Poverty and Child Health after the 2008 Global Financial Crisis: Thoughts Emerging from Analyses of Data from the QLSCD

*(Québec Longitudinal Study of Child Development /
Enquête longitudinale du développement des enfants du Québec-ELDEQ)*

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Puzzling Findings on the Health Impact of the 2008 Global Financial Crisis (GFC)

Objectives of the Analyses

- Describe how the proportion of deprived households evolved between 2008 and 2014 in the QLSCD (*Québec Longitudinal Study of Child Development*).

- Describe how health evolved from 2008 to 2014 among children in the QLSCD as a function of deprivation

- Examine how deprivation and child health are associated between 2008 and 2014 while controlling for previous deprivation.

Data

- The QLSCD *(Québec Longitudinal Study on Child Development)*

  - A prospective birth cohort started in 1998

  - Annual or biennial follow-ups of 2120 children who were 5 months old in 1998 (initial participation rate: 83%)

  - Interviewer-administrated questionnaires & self–administrated (parents, teacher, & child) reports

  - Birth data extracted from hospital charts

Participation Rates across Time

Participation rates at follow-up
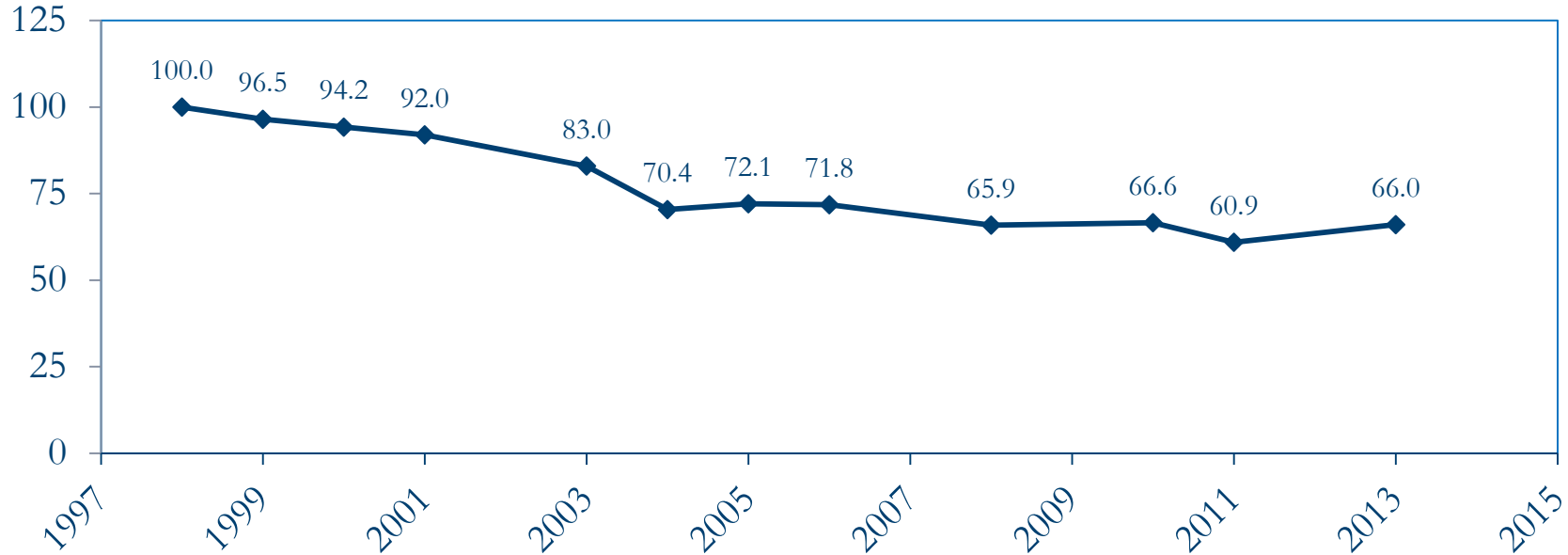
Measures of Deprivation

- Poverty

  - Household income below the Canadian before taxes cut-offs (LICO)

- Willms' index of SocioEconomic Status (SES) (selected results)

  - A composite standardized score (transformed into quintiles) based on

    - Parent's highest education level
    - Household income
    - Prestige of the parent's occupation (the highest)

- Social welfare as main source of income (not shown)

Child Health Indicators

- Perceived health status (Parent reports)

- Depressive symptoms (Child reports)

- Proactive aggressive behavior (Child reports)

Perceived Health

- Rated by the person most knowledgeable about the child

- At each occasion since baseline

  - *In general, would you say that [1ˢᵗ name]'s health is*

    Excellent
    Very good
    Good
    Fair
    Bad ?

- Dichotomized **(*Less than Very Good* *vs*. Very Good-Excellent**)

Youth Self-rated Depression Symptoms

Children Depression Inventory (CDI – Kovacs, 1985)

- 8 Sets of Depression Symptoms in the previous 2 weeks from the according to 3 levels severity

- Scores summed and standardized
  (0 to 10 with higher scores = higher level of depressive symptoms)

- Measured in 2008, 2010, & 2011

Youth Self-rated Proactive Aggression

Items from the 6th cycle of the NLSCY

- Frequency *Never (1) Sometimes(2) or Often(3)* of 4 Proactive Aggressive Behaviors:
  - Threaten to hit people
  - Encourage other children to pick on a particular child
  - Try to dominate other children
  - Scare other children to get what you want.
- Scores summed and standardized (0

  (0 to 10 with higher scores = more aggressive behavior)
- Measured in 2008, 2010, & 2011

Analyses

- Description of evolution of Low-Income Households, SES, & Receipt of Social Welfare
  - Plotting of estimates
  - Joinpoint analysis
  - Latent growth curves analysis: *1998-2007 Deprivation Trajectories*
- Associations between Deprivation & Child Health data collected in 2008, 2010, 2011, & 2013:
  - Multilevel Logistic Regressions: *Perceived Health*
  - Multilevel Poisson Regressions: *Depression & Proactive Aggression*
  - Concurrent & lagged associations

