VOL. II

Royal Commission on HEALTH SERVICES

ROYAL COMMISSION ON

HEALTH SERVICES

1965—VOLUME II

II

ROYAL COMMISSION ON HEALTH SERVICES

95863—1½

CANADA

ROYAL COMMISSION ON HEALTH SERVICES

1965 -- VOLUME II

Available by mail from the Queen's Printer, Ottawa,
and at the following Canadian Government bookshops:

OTTAWA
Daly Building, Corner Mackenzie and Rideau

TORONTO
Mackenzie Building, 36 Adelaide St. East

MONTREAL
Æterna-Vie Building, 1182 St. Catherine St. West

or through your bookseller.

A deposit copy of this publication is also available
for reference in public libraries across Canada.

Price $5.00 Catalogue No. Z1-1961/3-2

Price subject to change without notice

ROGER DUHAMEL, F.R.S.C.
Queen's Printer and Controller of Stationery
Ottawa, Canada
1965

TO HIS EXCELLENCY

THE GOVERNOR GENERAL IN COUNCIL,

MAY IT PLEASE YOUR EXCELLENCY,

We, the Commissioners appointed by an Order in Council dated 20th June, 1961, to inquire into and report upon the existing facilities and the future need for health services for the people of Canada and the resources to provide such services, and to recommend such measures, consistent with the constitutional division of legislative powers in Canada, as the Commissioners believe will ensure that the best possible health care is available to all Canadians:

BEG TO SUBMIT TO YOUR EXCELLENCY

THE SECOND AND FINAL VOLUME OF OUR REPORT

CANADA

Elizabeth the Second

BY THE GRACE OF GOD

OF THE UNITED KINGDOM,

CANADA AND HER OTHER

REALMS AND TERRITORIES

Queen

HEAD OF THE COMMONWEALTH,

DEFENDER OF THE FAITH

ACTING DEPUTY ATTORNEY GENERAL

DEPUTY ADMINISTRATOR

TO ALL TO WHOM THESE PRESENTS SHALL COME OR WHOM THE SAME MAY IN ANYWISE CONCERN,

Greeting:

WHEREAS pursuant to the provisions of Part I of the Inquiries Act, chapter 154 of the Revised Statutes of Canada, 1952, His Excellency the Governor in Council, by Order P.C. 1961-883 of the twentieth day of June, in the year of Our Lord one thousand nine hundred and sixty-one, a copy of which is hereto annexed, has authorized the appointment of Our Commissioners therein and hereinafter named to inquire into and report upon the existing facilities and the future need for health services for the people of Canada and the resources to provide such services, and to recommend such measures, consistent with the constitutional division of legislative powers in Canada, as the Commissioners believe will ensure that the best possible health care is available to all Canadians and, in particular, without restricting the generality of the foregoing, to inquire into and report upon

(a) the existing facilities and methods for providing personal health services including prevention, diagnosis, treatment and rehabilitation;

(b) methods of improving such existing health services;

(c) the correlation of any new or improved program with existing services with a view to providing improved health services;

(d) the present and future requirements of personnel to provide health services;

(e) methods of providing adequate personnel with the best possible training and qualifications for such services;

(f) the present physical facilities and the future requirements for the provisions of adequate health services;

(g) the estimated cost of health services now being rendered to Canadians, with projected costs of any changes that may be recommended for the extension of existing programs or for any new programs suggested;

(h) the methods of financing health care services as presently sponsored by management, labour, professional associations, insurance companies or in any other manner;

(i) the methods of financing any new or extended programs which may be recommended;

(j) the relationship of existing and any recommended health care programs with medical research and the means of encouraging a high rate of scientific development in the field of medicine in Canada;

(k) the feasibility and desirability of priorities in the development of health care services; and

(l) such other matters as the Commissioners deem appropriate for the improvement of health services to all Canadians,

and has conferred certain rights, powers and privileges upon Our said Commissioners as will by reference to the said Order more fully appear.

NOW KNOW YE that, by and with the advice of Our Privy Council for Canada, We do by these Presents nominate, constitute and appoint Chief Justice Emmett M. Hall of the City of Regina, in the Province of Saskatchewan, Miss Alice Girard, Registered Nurse, of the City of Montreal, in the Province of Quebec, Doctor David M. Baltzan, of the City of Saskatoon, in the Province of Saskatchewan, Professor O. J. Firestone, of the City of Ottawa, in the Province of Ontario, M. Wallace McCutcheon, Esquire, of the City of Toronto, in the Province of Ontario, Doctor C. L. Strachan, of the City of London, in the Province of Ontario, and Doctor Arthur F. Van Wart of the City of Fredericton, in the Province of New Brunswick, to be Our Commissioners to conduct such enquiry.

TO HAVE, HOLD, EXERCISE AND ENJOY the said office, place and trust unto the said Emmett M. Hall, Alice Girard, David M. Baltzan, O. J. Firestone, M. Wallace McCutcheon, C. L. Strachan, Arthur F. Van Wart, together with the rights, powers, privileges and emoluments unto the said office, place and trust of right and by law appertaining during Our Pleasure.

AND WE DO HEREBY authorize Our said Commissioners to exercise all the powers conferred upon them by section 11 of the Inquiries Act and be assisted to the fullest extent by government departments and agencies.

AND WE DO HEREBY authorize Our said Commissioners to adopt such procedure and methods as they may from time to time deem expedient for the proper conduct of the enquiry and sit at such times and at such places in Canada as they may decide from time to time.

AND WE DO HEREBY authorize Our said Commissioners to engage the services of such counsel, staff and technical advisers as they may require at rates of remuneration and reimbursement to be approved by the Treasury Board.

AND WE DO HEREBY require and direct Our said Commissioners to report their findings to Our Governor in Council, and file with the Dominion Archivist the papers and records of the Commission as soon as reasonably may be after the conclusion of the inquiry.

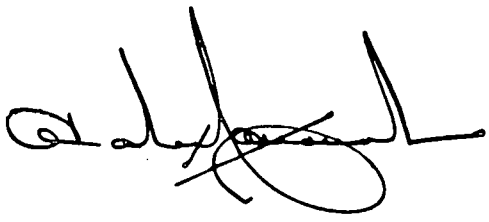
AND WE FURTHER appoint the said Chief Justice Emmett M. Hall to be Chairman of Our said Commissioners.

IN TESTIMONY WHEREOF We have caused these Our Letters to be made Patent and the Great Seal of Canada to be hereunto affixed.

WITNESS: The Honourable Charles Holland Locke, Puisne Judge of the Supreme Court of Canada and Deputy of the Honourable Patrick Kerwin, Chief Justice of Canada and Administrator of Our Government of Canada.

AT OTTAWA, this twenty-fourth day of July in the year of Our Lord one thousand nine hundred and sixty-one and in the tenth year of Our Reign.

By Command,



ACTING UNDER SECRETARY OF STATE

TABLE OF CONTENTS

	PAGE
Foreword	xvii
Chapter 1. BASIC REQUIREMENTS	1
Quality	1
Freedom within the Health Services Programmes	10
(1) Physician	10
(2) Patient	11
(3) Research and Innovation	12
Voluntary Organizations	13
Co-operative Planning	14
Research	15
Organizational Arrangements	17
Conclusion	18
Chapter 2. PHARMACISTS	21
Changing Role of Pharmacists and Adjustment in their Education	21
Supply and Distribution of Pharmacists	24
Pharmacy Graduates and Students	26
Demand and Utilization	29
Retail Pharmacy	30
Hospital Pharmacy	31
Pharmaceutical Industry	33
Staff of Schools of Pharmacy	34
Government Services	34
Armed Services	34
Pharmacy Organizations	35
Future Requirements and Supply, 1966 and 1971	35
Conclusion	36
Chapter 3. SELECTED PROFESSIONAL, TECHNICAL AND OTHER HEALTH PERSONNEL	39
Introduction	39
Paramedical Personnel	40
Employment of Selected Health Personnel, 1953 and 1961	42
Dietitians	48
Medical Record Librarians	50
Medical Technicians	52
Laboratory Technicians	52
Radiological Technicians	54
Operating-room Technicians	56
Other Technicians	57
Therapists	57
Physiotherapists	57
Occupational Therapists	60
Speech and Audiological Therapists	62
Medical Social Workers	63

PAGE

Chapter 3. SELECTED PROFESSIONAL, TECHNICAL AND OTHER HEALTH PERSONNEL—*Concluded*
Future Requirements and Supply of Selected Paramedical Personnel 65
Hospital Requirements 65
Total Requirements for Selected Paramedical Groups 68
Conclusion 69
Other Health Personnel 70
Optometrists 70
Opticians 74
Contact Lenses 75
Podiatrists 75
Drugless Practitioners 76
Chiropractors 76
Naturopaths 79
Osteopaths 80
Special Problems 80
Professional Titles 81
Radiography 82
Ambulance Services 84

Chapter 4. HEALTH RESEARCH 87
Sponsorship of Health Research 90
Federal Government 90
Medical Research Council 91
Functions 91
Grants-in-Aid 91
Personnel Support 92
Administration and Assessment 93
Associate Committee on Dental Research of the National Research Council 94
Functions 94
Grants-in-Aid 94
Personnel Support 95
Administration and Assessment 96
The Department of National Health and Welfare 96
Extramural Research 96
Intramural Research 97
Defence Research Board 98
The Department of Veterans Affairs 98
Queen Elizabeth II Fund for Research into Diseases of Children 99
Provincial Health Agencies 99
Voluntary Organizations and Foundations 100
Foreign Agencies 101
Expenditures on Health Research 101
Federal Expenditures 102
Provincial and Voluntary Organizations and Foundations 105
National Institutes of Health 105
Total Health Research Expenditures 106
The Inadequacy of Support for Health Research in Canada 107
Shortages of Personnel and Facilities 108
Other Problems 113
The Future Supply of Medical and Dental Scientists 114
Projected Spending on Medical and Dental Research, 1961-1971 116
Future Capital Expenditures for Medical and Dental Research 120
Hospitals 121

PAGE

Chapter 4. HEALTH RESEARCH—*Concluded*
Medical Schools ... 121
Dental Schools ... 122
Research and the Quality of Health Care ... 123
Health Sciences Research Council ... 125
Organization ... 125
Functions ... 126
Private Donations for Health Research ... 128
Conclusion ... 130

Chapter 5. HEALTH STATISTICS ... 133
Existing Situation ... 133
Improvement of Health Statistics ... 137
Future Statistical Requirements ... 137
Statistical Organization ... 142
A Health Statistical System for Canada ... 143
Conclusion ... 149

Chapter 6. VOLUNTARY HEALTH ORGANIZATIONS ... 151
Introduction ... 151
Development of Voluntary Activities ... 152
Current Programmes of Voluntary Organizations ... 161
Direct Services to Patients ... 161
Case-Finding, Diagnosis, Treatment and Rehabilitation Services ... 161
Community Nursing ... 163
Homemaker Services ... 164
Red Cross Blood Transfusion Services ... 165
Sick-room Supplies, Home Care Equipment, Appliances ... 166
Transportation Services, Hostels, and Sheltered Workshops ... 167
Research and the Education of Health Personnel ... 170
Research ... 170
Education of Health Personnel ... 170
Public Information, Health Education, and First Aid ... 172
Sources and Distribution of Funds ... 176
Sources of Funds ... 177
Distribution of Funds ... 185
Organization ... 186
Voluntary Health Organizations in Selected Countries with Comprehensive Health Schemes ... 188
United Kingdom ... 189
Denmark ... 190
Sweden ... 192
Norway ... 192
New Zealand ... 192
Israel ... 194
Conclusion ... 194

Chapter 7. ORGANIZATION OF HEALTH SERVICES ... 199
Recent Trends in Business and Government Organization ... 201
Recent Trends in the Organization of Health Services ... 204
Future Organization of Health Services ... 210
Provision of Health Services ... 210
Administration and Planning of Health Services ... 214
Provincial Administration ... 216
Federal Administration ... 220

PAGE

Chapter 7. ORGANIZATION OF HEALTH SERVICES—*Concluded*
Health Planning Councils ... 222
Federal-Provincial Co-operation ... 226
A Summary Description of Health Administrative Organizations ... 228
Provincial Health Services Commissions ... 228
Provincial Health Planning Councils ... 230
Regional and Local Health Planning Councils ... 231
Provincial Departments of Health ... 231
Federal Department of Health ... 232
Health Planning Council of Canada ... 233
Health Sciences Research Council ... 233
Federal-Provincial Health Services Co-ordinating Committee ... 234
Federal-Provincial Health Ministers Conference ... 234
Conclusion ... 234

Chapter 8. CO-ORDINATION OF HEALTH SERVICES AT THE COMMUNITY LEVEL ... 237
Introduction ... 237
Present Provision of Local Health Services ... 237
Emerging Patterns of Local Health Services ... 240
General Practitioner ... 240
Group Practice ... 246
Home Care ... 246
Preventive Services ... 248
Rehabilitation ... 250
Co-ordination and Health Services Administration ... 254
Regional or Municipal Organization ... 257
Conclusion ... 258

Chapter 9. HEALTH SERVICES IN THE NORTH ... 261
The Meaning of the North ... 261
Health Problems ... 265
Health Services Needed ... 266
Organized Flying Health Service Circuits ... 268
Other Services ... 269
Supply of Personnel ... 270
Integration of Planning and Services ... 272
Costs ... 274
The North in Canada and Elsewhere ... 275
Recommendations ... 280
Conclusion ... 284

Chapter 10. RECOMMENDATIONS ... 289

Appendices
Appendix A—Staff of the Commission ... 301
Appendix B—Studies prepared for the Commission ... 303
Appendix C—List of Text Tables ... 305
Appendix D—Subject Index for Volume I ... 307
Appendix E—Subject Index for Volume II ... 355

FOREWORD

In fulfilling our Terms of Reference, as provided for in Order in Council P.C. 1961-883, this Commission has presented its Report in two volumes. Volume I, tabled in the House of Commons on June 19, 1964, presented our main analysis of the health problems faced by, and the type and extent of health services available to Canadians, the gaps and inadequacies in such services, and what we consider the best means of meeting the needs of the nation in the various parts of the country, now and in the future, so as to ensure that the *best possible health care is available to all Canadians.* This, our second volume, rounds out our analysis in areas not covered in Volume I and it completes our Report.

We now spell out in Chapter 1 some of the basic requirements of the comprehensive Health Care Programmes which we recommended in Volume I, and dealt with in the analysis of that Volume, including the quality of health services and the freedom of both the providers and users of health services.

We then present, in Chapters 2 and 3, the requirements for health personnel not covered in detail previously, i.e., pharmacists, paramedical personnel, optometrists, opticians, podiatrists, ambulance personnel and drugless practitioners including chiropractors, naturopaths and osteopaths.

The expansion and organization of health research and the integration and development of health statistics are reviewed in Chapters 4 and 5, with the increased importance of voluntary health organizations in comprehensive Health Care Programmes presented in Chapter 6.

Planning, co-ordination and organization of health services, at the federal, provincial, and local and community levels, with special emphasis on the requirements of the Northland, are the theme of Chapters 7, 8 and 9.

We presented in Chapter 2 of Volume I our Recommendations 1-200. We offer additional Recommendations numbering 201-256 in Volume II, with the reasoning underlying these recommendations spelled out in the text, where appropriate. In Chapter 10, we pull together Recommendations 201-256, and include addenda to Recommendations 59, 61, 62, 80, 109 and 195 made previously in Volume I.

In preparing the estimates on costs of the over-all programmes for health care for Canadians, allowance has been made for the recommendations

which we include in Volume II.[1] Some upward adjustments would be required for the financial implications of expanded research and public health programmes, the provision of medical libraries and certain special requirements to provide adequate health services for the Northern areas recommended in Volume II. The amounts involved, while substantial in themselves and of great importance to the success of these two types of programmes, are comparatively small in relation to total expenditures so that, as we said in Volume I, the cost figures submitted earlier can, for all practical purposes, be taken as the cost of the over-all programmes.

In preparing the Report of the Commission, we had the competent assistance of our staff, as listed in Appendix A of this Volume[2] and immeasurable help from many scholars who have, singly or in teams, prepared 26 research studies for us, as listed in Appendix B.[3] In particular we express our appreciation for the valuable help received from Dr. J. J. Madden of the University of Western Ontario. The Commission held 67 days of public hearings in every province of Canada and in the Yukon,[4] and it received submissions and heard representations from 406 organizations and individuals,[5] as listed in Appendices D and E in Volume I.

We emphasized in Volume I[6] and we wish to repeat here that time is of the essence in the development of certain health services such as the implementation of crash programmes for the education and training of health personnel, the expansion and organization of health research, the introduction of children's dental programmes and the provision of expanded health services for retarded and crippled children. Similar urgency applies to the expansion of the scope of the Hospital Insurance and Diagnostic Services Act, particularly the inclusion of mental health hospital services under the coverage of that Act. In fact we are heartened by the initiative shown by some of the provincial governments which are proceeding with the development of extensive programmes of education and training of health personnel, and we refer particularly to the imaginative programme involving $100 million announced recently by the Ontario Government.

In other fields, no less important in the development of comprehensive and effective health services for all Canadians, haste should be made slowly because of the important long-term implications of the comprehensive programmes which we have recommended. We visualize that full implementation of the programmes may take seven years so that by 1971, Canadians would have all the health services which scientific genius and human skill can

---

[1] *See* Volume I, p. xxii.

[2] There have been some staff changes since the preparation of Volume I (*see* Appendix C, Volume I, p. 888).

[3] For detailed acknowledgements, *see* Volume I, Appendix A, pp. 881-885.

[4] *See* Volume I, Appendix D, p. 889.

[5] *See* Volume I, Appendix E, pp. 898-903.

[6] *See* Volume I, Chapter 2, pp. 91 and 92.

create. We have also presented evidence that given the continued economic expansion of our country, which is fully realizable, Canada will have the means in terms of qualified manpower, capital facilities and financing to undertake these programmes without in any way interfering but, on the contrary, strengthening the economic capacity and growth prospects of our country.

We recommended in Volume I that a Federal-Provincial Conference be convened within six months of the tabling of that Volume, to initiate the necessary planning and fiscal arrangements for the co-ordinated implementation of the programme as a whole and to reach agreement on the implementation of the Health Services Programmes we have recommended.[1]

A preliminary and exploratory conference has already been held and the Canadian Government has announced that further conferences are planned. We cannot emphasize strongly enough that the programme which we have recommended is one which will only achieve its desired objective for the *best possible health care for all Canadians* if it is developed in co-operation between the federal and provincial governments and in full consultation with the health professions, the providers of the services. The prime responsibility of the provinces in the field of health services must be borne in mind and account must be taken of the changing pattern of the federal-provincial fiscal and constitutional arrangements. The developing opting-out procedures in respect to federal-provincial shared programmes are, in our opinion, fully reconcilable with the over-all objectives of the comprehensive Health Care Programmes recommended by the Commission and we make this point clear in Chapter 10.[2]

Health needs will change, and so will the means of meeting these needs. Organizational arrangements and methods of payment as between the private and the public sectors will be altered. Federal-provincial shared programmes may and can become co-operative programmes. But whatever the method, the determining factor must be to provide Canadians with comprehensive Health Care Programmes which Canadians want and which the economy is capable of providing.

To be truly effective and to implement the programme within the seven-year period we have suggested requires a flexible approach on the part of the framers of the programme, a willingness to give and take, and a realization that health, like prosperity and happiness, is indivisible.

---

[1] *Ibid.*

[2] *See* addendum to Recommendation 195, p. 298.

1

Basic Requirements

This Second Volume of the Commission's Report has a number of purposes. Among the most important are the following:

(1) to treat those areas of health services and those categories of health personnel with which we were unable to deal fully in Volume I;

(2) to present proposals for organization and administration of the recommended health services programmes.

In accordance with its Terms of Reference the Commission was directed to make recommendations to ensure "that the best possible health care is available to all Canadians". We have construed "best possible" to mean "of the highest possible quality". We consider quality as the most essential element in health services and every aspect of the programmes must be constantly directed to that end.

Inseparably linked to quality are the freedoms of the health professions and the freedom of the public as potential patients. These freedoms must be spelled out in the basic legislation, safeguarded through appropriate organizational arrangements, and mutually respected. To achieve the primary objective of quality, we need the fullest participation, both in planning and implementation, of the health professions, health agencies, voluntary organizations, governments and of the public. What this entails is outlined in this chapter and developed further in Chapters 7 and 8.

QUALITY

Quality depends primarily on the supply, availability, knowledge, skill, and dedication of professionally qualified personnel, secondly, on the facilities at their disposal and, thirdly on the organization of the services. The preparation of qualified workers depends on the quality of the professional schools and in these there is a close relationship between the quality of instruction and the amount and quality of related research. Once graduated, the individual health practitioner is assisted in maintaining and improving quality by the requirements of his profession, standards for licensure, accreditation of hospitals, professional committees, continuing education, and the like.

Therefore, on the subject of quality, it cannot be emphasized too strongly that from first to last, quality of service rests in the hands of the medical profession, the dental profession, the nursing profession, and the other health professions. Judging from past experience, the Commission is convinced that with provision of the new and improved facilities, the extended financial assistance, and the organizational arrangements we have recommended, the professions working as individuals and in their collective capacities are an adequate guarantee that quality will continue to improve and, indeed, at a more rapid rate than in the past.

The Commission has been greatly impressed by the various factors that have contributed to rising qualifications of health personnel and the improvement of facilities, and its recommendations have been directed towards improving quality of education, more resources for continuing education, expansion of research, more thorough surveys of hospitals, more authority for professional bodies in the exercise of controls of standards and discipline, improved facilities in hospitals and group practice clinics, and greater participation of the health professions, particularly the medical profession, in the planning and development of health care programmes.

But there is a further element essential for high quality health care, and that is adequate time: time for investigation, time for diagnosis, time for the needed therapy. And this automatically raises the question of supply of health personnel in relation to the demands of patients. In the course of our hearings concern was expressed that the introduction of a universal programme of medical services would swamp the medical profession and automatically result in a deterioration of quality. The Commission made its recommendations for universal programmes with knowledge of this expressed apprehension and gave full consideration to all the evidence presented and, in particular, to the following:

(1) the Canadian Medical Association said, "Insurance to prepay the costs of medical services should be available to all regardless of age, state of health or financial status.";[1]

(2) the Canadian Health Insurance Association said, "(1) The plan will make medical care insurance available to everyone in Canada. (2) Insurance companies will make available to everyone, regardless of age, condition of health, occupation or geographic location, two standard policies of medical care insurance as described in Appendix II. These policies will be made available on both an individual and a family basis.";[2]

---

[1] *The Canadian Medical Association*, brief submitted to the Royal Commission on Health Services, Toronto, May 1962, p. 79.

[2] *Canadian Health Insurance Association*, brief submitted to the Royal Commission on Health Services, Toronto, May 1962.

(3) the programme in Alberta, drafted in co-operation with the Canadian Medical Association and the insurance industry, is designed to cover all residents of Alberta, those who will become insured by payment of their own premium and those who will be subsidized by government;

(4) the proposed Ontario Act is also intended to cover everybody, again with the two categories of those who will pay their own premium and those who will require subsidy. Both the Canadian Medical Association and the insurance industry support this plan.

It is clear that the two stated policies and the two government programmes intend that every Canadian will have, or will be entitled to have, prepaid coverage enabling each and every one to seek the services of a physician and then to receive the services which, in his physician's judgment, are required. By advocating these proposals, and supporting the two programmes, the Canadian Medical Association and the spokesmen for the insurance industry are clearly in support of universal coverage and, therefore, it is implicit in these proposals that the medical profession is confident that it is now capable of meeting *all the needs of all Canadians for physicians' and surgeons' services on a prepayment basis.*

The Medical Services Programmes recommended by the Commission[1] are intended to achieve this very same objective, that is, *to meet all the medical needs of all Canadians on a prepayment basis.*

We conclude, therefore, that if the medical profession spokesmen are confident that they can meet all the needs of Canadians if they are insured through profession-sponsored prepayment plans and the insurance industry, then there need be no less confidence in the ability of the medical profession to meet the needs under the Medical Services Programmes recommended by the Commission.

Nevertheless, even if the demand for medical services would be the same, regardless of whether universal coverage is achieved under the auspices of a voluntary plan, a private insurance plan or a government plan, the question of volume of demand does need further consideration.

The question is, how much more care will be demanded under universal prepayment? This obviously depends on the demand emanating from those not now insured who will have the economic barrier removed. And this is clearly related to the amount of care they receive now.

The Canadian Medical Association's brief to the Commission is explicit on this point:

> "It may be stated at the outset that relatively few Canadians have found that inability to pay for doctors' services is a deterrent to obtaining

[1] *See* Volume I, Chapter 2, Recommendations 1, and 30 to 38, pp. 19-21, and pp. 32-34.

> necessary medical care. Canadian doctors have long maintained the tradition of treating patients without regard to ability to pay and will continue to do so when circumstances warrant."[1]

In other words, there is a strong feeling among the profession that the basic needs of the uninsured population are being met, despite the serious economic consequences that may be borne by some patients and the burden of charity or of subsidy to others borne by the profession.

However, we do know that uninsured persons receive less care than do insured persons,[2] but the question is, should the 41 per cent of the population without *any* form of medical coverage in fact receive less care than the 59 per cent of the population with some form of protection?[3] In the opinion of the Commission the answer is no. The uninsured do require the level of health services available to the insured and the purpose of the universal prepayment programme we recommend is to make certain that the volume of essential services received by these uninsured eventually approaches the volume of essential care received by those adequately insured.

This, however, raises the question whether a prepayment plan encourages or induces a substantial volume of demands for unnecessary medical care simply because of the removal of the economic barrier to a desirable service. Is the increased demand arising from the introduction of a universal prepaid programme a demand for unessential health services?

There have been statements made recently by members of the medical profession in Canada that the introduction of a universal comprehensive prepaid medical care programme would lead to the unnecessary use of health services and they advocate as a remedy the policy of requiring the patient to pay part of the fee at the time he receives the service in order to induce a greater sense of responsibility in his demand for care.

But before applying such a remedy, it is essential that we be absolutely certain of the precise nature of the problem and, if the problem is correctly defined, that the remedy is, in fact, the proper one.

That the problem is incorrectly stated can be seen from the observations of the Medical Director of one of Canada's largest medical prepayment plans on the subject of utilization. He is Dr. W. B. Stiver, Medical Director of Physicians' Services Inc., Toronto, who wrote in the issue of July 13, 1963,

---

[1] *The Canadian Medical Association, op. cit.*, p. 81.

[2] Department of National Health and Welfare and Dominion Bureau of Statistics, *Volume of Health Care for Insured and Non-insured Persons*, Canadian Sickness Survey 1950-51, Ottawa: Queen's Printer, August 1961, p. 14.

[3] In 1961, over 7.5 million or 41 per cent of the population had no medical care insurance whatever, 1.0 million or 6 per cent were covered through membership in the Armed Services, R.C.M.P., the Swift Current Health Region or through programmes for the assistance to Indians, Eskimos, institutional residents and public welfare recipients, 9.7 million or 53 per cent of the population were covered through commercial insurance or prepayment plans, a sizeable proportion of whom had incomplete coverage. *See* Volume I, Chapter 18, p. 743.

of *News & Views on the Economics of Medicine*, a publication prepared by the Department of Medical Economics of the Canadian Medical Association:

> "There appears to be a body of opinion in the medical profession which is also shared by interested laymen that over-utilization is entirely due to the programs of our physician-sponsored plans in Canada in which comprehensive medical care, including first-dollar coverage, is offered to employed groups. If you listen to the proponents of this opinion, you would think that prior to the advent of such plans there was no such thing as over-utilization of medical care. We know that this is not so. We are all aware of the fact that the pattern of practice of individual members of the profession varies a great deal. We see every-day examples of the possibly insecure physician who in his enthusiasm, or for other reasons, overservices the majority of his patients. This type of practitioner has been with us for many, many years, long before comprehensive prepaid medical care on a "service" basis was brought into being by the profession. We also know that there has been a certain segment of the population which has always demanded a great deal of medical care and which will continue to make unreasonable demands if not brought under control by the medical profession. In my opinion these are the two basic factors in utilization."

The problem also is incorrectly stated in that it assumes that it is only the poor who "abuse" prepaid services. Obviously, it is only those in the low income groups for whom a part-payment would have any economic significance and thus deter the use of health services. But surveys of the use of medical services show an extremely high correlation between high incomes and high use of services.[1]

To the extent that over-utilization or demand for unnecessary services is a problem—and its existence, though limited, cannot be denied—it is one which cuts across all income groups and is not concentrated in the poor.

Even so, there still remains the question whether part-payments are the remedy. Again, it seems to the Commission that Dr. Stiver's views, gained from his extensive experience, are incontrovertible when he says in the same article:

> "We have in the medical profession today an opinion that the cure of over-utilization in prepaid comprehensive care is a combination of deterrents, deductibles and co-insurance now given the sophisticated name of "patient participation". It appears to me that the basis of this opinion is purely impressions. I know of no published work either in Canada or the United States which would indicate that patient participation has any worthwhile influence on utilization. We are told that it has, but I have yet to see a study that would substantiate such an impression."

---

[1] Department of National Health and Welfare and Dominion Bureau of Statistics, *Illness and Health Care in Canada*, Canadian Sickness Survey 1950-51, Ottawa: Queen's Printer, July 1960, pp. 49, 53 and 55, and Health Statistics from the United States National Health Survey, *Medical Care, Health Status, and Family Income, United States*, Series 10—No. 9, U.S. Department of Health, Education, and Welfare, Public Health Service, Washington, D.C.: U.S. Government Printing Office 1964, p. 24.

We are compelled to conclude, therefore, that a policy imposing part-payment would simply deter the poor and have no effect on the unnecessary demands of those in middle- and high-income categories. Such a policy would mean that Canada was simply continuing to ration health services *on the basis of ability to pay*, a policy which was overwhelmingly denounced in submissions to the Commission.

The entire proposition must be rejected on the basis of an incorrect statement of the real problem.

As suggested, the remedy for such over-demand and over-servicing as do exist lies in "control by the medical profession". Fortunately, one regulating factor—the appointment system—is a characteristic of the Canadian pattern of practice. It has been frequently argued that the introduction of universal prepayment in Canada will result in a duplication here of what are said to be the "crowded surgeries of the British general practitioner". What this overlooks is that in England the general practitioner does not, except in rare instances, conduct his practice on an appointment system. Consequently, to the extent that English surgeries *are* overcrowded, it is obviously related in part to the fact that the physician has no idea on a given day how many patients will present themselves for attention. The English system is different and, therefore, not relevant to Canada.

Except for emergencies, which will not automatically increase because of universal prepayment, the great proportion of patients in Canada go to a physician's office by appointment. Physicians thus largely control the number of patients they will see on a given day by the number of persons they accept for appointment. We realize that the appointment system is subject to interruption by emergencies, phone calls, requests for repeat prescriptions, and the like. Those who cannot be seen immediately must wait for an appointment.

With the introduction of universal prepayment programmes, in the first stage, some will have to wait longer for an appointment but this, we believe, is a more equitable form of making available physicians' services than at present on the basis of ability or, more correctly, inability to pay.[1]

How much will the waiting periods be extended in the short term, that is, in the first five years? Without trying to answer the question quantitatively, certain relevant points may be made:

(1) Home calls and night calls are obviously two of the most time-consuming and burdensome demands upon a physician. But changes in medical diagnosis and methods of treatment, aided by modern transportation, have made it both easier for and advantageous to the patient to call at the physician's office or to go or be taken directly to the out-patient department of a hospital where, in both cases, the

[1] We refer here particularly to the uninsured who are unable to pay for health services and who may be receiving inadequate or no services.

facilities for diagnosis and treatment are at hand. The trend to specialization within the profession also has emphasized the value of office and hospital services in preference to home visits.[1]

(2) There should be no important increase in night calls simply because there will be no relative increase in emergencies that require them. Emergencies such as heart attacks, strokes, acute anxieties, precipitate labors, etc., will continue to be unpredictable as to time, as will demands upon the obstetrician, but the fact of universal insurance will not affect the need arising therefrom. We know that events, such as accidents, epidemics and disasters, are translated into effective demand now.

