Living Environments and Health at the Local Level

The Case of Three Localities in the Québec City Region

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ABSTRACT

Background: To arrive at a better understanding of the combined impact of social health determinants on health inequities a research project was carried out in three localities in the Québec city region. This paper aims to show how residents' health status and health determinants can be explored through various data sources and analytic perspectives, and how these can then be combined to create a more comprehensive picture of health status at the local level.

Methods: A multidisciplinary approach was adopted. Both quantitative and qualitative methods were used: information from databases entered into a geographic information system, telephone survey and face-to-face interviews with key informants, telephone surveys with representative samples of the population in each locality and in-depth interviews with citizens. The localities were subdivided into neighbourhood units to refine the analysis on local environment.

Results: The results obtained in the locality of Saint-Louis, which displays the worst scores of the three localities, illustrate the research strategy's potential. Socio-economic and health indicators show that Saint-Louis is less well-off than the two other localities and that huge disparities among neighbourhoods are present within this locality. Results from the interviews with key informants, the telephone survey and interviews with citizens confirm this overall picture, raising many hypotheses about the various factors interacting to contribute to levels of health.

Interpretation: Two main methodological conclusions can also be drawn from this study: that defining the appropriate spatial scale to study the impact of living environments is crucially important, and that a life course approach is essential to understanding how inequities develop.

MeSH terms: Health determinants; health status; social environment; methods

La traduction du résumé se trouve à la fin de l'article.

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Ever since social inequalities were identified as determinants of health inequalities, many follow-up studies have been carried out.¹⁻¹⁰ The debate over the importance of various social factors is well under way but far from resolved.¹¹ The literature has addressed determinants such as income inequality, occupational class, marital status and social environment, among others.¹²⁻¹⁵ Living in precarious material or social conditions is now considered particularly deleterious to health and well-being.¹⁶⁻¹⁸ However, few effective population health interventions have been developed. Although some progress has been made in identifying health determinants, the combined impact of different conditions is not well documented, which has given rise to a host of hypotheses.^{19,20}

To arrive at a better understanding of these determinants and their interactions, we adopted a community-health research strategy. This strategy has been receiving increasing attention in recent years. It consists of carrying out in-depth analyses of a small number of well-defined localities.²¹ We selected three localities, all in the Québec City region, that are representative of most industrialized settings in North America and Europe.* Two are urban—one is downtown and the other suburban—and correspond to the Québec City boroughs of Saint-Louis and Banville. The third corresponds to the rural county (Municipalité régionale de comté, MRC) of Verdiers. These localities were selected because of their contrasting geographic, demographic, socio-economic and health characteristics but also because of discrepancies in their deprivation levels and the health status of their populations. For instance, the Banville and Saint-Louis boroughs differ markedly in terms of population age structure, material deprivation and health status indicators. Banville has a younger population as well as more positive socio-economic and health indicators than Saint-Louis. The situation in Verdiers, on the other hand, is less clear-cut. This MRC has health indicators similar to those of Banville but a material deprivation level equivalent to that of Saint-Louis. Moreover, it appears to be less socially disadvantaged than the two Québec City boroughs, thus illustrating a rural-urban distinction that has already been demon-

* For ethical reasons, the names used here are fictional.

strated both in the Québec City region and throughout the province.^{22,23}

These contrasts among localities provided the ideal context for a field study exploring the role of local, family, and work environments as health determinants. The observations described suggested the following research questions: (1) Why do Saint-Louis and Verdiers, which share the same level of material deprivation, exhibit very different health status indicators? (2) How is it that Banville and Verdiers have different levels of material deprivation but quite similar health status indicators? (3) Could differing degrees of social disadvantage (i.e., fragility of social networks) explain these incongruities? Our working hypothesis was that the differences in health status indicators among these localities were related to social determinants that emerge only after in-depth analyses. Following Lynch et al.'s suggestions, we decided to investigate individual pathways and their immediate environments (i.e., local, family and work environments).²⁴⁻²⁶

In this paper, we first present our theoretical background and methodology, and then the results we obtained for Saint-Louis, which displays the lowest scores of the three localities selected. Our aim is to show how residents' health status and health determinants can be explored through various data sources and analytic perspectives, and how these can then be combined to create a more comprehensive picture of health status at the local level.

THEORETICAL BACKGROUND AND METHODS

Our research plan is based on Health Canada's theoretical framework for health determinants, which adopts many elements of the population health approach put forward by the Canadian National Forum on Health.^{9,27-29} This framework attests to the complexity of the factors involved in health and illness development and promotes multidisciplinary approaches. It considers social determinants, among all determinants, to play a major role in health and illness. To investigate their role more thoroughly, we used existing knowledge and our previous research to select three environments: local, family and work.

We adopted a multidisciplinary approach and used both quantitative and qualitative methods. We put in place an advisory com-

Figure 1. Saint-Louis, its districts and neighbourhoods

mittee composed of actors from the selected localities. Our objective was to involve the members of this committee in all phases of the project by having them share their expertise (particularly concerning local social dynamics), give their opinions on the instruments used for data collection and on our findings and interpretations of the data, and help in the dissemination of this information. Their input has proved invaluable. The project was approved by the Comité d'éthique de l'université Laval.

The localities were selected through in-depth analyses of both census and mortality data and hospital admission records. To this assessment we added an empirical dimension by visiting the areas in person. We also entered information from a variety of databases* into a geographic information system (GIS) in order to develop the most comprehensive profile possible of the localities. This information was supplemented with telephone surveys of key local informants about day care and school resources

and with face-to-face interviews with informants involved in economic or community development and in mental health services.