Handling of Missing Data

- Evidence of differential attrition *(i.e., Poor, single-parent-families overrepresented)*
- Applied occasion-specific weights
  - Constructed at each measurement occasion
  - Using the response propensity stratification method
  - Adjusted using administrative data
- Multiple imputation not used
  - Not aware of any procedure for combining time-varying weights with multiple imputation
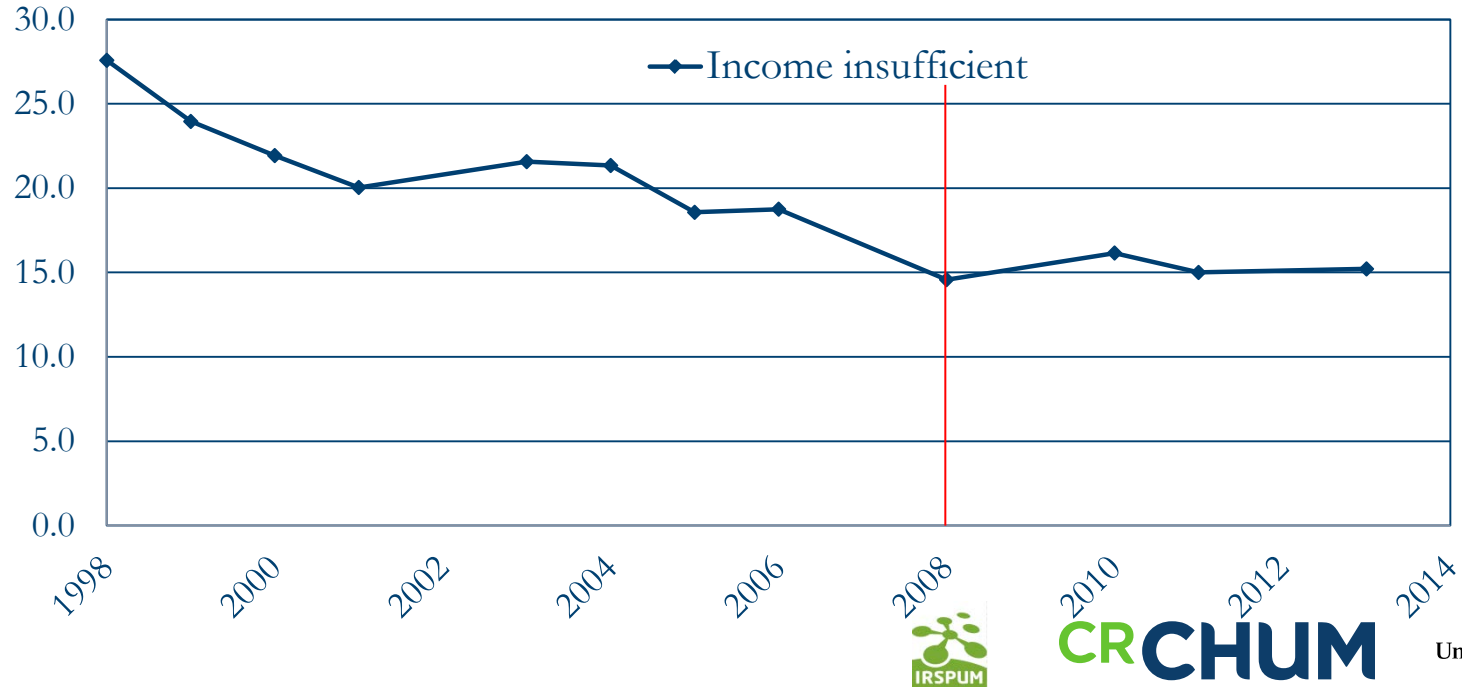 - Inclusion of time-invariant sampling weights still under discussion
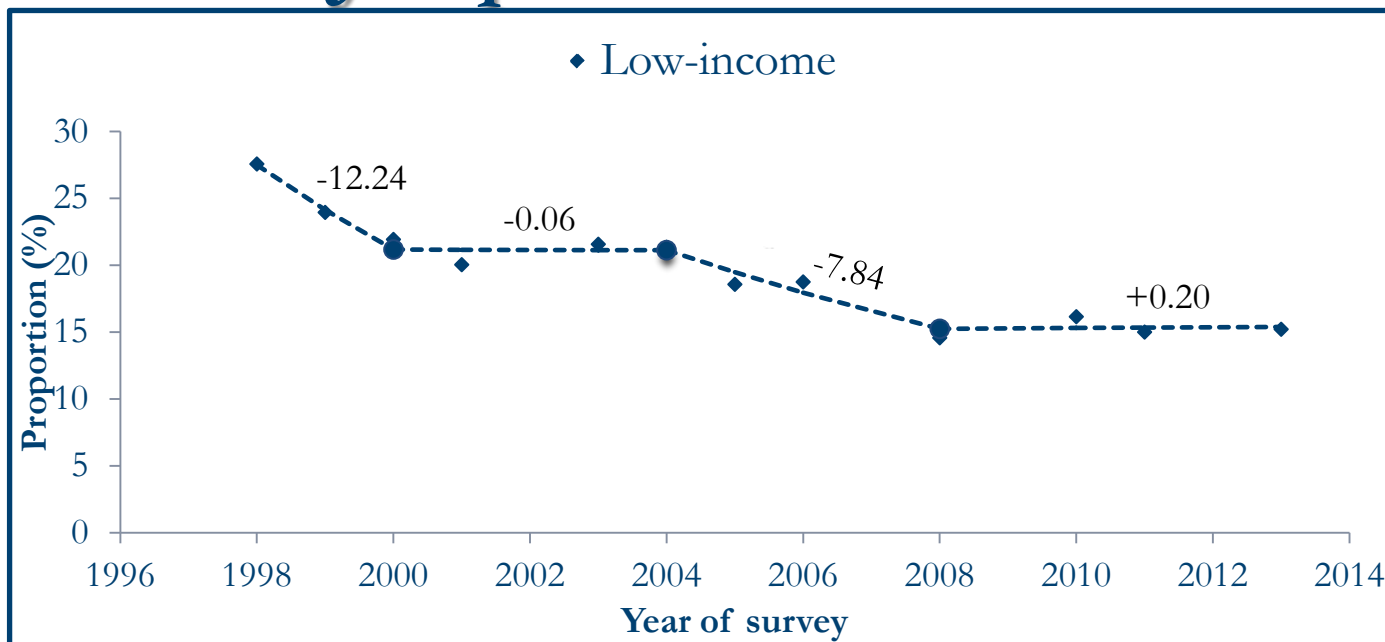
Weighted Proportion of Low-Income Households, QLSCD (1998-2013)

Trend of Low-Income Households : Joinpoint Estimates

Low-income

-12.24

-0.06

-7.84

+0.20

Proportion (%)

Year of survey

Circles= Joinpoints;

Values = Annual percent change in the time trend;

* Change is significantly different from zero (Alpha=0.05).

