Factors affecting New Brunswickers' use of an Emergency Department for a non-life threatening health problem

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Factors Affecting New Brunswickers' Use of an Emergency Department for a Non-Life Threatening Health Problem

- Executive Summary -

Context

Controversy exists as to the roles that emergency departments should fulfill within the healthcare system. Some argue that emergency departments were designed to respond only to life threatening health problems. However others view emergency departments as a *safety net* for the healthcare system because they are available 24/7 (24 hours a day, 7 days a week) for the immediate treatment of any health problem. Recent media reports highlight the difficulties that emergency departments are experiencing in their attempt to respond to the needs of those seeking services. Such reports suggest that a decade of healthcare reforms has created holes in this safety net. Increasingly, people who visit an emergency department face over-crowded conditions, long wait times, and may feel the need to justify the appropriateness of their visit. Finding solutions for this problem is hampered by the lack of information regarding factors influencing when and how people respond to non-life threatening health problems including the decision to access professional healthcare services. A better understanding of the factors influencing the use of healthcare services, including the use of an emergency department, is needed to develop systems that provide timely access to cost-effective and quality services that respond to people's healthcare needs.

Description of Study

Information was collected from 1,973 New Brunswickers who presented with a non-life threatening health problem* to 1 of 5 five emergency departments in two health regions between December 2003 and December 2004. Interviews took place while participants waited for treatment in the emergency department. A follow-up interview was also conducted either by telephone (for those discharged) or face-to-face (for those admitted to hospital).

Implications

Healthcare professionals working in New Brunswick emergency departments respond to a wide variety of health problems. These problems are experienced by people with differing health needs, values and expectations for care.

> *Findings:* Participants reported a variety of non-life threatening health problems. The most common problems were: upper respiratory infections (24%), injuries (18%), and non-injury-related problems involving bones or muscles (12%). In over half (58%) the cases, pain was associated with the health problem.
>
> One-third of participants reported being worried or very worried by the health problem.
>
> Only a weak association was observed between participants' ratings of their health problem and the triage code assigned by the emergency nurse.

Participants' recall of the time spent in the emergency department was comparable to time recorded on emergency record.

> *Findings:* On average, participants spent 3.0 hours (± 2.1) in the emergency department.
>
> No significant difference between the time spent in the emergency department as recorded on the emergency record and participants' perception of time spent.

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* Healthcare professionals frequently refer to non-life threatening health problems as non-urgent or minor.

Approximately, 32% of participants reported the time spent in the emergency department was longer than they had expected. An additional 15% did not know what wait time to expect.

Approximately 9% (or 161) participants left the emergency department before treatment was received. Long wait time was the main reason for this action.

The current structure and organization of the healthcare system in New Brunswick may influence how people use services more than individual or community characteristics.

Findings: Three most important factors influencing the decision to go to an ED were:
a) concerns about health problems,
b) advice received from others, and
c) perceived lack of options.

Approximately one-third of participants indicated they would have waited 2 days for an appointment with a doctor or nurse practitioner. People more willing to wait were those who:
a) felt the problem was less serious and did not have an injury or disturbing symptom
b) were older, female, and presented with a problem for themselves rather than a child
c) lived in smaller communities and did not have a family doctor.

However willingness to wait for treatment was not associated with participants':
a) level of education, marital status, number of children in household,
b) income, years lived in community or distance traveled to emergency department.

Despite the number of individual and community-level characteristics examined in this study, the theoretical model tested was limited in its ability to predict participants' use of healthcare services. This finding suggests that use of services may be affected more by system-level factors.

Most New Brunswickers attempt to deal with health problems before seeking professional help. Opportunities exist to improve self-care practices when people access healthcare services.

Findings: Visit to the emergency department was generally not the first action taken by participants:
a) 74% attempted some form of self-treatment (for example, applied heat or cold)
b) 35% had sought advice from a family member or friend
c) Surprisingly, only 5% had called the provincial tele-health service.

New Brunswickers' health needs, values, and use of services are changing. One indication of this is the number of participants who reported problems accessing needed health information or treatment.

Findings: One-third reported experiencing problems accessing health information and/or immediate treatment for a minor health problem in the past year.

Problems were more likely to be reported by those who:
a) reported poorer quality of care during recent visit to emergency department
b) had higher education
c) did not have a family doctor

Interestingly, problems accessing healthcare were not explained by participants':
a) self-ratings of health, confidence in self-care abilities
b) age, gender, marital status, number of children in household
c) income, size of community, years lived in community, or distance traveled to ED

Over 40% of participants were worried or very worried that needed healthcare services may not be available for themselves or a family member when needed.

Emergency departments and family physicians ranked as the most important healthcare services, however emergency departments were viewed as more available.

A limitation of this study is that it included only English-speaking New Brunswickers in two health regions who accessed an emergency department for treatment of a non-life threatening health problem.

Recommendations

- To improve the health and wellness of New Brunswickers, options for providing timely access to primary healthcare services on a 24/7 basis (24 hours a day and 7 days a week) need to be critically evaluated in terms of the specific needs and resources of communities.

- New Brunswickers' health needs, values, and use of services are changing. To understand and respond to these changes, healthcare policy-makers, practitioners, and researchers need access to timely, accurate and comprehensive health information.

- In future studies, a more diverse sample should be used not only in terms of the demographic characteristics of participants but also the healthcare services accessed (for example, emergency department, after-hours clinic, family physician's office, or tele-health).

- Solutions to current challenges in the New Brunswick healthcare system will be achieved through ongoing research that evaluates and builds on current theories and practices.

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Context

Controversy exists as to the roles that emergency departments should fulfill within the healthcare system. Some argue that emergency departments were designed to respond only to potentially life threatening health problems[1]. However others view emergency departments as a *safety net* for the health care system because they are available 24/7 (24 hours a day, 7 days a week) for the immediate treatment of any health problem[2]. Recent media reports highlight the difficulties that emergency departments are experiencing in their attempt to respond to the needs of those seeking services[3]. Such reports suggest that a decade of healthcare reforms has created holes in this safety net. Increasingly, people who visit an emergency department face over-crowded conditions, long wait times, and may feel the need to justify the appropriateness of their visit. Finding solutions for this problem is hampered by the lack of information regarding factors influencing when and how people respond to health problems including the decision to access professional healthcare services. A better understanding of the factors influencing the use of informal and formal healthcare resources, including the use of an emergency department, is needed to develop systems that provide timely access to cost-effective, quality services that respond to healthcare needs.

