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## Report

# Closer Than You Think: Linking Primary Care to Emergency Department Use in Quebec

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**CLOSER THAN YOU THINK:  
LINKING PRIMARY CARE TO EMERGENCY DEPARTMENT USE IN QUEBEC**

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## KEY MESSAGES

- Resource planning for emergency departments should take into account the differences between patients in urban and rural settings. Rural patients are younger and healthier than urban patients, less likely to require hospitalization, and tend to use the emergency department for primary care.
- Emergency departments in Quebec can be divided into three types based on their ties to community care-providers, the number of specialized staff and services available for treating seniors. The distribution of these types of emergency departments corresponds to the differences in rural and urban populations; there is a reasonably good match between the type of emergency departments and the needs of the seniors they serve. However, all three types could improve the balance between on-site specialized seniors care and the transition to care in the community.
- An important area of attention is the weak connection between metropolitan emergency departments and community services. Community-based chronic disease management programs would reduce the number of emergency visits in metropolitan areas, where the patients are older and chronic disease more prevalent.
- Lack of a family doctor is a strong predictor of emergency department visits, especially among seniors. However, this finding doesn't apply to rural settings, where the emergency department is also a habitual site for primary care, not just a place to go when one doesn't have a family doctor.
- In large cities and other urban areas, seniors who see a specialist instead of a family doctor — as often happens when a family physician is not available — visit the emergency department more frequently than those who have a family physician.
- The importance of family physicians in preventing emergency visits is confirmed in the strong association between annual physical exams and emergency department use. People who receive a physical each year are less likely to visit an emergency department than those who do not.
- The strong link between primary care and emergency department visits suggests that investments to improve primary care, especially for seniors and vulnerable populations, will help to limit the use of emergency departments.

## EXECUTIVE SUMMARY

We have all experienced the agonizing tedium and anxiety of waiting hours for care in an emergency room. Overcrowding and long waits are the bane of emergency departments across Canada, and Quebec is no exception. What causes this problem? Not enough staff? Are people getting sicker? Or is there nowhere else to go when we turn an ankle or need a niggling cough checked?

There is evidence to suggest that emergency department visits, especially for non-urgent care, are triggered by poor access to primary care. Certain aspects of primary care — not having a family physician; unmet health needs; poor continuity of care — have been shown to increase emergency department use. Even some patients who arrive at the emergency department acutely-ill, such as those with an underlying chronic illness, could avoid an emergency visit if they received better primary care. Reducing the inappropriate use of emergency departments would in part address the problem of overcrowding, reduce costs, and improve patient satisfaction.

There is good reason to suspect a strong link between emergency department visits and primary care in Quebec. Compared to the rest of the country, the number of people in Quebec with a family doctor is low, and international comparative studies show Quebec to have among the highest rates of emergency department use. Of course, not all emergency visits are the same, let alone inappropriate or avoidable. The emergency department is a potentially appropriate site for primary care, especially in rural areas.

To effectively manage Quebec's emergency departments it is important to learn how they are used across the province. Who is visiting and why? This report, which synthesizes four separate studies, provides a portrait of emergency department use in Quebec so that decision makers in different geographic contexts can plan the use of resources. It also demonstrates that poor access to primary care is at least partially to blame for high rates of emergency visits. The findings of this report suggest that emergency departments are not the only place to tackle the overcrowding problem. At least in metropolitan and urban settings, investments to improve access to primary care should alleviate the pressure on emergency departments.

### **An emergency visit in the city is different from one in the country**

The differences between metropolitan, urban and rural emergency patients suggest that the resources and services available in each of these areas should also be different. The people using emergency departments in rural parts of Quebec are younger and healthier than those in metropolitan and urban areas. In the country, an emergency visit is less likely to lead to hospitalization, suggesting that the emergency department is often used for non-urgent primary care. This does not point to inappropriate use; it simply indicates an overlap between the community and the hospital as a site for primary care. Overall, rural residents actually make fewer doctor visits than other residents, but a higher proportion of those visits are in the emergency department.

### **A look at emergency departments and seniors**

When considering how to deal with emergency department overcrowding, particular attention should be paid to seniors — especially in larger cities, where the people using emergency departments are the oldest. Seniors require more resources at a visit, have longer stays in the emergency department, are more likely to require hospitalization, and tend to have worse outcomes.

Community-based geriatric evaluation and management programs have the potential to reduce seniors' emergency visits. Interventions with seniors in the emergency department linked to the appropriate community services could also reduce the rates of functional decline and other adverse outcomes. Therefore, it is important to know how prepared emergency departments are for the needs of seniors, including their linkages to services in the community, where careful management of seniors' care could keep them healthier and in less need of urgent care.

Emergency departments in Quebec can be divided into three types based on the number of specialized staff and services available for treating seniors and the linkages to community services. Prior research shows that emergency department geriatric services can be organized according to three dimensions: the staff available; the processes for detecting seniors at risk, evaluating seniors' needs and discharge planning; and the accessibility of community resources and the link between the emergency department and these resources. The three types found in Quebec are described below:

- Type 1: Large emergency departments with a high number of specialized staff and services for seniors. These emergency departments are mostly located in metropolitan areas, and they tend to have poor linkages with community physicians.
- Type 2: These departments have some staff and services dedicated to seniors and poor linkages to community services. They tend to be found in both metropolitan and urban areas.
- Type 3: These are the smallest emergency departments, with the lowest levels of specialized care for seniors. They tend to have the strongest ties to community services and physicians and are usually found in rural locations.

As we can see, the emergency department types differ not only by how they function with respect to seniors care but where they are located. In rural areas around 80% of emergency departments can be classified as Type 3, whereas in metropolitan areas about 80% of departments are Type 1 or Type 2. Given the portrait of emergency department users described above, this should come as no surprise. Patients in larger cities are older and sicker and therefore there should be a higher proportion of departments offering specialized seniors care.

