health research for every child

TARGetKids!

Toronto Applied Research Group for Kids!

Targeting Child Health:

Obesity Prevention Research in Preschoolers

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UNIVERSITY of TORONTO

SickKids
RESEARCH INSTITUTE
Child Health Evaluative Sciences

Overview

1. The TARGet Kids! challenge
2. An overview of TARGet Kids!
3. Early TARGet Kids! results
4. Determinants of obesity: screen time
5. Obesity surveillance
6. Cardiometabolic risk
7. Discussion

?

health research for every child

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The TARGet Kids! Challenge

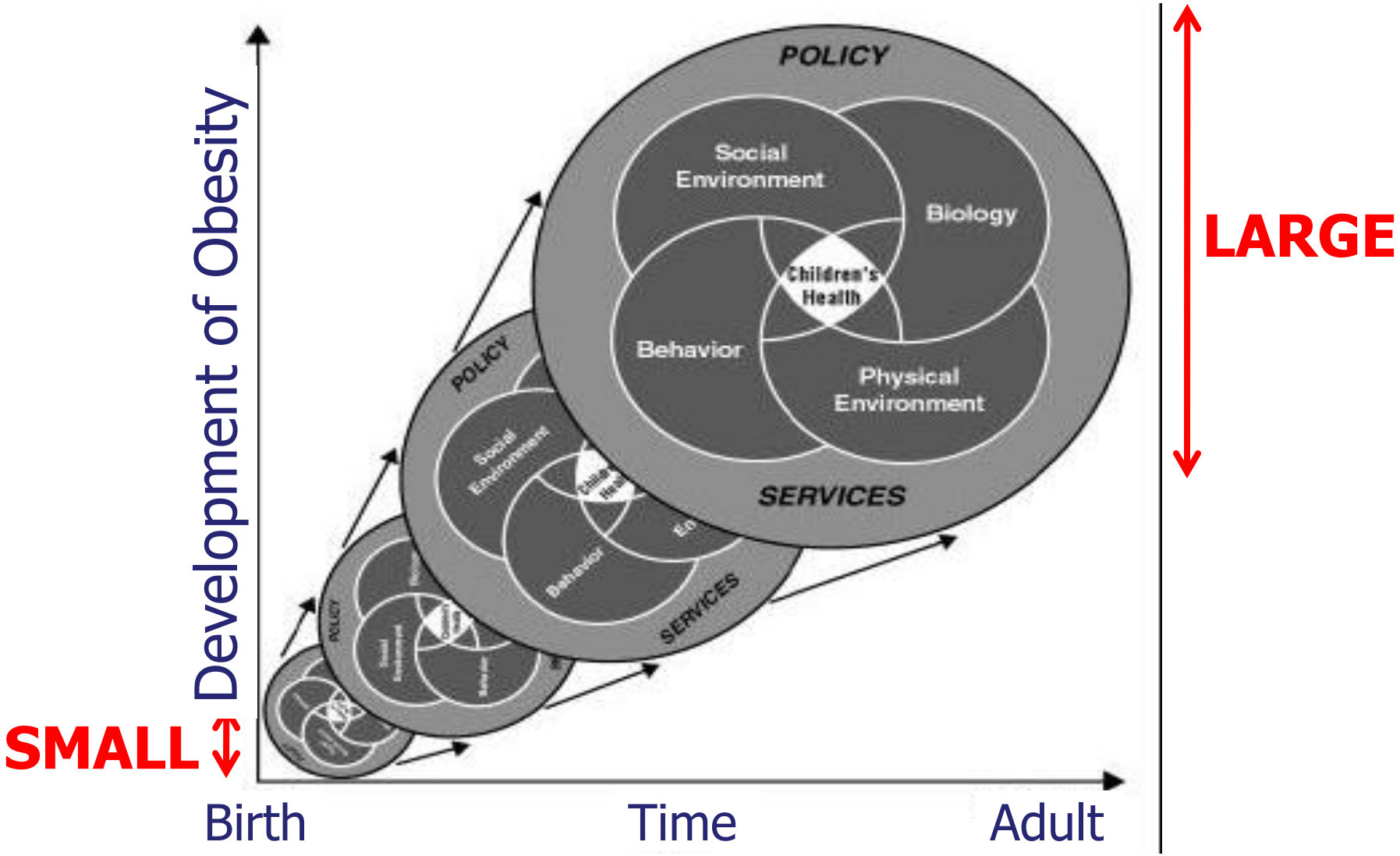
- Early childhood influences are antecedents to adult health
- Investments in early childhood result in high returns
- Understanding early influences can result in interventions for prevention
- Critical gaps in knowledge regarding primary and secondary (screening) prevention for children

