

**Equity in active living among youth:  
Understanding the influence of school policies  
and programs on screen time**

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**COMPASS** is a longitudinal hierarchical research platform for evaluating how natural experiments related to changes in **school-level programs, policies and built environment** impact changes in multiple **YOUTH** health behaviours and **outcomes**.

# DESIGN & METHODS

- Longitudinal quasi-experimental design
- 90 schools (79 in Ontario and 11 in Alberta)
- >50,000 Students between grades 9-12
- Wave 1 data collection was conducted in 2012-2013 academic year and this study utilizes data from Wave 2 (2013-2014)
- School-level data: program and policy environment and built environment characteristics within each school, and built environment characteristics in the community immediately surrounding each school
- Student-level data: obesity, healthy eating, physical activity, sedentary behaviour (**SCREEN TIME**), tobacco use, alcohol and marijuana use, school-connectedness, bullying, and academic achievement.

- Inability to meet screen time guidelines was significantly associated with **overweight/obese** status regardless of meeting the physical activity guidelines (Bai et al., 2016)
- Screen time was associated with an increased likelihood of **metabolic syndrome** independent of physical activity (Janssen and Mark, 2008)
- High screen time increases the risk of **asthma**, (Protudjer et al., 2012)
- Screen time was negatively associated with **fitness** (Sandercock et al., 2013) and **isometric trunk muscle strength** (Grøntved et al., 2013)
- Video game playing and computer use, but not TV viewing were associated with depressive symptoms. High computer use was associated with approximately a 50% increased engagement in **multiple risk behaviours** (Carson et al., 2011)

# STUDY-SPECIFIC DATA SOURCES

- **Screen time** ( TV viewing, Computer use, video games)
- **School policies during, and after school hours:** access to indoor/outdoor physical activity areas; access to sports equipment; access to physical activity infrastructure, hours of mandatory physical education
- **School programs:** number of intramural programs/clubs that promote physical activity in each season; number of non-competitive sports clubs that promote physical activity; participation in special events (e.g.. Terry Fox Run); type and number of varsity programs (e.g. tennis, rugby)
- **Built environment** around schools: parks; open areas; amusement parks; sport goods and bike shops; physical fitness facilities; museums, galleries and gardens
- **Weather data:** Daily maximum temperature, daily precipitation, number of daylight hours

- Sex and geography-specific multilevel random-intercept linear regression models
  - 4 models: Ontario (ON) boys, Ontario girls, Alberta (AB) boys and Alberta girls
- Screen time-specific multilevel random-intercept linear regression models
  - 2 Models: ON boys and ON girls
- Main variables: school policies, programs and built environment around the schools
- Models were controlled for grade, ethnicity and weather

