Special Article

Manpower in Canadian Academic Rheumatology Units: Current Status and Future Trends

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ABSTRACT. ***Objective.*** To examine manpower and activity profiles of attending staff, and enrollment in training programs over 3 years in academic rheumatology units in Canada.

Methods. In 1998, the Canadian Council of Academic Rheumatologists (CCAR) established a database to annually monitor trends in manpower, activity profiles, and recruitment in 15 academic rheumatology units in Canada. Information was also collected on residents pursuing subspecialty training in rheumatology.

Results. Between 1998 and 2000, the total number of rheumatologists increased from 157 (137 adult; 20 pediatric) to 162 (139 adult; 23 pediatric). Male to female ratio was about 2:1 and mean age increased from 48 to 49 years. About 60% of rheumatologists held fulltime positions within their academic units. In the year 2000, 57% of individuals had a substantial commitment (≥ 50% time) to clinical care activities compared to 17% for research and 3% for teaching. There were 21 unfilled positions, mainly fulltime in adult rheumatology, across 12 centers. A substantial commitment (≥ 50% time) for research was identified in 11 of the unfilled positions, for clinical care activities in 6, and for teaching in one. Significant barriers to recruitment as identified by 11 centers were lack of suitable applicants (9), financial resources (5), and physical resources (3). From 1998 to 2000 the number of trainees in pediatric and adult rheumatology fell from 38 to 29 and the number of active training programs from 12 to 11. The mean age of trainees was 30–32 years, with equal representation for males and females. Over the 3 years studied, funding of trainees was provided by government (range 41–51% of trainees), The Arthritis Society (21–26%), and alternative sources (23–38%). Based on current recruitment, anticipated changes in population growth, and increased prevalence of rheumatic diseases, there will be a 64% shortfall in rheumatologists required in Canada by 2026.

Conclusion. Rheumatology manpower in Canadian academic units needed to fulfill responsibilities in delivery of clinical services and academic programs is inadequate. Enrollment in rheumatology training programs is falling and is insufficient to meet the present and future manpower needs for patients with rheumatic diseases in Canada. (J Rheumatol 2001;28:1944–51)

Key Indexing Terms:
CANADA RHEUMATOLOGY MANPOWER

Rheumatology has been practiced in Canada for over 50 years and was accredited as a distinct subspecialty of internal medicine by the Royal College of Physicians and Surgeons of Canada 25 years ago. The Canadian Rheumatism Association (now the Canadian Rheumatology Association) was formed in 1935, one year after the establishment of the American College of Rheumatology. There are 16 academic rheumatology units, each strategically aligned with a Canadian medical school. This network of academic centers was established in 1976 and has been the primary source for scholarly activity in research and medical education, providing a backbone for coordinating care delivery to patients with rheumatic diseases and acting as an incubator to meet the future rheumatology manpower needs in both academic units and in community rheumatology practice.

As with many Western countries, Canada has seen significant changes in its health care system and medical schools over the past 10 years as a result of changing population demographics, escalating health care costs, and fiscal restraints. Such fundamental changes provide both threats and opportunities for academic medicine and frequently influence manpower development within specialities. We report on manpower within Canadian academic rheumatology units, the allocation of time for both academic and clinical care activities, and recruitment of rheumatology trainees into teaching programs. The results of our study, which is derived from a prospective

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national database over a 3 year period, illustrate the current manpower status and provide insight into future trends.

MATERIALS AND METHODS

The Canadian Council of Academic Rheumatologists (CCAR) consists of the heads of each of the 16 academic rheumatology units across Canada with independent representation from pediatric rheumatology and The Arthritis Society. Established over 25 years ago and known as the Rheumatic Disease Unit Council until 1997, its mandate is largely 2-fold: (1) To facilitate communication and activities between the academic units, and (2) to advise the national board of The Arthritis Society on matters related to academic programs within rheumatology.

In July 1998, CCAR established a prospective database to gather information annually on academic manpower, activity profiles, and recruitment within academic rheumatology units in Canada. Fifteen of the 16 units participated (University of British Columbia, Vancouver, British Columbia; University of Alberta, Edmonton; University of Calgary, Calgary, Alberta; University of Saskatchewan, Saskatoon, Saskatchewan; University of Manitoba, Winnipeg, Manitoba; University of Western Ontario, London; McMaster University, Hamilton; University of Toronto, Toronto; Queen's University, Kingston; University of Ottawa, Ottawa, Ontario; McGill University, Montreal; University of Montreal, Montreal; University of Sherbrooke, Sherbrooke, Quebec; Dalhousie University, Halifax, Nova Scotia; Memorial University, St. John's, Newfoundland, Canada).

