

Regional variation in nonmedical factors affecting family physicians' decisions about referral for consultation



Evidence

Études

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Abstract

Objective: To determine whether there is regional variation in environmental (non-medical) factors affecting referral decisions of family physicians (FPs).

Design: Cross-sectional interview survey.

Setting: Nova Scotia.

Participants: A random sample of 125 FPs grouped into 1 of 5 functionally defined geographic regions of Nova Scotia (25 in each group). Groupings were based on access to general hospital beds through active staff hospital appointments or to specialist consultants in the community, or both. Participants were personally interviewed on site. No physician refused an interview. In 9 cases the physician indicated that he or she did not fit the profile of the assigned group; the physician was excluded from the study and the next doctor on the list was substituted.

Outcome measures: The questionnaire was designed to test several hypotheses about factors known to potentially influence decisions about referral. Geographic differences in factors affecting referral and in decisions about 5 hypothetical cases were assessed with the use of significance tests for proportions that were sensitive to specific orders across groups.

Results: Three factors affecting referral showed unequivocal variation across the 5 groups. Access to hospital facilities and remoteness from specialist care, leading to local styles of practice or treatment policies, and the FP's relationship with specialist consultants appeared to be important nonmedical factors affecting referral decisions. For similar case scenarios the physicians living in rural areas would refer only half as often overall as those living in urban areas with tertiary care hospitals; for some cases, such as a severe asthma attack, the difference was more than 7-fold.

Conclusions: Significant differences in nonmedical factors affecting referral, and in referral decisions about hypothetical cases, were found between the groups of FPs. Differences in access to resources, creating local styles of practice, appeared to explain most of the variation. The results may account for previously observed differences in actual rates of referral for these particular groups.

Résumé

Objectif : Déterminer si les facteurs environnementaux (non médicaux) qui jouent sur les décisions des médecins de famille relatives aux consultations varient selon les régions.

Conception : Étude transversale par entrevue.

Contexte : Nouvelle-Écosse.

Participants : Un échantillon aléatoire de 125 médecins de famille regroupés en 1 des 5 régions géographiques de la Nouvelle-Écosse définies en fonction de critères fonctionnels (25 dans chaque groupe). Les groupes étaient fondés sur l'accès aux lits d'hôpitaux généraux grâce au statut de membre actif du personnel de l'hôpital, sur l'accès à des consultants spécialistes dans la communauté, ou sur les deux. On a interviewé en personne les participants sur place. Aucun médecin n'a refusé de participer à une entrevue. Neuf médecins ont indiqué

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This article has been peer reviewed.

Can Med Assoc J 1997;157:265-72



qu'ils ne correspondaient pas au profil du groupe auquel ils étaient affectés. Ils ont été exclus de l'étude et l'on a alors communiqué avec les médecins dont le nom suivait sur la liste.

Mesures des résultats : Le questionnaire était conçu de façon à vérifier plusieurs hypothèses au sujet des facteurs reconnus qui pourraient agir sur les décisions relatives aux consultations. On a évalué les différences géographiques au niveau des facteurs jouant sur la consultation et les décisions portant sur 5 cas hypothétiques en soumettant à des tests d'hypothèse les proportions sensibles à des ordres précis entre les groupes.

Résultats : Trois facteurs qui jouent sur les consultations ont varié clairement entre les 5 groupes. L'accès aux installations hospitalières et l'éloignement de soins de spécialistes, qui entraînent des styles de pratique ou des politiques de traitement particuliers à l'échelon local, et la relation entre les médecins de famille et les consultants spécialistes ont semblé constituer des facteurs non médicaux importants qui jouent sur les décisions relatives aux consultations. Dans des scénarios portant sur des cas semblables, les médecins vivant en région rurale envoyaient leurs patients consulter un spécialiste 2 fois moins souvent que ceux qui vivent dans un milieu urbain doté d'hôpitaux de soins tertiaires. Dans certains cas, comme une crise d'asthme grave, la différence était supérieure à 7 fois.

