

Addressing inequities in child health: What we can learn from families involved in a community-based primary care research network?

Catherine S. Birken MD, MSc, FRCPC

www.targetkids.ca

DECISIONS

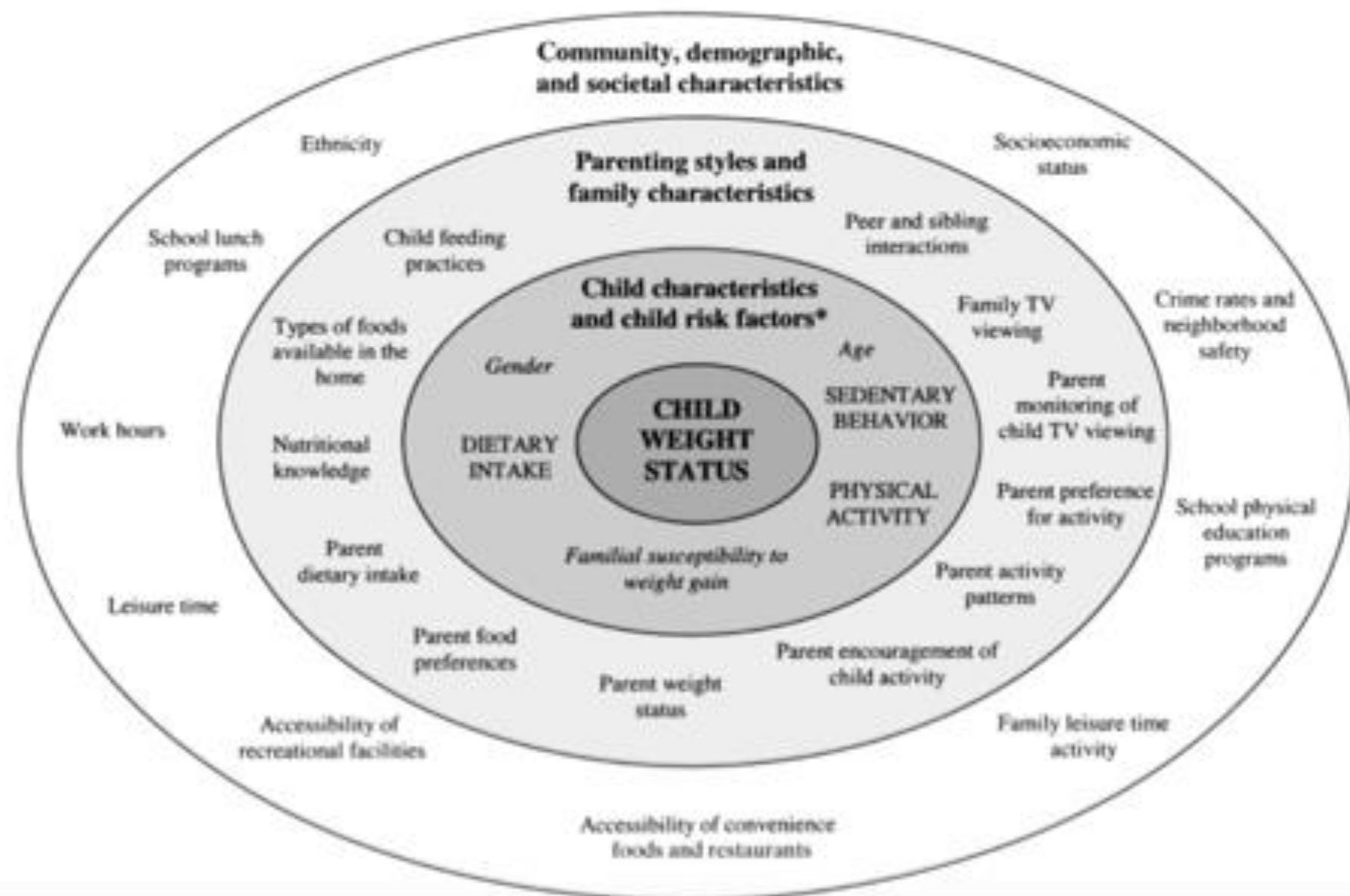
Obesity in a young child

Catherine Birken MD MSc, Jill Hamilton MD

- A 3 year old boy is scheduled for his annual well-child visit at his primary care physicians office
- His mother tells the physician that she is worried about her son's behavior and he is being teased about his weight
- She has had trouble finding subsidized daycare, precarious employment
- Had trouble in the past paying the bills

Ecological model of predictors of childhood overweight

Davison & Birch, 2001



RoadMap

- Primary health care and prevention research
- Social Determinants of Health and obesity in children
- Research Methods
 - Mapping Child Indicators
 - Assessing associations with health outcomes
 - Trials considering inequities
 - Work ahead in PBRN

Burden of Illness for Children

1 in **4**



children are
overweight
or obese

10%



Mood disorders
like depression
comprise 10% of all
illnesses in Ontario

34%



of boys in Ontario
aren't ready to start
school

Major Impact on Children, Families, Communities
Economic Impact of obesity, cardiovascular
disease, mental illness

UNICEF REPORT

CANADA RANKS 9TH | OUT OF 38 COUNTRIES
In the league table of equality across the stages of education

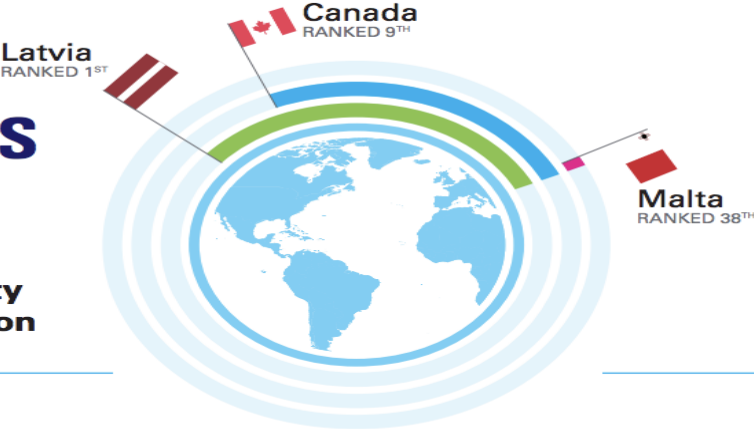


Figure 1: The well-being of Canada's children and youth

CANADA'S INDICATORS	RANK AMONG 41 COUNTRIES	% CHILDREN AFFECTED
MENTAL HEALTH	14	22%
FOOD INSECURITY	24	12%
CHILD POVERTY	24	22%
BULLYING	27	15% (TWICE IN PAST MONTH)
OBESITY	29	25%

Data from UNICEF Report Card 14 (2017).

Socioeconomic Status (SES) and Obesity in Children

- Income has been associated with childhood obesity
- Income is often used as a proxy measure for SES

Study ²⁻⁶	Population	Study	Results (Odds/risk of overweight/obesity in low vs high SES)
Goisis et al. UK	Children 0-11 years	Cohort	OR: 5 years: 2.0 (95% CI: 1.4-2.8) OR: 11 years: 3.0 (95% CI: 2.0-4.5)
Kakinami et al. Quebec	Children 0-12 years	Cohort	2.22, 2.34, and 3.04 OR at age 8, 10, and 12 years
Lee et al. U.S.	Children between 0 and 15 years	Cohort	OR: 15.5 years: 1.66 (95% CI = 1.16, 2.37) for children who experience poverty before 2 years
Strauss et al. U.S.	Children between 0 and 8	Cohort	OR: 2.91 [1.66-5.08] at 6-year follow-up
Systematic review of SES and child obesity	Children 0-15 years		OR for overweight: 1.10 (95% CI: 1.03–1.17) OR for obesity: 1.41 (95% CI: 1.29–1.55)

There are major **gaps** in Canada
in the evidence for prevention in
children and their families

GAPS IN POPULATION HEALTH SURVEILLANCE

Canadian Community Health Survey (CCHS)

Target Population - Canadians aged 12 and over

Canadian Health Measures Survey (CHMS)

NO data on children under 3

Minimal data on children 3 – 5 years

Ontario Health Study

no children

Gaps in Trial Level Evidence

SPECIAL ARTICLE

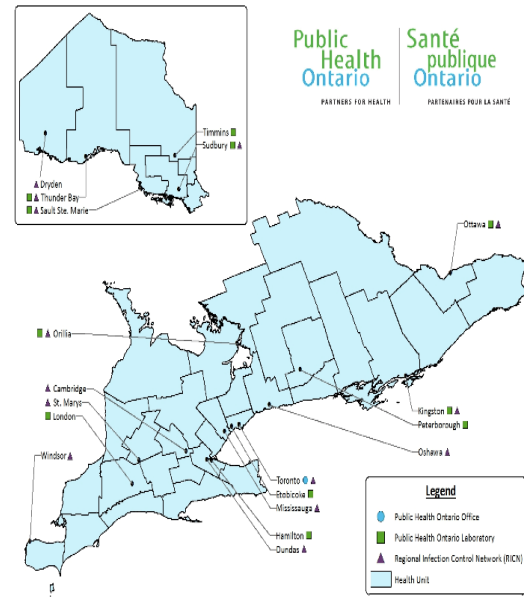
USPSTF Perspective on Evidence-Based Preventive Recommendations for Children

AUTHORS: Bernadette Mazurek Melnyk, PhD, RN, CPNP/PMHNP, FNAP, FAAN,^a David C. Grossman, MD, MPH,^b Roger Chou, MD,^c Iris Mabry-Hernandez, MD, MPH,^d Wanda Nicholson, MD, MPH, MBA,^e Thomas G. DeWitt, MD,^f Adelita G. Cantu, PhD, RN,^g and Glenn Flores, MD, FAAP,^h for the US Preventive Services Task Force

- Trials for prevention are lacking
- Lack of high quality screening and counseling studies in primary care for children
- Most child health recommendations are Grade ‘I’ - insufficient evidence

Poor Integration of Child Health Services

Public Health



Primary Care



Opportunities in Primary Health Care

- Frequent and longitudinal follow up
- Trusting relationships
- Parents are engaged around health
- Efficient use of existing public funded health system

THE FIRST 5 YEARS

A FOUNDATION FOR LIFE

WHO IS AT INCREASED RISK?

