

# Career choices of physicians 15 years after entering medical school

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**Summary:** The career status of 149 graduates of the University of Toronto faculty of medicine who entered in 1958 and graduated in 1962 was determined in 1973. The response rate to the mailed questionnaire was 96.6%. Of the graduates 4.7% were not practising medicine, 2.0% stated that medicine was not their primary gainful activity and 4.1% were untraceable or unknown. Of the 24 women in the class 17 (70.8%) were practising at least 76% of their time and 4 (16.7%) were practising 26 to 75% of their time. General practice or family medicine had been chosen by 39.0% of the class and a specialty by 55.7%; 5.4% were unknown or untraceable. The place of longest residence before entrance to university was a good predictor of ultimate location of practice but not of type of practice.

**Résumé:** Nous avons établi en 1973 quelle carrière avaient choisie 149 diplômés de la faculté de médecine de l'Université de Toronto qui étaient entrés à l'école en 1958 et qui avaient reçu leur diplôme en 1962. Au questionnaire qu'on leur avait soumis 96.6% ont répondu. Il en ressort que 4.7% ne pratiquaient pas la médecine, que 2.0% déclaraient que la médecine n'était pas leur principale activité rémunératrice et que 4.1% n'ont pu être retrouvés. Des 24 femmes de cette promotion 17 (70.8%) pratiquaient la médecine pendant au moins 76% de leur temps et 4 (16.7%) pratiquaient la médecine de 26 à 75% de leur temps. La médecine générale ou la médecine de famille avait été choisie par 39.0% de la promotion et une spécialité par 55.7%; 5.4% étaient inconnus ou n'ont pu être retrouvés. La durée de leur plus longue résidence au même endroit était un élément susceptible de prévoir l'endroit où les médecins finiraient par pratiquer, mais non le genre de pratique qu'ils choisiraient.

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Health manpower is the most important component of health services. It is also the most costly factor of production in a "labour intensive industry". The number, distribution and relative proportions of professionals in various categories that can ensure adequate access to health care must be maintained if universal health insurance is to be more than a theoretic principle. The development of health professionals requires the deployment of substantial resources and lengthy "lead time" in some cases.

Recent studies suggest that Canada as a whole, and certainly particular provinces, may be entering a period of general adequacy or even oversupply of various categories of resources required to provide health services: the number of acute and total treatment beds per 1000 population compares favourably with that of the majority of developed nations;<sup>1</sup> substantial numbers of nurses seeking work have been unemployed in Ontario;<sup>2,3</sup> and although the total number of physicians appears adequate in certain categories, some projections point to imminent surpluses in some provinces<sup>4</sup> and particularly in Ontario.<sup>5</sup>

Increasingly sophisticated and useful data on physician manpower in Canada have recently been gathered and published, especially by the health manpower directorate of Health and Welfare Canada, which prepares a comprehensive annual inventory.<sup>4</sup> Several "one-time" reports also have explored particular manpower issues in depth,<sup>6-12</sup> and, under the sponsorship of the Association of Canadian Medical Colleges, various studies focusing on the enrolment of medical students and on medical manpower deployed in teaching<sup>13-15</sup> and research have been published. Physician manpower studies usually report a cross-sectional view of the situation at a specific time or summarize events taking place during a certain interval—events such as new registrations, emigrations, deaths and changes in specialty status. The data encompass details concerning medical doctors practising in a given geographic jurisdiction, and the kind of information usually available is comparable to prevalence and incidence data as defined by clinicians and epidemiologists.

Following a class of medical students for a long time after graduation pro-

vides additional unique information helpful in long-range planning. The cohort and natural history approach can identify determinants of career choices and useful predictors of ultimate career profiles. The predictors may be entry characteristics or performance profiles in medical school. The "behaviour" of such a cohort of doctors can help explain why a province or a region has acquired certain manpower ratios and distributions as described by cross-sectional studies.

We report a cohort study of the University of Toronto's graduating class of 1962, which entered the first medical year in 1958.\* The doctors studied were in their 10th year of professional work following mandatory internship. It seemed reasonable to assume that all but a few were in their definitive careers and permanent locations, which made the timing of the survey appropriate. The study was planned with an emphasis on correlations of certain entry characteristics of the cohort with the type of professional activity and with the location of practice eventually chosen.