Next, we carried out telephone surveys with representative samples of the population in each locality. The 67% response rate yielded a total of 1,805 valid questionnaires (558 in Saint-Louis, 608 in Banville and 639 in Verdiers). The questionnaire comprised 170 questions (on social and demographic characteristics; on family, work and local environments; and on health) and was developed using validated questions drawn from various other surveys. We obtained permission from Sally Macintyre's team (MRC Social and Public Health Sciences Unit, University of Glasgow) to use its questions for the neighbourhood problems scale; to measure social cohesion in neighbourhoods we used Buckner's questions.³⁰ Ten questions were open-ended and collected geographic information (place of work, name of neighbourhood, addresses of frequently used shops and grocery stores) and information about past employment and economic sector. Finally, these data were supplemented with in-depth interviews with 45 of the participants in the telephone survey. These interviews were initiated with a general question about their residential setting, and interviewees were invited to talk about their family and work environments.

* Data were drawn from census publications (Statistics Canada), registers of deaths, Med-Echo, the Québec Health Insurance Board, and from agencies and organizations such as school boards, towns, the Québec Urban Community (Communauté urbaine de Québec), the Regional Health and Social Services Board of Québec City (Régie régionale de la santé et des services sociaux de Québec), police departments and occupational health programs in area CLSCs (local community service centres).

TABLE I

Population and Socio-economic Characteristics of Districts and Neighbourhoods, Saint-Louis, Québec

District	Neighbourhood	Population			Socio-economic Characteristics					
		Total	Young*	Elderly†	Income‡	Education§	Living Alone	Single-Parent Family¶	Deprivation**	
		<i>n</i>	%	%	\$	%	%	%	Index	Index
Lafontaine		15,925	10.3	22.0	20,540	33.4	27.0	24.5	3.35	4.46
	1	3,125	11.7	18.0	18,590	37.2	28.2	33.5	3.65	5.00
	2	5,200	10.6	25.6	22,213	35.7	25.5	21.6	3.56	3.99
	3	3,215	8.7	22.4	23,138	29.6	26.0	23.8	2.33	4.72
Iberville	10	4,385	10.2	20.3	17,994	30.7	28.5	21.6	3.67	4.41
		14,555	13.4	17.8	17,896	43.1	25.5	28.7	4.54	4.58
	4	2,485	9.1	13.5	15,611	39.2	29.4	26.4	4.62	4.62
	5	4,360	12.2	17.6	20,868	38.9	21.5	20.6	4.34	4.00
Vieux-Saint-Louis	6	2,145	23.7	9.3	14,260	50.8	15.9	44.1	5.00	5.00
	7	5,565	12.4	23.2	17,786	45.2	30.5	29.7	4.48	4.85
		14,505	11.0	17.9	19,500	35.4	28.0	32.3	3.31	4.91
	8	4,290	10.6	16.7	16,636	38.0	26.8	34.2	4.39	4.88
Saint-Louis	9	6,010	10.1	18.3	23,066	27.0	25.7	28.7	2.00	4.93
	11	4,205	12.6	18.6	17,184	44.6	32.4	36.0	4.33	4.90
Banville		44,985	11.5	19.3	19,374	37.2	26.8	28.2	3.74	4.63
Verdiers		70,285	14.3	14.4	26,930	24.9	12.7	17.7	2.33	3.10
Québec Province		44,545	16.7	16.0	23,459	36.2	11.5	12.6	3.60	2.50
		7,237,475	17.9	13.3	27,125	32.8	12.5	16.6	3.00	3.00

* Proportion of people below age 15, as percentage of total population

† Proportion of people age 65 and over, as percentage of total population

‡ Mean personal income of people age 15 and over, in dollars

§ Proportion of persons with no degree, certificate or diploma, as percentage of population age 15 and over

|| Proportion of people living alone, as percentage of people age 15 and over in private households

¶ Proportion of single-parent families, as percentage of all types of families

** Material and social deprivation indices: varies from 1 (least deprived) to 5 (most deprived). The material form reflects employment, education and income, the social form, the fact of living alone, in single-parent families or being separated, divorced or widowed.

Source: Canadian census, 2001

To refine our view of the local environment, we subdivided the three localities into neighbourhood units. No consensus yet exists on the most appropriate method for producing meaningful spatial units to analyze local health status.^{21,31} To define these units, we adopted a three-fold approach that combined historical and socio-economic information as well as the perceptions of local representatives.³² First, we integrated all spatial subdivisions used by local administrations and institutions for the past 40 years into a GIS, weighted them according to certain criteria and mapped them. The resulting map displayed the most frequently used boundaries for each area. Second, we performed a cluster analysis of socio-economic indicators drawn from the Canadian census, by Dissemination Area, and mapped those results. Finally, we conducted group discussions with stakeholders from various local organizations and government agencies (MRCs, municipalities and community groups) in order to validate, complement and integrate the boundaries that had emerged from the previous work. In Saint-Louis, for instance, key stakeholders agreed on a final set of 11 neighbourhood units (Figure 1). As a further attempt to increase the relevance of this spatial grid for intervention, we combined these units to approximate the geographic boundaries for

local districts, which are administrative areas used by the City and the Borough councils for planning purposes. In Saint-Louis, three such districts exist: Lafontaine, Iberville and Vieux-Saint-Louis. These represent an intermediate level between the Borough and the neighbourhoods. The results converge, and qualitative information (most of it repeated from one group of interviewees to the other) gives more depth to quantitative data.

RESULTS

In the following section, we focus on Saint-Louis and present some results drawn from the sources mentioned, namely, administrative databases (comprising mainly census, mortality and hospitalization data), telephone surveys with the general population, surveys with key informants and face-to-face interviews with residents. These results converge, and qualitative information (most of it echoing from one group of interviewees to the others) gives more depth to quantitative data.