Conclusions : On a constaté, entre les groupes de médecins de famille, des différences importantes à l'échelon des facteurs non médicaux qui jouent sur les consultations et sur les décisions d'envoyer un patient consulter dans des cas hypothétiques. Les différences sur les plans de l'accès aux ressources, qui donnent naissance à des styles de pratique locaux, ont semblé expliquer la majeure partie de l'écart. Les résultats peuvent expliquer des différences que l'on a déjà observées à l'échelon des taux réels de présentation dans le cas de ces groupes en particulier.

Pronounced unexplained regional variations in the use of a variety of health care services¹⁻⁵ have led to consideration of whether the higher or the lower rate of use is the more appropriate.^{3,6} This issue cannot be resolved satisfactorily without an understanding of the reasons underlying such regional variations.⁴ A greater understanding might permit the development of more appropriate, fairer or more cost-effective alternatives. In some cases variation may reflect previously unrecognized factors that have been legitimately incorporated into patient-physician decision-making and that should be considered in future health care planning.

Examination of large databases that demonstrate variation in the use of health care services by geographic region,¹⁻⁵ provider^{1,5-9} or user group¹⁰⁻¹³ indicates the need for study of the microenvironment where these decisions are made. Physician interviews provide a means to assess this decision-making environment. We have used this approach in previous studies.^{14,15}

In one study we observed regional variation in actual rates of referral by family physicians (FPs) to specialists.¹⁴ However, the variation differed from that expected on the basis of attitudes about referral in analogous hypothetical cases.¹⁴ We suggested that factors in the actual decision-making environment that were not included in the hypo-

thetical case scenarios might account for the discrepancy.^{14,16-23} For example, the provincial insurance records, which revealed marked geographic variation in the referral of patients by FPs to specialists, showed that decreasing rates of referral seemed to be related to increasing access to hospital beds coupled with decreasing access to specialists.¹⁴ Referral rates for hypothetical scenarios showed a similar trend.¹⁴ In a subsequent study, carried out to identify nonmedical factors in decision-making, FPs reported several factors that influenced their decision to refer.¹⁵ These included the patient's and family's wishes about referral, the FP's capabilities, confidence and style of practice, the FP's geographic location, availability of a consultant and the FP-patient relationship.

The objectives of the current study were to determine the relative importance of the nonmedical factors identified by FPs as affecting their decision to refer to specialists¹⁵ and to determine whether any showed regional variation. Based on the pilot study¹⁵ we hypothesized that some factors (e.g., patient's wishes) would increase referral, others (e.g., lack of an available consultant) would decrease referral, and a few (e.g., the FP's uncertainty or confidence) had the potential to either increase or decrease referral, depending on particular clinical circumstances.



Methods

Family physician groups

The Nova Scotia Department of Health had classified hospitals into tertiary, regional and community and had subclassified the last 2. From this classification 5 functionally defined groups were created, and all FPs in the province were assigned to 1 of these. This permitted physicians to be grouped according to their access to general hospital beds or to specialist consultants, or both. Physicians in group 1 (tertiary care hospitals) practised in a large metropolitan area with a university-hospital complex. They had access to specialists and subspecialists but did not have active staff hospital appointments such that they could attend their patients in hospital. Physicians in group 2 were in the immediate area of large regional hospitals. They had hospital privileges and access to specialists and subspecialists. Doctors in group 3, in the area of small regional hospitals, had hospital privileges and access to general surgical and medical specialists. Physicians in group 4, in the immediate area of large community hospitals, had access to surgical specialists, but only 4 of 11 communities had an internal medicine specialist. The fifth area was that of the small community hospitals, where the doctors (group 5) had hospital privileges, but their hospitals did not have attending specialists.

We hypothesized that the rank order of referrals for these 5 functional groups would be from group 1 (highest) to group 5 (lowest).

Participants

Twenty-five physicians were randomly selected from alphabetic lists of general practitioners after assignment to the 5 functional groups. The lists were provided by Medical Services Insurance, the government-approved third-party paying agency in Nova Scotia to which all physicians in the province belong. The study was described during a telephone call, and an on-site, personal interview was requested. No physician refused an interview. Interviews were held in the physician's office or hospital during the 14 months before June 1993. During the interview 9 physicians indicated they did not fit the profile of the assigned group. These doctors were excluded from the study, and the next physician on the list was substituted. Thus, the final groups were all confirmed by personal interview with respect to the assigned group.