Information was also collected on medical residents pursuing subspecialty training in rheumatology. Data were collected in 3 main areas:

1. Current academic manpower including age and sex of academic faculty and whether individuals had primary responsibility for adult or pediatric rheumatology. The proportion of an individual's professional time spent within the academic unit was defined as the fulltime equivalent (FTE) and the allocation of each individual's time for clinical care activities, teaching (undergraduate or postgraduate), research (clinical or basic science), and administrative activities was recorded.
2. Information was gathered on all vacant positions within the academic units at the time of data collection. This included identification of whether primary responsibility was for adult or pediatric rheumatology, the FTE allotment within the academic unit, and the allocation of time to clinical care activities, teaching, research and administration. Information on potential barriers to recruitment was also sought, in particular with regard to the suitability of applicants, the lack of financial resources, and lack of physical resources.
3. Information was gathered on rheumatology trainees within the academic units. This included age, sex, whether they were training primarily in adult or pediatric rheumatology, year of fellowship training within a 2 year program, and the trainee's source of funding. After completion of the 2 year clinical fellowship, data were collected on whether individual trainees pursued additional training in clinical care, basic science, or clinical research. Upon acquiring an attending staff appointment it was determined whether this occurred within Canada and whether the appointment was primarily within an academic unit or in fulltime community practice. The information was entered into a database written in Microsoft Access and summary reports were generated. The data were analyzed in Microsoft Excel.

RESULTS

In July 1998, there were a total of 157 rheumatologists within 15 academic units. Of these, 137 had primary responsibility in adult rheumatology and 20 in pediatric rheumatology. The mean age was 48 years (range 31–76) with a male predominance of 112:45. The overall average fulltime equivalent was 76% (range 53–100). By July 2000 there were 162 rheumatologists (139 adult, 23 pediatric) affiliated with the academic units. The mean age was 49 years (range 29–74) and the male predominance continued with a male:female ratio of 110:52. The overall average FTE was 79% with range 53–100. The distribution of time between clinical care activities, teaching, research, and administration is summarized in Figure 1.

Over the 3 year period, there were 21–25 vacant positions within 11–13 academic centers. The majority of these positions were in adult rheumatology and were fulltime (100% FTE) within the academic units. Most centers encountered problems with recruitment and identified the lack of suitable applicants and lack of financial and physical resources as specific barriers to successful recruitment (Table 1). The projected allocation of time for clinical care, teaching, research, and administration for these unfilled positions is illustrated in Figure 2. It was noteworthy that, in contrast to existing staff positions, there was a proportionately greater allotment of time for research activities in these unfilled staff positions.

In July 1998, there were 38 trainees engaged in clinical fellowship training within a 2 year program in 12 of the 15 academic centers. Of these, 31 were enrolled in adult rheumatology programs and 7 in pediatric rheumatology. The mean age of trainees was 30 years (range 26–40) with equal gender representation, a male:female ratio of 20:18. Over the ensuing 3 years there was a reduction in the total number of trainees, which fell to 29 (25 adult, 4 pediatric rheumatology) in 11 centers by July 2000 (Figure 3A). The mean age was comparable to 1998, and equal representation by both sexes was maintained. Over the 3 years, funding of trainees was provided by government (range 41–51% of trainees), The Arthritis Society (21–26%), and alternative sources (23–38%) (Figure 3B). The latter was predominately provided to foreign trainees by government sources outside Canada.

In July 2000, information was available on the activities of trainees subsequent to their completion of core clinical training in rheumatology. Twenty-one individuals were pursuing additional training. Of these, 5 were engaged in the acquisition of additional clinical expertise, 5 were pursuing training in basic science research, and 11 in clinical research. A total of 14 individuals took up attending staff positions within Canada, of whom 7 were appointed within academic rheumatology units and 7 entered fulltime community practice. An additional 7 individuals took up staff positions outside Canada, but in most cases information was not available on whether these positions were within academic units or in fulltime community practice. All 7 individuals had received funding during their period of training from their country of origin, to which they returned.