## Methods

A questionnaire† was mailed to the 149 members of the 1962 class during the 11th year after their graduation from the faculty of medicine of the University of Toronto. Addresses for the majority of members were obtained from the class secretary, who had organized a 10-year class reunion; the remaining addresses were sought with the help of the office of the dean of medicine of the university, the University of Toronto Medical Alumni Association, the College of Physicians and Surgeons of Ontario, and, for the most elusive 10 members, by means of Canadian and American medical directories and enquiries through classmates and former professional colleagues and through hospitals where the physicians sought had been last known to hold house-staff positions. None of the physicians, it appeared, had died. The pos-

\*Approximately two thirds of the students had been admitted to premedicine in 1956 with virtual assurance of entry into medicine in 1958 if passing grades were maintained.

†A copy of the questionnaire may be obtained by sending the request with a self-addressed envelope to the senior author.

sibility of confinement in institutions for the care of the disabled was discreetly, briefly and unsuccessfully pursued.

The questionnaires were returned by 106 class members on first mailing, by 18 on second mailing and by 10 on third mailing preceded by a telephone call to prompt reply. Information on 10 more was obtained by telephone interview and by proxy. The process of tracing respondents and of receiving the questionnaires analysed took 28 weeks, from Sept. 12, 1972 to March 28, 1973. Details of age distribution were obtained later through the dean's office and supplementary information on weekly professional activities was obtained from 20 of the women in a supplementary telephone survey.

The "place of longest residence prior to university" was defined as the period before the first undergraduate year at a university. For the majority of the 1962 Toronto class it meant the period before the first premedical year. The "permanent practice location" was considered arbitrarily to be equivalent to "1973 location" as used in this paper.

Population size of communities where doctors originated or practised included surrounding areas within 20 miles of the centre. For example, a suburb of 6000 on the edge of Hamilton (population 303 000) would be included in the category ">50 000".

## Results

### Response rates

We were able to contact 144 of 149 physicians in the 1962 graduating class of the University of Toronto (overall response rate, 96.6%). Five physicians could not be traced. The self-administered questionnaires were returned after one, two or three requests by 134 (89.9%). Seven respondents (4.7%) were interviewed by telephone, and the information on three respondents (2.0%) was obtained by proxy from friends, colleagues or relatives. Because the respondents contacted did not answer all questions, the totals in the various tabulations and tables do not necessarily equal 144; some

questions were not applicable to all respondents and some information was available from sources not dependent on an interview.

### Selected variables descriptive of the cohort

The mean age at graduation was 26 years; the mode was 25 years. Four respondents (2.7%) were 23 years old or less and 14 (9.4%) were 30 or more when they received their MD degree. There were 125 men (83.9%) and 24 women (16.1%). The place of birth and the place of longest residence before attending university are given in Table I. The number of years respondents had lived at the place of longest residence ranged from 1 to 10 in 23 instances (16.1%), 11 to 20 in 106 (74.1%) and 21 to 30 years in 14 (9.8%). The most frequently reported duration was 18 years (33 respondents); the second most frequent duration was 20 years (18 respondents).

The population size of the place of longest residence before attendance at university was 25 000 or less for 23 respondents (16.9%), more than 25 000 but less than 50 000 for 6 (4.4%) and 50 000 or more for 107 (78.7%); this category of information was not obtained for 13 respondents.

### Location and practice status of respondents 11 years after graduation

The location of respondents in 1973 is also shown in Table I. The population size of the 1973 location was 25 000 or less in 26 cases (18.1%), more than 25 000 but less than 50 000 in 10 instances (6.9%) and 50 000 or more in 108 instances (75.0%). Of 144 respondents, 80 (55.6%) lived less than 100 miles from the place of longest residence before attending university.

Among all class members 133 (or 89.3% of those graduating) reported that medicine was their primary gainful activity, 7 (4.7%) indicated they were not practising, 3 (2.0%) stated that medicine was not their primary gainful activity, the status of 1 (0.7%) was not provided and 5 (3.4%) were the untraceable graduates.

Of the 24 women who graduated 23

were traced. Of those, 17 (73.9%) spent more than 75% of their time in medical professional work. The corresponding figure for 119 men traced was 102 (85.7%). The time the women invested in medical professional activities was confirmed separately. The average time per week for all 23 women traced was 43.9 hours. For the four women who reported 26 to 75% time involvement the mean was 24.0 hours; for the 17 working in medicine 76% or more of their time the average was 53.3 hours (range, 37 to 72 hours per week).

