



# **Dangerous Drop-Off of Student Passengers, Pedestrian Behaviours and the Built Environment Around Schools**

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# INTRODUCTION

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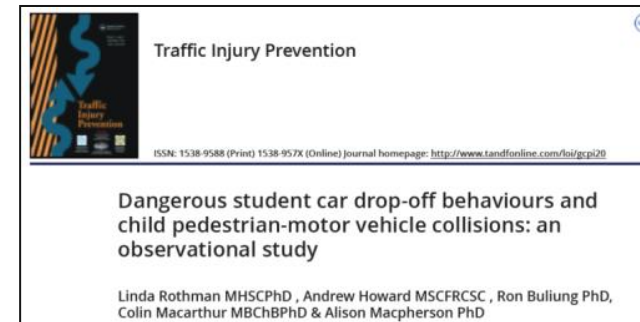
- Dangerous student passenger drop-off behaviours have not been well described
- Some observational data re: speeding, stop-sign violations near schools
- Some parent-perceived dangerous driving using surveys



# INTRODUCTION

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- Cross-sectional study (2011)
  - dangerous drop-offs, greater social disadvantage and higher speed roads associated with higher child pedestrian-motor vehicle collisions (PMVCs) near schools
- Case control study (2015)
  - more dangerous drop-off and pedestrian behaviours, walking exposure



# OBJECTIVES

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1. To identify correlates of child pedestrian-motor vehicle collisions (PMVCs) related to dangerous passenger drop-off and pedestrian behaviour around elementary schools in the City of Toronto, Canada
2. To identify built environment correlates of dangerous passenger drop-off and pedestrian behaviour around elementary schools



# **METHODS: Covariates**

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- **Built environment (BE)**

- Downtown urban vs. inner suburb
- School crossing guards
- Designated car drop-off areas (Kiss 'n ride)
- Major and minor arterial roads (200m)
- Intersections (200m)
- Walking trails (200m)