Projected changes in manpower over the next 30 years within the academic units are shown in Figure 4. Retirement alone will cause a progressive loss in manpower, assuming that all the rheumatologists currently within the academic units retain these positions until age 65. If the number of first-year rheumatology trainees and rheumatologists recruited to the academic units continues at the level of July 2000, the total number of rheumatologists will remain stable until 2016, but will decrease substantially thereafter. In order to generate

Table 1. Unfilled staff rheumatology positions within academic units in Canada, 1998–2000.

	No. of Positions	No. of Centers	No. Fulltime	Barriers to Recruitment (No. of Centers)* Lack of Applicants	Lack of Finances	Lack of Space
1998	24	11	22/24	6	4	2
1999	25	13	25/25	8	6	3
2000	21	12	19/21	9	5	3

* More than one barrier may exist at a center.

a projection for manpower needs within the academic units the following assumptions have been made: (1) successful recruitment to current vacancies within the academic units; (2) replacement of all physicians vacating positions at any time during their career, including loss due to retirement at age 65; (3) annualized manpower growth of 1.5% to allow for the projected growth of the Canadian population and increase in the prevalence of rheumatic diseases. To achieve these manpower goals, and assuming that the same proportion of trainees will join the academic units as in 2000, it will be nec-

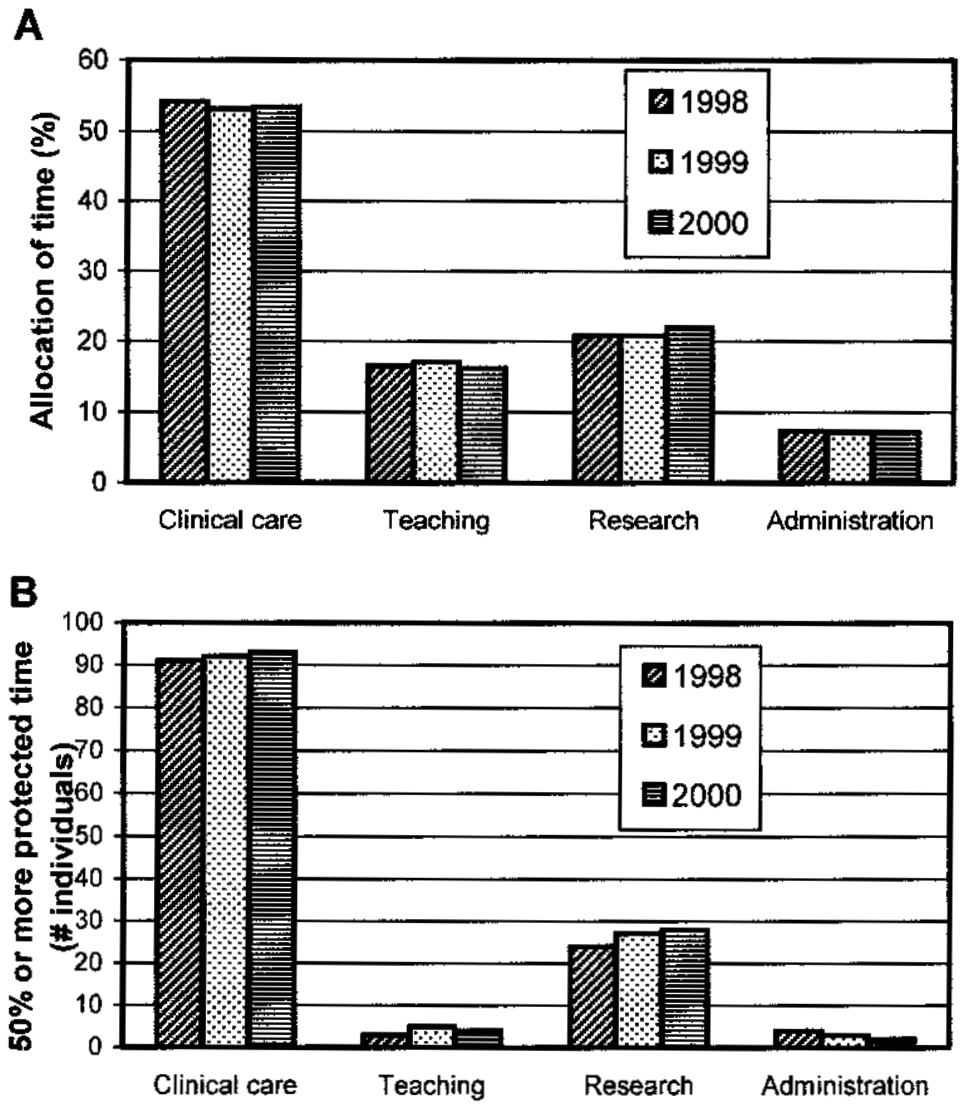

Figure 1. The allocation of time to clinical care activities, teaching, and research by attending staff rheumatogists in Canadian academic rheumatology units between 1998 and 2000 as indicated by mean percentages for time allocation (A); and the number of individuals with a substantial commitment (defined as ≥ 50% time) for each of these activities (B).