Some children are more likely to experience vulnerabilities in early childhood growth and development, including:¹⁻⁶

- Boys
- Children from low income families
- Children from families with lower parental education
- Aboriginal children

WHAT ARE THE HEALTH CONSEQUENCES?

Children experiencing vulnerabilities in early childhood growth and development are at increased risk for a number of outcomes in later years, including:⁷⁻⁸

- Teens** Increased rate of school failure, antisocial behaviour, teen pregnancy
- Young adults** Obesity, high blood pressure, depression
- Middle age** Coronary heart disease, type 2 diabetes
- Older adults** Premature aging, memory loss

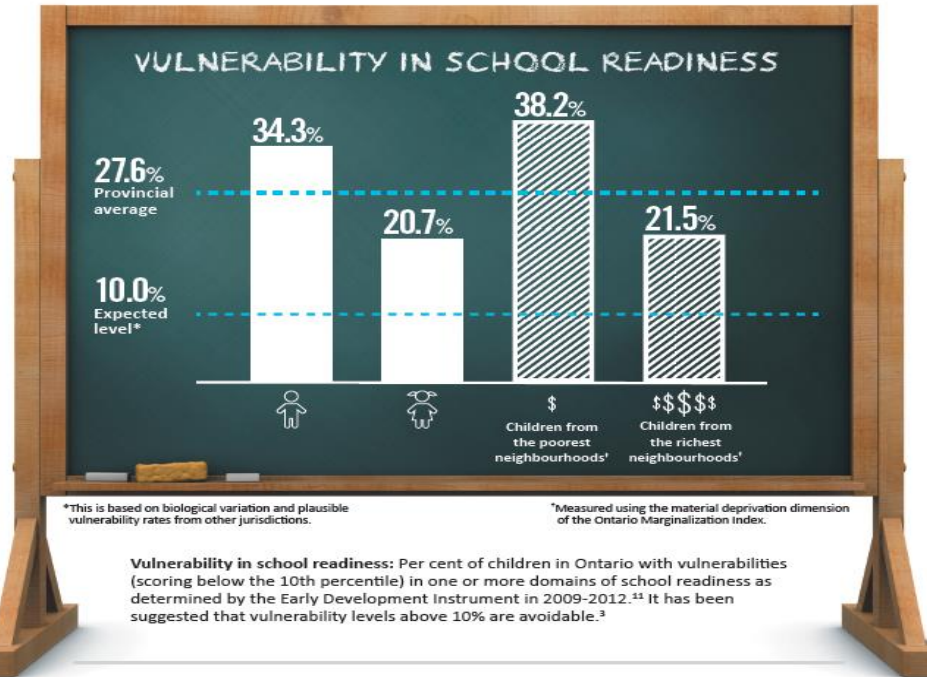
Intervention during the early years of a child's life through public investment programs has an estimated return of **6-to-1**

WELL-BABY VISIT: A MEASUREMENT OPPORTUNITY

The enhanced 18-month well-baby visit is the last routine contact between children and their physicians before school entry. It is an ideal point for assessing early childhood growth and development.¹⁰

As few as **38.2%** of eligible children were recorded as receiving an enhanced 18-month well-baby visit in 2009-2010.¹¹

A child's first five years strongly influence health across the life course.^{1,2,7,8} Some children, due to socioeconomic, environmental and biological factors, experience vulnerabilities in early childhood growth and development, leaving them at a disadvantage.



SCHOOL READINESS AND ONTARIO'S CHILDREN

School readiness is a good indicator of early childhood growth and development, and a predictor of outcomes in later years. It is assessed using the Early Development Instrument (EDI), an internationally recognized tool completed by a child's teacher upon school entry that identifies vulnerabilities in readiness to learn in five domains.¹²

Per cent of children entering school in Ontario with vulnerabilities in the following domains:

- Physical health and wellbeing¹¹: 14.3% (Boys: 17.0%, Girls: 11.5%)
- Communication skills and general knowledge¹¹: 11.5% (Boys: 14.5%, Girls: 8.5%)
- Emotional maturity¹¹: 10.1% (Boys: 15.3%, Girls: 4.9%)
- Social competence¹¹: 9.1% (Boys: 12.8%, Girls: 5.2%)
- Language and cognitive development¹¹: 7.6% (Boys: 9.8%, Girls: 5.4%)

1. Kuehse P, Fene B. Selection of socio-behavioural data for administrative data-an integrational approach to the study of physical and child development. Health Place. 2013;18(2):508-11. 2. Davis M, Herbstein C, editors. Early childhood development: Advances in research and developmental health. The Royal Society of Canada - Canadian Academy of Health Sciences Expert Panel. Ottawa, ON: Royal Society of Canada; 2012. Available from: https://www.scribd.com/document/118642216/2013-Report_2.pdf. 3. Kuehse P, Anderson L, Weharten B, Herbstein C. Is by 15: A comprehensive policy framework for early human capital investment in BC. Vancouver, BC: Human Early Learning Partnership; 2009. Available from: <http://earlylearningabc.ca/wordpress/wp-content/uploads/2013/05/15-18-report.pdf>. 4. Carter M, Neidell I, Strulik A, Pury U. Determinants of vulnerability in early childhood development in Ireland: A cross-sectional study. BMC Open. 2013;3(2):e20217. 5. Cochran JA, Yu LTH, Jansen RL, Mukherjee R. Neighborhood poverty impacts children's physical health and well-being over time: Evidence from the early development instrument. Early Educ Dev. 2013;2013:184-205. 6. Brinkman SA, Galanos A, Rakman A, Mistry NK, Gregory TA, Sibara S, et al. Jurisdictional, socioeconomic and gender inequalities in child health and development: Analysis of a national census of 5-year-olds in Australia. BMC Open. 2012;2(5):e4002075. 7. Baker DP. The developmental origins of adult disease. J Am Coll Nutr. 2004;23:385S-393S. 8. Lerner J, Davis M, Forget-Dubois N, Diorio G, Segin JR, Bredemeyer M, et al. The genetic environmental aetiology of cognitive school readiness and later academic achievement in early childhood. Child Dev. 2010;78(6):1855-63. 9. Heckman JJ. The case for investing in disadvantaged young children. In: First Focus, ed. Big Ideas for our children: Investing in our nation's future. Washington, D.C.: First Focus; 2010. p. 45-58. Available from: <http://www.firstfocus.org/sites/default/files/The%20Case%20for%20Investing%20in%20Disadvantaged%20Children%20-%202010.pdf>. 10. Guttmacher A, Hui S, Gribble J, Kopp A, Cairney J. Update of the new low code for Ontario's enhanced well-baby visit: A pediatrician's handbook. Toronto, ON: Institute for Clinical Evaluation Sciences; 2011. Available from: http://www.ices.on.ca/Files/Well%20Baby_Visit%20Report.pdf. 11. Data source: Early Development Instrument, Offical Centre for Child Studies via Ministry of Child and Youth Services (names approved do not necessarily reflect those of the Ministry). 12. Jansen RL, Offord DR. Development and psychometric properties of the early development instrument (EDI): A measure of children's school readiness. Can J Public Health. 2007;98(1):1-22.

For more information, visit publichealthontario.ca



nutrition now, matters forever





TARGetKids!
The Applied Research Group

A state of the art primary care
practice-based research network
and child cohort



Large Group Practices

Regent Park CHC

Dr. Fatima Uddin

Clairhurst Paediatrics

Dr. Michael Peer
Dr. Sheila Jacobson
Dr. Carolyn Taylor

Paediatrics Experience

Dr. Janet Saunderson
Dr. Anh Do
Dr. Michelle Porepa
Dr. Joanne Vaughan

Village Park Paediatrics

Dr. Eddy Lau
Dr. Brian Chisamore
Dr. Sharon Naymark

Trillium Paediatrics

Dr. Michael Zajdman
Dr. Nicholas Blanchette
Dr. Hafiz Shuja
Dr. Lukasz Jagiello
Dharma Dalwadi (RA)

Paediatrics

@HumberCollege

Dr. Peter Wong
Dr. Barbara Smiltnieks
Dr. Michael Dorey

Danforth Paediatrics

Dr. Marty Perlmutter
Dr. Karoon Danayan
Dr. Alana Rosenthal
Dr. Paul Kadar
Dr. Aleks Meret

Melville Pediatrics (Montreal)

