
Report issued by requirements subcommittee of National Committee on Physician Manpower

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It has become fashionable to state that Canada is wealthy in medical manpower, that we have a surplus of physicians, that Canadian schools can pretty well meet the growing health needs of this country.

But how do we know that's true unless we also know what we will need 5 or 10 years from now? And how can we make such projections if we really don't know what we have to date?

The questions are puzzling. And, as the National Committee on Physician Manpower (set up in 1971) can testify, the answers are elusive. The national committee set up a requirements subcommittee, which issued a three-volume report earlier this year.

For example, of what value is it to know that Canada has close to 39 000 physicians to serve 22 million people unless we also know how many of these physicians deal with patients — fully, peripherally or not at all?

(The national stock of physicians on Dec. 31, 1973 was 35 923 [1:621]. By Dec. 31, 1974 the total number of physicians, excluding interns and residents, increased to 37 297 [1:608]. As of Dec. 31, 1975, it is estimated there were 38 665 physicians in Canada [1:595]. These figures include interns and residents, who account for approximately 15.5% of total physician numbers, but exclude a minimal number of physicians in the Canadian Forces.)

Of what value is it to know that our medical schools are capable of turning out more than 1700 graduates annually unless we also know how many of these will be going into which residency programs and how many programs will absorb how many immigrants?

As the subcommittee has so strongly emphasized in the reports now being

studied by a wide range of national and provincial physicians' groups, computer data on patient services may be bountiful, but the means of monitoring information on existing stocks of physicians and what physicians are doing is grossly inadequate — ironic in this age of computer technocracy.

Given this conspicuous void in information, the various working parties (recruited from medical specialty bodies) assigned to the requirements subcommittee have shown much resourcefulness in piecing together — from a lot of disparate information sources — a baseline that should help federal and provincial health planners, medical schools and organizations plot a reasonable course for the future.

Big Brother?

There are many who will not like some of the subcommittee's recommendations, because there are many who do not like the prospect of time and motion studies, census techniques, activity inventories, practice profiles, registration procedures — devices that so redolently smack of Big Brother. But as the report suggests, there is a compromise that has to be achieved if manpower distribution is to become less wasteful and more rational and responsive to patient needs.

There are also those who will see something sinister in the overt rejection of "laissez faire" growth techniques.

As the subcommittee states, "Even with elaborate planning, it is axiomatic that the ideal distribution will never be attained in a dynamic system. However, it will not be even closely approached if laissez faire policies operate."

In grappling with the imponderables of manpower planning, the subcommittee, through its 30 working parties,

comes as close as anyone has to date not only in fixing a current inventory of physicians, but in articulating some of the interdisciplinary tensions that are part of the manpower grid.

The requirements subcommittee's projected manpower targets (as well as its estimates of current stocks) are based on "workload" calculations prepared by each of the working groups. In some cases the subcommittee went along with the projections of the working groups; in most it moderated them somewhat.

Excluding interns and residents, who make up about 15% of physician numbers, Canada in the base year 1972-73 had 30 481 physicians. Optimally she should have had between 33 000 and 34 000.

The 1981 requirements should range up to 38 818 — thus shifting the national physician/population ratio from the 1:723 of 1972 to as much as 1:630, say the working parties. The subcommittee report concluded that the physician/population ratio should be 1:665, requiring 36 812 physicians.

We will also need a realignment of the various disciplines within the overall manpower pool, so that general/family physicians and the surgical specialists decline as a percentage of all physicians while medical and other specialists (anesthesia, nuclear medicine, biochemistry, radiology, pathology, etc.) correspondingly increase as a percentage of all physicians. The subcommittee's findings and proposals are set out in Table I, along with the proposals of the working parties of generalists and specialists.

Given the importance of general/family practice as a proportion of all medicine, whatever happens to this discipline is likely profoundly to affect many others.

The report of the subcommittee en-

Table I—Distribution by broad specialty groups of present and future projected requirements for physicians

Group	Present stock		Future requirements proposed by working parties		Future requirements recommended by requirements subcommittee	
	Number	%	Number	%	Number	%
General/family practice	15 007	49.2	16 937	44.4	16 937	46.0
Medical specialists	5 687	18.7	8 165	21.4	7 464	20.3
Surgical specialists	5 903	19.4	7 095	18.6	6 892	18.7
Other specialists	3 884	12.7	5 925	15.6	5 519	15.0
All Physicians	30 481	100.0	38 122	100.0	36 812	100.0

dorses a GP/population ratio of 1:1440, both now and by 1981. This ratio includes all GPs, even those not in full-time, fee-for-service practice. When one considers only the 63.5% of general/family physicians who are full-time, fee-for-service practitioners, the ratio goes to 1:2300.

It is important to understand what the field of general/family medicine perceives as its domain and to realize how seriously shifts in GP trends can affect other disciplines.

For example, if all the 1.36 million annual office visits performed by pediatricians were performed by general/family practitioners, that would add but two visits per week to the workload of the average GP; but the workload of pediatricians would be reduced by 30%.

Conversely, if pediatric services provided by general physicians decreased even slightly, the pediatricians' workload would increase disproportionately, and many more pediatricians would be needed. Similar equations could be applied to the interface between GPs and obstetrician/gynecologists, or GPs and general internists.

To keep up with attrition, estimated at 3% per year, and the 9-year population growth of 12.8%, and to maintain the 1:1440 ratio, the subcommittee suggests increasing the absolute numbers of general/family physicians by 12.8% from the base year 1972 to 1981. Result: that we require 713 general/family physicians per year — well within the capability of Canadian programs. Immigration into this field would not be desirable, says the subcommittee.

The 713 new GP/family physicians would likely include only 452 full-time, fee-for-service practitioners.