Administrative databases

Saint-Louis's population is older and more deprived than the population of the province of Quebec. It is less well-off and has lower levels of educational attainment. Twice as many people live alone, and 28.2% of fami-

lies have single parents (Table I). A very high proportion of the population depends on employment assistance: almost 20% of the population, more than two-thirds of them living alone, and 26% of the 45-64 age group were in this situation in January 2004.* Life expectancy is lower for both women and men in Saint-Louis than in Quebec as a whole, as is health expectancy (Table II). Whether we consider premature mortality, long-term disability or hospitalization, the rates among residents of Saint-Louis are higher (Table III). As well, the level of hospitalization for mental health problems among Saint-Louis residents is three times higher than Quebec's rate. There is also a high incidence of cancer (Table IV).

Socio-economic and health indicators vary considerably by neighbourhood unit in Saint-Louis. Indicators for neighbourhood unit 11 are at odds with those for unit 9, which is adjacent (Vieux-Saint-Louis), and unit 3 (Lafontaine). Although unit 11 displays poor indicators, units 9 and 3 have good ones. For example, health expectancy at birth for unit 11 is 64.1 years, whereas it is 74.3 years for unit 9 and 80.1 years for unit 3 (Table II). Even

* Source: Statistiques de la Direction générale adjointe de la recherche, de l'évaluation et de la statistique, Ministère de l'Emploi, de la Solidarité sociale et de la Famille.

TABLE II

Life Expectancy (LE)* and Health Expectancy (HE)† at Birth by Sex, District and Neighbourhood, Saint-Louis, Québec

District	Neighbourhood	Life Expectancy						Health Expectancy					
		Female		Male		Total		Female		Male		Total	
		LE	CI‡	LE	CI	LE	CI	HE	CI	HE	CI	HE	CI
Lafontaine		82.0	(80.5-83.5)	75.0††	(73.3-76.7)	79.0††	(77.8-80.1)	75.9††	(74.1-77.7)	70.0††	(68.0-72.0)	73.0††	(71.6-74.4)
		82.0	(80.5;83.5)	75.0	(73.3;76.7)	79.0	(77.8;80.1)	75.9	(74.1;77.7)	70.0	(68.0;72.0)	73.0	(71.6;74.4)
	1	80.4	(77.5;83.3)	72.4	(66.2;78.7)	77.2	(74.4;80.0)	74.6	(71.5;77.7)	67.4	(59.3;75.6)	71.5	(68.0;75.0)
	2	80.6	(74.1;87.2)	73.7	(70.0;77.3)	78.9	(76.6;81.3)	74.7	(66.1;83.4)	69.6	(65.7;73.5)	72.8	(70.1;75.6)
Iberville	3	90.6††	(87.7;93.5)	81.3††	(77.7;84.8)	86.1††	(83.7;88.5)	84.7††	(81.5;87.9)	75.9††	(72.2;79.6)	80.1††	(77.6;82.7)
	10	79.4	(76.6;82.2)	72.9	(69.1;76.7)	76.4	(74.1;78.7)	72.3	(69.0;75.6)	67.2	(62.6;71.8)	70.1	(67.3;72.9)
		81.8	(80.2;83.5)	71.0	(69.2;72.9)	76.9	(75.7;78.2)	72.7	(70.9;74.5)	65.7	(63.6;67.9)	70.0	(68.6;71.4)
	4	88.9	(80.3;97.5)	77.3	(70.8;83.8)	85.8††	(80.1;91.5)	72.3	(62.2;82.4)	69.4	(61.8;77.0)	72.9	(66.2;79.5)
Vieux-Saint-Louis	5	84.5††	(82.1;87.0)	72.1	(68.4;75.7)	78.8	(76.5;81.0)	77.6††	(74.9;80.4)	66.5	(62.5;70.4)	73.0	(70.6;75.5)
	6	80.4	(76.8;84.0)	74.2	(68.2;80.1)	78.1	(74.9;81.3)	68.9	(64.8;73.1)	63.8	(57.6;69.9)	68.6	(65.0;72.1)
	7	81.1	(78.9;83.3)	68.5	(64.0;73.0)	75.7	(73.8;77.7)	71.9	(69.5;74.3)	64.1	(58.4;69.8)	69.2	(67.0;71.4)
	8	79.0	(77.2;80.8)	71.3	(69.8;72.8)	75.5‡‡	(74.3;76.6)	70.8‡‡	(68.7;72.9)	65.3	(63.5;67.0)	68.8	(67.5;70.2)
Saint-Louis	9	79.0	(75.5;82.5)	70.4	(67.9;72.9)	74.7‡‡	(72.6;76.8)	71.7	(67.6;75.8)	65.4	(62.4;68.3)	68.2	(65.8;70.6)
	11	85.0††	(82.3;87.8)	75.3	(72.6;78.0)	80.8††	(78.8;82.8)	75.2	(72.1;78.3)	70.4	(67.4;73.4)	74.3††	(72.1;76.6)
		74.4‡‡	(70.5;78.3)	68.6‡‡	(65.7;71.4)	71.9‡‡	(69.5;74.3)	65.8‡‡	(61.2;70.3)	59.8‡‡	(56.4;63.2)	64.1‡‡	(61.3;67.0)
		80.8‡‡	(79.9;81.7)	72.5‡‡	(71.5;73.5)	77.1‡‡	(76.4;77.7)	73.1‡‡	(72.1;74.2)	67.1‡‡	(65.9;68.2)	70.6‡‡	(69.8;71.4)
Banville		83.9††	(83.2;84.6)	77.6††	(76.9;78.3)	81.0††	(80.5;81.5)	78.0††	(77.2;78.9)	73.5††	(72.7;74.4)	76.0††	(75.4;76.6)
Verdiers		83.2††	(82.4;84.0)	75.6	(74.7;76.5)	79.4	(78.8;80.0)	77.8††	(76.9;78.7)	71.3	(70.3;72.3)	75.0††	(74.3;75.6)
Québec Province		82.1	(82.0;82.1)	76.0	(75.9;76.0)	79.1	(79.1;79.2)	76.3	(76.2;76.4)	71.5	(71.4;71.5)	74.0	(73.9;74.0)

