BYPASSING THE NEAREST HOSPITAL TO OBTAIN GENERAL HOSPITAL CARE OUTSIDE DISTRICT BOUNDARIES: HOW MUCH OCCURS IN NOVA SCOTIA, AND WHY IT MATTERS

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EXECUTIVE SUMMARY

This research estimates how many residents of Nova Scotia travelled further than necessary to obtain hospital-based care that was otherwise available in their home districts, and attempts to determine characteristics that distinguish those who by-pass local services from those who do not.

KEY FINDINGS:

- In 2000/01, approximately 9.3% of Nova Scotia bypassed district hospitals to obtain care otherwise available in their district of residence.
- There were wide variations in the rates of district hospital bypassing. In 2000/01, for instance, DHA 4 (34.4%) and DHA 1 (23.8%) recorded the highest rates and DHA 9 (1.8%) and DHA 8 (7.4%) recorded the lowest rates.
- The provincial and district-specific rates of district hospital bypassing were fairly constant over the period 1992/93 to 2000/01.
- The majority of out-of-district utilization was obtained in DHA 9, Capital Health District (e.g., approximately 75% in 2000/01).
- The net out-migration of patients obtaining these procedures is felt most negatively in smaller populated districts such as DHAs 1, 2, 4, 5 and 6.
- The strongest predictor of district hospital bypassing in 2000/01 was bypassing in the previous three year period (1997/98 to 1999/2000)
- Approximately half of district hospital bypassing in 2000/01 was generated by residents who had obtained the same procedure out-of-district during the previous three year period.

POLICY IMPLICATIONS:

- The persistence of relatively high rates of district hospital bypass in DHAs 1, 2, 4, 5 and 6 amounts to a loss in potential volume of patient activity in what are already less well-serviced areas. This is likely to undermine further efforts to attract and retain physicians and other health professionals in these areas of the province.
- More needs to be done to recruit and retain general practitioners and general surgeons outside of the provinces' larger urban centres in order to make these districts more attractive as options for obtaining secondary care.
- The Department of Health and the DHAs should continue to monitor district hospital bypassing and the overall levels of eligible secondary level procedures as measures of the performance of DHAs.

FUTURE IMPLICATIONS:

- High rates of district hospital bypassing could be an indication of low levels of confidence in local hospital services amongst patients and their general practitioners
- More research is needed into the impacts on service providers and hospital resources in districts sending, but also receiving, a large share of cross-district activity for general levels of hospital care.

1.0 PROJECT DESCRIPTION

This research sought to estimate how many residents of Nova Scotia travelled further than appears necessary to obtain hospital-based services that are otherwise available in their district of residence. A methodology for estimating this kind of activity was developed using hospital discharge abstract data for all residents of Nova Scotia. Annual estimates of the rate of district hospital bypassing were calculated over the period 1992/93 to 2000/01 using present district health authority boundaries as the spatial unit of analysis. Consumer profiles of bypassing for seven common procedures were constructed from the hospital discharge abstract and medical services data. Statistical analysis was performed for each of the procedures using 2000/01 data as the base year to compare the characteristics of district hospital bypassers to those obtaining the same procedure at a facility in their district of residence.

2.0 DATA AND METHODS

Data were obtained from the Nova Scotia Hospital Discharge Abstract held by the Population Health Research Unit (PHRU) at Dalhousie University. These data contain information on every hospital discharge in the province of Nova Scotia since 1989, including patient age, sex, reason(s) for hospitalization, length of stay, data of admission, discharge or transfer, and attending physician(s). Population estimates for Nova Scotia DHAs were obtained from the Clinical Services Steering Committee based on Statistics Canada Census data and Annual Demographic Statistics.

As of 2001, there were thirty-eight hospitals or community health centres in Nova Scotia. While no formal system of hospital classification has been established, the system used under the previous regional boards is helpful for describing the methods used in this study. In 2001, the province had three tertiary facilities, all located in Greater Halifax. There were nine regional facilities located in the largest urban centres across the province. The regional facilities are the same ones that the Nova Scotia Department of Health intended to “anchor” the new District Health Authorities. Finally there were 26 community hospitals in smaller centres across the province. These hospitals range in size and function from relatively large facilities, by Nova Scotia standards, that handle in excess of 3,000 weighted annual cases, to very small community health centres that offer only the most basic general practice, lab and emergency services.