Opportunities for Obesity Prevention

- Overweight begins at young age
- Parents have control over feeding and activity at a young age
- Patterns of eating, activity, and sedentary behaviour begin at young age
- Children who learn and adopt healthy behaviors are more likely to engage in those as adult

Can we build healthy children?

A Life Course Approach is Needed



Institute of Medicine, 2004

TARGetKids!

Toronto Applied Research Group for Kids!

We are:

- Primary care healthcare research network
- Focusing on child health in the early years
  - obesity, micronutrient deficiency, development

We aim:

- To build healthy people through community oriented primary preventative health care

University of Toronto

Philosophy

Opportunity	→	Go where healthy children go (Primary healthcare)
Pragmatism	→	Do what can be done now (Can do…. Not perfection)
Technology	→	High throughput data collection (Survey, physical measurement, laboratory)
Efficiency	→	Multiple studies, single platform
Collaboration	→	Multiple research partners Multiple stakeholders

Data Collection:
The status quo clearly doesn't work!

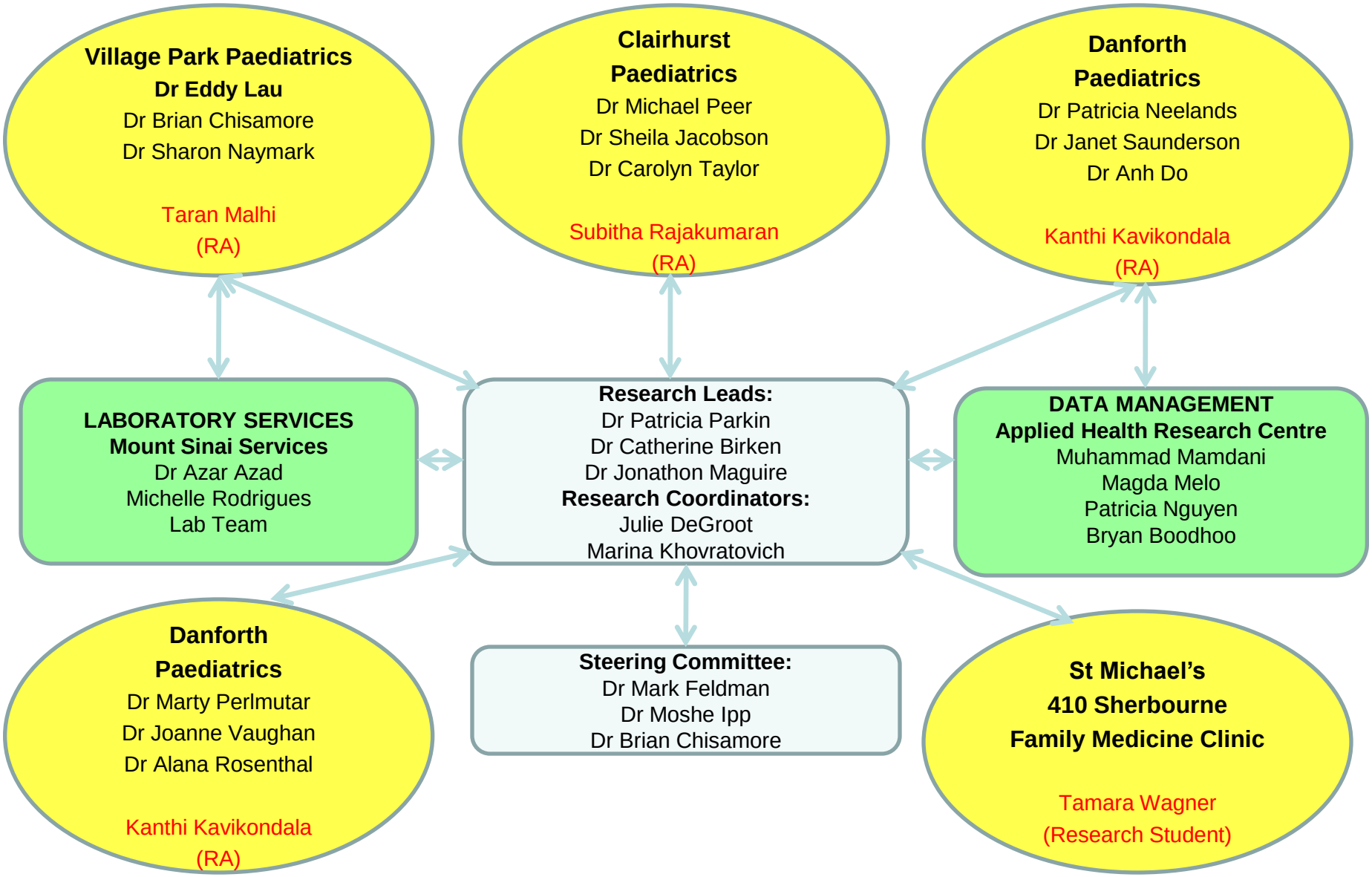
TARGet Kids! Data Collection

Primary Care Group Practice

LABORATORY SERVICES
Mount Sinai Services