"There is no convincing evidence that a substantial increase in the number of general practitioners is any longer needed," says the requirements subcommittee. And, in fact, some undersupply may even be tolerable, given the possibility that more primary medical services may be provided by other physi-

cians not directly trained for general practice.

Conversely, if the growing interest in general/family practice continues, and if the proportion of physicians in this discipline increases by even 10% in a decade, there could be considerable ramifications for physicians in other disciplines now providing primary care service — obstetrician-gynecologists, general internists, general pediatricians.

As the working parties pointed out time and again, what happens in one specialty can't help but influence projections in several others. In this respect, the working parties gave a good deal of attention to charting intradisciplinary shifts within the specialty groupings themselves — the medical specialties, surgical specialties and others.

The reports of the working parties, when aggregated, form a recommendation to increase from the present 18.7% to 21.4% the proportion of the total medical workforce represented by medical specialists. There would be some realignments.

The working parties see internal medicine and its subspecialties dropping from 42% to 39% of all medical specialists, with significant increases in physical medicine and rehabilitation and public health.

In reducing internal medicine and its

subspecialties, the compilation of the working party recommendations does not suggest across-the-board reductions. On the contrary, they see all subspecialties — allergy and clinical immunology, gastroenterology, hematology, respiratory and rheumatology — increasing their proportion of the internal medicine component and doing so at the expense of general internal medicine and cardiology, which they see dropping from 61.5% of the total manpower of this section, to 48.7% (see Table II).

It should be noted that even though the general internal and cardiology subspecialties would be reduced as proportions of the total internal medicine component, there would still have to be some increases in absolute numbers — from 1457 to 1556 — to account for population growth by 1981.

The surgical specialties, including obstetrics and gynecology, now account for 19.4% of total physician manpower. This proportion could be trimmed to 18.6% by 1981, say the working parties.

This would entail some rearrangements; see Table III for the conclusions of the working parties.

Other specialties, those that don't fit too precisely into medical or surgical groupings (anesthesia, medical biochemistry, medical microbiology, nuclear medicine, diagnostic radiology and radiation oncology), account for 12.7% of all physicians. By 1981 the working parties would like to see these groups account for 15.6% of all physicians. Except for anesthesia, where the working groups see a small increase in the relative size of the specialty, "substantial increases" for all other subgroups are urged.

To reach the targets proposed by the requirements subcommittee, an average of 1796 new physicians would have to be added to the workforce annually. With medical school production in Canada now averaging 1684 per year and expected to reach 1883 by 1981, the subcommittee sees few specialties

Table II—Medical specialties: present stock and future requirements proposed by working parties

Specialty	Present stock		Future requirements	
	Number	%	Number	%
Internal medicine and subspecialties	2370	41.7	3193	39.1
Dermatology	250	4.4	375	4.6
Neurology	202	3.5	288	3.5
Pediatrics	1005	17.7	1340	16.4
Phys. med. & rehab.	121	2.1	368(a)	4.5
Psychiatry	1614	28.4	2240(a)	27.4
Public health	125	2.2	361(a)	4.5
Total	5687	100.0	8165	100.0

(a) Mean of range cited

in which immigration will play any major part in bringing manpower resources up to target. Those that will require help from out of the country are psychiatry, obstetrics and gynecology, anesthesia, radiation oncology and medical biochemistry.

The issue of immigration is likely to harass planners for some time, largely because there is no way of knowing — precisely — how immigration influences manpower stocks.

As the subcommittee report points out, there is no central registry of graduates of Canadian and foreign medical schools in residency.

The royal college has indicated that the majority of physicians sitting specialty examinations in Canada recently were foreign medical graduates. And though these graduates had a pass rate of only 30% (compared to 70% for Canadian graduates) they still make up about 50% of new certificants in recent years.

Currently about half the physicians entering practice in Canada are foreign medical graduates. If this continues, says the report, "there would be serious oversupply."

Critical question

In drawing up estimates of physician manpower and projecting need, one of the most critical questions is, "Who is doing what?"

There are a number of physicians who, though not certified as specialists, continue to function as specialists. For example, 60% of orthopedic work done by physicians in Ontario during April, 1972 was performed by non-certificated orthopedic surgeons. There are general practitioners who have developed special skills in allergy or anesthesia; there are residents who fail or drop out of specialty programs but continue functioning as specialists who are counted as general practitioners.

There are foreign-trained medical graduates who have obtained specialty training in the UK or US but have not become certificated in this country, and they too are counted as GPs.

The requirements subcommittee notes that, at present, about 15% of surgery in Canada is done by physicians other than certificated surgical specialists. If surgery were limited to certificated surgeons, their workload would increase about 15%, and the workload of the general physicians would be proportionately reduced.

And so, the subcommittee believes, setting up a registry which includes the practice profiles of each physician would be yet another device to sort out the muddled line between generalist and specialist functions.

Table III—Surgical specialties: present stock and future requirements proposed by working parties

Specialty	Present stock		Future requirements	
	Number	%	Number	%
General surgery	2078	35.2	2234	31.5
Cardiovascular and thoracic surgery	175	3.0	210	3.0
Neurosurgery	158	2.7	147	2.1
Obstetrics and gynecology	1175	19.9	1577	22.2
Ophthalmology	780	13.2	887	12.5
Otolaryngology	415	7.0	490	6.9
Orthopedic surgery	555	9.4	816	11.5
Plastic surgery	172	2.9	245	3.4
Urology	395	6.7	489	6.9
Total	5903	100.0	7095	100.0

Over and above these jurisdictional stresses, there are many external factors that may impact on future manpower requirements, and these are documented by the requirements committee.

Will the fertility rate remain low? Will the immigration rate stay constant or accelerate? Will changing interpretations of what is "good" health care and what is not have an important effect on demands made on the system?