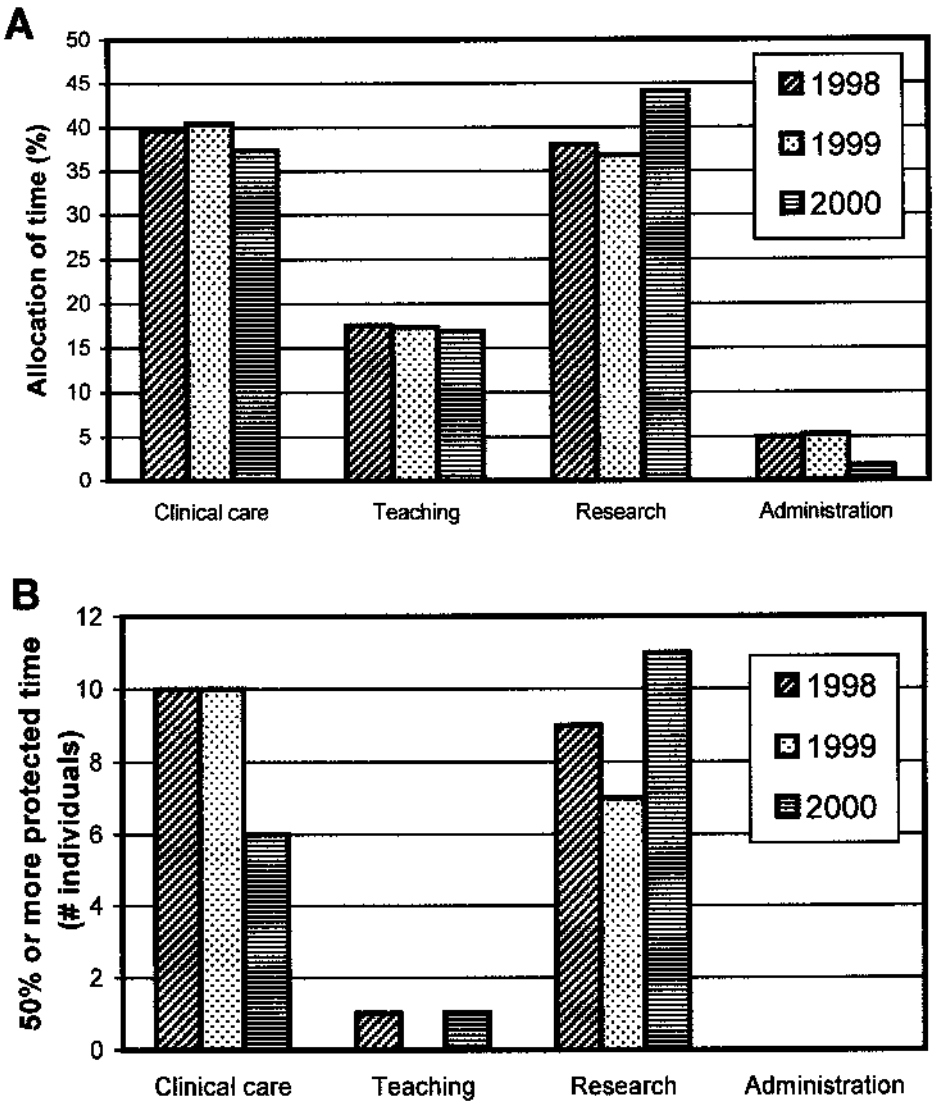

Figure 2. The allocation of time to clinical care activities, teaching, and research in unfilled rheumatology staff positions in Canadian academic rheumatology units between 1998 and 2000 as indicated by mean percentages for time allocation (A); and the number of positions with a substantial commitment (defined as ≥ 50% time) for each of these activities (B).

essary to double the total number of candidates within the rheumatology training programs.