The subdisciplines of the 149 physicians are as follows: general practice or family medicine, 58 (39.0%); specialized practice, 83 (55.7%); unknown or untraceable, 8 (5.4%). Table II shows the distribution of those known to practise a specialty.

Table II—Specialist-respondents' distribution by specialty

Specialty	No. (and %) of respondents
Anesthesia	4 (4.8)
Psychiatry	11 (13.3)
Pediatrics	4 (4.8)
Medical specialties	
General internal medicine	7
Cardiology	1
Dermatology	6
Gastroenterology	1
Hematology	1
Immunology	1
Neurology	3
Rehabilitation	1
Rheumatology	2
Respirology	1
Subtotal	24 (28.9)
Surgical specialties	
General surgery	4
Cardiac and thoracic surgery	2
Neurosurgery	3
Ophthalmology	3
Orthopedics	5
Otolaryngology	5
Plastic surgery	2
Urology	3
Subtotal	27 (32.5)
Obstetrics and gynecology	4 (4.8)
Pathology	3 (3.6)
Diagnostic radiology	3 (3.6)
Others	
Clinical epidemiology	1
Clinical pharmacology	1
Medical microbiology	1
Subtotal	3 (3.6)
Total	83 (99.9)

Table I—Respondents' birthplace, place of longest residence before attending university and location 11 years after graduation

Geographic location	Place of birth No. (and %)	Place of longest residence before attending university No. (and %)	Location 11 years after graduation No. (and %)
Toronto	65 (45.5)	79 (54.9)	71 (49.3)
Rest of Ontario	37 (25.9)	44 (30.6)	41 (28.5)
Rest of Canada	13 (9.1)	3 (2.1)	17 (11.8)
United States	2 (1.4)	1 (0.7)	13 (9.0)
Elsewhere	26 (18.2)	17 (11.8)	2 (1.4)
Total	143 (100.1)	144 (100.1)	144 (100.0)
(Unknown)*	(6)	(5)	(5)

\*Not included when percentages were calculated.

Table III—Reasons for changing from general practice to a specialty among 20 respondents

Interest in particular specialty	7
Interest in specialized knowledge	6
Time requirements (volume of work)	6
Planned general practice before specialty	3
Boredom, dislike of general practice	2
Concern for poor quality of general practice as shown by older GPs	1
More independence	1
Difficulty of raising family (as a mother)	1
Total	27*

\*Some respondents gave more than one reason.

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Formal qualifications obtained in addition to the MD degree among the graduates were as follows: fellowship of the Royal College of Physicians and Surgeons of Canada, 75 (also a master's degree in 2 instances); PhD, 6 (only a PhD in 5 instances); master's degree, 3 (one physician having 2 master's degrees); other degrees, 6. Appointments

in universities were currently held by 56 of the 1962 class, of which 33 were at the University of Toronto.

Of 83 who were practising as specialists 20 indicated that they had engaged in general practice before specializing and gave 27 reasons for the change as enumerated in Table III.

**Table IV—Correlation\* between place of longest residence before attendance at university and 1973 practice location of respondents†**

Place of longest residence before university	1973 geographic distribution of respondents no. (and %)			Total
	Ontario	Rest of Canada	Elsewhere	
Ontario	87 (79)	15 (14)	8 (7)	110 (100)
Rest of Canada	2 (100)	0 (0)	0 (0)	2 (100)
Elsewhere	11 (79)	1 (7)	2 (14)	14 (100)
Total	100 (79)	16 (13)	10 (8)	126 (100)

\*Results of statistical analysis:  $\chi^2_1 = 1.711$ ,  $P > 0.8$ ; Bowker's  $\chi^2_3 = 22.83$ ,  $P < 0.0001$ .

†Limited to those practising more than 50% of the time.

**Table V—Correlation\* between place of longest residence before attendance at university and 1973 practice location for those indicating Ontario as earlier residence and remaining in Ontario†**

Place of longest residence before university	1973 geographic distribution of respondents within Ontario no. (and %)			Total
	Toronto	Rest of Ontario	Total	
Toronto	42 (79)	11 (21)	53 (100)	
Rest of Ontario	15 (44)	19 (56)	34 (100)	
Total	57 (66)	30 (34)	87 (100)	

\*Results of statistical analysis:  $\chi^2_1 = 11.313$ ,  $P < 0.001$ ; Goodman-Kruskal  $G = 0.657$ ,  $P < 0.001$ .

†Limited to those practising more than 50% of the time.