Questionnaire

The questionnaire was designed to test several hypotheses made before the data were analysed and was

pretested through pilot interviews with 8 FPs. A copy of the questionnaire is available from us on request.

After a description of the purpose of the interview, the participants were given a page on which were listed, in a random arrangement for each physician, the 27 nonmedical factors that physicians had previously indicated affected their decision to refer.¹⁵ A final item provided the option to list other factors influencing a referral decision. The physicians indicated whether the factor never or almost never affects referral, sometimes increases referral, almost always increases referral, sometimes decreases referral, or almost always decreases referral.

The participants next considered 5 hypothetical scenarios and indicated whether they would refer each patient as described. Two scenarios were expected to show little or no variation among the physician groups.^{14,24-26} One of these (scenario 3: severe chest pain suspected of being acute myocardial infarction) was expected to lead to referral in all cases, and the other (scenario 4: back pain) was not expected to lead to referral. These 2 cases were considered to be "tracer" or nondiscretionary. The other 3 scenarios were expected to show variable probabilities of referral and were considered "query" or discretionary.¹⁴ After they made their decisions the participants were asked to review each scenario and give the reason(s) for their decision to refer or not to refer in each case. They then were asked to rank order 3 of the 27 nonmedical factors affecting referral that best explained their referral decision. Finally, the physicians were asked to rank order the 3 nonmedical factors that most affected their overall referral practice. The participants' comments were recorded in handwritten notes.

Analysis

We analysed the responses to the 27 nonmedical factors potentially affecting referral as follows. First, the responses were converted into pairs of binary responses (increases referral = Yes, does not increase referral = No; decreases referral = Yes, does not decrease referral = No), producing 54 variables. The proportion of physicians in each of the 5 groups reporting a Yes was tabulated for each of the 54 variables. We used 2 tests for each variable to compare the proportions among the 5 groups. These tests differ in their power to detect specific types of departures from the null hypothesis of no difference among groups. The first was Bartholomew's test for order based on isotonic regression,^{27,28} where the alternative hypothesis specified the highest expected referral rate for group 1 and the lowest expected referral rate for group 5, with declining rates in between. Pearson's χ^2 test was applied to detect other possible patterns

of differences in the referral rates. Because 2 tests were used, only p values less than 0.01 were considered significant. The referral decisions for the scenarios were subjected to the same analyses.

We calculated priority scores¹⁵ to assess the relative importance of the nonmedical factors in the referral decision. Priority scores were calculated for the 3 factors that the participants felt best explained their referral decision for each hypothetical scenario as well as the 3 factors that most affected their overall referral practice. A score of 3 was assigned to the factor ranked most important, a score of 2 to the factor ranked second most important and a score of 1 to the factor ranked third most important. The highest possible priority score for a single factor affecting overall referral practice therefore was 375, since if all 125 participants chose the same factor as most important, that item would have a priority score of $125 \times 3 = 375$. Calculation of priority scores for the factors affecting the referral decision for the hypothetical scenarios was similar. However, since there were 5 scenarios, the highest possible priority score for a single factor was 1875 ($125 \times 3 \times 5$).

Results

Characteristics of respondents

The characteristics of the FPs and the groups are shown in Table 1. The important differences between the groups were in hospital affiliation and the number of specialist consultants available to them.

Factors affecting referral

The physicians' responses to the nonmedical factors potentially affecting referral are shown in Table 2. The factors are grouped according to the hypotheses proposed before the study. Because some factors had different effects on referral in different circumstances, more than 1 response per physician is included.

