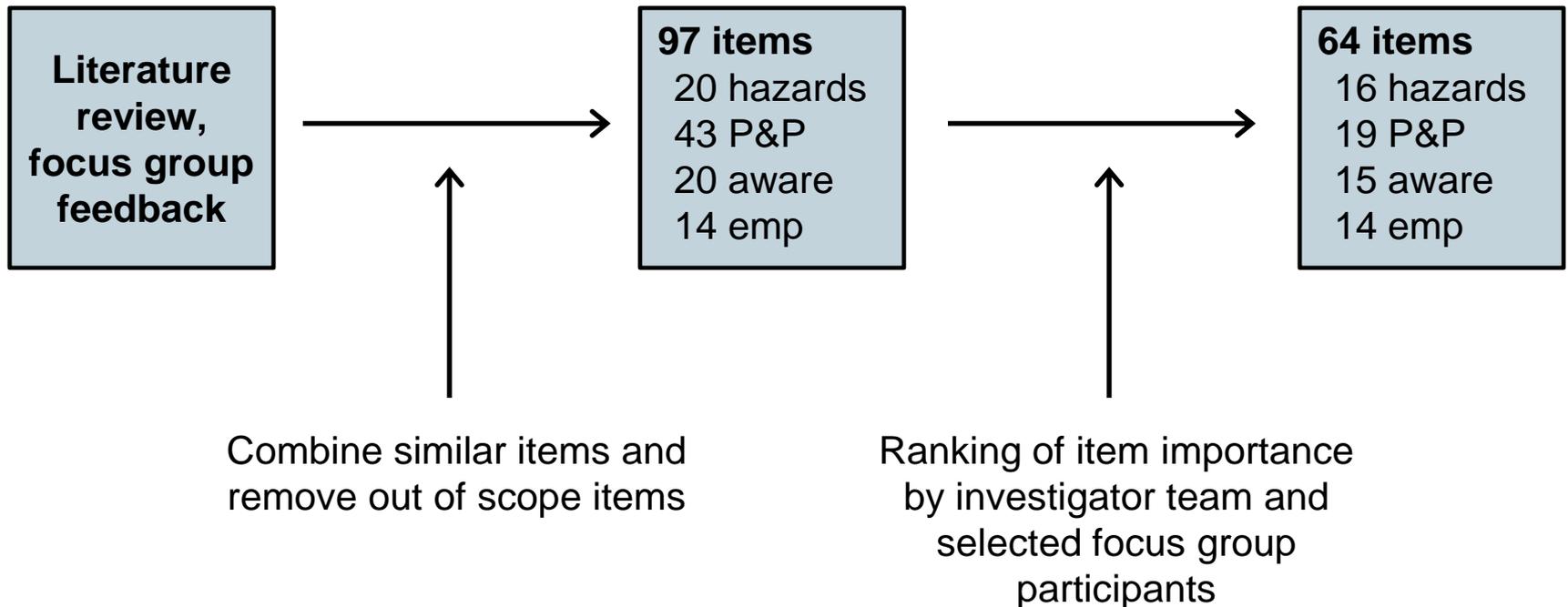
Seven focus groups run in Ontario and Victoria, Australia

- 2 employees
- 2 policy makers
- 1 employees (ON)
- 1 employer representatives (Vic)
- 1 employee representatives (Vic)

Purpose was to get feedback on

- conceptual framework,
- utility of developing a measure for workers,
- types of questions that should be asked

Reducing the pool of potential items: step one





Reducing the pool of items: step two (pilot survey) (1)

List of 64 items given to a sample of 328 employees in Ontario and BC

Sample recruited through EKOS Probit survey panel

- Panel of approximately 90,000 households who agree to participate in surveys from “time-to-time”.
- Covers both landline and cellular telephones



Reducing the pool of items: step two (pilot survey) (2)

Compared to Labour Force Survey, the Probit-based sample was

- Older;
- More likely to work in health, education, social or community services occupations;
- Less likely to be in sales and services occupations; and
- Less likely to be employed by a small business

A test-retest reliability sample was also recruited (N = 62) who did the same survey two weeks later (94% to 97% reported no change across OH&S vulnerability dimensions)



Reducing the pool of items: step two (pilot survey) (3)

Using the pilot survey and test-retest samples we identified:

- Items with a high percentage of missing or not applicable responses (N = 11)
- Items that were highly correlated with other items (N = 2)
- Items not correlated with other items in the same dimension (N = 6)
- Items with low test-retest reliability (N = 14)
- Items with ceiling or floor effects (N = 1)