Healthcare Resources

People access a variety of healthcare resources in an attempt to promote or restore their health or the health of their family (Table 1). These resources can be described as either informal or formal healthcare resources. Informal healthcare resources refer to self-care activities and consultation with lay persons who by virtue of their social position are believed to have expertise in health matters. Self-care activities may take various forms including the use of physical devices (band-aids, slings, crutches), application of heat/cold, deliberate physical or cognitive actions (rest, massage, prayer, positive self-talk), and/or the use of commercially available products (over-the-counter products), herbal remedies, and certain foods or fluids. Conversely, formal or professional healthcare resources refer to those services offered by healthcare professionals. Once it is decided that a health problem warrants professional intervention, people may access help

through telephone consultation or by direct face-to-face contact. Telephone consultations with a healthcare professional may be done through the family doctor's office, some emergency departments, or the recently established tele-health services. Typically, interactions with the formal healthcare system constitute only a small portion of the total illness/injury experience.

Table 1. ***Examples of Formal and Informal Healthcare Resources***

Types of Healthcare Resources	
Informal	**Formal (Professional)**
Self-care activities - Over-the-counter or herbal products - Home remedies - Changes in diet	Professional consultation - Call tele-health - Seek advice pharmacist - Phone doctor's office
Access information - Self-help books - Computer website	Direct contact - Family physician - Nurse practitioner
Lay consultation - Seek advice family members or friends	Access after-hours clinic Access emergency department

Healthcare Decision-making

Deciding the appropriate type of healthcare resource to access for a health problem can be daunting as people wonder whether or not they are doing the right thing. However these decisions can have serious consequences both at an individual and system level if inappropriate actions are taken. For example, the decision to delay accessing formal healthcare services for the experience of chest pain secondary to myocardial infarction can seriously jeopardize health outcomes while activating the emergency medical system due to chest pain that is muscular in origin represents an unnecessary expense to the healthcare system. Similarly, the experience of abdominal pain may occur with a problem that will resolve spontaneously or it may signal the occurrence of conditions, such as appendicitis, that require immediate medical intervention to prevent complications. The ability to assess health problems and differentiate those warranting immediate intervention from those that do not is a skill learned by healthcare professionals. However it is also an activity performed by individuals whenever a health

problem is experienced. Despite this, little is known about the factors influencing the decision to access various informal and formal healthcare resources. In addition, few studies have examined the relationship between the use of self-care activities and professional healthcare services, despite the increasing recognition that some self-care activities may have a significant effect on individuals' responses to formal treatments.

Gap in Knowledge: Few studies have examined the relationship between the use of self-care activities and professional health care services, despite the increasing recognition that some self-care activities may have a significant effect on individuals' responses to formal therapies.

Purpose

The purpose of this study was to investigate how people respond to non-life threatening health problems* and the factors affecting the decision to seek treatment at an emergency department. The focus of this study was on people who presented to an emergency department with a non-life threatening health problems because it has been estimated that over half of emergency department visits are for less urgent conditions[4].

Study Purpose: The purpose of this study was to investigate factors affecting how and when people access an emergency department for a non-life threatening health problem.

Method

In this study, participants were recruited from five emergency departments located in two health regions (Appendix A). Two of the emergency departments were located in urban centres and the remaining three were located in smaller communities. All but one of the departments provided 24 hour services. Participant recruitment occurred by convenience during times when a research assistant was present in the emergency department. Structured interviews were conducted at two time periods. First, participants answered questions about their health problem while they waited for treatment in the

* Healthcare professionals frequently refer to non-life threatening health problems as non-urgent or minor.

emergency department. Follow-up interviews were also conducted. Telephone interviews were conducted with participants who had been discharged home while admitted patients were interviewed directly by a research assistant (i.e., face-to-face interview). In addition, information pertaining to the initial triage code, times of arrival and discharge from the department, and final disposition were obtained from the emergency patient record.

Between December 2003 and December 2004, data were collected from 1,973 New Brunswickers' who accessed an emergency department due to a non-life threatening health problem experienced by themselves or a dependent child or adult. The typical participant was a middle aged (Mean 42 years; Range 16 to 93) female (62%) who had resided in the same community for more than 10 years (57%) (Table 2). Slightly more than half of participants (53%) reported no post-secondary education. Significant differences by data collection site were observed for participants' age, level of education, and income (Appendix B). Participants who accessed the two rural emergency departments tended to be older and have lower levels of education and income. Analysis of the data focused on answering five research questions. A more detailed description of the procedure used for the collection and analysis of data is presented in Appendix C.

Research Questions

1. What are the types, severity, and timing of unexpected non-life threatening health problems that prompt individuals to access emergency health care services?

2. What informal and professional health care resources do people use in response to an unexpected non-life threatening health problem?

3. What factors influence the decision to access an emergency department for a non-life threatening health problem?

4. What are New Brunswickers' perceptions of:
   (a) the importance and availability of various health care services, and
   (b) problems accessing healthcare services?

5. What effect do factors specific to individuals and their communities have on New Brunswickers' perceptions of their healthcare system?

Table 2. ***Sample Characteristics (N = 1,973)***

Characteristic	Descriptive Statistics
Female	1,230 (62.3%)
Age in years	Mean = 41.7 (Range16 to 93)
Married / Common-in-Law	1,146 (58.1%)
Household Income (593 missing; 29.5%)	Median = 40,000 (25th & 75th percentiles = 22,000 to 60,000)
English; Main Language Spoken in Home	1,911 (96.9%)
Highest Level of Education	
- Less than high school	170 (8.6%)
- Some high school	294 (14.9%)
- Completed high school	586 (29.7%)
- Some post-secondary courses	303 (15.4%)
- Diploma / Certificate	381 (19.3%)
- University degree	237 (12.0%)
Number Less than 18 years in Household	
- None	1,050 (53.3%)
- One	388 (19.7%)
- Two or More	531 (27.0%)
Size of Community of Residence	
- City (more than 40,000)	533 (27.0%)
- Large town (10,000 to 40,000)	153 (7.8%)
- Medium town (1,000 to 9,999)	262 (13.3%)
- Small town (500 to 999)	100 (5.1%)
- Village (less than 500)	301 (15.3%)
- Rural area	623 (31.6%)
Years in Community of Residence	
- Less than one year	172 (8.7%)
- 1 to 2 years	186 (9.4%)
- 3 to 5 years	264 (13.4%)
- 6 to 10 years	235 (11.9%)
- More than 10 but less than 20 years	306 (15.5%)
- More than 20 years	809 (41.0%)
Self-rating of Health	
- Very good	682 (34.6%)
- Good	842 (42.7%)
- Fair	359 (18.2%)
- Poor	89 (4.5%)

