

Child Health Evaluative Sciences Rounds

Presenter: Dr. Barry Forer

Feb. 27, 2023

Monitoring and Contextualizing
Population-Level Early Child
Development in Canada, With a BC Focus



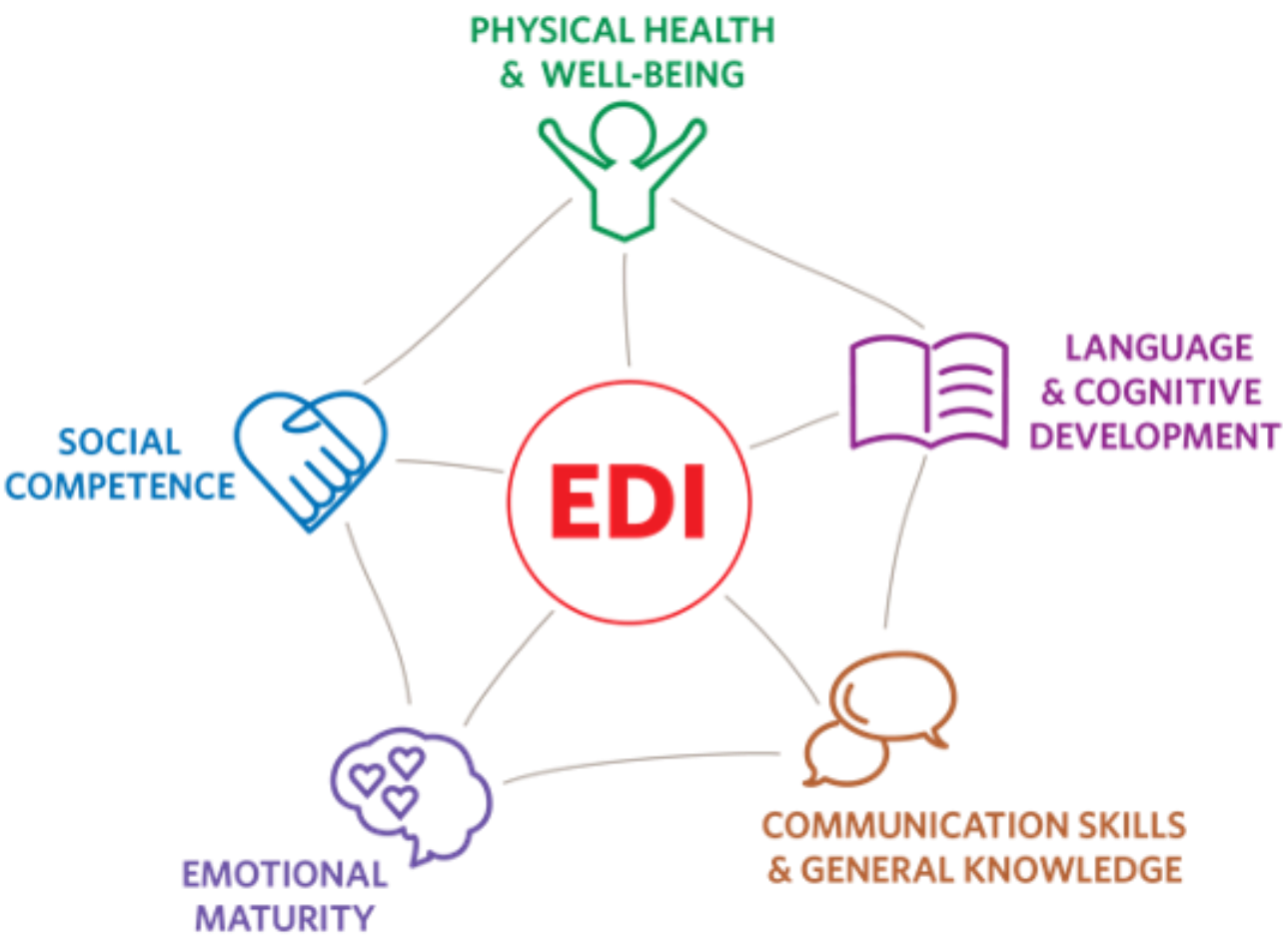
Early
Development
Instrument

HUMAN
EARLY LEARNING
PARTNERSHIP



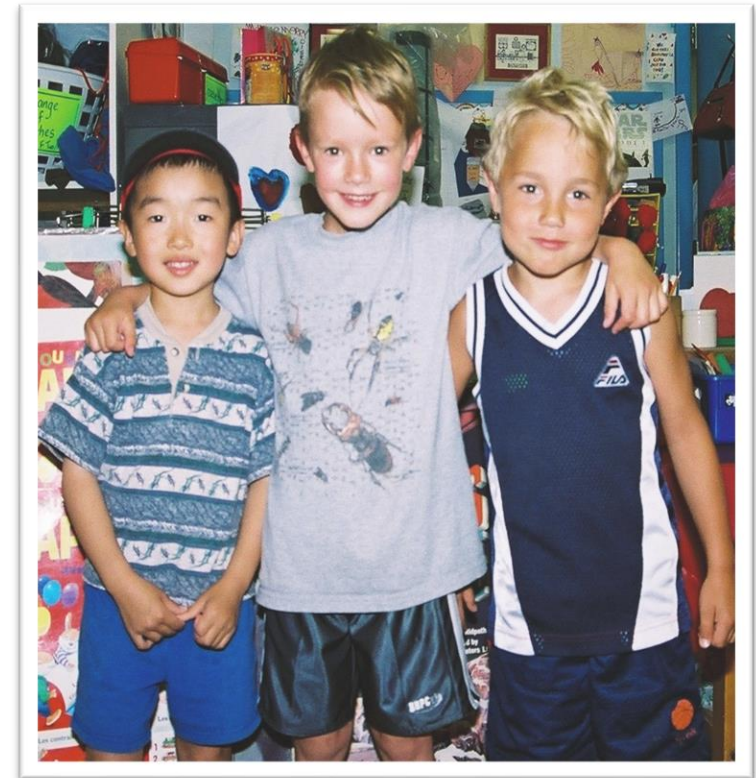
Outline of Today's Presentation

1. Brief introduction to our measure of early developmental health, the Early Development Instrument (EDI)
2. History of the development of the pan-Canadian SES Index
3. Composition and characteristics of the pan-Canadian SES Index
4. How the pan-Canadian SES Index has been used in the literature
5. Deep dive into one “off-diagonal” community in BC
6. Questions





EARLY DEVELOPMENT INSTRUMENT



1,402,919
Completed EDIs

The EDI information collected for five-year-old children in Canada since 2004



12 of 13
Provinces & territories

Canadian provinces and territories EDI has been implemented in



27%

The number of children vulnerable in at least one developmental domain



34% **20%**

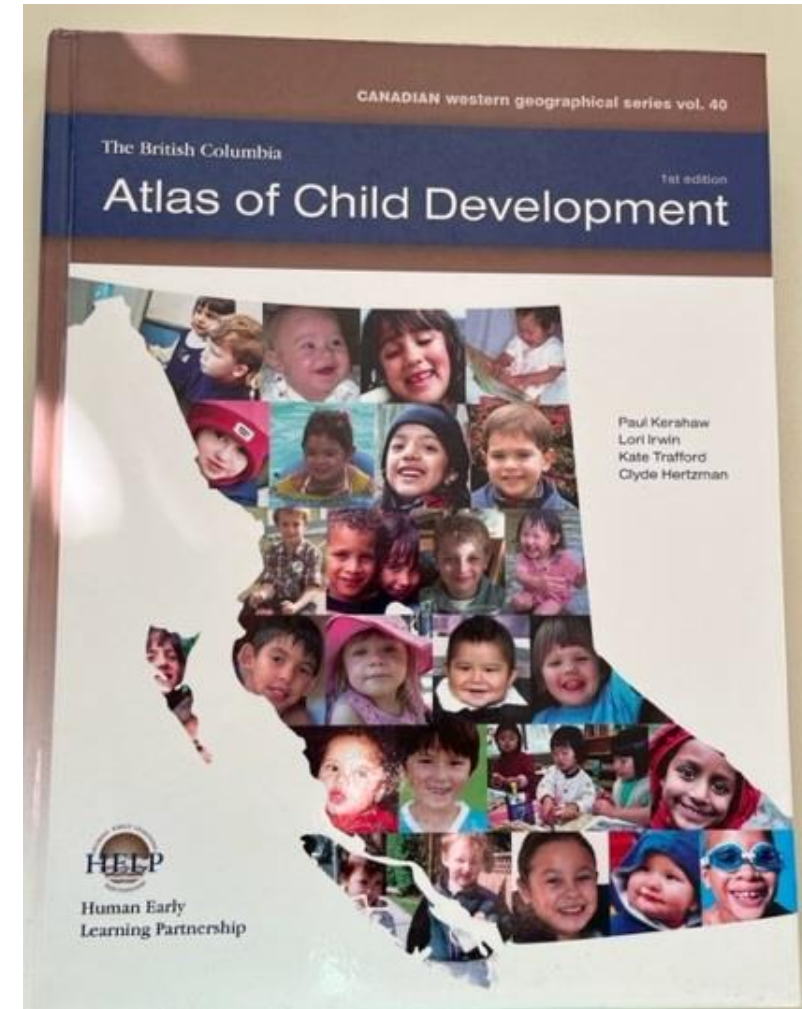
Males vulnerable Females vulnerable
The number of children vulnerable in at least one developmental domain by gender