Final measure consisted of 29 items (11 hazards, 7 policy and procedure, 6 awareness, and 5 empowerment)

Final Measure: Hazards

How often do you

1. Have to manually lift, carry or push items heavier than 20kg at least 10 times during the day?
2. Have to do repetitive movements with your hands or wrists for at least 3 hours during the day
3. Have to perform work tasks, or use work methods, that you are not familiar with?
4. Interact with hazardous substances such as chemicals, flammable liquids and gases?
5. Have to work in a bent, twisted or awkward work posture?
6. Experience pain or discomfort as a result of your job?
7. Work at a height that is 2 metres or more above the ground or floor?
8. Work in noise levels that are so high that you have to raise your voice when talking to people less than one metre away
9. Have you been bullied or harassed at work?
10. Have to stand for more than two hours in a row?
11. Come to work feeling fatigued?

Never; once a year; every 6 months; every 3

www.iwh.on.ca months; every month; every week; every day

Final Measure: Policies and procedures

At my workplace

1. Everyone receives the necessary workplace health and safety training when starting a job, changing jobs or using new techniques
2. There is regular communication between employees and management about safety issues
3. Systems are in-place to identify, prevent and deal with hazards at work
4. Workplace health and safety is considered to be at least as important as production and quality
5. There is an active and effective health and safety committee, and /or worker health and safety rep
6. Incidents and accidents are investigated quickly in order to improve workplace health and safety
7. Communication about workplace health and safety procedures is done in a way that I can understand

strongly agree; agree; disagree; strongly disagree

Final Measure: Awareness

At my workplace

1. I am clear about my rights and responsibilities in relation to workplace health and safety
2. I am clear about my employers' rights and responsibilities in relation to workplace health and safety
3. I know how to perform my job in a safe manner
4. If I became aware of a health or safety hazard at my workplace, I know who (at my workplace) I would report it to

5. I have the knowledge to assist in responding to any health and safety concerns
6. I know what the necessary precautions are that I should take while doing my job

strongly agree; agree; disagree; strongly disagree

Final Measure: Empowerment

At my workplace

1. I feel free to voice concerns or make suggestions about workplace health and safety at my job
2. If I notice a workplace hazard, I would point it out to management
3. I know that I can stop work if I think something is unsafe and management will not give me a hard time
4. If my work environment was unsafe I would not say anything, and hope that the situation eventually improves (reverse scored)
5. I have enough time to complete my work tasks safely

strongly agree; agree; disagree; strongly disagree



Final Survey

The 29-item measure was administered to 1,835 employees in Ontario and British Columbia between May and June 2014 (63% Ontario)

- 1,796 responses through the Probit panel (17% response rate)
- 268 response through RDD approach (13% response rate)