The projected total number of rheumatologists required in both academic centers and fulltime community practice is shown in Figure 5. Currently there are a total of 270 rheumatologists in Canada, including the 162 affiliated with the academic centers. An estimate of the total number of rheumatologists who will be available between 2001 and 2026 was determined using the following assumptions: (1) the age distribution of the 108 rheumatologists who are not affiliated with the academic centers is similar to that in the academic units; (2) all physicians will continue to work until 65 years of age and will be replaced upon retirement; (3) the number of young physicians entering rheumatology training programs and, upon completion of training, the proportion of trainees remaining within Canada will follow a similar pattern to that of 2000. An estimate of the total number of rheumatologists required was based upon the recent recommendation of one rheumatologist per 70,000 population[1,2], using data from Statistics Canada for projected population growth up to 2026. The number of rheumatologists required was also adjusted for changes in the projected increase in prevalence of rheumatic diseases due to aging over the same period[3]. On the basis of these assumptions there will be an increasing gap between the total number of rheumatologists required and the total available over the next 25 years. By 2026 the required number of rheumatologists will be 740 compared to 270 predicted on the basis of the above assumptions, representing a shortfall of 470 (64%).

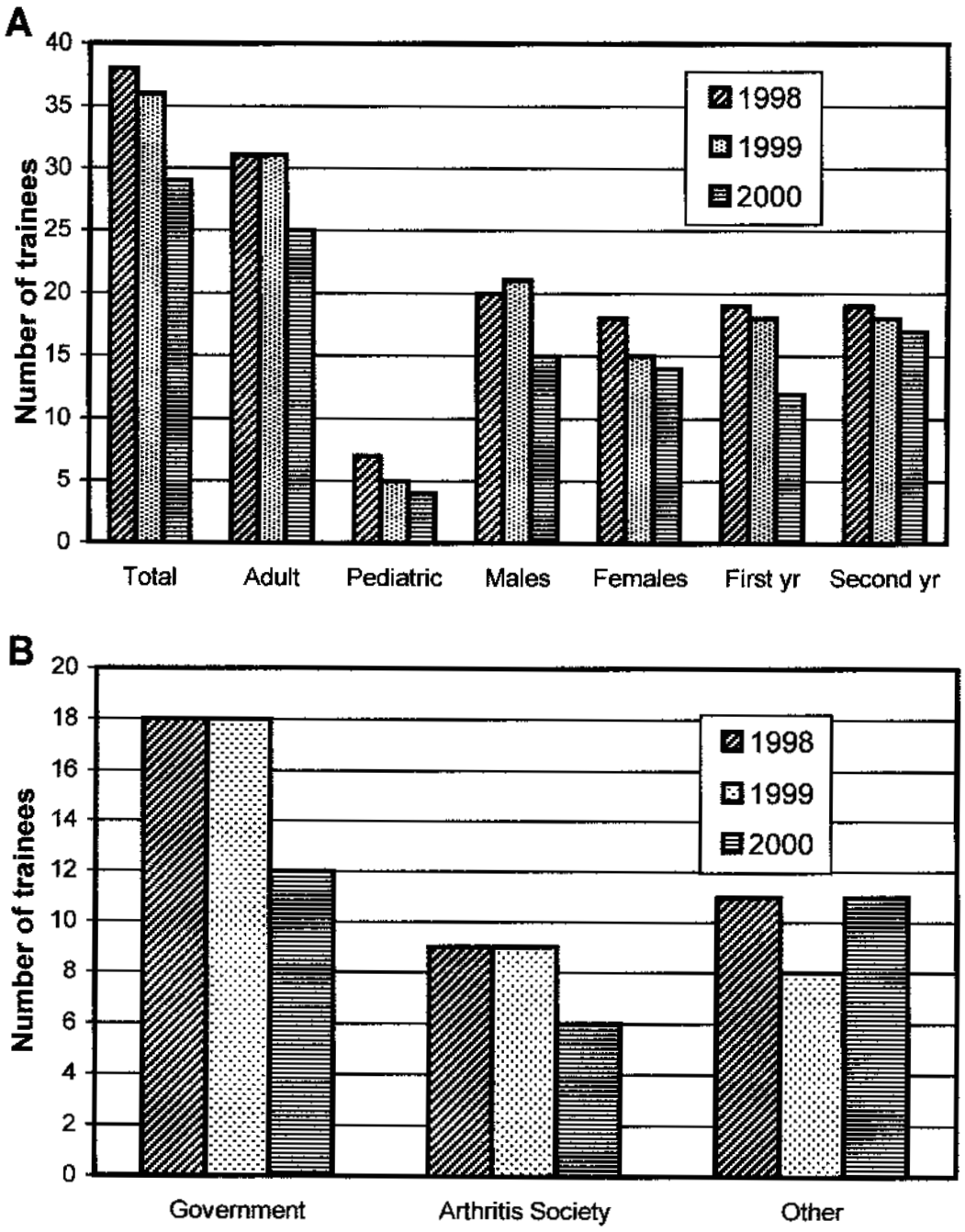