History of the Development of a Pan-Canadian SES Index (1)

Phase 1: BC Atlas of Child Development (2005)

Important first summary of regional variations in early childhood development at Kindergarten

- In absolute terms, and
- In the context of social determinants of health
- Based on first provincial “wave” of EDI results and 2001 Census variables, both aggregated to HELP NHs
- 19 variables were important predictors across domains, including variables specific to gender (employment, occupation) and/or to young families (employment)
- Demonstrated the importance of considering intersectionality



History of the Development of a Pan-Canadian SES Index (2)

Phase 2 (starting after 2006 Census variables were available)

- Added neighbourhood-level Taxfiler variables to the mix of potentially important SES/demographic factors
- Used these variables to expand scope for intersectionality (e.g., economic markers for families with/without young children, or lone/couple families, gender division of earnings, income inequality, child-related benefits/expenses)
- For each Census time period and neighbourhood, calculated one composite SES Index score that combines the important predictors from all EDI domains
- Used the SES Index scores to calculate each neighbourhood's predicted overall vulnerability rate
 - By comparing the actual vulnerability rate with the Index-derived predicted vulnerability rate, can identify neighbourhoods that are consistently “off-diagonal”

History of the Development of a Pan-Canadian SES Index (3)

Phase 3 (starting in 2011)

- Presented results of our BC EDI-SES analyses to the pan-Canadian EDI research network (McMaster, Manitoba, Saskatchewan)
- Successfully applied (second attempt) to CIHR to conduct a five-year pan-Canadian research study on the social determinants of early childhood development
- Study acronym is CanNECD = Canadian Neighbourhoods and Early Child Development

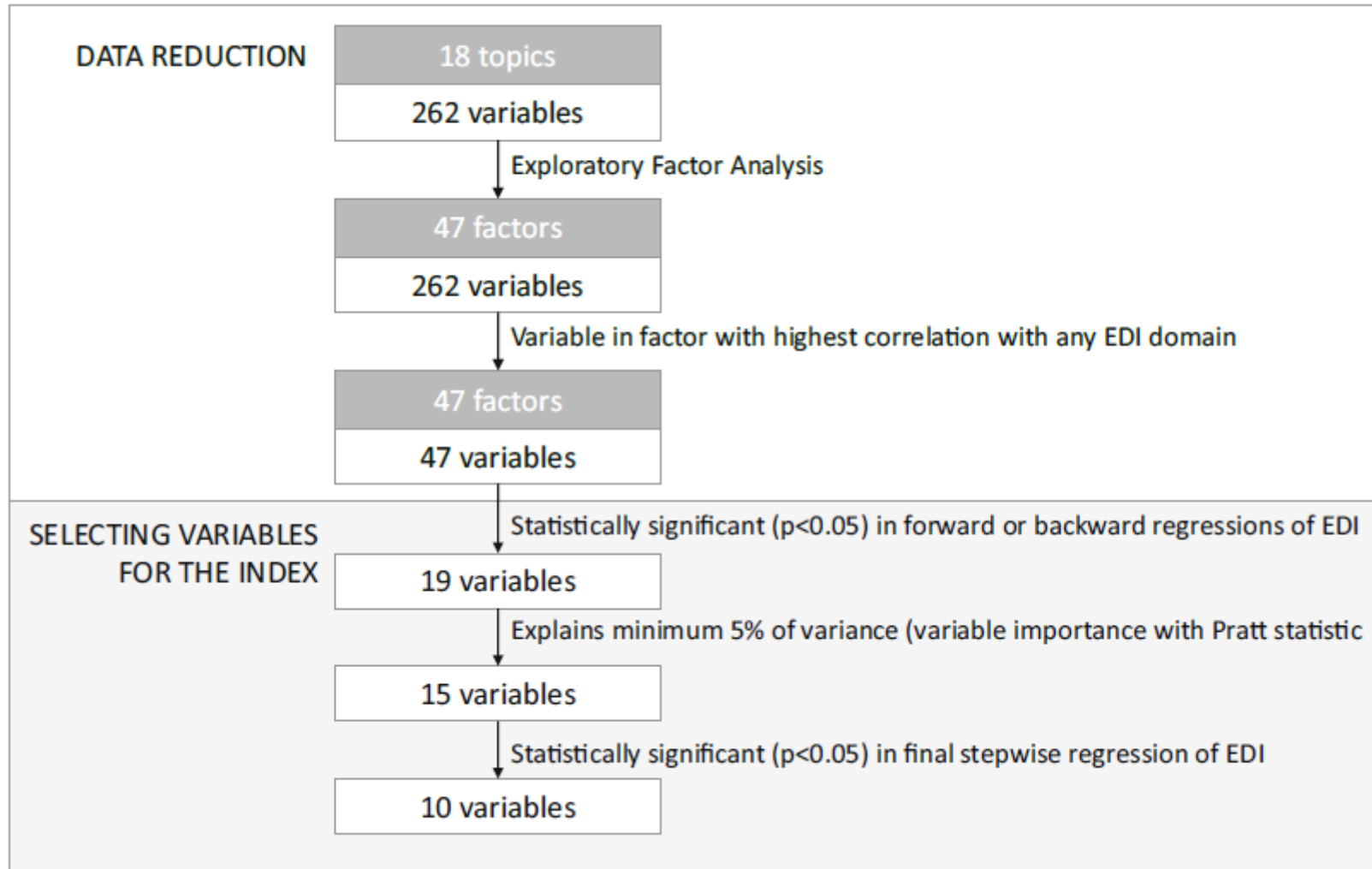
What is the CanNECD SES Index?

- Neighbourhood-level composite of 10 SES/demographic variables
- Created from 2006 Census and 2005 Income Tax (Taxfiler) data
- Aggregated to 2,058 custom neighbourhoods covering all of Canada

- Updated every five years
- Currently three time points (almost four)

Forer, B., Minh, A., Enns, J., Webb, S., Duku, E., Brownell, M., Muhajarine, N., Janus, M., & Guhn, M. (2020). A Canadian neighbourhood index for socioeconomic status associated with early child development. *Child Indicators Research*, 13, 1133-1154.

Methodology to Create the CanNECD SES Index



What are the 10 variables in the CanNECD SES Index?