Some of the factors hypothesized to increase referral were perceived by the respondents as sometimes being reasons for decreased referral, and vice versa. That is, the factors capable of either increasing or decreasing referral,

Table 1: Characteristics of 125 family physicians (FPs) in Nova Scotia grouped according to access to general hospital beds or to specialists, or both

Characteristic	Group 1 <i>n</i> = 25	Group 2 <i>n</i> = 25	Group 3 <i>n</i> = 25	Group 4 <i>n</i> = 25	Group 5 <i>n</i> = 25
Age, yr*					
Median	42	41	38	42	42
Range	31–71	33–67	29–67	31–60	29–71
No. of years in practice					
Median	14	12	9	13	17
Range	3–42	4–35	1–45	3–26	2–41
Type of practice (group/solo), no. of physicians	22/3	23/2	25/0	17/8	23/2
No. of physicians with hospital appointment (active with admitting privileges)	0	25	25	25	25
Hospital type in practice area	Tertiary care	Large regional	Small regional	Large community	Small community
No. of hospital areas sampled/total no. of hospital areas	2/2	6/6	3/3	10/11	11/19
Population of physicians' practice area					
Median	227 710	64 180	47 680	16 007	4 375
% aged \geq 65 yr	11	14	9	15	11
% aged < 15 yr	19	16	22	22	13
No. of hospital beds in area(s)					
Median	1 326	145	173	79	23
Range in physicians' practice area	1 326†	110–333	83–180	47–141	12–45
No. of specialists in area(s)					
Total no. of surgeons	125	75	22	17	0
Range in physicians' practice area	125†	6–19	5–11	0–3	–
Total no. of internists	145	36	6	6	0
Range in physicians' practice area	145†	3–11	2	0–3	–
Total no. of pediatricians	53	13	3	0	0
Range in physicians' practice area	53†	1–5	0–2	–	–

*Information on age was available for 24 physicians in groups 1 and 2, and for 22 in group 5.

†Ranges for number of hospital beds and number of specialists are the same as the median or totals listed, because only 1 hospital was involved.



depending on the circumstances, were more numerous than hypothesized.

We found differences across the 5 groups in several factors affecting referral. The 4 factors shown in Table 3 are those for which statistically significant differences were observed ($p < 0.01$).

Referral of hypothetical patients

Table 4 shows the referral decisions for the 5 hypothetical scenarios. There was significant variation across groups for 3 of the 5 scenarios: the child with a severe asthma attack, the adult with a severe asthma attack and the patient with severe chest pain. The overall referral rates were 53%, 45%, 37%, 26% and 26% for groups 1,

2, 3, 4 and 5 respectively. This was the expected rank order of referral rates for the groups.

The physicians' comments seemed to clarify their referral decisions. For example, the single physician in group 3 who would not refer the patient in scenario 3 (severe chest pain suspected of being acute myocardial infarction) said he was an attending staff member of the intensive care unit (ICU), where he rotated with 2 internists on ICU call. Of the 19 physicians in groups 4 and 5 who would not refer this patient, 17 indicated that a regional policy for their community hospital existed whereby experienced FPs competent in cardiopulmonary resuscitation assessed such patients, consulting by telephone with specialists in the regional hospital if required. The policy was that such patients were retained in the community hospi-

Table 2: Family physicians' responses to the nonmedical factors potentially affecting referral

Factor	Effect; no. of physicians		
	Increases referral	Never or almost never affects referral	Decreases referral
Factors hypothesized to increase referral			
Patient asks for referral or second opinion, patient pressure, patient's wishes	121	4	0
Family requests referral	117	8	2
Medicolegal issues	98	27	0
Medical advances	98	23	24
Patient's knowledge, education, attitude, sophistication	86	33	33
Recent bad experience	82	43	3
Community influence, expectations, friends' influence	70	54	5
Hospital regulations	69	54	5
FP's relationship with patient, patient reassurance, patient's personality	61	11	59
Nurse's wishes, nurse intimidated, FP's relationship with nurse	53	72	3
FP's time constraints	33	89	3
Factors hypothesized to either increase or decrease referral			
FP's uncertainty or confidence	125	0	14
Type of problem, patient's health status, change in problem and particular circumstances	121	6	35
FP's interests, capabilities, experience, knowledge	106	2	84
FP's style of practice, treatment policy	77	38	21
FP's wishes, expectations, beliefs	63	54	23
FP's geographic location, access to resources (hospital beds, laboratory tests, admitting privileges)	49	40	48
Factors hypothesized to decrease referral			
Patient travel difficulties	1	55	69
Availability of consultant	33	44	65
FP's relationship with consultant	71	37	45
Patient compliance	50	54	45
Patient's age, degree of independence	38	61	44
Cost, wasted resources, free medical care	28	46	65
Patient's socioeconomic status, finances, occupation, social support	4	86	36
Patient time constraints	3	86	36
Consultant's calibre, attributes, experience, reputation	56	67	23
Loss of patient, if no referral patient will go elsewhere	27	93	7

tal unless there were complications, in which case they were transported to the regional hospital. Conversely, of the 31 physicians in groups 4 and 5 who would refer this patient, 21 cited the lack of an ICU in their hospital or lack of a specialist, and 6 cited their hospital policy, which required referral.