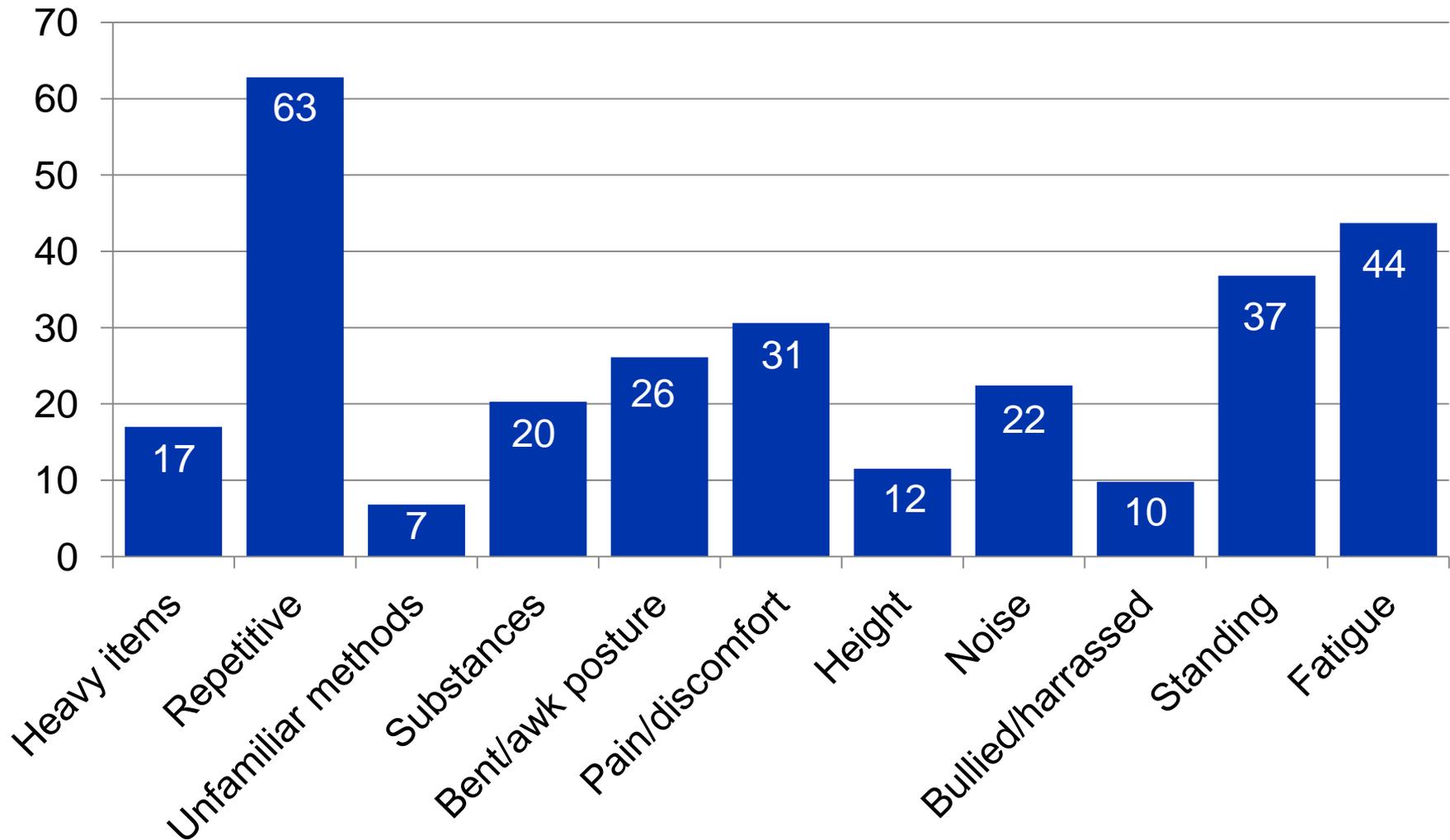
Objectives

Examine distribution of survey items

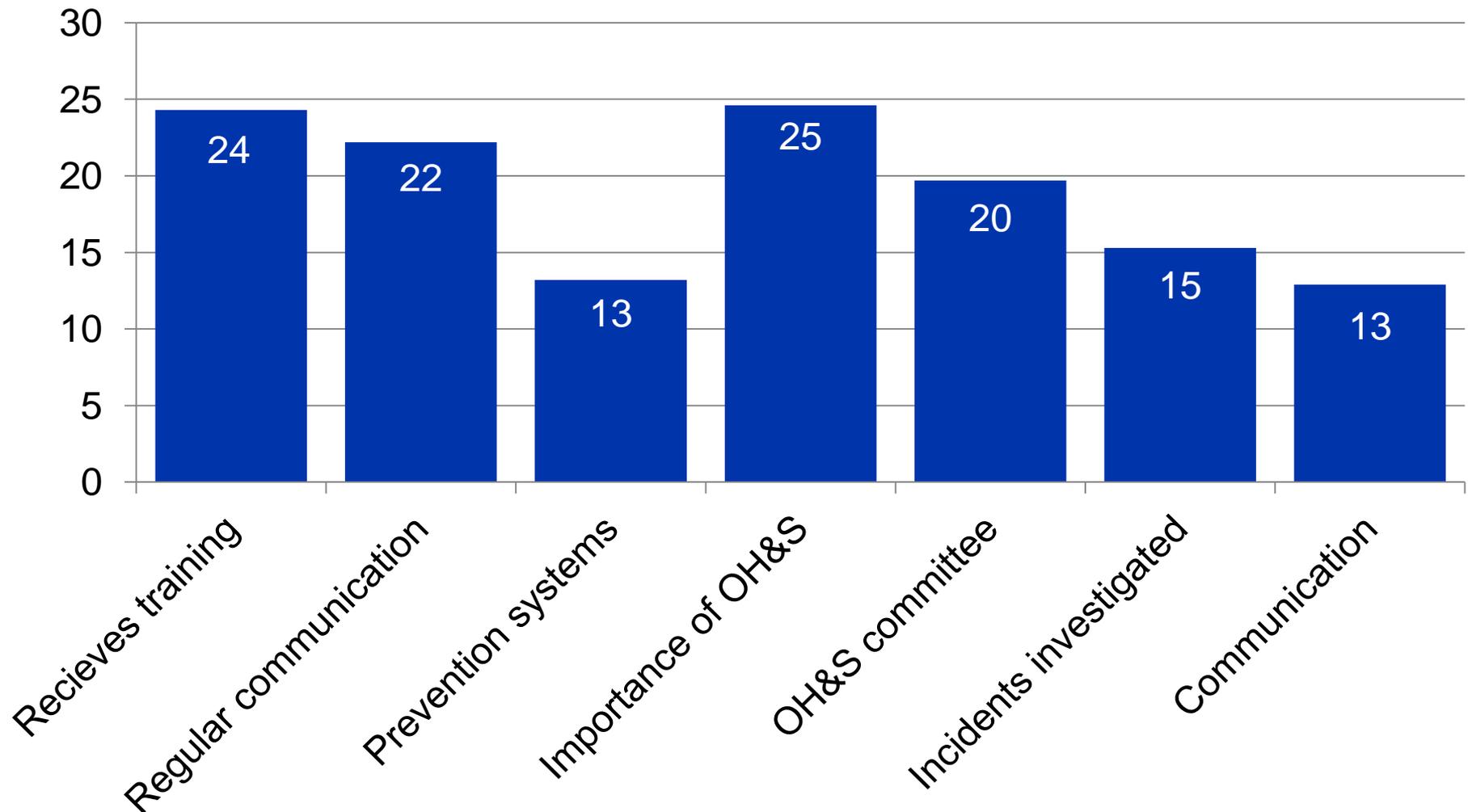
Exploratory factor analysis of policy and procedure, awareness and empowerment dimensions