Percentages may not total 100 due to rounding

Implications of Study Findings

Results of this study provide insight as to how New Brunswickers' respond to non-life threatening health problems and the factors that affect their decision to access an emergency department. Based on these findings, four recommendations for healthcare policy-makers, practitioners, and researchers are offered.

Recommendation No. 1

- To improve the health and wellness of New Brunswickers', options for providing *timely* access to primary healthcare services on a 24/7 basis (24 hours a day and 7 days a week) need to be critically evaluated in terms of the specific needs and resources of communities.

Response to Health Problems

Although participants accessed an emergency department for a variety of health problems, the main groupings were: upper respiratory infections (24%), injuries (16%), and non-injury-related musculoskeletal problems (13%) (Table 3). In addition, over half (58%) of participants reported that the health problem was associated with the experience of pain. Throughout this document, a deliberate decision was made to avoid describing participants' health problems as 'minor' or 'non-urgent'. The rationale for this decision is found within the findings. Only 11% of participants rated the severity ('how bad') of their health problem as less than 4 on a 10-point numerical rating scale (1 being 'not bad at all' and 10 'as bad as it could be') and only 14% reported being 'not at all worried' by it. In fact, 36% of participants reported being worried or very worried about the problem (Figure 1).

Results of this and previous studies[5] suggest only a very weak association exists between ratings of the need for care obtained from those experiencing a health problem and from healthcare professionals. This discrepancy is not surprising given the ability to assess and diagnose health problems is a skilled learned by healthcare professionals. Despite this, it is also a task performed by individuals each time a health problem is experienced. It is also interesting to note that 21 participants who presented with a non-life threatening health problem were subsequently admitted to hospital or transferred to

another healthcare facility. This finding highlights that non-life threatening health problems may still warrant professional healthcare services.

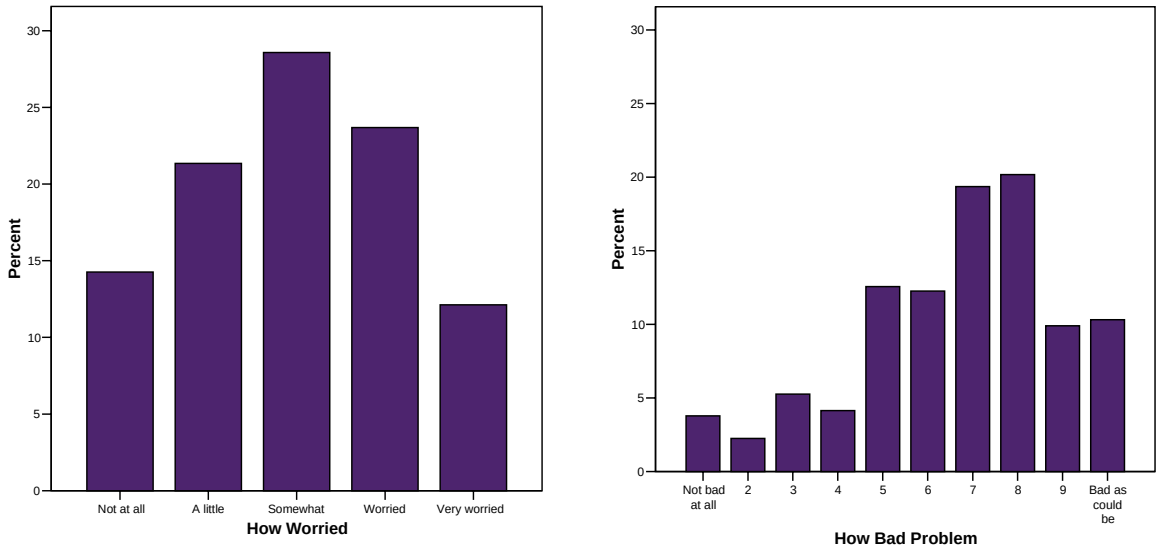
Table 3. ***Characteristics of Health Problem (N = 1,973)***

Characteristic	Descriptive Statistics
Problem for	
- Self	1,650 (83.6%)
- Dependent Child or Adult	321 (16.4%)
Primary Problem	
- Upper Respiratory Tract Infection (eyes, ears, nose, throat)	470 (23.8%)
- Injury (includes bites, burns, foreign bodies)	357 (18.1%)
- Musculoskeletal (not new injury)	270 (13.7%)
- Skin Rashes / Lesions	163 (8.3%)
- Gastrointestinal (including flu)	154 (7.8%)
- Genitourinary / Gynecology / Pregnancy concerns	160 (8.1%)
- Respiratory	103 (5.2%)
- Neurological (headaches, dizziness, weakness)	70 (3.5%)
- Recurrent health problem	62 (3.1%)
- Forms / Notes / Refills / Follow-ups / Complications	111 (5.6%)
- Other	53 (2.7%)
Noteworthy Presentation*	
- An injury	361 (18.3%)
- Pain associated with problem	1,151 (58.3%)
- Disturbing symptom (blood, dizziness, weakness)	602 (30.5%)
Time of Day First Noted	
- Daytime (0800 to 1659)	1,152 (58.4%)
- Evening (1700 to 2159)	296 (15.0%)
- Night (2200 to 0759)	285 (14.4%)
- Unsure	240 (12.1%)
Time lapsed onset to arrival ED	
- Less than 2 hour	218 (11.1%)
- More than 2 hours but less than day	507 (25.7%)
- More than day but less than week	764 (38.7%)
- More than week but less than month	318 (16.1%)
- More than month	166 (8.5%)
Final Disposition	
- Discharged to home	1,786 (90.7%)
- Admitted to hospital / Transferred another facility	21 (1.2%)
- Left without treatment	161 (8.2%)

* Percentages do not total 100 as participant could have more than one noteworthy presentation.