Dr. Denis Leduc
Dr. Evelyn Constantin
Dr. Patricia Li

St. Michael's Hospital Sumac Creek Health Centre

Dr. Nada Abdel-Malek
Dr. Andrew Pinto

St Michael's Hospital Pediatric Ambulatory Clinic

Dr. Tony Barozzino
Dr. Michael Sgro
Dr. Sloane Freeman

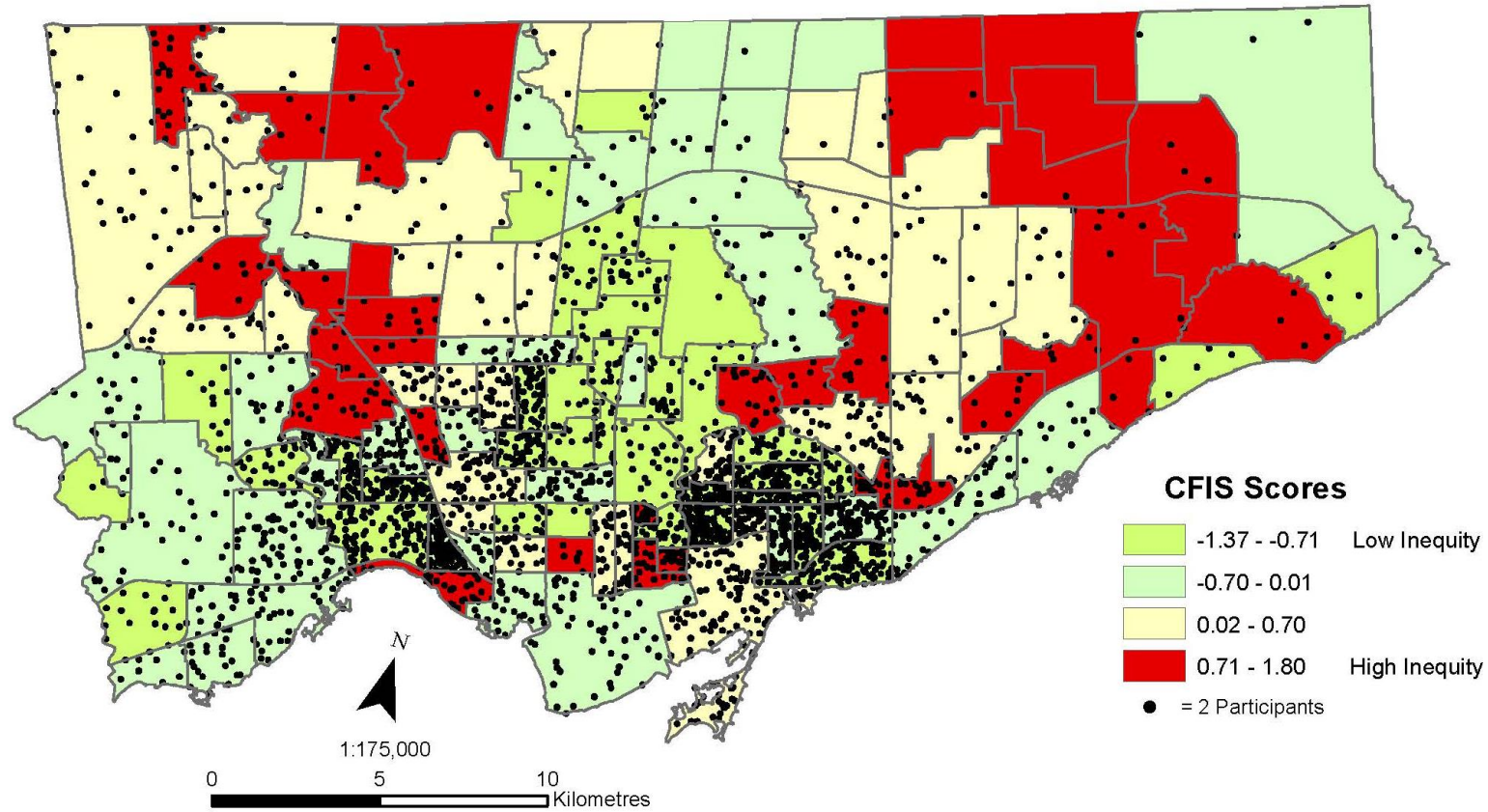
St Michael's Hospital 410 Sherbourne Family Medicine Clinic

Dr. Susan Shepherd

St Michael's Hospital 80 Bond Street Family Medicine Clinic

Dr. Nav Persaud

>10,500 Families
>10,000,000 Data Points





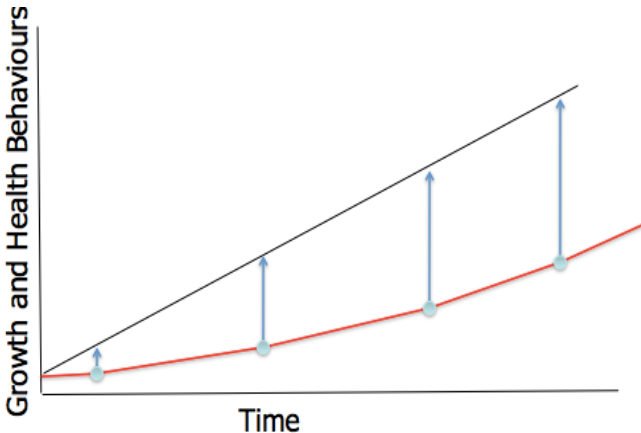
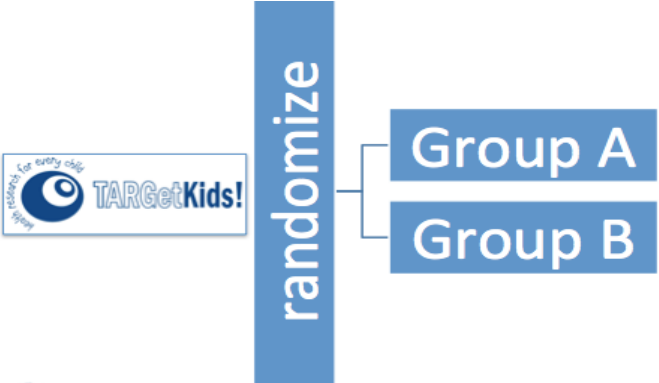
Vision

Healthy children together

Mission

To partner with community health care providers, families and children and create knowledge to raise healthy children

LONGITUDINAL COHORT AND TRIALS



WHAT HAVE WE LEARNED?

CBSNEWS Video US World Politics Entertainment Health

By MICHELLE CASTILLO / CBS NEWS / December 17, 2012, 12:16 PM

2 cups of milk per day best for toddlers, study finds



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CHILDREN'S HEALTH · Published February 19, 2016

Children breast-feeding after first birthday should take vitamin D



THE GLOBE AND MAIL 



Poor preschooler eating habits can raise cholesterol, set stage for heart disease

BY SHERYL UBELACKER

The Canadian Press

Kids Who Use Smartphones Start Talking Later



Cutting Preschoolers Screen Time is Tricky



Strollers may be too sedentary for kids



Parent and Clinician Priority Setting



Lavigne M et al. Arch Dis Child 2017

Results -Top Research Priorities

- What are effective strategies for screening and prevention of mental health problems?
- What are interventions to increase physical activity in children?
- What is the impact of daycare attendance on child health and development?
- What are effective intervention for obesity prevention?
- What interventions promote social skill development?

Capacity across disciplines

Develop capacity in child health research



Using other Primary Care Data in Ontario

Using Primary Care Electronic Medical Records to Estimate the Prevalence of Severe Obesity in Children



Sarah Carsley, PhD(c)
April 27, 2017



Institute of Health Policy, Management & Evaluation
UNIVERSITY OF TORONTO

zBMI >3 by age and sex in Ontario, Using EMR data

Age group, years		BMI z-score				
		<-2	≥-2 to ≤ 1	>1 to ≤ 2	>2 to ≤ 3	>3
All children and adolescents	No. of children	%	%	%	%	%
0-4	20412	3.1%	74.6%	16.9%	4.3%	1.1%
5-9	9921	2.0%	73.1%	15.5%	6.7%	2.7%
10-14	7700	1.9%	63.0%	21.2%	10.9%	3.0%
15-19	4131	1.6%	67.0%	18.7%	8.7%	3.9%
Boys						
0-4	10455	3.1%	73.2%	16.8%	4.8%	1.4%
5-9	5076	2.1%	71.7%	15.8%	6.8%	3.5%
10-14	3846	1.8%	61.1%	21.1%	12.7%	3.4%
15-19	1915	2.2%	64.0%	19.6%	10.4%	3.8%
Girls						
0-4	9957	3.1%	76.2%	16.1%	3.8%	0.8%
5-9	4845	1.8%	74.6%	15.1%	6.6%	1.9%
10-14	3854	2.0%	65.0%	21.3%	9.2%	2.5%
15-19	2216	1.1%	69.6%	17.9%	7.3%	4.1%

Overweight and obesity in preschool aged children and risk of mental health service utilization



Sarah Carsley, PhD, Karen Tu, MD, MSc, FRCP, Eleanor Pullenayegum, PhD, Patricia Parkin, MD, FRCPC, Catherine Birken, MD, MSc, FRCPC



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Adjusted Cox proportional hazards regression model of weight status and risk of mental health service use

Variable	Overall		Girls		Boys	
	HR* (95% CI)	p-value	HR (95% CI)	p-value	HR (95% CI)	p-value
Weight status (ref=zBMI ≤ 1)						
≥1 to ≤2	1.14 (0.99, 1.30)	0.07	0.99 (0.78, 1.24)	0.91	1.22 (1.03, 1.44)	0.02
>2 to ≤3	1.25 (0.99, 1.57)	0.06	0.92 (0.60, 1.42)	0.71	1.43 (1.09, 1.87)	0.01
>3	1.73 (1.21, 2.48)	0.003	2.73 (1.62, 4.60)	<0.001	1.28 (0.78, 2.11)	0.34

*Adjusted for sex, rural residence, neighbourhood income quintile, ethnicity, immigration status, RUB

Interpretation

- Boys who were overweight at 2 to <5 years had a 1.43 (1.09, 1.87) times increased risk of mental health service use between 5 and <19 years
- Girls who were obese at 2 to <5 years had a 2.73 (1.62, 4.60) times increased risk of mental health service use between 5 and <19 years

Discussion

- Preschool aged children with overweight and obesity have an increased risk of mental health service utilization in later childhood. This association is especially strong for girls with $zBMI > 3$ (obesity).
- Corroborates previous evidence of gender differences in the association between obesity and mental health

What about inequities?