**Table VI—Correlation\* between population of place of longest residence before attendance at university and that of 1973 practice location†**

Population of place of longest residence before university	Population of 1973 practice location of respondents no. (and %)			Total
	< 25 000	25 000 to 50 000	> 50 000	
< 25 000	7 (31)	4 (17)	12 (52)	23 (100)
25 000 to 50 000	0 (0)	1 (17)	5 (83)	6 (100)
> 50 000	11 (12)	5 (6)	74 (82)	90 (100)
Total	18 (15)	10 (8)	91 (77)	119 (100)

\*Results of statistical analysis:  $\chi^2_4 = 10.742$ ,  $P < 0.05$ ; Goodman-Kruskal  $G = 0.488$ ,  $P < 0.002$ ; Bowker's  $\chi^2_3 = 8.087$ ,  $P < 0.05$ .

†Limited to those practising more than 50% of the time.

**Table VII—Correlation\* between population of place of longest residence before attendance at university and choice of general or specialized practice†**

Population of place of longest residence before university	Type of practice in 1973 of respondents no. (and %)			Total
	Family medicine or general practice	Specialty	Total	
< 25 000	11 (48)	12 (52)	23 (100)	
25 000 to 50 000	3 (50)	3 (50)	6 (100)	
> 50 000	28 (31)	62 (69)	90 (100)	
Unknown	4 (57)	3 (43)	7 (100)	
Total	46 (37)	80 (63)	126 (100)	

\*Results of statistical analysis:  $\chi^2_3 = 4.159$ ,  $P > 0.2$ , not significant.

†Limited to those practising more than 50% of the time.

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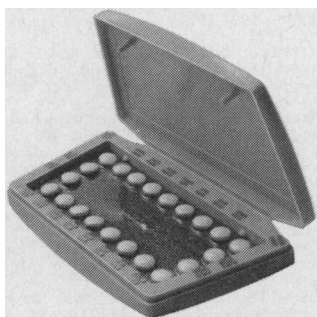
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## *Birthplace and earlier residence of members of the cohort as predictors of subsequent practice location*

We determined the correlation between birthplace of respondents and subsequent location of their practice. Correlations between the place of longest residence before attendance at university and the ultimate location of practice were also determined. For one phase of these analyses geographic classifications were in three groups: Ontario, rest of Canada and elsewhere. In some correlations, those originating in Ontario and remaining in Ontario were classified in two categories: Toronto and rest of Ontario. We report and display only tables about relationships between longest earlier residence and 1973 practice location because the findings for place of birth were similar and led to the same conclusions. Only those known to be practising at least half-time were included in these correlations.

*Place of longest residence before attending university and 1973 practice location:* Table IV shows the relationship between place of longest residence and current location for all graduates in practice. The 1973 practice location was independent of place of longest residence before attendance at university; in other words, regardless of where graduates had lived they have tended to practise in Ontario. The tendency is statistically significant as determined by Bowker's chi-square test.<sup>16</sup>

For those having lived longest in Ontario before attending university and remaining in Ontario the relationships are shown in Table V. For these individuals the 1973 location of practice was not independent of earlier residence: 70% (61 of 87) retained their preuniversity residence classification. Goodman-Kruskal's test of positive agreement<sup>17</sup> indicates that students from Toronto tended to practise in Toronto and those who had lived elsewhere tended to practise outside the provincial capital. Although there seemed to be an apparent "gain" for Toronto in relation to the rest of Ontario, the difference between 15 and 11 is not significant.

*Population of place of longest residence before attending university and population of 1973 practice location:* Table VI indicates how population of preuniversity long-term residence predicts the choice of size of community in which to practise. Of 119 graduates 82 (68.9%) settled in communities of comparable size to those in which they had lived. A tendency to move to larger centres was observed. Nevertheless, the cities of more than 50 000 received only one more physician than the number of graduates they contributed to the man-

power pool (17 versus 16). Communities of less than 25 000 gained 11 and lost 16.

*Population of place of longest residence before university and choice of general or specialized practice:* The size of community of longest residence as a predictor of choice of type of practice is shown in Table VII. The proportion of graduates in each of the two main types of practice chosen and reported in 1973 did not depend on the size of the community of longest residence before attending university.

## Discussion

### *Methodology*

This report illustrates the categories of information available from longitudinal studies that are difficult to obtain from data gathered any other way.