* Average number of years to live at birth

† Average number of years to live at birth without disabilities, as defined in Table III

‡ Confidence Interval at 95%

†† When district or neighbourhood, LE or HE higher than that of Saint-Louis ($p < 0.05$); when Saint-Louis, Banville or Verdiers, LE or HE higher than that of Québec province ($p < 0.05$).‡‡ When district or neighbourhood, LE or HE lower than that of Saint-Louis ($p < 0.05$); when Saint-Louis, Banville or Verdiers, LE or HE lower than that of Québec province ($p < 0.05$).

Sources: Quebec death database, years 1998 to 2002; Canadian census 2001

TABLE III

Mortality, Disability and Hospitalization Among People Below Age 65 by District and Neighbourhood, Saint-Louis, Québec

District	Neighbourhood	Mortality			Disability			Hospitalization		
		n*	Rate†	CI‡	n	Rate§	CI	n	rate	CI
Lafontaine		41	287	(247;327)	680	4.96	(4.24;5.69)	1,710	14.1	(13.4;14.7)
	1	8	291	(202;381)	125	4.59	(3.02;6.17)	361	14.6	(13.0;16.1)
	2	13	272	(203;341)	200	4.66	(3.40;5.91)	540	14.1	(12.8;15.4)
	3	6	191‡‡	(122;260)	135	4.31	(2.89;5.73)	306	12.6‡‡	(11.1;14.1)
Iberville	10	14	383	(293;473)	220	6.04	(4.49;7.58)	503	14.8	(13.5;16.1)
		45	360	(312;407)	725	6.03	(5.18;6.88)	1,801	15.0††	(14.3;15.7)
	4	8	395	(274;516)	135	6.59	(4.44;8.74)	358	16.8††	(15.0;18.6)
	5	15	411	(319;504)	170	4.51	(3.18;5.83)	501	14.0	(12.7;15.2)
Vieux-Saint-Louis	6	5	262	(154;369)	145	8.28††	(5.70;10.86)	309	16.0††	(14.2;17.8)
	7	16	349	(273;425)	275	6.24	(4.81;7.67)	633	14.7	(13.6;15.9)
	8	40	341	(293;388)	685	5.74	(4.91;6.58)	1,632	14.4	(13.7;15.1)
	9	10	292	(211;372)	210	6.07	(4.48;7.67)	488	14.3	(13.0;15.6)
Saint-Louis	11	13	286	(217;356)	195	3.96‡‡	(2.87;5.05)	593	12.8‡‡	(11.7;13.9)
		16	461††	(359;563)	280	7.79††	(6.04;9.55)	551	16.9††	(15.4;18.4)
		126	327††	(301;353)	2,090	5.57††	(5.11;6.03)	5,143	14.4††	(14.0;14.8)
	Banville	620	181‡‡	(166;195)	1,920	3.05‡‡	(2.78;3.32)	6,765	11.3††	(11.1;11.6)
Verdiers		86	213	(192;233)	1,435	3.68	(3.31;4.06)	3,939	10.6‡‡	(10.2;10.9)
Québec Province		12,826	204	(203;206)	221,790	3.58	(3.55;3.61)	687,925	11.0	(10.9;11.0)

* Average annual number of deaths or hospitalizations

† Rate per 100,000 inhabitants, adjusted by age and sex

‡ Confidence Interval at 95%

§ Rate per 100 inhabitants, adjusted by age and sex

|| People who often had difficulties with daily activities or often had to reduce the amount or kind of activities because of physical or mental conditions or health problems

†† When district or neighbourhood, rate higher than that of Saint-Louis ($p < 0.05$); when Saint-Louis, Banville or Verdiers, rate lower than that of Québec province ($p < 0.05$).‡‡ When district or neighbourhood, rate lower than that of Saint-Louis ($p < 0.05$), when Saint-Louis, Banville or Verdiers, rate lower than that of Québec province ($p < 0.05$).

Sources: Quebec death database, years 1998 to 2002; Canadian census, 2001; Quebec hospitalization database, year 2000-01.

after the confidence intervals associated with this indicator are taken into account, a gap in health expectancy of over 10 years exists between residents of unit 11 and those of unit 3. This gap is partly due to the distribution of nursing homes and senior residences: unit 11 has five homes or

residences whereas unit 9 has two and unit 3 none. This gap could also be related to resident attributes. Income, schooling and family structures in unit 11 are among the most unfavourable in Saint-Louis, as opposed to those characterizing units 9 and 3.