Similar discrepancies in referral were observed between groups 1 and 5. In group 1, 31 of the 50 decisions regarding severe asthma were for referral, whereas in group 5 only 4 of the 50 decisions were for referral. Of the 13 physicians in group 1 who would refer the adult with asthma, 8 indicated that their location limited them to an office practice and cited their lack of competence in the management of this patient. Conversely, physicians in group 5 said their assessment was that the adult patient needed immediate treatment and that they had the facilities and experience to provide it.

Relative importance of factors affecting referral

The relative importance of the factors affecting referral is shown in Table 5. Some factors appeared to be more important in the context of the specific hypothetical cases.

For example, style of practice had a relatively low priority score from the rank ordering of factors affecting overall referral practice. However, it was the most important when the rank ordering of factors affecting the 234 specific decisions to refer (Table 4) was determined.

Discussion

Three factors showed significant variation across physician groups: geographic location, which encompassed access to resources (hospital beds, laboratory tests and admitting privileges); style of practice, which encompassed treatment policies and colleagues' expectations about referral; and the FP's relationship with the consultant. One of these factors, geographic location, was the basis for the definition of the groups.

We used 5 hypothetical scenarios as a means to provide a more context-specific understanding of factors that showed significant variation across the groups. One tracer case (back pain) was not expected to lead to referral, and did not. The other tracer case (severe chest pain suspected of being acute myocardial infarction) was chosen with the expectation that all physicians would refer this patient.

Table 3: Differences between groups in factors affecting referral to specialists

Factor	No. of physicians					p value*	p value†
	Group 1	Group 2	Group 3	Group 4	Group 5		
FP's geographic location, access to resources (hospital beds, laboratory tests, admitting privileges) increases referral	19	8	10	4	8	< 0.005	< 0.001
FP's geographic location, access to resources (hospital beds, laboratory tests, admitting privileges) decreases referral	3	8	11	10	16	< 0.005	0.005
FP's style of practice, treatment policy decreases referral	4	1	5	1	10	< 0.005	0.004
FP's relationship with consultant decreases referral	4	5	13	14	9	< 0.005	0.007

*Bartholomew's test.
†Pearson's χ^2 test.

Table 4: Family physicians' referral decisions about hypothetical cases

Scenario	No. of physicians who would refer					p value*	p value†
	Group 1	Group 2	Group 3	Group 4	Group 5		
1. 26-year-old woman with severe asthma attack	13	6	1	2	0	< 0.005	< 0.001
2. 40-year-old woman with breast lump	10	14	15	7	15	> 0.10	0.09
3. 51-year-old man with severe chest pain‡	25	25	24	17	14	< 0.005	< 0.001
4. 60-year-old man with back pain‡	0	0	0	0	0	NA§	NA
5. 10-year-old boy with severe asthma attack	18	11	6	7	4	< 0.005	< 0.001
Total no. of referrals	66	56	46	33	33		

*Bartholomew's test.
†Pearson's χ^2 test.
‡Tracer scenario.
§NA = not applicable.



However, there was variation in the referral of this patient, largely for the physicians associated with community hospitals (groups 4 and 5). Interviews with the physicians indicated that access to resources, leading to local styles of practice or treatment policies, appeared to account for most of the differences.

The responses of the physicians to 2 of the 3 query-type hypothetical cases (severe asthma attack) showed group variation, as expected. Again, access to resources and local styles of practice appeared to account for most of the variation. Referral in the third query-type hypothetical case (breast lump) also seemed to relate to hospital and physician resources, although there was no significant group variation in referral of this patient.