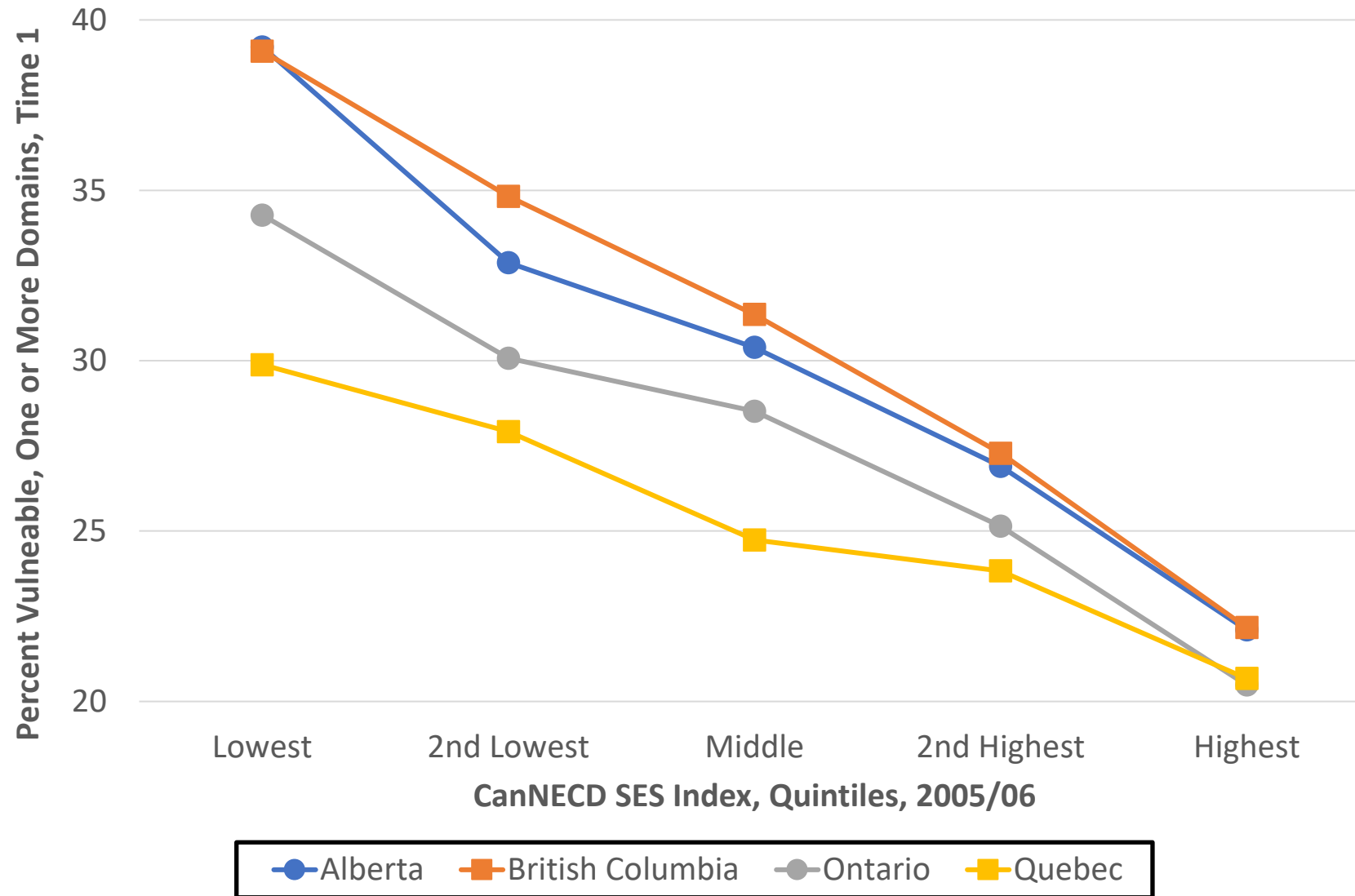
1. **Poverty**: % below Low Income Measure (TF: lone parents, kids <6)
2. **Marital Status**: % separated or divorced (Census)
3. **High Income**: % with incomes twice the provincial median (TF: kids <6)
4. **Unionized Work**: % with union/association dues (TF: kids <6)
5. **Wealth**: % with investment income (TF: kids < 6)
6. **Residential Stability**: % non-migrant movers in the past year (Census)
7. **Social Capital**: % with charitable donations (TF: kids < 6)
8. **Education**: % without a high school diploma (Census)
9. **Language/Immigration**: % not speaking English or French at home (Census)
10. **Income Inequality**: GINI coefficient (TF: lone female families, kids < 6)

CanNECD SES Index vs. Other Canadian SES Indices

Table 6 Variance in overall vulnerability explained by Canadian SES indices

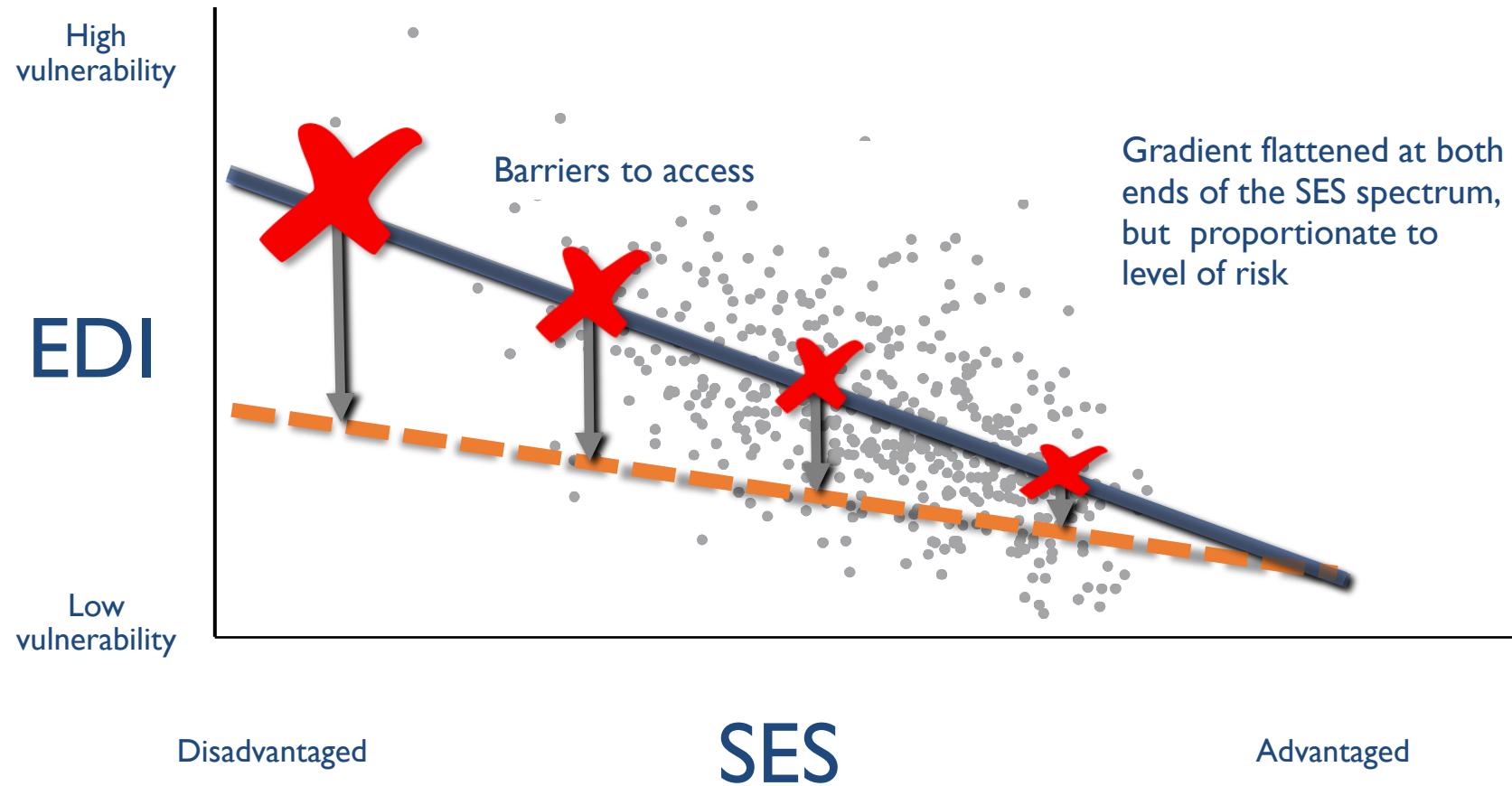
Index (# variables within)	Adjusted R ²	
	Overall Index	Index in Factors (# factors)
CanNECD SES Index (10)	32%	34% (3)
Canadian Deprivation Index (6)	17%	17% (2)
Socioeconomic Factor Index (4)	16%	16% (1)
Canadian Marginalization Index (18)	13%	17% (4)
Early Childhood Mapping Project (26)	17%	25% (5)

EDI-SES Gradients, for Four Canadian Provinces, 2005/06



Proportionate Universality

Universal access at a scale and intensity that addresses barriers at every level



Trends Over Time: CanNECD SES Index

Canada

- Mean Score and Range
 - 2006 – 100 (50 to 153)
 - 2011 – 104 (56 to 155)
 - 2016 – 105 (63 to 155)
- Variance Accounted For
 - 2006 – 31.6%
 - 2011 – 33.1%
 - 2016 – 29.9%

Ontario

- Mean Score and Range
 - 2006 – 103 (60 to 153)
 - 2011 – 105 (58 to 155)
 - 2016 – 105 (63 to 148)
- Variance Accounted For
 - 2006 – 39.2%
 - 2011 – 38.2%
 - 2016 – 32.8%