# RESULTS

Variable	ON (N = )				AB (N = )			
	Female (n = 20388)	Male (n = 20936)	D F	Prob	Female (n = 1761)	Male (n = 1776)	D F	Prob
%(count)								
<b>Grade</b>								
9	26.7 ( 5445)	27.5 ( 5742)	3	0.027	15.0 ( 264)	15.4 ( 274)	3	0.697
10	26.2 ( 5344)	25.3 ( 5277)			33.0 ( 582)	31.3 ( 556)		
11	24.9 ( 5062)	24.4 ( 5099)			28.3 ( 499)	28.5 ( 505)		
12	22.2 ( 4511)	22.9 ( 4777)			23.6 ( 416)	24.8 ( 440)		
<b>Ethnicity</b>								
White	75.3 ( 15342)	73.2 ( 15315)	5	<.0001	74.2(1307)	72.6 ( 1290)	5	0.006
Black	3.2 ( 657)	4.9 ( 1033)			1.2 ( 21)	2.8 ( 50)		
Asian	5.2 ( 1068)	5.2 ( 1082)			3.4 ( 60)	4.4 ( 78)		
Indigenous	3.0 ( 613)	2.8 ( 591)			<b>11.1 ( 195)</b>	<b>10.2 ( 182)</b>		
Hispanic	1.9 ( 386)	2.2 ( 453)			0.5 ( 8)	0.2 ( 4)		
Other	11.4 ( 2322)	11.8 ( 2462)			9.7 ( 170)	9.7 ( 172)		
<b>Weight Status</b>								
Under	1.4 ( 282)	1.7 ( 350)	4	<.0001	1.4 (25)	1.8 ( 32)	4	<.0001
Healthy	61.7 ( 12574)	52.6 ( 11021)			58.0 (1022)	50.0 ( 888)		
Overweight	11.4 ( 2332)	16.7 ( 3493)			11.8 ( 208)	16.9 ( 300)		
Obese	4.1 ( 838)	8.3 ( 1734)			<b>6.0 ( 105)</b>	<b>10.1 ( 180)</b>		
<b>Mean(SD)</b>								
AGE	15.6(1.2)	15.6(1.3)		0.0003	15.8(1.1)	15.9(1.1)		0.001
TV (min/day)	121.4(89.1)	118.1(90.6)		0.0002	115.1(88.4)	117.3(93.2)		0.464
Inter. Surfing (min/day)	<b>139.1(123.5)</b>	113.2(112.9)		<.0001	<b>123.6(125.7)</b>	100.2(109.1)		<.0001
Video Game (min/day)	37.2(77.3)	<b>121.0(119.8)</b>		<.0001	43.4(82.8)	<b>120.9(119.2)</b>		<.0001

# TOTAL SCREEN TIME

- Visible minorities have consistently higher screen time: ON and AB boys and girls
- Regular access to INDOOR physical activity areas during non-instructional school time is associated with lower screen time: ON girls
- Presence of gymnasiums is associated with lower screen time: AB boys
- Varsity programs are associated with lower screen time:
  - Swimming: ON boys
  - Tennis: ON girls
  - Football: AB girls
- Presence of physical fitness facilities around schools is associated with lower screen time: ON boys
- Higher daily maximum temperature is associated with lower screen time: ON boys and girls



# TV vs. COMPUTER TIME

## TV

- Except youth who identified as Asian, all **visible minorities** are consistently associated with higher TV time: ON boys and girls
- Boys who identified as **Asian** had lower TV time
- Presence of **physical fitness facilities** around schools is associated with lower TV time: ON boys
- **Varsity programs** are associated with lower TV time:
  - Swimming: ON boys; Rugby: ON girls

## Computer time

- **Visible minorities** are associated with higher computer time: ON boys and girls
- Presence of **physical fitness facilities** around schools is associated with lower computer time: ON boys
- **Varsity programs** are associated with lower computer time:
  - Swimming: ON boys; Rugby: ON girls; Track and Wrestling: ON girls
- Presence of **museums** around schools is associated with lower computer time: ON girls

## Consistency of evidence across ON and AB

- Targeted policy and programming to reduce screen time in visible minorities

## ON-Specific evidence

- Design built environment to facilitate physical fitness facilities around schools

## Variation of evidence between different types of screen time

- There is a need to factor in video games time as an outcome variable

## Variation of evidence between boys and girls

- There is a need to inform sex-specific varsity programming

- Conduct analyses with videogames as one of the key outcome variables.
- Conduct longitudinal analyses to understand the influence of changing school policies and programs on screen time
- Provide evidence that would inform COMPASS School-Specific Health Profiles
- School health profiles are annual knowledge translation reports that provide schools with:  
a) evidence-based suggestions for policies and programs; b) suggestions for curriculum supplements aimed at improving student awareness and knowledge
- Specific to screen time, translate knowledge to schools regarding high-risk groups (**visible minorities**), sex and geography-specific school policies and programs (**indoor physical activity facilities and varsity programs**), and built environment around the schools (**physical fitness facilities**)
- Finally, identify potential overlap between these negative/positive screen time determinants with other youth behaviours to provide schools comprehensive preventive strategies.

Thank  
you!

Questions?

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