WEB BASED DATA MANAGEMENT SYSTEM
Applied Health Research Centre

TARGet Kids! Structure



A platform for surveillance

90% of preschoolers receive routine primary health care

→ We can measure prevalence

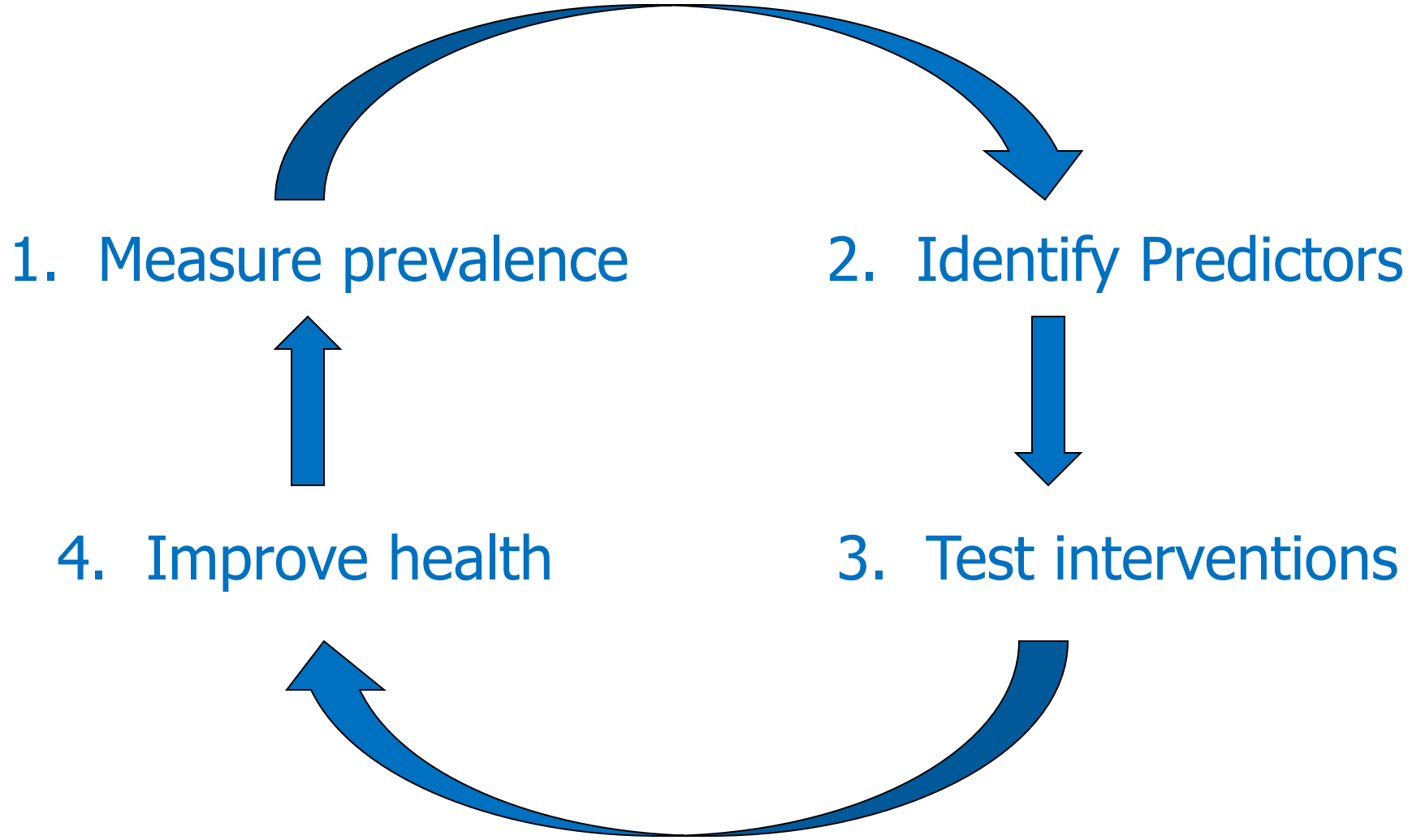
A platform for cohort studies

Pregnancy Birth Risk factors Adverse outcomes

Environmental Biological Social Behavioural Genetic

= Child health

A platform for RCTs



Subject Recruitment

Over the last 2 years…

Site	Total Enrolled	Blood Samples Collected
Village Park Paediatrics	1113	658
Clairhurst Paediatrics	1191	574
Danforth Paediatrics (4^{th} floor)	777	460
Danforth Paediatrics (1^{st} floor)	456	314
St. Michael's – 61 Queen St.	57	47
St Michael's Family Medicine	23	16
Total	3620	2072

Where?


ONTARIO
CANADA
Toronto
Mississauga
Brampton
Oakville
Burlington
Hamilton
Kitchener
Cambridge
Guelph
Oshawa
Pickering
Richmond Hill
Aurora
Newmarket
Orangeville
Caledon
Vaughan
Halton Hills
Milton
Dundalk
Shelburne
Mono Centre
Mount Forest
Grand Valley
Arthur
Drayton
Fergus
Elora
Erin
Eramosa
St. Jacobs
Wellesley
Puslinch
Alliston
Whitchurch-Stouffville
Port Hope
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Somerset
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400
404
407
410
401
