



The Critical Role of Economics in Transdisciplinary Research on Work Disability Policy

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New Frontiers in Research Fund
Fonds **Nouvelles frontières** en recherche

My background

- PhD, Economics, McMaster University
- MA, Economics, University of Toronto
- MBA, University of British Columbia
- BFA, York University
- Executive Director, Inclusive Design for Employment Access (IDEA)
- Director, Centre for Research on Work Disability Policy (CRWDP)
- Member of various federal advisory boards on disability policy
- Technical committee member of various management system standards

Outline

1. Overview of my research program journey
2. System level economic evaluation of exposure reducing efforts
3. Economic burden of work injuries and diseases in 5 EU countries
4. Benefits of inclusion of persons with disabilities in society
5. Lessons learned through the journey

Many academics from different disciplines have contributed substantially to my research program

Amir Mofidi, Economist, Employment and Social Development Canada

Dan Samosh, Industrial Relations Specialist, Queen's University

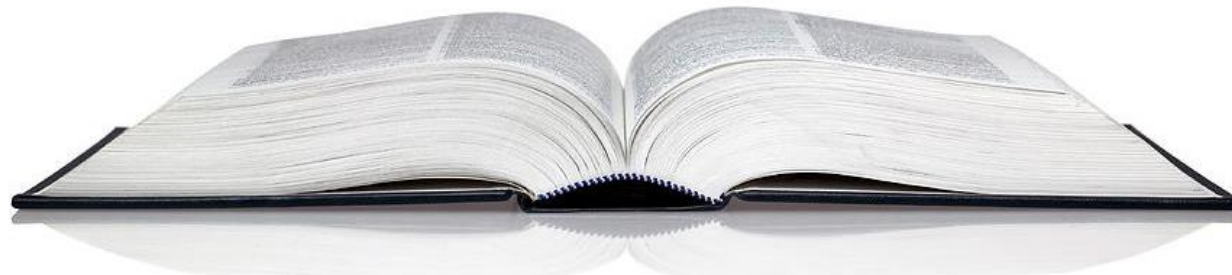
Alexis Buettgen, Critical Disability Studies Scholar, Laurier University

Pam Lahey, Policy Analyst, Employment and Social Development Canada

Paul Demers, Epidemiologist, Occupational Cancer Research Centre

Rebecca Gewurtz, Rehabilitation Scientist, McMaster University

Key Message: It takes a multidisciplinary team to advance an applied policy research program



A multidisciplinary (EDI+A) research program developments story

Some of the many talented new academics I have worked with over the years



My core funding journey has depended heavily on strong community partnerships

Research Action Alliance on the Consequences of Work Injury (RAACWI)

6-year SSHRC Community-University Research Alliance (CURA) (2006-2012)



Centre for Research on Work Disability Policy (CRWDP)

7-year SSHRC Partnership Grant (2013-2020)



Inclusive Design for Employment Access (IDEA)

Social Innovation Laboratory

6-year NFRF Transformation Stream Grant (2021-2028)

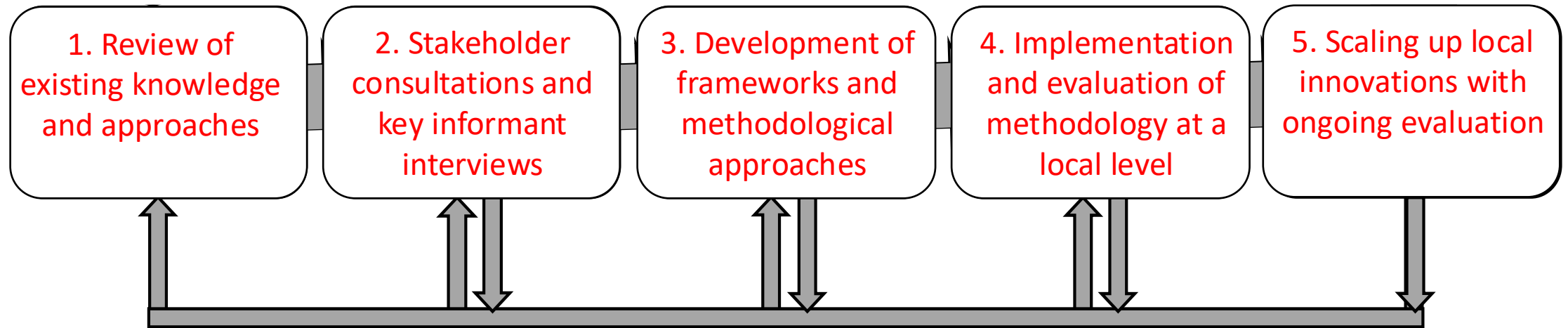


Transforming Workplace Systems to Build Sustainable Capacity for Inclusion of Diverse Youth

3.5-year ESDC Youth Employment and Skill Strategy (YESS) Grant (2025-2028)



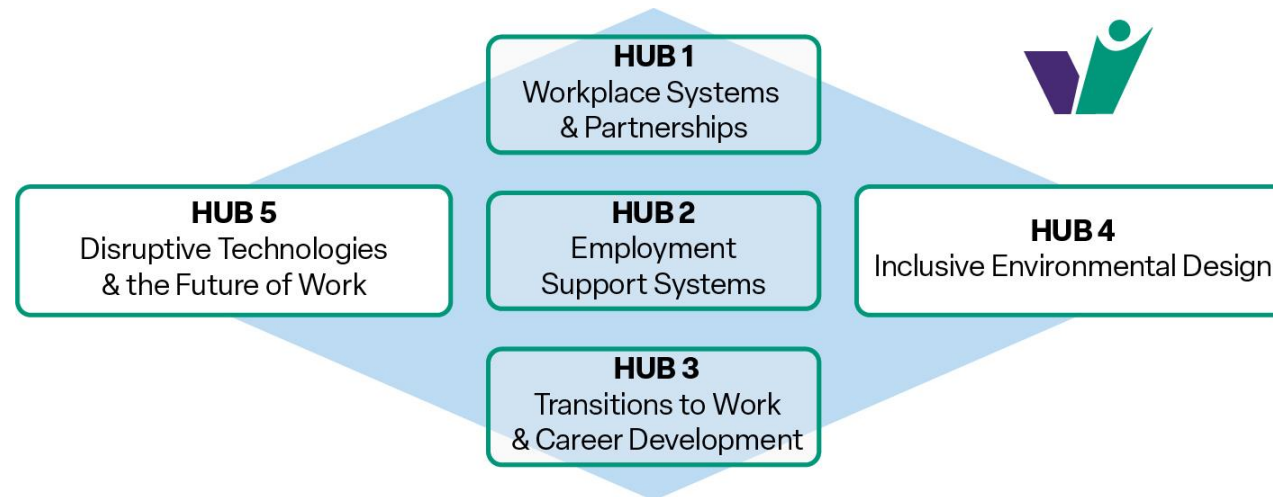
The study development process at the centre of these research programs



Iterative process that sometimes requires returning to an early step

An overview of Inclusive Design for Employment Access (IDEA)

- IDEA is a knowledge-to-practice social innovation laboratory funded by the NFRF Transformation Stream
- We focus on advancing the skills and capacities of workplace parties in the area of inclusive employment
- Our unique approach is to develop evidence-informed resources that help organization create and maintenance inclusive workplaces



Most of the knowledge-to-practice research initiatives I have worked on are in EDI+A

- RAACWI, CRWDP, IDEA, YESS initiatives
- CSA Z301:24 Equity diversity, inclusion and accessibility in apprenticeship programs
- CAN/ASC-1.1:2024-Employment – focused on the social model of disability, human rights and anti-ableism
- CSA Z1011:20 Work disability management system – includes recruitment, hiring and onboarding of persons with disabilities
- Participation on various advisory boards