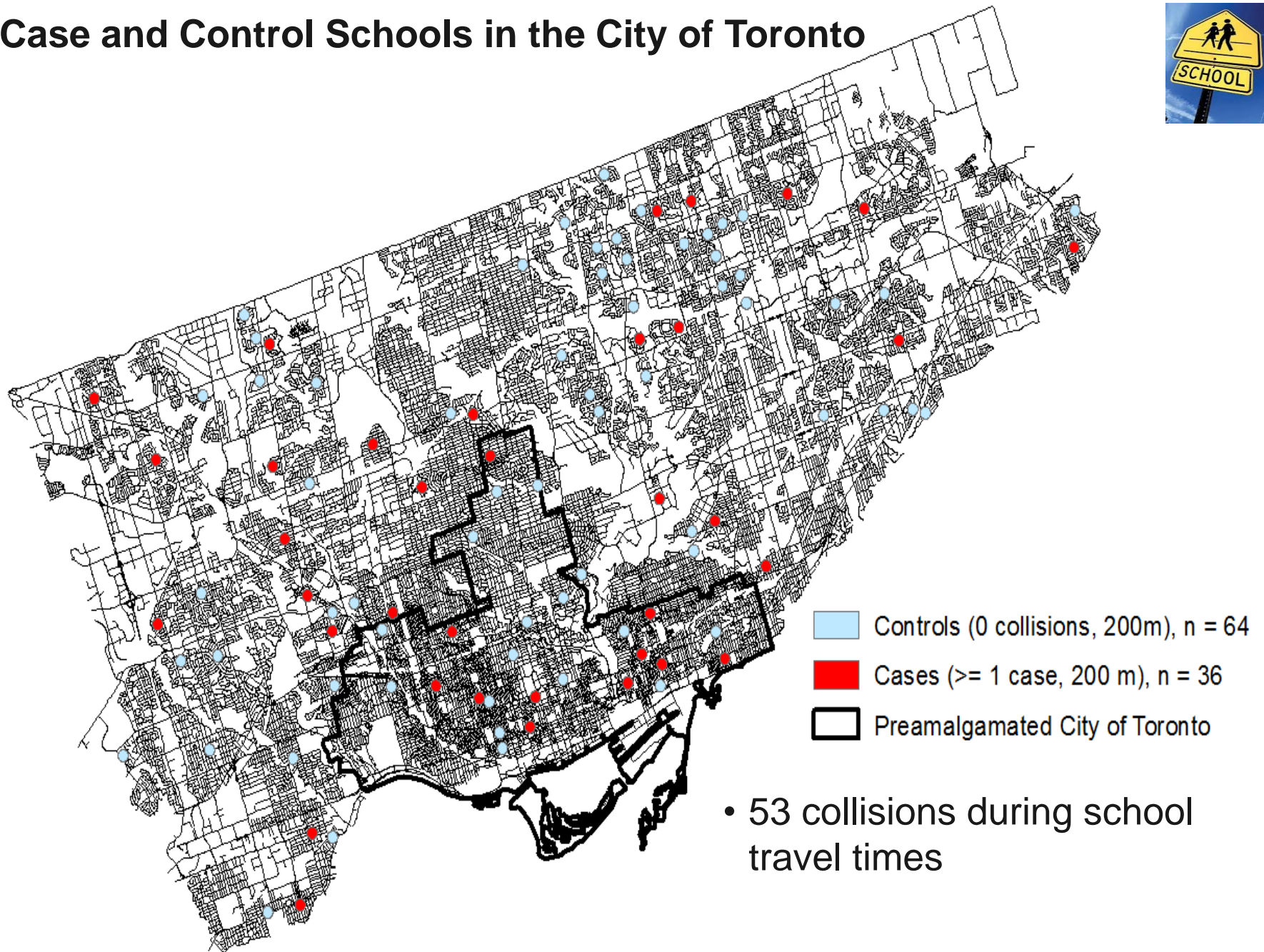
- **Social disadvantage**

- Learning Opportunities Index (LOI), scale 0-1

- **Walking to school (proportions)**

- **Logistic regression**

# Case and Control Schools in the City of Toronto



# Descriptive Comparison of Case and Control Schools

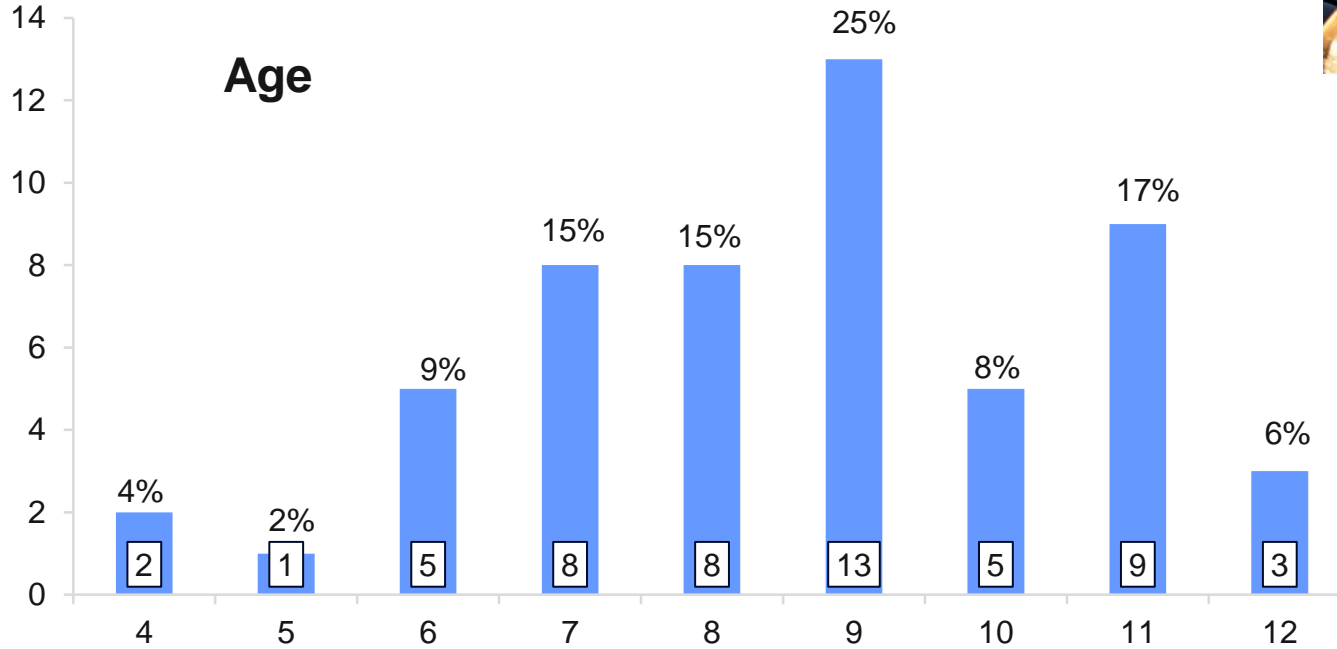
	N (%), Mean (S.D.)		
	Case n = 36	Control n = 64	Total n = 100
<b>Built Environment</b>			
Urban School (n = 25)	11 (30.6%)	14 (21.9%)	25 (25%)
Designated drop-off areas	23 (63.9%)	35 (54.7%)	58 (58%)
School crossing guard	19 (52.8%)	22 (34.4%)	41 (41%)
Congestion	25 (69.4%)	42 (65.6%)	67 (67%)
Major/minor arterial (m)	221.5 (106.0)	96.4 (177.0)	141.5 (212.8)
Intersection (#)	8.19 (6.17)	6.48 (5.38)	7.10 (5.7)
Walking trail (m)	0.73 (0.47)	0.86 (0.35)	0.82 (0.39)
<b>LOI (scale 0 – 1)</b>	0.59 (0.27)	0.45 (0.31)	0.49 (0.30)
<b>% Walking to school</b>	71.0% (15.3%)	62.6% (17.1%)	65.6% (16.9%)