In what way will environmental and behavioural changes in society modify patient-generated demand? How much more responsibility will or should physicians be asked to assume for illness of psychosocial origin?

Another critical factor is the physician's own attitude to work and lifestyle.

More and more physicians are seeking to cut their working time down to compare more favourably with other professionals.

The weighted average workweek of the full-time, fee-for-service physician is 47 hours — but generally this does not account for time spent on call, on committee work and at study.

In 1971, 80% of office workers in Canada worked no more than 37.5 hours per week, and 82% of non-office employees worked less than 40 hours per week.

Then again, hours of patient service work vary dramatically within the various disciplines. The general surgeon, for example, works an average of 57 hours on fee-for-service work, the hematologist only 30 hours. But these figures do not reflect the fact that fee-for-service work for the hematologist is only one part of his laboratory workload.

Another important factor in planning manpower is that more women are providing medical care. In Canada, there has been almost a five-fold increase in the number of women enrolling in medical schools during the past 15 years.

At present, more than 26% of stu-

dents in Canadian medical schools are women. McMaster increased its proportion of female enrollees from 44% in 1974 to 52% in 1975.

At the University of Montreal, women numbered 35% of new enrollees, at Laval 36% and at Sherbrooke 40%.

As the requirements subcommittee report emphasizes, this changing sex balance can have profound implications for manpower target planners, since women physicians have a lower lifetime productivity than men.

One Quebec study showed that the production of women in fulltime practice is about 30% less than that of men, and their lifetime productivity is 20 to 30% less.

The study also showed that women tend to select institutional rather than private practice more often than men.

A recent US study showed that active female physicians average 68% of the hours worked by male physicians over a professional lifetime.

Three major objectives

Essentially, the subcommittee recognized three major objectives:

- To determine the present status of physician manpower in each discipline.
- To determine physician requirements for the immediate future for each discipline.
- To develop improved methodology to estimate physician manpower requirements.

Given the paucity of hard, workable, practical data, the subcommittee and most of the 30 interdisciplinary working groups resorted to what they called the "workload method" of estimating existing supplies of physicians and projecting future requirements.

Most simply (it is actually anything but simple) this involved defining the service role of the particular discipline, calculating the specific number of services and hours of work expended by the discipline as a whole and breaking this down to individual averages.

This would then lead to a set of

questions: Was provision of services adequate? Was it responsive to unmet needs? Was it superfluous?

If it was inadequate, how many more physicians would be required not only in the fee-for-service segment of the discipline, but in the salaried, sessional, teaching, research and administrative components?

The working parties would also have to consider what changes might be anticipated in coming years, what trends might develop. Would generalists go back to general work and allow specialists to specialize?

Given such a broad range of questions, there were obviously many imponderables, and not all working parties were equally reliant on the workload methodology. Some just found it unworkable and made up their own rules as they went along.

Some, to buttress their workload method findings, resorted to a "Delphic" technique — an informed consensus based on expertise and judgement.

The subcommittee found that in some procedures, particularly surgical services, operations could be easily enough timed. In such cases it was not too difficult to calculate workload.

But precision becomes much more elusive in gauging the working time involved in the vast numbers of office visits, consultations and hospital visits.

For example, in one base year, almost 39 million office visits were provided by general practitioners. A 4-minute error in time allotted to this service would increase the annual workload by 2.5 million hours — hypothetically necessitating more than 1000 additional general practitioners.

Moreover, there is the "invisible" work that doesn't show up on fee-for-service scans: the professional work of salaried physicians in insurance, industry, teaching, administration, public health, the civil service, the armed forces and workmen's compensation boards. This "invisible" work accounts for substantial service within many disciplines.

Fee practitioners

The requirements subcommittee found that an average of only 69% of all physicians were full-time, fee-for-service practitioners. The criterion for full-timers is that they will have received at least \$20 000 from their provincial medical care insurance plan in any given year.

Furthermore, these figures were anything but constant from discipline to discipline.

In urology and otolaryngology, for example, 88% of physicians could be

listed as full-timers, in general/family practice, 64%.

In psychiatry and hematology, the proportions of full-time, fee-for-service physicians fell to 54% and 42% respectively.

It was also found that medical specialties have a lower proportion of physicians who are full-timers than have surgical specialties.

At the other extreme, the subcommittee found that as of December 1974 nearly 9% of general/family physicians and 4.3% of all specialists were in full-time, salaried positions with government or industry.

Information system

Over and above the recommendations concerning realignment of manpower in the particular disciplines, the subcommittee report is a powerful plea for an information system akin to 20th century technology.

Such a system might have far-reaching implications for individual physicians as well as for their various representative organizations.

Following are some of the recommendations reflecting components of that system:

- Provincial colleges of physicians and surgeons collaborate to ensure that each physician be required, at the time of his annual licence renewal, to update the information needed to maintain a national, functional inventory of physicians. One or more federal agencies with access to data-handling facilities would keep the inventory current and publish it annually.

- The Royal College of Physicians and Surgeons and the Professional Corporation of Physicians and Surgeons of Quebec keep a register of residents in training in each specialty.

- Because of the different terminologies used from province to province to describe medical services, and because these fee-for-service data are so critical to assessing workload and utilization profiles, a uniform nomenclature for physicians services (and ideally uniform fee service codes) be established. The subcommittee charges the CMA with convening a meeting of the various provincial organizations for this purpose.

- The primary diagnosis of the condition for which the service was provided be recorded on claim cards.

- To more effectively calibrate workload data, time and motion studies of representative practices be done.

- Data be analysed annually, by specialty, to determine consumption of medical services by sex and age groups.

- Accurate determination of the

rate of attrition in each discipline be calculated using demographic data and professional activity profiles.

- The National Committee on Physician Manpower (the subcommittee's parent body) assign responsibility to, and support, a nationally based organization to translate current best estimates of physician manpower requirements into appropriate adjustments to the supply.

