



# The Relationship of Neighbourhood-level Material and Social Deprivation with Health-related Quality of Life

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# What is deprivation?

- Concept of deprivation was first introduced in the 1980's by Peter Townsend– "an observable and demonstrable disadvantage **relative** to the local community or the wider society or nation to which the individual, family or group belong"
- Two forms of deprivation: material and social
  - Material deprivation refers to the access of goods and conveniences
  - Social deprivation refers to disadvantages related to social position
- The objective of this study was to examine the relationship of neighbourhood-level material and social deprivation with health-related quality of life, measured by the EQ-5D-5L, in the general adult population in Alberta.



# Data Source

- Health Quality Council of Alberta cross-sectional “Satisfaction & Experience with Healthcare Services Survey”
- Three independent cross-sectional population-based surveys from 2012, 2014, and 2016
- Residents of Alberta, Canada, aged 18 years and older who were living in a household
- Survey responses gathered by telephone
- Sampling quotas were based on healthcare registration data from the previous year to ensure final samples were representative of age, gender, and composition of the five Alberta Health Zones
- n= 11,835



# How do you measure neighbourhood-level deprivation?

- Area-based indices of material and social deprivation
- Indices were derived using the Pampalon index and the 2006 Canadian census based on postal code dissemination areas.
  - **Material deprivation** incorporates the proportion of individuals without a high school diploma, the employment-population ratio, and the average person income
  - **Social deprivation** incorporates the proportion of individuals living alone, the proportion of individuals separated, divorced, or widowed, and the proportion of single parent families
- The dissemination areas were assigned into quintiles, with those in the highest quintiles representing the most deprived areas.

# How do you measure HRQL?



## EQ-5D-5L

Under each heading, please tick the ONE box that best describes your health TODAY.

### MOBILITY

- I have no problems in walking about
- I have slight problems in walking about
- I have moderate problems in walking about
- I have severe problems in walking about
- I am unable to walk about

### SELF-CARE

- I have no problems washing or dressing myself
- I have slight problems washing or dressing myself
- I have moderate problems washing or dressing myself
- I have severe problems washing or dressing myself
- I am unable to wash or dress myself

### USUAL ACTIVITIES (e.g. work, study, housework, family or leisure activities)

- I have no problems doing my usual activities
- I have slight problems doing my usual activities
- I have moderate problems doing my usual activities
- I have severe problems doing my usual activities
- I am unable to do my usual activities

### PAIN / DISCOMFORT

- I have no pain or discomfort
- I have slight pain or discomfort
- I have moderate pain or discomfort
- I have severe pain or discomfort
- I have extreme pain or discomfort

### ANXIETY / DEPRESSION

- I am not anxious or depressed
- I am slightly anxious or depressed
- I am moderately anxious or depressed
- I am severely anxious or depressed
- I am extremely anxious or depressed

- We would like to know how good or bad your health is TODAY.

- This scale is numbered from 0 to 100.

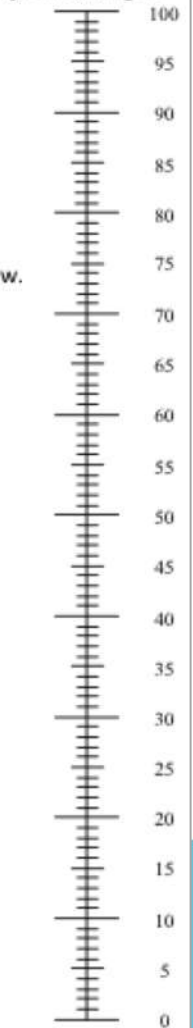
- 100 means the best health you can imagine.
- 0 means the worst health you can imagine.

- Mark an X on the scale to indicate how your health is TODAY.

- Now, please write the number you marked on the scale in the box below.

YOUR HEALTH TODAY =

The best health you can imagine



The worst health you can imagine

# Analysis

- Sub-groups:
  - number of co-morbidities (0, 1, or  $\geq 2$ )
  - sex (male; female)
  - age (18-44, 45-64, 65+ years)
- EQ-5D-5L dimension level data:
  - no problems (level 1)
  - slight or moderate problems (levels 2-3)
  - severe or extreme problems (levels 4-5)
- EQ-5D-5L dimensions, index and VAS scores were compared across the material and social deprivation indices quintiles in the overall sample and by participant sub-groups, and differences were tested using ANOVA and chi-square tests.
- Multivariate linear regression models (adjusted for age, sex, and number of comorbidities) were conducted to examine the independent association of material and social deprivation with the EQ-5D-5L index and VAS scores, and multinomial logistic regression models with each of the EQ-5D-5L dimensions.

