The Impact of Primary Care on Outcomes in Vulnerable Children: A Population-Based Retrospective Cohort Study in Québec, Canada

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BACKGROUND

- Vulnerable children, such as those with low socioeconomic status (SES), have increased healthcare needs
- Having a source of primary care (PC) is associated with better overall outcomes for these children
- PC delivery models for children in Québec include pediatricians, family MDs in Family Medicine Groups (FMGs) or not in FMGs
- FMGs were implemented in Quebec since 2002 as part of reforms to improve the PC medical home (e.g. accessibility, continuity, comprehensiveness)
- Few studies have examined the impact on primary care models on health service utilization of socioeconomically vulnerable children in Quebec

OBJECTIVES

We sought to determine:

1. Association between socioeconomic status (SES) and outcomes (ED visits, hospital admissions)
2. Whether primary care mediates socioeconomic inequalities in outcomes

METHODS

- Participants: Children aged 0-18 years old (n=1,184,780)
- Data Source: Province-wide health administrative data from the Régie de l'assurance maladie du Québec (RAMQ)
- Regression models: Multivariable zero inflated negative binomial and logistic

Study Design: Population-based retrospective cohort study

Baseline Period: 2010-2011 — **Outcome Period: 2012-2013**

Main Exposure: SES (material and social deprivation index, i.e. Pampalon index)

Covariates:

age, gender, health status (asthma, diabetes, complex chronic diseases or none), rurality, PC model (Family Medicine Groups [FMGs], family physicians not part of FMGs, pediatricians, or no PC), previous healthcare utilization (ED visits, hospital admissions), PC model*SES (interaction term)

→ Primary Outcome: ED visits
Secondary: Hospital Admissions

RESULTS

Table 1: Baseline Characteristics Across all SES levels

CHARACTERISTICS	SES LEVELS Q1 (least deprived) N=285319 (24.1%)	Q2 N= 272321 (23.0%)	Q3 N= 228072 (19.3%)	Q4 N= 200817 (17.0%)	Q5 (most deprived) N=198250 (16.7%)	ALL N=1184780
AGE						
Mean	9.7	9.5	9.5	9.6	9.5	**9.6**
Standard Deviation	6.2	6.3	6.3	6.3	6.3	**6.3**
GENDER (%)						
Female	49.2	49.0	49.0	49.0	48.8	**49.0**
HEALTH STATUS (%)						
Asthma	3.0	3.0	2.8	2.9	3.1	**3.0**
Diabetes	0.2	0.2	0.2	0.2	0.1	**0.2**
Children Medical Complexity	2.7	2.6	2.5	2.5	2.5	**2.6**
None of the above	94.1	94.3	94.5	94.4	94.3	**94.3**
PRIMARY CARE MODEL (%)						
FMG	20.8	23.9	23.3	20.4	16.1	**21.2**
Non-FMG	15.7	15.9	15.9	16.4	17.3	**16.2**
Pediatrician	24.7	18.7	16.1	16.5	15.9	**18.8**
No Primary Care	38.8	41.4	44.6	46.8	50.7	**43.9**
RURALITY (%)						
Urban	87.8	73.2	61.1	64.1	74.2	**73.0**
Strong MIZ	5.3	9.6	8.2	8.3	9.1	**8.0**
Moderate MIZ	3.0	7.6	9.8	8.7	4.0	**6.4**
Weak MIZ	3.1	7.4	14.3	14.4	8.7	**9.1**
Rural	0.7	2.2	6.6	4.5	4.0	**3.4**
Previous ED visit(s) (yes,%)	29.7	33.8	35.9	36.2	36.7	**34.1**
Previous hospital admission(s) (yes,%)	7.5	8.6	8.9	8.6	8.4	**8.4**