Variable	Overall		Girls		Boys	
	HR* (95% CI)	p-value	HR (95% CI)	p-value	HR (95% CI)	p-value
Weight status (ref=zBMI ≤ 1)						
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*Adjusted for sex, rural residence, neighbourhood income quintile, ethnicity, immigration status, RUB



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Mapping Indicator

TARGet Kids! Quality Child Health Indicator Data to Assess Health Equity in Toronto Neighbourhoods

Cory Borkhoff, PhD

Clinical Epidemiologist / Team Investigator,
Division of Pediatric Medicine and Child Health Evaluative Sciences,
The Hospital for Sick Children Research Institute
Assistant Professor, iHPME, University of Toronto

cory.borkhoff@sickkids.ca

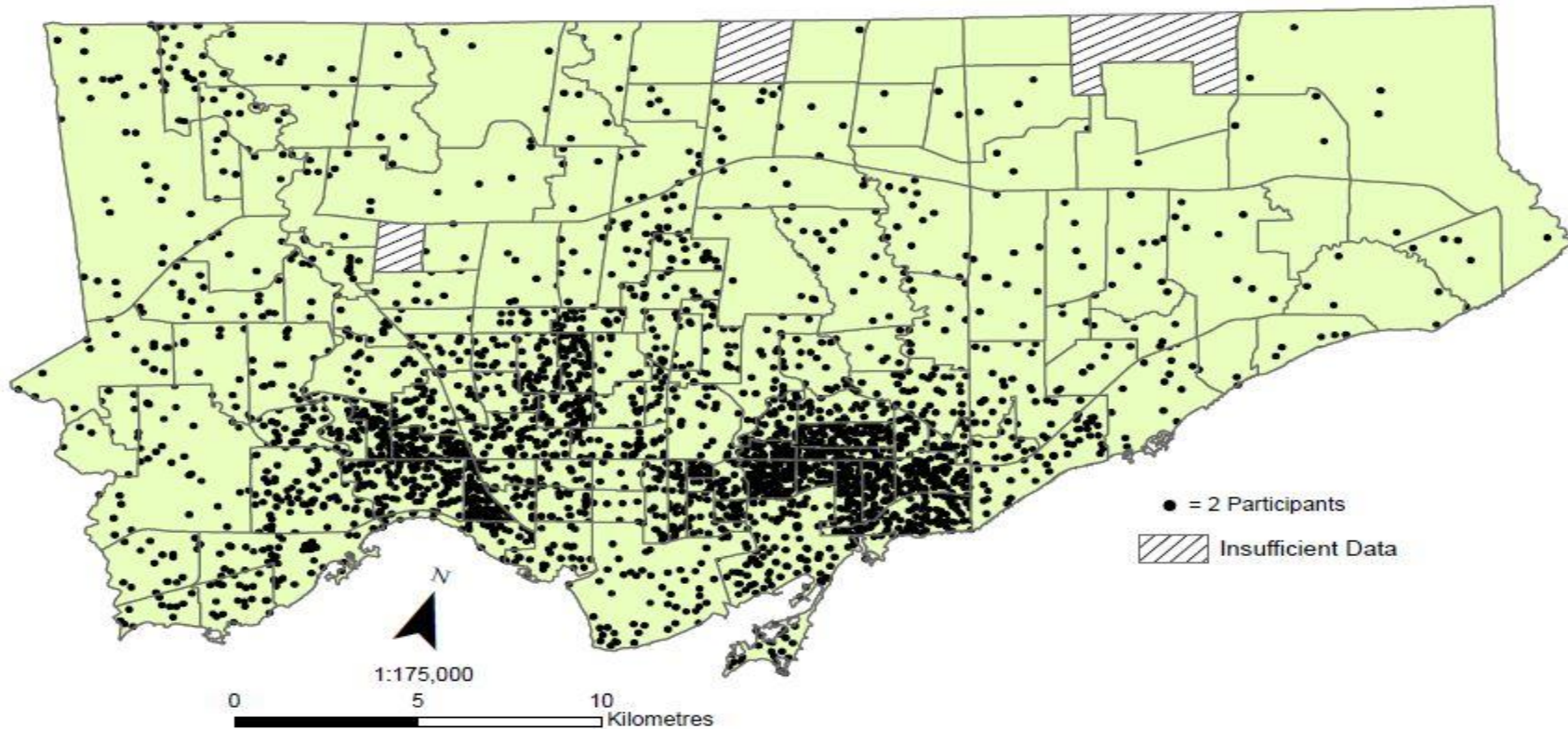
SickKids[®]



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Contributing to Child Health Indicator Data in Toronto

TARGet Kids! Participants by Neighbourhood in Toronto



Need for Child Health Indicator Data in Toronto

- City's Toronto Child & Family Network launched the Raising the Village Initiative in 2013
- Goal – measuring the well-being of children and families in Toronto
- **Health indicators** – single summary measures of health and factors which influence health



Are children and families experiencing good outcomes?

The Toronto Child & Family Network has developed five outcomes for children, and five outcomes for families. Together they describe the well-being that we hope all children and families in Toronto experience. Explore these outcomes below, and the [indicators](#) we are using to monitor them. In partnership with the Indigenous community, [outcomes for Indigenous children and families](#) were also developed that reflect the specific needs and worldviews of Toronto's diverse Indigenous communities.

Child Outcomes:

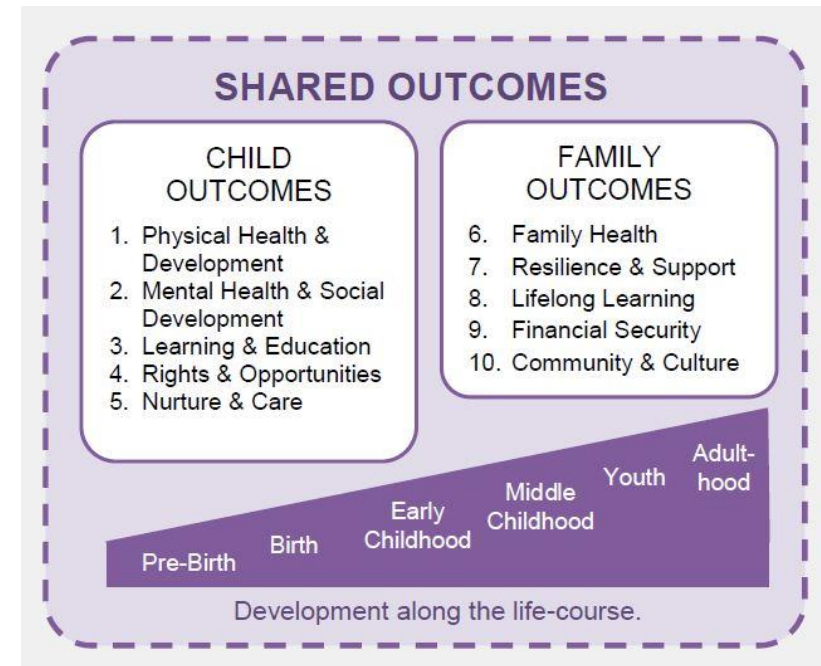
 Physical Health & Development Children are born healthy, and reach their optimal physical health and development.
 Mental Health & Social Development Children have the social, emotional, mental and spiritual well-being to reach their potential.
 Learning & Education Children are engaged and curious learners, gain knowledge and skills, and have educational success.
 Rights & Opportunities Children's rights are fulfilled: they have opportunities for personal development and participate in decisions about their lives.
 Nurture & Care Children have safe, nurturing and positive environments that encourage learning and development.

Family Outcomes:

 Family Health Families experience optimal individual physical and mental health, and contribute to the growth and development of each family member.
 Resilience & Support Families are able to cope with challenges, and have consistent support through social networks and appropriate services.
 Lifelong Learning Families have equitable access to learning and training, and are active in their children's education.
 Financial Security Families have material well-being and an equitable standard of living.
 Community & Culture Families belong to communities, and have the freedom to express, and opportunities to foster, their culture and identity.