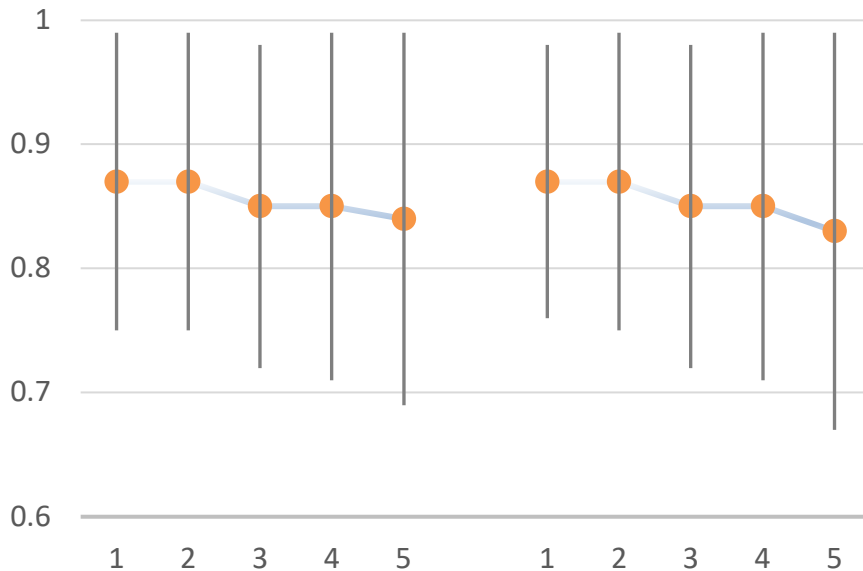
# Participant characteristics

	Characteristic <sup>a</sup>	Mean ± SD or n (%) (N= 11,835)
Age (years)	18-44	8,735 (73.8)
	45-64	2,545 (21.5)
	65+	555 (4.7)
Sex	Male	5,370 (45.4)
	Female	6,465 (54.6)
Number of comorbidities	0	5,014 (42.4)
	1	2,490 (21.0)
	≥2	4,331 (36.6)
Neighbourhood-level material deprivation quintiles	1	2,029 (17.1)
	2	2,350 (19.9)
	3	2,358 (19.9)
	4	2,567 (21.7)
	5	2,531 (21.4)
Neighbourhood-level social deprivation quintiles	1	1,880 (15.9)
	2	2,027 (17.1)
	3	2,502 (21.1)
	4	3,179 (26.9)
	5	2,247 (19.0)
EQ-5D-5L	Index score	0.85 ± 0.13
	EQ-VAS	78.3 ± 15.7
	Mobility*	2,823 (23.9)
	Self-care*	621 (5.3)
	Usual activities*	2,759 (23.3)
	Pain/discomfort*	6,945 (58.7)
	Anxiety/depression*	3,790 (32.0)

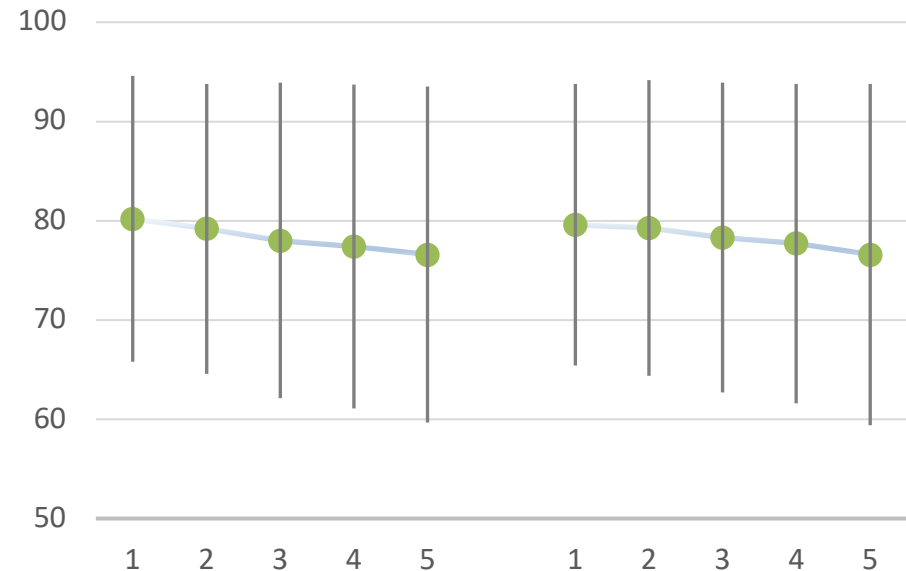
<sup>a</sup>Survey weights applied \*Presence of problems (levels 2-5)