Other data support this match between the types and their locations. Compared to the seniors who visit Type 2 and Type 3 departments, the seniors who visit Type 1 departments are sicker and more likely to suffer adverse outcomes - hospitalization; admission to a long-term care facility; death - following their visit. The seniors who go to Type 3 emergency departments visit more frequently, but they tend to be healthier, reinforcing the finding that rural emergency departments play a large role in primary care.

The most important implication of the distribution of these types is that in metropolitan areas, where strong ties to the community would have the most benefit, the connection to community services is the weakest. Community-based chronic disease management programs would reduce the number of emergency visits in metropolitan areas, where the patients are older and chronic disease more prevalent. To minimize overcrowding, metropolitan emergency departments should also find ways to discharge patients more quickly, by increasing access to hospital beds or creating observation units for senior patients.

## **Poor primary care puts pressure on emergency departments**

To what degree are people visiting emergency departments because they do not have access to primary care in the community? This is difficult to determine in rural regions, where the emergency department is a frequent site for primary care. Elsewhere it is a different story.

In metropolitan and urban areas, two indicators of poor primary care, lack of a regular family doctor and the feeling that health needs are not being met, make it more likely that a person will seek care in the emergency department. Among seniors, the lack of a regular family physician is an even stronger predictor of emergency visits, not surprising given their complex care needs. Seniors may receive regular care from specialists instead of family doctors — a consequence of lack of access to family physicians in some areas. It is therefore important to note that seniors receiving care from a specialist are more likely to make an emergency visit than those who receive care from a family doctor. Specialists may have difficulty in coordinating care because they lack expertise outside their traditional domain of specialization.

Reinforcing the link between primary care and emergency department use is the finding that people who receive annual physical examinations make fewer emergency visits. Regular, comprehensive care likely reduces patient worry and delivers more preventive services, keeping people healthy and happy to stay clear of a hospital.

These findings suggest that we could take some pressure off of the emergency departments if we could match more people to family doctors. This would not be easy to achieve, but there is reason to believe there is room for improvement: although a relatively low number of Quebec residents have family doctors, Quebec has one of the highest ratios of doctors to people in Canada. When they see patients who do not have a regular family doctor, emergency departments in Quebec should refer them upon discharge to the Registration Program for Clients in Search of a Family Doctor (GACO).

Continuity of care also appears to be an important factor in reducing emergency visits. Among very ill people — those who see a doctor more than once a month — strong continuity of care is associated with far fewer visits to an emergency department. This finding is less pronounced among healthier people. Interestingly, when we look at people who are moderately ill (with one chronic condition that could potentially require urgent care, and sometimes with another chronic condition), continuity of care from a specialist physician predicts fewer emergency visits. The same effect is not seen among those who are fairly healthy or those who are very sick. Healthy people are less likely to benefit from having a physician who can manage different medical problems. The consequences of poor coordination are usually not severe. As for very sick people, it might be that specialists have more difficulty in treating multiple medical problems due to a lack of expertise outside their area of specialization.

There is no single solution to emergency department overcrowding in Quebec. This research shows that specific improvements to primary care are a promising approach to the overcrowding problem. Increasing access to family doctors; increasing the number of people receiving comprehensive annual check-ups; encouraging greater continuity of care, especially for older and more vulnerable populations: these should be pieces of a comprehensive strategy to reduce emergency visits in the population. Finally, we should remember that the problem of emergency department crowding is not solely based on deficits in the primary care system; this problem may also arise from different levels of care and their coordination, including the hospital level.

## FULL REPORT

### INTRODUCTION

Emergency department crowding has long been a problem in Quebec,<sup>1</sup> as it has been in other parts of Canada and in many other countries. While this problem has many causes, the relationship between community-based primary care and emergency department use is one critical component. The main purpose of an emergency department has always been to provide urgent and emergency care, but increasingly it appears to function as a source for primary care for problems that could be treated in the community. Many factors contribute to this shift, including changes in the population -- which is getting older and carries a higher burden of chronic disease -- and the difficulties community-based primary care services have had adapting to these demographic changes.

The link between primary care and emergency department use especially warrants investigation in Quebec. Despite the relatively high ratio of family doctors to people in the province, Quebec residents are less likely than other Canadians to have a regular family doctor, and they use specialists more frequently.<sup>2,3</sup> They also have among the highest rates of emergency department visits in international comparative studies.<sup>1,4,5</sup> To assist decision makers with the development of policies that can redress the problem of overcrowding, this paper summarizes four population-based studies that look at the link between primary care and emergency department use in Quebec.

### BACKGROUND

Absence of a regular source of primary care in the community has been cited as one of the factors that contribute to increased rates of emergency department visits, particularly those for non-urgent care.<sup>4,5</sup> Other features of poor primary care (e.g., lack of a regular physician, poor continuity of care, lack of rapid access to care) have been associated with an increased likelihood of making an emergency visit.<sup>4,6-11</sup> In Quebec, restructuring of primary care, including efforts to encourage family doctors to work in multidisciplinary group practices, is challenged by a relative shortage of family doctors, particularly in metropolitan areas, where specialists are more likely to function as the primary physician.<sup>12</sup>

These issues are accentuated in the growing population of older people and those with chronic medical conditions. Seniors (defined here as those aged 65 or over) require more resources at an emergency visit, are more likely to be hospitalized, have longer emergency department stays, and have worse outcomes than younger adults.<sup>13,14</sup> Emergency department-based geriatric-care interventions (e.g., high-risk screening and assessment) have the potential to reduce rates of functional decline and other adverse outcomes when linked to appropriate community services (e.g., high-risk screen and assessment)<sup>15</sup>. These interventions require appropriately trained staff together with the protocols and tools to deliver them. The extent to which Quebec emergency departments offer's services appropriate to seniors has not been investigated before. Outside the emergency department, community-based geriatric evaluation and management programs also have the potential to reduce seniors' emergency visits.<sup>8</sup>

People with chronic medical conditions (most of whom are aged 65 and over) are major contributors to the use and cost of health services.<sup>16</sup> Better management of these conditions in the community may improve the process of care and clinical outcomes<sup>17-19</sup> and reduce complications that could lead to an emergency visit or hospitalization.<sup>20,21</sup> Rates of hospitalization for some chronic illnesses are used in many jurisdictions as an indicator of access to primary care.<sup>20</sup>