Figure 3. Data on the number of trainees within Canadian rheumatology training programs (A) and their sources of funding (B) 1998–2000.

DISCUSSION

Academic rheumatology units are affiliated with each of Canada's 16 medical schools. These units have a long tradition in delivering care and promoting teaching and research in the rheumatic diseases. However, in recent years there have been concerns that academic rheumatology manpower in Canada has stalled and even declined in individual centers. The results of the current study provide support for this, and indicate that the number of Canadian academic rheumatologists has remained static over a 3 year period from 1998 to 2000. Further, the entry of new recruits into rheumatology training programs fell substantially over the same time. If this decline in recruitment into rheumatology training programs continues, it will seriously threaten the survival of the speciality at a time of both unprecedented increases in the number of patients with rheumatic diseases[3] and unparal-

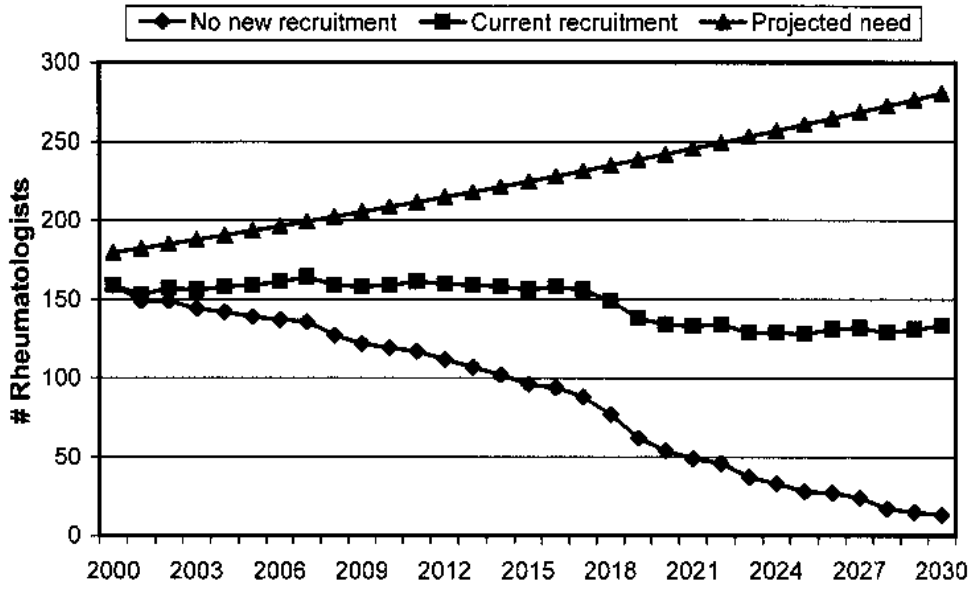

Figure 4. Manpower projections for Canadian academic rheumatology units 2000–2030 under the following circumstances: (1) no recruitment or replacement of attending staff rheumatologists (no new recruitment); (2) addition of rheumatologists assuming that the number of first-year subspecialty rheumatology trainees and the addition of staff rheumatologists that occurred in July 2000 will be maintained (current recruitment); (3) projected actual recruitment of rheumatologists to academic centers required 2000–2030 to maintain clinical services and academic programs (projected need) (see text for details).