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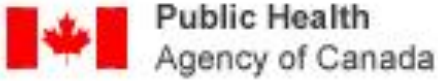
Support


CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada


Canadian Paediatric Society


St. Michael's Foundation
Inspired care. Inspiring Science


Sun Life Financial


Public Health Agency of Canada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TORONTO
Public Health


PSI
PSI FOUNDATION


Milk
DAIRY FARMERS OF ONTARIO

Determinants of Obesity Prevention

Diet, Physical Activity, Sedentary Behaviour, Sleep

TARGet Kids! Data

Overweight	15%
Obesity	4.5%
Daily screen time	3.5 hours
No vegetables in diet	35%
At nutritional risk	10%
Stroller use >½ time	46%

Screen Time and Obesity

- Preschool children watching 3-5 hours of screen time/day *(Certain, 2002)*
- Screen time associated with overweight at age three; Odds Ratio: 2.61 *(Lumeng, 2006)*
- Study objective: To identify factors associated with increased screen time in three year old children

Parent Factors Associated with Screen Time

	Factors associated screen time*	Change in screen time in minutes per day (95% CI)
Weekday	Screen at Lunch	+96 (30, 192)
	Screen at Dinner	+42 (12, 90)
	Mother employed	+36 (6, 72)
Weekend	Screen at Lunch	+78 (36, 132)
	Parent screen time/hr	+12 (6, 18)
	Family screen rules	-30 (-6, -54)