We sought to address these issues in four population-based studies. A population-based approach is important for decision-makers as it avoids the potential bias in studies limited to certain emergency departments or regions. In particular, we were aware of potentially important differences in the organization of primary care and emergency services in rural and urban areas that might affect emergency department use and its relationship to community-based primary care.<sup>3,6,11</sup>

## THE QUESTIONS

This population-based study of emergency department use among Quebec adults sought to provide answers to the following questions:

1. Do the rates of emergency visits differ between urban and rural regions?
2. Do the characteristics of emergency department users differ between urban and rural regions?
3. Do emergency services for older adults differ in urban and rural regions?
4. Is affiliation with a family doctor associated with emergency visits?
5. Is continuity of care with a family doctor associated with emergency visits?
6. Are affiliation and continuity of care with a specialist primary physician associated with emergency visits?
7. Are comprehensive annual exams associated with emergency visits?

## THE DATABASES

We used the following six databases:

- Two cycles of the Canadian Community Health Survey,<sup>22</sup> carried out in 2003 and 2005 (n=33,491).
- A survey of emergency department services for seniors carried out in 2006. A total of 68 emergency departments participated fully in the survey; key informants (chief physicians and head nurses) completed survey questionnaires on emergency department staff and services for seniors.<sup>23</sup>
- Three administrative databases, covering a three-year period starting April 1 2003. The administrative databases consisted of the enrollee, physician billing and hospital-discharge files.<sup>24</sup> We chose a sample of 579,669 adults registered to the provincial public insurance program during that period from the administrative enrollee file. Indicators were created on a period starting April 1 2003 and ending March 31st 2004.

We also created a cohort of Quebec residents to address questions four to seven. A cohort design is methodologically superior to the usual cross-sectional study design because it allows the causal sequence between primary-care characteristics and emergency visits to be examined.<sup>25</sup> Using provincial administrative databases we created a cohort of 311,701 adults aged 18 and over. We restricted the study to residents of metropolitan and other urban areas of Quebec because emergency visits in rural areas do not reflect differences in primary care.<sup>6,26</sup> Using this cohort, we investigated the relationship between primary care characteristics (measured during a 2-year baseline period) and emergency department visits (during a 1-year follow-up period).

These are some of the key measures extracted from these databases:

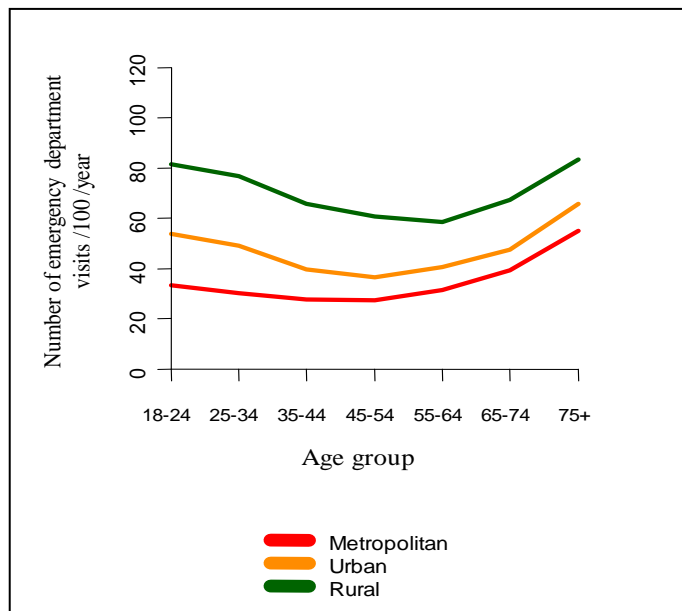
- Region of residence was determined from postal codes, which were converted to three types of regions: metropolitan, other urban, rural.<sup>27</sup>
- Disease burden: This measure assesses the number and severity of medical diagnoses made on an individual.
- Family doctor vs specialist: We distinguished doctor visits to a family doctor or general practitioner from those to medical specialists.
- Place of family doctor visit: We distinguished family doctor visits in the emergency department from those in other locations (offices and clinics).<sup>25</sup>
- Family doctor affiliation: Whether an individual had an affiliation with a family doctor.
- Specialist primary physician: Among individuals with no family doctor affiliation, the specialist primary physician was the medical specialist the patient visited most frequently.
- Continuity of care: Among individuals with a family doctor or with a specialist primary physician, the proportion of all doctor visits with that primary doctor: low (less than 40%); medium (40-79%); and high (80% or more).
- Complete annual exam: Among individuals with a family doctor, whether they had received any complete annual exam or check-up during 2 years.

**FINDINGS**

**1. Do rates of emergency department visits differ between urban and rural regions?**

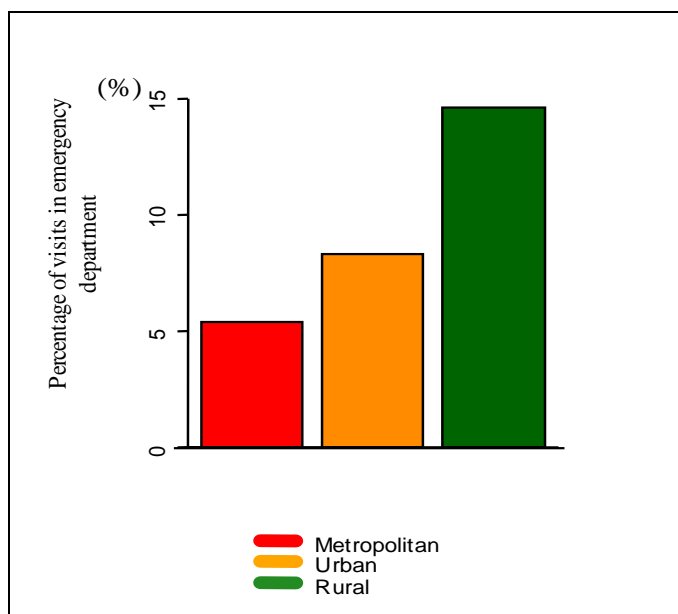
There was a strong gradient between region of residence and use of the emergency department. Rural regions had the highest annual number of emergency visits and metropolitan regions the lowest (Figure 1). Although emergency department visit rates differed by age, with higher rates among young adults and seniors, the urban-rural differences were seen in all age groups. Even among people of similar disease burden emergency department visit rates were highest in rural and lowest in metropolitan populations.