(3) The experience of utilization of services under prepayment makes clear that the fact of prepayment does not result in an immediate release of pent-up demand. Rather, demand increases gradually as people become educated to the availability of services and their use. The statistics of utilization in Manitoba Medical Service, for example,[2] show the following pattern of demand for new subscribers over an eight-year period: (*a*) virtually no change over the period in the demand for in-hospital services, (*b*) a gradual rise in demand for home and office calls, resulting in an increase over the eight-year period of about one-third, (*c*) a gradual rise in demand for laboratory and X-ray services over the period, an increase totalling about 40 per cent, (*d*) a gradual rise in total services, amounting to about one-third. Stated in other terms, during the first two or three years of being insured, a person receives only about three-fourths as much care as the person insured continuously seven or eight years. Demand for services is thus a factor of education in their use.

(4) The Saskatchewan experience since 1962 does not appear to have created an undue burden either on physicians or patients resulting from the introduction of their Programme. If the fears expressed proved valid they could have been expected to produce excess demands on physicians' time. Moreover, all the provinces from Quebec west have a physician-population ratio equal to or better than that of Saskatchewan. The situation in the Atlantic Provinces is not as favourable and, therefore, active recruiting of personnel will be necessary. The rate at which demand will increase in this region will depend on the education and time factors mentioned above.

---

[1] We recognize, of course, that the home care programme we have recommended will increase the number of home calls, but it will do this by equivalent or greater savings on hospital calls.

[2] Berry, C. H., *Voluntary Medical Insurance and Prepayment*, a study prepared for the Royal Commission on Health Services, Ottawa: Queen's Printer, Table 6-9 (*in press*).

These are, as we suggest, the immediate short-run factors. Over the long run, say, after the first six or eight years, other factors will enter the situation.

A good deal of comment has centred on the contention that, whatever the short-run effects, the introduction of a universal health care programme will result in a deterioration of quality over the first ten-year period. We categorically reject this forecast and the reasoning underlying our judgment is as follows:

(1) There has been no suggestion that deterioration of quality will ensue if Canadians are universally insured through physician-sponsored prepayment plans and commercial insurance. Accordingly, we conclude that there is no more reason to assume that quality will deteriorate if universal coverage is achieved through government-sponsored prepayment. However, *if* deterioration will ensue under either method, then the problem becomes one of ascertaining why quality should deteriorate and of taking steps not only to prevent deterioration but to make certain that quality is improved.

(2) As we said above, one of the chief factors influencing quality of care is time for patients, and the chief factor determining available time is the ratio of personnel to population to be served. On this issue the Commission has realistically recommended a "crash programme" of immediate expansion of our medical, dental and nursing schools. The Commission has also recommended generous professional training grants to attract not only the best students but also to provide for an expansion and up-grading of the faculties of professional schools. For example, the provision of bursaries of $2,000 for medical and dental students in their final two years will attract into those professions a host of able young people previously denied such opportunity by the prohibitive costs of professional education. Adequate remuneration for interns and the up-grading of hospital teaching resources should induce more Canadian graduates to remain in Canada, as will the financial assistance for post-graduate specialization. And there are other factors that will improve quality and enhance the effectiveness and "productivity" of the physician: continuing development of new methods of treatment; new and more effective equipment; continuing discoveries of "wonder" drugs; the probability of a break-through in research in cancer, heart disease, or arthritis; rapid expansion of group practice clinics; closing of the distance between patients and physicians through modern means of communication and transportation; new emphasis on health education; and, not least, better organization and co-ordination of all health services. In view of all these expected developments it would, indeed, be a man of no confidence who would counsel despair or pessimism.

(3) Again, on the positive side, another factor to consider is that the insuring of a given population group has always attracted more physicians to give service, in part, because physicians' incomes are higher. Within three years of the introduction of the Swift Current Medical Insurance Programme the number of physicians practising in the region increased by nearly 50 per cent, while the population served remained relatively stationary. Moreover, even the Saskatchewan experience is encouraging. As we indicated in Volume I, it is our opinion that the introduction of that programme was attended by much unnecessary bitterness and disagreements, and should not, therefore, be considered as typical. No programme could really succeed without harmony. Prior to and immediately after its beginning there was both a decline in the number of physicians entering the province and an increase in those leaving, resulting in 1962 in a lesser number of physicians than in 1959 (878 compared to 972). However, as the programme settled down and as most of the anticipated anxieties did not materialize, there were, by July 1, 1964, 1,002 physicians or 124 more than in July 1962 (49 being Canadian graduates and 75 from abroad).[1] We can hope, therefore, that the introduction of universal insurance in Canada will reduce our present losses to the United States and will result in Canada becoming self-sufficient as the new medical schools are established and existing schools expanded.

(4) There is still another consideration, namely, the ultimate effects of modern preventive medicine on the volume of health services. The medical profession and other health organizations have had for a long period far-sighted and worthwhile programmes of public education directly and through the news media on the merits of regular examinations and early consultation of physicians at the first indication of any adverse health condition. The result of this has been an increasing awareness on the part of the public of the importance of consulting physicians at an early stage and on a continuing basis. The closer relationship between people and physicians augurs well for the future in that it will contribute to an improvement in the quality of medical services and will reduce the time needed for treatment and the costs that arise when early conditions are neglected.

The Commission does not wish to convey an impression that it believes that demands on our health resources will not increase. On the contrary, it is the purpose of the programme to increase services by seeing that all genuine health needs are met. Nor does the Commission believe that there

[1] Report of Saskatchewan College of Physicians and Surgeons, *Saskatoon Star Phoenix*, September 4, 1964.

will not be increased pressures on health personnel. There will be heavy demands upon physicians just as there are heavy demands upon physicians today. The crowded physician's office is not something new. It has been the normal condition since the end of World War II. The Commission does believe, however, that the demand will not be excessive in the early stages but will develop gradually. Parallelling that increase, the expansion of the educational facilities we recommend will provide the additional personnel necessary to meet these extra needs and to give the overworked physician the time not only for the performance of his professional duties but time for a normal life with his family and time for continuing education and research.

FREEDOM WITHIN THE HEALTH SERVICES PROGRAMMES

With quality of health care and its availability to all as a central theme of Volume I, the other major theme was freedom. Our recommendations concerning the provision of health services, rather than envisaging a centralized monolithic bureaucratic organization, are characterized by a desire for diversity, for the participation of all kinds of institutions, private, voluntary, professional and public, in meeting the health needs of Canadians. Freedom is a fundamental feature of the Health Services Programmes. The co-ordination of health services and the planning of future development of the Health Services Programmes is not to be concentrated in one centralized body. Rather, we see the closest co-operation among health professions, voluntary organizations, governments, and the public in establishing the paths along which the programmes will progress. Freedom, therefore, has three aspects: (1) its application to the physician, (2) its application to the patient, and (3) its application to research and innovation. We summarize here these points in the Commission's recommendations.

(1) Physician

The most fundamental feature of the programmes recommended is that they are based on free, independent, self-governing professions. The provision of and payment for services is to be the result of a negotiated contractual relationship based principally on the fee-for-service concept. The physician continues in private practice. He renders the service which, in his judgment, his diagnosis indicates. The state does not interfere in any way with his professional management of the patient's condition, nor with the confidential nature of the physician-patient relationship. *Only the manner of receiving payment is altered.* No one can seriously suggest that any one method of receiving payment is sacrosanct or that it has any therapeutic value. In fact, there is good reason to believe that eliminating the financial element at time of receiving service does have a salutary effect on the patient,

and on the physician-patient relationship. Moreover, any physician is free to practise independently of the programme, either wholly or partially. There will undoubtedly be some patients who, though covered, will elect to make private financial arrangements to avail themselves of the services of such physicians. In such cases, the physician would look for payment only from the patient. Such arrangements would operate independently from the programme we have recommended and thus would not be contrary to the principle of extra billing rejected by us.[1]

The emphasis on the freedom to practise should not obscure the fact that the physician is not only a professional person but also a citizen. He has moral and social obligations, as well as self-interest to do well in his profession. The notion held by some that the physician has an absolute right to fix his fees as he sees fit is incorrect and unrelated to the mores of our times. This nineteenth century *laissez-faire* concept has no validity in the twentieth century in its application to medicine, dentistry, law, or to any other profession, or, in fact, to any other organized group. Organized medicine is a statutory creation of legislatures and of parliament. When the state grants a monopoly to an exclusive group to render an indispensable service it automatically becomes involved in whether those services are available and on what terms and conditions.[2]

(2) *Patient*

The patient will be as free to choose his physician as he is now but it should not be overlooked that freedom to seek needed health services will be greatly expanded by accessibility to the services for another ten million Canadians by the elimination of the financial barrier between the patient and his physician.

The method of prepayment which we recommend in no way alters the individual's responsibility to use prudently and wisely the increased health services to be rendered by an expanding supply of health personnel and particularly the physician. We emphasized this point strongly in Volume I when we said:

> "The Commission believes that the individual's responsibility for his personal health and that of the members of his or her family is paramount to the extent of the individual's capacities. Briefs from the health professions and other experts, and studies by our research staff emphasize the wide scope that the individual has for the determination of his own health and well-being. With the near-disappearance of most communicable diseases, that range of self-determination has increased. Personal hygiene, cleanliness in the home, balanced diets, precautions against accidents, adequate rest, regular exercise, wise use of time for leisure and recreation; in short, temperate living—all of these are not only of first importance in the maintenance of health but are largely under the control of the individual, and in our opinion, are clearly his responsibility.

[1] *See* Volume I, Chapter 2, p. 29.
[2] *Ibid,* Chapter 1, p. 12, 8(c) and Volume II pp. 229 and 230.

> "However, in this day of advanced medical knowledge and skill, these are not enough. The individual must assume responsibility for wise and prudent use of health services, for periodic health examinations, including regular dental examinations, for assuring that the mother receives complete pre- and post-natal care, for seeing that children are properly immunized, and at the first sign of symptoms for consulting a physician or dentist. The wise use of available health services cannot be over-stressed. Much serious illness and unhappiness would be avoided if this were done. It goes without saying that since all such resources are scarce, it is the duty of the individual, as well as of the practitioner prescribing them, to see that the services are used with prudence and economy."[1]

This concept of freedom and responsibility on the part of the individual involves in no way a transfer to the state of any of his obligations for the maintenance and advancement of his health. The individual's responsibility remains paramount. Up to the present the principal impediment to the full exercise of that responsibility has been removed for only about half the population. The introduction of universal programmes throughout Canada will remove it for the other half.

We interpret "freedom" of the patient broadly to include his right to seek services wherever he may choose, including from physicians practising independently of the programme,[2] and the right to purchase from commercial and other carriers additional insurance coverage as he may see fit such as sickness income maintenance, adult dental services, and private duty nursing, etc., just as now, under the present hospitalization programme, he may purchase insurance to cover the cost of semi-private or private accommodation and of private duty nursing care, etc. Such an arrangement would be similar to recent developments in England where coverage may be purchased to pay for services received from a physician other than the one with whom the patient is registered.

(3) Research and Innovation

The Commission has also recognized that continuing improvements in quality, effectiveness, and efficiency depend upon the existence of an organizational structure that provides for freedom to do research and to innovate, and the opportunity for creative people to do new things, or old things in new ways. The existence of ten provincial programmes, the variety of ways through which health services can be provided within each programme, the stimulation of research provided by the Health Sciences Research Council and the increased number of University Medical Centres, enhance the likelihood of experimentation and innovation and assure as well as anything can in contemporary society that there will be an absence of conformity and constraint in adjusting to the changing patterns of future development.

---

[1] *See* Volume I, Chapter 1, pp. 3 and 4.
[2] *See* pp. 10 and 11.

VOLUNTARY ORGANIZATIONS

Another essential in this context of freedom is the opportunity for voluntary organizations to play their part, along with private practitioners and government bodies, in the future organization and provision of health services.

The Health Charter emphasizes "the necessity of retaining and developing further the indispensable work of voluntary agencies in the health care field", and the Commission's statement of basic concepts stresses the function of voluntary action as the mainspring for most progress in our open society. The full force of this mainspring must continue to be directed toward three major objectives:

(1) continuation, expansion and modification of existing programmes;
(2) the ascertaining of existing unmet needs;
(3) experiment and innovation in developing new programmes to meet those needs.

It is in these ways, as we said, that progress will continue and, we believe, at an accelerated rate.

We are aware, of course, that the introduction of ten provincial Health Services Programmes on the scale we have recommended will inevitably affect most, if not all, of the existing voluntary health agencies in Canada. For many, the comprehensive services will mean the achievement of objectives for which they have worked for many years and a lesser need for soliciting funds; for some, it will mean released funds which will enable other aspects of their programmes to be strengthened; for others, it will mean increased responsibilities and activities as their services are sought by provincial programmes.

Unfortunately, there has been in the minds of some people a tendency to categorize action in the health and welfare field as being either strictly voluntary or strictly governmental and to assume, further, that any extension of government action must be to the detriment or at the expense of voluntary action. Whatever validity this view has elsewhere, it has no validity in Canada. On the contrary, what is most striking about Canadian experience is the extent to which governments at all levels have fostered and assisted in the financing of voluntary organizations, joining with them in the achievement of mutual objectives. For example, in 1963-64, over $250,000 in grants were made available by the Department of National Health and Welfare to national voluntary agencies. The National Cancer Institute, a voluntary research agency, receives over $2.5 million annually from joint Federal-Provincial grants. About 15 per cent of the revenues of the Canadian Arthritis and Rheumatism Society come from government sources. Also through the National Health Grants Programme assistance has been given to pro-

vincial heart foundations for research and assistance to societies for crippled children, cerebral palsy, tuberculosis, mental health and rehabilitation. Often this assistance has taken the form of matching grants from both the federal and provincial governments.

But there are other forms of voluntary agency-government relationships. One of the most important is through the purchase, on a fee basis, of services provided by voluntary agencies, perhaps the most typical being the services of visiting nurse and homemaker organizations. Undoubtedly one of the most dramatic examples of joint voluntary agency-governmental co-operation is the Blood Bank service of the Canadian Red Cross and the provincial hospital insurance plans. The voluntary agency performs a service that government probably could not achieve or could achieve only with difficulty and high cost. Governments, on the other hand, assume financial responsibility of a magnitude beyond the capacity of voluntary effort.

Still another way in which co-operation is achieved is through the appointment of voluntary advisory committees to health departments and the appointment of government officials to the boards of directors of voluntary agencies. These provide for a continuing exchange of information and opinion and assist greatly in achieving progress in the health field. We foresee a major expansion of this type of consultation and joint endeavour through the establishment of advisory committees and health planning councils recommended elsewhere in our Report.[1]

We believe this pattern of voluntary agency-government co-operation to be a highly desirable characteristic of our Canadian democracy; we believe it will be expanded. Both types of agency have specialized functions to perform, and it is evident from the many briefs submitted to us and from our own findings, as well as from the examples of other countries, that there is more to be done in raising the level of well-being of all our citizens than the combined efforts of individuals, voluntary agencies and governments can possibly accomplish in the foreseeable future.

CO-OPERATIVE PLANNING

Another feature designed to ensure that the Health Services Programmes meet the needs of the present and are adapted to meet the changing needs of the future is the provision for representative Health Services Commissions and for advisory health planning councils at regional, provincial and federal levels. These will present adequate opportunities for assessment of needs, evaluation of programme performance, and sound planning for the future. Although planning councils will have only advisory functions, their authority will depend upon their wise use of the broad information available to them and on the quality of their recommendations. Considering the impact

[1] *See* Chapters 7 and 8.

on public opinion and on the commissions that such recommendations will create, their influence on the availability and quality of service should be enormous. The members of these councils will know that the enlightened self-interest of the public will be best served by making the health programmes so excellent that not only are the people well served, but the health professions become so attractive that an expanding stream of highly qualified young people are annually recruited to them.

We see these planning councils becoming important forums where informed lay people and representatives of professions, voluntary associations, and governments meet together to examine, consider, weigh, and plan for the improvement of health services. With the full and free flow of information among these various groups, together with a similar flow among federal, provincial and regional councils, planning for health services in Canada should move forward on a basis of fact and informed opinion of purposes, methods, and costs, not previously experienced.

RESEARCH

Research and education are the prime movers of the twentieth century. It is these two forces that account for the extraordinary advances in science, technology, and skill on which our health services now so greatly depend.

Although Canada is justifiably proud of the scientific contributions of many of its researchers, some of whom are world-renowned, the facilities and financial resources needed to support health research have not kept pace with the expanding needs of this dynamic field. In particular, we have been informed that teachers in Canadian medical schools, with the ability to do high quality research, have been insufficiently supported with staff so that their teaching and administrative responsibilities reduce their research output. The inadequacy of teaching budgets has had as its consequence the loss of Canadians of great promise to the United States.[1]

It is evident that Canadian governments have not given priority to the needs of health research, this despite the large sums that have been made available for treatment services. In 1962-63, expenditures by the Federal Government for the support of medical and dental research—including pharmacological research—amounted only to $11.3 million of which $8.5 million was allocated to universities and associated institutions.[2] The limited nature of this support has meant that health research in the universities has been restricted partly through the inability of universities to afford qualified personnel and partly through the difficulties faced by university personnel in obtaining adequate research funds.

[1] MacFarlane, J. A., *et al., Medical Education in Canada,* a study prepared for the Royal Commission on Health Services, Chapter 10, Ottawa: Queen's Printer (*in press*).
[2] *See* Table 4-3.

The limited support of Canadian governments[1] has been offset, to some extent, by grants from the United States Government through the National Institutes of Health. In recent years these institutes have provided substantial funds for the support of research in medical, dental and other scientific areas by Canadians in Canadian universities. In 1962-63, this support amounted to $2.3 million.

However, since the completion of Volume I of our Report, the United States Government has indicated a modification of this policy and in the future Canadians will be eligible for American research funds on a progressively reducing scale. It is not simply a matter that this loss will put a stop to much important research in Canada; the real danger is that there will be an immediate exodus of highly qualified researchers, an acceleration of the "brain drain" that has traditionally depleted Canada's resources. This is a crucial shortage that even the expenditures of very large sums of money in a short period of time can correct only with difficulty. To a considerable extent, qualified research workers in Canada now obtain some support from government, voluntary or foreign sources for their research activities. The funds are not sufficient to do all that could be done, but few go without funds altogether. What limits research even further is the scarcity of personnel engaged in medical and dental education who carry out health research as part of their normal activities. Manpower shortages, arising from the failure to expand medical and dental educational facilities, besides limiting the supply of physicians to care for the health of Canadians, also have limited the amount of health research.

The withdrawal of United States support only adds greater urgency to the actions we recommend to expand greatly the facilities and trained manpower needed both to provide for medical and dental education and health research in Canada. While there is no absolute and objective gauge of what would constitute adequate funds for health research, there are clear indications that support, both in the past and present, has been insufficient.

Moreover, research in the field of health must be expanded. The case for expansion of pure and clinical research is self-evident and generally accepted. Not only is the expansion necessary for the direct contributions to prevention and treatment that will ensue, but because of the contribution to improved teaching in our professional schools that will result. But one of the most important areas for expansion is that which has come to be called "operations research". We need to evaluate existing health programmes as well as the new ones to be established. We should be undertaking compre-

[1] Although it is difficult to make an absolute judgment about the priorities in types of research, it is worth pointing out that the United States Government allocates 4.8 per cent of all its research expenditures to health and welfare and the Canadian Government allocates only 2.0 per cent to this field. *See* Organization for Economic Co-operation and Development, *Science, Economic Growth and Government Policy*, Paris: The Organization, 1963.

hensive analyses of hospital design, of the desirable relationships between chronic, convalescent and active treatment services, of the effectiveness of current health education methods, of the possibility of improving methods of processing physicians' accounts in the prepayment plans, of maximizing the participation of private physicians in public health, of the value of multi-phasic screening, of the curricula for professional training, of administration in hospitals, of use of nurses' time; the list is endless, and the possibilities of improvement unlimited.

It is only through intensified research that we can hope to come nearer the solution of many of our serious health problems. We cannot sit back and let others do the research from which we may hope to benefit. Just as we share health problems with other countries, we also share the obligation to contribute to their solution. We are as much concerned as others with the advancement of knowledge in this field and, last but not least, we can attract and hold qualified personnel only if they are given the opportunity to carry out research in the subject matter fields of their choosing. This applies to those practising in the health professions as well as those who are to teach the coming generations of practitioners and researchers alike.

ORGANIZATIONAL ARRANGEMENTS

In Chapters 7 and 8 we turn to a discussion of how to improve the organization and co-ordination of our health resources and services to make them more effective in achieving our health goals. As we indicated in Volume I, the health services area of our economy lags behind other areas in developing the means whereby the totality of our knowledge and skills is made available to potential patients. Much progress has been made and these chapters, although breaking no new ground, do consider ways and means of building upon and extending methods already in operation.

The proposals with respect to planning and organization reflect the main theme of our other recommendations: the emphasis on freedom of professions and the availability of high quality care. In short, the objective is to create (1) democratic planning councils that will be concerned with long-range planning and (2) independent health services commissions that will be representative of professions, public and government. By these two types of organizations the people of Canada can be assured that their true needs are met and the professions can be certain that there will be no interference in their freedom to practise as their own high standards dictate. These arrangements will also provide for a much greater degree of co-operation on the part of professions, voluntary organizations, and government agencies than is possible now. The Commission is convinced that by the development of the Health Sciences Research Council we shall obtain more and better information on which decisions can be made. By the development of national,

provincial and regional planning councils we can make certain that the information is used to make the right decisions. By the establishment of the representative Health Services Commissions we can ensure that the decisions are acted upon to improve quality, make service more readily available, close gaps, and remove duplication and fragmentation.

We visualize these organizational arrangements to take full effect over the period 1965 to 1971, as the broad range of health services, educational, research and capital facilities programmes which we have recommended are implemented.

In Chapter 9, we deal more specifically with the necessity to regard health services in the North as an integral part of a broader programme embracing education, housing, sanitation and employment opportunities without which no real or permanent progress can be achieved.

CONCLUSION

The principle which has dominated our thinking is that money spent on essential health care is money well spent, an investment in human resources that will pay handsome dividends not only in terms of economics but in human well-being. It is, however, an investment in which all Canadians must have the opportunity to participate. We felt compelled to adopt the relatively simple method of having the Federal Government and the Provinces subsidize ten provincial insurance funds rather than the cumbersome device of subsidizing millions of individuals because it is evident that this is the only way to guarantee accessibility to the health services *all* are entitled to seek and to have.

The right to education is one now universally recognized in Canada. It is an entrenched right which no one would dare to challenge. It is now beyond question that all our young people must be better educated and more competently trained if Canada is to survive in this highly competitive age of specialization and automation. It is equally true that health services are as much an investment as education. Health services and education must now be regarded as twin endeavours, advancing mankind. Neither will attain its full potential for good if one is allowed to lag behind the other. Progress in one must be paralleled by progress in the other. The fruits of this progress must be available to all—not just to those whose incomes are high enough to pay the premiums demanded to provide coverage against expenditures for physicians services alone, but to everyone, and for the whole range of health services, including hospital care, dentistry, drugs, home nursing, and optical services.

No matter how successful our health services, however, and regardless of ways and means of preserving and maintaining good health, there are limitations, imposed by nature, to life and health, which mortal man must accept.

The fruits of research and better health will nevertheless further extend the life span from the three score years and ten which Canadians have already reached. We have referred to the many hazards in our environment such as radioactive fallout and other forces and substances, as yet not fully recognized or evaluated in their effect upon the health of the living and, through genetic effects, also upon the life and health of yet unborn generations. The recognition and control of them and other hazards, both natural and man-made, remain among the great challenges to health research and its application by the individual and by the health services at his disposal.

What we have tried to avoid is the perpetuation in Canada of dual classes of citizenship, one of which will be inferior or second class merely from the fact of the disparity in incomes. All must have access to needed health services through the same door. Canada cannot have millions of its citizens obtain health services through a back door bearing the sign, "This way for those to be means tested".

We cannot emphasize too strongly that health services are not "welfare" services, although it is only too true that lack of health services leads directly to the need for welfare services. Welfare costs attributable to poor health conditions and services have long been a charge on the public sector of the economy. As we said in Volume I: "Many of our so-called 'welfare' expenditures are the end result of illness, disability, and premature death. Not all of these expenditures are avoidable, of course, but clearly many of them are".[1] But there is no sharp line dividing cause and effect in these fields, for many health expenditures are occasioned by inadequate living conditions. Expenditures in the public health field have also long been a charge on the public sector and every inhabitant, rich or poor, has benefited from them. These services are necessarily provided by government at some level because they affect all citizens. They exist to guard against the spread of contagious disease and to secure public safety, and thus involve community action.

Personal health services and public health services complement each other. But personal health services are only one aspect of the total health problem. That personal health services should engage public interest far greater than all the other services is natural because it is an area where new ideas and important changes are rapidly appearing. Contemporary prepaid medical services insurance is in this category. Prepayment plans were introduced by voluntary non-profit agencies, by hospital associations, by the insurance industry, and more extensively by the medical associations. The value of their experience is great. The popular demand for prepayment coverage is evident in the number enrolling in these plans, and is underscored by the proposals to the Commission to extend prepaid insurance to cover everybody regardless of age or condition. To accelerate the achievement of this

[1] *See* Volume I, Chapter 1, p. 6.

objective, we recommended Canadian-designed Health Services Programmes organized on a provincial basis and to be developed in stages. The personal health services would be financed by an insurance mechanism best suited to the needs of all Canadians, and which offers the best possible incentives and encouragement to all those upon whom these services depend. As we have said, the central figure in the personal health services complex is the physician; he alone is directly connected with all the related health service branches and all other health professions.

It is implicit in the term "health care" that the services be comprehensive. The sum total of all health services comprises comprehensive health care. We recommend what must be made available—the instruments for planning, education, research, co-ordination, and implementation. At the same time, there is no compulsion to render services or to utilize those that are made available. The providers of, and those who utilize, the health services share equal responsibility in the supply, availability, and prudent use of the services and facilities.

As we have been careful to point out, good health care is expensive and we have been realistic in our estimates of costs. We have deliberately taken a cautious view by projecting only an average increase in the annual output of the economy and a high estimate of increasing costs of health services. But two things must be clearly appreciated: first, the only thing more expensive than good health care is inadequate or no health care; and second, the bulk of the expenditures to be made on health care will be made even if there are no programmes. Such increases as will occur will result from higher quality services and an increase in volume of services received by people who were previously uninsured. There will be no increase in total costs resulting from the shift of health expenditures from the private to the public sector of the economy. In fact, as we have shown, there will be substantial savings through lower administrative costs.[1]

We have in Canada a land of immense resources. We must use them for the good of all Canadians. We have here an opportunity to build upon the northern half of this continent a nation of educated and healthy people. Nature itself favours such a possibility. Admitting that climatic conditions in the northern areas are often forbidding, nevertheless the country as a whole is singularly free of those hazards to good health to be found in so many parts of the world. It is for us so to organize our resources in harmony with our favoured situation that Canada may become a showplace of man's humanity to man. We will rightly stand condemned by history if we fail to do what our people need and what our resources and our know-how make readily possible.

---

[1]*See* Volume I, Chapter 18, p. 745.

2

Pharmacists

The growing importance of drugs and medications in therapy makes it important to consider the changing role of pharmacists in the provision of health services during the last fifty years or so in Canada, the corresponding adjustment in their training and formal education, and to present certain basic information about their number, geographical distribution, recruitment, utilization and other characteristics. The Commission's recommendations concerning the introduction of a Prescription Drug Benefit within the Health Services Programmes[1] require also an estimate of future requirements and expected supply of pharmacists in this country.

CHANGING ROLE OF PHARMACISTS AND ADJUSTMENT IN THEIR EDUCATION

Pharmacy may be defined as the profession whose contribution to health services is the preparation and distribution of drugs used in the diagnosis, treatment, and prevention of disease. To be licensed to practise, the pharmacist in almost all provinces must qualify by successful university training and satisfy provincial licensing legislation.[2] His principal duties include the compounding and dispensing of drugs prescribed by physicians and dentists, the determination of their potency, toxicity, therapeutic activity,

[1] *See* Volume I, Chapter 2, Recommendations 58-60, p. 41.

[2] Licensing of pharmacists in Canada is the responsibility of the provincial statutory bodies which are charged with the administration of the Pharmacy Professional Act, or its equivalent, in their respective provinces. Such licensing is granted on the basis of differing combinations of academic qualifications and internship (usually 12-18 months) from one province to another. However, professional licensing is principally required of pharmacists in the retail practice of the profession. The provinces of Saskatchewan and British Columbia require also that all hospital pharmacists be fully licensed. The degree of Bachelor of Science in Pharmacy is a prerequisite to licensing in all provinces except in Newfoundland where formal training in pharmacy is acquired through the master-apprenticeship method and administered by the licensing body itself.

dosage form, potentiality as compared with other drugs, synergism in combination, and the application of legal procedures in the use of drugs. Pharmacists' knowledge must also include the standardization, analysis and critical evaluation of medical materials and pharmaceutical preparations.[1] Pharmacists are employed in retail pharmacies, hospitals, government laboratories, manufacturing pharmaceutical establishments, and by drug distributing firms. The pharmacists who complete graduate studies may also be engaged in research and teaching.

Since the beginning of this century, and particularly, during the past two or three decades, rapid and significant developments in drugs have altered the nature of the practice of pharmacy which have necessitated a change in the education and training of pharmacists. The education of pharmacists prior to Confederation was informal and the training followed the master-apprenticeship system of qualifying for the handling and dispensing of drugs. The pharmacist carried in his dispensary only a small number of medicines and the prescriptions demanded only a limited knowledge of mixing and compounding techniques. The training then was designed for this type of practice. Later in the nineteenth century, formal education was introduced when specific course requirements plus internship were demanded by provincial pharmaceutical organizations; such courses were usually of one to two years' duration at the end of which a diploma was granted. Gradually, however, the formal training of pharmacists was turned over to recognized universities while licensing continued to be the responsibility of professional associations, operating under provincial legislative authority.

The development of new drugs such as antibiotics, tranquilizers, antihistamines, steroid hormones, and other chemical agents, has imposed new tasks and responsibilities on pharmacy practitioners. Twenty-five years ago, about three-quarters of the drugs and chemicals used in today's modern therapy were unknown. Formerly, the introduction of a new medicament was rare, whereas at present over 400 new preparations appear annually. To operate an efficient pharmacy today requires thousands of compounds and preparations.[2] There is every indication that the discovery of new drugs and medicaments will continue unabated, because of the increased emphasis on research and the active search for remedies for cancer, mental diseases, cardiac conditions and other chronic diseases.

The discovery and development of the new drugs and medicines require expensive manufacturing equipment, research facilities and highly trained personnel. No longer is the pharmacist expected to extract, synthetise, prepare and compound the new medicaments. During the last two or three

---

[1] *The Canadian Pharmaceutical Association, Inc.*, brief submitted to the Royal Commission on Health Services, Toronto, May 25, 1962, p. 10.

[2] Morrison, F. A., *Recruitment, Education and Utilization of Pharmacists in Canada*, a study prepared for the Royal Commission on Health Services, Part II, Chapter IV, Ottawa: Queen's Printer (*in press*).

decades the method of dispensing drugs has completely changed. A quarter century ago, approximately 80 to 90 per cent of the prescriptions written required basic compounding, but today quite the opposite is found to be the case as approximately nine-tenths of all prescriptions call for precompounded medications, while the remainder requires compounding by the pharmacist.[1] The role of the pharmacist as a compounder and chemical formulator has changed largely to one of the dispenser of complex drugs.

The fact that medication is largely precompounded in no way lessens the educational requirements of the modern pharmacist to prepare him for the safe handling and dispensing of the large number of pharmaceuticals currently available and new items coming on the market in increasing numbers and varieties. It has been suggested that a retail pharmacy today is becoming gradually a "public health information centre" and a pharmacist a "consultant on drugs" for the community.[2]

In the light of these changing conditions, the Canadian Conference of Pharmaceutical Faculties in 1950 approved a four-year university curriculum after Senior Matriculation or its equivalent as the requirement for the degree of Bachelor of Science in Pharmacy.[3] The extension of the period of education from three to four years of university training along with its broadening in scope to include professional courses indicated the desire to keep pharmaceutical education both professional and broadly based.[4] By 1962-63 this programme was accepted and implemented by the eight schools of pharmacy.[5]

All programmes offered in Canadian pharmacy schools provide for specialization at the undergraduate level in retail, hospital, and industrial pharmacy. Since 1958 every school has expanded its facilities and when present building programmes are completed, these facilities will have increased by at least 50 per cent. In 1962 it was stated that this expansion would ". . . serve the needs of the undergraduate programme with its foreseeable future enrolment for the next five years".[6]

Graduate degrees are offered in six schools, three of these (the universities of British Columbia, Saskatchewan and Manitoba) offer the Master of Science (Pharmacy) only, and the other three (the universities of Alberta, Toronto and Montreal), the Doctor of Philosophy (Pharmacy).