Figure 1.

***P*articipants' ratings of health problem in terms of how worried and how bad (N = 1,973).**

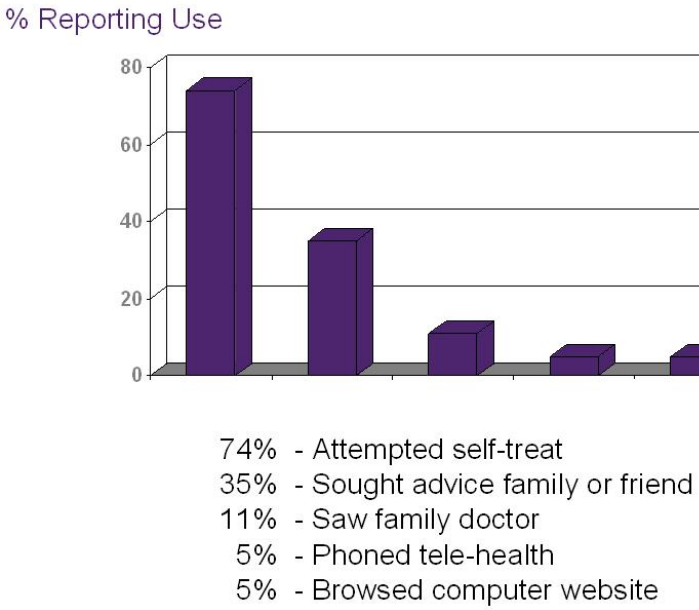


Self-Care Actions

Despite participants' concern about the health problem, findings suggest that accessing an emergency department was not the first action taken. Almost three-quarters of participants had attempted some form of self-treatment (i.e., use of an over-the-counter product or home remedy) and one-third had sought advice from family members or friends (Figure 2). Use of self-treatments was more likely to be reported by participants who were female and those who perceived the health problem as more serious (bad) but not associated with an injury or a disturbing symptom. Although the appropriateness of the reported self-treatments has not yet been evaluated, the proportion of participants who initiated such actions suggests that strategies aimed at augmenting New Brunswickers' self-care abilities may be well received.

Figure 2.

Percentage reporting use of various healthcare resources (N = 1,973).



Time to Treatment

New Brunswickers' place a high value on their health[6]. Consequently, it is not surprising that New Brunswickers' expect prompt treatment when they perceive their health is threatened. As New Brunswickers' become more informed about their health, they also become more aware of the potential risks and consequences associated with illnesses and injuries. This heightened awareness may hasten the decision to access professional healthcare services.

Study findings suggest that people have preconceived notions in terms of what constitutes an acceptable timeframe to wait for treatment. The finding that one-third of participants were willing to wait two days for an appointment with a physician or a nurse practitioner gives some indication of what constitutes an acceptable timeframe in the case of many non-life threatening health problems. However this timeframe is influenced by the type of health problem experienced. For example, participants experiencing injuries or disturbing symptoms were less willing to wait for treatment. In addition, the desire for prompter service was more likely to be expressed by participants who were young, male, presenting with a health problem for a dependent (child or adult), residents of larger

communities, and those with a family doctor. Surprisingly, willingness to wait for treatment was not associated with participants' level of education, marital status, number of children, income, years resided in a community, or the distance traveled to the emergency department.

Structure and Organization of Healthcare Services

Individuals who access the emergency department for what is deemed by healthcare professionals to be non-urgent or minor problems are occasionally referred to as inappropriate users or even abusers of the healthcare system. Another plausible explanation is that these individuals are actually victims of a system ill-equipped to meet their healthcare needs. The main factors influencing participants' decisions to access the emergency department were concerns about the health problem, advice received from others and perceived lack of options (Table 4).

Table 4. ***Rank Ordering of 16 Items Influencing Decision to Access Emergency Department based on Mean Scores (n = 1,623)***

Rank	Item	Mean (SD)
1	Severity Problem	3.1 (0.88)
2	Concern get Worse	2.8 (1.03)
3	Availability/Unavailability of Family Doctor	2.7 (1.30)
	No other options	2.7 (1.20)
5	Convenience of ED	2.6 (1.16)
6	Needed service only at ED	2.3 (1.22)
7	Advice Family/Friends	2.0 (1.12)
8	Demands Work/School	1.9 (1.11)
9	ED Hours of Operation	1.7 (1.04)
10	Advice Health Care Provider	1.6 (1.06)
11	Concern find serious problem	1.5 (0.86)
12	Dislike hospitals	1.4 (0.79)
13	Concern not taken seriously	1.3 (0.69)
	Concern admit	1.3 (0.65)
15	Child Care Issues	1.2 (0.59)
16	Weather conditions	1.1 (0.38)

Higher scores indicate item had more influence on decision to access emergency department.

It is reassuring to note that almost 80% of participants rated the quality of the care received in the emergency department as good or very good. However because measures of satisfaction or quality of care tend to be high, several indirect measures of the care

received were also collected. On average, participants reported that it took 3 hours for them to receive necessary treatment in the emergency departments (SD = 2.1). Participants' recollection of their wait time appeared to be quite accurate when compared to the mean computed from the times recorded on the chart record (Mean = 2.9 hours, SD = 2.2). Approximately 32% of participants indicated the time spent in the emergency department was longer than they had expected. An additional 15% indicated that they did not know what wait time to expect. One hundred and sixty-one participants left the emergency department without treatment. The main reason given for this action was the wait time.

Although the majority of participants (69%) reported a degree of confidence in their ability to manage the health problem when they left the emergency department, almost 30% did not. One-quarter of participants also reported seeing another healthcare professional following their visit to the emergency department. The main reasons for this contact were continued concerns about the health problem (44%) and being referred to (advised to see) another professional (33%).