**Figure 1: Number of emergency-department visits by age groups and location of residence, per 100 individuals. (Quebec, April 2003 to March 2004)**



Another way to examine regional differences in emergency visits is to use the percentage of total family doctor visits that occur in the emergency department. Rural residents were almost three times more likely than metropolitan residents to see a family doctor in the emergency department rather than at another location, such as a clinic or doctor's office (14.4% versus 5.3%; see Figure 2).

**Figure 2: Percentage of family doctor visits that took place in an emergency department. (Quebec, April 2003 to March 2004)**



## 2. Do the characteristics of emergency department users differ between urban and rural regions?

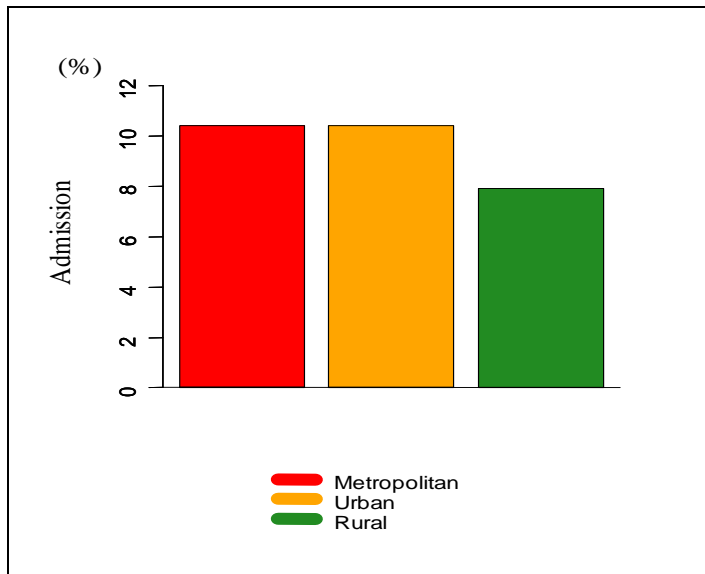
The age and burden of illness of emergency department users varied significantly by area of residence. A higher proportion of those in metropolitan areas were seniors (21.4% being 65 or over) compared to those in rural areas (19.3%). Metropolitan emergency department users also tended to have a higher burden of disease; 11.8% were in the highest disease burden category, a number that drops to 8.8% in rural areas.

These differences in age and disease burden translate into higher rates of hospitalization during an emergency department visit in metropolitan and urban areas compared to rural areas (10.4% versus 7.9%; see Figure 3).

## 3. Do emergency services for older adults differ between urban and rural regions?

To help us to answer this question we applied an emergency department classification framework that we developed in a previous study. This framework considers three aspects of how emergency geriatric services are organized: (1) the staffing available in the emergency department and in the hospital for treating seniors; (2) the presence of formalized care processes for detecting seniors at risk, evaluating the needs of seniors, and discharge planning; and (3) the accessibility of community resources and the link between the emergency department and these resources.<sup>28,29</sup>

**Figure 3: Percentage of emergency visits that resulted in hospital admission. (Quebec, April 2003 to March 2004)**

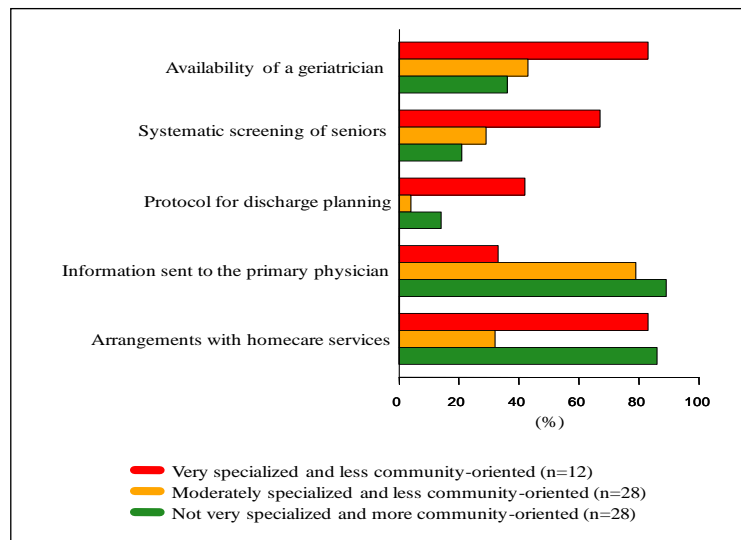


Our classification identifies three different types of emergency department:

- Type 1 - Very specialized and less community-oriented: these are the largest and most specialized emergency departments in terms of internal staff and geriatric care processes for seniors, but they have poor linkages to physicians in the community.
- Type 2 - Moderately specialized and less community-oriented: these departments are characterized by moderate levels of specialization but have poor linkages to community services.
- Type 3 - Not very specialized and more community-oriented: these are the smallest and least specialized departments in terms of internal staff and geriatric care processes, but they have the strongest linkages to both community physicians and community services.<sup>30</sup>

