

Québec's Minority Linguistic Communities and Myocardial Infarction:

A Problem of Language Barriers—or Access?

Catherine Drouin

Doctoral Student in Clinical Sciences





March 16, 2011

Overview of the Presentation

Context and Issues

Objectives

Methodological Approach

Results

Le Sys	stème d	'information sp	atio-temporel sur l'athérosclérose
Décou	ipage géo	graphique	Analyses complémentaires
	Découpage ad	ministratif	Spatiales
	RSS - Régions so	odaux-sanitaires	→ Non spatiales
	RLS - Réseaux Io	coux de santé	
	CLSC - Centres k	ocaux de services communautaires	
→ L	Découpage ru	ral/urbain et accessibilité	Documentation
	Classe de ruralité Bassin de déserti	i e autour des centres tertiaires	→ Méthodologie
-+ L	Découpage se	lon défavorisation matérielle	e et sociale







- Why focus on myocardial infarction?
 - One of Canada's main causes of death and disability¹
 - Cardiovascular diseases have the greatest economic impact¹
 - A serious consequence: death!
 - Prognosis depends upon how quickly medical attention is administered²
 - There is an established link to certain segments of society
 - Rurality³
 - Immigration⁴
 - Materially and socially disadvantaged⁵

"The Effect of English Language Proficiency on Length of Stay and In-hospital Mortality" John-Baptiste, A. *et al.*, J GEN INTERN MED 2004;19:221-228

- Cohort study
- Population
 - Patients admitted to 3 Toronto hospitals between April 1993 and December 1999
- Conclusions
 - Length of stay 0.5 days longer for those with limited English
 - No difference in the case of mortality during the stay
- Recommendation
 - Longer-term studies of mortality are recommended

"Acute Myocardial Infarction Length of Stay and Hospital Mortality are Not Associated with Language Preference"

Grubbs, V. et al., J GEN INTERN MED 2008;23(2):190-194

- Cohort study
- Population
 - Non-handicapped Medicaid recipients age 35 and older admitted to a California hospital for acute myocardial infarction between 1994 and 1998
- Conclusions
 - No difference between linguistic communities
 - BUT patients whose language preference is not English are more likely to undergo cardiac or surgical intervention
- Recommendation
 - Longer-term studies of mortality are recommended

Objectives

- Primary objective
 - Verify whether health-related disparities exist as regards myocardial infarction between Québec's French-speaking and non-French-speaking communities
 - » Incidence of the disease
 - » Use of revascularization
 - » Mortality
 - » Use of services
- Secondary objective
 - Establish a process for identifying minority linguistic communities in the public health environment

- Specifications
 - Secondary data analysis based on ecological estimates
- Analysis unit
 - Census subdivision (CSD)
- Data sources
 - Statistics Canada
 - RAMQ
 - MEDECHO

- Target population
 - Québec residents outside the metropolitan Montréal area
 - 2001 census survey
- Cohort for MI cases
 - Patients age 25 and older
 - Hospitalized in Québec between January 1, 2000, and December 31, 2003
 - Primary diagnosis: myocardial infarction CIM-9: 410

- CSDs clustered into 5 linguistic groups
 - The mother tongue was the variable
 - The Jenks Natural Breaks Classification method was used
- Calculations and rates were established by linguistic group



	Groupes linguistiques						
Indicateurs de santé	Francophone	Fortement francophone	Mixte	Fortement non franco.	Non francophone		
Incidence IM	0,73%	0,73%	0,59%	1,07%	0,51%		
Taux de décès à HI	10,75%	10,55%	10,26%	10,67%	9,36%		
Taux de décès à 12 mois	8,15%	8,53%	8,03%	10,27%	10,32%		
Taux de décès par MCV à 12 mois	4,26%	4,38%	3,16%	5,24%	6,45%		
Taux de revasc. à HI	39,59%	37,54%	36,98%	32,70%	24,52%		
Taux de PTCA à HI	32,75%	32,90%	33,82%	27,25%	21,29%		
Taux de PAC à HI	7,43%	4,86%	3,65%	5,87%	3,23%		
Taux de revasc. à 12 m.	48,53%	44,06%	44,28%	39,83%	31,61%		
Taux de PTCA à 12 m.	38,69%	37,34%	39,17%	31,24%	24,52%		
Taux de PAC à 12 m.	11,61%	7,67%	6,08%	9,85%	8,39%		
Taux de réhospitalisation à 12 mois	44,74%	41,66%	39,17%	40,67%	54,19%		
Taux de réhospitalisation pour IM à 12 mois	5,86%	5,38%	6,81%	5,45%	5,81%		
Taux de réhospitalisation pour MCV à 12 mois	27,16%	23,78%	22,38%	24,53%	27,10%		