The potential significance of certain attributes becomes obvious when mortality, disability and hospitalization rates are considered among people under 65, who rarely use nursing homes and senior residences (Table II). In this connection, a specific unit's profile deserves mention. Unit 6, in the north-

TABLE IV
Hospitalization for Mental Disorders and Incidence of Cancer Among People Below Age 65 by District and Neighbourhood, Saint-Louis, Québec

District	Neighbourhood	Mental Disorders§			Cancer		
		n*	Rate†	CI‡	n*	Rate†	CI‡
Lafontaine		190	1,408‡‡	(1,205;1,612)	28	184	(149;218)
	1	36	1,320	(884;1,756)	6	218	(133;304)
	2	48	1,101‡‡	(786;1,417)	8	154	(101;207)
	3	23	817‡‡	(480;1,154)	5	160	(89;230)
Iberville	10	83	2,260‡‡	(1,766;2,754)	8	215	(141;288)
		256	2,081‡‡	(1,825;2,336)	20	155	(120;189)
	4	50	2,277	(1,630;2,923)	2	95	(29;160)
	5	61	1,621	(1,213;2,029)	7	182	(113;250)
Vieux-Saint-Louis	6	34	1,896	(1,256;2,536)	3	161	(66;257)
	7	111	2,483‡‡	(2,016;2,951)	8	159	(104;214)
		205	1,649	(1,419;1,879)	19	161	(124;197)
	8	72	1,942	(1,484;2,400)	6	151	(88;215)
Saint-Louis	9	58	1,159‡‡	(854;1,465)	7	144	(89;198)
	11	75	2,049	(1,580;2,517)	7	187	(116;258)
		651	1,705‡‡	(1,573;1,837)	66	168‡‡	(148;188)
Banville		424	707‡‡	(640;775)	106	146	(132;160)
Verdiers		184	474‡‡	(405;543)	64	152	(134;171)
Québec Province		34,563	551	(545;557)	8,816	140	(142;146)

* Annual number of hospitalizations and mean annual number of new cases of cancer

† Rate per 100,000 inhabitants, adjusted by age and sex

‡ Confidence Interval at 95%

§ Mental disorders; ICD9 codes 290 to 316

|| Cancers for the following sites: stomach, colon-rectum, pancreas, lung, breast, prostate and bladder; ICD9 codes 151, 153, 154, 157, 162, 174, 185 and 188

‡‡ When district or neighbourhood, rate higher than that of Saint-Louis ($p < 0.05$); when Saint-Louis, Banville or Verdiers, rate higher than that of Québec province ($p < 0.05$)

‡‡ When district or neighbourhood, rate lower than that of Saint-Louis ($p < 0.05$); when Saint-Louis, Banville or Verdiers, rate lower than that of Québec province ($p < 0.05$)

Sources: Quebec hospitalization database, years 2000-01; Quebec cancers registry, years 1998 to 2001.

eastern part of the locality (Iberville), has a population that is younger and more materially and socially deprived than other parts of Saint-Louis. Despite its younger age distribution, the disability and hospitalization rates among people under 65 are higher.

Finally, also worth mentioning are significant variations in hospitalization rates for mental health problems among people under 65 in two districts, Lafontaine and Iberville (Table IV). In Iberville, however, the variation may be partially explained by the fact that unit 7 (which has the highest rate) is situated next to a psychiatric centre.

Telephone survey

An analysis of the data in the 558 valid questionnaires from Saint-Louis fleshes out this overall picture. Although respondents in general consider themselves to be in good health, they also point out some problems. Compared with the two other localities, Saint-Louis has the highest rate of respondents reporting their health as bad or fair (18.1% versus 8.4% in Banville and 11.6% in Verdiers). Survey results also show that the rate of long-term disability is highest in Saint-Louis, which corroborates existing administrative data. The same appears to hold true for short-term disabili-

ties: Saint-Louis residents report a higher rate than do residents of the two other localities (19.5% versus 10.6% in Banville and 12.5% in Verdiers), and the disabilities are of longer duration (7.1 days versus 5.3 in Banville and 6.7 in Verdiers). With regard to perceived levels of personal control over their environments (an index of mastery used in the Canadian Community Health Survey), 24.2% of the Saint-Louis respondents feel their control to be weak, a much higher proportion than the 17.3% for Verdiers and 16.4% for Banville.

Given what we already know about the relationship between socio-economic conditions and smoking, it was no surprise to learn that 25.3% of the Saint-Louis respondents report being regular smokers versus 16.0% for Banville and 19.6% for Verdiers. The average number of cigarettes smoked per person per day is 16.9, 14.4 and 16.1, respectively. The same relationship held for food insecurity: 17.4% of Saint-Louis respondents answered positively to questions describing such a situation, a higher proportion than in the two other localities.

The telephone survey also gave us access to information on the number and nature of medical and mental health visits. In both cases Saint-Louis respondents have higher

rates: 73.2% report having consulted a physician (general practitioner or specialist) within the preceding year (compared with 69.7% in Banville and 66.8% in Verdiers) and 13.0% report having consulted a mental health professional (versus 9.4% for Banville and 8.8% for Verdiers). (We obtained some information on the utilization of mental health services from the CLSCs in our three localities. For instance, we learned that in Saint-Louis, 51% of visits were for serious disorders, as compared with 24% in Banville and 30% in Verdiers, whereas in that locality there was a lower proportion of visits for mood disorders and personality problems than in the other two localities.) With respect to the use of tranquilizers and sleeping pills, 14.7% of Saint-Louis residents answered in the affirmative compared with 11.4% for Banville and 13.9% for Verdiers.