# Child PMVCs -2000-2013



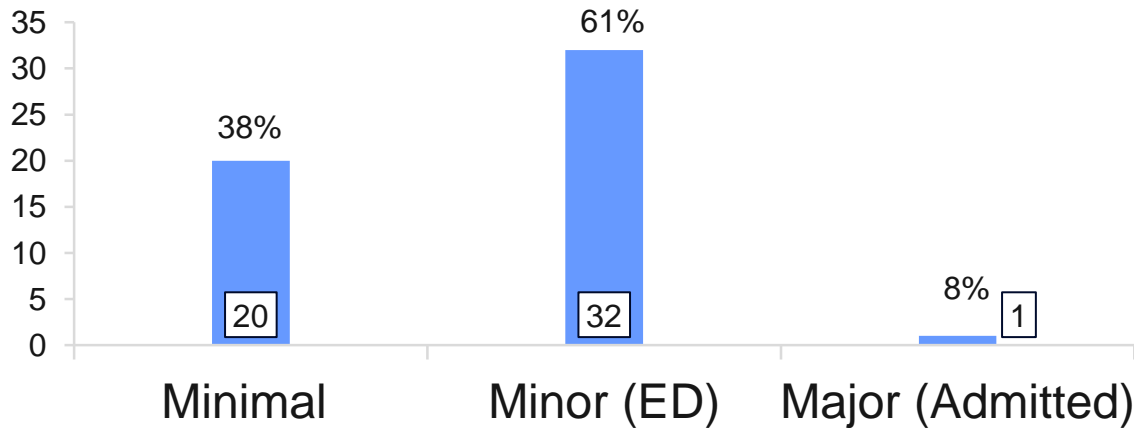
Frequency

## Age

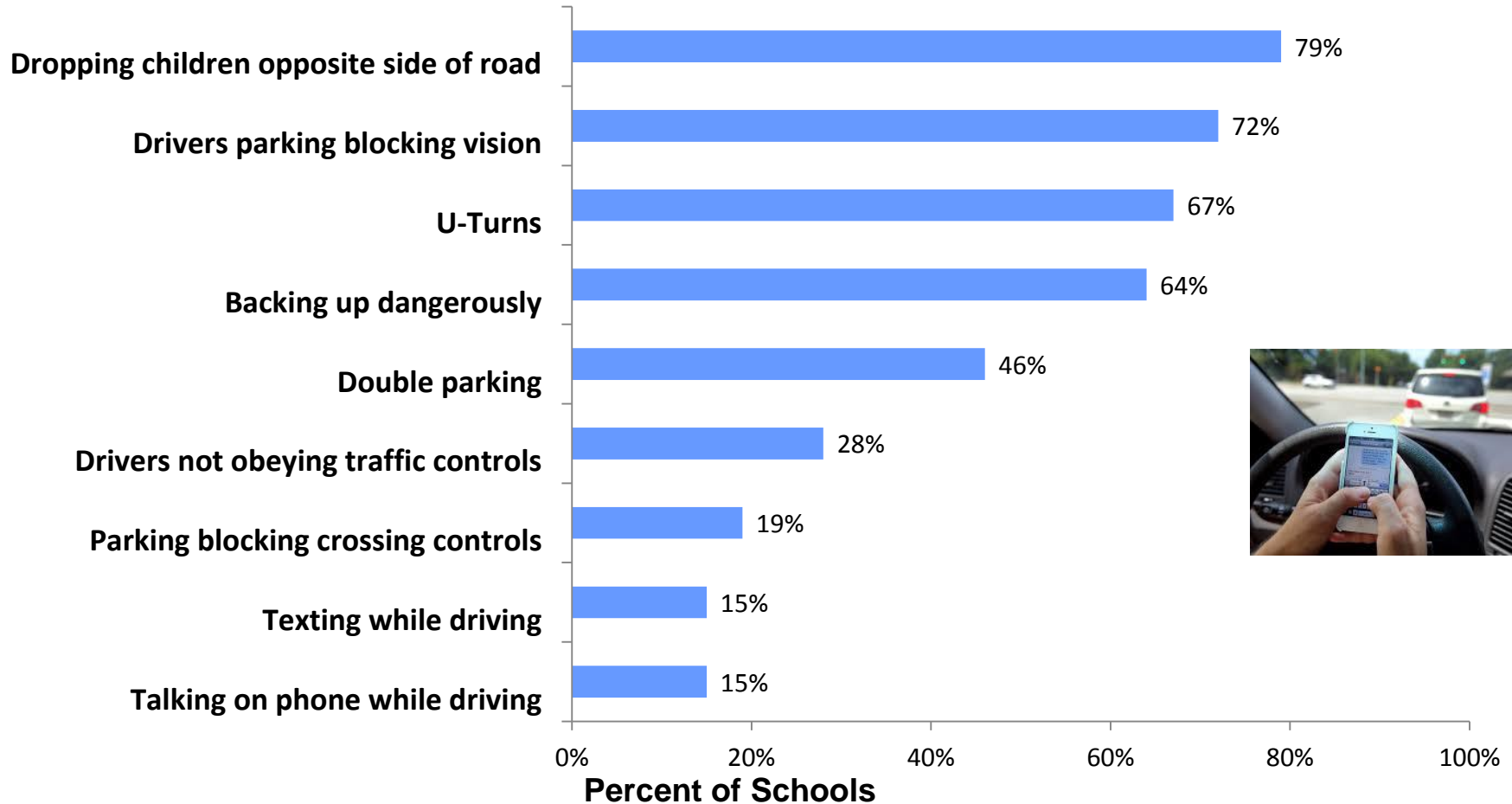


Frequency

## Severity

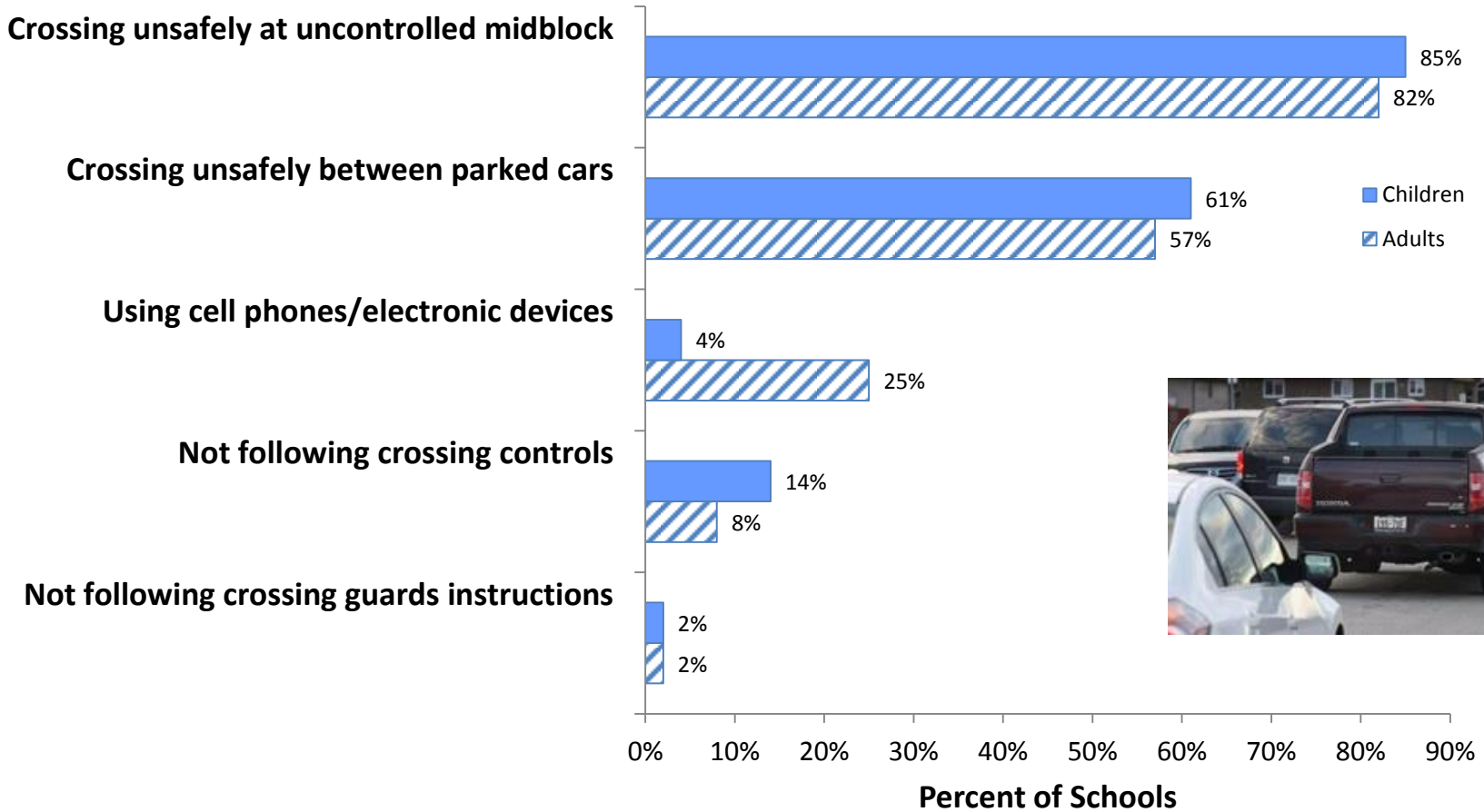


# Dangerous Driving Behaviours ( n = 100)



$\geq 1$  dangerous driving behaviour, 98% of schools

# Dangerous Pedestrian Behaviours ( n = 100)



$\geq 1$  dangerous pedestrian behaviour, 90% schools

# Odds of at least one collision within 200m

	Odds Ratio (95% CI) Adjusted
<b>Pedestrian Behavior:</b>	
Children crossing at uncontrolled midblock locations	9.82* (1.10, 87.77)
<b>Correlates</b>	
Major and minor arterial roads/100m	1.37* (1.09, 1.73)
Social disadvantage (LOI)	2.03 (0.34, 11.98)
% Walking to School	5.72 (0.21, 155.54)

\*significant

**None of the dangerous driving variables were significant**

# Odds of Dangerous Drop-off Behaviours

## OUTCOMES OR (95% CI)

	Double Parking	Parked Blocking Vision	Parked Blocking Controls	Dangerous Reversing	Texting While Driving	Talking on Phone
<b>Traffic congestion</b>	5.96* (2.14, 16.61)	5.11* (1.97, 13.31)	-	4.14* (1.67, 10.32)	-	-
<b>Inner suburb</b>	2.05 (0.71, 5.95)	-	7.57 (0.96, 60.00)	-	-	-
<b>% Walking</b>	-	12.7 (0.77, 209.17)	-	-	-	-
<b>Designated drop-offs</b>	-	-	0.26* (0.09, 0.75)	0.34* (0.14, 0.93)	-	2.92* (1.05, 8.13)
<b>School crossing guards</b>	-	-	0.32 (0.10, 1.04)	-	0.18* (0.04, 0.85)	-