Weighted Proportion of **Low-Income Households** as a function of Type of Family, QLSCD (1998-2013)

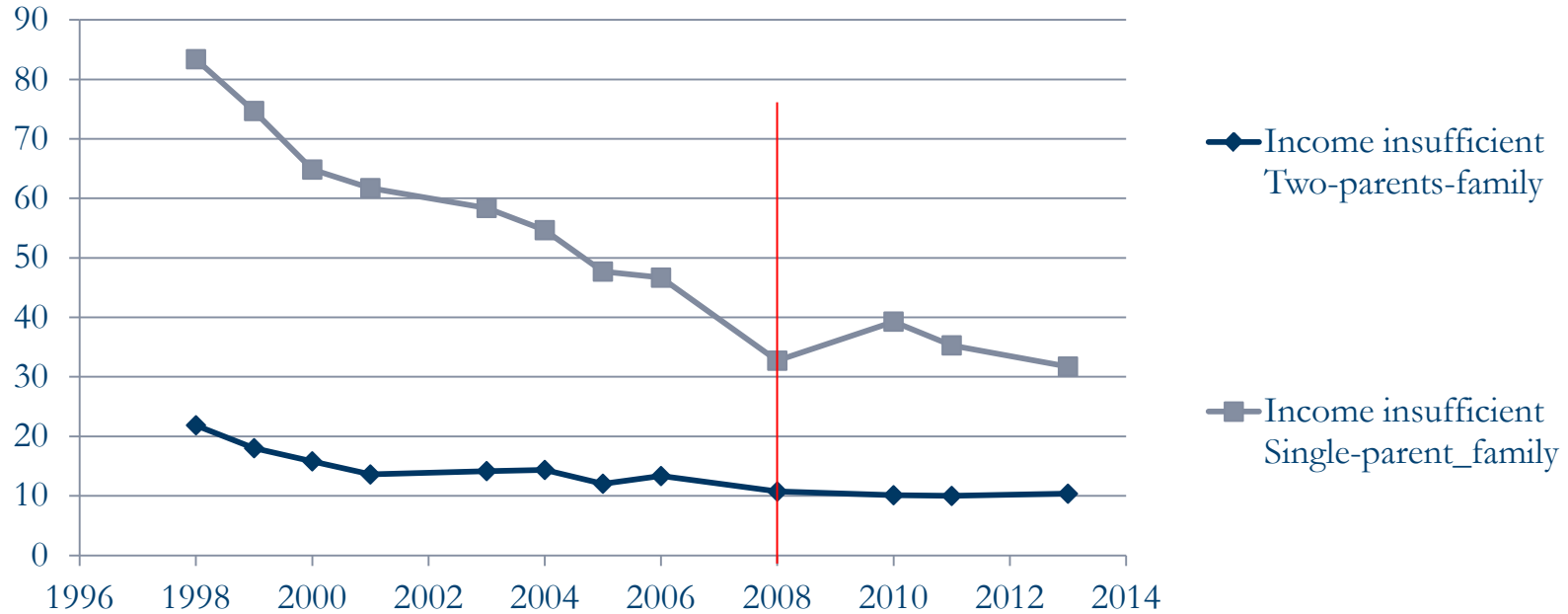# Trend of Low-Income Households by Type of Family: Joinpoint Estimates

Circles= Joinpoints;
Values = Annual percent change in the time trend;
* Change is significantly different from zero (Alpha=0.05).

Weighted Proportion of Low-Income Households, QLSCD (1998-2013) as a function of Mother's Immigration Status

Legend:
- Mother born in Canada or in Europe Income insufficient
- Mother born outside Canada & Europe Income insufficient