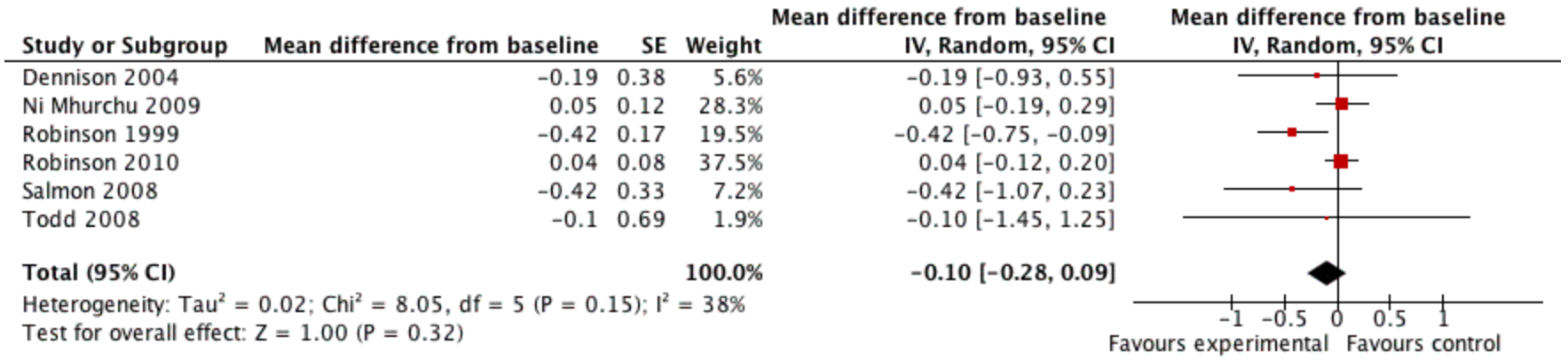
*adjusted for maternal education, age

Birken et al, Public Health Nutrition, 2010

Screen Time Interventions

- Systematic review screen time interventions showed *no* effect overall on BMI or Screen time outcomes *(Wahi, 2010)*
- Subgroup analysis on 2 preschool studies showed reduction in screen time

Figure 1 - Forest plot of primary outcome, unadjusted difference in mean change BMI



TARGet Kids! Screen Time RCT

- Randomized control trial in three year olds
- Intervention: 10 minute ‘doc talk’: reduce screen time, remove screen from bedroom, turn off TV during meals
- Results: Reduction of meals with TV (over 2 meals per week)
- No effect on BMI, screen time, TV in room *(submitted for publication)*

Obesity Surveillance in Practice

Obesity Surveillance

- US Preventive Services Task Force (2010):