---

[1] *Ibid.*

[2] *Ibid.*, Part II, Chapter I.

[3] In the case of the Maritime College of Pharmacy admission is based on Junior Matriculation and in the two schools in the Province of Quebec a baccalaureate degree or its equivalent is required.

[4] Of the total study time (3,200 hours), 15-20 per cent was devoted to the humanities and 30-35 per cent to the basic sciences.

[5] In 1962-63, the Faculty of Pharmacy at the University of Alberta offered as an optional course a four-year programme following Senior Matriculation leading to a Bachelor of Science in Pharmacy (Honours). The present requirement for licensing in Alberta, however, is a three-year degree programme, Morrison, *op. cit.*, Part II, Chapter I.

[6] Morrison, F. A., *op. cit.*, Part II, Chapter II.

Until five years ago, candidates for the Ph.D. degree in pharmacy had to study outside Canada while the M.Sc. (Pharmacy) degree has been available in Canada for a somewhat longer period of time. These programmes provide pharmacists for research and teaching in Canada.

Five of the eight pharmacy schools are autonomous organizations within their university administration; the other three are parts of other faculties. Thus, at the universities of Manitoba, Laval and Dalhousie, the School of Pharmacy is located in the Arts and Science Faculty, the Faculty of Medicine, and the Faculty of Health Services respectively.

SUPPLY AND DISTRIBUTION OF PHARMACISTS

The total number of pharmacists in Canada is difficult to assess. A survey undertaken on behalf of this Commission revealed that in 1962 there were 9,401 pharmacists practising in Canada.[1] This count is incomplete as not all pharmacists responded to the survey questionnaire but based on the number identified, the population-pharmacist ratio in Canada in 1962 was 1,975. Of the pharmacists identified, 9,166 were licensed, the remainder practising in hospitals where a licence is not a prerequisite for practice.

TABLE 2-1 POPULATION-LICENSED PHARMACIST RATIOS, CANADA AND PROVINCES, 1955 AND 1962

Province	1955	1962
Newfoundland	4,721	4,393
Prince Edward Island	2,857	2,944
Nova Scotia	2,970	3,202
New Brunswick	3,162	3,679
Quebec	4,873	3,530
Ontario	1,487	1,575
Manitoba	1,607	1,535
Saskatchewan	1,682	1,691
Alberta	1,875	1,829
British Columbia	1,392	1,425
Yukon and Northwest Territories	14,500	7,800
CANADA		
Population-Licensed Pharmacists Ratios	2,070	2,026
Number of Licensed Pharmacists	7,584	9,166

SOURCE: Ross, T. M., *Pharmacist Manpower in Canada*, a study prepared for the Royal Commission on Health Services, Chapter 2, Ottawa: Queen's Printer (*in press*).

[1] Ross, T. M., *Pharmacist Manpower in Canada*, a study prepared for the Royal Commission on Health Services, Chapter 4, Ottawa: Queen's Printer (*in press*).

Because detailed information is available concerning licensed pharmacists only, the ensuing analysis excludes those who hold a university degree in pharmacy and practise their profession but are not licensed. The number excluded is small and would not affect the analysis significantly.

Between 1955 and 1962 the number of licensed pharmacists increased by 20 per cent, from 7,584 to 9,166. During the same period the population of Canada increased by 18 per cent. Consequently, there has been no appreciable change in the population-licensed pharmacist ratio over the last seven years as there were 2,026 Canadians per licensed pharmacist in 1962 compared with 2,070 in 1955.

Table 2-1 shows the wide variation in the provincial ratios both in 1955 and 1962. In the latter year there were 1,425 persons per licensed pharmacist in British Columbia while the corresponding figure for Newfoundland was 4,393. It is notable that all the western provinces and Ontario have consistently registered more favourable ratios than the national average during that period. The population-licensed pharmacist ratios deteriorated more in the Maritime Provinces than elsewhere between 1955 and 1962.

An important aspect of the growth in the supply of licensed pharmacists is the increasing number of women entering the profession. During the last decade the practice of pharmacy has become remarkably attractive to women with the result that the number of female licensed pharmacists increased by 57 per cent, from 534 to 840, between 1955 and 1962. Women pharmacists accounted for 11 per cent of all licensed pharmacists in 1962 as compared with 8 per cent in 1955. The concentration of female licensed pharmacists was highest in Alberta where they represented almost one-fifth of the province's pharmacist manpower in 1962. Female pharmacists tend more strongly than males toward hospital practice with over a quarter of them employed in hospitals while less than 5 per cent of males are so employed.

The rural-urban distribution of licensed pharmacists is shown in Table 2-2 which reveals the concentration of pharmacists in larger cities. In addition to the personal preference for urban living, common to most Canadians, larger cities provide an opportunity for the employment of pharmacists in the pharmaceutical industry, hospitals, universities and laboratories. Table 2-2 also shows that while 30.4 per cent of the population lived in rural areas, only 6.4 per cent of licensed pharmacists were located in such areas. This is due to the fact that most less densely populated areas cannot support a privately owned retail pharmacy store. However, with the improvements in transportation a substantial proportion of the rural population has more adequate access to the services of pharmacies located in adjacent towns and cities. In other areas, where there are no pharmacies, some of the required drugs are provided by practising physicians themselves.

TABLE 2-2 PERCENTAGE DISTRIBUTION OF POPULATION AND LICENSED PHARMACISTS, BY SIZE OF LOCALITY, CANADA, 1962

Size of Locality	Population	Pharmacists
Village — farm or rural	30.4	6.4
Town — 5,000 or less	7.8	12.1
Cities — 5,000–50,000	12.8	24.4
50,000–100,000	5.6	7.2
100,000–200,000	5.3	7.4
Over 200,000	38.1	42.5

SOURCE: Ross, T. M., *Pharmacist Manpower in Canada,* a study prepared for the Royal Commission on Health Services, Chapter 3, Ottawa: Queen's Printer (*in press*), and Bulletin 1.1-7, Dominion Bureau of Statistics, Census of Canada 1961, Ottawa: Queen's Printer, 1963.

PHARMACY GRADUATES AND STUDENTS

Immigration has not been an important source of supply of pharmacists in Canada in the past and has become increasingly less so over the last five years. In 1962 the survey of pharmacists in Canada revealed that only 4.3 per cent were foreign-born and foreign-trained and only 15.5 per cent of these immigrant pharmacists had come to Canada in the five-year period preceding the survey year.[1] This trend is likely to continue since rising pharmacy educational standards in Canada may discourage immigrant pharmacists seeking practice in this country. Pharmacy immigration gains have largely been offset by Canadian pharmacists leaving for the United States. The number of Canadians studying pharmacy in the latter country is very small. Still, those who study in the United States tend to remain in that country after graduation. Consequently, the graduates from the eight Canadian schools of pharmacy are the main source of supply of the nation's pharmacists. Table 2-3 shows the number of graduates during the period 1948 to 1963.

Between 1948 and 1963, Canadians schools of pharmacy have produced 5,016 graduates or an average of 314 per annum. The actual number of graduates each year shows a marked variation between the maximum of 427 in 1949 and the minimum of 240 in 1958. As indicated in Table 2-3 there were two distinct trends in graduation, one from 1948 to 1954 and the other from 1955 to 1963. The average number of graduates per year in

[1]Ross, T. M., *op. cit.*, Chapter 2.

TABLE 2-3 GRADUATES OF CANADIAN SCHOOLS OF PHARMACY, 1948-1963

Year	Graduates	Year	Graduates
1948	310	1956	294
1949	427	1957	262
1950	391	1958	240
1951	354	1959	254
1952	370	1960	270
1953	377	1961	281
1954	347	1962	281
1955	265	1963	293

SOURCE: Figures for 1948-1960, *see* Ross, T. M. *Pharmacist Manpower in Canada*, a study prepared for the Royal Commission on Health Services, Chapter 2, Ottawa: Queen's Printer (*in press*); data for 1961-1963 are from Dominion Bureau of Statistics, Education Division, Higher Education Section, Ottawa: Queen's Printer.

the former period was 368 and in the latter, 271. The greater number of graduates between 1948 to 1954 is a reflection of the increased number of veterans graduating. The sizeable reduction in the annual number of graduates after 1954 also reflects the fact that most schools shifted from a three-year to a four-year programme. Recently, the number of pharmacy graduates has tended to rise again.

Table 2-4 gives the annual enrolment of pharmacy schools in Canada between 1947-48 and 1963-64. After making allowances for post-war veteran enrolment and concurrent courses the data show two noteworthy trends. The first is that women constitute an increasing proportion of total pharmacy undergraduates. Thus in 1963-64 almost one out of every three pharmacy students was female as compared with one out of every ten in 1950-51. With an increasing enrolment of women, pharmacy may be faced with the problem of premature retirements. The professionally active years of women are as a rule shorter than those of men. Most women may work only during the early part of marriage or until they have children and then either leave the profession entirely or seek part-time work. Some may return later to the profession as their children grow up or other contingencies make this necessary. If this trend were to continue, schools of pharmacy may have to train more pharmacists than would otherwise have been required.

Secondly, a career in pharmacy apparently is becoming relatively less attractive to the young people in Canada. Pharmacy enrolment grew at a rate faster than that of total university enrolment in the early years of the period under review and reached a peak in 1952-53 when it was 2.4 per cent of total university enrolment. Since then growth patterns have been reversed and comprised only 1.1 per cent of total university population in

TABLE 2-4 UNDERGRADUATE PHARMACY STUDENT ENROLMENT, BY SEX, AND AS A PERCENTAGE OF TOTAL UNDERGRADUATE ENROLMENT, CANADA, 1947-48 TO 1963-64

Year	Undergraduate Pharmacy Student Enrolment			
	Total	Male	Female	Per Cent of Total University Enrolment
1947-48	1,271	86.5	13.5	1.7
1948-49[a]	1,111	88.7	11.3	1.7
1949-50	1,432	87.8	12.2	2.3
1950-51	1,383	89.2	10.8	2.3
1951-52	1,355	88.4	11.6	2.3
1952-53	1,367	87.4	12.6	2.4
1953-54	1,256	87.0	13.0	2.2
1954-55	1,212	84.7	15.3	2.0
1955-56	1,199	82.5	17.5	1.8
1956-57	1,145	82.9	17.1	1.6
1957-58	1,100	80.1	19.9	1.4
1958-59	1,219	77.1	22.9	1.4
1959-60	1,307	74.4	25.6	1.4
1960-61	1,482	73.3	26.7	1.4
1961-62	1,529	74.4	26.0	1.3
1962-63	1,636	71.5	28.5	1.2
1963-64	1,665	70.0	30.0	1.1

[a]Excluding University of Montreal.

SOURCE: Dominion Bureau of Statistics, *Fall Enrolment in Universities and Colleges*, 1947 to 1961. Data for 1961-1964 are from Dominion Bureau of Statistics, Education Division, Higher Education Section, Ottawa: Queen's Printer.

1963-64. However, in absolute terms the number of graduates has increased since 1958. It has been reported that approximately 25 to 30 per cent of those who begin training at schools of pharmacy do not graduate. Students who withdraw do so mainly for academic reasons.[1]

Pharmacy students are drawn from all levels of economic background. However, most come from middle income families since about half of the students estimated the average annual income of the chief wage earner in his family was below $6,000 in 1962, and only about one-sixth estimated this income at $10,000 or more.[2]

The average pharmacy student spent $1,550 in the 1961-62 academic year, $543 of which could be directly attributed to education expenses and

[1] Morrison, F. A., *op. cit.*, Part IV, Summary and Conclusions.
[2] Ross, T. M., *op. cit.*, Chapter 2.

the remainder for living and social costs. This annual expenditure was approximately equal to that of the average engineering student, but was at least 25 per cent lower than the expenditure of students in law, medicine or dentistry. The pharmacy student achieves these lower expenditures as compared with the other three categories of students by spending less on living costs. Naturally, the pharmacy student's expenditures tend to vary according to marital status, whether living at home or elsewhere, and according to the region of the country in which the student attends college. Savings from summer employment and funds from the family together accounted for over one-half of the average pharmacy student's income. The average pharmacy student received a considerably larger portion of his income from earnings from part-time jobs during the school year than did students in engineering, law, medicine and dentistry. About half of the pharmacy students relied on part-time employment.

About 29 per cent of pharmacy students received financial aid from scholarships and bursaries in 1961-62; this percentage was smaller than that of students in the other faculties compared. The average scholarship and bursary income per student receiving assistance amounted to $336, an amount slightly higher than that received by law and dentistry students and lower than that received by students in engineering or medicine.[1]

We conclude that the financial problems of the pharmacy students are the same as those of most other university students and that no special financial barriers prevent their entering pharmacy school.

DEMAND AND UTILIZATION

The demand for professional personnel in all branches of pharmacy in Canada has rapidly increased over the last decade under the impact of several factors. Naturally, these factors did not affect all branches of pharmacy uniformly but they affected some branches more directly than others. These factors are generally socio-demographic and institutional in nature.

The growth in Canada's population increased the volume of illness and the demand for drugs. This indirectly increased the number of pharmacists required at the production and distribution levels as well as in government agencies inspecting and testing these drugs, and in pharmacy faculties instructing a growing student body. Other demographic trends served to magnify this demand. For example, the increasing proportion of the very young and older people in our population structure contributed to a greater

[1] Dominion Bureau of Statistics, *University Student Expenditures and Income in Canada, 1961-62*, Ottawa: Queen's Printer, 1963.

use of medication. Superimposed on these demographic factors was the changing attitude of Canadians concerning the use of drugs. Canadians like most other people want to get well as quickly as adequate health services and new "wonder" drugs make this possible. Modern drugs in many cases accomplish just this, with the result that most Canadians, when ill, increasingly consider drugs as a necessity. Consequently, during the decade 1951-1960 the total value of prescriptions dispensed in this country rose by over 150 per cent, from $52 million to $131 million. During the same period the number of prescriptions per capita increased from 2.21 to 2.41.[1] The ensuing analysis appraises demand and utilization conditions in each field of pharmacy separately.

Retail Pharmacy

The growing utilization of prescribed drugs in Canada has resulted in an increase in the demand for pharmacists at the retail level where approximately three-quarters of all prescribed drugs are dispensed. In 1962, the 5,022 retail pharmacies employed a major proportion of all pharmacists—7,972, or 87 per cent, of all licensed pharmacists. The average number of pharmacists per retail pharmacy in that year was 1.6.

The demand for retail pharmacists also has been strongly influenced by institutional forces. As pointed out earlier, the trend for most medicinal supplies to be in a form suitable for dispensing has reduced the time necessary to fill a prescription. On the other hand, because of new discoveries as well as the competition among drug manufacturers, the number and complexity of pharmaceutical products have increased. Thus, while the pharmacist spends less time in actually dispensing drugs, the time required to maintain a satisfactory service, to maintain extensive inventories, keep abreast of new developments, provide information to physicians and customers has increased considerably. Furthermore, as a consequence of the increased government requirements for safeguards, the retail pharmacist is required to spend more time keeping detailed accounts of all purchases and sales of a wide variety of drugs. The pharmacist's work has not, on the whole, become less time consuming but has changed in character.

Within the field of retail pharmacy, non-professional activities including merchandising of non-prescribed drugs and other commercial operations continue to absorb a substantial share of the pharmacist's work-day. In 1960, prescribed drugs comprised only 25 per cent of the total sales volume of retail pharmacies. As a practical consequence of this, the retail pharmacist in 1962 filled on the average 96 prescriptions in a 44-hour week, while the hospital pharmacist filled 504 in a 39-hour week. In other words,

[1] *The Canadian Pharmaceutical Association, Inc.*, brief submitted to the Royal Commission on Health Services, Toronto, May 1962, p. 123.

whereas the hospital pharmacist, on the average, filled 13 prescriptions every working hour the retail pharmacist filled only 2.2.[1]

Despite the present concentration of pharmacists in retail pharmacy, it has been suggested that there is a shortage of pharmacists in this field of practice. In the evidence presented to the Commission it was argued that this shortage was the principal reason for the failure of the number of retail pharmacies to keep pace with the growth of population in Canada between 1955 and 1962.[2] The average number of people served by each pharmacy rose from 3,317 to 3,698 during this period. Moreover, the Pharmacist Survey conducted by the Commission in 1962 suggests that retail pharmacies would have employed an additional 2,056 pharmacists if they had been available. This number when added to the number of pharmacists actually employed in that field indicates a desired ratio of 2 pharmacists per retail pharmacy.

Manpower requirements, however, must be based on the efficient utilization of personnel. That is, the retail pharmacist should be engaged as far as possible exclusively in performing professional tasks. The Pharmacist Survey indicated that, in 1962, 45 per cent of retail pharmacists spent less than one-quarter, and a further 33 per cent spent between one-quarter and one-half of their working hours filling prescriptions.[3] This suggests that given a functional re-organization of the practice of retail pharmacy and a relegation of commercial and non-professional activities to less qualified personnel, the existing number of retail pharmacists could handle a larger volume of prescriptions. The pharmacists' continued participation in non-professional activities indicates an inefficient utilization of their professional services and implies that the shortage of professional staff is not substantial.

The projected growth of population will, of course, require more pharmacists if the present population-pharmacist ratio is to be maintained while the increased volume of prescribing, resulting from our recommendations in the area of prescribed drugs, could be met by retail pharmacists reducing their non-professional activities.[4] In this area the pharmacist's work would also be facilitated by the Commission's recommendations relating to the National Drug Formulary and Drug Information Service that would issue periodic bulletins providing the latest information on drugs.[5]

Hospital Pharmacy

The main function of the hospital pharmacist is the dispensing, distribution and control of all drugs and medicines issued to patients and hospital departments.

---

[1] Ross, T. M., *op. cit.*, Chapter 4.
[2] *Ibid.*
[3] *Ibid.*
[4] *See* Volume I, Chapter 16, pp. 653 and 654.
[5] *See* Volume I, Chapter 2, Recommendation 62, p. 42.

95863—4½

With the increased volume of hospital care in Canada and the growing use of prescription drugs, drug utilization in our hospitals has steadily increased and by 1960 hospitals accounted for one-quarter of all drugs purchased in this country.[1] For these reasons there has been an increase in demand for hospital pharmacists. The Pharmacist Survey conducted by the Commission showed that in 1962 about 600 pharmacists, one-third of whom were not licensed, were working in hospitals. The high proportion of non-licensed practitioners is due to the fact that at present in only two provinces is licensing a prerequisite for the practice of hospital pharmacy.

Freed from the necessity of conducting retail commercial activities hospital pharmacists are almost exclusively engaged in professional duties. Thus, approximately 50 per cent of them spend over half of their work-day filling prescriptions and about 20 per cent of them spend three-quarters of their time at this work.[2] The balance of their time was devoted largely to administrative duties connected with the operations of the hospital.

Despite the increase in the number of hospital pharmacists, many Canadian hospitals, though generally only the small hospitals, are without the services of a pharmacist. In 1961, 604 reporting public general hospitals with 99 or fewer beds employed only 56 pharmacists, while the 199 reporting hospitals with 100 to 499 beds accounted for 333 pharmacists, and 31 hospitals with 500 beds and over employed 196 pharmacists.[3] Moreover, the majority of hospitals employing pharmacists indicated that their pharmacist manpower was inadequate. Thus 233 hospitals indicated a total shortage of about 150 pharmacists.[4]

The Canadian Society of Hospital Pharmacists stated that, on the basis of their standard,[5] in 1961 a work force of 2,480 pharmacists was needed to provide adequate pharmaceutical services in hospitals in Canada. This would imply that only about one-quarter of our needs for hospital pharmacists was met in that year. The above figure represents an ideal level of hospital service rather than an effective demand for hospital pharmacists, as the majority of the "needed" 1,900 pharmacists, even if they were available, would probably not have found employment in hospitals because of budgetary restrictions.[6] Although the scarcity is perhaps not as acute as the Society

---

[1] The Canadian Pharmaceutical Association, Inc., submission to the Restrictive Trade Practices Commission, October 1961, Toronto, p. 51.

[2] Ross, T. M., *op. cit.*, Chapter 4.

[3] Dominion Bureau of Statistics, *Hospital Statistics 1961*, Volume III, Ottawa: Queen's Printer, 1964.

[4] Ross, T. M., *op. cit.*, Chapter 4.

[5] The Society's standard was—hospitals of 75 beds and over one full-time pharmacist and an additional pharmacist for each additional 100 beds or major portion thereof; hospitals of 74 beds or less, one part-time pharmacist. *Canadian Society of Hospital Pharmacists*, brief submitted to the Royal Commission on Health Services, Toronto, May 1962, p. 30.

[6] Ross, T. M., *op. cit.*, Chapter 4.

suggests, there is undoubtedly a shortage of manpower in this field. This shortage was estimated to be between 300 and 400 in 1962.[1]

The hospital pharmacists, as earlier stated, spend most of their time performing professional activities. Changes in the character of their practice, therefore, cannot be expected to relieve the existing shortage of this type of personnel. The problem is essentially one of increasing the supply although some assistance could be provided through the use of the part-time services of retail pharmacists. That is, retail pharmacists located in less densely populated areas could provide a local hospital with pharmacist services on a part-time basis.

Pharmaceutical Industry

The rapid increase in drug utilization in Canada has stimulated a corresponding growth of the Canadian pharmaceutical industry. This over-all expansion of the output, and the tendency among the pharmaceutical firms to introduce a large variety of similar drugs, have led to an increase in the number of pharmacists employed in the drug manufacturing industry. The vast majority of these pharmacists are engaged as sales representatives of pharmaceutical firms in medical promotion and detailing. In addition to being employed as sales representatives, pharmacists are also engaged in research, production, quality control and product development programmes.

A survey was undertaken for this Commission covering the majority of all pharmaceutical firms employing pharmacists which located 612 pharmacists in the Canadian drug manufacturing industry in 1962.[2] In that year, according to the responding firms, an additional 456 pharmacists could have been employed in the industry if these had been available at prevailing salaries. Assuming that non-respondents experienced a similar shortage the industry could have employed an additional 515 pharmacists. The majority of those unfilled positions were for medical representatives for which the pharmacist's knowledge makes him a prime candidate; some, however, were for scientific personnel.

Since science graduates in other fields can fulfil the position of detail men[3] and the shortages that exist in the area of research, quality control, production and product development also can be met to a considerable extent from persons who have advanced scientific degrees but who do not possess a basic education of pharmacy, the apparent scarcity of personnel is much less severe.

---

[1] *Ibid.*

[2] A survey of drug manufacturers conducted by The Canadian Pharmaceutical Manufacturers Association for the Royal Commission on Health Services; Ross, T. M., *op. cit.*, Chapter 4.

[3] For a discussion of the need for detail men in the pharmaceutical industry, *see* Volume I, Chapter 16, pp. 664-666.

Staff of Schools of Pharmacy

The demand for pharmacists by schools of pharmacy is, generally, for those with advanced degrees. In 1962, 78 pharmacists were employed on the staffs of these institutions. In view of existing student enrolment the current demand for pharmacists in university faculties is being adequately met. However, it has been suggested that with increased student enrolment and more intense competition between universities and the pharmaceutical industry for better qualified pharmacists, a shortage of pharmacy professors may develop in the future.[1] Moreover, the implementation of the Commission's recommendation that the Federal Government expand research grants to universities through the Health Sciences Research Council to encourage the development of new drugs and/or improvement of existing drugs in Canada will result in additional demand for pharmacists with advanced degrees.[2]

Government Services

In 1962, the Federal Government employed 37 pharmacists and provincial governments 14.[3] Sixteen of the federally employed pharmacists worked as food inspectors for the Food and Drug Directorate and the Division of Narcotic Control of the Department of National Health and Welfare.

It has been estimated that in 1962 there were 13 vacancies at the provincial level and 19 at the federal level of government.[4] The implementation of the Commission's recommendations regarding the Drug Advisory Committee, a National Drug Formulary and an Information Service,[5] will also result in an increased demand for pharmacists employed by the Federal Government.

Armed Services

In 1962, 77 pharmacists were employed in the three branches of the Armed Services and 13 established positions were unfilled.[6] The present policy of integrating the three branches of the Armed Services may tend to reduce the demand for pharmacists from this source.

---

[1] *Canadian Conference of Pharmaceutical Faculties,* brief submitted to the Royal Commission on Health Services, Toronto, May 1962, p. 28.

[2] *See* Volume I, Chapter 2, Recommendation 80, p. 44.

[3] These figures exclude pharmacists in the Armed Services or working in hospitals.

[4] Ross, T. M., *op. cit.,* Chapter 4.

[5] *See* Volume I, Chapter 2, Recommendations 61-63, pp. 41 and 42.

[6] Ross, T. M., *op. cit.,* Chapter 4.

Pharmacy Organizations

Professional organizations of pharmacists at federal and provincial levels also employ some pharmacists in administrative capacity. In 1962 there were 16 pharmacists so employed.

FUTURE REQUIREMENTS AND SUPPLY, 1966 AND 1971

An estimate of requirements for pharmacists for 1966 and 1971 in the various fields of pharmacy and the expected supply are shown in Table 2-5.

TABLE 2-5 PROJECTED REQUIREMENTS AND EXPECTED SUPPLY OF PHARMACISTS, CANADA, 1966 AND 1971

Year	Retail	Hospital	Pharmaceutical Industry	Armed Services	Government	Pharmacy Schools	Pharmacy Organizations	Total Requirements	Expected Supply	Shortage
1962	7,972	595	612	77	51	78	16	—	9,401	—
1966	8,240	900	812	93	129	106	20	10,300	9,800	500
1971	8,575	1,250	1,000	98	225	150	27	11,325	10,695	630

SOURCE: Based on Ross, T. M., *Pharmacist Manpower in Canada*, a study prepared for the Royal Commission on Health Services, Ottawa: Queen's Printer (*in press*), and additional data.

As we have already indicated the 1962 Pharmacist Survey located 9,401 pharmacists although it is known that the actual number available exceeded that figure. We estimate that the requirements for pharmacists will increase to 10,300 by 1966 and 11,325 by 1971. If these estimated requirements were to be achieved the population-pharmacist ratios for 1966 and 1971 would be 1,970 and 1,995 respectively, as compared with 1,975 for 1962. The anticipated deterioration in the ratio between 1966 and 1971 is not serious and with the suggested functional re-organization of the practice of retail pharmacies an increased volume of pharmaceutical services will be possible.

The estimate of the number of retail pharmacists required is based on the assumption that 42 new community pharmacies would be established annually,[1] corresponding to the growth of population,[2] and they would be manned 1.6 pharmacists per pharmacy as in 1962. The projected requirements for hospital pharmacists include an increase of 300 by 1966 and an additional 350 by 1971 to meet the suggested deficiency of 350 hospital

[1] Ross, T. M., *op. cit.*, Chapter 4.
[2] Assuming projected population with 50,000 net immigration per annum.

pharmacists in 1962 and the expected growth in hospital utilization and hospital out-patient services. As for the employment of pharmacists in the pharmaceutical industry, in view of the Commission's recommendation[1] that only 15 per cent of total sales should be allowable deductible expenses for promotional and detailing activities and assuming that this recommendation is implemented, the use of pharmacists as "detail men" will be reduced. Consequently, an additional 50 pharmacists per year up to 1966 and 40 per year between 1966 and 1971 should be adequate to meet the demand from this source. With the increased activities of the Federal Government in research and evaluation of pharmaceuticals, we have projected a 170 per cent increase in the employment of pharmacists in 1971 over 1962. The requirements for pharmacists in the Canadian schools of pharmacy are related to the expected enrolment and are based on the 1962 pharmacy student-staff ratio.

Against these requirements the expected supply of pharmacists is estimated at 9,800 in 1966 and 10,695 in 1971 yielding deficits of 500 and 630 respectively.[2] To achieve this supply the eight schools of pharmacy will have to increase their annual number of graduates by 60 per cent or from 370 to 600 between 1963 and 1971. The expansion of facilities of Canadian schools of pharmacy which began in 1958 is still continuing and should be sufficient to provide the necessary increase in student enrolment up to 1971. In view of the future needs of the Atlantic provinces an additional school of pharmacy would be required early in the 1970's. The establishment of such a school at Memorial University at the same time and as a department of the medical school we have recommended should meet this need.[3]

Deficits of the order indicated for the next seven years do not appear unmanageable. First, there is no doubt a number of pharmacists in 1962 did not respond to the survey undertaken for this Commission. Second, the increasing enrolment of pharmacy students in recent years, if speeded up, could meet what at present appears to be a moderate shortage of professional pharmacists. Hence the expansion of existing pharmaceutical educational facilities expected in the normal course of events, plus one additional school we recommend, should meet the needs for the foreseeable future.

CONCLUSION

This century has witnessed rapid and significant changes in the practice of pharmacy. Changes have taken place in the location of pharmacists as

[1] *See* Volume I, Chapter 2, Recommendation 64, p. 42.

[2] In calculating the expected supply of pharmacists a 3.4 per cent attrition rate is assumed as compared with a 3.2 per cent attrition rate for physicians because of the growing proportion of women in pharmacy. The source of supply is confined to graduates of Canadian schools of pharmacy.

[3] *See* Recommendation 202, p. 38.

more are employed in hospitals, the pharmaceutical industry, government and in retail pharmacies in large cities. The developments in drug therapy have resulted in changes in the education and work of pharmacists. A generation ago, about three-quarters of the drugs and chemicals used in today's drug therapy were unknown; the greater proportion of prescribed drugs were compounded in the retail pharmacy; today 90 per cent of prescribed drugs are precompounded. At the retail level, due to advances in the manufacture and prepackaging of drugs, the pharmacist spends less time in actually dispensing drugs and more on such matters as maintaining inventories, keeping abreast of developments in drug therapy, providing information to physicians and customers, and especially merchandising services. With regard to these last named services, it is noted that in 1960, prescribed drugs comprised only 25 per cent of the total sales volume of retail pharmacies.

In the light of these developments, it is difficult to project the demand for pharmacists' services over the immediate future. The growing use of prescribed drugs and the growth of population create an increased need for pharmacists. On the other hand, the fact that retail pharmacists, who make up the majority of the profession, are underutilized in their professional capacity makes the rapid growth of supply of less importance.

The problem of retail pharmacy appears to be one of more efficient utilization of professional personnel. The data at our disposal indicate that if the commercial and non-professional activities of retail pharmacists could be delegated to less qualified personnel, they themselves could handle a larger volume of prescriptions. However, in small communities it is these commercial and non-professional activities which provide the retail pharmacist with the necessary income to continue to operate. Without these supplementary sources of income, small communities would be without the services of a pharmacist. However, with the introduction of the Prescription Drug Services Programme that we recommend, the volume of prescribed drugs dispensed by pharmacists would increase, thereby making it less necessary for them to rely as much on their non-professional activities in the future as they did in the past. The more intensive use of professional retail pharmacists would also reduce the need for additional pharmacists to meet the demands of the programme. There is, of course, a shortage of pharmacists in the area of hospital pharmacy but we feel that this shortage could be alleviated to some extent by the part-time employment of retail pharmacists by small hospitals located in rural communities.

The eight schools of pharmacy in Canada are almost the exclusive source of this nation's pharmacist manpower. As studies undertaken by the Commission show, when present programmes for expansion are complete, educational facilities will have increased by 50 per cent compared with those of 1958. This expansion will provide the increased supply of pharmacists

that will be needed in the immediate future although an additional pharmacy school will likely be required in the Atlantic Provinces early in the 1970's.

There is one area where shortages are very evident and this is the area of teaching and research. This shortage will become more marked as pharmaceutical research is stimulated by the universities and the Health Sciences Research Council. Special financial assistance will be required to expand post-graduate studies in pharmacy if this shortage is to be eliminated.

The Commission recommends:

201. That small hospitals, particularly in communities which find it difficult to employ a full-time pharmacist, employ a part-time pharmacist to serve selected neighbouring hospitals jointly or to combine retail pharmacy with hospital employment.

202. That, in view of the shortage of qualified pharmacists in the Atlantic Provinces, there be established a school of pharmacy at Memorial University, St. John's, Newfoundland, at the same time as the medical school we have recommended and as a department thereof.[1]

203. That annual Professional Training Grants of $2,000 each be made available to graduate pharmacists pursuing post-graduate studies in pharmacy.

