

# CHILDHOOD POVERTY, CUMULATIVE ADVERSITIES AND, CHRONIC HEALTH CONDITIONS AT 10 YEARS OLD IN THE QUEBEC BIRTH COHORT

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# *The presentation*

- Introduction;
- Objectives of the study;
- Methods:
  - The Quebec Longitudinal Study of Child Development regular interview
- Results:
  - Trajectories of poverty from birth to 10 years old
  - Trajectories of child poverty, adversities, and chronic health conditions
- Summary and conclusions
- Strengths and limitations of the study;
- Future directions.



# *Introduction*

- Our societies are actually more concerned with the aging population and with the health of old age people than with child health;
- Yet there is a well documented link between childhood poverty and old age health.

## *Long term impact of child poverty*

- Early poverty (before 5 years old) is associated not only with child health but also with:
  - Higher early adult mortality
  - Higher risk of chronic health problems of aging adults such as CVD, Alzheimer, diabetes, etc.
- This higher risk for adults who were exposed to early poverty is present whatever the level of adult income or SES.

# *Child poverty and chronic adversities*

- Mechanisms explaining such a long term impact of exposure to early poverty are not understood;
- Exposure to cumulative chronic adversities during childhood has been associated with child chronic or toxic stress and with child health (Evans, 2007; 2010) ;
- Poor children are more often exposed to chronic adversities such as poor housing quality, family turmoil and violence, and unsafe neighborhood.

# Objective of this analysis

- To examine at 10 years of age the mediating or moderating role of cumulative adversities in the relationship between child poverty and childhood chronic physical and psychosocial health conditions.

## *Studies on child chronic health conditions*

- Studies on children's chronic health conditions are mostly cross-sectional and usually include all children under 18 years of age despite the variability of health problems at different ages;
- Given the growing prevalence of obesity, it has been suggested that obesity should be included in the definition of child chronic health conditions.
- (Van der Lee et al, JAMA 2007; Van Cleave et al, JAMA 2010; Halfon, Newacheck, JAMA 2010)

## *The Quebec Longitudinal Study of Child Development (QLSCD) methodology*

- ❖ Eligible newborns were identified through the Quebec birth registry and randomly sampled from a multistage cluster sampling design.
- ❖ Representative sample of Quebec singleton live births in 1997-98 except for First Nations and Northern Territories:
  - ❖ Sample size: 2120 participants at baseline at 5 months old, in 1998

# *The QLSCD methodology*

- ❖ Annual home interviews
- ❖ A large range of individual, family and environmental variables are available:
  - ❖ Annual parental report
  - ❖ Standardised measurement of child height and weight;
- ❖ Participation rate:
  - 92% 5<sup>th</sup> wave;
  - 63% 10<sup>th</sup> wave (n= 1334).

## *Differential attrition*

- ❖ Those lost to follow-up in the QLSCD are most often those with a low income, a lower level of education, who are lone parents or non-European immigrants;
- ❖ There were no differences between participants and non-participants in chronic health conditions, preterm birth, maternal depression, low family functioning, and parental smoking;
- ❖ To account for attrition:
  - ❖ Sample weights for cross-sectional data and longitudinal weights for longitudinal data were used;
  - ❖ Multiple imputations were used in some analysis.