Throughout the subcommittee's deliberations, the scale and distribution of specialty training programs re-emerges as critical to the manpower planning process. Clearly, the medical schools must have a positive influence on the distribution of physicians within their respective areas.

Therefore the subcommittee recommends that:

- The Association of Canadian Medical Colleges convene conferences of deans to develop and implement policies to ensure that students receive current manpower information to assist them in making appropriate career choices.

- The Royal College of Physicians and Surgeons and the Professional Corporation of Physicians of Quebec facilitate the assignment of residency positions and programs so that output meets projected requirements. It also asks provincial health ministries to find some means of funding residency positions necessary to meet with local and national needs.

Perhaps most important, the requirements subcommittee asks for fundamental declarations from the medical-health establishment on (a) whether Canada should become self-sufficient in physician supply and (b) to clarify Canadian responsibility for postgraduate training of foreign physicians above domestic requirements.

The working parties

The 30 working parties represented 33 medical disciplines. Each of these groups submitted its report to the requirement subcommittee. This subcommittee was charged with distilling the working parties' data, assessing their observations and then making its own recommendations. The result of this process is set out in Table IV.

Consequently, in some of the narrative that follows, there will be clear differences of opinion between what the working parties want, and what the requirements subcommittee is willing to recommend to its parent National Committee on Physician Manpower.

Throughout the following there is one keynote index that is used repeatedly: a full-time, fee-for-service physician is one who has received at least

Table IV—Proposed and recommended future (1981) requirements (a) and the supply rate needed to meet the recommended requirements

Discipline	Future requirements				Percentage difference WP/RS (%)	Annual supply	
	Proposed by working party (WP)		Recommended by requirements subcommittee (RS)			Present	Needed to meet requirements subcommittee recommendations by 1981
	Number	Ratio(b)	Number	Ratio(b)			
General/family practice							
Fee-for-service (Full-time fee-for-service)	16 937 (10 755)	1:1 440 (1:2 300)	16 937 (10 755)	1:1 440 (1:2 300)	0.0 (0.0)	NA (NA)	713 (452)
Medical specialties							
Internal medicine	3 193 (245)	1:7 700 (1:100 000)	2 987 (245)	1:8 200 (1:100 000)	-6.5 (0.0)	183 (4 to 8)	182 (20)
Allergy and clinical immunology	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Cardiology(c)	(281)	(1:87 100)	(245)	(1:100 000)	(- 12.8)	(6 or 7)	(14)
Gastroenterology	(414)	(1:59 000)	(377)	(1:65 000)	(- 8.9)	(21 or 22)	(23)
Hematology	(490)	(1:50 000)	(311)	(1:78 600)	(- 36.5)	(NA)	(16)
Respirology	(207)	(1:118 200)	(163)	(1:150 000)	(- 21.3)	(NA)	(10)
Rheumatology							
Dermatology	375	1:65 300	375	1:65 300	0.0	12	24
Neurology	288	1:85 000	272	1:90 000	-5.6	NA	18
Pediatrics	1 340	1:18 260	1 224	1:20 000	-8.7	80 to 85	62
Physical medicine & rehab.	245 to 490	1:100 000 to 1:50 000	245	1:100 000	0.0 to - 50.0	11	22
Psychiatry	1 984 to 2 497	1:12 300 to 1:9 800	2 225	1:11 000	12.2 to - 10.9	80	141
Public health	136 to 586	1:180 000 to 1:42 000	136	1:180 000	0.0 to - 76.8	NA	2
Surgical specialties							
General surgery	2 234	1:11 000	2 234	1:11 000	0.0	85	96
Cardio- and thoracic surgery	210	1:117 000	210	1:117 000	0.0	15 to 20	7
Neurosurgery	147	1:166 700	147	1:166 700	0.0	11	4 to 5
Obstetrics/gynecology	1 577	1:15 500	1 398	1:17 500	- 11.4	55 to 60	63
Ophthalmology	887	1:27 600	874	1:28 000	- 1.5	35	24
Otolaryngology	490	1:50 000	490	1:50 000	0.0	14 to 28	26
Orthopedic surgery	816	1:30 000	805	1:30 400	- 1.3	40 to 50	45
Plastic surgery	245	1:100 000	245	1:100 000	0.0	15	13
Urology	489	1:50 000	489	1:50 000	0.0	23	29
Other specialties							
Anesthesia	1 781	1:13 742	1 781	1:13 742	0.0	82	105
Nuclear medicine	89 to 206	1:275 000 to 1:120 000	98	1:250 000	10.1 to - 52.4	NA	4
Medical biochemistry	120	1:204 000	120	1:204 000	0.0	3	13
Medical microbiology	245 to 311	1:100 000 to 1:78 600	245	1:100 000	0.0 to - 21.2	NA	20
Pathology	1 798	1:13 600	1 517	1:16 100	- 15.6	NA	73
Radiology (diagnostic)	1 599	1:15 300	1 599	1:15 300	0.0	89	97
Radiation oncology	202	1:121 000	159	1:154 000	- 21.3	7.5	13
TOTAL	37 427 to 38 818	1:654 to 1:630	36 812	1:665	- 3.4		1 796

(a) Excluding interns and residents

(b) Based on an estimated 1981 population of 24 472 500

(c) NA = not available

\$20 000 from fee-for-service billings as recorded by medicare in any given year.

General/family practice

Though Canada in 1972-73 had approximately 15 000 general physicians claiming at least some services under medicare, only 64% could be considered full-time, fee-for-service physicians.

In effect, 94% of the fee-for-service workload was done by 9535 full-timers. This calculates out to a ratio of one full-time, fee-for-service GP to 2276 people (1:2276). If one were to count in all general physicians, including those not full-time on fee for service, the ratio would be 1:1440.