[1] *See* Volume I, Chapter 2, Recommendation 141, p. 71.

3

Selected Professional, Technical and Other Health Personnel

INTRODUCTION

In addition to the well established, organized, and recognized traditional health professions—such as physicians, dentists, nurses and pharmacists—scientific and technological specialization has given rise to an increasing number of professional, technical and other occupations in the health field.[1] Typically, these occupations become identified only gradually as formal education and training replace and supplement the experience gained by working in a certain field. As formal training gains wider acceptance professional associations emerge which, in addition to promoting the interests of their members, usually establish and endeavour to maintain standards of qualifications.

Because of the wide range of training and education and because of their varied relations with the medical profession it is difficult to provide a generic term for these occupations. Consequently, we have classified them into three groups:

(1) paramedical personnel numbering about two dozen occupations which assist the physician in the performance of his functions;

(2) other health personnel consisting of optometrists, opticians, and podiatrists; and

(3) drugless practitioners including chiropractors, naturopaths, and osteopaths.

Each of these groups is discussed below. We conclude with some comments on special problems, the use of professional titles, hazards of radiography, and ambulance services.

[1] For a discussion of physicians, dentists, nurses, pharmacists, nursing aides, ward aides, homemakers, dental auxiliaries, *see* Volume I, Chapters 7 and 13, and Chapter 2 of this volume.

PARAMEDICAL PERSONNEL

Among the occupations that have been described as part of the paramedical group are:

Psychologists—Clinical
Dietitians
Medical Librarians
Medical Record Librarians
Public Health Inspectors
Sanitary Engineers
Medical Technicians—Laboratory
Radiological
Operating Room
Electroencephalography
Electrocardiography
Orthoptists
Prosthetists and Orthotists
Therapists—Physio
Occupational
Speech and Audiological
Medical—Artists
Illustrators
Photographers
Medical Social Workers

Because of limitations of data we have limited our examination to the following: dietitians; medical record librarians; laboratory, radiological, operating room, electroencephalography and electrocardiography technicians; physiotherapists, occupational, and speech and audiological therapists; and medical social workers.

The rapid increase in the use of paramedical personnel in Canada can be attributed largely to two factors. First, this type of personnel plays a vital supporting role to the physician, and the increasing complexity of modern medicine demands team-work by many specialists some of whom may have skills that the physician may not himself possess. Second, the shortage of medical manpower relative to the rapid growth in demand for health services has accelerated the transfer of some tasks which require less education and training from this group to other occupations.

Two special aspects of the work of these personnel deserve mention, namely, the nature of the work itself and the place where the work is performed. Paramedical personnel all depend upon the physician for initiation of instructions which call their special skills into play and are all responsible to and supervised by the medical practitioner whom they assist in the pro-

vision of health care. However, the degree of supervision varies among the groups referred to here. Some, for example, laboratory and radiological technicians work under the immediate and close supervision of the physician, while others, including dietitians and medical social workers, have a relatively independent status.

Most paramedical personnel are employed in medium or large hospitals because the complex equipment and laboratories required by the modern methods of diagnosis and treatment are located in these hospitals. Outside the hospital, specialists rely to a larger extent than general practitioners on the services of paramedical personnel, and specialists in group practice employ relatively more paramedical personnel than those in solo practice.[1] The recent trend towards specialty group practice among physicians has resulted in an increase in the number of paramedical personnel employed outside the hospital. Some of the paramedical groups are also employed out of hospital in rehabilitation centres and home care services.

The quality of care which this type of personnel can provide is directly related to their education and training. Hence the importance of educational standards and institutions. In general, the education and training of this type of personnel in Canada have been upgraded in the post-war period and today compare favourably with the best provided in any industrialized country. The national societies of these occupations and the Canadian Medical Association, which jointly determine educational standards, have worked consistently to improve the quality of education and training. However, if educational and training standards are to be maintained at their high level in the future, they will have to be periodically evaluated in the light of improved medical and scientific knowledge and techniques, particularly with regard to the location of training facilities.

Traditionally these categories of personnel have been trained in universities and hospitals. Some of the university-trained personnel, such as physiotherapists, are trained to the diploma or certificate level while others, including dietitians and medical social workers, are trained to the baccalaureate or post-graduate level. To qualify for practice some university-trained personnel are required to complete a stipulated hospital internship. Other groups, like medical record librarians and medical technicians, receive their training in large hospitals. Recently, because of shortages of qualified personnel to conduct training programmes in all hospitals and with the growth of technical institutes, there has been a shift in the didactic part of training programmes from individual hospitals to regional hospitals or to vocational and technical institutes. These institutions likely will play an increasing role in the future training of some occupations which are presently hospital-trained.

[1] Judek, S., *Medical Manpower in Canada*, a study prepared for the Royal Commission on Health Services, Chapter 6, Ottawa: Queen's Printer (*in press*).

In view of the increasing variety of these personnel employed by hospitals and because of our recommendations encouraging the development of medical group practice[1] and home care programmes,[2] that will lead to their increased employment outside of hospitals, we are concerned with their number, their educational qualifications and place of employment. Consequently for each of the selected occupations we will examine the trends in their numbers and distribution, assess the adequacy of educational staff and facilities, and where necessary provide estimates of future personnel requirements.

Employment of Selected Health Personnel, 1953 and 1961

The occupations discussed here include most of the major paramedical occupations. Even here, however, there is a scarcity of statistics. Only one publication, *Hospital Statistics*,[3] provides annual data on these personnel. Some additional data have been provided by the national societies of the paramedical groups considered. Within each occupation group covered, *Hospital Statistics* include only those individuals holding hospital employment. This limitation has made it necessary for us to consider the supply of personnel primarily with reference to hospitals. Since hospitals presently employ the majority of these personnel (in 1962, hospitals provided employment for between 70 to 95 per cent of the personnel in each group for which data are available) this limitation is not serious. Bearing in mind this qualification, Table 3-1 indicates the number of personnel employed in reporting hospitals between 1953 and 1961 and provides an approximation of the trends in their employment in Canada over these years.

TABLE 3-1 PARAMEDICAL PERSONNEL AND BED CAPACITY AND PATIENT-DAYS PER PARAMEDICAL PERSONNEL IN REPORTING HOSPITALS, BY TYPE OF HOSPITAL, CANADA, 1953 AND 1961

Type of Occupation	1953			1961		
	Number of Personnel	Bed Capacity per Personnel	Patient-Days per Personnel	Number of Personnel	Bed Capacity per Personnel	Patient-Days per Personnel
	Public General and Allied Special					
Dietitians	965	73	19.2	772	125	38.0
Medical Record Librarians	634	111	29.3	737	131	39.8
Laboratory Technicians	1,774	40	10.5	4,098	24	7.2
Radiological Technicians	1,218	58	15.2	2,613	37	11.2
Physiotherapists	287	245	64.6	747	129	39.2
Occupational Therapists	67	1,048	276.9	143	675	204.9
Social Workers	197	356	94.2	291	332	100.7

[1] *See* Volume I, Chapter 2, Recommendations 34 and 35, p. 34.
[2] *Ibid.*, Recommendations 116-123, pp. 61 and 62.
[3] Dominion Bureau of Statistics, annual reports.

TABLE 3-1—*Concluded*

Type of Occupation	1953			1961		
	Number of Personnel	Bed Capacity per Personnel	Patient-Days per Personnel	Number of Personnel	Bed Capacity per Personnel	Patient-Days per Personnel
	Private					
Dietitians	18	160	44.1	9	404	117.7
Medical Record Librarians	4	720	198.3	16	227	66.2
Laboratory Technicians	9	320	88.1	35	104	30.3
Radiological Technicians	9	320	88.1	26	140	40.7
Physiotherapists	7	412	113.3	12	303	88.3
Occupational Therapists	1	2,881	793.1	1	3,637	1,059.2
Social Workers	13	222	61.0	3	1,212	353.1
	Federal					
Dietitians	—	—	—	93	108	29.1
Medical Record Librarians	—	—	—	22	458	123.0
Laboratory Technicians	—	—	—	240	42	11.3
Radiological Technicians	—	—	—	123	82	22.0
Physiotherapists	—	—	—	5	168	45.1
Occupational Therapists	—	—	—	60	234	62.9
Social Workers	—	—	—	43	234	62.9
	Mental					
Dietitians	59	870	376.9	72	973	355.4
Medical Record Librarians	—	—	—	—	—	—
Laboratory Technicians	93	552	239.1	136	515	188.2
Radiological Technicians	49	1,047	453.9	73	960	350.5
Physiotherapists	—	—	—	21	3,336	1,218.5
Occupational Therapists	230	223	96.7	372	188	68.8
Social Workers	78	658	285.1	234	299	109.4
	Tuberculosis					
Dietitians	63	272	92.5	42	268	70.5
Medical Record Librarians	—	—	—	—	—	—
Laboratory Technicians	162	105	36.0	157	72	18.9
Radiological Technicians	120	143	48.6	107	105	27.7
Physiotherapists	—	—	—	—	—	—
Occupational Therapists	—	—	—	—	—	—
Social Workers	37	463	157.5	24	468	123.4
	Total					
Dietitians	1,105	128	42.9	988	194	62.4
Medical Record Librarians	638	114	30.3	775	142	42.7
Laboratory Technicians	2,038	69	23.3	4,666	41	13.2
Radiological Technicians	1,396	101	34.0	2,942	65	20.9
Physiotherapists	294	249	65.8	840	215	69.8
Occupational Therapists	298	418	139.5	559	322	104.9
Social Workers	325	436	145.9	595	322	103.6

SOURCE: Dominion Bureau of Statistics, Health and Welfare Division, calculated from *Hospital Statistics, 1953*, Ottawa: Queen's Printer 1955, and *Hospital Statistics, 1961*, Ottawa: Queen's Printer, 1964.

The rapid increase in the use of paramedical personnel in hospitals in recent years is clearly shown in Table 3-1. Between 1953 and 1961 these selected paramedical occupations increased in number from 6,094 to 11,648, or by 91 per cent. Bed capacity and patient-days of the reporting hospitals increased by only 24 and 20 per cent respectively during the same period.[1] The increased employment of this type of personnel is to a substantial extent the consequence of the improved quality of health care Canadians now receive.

The selected groups taken individually show marked variations in their rate of increase during the period. Some, like medical technicians and physiotherapists, increased at an explosive rate; others, like medical record librarians and medical social workers, increased less rapidly, and one group, dietitians, actually decreased. However, all groups except dietitians and medical record librarians have increased at a more rapid rate than hospital-bed capacity and patient-days. Thus in Table 3-1, all groups except these two show a reduced ratio of bed capacity and patient-days per personnel between 1953 and 1961. In the case of physiotherapists, Table 3-1 indicates that although there was an improvement in the ratio of personnel to bed capacity, the ratio of personnel to patient-days deteriorated. The explanation for this lies partly in the fact that mental hospitals were excluded in 1953 because of data limitations but included in 1961, and the ratio reflects the inadequate volume of physiotherapy care provided in mental hospitals.

There is a wide disparity in the quality of care provided by different types of hospitals in Canada. This was stressed in Volume I and recommendations were made to remedy the situation.[2] Table 3-1 shows that public and federal hospitals are the best staffed with respect to personnel, and mental hospitals the most inadequately staffed. Mental hospitals, for five of the seven groups, had considerably higher bed capacity and patient-days per personnel than the average for all types of hospitals. Private hospitals serve primarily chronically ill and do not employ paramedical personnel to the same extent as do other types of hospitals.

Small hospitals provide each patient with fewer services than large hospitals. This applies particularly to the services rendered by paramedical personnel. Table 3-2 shows that in all but two of the paramedical groups listed there is a direct relationship between the intensity of service, as judged by patient-days per personnel, and the size of hospital. Medical record

---

[1] Bed capacity and patient-days are both measures of available hospital facilities. The slower rate of increase in the latter is evidence that the expansion of hospital facilities during the period has brought the demand for hospital care and supply of adequate hospital facilities into better balance. *See* Volume I, Chapter 8, p. 300.

[2] *Ibid.*, Chapter 2, pp. 51-58, and Chapter 8.

95863—5

TABLE 3-2 RATIOS OF BED CAPACITY AND PATIENT-DAYS PER PARAMEDICAL PERSONNEL IN PUBLIC GENERAL HOSPITALS, BY SIZE OF HOSPITAL, CANADA, 1961

Type of Occupation	Bed Size						Total	
	1–99		100–499		500+			
	Bed Capacity	Patient-Days	Bed Capacity	Patient-Days	Bed Capacity	Patient-Days	Bed Capacity	Patient-Days
		('000)		('000)		('000)		('000)
Dietitians	245	69.6	119	36.0	88	27.2	120	36.2
Medical Record Librarians	97	27.5	112	33.9	210	65.3	124	37.4
Technicians:								
Laboratory	56	15.8	21	6.3	15	4.8	22	6.5
Radiological	57	16.2	32	9.8	28	8.6	34	10.2
Combined Laboratory and Radiological	82	23.4	1,548	467.8	4,988	1,553.0	322	97.0
Physiotherapists	508	144.7	149	45.1	88	27.2	143	42.9
Occupational Therapists	19,325	5,500.0	1,492	451.0	396	123.3	935	281.5
Social Workers	3,221	916.7	516	155.9	147	45.7	335	100.8

SOURCE: Dominion Bureau of Statistics, *Hospital Statistics, 1961*, Ottawa: Queen's Printer, 1964.

librarians and combined radiological and laboratory technicians are the two exceptions.[1]

Two other aspects in the supply of these personnel merit examination; namely, trends in the supply of fully qualified and part-time personnel. Table 3-3 provides these data by occupation-group for public hospitals in 1953 and 1961. During this period there has been an increase in the proportion of qualified personnel in these occupations employed in hospitals, indicating a general upgrading in the quality of hospital staff. Despite this, there are still substantial numbers who are not fully qualified, especially in the predominantly hospital-trained occupations such as medical record librarians, laboratory and radiological technicians. While a high proportion of non-professionals may reflect a shortage of trained personnel, it may also indicate an efficient allocation of tasks between professionals and non-professionals in the interest of minimizing the cost of operation.

Part-time employment of paramedical personnel is important because the majority of them are female. Many married women while unable to work full time may desire part-time employment. The availability of part-time jobs will therefore ensure a more complete utilization of our potential paramedical work-force. Between 1953 and 1961 there was some decline in the over-all proportion of part-time persons in all these occupations taken together, namely from 9.7 to 7.0 per cent. However, most of this decline was accounted for by the drop in part-time radiological technicians from 12.7 to 3.6 per cent. In several occupations, e.g., dietitians, occupational therapists and medical social workers, the percentage employed part time has actually increased. Moreover, taking all groups together, the number of part-time staff has increased from 500 to 659 during the period.

In general, there has been a rapid increase in the number of this type of health personnel employed in hospitals. The occupations for which training is provided in hospitals have experienced the most rapid rate of increase, and for laboratory and radiological technicians the number of professionally qualified persons employed also has risen rapidly. The university-trained groups generally have experienced only modest increases in supply.

Despite the increase in number the supply of paramedical personnel has not yet caught up with the demand for them. Evidence of this is provided by Table 3-4 which shows existing job vacancies and vacancy rates by occupation groups in general and allied special hospitals in 1961. Admittedly, vacancy rates are at best an imprecise measure of unmet requirements. These data suggest that while the gap between demand and supply of personnel

[1] Large hospitals probably employ more advanced record techniques which increase the productivity of record librarians. Combined radiological and laboratory technicians may be better suited to work in small rather than large hospitals.

has almost disappeared in the case of technicians, shortages in the supply of therapists, dietitians and medical social workers still prevail.

A high attrition rate is a prime determinant of the present shortages in this field. Although large numbers of persons are trained, this attrition rate is due to the fact that the paramedical personnel are predominantly female. Like teaching, nursing and other predominantly female occupations,

TABLE 3-3 SELECTED PROFESSIONALLY QUALIFIED AND NON-QUALIFIED PERSONNEL AND PERCENTAGE EMPLOYED PART-TIME IN PUBLIC HOSPITALS, CANADA, 1953 AND 1961

Type of Occupation	1953		1961		Change	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Dietitians	965		772		−193	−20.0
Professionally Qualified	496	51.4	563	72.9	67	13.5
Other	469	48.6	209	27.1	−260	−55.4
Number and Per Cent Part-time	57	5.9	87	11.3		
Medical Record Librarians	634		737		103	16.2
Professionally Qualified	151	23.8	426	57.8	275	182.0
Other	483	76.2	311	42.2	−172	−35.6
Number and Per Cent Part-time	69	10.9	65	8.8		
Laboratory Technicians	1,774		4,098		2,324	131.0
Professionally Qualified	988	55.7	2,401	58.6	1,413	143.0
Other	786	44.3	1,697	41.4	911	115.9
Number and Per Cent Part-time	164	9.2	242	5.9		
Radiological Technicians	1,218		2,613		1,395	114.5
Professionally Qualified	579	47.5	1,453	55.6	874	150.9
Other	639	52.5	1,160	44.4	521	81.5
Number and Per Cent Part-time	155	12.7	95	3.6		
Physiotherapists	287		747		460	160.3
Professionally Qualified	n.a.	—	667	89.3	—	—
Other	n.a.	—	80	10.7	—	—
Number and Per Cent Part-time	38	13.2	104	13.9		
Occupational Therapists	67		143		76	113.4
Professionally Qualified	n.a.	—	108	75.5	—	—
Other	n.a.	—	35	24.5	—	—
Number and Per Cent Part-time	5	7.5	21	14.7		
Social Workers	197		291		94	47.7
Professionally Qualified	128	65.0	227	78.0	99	77.3
Other	69	35.0	64	22.0	−5	−7.2
Number and Per Cent Part-time	12	6.1	45	15.5		

SOURCE: Dominion Bureau of Statistics, *Hospital Statistics, 1953*, Ottawa: Queen's Printer, 1955, and *Hospital Statistics, 1961*, Ottawa: Queen's Printer, 1964.

95863—5½

paramedical groups have a very high attrition rate due to the tendency for women to retire from labour force either permanently or for a number of years after marriage.

TABLE 3-4 VACANCY RATES FOR FULL-TIME SELECTED PROFESSIONAL AND TECHNICAL STAFF IN GENERAL AND ALLIED SPECIAL HOSPITALS, CANADA, 1961*

Type of Occupation	Positions Established	Number Employed	Vacancies	Vacancy Rates†
Dietitians	972	827	145	14.9
Medical Record Librarians	803	739	64	8.0
Laboratory Technicians	4,492	4,246	246	5.5
Radiological Technicians	2,760	2,712	48	1.7
Physiotherapists	895	764	131	14.6
Occupational Therapists	231	176	55	23.8
Social Workers	366	315	51	13.9

*Include public, private and federal hospitals, two part-time persons were taken as equivalent to one full-time worker.

†Vacancy rate is the percentage of vacancies to positions established.

SOURCE: Data supplied by Dominion Bureau of Statistics, Health and Welfare Division.

In order to see what the present situation is in the education and use of paramedical personnel we have examined, in more detail, the major paramedical groups in terms of their present functions, educational requirements, supply and shortages. These details are presented below.

Dietitians

The main work of dietitians consists in the organization, administration and supervision of food services in communal and commercial establishments. Traditionally, dietitians have been employed in hospitals, schools, corrective institutions, the Armed Services and similar institutions but there has been a growing tendency for them to be employed in commercial enterprises. In the hospital the dietitian is responsible for general food service and for therapeutic diets for patients as well as food supply for the hospital medical staff, nurses, and others. The hospital dietitian may also perform a teaching function in the hospital schools of nursing or a research function as a member of a metabolic research team.

In Canada the professionally qualified dietitian is considered to be one who has the qualifications necessary for membership in the Canadian Dietetic Association. Membership requires a baccalaureate degree in Home Economics and completion of either a 10- to 12-month dietetic internship in an approved hospital or three years attested experience. Possession of a

Master's degree in Food and Nutrition also assures eligibility for membership. At present there are 16 universities in Canada offering accredited courses in Home Economics. The hospitals providing internship training are dispersed throughout most of the provinces. Manitoba, New Brunswick, Prince Edward Island and Newfoundland, however, have no hospitals with facilities for training dietetic interns.

At the sub-professional level in the dietary occupation come the certified "dietary aides" such as food supervisors and dietary assistants. To qualify for these positions one must successfully complete a programme of studies offered at vocational schools or arranged jointly by the provincial hospital and dietetic associations. At a third level in the dietary service come the non-certified "dietary aides". On-the-job training in hospitals over a stipulated period qualifies one for these positions, with the stipulated period varying between 6 and 18 months.

Although the number of dietitians employed in hospitals has declined the number of professionally qualified dietitians has increased. In 1961 there were 988 dietitians employed in hospitals as compared with 1,105 in 1953. Data on the distribution of dietitians by professional qualifications are limited to public hospitals. In these hospitals, between 1953 and 1961, the number of professionally qualified dietitians employed increased from 496 to 552, while the number of all dietitians (irrespective of qualification) decreased from 965 to 772. As a result, about seven out of every ten dietitians employed in public hospitals were professionally qualified in 1961 as compared with five out of ten in 1953. Since these hospitals employ about 80 per cent of all dietitians working in hospitals, Canadian hospitals increasingly are using professionally qualified dietitians and reducing their employment of the non-professionally qualified.

During the period, the increased volume of hospital care as measured by patient-days and the reduced number of dietitians employed would suggest shortages in the supply of dietitians. In view of the increased supply of professionally qualified dietitians and the recent tendency for hospitals to contract out to commercial caterers a share of the food preparation previously done within the hospital kitchen, an increase in patient-days per dietitian provides an inadequate measure of shortage of personnel.

The Canadian Dietetic Association has suggested a standard of dietary service of one professionally qualified dietitian per 100 rated beds. Assuming that the volume of service in hospitals of size 100 beds is too small to warrant the full-time employment of a professionally qualified dietitian, the need for these personnel in hospitals of 100 beds and over may be determined by applying this standard to total bed capacity in these hospitals. On this basis approximately 670 professionally qualified dietitians were needed in public hospitals in 1961 as compared with 552 actually employed. The number of reported vacancies also provides an indication of shortages. In 1961 there

were 145 full-time vacancies (15 per cent) for dietitians in public, federal and private hospitals. Thus, dietitians had the second highest vacancy rate of all the groups studied.

Despite the existing shortage of these personnel no expansion of training facilities need be contemplated at present because university courses in home economics and facilities for training dietetic interns in hospitals are presently under-utilized. Inadequate salaries are a factor affecting the inability of hospitals to attract and hold professionally qualified dietitians.[1] To attract dietitians, salaries offered by hospitals must be made commensurate with those paid by other enterprises and to other hospital professionals with similar academic background and responsibilities. Hospitals also face the problem of retaining the services of the dietitians that they employ. Many married women withdraw from employment when home responsibilities conflict with their professional duties. It is possible that higher salaries and better working conditions and hours of work will induce many married dietitians to return to hospital work.

Another approach to the solution of the existing shortage of professionally qualified dietitians may be that training programmes for certified "dietary aides", who require a shorter training period than the professionally qualified dietitian, should be expanded. The increased use of these auxiliary dietary workers, once they receive adequate supervision, will increase the productivity of the professional dietitian.

There also exists the problem of ensuring that the dietary service in smaller hospitals is at a satisfactory level. Because of the small number of patients the employment of a professionally qualified dietitian in such hospitals is not economically warranted. A practical solution to the problem of maintaining quality diet at economic cost in these small hospitals could come through the regional organization of health services in which one professionally qualified dietitian, with the assistance of certified auxiliary dietary workers, e.g., food supervisors, would serve a group of these small hospitals.

Medical Record Librarians

The medical record librarian, working in hospitals and clinics, is responsible for the patient's records which show the course of his illness and treatment. More specifically, her duties include the following: "(*a*) reviewing patients' records for completeness and accuracy; (*b*) coding and indexing of diseases, operations and special treatments according to recognized classification systems; (*c*) assisting the medical staff in research involving medical records; (*d*) selecting and tabulating record information for specific

---

[1] *The Ontario Dietetic Association*, brief submitted to the Royal Commission on Health Services, Toronto, May 1962, p. 3, and Manitoba Hospital Survey Board, *Report on Hospital Personnel*, Winnipeg: Queen's Printer, 1963, p. 173.

purposes of the hospital, the clinic, or health authorities; (*e*) abstracting case histories for special reports; (*f*) preparing periodic narrative and statistical presentations on the utilization of the hospital or clinic; (*g*) answering inquiries for record information in accordance with prescribed policies; (*h*) representing the hospital or clinic in court or other medico-legal activities; and (*i*) serving on the hospital's medical record committee".[1]

Formal training and qualifications are becoming more important for this occupation. In Canada, a qualified medical record librarian must be registered with the Canadian Association of Medical Record Librarians. To be eligible for membership the applicant must successfully complete a training programme at an approved school. In 1961, there were 11 hospital schools providing courses of training approved by the Canadian Association of Medical Record Librarians. These courses were of 12-month duration. Admission requirements to these courses include completion of senior matriculation, and a knowledge of shorthand and typing. In addition to the hospital training programmes the Canadian Hospital Association, in co-operation with the Canadian Association of Medical Record Librarians, offers an 8-month extension course which provides training to non-qualified personnel in the medical record departments of small hospitals.

The number of qualified and non-qualified medical record librarians employed in public general and allied hospitals and private hospitals in 1961 was 753, an increase of 18 per cent between 1953 and 1961. During this period the number of professionally qualified librarians rose much more rapidly. Thus, in public hospitals which employ the bulk of these personnel working in hospitals, registered librarians increased in number from 151 to 426, or 182 per cent. In these hospitals registered persons comprised almost 60 per cent of all medical record librarians in 1961, as compared with less than 25 percent in 1953.

Despite the increased employment of these personnel in recent years, the Canadian Association of Medical Record Librarians reported shortages of professionally qualified librarians in 1961. The Association suggests that general hospitals should have one registered record librarian per 100 beds.[2] If this standard is applied to public hospitals with 100 beds or more it appears that in 1961 these hospitals needed an additional 244 registered record librarians. Since there is some substitution between non-qualified and qualified record librarians, existing shortages are probably somewhat lower than the level suggested by these data. In 1961, public, private and federal hospitals reported 64 full-time vacancies for these personnel, but this figure underestimates the shortage of record librarians in that year. The low attrition rate of this profession, resulting from the fact that about one-third of its

[1] Manitoba Hospital Survey Board, *op. cit.*, p. 182.

[2] *Canadian Association of Medical Record Librarians*, brief submitted to the Royal Commission on Health Services, Toronto, May 25, 1962, p. 2.

members belong to religious orders, helped to prevent more serious shortages from arising.

We conclude therefore that moderate shortages of these personnel exist. However, the increased use of medical records to maintain high quality health care and the increased volume of health services that will result from the recommended Health Services Programmes will necessitate a significant rise in the volume of medical records, and consequently in the demand by hospitals for these personnel. On the other hand, the wide-spread introduction of new methods of collecting, coding and classifying these records would tend to reduce the demand for them. It is unlikely, however, that automation will significantly affect the demand for these personnel for the foreseeable future. Existing training facilities are adequate to handle the expansion of enrolment that must take place if present shortages are to be removed and future requirements met. The continued extension of financial assistance under the National Health Grants, Technical and Vocational Training Programmes, and the Hospital Insurance Programme will help to stimulate the required expansion in enrolment.

The employment of full-time registered librarians is appropriate only in those hospitals with relatively large and complex care programmes. Therefore, medical record work in smaller hospitals will continue to be carried out by nurses or clerical personnel. However, a system under which a registered record librarian supervises the records in a group of these small hospitals, on a regional basis, would ensure that the quality of record services in rural areas is of an adequate standard.

Medical Technicians

LABORATORY TECHNICIANS

The work of laboratory technicians encompasses all laboratory procedures that assist in the detection and control of disease and in the investigation and maintenance of the normal functions of the human body.[1] In Canada about four-fifths of the certified laboratory technicians work in hospitals, the remainder are employed in provincial government laboratories, universities and private laboratories.

The registering body for this paramedical group is the Canadian Society of Laboratory Technologists which after examination, grants a Certificate of Registered Technologist as the standard qualification for the practice of medical laboratory technology. Only graduates from approved training programmes in laboratory technology are eligible to take this exami-

[1] Department of Labour, *Medical Laboratory Technologists*, Monograph 42, Canadian Occupation Series, Ottawa: Queen's Printer, 1957.

nation.[1] In 1960, there were 119 centres in Canada which were approved for the training of laboratory technicians. These centres were of four types: approved hospital laboratories, provincial government laboratories, regional centralized laboratories, and colleges and universities.

Training programmes in approved hospital laboratories are under the direction of a certified pathologist and are of 12 to 24 months duration. Instruction in the theoretical and practical aspects of medical technology is provided by the technical staff. Training at provincial government laboratories is divided in two phases: 6 to 8 months of theoretical training and followed by one year of practical training in an approved hospital laboratory. Under the centralized training programme approved hospital laboratories co-ordinate the didactic phase of their training in one centre; students then return to their respective hospitals for an additional year of practical experience. All existing university courses in medical technology have the approval of the Canadian Medical Association. The universities of Saskatchewan and Alberta offer a three-year degree course in medical technology; the other universities offer two-year diploma courses.

The supply of laboratory technicians has increased at a rapid rate in recent years. Between 1953 and 1961 the number of laboratory technicians employed in all reporting hospitals, excluding federal, increased from 2,038 to 4,426, or by nearly 120 per cent. In addition to this rapid growth in numbers, one other aspect of the supply of this group deserves specific mention—that is the sharp rise in the employment of qualified technicians. During the period under review, public hospitals employed an additional 1,413 qualified laboratory technicians, and as a consequence, the qualified technicians comprised 58.6 per cent of all laboratory technicians working in these hospitals in 1961 as against 55.7 per cent in 1953. In recent years there has been a sharp increase in the productivity of this type of personnel. It has been estimated that there was a 12 per cent annual increase in the volume of laboratory units per technician over the period.[2]

Despite the marked increase in the supply of these personnel there is some evidence that shortages still existed in 1961 but it is not believed that these shortages were serious. For example, in 1961 only 246 of the 4,492 positions established were unfilled, a vacancy rate of 5.5 per cent which is the second lowest of the groups studied. We conclude, therefore, that there is no significant shortage of this paramedical group.

Since the co-ordination and concentration of the didactic phase of training permits a more efficient utilization of training personnel and ensures

---

[1] Training programmes are approved by the Canadian Medical Association Committee on approval of Hospital Laboratories for Training Medical Technologists.

[2] Boyd, A. D., *Paramedical Manpower in Canada*, a study prepared for the Royal Commission on Health Services, Ottawa: Queen's Printer (*in press*).

a higher quality of training, the expansion of centralized training programmes should be stimulated. Before this can be done, in view of the present shortage of qualified instructors, some expansion of advanced training programmes must be undertaken. Some approved hospitals have already inaugurated courses for advanced certification but the number of advanced courses appears inadequate. Universities, especially, should consider the establishment of advanced courses in medical technology.

If the supply of this type of personnel is to be maintained we must be concerned with their high attrition rate. The Canadian Society of Laboratory Technologists estimates that about 90 per cent of the laboratory technicians are females who seldom remain in the profession more than 2 or 3 years.[1] Salary increases might tend to attract more males to the profession. Moreover, an increased number of professionally qualified males would assure stability in the senior laboratory technician positions and ensure that experienced personnel are always available to train students. Improved working conditions and better working hours might reduce the withdrawal rate for females and attract married women to work on a part-time basis.

Many small hospitals in rural areas have no laboratory technicians on their staff although some such hospitals combine laboratory and radiological work. In 1961 about 70 per cent of the hospitals of under 100 beds did not employ a qualified laboratory technician. This does not suggest that the required laboratory services were not performed but that they were not performed intramurally. Smaller hospitals have their laboratory procedures performed in larger hospitals or provincial laboratories. In view of the low volume of their laboratory needs many small hospitals find it more economical to have their laboratory work done extramurally. Consequently, it appears that no change in the existing arrangement is necessary.

RADIOLOGICAL TECHNICIANS

This paramedical group is concerned with the technical aspects and use of ionizing radiation in medicine under the direction of a physician. Most of the radiological technicians are engaged in the diagnostic and some in the therapeutic field of radiology, while only a few work in both fields. The majority of these technicians work in hospitals but others are employed in the offices of radiologists, dentists, and group practice clinics, as well as in laboratories serving the health professions.