In all these activities, economics and the business case feature prominently in the discourse



The Raft of the Medusa
(1818-1819)
Théodore Géricault

My early work started with the economic evaluation of OHS initiatives

- Lack of standardization across studies
- Perspective often not explicitly stated
- Narrow focus on workers' compensation, absenteeism, and health care expenses
- Transfer payment sometimes included in societal level studies
- No consideration of future resource implications
- Failure to adjust monetary values for inflation and time preference
- Reliance on questionable assumptions with no sensitivity analysis
- Scant reporting of details such as context, firm size, sample size, and time period of the intervention
- **No valuation of health outcomes**
- Few economists working in this area



Need for standardization of methods

- Several groups in North America and Europe have worked on standardizing OHS economic evaluation methods
- Several suggestions of adopting a reference case – set of standardized criteria for analysis and reporting that have professional scientific consensus
- Improve comprehension by readers, aid comparability, and facilitate uptake by policymakers, employers and other stakeholders
- I have suggested creating a registry like Cochrane and Campbell



A key challenge is getting colleagues in other disciplines to realize the value of having an economist on an evaluation team



Invite an economist to your next program evaluation study planning party!



Why are there no economist on your evaluation team!?

- Considering resource implications of program alternatives is imperative!
- It is critically important to policy decision making!



Subsequent research activities

- Economic evaluation of workplace OHS interventions
- Economic burden of various occupations cancers
- Economic evaluation of sector-level best practice initiatives
- Case study analyses including economic evaluation
- Regulatory impact analysis of various regulations coming on stream within the Accessible Canada Act
- EU study to standardize measurement of the economic burden of work injury and illness at the country level

Key message: There is more demand for economics expertise in OHS/social determinant of health and EDI+A areas than there is expertise available



Finland



Germany



Italy



The Netherlands



Poland

**Economic burden of
work injuries &
diseases in
5 EU countries**

Economic burden of work injuries & diseases in 5 EU countries

Objective

To estimate the national economic burden of occupational injuries and diseases in five European Union (EU) countries

Key Question

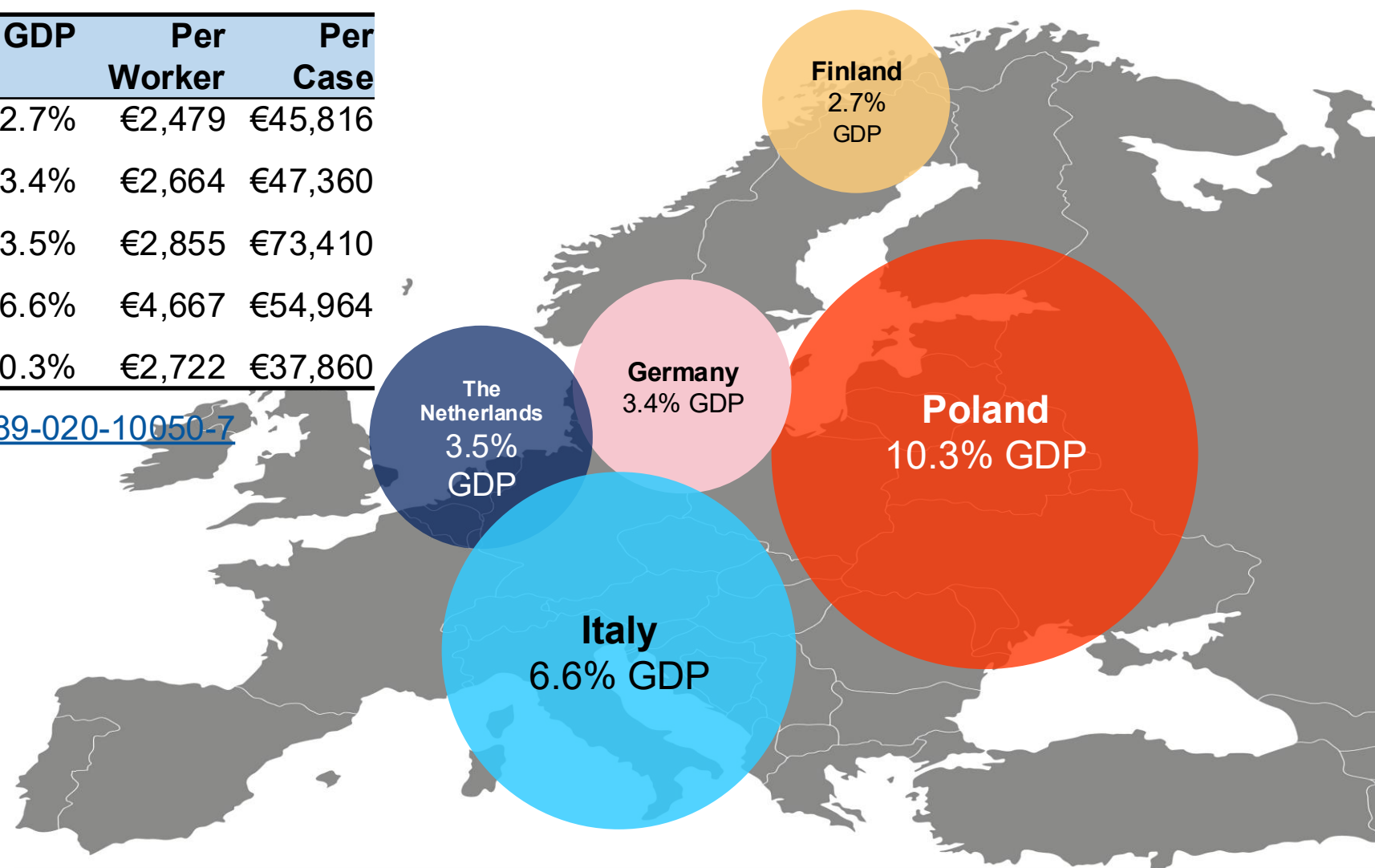
What would be the economic gains of each country if they had no new work injuries or diseases in a particular reference year?

- Serve as a basis for within- and cross-country comparison over time to monitor improvements in a country's OHS system
- Study was a pilot to determine feasibility before rolling out the method across Europe—currently being implemented in Denmark and Sweden
- Incidence cost study with reference year 2015

Impact of occupational injury and disease

Country	Total Cost	GDP	Per Worker	Per Case
Finland	B€5.6	2.7%	€2,479	€45,816
Germany	B€102.4	3.4%	€2,664	€47,360
The Netherlands	B€24.1	3.5%	€2,855	€73,410
Italy	B€109.5	6.6%	€4,667	€54,964
Poland	B€44.4	10.3%	€2,722	€37,860

<https://doi.org/10.1186/s12889-020-10050-7>





Development and implementation of a framework for estimating the economic benefits of an accessible and inclusive society

Key Question

What would be the benefits to Canadian society in reference year 2017, if Canada was accessible and inclusive in all domains relevant to full participation?