Examine association between demographic and labour market measures and OH&S vulnerability dimensions

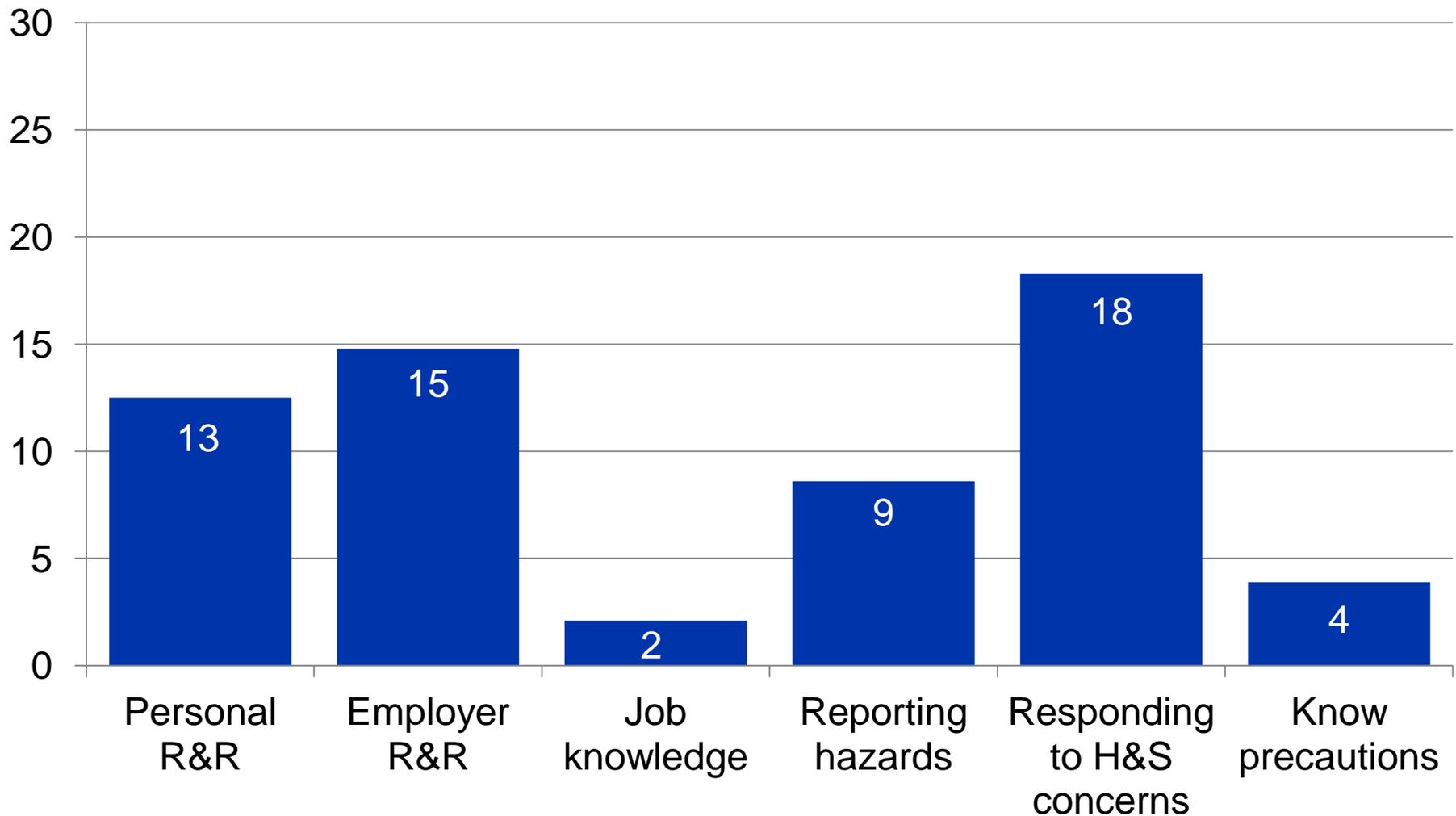
Results: Percent of sample with hazard exposure every week or more by hazard type (N = 1,835)