# Neighbourhood-level deprivation and EQ-5D-5L index and VAS scores

MEAN (AND SD) EQ-5D INDEX SCORES  
WITHIN DEPRIVATION QUINTILES



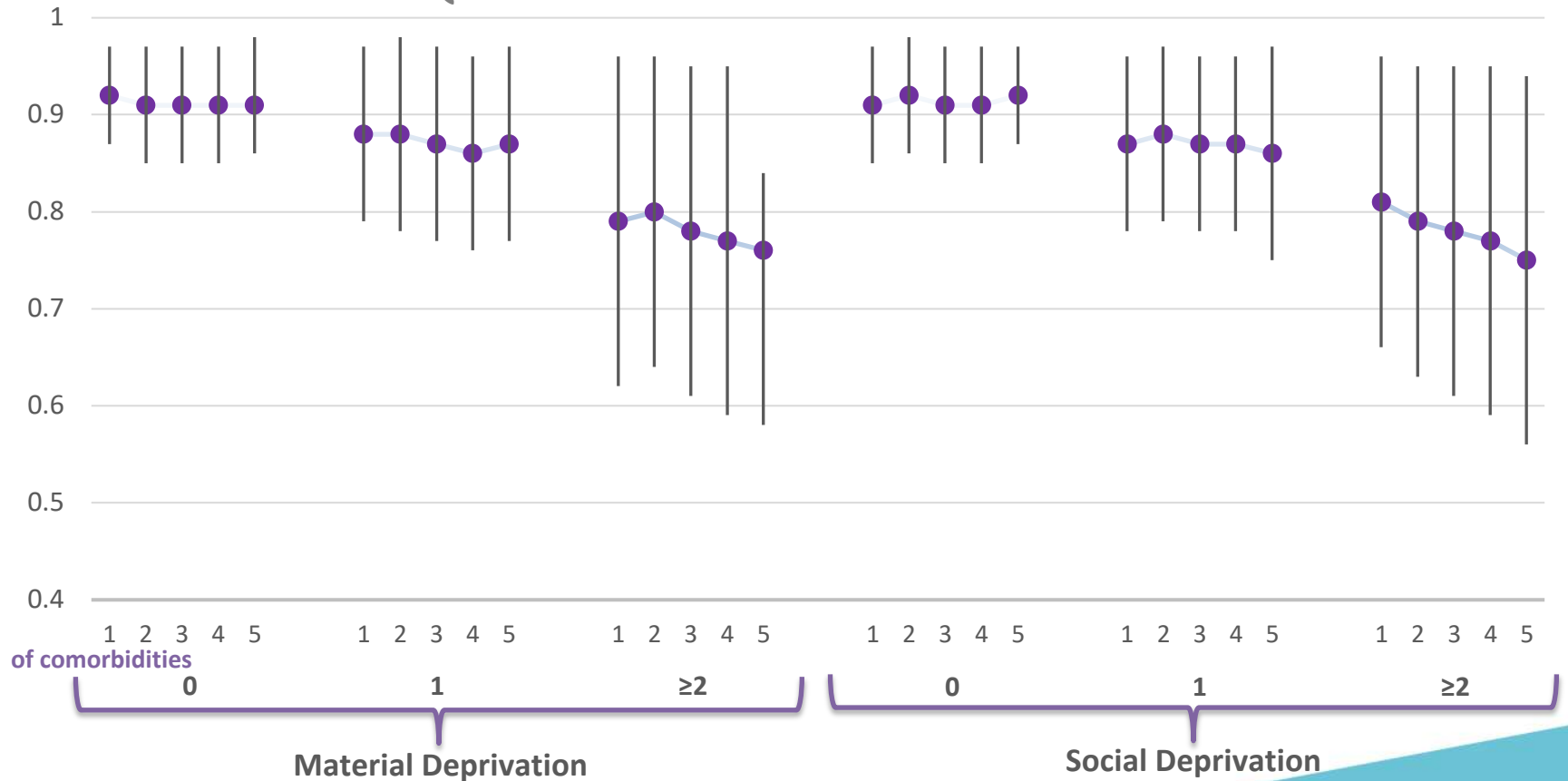
MEAN (AND SD) EQ-5D VAS SCORES WITHIN  
DEPRIVATION QUINTILES





# HRQL, Deprivation, and Comorbidities

MEAN (AND SD) EQ-5D INDEX SCORES WITHIN DEPRIVATION INDEX QUINTILES BY NUMBER OF COMORBIDITIES



# Neighbourhood-level deprivation and EQ-5D-5L dimensions

EQ-5D-5L Dimensions (Presence of problems, levels 2-5)	Material Deprivation Quintiles						Social Deprivation Quintiles					
	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	p-value	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	p-value
<b>Mobility</b>	19.2	19.6	24.9	25.9	29.2	<0.001	19.8	20.2	23.2	25.9	29.4	<0.001
<b>Self-care</b>	4.4	4.6	5.0	5.8	6.7	0.002	3.6	4.1	4.9	6.3	7.0	<0.001
<b>Usual activities</b>	19.4	20.5	25.4	24.9	26.1	<0.001	20.9	20.3	23.3	24.0	27.8	<0.001
<b>Pain/discomfort</b>	51.9	55.6	59.1	61.5	64.0	<0.001	56.0	55.4	59.1	60.5	61.2	<0.001
<b>Anxiety/depression</b>	28.8	31.5	31.6	33.4	34.0	0.002	28.6	28.6	33.4	32.7	35.4	<0.001

# Independent association of neighbourhood-level deprivation with EQ-5D-5L

	EQ-5D-5L index score			EQ-5D-5L VAS score		
	Beta	SE	P-value	Beta	SE	P-value
<b>Neighbourhood-level Material deprivation (ref: quintile 1)</b>						
2	-0.002	0.004	0.676	-0.6	0.4	0.141
3	-0.009	0.004	<b>0.014*</b>	-1.3	0.4	<b>0.002*</b>
4	-0.013	0.004	<b>&lt;0.001*</b>	-1.7	0.4	<b>&lt;0.001*</b>