Models for the Management of Non-Life Threatening Health Problems

Several models for the management of people with non-life threatening health problems have been suggested[7, 8]. These models can be divided into two groups: (1) those aimed at diverting people from the emergency department and (2) those aimed at improving the flow of patients within the department. Examples of programs aimed at diverting people from the emergency department include after-hours or free-standing clinics, triaging out of the department, and tele-health programs. Flow-improvement models include: see and treat and fast-track programs, introduction of nurse practitioners into the department, and the expanded role for emergency nurses recently introduced by the New Brunswick government [9]. Unfortunately, limited information is available upon which to compare the effect these programs have on health outcomes. Such information is required to critically evaluate the strengths and limitations not only of current models of healthcare delivery but also alternative approaches to care.

In a recent issue of the *Journal of Health Services Research and Policy*, a two-step process was outlined to determine what programs work for whom, in what circumstances,

and how[10]. The first step is to make explicit the assumptions about how a program is intended to work and the desired outcomes. The second step is to collect and synthesize relevant information in an attempt to ascertain what works for whom, how, and under what circumstances. For example, programs and services that effectively respond to the health needs of people in urban centres may not be appropriate or cost-effective in smaller communities. Conducting this type of evaluation on the tele-health program might be extremely beneficial. Surprisingly, only 1 in 20 participants had attempted to obtain health information from this service. These low numbers precluded further analysis to identify characteristics influencing the use/non-use of this service. This finding is noteworthy however, given that this program was specifically designed to meet the needs of this population. A limitation of much of the research conducted on tele-health programs is that the focus has been on the users of the service[11]. Research is needed to compare the characteristics of individuals who are repeat users of the services from those who have previously used the service but now opt not to use it, as well as those who have never used this service.

Importance and Availability of Healthcare Services

During the follow-up interview, participants were asked to rate the importance and availability of 10 common healthcare services (Table 5). Of the pre-selected healthcare services, the family physician and the emergency department ranked as most important based on participants' responses. Other healthcare services that were ranked as being very important were eye care, ambulance, and dental services. The healthcare services that had the lowest mean score for importance was tele-health. Given the importance attached to the family physician, it is noteworthy that this service had the lowest rating for availability. Interestingly, dental and eye care were rated as most available. However a number of participants mentioned that although dental and eye services are available, they were not *affordable.*

Table 5. ***Ranking of Importance and Availability of Healthcare Services (n = 1,557)***

Importance			Availability	
Service	**Mean (SD)**	**Rank**	**Service**	**Mean (SD)**
Emergency Department	1.3 (0.5)	1	Dental Care	1.5 (0.7)
Family Physician	1.3 (0.5)			
		2	Ambulance	1.6 (0.7)
			Eye Care	1.6 (0.7)
Eye Care	1.4 (0.6)	3		
Dental Care	1.6 (0.8)	4	Emergency Department	1.7 (0.7)
Ambulance	1.6 (0.8)			
		5	Tele-health	1.8 (0.8)
After Hour Services	1.9 (0.9)	6	Home Care	1.9 (0.9)
Nurse Practitioner	2.1 (0.9)	7	Help Emotional Crisis	2.1 (0.9)
Help Emotional Crisis	2.1 (1.0)		After Hour Services	2.1 (0.9)
Home Care	2.1 (1.1)			
		8		
		9	Family Physician	2.3 (1.0)
Tele-health	2.3 (1.0)	10	Nurse Practitioner	2.5 (1.1)

Services rated on 5-point Likert scale with '1' very important/very available and '5' not important/ not available.

Recommendation No. 2

- New Brunswickers' health needs, values, and use of services are changing. To understand and respond to these changes, healthcare policy-makers, practitioners, and researchers need access to timely, accurate and comprehensive health information.

Responding to Changing Health Needs

To understand and effectively respond to the changing health needs and health care utilization patterns of New Brunswickers, healthcare policy-makers, practitioners, and researchers need access to timely, accurate, and comprehensive data. During the follow-up interview, a series of questions were asked to obtain participants' perceptions of current healthcare services. When participants were asked whether they had noticed any change in the healthcare services available to them and their families during the past five years, slightly more than half (51%) reported no change. Ten percent reported an improvement in healthcare services while the remaining 39% reported a decline in the healthcare services available (Figure 3). For those reporting a decline in services, increased wait times and reduced access to a family doctor were the most frequently reported changes. Slightly more than 40% of participants reported being worried or very worried that needed healthcare services might not be available to them or their family when required (Figure 4).

Figure 3.

Perception of healthcare services in past five years (n = 1,557).

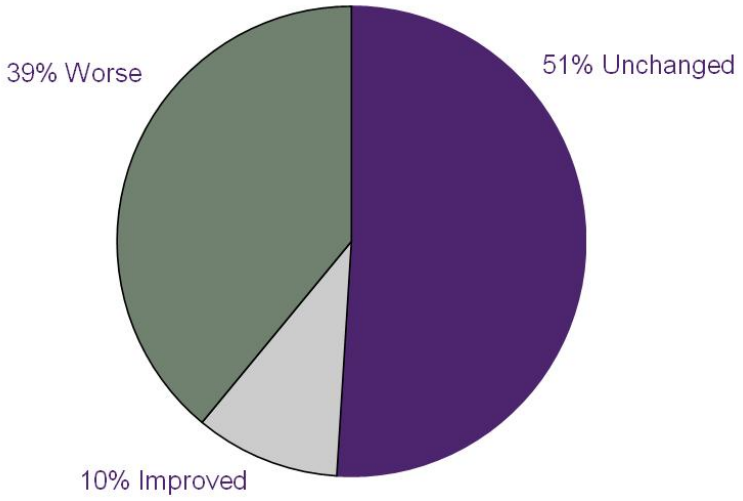
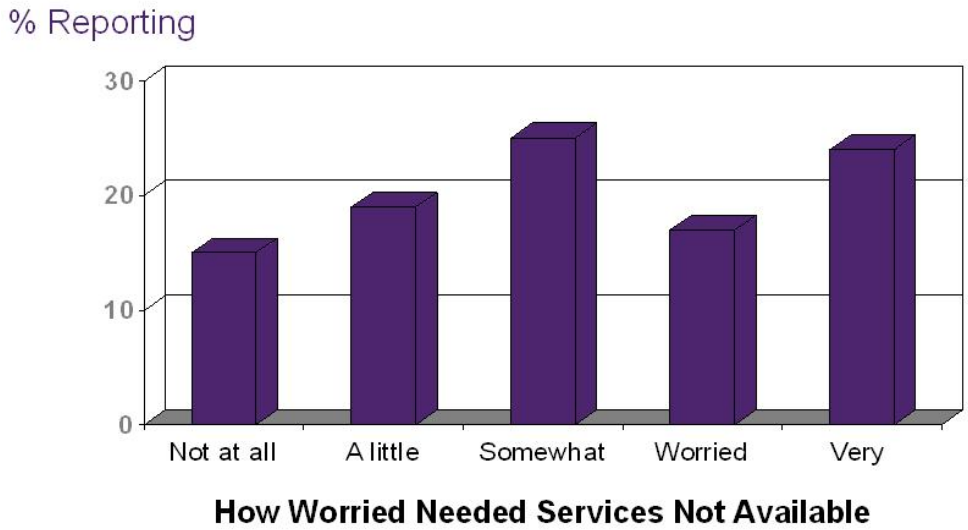