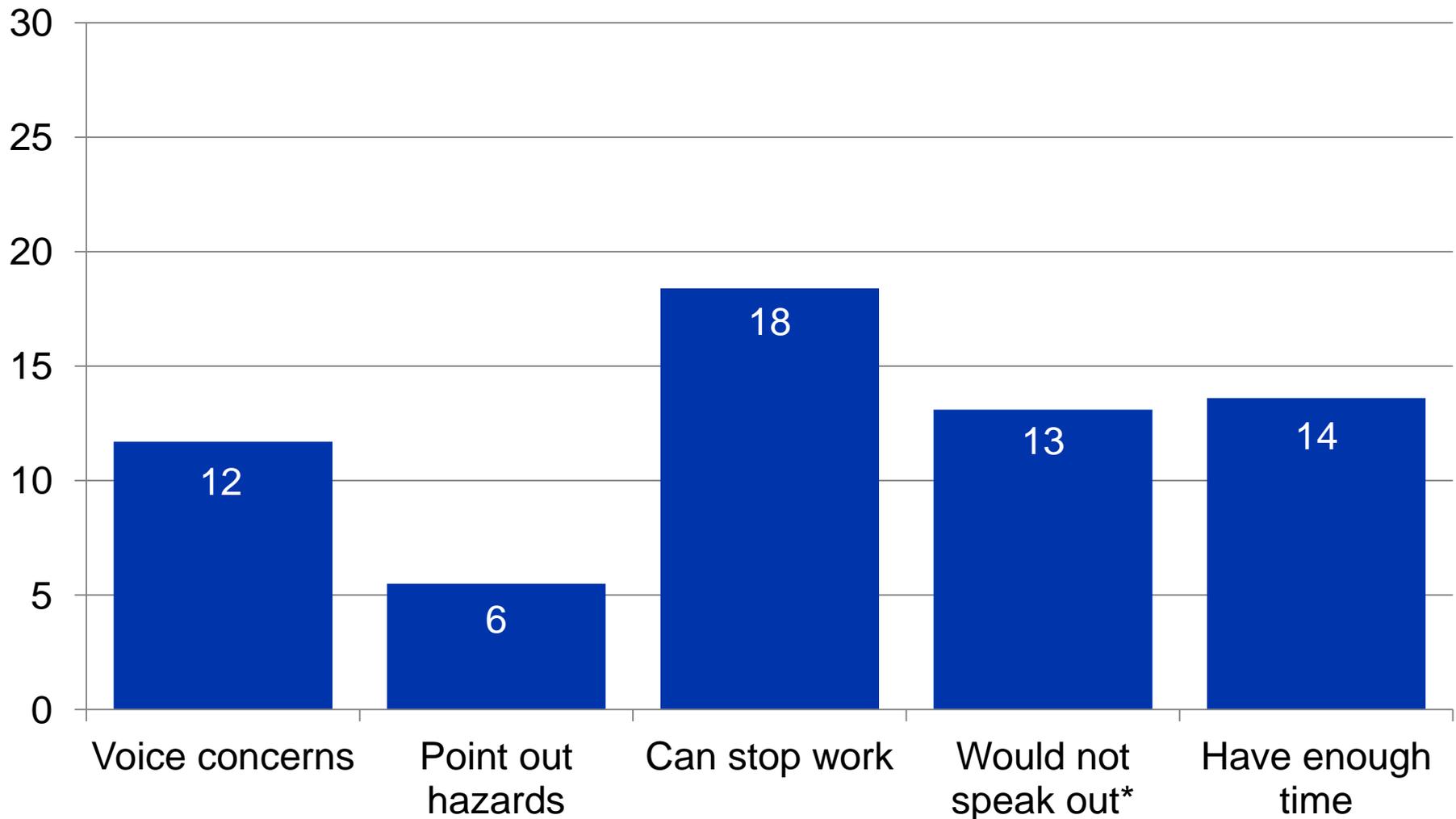
Results: Percent of respondents disagreeing or strongly disagreeing with policy and procedure items (N = 1,835)