Discharge abstract data were used to generate a list of procedures eligible for the analysis in each of the fiscal years 1992/93 to 2000/01. In the first stage of the analysis, all principal procedure codes appearing in the database that were common to tertiary, regional and community hospitals were deemed to be “secondary level” procedures. Procedures provided to out-of-province residents were excluded. Procedures provided on a very infrequent basis in a given district were not considered to be viable options for those seeking care and were excluded. In particular, procedures had to have been

delivered in at least one hospital in the district that year. Furthermore, procedures offered between 20 and 99 times a year in the province had to be provided 5 or more times in a given district to be included in the analysis, and procedures offered 100 or more times a year province-wide had to be provided 10 or more times within the district to be included in the analysis. Finally, diagnostic procedures, entry through emergency, and billing codes used in Nova Scotia to indicate circumstances such as cancelled surgeries, were also excluded from the analysis. We then queried the data subset of eligible secondary level procedures to flag hospital visits that occurred out of district (i.e., district hospital bypassing). To make meaningful comparisons between districts of different population sizes, we report the annual rate of district bypassing, or the number of bypasses divided by the number of eligible secondary level procedures in a year for each district.

3.0 FINDINGS

Rates of district hospital bypassing remained relatively constant at just over 9% of eligible separations over the entire study period (Table 1). Of note, the introduction of regional governance in 1998 and the replacement of the original four Regional Health Boards with nine District Health Authorities in 2001 made little difference in the overall rates. It can reasonably be argued that RHBs, and especially DHAs, were not in place long enough to expect improvement in the retention of hospital patients at the local level. Nevertheless, DHAs and the Department of Health should keep monitoring the rate of district hospital bypass to determine whether improvements have since occurred and/or continue to occur in both the number and volume of eligible secondary procedures, and the rates of district retention of these eligible separations.

Table 1.Estimates of district hospital bypassing using DHA boundaries, Nova Scotia, 1992/93 to 2000/01

Year	District Hospital Bypassing	Eligible Secondary Level Separations	Rate of Bypass
1992/93	8,696	92,774	9.4%
1993/94	8,821	91,194	9.7%
1994/95	8,552	91,524	9.3%
1995/96	8,152	85,305	9.6%
1996/97	7,960	85,021	9.4%
1997/98	8,204	88,675	9.3%
1998/99	8,692	91,071	9.5%
1999/00	8,532	93,127	9.2%
2000/01	8,204	88,675	9.3%

There were wide spatial variations in rates of district bypass (see Table 2), with smaller populated districts tending to record the highest rates. In general, the two larger populated DHAs recorded very low levels of district bypass, and the other seven DHAs recorded considerably higher rates. DHA 4 consistently recorded the highest level of local bypass. This is partly a function of the way in which the boundary between DHA 4 and its neighbour to the south, DHA 9, were drawn. Specifically, the boundary divides Hants County in two, and may have resulted in inflated estimations of bypass activity in both directions by including residents who travel across district boundaries, but who are nevertheless obtaining care at the nearest facility. Unfortunately, we were unable to estimate how much of the cross district exchange occurring between these two jurisdictions was for this reason.

Table 2. District estimates of district hospital bypassing, 1992/93 to 2000/01

	Year								
DHA	***92/93***	***93/94***	***94/95***	***95/96***	***96/97***	***97/98***	***98/99***	***99/00***	***00/01***
1	21.1%	19.9%	18.3%	22.6%	22.8%	23.8%	23.4%	21.2%	23.8%
2	16.7%	17.1%	14.4%	13.7%	12.3%	17.1%	18.8%	19.3%	17.1%
3	14.4%	12.8%	13.6%	13.7%	12.6%	11.9%	12.4%	12.8%	11.9%
4	31.2%	32.2%	31.0%	31.3%	32.7%	34.4%	34.3%	34.3%	34.4%
5	15.4%	19.5%	16.4%	17.5%	17.2%	15.6%	18.1%	17.4%	15.6%
6	13.0%	14.7%	14.3%	12.7%	14.3%	15.0%	19.1%	16.3%	15.0%
7	18.3%	19.3%	15.2%	16.8%	14.7%	16.5%	15.0%	14.5%	16.5%
8	6.7%	7.2%	8.0%	8.5%	8.2%	7.4%	7.4%	7.3%	7.4%
9	2.0%	2.1%	2.0%	1.8%	1.9%	1.8%	1.8%	1.7%	1.8%

District bypassing is not a one-way exchange, although, on average, approximately 75% of annual bypassing was obtained in DHA 9. For this reason, we calculated the net patient transfer in each district (see Table 3) to determine the combined effects of in- and out-migration. The net transfer of patients is given by the number of patient “in-migrants” (i.e., people from out of district coming to a given district to obtain an eligible secondary level procedure) minus patient “out-migrants” (i.e., the number of district residents obtaining eligible secondary level procedures in a different district). The data in Table 3 suggest that most of the DHAs experience a net out-migration of patients in this exchange, while DHA 9 is clearly the only jurisdiction in the province experiencing a strong net in-migration of patient seeking the secondary level procedures included in this analysis.