Trend of Low-Income Households as a function of Mother's Immigration Status : Joinpoint Estimates
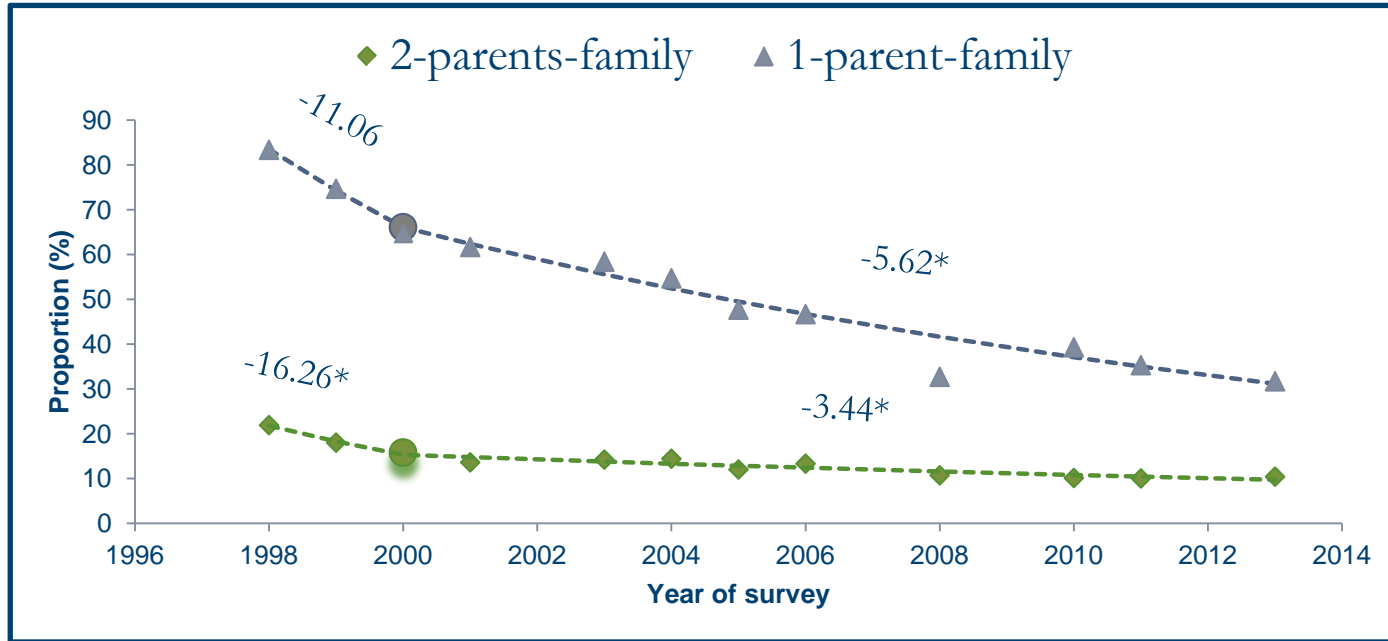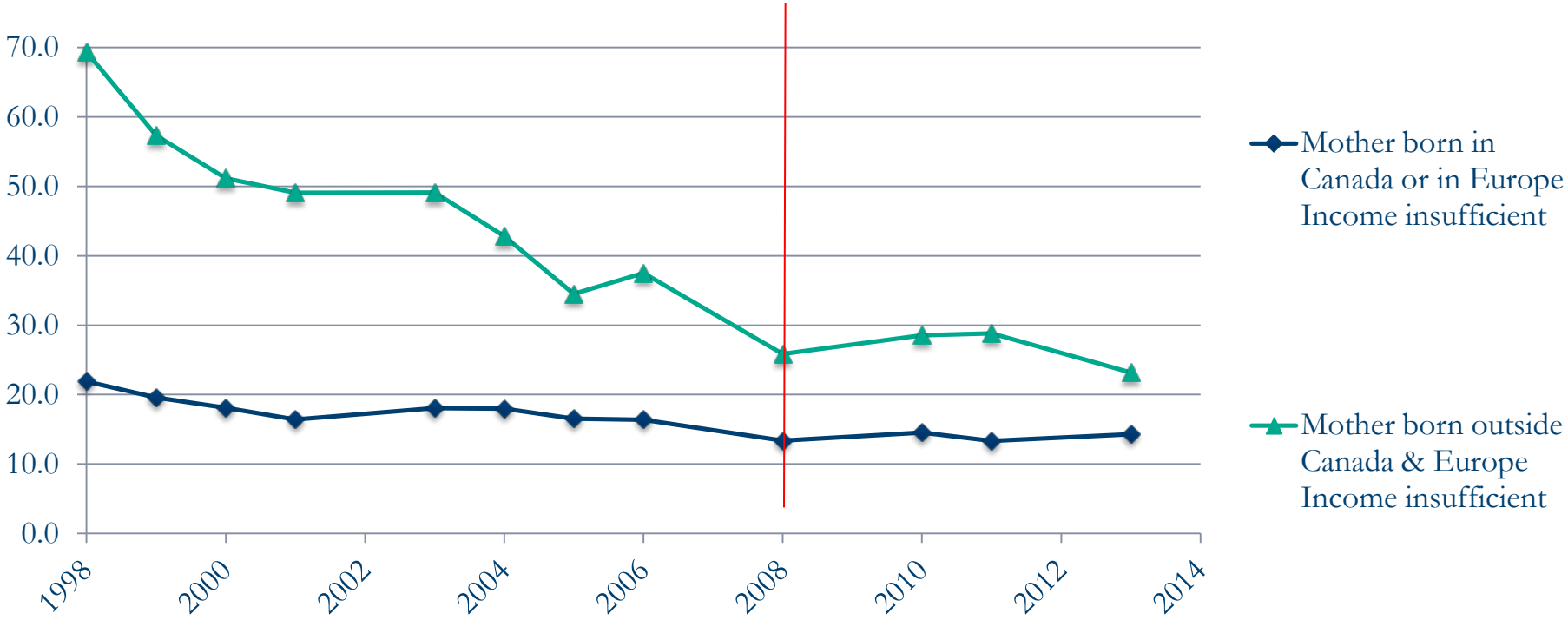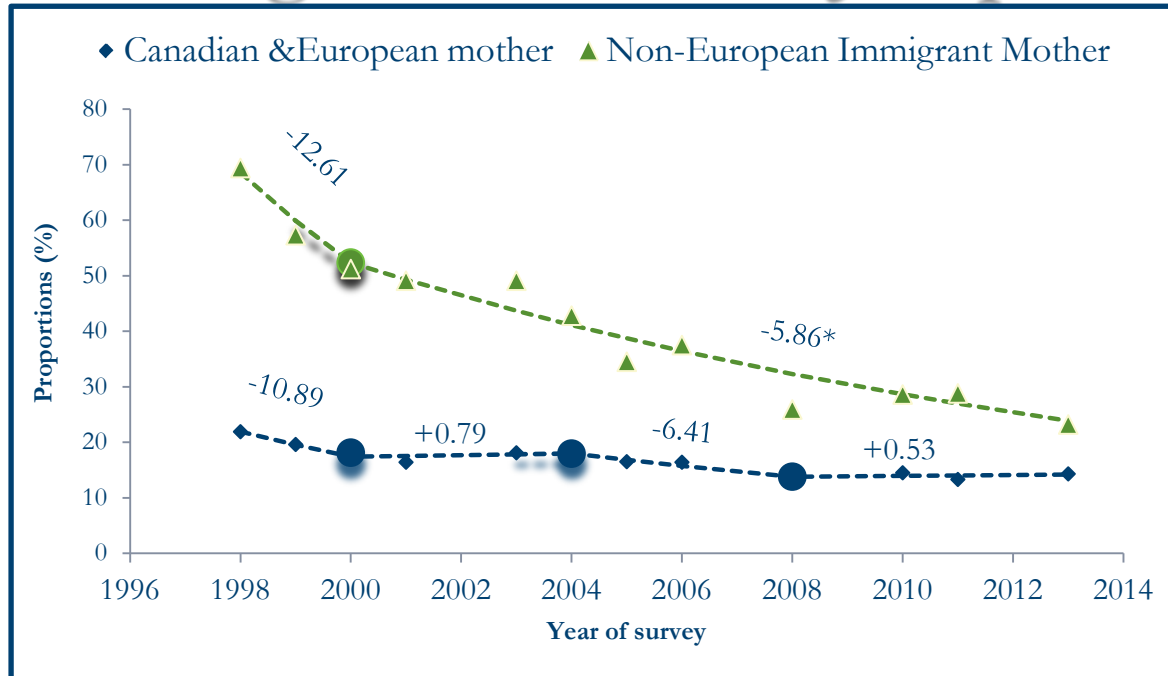

Circles= Joinpoints;
Values = Annual percent change in the time trend;
* Change is significantly different from zero (Alpha=0.05).