Results: Percent of respondents disagreeing or strongly disagreeing with awareness items (N = 1,835)



Results: Percent of respondents disagreeing or strongly disagreeing with empowerment items (N = 1,835)



Factor Analyses results (1). N = 1,469

	P & P	Aware	Emp
Receives training	0.76	0.09	-0.03
Regular communication	0.84	-0.02	0.01
Prevention systems	0.79	0.07	0.02
Importance of OH&S	0.75	-0.04	0.14
OH&S committee	0.73	-0.003	0.03
Incidents investigated	0.76	-0.07	0.12
Communication	0.76	0.11	0.02
Personal R&R	0.08	0.87	-0.04
Employer R&R	0.09	0.82	0.002
Job Knowledge	-0.07	0.66	0.22
Reporting hazards	0.13	0.54	0.23
Responding to OH&S	0.14	0.67	-0.004
Know precautions	-0.003	0.72	0.11

Factor Analyses results (2)

	P & P	Aware	Emp
Voice concerns	0.15	0.008	0.74
Point out hazards	-0.06	0.17	0.67
Can stop work	0.17	0.04	0.64
Would not speak out	-0.006	0.05	0.32
Have enough time	0.08	0.08	0.54

Factor correlations

P&P and awareness: $r = 0.61$

P&P and empowerment: $r = 0.62$

Awareness and empowerment: $r = 0.63$

Crude associations (higher values = worse OH&S vulnerability). Sample weighted by age, gender and province

Hazards:

Men > women

Younger > older

Non-perm > perm

Small workplace > large workplace

Policy and Procedures

Men > women

Canadian born > Non-Canadian born

Non-perm > perm

Small workplace > large workplace

Awareness:

No statistically significant associations

Empowerment:

Large workplace > small workplace



Operationalising OH&S vulnerability (1)

Our Definition

Where workers are exposed to hazards in combination with inadequate workplace policies and procedures and/or low OH&S awareness and/or a workplace culture that discourages workers participation in injury prevention



Operationalising OH&S vulnerability (2)