To put the impact of these data in perspective, it is useful to consider net patient transfer as a proportion of all eligible secondary level procedures provided in a district in a given year. For example, the net export of 1,446 patients from DHA 4 in 1999/2000 represents approximately 37% of the 3,984 eligible separations delivered in hospitals in the district that year. The net export of 1,039 patients from DHA 8, on the other hand, only accounted for approx. 6.5% of the 15,983 eligible separations provided by hospitals in that district in 1999/2000. Looking at the data in this manner reveals that, in addition to

DHA 4, there are a number of DHAs whose negative net transfer of patients for eligible secondary level procedures represent considerable losses in potential patient volumes (e.g., 21.6% in DHA 2, 19.3% in DHA 5, 14.3% in DHA 1 and 13.7% in DHA 6). DHA 3 and DHA 7 had values representing a balanced exchange. That is, while both these districts had relatively high rates of bypass, there were about as many patients traveling to the respective districts to obtain these services in 1999/2000 to neutralize the impacts of out-migration. Finally, DHA 9 had a positive transfer that represented about 10% of the procedures delivered in its hospitals in 1999/2000.

When analyzed in the context of the supply of eligible secondary procedures (i.e., hospital procedures that district hospitals have decided to offer), negative net transfers represent a loss of potential "demand" for these procedures in a given DHA. In smaller populated districts, this represents a "leakage" of patients that may exacerbate difficulties in recruiting and retaining physicians and other health professionals, and may also signal a lack of confidence in district hospital services from the perspectives of patients and the general practitioners.

Table 3. Net patient transfer by District Health Authority, 1992/93 to 1999/00

	Pre-RHB era					RHB era		
DHA	***1992/93***	***1993/94***	***1994/95***	***1995/96***	***1996/97***	***1997/98***	***1998/99***	***1999/00***
1	-829	-725	-614	-889	-913	-901	-847	-676
2	-844	-930	-858	-747	-634	-804	-941	-943
3	-137	39	-98	-5	48	114	194	108
4	-1,537	-1,541	-1,590	-1,347	-1,397	-1,507	-1,470	-1,446
5	-346	-465	-434	-406	-403	-345	-385	-401
6	-387	-464	-467	-332	-391	-443	-591	-485
7	-183	-201	-26	-126	54	-30	-7	-16
8	-981	-1,142	-1,232	-1,243	-1,230	-1,080	-1,118	-1,039
9	5,244	5,429	5,319	5,095	4,866	4,996	5,165	4,898

Our research also tried to determine whether the characteristics of patients who bypassed the local district hospital differed from those who obtained the same procedure locally. We examined factors like age, sex, number of visits to GPs in the same year and in previous year, hospitalization in the same and previous year, and whether the patient had bypassed district hospitals in the previous three years (1997/98 to 1999/00). We performed a series of logistic regression analyses comparing bypass visits and non-bypass visits for each of seven procedures that were consistently among the top contributors to bypass activity throughout the study period (see Table 4). Previous district hospital bypass in the years 1997/98 to 1999/00 was clearly the most important predictor of bypassing for each of the seven procedures examined using 2000/01 data.

Table 4. Seven procedures commonly contributing to district hospital bypass

Procedure Code	Description
57.32	Optical instrumental (cystoscopy) exam of the bladder or urethra
13.71	Insertion of plastic lens (pseudophakos) at time of cataract removal
45.16	Endoscopic examination of esophagus, stomach and/or duodenum, with biopsy
08.63	Reconstruction of eyelid with hair follicle graft
45.23	Flexible fibreoptic colonoscopy to diagnose tissue of large intestine
45.25	Closed (endoscopic) biopsy of the large intestine
20.01	Incision of tympanic membrane with insertion of tube for drainage

Further analysis of previous bypass behaviour revealed that approximately half of these patients were bypassing in order to obtain the same procedure in the earlier period as they bypassed to obtain in 2000/01 (see Table 5). We refer to this as "repeat bypassing." This effect was even stronger when the two largest populated districts (i.e., DHAs 8 and 9) were removed from the analysis.