It appears that the potential usefulness of the data in the formulation of selection policies for medical schools and for monitoring these policies' impact on the manpower pool justifies the method described. Longitudinal studies should be undertaken regularly and expanded with adequate financial support to encompass entire provinces or the entire nation. An example of a nationwide cohort study was the project of Last and colleagues,<sup>11,12</sup> which, even with a short follow-up period (3 to 5 years after graduation), identified important factors affecting medical manpower and medical school policies.

Additional variables could be incorporated in surveys. In our case we regret the omission of data about graduates' spouses, particularly place of longest residence of spouse before marriage. In important prospective longitudinal studies now under way<sup>18-20</sup> extensive data on entry characteristics and academic performance are being monitored. The value of the reports that will arise from this work promises to be high, as it was in the British project that examined similar variables.<sup>12</sup>

Longitudinal studies are feasible and of reasonable cost.† They can be done prospectively and retroactively,<sup>21</sup> as was done in this project, without serious loss of information. Response rates attained (96.6% in our study and always more than 85% in other studies cited in this article) permit analyses from which inferences can be made with confidence.

†The study reported here used less than \$1000 of a research and training grant from Health and Welfare Canada, excluding faculty members' time.

§"Retrolective" refers to the timing of data collection planned and executed after the events of interest have occurred. "Retrospective" refers to the directional pursuit of the study subject. A "prospective" study deals with a forward investigation of a cohort toward a target event.

## Findings of study

The results suggest that the Toronto class of 1962 "behaved" in socially desirable ways according to standards and expectations of today's society.

That 39% of the class were in family medicine or general practice at an apparently permanent stage of their career was an unexpected finding. The percentage is surprisingly high and it is noteworthy that twice as many graduates chose general practice as a specialty area. If one estimates conservatively that the primary care contribution of the 4 pediatricians, the 11 psychiatrists, the 7 general internists, the 6 dermatologists, the 3 ophthalmologists and the 4 obstetricians adds a minimum of a further 10% to the total "primary care production", then the "50% primary care" guideline of many governments for the 1970s and 1980s seems to have been attained before the years of incentives, exhortations, purpose-oriented selection of students, development of departments of family medicine, certification in family medicine and the greater recognition of the intellectual worthiness of primary care. The favourable "body counts" should not distract attention unduly from issues that focus on the appropriateness of the educational experience of 1962 graduates as a preparation for family medicine and on subsequent performance as primary care practitioners. Such issues, however, are outside the scope of this article.

We considered the possibility that the high percentage of those in general practice or family medicine was a random departure from norms for that period. Less rigorous "spot checks" were done to determine whether the 1962 class seemed unusual, simply by classifying class graduation pictures according to information from the "Canadian Medical Directory". Data from published and unpublished reports were also used. For the 1960 class at least 32% appeared to be in general practice or primary care. In an immediate follow-up of the 1965 graduates (done in 1966) Chipman, Clarke and Steiner<sup>18</sup> determined that 36% appeared to have chosen general practice for temporary or permanent careers. In a longer follow-up of the classes graduating between 1965 and 1970, Fruen and Steiner<sup>19</sup> determined that 48% of the graduates were embarked in family medicine careers as of 1973. In another report Roos and Fish,<sup>22</sup> after a 4-year follow-up, discovered that 53% of 1969 Toronto graduates were in family medicine or general practice and that this was the second highest percentage for Ontario medical schools and the fifth highest for Canada. The 1962 patterns, therefore, do not appear

to be an isolated phenomenon for that graduating year at the University of Toronto. Rather, they appear to reflect a trend in that medical school that was sustained for some time. Figures from a cotermporal cohort in the United Kingdom study reported by Last and Stanley<sup>12</sup> showed that 28% of 1962 graduates were in general practice 4 years later.

Nonurban populations of Ontario seemed to be served well by doctors graduated by the University of Toronto in 1962. Although the number of students from larger cities was approximately equal to the number of doctors ultimately located in larger cities, the less populated areas probably had a final net advantage in terms of physician:population ratios because of the much more rapid growth of cities, in part at the expense of smaller communities and rural areas. Certainly, Ontario as a whole gained many more practitioners from elsewhere than it lost. Regardless of the origin and preuniversity place of residence of students admitted in 1958, the practice location in 1973 tended to be Ontario.

The place of longest residence before attending university definitely was a predictor of the choice of community for practice, both in terms of geographic location and the size of community (Tables IV, V and VI). However, population size of community of longest residence was independent of type of practice chosen. The evidence (Table VII) does not support claims that selecting more "small town" students can be expected to increase the proportion of those choosing family medicine or primary care.