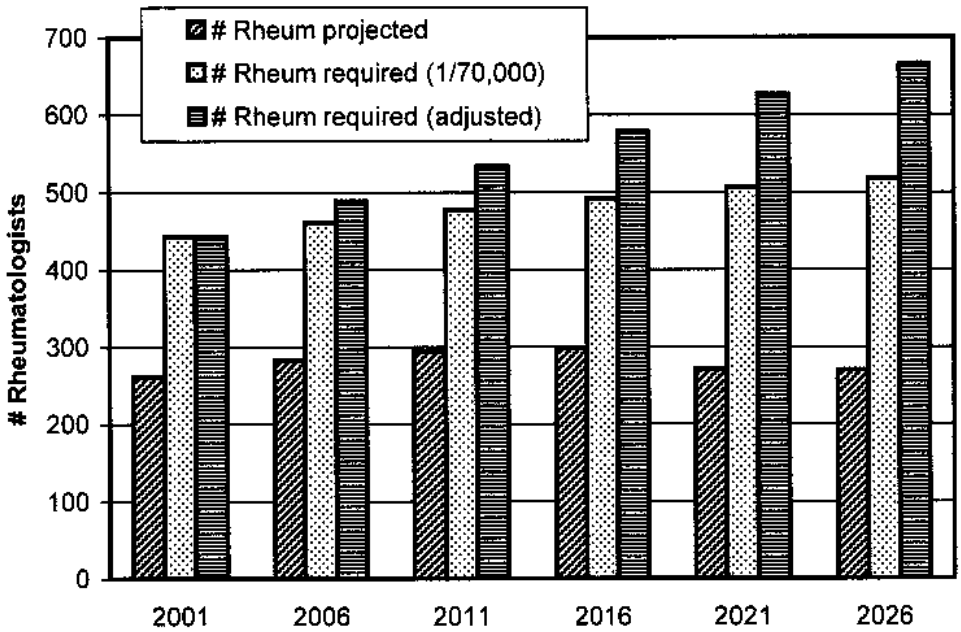

Figure 5. Manpower projections for the total number of Canadian rheumatologists in both academic centers and fulltime community practice 2001–2026. The number of rheumatologists projected (# Rheum projected) is based upon data from July 2000 on the number of first-year subspecialty rheumatology trainees and the number of rheumatologists joining academic centers or entering fulltime community practice upon completion of their training in Canada; the number of rheumatologists required (1/70,000) is based upon the recommendation of one rheumatologist per 70,000 general population; and the number of rheumatologists required (adjusted) is based upon the same calculation with adjustment for the increase in prevalence of rheumatic diseases between 2001 and 2026 (see text for details).

leled opportunities for effective and safe therapeutic interventions.

Not surprisingly, the reasons for the current state of Canadian academic rheumatology are multifactorial. A recent report by the Canadian Medical Forum Task Force on Physician Supply in Canada[4] indicates a significant shortfall in the total number of physicians in the country. For example, in 1999 the ratio of physicians per 1000 population was 1.8 in Canada compared to 2.3 in the United States, 1.9 in New Zealand and Australia, and 2.4–3.4 in most European countries. Only the United Kingdom had a lower ratio (1.7) of physicians per 1000 population. The reasons for this are 2-fold. First, in compliance with the recommendations of the Barer-Stoddart Report[5], a decision was made by the Canadian Provincial and Territorial Ministers of Health in 1992 to reduce medical school enrollment by 10%. This target was not only achieved but was exceeded, as demonstrated by comparison of medical school enrollment figures between 1985 and 1999 that indicate a reduction of 17%[4]. Second, in the 1960s and 1970s there were a significant number of international medical graduates entering the Canadian health care system. By 1975, the "preferred status" for physicians wishing to immigrate to Canada had been removed, thereby reducing the physician supply from that source. If the current trend continues, the ratio of physicians per 1000 population in Canada is expected to fall to 1.3 by the year 2021[4]. This will coincide with a time of increased need for physicians due to population aging, changes in knowledge and technology, and increased expectations of the population.

Additional factors amplifying this numerical shortfall in physicians include "greying" of the physician population, changing lifestyles and expectations of younger physicians, and an increasing proportion of female physicians, who must often deal with conflicting demands on their time, in the medical workforce.

The lack of funding for academic centers in Canada is another factor that has negatively affected academic rheumatology manpower over the past decade. For some time, scholarly activity in teaching and research has received inadequate financial support from individual medical schools ("hard money"). As a consequence there has been increasing reliance upon funds generated by clinical service delivery ("soft money"), largely based on a fee-for-service model, with a concurrent reduction in "protected time" for academic activities. For rheumatology, the difficulty of diverting such funds to support scholarly activity is amplified by the relatively poor level of remuneration for cognitive specialties compared to those with a greater proportion of interventional procedures. This funding model has also been identified as a significant factor contributing to the difficulties encountered by academic rheumatology units in the United States[3], where there are striking parallels with the Canadian situation. For example, in the United States there was a 40% fall in the number of first-year rheumatology trainees between 1992 and 1998[6]. This was the largest drop in any of the subspecialties of internal medicine and is a major contributing factor to the prediction that by 2010 there will be "fewer than half the number of rheumatologists needed to deliver quality care"[6]. If the current threat to the Canadian academic rheumatology units is not addressed, there will not only be significant consequences for academic rheumatology programs, but also a very negative impact upon the quality and quantity of care delivered to patients with rheumatic diseases. The demise of the academic units will remove the only means of training clinical rheumatologists in Canada, who are sorely needed, not only to maintain the academic ranks, but also to meet the service needs of communities outside the boundaries of the academic centers.