Residents were also asked about their perceptions of their local environments. Their answers contrast with those obtained in the other localities. Regarding their sense of community, Saint-Louis residents score higher than Banville's but lower than Verdiers's; however, they are more negative about the perceived attractiveness of their local environments and the closeness of their relationships with neighbours. These attitudes seem to have a parallel in the percentage of people saying that social and environmental problems were serious or somewhat serious. Two such problems in particular stand out: 50.2% of Saint-Louis respondents consider vandalism a problem (whereas 28.5% of Banville and 33.8% of Verdiers residents share this perception), and 47.1% had a similar view of theft (versus 29.5% in Banville and 33.9% in Verdiers). A multilevel analysis of environment- and health-related perceptions in the three localities not only confirmed that such perceptions are higher in Saint-Louis but also revealed considerable variation among neighbourhoods and impacts on health status after individual attributes had been adjusted for, thus demonstrating how a local spatial scale can be instructive.³³

Key informants

Interviews with individuals involved in economic or community development or in mental health services shed a different light on the results derived from administrative databases and from the telephone survey. Beyond adding information to the data obtained from other sources, these individu-

als have an original contribution, since their perspective is quite different. Not only can such people reflect on the characteristics of their environment but they also try to explain some of its dynamics. Key informants often manage to suggest diagnoses for problems affecting their localities while also identifying strengths and potential. One often-repeated observation is that their locality clearly needed more local economic projects.

All informants talked about the numerous social problems in Saint-Louis, thus confirming residents' perceptions. Many mentioned the poverty experienced by a majority of residents, often accompanied by other problems. Poverty explains the presence of many groups providing a variety of social support services (e.g., food baskets, low-cost meals, meals for school children, child-development projects). The hardships experienced by single-parent families, the difficulties immigrants have in adapting to local conditions, the transmission of poverty from one generation to the next and the prevalence of mental health problems were also mentioned.

Some informants also raised the issue of the professional reintegration of certain segments of Saint-Louis's population (e.g., people receiving employment assistance, single-parent families, immigrants).

Participation in local affairs was reported as not very strong. Informants brought to the fore the feeling of powerlessness they believe to be widespread among residents because of convictions that they could neither improve their personal situations nor contribute to local development. This last result echoes some answers about perceived levels of personal control obtained from the telephone survey: "They do not believe in democracy, that we can influence some things" (K-2). "They feel that even if they go, it won't change a thing" (K-5). A pervasive passivity may thus result from a feeling of low self-esteem in one's ability to influence events.

According to informants, people tended to identify strongly with one of the three districts described, each with social, economic and health characteristics that differed significantly from the others. Again, reinforcing our conviction that populations' experiences should be captured at a local scale, they pointed out several areas in these districts with high levels of poverty and suggested ways that specific populations (e.g., poor families, psychiatric clien-

tele, immigrants, young professionals), small industrial and service enterprises, public and private establishments (e.g., hospitals, churches, grocery stores, colleges, swimming pools, parks) and social dynamics might shape local environments.

Interviews

Finally, residents' discourses confirm the importance of living environments and the impact, both direct and indirect, of neighbourhood characteristics on their daily lives and their health. Most important is "why" they live where they do, the influence their location has on family and work environments, their perceptions of the local environment (its advantages and disadvantages) and their desire to stay there or not. When discussing their experiences ("lived experience of place"), they tend to confirm the characterizations made by key informants, thereby providing further insights into the relationship between place and health.³⁴

Residents raised many of the same issues as key informants, emphasizing the advantages of living in a city where most services are within easy reach (even without a car) and where community groups are involved in the social life of the districts. They also emphasized the diversity observed in their locality and of its population, describing it in a variety of ways. Some interviewees mentioned the existence of social classes, either when they compared Saint-Louis with some other locality (Saint-Louis being considered a working-class area) or discussed the various socio-economic groups within the locality. Interestingly, the arrival of professionals in a part of the locality was described by one respondent as "gentrification" and by others as a threat. An interviewee explained how he did not want to be associated with other residents' status: "... my neighbours represented something with which I did not want to identify myself, kind of welfare ... I do not want to be identified to that, it confronts my values" (I-1250). Last, personal safety issues cropped up as important in the interviews that dealt with everyday experiences: "I don't like the type of people who hang about in that park ... I would be afraid if my children went there by themselves" (I-132). Interviewees described how concerns about safety affect them personally and limit their activities (such as taking walks

or going to parks at night). In this connection, they also mentioned the reputation of Saint-Louis, and particularly of their own districts, about which they seem to be particularly sensitive.

DISCUSSION

On the basis of these results, we may advance several hypotheses about the role of the local environment in the construction of health status inequities. Various factors in combination may contribute to lower levels of health among Saint-Louis residents. Following Macintyre et al. we can identify *composition* and *context* effects and also *collective explanations*.³¹

Composition

Composition comes into play through demographic, social and economic characteristics known to have an impact on health either directly or in combination with other factors (e.g., population age structure, sex, schooling, marital status, employment, income). In Saint-Louis the indices of material and social deprivation are high (Table I). Deprivation indices, however, are much higher for unit 11 than for units 9 and 3; health indicators for these units displayed similar contrasts. As mentioned earlier, a key informant reinforced this composition hypothesis by explaining how poverty increases as poor families move in. Comments about the reputations of the neighbourhoods and the prejudices such reputations engender provide clear indications as to the way composition comes into play. Some interviewees described feeling comfortable in their own neighbourhoods because they were not "out of place". According to these interviewees, it is the diversity of Saint-Louis residents that allows them to find "their place" here (which does not necessarily apply to Saint-Louis as a whole but, rather, only to appropriate neighbourhoods). References to transformations that have occurred in some parts of Saint-Louis with the arrival of middle-class residents reinforce this explanation. Indeed, in the opinion of several interviewees, this socio-economic transformation may mean that they will have to move away. On the one hand, these changes are seen to "raise" the socio-economic status of those neighbourhoods; on the other hand, some current residents

consider them to be a threat. This kind of social class transformation has not taken place in the more deprived neighbourhoods, thereby increasing the likelihood that even more inequalities may result.