Table 5. Analysis of previous district hospital bypass behaviour, 2000/01

	Procedure							
	13.71	*20.01*	*45.16*	*45.23*	*24.25*	*57.32*	*8.63*	***Combined***
(a) All DHAs								
All previous bypassing (97/98 – 99/00)	289	110	502	438	357	1789	268	3753
Same procedure as 2001 bypass	76	73	183	88	88	1216	110	1834
% of previous bypassing to obtain same procedure	26.3%	66.4%	36.5%	20.1%	24.6%	68.0%	41.0%	48.9%
(b) Excluding DHA 8 and DHA 9								
All previous bypassing (97/98-99/00)	192	92	287	219	229	1119	173	2311
Same procedure as 2001 bypass	69	67	148	78	72	710	99	1243
% of previous bypassing to obtain same procedure	35.9%	72.8%	51.6%	35.6%	31.4%	63.4%	57.2%	53.8%

Repeat bypassing may reflect the presence of chronic conditions being managed in a tertiary setting, such as the treatment of children with persistent ear infections or those with ongoing disorders of the bladder or urethra. This finding presents two divergent policy responses. On one hand, patients with chronic conditions requiring ongoing monitoring may be better served by seeking expert care in a tertiary setting, where specialists handle higher and more complex caseloads and where a broader range of services and specialists are available. On the other hand, more might be done to enhance service offerings outside of tertiary settings, such as identifying opportunities to consolidate diagnostic and follow-up treatment in larger district/regional facilities. Such initiatives would benefit patients by reducing the costs of travel, as well as contributing to the viability and attractiveness of the district for a broader range of health services.

The remainder of previous bypassing behaviour (i.e., the other 50%) appears to represent a more discretionary use of the healthcare system that could also be the focus of efforts to promote greater patient retention in smaller and more rural districts. Patient and general practitioner preferences for referral to a tertiary care site, and/or perceptions of poor quality at the nearest available treatment location, are factors that might be modified through the application of informational campaigns, particularly if it can be demonstrated that patients suffer no loss in efficacy and outcomes if they obtain routine procedures at local facilities.

4.0 GENERAL SUMMARY

Bypassing occurred consistently throughout the study period, and was generally greater in smaller populated districts. In addition, there is strong evidence of metropolitan dominance in the provision of general hospital services, whereby approximately 75% of district hospital bypassing is for services obtained in DHA 9 rather than in patients' home districts.

The persistence of relatively high rates of district hospital bypass in DHAs 1, 2, 4, 5 and 6 may indicate low levels of confidence in local hospitals from the perspective of patients and/or general practitioners in these smaller populated districts. Clearly, more needs to be done to recruit and retain general practitioners and general surgeons outside of the provinces' two largest urban centres in order to make these districts more attractive as options for obtaining secondary care. Bypassing also amounts to a loss in potential volumes of patient activity in what are already less well-serviced areas. Coupled with negative net transfers of patients obtaining these secondary level procedures, this type of hospital seeking behaviour is likely to undermine efforts to attract and retain physicians and other health professionals in these areas of the province.

The Department of Health and the DHAs should continue to monitor district hospital bypassing. While the time period examined in this research precludes a meaningful assessment of the impacts of regional governance in Nova Scotia, it is reasonable to regard both the overall availability of secondary level procedures and the rate of district

hospital bypassing as measures of DHA performance in making general hospital care closer to home. Reporting these measures annually would provide health care administrators, Department of Health officials, health professionals and the general public better information and benchmarks with which to evaluate the performance of District Health Authorities. At the same time, more research is needed into the impacts on service providers and hospital resources in districts sending and receiving a large share of cross-district activity for care that is otherwise available more locally.

5.0 NOTES

A NOTE ABOUT SOURCES

Tables 2, 4 and 5 are based on material included in Hanlon, N. and Skedgel, C., (forthcoming) Cross-district utilization of general hospital care in Nova Scotia: policy and service delivery implications for rural districts. *Social Science and Medicine*.

Table 3 appeared in Hanlon, N.T., 2003, Measuring aspects of devolved health authority performance: Nova Scotia patients who travel further than necessary to obtain hospital care. *Healthcare Management Forum* 16(2): 8-13.

A NOTE ABOUT DHA IDENTIFIERS

This report uses the original system of numbered identifiers, which are legally recognized in addition to names subsequently decided upon by residents and their respective boards. In case these groups decide to alter the names of DHAs in the future, we decided not to refer to DHA names in the tables or text of this report. For reference purposes, the correspondence between the original DHA numbered identifiers and official names, as of December 2004, are provided in the table below.

Identifier	**Name**
DHA 1	South
DHA 2	Southwest
DHA 3	Valley
DHA 4	Central
DHA 5	North
DHA 6	Pictou / New Glasgow
DHA 7	Strait
DHA 8	Northeast Cape Breton
DHA 9	Capital

AVAILABILITY

Further copies of this report may be obtained online at the Geography Program at UNBC webpage (http://web.unbc.ca/geography/faculty/neil/), or by contacting Neil Hanlon at Geography Program, University of Northern British Columbia, 3333 University Way, Prince George, BC, V2N 4Z9, (Tel) 250-960-5881, (Fax) 250-960-6533, or E-Mail (hanlon@unbc.ca).