Summary of CanNECD Index Consistency Over 3 Time Points

- The explanatory power of the Index across the different domains of child development has diminished very little
 - Possible exception: Emotional domain of the EDI
- Each of the 10 Index components have also maintained their associations with child development
 - Possible exception: Language/immigration component
- There was good consistency in terms of the Index quintiles of the 2,058 neighbourhoods over time, and the factor membership of components


CanNECD SES Index in the Peer-Reviewed Literature

1. Child Indicators Research (2020) 13:1133–1154
<https://doi.org/10.1007/s12187-019-09666-y>

A Canadian Neighbourhood Index for Socioeconomic Status Associated with Early Child Development



Barry Forer, et al. *[full author details at the end of the article]*

2.  International Journal of
*Environmental Research
and Public Health* <https://doi.org/10.3390/ijerph18073397>



Review

Population-Level Data on Child Development at School Entry Reflecting Social Determinants of Health: A Narrative Review of Studies Using the Early Development Instrument

Magdalena Janus ^{1,2,*} , Caroline Reid-Westoby ¹ , Noam Raiter ³, Barry Forer ² and Martin Guhn ²

CanNECD SES Index in the Peer-Reviewed Literature

Journal of Autism and Developmental Disorders (2021) 51:433–443
<https://doi.org/10.1007/s10803-020-04545-w>

ORIGINAL PAPER



Teacher-Reported Prevalence of FASD in Kindergarten in Canada: Association with Child Development and Problems at Home

Jacqueline Pei¹ · Caroline Reid-Westoby² · Ayesha Siddiqua³ · Yomna Elshamy¹ · Devyn Rorem¹ ·
Teresa Bennett² · Catherine Birken^{4,5} · Rob Coplan⁶ · Eric Duku² · Mark A. Ferro⁷ · Barry Forer⁸ · Stelios Georgiades² ·
Jan Willem Gorter^{9,10} · Martin Guhn⁸ · Jonathon Maguire^{4,11} · Heather Manson¹² · Rob Santos¹³ · Marni Brownell¹⁴ ·
Magdalena Janus²

CanNECD SES Index in the Peer-Reviewed Literature

SSM - Population Health 10 (2020) 100512



Contents lists available at [ScienceDirect](#)

SSM - Population Health

journal homepage: <http://www.elsevier.com/locate/ssmph>



Article

Sex differences in the socioeconomic gradient of children's early development

Simon Webb^{a,*}, Eric Duku^a, Marni Brownell^b, Jennifer Enns^b, Barry Forer^c, Martin Guhn^c, Anita Minh^c, Nazeem Muhajarine^d, Magdalena Janus^a



<https://doi.org/10.1016/j.ssmph.2019.100512>

CanNECD SES Index in the Peer-Reviewed Literature

BMJ Open Socioeconomic gradient in the developmental health of Canadian children with disabilities at school entry: a cross-sectional study

Dena Zeraatkar ¹, Eric Duku,² Teresa Bennett,² Martin Guhn,³ Barry Forer,³ Marni Brownell,⁴ Magdalena Janus ²

<http://dx.doi.org/10.1136/bmjopen-2019-032396>

CanNECD SES Index in the Peer-Reviewed Literature


Social Indicators Research (2022) 159:549–568

<https://doi.org/10.1007/s11205-021-02753-0>

ORIGINAL RESEARCH




Does social capital flatten the social gradient in early childhood development? An ecological study of two provinces in Canada

Anita Minh^{1,2}  · Lisa Ritland¹ · Simon Webb⁴ · Barry Forer¹ · Marni Brownell⁵ · Eric Duku⁴ · Monique Gagné¹ · Magdalena Janus^{1,4} · Nazeem Muhajarine³ · Martin Guhn¹

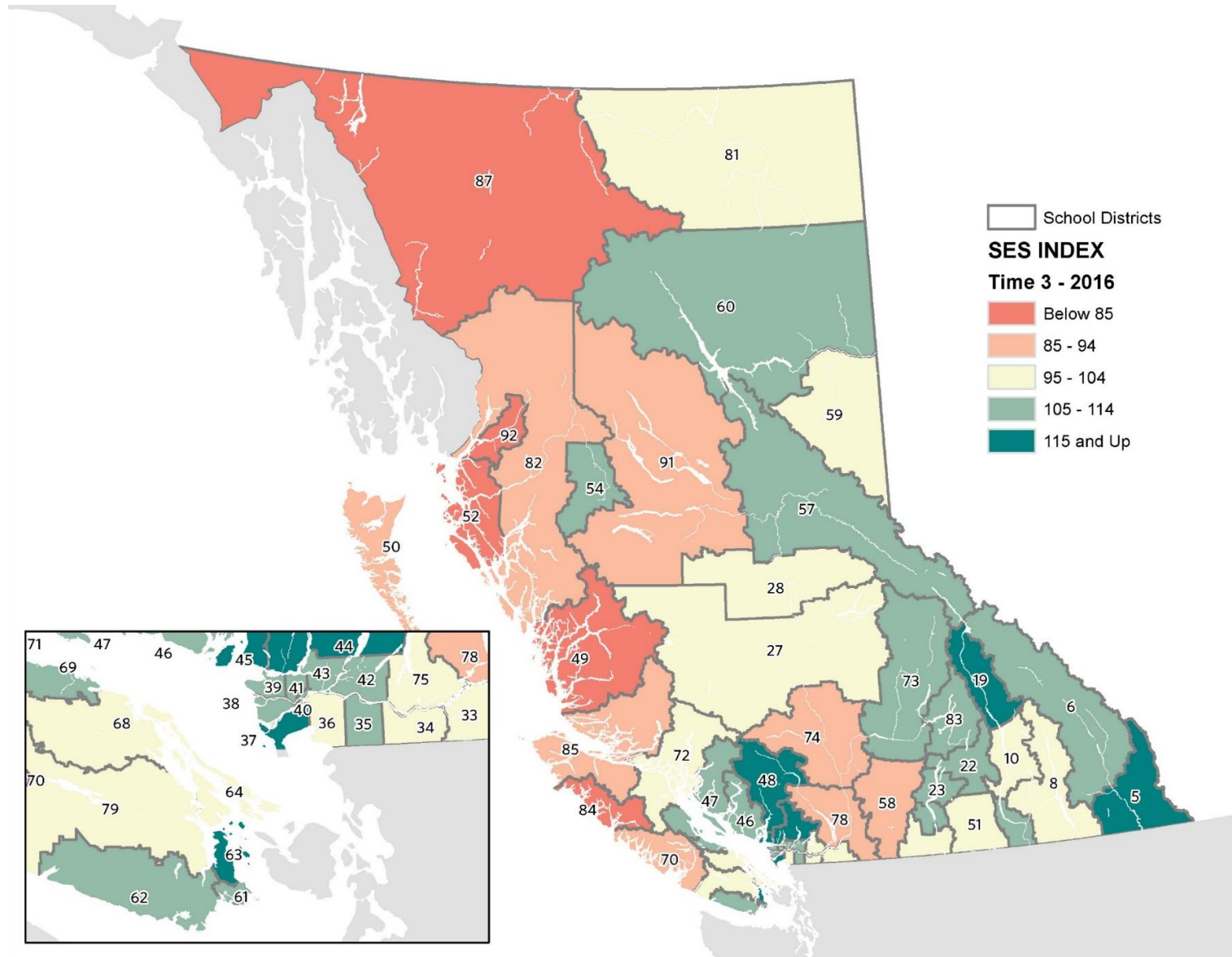
Back to British Columbia: Studying Off-Diagonal Communities

- CanNECD SES Index methodology applied to BC-only data (298 neighbourhoods)
- Time 1: Wave 2 neighbourhood-level EDI scores matched to neighbourhood-level 2006 Census and 2005 Taxfiler variables
- Mean SES Index score set to 100 in Time 1
- Trend in mean SES Index score:
 - 2006: 100
 - 2011: 104
 - 2016: 107
- Variance in overall vulnerability accounted for by SES Index: 40% to 45%