Certain neighbourhoods and residential complexes appear to have higher levels of poverty, which lends credibility to the composition effect. Poverty also contributes to perceptions that certain areas are unsafe and that buildings are of sub-standard quality. The significance of the level of control over one's environment, measured in the survey and commented on in the interviews, must be underlined here. This factor may also help understand the health impacts of place. If daily life experiences in a given place lead residents to feel powerless to improve their surroundings, those experiences are also likely to have consequences for mental and physical health.

Why, then, do people with similar characteristics find themselves living together in certain neighbourhoods, and why do underprivileged people tend to congregate in Saint-Louis? Is it because rents are lower? If so, is that simply a function of the type of housing available? At the same time, how might we explain the influx of young professionals into Saint-Louis? Does *context* (infrastructures, services, etc.) attract certain groups, or do those groups stimulate particular forms of development? *Context* and *composition* effects may also affect health status in different ways.

Context

The context effect, when applied to Saint-Louis, is a relevant explanation for the development of neighbourhood units; certain infrastructures and conditions come into play here. Informants and participants both have emphasized the importance of infrastructures when explaining positive or negative characteristics of neighbourhoods. More affluent neighbourhoods are not so by chance; they are better off because they have the requisite physical potential and infrastructure. Projects considered to constitute assets in some neighbourhoods are viewed as liabilities elsewhere. Infrastructures influence perspectives: Is the neighbourhood worth investing in? Is its future promising? This dimension is particularly significant when considering policies designed to bring about positive change.

Including context in the analysis adds some complexity to the interpretation of *composition* effects. Many authors have mentioned that the physical characteristics of local environments result from social and political decisions: Where should services (e.g., hospitals, schools) be located? Where should roads and incinerators be built? Policies regarding housing are also important: social housing, the accessibility of home ownership and improvements to apartment buildings influence not only housing but also the physical and mental health status of residents. It is noteworthy that when it comes to social and health infrastructures, Saint-Louis is far from being disadvantaged. Although dental care is less available, physical access to health services, drugstores, and physicians is better than average in the region.

Saint-Louis's residents are mostly tenants; some receive housing subsidies. The type of housing available affects demand and thereby influences the composition of the population. The relatively high proportion of tenants may explain the greater mobility of Saint-Louis residents compared with those in other localities. Moreover, individual interviews revealed that most residential projects were ones involving home ownership, usually considered far less feasible for Saint-Louis residents. According to the accounts we received, infrastructure and housing improvements are not taking place everywhere. Areas that are more deprived not only risk remaining that way but as well their situations could even worsen, especially if efforts to maintain accessible housing are directed at only a few neighbourhoods in the future.

Both statistical analyses and oral accounts reflect the social and economic difficulties in Saint-Louis. Although there have been a number of positive developments (in particular, the influx of several cultural enterprises and higher-income residents), these socio-economic improvements seem to have had little impact on the well-being of the population as a whole. Because we cannot explain the presence of so many unemployed residents solely by the lack of jobs in Saint-Louis itself, we may hypothesize that their presence is related to the availability of affordable housing. Does the presence of so many unemployed make Saint-Louis less appealing as a community? People general-

ly do not move to Saint-Louis for employment. Saint-Louis stands out from our data as a place that attracts residents because it is accessible, rents are affordable, it is possible to live there with few means and without a car, and the heterogeneity of the population reduces discrimination towards the economically disadvantaged. Political decisions to support employment (and creation of good jobs) and affordable, decent housing for unemployed and low-wage workers, which are taken at another level, could certainly help to develop a pleasant environment.

Collective explanations

Does the interaction between context and composition give rise to situations that compromise the health of the population or, conversely, support its improvement? A collective explanation may help here. Indeed, by considering the social and cultural dimensions as proposed by Macintyre et al. an understanding can be reached of how situations develop from "collective functioning" when considered in relation to material infrastructure and population characteristics.³¹ Our data on Saint-Louis provide plenty of information to support this type of analysis. These data, quantitative and qualitative, indicate that clustering of populations (poor together, better off together) may influence the composition and context of a locality when combined with community dynamics. In poorer areas, for instance, community groups are formed to alleviate the impact of poverty, thus tending to attract populations with financial problems. When it comes to economic development, however, community groups' efforts seem less effective, in part, local leaders say, because residents adopt passive attitudes due to the difficulties and loss of hope they experience. As a result of such a circular causality, the social and physical environment may deteriorate.

How residents represent their locality should be taken into account here. This influences the way people feel about where they live and is significant because it mirrors who they are as residents of a particular environment. Some characteristics of prevailing representations emerge from our data analyses. The social diversity of Saint-Louis has fostered a mixed and heterogeneous environment where people of different backgrounds and origins can live togeth-

er and where virtually everyone fits in; but there are also negative aspects. Residents are considered underprivileged and dependent on social programs, an image that can discourage individual and collective initiatives. Negative representations do not favour a sense of belonging; neither do high proportions of renters who move frequently. If the sense of belonging has a positive impact on health, then positive or negative representations of one's local environment, which influence this sense, may mediate this impact. Despite these negative aspects, we must not overlook evidence of solidarity and mutual assistance.

Finally, the three modes of explanation discussed, although suggesting certain interpretations, are insufficient to understand how inequities in health develop. However, in data gathered on work and family environments and in individual interviews, we have found arguments for a more comprehensive and dynamic explanation.

Other environments

For example, in Saint-Louis, residents' jobs are more difficult and less lucrative than in the other localities that have better health status indicators. Residents' professional lives (or lack of them) are often related to local environment (low wages, services for the unemployed), as demonstrated by comparisons with the other localities. We also know that family influences come into play independently of professional considerations (such as when one spouse follows the other or because of wages). In Saint-Louis, more people live alone or are parents who have separated from their spouses. These characteristics reflect their family histories and are not independent of their "choice" to live where they live. Moreover, our data on resources for children and on schools show that many children in Saint-Louis do not have the same opportunities as children from the other localities, particularly access to services like day care, a factor that has been shown to promote child development.³⁵ Families (and particularly single-parent families) perceive more often than families living in better-off localities that their use of day care services calls into question their capabilities as parents. Data also reveal that Saint-Louis's schools deal with more problems because parents have problems (e.g., those related to finances and unemployment).