5	-0.018	0.004	<b>&lt;0.001*</b>	-2.1	0.4	<b>&lt;0.001*</b>
<b>Neighbourhood-level Social deprivation (ref: quintile 1)</b>						
2	-0.004	0.004	0.316	-0.5	0.5	0.319
3	-0.009	0.004	<b>0.011*</b>	-0.8	0.4	0.079
4	-0.011	0.004	<b>0.002*</b>	-0.9	0.4	<b>0.038*</b>
5	-0.022	0.004	<b>&lt;0.001*</b>	-1.7	0.4	<b>&lt;0.001*</b>

\*Statistical significance at P<0.05

# Independent association of neighbourhood-level deprivation with EQ-5D-5L

	Mobility			Self-care			Usual activities			Pain/ discomfort			Anxiety/ depression		
	OR	95%CI		OR	95%CI		OR	95%CI		OR	95%CI		OR	95%CI	
<b>Material deprivation (ref: quintile 1)</b>															
<b>2</b>	0.99	0.84	1.16	0.99	0.74	1.34	1.03	0.87	1.20	1.13	0.99	1.28	1.07	0.93	1.23
<b>3</b>	<b>1.28</b>	1.09	1.50	0.98	0.74	1.31	<b>1.30</b>	1.11	1.52	<b>1.23</b>	1.08	1.40	1.01	0.88	1.16
<b>4</b>	<b>1.36</b>	1.16	1.59	1.15	0.87	1.52	<b>1.24</b>	1.06	1.45	<b>1.38</b>	1.21	1.57	1.09	0.96	1.25
<b>5</b>	<b>1.52</b>	1.30	1.78	1.23	0.94	1.62	<b>1.24</b>	1.06	1.45	<b>1.46</b>	1.28	1.67	1.09	0.95	1.25
<b>Social deprivation (ref: quintile 1)</b>															
<b>2</b>	1.07	0.90	1.27	1.18	0.85	1.64	0.98	0.83	1.16	1.00	0.87	1.15	1.01	0.87	1.17
<b>3</b>	1.16	0.99	1.36	1.30	0.95	1.76	1.08	0.93	1.27	1.08	0.94	1.23	<b>1.21</b>	1.05	1.38
<b>4</b>	<b>1.25</b>	1.07	1.46	<b>1.58</b>	1.19	2.11	1.05	0.90	1.22	1.06	0.93	1.20	1.13	0.99	1.29
<b>5</b>	<b>1.47</b>	1.25	1.73	<b>1.70</b>	1.27	2.29	<b>1.26</b>	1.08	1.47	1.07	0.93	1.22	<b>1.26</b>	1.10	1.45