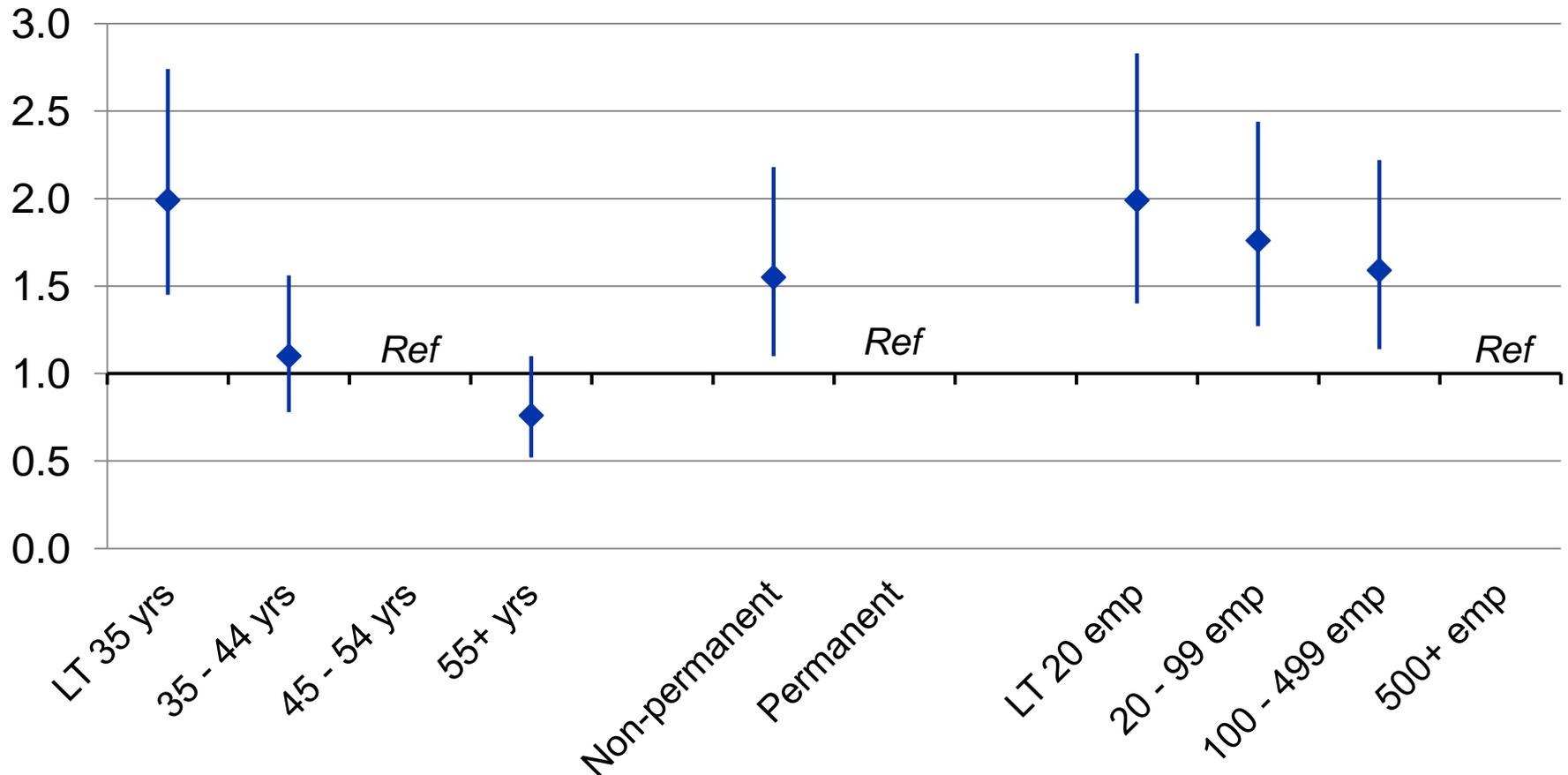
Hazards: Exposed to two or more hazards on a weekly basis*
(52% of sample)

P&P, Awareness and Empowerment: Disagreeing with one or more
of items (43% for P&P, 24% for awareness, 34% for
empowerment)

N = 1,492	Exposure to negative P&P, Awareness or Empowerment			
	0	1	2	3
Hazards				
No	23%	14%	7%	4%
Yes	20%	13%	10%	9%