Most of the approved centres for the training of these personnel are in hospitals, but some universities and vocational schools and technical institutes have also been designated as teaching centres.[2] Minimum educa-

---

[1] *Canadian Society of Laboratory Technologists*, brief submitted to the Royal Commission on Health Services, Toronto, May 31, 1962, p. 9.

[2] The six university centres offering training for radiological technicians are located in Saskatchewan, Ontario, Quebec and Nova Scotia.

tional qualification for entrance into approved schools is junior matriculation, or university entrance requirements for training in the university centre for radiological technicians. The duration of training in approved schools is not less than 24 months for diagnostic or therapeutic techniques and 36 months for both fields combined.

The Canadian Society of Radiological Technicians is the only certifying body for radiological technicians in Canada. Certification examinations in both diagnostic and therapeutic techniques are held twice annually. Successful candidates are granted certificates and are entitled to the qualification of Registered Radiological Technician. At present graduates of both approved and non-approved training centres are eligible to sit for the certification examinations, but after May 1966 only graduates of approved training centres will be permitted to do so.

There has been a significant rise in the employment of radiological technicians in hospitals in recent years. Between 1953 and 1961 the number of these personnel employed in all hospitals, excluding federal, increased from 1,396 to 2,819, i.e., an increase of over 100 per cent. The effective increase is even greater since there was, during this period, a tendency for a larger proportion of these technicians to work on a full-time basis. In public hospitals, 96 per cent of these technicians worked on a full-time basis in 1961 as compared with 87 per cent in 1953. This group has also shown an impressive improvement in qualifications during this period. For example, in public hospitals, which employ nine-tenths of all radiological technicians working in hospitals, there were 1,453 fully qualified technicians in 1961 as compared with 579 in 1953. They comprised 56 per cent of all technicians employed in these hospitals in 1961 as against 48 per cent in 1953.

This marked improvement in the supply of these technicians between 1953 and 1961 does not imply that it was completely adequate. Available data suggest that while shortages exist they are quite moderate. In 1961 only 58 of the 2,760 full-time positions established for radiological technicians were unfilled. The resulting vacancy rate of 1.7 per cent was the lowest of all groups studied. It can be concluded therefore that there is no serious shortage in the supply in this group of personnel.

To assure an adequate supply of qualified teachers in radiological techniques some increase in the numbers of advanced and refresher courses appears desirable. Further, the reorganization of existing hospital training programmes to permit the co-ordination of the didactic phase in centralized schools would promote the more efficient use of available resources. These centralized training centres would be best established in regional hospitals, vocational schools, and institutes of technology. The expansion of advanced courses would enable technicians to qualify for senior positions and thereby increase the attractiveness of a career in radiological technology for males.

One factor affecting the supply of this group is the high attrition rate. For example, the Canadian Society of Radiological Technicians estimates that a large proportion of its present membership are graduates of less than five years experience.[1] To reduce the high attrition rate more males should be attracted to this occupation and an increase in salary scales will serve to achieve this objective. But improved working conditions and better working hours may tend to retain females in this occupation.

Finally there remains the problem of ensuring that the standard of radiological services in small hospitals is of an acceptable quality. Small hospitals in rural areas, which generally provide less radiological services than larger hospitals, encounter difficulty in attracting registered radiological technicians. In 1961 about two-thirds of the hospitals with less than 100 beds did not employ a registered radiological technician. A high quality of service could still be assured in these hospitals by having one qualified technician serve two or three small hospitals in adjacent communities.[2] Many qualified technicians are reluctant to accept employment in rural hospitals because it precludes advancement in technical skill, which, in turn, limits the opportunities for advancement into better paying positions. This may result in small hospitals in rural areas being unable to obtain the qualified personnel they require. It has been suggested that a travelling supervisory service and refresher courses, by removing the fear of obsolescence of skill, would reduce the technicians' reluctance toward rural employment.[3] These proposals should therefore be given serious consideration.

OPERATING-ROOM TECHNICIANS

Operating-room technicians work exclusively in hospitals and constitute a relatively new paramedical group as nurses have previously been used in this capacity. These technicians are not widely employed in Canada and because of their small numbers no national organization has been established. Consequently there is no accredited course of training. Two types of programmes, both offered in hospitals, are available for the training of these technicians. Some large hospitals provide basic training for their own operating-room technicians. The duration of this training is six months after two years working as an orderly. More recently, the Winnipeg General Hospital has established a six-months course designed to train such technicians to work in other hospitals. Presently, this course is limited to ten students annually.

---

[1] *The Canadian Society of Radiological Technicians,* brief submitted to the Royal Commission on Health Services, Toronto, May 29, 1962, p. 8.

[2] Manitoba Hospital Survey Board, *op. cit.,* p. 142.

[3] *Canadian Society of Radiological Technicians, Manitoba Division,* brief submitted to the Royal Commission on Health Services, Winnipeg, January 17, 1962, p. 10.

The functions of a scrub nurse are of a specific nature and can be performed just as adequately by the operating-room technician as by the registered nurse. In view of the shortage of nursing personnel and their longer period of training, the substitution of these technicians for nurses in the operating-room will promote the more efficient allocation of our health manpower. Compared with nurses or student nurses the employment of this group reduces staff turnover. To assure that the supply of operating-room technicians is sufficient to permit this substitution the Commission recommended in Volume I that "... a new classification of this type of work be established with adequate salaries so that men may make a career of this occupation".[1]

OTHER TECHNICIANS

The growing complexity of the equipment used in the diagnosis and treatment of disease in the physicians' offices, hospitals, and laboratories has led to a corresponding demand for personnel to operate such equipment. We have described groups of technicians in fields where special knowledge and skills are required, and where specific qualifications have been identified as a prerequisite for practice. These qualifications range from formal training and certification in the case of laboratory and radiological technicians, to several months training in a hospital without the need for formal certification as in the case of operating-room technicians.

There are other areas, where the requirements for training are still less specific or uniformly accepted. Among these are the electroencephalography technicians whose training on the job ranges up to 3 to 4 years. They, like the equipment they use, are mostly employed in hospitals.

Electrocardiography technicians, on the other hand, are employed predominantly in physicians' offices or clinics. Little training is required for this type of work often performed by nurses or other personnel in the office, clinic, or hospital.

Therapists

PHYSIOTHERAPISTS

Physiotherapy is the treatment of disease and injury by the use of heat, light, electricity, massage, therapeutic exercises and other rehabilitation procedures.[2] It is an accepted and valuable adjunct of modern medical and rehabilitative treatment and is used extensively in all branches of medicine including surgical (orthopaedic, neurosurgical and reconstructive), dermatological, neurological, obstetrical, gynaecological, paediatric and geriatric.

---

[1] *See* Volume I, Chapter 2, Recommendation 139, p. 69.
[2] Manitoba Hospital Survey Board, *op. cit.*, p. 145.

The physiotherapist is employed in departments of general, special and rehabilitative hospitals, in out-patient centres, private patient clinics and in the home. Three out of every five physiotherapists in Canada are employed by hospitals, but irrespective of place of employment the physiotherapist provides treatment only under the direction of a medical practitioner.

In most provinces, physiotherapists must be licensed under a provincial act[1] in order to practise. The legislation requires a standard of training similar to that set by the Canadian Physiotherapy Association for its membership. Membership in the national organization is restricted to graduates of Canadian university schools of physiotherapy after completion of a five-months internship, and to foreign-trained physiotherapists who either have diplomas or degrees which are recognized by the national organization, or pass a special examination set by the Canadian Physiotherapy Association. There are now in Canada six schools providing training in physiotherapy[2] each within a university medical faculty. Three of these schools offer combined training in physical and occupational therapy and the remainder offer separate training in both specialties. In all six schools, a diploma in physical therapy is given on the successful completion of a two- or three-year course of study and specified internship.

Beyond the diploma level, McGill University offers a four-year degree course in both therapies combined, and the University of Toronto offers further training towards a teacher's certificate in physiotherapy. There are also refresher courses for practising therapists.

In 1961 there were 840 physiotherapists, employed in Canadian hospitals, of whom 90 per cent worked in public general and allied special hospitals. Between 1953 and 1961 the number of physiotherapists employed in public hospitals increased by 160 per cent from 287 to 747, thereby registering the greatest percentage increase of all paramedical groups studied here. Because of this rapid increase, there has been a significant improvement in the beds and patient-days–physiotherapist ratios during this period. Private hospitals have also experienced some improvement in the adequacy of their physiotherapist personnel. Approximately 14 per cent of physiotherapists in public hospitals were employed on a part-time basis.

The increase in the supply of physiotherapists between 1953 and 1961 does not mean that needs were being adequately met even in the latter year. There is much evidence to suggest that there was a serious shortage in these occupations in 1961. In that year, there was one professionally qualified physiotherapist for every 14,500 Canadians. Comparable figures for other countries were as follows: Denmark—2,200; Sweden—

---

[1] New Brunswick, Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia have such acts; licensing is mandatory in all these provinces except Alberta.

[2] Universities of Toronto, Montreal, Manitoba, Alberta, British Columbia and McGill.

2,600; United Kingdom—6,000; Australia—8,000; and France—12,000. The difference in population-physiotherapist ratios of the provinces (e.g., British Columbia—10,800 and Newfoundland—37,700) suggests that the supply of physiotherapists is both inadequate and unevenly distributed. In fact it has been suggested that about half of the sick and injured Canadians who need and could benefit from physiotherapy are unable to obtain this service.[1]

Further evidence of the existing shortage of physiotherapists is provided by the number of vacancies in hospitals. In 1961, there were 895 full-time positions for this type of personnel in all hospitals excluding mental and tuberculosis. Of these, 131 or 14.6 per cent were unfilled. This vacancy rate was the third highest of the seven paramedical groups studied, exceeded only by occupational therapists and dietitians.

The employment of trained aides will increase the volume of services which our present supply of physiotherapists provide. These aides should be trained on-the-job by senior staff physiotherapists and their work should be directly supervised by qualified personnel.

To assure an adequate supply of physiotherapists the Continuing Committee of the Canadian Conference on Physiotherapy has recommended: that seven additional schools in physiotherapy be established, each in a university with a medical faculty; that two additional schools, in universities not previously having medical faculties, be created which should offer a diploma in physiotherapy; and that these schools be established by 1971.[2] Since students in this field, after graduation, tend to practise in areas close to the school, we must conclude that, because of the present maldistribution of our physiotherapy manpower, the Atlantic Provinces and Quebec should have priority in any programme to provide training facilities for physiotherapy.[3]

The high attrition rate of this profession is an important determinant of existing shortages. It has been estimated that approximately 10 per cent of the graduates of Canadian physiotherapy schools never practise and another 65 per cent leave the profession by the fifth year after graduation.[4] Salary increases and better working conditions might encourage the female physiotherapist to remain in active practice. More adequate remuneration will also attract more men, whose attrition rate is lower, into these occupations.

Most small hospitals are without the services of a qualified physiotherapist. In 1961, only 2 of the 604 reporting hospitals of size 1-99 beds employed a physiotherapist. Failure to employ these personnel was due to the low volume of physiotherapist services considered essential and to an inability

---

[1] *The Continuing Committee of the Canadian Conference on Physiotherapy*, brief submitted to the Royal Commission on Health Services, Toronto, May 24, 1962, p. 2.

[2] *Ibid.*, pp. 14 and 15.

[3] *See* Recommendation 209, p. 70.

[4] *Canadian Physiotherapy Association*, brief submitted to the Royal Commission on Health Services, Ottawa, March 1962, p. 8.

to finance the costs involved. A solution to the problems facing these small hospitals can be found through a regional approach. A travelling regional physiotherapy service under which a physiotherapist is shared among a few small hospitals is one means by which these hospitals can provide adequate physiotherapy care to their patients.

OCCUPATIONAL THERAPISTS

Occupational therapy is a rehabilitative procedure guided by a qualified occupational therapist who, under medical supervision, uses self-help, manual, creative, recreational and social, educational, pre-vocational and industrial activities to promote the maximum recovery of the physical and mental functions of patients. Besides treating patients, occupational therapists may also be employed in administrative and teaching positions.[1] In the past, these therapists were primarily engaged in treating long-stay patients in hospitals but in recent years their skills are being used more widely. Today much of their treatment is provided in community workshops, curative workshops, home-care programmes, and to short-stay patients in general hospitals. However, mental hospitals still employ about two-thirds of the occupational therapists working in hospitals. In 1961, about one-third of the active occupational therapists in Canada were employed in rehabilitative clinics and centres.

Training in occupational therapy in Canada is provided in six schools, each within a medical faculty.[2] Three of these schools offer a diploma in occupational therapy and the others have a combined diploma course in occupational and physical therapy. The duration of these diploma courses is two to three years plus a six-month internship. The Canadian Association of Occupational Therapy in addition offers a special 18-months diploma course at Kingston. Admission requirements to this special course are a degree in nursing, a B.A. degree or equivalent experience in this occupation.

There has been a significant increase in the supply of occupational therapists in recent years. The total number employed in public, private and mental hospitals stood at 516 in 1961 as compared with 298 in 1953. This is one paramedical occupation in which immigration has had a considerable impact on the increase in supply. For example, between 1957 and 1961 the foreign-trained share of total active membership of the national association increased from 26 to 36 per cent. As hospital-bed capacity and patient-days grew at a less rapid rate than the supply of occupational therapists between 1953 and 1961, the patient-days and bed capacity per personnel ratio for this paramedical group improved during the period. In 1961 about 85

[1] In 1961, of the 342 members of the Canadian Association of Occupational Therapy, 2 were employed in administrative positions and 21 in teaching.

[2] Universities of Toronto, Montreal, Manitoba, Alberta, British Columbia and McGill.

per cent of the occupational therapists in public hospitals were employed on a full-time basis as compared with 92 per cent in 1953.

Despite the rapid increase in their supply serious shortages of these personnel still exist. The Rehabilitation Committee of the Canadian Medical Association has suggested a ratio of one occupational therapist per 15,000 population.[1] To meet this standard, 1,200 occupational therapists would have been needed in 1961. In that year membership in the national association was 342, of whom only 319 were providing treatment to patients. Further evidence of the acute shortage of these personnel is provided by the vacancy data for hospitals. General and allied special hospitals in 1961 had 231 full-time positions established for occupational therapists. Of these only 176 were filled. The resulting vacancy rate of 24 per cent was clearly the highest of all the paramedical groups studied. In mental hospitals the Canadian Association of Occupational Therapy estimated that 367 vacancies for therapists existed in these institutions in 1961. A conservative estimate would place our shortage of qualified therapists in 1961 at between 400 and 500.

This predominantly female profession has a very high attrition rate. For example, between January 1957 and December 1961, 300 additional Canadian-trained personnel were appointed in Canada but during the same period 298 resigned. An increase in male participation in this profession would, of course, reduce the attrition rate. Increases in salaries of occupational therapists may make a career in this field more attractive to males. In addition, efforts should be made to emphasize the opportunities for males in this profession through vocational guidance programmes at the secondary school level. Improved working conditions and better working hours may retain married women in this occupation.

Another method of relieving existing shortages is by training more aides to carry out the routine responsibilities and auxiliary functions of the occupational therapists. The scope of their duties includes work assigned by qualified occupational therapists, maintenance of equipment and preparation of patients for scheduled treatment.[2] In order to maintain the desired level of health care the work of these aides must be directed and supervised by qualified occupational therapists. Consequently, the supply of qualified therapists limits the extent to which the expansion of existing training programmes for aides can effectively compensate for the shortage of this personnel. In view of the existing shortage there must be a rapid expansion of university and clinical facilities for the training of therapists.

To assure the maintenance of desirable professional standards the Canadian Association of Occupational Therapy recommends that new occupational therapy courses be established within university medical facul-

[1] *The Canadian Association of Occupational Therapy*, brief submitted to the Royal Commission on Health Services, Toronto, May 23, 1962, p. B-2.

[2] *Ibid.*, p. 10.

ties.[1] One of these courses should be provided at l'Université de Sherbrooke where a medical school is now being established.[2] Increased financial assistance, e.g., scholarships, bursaries, and loans, would also augment the number of applicants for training.

SPEECH AND AUDIOLOGICAL THERAPISTS

Speech therapists are concerned with the evaluation and education of those suffering from communication disorders which affect the comprehension and expression of language. The primary objective of speech therapy is to diagnose and treat disorders of articulation, voice and language. Audiology, the study of hearing, is chiefly concerned with different methods of testing hearing and educating the person with a hearing impediment. The audiological therapist carries out the prescribed treatment for the hearing impairment. Speech and audiological therapists work in hospitals, rehabilitation centres, clinics, special schools for the handicapped or deaf, as well as in the regular school system.

Manitoba is the only province with a licensing board defining the conditions under which individuals are entitled to practise speech and hearing therapy.[3] There is no national organization but there are provincial associations in Quebec, Ontario, Manitoba, Saskatchewan and British Columbia.

Speech therapy and audiology are complementary skills and are taught together in Canada, so that the graduates may practise in either specialty. Three Canadian universities provide training in these areas, namely, the Universities of Montreal, Toronto and McGill.[4] In all three universities training for speech and audiological therapists comes under the medical faculty. Admission requirements in the schools is either a B.A. or B.Sc. degree or equivalent.[5] The duration of all courses is two academic years plus a six-month internship.

Because of the location of the Canadian schools in Eastern Canada, students from the western provinces usually receive their training at universities in the United States.

Statistics on speech therapists are lacking. Membership in the five provincial associations in 1961 was 129 but both speech therapists and correctionists are eligible for membership in these associations. It is estimated that there were between 100 and 125 qualified speech therapists in Canada in that year. Most of them work in hospitals. Generally, however, the hospital-

---

[1] *Ibid.*, p. 8.

[2] *See* Recommendations 207 and 209, p. 70.

[3] A Bill, with the same intent, is at present before the Quebec Legislature.

[4] The Universities of Montreal, Toronto, and McGill began their courses in this field in 1956, 1958 and 1963 respectively. At McGill University, administratively, the School of Graduate Studies looks after students in this field.

[5] University of Toronto accepts registered nurses, i.e., R.N. and Teacher's Certificates, with experience as equivalent.

employed speech therapist also works part-time in a clinic or rehabilitation centre. It has been estimated that between 400 and 500 additional speech therapists are needed.[1]

At present existing training facilities graduate about 12 speech therapists per year; in addition, another 10 to 20 foreign-trained speech therapists annually migrate to Canada. This annual gross increment to supply is seriously inadequqate in view of the shortage that exists in this country. The need for further expansion of training facilities is self-evident. Additional facilities should be established and they should be associated with the medical faculties of Dalhousie University, in one of the Prairies' medical schools and the University of British Columbia. In the latter province such a school should be associated with the Health Sciences Centre.[2]

Medical Social Workers

Social work has gained an essential role in the provision of good health services and as the social component in sickness has become more recognized, the contribution of the medical social workers has become increasingly more significant. They are employed in hospitals, clinics and rehabilitation centres and deal with social problems of patients and their families. Among the principal tasks which medical social workers undertake are the provision of assistance to patients and their families to overcome problems which prevent them from benefiting fully from medical care available; helping patients and their families to remedy conditions contributing to illness such as housing, family attitudes, working conditions, etc.; making available community services to the patients and their families; serving as a consultant to the administration of the hospital or clinic in the formulation of policies affecting the social well-being of the patient; and, finally, assisting patients to readjust themselves after medical treatment or because of permanent disability.[3]

Social workers may receive their formal education in Canada at seven universities located in British Columbia, Manitoba, Ontario, Quebec and in one other institution, the Maritime School of Social Work. Entrance requirement into a school of social work is a B.A. degree; an additional year of training leads to the Certificate in Social Work; and two years of training leads to the degree of Master of Social Work.

Membership in the Canadian Association of Social Workers requires graduation from a school of social work approved by the association.

---

[1] Estimate made by the Medical Rehabilitation and Disability Advisory Service, Department of National Health and Welfare.

[2] *See* Recommendation 208, p. 70.

[3] *The Canadian Association of Social Workers,* brief submitted to the Royal Commission on Health Services, Toronto, May 28, 1962, pp. 1 and 2.

While in-service courses are given by some provincial governments and private agencies, they do not qualify individuals for membership.

There has been a significant rise in the number of social workers employed in hospitals. In 1953 some 325 were employed in hospitals (excluding federal for which no data are available) and 595 in 1961, or an increase of 270 or 83 per cent. Consequently, the ratio of patient-days per social worker has improved from 145,900 to 103,600 between the two years. In public general and allied special hospitals the number of social workers rose from 197 in 1953 to 291 in 1961, or a rise of 48 per cent, while in mental hospitals the corresponding numbers were 78 and 234, or a rise of 200 per cent. There was, however, a more rapid rise in the number of professionally qualified social workers employed in public hospitals in this same period, from 128 to 227 or by 77 per cent. The fully qualified social workers accounted for 78 per cent of the total number employed in public hospitals in 1961 as compared with 65 per cent in 1953. Out of the total of 291 social workers in public hospitals in 1961 about one-sixth were working on a part-time basis.

As needs for personnel in this field vary between hospitals depending on the type of hospital, its location, and the proportion of in-patient to out-patient services, it is difficult to establish a standard by which the adequacy of our supply of medical social workers may be determined. It is evident, however, that shortages of these personnel exist. In 1961 there were 51 full-time vacancies or 14 per cent of positions established for social workers unfilled in public, federal and private hospitals. With the Commission's recommendations to establish home care and to treat more mental patients in general hospitals and in the community,[1] there will be a still greater need for medical social workers both to help discharged patients and to assist their families. Methods must therefore be devised of overcoming existing and future shortages of these personnel.

The expansion in the training of a less qualified type of social worker who would work under the supervision of a professionally qualified worker would contribute to a reduction in existing shortages of qualified personnel.[2] Measures which would increase the number of university graduates in social work, e.g., bursaries and loans, would assist materially in expanding the supply of qualified social workers in the health field.

Finally there is the problem of the provision of these services in small hospitals. In 1961 none of the 604 reporting hospitals of size 1-99 beds employed a medical social worker. While it may not be feasible for small hospitals to employ a full-time medical social worker, some system must be

[1] *See* Volume I, Chapter 2, Recommendations 9, 18 to 20, and 116 to 123, pp. 24, 26, 61 and 62.

[2] Manitoba Hospital Survey Board, *op. cit.*, p. 162.

devised to ensure that the services of a qualified social worker are available to patients of these hospitals. One such arrangement is for these hospitals to employ social workers on a part-time basis. Alternatively, this service could be organized regionally with the social workers being attached to a county health unit or regional welfare office.

Future Requirements and Supply of Selected Paramedical Personnel

Thus far we have discussed the functions and education of selected paramedical groups and evaluated their present supply. Where serious deficiencies exist we have indicated how they could be overcome. It remains for us finally to estimate our future requirements of paramedical personnel and to determine to what extent existing training facilities will be adequate to supply the additional personnel that we must have if our future needs are to be met.

HOSPITAL REQUIREMENTS

The purpose of this section is to determine requirements for full-time professional and technical staff employed in hospitals with the use of a measurable factor, such as the patient-days per person of each paramedical group, and to estimate the expected supply of such personnel until 1971. No precise estimates are possible because of many uncertainties connected with the changing role of paramedical personnel in the provision of health services and the changing pattern of organization of health services, particularly in hospitals. For example, future demand for auxiliary health personnel will depend, apart from the influence of increased population, on the extent to which hospital facilities and treatments are increased, and on the degree of growth in out-patient and home-care services which require the services of physiotherapists, occupational therapists and medical social workers.

A minimum estimate of requirements for the various paramedical groups employed in hospitals was made on the basis of the actual 1961 ratio of patient-days to person employed in each group and the projected aggregate volume of patient-days for 1966 and 1971.[1] A higher estimate of future requirements was based on the assumption of the improved staff-patient-days ratio, i.e., the patient-days per full-time position established in each paramedical group as of 1961. Because of the expected increase in hospital-associated out-patient and home-care services and the increased use of medical records in maintaining high quality health care, we allow in our

[1] Madden, J.J., *Economics of Health*, a study prepared for the Royal Commission on Health Services, Ottawa: Queen's Printer (*in press*).

TABLE 3-5 PROJECTED REQUIREMENTS AND SUPPLY OF SELECTED FULL-TIME PROFESSIONAL AND TECHNICAL STAFF EMPLOYED IN HOSPITALS, CANADA, 1966 AND 1971*

Occupation and Year	Number of Staff Required								Expected Supply of Qualified Personnel*	Projected Deficiencies	
	(1) At 1961 Staff: Patient-days Ratio				(2) At Improved Staff: Patient-days Ratio						
	General and Allied	Mental	Tuber-culosis	Total	General and Allied	Mental	Tuber-culosis	Total		(1)	(2)
Dietitians											
1961	827	72	42	941	—	—	—	—	—	—	—
1966	1,024	63	26	1,113	1,203	74	30	1,307	922	191	385
1971	1,200	58	17	1,275	1,410	68	20	1,498	1,162	113	336
Medical Record Librarians											
1961	739	n.a.	n.a.	739	—	—	—	—	—	—	—
1966	915	—	—	915	993	—	—	993	677	238	316
1971	1,572	—	—	1,572	1,665	—	—	1,665	927	645	738
Laboratory Technicians											
1961	4,246	136	157	4,539	—	—	—	—	—	—	—
1966	5,258	119	97	5,474	5,562	126	103	5,791	4,477	997	1,314
1971	6,161	110	66	6,337	6,518	116	70	6,704	7,555	+1,218	+ 851
Radiological Technicians											
1961	2,712	73	107	2,892	—	—	—	—	—	—	—
1966	3,358	64	66	3,488	3,417	65	67	3,549	2,586	831	963
1971	3,936	59	45	4,040	4,004	60	46	4,110	4,165	+ 125	+ 55
Physiotherapists											
1961	764	21	n.a.	785	—	—	—	—	—	—	—
1966	946	18	—	964	1,108	21	—	1,129	1,030	+ 66	99
1971	1,608	17	—	1,625	1,798	20	—	1,818	1,415	210	403

Occupational Therapists											
1961	176	372	n.a.	548	—	—	—	—	—	—	—
1966	217	326	—	543	286	430	—	716	436	107	280
1971	755	301	—	1,056	835	397	—	1,232	480	576	752
Medical Social Workers											
1961	315	234	24	573	—	—	—	—	—	—	—
1966	390	205	15	610	453	238	17	708	615	5	93
1971	957	189	10	1,156	1,030	220	12	1,262	880	276	382

*Methods of estimating the expected supply of professionally qualified paramedical personnel employed in hospitals 1966 and 1971.

In all cases supply is stated in terms of full-time equivalent. Conversion into full-time equivalent was made on the assumption that in all hospitals the distribution of professionally qualified between full- and part-time employment was similar to that of the corresponding paramedical group in public hospitals in 1961. It is further assumed that two part-time equal one full-time professional.

Dietitians and Medical Record Librarians: The projected gross supply of each of these groups is computed by adding to the professionally qualified employed in hospitals in 1961, the gross number of professionals taking up hospital employment between 1961–1966 and 1961–1971. The latter figure is determined on the basis of the average annual gross addition of professionally qualified in hospitals over the 1956–1960 period for dietitians and 1958–1961 for medical record librarians.

Technicians (Laboratory and Radiological) and Medical Social Workers: Projections of the net supply of each of these groups are based on the assumption that the professionally qualified members will increase during the decade 1961–1971 at the same rate as that registered between 1953–1961 on the assumption that educational facilities will show the same rate of growth as in the last decade. Consequently, for each group, the number of professionals employed in 1961 is inflated by the respective annual average growth rate registered between 1953–1961.

Physiotherapists: Estimates of the supply of physiotherapists in 1966 and 1971, made by the Continuing Committee of the Canadian Conference on Physiotherapy, are used. The net supply of hospital-employed physiotherapists is determined on the assumption that the 1961 distribution of therapists between hospital and non-hospital employment will be maintained in 1966 and 1971.

Occupational Therapists: The projected net supply of occupational therapists is computed by adding to the professionally qualified employed in hospitals in 1961 the net number of professionals taking up hospital employment between 1961–1966 and 1961–1971. The latter figure is determined on the basis of the average annual net addition of these professionals in hospitals between 1957–1961.

estimated requirements for an additional 500 persons in general hospitals by 1971 for each of the following paramedical groups: physiotherapists, occupational therapists, medical social workers and medical record librarians. The expected supply of these auxiliary health occupations was calculated only in terms of professionally qualified persons on the assumption that non-professional personnel would be gradually replaced by fully qualified people. All figures relate to full-time professional and technical staff. This was determined by converting part-time to full-time workers on the basis that two part-time workers equal one full-time worker.

Table 3-5 shows the projected requirements and supply of selected full-time professional and technical staff employed in hospitals by 1966 and 1971.

It is evident from Table 3-5 that unless training of these categories of health personnel is accelerated some shortages in fully qualified persons will appear in most of the occupations studied here, particularly medical record librarians, physiotherapists, occupational therapists and medical social workers. The implication is that with the present rate of supply of qualified personnel the hospitals may have to rely on the services of less qualified personnel.

TOTAL REQUIREMENTS FOR SELECTED PARAMEDICAL GROUPS

For some paramedical personnel there will be not only a shortage in hospitals but also a shortage outside of hospitals. With the expansion of home care and rehabilitation programmes there will be an increased need for physiotherapists, occupational therapists, and speech and audiological therapists. It is not possible to estimate separately the out-of-hospital requirements for these occupations. However, it is possible to establish approximately total requirements, both in and out of hospitals, by using a population-practitioner ratio.

The Canadian Medical Association has suggested that the desirable population-personnel ratio would be 10,000 for physiotherapists, 15,000 for occupational therapists, and 25,000 for speech and audiological therapists.[1] Applying these ratios to the 1961 population indicates on over-all shortage of 650 physiotherapists in that year. On the basis of our population estimates (assuming net migration of 50,000 annually) and the projected supply of personnel, this shortage should decline to 250 by 1966 and disappear by 1971. With respect to occupational therapists, the shortage was 668 in 1961 and likely would gradually increase to 682 and 768 in 1966 and 1971 respectively. The shortage of speech and audiological therapists

[1] *The Canadian Medical Association*, brief submitted to the Royal Commission on Health Services, Toronto, May 1962, pp. 65 and 66.

amounted to 630 in 1961 but is projected to decline to 562 in 1966 and 529 in 1971.

It is evident that if the needs of Canadians are to be met in these areas, the supply of paramedical personnel must continue to grow and a special effort must be made to increase the number of occupational therapists and speech and audiological therapists.

Conclusion

For every physician today there are many other members of the health team. The growth in these paramedical personnel is due, in part, to their support of the physician in the increasingly complex field of health care, and in part, to the shortage of physicians and nurses in the face of a rising demand for health services. As we have noted, the responsibility for developing training programmes for the paramedical personnel has been undertaken to a large extent by hospitals, universities, national professional and accrediting associations and specialized institutions.

These occupations are predominantly female and suffer from rapid turnover with a resulting heavy expenditure for training purposes in order to maintain an adequate supply. The evidence at our disposal indicates that if these occupations could attract a larger number of males this high turnover rate could be decreased with a consequent saving in training expenditures. We believe that this situation can be improved if financial assistance is given to students in training and salaries are revised to attract men into these occupations.

Since 1948 the Professional Training Grant, other health grants and later the hospital insurance programmes as well as the Technical and Vocational Training Programme, have provided funds for the training of personnel in these fields, and there is no doubt that these grants have helped to train a significant number. Despite these financial incentives there is still a substantial proportion without the required standard of training. We think the time has come for a major effort to fill the gaps in the supply of these personnel so that the health team can provide the paramedical health care services of the highest quality.

The Commission recommends:

204. That there be established in each province a Paramedical Education Planning Committee, advisory to the provincial Health Planning Councils, to plan and direct the orderly development of the education and training of paramedical personnel. The Committee should be representative of the various provincial paramedical associations, university(ies), the Health Services Commission and the Department

of Education, and advise the Health Planning Council of those paramedical fields in which shortages of personnel exist, training facilities needing expansion, training programmes and other matters concerned with the supply of and demand for paramedical personnel.

205. That, to encourage suitable personnel to enter and remain in these occupations, salaries commensurate with their training and responsibilities and similar to those in comparable fields be paid by federal and provincial agencies and by hospitals.