Benefits of including persons with disabilities

Measurement context

- Prevalence study
- Different conceptual framing required than a cost of illness study
- Considers a counterfactual scenario of the absence of barriers to inclusion, rather than absence of impairment or disability
- Study is the first part of a module of work on the regulatory impact analysis of the *Accessible Canada Act*, enacted in 2019

Key challenges

- What does the counterfactual look like?
- How is it different from the current situation?
- How can we measure the difference?
- Undertook extensive key informant interviews, literature syntheses, and stakeholder consultations to build up a methodology and implement it

Prevalence of disability in Canada

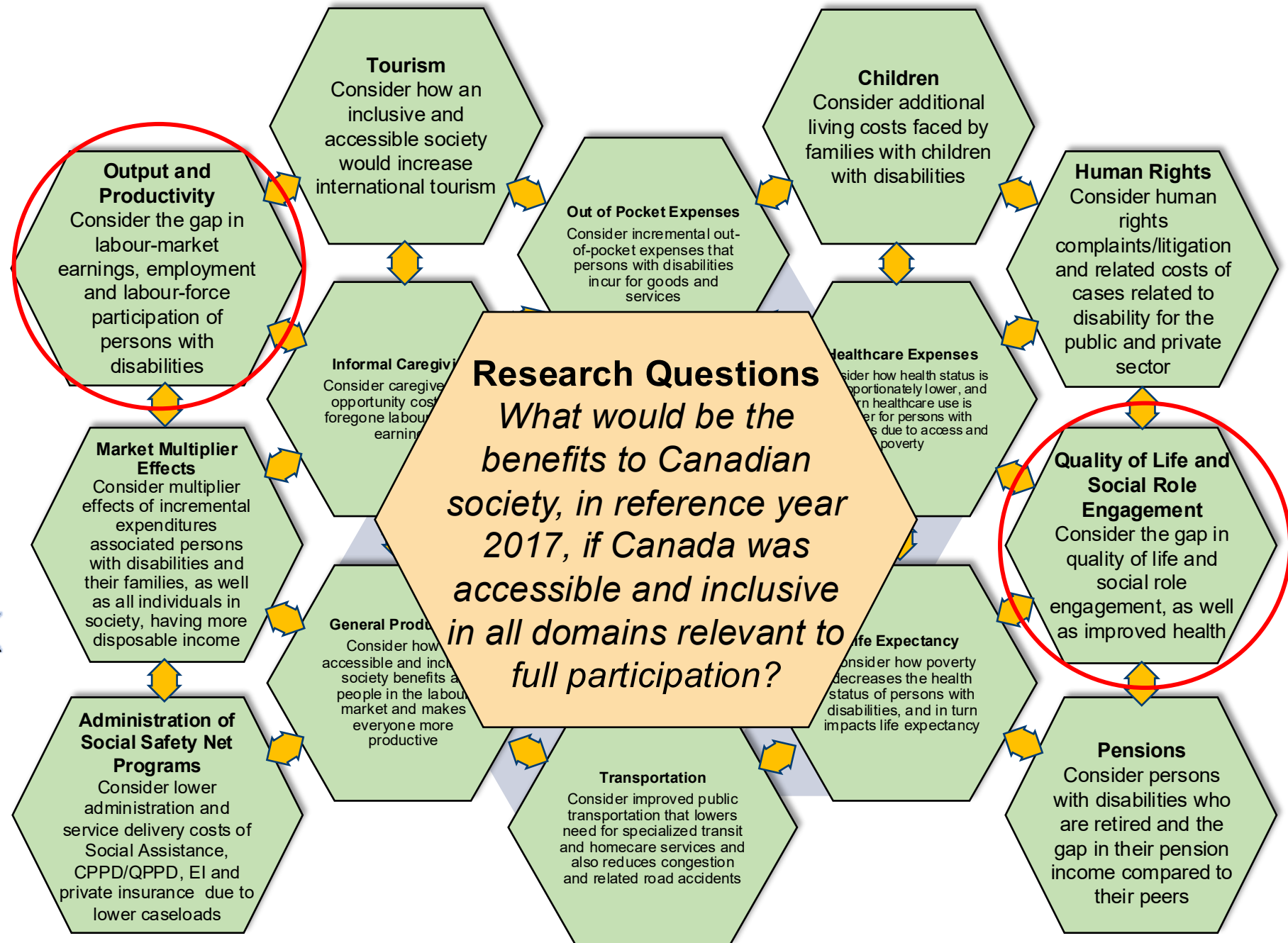
Age group	Total Population	Persons without disabilities	Persons with disabilities	Prevalence of disability
Total - aged 15 years and over	28,008,860	21,762,230	6,246,640	22.3%
15 to 24 years	4,155,440	3,609,040	546,410	13.1%
25 to 44 years	8,940,410	7,572,150	1,368,270	15.3%
45 to 64 years	9,695,840	7,336,190	2,359,650	24.3%
65 to 74 years	3,241,250	2,204,670	1,036,580	32.0%
75 years and over	1,975,920	1,040,190	935,730	47.4%

Statistics Canada, Canadian Survey on Disability (CSD), 2017 formed the basis of the study, **CSD 2022** has since been released

14 domains identified through an extensive literature review and stakeholder dialogues

1. Healthcare Expenses
2. Out-of-Pocket Expenses
3. Output and Productivity
4. Quality of Life and Social Role Engagement
5. Life Expectancy
6. Informal Caregiving
7. Children with Disabilities
8. Human Rights
9. Transportation
10. Tourism
11. General Productivity
12. Administration of Social Safety Net Programs
13. Pensions
14. Market Multiplier Effects

Benefits of Inclusion Conceptual Framework



Domain of output and productivity

$$Loss = \sum_{i=1}^k P n_i \gamma_i \text{ and } \gamma_i = \underbrace{(\beta_i^* - \beta_i) e_i}_I + \underbrace{\beta_i^* (u_i - u)}_{II} + \underbrace{\beta_i^* (d_i - d)}_{III}$$

$e_i + u_i + d_i = 100\%$ (Buckup, 2009)

P is the earnings of peers without disabilities,

n_i is the number of persons with disabilities within a certain category identified by *i*

γ_i is the productivity adjustment factor if the labour-force was accessible and inclusive

β_i^{*} is the potential labour-market earnings of persons with disabilities expressed as a percentage of *P*

β_i the actual earnings also expressed as a percentage of *P*

e_i is the employment rate of persons with disabilities

u_i, u the unemployment rate of persons with disabilities and their peers without disabilities

d_i, d the labour-market non-participation rate of persons with disabilities and their peers without disabilities

- In the counterfactual scenario, we leveled up earnings of persons with disabilities with that of their non-disabled peers

Domain of quality of life and social role engagement

- In this domain we consider the gap in quality of life and social role engagement between persons with and without disabilities
- We use QALYs/HUIs to capture quality of life
- We draw on data from the Canadian Community Health Survey (CCHS)

Health Utilities Index (HUI) for persons with and without disabilities

Participation and activity limitations ^[1]	Frequency	Mean weighted HUI
Sometimes + Often	33%	0.72
Never/Not applicable	67%	0.93

[1] CCHS, 2014.