Weighted Proportion of Low-Income Households as a function of Mother's Education Level, QLSCD (1998-2013)

Trend of **Low-Income Households** as a function of Maternal Education: Joinpoint Estimates
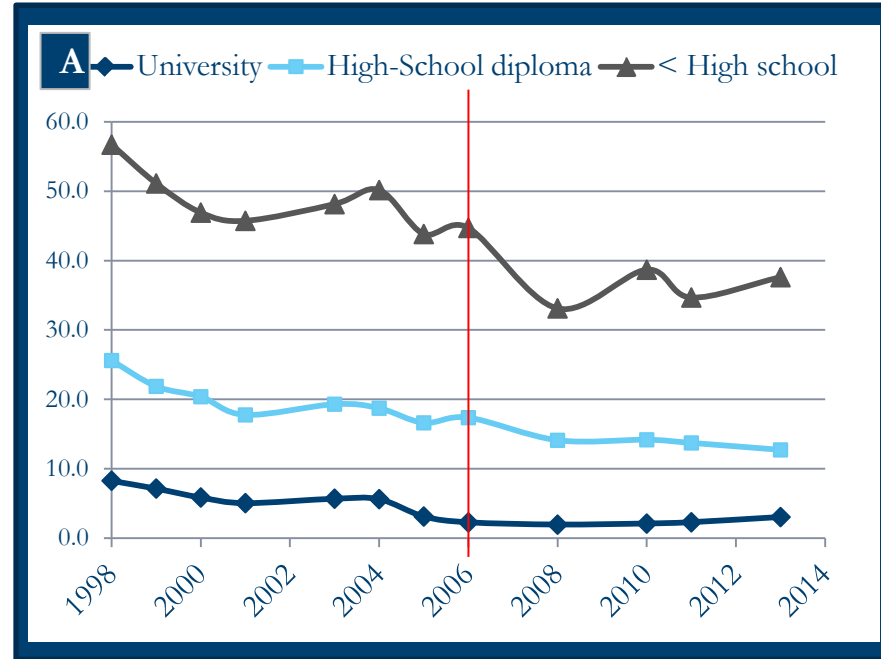

Circles= Joinpoints;
Values = Annual percent change in the time trend;
* Change is significantly different from zero (Alpha=0.05).

Interpretation: GFC as experienced in Québec & Deprivation among QLSCD Families

- ## In the Entire Cohort

  – Statistically **non-significant change** in the proportion of households with low-income from 2008 to 2013.

- ## Among Subgroups

  – Among 2-parent families, single-mother families, & families with non-European immigrant mothers, **significant decrease** in poverty from 2000 to 2013

  – Among families with mothers with no high school diploma, **significant increase** in poverty between 2008 and 2013

Results

How Health evolved from 2008 to 2014 among Children in the QLSCD as a function of Poverty

Proportion of Children Perceived as being in Less than Very Good Health in the Entire Sample and as a function of Income Level

Whole sample
Income sufficient
Income insufficient

20
15
10
5
0

2008
2010
2011
2013

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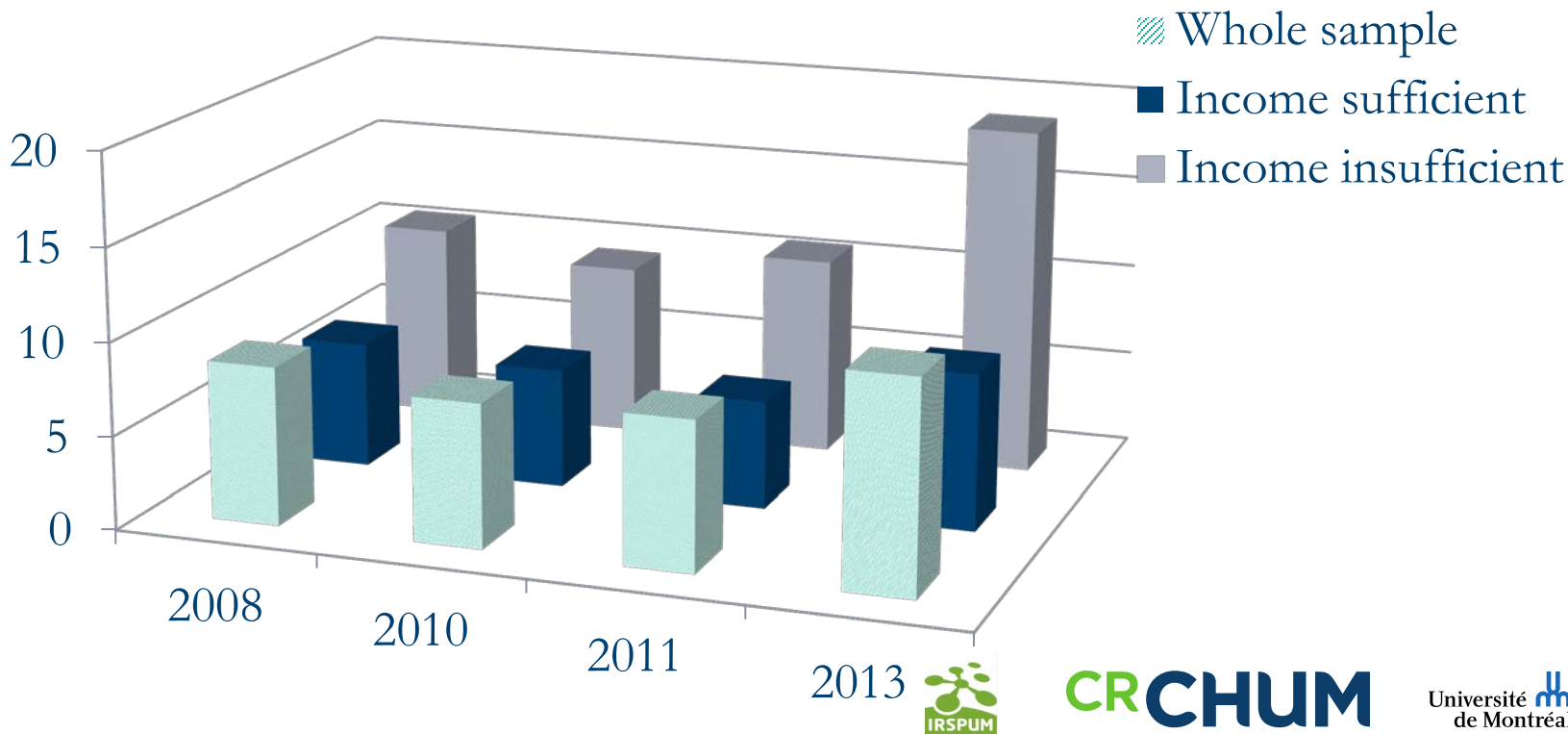
Being Perceived in Less than Very Good Health: Identifying If and When Change Occurred (Joinpoint estimates)