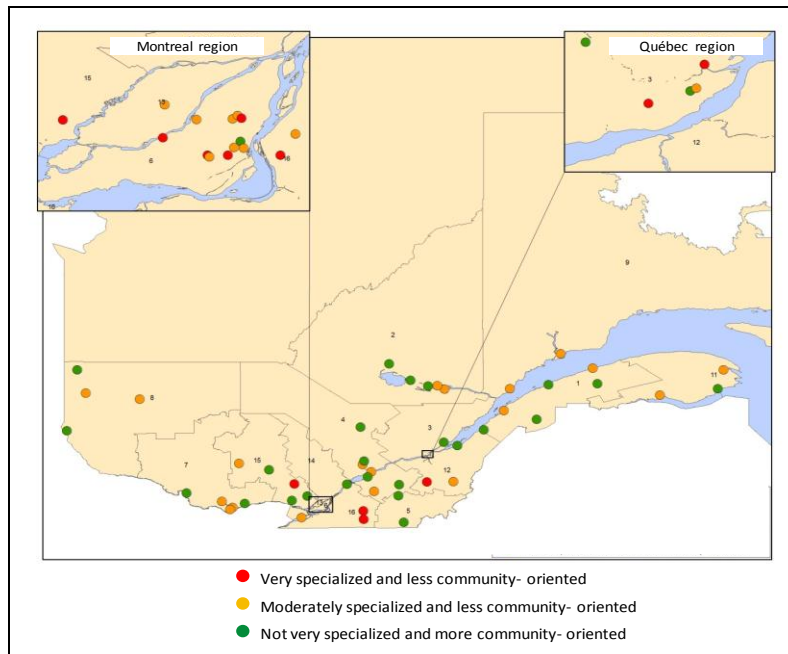
Some examples of specific services and care processes in these three emergency department types are shown in Figure 4.

**Figure 4: Percentage of emergency departments with selected services, by type of emergency department. (Quebec, March 2006 to September 2007, n=68 EDs)**

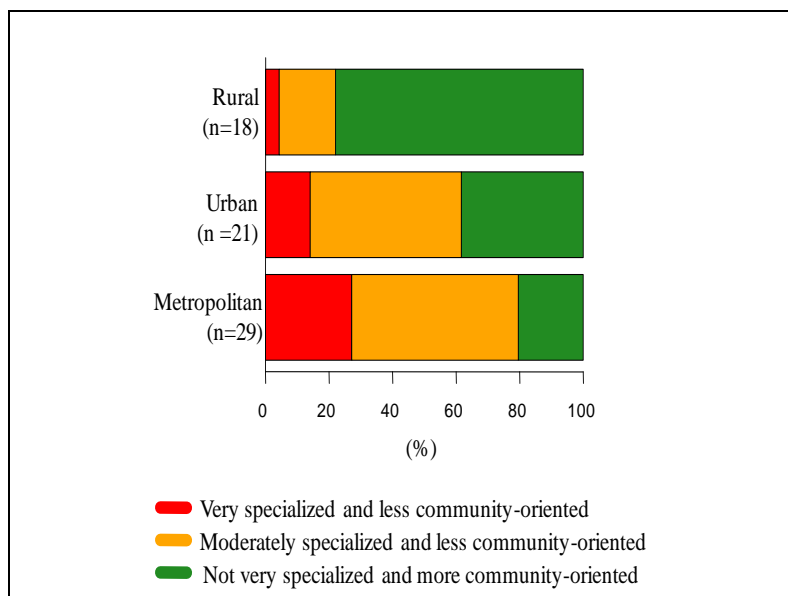


Figures 5 and 6 show the geographic distribution of these emergency department types in Quebec. Notably, around 80% of metropolitan emergency departments are of Types 1 and 2 (more specialized services for seniors but not well linked to the community) while around 80% of rural EDs are of Type 3, offering fewer specialized services but having better connections to the community.

**Figure 5: Distribution of emergency department types with respect to services for seniors.**



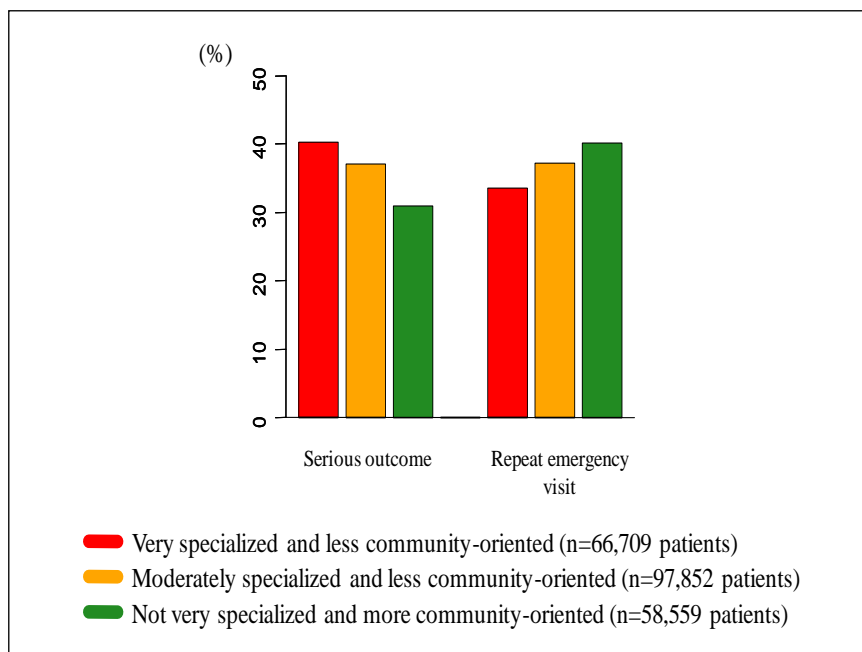
**Figure 6: Percentage of emergency department types by location (metropolitan; urban; rural.) (Quebec, March 2006 to December 2007, n=68 EDs)**



Consistent with our previous finding that individuals who visit an emergency department in metropolitan or other urban areas tend to be older and sicker than those in rural areas, we found that seniors who visited Type 1 emergency departments were more vulnerable and experienced worse outcomes (death, hospitalization, and long-term care admission) than those who visited Type 3 departments (see Figure 7).<sup>31</sup> These higher-risk seniors are likely to need more specialized geriatric services in the emergency department and after they are discharged to the community. This is why the poor linkages to community services in Type 1 emergency departments are a concern.