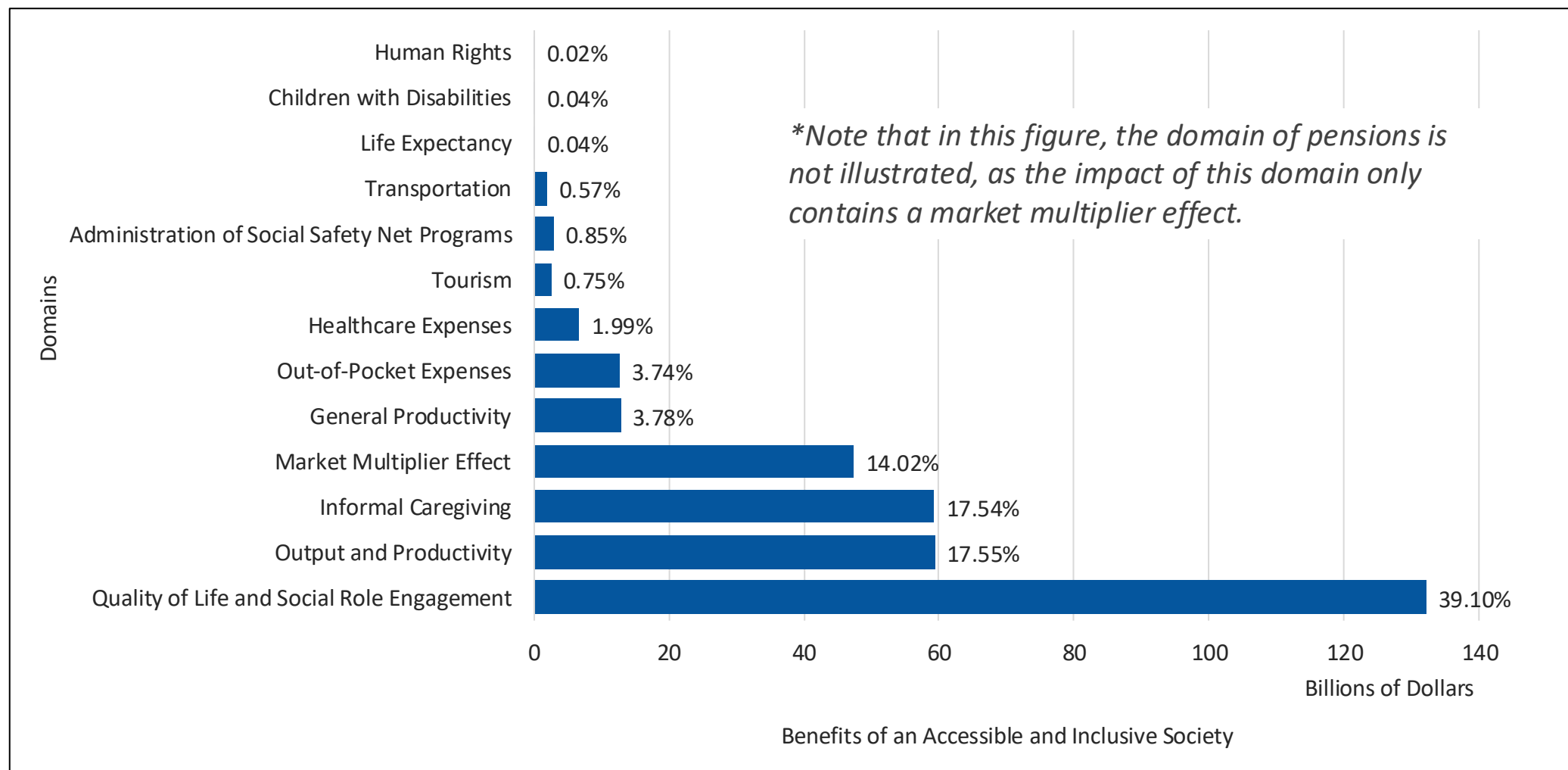
- In the counterfactual scenario, we assume persons with disabilities have the same quality of life as persons without disabilities
- We translated HRQoL into monetary terms using the value of \$100,000/QALY



Total Benefits: \$338 Billion (17.6% of GDP) in 2017
Labour-Market Benefits: \$62.2 Billion (3.2% of GDP)

Category	Lower healthcare expenses	Output and productivity gains	Quality of life and social role engagement	Spillover effects	Market multiplier effects	Total benefits	Range
Total	\$19.4 B	\$62.2 B	\$132.2 B	\$76.7 B	\$47.3 B	\$337.7 B	\$252.8-\$422.7 B
Percent	5.73%	18.42%	39.13%	22.70%	14.02%	100.00%	100.00%
Per person	\$3,100	\$9,957	\$21,156	\$12,273	\$7,578	\$54,066	\$40,473-\$67,675
Percent of GDP	1.0%	3.2%	6.9%	4.0%	2.5%	17.6%	13.1%-22.0%

Share of monetized benefits by domain



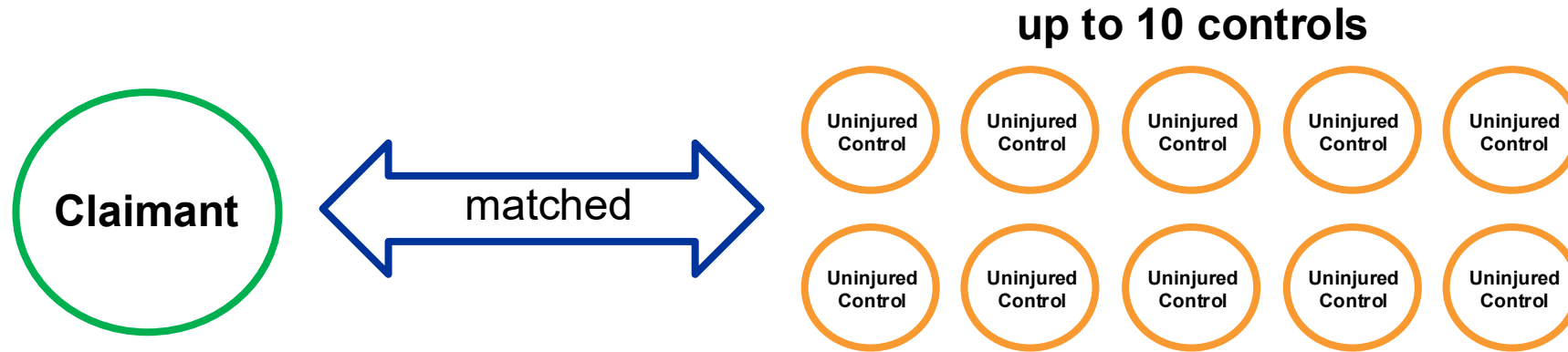
Study of income loss due to permanent impairment from a work injury

Measuring Earnings Loss

- Compared worker's labour-market earnings with control group made up of workers with similar earnings to injured worker prior to injury date
 - Addresses earnings trajectory over the life course
 - Addresses business cycle effects
- Undertook linkage of workers' compensation data with the Longitudinal Administrative Databank (LAD)—20% simple random sample of all Canadian tax filers
- Matched each claimant with similar controls to identify income difference

There is much potential to investigate factors contributing to earnings loss associate with disability with tax file linkages