Figure 4.

Degree participants' worry necessary health care services may not be available when needed (n = 1,557).

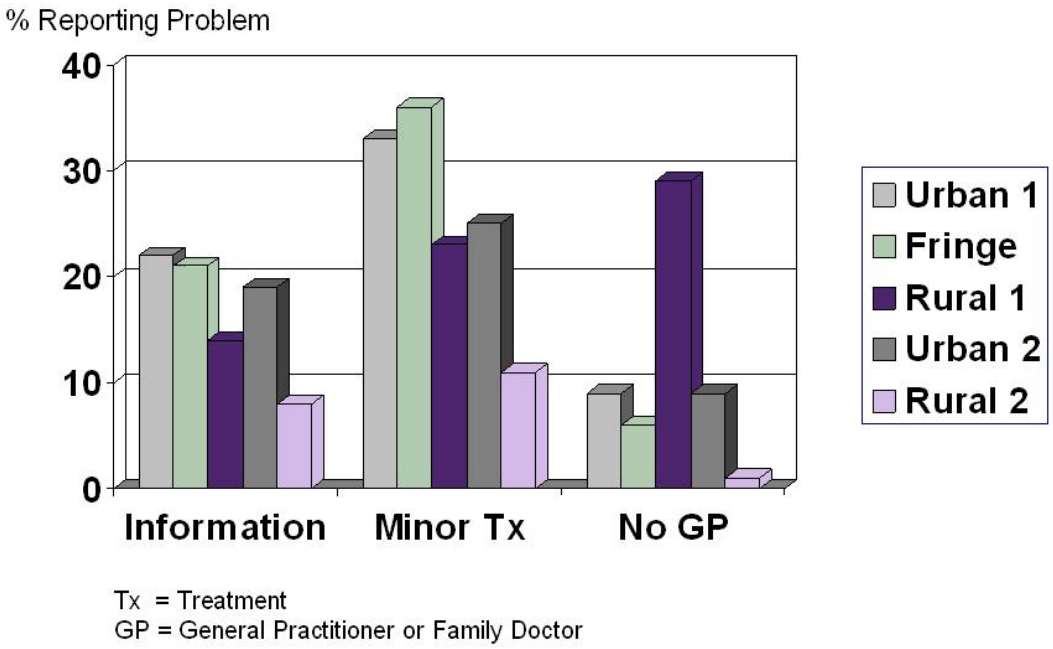


Approximately 2 in every 10 participants reported that they had experienced problems accessing health information during the past year and 1 in 4 reported problems accessing immediate treatment for a minor health problem. As evidenced by Figure 5, differences were evident in the percentage of participants reporting problems accessing

health information or immediate treatment for a minor health problem among the five data collection sites. The percentage of people reporting access problems is comparable to those reported by Statistics Canada for New Brunswickers based on data collected in their 2003 Canadian Community Health Survey Cycle 2.1 (i.e., 17% for health information and 24% for immediate care for minor health problem)[12].

Figure 5.

Percentage reporting problems accessing health information, treatment for minor health problem, or lack of a family physician (n = 1,557).



Tx = Treatment
GP = General Practitioner or Family Doctor

In this study, access problems were more likely to be reported by participants who rated the quality of the care received during their recent visit to the emergency department as poorer, had higher levels of education, and did not have a family physician. Perhaps even more noteworthy however, is the number of factors that did not influence reports of access problems. Problems accessing healthcare services were not explained by participants' self-rated health, confidence in abilities to self-treat, age, gender, marital status, number of children, income, size of community, years lived in community, or distance traveled to emergency department.

Continuity versus Accessibility of Care

Although healthcare professionals recognize the merits of continuity of care, findings from this and other studies[13] suggest that users of the system may value the ability to access health care services when and where they need them more than the presence of a constant provider of health care at least for non-life threatening health problems. It is important that healthcare services be organized and structured to reflect the changing needs, values, and healthcare practices of New Brunswickers. For example, if the norm is for people to access healthcare services at a variety of locations, then system must be created to facilitate healthcare professionals ability to access relevant health data (e.g., patient's health record) to avoid unnecessary duplication of services. This would be facilitated by a centrally coordinated initiative to enhance, standardize, and integrate provincial health data, which includes data on New Brunswickers' ambulatory care practices, and to increase the accessibility of these data while maintaining a high level of security (e.g., confidentiality). Because of New Brunswick's accomplishments in the area of information technology, we are ideally positioned to move this initiative forward.

One example of the potential value that could be achieved from a standardized system for the collection of health data is a recent publication from the Canadian Institute for Health information (CIHI, 2005) titled *Understanding Emergency Department Wait Times*[4]. In this document, CIHI attempts to unravel the multiplicity of factors affecting how long people wait for treatment in emergency departments. Unfortunately, the generalizability of findings in this document is limited because its data sources are primarily Ontario hospitals. This is unfortunate given that long wait times is a phenomenon currently reported by most provinces. Solutions to current challenges in the healthcare system will be achieved through ongoing research that tests and expands current theoretical and practical perspectives on health care delivery.

Recommendation No. 3

- Solutions to current challenges in the New Brunswick healthcare system will be achieved through ongoing research that evaluates and builds on current theories and practices.