Statistical significance at P<0.05

# Key findings

- An increase in deprivation, material or social, is accompanied by a reduction in HRQL, demonstrated by the EQ-5D-5L index and VAS scores, regardless of age, sex, or number of comorbidities.
  - This reduction is slightly larger in older adults and in those with more comorbidities.
- The proportion of problems in each EQ-5D-5L dimension was higher with each deprivation quintile (social or material) especially in mobility, pain/discomfort, and anxiety/depression.

# Discussion of findings

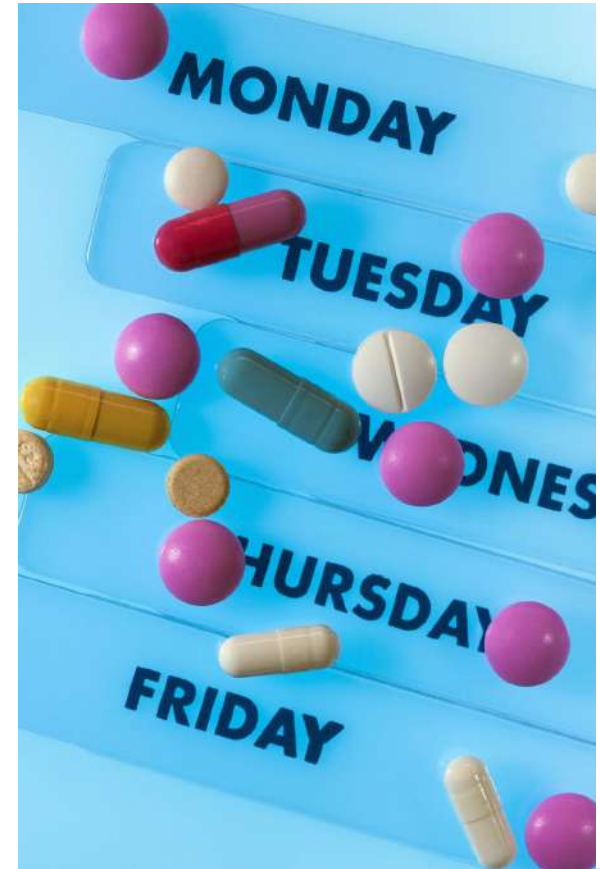
- Interactions between dimensions
  - ↓ mobility= ↓ usual activities
  - ↑ anxiety/depression= ↓ usual activities
  - ↑ pain/discomfort= problems in all other dimensions
- Higher levels of material deprivation (but not social) associated with problems in pain/discomfort
  - Physically demanding occupations
- Higher levels of social deprivation (but not material) associated with problems in anxiety/depression
  - Poorer mental health in those with weak social support

# Limitations

- Response heterogeneity
- 32% response rate
- Community-dwelling participants only
- Residual confounding
- Misclassification bias

# Implications for public policy

- Health policies or interventions to reduce inequalities in HRQL should be targeted to individuals with multiple morbidities. Targeting these populations would also likely reduce problems reported with mobility, pain, and anxiety/depression (greatest amount of problems reported).





# Conclusions

- Neighbourhood-level material and social deprivation are significantly associated with EQ-5D-5L dimensions, index and VAS scores.
- Individuals in higher deprivation quintiles reported lower HRQL, and more problems on each of the EQ-5D-5L dimensions.
- Neighbourhood-level material deprivation affects HRQL differently than social deprivation.
- Future research must look broadly into the mechanisms for poorer HRQL among deprived individuals.

# Thank you for listening!

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