Low-income   Sufficient income
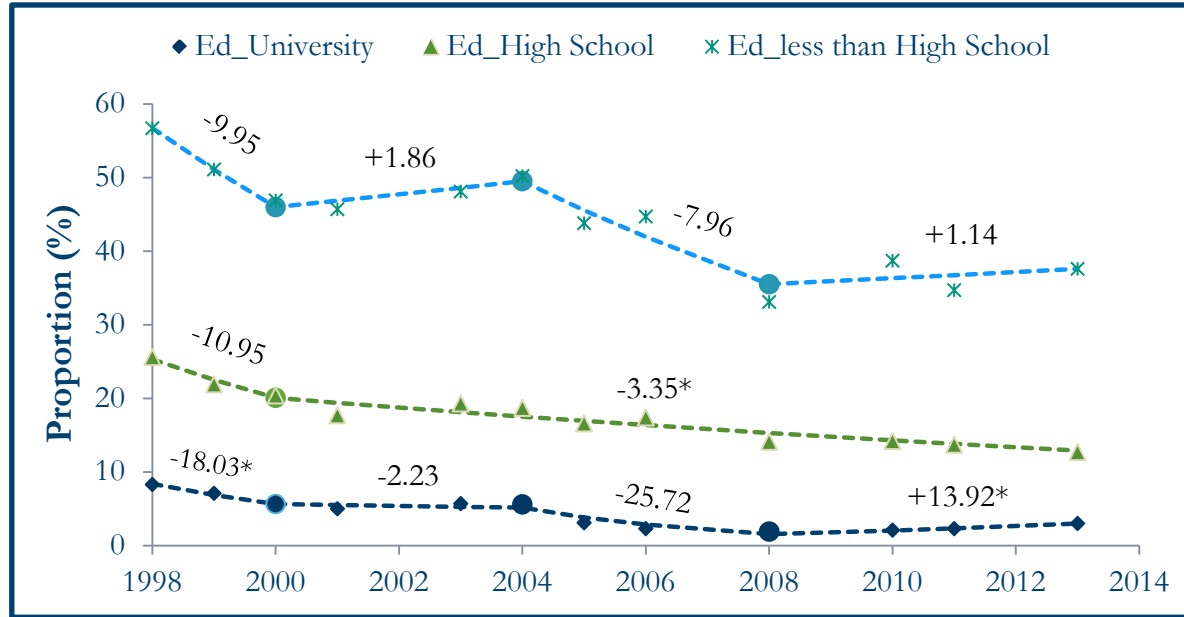
+3.74
+27.42*
-6.52
-0.79

Proportion (%)
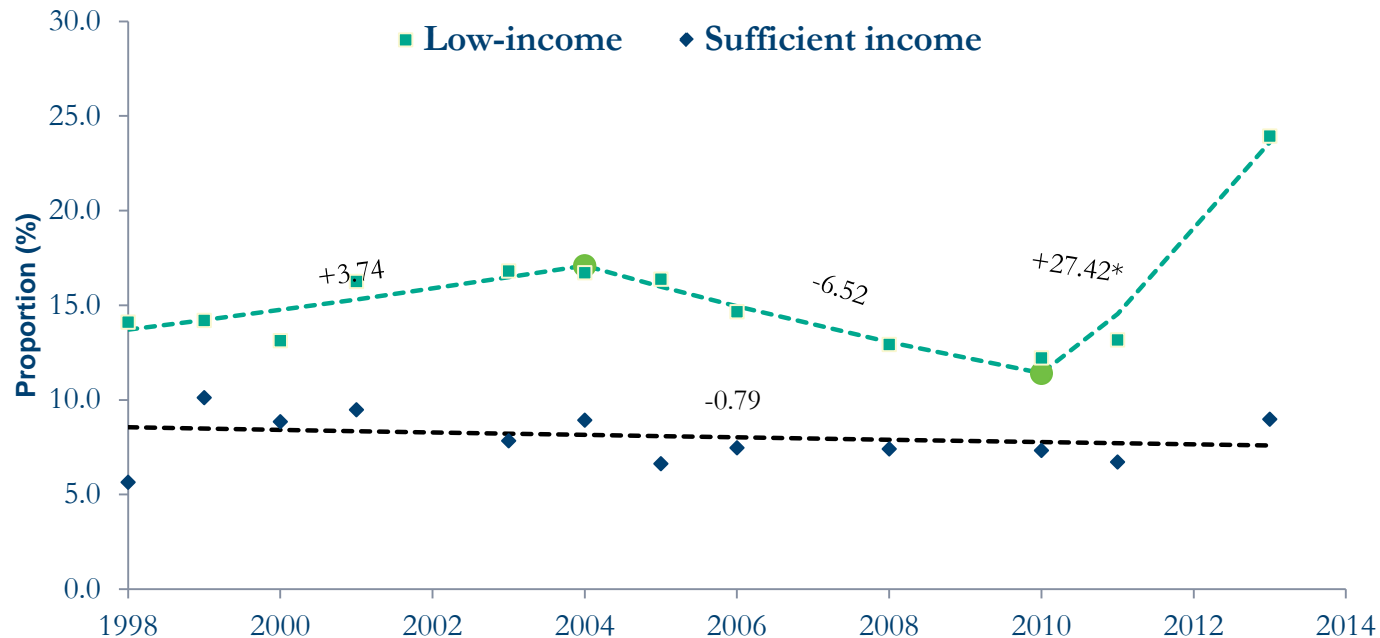
Circles= Jointpoints;
Values = Annual percent change in the time trend;
* Change is significantly different from zero (Alpha=0.05).