# *Analysis*

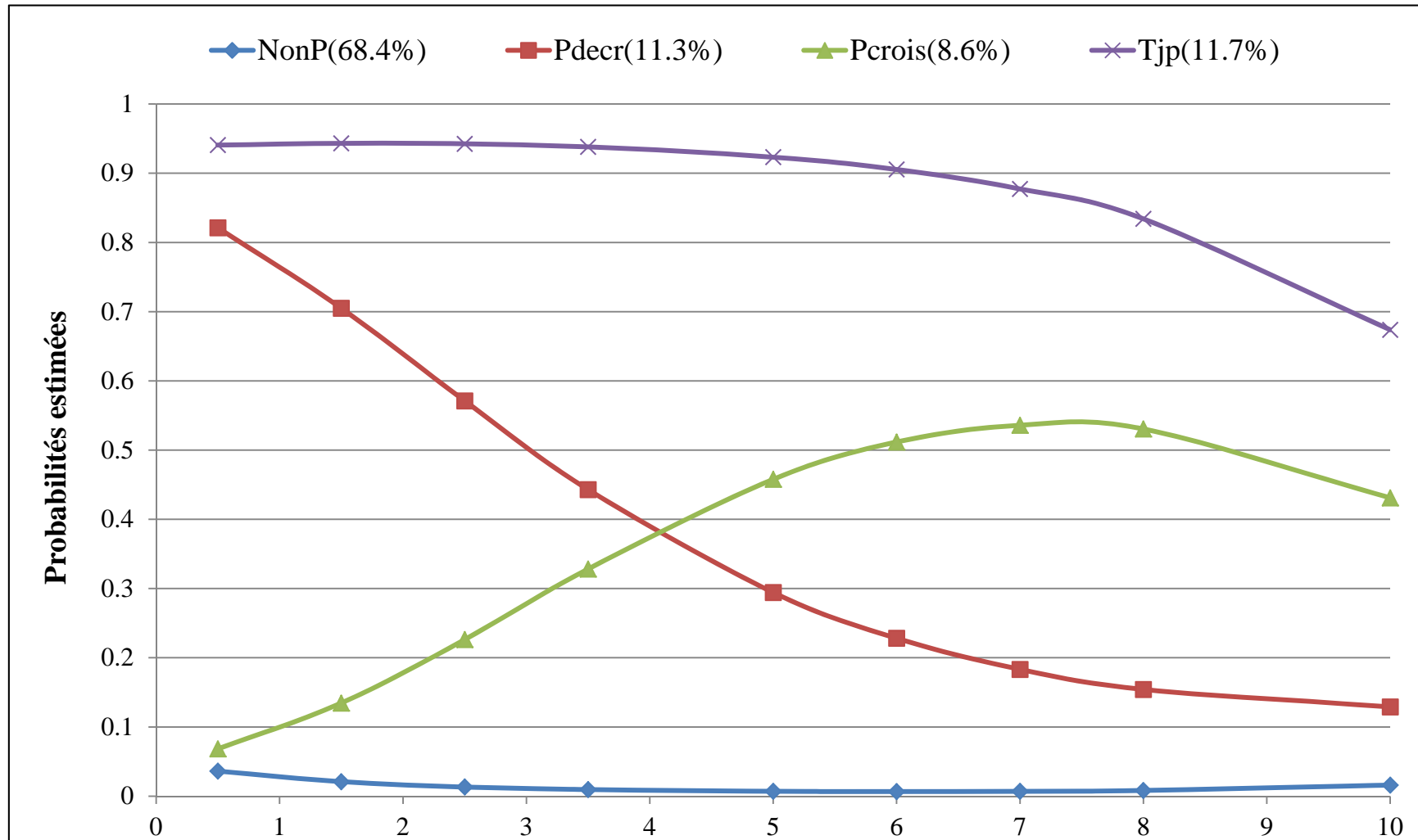
- Identification of trajectories of poverty
- Creation of an index of cumulative adversities associated with poverty;
- Logistic regressions analysis between trajectories of poverty, cumulative adversities and, chronic health problems at 10 years of age;
- Distinct analysis for physical and for psychosocial chronic health problems.

## *Identifying trajectories of poverty in the Quebec birth cohort*

- Latent class growth analyses were carried out among children followed from 5 months to 10 years old to identify different trajectories of poverty as defined by LICOs from Statistics Canada;
- The model that best fit the data was selected based on the lowest BIC\* value, higher entropy (>0.90), and plausibility of interpretation.

\* BIC= Bayesian Information Criterion

## Trajectories of low-income as defined by LICOs, from birth to 10 years of age (N=2120), the QLSCD, 1998-2008



## *Index of cumulative adversities (5 months to 10 years old)*

- Accumulation over time, *during the 1<sup>st</sup> 10 years of life;*
- Accumulation over different types of adversities;
- Indicators:
  - Unsafe neighborhood
  - Neighborhood with low social cohesion
  - Low family functioning
  - High score of maternal depression symptoms
  - Marital violence
  - Child hit by parents.