Seniors with less complex needs were more often treated at the more community-oriented, Type 3 emergency departments. The higher rates of return visits at these emergency departments is consistent with their greater role in providing primary care. Indeed, many of these emergency departments are located in rural areas, where family doctors are more likely to practice in multiple locations, including the emergency department.<sup>32</sup>

**Figure 7: Percentage of emergency department patients aged 65 or over who have a serious outcome (death, acute or long term care hospital admission) and repeat emergency visits over a period of six months following discharge from the emergency department, by emergency department type. (Quebec, ED claims from August 2004 to September 2005, 68 EDs, n=223,120 patients)**



#### 4. Is having a family doctor associated with emergency visits?

Using the Canadian Community Health Survey we found that patients who report having a regular family doctor are less likely to report having their last contact with a doctor in an emergency department than those without a regular family doctor (2.5% compared to 14.3%).<sup>26</sup>

We also examined this question in the urban cohort. Figure 8 shows the four categories of affiliation status: affiliated to a family doctor (67.1%); affiliated to a specialist (8.2%); no primary doctor (4.4%); and low users (fewer than three doctor visits in two years, 20.2%).

The affiliation status varied by age. Among those over 65, 84.5% were affiliated with a family doctor, whereas only 63.9% of those under 65 had a regular family doctor. Only 6.3% of people aged 65 or over had less than 3 visits with a doctor during a 2 year period, compared to 22.8% of those aged less than 65.

Affiliation with a family doctor predicted fewer emergency visits in all age groups, but the strength of this relationship was greater among older adults. Among those under 65 with a family doctor, annual emergency department visits/100 individuals were 37.8 versus 41.7 for those without a family doctor. Among those 65 or over with a family doctor, annual emergency department visits/100 were 57.0 versus 71.3 for those without a family doctor/GP. These differences were not explained by sociodemographic factors or burden of disease.<sup>25</sup>

### **5. Is continuity of care with a family doctor associated with emergency visits?**

Using the same urban cohort we investigated the relationship between continuity of care with a family doctor and emergency visits.<sup>25</sup> Continuity levels were based on the proportion of all doctor visits with the family doctor: low (less than 40%); medium (40-79%); and high (80% or more). Only 15.8% of people with a family doctor had high continuity and 34.7% had low continuity.

For individuals who made less than one doctor visit a month, on average, continuity levels with the family doctor had no effect on emergency visits. However, for patients who made more frequent doctor visits, greater continuity with the family doctor predicted lower emergency department use -- 76.5 versus 89.4 emergency visits per year when comparing individuals with high versus low continuity.

These results suggest that more frequent users of physician services may benefit from greater coordination of their care by a family doctor.<sup>33</sup>

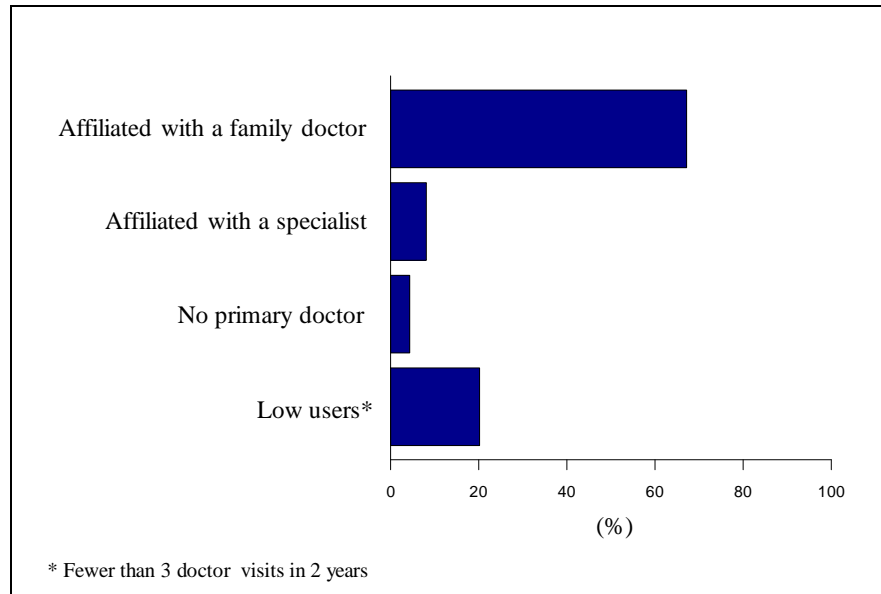
### **6. Are affiliation and continuity of care with a specialist primary physician associated with emergency visits?**

Under the same longitudinal cohort-study design as described above, we investigated care with a primary specialist and use of the emergency department. The percentage of the population with a specialist primary physician was 8.2% overall (Figure 8). The association of emergency visits with an affiliation with a specialist primary physician rather than a family doctor differed by age. Among those under 65, emergency department use was similar in the two groups. However, among those aged 65 and over having a specialist primary physician compared to a family doctor was associated with greater use of the emergency department (64.2 versus 57.0 emergency department visits per year per 100 individuals, respectively). Younger adults have less complex needs in general than seniors and may not benefit from the ability of the family doctor to treat different medical problems. Specialists may also be less likely than family doctors to use preventive care, such as the influenza vaccine<sup>34</sup>.

Among those with a specialist primary physician, 15.2% had low continuity of care (less than 40% of all doctor visits with the primary physician), while 20.7% had high continuity of care (80% or more of doctor visits with the primary physician). Greater continuity of care with a specialist predicted lower use of the emergency department overall: there were 39.1 emergency visits per year per 100 individuals with high continuity and 45.8 visits for individuals with low continuity. However, the beneficial effect of greater continuity of care was restricted to those with only one chronic illness and lower levels of

hospitalization. For healthier individuals the need for coordination is less important; when it comes to the sicker population, specialists may have difficulty in coordinating care because they lack expertise outside their traditional domain of specialization.