Limitations of Current Models of Healthcare Utilization

For over three decades, Andersen's model of healthcare utilization has been extensively used to describe and explain people's use of healthcare services[14,15]. For example, a search of the Web of Science database revealed that Andersen and Aday's classic paper of 1974 has been cited over 800 times. Despite the popularity and intuitive appeal of Andersen's model, its predictive capabilities in this study were extremely limited. Several explanations may be put forward to explain the poor performance of the model. One possible explanation is that variables included in the analysis were not appropriate. This explanation seems unlikely as the selected variables reflect those used in previous studies. Another possible explanation is that participants' responses to the experience of non-life threatening health problems may be affected more by the organization and structure of the healthcare delivery system than by factors specific to individuals or their community. A final explanation is that data collection was limited to a convenience sample of English-speaking New Brunswickers' who opted to access an emergency department in one of five communities. In future studies, a more diverse sample pool should be used not only in terms of the demographic characteristics of participants but also the services accessed in response to non-life threatening health problems (for example, emergency department as well as after-hours clinic, family physician's office, or tele-health).

Recommendation No.4

- In future studies, a more diverse sample should be used not only in terms of the demographic characteristics of participants but also the healthcare services accessed (e.g., emergency department, after-hours clinic, family physician's office, or tele-health).

Summary

The New Brunswick government has made a significant investment in its Wellness Initiative[8]. To optimize the health and wellness of New Brunswickers', it is important to ensure *timely* access to primary healthcare services on a 24/7 basis (24 hours a day and 7 days a week) and to maximize opportunities to promote self-care practices through health education. When non-life threatening health problems are experienced, New Brunswickers' awareness of the value and fragility of their health may be heightened. This heightened awareness not only prompts people to seek help from informal and formal healthcare resources but may also increase their receptivity for health education and for efforts aimed at enhancing their self-care abilities. Results of this study provide information about how New Brunswickers' respond to non-life threatening health problems and the factors that affect their decision to access an emergency department. A key finding is that New Brunswickers' use of services may be influenced more by the current structure and organization of the healthcare system than by characteristics specific to individuals or their communities. Further research is needed to ensure available primary healthcare services are structured to not only ensure *timely* access but also to enhance New Brunswickers' self-care capabilities.

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Appendix A

Characteristics of Participating Communities

	Pop'n	Median Age (years)	% University Education of those aged (yrs) 20-34	35-44	45-65	Median Income	Main Sources of Employment
Health Region 2							
- Saint John	69,661	39	18%	15%	14%	$18,800	Irving, Aliant, Tourism
- Sussex	4,182	41	16%	18%	18%	$17,300	Agriculture
Health Region 3							
- Fredericton	47,560	37	36%	34%	35%	$22,100	Government, UNB, Health
- Oromocto	8,843	29	17%	13%	13%	$26,100	Canadian Armed Forces
- Bath	592	40	22%	27%	20%	$19,400	Agriculture, McCains
Provincial	729,498	39	18%	15%	15%	$18,300	

Statistics Canada Census Data 2001

Note: These percentages do not capture students attending university. The fulltime student enrolment at the University of New Brunswick Fredericton campus in 2005-2006 was 8,059 students and 2,587 at the Saint John campus.

Appendix B. *Sample Characteristics by Data Collection Site (N = 1,973)*

Characteristic	Urban 1 (n = 398)	Fringe (n = 361)	Rural 1 (n = 550)	Urban 2 (n = 333)	Rural 2 (n = 331)
Female	246 (61.8%)	249 (69.0%)	330(60.0%)	202 (60.7%)	203 (61.3%)
Age in years: *Mean (SD)*	34yrs (13.0)	38yrs (13.4)	48yrs (17.6)	39yrs (21.0)	48yrs (19.0)
Married / Common-Law	184 (46.2%)	222 (61.5%)	353 (64.3%)	184 (55.3%)	203 (61.5%)
Household Income: *Median (25^{th} - 75^{th} percentile)*	$40,000 (21,000 to 65,000)	$45,000 (25,300 to 70,000)	$35,000 (20,000 to 50,000)	$45,000 (26,300 to 70,000)	$30,000 (20,000 to 50,000)
Highest education less than high school diploma	59 (14.8%)	74 (20.5%)	168 (30.7%)	56 (16.8%)	107 (32.3%)
Lived in Community more than 10 years	196 (49.3%)	153 (42.4%)	319 (58.1%)	220 (66.1%)	227 (68.6%)
Type of Health Problem					
- Upper Respiratory Tract Infections	65 (16.3%)	133 (36.8%)	139 (25.3%)	59 (17.7%)	74 (22.4%)
- Injury (includes bites, foreign bodies, burns)	97 (24.4%)	62 (17.2%)	79 (14.4%)	90 (27.0%)	29 (8.8%)
- Musculoskeletal (not new injury + chest pain)	60 (15.1%)	47 (13.0%)	60 (10.9%)	34 (10.2%)	41 (12.4%)
- Respiratory	15 (3.8%)	18 (5.0%)	24 (4.4%)	15 (4.5%)	31 (9.4%)
- Gastrointestinal	48 (12.1%)	27 (7.5%)	30 (5.5%)	28 (8.4%)	21 (6.3%)
- Genitourinary or Gynecological (pregnancy)	32 (8.0%)	18 (5.0%)	32 (5.8%)	19 (5.7%)	30 (9.1%)
- Neurological (headaches, dizziness)	19 (4.8%)	5 (1.4%)	12 (2.2%)	20 (6.0%)	14 (4.2%)
- Skin rashes / lesions	30 (7.5%)	28 (7.8%)	43 (7.8%)	17 (5.1%)	45 (13.6%)
- Forms / Refills / Follow-ups / Recurrence	8 (2.0%)	6 (1.7%)	113 (20.6%)	19 (5.7%)	27 (8.1%)
- Other	9 (2.3%)	6 (1.7%)	12 (2.2%)	17 (5.1%)	9 (2.7%)
Worried or Very Worried by Problem	155 (38.9%)	111 (30.8%)	194 (36.0%)	141 (42.3%)	102 (30.8%)
Rating of How Bad: *Mean (SD)*	7.0 (2.0)	7.0 (1.9)	6.2 (2.8)	6.8 (2.3)	6.4 (2.2)
Distance Traveled to Access ED: *Mean (SD)*	11.4 (14.9)	15.1 (15.0)	16.8 (16.1)	20.1 (18.6)	18.1 (14.6)
Self-rated overall health as Fair or Poor	78 (19.6%)	90 (25.0%)	123 (22.4%)	63 (18.9%)	94 (28.4%)
Does not have a Family Doctor	36 (9.0%)	23 (6.4%)	158 (28.7%)	31 (9.3%)	3 (0.9%)