*Cumulative adversities as a function of trajectories of poverty, birth to 10 years old, (n=1053), QLSCD, 1998-2008*

	Trajectories of low-income*			
	Consistent sufficient income n=819	Decreasing likelihood n=76	Increasing likelihood n=98	Consistent low income n= 74
Index of cumulative adversities	%	%	%	%
0	22.3	9.2	8.2	4.1
1	29.3	23.7	17.3	8.1
2	24.3	23.6	26.5	16.2
3	13.3	21.1	18.4	21.6
≥4	10.7	<b>22.4</b>	<b>29.6</b>	<b>47.3</b>

\* P < 0.001

## *Child chronic health conditions in the QLSCD*

- Chronic health conditions are defined as problems diagnosed by a health professional and lasting 6 months or more;
- They are reported by the person who knows the child best (most often the mother) in the QLSCD regular interview.

*Proportion of 10 years old children with chronic physical health conditions, QLSCD, 2008*

<b>Physical health conditions</b>	<b>n</b>	<b>(%)</b>
<b>Chronic/active asthma (under treatment)</b>	<b>157</b>	<b>(11.8)</b>
<b>Obesity</b>	<b>184</b>	<b>(14.7)</b>
<b>Allergies (food, respiratory, other)</b>	<b>215</b>	<b>(16.1)</b>
Heart problems	11	(0.8)
Epilepsy	5	(0.4)
Kidney disease	4	(0.3)
High cholesterol level	5	(0.4)
Eczema	8	(0.6)
Other chronic health condition	54	(4.1)

*Proportion of 10 years old children with chronic psychosocial conditions, QLSCD, 2008*

<b>Psychosocial health conditions</b>	<b>n</b>	<b>(%)</b>
<b>Hyperactivity /inattention</b>	<b>102</b>	<b>(7.7)</b>
<b>Learning problems</b>	<b>74</b>	<b>(5.6)</b>
Emotional problems	22	(1.7)
Autism	11	(0.8)
Mental retardation	3	(0.2)

*Trajectories of poverty, cumulative adversities and any chronic psychosocial health condition at 10 years old, QLSCD 1998-2008, (n=2 120)*

	Adjusted OR *	
	OR	(95% C.I.)
Poverty trajectories , <i>birth to 10-11 years of age</i>		
Consistent sufficient income	1.00	
Decreasing likelihood	1.18	(0.64,2.16)
Increasing likelihood	1.27	(0.68,2.38)
Consistent low-income	<b>2.11</b>	<b>(1.22,3.65)</b>
Index of cumulative adversities		
0 : Ref	1.00	
1	1.70	(0.89,3.25)
2	<b>1.90</b>	<b>(1.01,3.57)</b>
3	<b>2.78</b>	<b>(1.48,5.20)</b>
4+	<b>2.68</b>	<b>(1.37,5.22)</b>

\* Adjusted for sex, birth order, family type, and maternal age, education, and immigration status

*Trajectories of poverty, cumulative adversities, and any chronic physical health condition at 10 years old, QLSCD, 1998-2008, (n=2120)*

	Adjusted OR *	
	OR (95% C.I.)	
Poverty trajectories , <i>birth to 10-11 years of age</i>		
Consistent sufficient income	1.00	
Decreasing likelihood	<b>1.56</b>	<b>(1.06,2.29)</b>
Increasing likelihood	0.81	(0.52,1.27)
Consistent low-income	0.98	(0.66,1.47)
Index of cumulative adversities		
0 : Ref	1.00	
1	0.95	(0.69,1.30)
2	0.91	(0.65,1.29)
3	0.90	(0.61,1.33)
4+	1.15	(0.75,1.75)

\* Adjusted for sex, birth order, family type, maternal age, education, immigration status, BMI, and parent's asthma status and smoking at home.