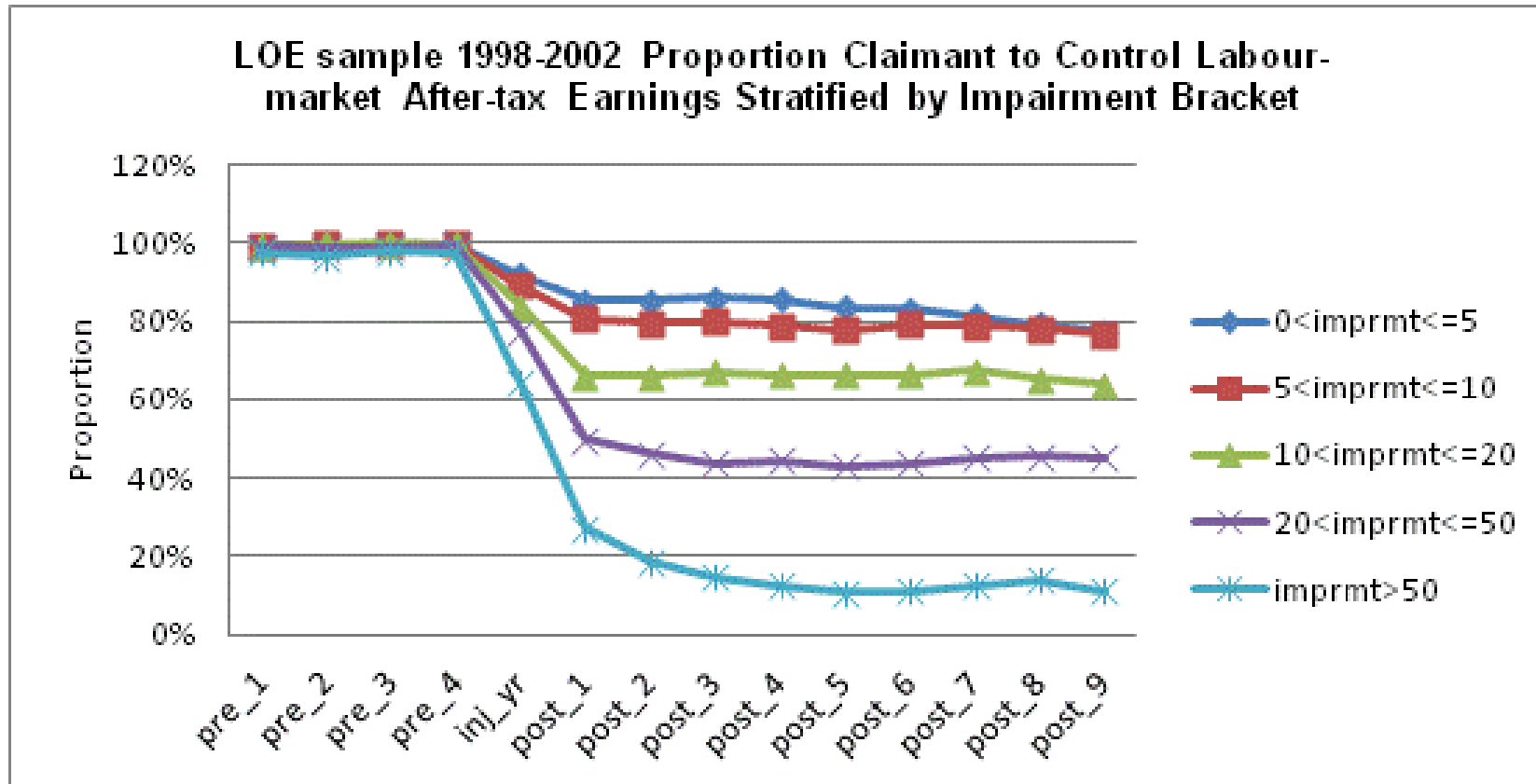
Matched each claimant with similar controls



Matching Characteristics

earnings in each of 4 years prior to accident year
presence patterns in tax files
sex
age
region of residence
propensity score

Average yearly labour-market earnings loss by impairment bracket



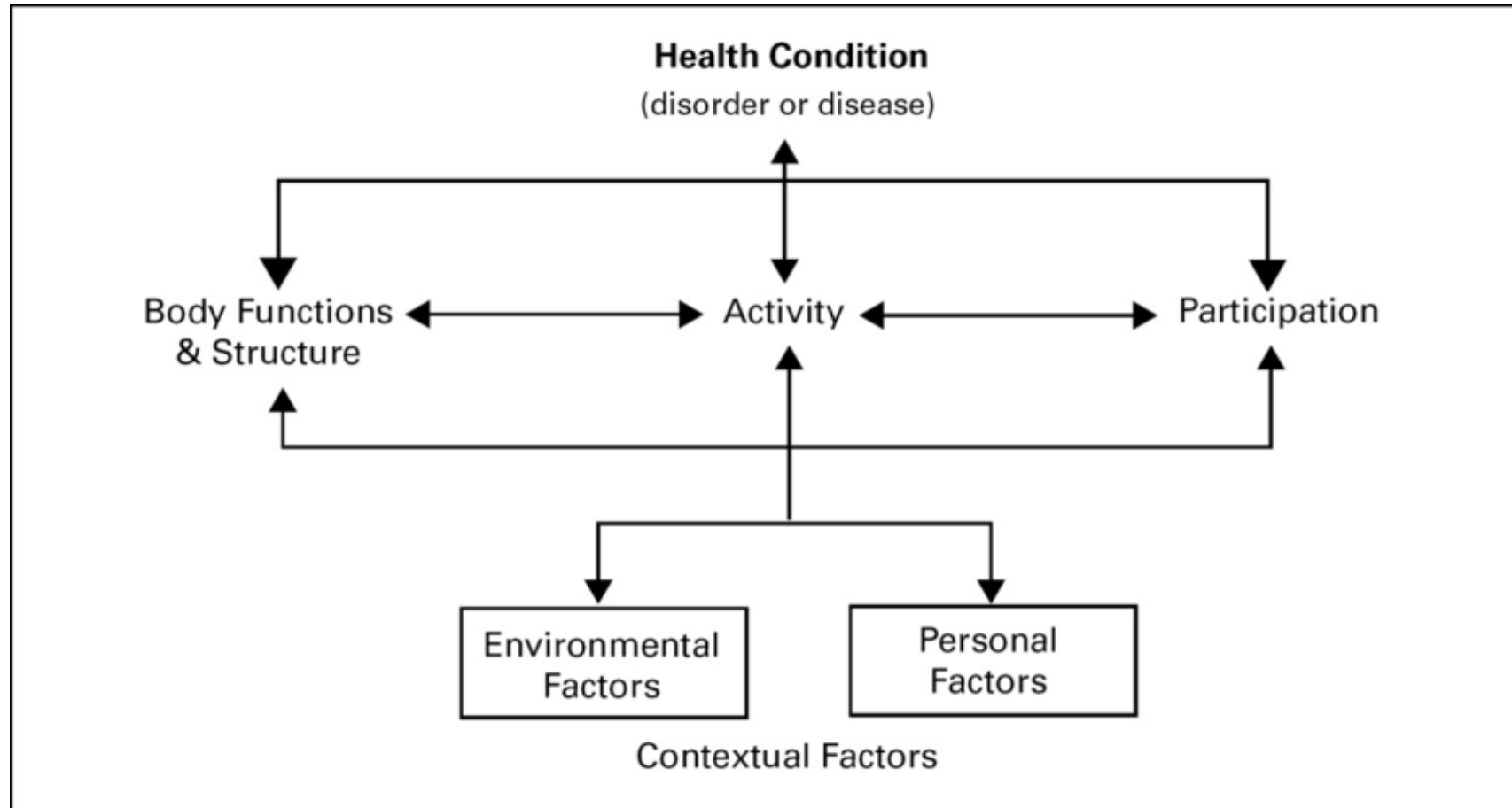
Summary of study findings

- Earnings loss following permanent impairment from a work injury varies by severity of impairment
- Even low levels of impairment experience earnings losses
- Distribution of earnings losses vary substantially even within an impairment bracket
- We used these linkages to investigate changes (associated with permanent impairment) in life expectancy, marital dissolution and other economic and social outcomes