In a previous study we found regional variation in actual rates of referral by FPs to specialist consultants, but the variation was not in agreement with that determined from decisions about analogous hypothetical cases.¹⁴ We suggested that factors in the actual decision-making environment that were not included in the hypothetical scenarios might account for the discrepancy. The scenarios in that study were presented in a more idealized decision-making environment than probably exists in actual practice.

In the current study we identified several nonmedical factors that exist in the actual decision-making environment and some that affect groups of FPs differently.

Three of these factors — geographic location, style of practice and relationship with the consultant — affected the decision in the same direction as the difference in the rate of referral. For example, of the physicians in the tertiary care region, who had the highest rate of actual referrals in a previous study¹⁴ and the highest rate of referral of hypothetical patients in the current study, 76% indicated that their geographic location increased referral. Conversely, for the physicians in rural areas, who had the lowest rate of actual referrals in a previous study¹⁴ and the lowest rate of referral in the hypothetical cases in the current study, 2 factors were found that decreased their referral rates: geographic location and style of practice. Analysis of the priority scores indicated that these factors were important in their decision-making. These results suggest that nonmedical factors are incorporated into patient-physician decision-making and may account for some of the regional variation in rates of referral by FPs to consultants.

A limitation of a study of this kind is that it is unlikely that physicians' responses to a few hypothetical cases can capture the many facets of the decision-making environment.^{29,30} However, physicians' comments about hypothetical cases can provide helpful insights into decision-making within well-defined contexts.^{14,31} An example from the current study is the perceived influence of re-

Table 5: Relative importance of nonmedical factors affecting family physicians' referral decisions

Factor	Priority score*		
	Factors affecting overall referral practice	Factors affecting decisions to refer hypothetical patients	Factors affecting decisions not to refer hypothetical patients
FP's interests, capabilities, experience, knowledge	222	202	618
FP's uncertainty or confidence	204	139	395
Type of problem, patient's health status, change in problem and particular circumstances	120	160	336
FP's style of practice, treatment policy	65	209	168
FP's geographic location, access to resources (hospital beds, laboratory tests, admitting privileges)	48	142	196
Patient asks for referral or second opinion, patient pressure, patient's wishes	40	24	0
Availability of consultant	17	44	90
Hospital regulations	2	81	12
FP's relationship with consultant	13	5	55
Medicolegal issues	4	23	12
Patient's knowledge, education, attitude, sophistication	2	9	20

*A score of 3 was assigned to the factor ranked most important, a score of 2 to the factor ranked second most important and a score of 1 to the factor ranked third most important (see Methods).



gional health care policies on decisions about referral of a patient with severe chest pain in a region with low numbers of referrals.

Hypothetical case scenarios are sometimes used to study physician decision-making and are employed frequently in the education of medical students. However, unless they include nonmedical (environmental) factors in an appropriate context, such scenarios seem to be of quite limited value.^{14,29-31}

Another limitation of a study of this kind is that outcome information is not available. Thus, it was not possible to assess the quality of care provided by the different groups compared in the present study. For example, does the lower referral rate for the physicians in rural areas (observed for the hypothetical cases and for actual referrals in a previous study¹⁴) have any evidence-based effect on quality of care? This crucial question needs to be answered, given its important implications for health care policy.

The relationship between FPs and specialist consultants in this country has generally been robust and effective, although not without significant problems.³² The relationship seems to centre on the consultation and referral process,³³ for which guidelines have now been proposed.³⁴ The proposed guidelines identify the patient's best interests as the guiding principle, define the responsibilities of the patient, the FP and the consultant in the consultation and referral process, and recommend an open and supportive relationship among all 3 parties. An understanding of the factors affecting referral from the FP to the consultant should help this relationship.

The most striking finding from our study was that, for the same case scenarios, physicians living in rural areas would refer only half as often overall as physicians living in an urban tertiary care area. For some scenarios, such as a severe asthma attack, the differences were much greater. These results may explain the marked differences observed in actual referral rates for these physicians.¹⁴ These findings also suggest that there are rational and legitimate explanations for some types of regional variation in the use of health care services.

We thank the physicians who participated in this study. We also thank Andrea MacLellan for preparing the questionnaires and tabulating the data.

This study was supported by a grant (no. 6603-1366-302) from the National Health Research and Development Program of Health Canada.

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