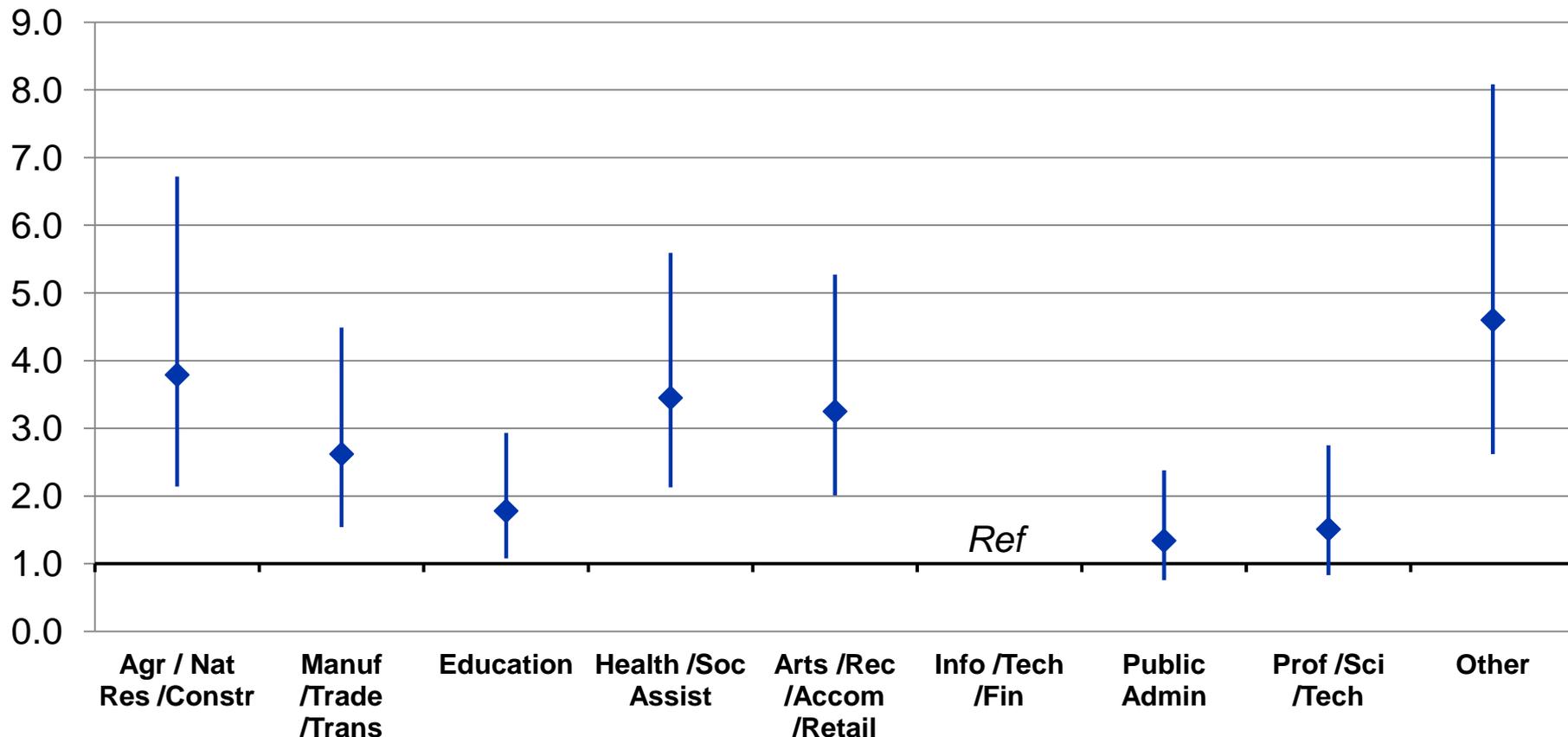


Demographic, occupation and workplace variables associated with increased risk of OH&S vulnerability (N = 1,492)





Industry groups associated with increased risk of OH&S vulnerability (N = 1,492)





Conclusions

- Our 29-item measure can be used to assess different dimensions of OH&S vulnerability at the level of the worker
- Our measure demonstrates good variability and strong factorial validity
- Groups associated with higher OH&S vulnerability include younger workers, non-permanent employees and those in small workplaces
- Future studies should examine measure performance in harder to reach samples (e.g. recent immigrants, short tenure employees)



Acknowledgements

The Institute for Work & Health operates with the support of the Province of Ontario.

The views expressed in this document are those of the authors and do not necessarily reflect those of the Province of Ontario.

This work was supported through grants from the Canadian Institutes of Health Research (CIHR) and the Institute for Safety, Compensation and Recovery Research.

PS was supported by a Discovery Early Career Researcher Award from the Australian Research Council and is currently supported by a Research Chair in Gender, Work & Health from CIHR



For copies of this presentation

Please contact me:

Peter Smith

Institute for Work & Health

Email: psmith@iwh.on.ca

Phone: 416.927.2027 (ext 2226)



Keep up on evidence-based practices from IWH



Sign up online for our monthly e-alerts, our quarterly newsletter, event notifications and more: www.iwh.on.ca/e-alerts



Follow [@iwhresearch](https://twitter.com/iwhresearch) on Twitter: www.twitter.com/iwhresearch



Connect with us on LinkedIn:
www.linkedin.com/company/institute-for-work-and-health



Subscribe to our YouTube channel: www.youtube.com/iwhresearch



**Institute
for Work &
Health**

Research Excellence
Advancing Employee
Health

www.iwh.on.ca



Occupational groups associated with increased risk of OH&S vulnerability (N = 1,492)