Need for Child Health Indicator Data

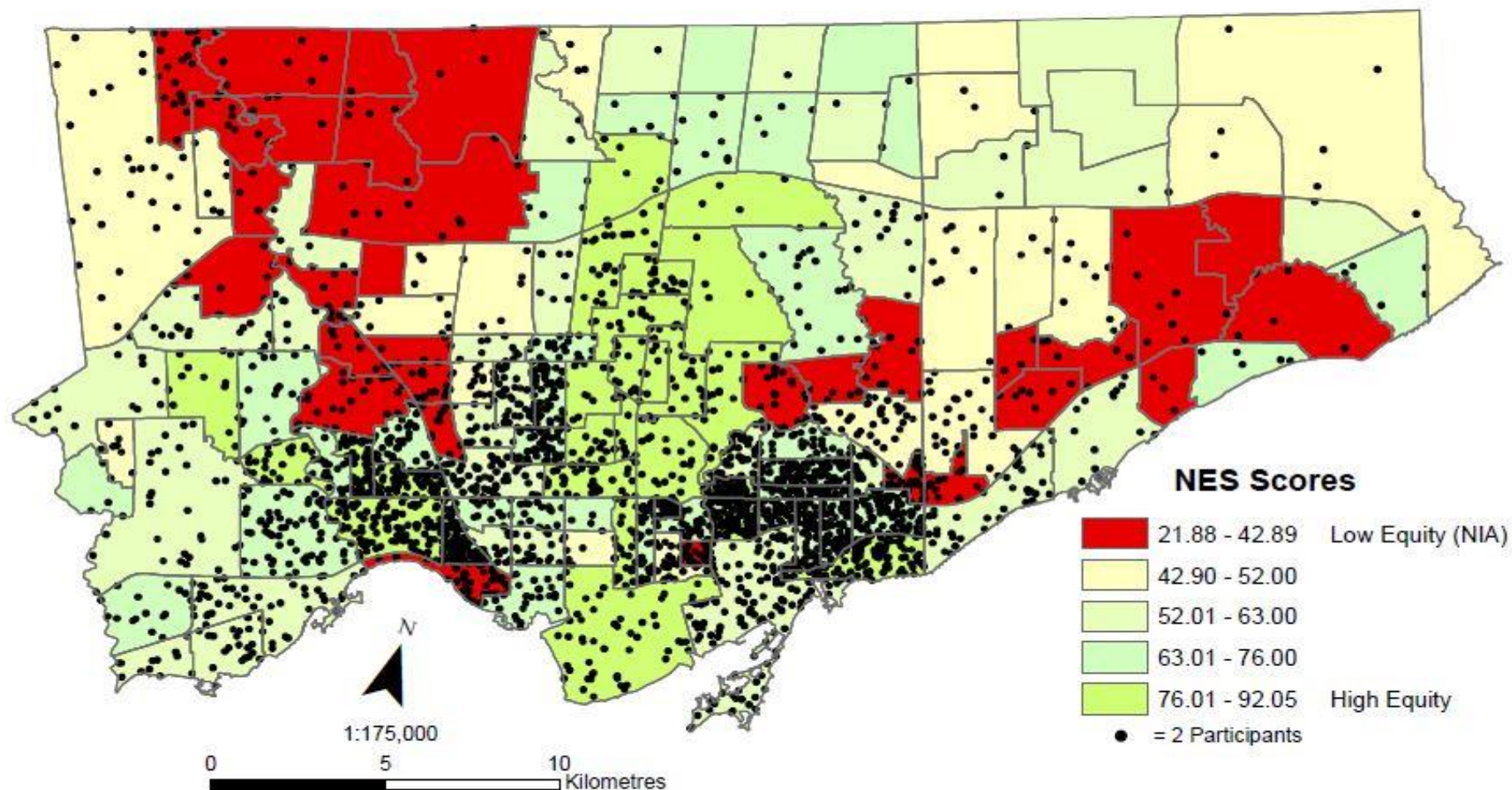
Neighbourhood Equity Score
Child and Family



Neighbourhood Equity Score

- Composite Index of Scores
- Quantitative assessment of Toronto neighbourhood wellbeing
- Developed by Urban HEART Toronto
- 5 Domains and 15 Indicators;
 - Economic Opportunities
 - Unemployment
 - Low Income
 - Social Assistance
 - Social Development
 - High School Graduation
 - Ontario Marginalization Index
 - Post-Secondary Completion
 - Participation in Decision Making
 - Municipal Voting Rate
 - Physical Surroundings
 - Community Places for Meeting
 - Walkability
 - Health Food Stores
 - Green Space
 - Healthy Lives
 - Premature Mortality
 - Mental Health
 - Preventable Hospitalizations
 - Diabetes

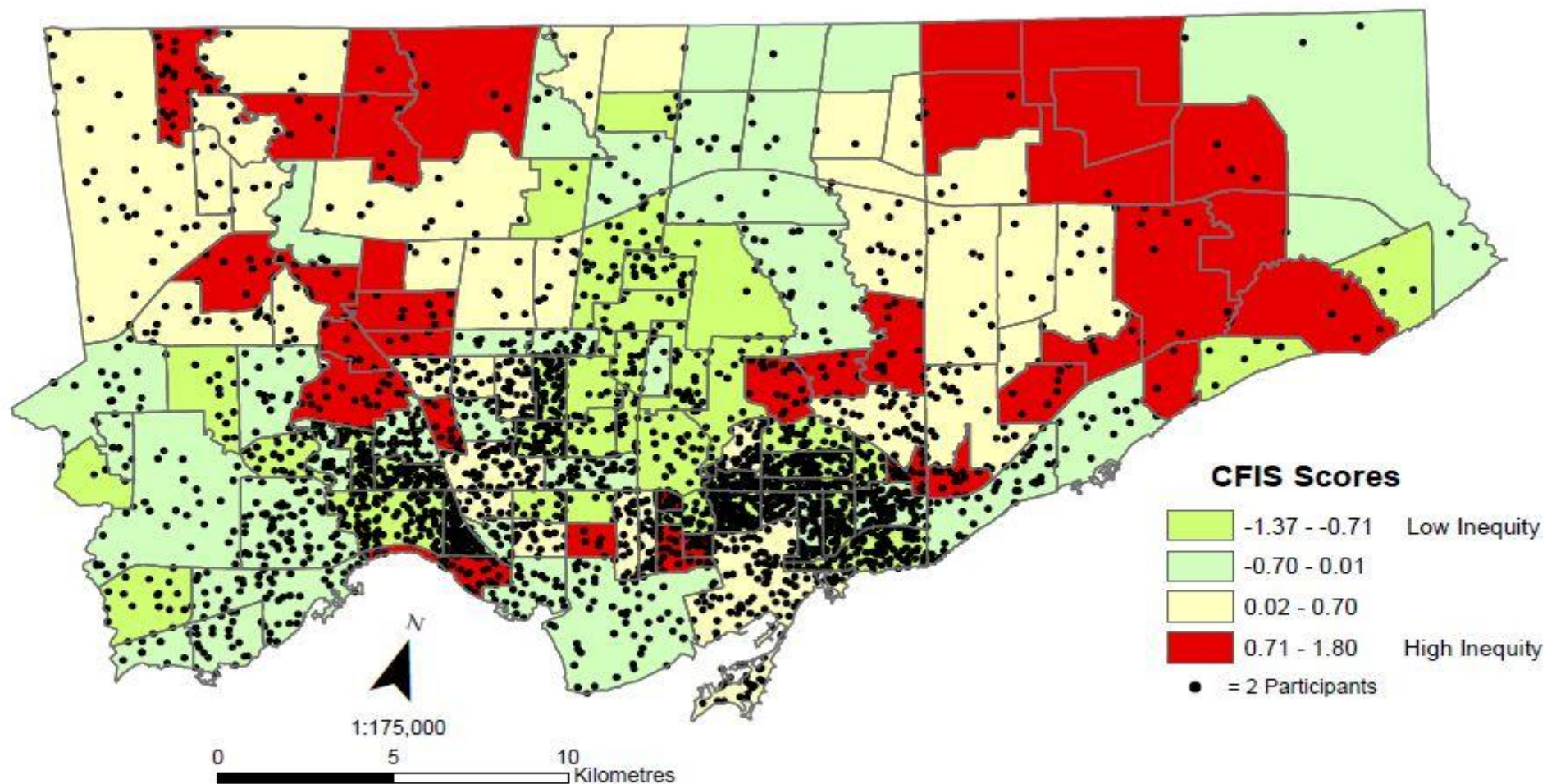
TARGet Kids! Participants by Neighbourhood in Toronto with Neighbourhood Equity Scores by Neighbourhood