The subcommittee feels this is an

adequate ratio, but in order to maintain that level in light of an attrition rate of 3% and a medium fertility population growth, Canada would have to add an average 452 full-timers to the workforce each year.

Complicating this projection is the high proportion of general/family physicians who have but minimal involvement with fee-for-service patients — 36.5%. If this proportion remains constant, Canada must add 713 general practitioners each year so as to net the 452 full-timers it needs.

Internal medicine

The working party in its survey, noted that in 1972-73 only 1616 internists (68% of the total 2370 fee-for-service internists) could actually be considered full-time, and that they were

in effect providing 94% of the patient services and working an average 51 hours a week. Twenty percent claimed their major involvement was with teaching, research, government or industrial work. The working party reckoned that bringing the workload down to 48 hours a week and making up for an estimated 10% current underservicing would require 1971 full-timers.

The working party's 1981 projection, counting in non-full-timers and correcting for population growth and changing service trends, would result in a total requirement of 3193 internists (1:7700), up from 2370 in 1972-73.

The requirements subcommittee comments that until work profiles are more precisely defined it cannot support the recommendation that 10% be added to the workforce to account for under-

servicing. It says a ratio of 1:8200 should be adequate, particularly because of the increasing availability of general/family physicians. The 1974 production of Canadian certificants was 191; the working party says it needs 10% more; the requirements subcommittee disagrees.

In this grouping, the working party addressed itself to all segments of internal medicine excluding dermatology and neurology.

Cardiology

The working party asserted that approximately 25% of physicians involved in internal medicine and its subspecialties deal predominantly with cardiovascular problems.

In Quebec, where subspecialties are defined, 38% of internists are cardiologists. This is equivalent to a ratio of 1:35 000. Because of the difficulty of sorting out cardiology statistics from the whole of internal medicine, no projections were made.

Gastroenterology

All areas of Canada except Quebec and Manitoba have been reported short of gastroenterologists.

At the time of reporting, the working party noted that there were 182 gastroenterologists in practice — 79% of whom were in full-time, fee-for-service practice. The data also showed the average full-time workload at 47 hours per week.

If the workload was lightened somewhat (the working party suggests 40 hours over 46 weeks), the present requirement for all Canada would be 222 gastroenterologists — a ratio of 1:98 800.

In its projection, the working group adds in an 11.5% population increase and 15% more for "other factors" and comes up with a 1981 requirement of 281 gastroenterologists — 21 annually. Canadian programs now turn out seven a year.

The requirements subcommittee disagrees. It feels these estimates are too liberal, especially the 15% for "other factors" and the 4% estimated attrition. It recommends a 1981 target ratio of 1:100 000.

Hematology

Current rates of production of hematologists (averaging 25 a year) are lower than required if this specialty is to achieve optimal numbers by 1981.

The working party for hematology recommends 8.5 clinical hematologists (excluding hematopathologists) for each half-million population. This would boost the existing Canadian ratio from

1:86 000 to 1:59 000. That would mean going from the existing equivalent of 255 full-time hematologists (as of 1974) to 414 by 1981 (27 new clinical hematologists each year).

Considering that a certain amount of hematology is (and likely will continue to be) done by internists, the subcommittee suggests a 1:65 000 ratio is appropriate for planning purposes.

Respirology

The complement of full-time chest physicians in Canada should be increased more than 130% between 1972 and 1981, says the working party on respirology.

"A waiting time of 30 to 45 days for an appointment for a non-urgent condition suggests a considerable shortage of chest physicians," it says.

The current stock of 212 (extrapolated data) allows a ratio of 1:103 000. Of this stock, there were 148 who were full-timers and who worked an average 56 hours per week. To bring this down to 45 hours per week would require 36 more respirologists.

The working party would like to see a complement of approximately 490 chest physicians by 1981, a ratio of 1:50 000. This would mean 38 new chest physicians per year. Existing programs are capable of turning out no more than 20.

The requirements subcommittee considers this sharp increase by 1981 unfeasible and "probably unjustified". It suggests a ratio of 1:78 600 for planning purposes — a 47% increase over existing stocks.

Rheumatology

Although agreeing that Canadians should have greater access to specially trained rheumatologists, the requirements subcommittee doesn't believe the 45% increase sought by the working group is an appropriate or justified short-term goal.

The existing ratio is about 1:193 000 (81 full-time and 32 part-time rheumatologists). The working party projects a 1981 need of 207 rheumatologists (1:118 000). This would require 16 new rheumatologists annually, which is within the capability of Canadian training programs.

The subcommittee disagrees with the recommendations. It says it may be a better use of manpower to improve the expertise of general internists and family physicians in this field rather than "attempting to ensure that every citizen with rheumatic disease has easy access to rheumatologists."

The subcommittee suggests a 1981 target ratio of 1:150 000.

Allergy

Canadian training programs could double, even triple their output of clinical allergists over the next 5 years and still not create oversupply, says the working party on allergy and clinical immunology.

The 151 clinical allergists identified in Canada in 1974 yielded a ratio of but 1:149 000. An appropriate ratio for Canada, one that would permit a reduction of the present average 35-day wait, would be closer to 1:100 000, says the working party. The requirements subcommittee agrees.

To achieve that ratio by 1981, Canada will require a total of 245 clinical allergists. Since it appears unlikely that many clinical allergists could be recruited from outside Canada, domestic training programs will have to be accelerated.

The working party expressed concern that the Royal College of Physicians and Surgeons of Canada has tended to overemphasize the academic and laboratory-oriented aspects of this field.

It is estimated that Canadian schools have averaged only four new clinical allergists a year for the past decade.

Dermatology

There are marked regional disparities in the distribution of dermatologists in Canada, with the prairie and Atlantic provinces grossly undersupplied, reports the working party on dermatology.