The challenge here is to identify which factors among all the ones interacting to draw people to deprived settings and hold them there, where health status is lower, are the decisive factors that should be addressed first. Our research results clearly demonstrate that the way local environments are represented is a key factor influencing their composition and context, as well as people's relationship to them. This last dimension is likely associated with perceived health status. More research remains to be done to determine its effect on other health indicators.

CONCLUSION

To help identify and implement appropriate policies and interventions, two main methodological conclusions drawn from our study are germane. The first has to do with the "appropriate spatial scale".³¹ Our attempt at defining neighbourhood units proved to be fruitful. We think it is essential to find ways of getting as close as possible to spatial reference units that local residents find meaningful.

Second, a life course approach, which makes use of information on the different settings in which people live and on the events that have contributed to their pathways is essential to understanding how inequities develop. In other words, to understand the effects of neighbourhood on health, we must also understand what neighbourhood means to residents and thereby gain insight into their "lived experience of place".³⁴ Not only does this approach bring us closer to people's daily lives but it also enables us to see the differences among the neighbourhoods that combine to make up larger areas.

Our study has a great deal to say about the importance of such approaches. A variety of interventions are needed, some of them at an essentially "local" level. The analyses we have performed on a region of relative homogeneity (greater Québec City) also make a case for using a variety of approaches, incorporating social dynamics into the process and adopting a temporal perspective when analyzing population health.

Open-ended interviews with residents can achieve at least part of these aims. When people talk about their lives, their experiences, their choices and the events

that, from their perspective, have had decisive impacts, they give meaning to the places where they live or have lived. They also describe how their families and professional lives have influenced their choices (or forced them to make decisions). Saint-Louis, the locality we have presented here, comes alive in the oral accounts people give. Residents live there because they feel socially at ease (composition effect), because they are close to their jobs and to services, because of the urban setting and because rents are lower than elsewhere (context effect). At the same time, they suffer from negative representations of their living environment (collective effect). In contrast, respondents from rural areas in our study most often explained their place of residence by citing interpersonal and family ties, suggesting that social and cultural dimensions were priorities for them. Moreover, certain life events (e.g., losing a job, starting a family or breaking one up, losing a loved one, tending to children's needs as they grow up) may have prompted residents, or may prompt them in the future, to change their place of residence. Their personal accounts illustrate how the effect of place on health may be better understood by taking human agency into account. When information from different local figures is also considered, and particularly when both converge (which was the case here), social dynamics can be better understood. This may help define interventions to support positive social developments.

The participative strategy we used – having an advisory committee – has not only helped us in collecting and analyzing the data but also in transferring the results to those from different sectors involved in the political decisions, conception and implementation of programs. By itself, this strategy demonstrates a global approach and, it is hoped, more integrated action on the environment.

The research results presented here are partial. Answering Nancy Krieger's appeal, "The construct of embodiment . . . invites us to consider how our bodies, each and every day, accumulate and integrate experiences and exposures structured by diverse yet commingled aspects of social position and inequality",³⁶ remains a challenge, but we have identified some avenues. Krieger suggests a constructive approach to the

definition of social inequality in health, which is what the present study has used, but she also raises a policy issue: How might we reconcile the specificity of individual experience and population-based approaches? Our data uncover a few meeting points, such as the level of personal control experienced by individuals, which may be reflected in their collective investment in their community. On the other hand, the data also demonstrate the complexities that characterize the social construction of inequalities that we want to explain. We now have the conviction that to get as close as possible to such explanations, research must use participative approaches enabling local actors to have a say in the identification of the particular dynamics coming into play. Finally, and most important, field actors must be able to translate research results into efficient policies. If they have been invited to join the process, this will be easier.

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RÉSUMÉ

Contexte : Pour améliorer la compréhension de l'impact combiné des déterminants sociaux de la santé sur les inégalités de santé, une recherche a été menée dans trois territoires de la région de Québec. Cet article a pour but de montrer comment les bilans de santé et les déterminants de santé peuvent être explorés à partir de diverses sources et perspectives analytiques et comment celles-ci combinées produisent un portrait plus complet à l'échelle locale.

Méthode : Une approche multidisciplinaire, des méthodes quantitatives et qualitatives ont été utilisées : banques de données et système d'information géographique, enquête par téléphone et par entrevues avec des informateurs clés, enquêtes téléphoniques auprès d'échantillons représentatifs des populations, entrevues avec des citoyennes et citoyens. Les territoires ont été subdivisés en unités de voisinage pour raffiner l'analyse de l'environnement local.

Résultats : Les résultats obtenus à Saint-Louis, qui présente les scores les plus négatifs des trois territoires, illustrent le potentiel de la stratégie de recherche. Les indicateurs socioéconomiques et de santé indiquent que Saint-Louis s'en tire moins bien que les deux autres territoires et ceux-ci varient considérablement selon les unités de voisinage. Les résultats obtenus à l'aide des différents types de collecte confirment ce portrait général soulevant plusieurs hypothèses sur les facteurs qui interagissent.

Interprétation : Deux conclusions méthodologiques principales peuvent être tirées de l'étude, soit l'importance de définir une échelle spatiale appropriée pour l'étude des milieux de vie et le caractère essentiel du recours à une approche de parcours de vie pour comprendre comment les inégalités se développent.