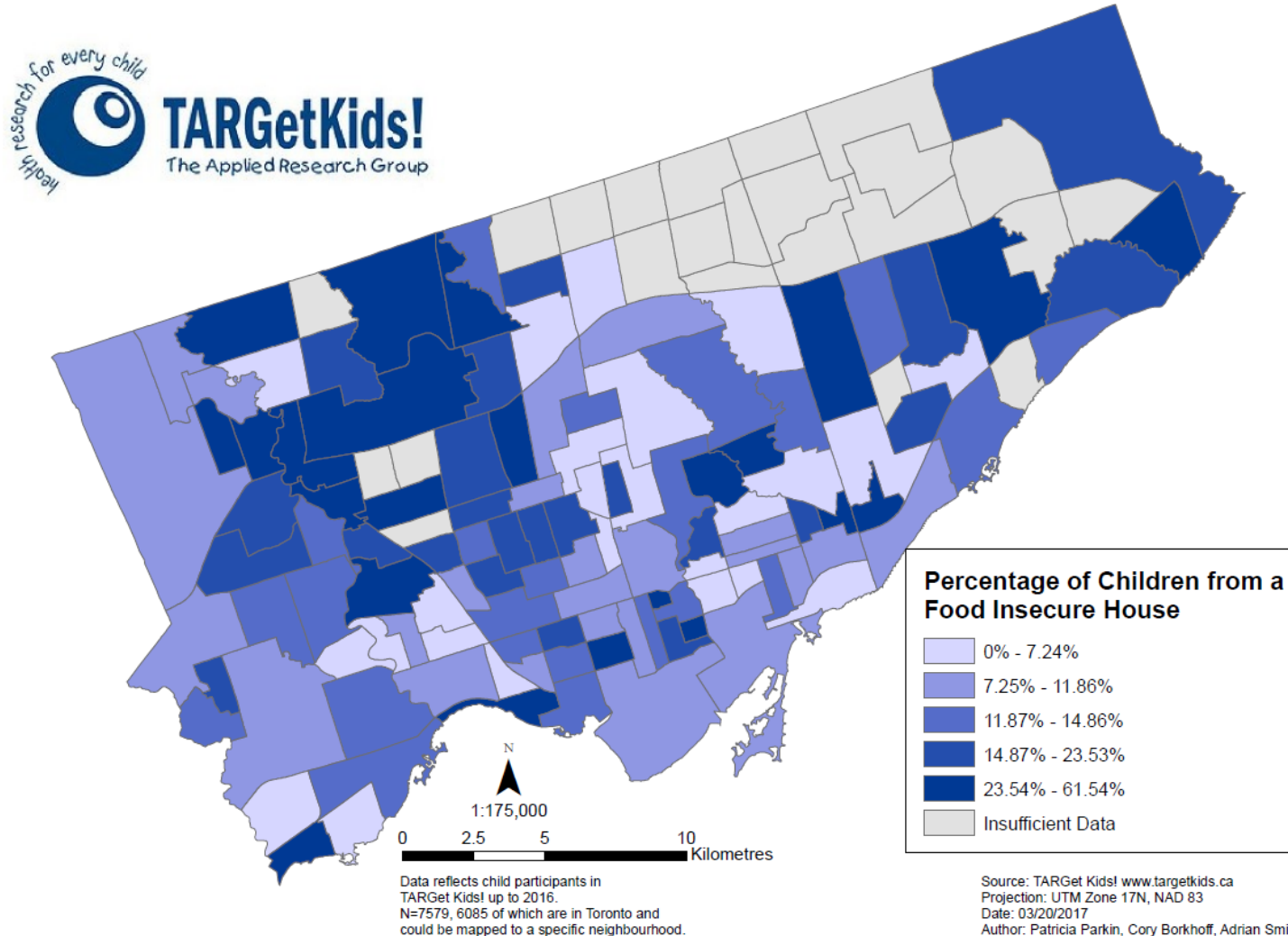
Child and Family Inequity Score

- Indicators specific to families with children under 12 yrs
- Indicators known to be social determinants of child health
- 5 Indicators:
 - Low Income Measure
 - Parental Unemployment
 - Low Parental Education
 - No Knowledge of Official Language
 - Core Housing Need

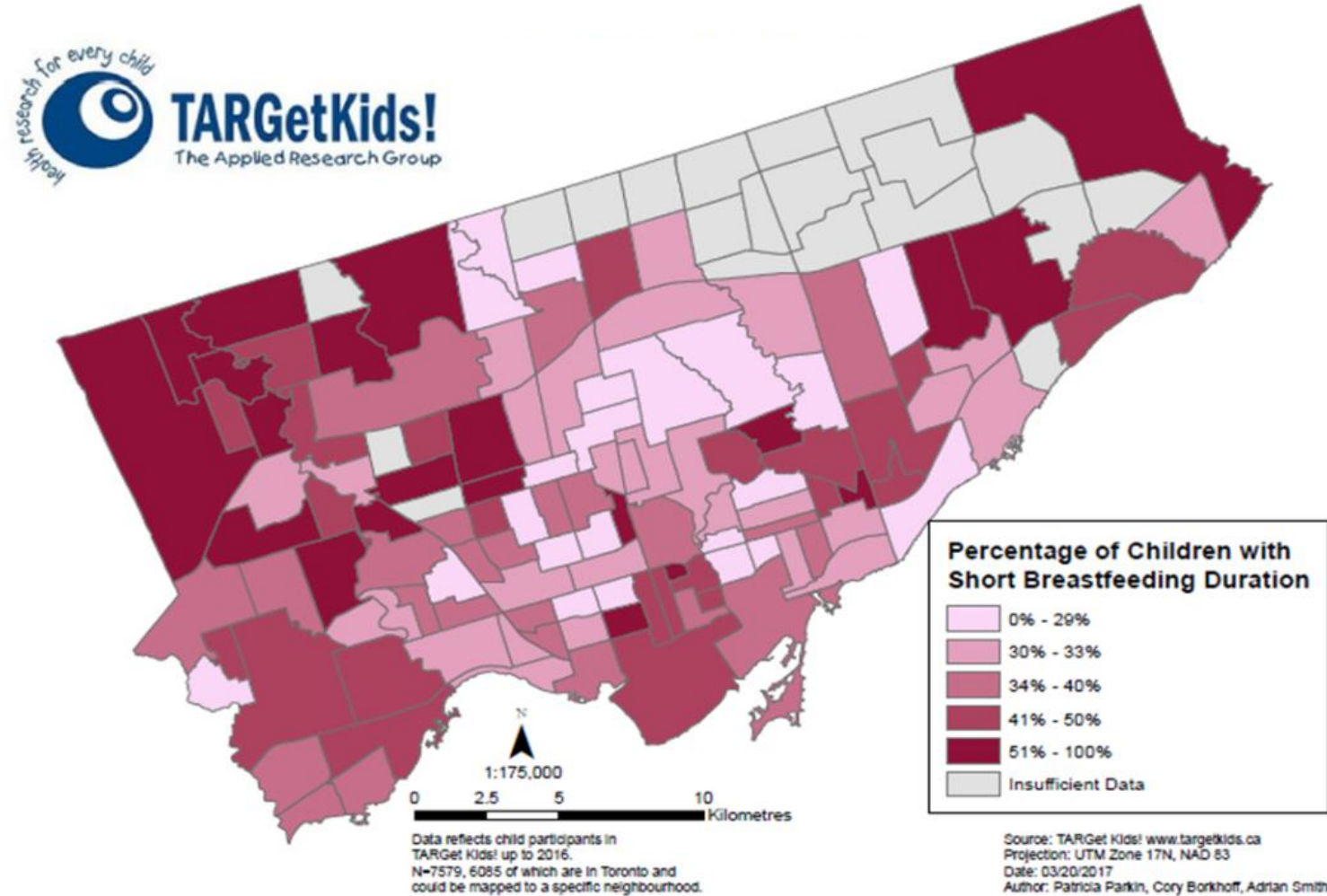
TARGet Kids! Participants by Neighbourhood in Toronto with Child and Family Inequity Scores by Neighbourhood



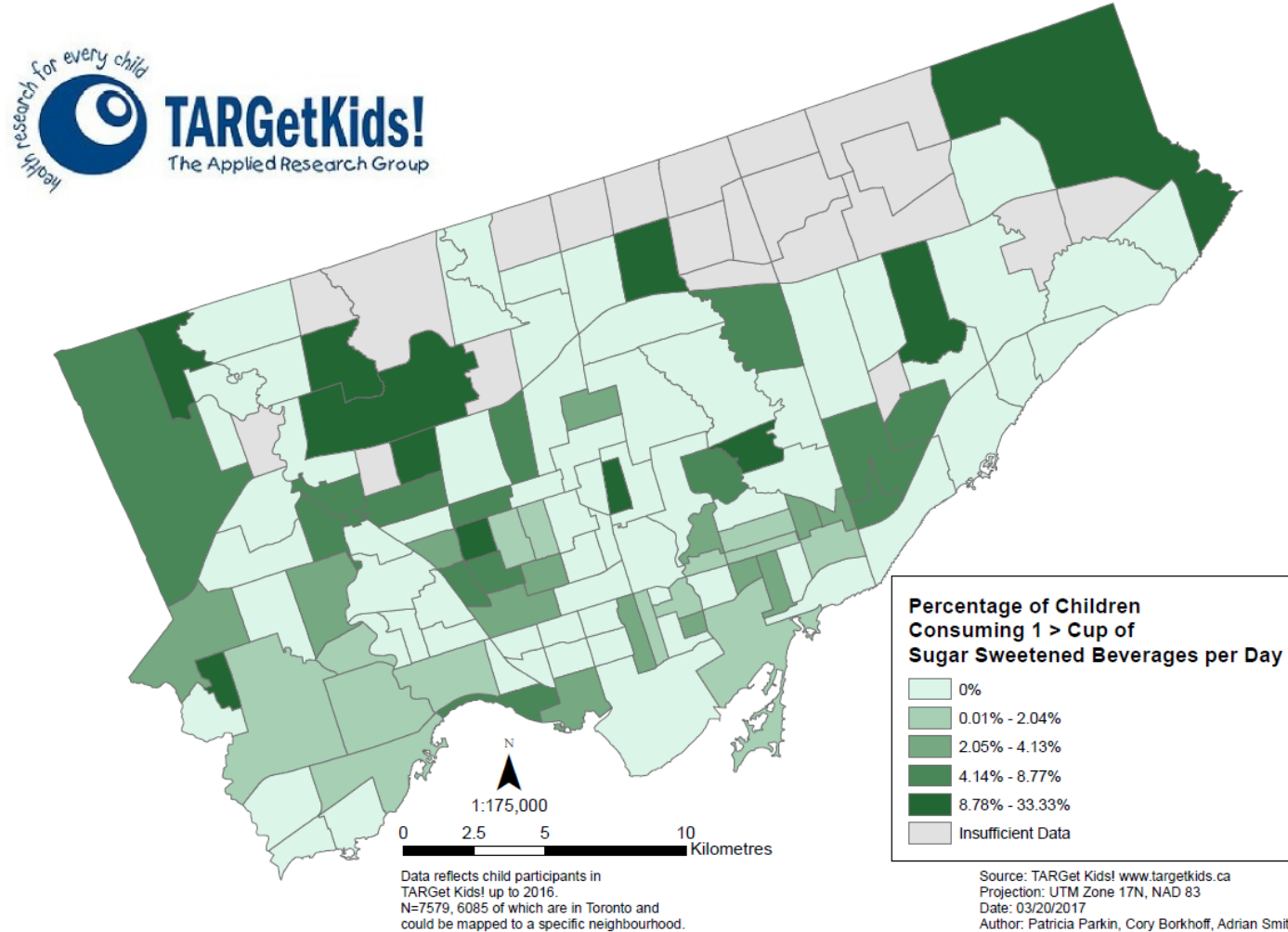
Food Insecurity



Short Breastfeeding Duration



Sugar Sweetened Beverages



Child Health Indicator Mapping

- When mapped, TARGet Kids! health indicators exhibit spatial trends, patterns and relationships.