The report noted that the 250 dermatologists practising in Canada in 1974 accounted for a ratio of but 1:89 000. This is half the US equivalent.

To achieve a ratio of 1:65 300, which the requirements subcommittee agrees is more appropriate, Canada would require a total of 375 dermatologists by 1981. Correcting for attrition and population increase would mean 24 dermatologists should be added to the work force each year.

Currently, about 18 dermatologists enter practice in Canada each year, of whom 6 are foreign-trained. The working party recommends that output from Canadian programs be doubled and effective measures be adopted to improve distribution.

Neurology

A reorganization of the neurologist's work week to allow more teaching time, research and administration and a lessened patient load has been recommended by the working party on neurology.

Of a stock of 202 neurologists in the base year 1972-73, 76% were in full-time, fee-for-service practice, and these full-timers were working 40 hours a

week on patient services alone. This should be reduced to 30 hours, says the group.

To effect such changes and achieve a ratio of 1:85 000 by 1981 would require a total of 288 neurologists, says the working group. That would necessitate 21 new certificants per year; present training capacity should be able to handle that.

The requirements subcommittee, however, believes that the existing projection of neurologists is already "probably excessive" and suggests a target ratio of 1:90 000. The only shortage it recognized in this group was in pediatric neurology.

Pediatrics

Immigration of pediatricians should be stopped, except for a few with special qualifications, says the subcommittee.

Furthermore, requirements for pediatric subspecialties, such as genetics, allergy and immunology and gastroenterology, should be met from Canadian programs as much as possible.

In 1972-73 there were 1005 clinical, fee-for-service pediatricians, for a ratio of 1:21 600. Only 693 of these were classified as full-timers, however. The working party, proposing a ratio of 1:18 260, estimates that 1340 pediatricians will be required in 1981. To meet this 1981 target would require the addition of 77 pediatricians annually, but programs in Canada are already turning out 80 pediatricians each year.

The requirements subcommittee believes a ratio of 1:20 000 is adequate. One salient concern of the subcommittee appears to be use of "expensively trained specialists to render primary care to essentially healthy children."

Physical medicine

Canadian training programs need to double their output of physiatrists as soon as possible, reports the requirements subcommittee.

In 1974 there were but 121 physiatrists, with an average workweek of 40 to 54 hours of patient service.

The working party indicated there are now between 27 and 40 vacancies in Canada. If a ratio of 1:100 000 was established (and the requirements subcommittee agrees that would be appropriate) Canada would need 245 physiatrists by 1981.

This would mean adding 22 physiatrists to the work force yearly. Present programs graduate only 11.

The subcommittee recommends that departments of physical medicine and rehabilitation be supported at each medical school in Canada and that ap-

propriate measures including "financial inducements" be adopted to increase the attractiveness of the specialty for potential candidates.

Psychiatry

Sharply increasing the output of psychiatrist training programs, while continuing to facilitate immigration of trainees or trained psychiatrists, has been recommended by both the working party and the requirements subcommittee.

At present, Canadian psychiatrists work an average weekly 51 hours, 34 of them in direct patient care. This should be reduced to 48 hours, 35 of which would be an optimal clinical workload, says the working group.

In 1973, there were 1614 certificated psychiatrists in Canada, for a ratio of 1:13 714. Only about half, however, are full-time, fee-for-service physicians. There still is underservicing, particularly outside urban areas and in subspecialties such as child psychiatry, psychogeriatrics and forensic psychiatry, says the report.

The subcommittee recommends a ratio of 1:11 000 and says that to achieve this, training programs will have to expand to produce 141 new certificants per year. This means that by 1981 Canada should have 2225 psychiatrists.

The working party also shows concern about the dependence Canada has, and will likely maintain, on other countries. In 1972, 32.5% of certificated psychiatrists were foreign medical graduates.

Public health

The emphasis on community health services, as outlined by the federal government publication "A new perspective on the health of Canadians", has been clearly reflected in the report of the working party on public health.

The working party has recommended that the present complement of 490 public health physicians (365 general physicians with a primary interest in public health and 125 certificated specialists) will have to be increased substantially and rapidly.

The working party recommends 490 specialists, 96 university teachers and 500 primary care physicians by 1981.

The requirements subcommittee, though admitting "an urgent need for experts in community health", is less convinced that the new perspective will take shape so rapidly.

Without further information, crash programs to train large numbers of community physicians cannot be endorsed, says the requirements subcommittee report. Until the future shape of

community health services in Canada becomes better defined, the report recommends that the 1981 minimum requirements be maintained at their current rates (1:46 250) but that appropriate measures be taken to promote training in this specialty for potential candidates.

General surgery

A moderate increase in training programs for general surgery has been recommended by the working party and the requirements subcommittee.

The potential output from Canadian programs now is approximately 85 general surgeons annually. This rate should be increased to 96, says the subcommittee, an increase which is "not only desirable, but feasible."

Full-time, fee-for-service, general surgeons now appear to be averaging 60 hours of work each week, and this is excessive, says the working party. It recommends 55 hours, for a 45-week year. Of Canada's total of 2078 general surgeons, 1684 are full-time on fees for service.

The requirements subcommittee is also concerned about the effects of the shift in surgery away from general practice. If this trend continues, it might increase the workload for general surgery by approximately 15%.

The subcommittee recommends a ratio of 1:11 000 — equivalent to a total of 2234 surgeons by 1981, of whom 1862 would be full-time fee-for-service.

Cardiovascular and thoracic surgery

Some cutbacks in production of cardiovascular and thoracic surgeons, as well as tighter immigration restrictions, have been recommended by the requirements subcommittee.

The working party noted that in 1974 the stocks of cardiovascular and thoracic surgeons stood at 175 — very close to their target 1:124 000 ratio.