*MIZ= metropolitan influenced zone

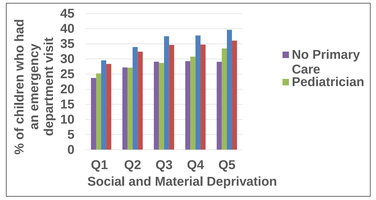

Figure 1A: Crude Proportions ED visits, by Primary Care Model within SES quintiles

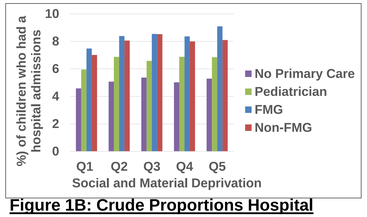

Figure 1B: Crude Proportions Hospital Admissions, by Primary Care Model within SES quintiles

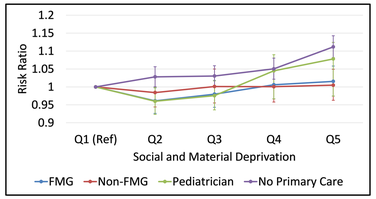

Figure 2A: Association between ED visits and Socioeconomic Status (Zero Inflated Negative Binomial Model)

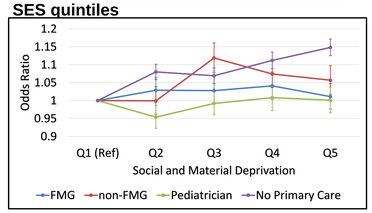

Figure 2B: Association between ED visits and Socioeconomic Status (Logistic Model)

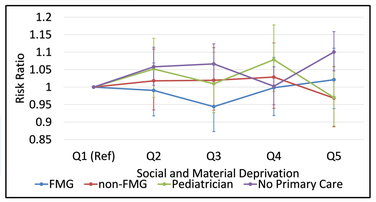

Figure 3A: Association between Hospital Admissions and Socioeconomic Status by Primary Care Model (Zero Inflated Negative Binomial Regression)

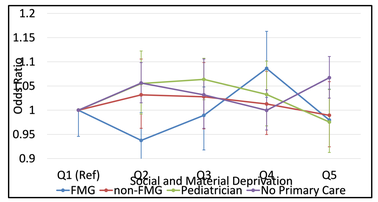

Figure 3B: Association between Hospital Admissions and Socioeconomic Status by Primary Care Model (Logistic Regression)

KEY FINDINGS

- Overall, 43.9% of children in no primary care model
- Most deprived SES quintile (Q5) vs. least deprived (Q1):
  - ↑ % in no Primary care model
  - ↑ % in non-FMG PC model
- Overall, 30.1% had ED visit and 6.5% had hospital admission
- Most (Q5) vs. least deprived SES quintile (Q1) ↑ risk and odds ED visit
  - Association greater for no primary care group (RR 1.11; 95% CI: 1.08-14) vs. other primary care models (FMG: RR 1.01; Pediatrician: RR 1.07; non-FMG: RR 1.00)
- Factors associated with ↑ risk and odds ED visit: older age, female, non-urban, previous ED or outpatient visits
- No clear trends for association between SES (by primary care model) and risk/odds of hospital admissions
- Factors associated with ↑ risk and odds hospital admission: younger age, male, non-urban, previous admissions, ED or outpatient visits

LIMITATIONS

- Pampalon Index is not individual-based measure of SES but a widely used proxy for health services research
- Although variability in services and care provided within each PC model likely exists (e.g. not all FMGs are the same), limitation may be less pertinent in this study using large, population-based data
- Other co-morbidities/clinical characteristics of patients may not be accounted for, but included most common ones that are associated with ↑ health service utilization

CONCLUSIONS

- Greater proportion of children in most deprived SES quintile have no primary care compared to the lesser deprived SES quintiles
- Overall, 66.1% of children had primary care
- Primary care may mediate SES inequalities in ED visits
- Association between primary care and SES inequalities in hospital admissions less evident
- Future analyses will examine the impact of primary care models among vulnerable children on different outcomes (primary care and outpatient visits).

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