Appendix C

Procedure for Data Collection and Analysis

Study Protocol

The population-of-interest was adults who accessed an emergency department due to a non-life threatening health problem experienced either personally or by a dependent family member (child or adult). Criteria for participant selection included: (a) English-speaking, (b) 17 years of age or older, (c) ability to communicate verbally, (d) discharged home to a private residence with access to a telephone or admitted to the participating healthcare facility, (e) free of acute or chronic mental confusion or dementia, and (f) medically stable. Prior to commencement of this study, approval was obtained from the ethical review boards of the university as well as the two regional health authorities. A pilot study involving 48 participants was conducted to evaluate the adequacy of the questionnaire and study protocol.

Data collection for the main study took place from December 2003 to December 2004 to capture seasonal variations which may influence both the type of health problems experienced as well as the utilization of healthcare resources. Participant recruitment occurred by convenience during times when a research assistant was present in the emergency department. Although the periods of data collection were flexible, research assistants were instructed to vary their days and hours of work. To maximize the available sample pool, participant recruitment occurred between the hours of 0700 and 2300.

Structured interviews were conducted at two time periods. First, participants answered questions about their health problem while they waited for treatment in the emergency department. On average, these interviews lasted 14 minutes (SD = 5.2). A follow-up interview was conducted with participants (Median 6 days following disposition from emergency department). Telephone interviews were conducted with participants who had been discharged home while admitted patients were interviewed directly by a research assistant (i.e., face-to-face interview). On average, these interviews lasted 9 minutes (SD = 5.2). In addition, information pertaining to the initial triage code, times of arrival and discharge from the department, and final disposition were obtained from the emergency patient record.

Participants' responses were recorded using the palm pocket data entry program of Entryware ®. This program was used to expedite data collection and enhance the quality of the data. During the interviews, the research assistants did not offer health education or advice to participants. However, if a concern about the well-being of a specific participant was identified, the research assistant advised the participant to inform his/her medical physician or the emergency department staff.

Data Analysis

Data analysis was conducted using SPSS®. Preliminary descriptive statistics were conducted to ensure the quality of the data and to ensure assumptions underlying the planned statistical analyses were satisfied. Next, descriptive statistics were run to summarize: (1) sample characteristics, (2) type, frequency, and severity of presenting problems, (3) type and frequency of self-care activities used, (4) factors influencing decision to access an emergency department, and (5) perceptions of current healthcare services. Finally, four separate hierarchical logistic regression analyses were conducted. Two outcome measures addressed participants' use of informal healthcare resources (i.e., sought advice and use of over-the-counter products or home remedies), one captured the use of formal (professional) services

(i.e., willingness to wait), and the final one dealt with problems accessing healthcare services. In each of the analyses, the dichotomous dependent variable was coded so that 'no' was assigned a value of '0' and yes a '1'.

The same sequence was utilized for all regression analyses to test the explanatory capabilities of Andersen's theoretical framework. In the first block of the regression, variables pertaining to perceived need for healthcare were entered. Predisposing factors were entered in the second block of the analysis after adjusting for the effects of the need factors. Finally, the enabling factors were entered into the analysis after adjusting for the effects of the need and predisposing factors. For all analyses, alpha was preset at .025. A more stringent alpha, than the tradition .05, was used given the number of statistical analyses conducted.

Procedure Used for Hierarchical Logistic Regressions

In the first step, five variables were entered that measured aspects of the perceived need for healthcare. Participants' perceptions of the need for healthcare services were investigated using two variables. A 10-point numerical rating scale was used to measure participants' perceptions of the seriousness of the health problem. Participants were asked to indicate how bad their health problem was using a numerical scale with 1 coded 'not bad at all' and 10 as 'bad as it could be'. A measure of the emotional response to the health problem was obtained by asking participants to report how worried they were about the health problem on a 5-point Likert scale (1 not at all to 5 very worried). Previous research has also suggested that disturbing signs and symptoms, such as pain or the presence of blood or other body discharges, may hasten the use of health care services. Given this, participants' presenting complaints were categorized into three dichotomous variables: injury, pain, and other disturbing symptom. Coding of these variables was based on the initial presenting complaint recorded on the emergency patient record. The variable labeled disturbing symptom was operationally defined as an out-of-the-ordinary sign or symptom. It included both signs that were visible (blood, pus, phlegm, laceration, rash, swelling, fever) as well as unusual sensations (dizziness, weakness).

After adjusting for the effect of the perceived need, six variables that could affect participants' inclination or predisposition to access healthcare services were entered. These predisposing variables were: (1) participants' age in years, (2) health problem experienced by self as opposed to dependent child/adult, (3) gender is female, (4) has a partner (married or common-in-law), (5) number of people in household less than 18 years of age, and (6) level of education. A decision was made not to include ethnicity as a variable because 97% of participants reported English as the main language spoken with the home.

Finally, six variables were identified that could enable or impede participants' utilization of healthcare resources. Two variables were specific to the individual (i.e., income and years resided in community) while the remainder reflected elements within the communities. These variables were community size (higher scores representing smaller communities), distance traveled to access emergency department, activity space (higher scores representing fewer trips to community where emergency department located), and has a family doctor. When appropriate, whether or not advice had been sought from a family member or friend was included as an additional factor as it was hypothesized that this might affect use of other healthcare resources.

A slightly different set of variables was used to predict those participants who experienced access problems given the broader focus of this analysis. In the first step, three indicators of perceived need for healthcare were entered: (1) self-rating of general health status (higher scores indicate better health), (2) quality of care received in emergency department during recent visit (higher scores indicating poorer rating), and (3) degree of confidence in ability to manage problem when left emergency (higher scores, more confident). Next five predisposing factors were entered (i.e., age, gender, partner, level of education, and number of persons less than 18 years in household). Finally, the six enabling variables were entered into the model.