Concern with use of QALY

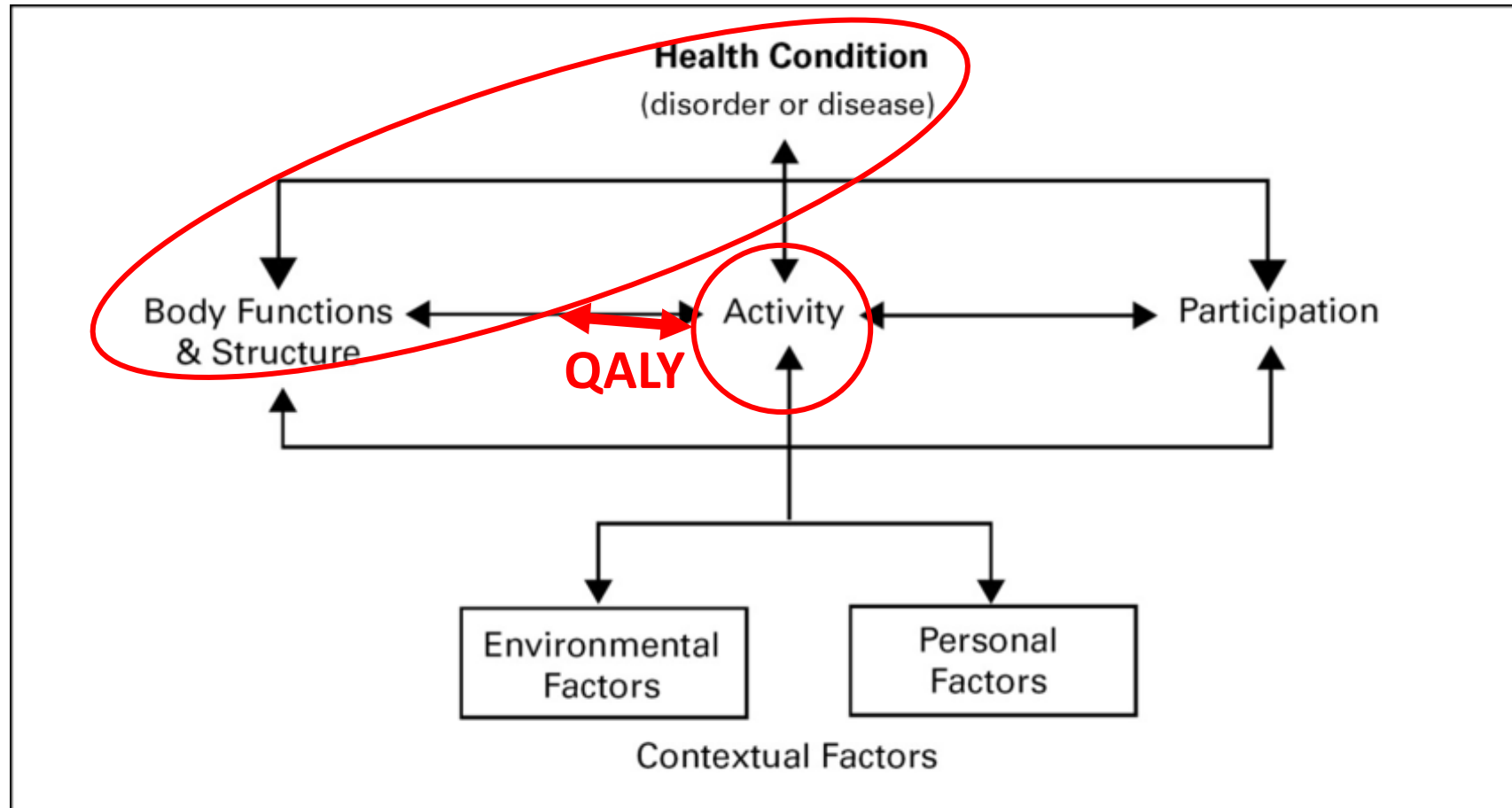
- QALY is focused on individual health and function
- Measure based on an individual's preference for different health states
- For the *Accessible Canada Act*, issue is about accessibility and inclusion related to environmental factors, not health and function
- Built and social environments are critical factors that create barriers to full participation
- Disability is a person in context phenomenon
- WHO biopsychosocial model provides a good framework for conceptualizing the impact of personal, health and contextual factors on social role participation

World Health Organization framework

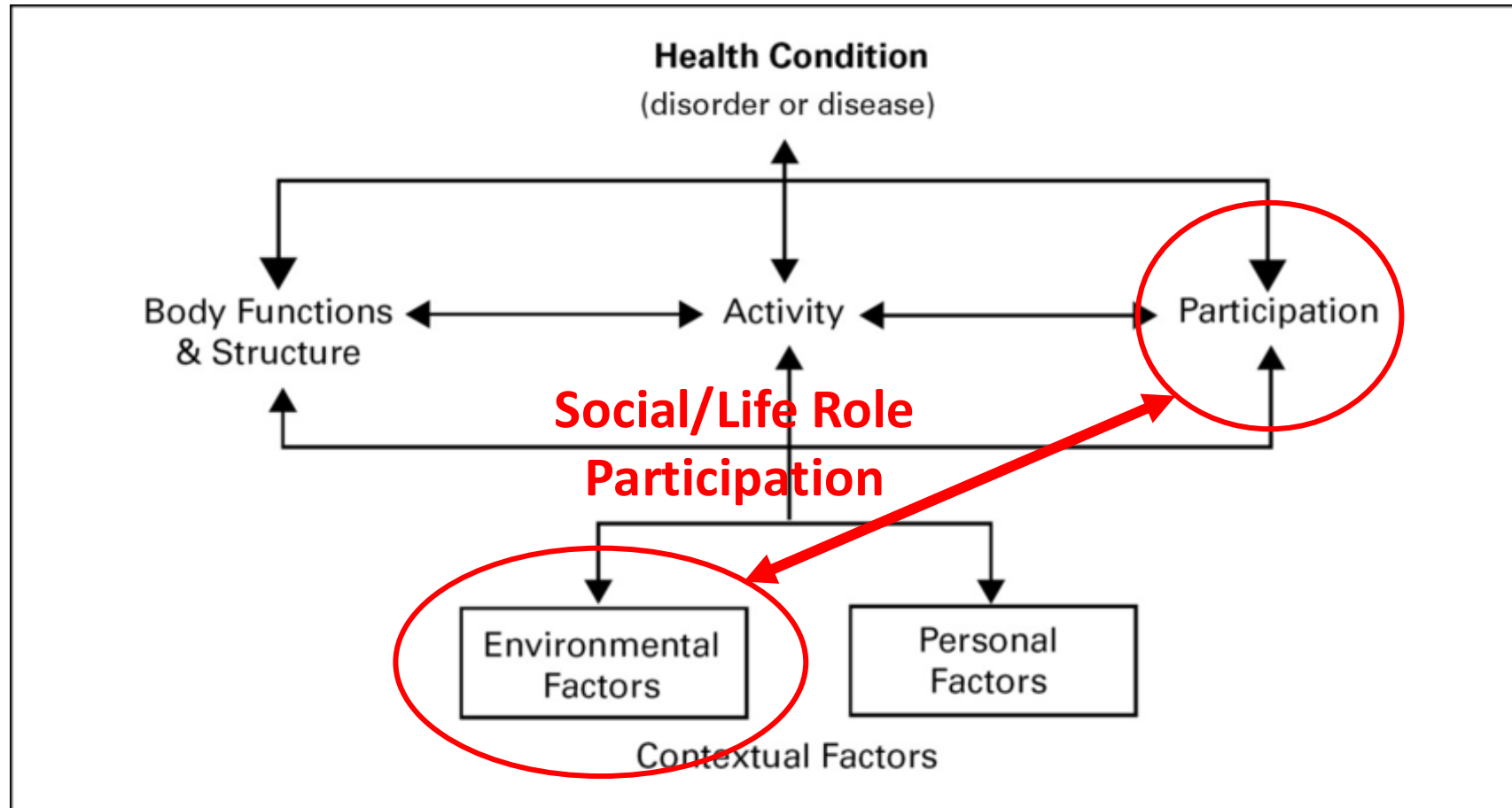


Biopsychosocial Model of Disability (WHO, 2001)