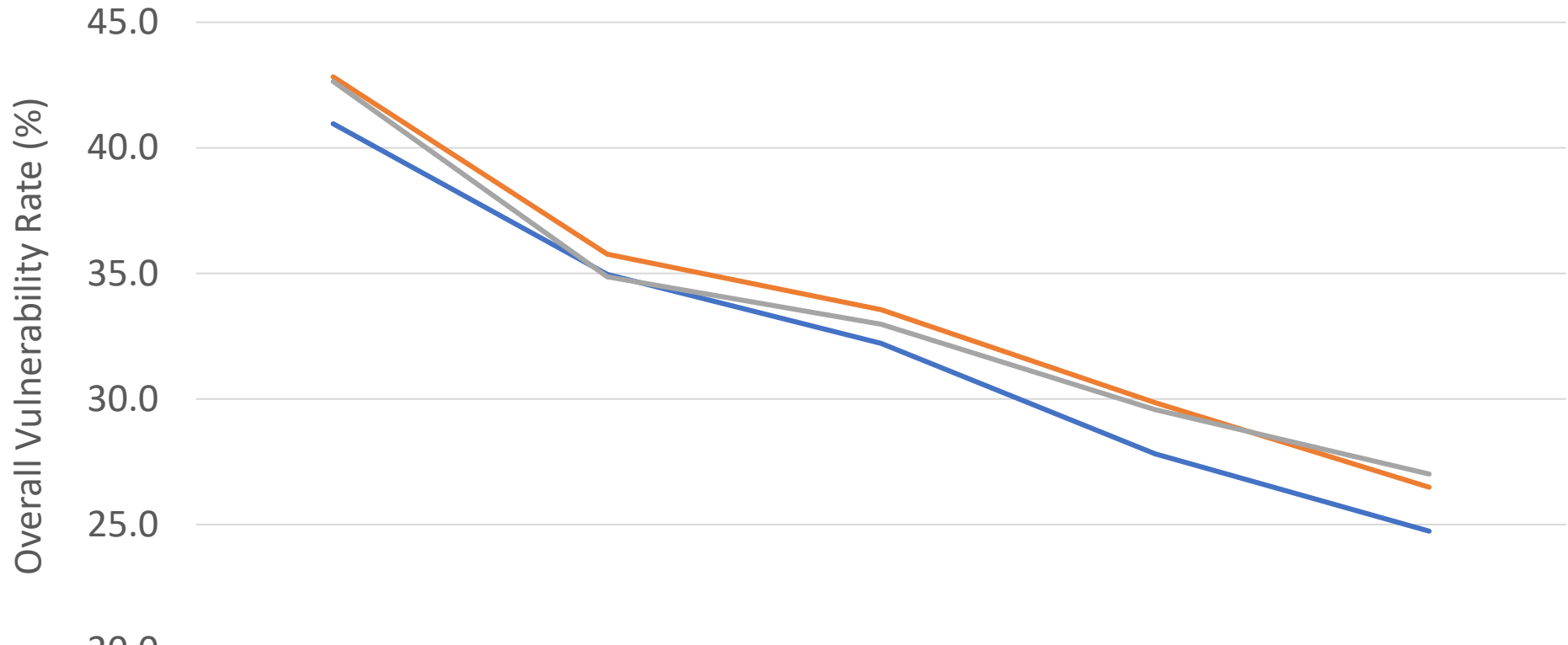
SES Index Variables: British Columbia (298 NHs)

1. **Education**: % with no high school diploma
 2. **Language/Immigration**: % not speaking either official language at home
 3. **Lone parents**: % lone parent families
 4. **Poverty**: % with low income, families with children under 6
 5. **Wealth**: % with investment income, families with children under 18
 6. **High Income**: % with incomes twice or higher than the provincial median, families with children under 18
 7. **Poverty**: % with low income, lone parent families with children under 6
- 

HELP SES Index 2016, by BC School District

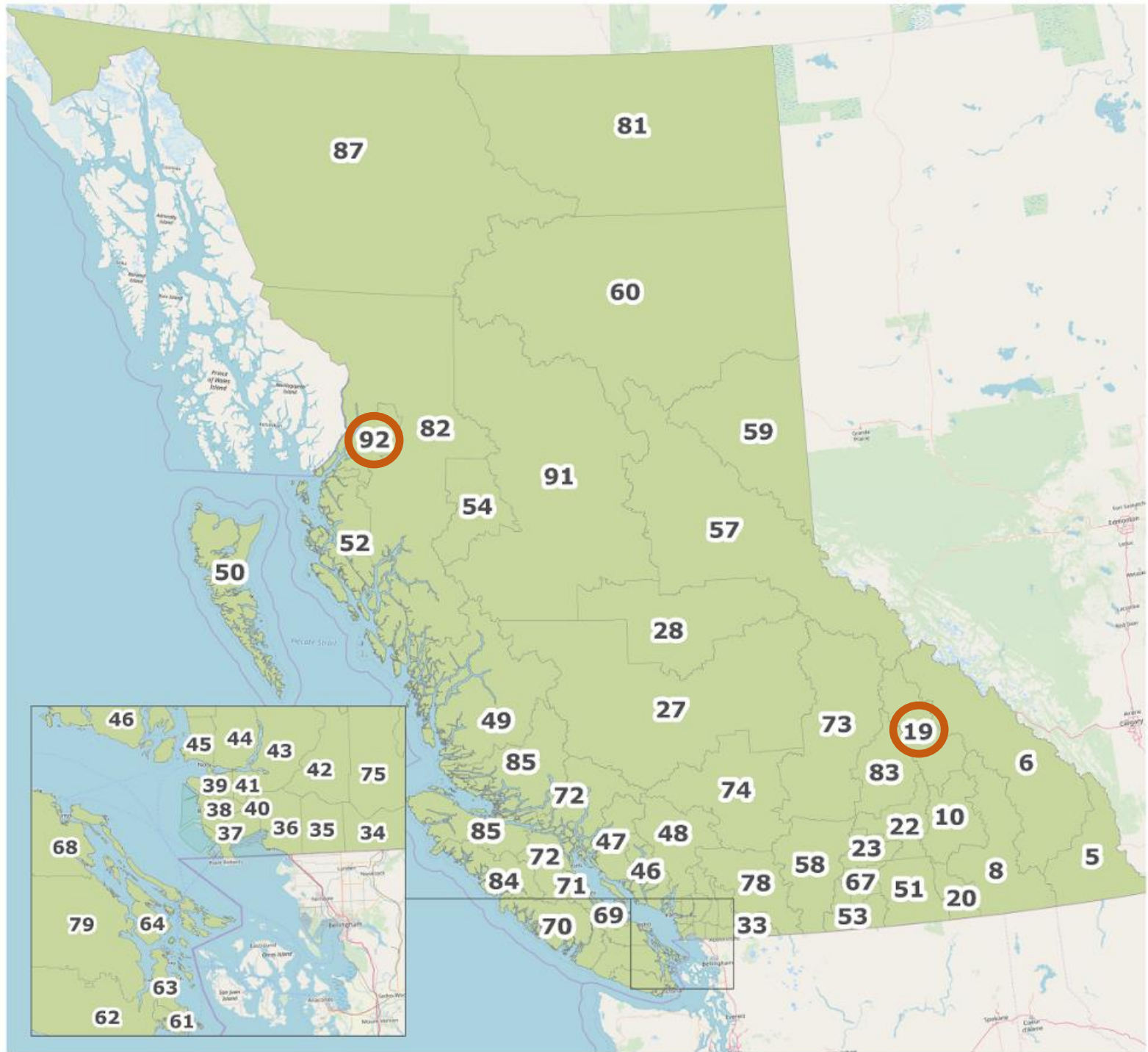


EDI-SES Index Gradient, Wave 6 (2013-16) to Wave 8 (2020-22)



	Lowest	Second lowest	Middle	Second highest	Highest
— Wave 6	40.96	34.96	32.21	27.81	24.73
— Wave 7	42.83	35.76	33.55	29.85	26.48
— Wave 8	42.64	34.86	32.97	29.57	27.01

— Wave 6 — Wave 7 — Wave 8



Better Than Predicted, Overall Vulnerability

Revelstoke	2006	2011	2016
Actual vulnerability rate, one or more scales	9.3	10.6	11.1
Predicted vulnerability rate, one or more scales	25.3	28.3	29.2
SES Index	108	112	117

Better Than Predicted, Overall Vulnerability

Nisga'a	2006	2011	2016
Actual vulnerability rate, one or more scales	32.4	33.9	23.7
Predicted vulnerability rate, one or more scales	44.5	47.1	47.5
SES Index	64	65	68

HELP'S Child Development Monitoring System



Toddler Development Instrument (TDI)

12 - 24 months

Parent & caregiver questionnaire

EARLY EXPERIENCES & CONTEXTS



Childhood Experiences Questionnaire (CHEQ)

Start of Kindergarten

Parent & caregiver questionnaire

EARLY EXPERIENCES & CONTEXTS



Early Development Instrument (EDI)

Mid-Kindergarten

Teacher questionnaire

SKILLS & COMPETENCIES



Middle Years Development Instrument (MDI)