By adjusting for a more optimal workload — cutting back from 53 to 46 hours of patient service work per week, the working party anticipates a 1981 requirement of 210 surgeons, for a ratio of 1:117 000. The requirements subcommittee agrees this is justified.

This will require the production of seven new cardiovascular and thoracic surgeons annually. At present, between 15 and 20 residents in cardiovascular surgery complete their programs each year.

Neurosurgery

There is a crisis of oversupply looming in Canadian neurosurgery, says the working party.

In 1974 there were 158 practising neurosurgeons in Canada, for a ratio of 1:142 000. On the basis of a 1:166 700 ratio, which is considered appropriate, only 135 neurosurgeons were required, says the working party. Consequently, there is already an excess of 23.

Production since 1969 has averaged 11 newly certificated neurosurgeons each year, and there are currently 64 trainees in the 5-year program.

The requirements subcommittee recommends a cutback in the number of trainees accepted each year to not more than five and recommends that immigration of neurosurgeons be stopped.

Furthermore, each province should limit the number of hospitals permitted to have neurosurgical units and should limit the number of neurosurgeons licensed by each provincial licensing authority.

Obstetrics and gynecology

The current rates of production of obstetricians and gynecologists cannot be expected to meet Canada's projected need, reports the ob/gyn working party.

And if immigration is restricted "the problem (of undersupply) may become severe, adds the requirements subcommittee.

The working party revealed that in 1972 there were 1175 fee-for-service obstetricians and gynecologists, for a ratio of 1:18 400. They were working an average of 54 hours a week for 48 weeks a year on patient services alone — not including teaching and administration.

To achieve a more reasonable 48 hours over a 46-week year, 17% more obstetricians and gynecologists would be required right now.

Considering population growth and other factors, Canada should aim for a complement of 1577 obstetricians and gynecologists by 1981, for a ratio of 1:15 500 says the working party.

This would require 84 new certificants each year. At present, the annual output of training programs is but 55 to 60, of whom nearly half are foreign medical graduates.

The requirements subcommittee disagrees, arguing that a lower fertility rate will reduce obstetric services and that practice patterns should change, with general/family physicians assuming more responsibility for well-woman care and specialists more stringently restricting their activity to referral work. The subcommittee suggests:

- A ratio of 1:17 500.
- Increased Canadian production.
- More appropriate allocation of discipline responsibility for maternity and well-woman care.

Ophthalmology

The working party noted that at present Canada has 593 full-time, fee-for-service ophthalmologists and 127 part-timers. It also asserted that 10% of the ophthalmologic workload is performed by noncertified ophthalmologists or general practitioners.

Allowing for population growth and other trends, the working party recommends a complement of 887 ophthalmologists (1:27 600) by 1981. Of these, 733 would be full-time, fee-for-service practitioners. To achieve this would require adding an average of 23 ophthalmologists per year.

The requirements subcommittee recommends that a ratio of 1:28 000 be retained and that something be done to improve availability of primary eye-care services to cut the current long waiting time for a non-urgent appointment.

Otolaryngology

Reactivating interest in otolaryngology among Canadian medical students is deemed important by the requirements subcommittee.

To meet a projected 1:50 000 ratio, which the working party claims is optimal, the existing stock of 415 full-time, fee-for-service otolaryngologists (1:53 000) should be supplemented as soon as possible. The working party suggests 26 new otolaryngologists be added to the workforce each year between now and 1981, for a total stock of 490.

The subcommittee noted that, despite the capacity of Canadian programs to produce 35 to 38 otolaryngologists annually, recent production has varied from 14 to 28. In 1974, only 14 of 24 otolaryngology certificants of the royal college were Canadian trainees.

Orthopedic surgery

Despite a 112% increase in the number of practising orthopedic surgeons during the 1960s, the working party reports a pattern of regional maldistribution and a considerable shortfall from current needs.

The working party was able to identify 555 orthopedic surgeons in 1972, for a ratio of 1:39 000. Only 490, however, could be considered full-timers.

Optimally, says the working party, there should have been 580 full-timers. As well, an additional three orthopedic surgeons per half-million population are required, principally for teaching, research and administration. This would bring the total present requirement to 709, a ratio of 1:30 400, says the working party.

The questionnaire survey sent out by

the working party showed 92 openings for orthopedic surgeons in Canada.

If a ratio of 1:30 000 was applied, Canada would require 816 orthopedic surgeons by 1981. The requirements subcommittee noted that, because of regional disparities, a lot of orthopedic work is being done by nonorthopedists. The working party says this figure goes as high as 60%.

If this workload is to continue to be maintained by nonorthopedic surgeons, then a 1:30 400 ratio would appear to be adequate, says the subcommittee. Existing Canadian programs have that training capacity.

Plastic surgery

Plastic surgeon/population ratios currently range from 1:104 448 in Quebec to 1:526 000 in Newfoundland, says the working party.

In 1973, Canada's 172 plastic surgeons (146 full-time) worked an average 56 hours per week. This should be shortened to 45 hours, says the working party.

The optimal 1981 requirement, as recommended by the working party, was a ratio of 1:100 000. The requirements subcommittee agrees that a ratio of 1:100 000 would be sufficient. This would require no more than 13 certificants to be added each year.

At present, it is estimated that about 17 plastic surgeons are being certificated each year. The subcommittee urges a stop to immigration of plastic surgeons.

Urology

In 1972-73, there were 395 active, full-time practising urologists in Canada, working an average 55 hours per week for 48 weeks of the year, says the working party. This workload should be decreased to 52 hours over 46 weeks.

The working party, recommending a 1:50 000 population ratio by 1981 (in 1973 the ratio was 1:55 500), said Canada would require a total of 489 urologists in 1981. Allowing for attrition and population growth, training programs would have to produce 29 urologists per year during the forecast period.