World Health Organization framework



World Health Organization framework

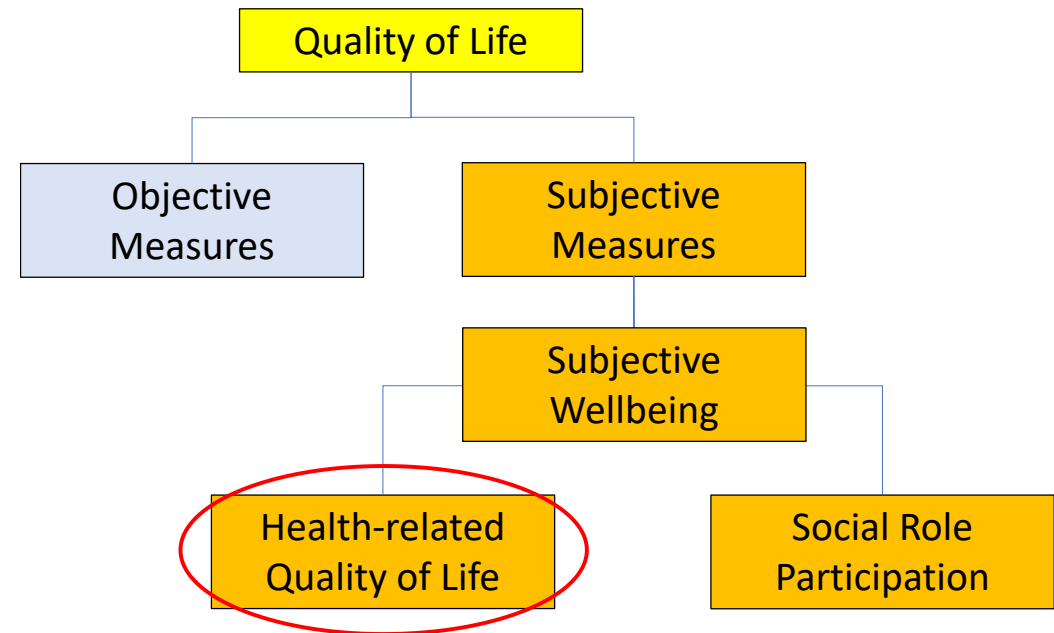


Biopsychosocial Model of Disability (WHO, 2001)

Project on expanding QoL measure

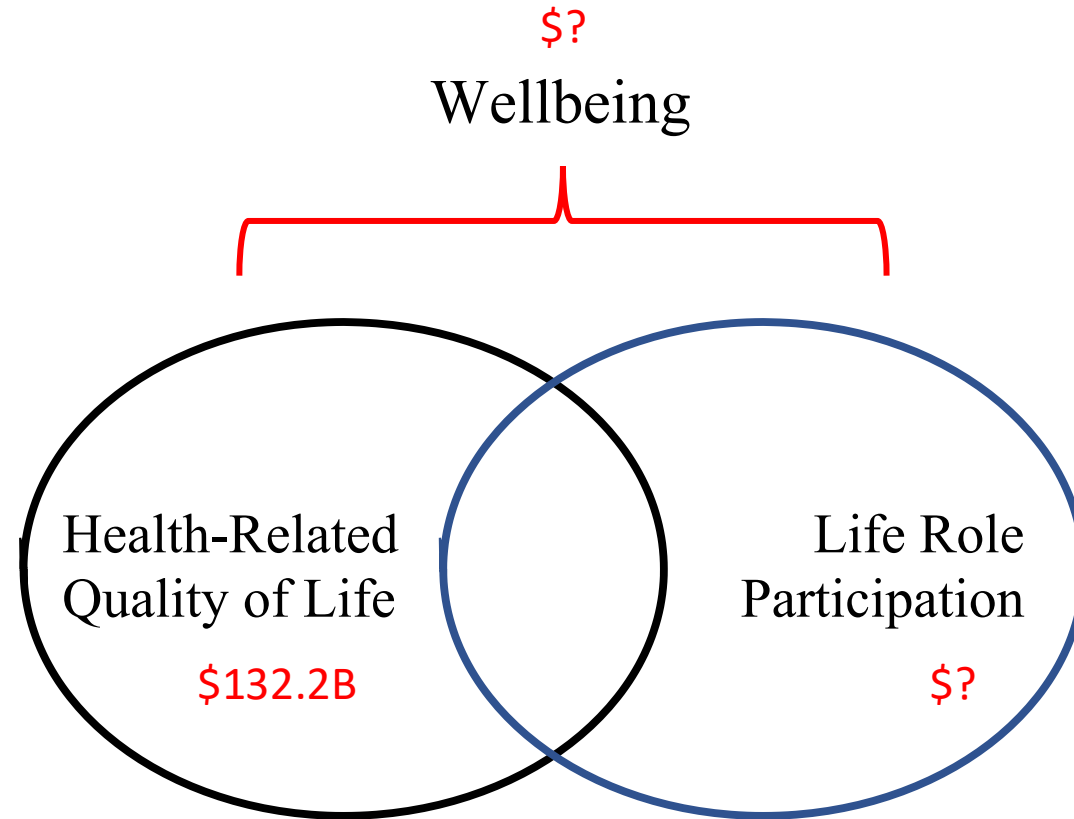
Objectives

1. Expand the QoL measure to better quantify and monetize the benefits of inclusion
2. Develop a framework for QoL in terms of Social/Life Role Participation



Relationship between three key QoL constructs

Relationship identified through expert insights



← We explored ways to monetize wellbeing

← We explored measures of life role participation to identify a way to monetize this construct

Step 1. Difference of life satisfaction of persons with and without disability

- General Social Survey (GSS) and Canadian Community Health Survey (CCHS) offer an opportunity to examine life satisfaction and their correlates over time using a consistent analytical framework (Bonikowska et al., 2014)
- Used life satisfaction from CCHS 2010-2011 cycle
- Question asked: Using a scale of 0 to 10, where 0 means "Very dissatisfied" and 10 means "Very satisfied," how do you feel about your life as a whole right now?

Total gap in life satisfaction of persons with disabilities =

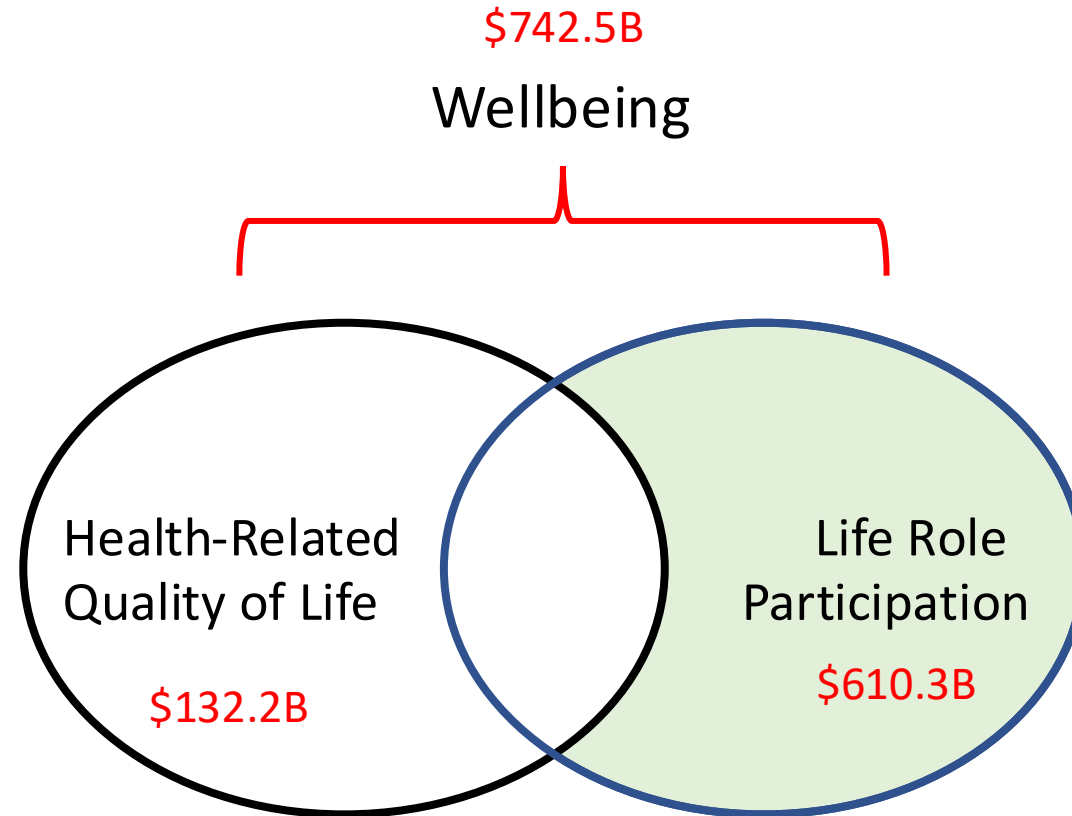
$\sum$ persons with disabilities in gender age bracket x gap in life satisfaction