The assumptions that underlie the proposed changes in manpower within the academic units and community practice, and the steps required to address these within the training programs are conservative for a number of reasons. First, manpower changes effected through retirement at age 65 are probably an underestimate, as there will certainly be additional losses due to early retirement, selection of alternative professions, emigration, and premature demise. Although the model assumes these individuals will also be replaced, replacement will happen only if the number of rheumatology trainees increases. Second, the number of current vacant staff positions in the academic units is limited by fiscal restraints; it is likely therefore that the manpower required to support clinical services and academic programs is actually greater. Finally, these manpower projections can only be met if there is increased recruitment into the rheumatology training programs. Between 1998 and 2000 there was a 33% fall in Canadian graduates from rheumatology training programs. It is unclear whether this trend has reached a nadir or will continue. This issue must be addressed if the academic centers are to survive.

Given these circumstances, what steps should be taken to ensure adequate manpower? First, there is evidence that the provincial and federal governments in Canada have finally recognized the crisis in physician supply, and as a consequence, have requested medical schools to increase enrollment. With one exception, all schools are planning an immediate increase in enrollment of 10–20% in both undergraduate and postgraduate programs (personal communication, Dr. William Wrixon, Associate Dean of Postgraduate Education, Dalhousie University, Halifax, Nova Scotia). In addition to funding clinical and research fellowships in rheumatology[7], The Arthritis Society, in conjuction with 2 industrial sponsors, will soon introduce a new personnel award program for clinician-teachers. This program, which has many similarities to the Clinician-Scholar-Educator Program supported by the American College of Rheumatology[8], is intended to increase the profile of rheumatology within undergraduate and postgraduate medical school curricula in order to enhance recruitment of physicians into rheumatology training programs and eventual placement in academic arthritis centers and community practice in Canada. It will also be important to reform the

mechanism for funding academic rheumatology units. Initial experience with "alternative funding plans" that equally reward clinical care, teaching, and research is encouraging. Finally, there needs to be a philosophical shift by government in the funding of different subspecialty groups to recognize the equal value of cognitive and procedure oriented clinical services.

Physicians who practice rheumatology have always found it a gratifying and intellectually satisfying subspecialty of internal medicine. A fair and appropriate allocation of resources is now required to meet the well documented and escalating needs of patients with rheumatic diseases. If it is provided, there will be many exciting opportunities for physicians in training seeking careers in rheumatology, both within academic centers and in fulltime community practice.

APPENDIX

The Canadian Council of Academic Rheumatologists: Dr. John M. Esdaile, University of British Columbia, Vancouver, British Columbia; Dr. Anthony S. Russell, University of Alberta, Edmonton; Dr. Liam Martin, University of Calgary, Calgary, Alberta; Dr. John Sibley, University of Saskatchewan, Saskatoon, Saskatchewan; Dr. Hani El-Gabalawy, University of Manitoba, Winnipeg, Manitoba; Dr. Nicole Le Riche, University of Western Ontario, London; Dr. Jonathan Adachi, McMaster University, Hamilton; Dr. Robert Inman, University of Toronto, Toronto; Dr. Tassos Anastassiades, Queen's University, Kingston; Dr. Gunnar Kraag, University of Ottawa, Ottawa, Ontario; Dr. Henri Menard, McGill University, Montreal; Dr. Jean-Pierre Pelletier, University of Montreal, Montreal; Dr. Gilles Boire, University of Sherbrooke, Sherbrooke, Quebec; Dr. John Hanly, Dalhousie University, Halifax, Nova Scotia; Dr. Catherine Alderdice, Memorial University, St. John's, Newfoundland; Dr. Rayfel Schneider, Pediatric Rheumatology representative, University of Toronto, Toronto; Denis Morrice, President and CEO, The Arthritis Society, Toronto, Canada.

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