Canadian training programs have the capacity to meet these requirements, says the working party. The requirements subcommittee agrees.

Anesthesia

If immigration of anesthetists is restricted, Canadian hospitals must face worsening shortages of trained anesthetists, the requirements subcommittee has been told.

In 1972, there were 1304 fee-for-service anesthetists in Canada, a ratio of 1:16 545. (The sizable amount of anesthesia practised by noncertificated specialists is emphasized.) Considering population growth and increased workload, the working party projects a 1981 requirement of 1781 (1:13 742).

The requirements subcommittee supports a 1981 ratio of 1:14 000. This would require an average annual production of 105 anesthetists. But the average annual turnout in Canada runs at 82. If this is not increased, the shortages will become even more acute.

The subcommittee urges encouraging more Canadian graduates into the field by making it more attractive and recommends encouraging foreign graduates to take anesthesia training in Canada. It also recommends that non-certificated anesthetists take not less than 6 months training in approved programs.

Medical biochemistry

According to the working party, Canada should have a ratio of 1:204 000 for medical biochemists. The requirements subcommittee agrees with this target.

In 1974, Canada had only 50 medical biochemists, for a ratio of 1:450 000.

If the optimal ratio is to be met, Canada will require a total of 120 medical biochemists by 1981. Canadian programs now graduate only three medical biochemists per year. To meet projections, 13 would have to be added to the workforce each year.

Consequently, the requirements subcommittee urges immigration be encouraged until training facilities and suitable numbers of candidates are developed in Canada.

Medical microbiology

With only 127 medical microbiologists practising in Canada in 1974 (a ratio of 1:177 000) the specialty falls short of meeting needs, particularly in less populated areas.

To meet a "minimal" ratio of 1:100 000, Canada should have 225 practising microbiologists right now, and to maintain that ratio by 1981, an additional 20 medical microbiologists would have to be added annually, says the working party. The requirements subcommittee agrees.

Only in Quebec, where income is directly related to productivity, has a sufficient level of medical microbiologic services been attained. In 1974, the royal college certified five medical microbiologists. The total number certificated in Quebec is not known, but it

has been shown that about one-third of all medical microbiologists in Canada work in that province.

Nuclear medicine

Training programs in this relatively small specialty should be carefully planned to avoid overproduction, suggests the requirements subcommittee.

In 1974 Canada had the equivalent of 80 physicians practising nuclear medicine full-time, for a ratio of 1:281 000. This calculation includes specialists from other disciplines with a part-time involvement in nuclear medicine.

Allowing for an improvement factor of 10% by 1981, the requirement would be for the equivalent of 89 full-time, nuclear medicine specialists to meet "the most limited staffing pattern". This would provide a ratio of 1:275 000.

The ideal staffing pattern, says the working party, would be 1:120 000.

The subcommittee, which recommends a ratio of 1:250 000, believes it can achieve this projection by producing the equivalent of three nuclear medicine specialists annually, and it appears that existing training programs should be able to handle this.

Pathology

Although the requirements subcommittee admits a marked shortfall in pathology manpower in Canada, it is not about to recommend dramatic increases in training programs until existing data are considerably more precise than they have been.

The working party, for example, recommends shifting the ratio from an existing 1:20 500 (based on 1096 full-time equivalents now practising in anatomical, general, and hematological pathology and in neuropathology) to 1:13 600 by 1981. That would require a total complement of 1798.

In proposing this ratio, the working party anticipates an increasing involvement in laboratory medicine in the future, a 10% annual improvement in services, new technology and demographic changes that would increase the requirements for anatomical and general pathologists by 14% between 1974 and 1981. Hematological pathology requirements would increase by 4%.

Such changes would require the equivalent of 102 full-time pathologists added to the work force annually, says the working party.

The subcommittee is, however, unconvinced about the methods used to calculate present stocks. Utilization data do not truly reflect workload, it says.

Until there are better data, the subcommittee recommends aiming for a 1981 ratio of 1:16 100, which would require a total complement of 1517 pathologists.

This would require the production of 73 new certificants in pathology per year: anatomical 37, general 33, hematological 3.

Diagnostic radiology

Current training programs appear to have the capability of meeting Canada's future needs for diagnostic radiologists, reports the requirements subcommittee.

In 1972-73 there were 1117 diagnostic radiologists in practice, a ratio of 1:19 600. As of January 1975, that ratio had improved to 1:17 916.

To reach a more optimal ratio of 1:15 300, which the working party recommends by 1981, the total complement of diagnostic radiologists would have to increase to 1599.

That would mean adding 97 new certificants to the work force annually up to 1981. The requirements subcommittee agrees with the 1:15 300 ratio and sees Canadian training programs as equal to the task.

Radiation oncology

Despite a relatively short waiting period for appointments (between 5 and 10 days), radiation oncologists will continue to be in short supply in Canada for some time.

The working party noted that as of March 1975, there were approximately 110 full-time radiation oncologists practising in Canada, a ratio of 1:206 000.

It appears that all except the Atlantic provinces and Manitoba share in this shortfall, says the working party.

Given the current prevalence of cancer deemed treatable, the working party calculates an existing shortfall of 37 full-time oncologists, and it recommends a ratio of 1:121 000.

To achieve this ratio by 1981, 28 radiation oncologists would have to be added to the rolls annually. This is four times the current rate of production.

Consequently, the requirements subcommittee sees no immediate relief from the heavy workload for therapeutic radiologists. It also feels that the supply-demand gap will not be closed by 1981, but it urges vigorous promotion of the specialty among medical students, and it encourages immigration of fully trained oncologists.

It also recommends some redistribution of existing health resources to allow radiation oncologists to concentrate on the radiation aspects of cancer treatment. ■