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Mean Youth Self-rated Score of Depression Symptoms in Entire Sample & as a function of Income Level
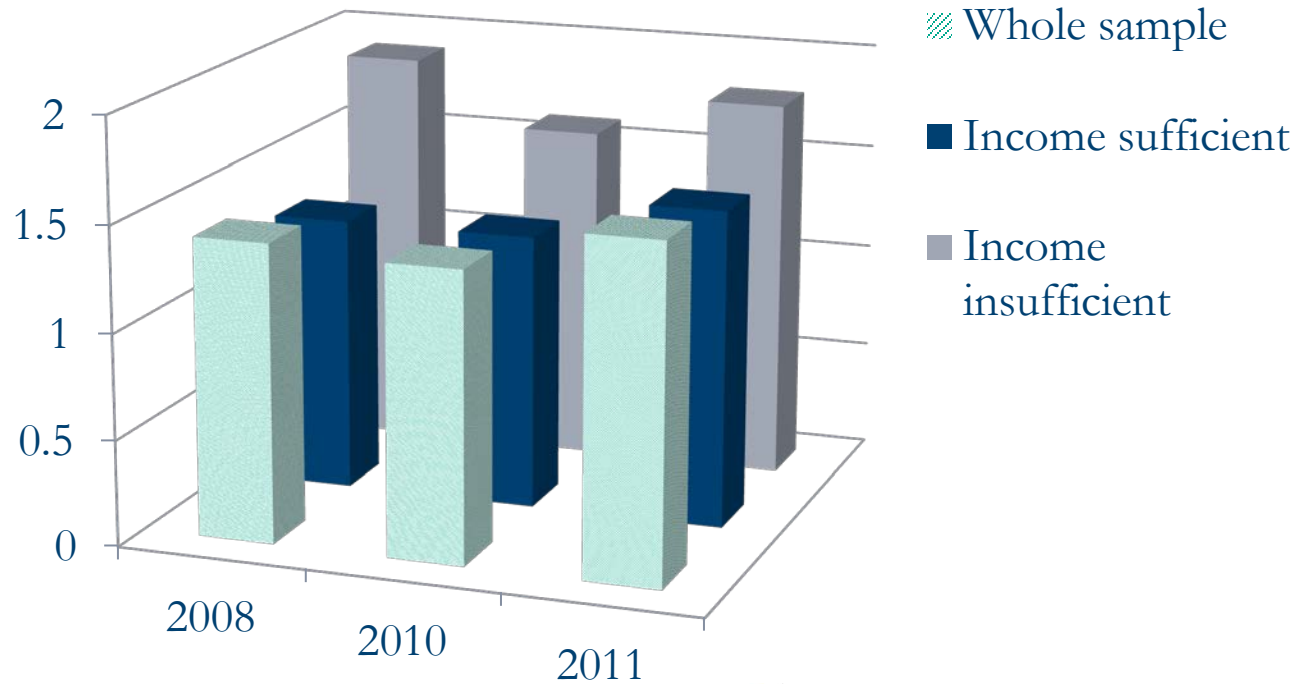
Mean Youth Self-rated Score of Proactive Aggression Behavior in the Entire Sample & as a function of Income Level

Interpretation: GFC as experienced in Québec & Child Health in the QLSCD

- On average, the likelihood of being perceived in less than very good health appeared to **increase** between 2010 and 2013 among children of poor families.

- The mean number of youth self-rated depressive symptoms may have **increased** or remained **stable** between 2008 and 2011.

- The mean score of youth self-rated proactive aggressive behavior may have **decreased** or remained **stable** between 2008 and 2011.

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Results

How Poverty and Child Health are associated between 2008 and 2014 while controlling for Poverty Before 2008

How we created Indicators of Previous Deprivation

- Latent class analyses
  - Never poor
  - Climbing out of poverty
  - Falling into poverty
  - Stuck in poverty
- Estimated for Low-income & Lowest-SES (not shown)

Trajectories of Low-Income based on the Most Likely Class Membership, QLSCD, 1998-2006

Concurrent Associations between Low-Income & Health

	<Very Good		Depression		Proactive Aggression	
	Time + Low Income	Fully Adjusted	Time + Low Income	Fully Adjusted	Time + Low Income	Fully Adjusted
• Time	+		+		-	
• Income sufficient *(Sufficient)*	+++		++		+++	
• Single-parent-family *(Two-parent)*						
• Mother Immigrant *(Canada/Europe)*						
• Mother's Education *(University)*						
High school						
< High school						
• Low-income Trajectories Pre-2008 *(Never Poor)*						
Falling into Poverty						
Climbing Out of Poverty						
Stuck in Poverty						

+   Positive association; -   Negative association; ns: not significant;
Reference categories in parenthesis; + or - :
p<0.05; ++ or --: p < 0.01 ; +++ or ---; p< 0.001

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Concurrent Associations between Low-Income & Health

	<Very Good		Depression		Proactive Aggression	
	Time + Low Income	Fully Adjusted	Time + Low Income	Fully Adjusted	Time + Low Income	Fully Adjusted
• Time	+	++	+	+	-	--
• Income sufficient *(Sufficient)*	+++	ns	++	ns	+++	ns
• Single-parent-family *(Two-parent)*		ns		ns		ns
• Mother Immigrant *(Canada/Europe)*		+		ns		ns
• Mother's Education *(University)*						
High school		+++		ns		ns
< High school		+++		ns		+
• Low-income Trajectories Pre-2008 *(Never Poor)*						
Falling into Poverty		ns		ns		+
Climbing Out of Poverty		+		ns		ns
Stuck in Poverty		+++		+++		+++

+ : p<0.05;
++ : p < 0.01;
+++ ; p< 0.001; ns: not significant at 0.05

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Lagged Associations between Low-income & Health

	<Very Good		Depression		Proactive Aggression	
	Time + Low Income	Fully Adjusted	Time + Low Income	Fully Adjusted	Time + Low Income	Fully Adjusted
• Time	++		+++		ns	
• Income Sufficient *(Sufficient)*	+++		+		+++	
• Single-parent-family *(Two-parents)*						
• Mother _Immigrant *(Canada/Europe)*						
• Mother's Education *(University)*						
High school						
< High school						
• Low-income Trajectories Pre 2008						
(Never Pooer)						
Falling into Poverty						
Climbing Out of Poverty						
Stuck in Poverty						

+ : $p < 0.05$;
++ : $p < 0.01$;
+++ ; $p < 0.001$; ns: not significant at 0.05

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<u>Lagged</u> Associations between Low-income & Health

	<Very Good		Depression		Proactive Aggression	
	Time + Low Income	Fully Adjusted	Time + Low Income	Fully Adjusted	Time + Low Income	Fully Adjusted
• Time	++	++	+++	+++	ns	ns
• Income Sufficient *(Sufficient)*	+++	ns	+	ns	+++	ns
• Single-parent-family *(Two-parents)*		ns		ns		ns
• Mother _Immigrant *(Canada/Europe)*		ns		ns		ns
• Mother's Education *(University)*						
High school		+++		ns		ns
< High school		+++		ns		ns
• Low-income Trajectories Pre 2008 *(Never Pooer)*						
Falling into Poverty		ns		ns		ns
Climbing Out of Poverty		+		ns		ns
Stuck in Poverty		+++		+		+

+ : p<0.05;
++ : p < 0.01;
+++ ; p< 0.001; ns: not significant at 0.05

Concurrent Associations between SES & Health

	<Very Good		Depression		Proactive Aggression	
	Time + Lowest SES	Fully Adjusted	Time + Lowest SES	Fully Adjusted	Time + Lowest SES	Fully Adjusted
• Time	+		+		--	
• Willms' Index of SES *(Q1 richest quintile)*						
Q2	ns		ns		+++	
Q3	+		+		+++	
Q4	+++		+++		+++	
Q5 (Poorest)	+++		+++		+++	
• Single-parent family *(Two-parents)*						
• Mother _Immigrant *(Canada or Europe)*						
• SES_Q5 Trajectory Pre 2008 *(Never Deprived)*						
Falling into Deprivation						
Climbing Out of Deprivation						
Stuck in Deprivation						