*Trajectories of poverty, cumulative adversities and chronic/active asthma at 10 years old, QLSCD 1998-2008, (n=1084)*

	All covariates *		
	OR(95% C.I.)		
Poverty trajectories, <i>birth to 10-11 years of age</i>			
Consistent sufficient income	1.00		
Decreasing likelihood	<b>2.71</b>	<b>(1.49,4.90)</b>	
Increasing likelihood	1.21	(0.53,2.79)	
Consistent low-income	1.47	(0.64,3.39)	
Index of cumulative adversities			
0 : Ref			
1	<b>2.14</b>	<b>(1.13,4.05)</b>	
2	1.21	(0.61,2.42)	
3	1.03	(0.46,2.28)	
4+	1.92	(0.94,3.94)	

\* *Adjusted for sex, birth order, family type, maternal education & age , and parent's asthma status and smoking at home.*

## *Risk of **Overweight or Obesity** according to exposure to poverty*

*(n=698) ÉLDEQ 1998-2010*

*Adjusted for sex, birth weight, maternal education and maternal obesity \* p<0.05, \*\* p<0.01*

	Age 6	Age 8	Age 10	Age 12
	OR (95%CI)	OR (95%CI)	OR (95%CI)	OR (95%CI)
Consistent poverty	1.55 (0.9-2.8)	<b>2.22 (1.1-4.5)*</b>	<b>2.34 (1.2-4.3)*</b>	<b>3.04 (1.7-5.5)**</b>
Increasing likelihood	0.83 (0.4-1.7)	0.91 (0.4-1.9)	<b>1.85 (1.1-3.2)*</b>	<b>1.71 (1.0-2.8)*</b>
Decreasing likelihood	1.14 (0.4-3.5)	<b>1.97 (1.0-3.7)*</b>	1.74 (0.9-3.2)	1.83 (0.9-3.4)
Never poor	1.0	1.0	1.0	1.0

## *In summary: Child poverty and chronic health conditions*

- During the first 10 years of life, chronic psychosocial conditions are associated with exposure to persistent poverty whereas chronic physical conditions are associated with early exposure to poverty, mostly during the preschool years;
- Among the physical health conditions:
  - Chronic/active asthma at 10 years of age has the strongest association with early poverty and with the index of adversities
  - Overweight/obesity are associated with all trajectories of exposure to poverty.

## *In summary: Role of cumulative adversities*

- Cumulative adversities might play a mediating role between persistent poverty and child chronic psychosocial health conditions but not for chronic physical conditions;
- No moderating role (no interaction) of exposure to cumulative adversities was found.

## *Limitations of the study*

- A secondary analysis;
- Income and health problems are reported by the mother (or the PKB);
- No information on other sources of financial support for the family was available;
- Differential attrition.

## *Strengths of the study*

- A representative birth cohort with annual follow-up at home since birth;
- A large range of individual, family, and environmental variables reported annually since birth;
- Possibility of examining the impact of early exposure and of chronic exposure to poverty on child health.
- Weighting of data and multiple imputations to account for the differential attrition.

## *Future directions*

- More effective interventions and public policies are needed in order to reduce the rate of child poverty and to limit the long term health consequences of child poverty;
- Interventions on some adversity factors (neighborhood safety and cohesion, maternal depression, family functioning, family violence) might limit the impact of child poverty on children's current and future health.

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- Thank you

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## *Questions sur le quartier*

- Quartier non-sécuritaire: le parent a rapporté comme problème grave la présence d'ordures et détritius; la vente ou consommation de drogues; la présence d'alcooliques; des groupes de jeunes qui causent problèmes.
- Faible cohésion sociale: le parent a rapporté **ne pas être d'accord** que les voisins ont tendance à s'unir pour régler des problèmes du quartier; sont prêts à s'entre-aider ; on peut se fier sur les voisins pour s'assurer que les enfants soient en sécurité ; il y a des adultes qui servent de modèles de comportement pour les enfants ; les voisins surveillent votre maison lorsque vous vous absentez.