\*significant

# Odds of Dangerous Pedestrian Behaviours



**Designated drop-off**

**Correlates**

**Social disadvantage**

**% Walking**

**Traffic congestion**

	OUTCOMES OR (95% CI)			
	Dangerous Midblock Crossings		Crossing Unsafely Between Parked Cars	
	Adults	Children	Adults	Children
Designated drop-off	0.18 * (0.04, 0.88)	0.27 (0.05, 1.37)	0.41* (0.17, 0.97)	0.31* (0.12, 0.75)
Correlates			-	-
Social disadvantage	5.20 (0.64, 42.15)	11.56 * (1.11, 120.7)	-	-
% Walking	2.81 (0.09, 91.37)	2.43 (0.06, 99.43)		
Traffic congestion	-	-	2.99* (1.24, 7.22)	2.71* (1.11, 6.63)

\*significant

# SUMMARY

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## 1. Correlates of child PMVCs

- Children crossing at uncontrolled midblocks
  - controlling for higher speed roadways

## 2. BE correlates of dangerous driving and pedestrian behaviours

- a) Traffic congestion
- b) Designated drop-off
- c) School crossing guards



# STRENGTHS AND LIMITATIONS

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## Strengths

- Multivariate analysis
- Objective measurements of driving behaviours

## Limitations

- Small number of collision events
- Assumption that behaviours were consistent over the 12 year collision period
- Dangerous driving behaviours may have been underestimated
- Not all behaviours measured (e.g. failure to stop at stop signs)

# CONCLUSIONS

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- Dangerous behaviours are pervasive
- May put children at risk for PMVCs
- Changes to the BE (designated drop-off areas, school crossing guards, reductions in traffic congestion) may reduce these behaviours and provide a safer child pedestrian environment
- We need to encourage more walking to school to decrease traffic congestion resulting in a safer child pedestrian environment



# MEDIA'S RESPONSE

**CBC NEWS | Toronto**

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**Driving your kids to school puts other children at risk, new study finds**

Dangerous driving a problem at over 100 Toronto-area elementary schools

CBC News Posted Jan 21, 2016 4:54 PM ET | Last updated Jan 21, 2016 4:54 PM ET



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Using police data, researchers at the University of Toronto, York University and Sick Kids Hospital found that 411 children were involved in vehicle collisions near 110 elementary schools over a 12-year period from 2000-2011. (iFlickr)

**thestar.com**

## SCHOOLS

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### Parents' dangerous driving at drop-off areas puts students at risk, study finds

Study finds increased chance of injury in and around schools in the morning rush as drivers break all the rules.

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**CityNews** LOCAL VIDEO NEWS TIPS

## School drop-offs more dangerous than parents think: study

BY NEWS STAFF  
POSTED JAN 21, 2016 10:31 AM EST

LIVE

Video: School drop-off tips for parents and students



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### Parents warned of dangers during school pick-up, drop-off times

**CTV Toronto: Study highlights school zone danger**

A new study says unsafe driving during school drop-off is putting children at higher risk of injury. Zuraiah Alman reports.



CTV Toronto: Study highlights school zone danger

News May 24 5:18PM ET

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### Parents' unsafe driving habits near schools put children at risk: study

**CP24 GO**

Study tracks bad driving behaviour around schools

Study tracks bad driving behaviour around schools

A York University study finds parents' bad driving behaviour can lead to small children suffering injuries on streets near schools.

Sibbe warns parents not to rush morning drop-off

Const. Dan Sibbe says parents who drive dangerously near schools often are in a rush to get to work on time.

Study examines unsafe driving near TD schools

A new study looks at parents' unsafe driving habits when dropping off and picking up their kids from school.





**Last day of  
observations  
Friday, June  
19, 2015**

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