Linguistic community comparisons

• Portrayal of consultations the year following an MI

	Nombre de consultations					
Niveau de consultation	auprès d'un omnipraticien	auprès d'un spécialiste	en service ambulatoire	aux urgences seulement		
1. Aucune	0	0	0	0		
2. Faible	1 à 3	1	1 à 6	1		
3. Modéré	4 à 6	2	7 à 10	2		
4. Élevé	7 à 10	3 à 4	11 à 16	3 à 4		
5. Très élevé	Plus de 10	Plus de 4	Plus de 16	Plus de 4		

Indicateurs de santé		Groupes linguistiques							
		Francophone	Fortement francophone	Mixte	Fortement non franco.	Non francophone			
Taux de consultations auprès d'un	Aucune	7,47%	7,98%	9,98%	12,37%	33,55%			
	Faible	23,68%	23,09%	21,41%	20,13%	20,65%			
	Modéré	26,37%	25,98%	23,84%	20,96%	13,55%			
	Élevé	22,80%	23,49%	25,30%	27,46%	19,35%			
ommpraticien	Très élevé	19,68%	19,46%	19,46%	19,08%	12,90%			
Tour	Aucune	19,34%	24,72%	29,20%	32,91%	43,23%			
Taux de	Faible	17,74%	17,97%	19,95%	21,38%	20,65%			
consultations	Modéré	18,83%	17,17%	20,19%	16,56%	15,48%			
aupres u un	Élevé	25,15%	23,09%	20,92%	19,92%	13,55%			
specialiste	Très élevé	18,94%	17,05%	9,73%	13,55%	7,10%			
Taux de	Aucune	2,11%	2,55%	4,62%	4,40%	7,10%			
	Faible	24,74%	24,21%	25,55%	27,88%	41,29%			
consultations	Modéré	24,40%	24,98%	25,30%	19,29%	16,77%			
ambulatoire	Élevé	25,24%	26,78%	24,09%	26,42%	23,23%			
	Très élevé	23,51%	21,49%	20,44%	22.01%	11,61%			
T 1	Aucune	40,89%	40,17%	42,09%	40,67%	40,00%			
raux de consultations aux urgences seulement	Faible	20,09%	20,49%	18,73%	23,69%	27,10%			
	Modéré	13,62%	13,93%	10,71%	12,79%	10,32%			
	Élevé	13,63%	13,71%	18,00%	10,48%	13,55%			
	Très élevé	11,76%	11,70%	10,46%	12,37%	9,03%			

