Big Data for Health Policy in Early Childhood: The TARGet Kids! Network



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Critical Gaps in Population Surveillance on Children in the Early Years

Canadian Community Health Survey (CCHS)

Target Population - Canadians aged 12 and over

Canadian Health Measures Survey (CHMS)

Target Population - between 3 and 79 years

Minimal data on children 3 – 5 years

Ontario Health Study (OHS) does not include children

TARGet Kids! is filling this gap





Targeting Child Health:

improving health outcomes for Canadians through preventive healthcare in early childhood

Co-Leads:

Dr. Patricia Parkin

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Dr. Jonathon Maguire



Risk factors

Predisposing factors

- country of birth
- ethnicity
- maternal education
- parent's employment status
- immigration

Maternal and paternal health

- maternal / paternal age
- smoking, alcohol, drugs
- BMI, waist circumference
- physical activity
- diabetes and hypertension
- parenting stress

Enabling resources

- family income
- food security
- child's living arrangement
- other children
- frequency of health care visits
- regular primary care physician

Child growth and development

Biological factors

- age, sex
- lipid profile
- serum ferritin (iron stores)
- vitamin D levels
- glucose, insulin activity

Anthropometric measures

- · BMI, waist circumference
- blood pressure and heart rate
- birth weight
- skin type

Lifestyle factors

- food and nutrient intake
- · feeding and eating behaviours
- physical activity
- amount of screen time
- sleep
- sun exposure

Child behaviour and development

- · temperament, personality
- development: vision, hearing, language, cognitive, physical, social/emotional, self-help
- · communicative development

Common health problems in urban preschool children linked with long-term negative health outcomes

Overweight and obesity

- → linked with cardiovascular risk
- estimated 25% overweight

Iron deficiency

- → linked with developmental delay, school readiness
- estimated 30% with low iron stores

Vitamin D deficiency

- → linked with bone health, cancer, multiple sclerosis
- estimated 30% with low vitamin D

Developmental problems

- 'toxic' stress and failure to thrive linked with adult vulnerability to unemployment, risky behaviours (e.g., substance abuse), mental health problems, physical illnesses (obesity and stunting, high blood pressure, depression, heart disease and diabetes)
- estimated 2/3 of the developmental vulnerabilities that children present with by school age are preventable

Figure 1. Research Focus of the TARGet Kids! study.

Child Health Research Network Embedded in Primary Care Practices

- Largest cohort of healthy preschool-aged children (from birth to 5 years) recruited in Canada
- 9 group practices (each with at least 3 MDs), > 50 physicians
- 7000 children enrolled through primary care doctor's offices during Well-Child visits and followed up yearly

Longitudinal dataset recruited since 2008; >50% with repeated

visits



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Table 2. General overview of data collected in TARGet Kids! Study

Data	Age at time of enrolment or follow-up								
	0-6 months	12 months	15 months	18 months	2 years	3 years	4 years	5 years	6+ years
PHYSICAL MEASUREMENTS									
Weight	✓	✓	✓	✓	✓	✓	✓	✓	✓
Length	✓	✓	✓	✓					
Height					✓	✓	✓	✓	✓
Waist circumference	✓	✓	✓	✓	✓	✓	✓	✓	✓
Blood pressure					✓	✓	✓	✓	✓
BLOOD SAMPLE									
CBC, a lipid profile, ferritin, vitamin D, PTH, chemistry panel	✓	✓	✓	✓	✓	✓	✓	✓	✓
HEALTH & LIFESTYLE FACTORS									
Nutrition and Health Questionnaire (NHQ)									
NHQ Initial Form	✓	✓	✓	✓	✓	✓	✓	✓	
NutriSTEP TM v. 18 to 35 months				✓	/				
Nutrition risk score based on child's food and nutrient									
intake, physical growth, developmental and physical capabilities, physical activity, food security and the									
feeding environment									
NutriSTEP TM v. 3 to 5 years						1	1	1	
CHILD BEHAVIOUR						•	•	•	
		,	/						
Infant Behaviour Questionnaire (IBQ)		•	•		,				
Early Child Behaviour Questionnaire (ECBQ)					•	,	,	,	/c
Children's Behaviour Questionnaire (CBQ) DEVELOPMENTAL SCREENING						•	•	•	•
				,				,	
Nipissing Developmental Screening Tool (NDDS)				•				•	
Infant Toddler Checklist (ITC)				V					
PARENTING									
Parenting Stress Index (PSI)		✓	✓						

Steering Committee

Overall design and conduct of the TARGet Kids! Study **Principal Investigators Clinical Experts**



Primary Care Practice Site

Patient Enrollment Data Collection ≥ 3 Site Investigators Research Coordinators Phlebotomist

Methods Centre

Day-to-day coordination of the TARGet Kids! Study **Principal Investigators Project Manager Research Coordinators** Research Assistants

Writing Committee

Manuscript Preparation Principal Investigators Postdoctoral Fellow **Graduate Students**

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Primary Care Practice Site

Patient Enrollment Data Collection ≥ 3 Site Investigators Research Coordinators Phlebotomist

Applied Health Research Centre (AHRC)

Secure web-based data management, statistical analysis Statisticians

Data Manager

Central Laboratory Services

Lab test analysis, lab test reporting to study physicians, lab data linking to central database, blood sample storage Laboratory test analysts

"Future" **Practice Site**

Patient Enrollment Data Collection ≥ 3 Site Investigators Research Coordinators. Phlebotomist ...

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Acknowledgments

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Thank you to all participating families for their time and involvement in TARGet Kids!



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