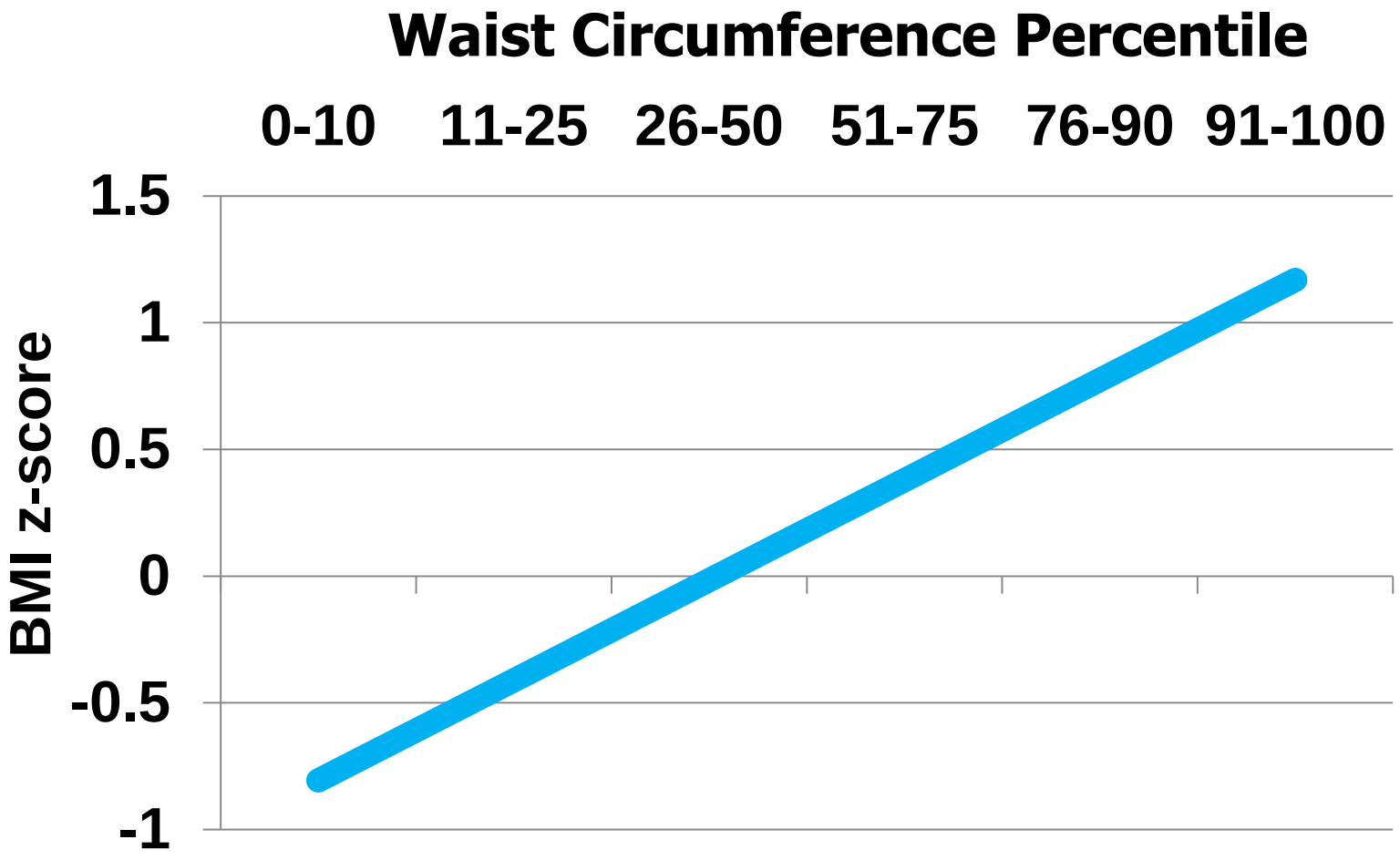
  Clinicians screen children 6 years and older for obesity using BMI

  Offer/ refer to intensive counseling and behavioural interventions (Grade B)
- Opportunities:
  - No evidence for under 6: Canadian Preventive Task Force Guide
  - How to screen:??? BMI, Waist circumference, other

Waist Circumference and Child Health

- WC is associated with cardiometabolic risk factor clustering in adolescents (Pediatrics, 2004)
- WC is correlated with DEXA (J Clin Nutr 2000)
- US Norms published in 2009; limited study in preschool children
- Objective: To describe waist circumference in a cohort of preschool children and to evaluate associations with BMI

BMI z-score is associated with Waist Circumference percentiles



‘Nutritional Risk’ Surveillance

- Nutritional Screening Tool for Every Preschooler: NutriSTEP™ (Simpson et al, 2008)
  - 17 item parent self-report
  - Constructs of nutrition risk: physical growth, food and fluid intake, physical activity and sedentary behaviors, food availability
  - Validated: dietician assessment, 3 day food records
- Currently performing analysis of adiposity and laboratory outcomes with the NutriSTEP™
- Preliminary data shows associations with lipid levels

NutriSTEP™ Sample Questions

3. My child usually eats fruit:
   - ☐ More than 3 times a day
   - ☐ 3 times a day
   - ☐ 2 times a day
   - ☐ Once a day
   - ☐ Not at all

11. I let my child decide how much to eat:
   - ☐ Always
   - ☐ Most of the time
   - ☐ Sometimes
   - ☐ Rarely
   - ☐ Never

15. My child usually watches TV, uses the computer, and plays video games:
   - ☐ 5 or more hours a day
   - ☐ 4 hours a day
   - ☐ 3 hours a day
   - ☐ 2 hours a day
   - ☐ 1 hour or less a day

Cardiometabolic Risk in Preschoolers

PROMOTE: Preschoolers at Risk-Obesity and Cardiometabolic Disease Towards Early Identification

Background

- Metabolic Syndrome: aggregation of factors associated with diabetes, coronary artery disease in adults
- Emerging evidence in youth
- International Diabetes Federation defined MetS in children >10 yrs:
  - obesity, high triglycerides, hypertension, high fasting glucose, low HDL
- Limited evidence in young children