Step 2. Monetary valuation of life satisfaction

- We drew on Helliwell et al. (2010) study, which is based on three Canadian surveys
- Drawing on this study, we assumed one point fall in job satisfaction (on a 10-point scale) has a cost of -\$30,000 to -\$55,000 (Helliwell and Huang, 2010; Fujiwara and Campbell, 2011)
- We adjusted this range from **\$36,561 to \$67,028** in 2017 Canadian dollars (mid-point at **\$51,794**) using consumer price index (CPI)

Relationship between the three QoL constructs

Relationship identified through expert insights



The total benefit arising from a fully accessible and inclusive society is much greater than our original estimate

We explored measures of life role participation to identify a way to monetize this construct

Summary of study findings

- Scan of measures of QoL in terms of life role participation did not uncover a comprehensive measure
- Estimated monetary value of life satisfaction was found to be substantially larger than original QoL estimate based on QALYs (i.e., \$742.5B versus \$132.2B)
- Followed this work with development of a conceptual framework for QoL in terms of social/life role participation
- Ultimately meant to underpin the development of a new measurement paradigm of QoL associate with social/life role participation

Furthering Accessibility and Innovation Research (FAIR) initiative

Project Objective

To develop an accessibility measurement protocol focused on the experiences of persons with disabilities through an environmental scan of existing measurement protocols and expert knowledge gathered through a modified Delphi Panel process.

Activities

1. An international review of existing accessibility questionnaires.
2. Feedback from disability experts through a modified Delphi Panel process.



Delphi panel process to develop a framework for life role participation

- Round 1: In-depth interview about views on Accessibility, Disability Inclusion, and Quality of Life constructs
 - Provided preliminary definitions from literature and asked to comment on them
 - Inquired about social/life role participation domains
- Round 2: Feedback on a preliminary framework developed from previous round responses and literature review
- Round 3: Feedback on draft questions for domains

Life roles and related activities/areas

Activities of Daily Living

- Personal care and health
- Nutrition
- Communication
- Mobility
- Physical fitness
- Psychological well-being
- Finances and shopping
- Interpersonal relationships

Vocational Activities

- Education
- Work
- Volunteering

Other Activities

- Community
- Spiritual
- Political
- Recreation

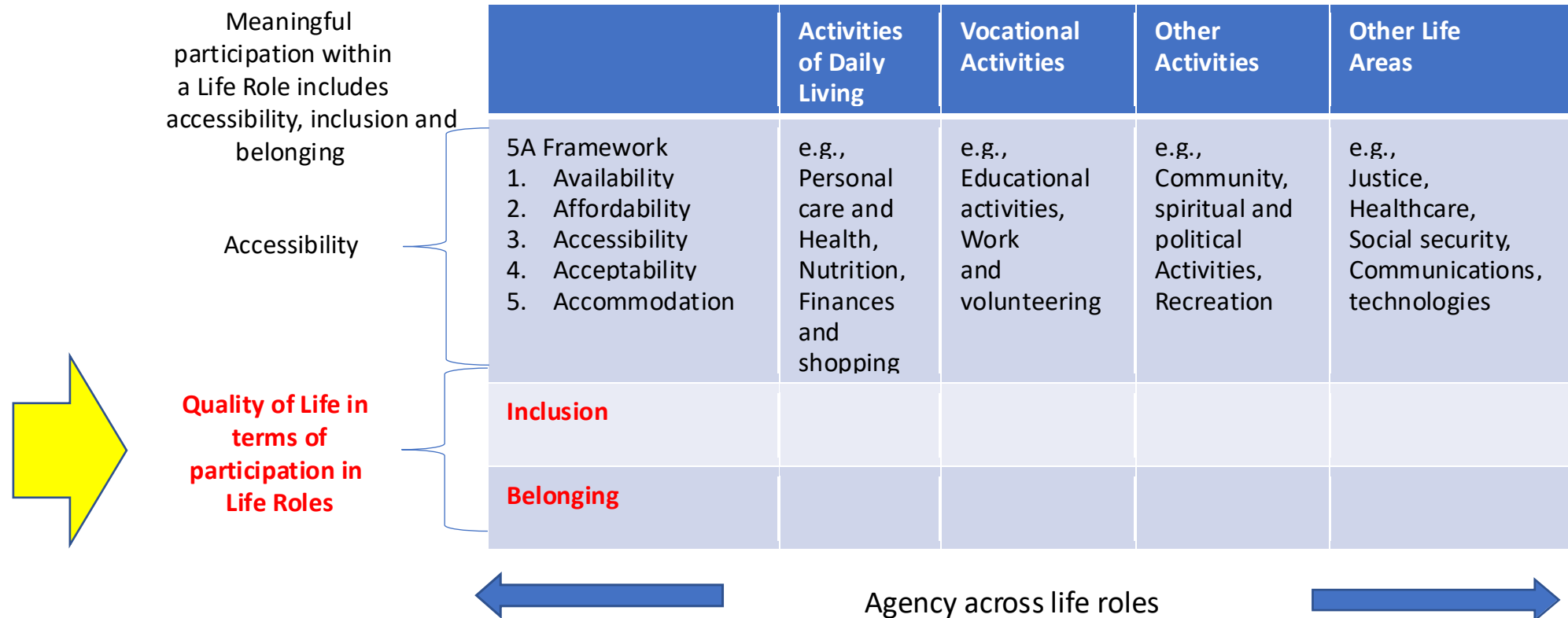
Other Life Areas

- Justice and equal recognition before the law
- Healthcare and rehabilitation services
- Financial/social security
- Social media, internet and other communication technologies

Cross-Cutting Themes

- Built and natural environment
- Public and private transportation
- Assistive technologies and services
- Attitudes and stigma

Framework for Quality of Life in terms of social/life roles



Degree of agency and independence across life roles bears on Quality of Life, i.e., freedom to make choices about what Life Roles to participate in and on what terms.

Summary of study findings

- Respondents found the initiative extremely important
- Social/life roles approach appears to have broad acceptance
- Cross cutting themes appear acceptable
- Other life areas needs further exploration
- Accessibility not being sufficient--inclusion and belonging were essential
- Freedom of choice, agency, and dignity were concepts that were often raised

Key message: Better measuring quality of life associate with social/life role participation is a hugely important area of work

Final comments

- It takes a multidisciplinary team to advance an applied policy research program
- Economics and the business case feature prominently in the EDI+A policy arena discourse
- One challenge is getting colleagues in other disciplines to realize the value of an economist on an evaluation team
- The bigger challenge is finding economists with an interest in participating in multidisciplinary, partnered research initiatives
- There is more demand for economics expertise in the OHS and EDI+A areas than there is expertise available
- Better measuring quality of life associate with social/life role participation is a hugely important area of work



Liberty Leading the People
(1830)
Eugène Delacroix

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