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Examining Associations between
Social Determinants and
Child Behaviours and Measures

Difficulty buying food, BMI, and eating habits in young children

Anne Fuller, MD,¹ Jonathon L. Maguire, MD,¹⁻⁵ Sarah Carsley, MSc,⁴ Yang Chen, MA, MSc,² Gerald Lebovic, PhD,²,
Jessica Omand, MSc,^{3,6} Patricia Parkin, MD,^{1,2,4,5} Catherine S. Birken, MD, MSc,^{1,2,4,5} on behalf of the TARGetKids!
Collaboration

“When all people, at all times, have physical, social and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences of an active and healthy life” (FAO)

- Commonly measured by the 18-item Household Food Security Survey Module
- Reflects limitations in dietary intake due to cost of food as well as stress about meeting family’s food

Food Insecurity and Childhood Obesity

- Food insecurity has been associated with obesity in adolescents and adults
- Inconsistent associations among young children
- Poverty associated with nutritional risks, including less health eating habits and infant feeding behaviors
- Household food insecurity may be a stronger marker of nutrient inadequacy among Canadian adults and youth compared with US counterparts

Study Objectives

- 1) To determine if difficulty buying food is associated with BMI z-score in our study population

- 2) To determine if difficulty buying food is associated with known dietary determinants of BMI z-score
 - Daily fruit and vegetable intake
 - Daily fruit juice and sweetened beverage intake
 - Weekly fast food intake

Study Variables

Exposure

- Difficulty Buying Food
- Parent response to Nutristep question:

"I have difficulty buying food to feed my child because food is expensive: most of the time; sometimes; rarely; never."

- Dichotomized as:
 - **No difficulty buying food**
 - **Difficulty buying food**

Outcomes

- Primary: BMI z-score for age and sex (primary)
- Secondary: dietary determinants
 - Daily fruit and vegetable intake
 - Daily fruit juice and sweetened beverage intake
 - Weekly servings of fast food

No association between Difficulty Buying Food and BMI Z-Score

Table 4. Association of eating habits with difficulty buying food rarely or sometimes/often*

Outcome	Rarely [†]	Sometimes/often [†]
	OR (95% CI)	OR (95% CI)
Fruit/vegetable ≤3 servings/day	1.22 (0.91–1.63)	1.54 (1.04–2.30)
Juice/sweetened beverages ≥1 cup/day	1.47 (1.13–1.91)	1.98 (1.32–2.97)
Fast food ≤2 [‡] years of age ≥1 serving/week [§]	2.88 (1.54–5.38)	2.98 (1.22–7.29)
Fast food >2 years of age ≥1 serving/week	1.03 (0.73–1.44)	1.14 (0.71–1.84)

* Each model was adjusted for child age, sex, maternal education, maternal immigration status, maternal ethnicity, and neighbourhood income.
[†] Compared with no difficulty buying food.
[‡] This age category includes children from 1 to 2 years of age.
[§] Stratified because of interaction.

Summary

- Food insecurity impacts eating behaviours in young children
- Focus should be on enhancing healthy eating behaviours


Testing interventions

PARENTING GROUPS AND HOME VISITS IN PRIMARY CARE



Healthy Habits for Healthy Lives

Get involved. Make a difference. Join our PARENT study!
Participation may include group-based parenting support and home visits to promote healthy growth and development in young children.







Do you live in Toronto?
Do you have a child between 18 months and 3 years of age?
Was your child's birthweight greater than 3.5kg (7.7 lbs)?
OR
Are you concerned about your weight or your partner's weight?

} If YES to these, you may be eligible to participate.

Grocery gift cards will be provided for participation.

Ask the TARGeT Kids! research expert in your doctor's office.
Contact us:
www.targetkids.ca/parent
or call 416-813-7654 ext. 309441



Version Date: 02/17/2014

PRECONCEPTION HEALTH OBESITY AND DEVELOPMENT



Healthy Life Trajectories Initiative



HEALTHY KIDS
COMMUNITY CHALLENGE



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Interventions

Healthy Kids Community Challenge

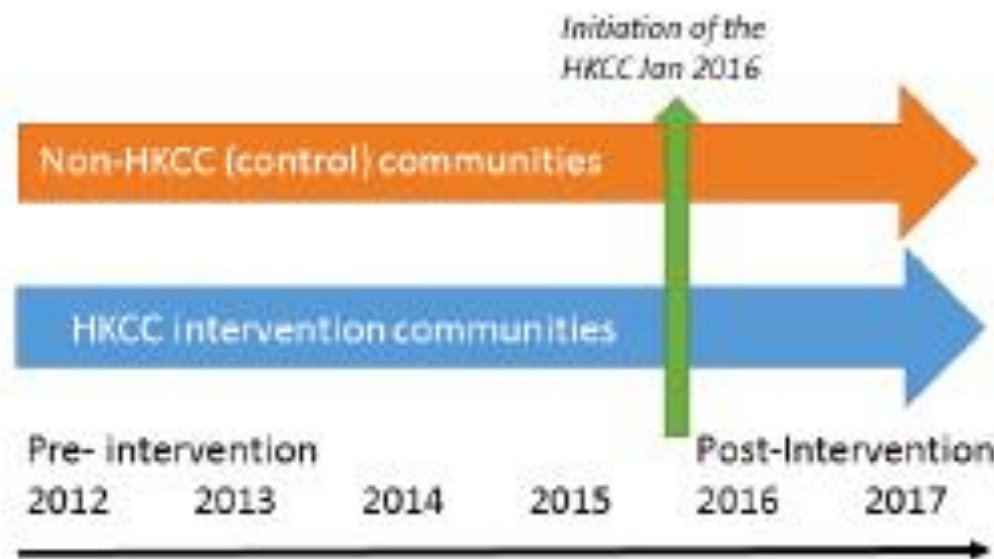
- Designed by the MOHLTC¹
- Community-based intervention implemented in 45 selected communities across Ontario (from 2016-2018)
 - Targeted high-risk communities in Toronto (low SES)
- Aimed to implement policies and programs to promote healthy behaviors and healthy weights in children aged 0-12 years



Evaluation of the Healthy Kids Community Challenge (HKCC) in Early Childhood



Greater Toronto Area



Study Objectives

To evaluate the impact of Healthy Kids Community Challenge on:

1. Child BMI
2. Obesity related Behaviours
3. Cardiometabolic Risk Factors
4. Health Equity

Pre-intervention
2012 2013 2014 2015

Post-Intervention
2016 2017



- TARGet Kids! Primary Care Based Research Network
- Open prospective cohort study
 - Network of >50 primary care providers
 - Nearly 7000 children <6 years of age with 70% follow-up
 - Data includes: Nutrition & Health Questionnaires, Blood, Physical Measures and Modifiers of Health Equity



HKCC Analysis- EMERALD

- higher proportion of children in the lowest neighbourhood income quintile living in HKCC communities (18.5% vs. 10.1% in non-HKCC communities)

Table 1. Comparison of baseline characteristics between children 1–12 living in HKCC communities vs. non-HKCC communities (N = 19 920).

	HKCC (N = 7 382)		Non-HKCC (N = 12 538)		Std Diff	P-value ^a
	n	%	n	%		
<i>Neighbourhood Income Quintile</i>						
1- Lowest	1 364	18.5	1 266	10.1	0.247	< .001
2	1 258	17.0	2 508	20.0		
3	1 570	21.3	2 696	21.5		
4	1 616	21.9	3 122	24.9		
5- Highest	1 557	21.1	2 911	23.2		
Missing income quintile	17	0.2	35	0.3		

TARGet Kids! Baseline Characteristics

	HKCC community (intervention) N=1228	Non-HKCC community (controls) N=5283
Age in months, Mean (SD)	27.3 (20)	27.6 (19.6)
Sex, N (%)		
Male	591 (49%)	2809 (53%)
Female	613 (51%)	2475 (47%)
Ethnicity, N (%)		
European	612 (55%)	3199 (67%)
East Asian	61 (5%)	339 (7%)
South Asian	124 (11%)	329 (7%)
Southeast Asian	48 (4%)	172 (4%)
Arab	29 (3%)	86 (2%)
African	110 (10%)	234 (5%)
Latin	35 (3%)	160 (3%)
Mixed	77 (7%)	233 (5%)
Other	7 (<1%)	15 (<1%)
Median Neighborhood Household Income from Postal Code, Mean (SD)	\$49,950 (\$15,268)	\$60,461 (\$26,690)
zBMI*, Mean (SD)	0.07 (1.20)	0.00 (1.18)

*zBMI, Body Mass Index (BMI) age and sex adjusted z-scores based on WHO growth standards

Comparison of the association between neighbourhood and household-level income and child BMI in TARGet Kids; baseline HKCC analysis

Tooba Fatima, Laura N. Anderson PhD, Catherine Birken MD, MSc, FRCPC

SES and Obesity: Past literature

Study ¹⁰⁻¹⁶	Population	Analysis	Results (Odds/risk of overweight/obesity in low vs high SES)
2014 Sweden	Children aged 0-14 years; N= 948,062	Multilevel logistic regression	Neighbourhood deprivation OR = 1.70, (95% CI = 1.55–1.89)
2005 Canada	Children and youth aged 5 to 17; N=11,455	Hierarchical non-linear modelling	Low neighbourhood SES OR: 1.29 (95% CI: 1.14-1.46)
2006 Canada	Youth in grades 6 –10 N=6684	Multilevel logistic regression	Unemployment rate OR: 1.74 (95% CI: 1.10, 2.76) Less than high school OR: 1.12 (95% CI: 0.61, 2.05) Employment income OR: 1.10 95% CI:0.59, 2.06)
2010 Washington	6–18-year-old children N = 8,616	Conditional autoregressive regression models	Median income OR: 1.15 (95% CI: 1.03, 1.29)
2006 U.S.	7–12th graders N= 20,745	Poisson regression	Neighborhood median household income ARR: 1.03 (95% CI:0.91–1.17)
2008 Canada	Children aged 2–3 N = 2152	Individual growth modelling	living in 'most poor' neighbourhood was associated with increasing BMI percentile 1.46 (95% CI 0.16 to 2.75)
2016 Germany	Children aged 5-7 years N=3499	hierarchical logistic regression	Neighbourhood SEP OR: 1.42 (95% CI:1.00-2.00)