Grades 4 - 8

Student questionnaire

WELL-BEING & ASSETS



Youth Development Instrument (YDI)

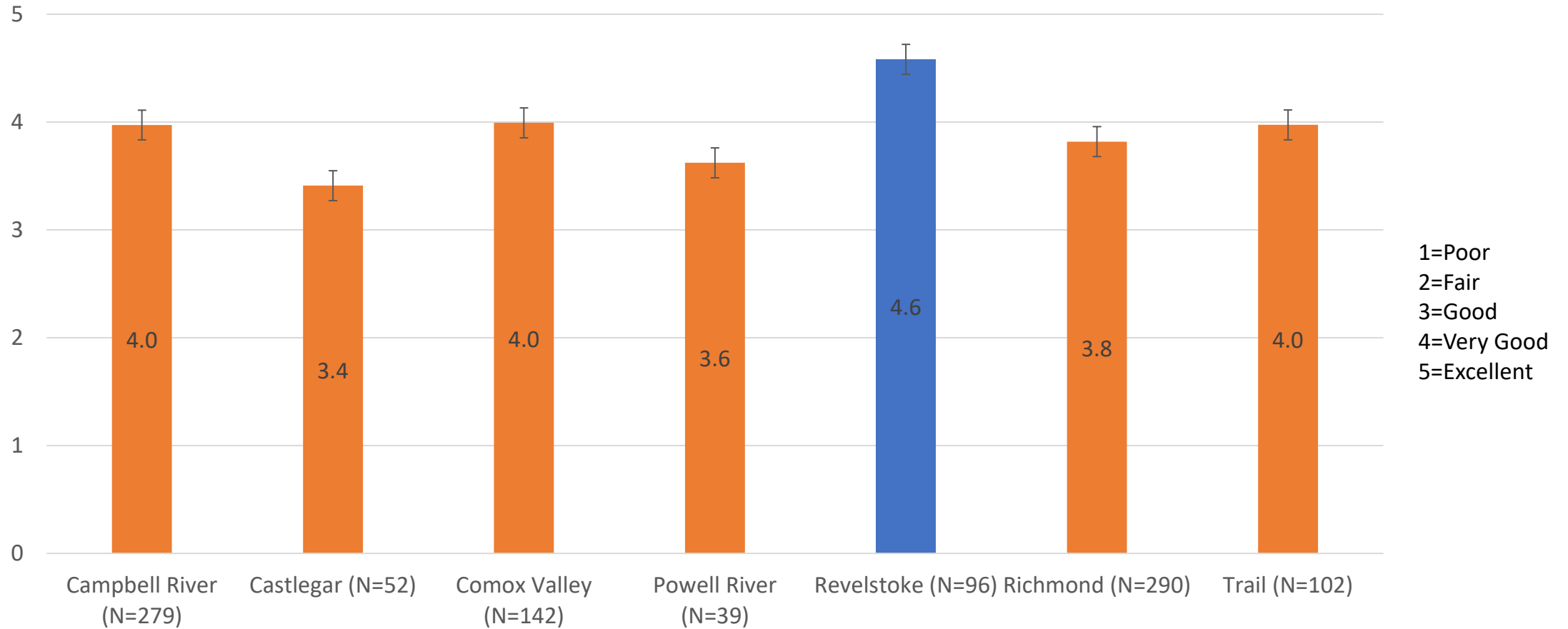
Grade 11

Student questionnaire

WELL-BEING & ASSETS

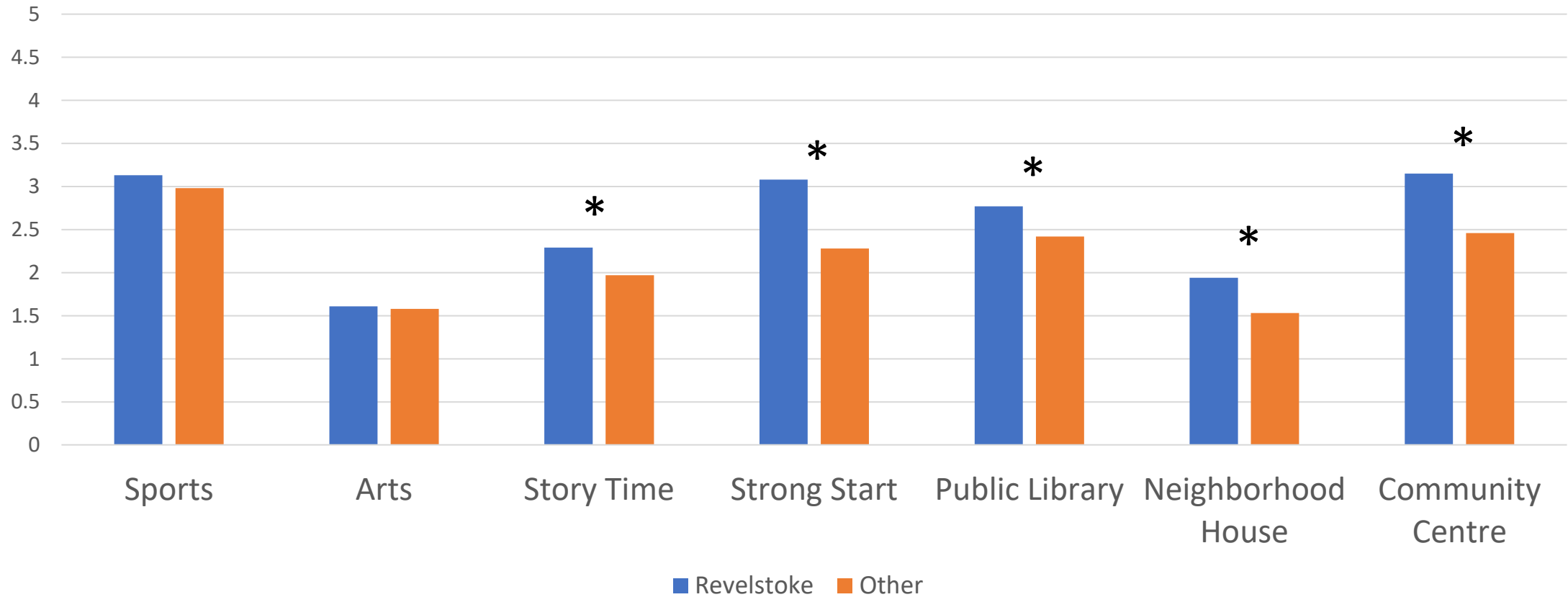
Revelstoke Data 2019-2020

How would you rate the overall access to child/family resources in your community?