Regressions according to Fish model

Taux		Coefficient bêta (risque relatif)								
			Modèle multivarié							
		Langue,		gue Âge		Défavorisation		Zone de desserte		
		modèle	Langue		Sexe			(réf : < 32 km)		
		univarie	Langue			matérielle	sociale	32-64	64-105	> 105
						indeficite		km	km	km
Revascularisation à HI		-0,0039°	-0,0039°	-0,0012ª	0,0236	-1,1269ª	0,6458	-0,0932	-0,1906°	-0,1359°
		(0,9961)	(0,9961)	(0,9988)	(1,0239)	(0,3240)	(1,9075)	(0,9110)	(0,8265)	(0,8729)
PTCA à HI		-0,0025	-0,0020	-0,0034	(1,0202-	-1,0943	-0,0825	-0,1550	-0,2088	-0,2235
		0.0045	-0.0045	-0.0016	0.0140	0,5355	0.4083	0.08045	0,7043)	0,7997)
Revasc. à 12 m.		(0.9955)	(0.9955)	(0.9984)	(1.0150)	(0.5854)	-0,4083	(0.0145)	(0.8002)	(0.9136)
		-0.0035	-0.0036	-0.0037	0.0137	-0.6598	-0.9659	-0 1366	-0 1928	-0.1696
PTCA à 12 m.		(0.9965)	(0.9965)	(0.9963)	(1.0138)	(0,5170)	(0.3806)	(0.8723)	(0.8246)	(0.8440)
Réhospitalisation à 12 m.		-0.0011	-0.0013	-0.0004	-0.0223	1.5137	-0.4294	0.0712*	0.1051	0.1005
		(0,9989)	(0,9989)	(0,9996)	(0.9779)	(4,5435)	(0.6509)	(1.0738)	(1.1108)	(1.1057)
Patients selon le		(((-)/			(0)0000	(-,,	(
niveau de										
consultations		0.0139	0.0125	0.01935	-0.0287	2 1596ª	-8 1048	-0 19085	-0.5041	0.1129
aunrès d'un	Aucune	(1.0140)	(1.0140)	(1.0195)	(0.9342)	(8,6677)	(0.0003)	(0.8263)	(0.6040)	(1,1195)
omninratioion		(1,0110)	(1,0110)	(1,01)0)	(0,55 12)	(0,0077)	(0,000)	(0,0200)	(0,0010)	(1,11))
(12 m.)										
Patients selon										
le niveau de										
consultations		0.0097	0.0088	0.0096*	0.0012	2.0361b	2.43546	0.4322	0.5861	0.6867
aunrès d'un	Aucune	(1.0097)	(1.0097)	(1.0096)	(1.0012)	(7.6607)	(11.4204)	(1.5406)	(1.7970)	(1.9871)
anpies a un		(1,000))	(-,	(1,007.0)	(-,)	(.,,	(,,	(1,2)	(-,)	(-,,-,-,
specialiste										
(12 m.)										
Patients selon										
le niveau de		0.0025	0.00001	0.000	0.0000	0.7470	0.000	0.10001	0.1000	0.0074
consultations	Faible	0,0037	0,0032	0,0036	0,0090	2,7470	-0,6653	-0,1002	-0,1902°	-0,0074
ambulatoires		(1,0037)	(1,0037)	(1,0036)	(1,0090)	(15,5958)	(0,5141)	(0,9047)	(0,8268)	(0,9926)
(12 m)										
(12 111.)						1	C	10.01		< 0.001
						* p < 0,0) '	p < 0,01	° 1	p≤0,001

18

- Cluster analyses¹
 - Identification of "hot spots" for extremely high or low values^{2,3}
 - Statistics: G_i* of Getis-Ord

$$G_{i}^{*} = \frac{\sum_{j=1}^{n} w_{i,j} x_{j} - \bar{X} \sum_{j=1}^{n} w_{i,j}}{S \sqrt{\frac{\left[n \sum_{j=1}^{n} w_{i,j}^{2} - \left(\sum_{j=1}^{n} w_{i,j}\right)^{2}\right]}{n-1}}}$$

- Targeted variables
 - MI-related health issues expressed as rates per CSD
- Conceptualization of the model
 - Polygon contiguity

Spatial analyses



20

Approche méthodologique

Analyses spatiales



21



Approche méthodologique





- Summing up...
 - The primary impact is at the level of service utilization
 - At the population level, the addition of demographic and socio-economic variables has little effect
 - Spatial clustering
 - Issues are related to access
 - Accessibility
 - Availability
 - Acceptability

- Watch out!
 - Ecological bias
 - Selection bias
 - Only MI cases involving hospitalized patients were used
 - MAUP
 - Geocoding validity

- And now what?
 - Multilevel analyses
 - Consider other variables
 - Other services
 - Medication
 - Other diagnostics
 - More information is needed!



Thank you!

Groupe de recherche **PRIMUS**

http://pages.usherbrooke.ca/primus





Instituts de recherche Canadian Institutes en santé du Canada of Health Research