**Figure 8: Distribution of primary physician affiliation status in the adult urban population. (Quebec, April 2003 to March 2005)**



### 7. Are comprehensive annual exams associated with emergency visits?

Finally, we investigated the relationship between receiving an annual exam from a family doctor and use of the emergency department.<sup>25</sup> Nearly 41% of people with a regular family doctor had received at least one annual exam during the two year baseline period. Annual exams were associated with fewer emergency visits. Individuals who had received two annual exams over 2 years made 36.1 emergency visits per year per 100 individuals, while those who had received one annual exam made 39.6 visits per year; those who did not receive an annual exam made 44.1 visits per year per 100 individuals. These benefits were seen in all age groups and among those with and without chronic diseases.

The potential benefits of complete annual examinations may be due to the opportunity to deliver preventive services and to alleviate patient health concerns.<sup>35</sup>

## CONCLUSIONS

This paper summarizes the main findings of a comprehensive investigation into factors that are associated with use of emergency departments in Quebec. Population-wide data on emergency department use in Quebec have been limited to date due in part to the lack of a comprehensive emergency department database linked to other provincial administrative databases. To overcome this problem, we used measures of emergency department use and primary care derived both from provincial administrative databases and the Canadian Community Health Survey, complemented by data from a survey of Quebec emergency departments on the organization of geriatric services.



## Urban-rural differences

The context of an emergency department visit differs in urban and rural areas. Rural residents make more emergency visits than urban residents and are the most likely to see a family doctor in the emergency department rather than elsewhere in the community. A greater number of emergency visits in rural regions does not reflect deficits in primary care as it does in urban areas, but rather results from a different mode of organization of primary care practice, characterized by physicians being affiliated to multiple sites and greater integration of the services. This mode of organization favors emergency department use but ensures access to care for immediate needs; it also ensures continuity of care (e.g., the possibility of seeing the family doctor at an emergency visit).<sup>11,30,36</sup>

Among those who make an emergency visit, rural residents are, not surprisingly, younger and have a lower burden of disease than those in urban areas. Rural residents are less likely than urban residents to be hospitalized at an emergency visit, even after adjustment for age and disease burden. These results are consistent with the urban-rural differences in mode of organization, as explained above.

The organization of emergency department services for seniors also differs in rural and urban areas. Large emergency departments, which are the most specialized in terms of staff and geriatric care processes, are mostly located in metropolitan areas. However, these emergency departments tend to have poor linkages to physicians in the community, which could be a barrier to effective community follow-up and lead to further visits to the emergency department. Small emergency departments, which are the least specialized in terms of their staffing and geriatric care processes, are mostly located in rural and other non-metropolitan areas but are the best linked to community physicians and other community services.<sup>30</sup> All emergency department types could improve the balance between on-site specialized seniors care and the transition to care in the community. Regarding community services, there is evidence suggesting that few resources are devoted to home care in the province. A greater availability of home care services can reduce lengths of stay in the emergency department by allowing patients to be discharged earlier.

As the mix of services provided by all emergency department types had certain deficiencies, we also consulted with an international panel of experts on emergency care for seniors to develop an assessment tool that emergency departments might use to support their quality assessment efforts, the “Elder-Friendly ED Assessment Tool”.<sup>37</sup> Further development and evaluation of the proposed tool is underway.

## Primary care and use of the emergency department

This study extends previous research on the benefits of having a family doctor by showing the greater importance of such an affiliation among seniors compared with younger adults.<sup>6,26,38</sup> We also found a beneficial effect of greater continuity of care with a family doctor among more frequent users of physician services, who stand to benefit from greater coordination of their care.<sup>33</sup> When discharging vulnerable patients to the community, emergency department staff may need to ensure access to a family doctor; for example, they could make referrals to programs that provide priority access for vulnerable patients. Increasing the capacity of multidisciplinary group-practices and chronic-disease management programs and provision of incentives to these programs to enroll vulnerable patients may also reduce the need for emergency visits.

In metropolitan and other urban areas, the shortage of family doctors has led some individuals to have a specialist as their primary physician. However, among those aged 65 and over use of the emergency

department is greater among those with a specialist primary physician compared to those with a family doctor, perhaps indicating the greater difficulty specialists have in coordinating complex care needs.

Overall, this study suggests that improvements in access to family doctors, and fostering greater continuity of care and comprehensive annual check-ups with these family doctors, particularly for older and more vulnerable populations, should be one component of a comprehensive strategy to reduce emergency visits in the population. Other aspects of primary care that may reduce emergency visits have been demonstrated elsewhere. For example, inability to access the family doctor outside normal working hours may result in an emergency visit.<sup>39</sup> Finally, we should remember that the problem of emergency department crowding is not solely based on deficits in the primary care system; this problem may also arise from different levels of care and their coordination, including the hospital level.<sup>1</sup>

## REFERENCES

1. Roberge D, Pineault R, Larouche D, et al. The continuing saga of emergency room overcrowding: are we aiming at the right target? *Healthc Policy*. 2010;5: 27-39.
2. Dunlop S, Coyte PC, McIsaac W. Socio-economic status and the utilisation of physicians' services: results from the Canadian National Population Health Survey. *Soc Sci Med*. 2000;51: 123-133.
3. Sibley L, Weiner J. An evaluation of access to health care services along the rural-urban continuum in Canada. *BMC Health Serv Res*. 2011;11: 20.
4. McCusker J, Karp I, Cardin S, et al. Determinants of emergency department visits by older adults: a systematic review. *Acad Emerg Med*. 2003;10: 1362-1370.
5. Petersen LA, Burstin HR, O'Neil AC, et al. Nonurgent emergency department visits: the effect of having a regular doctor. *Med Care*. 1998;36: 1249-1255.
6. Ionescu-Ittu R, McCusker J, Ciampi A, et al. Continuity of primary care and emergency department utilization among elderly people. *CMAJ*. 2007;177: 1362-1368.
7. Levesque JF, Pineault R, Simard B, et al. L'expérience de soins de la population: Portrait des variations intra-régionales à Montréal et en Montérégie. Montréal, Québec: Direction de santé publique de Montréal, Institut national de santé publique du Québec, Centre de recherche de l'hôpital Charles-Lemoine, 2007.
8. McCusker J, Verdon J. Do geriatric interventions reduce emergency department visits? a systematic review. *J Gerontol A Biol Sci Med Sci*. 2006;61: 53-62.
9. Gill JM, Mainous AG, III, Nsereko M. The effect of continuity of care on emergency department use. *Arch Fam Med*. 2000;9: 333-338.
10. Lowe RA, Localio RA, Schwarz DF, et al. Association between primary care practice characteristics and emergency department use in a medicaid managed care organization. *Med Care*. 2005;43: 792-800.
11. Haggerty JL, Roberge D, Pineault R, et al. Features of primary healthcare clinics associated with patients' utilization of emergency rooms: urban-rural differences. *Healthc Policy*. 2007;3: 72-85.
12. Hutchison B, Levesque J-F, Strumpf E, et al. Primary health care in Canada: systems in motion. *Milbank Q*. 2011;89: 256-288.
13. Salvi F, Morichi V, Grilli A, et al. The elderly in the emergency department: a critical review of problems and solutions. *Intern Emerg Med*. 2007;2: 292-301.