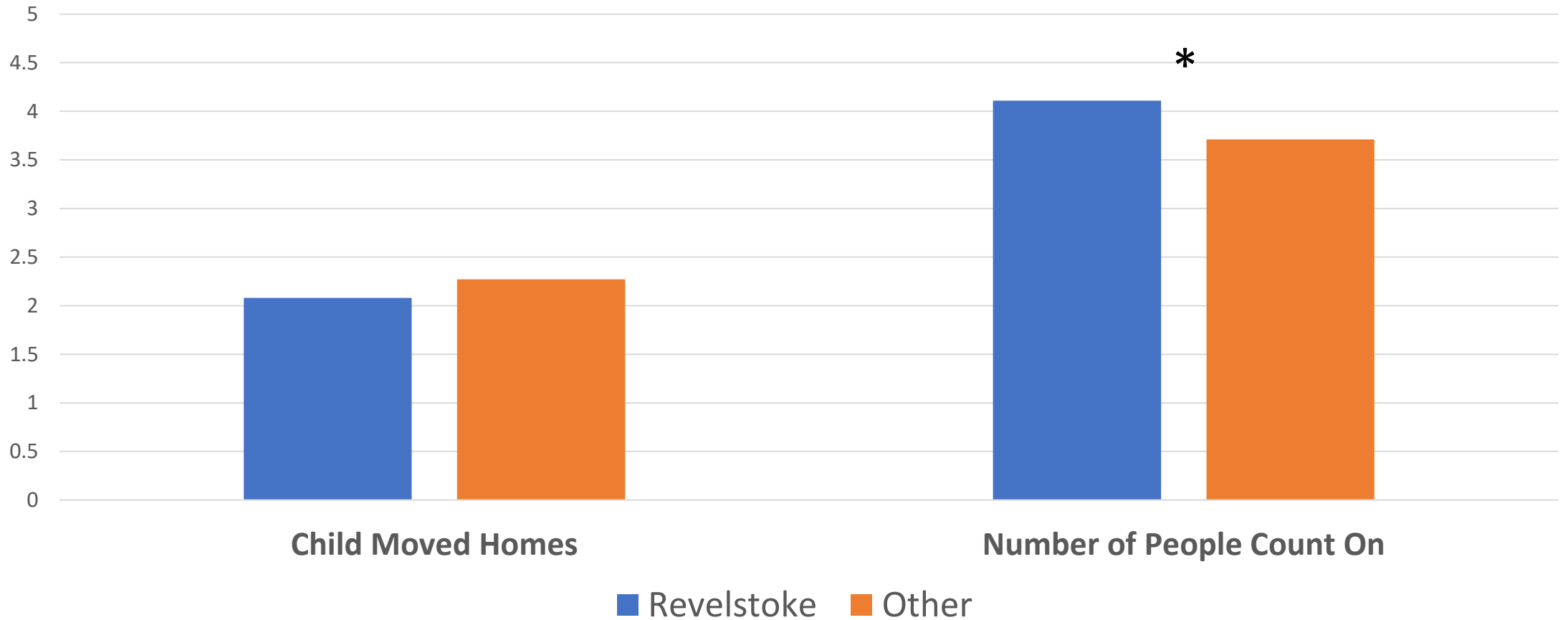
Revelstoke Data 2020

Activities the Child Participated in Age 3-5

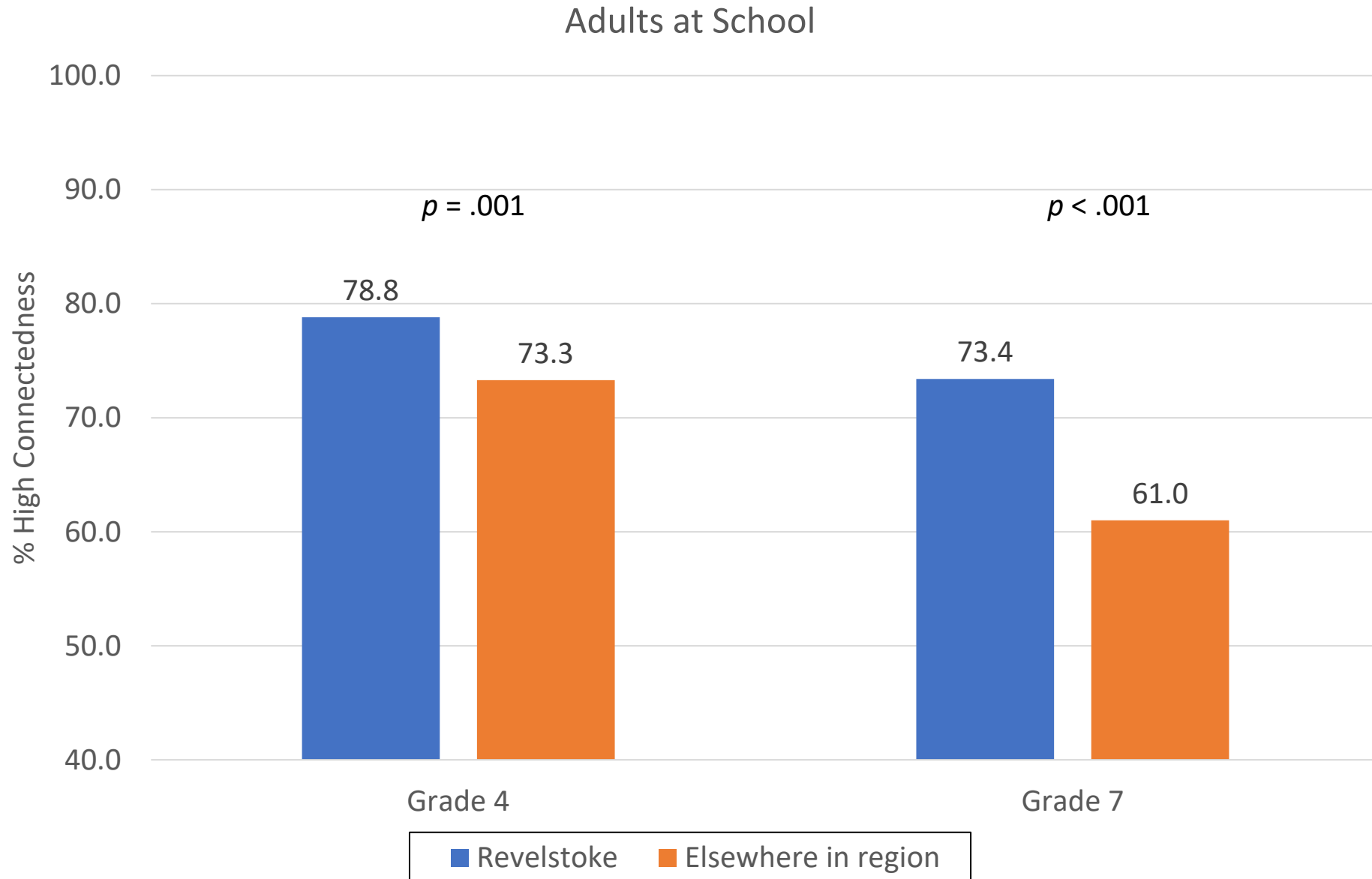


Revelstoke Data 2020

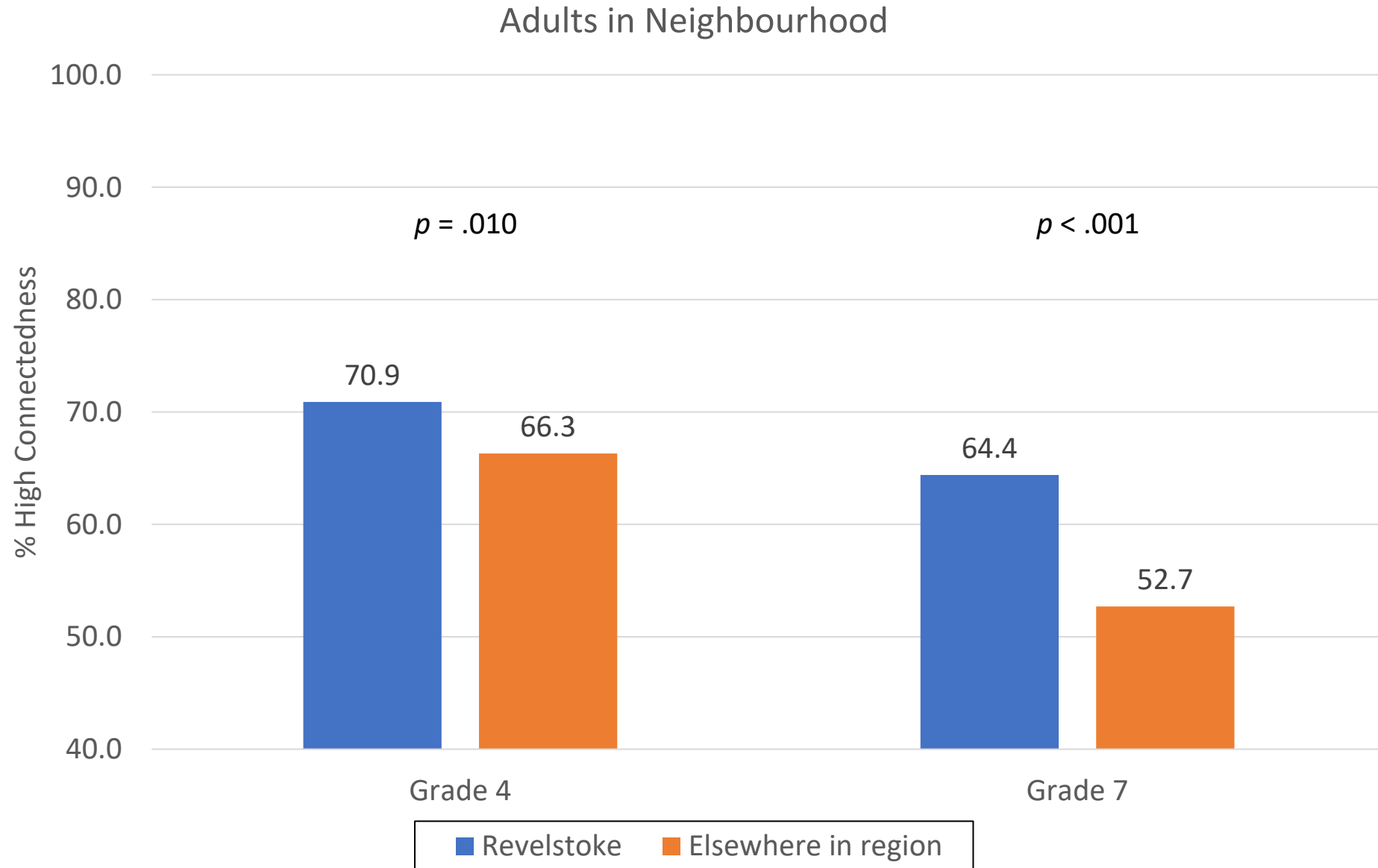
Neighborhood Connectedness



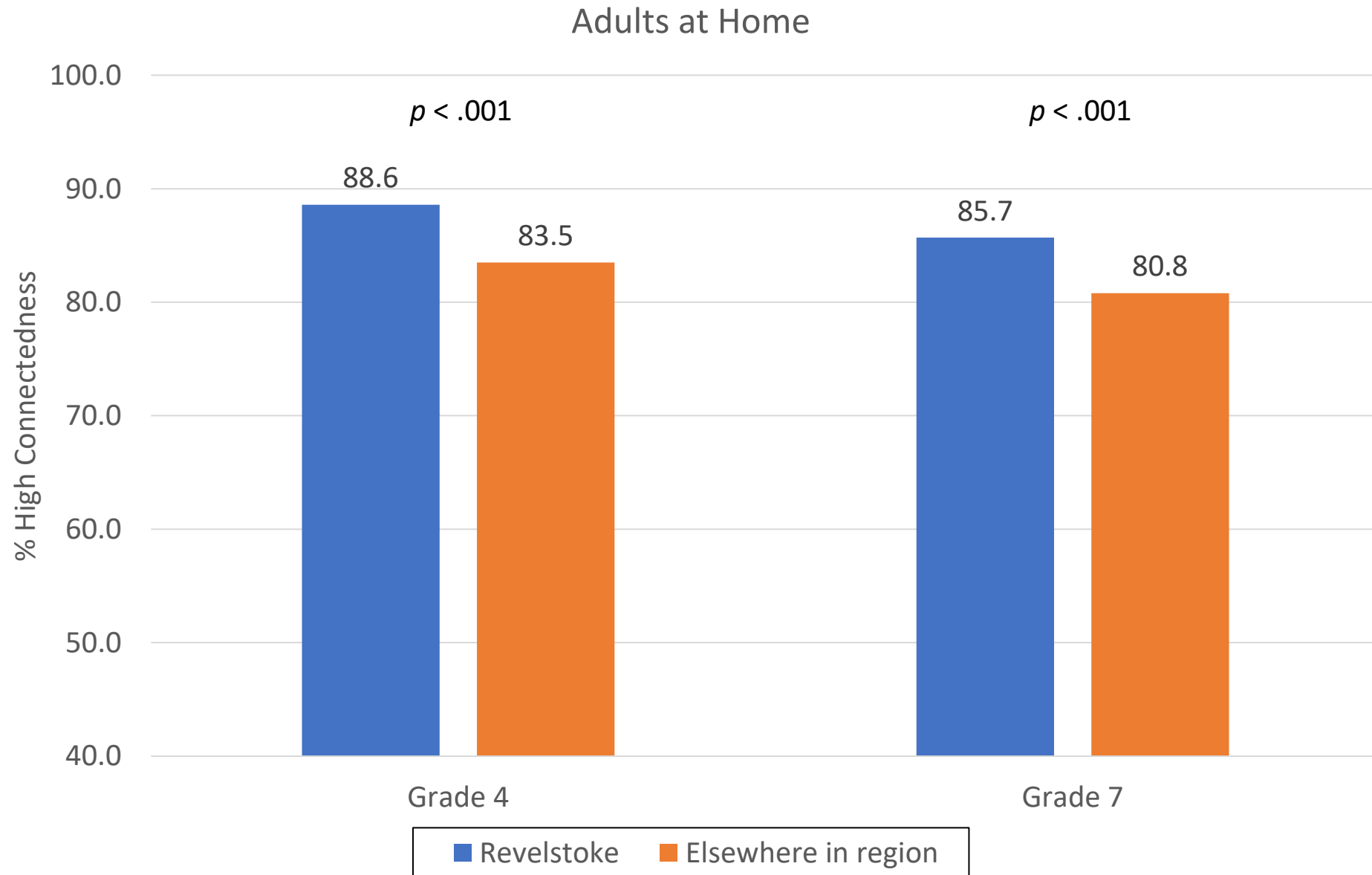
Exploring Connectedness in Revelstoke