206. That financial assistance under the Hospital Insurance and Diagnostic Services Act, and under the Technical and Vocational Training Assistance Act be expanded immediately to support any qualified applicants enrolling in courses of training prescribed for those paramedical fields in which shortages exist. On the national level we foresee shortages particularly in the following occupations: medical record librarians, physiotherapists, occupational therapists, speech therapists and audiological therapists, and medical social workers.

207. That financial assistance be provided to set up Departments of Rehabilitation in the medical schools at l'Université de Sherbrooke and at the University of Ottawa and such other universities as may be able to provide adequate training for paramedical personnel in this field.

208. That training facilities for speech therapy and audiological therapy be established in association with the medical schools of Dalhousie University, University of British Columbia within its Health Sciences Centre, and with one of the medical schools located in the Prairie Provinces.

209. That training facilities for physiotherapy and occupational therapy be provided in association with those medical schools which do not already possess such facilities.

210. That, in order to provide a continuous and uninterrupted supply of qualified paramedical personnel, more efforts be made to attract men into certain health occupations by ensuring working conditions, and especially salaries, competitive with other comparable occupations.

OTHER HEALTH PERSONNEL

Optometrists

In Volume I of our Report we referred to the functions and the numbers of optometrists. In Canada there are two schools for optometrists, namely the College of Optometry of Ontario in Toronto and l'École d'Optométrie, Université de Montréal. Over the years 1940 to 1961 inclusive there were 911 graduates in optometry from these schools. On the average, there

were about 30 graduates per year except during each of three years 1948 to 1950 when this number rose to about 100 due to the inflow of many veteran students. Some Canadian optometrists obtained their training in the United States schools.

The professional training programme for optometrists extends over a period of four academic years. At the present time in order to practise as an optometrist in Canada, an applicant must be a graduate of an accredited institute and meet the examination requirements of the Provincial Board of Examiners in Optometry. Each province has its own provincial Optometrical Association or Society which issues licences.

During the last three decades the number of optometrists has not kept pace with the growing Canadian population; consequently the population-optometrist ratio progressively deteriorated. In 1931, the number of optometrists was 1,240 giving a ratio of 8,286 while in 1941 the number was 1,321 and the corresponding ratio was 8,626. Between 1951 and 1961, the number of optometrists increased slightly from 1,348 to 1,429 but the ratio became less favourable being 10,374 in 1951 and 12,737 in 1961.[1] On the other hand, a higher degree of urbanization of our population in recent years makes possible better utilization of the services of optometrists located in urban centres.

Provincial population-optometrist ratios and estimated additional requirements for optometrists in 1961 are shown in Table 3-6. This measure of the adequacy of supply—like all population-personnel ratios—is subject to limitation but there is little evidence to suggest that there is any pressing shortage at present and it is likely that many optometrists could see more people if such people presented themselves for examination.

In view of the recommendations that we have made concerning optical services rendered by optometrists it is even more difficult to project the supply and demand for these personnel over the next decade. Table 3-7 indicates the number of optometrists that would be needed to match the growth of population on the basis of the ratio that existed in 1961. Over the decade the number required rises from 1,429 to 1,774. To match this growth, and to offset the attrition of personnel due to retirement, death and emigration, there would be the graduates of two schools of optometry which could be expected with present facilities to produce an average of 40 graduates a year over the period 1961-1966 and perhaps 50 graduates a year over the period 1967-1971. Other graduates could become available from American schools of optometry but compared with the number required to meet the 1961 population-optometrist ratio there would be a deficit of 165 in 1966 and 288

[1] Data on number of optometrists were obtained from the provincial Optometrical Associations. The above figures exclude Yukon and Northwest Territories and the 1931 and 1941 figures exclude also Newfoundland and Prince Edward Island.

TABLE 3-6 POPULATION-OPTOMETRIST RATIOS AND ESTIMATED REQUIREMENTS FOR OPTOMETRISTS, CANADA AND PROVINCES, 1961

Province	Number of Optometrists	Population-Optometrist-Ratio	Required Number of Optometrists		Deficit or Surplus	
			(1) at National Ratio 12,737	(2) at Improved Ratio 11,987†	(1)	(2)
Newfoundland	6	76,309	36	38	−30	−32
Prince Edward Island	5	20,926	8	9	− 3	− 4
Nova Scotia	38	19,395	58	61	−20	−23
New Brunswick	44	13,589	47	50	− 3	− 6
Quebec	420	12,522	413	439	+ 7	−19
Ontario	533	11,700	490	520	+43	+13
Manitoba	60	15,361	72	77	−12	−17
Saskatchewan	70	13,217	73	77	− 3	− 7
Alberta	112	11,892	104	111	+ 8	+ 1
British Columbia	141	11,554	128	136	+13	+ 5
Canada*	1,429	12,737	1,429	1,518	0	−89

*Excludes Yukon and Northwest Territories.

†This ratio is the weighted average ratio of Quebec, Ontario, Alberta and British Columbia in 1961, whose ratios were better than the national ratio.

in 1971. This estimate does not take into account the increase in the supply over this period of ophthalmologists who perform refractions. To the extent that ophthalmologists rather than optometrists perform refractions, this would reduce the demand for the latter's services.

TABLE 3-7 PROJECTED REQUIREMENTS AND SUPPLY OF OPTOMETRISTS, 1966 AND 1971*

Year	Number of Optometrists Required at 1961 Ratio 12,737	Expected Supply	Deficit in Supply
1961	1,429	1,429	—
1966	1,594	1,429	−165
1971	1,774	1,486	−288

*Projected population assuming 50,000 net immigration per annum.

The impact of the Optical Services Programme that we recommended in Volume I on the demand for optometrists will of course depend primarily on the extent to which existing and future graduates in optometry meet the educa-

tional standards we have indicated.[1] The whole question of supply is therefore involved with the facilities needed to provide this education. To the extent that some educational facilities are made available in existing medical schools or in new medical schools, it may be possible to expand the supply of qualified optometrists without building additional facilities in optometric colleges.

In short, given the evidence at our disposal at this time, we cannot recommend expansion of existing means for training optometrists. Instead, we suggest that provincial health planning councils review the resources available to achieve the objectives we recommend in this area. At the same time they could examine the need for expansion of schools of optometry. Schools of optometry must be affiliated with the medical school at a university or become an integral part of the health education facilities in a university.

[1] *See* Volume I, pp. 45-50. The principal comments relating to optometry are as follows:

(1) The shortage of ophthalmologists and the long period of their training makes any proposal for restricting all prepaid eye care in the Health Services Programme to that profession wholly unrealistic. Optometrists must be used and their qualifications upgraded.

(2) Since we believe that the schools of optometry do not provide adequate training in recognition of pathological eye conditions, there are two solutions:

(*a*) the need for provision in the present curriculum for increased training in anatomy, physiology, pathology, and in the use of cycloplegics. This instruction should be provided by qualified instructors in the medical school faculties. This will solve the problem, however, only for those optometrists graduating after the implementation of our recommendation for upgrading, say, 1968.

(*b*) the need for provision of courses in anatomy, physiology, pathology, and in the use of cycloplegics for optometrists now in practice through programmes of continuing education in the medical schools or in the Schools of Optometry provided by qualified instructors from medical school faculties. Co-operation from the medical profession to provide this instruction is essential and no refusal by the medical profession, or the medical school faculties, to assist in upgrading the optometrist can be tolerated. The objective should be a properly qualified optometrical profession practising their profession as such, and not relying on the sale of frames and other merchandise as their principal source of income.

(3) There is a strong case, we believe, for optometrists to be employed, as they are now employed in the Canadian Forces Medical Service, under the general direction of ophthalmologists in "eye clinics" or group practice clinics. This arrangement of practice would remove our concern about the completeness of the diagnostic examination and seems to us to represent a most effective co-ordination of skills.

The Commission recommends:

85. That refractions be provided by ophthalmologists, other qualified physicians, and by optometrists who graduate in or after 1968, and by optometrists who by the year 1967 have taken the recommended additional training in anatomy, physiology, pathogy, and in the use of cycloplegics.

86. That the schools of optometry be affiliated with the universities in the cities in which they are located, and the respective Medical School Departments should assume responsibility for the courses in anatomy, physiology, and pathology, and in the use of cycloplegics. Special courses should be provided in these subjects for optometrists now in practice, so that all who wish to do so may qualify to participate in the programme. The tuition fees, travelling and living expenses incurred by optometrists in taking such courses should be regarded as deductible expenses for income tax purposes.

91. That in order to augment our scarce resources in the field of vision care, consideration be given by both ophthalmologists and optometrists to uniting their special skills and their efforts in various forms of group practice.

Opticians

The optician's function of providing glasses and lenses is similar to that of the pharmacist in regard to prescribed drugs. The optician, or ophthalmic dispenser, has been described as "an auxiliary to medicine, who supplies and fits lenses, spectacles, eye glasses, artificial eyes, contact lenses or appurtenances thereto for the aid or correction of visual or ocular anomalies of the eyes, on the prescription of an ophthalmologist".[1] A prescription for glasses may also originate from an optometrist following a refraction. We have outlined in Volume I the respective roles of the ophthalmologist, the optometrist, and the dispensing optician.[2]

Like many other health professions and occupations, the qualifications for opticians are changing from apprenticeship to formal training ending in examinations and licensing.[3] Three provinces now have legislation providing for the licensing of opticians.[4] In several other provinces legislation is under consideration.

Reliable figures on the number of opticians are difficult to obtain, partly because of the differing standards in the provinces and partly because of the absence of compulsory registration.[5] Furthermore, the training of opticians has in the past not always been clearly distinct from that of the optometrists, and some qualified optometrists prefer to practise as opticians. The Canadian Guild of Dispensing Opticians, the national organization, is a voluntary association rather than a registering body. Though there may be several qualified opticians working in a firm or establishment, only one is registered while the others may join as associate members if voted in by other members.[6] The Guild has no licensing function. Opticians practise their calling either as individuals, in groups, or as employees of commercial suppliers of optical equipment. In the absence of the necessary data, no assessment of the manpower situation in this field is possible.

It is certain, however, that modern knowledge and techniques in the provision of vision aids require that the optician meet certain standards of proficiency in his field, and that licensing legislation determining such standards should be implemented in all provinces.

---

[1] *The Association of Dispensing Opticians of Ontario*, brief submitted to the Medical Services Insurance Enquiry, p. 3.

[2] *See* Volume I, Chapter 2, p. 46.

[3] A school exists in Quebec and a correspondence course is available in Ontario with examinations to be written before a licensing board.

[4] Manitoba, Ontario and Quebec.

[5] It is estimated that there are between 700 and 800 dispensing opticians in Canada; of these, 652 are licensed in the three provinces mentioned (communication received from the Canadian Guild of Dispensing Opticians).

[6] *Ibid.*

The Commission recommends:

211. That legislation regarding the qualification and licensing of dispensing opticians be enacted in all provinces and territories.

CONTACT LENSES

The present practices in the provision of contact lenses are a matter of concern to this Commission. We have emphasized in Volume I of our Report the need for more adequate training than has generally been obtained in the past in order to fully qualify optometrists to undertake eye examinations for refractions and the provision of glasses. Contact lenses, however, because of their immediate contact with the delicate anatomy of the eye, call for great care, and we have come to the conclusion that only the trained medical specialist in the field, i.e., the ophthalmologist, is qualified to determine not only the specifications of the lens but also whether, in the individual case, such lens can be worn without risk to the eye.

The Commission recommends:

212. That legislation be enacted restricting the sale of contact lenses by anyone, except on prescription by an ophthalmologist.

Podiatrists

Podiatry is concerned with the treatment of muscular-skeletal and some cutaneous foot ailments which are increasingly evident in older patients.

In Canada podiatric services are largely provided by private practitioners in offices but they are also supplied in foot clinics in some hospitals and, in a few instances, in industrial clinics.

The practice of podiatry throughout Canada is generally regulated by provincial legislation, which requires a candidate to pass a licensing examination set by the Board of Examiners in Podiatry. Only graduates of an accredited college of podiatry are eligible to write the licensing examination.

Training programmes at these colleges are of four years' duration and prerequisites for admission include the prior completion of one or two years premedical studies. At present there is no podiatry college in Canada and all Canadian podiatrists obtain their formal training in the United States schools.

In 1961, there were approximately 140 podiatrists practising in Canada, giving a ratio of 132,000 persons per podiatrist. Corresponding ratios for the United States and United Kingdom were 23,000 and 33,000 respectively.[1] We have recommended[2] that podiatric services be included under the medical services benefits, when prescribed by a physician.

[1] *The Canadian Podiatry Association,* brief submitted to the Royal Commission on Health Services, Toronto, May 1, 1962, p. 3.

[2] *See* Volume I, Chapter 2, Recommendation 30(m), p. 33.

DRUGLESS PRACTITIONERS

Chiropractors[1]

Chiropractic has been defined before the Commission as:

> "The science of chiropractic deals with the relationship between the articulations of the human body, especially the vertebral column, and the nervous system and the role of these relationships in the restoration and maintenance of health.
>
> "The philosophy of chiropratic is based upon the premise that disease or abnormal function is frequently caused by interference with nerve transmission and expression, due to deviation from their normal position, of the bony segments of the body, especially the vertebral column.
>
> "The practice of chiropractic consists of the location and correction of misalignments causing any interference with normal nerve transmission and expression, for the restoration and maintenance of health, without the use of drugs or surgery."[2]

In all provinces except Newfoundland, Prince Edward Island, Nova Scotia and Quebec the profession of chiropractors is governed by provincial legislation.[3] In the provinces with such legislation only chiropractors registered under it are allowed to practise their profession. To qualify for registration the chiropractor must pass a special examination[4] and be a graduate from an accredited chiropractic college.

All provinces with chiropractic legislation allow injured workmen to select a chiropractor under the Workmen's Compensation Act. An Alberta Order in Council authorizes payment for chiropractic services under the Treatment Services Act, and in Manitoba these services are covered under the Social Allowances Act.[5]

All the provincial acts make it illegal for chiropractors to prescribe or administer drugs, to use or prescribe the use of an anaesthetic, to practise surgery or mid-wifery, to practise medicine, and, in some provinces, the chiropractors may not treat communicable diseases. However, some provincial

---

[1] In questionnaires distributed to chiropractors, naturopaths and osteopaths which were returned to the Royal Commission on Health Services, some chiropractors referred to themselves as either chiropractor or chiropractor-naturopath. In fact, some practitioners maintain membership in both the Canadian Chiropractic Association and the Canadian Naturopathic Association. It is, therefore, impossible in many cases to separate statistically the two groups.

[2] *The Canadian Chiropractic Association*, brief submitted to the Royal Commission on Health Services, Toronto, May 1962; *The Journal of the Canadian Chiropractic Association*, Volume VI, No. 3, August 1962, p. 6.

[3] Drugless Practitioners Act in Ontario and Chiropractic Act in British Columbia, Alberta, Saskatchewan, Manitoba and New Brunswick.

[4] In most provinces chiropractic boards are solely responsible for conducting the examination except in Saskatchewan where the University of Saskatchewan is responsible for setting the basic sciences part of the examination and where medical faculty and officers of the chiropractic profession sit on the board of examiners chaired by the dean of medicine.

[5] Mills, D., *Chiropractors, Osteopaths and Naturopaths in Canada*, a study prepared for the Royal Commission on Health Services, Chapter 1, Ottawa: Queen's Printer (*in press*).

acts permit X-ray privileges. Canadian hospitals rarely allow chiropractors the use of hospital facilities for either diagnosis or treatment of their patients.

The Canadian Memorial Chiropractic College in Toronto is the only institution offering a training programme in chiropractic in Canada. Formal educational requirements for admission to this college are the Ontario Grade 13 certificate, or its equivalent, and the training course is of four years duration. Between 1949 and 1961 inclusive there were 669 graduates from that school.[1] However, during the same period 605 Canadians graduated from accredited colleges of chiropractic in the United States.[2]

There has been an increase in the number of chiropractors in Canada. In 1943 there were 668 active chiropractors, in 1951 about 740, and in 1961 their number rose to 1,073, of which 450 were in Ontario, 240 in Quebec, 148 in British Columbia and 121 in Alberta, but only 36 in the Atlantic Provinces.[3] In 1964 there were approximately 400 active in Quebec.

In 1950-51 about 128,000 or 1.0 per cent of the Canadian population reported obtaining services from chiropractors as compared with 5,851,000 or 43.2 per cent obtaining services from medical practitioners.[4]

In a survey of chiropractors undertaken by the Commission 45 per cent indicated that they consider themselves to be specialists although there is no body empowered to grant specialist status. Of this group the largest proportion claimed to be musculo-skeletal specialists. Among the other specialties mentioned were neurological, manipulative therapy, gastro-intestinal disorders, cardiovascular conditions, general organic work, improved radionics and colonic therapy.[5]

In the same survey chiropractors were asked to list the major items of diagnostic equipment used. Seventy-six per cent answered that they possessed radiological equipment. Of chiropractors who use X-ray in diagnosis, 7 per cent said that they X-rayed all patients, 33 per cent X-rayed two-thirds or more of their patients, and a further 10 per cent said that they X-rayed about one-half of their patients.[6] This Commission is aware that with adequate safeguards and proper use, radiography is an invaluable diagnostic procedure, but over-use or its use by those without the proper qualifications can be a danger to the health of both patient and practitioner. In addition, the interpretation of X-ray films by those without the proper qualifications is useless as well as dangerous.

---

[1] Transcript of evidence, *Hearings*, May 17, 1962, Vol. 55, pp. 10492-10496; and *The Canadian Chiropractic Association, op. cit.*, p. 73.

[2] *Ibid.*, p. 76.

[3] *The Canadian Chiropractic Association, op. cit.*, p. 10.

[4] Department of National Health and Welfare and Dominion Bureau of Statistics, *Illness and Health Care in Canada*, Canadian Sickness Survey, 1950-51, Ottawa: Queen's Printer, 1960, Table 113, p. 193, and Table 57, p. 156. Data for later years are not available.

[5] Mills, D., *op. cit.*, Chapter 5.

[6] *Ibid.*

Chiropractors also use therapeutic equipment, as distinguished from the diagnostic equipment mentioned above. The major items in this category are as follows: physical structure corrective, electrical thermal, electrical multi-functional, mechanical, hydrotherapeutic, and inhalation therapy.[1]

The Faculty of Medicine of McGill University in its presentation before the Royal Commission on Chiropractic in the Province of Quebec stated that "the theory which underlies chiropractic is false, and no consistently successful practice can be expected to result from false theory".[2]

The Canadian Medical Association also asserted that it will support any programme of medical services insurance which adheres among other principles to the following: "that all persons rendering services are legally qualified physicians and surgeons".[3] Another medical organization referring to practitioners licensed under the Drugless Practitioners Act suggested that "such groups lack appreciation of their own limitations and tend to apply their concepts beyond their knowledge and abilities, and under such circumstances constitute a distinct threat to life and limb".[4]

Against these criticisms the chiropractors say that after the Second World War the Department of Veterans Affairs sponsored chiropractic training in the Canadian Memorial Chiropractic College and the Workmen's Compensation Boards in most provinces recognize chiropractic on an equal basis with medicine.[5] The national organization of the chiropractors claims that "the members of the chiropractic profession make a special and necessary contribution to the health needs of Canadians" and that "Chiropractic has earned and deserves full recognition as a major member of the family of health methods on an equal basis with other recognized branches of the healing arts".[6]

It is obvious that there is a great gulf between the positions taken by the medical profession and chiropractors. The medical profession maintains that there is no scientific basis for the claims made by chiropractors or that chiropractic is a science and states further than chiropractic has no therapeutic value other than in the field of physiotherapy. Chiropractors, on the other hand, claim that theirs is a science.[7] This divergence of opinion can readily be seen as a fundamental scientific one beyond the competence of this Commission to resolve.

---

[1] *Ibid.*

[2] *The Canadian Medical Association Journal,* September 7, 1963, Volume 89, p. 2.

[3] The Canadian Medical Association, Preliminary Statement, September 27, 1961, *Transcript,* Volume 1, p. 106.

[4] *The College of Physicians and Surgeons of Ontario,* brief submitted to the Royal Commission on Health Services, May 1962, p. 4.

[5] Evidence of Mr. J. S. Burton, the General Counsel for the Canadian Chiropractic Association, September 28, 1961, *Transcript,* Volume 2, p. 191.

[6] *The Canadian Chiropractic Association, op. cit.,* p. 3.

[7] *See* their statement on p. 76.

The controversy has been going on for upwards of half a century and is one that ought to be faced and resolved in the public interest. We considered recommending to His Excellency, The Governor General in Council, that an independent scientific study be undertaken to resolve the issue. However, we now know that such a study is currently being done by Mr. Justice Lacroix of the Superior Court of Quebec who was named as a Royal Commissioner by the Government of Quebec "pour faire enquête sur la chiropraxie et la profession d'ostéopathe dans le Québec". We have consulted with Mr. Justice Lacroix and are convinced that the investigation being made by him is an impartial and thorough one. Justice Lacroix's inquiry is still proceeding. His findings and recommendations will be formulated only after this volume has been completed.

We believe that the report and findings of Mr. Justice Lacroix will be definitive and have application not only to the situation in Quebec but throughout the rest of Canada. Pending the report and findings of Mr. Justice Lacroix, we recommended in Volume I[1] that the medical services benefit should include chiropractic treatment when prescribed by a physician. We do not wish to make any recommendation to include chiropractic treatment as a health service under our programme beyond this until the Quebec Report is available.

If the study now being done by Mr. Justice Lacroix concludes that the position taken by the medical profession is the correct one, then all Canadians should be made aware of it. On the other hand, if the claims of chiropractors are found to be valid, they then should be incorporated into and integrated with the teaching of the health sciences in universities. No good can come from warring factions being competitors in the health care field. It is, in our view, fundamental to good health care, that all who labour legitimately in the field should do so in harmonious co-operation.

Naturopaths

Naturopathy has been defined as "a system of therapy that treats human injuries, ailments or diseases by methods of nature, including any agency of nature, and employs as auxiliaries for such purpose the use of electro-therapy, hydrotherapy, body manipulation and dietetics".[2]

All provinces in Canada, excluding Quebec and the Atlantic Provinces have passed licensing legislation with respect to the practice of naturopathy, which is restricted to recipients of diplomas from accredited schools of naturopathy who successfully complete the licensing examination set by the provincial examining board. There is no accredited school for the training of naturopaths in Canada. In general, the scope of practice of naturopathy is

[1] *See* Volume I, Chapter 2, Recommendation 30(m), p. 33.
[2] *An Act to amend Naturopathy Act, 1955,* Chapter 50, Section 2, Province of Alberta.

subject to legislative restrictions similar to that regulating chiropractic mentioned above.

It has been estimated that in 1962 there were about 140 active naturopaths in Canada.[1] Their number is not growing and they are not scientifically oriented to the extent that they should be included as providers of services to be paid for under the comprehensive health services recommended.

Osteopaths

Osteopathy is defined as the art and science of diagnosis and treatment of diseases and injuries that emphasizes manipulative procedures and employs medical appliances including radiographs in diagnosis and treatment.

In Canada osteopaths are without hospital privileges and consequently most osteopathic treatments are provided in offices and in the home.

In all provinces excluding Quebec, Prince Edward Island and Newfoundland, legislation governs the practice of osteopathy and only Manitoba and Saskatchewan have specific osteopathic acts, while in Ontario it comes under the Drugless Practitioners Act and in the other provinces it is controlled by medical acts. In the provinces with legislation, practice is restricted to graduates from an accredited osteopathy college who pass the licensing examination. In Nova Scotia, however, graduation from an accredited medical school is required. Since there is no school in Canada for the training of osteopaths, Canadians obtain their education in the United States and, in general, they tend to remain there because osteopathy enjoys a higher status and, in many states, hospital privileges.

Osteopathy is a declining profession in Canada. In the 1930's there were about 200 active osteopaths but in 1962 only 105 were actually practising. Moreover, about four-fifths of them were over 50 years old.[2]

The trend in the United States is to incorporate into the regular practice of medicine, osteopathic physicians who conform to the standard practice of medicine. There has not been a comparable development in Canada. We see no need for the establishment of a separate College of Osteopathy in Canada. It is our view that all health sciences should be under the aegis of universities.

SPECIAL PROBLEMS

The Commission has, following its Terms of Reference, reviewed the whole field of health services, present and future, in Canada. Because of the vastness of the task, however, it has not been able in its Report to offer a

[1] This number refers to naturopaths only and does not include naturopaths who are also chiropractors. *See* Mills, D., *op. cit.*, Chapter 2.

[2] Mills, D., *ibid.*

solution for every problem and we are well aware that a number of subjects received either no attention at all or are insufficiently covered though they may be of importance to those engaged in the provision of those health services. Many problems were clearly beyond our competence and resources; in regard to others it was simply a matter of having to be selective but we hope we have covered at least the main areas.

Aware of the inevitable gaps in our Report and also convinced that the rapid scientific development in the health field will continue to create new problems and changing situations, we have recommended the mechanism to continue the work begun by this Commission. This, we envisage, will be done by the Health Sciences Research Council in conjunction with the co-operative health services organization we recommend.

There are two items, however, generally related to health practice, on which we want to comment as a result of our observations. They concern the use of professional titles in the health field, and the possible radiation hazards from radiography. We have singled out these two matters, the first because the conclusions seemed obvious to us, and the second because of the possible risks involved in further delaying the general application of protective measures.

Professional Titles

A source of confusion to the public is the indiscriminate use of the "Doctor" title. The entitlement to its use follows from the granting of an advanced university degree. The right to confer this advanced degree is restricted, by provincial legislation, to recognized universities. These institutions award two types of doctoral degrees: (1) the earned doctorate conferred after a minimum of six years of academic and/or professional discipline; (2) the honorary doctorate awarded to selected citizens for outstanding contributions to society.

In the health field, the use of the title "Doctor" by persons without a doctor's degree from a recognized medical or dental school not only misleads the public but debases the worth of the degree earned by rigorous education in the universities. This situation should be corrected by restricting the use of the doctoral title in the health field only to those to whom it has been awarded by recognized universities.

The Commission recommends:

213. That legislation be enacted to provide that no practitioner of any healing art without a doctoral degree granted by a recognized university be permitted to designate himself as "Doctor", or to use any letter following his name indicating the same, or to advertise himself as such.

Radiography

Recent experience with atomic fall-out has highlighted, as never before, the hazards to human life and health from excessive radiation. In the mid-fifties, widespread apprehension in Canada and elsewhere led to intensive studies on the biological effects of atomic radiation. Both the Medical Research Council in the United Kingdom and the United States National Academy of Sciences have assessed the effects of radiation on man. The United Nations established, in 1956, a Scientific Committee on the Effects of Atomic Radiation, in whose work Canadian scientists participated.

These studies have drawn attention to the importance of radiation from sources other than fall-out, namely natural radiation and medical irradiation, with the latter accounting for a substantial portion of the risks involved.[1] As a consequence the radiation effects from diagnostic X-rays have been the object of intensive study. In 1957, the Ontario Tuberculosis Association established a special committee on radiation. This committee concluded that the application of modern techniques can reduce the radiation from chest X-ray examinations to "an extremely low level" and that the benefits from "properly conducted" chest X-ray programmes far outweigh any possible slight harm associated with X-ray exposure.[2] Other studies also put the emphasis on the need for the use of proper equipment by qualified persons.[3] The question, "are diagnostic X-ray examinations dangerous?" is answered with a flat "no" by one author who adds, however, that this is "dependent upon our acceptance of all the practicable precautionary measures which may be taken".[4] This statement is based on a report by the United Nations Scientific Committee on the Effects of Atomic Radiation.[5]

Despite the potential hazards from inadequate equipment or unqualified operators, only little legislative action has been taken at the provincial level to ensure the control of radiation from the use of X-ray equipment. Table 3-8 discloses that Nova Scotia is at present the only province with licensing regulations covering both X-ray technicians and equipment.

It is essential that licensing regulations applicable to the technicians as well as the equipment be instituted in all provinces. They should ensure uniformly high standards of safety throughout Canada, not only by regulating the initial licensing but also by providing for periodic inspection to ensure

---

[1] Bird, P. M., "Radiation Protection in Canada—Part I", reprint from the *Canadian Medical Association Journal*, Volume 90, April 25, 1964, pp. 1024-1030, p. 3.

[2] "Radiation and the Tuberculosis Chest X-Ray Examinations Program", Report of the Committee on Radiation, Medical Section, Ontario Tuberculosis Association, *Canadian Medical Association Journal*, Volume 79, July 15, 1958, p. 89.

[3] Lindell, B., and Dobson, R. L., *Ionizing Radiation and Health*, WHO Public Health Papers 6, Geneva, 1961, p. 32.

[4] Stapleton, J. G., "Are Diagnostic X-Ray Examinations Dangerous", *Canadian Medical Association Journal*, Volume 79, July 15, 1958, p. 89.

[5] "The Responsibilities of the Medical Profession in the Use of X-Rays and Other Ionizing Radiation", *British Journal of Radiology*, Vol. 30, 1957, p. 282.

TABLE 3-8 SUMMARY OF PROVINCIAL ACTIONS AFFECTING HEALTH AND SAFETY IN REGARD TO X-RAYS

Provinces with specific enabling Legislation applicable to X-rays	Provinces with detailed Regulations applicable to X-rays	Provinces prohibiting shoe-fitting X-ray Fluoroscopes	Provinces with specific Legislation applicable to Qualifications of Radiation Technicians
Nova Scotia Quebec Ontario Saskatchewan Alberta	Nova Scotia (registration of equipment and operators) Saskatchewan (registration of equipment: —approval of industrial layouts —qualifications of operators)	Nova Scotia Manitoba Saskatchewan Alberta	Ontario (medical) Saskatchewan (medical and industrial) Alberta (medical and industrial)

SOURCE: Based on Bird, P. M., "Radiation Protection in Canada—Part I", Reprint from *Canadian Medical Association Journal*, Volume 90, April 25, 1964, pp. 1024–1030, p. 6.

that safety standards are maintained. One important means of observing, indirectly, the maintenance of adequate safety measures is the film monitoring service available from the Radiation Protection Division of the Department of National Health and Welfare which provides a continuous raditionexposure record for workers exposed to radiation from X-ray equipment and other sources. Participation in this service is voluntary rather than mandatory but its fullest use is advisable and should be made part of the licensing procedure.

Federal control and surveillance of radiation risks from X-ray equipment are limited to consulting and inspection services provided on request. The film monitoring service is one of these. In 1963, the Department of National Health and Welfare established an advisory committee on the development of X-ray safety standards. The committee has provincial as well as professional representation and is expected to make detailed recommendations to serve as a basis for uniform safety standards and procedures throughout Canada.[1]

Radiation exposure also has genetic effects: here the danger is to the life and health of the offspring of the individual exposed. Knowledge of the genetic effects of radiation is still limited but scientific evidence suggests that any exposure no matter how small may have harmful genetic consequences

[1] Bird, P.M., "Radiation Protection in Canada—Part II", Reprint from *Canadian Medical Association Journal*, Volume 90, May 2, 1964, pp. 1075-1080, p. 8.

because of the cumulative effect.[1] A study of the radiation resulting from diagnostic X-rays[2] revealed that practically all the genetically significant dose resulted from diagnostic examinations of three body regions (pelvic, genito-urinary, and gastrointestinal), with about 70 per cent of the total due to examinations of the male pelvic region. In view of their invaluable contribution to present diagnostic standards, the use of X-rays in diagnosis is essential. However, because of the probability of genetic ill-effects of radiation, diagnostic X-rays should be used only when necessary.[3] In view of this, the growing tendency among some groups of private practitioners to emphasize and advertise the use of X-ray equipment in order to enlarge their practice is injurious to the nation's health and must be stopped.

Apart from the radiation hazard from diagnostic radiology, there is the problem of the interpretation of radiographs by unqualified practitioners who lack the training necessary to ensure proficiency in this vital area of health care. That diagnostic radiologists require four years of specialty training after medical graduation is ample evidence of the complexity of interpreting radiographs. Incorrect diagnosis, due to misinterpretation of radiographs, may result in a therapy that is deleterious to the patient's health. Consequently, the field of radiograph interpretation should be reserved for those who are qualified to practise it.

The Commission recommends:

214. That provincial legislation provide, to the extent that this is not already done, for the licensing of X-ray equipment, technicians, and operators, according to accepted uniform standards and ensuring that such standards are maintained after the initial licensing.

215. That provincial legislation be enacted to restrict the advertisement of diagnostic X-ray facilities.

216. That the proper scientific agencies continue the intensive study and observation of the consequences of radiation, including that resulting from diagnostic radiography.