14. Aminzadeh F, Dalziel WB. Older adults in the emergency department: a systematic review of patterns of use, adverse outcomes, and effectiveness of interventions. *Ann Emerg Med.* 2002;39: 238-247.
15. McCusker J, Verdon J, Tousignant P, et al. Rapid emergency department intervention for elders reduces risk of functional decline: results of a multi-center randomized trial. *J Am Geriatr Soc.* 2001;49: 1272-1281.
16. Broemeling A-M, Watson DE, Prebtani F. Population patterns of chronic health conditions, co-morbidity and healthcare use in Canada: implications for policy and practice. *Healthc Q.* 2008;11: 70-76.
17. Ofman JJ, Badamgarav E, Hennings JM, et al. Does disease management improve clinical and economic outcomes in patients with chronic diseases? A systematic review. *Am J Med.* 2004;117: 182-192.
18. Tsai AC, Morton SC, Mangione CM, et al. A meta-analysis of interventions to improve care for chronic illnesses. *Am J Manag Care.* 2005;11: 478-488.
19. Sanderson C, Dixon J. Conditions for which onset or hospital admission is potentially preventable by timely and effective ambulatory care. *J Health Serv Res Policy.* 2000;5: 222-230.
20. Weingarten SR, Henning JM, Badamgarav E, et al. Interventions used in disease management programmes for patients with chronic illness which ones work? Meta-analysis of published reports. *BMJ.* 2002;325: 925.
21. Bindman AB, Grumbach K, Osmond D, et al. Preventable hospitalizations and access to health care. *JAMA.* 1995;274: 305-311.
22. Statistics Canada. Canadian Community Health Survey - Annual Component (CCHS). Ottawa, Ontario, Québec, 2012.
23. McCusker J, Roberge D, Vadeboncoeur A, et al. Safety of discharge of seniors from the emergency department to the community. *Healthc Q.* 2009;12 24-32.
24. Régie de l'assurance maladie du Québec. Data and statistics. Available at: <http://www.ramq.gouv.qc.ca/en/data-statistics/Pages/data-statistics.aspx> Accessed August 13, 2012.
25. McCusker J, Tousignant P, Borges Da Silva R, et al. Factors predicting patient use of the emergency department: a retrospective cohort study. *CMAJ.* 2012;184: E307-316.
26. McCusker J, Roberge D, Lévesque J-F, et al. Emergency department visits and primary care among adults with chronic conditions. *Med Care.* 2010;48.
27. Gauthier J, Haggerty J, Lamarche P, et al. Entre adaptabilité et fragilité : les conditions d'accès aux services de santé des communautés rurales et éloignées. rapport de recherche. Montreal: Hôpital Charles LeMoine et l'Institut national de santé publique, 2009.
28. Samaras N, Chevalley T, Samaras D, et al. Older patients in the emergency department: a review. *Ann Emerg Med.* 2010;56: 261-269.
29. Hastings SN, Heflin MT. A systematic review of interventions to improve outcomes for elders discharged from the emergency department. *Acad Emerg Med.* 2005;12: 978-986.
30. Borgès Da Silva R, McCusker J, Roberge D, et al. Classification of emergency departments according to their services for community-dwelling seniors. *Acad Emerg Med.* 2012;19: 552-561.
31. McCusker J, Roberge D, Ciampi A, et al. Outcomes of community-dwelling seniors vary by type of emergency department. *Acad Emerg Med.* 2012;19: 304-312.
32. Borgès Da Silva R. La pratique médicale des omnipatients: influence des contextes organisationnel et géographique. Faculté de médecine, Volume Ph. D. Montréal: Université de Montréal, 2010.

33. Menec VH, Sirski M, Attawar D. Does continuity of care matter in a universally insured population? *Health Serv Res.* 2005;40: 389-400.
34. Rosenblatt RA. The generalist role of specialty physicians: is there a hidden system of primary care? *JAMA.* 1998;279: 1364-1370.
35. Boulware LE, Marinopoulos S, Phillips KA, et al. Systematic review: the value of the periodic health evaluation. *Ann Intern Med.* 2007;146: 289-300.
36. Roberge D, Larouche D, Pineault R, et al. Hospital emergency departments: substitutes for primary care? Results of a survey among the population of Montréal and Montérégie. Montreal: Direction de santé publique, Agence de la santé et des services sociaux de Montréal, 2007.
37. McCusker J, Verdon J, Vadeboncoeur A, et al. The elder-friendly emergency department assessment tool: development of a quality assessment tool for emergency department-based geriatric care. *J Am Geriatr Soc.* 2012;60: 1534-1539.
38. McIsaac WJ, Fuller-Thomson E, Talbot Y. Does having regular care by a family physician improve preventive care? *Can Fam Physician.* 2001;47: 70-76.
39. McCusker J, Ionescu-Ittu R, Ciampi A, et al. Hospital characteristics and emergency department care of older patients are associated with return visits. *Acad Emerg Med.* 2007;14: 426-433.