PROMOTE Study Objective

1. To determine if cardiometabolic factors cluster in early childhood

2. To determine if child and family characteristics are associated with cardiometabolic factors

Cardiometabolic risk and Adiposity (n=1537)

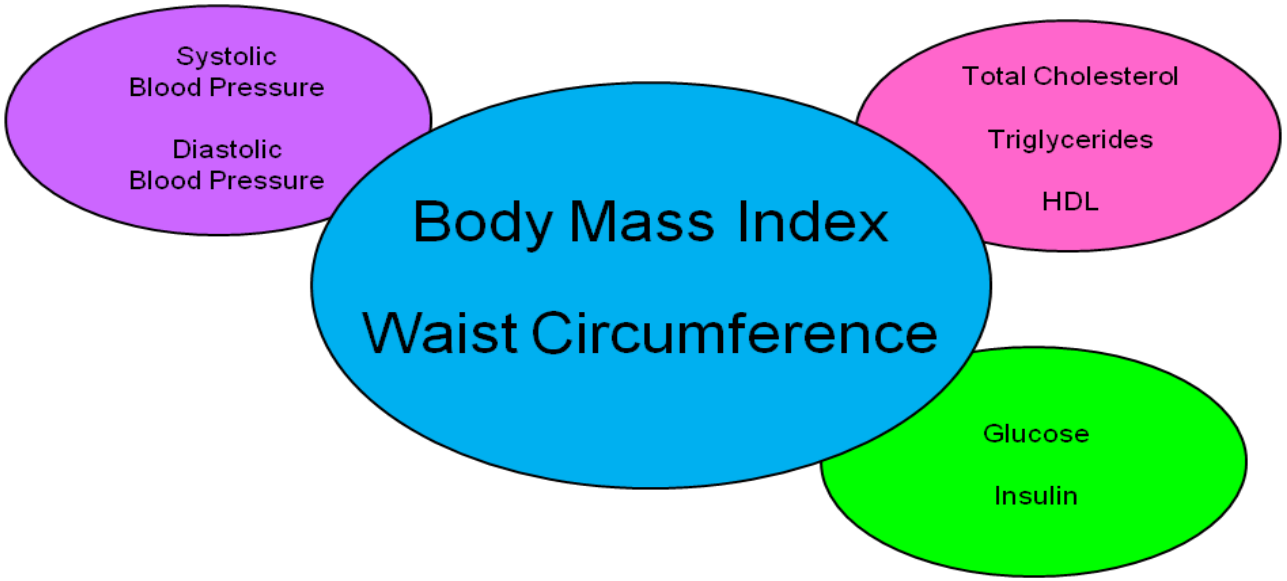
	Estimate	95% CI	p-value
zBMI			
Diastolic BP[1]	1.08	0.35,1.83	0.005
Waist Circumference			
Insulin[2]	1.32	0.33, 2.30	0.009

Controlling for:

[1]Age, gender, maternal BMI, parent education, and physical activity

[2]Age, gender, maternal BMI, fasting status, parent education, daycare,

Clustering of Cardiometabolic Factors



- 43 children (2.8%) had high risk
- Adjusting for age, sex, gestational diabetes, parent education.
- **Increased Birth Weight** was the only significant predictor of cardiometabolic risk
  OR 1.88 (95% CI 1.32, 2.67)

PROMOTE
Longitudinal Cohort Study

- Emerging evidence: rapid growth increases the risk of a metabolic syndrome, abnormal lipids in young adults
- Limitations: no data on obesity determinants
- PROMOTE cohort n=2040 children followed annually for 5 years:
  - to determine if rapid growth is associated with cardiometabolic risk, and how child and parent factors influence this relationship
- Goal: build the evidence base for assessment of young children in primary care practice

Take home messages

1. The early years: High payoff for community oriented primary healthcare
2. Leverages existing assets: The power of the health care system harnessed for surveillance, cohort studies and RCTs.
3. Opportunities for collaboration: Together, we can build healthier people!

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Building the evidence base for prevention…

"If not us then who?… If not now then when?"

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Child Health Evaluative Sciences

Acknowledgments

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