The high proportion of women remaining in practice for 75% or more of their time and their surprisingly large time investment in professional medical activities erodes the concern that admitting many women to medicine results in unnecessary "wastage" of manpower and of deployed educational and clinical resources. The wastage of men (lower in percentage but appreciably higher in absolute terms) deserves further attention.

The fact that at least 50% of the professional activities of Toronto's 1962 medical class are providing primary care supports the feasibility of goals established or suggested for more recent classes in older Canadian medical schools and particularly for new medical schools such as Calgary, McMaster, Sherbrooke and Memorial. The Toronto record (which seems to be improving with time) may be hard to beat. The behaviour of the 1962 University of Toronto class 15 years after entering "First Meds" establishes them as useful pacesetters. The 1973 outcomes suggest that the admissions com-

mittees of 1956 (for premed admissions) and of 1958 (for admissions to medicine) were doing something right, deliberately or serendipitously. An examination of the records of their activities might help identify some useful criteria, explicit or implicit. A good, hard look back cannot help but be profitable even if it reveals that it does not matter what a physician does.

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## References

1. BABSON JH: *Health Care Delivery Systems: A Multinational Survey*. Pitman, London, 1972, passim
2. HACON WS: Health manpower development in Canada. *Can J Public Health* 64: 9, 1973
3. Canadian Nurses' Association: *Report of a Preliminary Survey to Explore the Nursing Employment Situation in Canada in Terms of the Number of 1971 Graduates of Canadian Schools of Nursing Registered/Licensed for the First Time in 1971 Who Were Able or Unable to Obtain Permanent Employment in Nursing as of September 30, 1971*, IMAI HR (investigator), Ottawa, 1972, p 18
4. Health and Welfare Canada: *Canada Health Manpower Inventory 1973*. Ottawa, 1973, pp 111-13
5. SPAULDING WB, SPITZER WO: Implications of medical manpower trends in Ontario, 1961-1971. *Ont Med Rev* 39: 527, 1972
6. Province of Ontario: *Report of the Committee*, 1970, vol I, pp 156-161; vol II, pp 11-13 on the *Healing Arts*. Toronto, Queen's 51-64
7. Ontario Council of Health: *Report of the Ontario Council of Health on Health Manpower*, suppl 3. Toronto, Queen's Printer, 1970, passim
8. Idem: *Report of the Ontario Council of Health on Health Care Delivery Systems*, suppl 5. Toronto, Queen's Printer, 1970, pp 47-67
9. Province of Ontario: *Report of the Health Planning Task Force*. Toronto, Queen's Printer, 1974, pp 62-66
10. CASTONGUAY C, NEPVEU G: *Rapport de la commission d'enquête sur la santé et le bien-être social. Vol IV, La santé*. 1970, pp 13-17
11. LAST JM, MARTIN FM, STANLEY GR: Academic record and subsequent career. *Proc R Soc Med* 60: 813, 1967
12. LAST JM, STANLEY GR: Career preferences of young British doctors. *Br J Med Educ* 2: 137, 1968
13. FISH DG: Medical manpower in teaching and research: the present situation. *Can Med Assoc J* 97: 1587, 1967
14. GRAINGER RM: Medical student enrolment in Canada, 1971-1972. *Can Med Assoc J* 107: 1220, 1972
15. COLLISHAW NE, GRAINGER RM: Canadian medical selection and some characteristics of applicants, 1970-1971. *J Med Educ* 47: 254, 1972
16. BOWKER AH: A test of symmetry in contingency tables. *J Am Stat Assoc* 43: 572, 1948
17. GOODMAN LA, KRUSKAL WH: Measures of association for cross classifications. *J Am Stat Assoc* 49: 732, 1954
18. CHIPMAN ML, CLARKE GG, STEINER JW: Career choice within medicine. *Can Med Assoc J* 101: 34, 1969
19. FRUEN MA, STEINER JW: What our graduates are doing. *Univ Toronto Med Grad* 20: 6, 1974
20. FRUEN MA: *Career choice study at Toronto*. Presented at AAMC-AMA-UNM workshop on longitudinal research in medical education, Chicago, 1972, pp 7-9
21. FEINSTEIN AR: Clinical biostatistics. XI. Sources of chronology bias in cohort statistics. *Clin Pharm Ther* 12: 866, 1971
22. ROOS NP, FISH DG: Career and training patterns of students entering Canadian medical schools in 1965. *Can Med Assoc J* 112: 65, 1975