217. That the reading and interpretation of radiographs be undertaken only by recognized personnel.

Ambulance Services

Lack of legislation governing the services rendered by ambulance personnel appears to be one of the major gaps in general health services.

---

[1] Stapleton, J. G., *op. cit.*, p. 92.

[2] Bird, P. M. "Radiation Protection in Canada—Part III", Reprint from the *Canadian Medical Association Journal*, Volume 90, May 9, 1964, pp. 1114-1120, p. 19.

[3] Lougheed, Marvin N., "Present Concepts of Radiation Hazards", *Ibid.*, pp. 97 and 98, and Duggan, H. E., "Radiation Protection in Canada—Part IV", *The Canadian Medical Association Journal*, Volume 91, October 24, 1964, p. 894, and Lindell, *op. cit.*, p. 35.

There are only two provinces, Saskatchewan and Alberta, which have provincial legislation regarding the operation of ambulance services. In Saskatchewan, legislation covering ambulance services under the Public Health Act of 1958 requires an ambulance owner to register each December, and an ambulance driver or attendant to have a current senior first-aid certificate issued by the St. John Ambulance Association. Operators must also attend special one-day courses in advanced first-aid at intervals of not more than three years. A provincial act in Alberta requires ambulance drivers to have two-year St. John Ambulance certificates, and attendants three-year certificates. The act also stipulates minimum equipment requirements. With the above two exceptions, provincial Highway Traffic Acts concern themselves solely with the right of way of emergency vehicles, use of sirens and speed limits. Most laws governing standards of ambulance services have been passed by municipal councils but there are some municipalities which have no such regulations.[1]

Ambulance services in Canada are provided by various bodies such as provincial governments, fire and police departments, hospitals, municipalities, private companies and funeral parlors. Charges per call within city limits ranged in 1963 from $4.00 in St. John's to $18.00 in Vancouver and there are additional charges for service beyond city limits.

Prompt first-aid is an important factor in the care of the accident victim or other emergency cases pending professional treatment. It has been stated that "the success of definite treatment and the ultimate rehabilitation of a seriously ill or violently injured person are largely dependent on the initial handling of the emergency. The patient's fate may be contingent on the attention he receives at the site of the accident and during his transportation to a hospital".[2] Efficient ambulance service can save lives, diminish the period of hospitalization or the extent of permanent disability. This service becomes more important as accident rates continue to grow in traffic, home and industry.

We recommended, therefore, in Volume I that "ambulance services and similar forms of transportation of patients, except as may be designated as part of any other health service benefit"[3] be included among the insured services of the medical services benefit. Such an arrangement would provide adequate financial resources for essential ambulance services. We conclude that, to bring order out of chaos, uniform standards of high quality and availability of ambulance services in Canada should be instituted through provincial legislation which would set minimum standards of licensing, staffing and equipping ambulance vehicles.

---

[1] *The Financial Post*, September 28, 1963, pp. 51 and 52.

[2] Young Jr., Carl B., Young, Carl B., and Fry, R., *Transportation of the Injured, Springfield, Ill.;* Charles C. Thomas, 1958, p. 207.

[3] *See* Volume I, Chapter 2, Recommendation 30(n), p. 33.

The Commission recommends:

218. That, in order to ensure that ambulance services are of a high quality, legislation be enacted in all provinces and territories establishing standards for the training and qualifications of ambulance staff, and for the equipment used, and that these be subject to licensing.

219. That, to ensure that such services are readily available, the provincial Health Planning Councils establish guide lines for the efficient organization of ambulance services on a regional or community basis, and, where required, of air ambulances and other emergency transport.

4

Health Research

In this age of quickening scientific advance, health-related research draws upon many fields of science and many disciplines within each field. Within this broad context, the term "health research" rather than the traditional expression "medical research" is more fully expressive of the aims and efforts of our scientists to improve the mental and physical well-being of Canadians in particular and of mankind in general.

More specifically, health research may be defined as:

> "... all systematic study directed toward the development and use of scientific knowledge through fundamental research in the laboratory, clinical investigations, clinical trials, epidemiological studies, and engineering studies in the following areas:
>
> 1. The causes, diagnosis, treatment, control, prevention of, and rehabilitation relating to the physical and mental diseases and other killing and crippling impairments of mankind;
> 2. The origin, nature, and solution of health problems not identifiable in terms of disease entities;
> 3. Broad fields of science where the research is undertaken to obtain an understanding of processes affecting disease and human well-being;
> 4. Research in nutritional problems impairing, contributing to, or otherwise affecting optimum health;
> 5. Development of improved methods, techniques, and equipment for research, diagnosis, therapy, and rehabilitation."[1]

For our purposes it is necessary to extend this definition to include studies directed towards determining quantitatively or qualitatively the progress made in achieving the goals of a health services programme. Any systematic appraisal of a health programme requires not only those statistics that measure the volume of health care, it also requires the assessment of its goals in terms of the changing health needs of the community. In view of the

---

[1] United States Department of Health, Education, and Welfare, *Resources for Medical Research, Report No. 1*, U.S. Government Printing Office, Washington, D.C., August 1962, p. 14.

Health Services Programmes we have recommended, our definition of health research must include much more than has generally been included if Canadians are to obtain the best health care possible.[1]

The contribution of research to the health of mankind has, of course, been widely recognized. It has been observed that

> "More curative drugs have been discovered in the past twenty-five years than in the whole previous history of medicine. Research during these years has given us antibiotics; has expanded many times our knowledge of the value and uses of blood transfusion; has made possible the daily occurrence of surgery of the heart and lung; has led to notable advances in the field of anaesthesia, making such delicate surgery possible; has given us new methods of treating those with mental illness; has given us the blood bank, the bone bank, the eye bank, the blood-vessel bank; has made it possible to save lives with the artificial kidney; has shown us how to save premature babies and how careful we should be of the eyes of these babies when we use oxygen; has given us the Cobalt 60 therapy unit; tells us of the effects of noise of the jet aircraft and of certain industries on the human ear; has given us a potent weapon against poliomyelitis; and is our tool in the fight against cancer."[2]

In these decades Canada too has made impressive strides in its search for knowledge to combat disease and disability. A partial list of the contributions of Canadian scientists since the discovery of insulin in 1921 would include:

> "... the isolation of hormones from the parathyroid gland, the pituitary body and the placenta; the introduction and use of anti-coagulants; the use of refrigeration in major surgery; the identification of the sex chromosome; the preparation of an artificial medium for the cultivation of mammalian cells; the discovery of the function of certain areas in the cerebral cortex; methods of surgical treatment of epilepsy; the discovery of the nature of certain diseases of the liver; knowledge of the variations in metabolism in health and disease; and a host of fundamental discoveries which fit into the general pattern of scientific knowledge."[3]

To these achievements must be added those in the field of dental health. The research methods, the tools, and the qualifications of workers in dental research do not differ materially from those in medical research. Indeed some areas of study may overlap, e.g., studies on cancer or on bone. The ultimate objective of the dental researcher is the prevention, control and cure of disease of the mouth and teeth. Considerable advance has been made toward this objective during the past decade or so, particularly in the field of dental caries.

---

[1] It should be noted that pharmaceutical research, sometimes called drug research, is classed as medical research in this chapter.

[2] Gilbert Turner quoted in the *Report of The Special Committee Appointed to Review Extramural Support of Medical Research By The Government of Canada* to the Committee of the Privy Council on Scientific and Industrial Research, Ottawa, November 1959, p. 1. This document is hereafter cited as "The Farquharson Report".

[3] *Ibid.*

Research in Canadian laboratories also has added to the pool of knowledge in dentistry, and continues to do so at an increasing pace. Techniques for recording and analysing data on dental disease that were developed in Canada are now being used internationally. One of the most extensive studies done anywhere in the world on the growth and development of the head and face is being carried out in Canada. The same project is evaluating the value of early interceptive therapy on subsequent treatment requirements for occlusal abnormalities. This study is now being carried over into the teen-ages, where little information is available at present. One of the most authoritative studies on the effects of water fluoridation was a Canadian study. Using the latest histochemical and biochemical techniques, Canadians have made contributions to our knowledge of the nature of the tissues of the tooth itself and its environment—knowledge that is a prerequisite to development of prevention. As personnel are trained and funds provided, dental research activities are expanding. Laboratories have now been established in such diverse fields as virology, electron microscopy and experimental embryology and will soon make their contribution felt.

In recent years the evaluation of the health of Canadians and of the health services programmes that meet these health needs also has been fostered. This type of research, with its emphasis on the collection of data on which to base policy decisions regarding the planning of programmes and the improvement of health services, principally has developed as part of the continuing assessment of provincial hospital insurance programmes and medical care prepayment programmes sponsored by the medical profession, and as part of the efforts of governments to evaluate the health status of Canadians.

Although it is difficult to assess them quantitatively, in reviewing the institutional framework of health research in Canada, one also must not overlook the substantial contributions made outside universities, laboratories, hospitals, and health departments, by members of the health professions—individually, in teams or in committees in all of these areas.

Despite these developments the amount of health research undertaken in Canada in recent years, whether measured by the number of personnel involved or the sums of money spent, was inadequate both to meet the manifold needs of a modern society and relative to scientific advances in other fields. It is the purpose of this chapter to examine the manner in which health research is undertaken and supported in Canada, to determine how deficiencies might be remedied and to discuss how, in the future, an organizational framework could be established to ensure that adequate resources for research are made available on a continuing basis and used to achieve the goal of the best possible health care for Canadians.

SPONSORSHIP OF HEALTH RESEARCH

Health research in Canada is sponsored by governments, voluntary organizations, foundations, business corporations, professional bodies, hospitals and universities.

The research carried out by business corporations primarily consists of drug research undertaken by the pharmaceutical industry. In Volume I of our Report we have discussed this industry in some detail.[1] Later in this chapter and in Chapter 5 we discuss the type of research which is related to the evaluation of the health of Canadians and the health services programmes that exist to meet these health needs. The discussion here is limited therefore to the sponsorship of medical and dental research (including drug research) that is carried out in universities, hospitals, foundations and other non-commercial organizations.[2]

The sponsorship of medical and dental research in Canada takes two forms: the conduct of research by government agencies and the provision of funds by governments, voluntary organizations and foundations for the support of research in universities, or in various hospitals and research institutions generally associated with universities. The major institutions involved in sponsoring medical or dental research in Canada are the Federal Government, provincial governments, voluntary organizations and foundations, and the National Institutes of Health of the United States.[3] The activities of these organizations are described below under the following headings: functions, types of research support, methods of application and administration of research grants.

Federal Government

The Federal Government sponsors medical and dental research through the research it carries out itself (intramural research) and through its financial assistance for the support of research universities, hospitals and related institutions (extramural research). Intramural research is conducted

---

[1] *See* Volume I, Chapters 16 and 17.

[2] For a more detailed discussion of medical research *see* MacFarlane, J. A., *et al.*, *Medical Education in Canada*, a study prepared for the Royal Commission on Health Services, Ottawa: Queen's Printer (*in press*). For a discussion of dental research, *see* Paynter, K. J., *Dental Education in Canada*, a study prepared for the Royal Commission on Health Services, Ottawa: Queen's Printer (*in press*).

[3] A number of other organizations in the United States and the United Kingdom also provide funds for health research in Canada. Among these are the National Foundation for Infantile Paralysis, Life Insurance Medical Research Fund, Sugar Research Foundation, Commonwealth Fund, Rockefeller Foundation and the Markle Foundation in the U.S.A., and the Nuffield Foundation, and the Wellcome Trust in the United Kingdom. Funds becoming available from these sources are comparatively small.

by the Department of National Health and Welfare and the Defence Research Board. Extramural research is supported through the Medical Research Council, the National Research Council, the Department of National Health and Welfare, the Department of National Defence, the Defence Research Board, the Department of Veterans Affairs and the Queen Elizabeth II Fund.

MEDICAL RESEARCH COUNCIL[1]

Functions—In 1960, the Medical Research Council was created to advise the Government of Canada on policy and matters relating to medical research and to administer funds allocated to it for the support of research, functions that previously had been the responsibility of the Division of Medical Research of the National Research Council. Although the Council still operates within the administrative framework of the National Research Council, for all intents and purposes it is an autonomous body with full responsibility for the conduct of its own programme. The public funds at the Council's disposal are provided annually through a parliamentary appropriation, and in allocating these funds the Council has full executive control. There are 15 members of the Council—all professional men active in medical education, research or in practice.

The Council has established no research units or research institutes; it employs no scientific and technical staff as such. It makes no allocations for any specific fields, but is prepared to support research in the broad field of medical science, being especially interested in continuing investigation. This support consists of grants-in-aid of research along with personnel support in the form of awards for training, and stipends for trained investigators who may work in universities.

Grants-in-Aid—The Council provides two main types of grants-in-aid of research, operating grants and major equipment grants supplemented by limited aid for travel. Operating grants-in-aid are available to members of faculties of Canadian universities and to scientists active in hospitals or employed in other recognized Canadian institutions. These grants are not intended to cover the entire cost of the research for which they are provided, since space and certain basic facilities at the institution are prerequisites to an application for a grant. A grantee is not permitted personal remuneration from a grant. The funds may be used to employ students (graduate and undergraduate) and other assistants (professional and non-professional), to purchase equipment and supplies required for the investigation, and for other authorized purposes such as travel related to the investigator's research programme.

---

[1] Based on *Medical Research Council Extramural Programme*, Medical Research Council, Ottawa: Queen's Printer, revised, August 1964.

An award may be made in the form of an annual grant, a term grant which assures support for a definite period (usually three years), or a block grant which (either on an annual or a term basis) supports the activities of a group of associated investigators. Major equipment grants are offered for the purchase of units of special research equipment costing in excess of $3,000, that could not be included in the items provided by an operating grant. These grants only provide assistance for the purchase of research equipment. They are not intended to equip new laboratories with general equipment or to provide tools for teaching, diagnosis or care of patients. In addition to the use of operating grant funds for travel, travel grants are available to Canadian medical scientists to enable them to visit laboratories for the purpose of furthering their research, and to cover the cost of attendance at meetings when such travel is initiated by the Council.

Personnel Support—The Council provides support for career research investigators in medicine at Canadian universities as research associates, as research scholars, and as visiting scientists. It makes provision for the training of research personnel through research fellowships, and summer undergraduate scholarships. As already indicated, undergraduates and graduate students may be employed also as research assistants under operating grants.

Medical research associateships are designed to stimulate medical research on a long-term basis and to provide continuing financial support for individuals of outstanding ability and training who wish to make medical research a full-time university career. Universities must undertake to provide adequate research facilities and to give the associate an academic rank in the appropriate faculty. Candidates must have a degree in medicine or a Ph.D. in a related science, and, under ordinary circumstances, should be less than 40 years of age. The initial appointment is for three years and can be renewed. In 1964 salaries ranged up to a maximum of $16,720 per annum.

Medical research scholarships are designed to bridge the gap between the Council's associate programme (for the support of highly competent independent investigators) and its fellowship programme (for the provision of training and supervised experience in research). They are intended to provide support for the trained investigator who has shown promise of ability to initiate and carry out independent research. The sponsoring university must provide the successful candidate with an opportunity to develop and demonstrate such ability. In short, the scholar must not be obliged to carry out heavy teaching duties. The initial appointment is for a three-year period at a salary depending on the qualifications and experience of the successful candidate. The appointment may be renewed for a further period of two years, but in no case is a scholarship tenable for more than five years. To be eligible for appointment as a scholar, a candidate must have the M.D.

degree or the Ph.D. degree, or the equivalent, and be not more than 40 years of age at the time the application is made.

Medical research fellowships are designed primarily for training prospective research workers in the medical sciences. They are not awarded for the purpose of providing practical training and experience in the clinical or other branches of medicine. Candidates must be either graduates, with high standing in medicine or veterinary medicine, or holders of a Ph.D. degree in an appropriate field of science.[1] They must not be over thirty-five years of age at the beginning of tenure except under special circumstances. Fellowships are normally tenable at Canadian universities at stipends of $3,000 to $5,000; they are subject to three one-year renewals. Fellows with dependent children are given a $500 supplement for the first child and a $200 supplement for each additional child. Fellows are also paid a travel grant to enable them to reach the institution at which their award is tenable and to return home.[2]

Summer undergraduate scholarships are available to medical students to enable them to gain research training during the summer months. Two such scholarships, valued at $1,000 each, are available for each Canadian medical school. Candidates must have completed their first medical year, and must rank in the upper 20 per cent of their class.

Visiting scientists' awards enable experienced investigators to work in Canadian laboratories. Up to three awards are made available each year for investigators in the medical sciences from abroad or for such investigators not normally resident in Canada. The awards are tenable for periods of not less than three and not more than twelve months, and are held in the various medical schools or their affiliated institutions. The maximum stipend is $600 per month scaled in accordance with the qualifications and experience of the investigator.

Administration and Assessment—Applications for grants-in-aid of research are directed by the Secretary of the Medical Research Council to qualified referees through a panel or sub-committee for detailed study and recommendation to the Council. The Council has established Grants Sub-Committees in the four following areas of research: (i) biochemistry, (ii) physiology and pharmacology, (iii) bacteriology and pathology, and (iv) clinical investigation. Applications in fields other than these four are reviewed

[1] It should be noted that although holders of the bachelor's degree who wish advanced training and experience in the basic medical sciences are not eligible for medical research fellowships, such candidates may apply to the National Research Council for bursaries or studentships.

[2] An additional allowance equal to two-thirds of the individual fare will be paid towards the travelling expenses of a married Fellow when accompanied by his wife. No allowance is made towards the cost of travel of children.

by two referees and a recommendation is made to the Council by a member of the executive. When an award is made, the funds are sent to the university in which the applicant is employed. Applications for medical research associateships and medical research scholarships are made on behalf of a prospective candidate by the president or principal of the university on the recommendations of the head of the department concerned and the dean of the medical faculty. Recommendations for appointments are made by a Selection Committee named by the Council. Applications for medical research fellowships are made by the candidates to the Council. Each applicant must arrange for his admission to a university laboratory or teaching hospital acceptable to the Council. Fellowships are awarded to the applicants who are deemed well qualified by the Council on the evidence submitted. Applications for summer undergraduate medical research scholarships are made available to the Dean of Medicine who selects, in consultation with members of his faculty, the winners of the awards in his school. Applications for visiting scientists' awards are made by the host university.

ASSOCIATE COMMITTEE ON DENTAL RESEARCH OF THE NATIONAL RESEARCH COUNCIL[1]

Functions—The Associate Committee on Dental Research of the National Research Council was established in March 1945 to: 1) stimulate research of interest to dental science among members of the dental faculties and among researchers in the basic and medical sciences; 2) co-ordinate dental research in Canada; 3) advance the application of research results in the interests of improved national dental health; 4) encourage close collaboration with other research organizations in problems of mutual interest.

To achieve these objectives, the Associate Committee provides grants-in-aid of research and support for personnel through awards for training, and stipends for trained scientists who may work in universities.

The Committee consists of 14 members; 6 representing the dental profession and 8 representing the basic sciences. The President of the National Research Council and one dental representative from each of the Departments of National Defence, National Health and Welfare, and Veterans Affairs, are members of the Committee which meets once a year.

Grants-in-Aid—Operating grants-in-aid of dental research projects are made to qualified persons who have access to the laboratory or clinical facilities required for the investigation. An award may be in the form of an

---

[1]Based on National Research Council, *Associate Committee on Dental Research Extramural Programme*, Ottawa: Queen's Printer, September 1962.

annual grant, a term grant which assures support for three years, or a block grant on either an annual or a term basis. Term grants are not renewable, i.e., a new application must be submitted at the end of a given term. Major Equipment Grants are provided for the purchase of items of research equipment the cost of which will exceed $5,000 and could not be included under an operating grant.

Personnel Support—The Committee provides support for career investigators in Canadian universities as dental research associates, dental research scholars and visiting scientists, and for the training of research workers through graduate dental research fellowships, and summer undergraduate dental research scholarships.

Dental research associateships are open to individuals of outstanding ability and training who wish to make research a full-time university career. The sponsoring university must undertake to supply research facilities and adequate accommodation, and give the investigator an appropriate academic rank on the staff of the dental school. The initial appointment is for a two-year period; it may be renewed for five-year periods. To be eligible for such an appointment, a candidate must have a degree in dentistry or a Ph.D. in a related science and be under 40 years of age. The initial salary of an associate will depend upon his academic training and experience. Dental research scholarships are designed to provide support for the trained investigator who has shown promise of ability to initiate research and carry it out independently. The sponsoring university must give the investigator an opportunity to develop and demonstrate this ability without the obligation of engaging in a heavy teaching programme. The first appointment is for a three-year period at a salary depending on qualifications and experience, ranging from $6,000 to $9,000 per annum. A single renewal for a period of two years is permissible. But generally, the expectation is that the experience gained by the scholar will fit him for promotion to the rank of dental research associate.

Graduate dental research fellowships are awarded to applicants who are deemed well qualified for advanced training and experience in research in dental and associated sciences. To be eligible for a first award, an applicant must not be over 30 years of age at the beginning of tenure which is for one year; renewals are considered, but in no case are more than three renewals granted. Fellowships are normally tenable at Canadian universities at stipends from $3,000 to $5,000. Small supplements are provided for Fellows who have dependent children and for travelling expenses to enable them to reach the laboratory at which their award is tenable.

Summer undergraduate dental research scholarships, valued at $1,000 each, are available for research training during the summer months for two high-ranking students in each Canadian dental school.

95863—8½

A visiting scientists' award is made available each year to enable an experienced investigator to work in a Canadian laboratory. The award is tenable for periods of not less than three and not more than twelve months, at a stipend not more than $600 per month.

Administration and Assessment—All applications received by the Associate Committee on Dental Research are reviewed and assessed by competent referees. Applications for grants-in-aid of research are proposed by investigators holding appointments at Canadian universities. Applications for dental research associateships, dental research scholarships and visiting scientist awards are made by a university, on the recommendation of the head of the department concerned and the Dean of the Dental Faculty. Applications for a fellowship are made by the candidate directly to the Associate Committee. Applications for summer undergraduate scholarships are made to the Dean of the Dental School who selects, in consultation with members of his faculty, the winners of the awards in his school. Funds for all Associate Committee awards for grants-in-aid of research and salary payments for investigators are made through the business office of the university. Fellowship awards are paid directly to successful candidates.

THE DEPARTMENT OF NATIONAL HEALTH AND WELFARE

Extramural Research—The extramural research programme of the Department of National Health and Welfare can be described as follows:

The Department of National Health and Welfare assists surveys and experimental investigations designed to obtain valid information and to develop methods which are likely to have practical application for improving the health of the Canadian people. Specific objectives related to recognized public health, and medico-social problems are favoured. The major areas in which studies are undertaken include:

(a) the prevention of disease and disability;
(b) the promotion of health and physical fitness;
(c) the etiology and epidemiology of disease, including field studies;
(d) the diagnosis and treatment of disease, including evaluation of results being achieved;
(e) rehabilitation.

This programme is implemented through grants-in-aid of research conducted in universities, hospitals and other research institutions from funds provided under the National Health Grants Programme.[1] National Health Grants are made available in a fixed amount each year to the provinces

[1] For a discussion of the role of the National Health Grants in the support of Health Research, *see* Volume I, Chapters 2 and 10, pp. 88-91 and 405.

and territories to assist them in the development, improvement and extension of health services. A portion of these grants may be used for research. Additionally there is a Public Health Research Grant, which is not allotted in specified amounts to provinces, but for which applications are received from investigators in any province.

The Department does not directly offer fellowships for training in health research, but such training may be assisted under the Hospital Insurance and Diagnostic Services Act,[1] the National Physical Fitness and Amateur Sport Act and under Welfare Grants administered by the department.

All applications for research assistance through the Health Grants Programme originate with a sponsoring agency such as a university, a research institute, a local or provincial health department, a hospital or a voluntary agency. They are submitted to the provincial department of health in the province where the work is to be done and, if approved, are forwarded to the Health Grants Administration in Ottawa from whence they proceed through the principal Medical Officer for Research Development or a consultant division of the Department of National Health and Welfare, to one or more non-departmental experts for appraisal, to financial and administrative officers, to a specialized sub-committee, to a research advisory committee, and finally back to provincial health departments for formal notice to the sponsoring agency concerned, regarding approval or rejection. The agency in turn notifies the principal investigator, i.e., the person who is actively responsible for the research. Ordinarily grants-in-aid are made on an annual basis, but by agreement between the Department and the province concerned, a term grant may be made available. The purpose of term assistance is to provide the personnel on a research project with assurance of continuity of support at an agreed level for each of a specified number of years, generally three, and to simplify administrative arrangements.

Intramural Research—The intramural research of the Department is carried out through its laboratories, divisions and directorates and Research and Statistics Division with the various divisions and directorates carrying out research related to the specific area of their service. All aspects of these programmes are co-ordinated by the Research Development Section. The largest share of the research budget is spent by the Food and Drug Directorate which carries out basic research on foods and drugs and develops analytical procedures and methods for enforcement purposes. The Laboratory of Hygiene conducts research in public health and clinical laboratory fields;

---

[1] Regulations under the Hospital Insurance and Diagnostic Services Act preclude the direct costs of staff, supplies and equipment devoted wholly or mainly to research, but permit the cost of research whieh is incidental to normal hospital activities. Such activities include the intensive investigation required by certain patients.

it has six scientific sub-sections, namely bacteriology, virus, clinical, biochemical research, biologies control and zoonosis.[1] The Research and Statistics Division[2] of the department assists in the research programmes of other divisions and studies the social and economic aspects of health and health services.

The intramural research programme of the Department of National Health and Welfare is not subject to outside assessment; "individual projects are passed upon by groups of departmental officials without any independent advice from outside the public service".[3]

DEFENCE RESEARCH BOARD[4]

The Defence Research Board supports both intramural and extramural research programmes. Health research is carried out intramurally in its own establishment at Downsview, Ontario, and extramurally in Canadian universities by means of a grant-in-aid programme. In addition, research units have been established in four universities: The Arctic Medical Unit at the University of Manitoba, the Radiobiology Unit at the University of Toronto, the Psychiatry Unit at the University of Ottawa, and the Aviation Medicine Unit at McGill University. Occasionally the Board offers a fellowship for training in research.

Applications for assistance towards research projects must be related to health and its maintenance in the Armed Services. The fields of research that are of foremost interest to the Board are: aviation and naval medical research, radiation protection and treatment, nutrition, auditory and vestibular research, visual problems, epidemiology, shock and plasma expanders, management of burns and wounds, infection and immunity, arctic medical research, psychiatry, toxicology, blood and related problems. In each of these fields a panel of experts drawn from all parts of Canada is appointed to review applications for grants. No similar procedure is applied to the Board's own intramural research programme.

THE DEPARTMENT OF VETERANS AFFAIRS[5]

The Department of Veterans Affairs maintains a programme of clinical research in its hospitals and clinics across Canada. The programme

---

[1] Based on Department of National Health and Welfare, *Annual Report for the Fiscal Year ended March 31, 1963*, Ottawa: Queen's Printer, 1963; and *The Federal and Provincial Health Services in Canada*, Second Edition, Toronto, Canadian Public Health Association, 1962, pp. 6-17.

[2] *See* also Chapter 5 for a discussion of the statistical services provided by this Department and the Dominion Bureau of Statistics.

[3] *Report of The Royal Commission on Government Organization*, Vol. 3, Ottawa: Queen's Printer, 1962, p. 235.

[4] MacFarlane, J. A., *et al.*, *Medical Education in Canada, op. cit.*, Chapter 10.

[5] *Ibid.*

is varied but in the main it deals with conditions affecting aging, such as arthritis and arteriosclerosis, which the department is in a special position to investigate.

Over three-quarters of the department's research budget is used in support of applications which come from staff members, who conduct investigations in the wards and laboratories of the departmental hospitals. It should be noted that professional staffs of D.V.A. hospitals are employed on a part-time basis; most members of the medical staff are engaged in teaching and private practice, and hold appointments on the medical faculties of the various universities. The remainder of the budget is used to support the five self-contained clinical investigation units located in active treatment hospitals at Montreal, Toronto, London, Winnipeg and Vancouver.

Applications for research support are considered by the Advisory Board on Medical Research and Education, a group drawn from departmental officials, non-departmental officials and from scientists outside the public service. Awards are made on both an annual and term basis.

QUEEN ELIZABETH II FUND FOR RESEARCH INTO DISEASES OF CHILDREN

This fund, established by the Federal Government in 1959 with a capital of $1 million, yields a fixed sum per annum which is spent on fellowships for training research personnel and on salaries for the maintenance of trained scientists in the field of child care. All applications for support are approved by the Board of Trustees, acting on the advice of medical reviewers.

Provincial Health Agencies

In varying degrees health research is carried out by provincial governments in connection with the activities of their health departments, particularly the provincial laboratories and provincial hospital insurance programmes. Three of the provincial health departments have separate administrative units to deal generally with matters of health research and statistics.[1]

Apart from this intramural research incidental to the functions and activities of the departments concerned, there are provincial agencies such as the Alcoholism and Drug Addiction Research Foundation and the Ontario Cancer Treatment and Research Foundation which provide grants and fellowships for extramural research in their respective fields.

---

[1] In Ontario the Division of Medical Statistics, in Saskatchewan the Research and Statistics Branch, and in British Columbia the Vital Statistics Division which provides statistics for all divisions of the Health Branch of the Department.

Voluntary Organizations and Foundations

A number of voluntary agencies and foundations include among their principal objectives the encouragement and support of health research.[1] Among them are the National Cancer Institute (which at the time of its creation in 1947 entered into close collaboration with the pre-existing (1938) Canadian Cancer Society);[2] the Canadian Arthritis and Rheumatism Society; the Multiple Sclerosis Society of Canada; the Canadian Diabetic Association; the Muscular Dystrophy Association of Canada; the Canadian Heart Foundation (which is a federation of six provincial heart foundations and an Atlantic Provinces Division); the Canadian Association for Retarded Children; the Canadian Cystic Fibrosis Association; the Canadian Hemophilia Society and the newly formed Rehabilitation Foundation for the Disabled. It is noteworthy that the older organizations such as the Canadian Tuberculosis Association, the Canadian Mental Health Association and the Canadian Council for Crippled Children and Adults recently have taken an increasing part in supporting research. Other organizations which assist health research are the Banting Research Foundation, the J. P. Bickell Foundation, the Atkinson Charitable Foundation, the Canadian Life Insurance Officers Association, the National Sanitarium Association, the Picker Foundation, fraternal societies and service clubs.

Voluntary agencies and foundations promote research through selected projects in universities, hospitals and other research centres, provide training fellowships, and construct and purchase research facilities and equipment. Grants-in-aid of research and fellowships are made on the advice of the agency's Advisory Medical Committee comprising leaders in academic and scientific medicine.[3] It is interesting to note that applications for support of research in specific areas such as heart, cancer, arthritis, etc., which are directed to government health-supporting agencies are referred to the advisory bodies of the relevant voluntary agencies for scientific assessment. This provides a high degree of co-ordination between the public and private agencies which support health research in this country. In addition, representatives of governmental and voluntary research fund-granting bodies

---

[1] *See* Chapter 6, and particularly Table 6-9.

[2] As a consequence of an affiliation agreement, the Canadian Cancer Society assigned to the National Cancer Institute major responsibility for the co-ordination and maintenance of research activities in the field of cancer.

[3] Each agency and foundation has its own medical and scientific advisory body which assesses research applications and makes recommendations to the governing members of the agency or foundation. Although such bodies vary in size, they usually include recognized medical and scientific specialists drawn from the universities, departments of health and other government agencies concerned with health. Thus, the Canadian Arthritis and Rheumatism Society's "Committee on Research and Professional Education" comprises eight experts in medicine from the universities and elsewhere. It should be noted that there is some interlocking membership among the scientific advisory groups of voluntary agencies.

meet in January of each year to co-ordinate their programmes.[1] This gathering is held in conjunction with the monthly meeting of the "Interdepartmental Medical Research Co-ordinating Group", an informal and unofficial body consisting of representatives from the Department of National Health and Welfare, the Defence Research Board, the Department of Veterans Affairs and the Medical Research Council. Although of an informal character, it is clear that such liaison is very useful in that it permits a closer examination of possible duplication of research support and also reveals relationships between total research funds and the problems of health and disease that weigh heaviest on Canadians.