+ : $p<0.05$;
++ : $p < 0.01$;
+++ ; $p< 0.001$; ns: not significant at 0.05

Concurrent Associations between SES & Health

	<Very Good		Depression		Proactive Aggression	
	Time + Lowest SES	Fully Adjusted	Time + Lowest SES	Fully Adjusted	Time + Lowest SES	Fully Adjusted
• Time	+	++	+	+	--	--
• Willms' Index of SES *(Q1 richest quintile)*						
Q2	ns	ns	ns	ns	+++	++
Q3	+	ns	+	ns	+++	++
Q4	+++	ns	+++	ns	+++	+
Q5 (Poorest)	+++	ns	+++	ns	+++	+++
• Single-parent family *(Two-parents)*		ns		ns		ns
• Mother _Immigrant *(Canada or Europe)*		++		ns		+
• SES_Q5 Trajectory Pre 2008 *(Never Deprived)*						
Falling into Deprivation		+		ns		ns
Climbing Out of Deprivation		++		+		ns
Stuck in Deprivation		+++		++		++

+ : p<0.05;
++ : p < 0.01;
+++ ; p< 0.001; ns: not significant at 0.05

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Lagged Associations between SES & Health

	<Very Good		Depression		Proactive Aggression	
	Time + Lowest SES	Fully Adjusted	Time + Lowest SES	Fully Adjusted	Time + Lowest SES	Fully Adjusted
• Time	++		+++		ns	
• Willms' Index of SES *(Q1 richest quintile)*						
Q2	ns		ns		ns	
Q3	+		ns		ns	
Q4	ns		ns		ns	
Q5 (poorest)	ns		ns		+++	
• Single-parent family *(Two-parent)*						
• Mother _Immigrant *(Canada or Europe)*						
• SES_Q5 Trajectory Pre 2008 *(Never Deprived)*						
Falling into Deprivation						
Climbing Out of Deprivation						
Stuck in Deprivation						

+ : $p < 0.05$;
++ : $p < 0.01$;
+++ ; $p < 0.001$; ns: not significant at 0.05

Lagged Associations between SES & Health

	<Very Good		Depression		Proactive Aggression	
	Time + Lowest SES	Fully Adjusted	Time + Lowest SES	Fully Adjusted	Time + Lowest SES	Fully Adjusted
• Time	++	++	+++	+++	ns	ns
• Willms' Index of SES (*Q1 richest quintile*)						
Q2	ns	ns	ns	ns	ns	ns
Q3	+	ns	ns	ns	ns	ns
Q4	ns	ns	ns	ns	ns	ns
Q5 (poorest)	ns	ns	ns	ns	+++	++
• Single-parent family (*Two-parent*)		ns		ns		ns
• Mother _Immigrant (*Canada or Europe*)		ns		ns		ns
• SES_Q5 Trajectory Pre 2008 (*Never Deprived*)						
Falling into Deprivation		+		ns		ns
Climbing Out of Deprivation		++		ns		ns
Stuck in Deprivation		+++		ns		ns

+ : $p < 0.05$;
++ : $p < 0.01$;
+++ ; $p < 0.001$; ns: not significant at 0.05

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Interpretation

How Poverty and Child Health are associated between 2008 and 2014 while controlling for Poverty Before 2008

Interpretation: GFC as experienced in Québec Low-Income & Child Health in the QLSCD

- Statistically **significant unadjusted** associations between low-income from 2008-2013 and health (concurrent and lagged associations)

- However, **none** of the health indicators were significantly associated with concurrent & lagged measures of low-income once pre-2008 low-income trajectories were accounted for.

Interpretation: GFC as experienced in Québec SES & Child Health in the QLSCD

- Pre-2008 Exposure to Poverty and Lower SES
  - Associated with an **<u>increased</u>** risk of reporting *less than very good* perceived health, greater *depressive symptoms*, and greater *proactive aggressive behavior*
  - Associations are **<u>stronger</u>** for **<u>concurrent</u>** than **<u>lagged</u>** poverty (and SES)

Interpretation: GFC as experienced in Québec SES, & Child Health in the QLSCD

- **No** associations of SES with likelihood of being perceived in *less than very good health* & with self-rated *depressive symptoms* after accounting for pre-2008 exposure to poverty.

- Lowest SES quintile associated with **increased risk** of self-rated *proactive aggressive* behavior even after accounting for pre-2008 exposure to deprivation

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Cautious Conclusions

Cautious Conclusion: Impact of GFC on Child Health in the QLSCD

- **<u>No</u>** evidence of overarching effects of the GFC as experienced by participants in the QLSCD

- Possible **<u>exacerbation</u>** of poverty among youth of lower-educated mothers

- Possible **<u>deleterious</u>** effects of deprivation on youth self-reported *proactive aggressive* behavior.

- Yet, difficult to attribute any effects to GFC as alternative explanations for findings are possible.

Cautious Conclusion: Impact of GFC on Child Health in the QLSCD

- Possible explanations
  - Crisis was less severe in Canada than in the USA;
  - Stable & less deregulated banking system;
  - Instead of austerity policies at the federal level, in Québec
    - a province-wide infrastructure program (already adopted before the crisis)
    - adopting a universal low-fee daycare program is known to stimulate mothers' (particularly single mothers') participation in the labor market.

Acknowledgments

✓ Analyses funded by the *Canadian Institutes of Health Research* Grants #200309MOP-123079 and #200609MOP-165867

✓ The *Institut de la Statistique du Québec, Direction Santé Québec* was responsible for the data collection and validation of the data base.

Cautious Conclusion: Impact of GFC on Child Health in the QLSCD

- Yet
  - Possible **exacerbation** of deprivation among youth of low-educated mothers
  - Possible **deleterious** effects on youth self-reported *proactive aggressive* behavior.
- Not aware of any studies in Canada or in Québec to compare with
- Possibly consistent with evidence of
  - worsened economic hardship among vulnerable groups documented in some developed countries
  - deleterious impact of GFC on mental health documented in some developed
  - perceived economic uncertainty increased risk of behavioral problems among 9-year-old children in the USA, particularly among boys of single-parent-families

Cautious Conclusion: Impact of GFC on Child Health in the QLSCD

- Overall, it is difficult to attribute any (small) effects to GFC with our dataset
    - Counterfactuals are not readily available
    - We likely lack statistical power