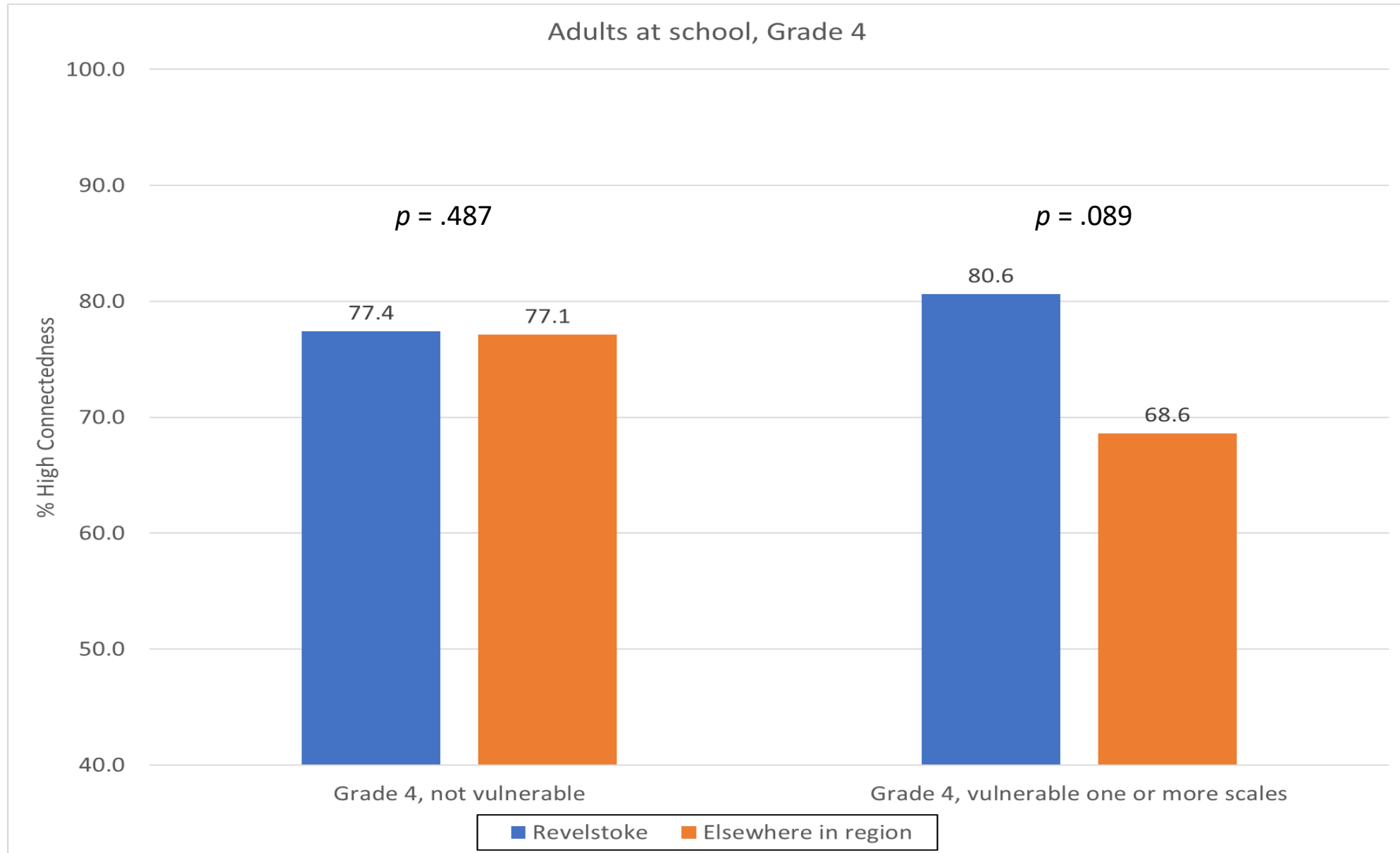
Exploring Connectedness in Revelstoke



Exploring Connectedness in Revelstoke



Exploring Connectedness in Revelstoke



Time for Questions, Hopefully

- Thank you for coming!
- If you have any further questions, please email me at barry.forer@ubc.ca