Area-level vs individual-level income

- When house-hold level income is unavailable, area-level income (typically neighbourhood) is used as a measure for SES
- Previous literature depicts poor agreement between individual and area-level income in urban populations with families

Minnesota (2013)⁷

Misclassification:

20-35%

Kappa: **0.26-0.36**

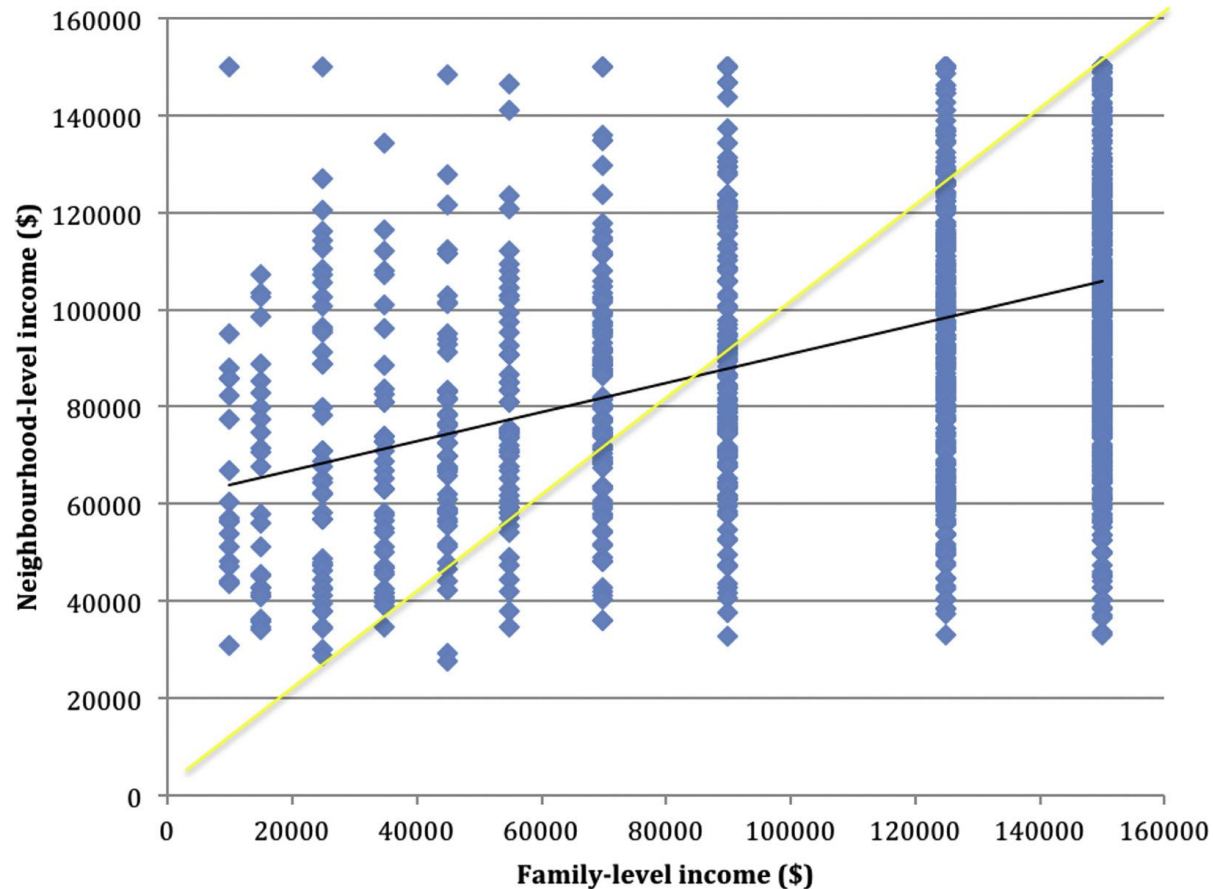
Missouri (2015)⁸

Misclassification:

22-31%

Kappa: **0.15-0.22**

Area-level vs individual-level income



The black line represents the trend line. The yellow line represents a perfect agreement (slope = 1)

- TARGeT Kids (2014)⁹
- Misclassification: **80%**
- Weighted Kappa: **0.22**

- Neighborhood-level income tended to overestimate family-level income for family-level incomes less than \$80,000 and underestimate family-level income for family-level incomes greater than \$80,000

What are the gaps?

Gaps

- No study compared the level of agreement between area-level associations to individual-level associations
- No study assessed the discordant categories of income (i.e. low-SES children living in high-SES areas on health outcomes (and vice versa))

Objectives

Primary objective: to compare the association between neighbourhood and family-level income and body mass index at baseline for HKCC cohort

- Not a causal question

Secondary objectives:

1. To evaluate the discordant categories of income on BMI
 - E.g. do low-income children living in high income areas have a higher or lower BMI than high-income children living in low-income areas
2. To compare the associations of neighbourhood income and the Ontario Marginalization Index with respect to BMI (OMI to be obtained from PHO)

Testing interventions – work ahead

PARENTING GROUPS AND HOME VISITS IN PRIMARY CARE



Healthy Habits for Healthy Lives

Get involved. Make a difference. Join our PARENT study!
Participation may include group-based parenting support and home visits to promote healthy growth and development in young children.



Do you live in Toronto?
Do you have a child between 18 months and 3 years of age?
Was your child's birthweight greater than 3.5kg (7.7 lbs)?
OR
Are you concerned about your weight or your partner's weight?

} If YES to these, you may be eligible to participate.

Grocery gift cards will be provided for participation.

Ask the TARGeT Kids! research expert in your doctor's office.
Contact us:
www.targetkids.ca/parent
or call 416-813-7654 ext. 309441



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PRECONCEPTION HEALTH OBESITY AND DEVELOPMENT



Healthy Life Trajectories Initiative



Challenges in Primary Health Care Research

- Ensuring inclusion
- Engaging all families
 - Translation of materials
 - Ensuring cultural safety
 - Engaging with families, neighbourhoods and communities
- Methods!!! to use the existing data

DECISIONS

Obesity in a young child

Catherine Birken MD MSc, Jill Hamilton MD

- A 3 year old boy is scheduled for his annual well-child visit at his primary care physicians office
- His mother tells the physician that she is worried about her son's weight
- She is also struggling with his behavior
- She has had trouble finding subsidized daycare, precarious employment
- Had trouble in the past paying the bills

DECISIONS

Obesity in a young child

Catherine Birken MD MSc, Jill Hamilton MD

Engage and Assess

- Assess parent concerns, health and behaviour, social situation

Ask Permission to discuss

- *would it be all right to discuss your child's health?*
- Readiness for change - SMARTER goal
- Link to support

Arrange follow up

Clinicians and Researchers role

Opportunities

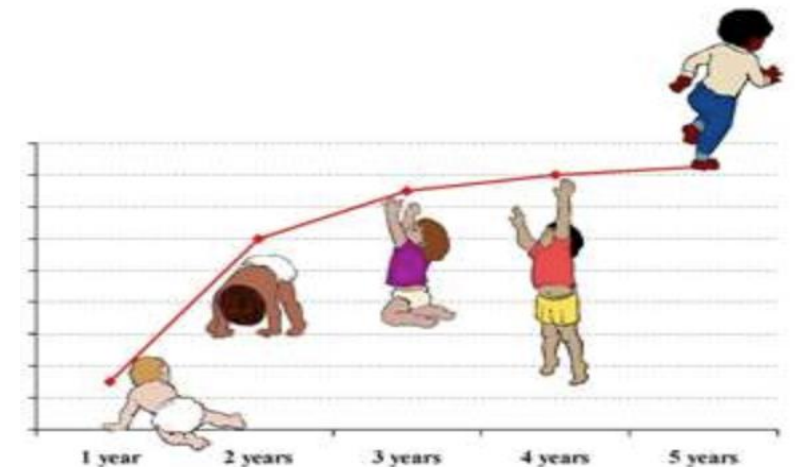
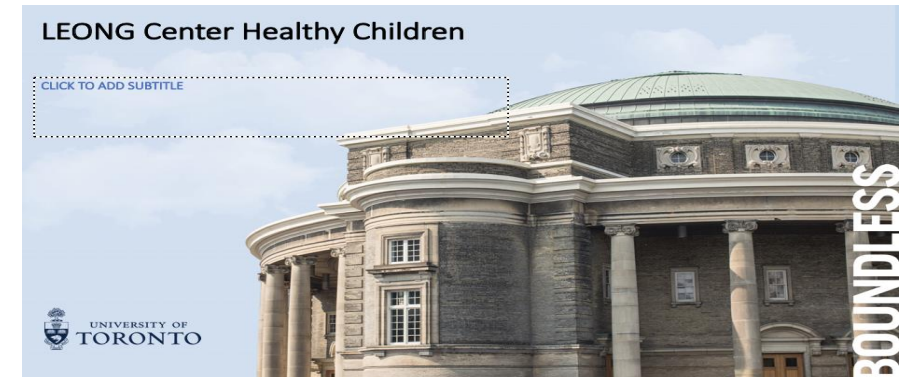
Work together

Prioritizing child health care and research for all children

Use Data more effectively to predict which intervention, for which families, at which time

Test and Scale up effective and meaningful interventions for all families

Evidence to effect policy



THANK YOU

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TARGetKids!

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UNIVERSITY OF TORONTO