Under the grants-in-aid, no payment is made to the principal investigator. The money is deposited with the institution where the work is to be done and administered by the appropriate controlling officer. Most grants provide support for one year's work and the scientist must apply each year for a renewal for as long as is necessary to complete the project. Fellowships are awarded to post-doctoral candidates preparing themselves for careers in research, or as specialists in a particular field. Candidates are required to secure their admission as graduate students at academic departments or laboratories approved by the agency, and fellowship stipends are paid directly to successful candidates.

Foreign Agencies

Funds supplied by the United States Public Health Service through its National Institutes of Health recently have provided substantial support for health research carried out in Canada. The NIH sponsor research projects in Canadian universities and other centres across the country and provide training fellowships. Financial support from private sources in the United States or the United Kingdom now is relatively limited.

EXPENDITURES ON HEALTH RESEARCH

It is difficult to obtain complete and fully comparable data on the total amount spent on health research in Canada. This is particularly the case with data relating to some agencies and to the proportion of the budgets of

[1] The following fund-granting voluntary bodies attended the January, 1964, meeting of the Interdepartmental Medical Research Co-ordinating Group: The Canadian Heart Foundation, Canadian Life Insurance Officers Association, Canadian Association for Retarded Children, Canadian Arthritis and Rheumatism Society, Canadian Tuberculosis Association, Canadian Rehabilitation Council for the Disabled, Ontario Addiction Research Foundation, Muscular Dystrophy Association, Multiple Sclerosis Society, National Cancer Institute, and the National Research Council Associate Committee on Dental Research.

universities spent on health research over and above that provided through grants. The percentage of a professor's time applied to research, and the proportion of their departmental budgets and university overhead spent on research are impossible to estimate with any precision. Again, it is not practical to separate all expenditures on clinical research or on the evaluation of health services included in the costs of hospital and medical insurance programmes. Expenditures of this type while an essential part of a research programme are not covered in the data that follow.

Federal Expenditures

The Federal Government through its various agencies has increased its support for health research in recent years. The growth of support for intramural and extramural research is summarized in Tables 4-1 and 4-2.

Between 1949-50 and 1961-62 federal expenditures on intramural research rose from $110,000 to $2,942,000. In 1962-63 there was a decline in such expenditures to $2.75 million. Even then, intramural expenditures increased over twenty-four fold in the 14-year period.

TABLE 4-1 FEDERAL SUPPORT FOR INTRAMURAL HEALTH RESEARCH BY DEPARTMENTS, FISCAL YEARS 1949-1962

(thousands of dollars)

Fiscal Year	Department of National Health and Welfare	Defence Research Board	Total
1949-50	—	—	110
1952-53	—	—	1,060
1955-56	—	—	1,170
1956-57	863	—	—
1957-58	947	—	—
1958-59	1,182	—	—
1959-60	1,656	—	—
1960-61	1,678	—	—
1961-62	1,792	1,150	2,942
1962-63	1,761	990	2,751

— indicates that data are not available.

SOURCE: Layton, B.D.B., "Financing Medical Research in Canada", *The Canadian Medical Association Journal*, 76, 1957, p. 536; Department of National Health and Welfare, *Annual Report*, various editions; and information supplied by the Defence Research Board.

Between 1946-47 and 1961-62, total federal support for extramural research increased from $158,000 a year to $7,757,000 and rose still further to $8.3 million in 1962-63 as shown in Table 4-2.

TABLE 4-2 FEDERAL SUPPORT FOR EXTRAMURAL HEALTH RESEARCH, FISCAL YEARS 1946-1962

(thousands of dollars)

Year	National Research Council*	Department of National Health and Welfare	Defence Research Board	Department of Veterans Affairs	Total
1946-47	158	0	0	0	158
1947-48	271	0	0	0	271
1948-49	357	150	40	0	547
1949-50	498	326	113	0	937
1950-51	539	720	179	1	1,439
1951-52	578	959	542	0	2,079
1952-53	617	1,248	357	2	2,224
1953-54	642	1,639	380	356	3,017
1954-55	652	1,600	365	367	2,984
1955-56	693	1,554	404	352	3,003
1956-57	849	1,740	419	375	3,383
1957-58	894	1,937	373	383	3,587
1958-59	1,523	2,000	409	303	4,235
1959-60	1,970	2,640	414	328	5,352
1960-61	2,300	3,600	448	331	6,679
1961-62	3,285†	3,481	450	359	7,575
1962-63	4,083†	3,368	447	409	8,307

*Excludes National Research Council Dental Research awards.
†Through the Medical Research Council.

SOURCE: Based on MacFarlane, J. A., *et al., Medical Education in Canada,* a study prepared for the Royal Commission on Health Services, Chapter 10, Ottawa: Queen's Printer (*in press*).

Total federal expenditures for health research, as shown in Table 4-3, rose from $1 million in 1949-50 to $10.7 million in 1961-62, an increase of over tenfold. In 1962-63, total expenditures had reached $11.3 million of which $8.5 million was for extramural research (73 per cent) and $2.8 million for intramural research (27 per cent).

TABLE 4-3 TOTAL FEDERAL SUPPORT FOR HEALTH RESEARCH, FISCAL YEARS 1949, 1961 AND 1962

(thousands of dollars)

Year	Intramural	Extramural	N.R.C. Dental Research	Queen Elizabeth II Fund	Total
1949-50	110	937	0	0	1,047
1961-62	2,942	7,575	132	24	10,673
1962-63	2,751	8,307	178	52	11,288

SOURCE: Based on Tables 4-1 and 4-2.

TABLE 4-4 GRANTS-IN-AID AND RESEARCH FELLOWSHIPS AVAILABLE THROUGH PROVINCIAL AGENCIES AND VOLUNTARY ORGANIZATIONS AND FOUNDATIONS, CANADA, 1961-1962

Sponsor	1961						1962					
	Grants-In-Aid		Fellowships		Total		Grants-In-Aid		Fellowships		Total	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Provincial Agencies:												
Ontario Addiction Research Foundation	10	66,720	—	—	10	66,720	3	17,891	—	—	3	17,891
Ontario Cancer Treatment Research Foundation	38	239,406	7	45,500	45	284,906	38	337,617	7	50,000	45	387,617
Sub-Total	48	306,126	7	45,500	55	351,626	41	355,508	7	50,000	48	405,508
Voluntary Organizations and Foundations:												
Canadian Heart Foundation	99	661,507	52	336,600	151	998,107	111	759,728	52	369,450	163	1,129,178
National Cancer Institute	84	1,201,828	—	51,962	84	1,253,790	89	1,447,245	16	48,950	105	1,496,195
Canadian Arthritis and Rheumatism Society	15	110,020	16	69,164	31	179,184	17	90,801	17	85,275	34	176,076
Muscular Dystrophy Association	25	226,381	12	53,441	37	279,822	26	236,772	14	59,175	40	295,947
Atkinson Charitable Foundation	4	128,981	—	—	4	128,981	5	81,044	—	—	5	81,044
J. P. Bickell Foundation	7	65,000	—	—	7	65,000	3	22,640	—	—	3	22,640
Multiple Sclerosis Society	9	65,423	1	4,600	10	70,023	9	62,289	3	7,900	12	70,189
Canadian Life Insurance Officers Association	—	36,100	14	79,999	14	116,099	—	22,900	13	67,920	13	90,820
National Sanitarium Association	6	32,400	—	—	6	32,400	7	39,155	—	—	7	39,155
Picker Foundation	2	7,950	—	—	2	7,950	2	11,100	—	—	2	11,100
Canadian Mental Health Association	2	11,250	—	—	2	11,250	4	21,875	—	—	4	21,875
Banting Research	18	59,760	—	—	18	59,760	17	57,513	—	—	17	57,513
Sub-Total	271	2,606,600	95	595,766	366	3,202,366	290	2,853,062	115	638,670	405	3,491,732
Total	319	2,912,726	102	641,266	421	3,553,992	331	3,208,570	122	688,670	453	3,897,240

SOURCE: Based on MacFarlane, J. A., *et al.*, *Medical Education in Canada*, a study prepared for the Royal Commission on Health Services, Chapter 10, Ottawa: Queen's Printer (*in press*).

Provincial and Voluntary Organizations and Foundations

Data are not available to indicate trends in expenditures of provincial and voluntary organizations and foundations on health research. Table 4-4 shows these expenditures for 1961 and 1962.

Provincial agencies and voluntary organizations increased their financial support of health research from $3.6 million to $3.9 million or by 9.7 per cent between 1961 and 1962. During the same period provincial support increased by 15 per cent and, as a consequence, the share of the latter in total health expenditures of provincial and voluntary organizations rose from 9.9 to 10.4 per cent.

National Institutes of Health

As already indicated, Canadian research workers have for some time received funds from the United States Public Health Service through grants from its National Institutes of Health. The contribution of these institutes to health research in Canada can be seen from an examination of Table 4-5. It will be noted that until 1958 such funds were quite minor. Since that

TABLE 4-5 SUMMARY OF UNITED STATES PUBLIC HEALTH SERVICE—NIH GRANTS TO CANADA, FISCAL YEARS 1954-1964

Awarded in Fiscal Year	Amount	Number of Grants
	$	
1954	9,671	1
1955	9,670	1
1956	9,670	1
1957	16,449	2
1958	71,169	5
1959	180,807	11
1960	559,543	23
1961	649,465	38
1962	1,504,765	67
1963	2,311,143	125
1964	599,759	32
Total awarded	5,922,111	306
Committed for Award in Fiscal Year		
1964	995,603	51
1965	784,717	41
1966	355,490	14
Total committed for award	2,135,810	106

SOURCE: Communication from the Canadian Embassy, Washington, D.C., to the Secretary of State for External Affairs, March 26, 1964.

date they have grown rapidly and by 1963 amounted to $2.3 million. Table 4-5 also indicates the reduction in the National Institutes of Health support of Canadian health research in 1964. Such support is being gradually cut back as the National Institutes of Health reduce their grants to developed countries.[1] Canadian medical scientists have argued that from the standpoint of continued scientific collaboration between the two countries, the PHS-NIH programme in Canada should not be reduced below $1.2 million per annum.[2] In any case, it is clear that a substantial reduction in PHS-NIH grants to Canadian investigators unless offset by increased Canadian funds would have a serious effect on research activity in Canada.

Total Health Research Expenditures

Table 4-6 shows the magnitude of total expenditures on health research, by source of funds, in Canada, for the years 1961 and 1962.

TABLE 4-6 TOTAL EXPENDITURES* ON HEALTH RESEARCH, BY SOURCE OF FUNDS, CANADA, 1961 AND 1962

(millions of dollars)

Source of Funds	1961		1962	
Federal Government†		10.2		11.0
Intramural Research	2.9		2.8	
Extramural Research‡	7.3		8.2	
Provincial Agencies[a]		0.3		0.4
Voluntary Organizations		3.2		3.5
United States National Institutes of Health[b]		1.4		1.6
Total		15.1		16.5

*Includes both grants-in-aid of research and fellowships.

†In the case of the Federal Government adjustments were made to convert data from a fiscal year basis to a calendar year basis.

‡Includes an estimated $130,000 and $150,000 for dental research in 1961 and 1962 respectively.

[a]Province of Ontario.

[b]Estimates adjusted to a calendar year basis.

SOURCE: Based on Tables 4-3, 4-4 and 4-5.

[1] Communication from the Canadian Embassy, Washington, D.C., to the Secretary of State for External Affairs, March 26, 1964.

[2] This view was the consensus of a meeting held in Ottawa on February 26, 1964, between Mr. Robert H. Grant, Deputy Director of the Office of International Research of the United States Public Health Service, and members of the Medical Research Council and its four grants subcommittees. (Information supplied by the Department of External Affairs, Canada). It should be recognized that offsetting the inflow of American research funds is an outflow of Canadian research workers and physicians and surgeons to the United States, whose costs of education and training are borne largely by Canada.

Total expenditures on health research increased from $15.1 million to $16.5 million or by 9.3 per cent between 1961 and 1962. In 1962 the Federal Government provided 66 per cent of this amount, voluntary organizations and provincial agencies 24 per cent, and U.S. National Institutes of Health 10 per cent. Considering expenditures excluding Federal Government intramural research expenditures which amounted to $13.7 million in 1962, the Federal Government accounted for 60 per cent, voluntary organizations and provincial agencies for 28 per cent, and the National Institutes of Health for 12 per cent.

THE INADEQUACY OF SUPPORT FOR HEALTH RESEARCH IN CANADA

There is general agreement that health research in Canada has developed remarkably within the last generation; that Canadian scientists have done distinguished work; that the conduct of health research has broad implications for the well-being of mankind; but that health research in Canada is failing to keep pace with the opportunities now available in the medical and health-related sciences and the obligations arising from the need to expand the supply of physicians, dentists and other health personnel. Despite a steady and substantial increase in the amount of money available for health research—both from government granting bodies and from voluntary organizations—available funds lag behind the amounts needed for the support of research.

The possibility of a gap between the funds and facilities available for research and the needs of medical research in Canada was examined in 1959 by The Special Committee Appointed to Review Extramural Support of Medical Research by the Government of Canada, under the chairmanship of Professor R. F. Farquharson. The Committee concluded that such a gap existed as a consequence of a number of factors that had characterized the post-war period.[1]

The first factor was the growth in the number of scientific personnel associated with existing medical schools which increased their needs for research support. The second factor was the establishment of two new medical schools and the expansion of a third into a full four-year course. These developments added to the supply of medical scientists, to the growth of scientific activities, and to the demand for research assistance. The third factor was that research had become more costly due to the development and use of sophisticated and very expensive research tools and inflationary pressures which had significantly increased the cost of equipment, salaries of technicians and other operating expenses. A fourth factor was the inadequacy

[1] *The Farquharson Report, op. cit.*, pp. 5 and 6.

of laboratory space for research. A fifth and fundamental factor was the high rate of scientific development in the field of medicine which occurred over the past two decades. Knowledge is contagious. Increased research leads to increased discovery. Increased discovery reveals many new problems which require investigation. In other words, the remarkable acceleration in the pace of the growth of new knowledge and in its application created new opportunities and obligations for research.

Since 1959 there has been considerable increase in the amount of funds made available for the support of research by the Federal Government, voluntary organizations and foundations, as well as the National Institutes of Health. Federal support for research, both intramural and extramural, doubled between 1958-59 and 1962-63. Grants from the National Institutes of Health rose from barely $0.2 million to over $2 million. Grants from voluntary organizations also increased. There has also been an expansion in the facilities for research as some existing universities added to space available. Yet deficiencies still continue to exist. Funds are still not sufficient to provide support for personnel, and facilities are inadequate even for the personnel available.

Shortages of Personnel and Facilities

The exact extent to which the funds available for the support of personnel now engaged in health research fall short of meeting the demands for such funds is difficult to say. Although evidence exists that indicates a gap between the demand for and supply of funds, the size of this gap is not easily expressed in quantitative terms. For example, there is information indicating that the amounts requested by research workers exceed the amounts granted by various granting bodies but the information is incomplete. In the first place, not all applicants for assistance may reach the standards required by the granting body. All applicants for fellowship assistance may not deserve appointment. Secondly, unsuccessful applicants to one granting body may receive assistance from some other source including the National Institutes of Health. Unfortunately, data are not available that would permit the elimination of duplicate applications and to assess the true shortages.[1] What can be said though is that qualified research workers believe that more funds could be spent usefully and without waste.[2]

The trends in the awarding of research assistance are evident in Tables 4-7 and 4-8. Bearing in mind the limitation of the data, Table 4-7

---

[1] The available data relate to Canadian granting bodies only. Canadian research workers also receive assistance from the National Institutes of Health.

[2] National Research Council of Canada, *Forty-sixth Annual Report 1962-1963*, Report of Chairman of Medical Research Council, Toronto: University of Toronto Press, 1963, p. 36, "Since the funds available are usually much less than the funds applied for . . . the initial recommendations must often be reduced".

indicates that the number of research grants awarded by the Medical Research Council has increased recently but that the proportion of applicants receiving grants declined.

TABLE 4-7 SUMMARY OF GRANTS REQUESTED AND AWARDED BY MEDICAL RESEARCH COUNCIL, FISCAL YEARS 1961-62 TO 1963-64

Grants Requested and Awarded	1961-62	1962-63	1963-64
Total requested for grants	$3,719,342	$4,883,392	$6,089,697
Number of grants awarded	370	444	495
Value of grants awarded	$2,697,077	$3,459,273	$3,971,273
Percentage of requests met	72	71	65
Number of requests rejected *in toto*	43	69	115
Value of requests rejected *in toto*	$342,625	$574,138	$1,088,414

SOURCE: Data supplied by the Medical Research Council.

Graduate research fellowships constitute the most common means of financial support for the training of investigators in the health sciences. As indicated in Table 4-8, unlike the grants awarded by the Medical Research Council, the proportion of fellowships awarded is increasing, amounting to 76 per cent in 1963. In the case of the National Cancer Institute and the Canadian Heart Foundation, a high proportion of fellowships were awarded, 89 and 84 per cent respectively in 1963. The over-all proportion of fellowships awarded rose from 70 per cent in 1961-62 and 1962-63 to almost 80 per cent in 1963-64.

As already indicated, the Medical Research Council provides 24 summer undergraduate scholarships, each with a value of $1,000. Applications in 1962 numbered over 100, indicating the shortage that existed in this area.

It is generally agreed that there is no person more worthy of support in health research than the investigator who has demonstrated his ability to conduct original and sustained research. Indeed, it seems fair to say that progress and discovery in the field of medicine can be correlated roughly with the number of such researchers working in universities, hospitals or special research organizations. By 1962-63, an all-time high of 29 research associates had been appointed.[1]

[1] Data obtained from the Medical Research Council.

TABLE 4-8 SUMMARY OF FELLOWSHIPS REQUESTED AND AWARDED BY SELECTED AGENCIES, 1961-1963*

Agency	1961		1962		1963	
	No.	Amount	No.	Amount	No.	Amount
		$		$		$
Medical Research Council						
Fellowships Requested	94		103		108	
Fellowships Approved	53		60		82	
Percentage Approved	56		58		76	
National Cancer Institute						
Fellowships Requested	16	79,750	19	90,800	18	91,750
Fellowships Approved	13	63,304	15	59,650	16	74,850
Percentage Approved	81	79	79	66	89	82
Canadian Heart Foundation						
Fellowships Requested	60	400,500	58	419,950	50	383,015
Fellowships Approved	52	336,600	52	356,200	42	280,100
Percentage Approved	87	84	90	85	84	73

*Medical Research Council data relates to 1960-61, 1961-62, 1962-63; Cancer Institute to 1961, 1962, 1963; Heart Foundation to 1961-62, 1962-63, and 1963-64.

SOURCE: Based on data supplied by the Medical Research Council, National Cancer Institute and the Canadian Heart Foundation.

It has sometimes been suggested that another piece of evidence indicating a shortage of research funds in Canada is the difference between the average amount of financial assistance provided to Canadian research workers compared with those in the United States. The data again are limited but they do indicate that American scientists received considerably larger average grants than Canadian scientists.[1]

Such a differential, from the point of view of research manpower, would be significant if it could be demonstrated that these differentials, or the

[1] The basic stipend for a Research Fellow of the Medical Research Council is $3,000 per annum; the maximum he may receive with five or more further years of training is $5,000. Since 1961, Fellows with dependent children are given a $500 supplement for the first child and a $200 allowance for each additional child. In the United States the National Institutes of Health provide post-doctoral fellowships for early post-graduate training. These fellowships range from $4,500 to $5,500 per annum; they have allowances for dependents ($500 for each) and for tuition. For subsequent training of medical investigators and to support those who need further experience to qualify for senior positions, the National Institutes of Health provide research career development awards. These awards are made for initial periods of five years and may be renewed to provide a total period of support of not more than ten years. The maximum salary an awardee may receive is $25,000 per annum. Medical research associateships are comparable in purpose to the "research career" awards of the National Institutes of Health. The latter, however, involves salaries up to $25,000 per annum while the upper limit of the former is $16,720 per annum. While there are some differences in the cost of living between the two countries, such differences are considerably less than the variations in stipends made available to scholars in the U.S. and in Canada, as indicated above.

shortage of research funds generally, did lead to losses of medical and dental scientists to the United States. How far this has been the case is difficult to say. Certainly, Canadian scientists have migrated to the United States but part of this loss has been offset by the inflow of scientists from other countries and the free flow of health information between countries.[1] It is true that monetary awards, on the average, are lower in Canada but it must be recognized that differences in living costs between Canada and the United States offset some of the differentials. The differences that remain reflect the higher income levels that prevail in the United States. These differentials have persisted over a very long period of time and are likely to persist in the immediate future. It is probably correct that it is only when differentials increase that the outflow of personnel becomes significant for this reason.

The deficiency in the field of health research is not so much the shortage of funds to provide qualified research workers with the support they require, although there is a shortage of such funds, but a shortage of qualified research personnel. This may be due to a loss of staff to the United States but is more clearly associated with the failure to develop a national manpower policy for the expansion of the supply of Canadian-trained physicians and dentists. If the appropriate facilities for training physicians and dentists had been made available the supply of potential research personnel would also have expanded as university teachers combined teaching and research in the health sciences. The outflow of this expanded programme in turn would have partly provided the manpower for health research over the next decade.

The shortages of personnel thus have been related to the shortages of research facilities in medical schools and teaching hospitals. Clinical research facilities have been limited while the older medical schools provided few facilities beyond those needed for teaching.[2] The extent of the need in this area can be determined from the memorandum prepared by the Associa-

---

[1] This is another example of the shortcomings of the statistics relating to the migration of professional personnel which increase the difficulty of planning health programmes in Canada. A rough estimate of the outflow of biomedical research workers from Canada to the United States has been made by Dr. K. M. West. He estimates that an average of 45 such research personnel emigrate to the United States each year. West, K. M., "Training for Medical Research: The World Role of the United States", *The Journal of Medical Education,* March, 1964, p. 256. On the other hand, Canadian graduates receive advanced research training in the United States—much of it by way of American government grants—and then return to Canada. Information is not available to assess the size of the long-term net flow of medical researchers between the two countries. This statistical gap of information vital for health research planning should be filled as the programme for comprehensive health statistics, outlined in Chapter 5, is implemented.

[2] *The Farquharson Report, op. cit.,* p. 5. "The buildings originally erected for the use of the older medical schools were designed for teaching, with little provision for research. Many of these are still in use; research is conducted in meagre quarters, in laboratories designed for teaching or even in corridors."

tion of Medical Colleges as a basis for discussion with the Honourable Gordon Churchill, Chairman of the Privy Council Committee on Scientific and Industrial Research, in late 1962.[1] As of November 26, 1962, a survey of the needs for new construction of medical schools and teaching hospitals associated with such schools indicated that the cost of the required building programme would amount to $190 million over the period 1963 to 1971, of which $57.8 million would be for research. Of the $190 million, $93 million was required for university construction and $97 million for hospital construction, but only $9 million of the latter amount was for research facilities.

Over the immediate future the staffing of the Canadian research programme, whether in medical science or dental science, largely will depend on the development of research facilities in universities, hospitals and associated institutions and the expansion of the supply of manpower in the medical and dental schools in Canada, supplemented by the increased personnel employed by the Federal Government, provincial governments and the pharmaceutical industry. The possibility of training too many people for medical, dental and related research need not be considered, certainly not before the decade of the nineteen seventies. The pressing need is to expand the staff and the facilities of medical and dental schools and, in this way, increase the volume of health research while at the same time expanding the supply of research workers in the future. The problems involved in the short run are substantial but in the long run the pay-offs can be extremely large.

That the problem essentially is one of expanding the supply of research personnel, more than providing funds for existing research personnel, can be seen from the position of dental research in Canada. In 1962, the number of Canadian dental personnel qualified to do research, and carry out some research as part of their general activities, was about 30. In that year ten dental graduates were undergoing research training preparatory to joining the staff of dental schools.[2] However, as the brief from the Faculty of Dentistry, University of Alberta, points out, research in dental science was limited by the scarcity of full-time teachers of dental science of whom there were fewer than ten in Canada.[3] Such was the shortage of qualified personnel, that despite limited financial resources, at the 1960 meeting of

---

[1] MacFarlane, J. A., *et al., op cit.*, Chapter 12. These estimates were included in the brief submitted by the Canadian Universities Foundation to the Government of Canada in May 1963.

[2] *The Canadian Dental Association*, brief submitted to the Royal Commission on Health Services, Ottawa, March 1962, XXIV-7. The first Canadian Conference on Dental Research was held in October 1961. This conference was attended by representatives from all dental schools, the Department of National Health and Welfare and the Royal Canadian Dental Corps.

[3] *The University of Alberta, Faculty of Dentistry*, brief submitted to the Royal Commission on Health Services, Edmonton, February 1962, p. 18.

the Associate Committee on Dental Research of the National Research Council it was reported that there were adequate funds available to meet the requests of those engaged in dental science research in Canada.[1]

Other Problems

One factor limiting the development of research in the field of medical science is the shortage of good medical libraries. There can be no doubt that the success or failure of a teaching and research programme is just as dependent on good libraries as it is on good laboratories and equipment. Yet holdings in only 2 of the 12 university medical libraries approach the size now generally accepted as necessary for the support of an expanding programme of graduate teaching and research.[2] More specifically, the number of current periodicals received regularly in all but two libraries falls below the suggested minimum standards; the combined lists of all 12 libraries do not cover the journals indexed in *Index Medicus* and no library can offer more than 50 per cent of the subject coverage represented by that list, while 3 have less than 20 per cent.

On a different level, most of the libraries are understaffed, and the facilities[3] of all libraries are strained to the utmost by the increasing demands being made upon them. In view of this situation, it is quite apparent that the library resources needed to support Canada's medical education and research programme are insufficient for present requirements and that future demands will be greater than ever before. Substantial financial assistance is required to bring medical library facilities in this country to a satisfactory standard required for the effective performance of research and educational efforts in Canada and we make appropriate recommendations in this respect at the end of this chapter.[4]

A different sort of problem is that of providing for the indirect costs of health research. The programme of assisted research grants initiated by the National Research Council more than forty years ago was based on the premise that the recipient was to be *assisted,* and that the university in which he worked was to provide space and facilities out of its own resources. This model was adopted by the other granting agencies as they were created. The health research programme has grown so large in the past few years, however, that universities are beginning to examine the cost of providing heat,

---

[1] *Ibid.*, pp. 20 and 21.

[2] This statement and those that follow are based on a brief by *The Committee on Medical Science Libraries of the Canadian Library Association,* presented to the Royal Commission on Health Services, Toronto, May 10, 1962.

[3] Facilities include working space for the library staff, seating capacity for the users, stacks, etc.

[4] *See* Recommendation 220, pp. 130 and 131.

light, cleaning service, and other services. What has become significant is that it is not unusual for the total amount of grant money received for research by the staff of a faculty of medicine to equal the total faculty budget for salaries for teachers and supplies. The costs of the accounting procedures associated with such grants can be substantial.

Protests by American universities about the increasing indirect cost of research have led to a practice among fund-granting agencies in the United States to provide "overhead" costs in their grants. The amount varies from 10 per cent to 50 per cent of the total grant. At the annual meeting of the Association of Canadian Medical Colleges in 1961 the deans of the faculties of medicine passed a resolution asking that granting organizations make supplemental grants to the universities to assist in meeting the indirect cost of administering grants-in-aid of research. The Commission recognizes that research grants often place significant financial burdens on the recipient university. We believe that some assistance should be provided for universities to help defray the costs of administering grants. Consequently we conclude, one way of meeting this problem could be that some part of the proposed annual 50 cents per capita Health Professions University Grant could be allocated to meet a share of the indirect costs of research grants.[1]

THE FUTURE SUPPLY OF MEDICAL AND DENTAL SCIENTISTS

What are the prospects for the expansion of medical and dental research personnel in Canada by 1971? In 1961-62 the deans of the Canadian medical schools reported that there were at least 1,200 persons professionally qualified to engage in health research at their universities and at associated hospitals. Of these about 800 were full-time faculty members and the remainder were fully trained part-time teachers.[2] Some faculty members devote all of their time to research, but all of the rest give part of their time. It is not possible to indicate the percentage of their time this latter group of academics applied to research. At the same time there were about 14 full-time and 2 half-time members of the staff of dental schools with graduate degrees in one of the biological sciences in addition to a dental degree; there were also 20 full-time and 34 part-time staff with qualifications in one of the clinical specialties. Virtually all of these had additional basic science training and some of them were engaged in research.[3]

---

[1] *See* Volume I, Chapter 2, Recommendation 174, p. 77.
[2] MacFarlane, J. A., *et al.*, *op. cit.*, Chapter 10.
[3] Data on dentists from Paynter, K. J., *op. cit.*

In addition to the scientists in the universities there were other men and women in government laboratories and pharmaceutical laboratories who were active in health research. The estimated number of scientists engaged in health research in Federal Government departments is shown in Table 4-9.

TABLE 4-9 BIOMEDICAL RESEARCH WORKERS IN FEDERAL GOVERNMENT DEPARTMENTS AS AT MARCH 31, 1963

Department	Number	Full-time Equivalent
National Health and Welfare	257	83
Veterans Affairs	53	34
Defence Research Board	20	20
Total	330	137

SOURCE: Information supplied by Dominion Bureau of Statistics, Business Finance Section.

The number of biomedical research workers in provincial government departments and in pharmaceutical companies is not available. However, it is believed that the number is relatively small.[1]

In summary, although we do not know the proportion of their time devoted to research, it is estimated that there were between 1,600 and 1,700 people engaged in medical and dental research in Canada in 1963.

Medical educators estimate that Canadian medical schools will require a faculty of at least 2,200 by 1971; of these, 1,600 would be full-time faculty.[2] All would be fully trained and expected to carry out research in their fields in conjunction with their pedagogical responsibilities. It is estimated that by 1971 about 150 of the faculty in schools of dentistry would carry out some research in connection with their teaching duties.[3] The

[1] A survey of scientific and technical professions conducted in 1963 by the Economics and Research Branch, Department of Labour, Canada, suggests that there were 23 individuals carrying on research related to medicine within provincial health departments and about 153 people doing the same work in private industrial laboratories. Most of the people in the latter group were employed in the pharmaceutical industry.

[2] For a more complete discussion concerning these figures *see* MacFarlane, J. A., *et al.*, *op. cit.*, Chapter 10; *see also* Volume I, Table 13-6.

[3] *See* Volume I, Chapter 13, p. 558. The requirements for dental faculty in 1971 are estimated at 660, including full-time, half-time and part-time personnel. What proportion of this total will do research is uncertain but for purposes of this estimate it has been set at 150. This is about 60 per cent of the estimated full-time and half-time personnel.

number of investigators engaged in health research in government laboratories is projected at 550 in 1971 as compared to 330 in 1963.[1]

Excluding those scientists with professional qualifications in provincial government laboratories and pharmaceutical laboratories, it is projected that there would be about 2,900 health research workers active in Canada in 1971, though not all would be doing full-time research. In view of the limitations of the data this figure must be recognized as subject to some considerable margin of error but it provides a basis for estimating the needs for research funds.

PROJECTED SPENDING ON MEDICAL AND DENTAL RESEARCH, 1961-1971

As indicated in Table 4-10, estimated medical and dental research expenditures in 1961 amounted to $15.1 million. Of the total spent, about $12.2 million was used to finance research carried out in universities and private research laboratories and $2.9 million for the support of intramural research of the Federal Government.[2]

How rapidly expenditures on health research will increase in the future is not easy to say. In view of the time it takes to expand the supply of research personnel associated with new and expanded university medical and dental schools and teaching hospitals, the demand for research funds in 1971 is difficult to estimate. In addition, the growing complexity of research and the increase in prices that will occur over the period make projections even more difficult. It is evident, however, that research expenditures must increase if Canada is to receive the benefits that accrue from such activities, and our projections reflect this view. As shown in Table 4-10, we project that by 1966 the sum of money available to finance medical and dental research should amount to $26 million and by 1971 should increase to $48 million, which excludes expenditures by the Federal Government for intramural research. Federal expenditures on intramural research are projected to rise to $4.5 million in 1966 and to $6.0 million in 1971. Total funds available for the support of medical and dental research therefore are projected to rise from $15.1 million in 1961 to $54 million in 1971, an

---

[1] The major increase in government employment arises from the recommendations relating to drug research. *See* Volume I, Chapter 2, Recommendations 80-82, pp. 44 and 45.

[2] When comparing these figures with those shown in Volume I, Chapter 11, p. 471, the following points should be kept in mind. On p. 471, estimated expenditures on medical and dental research were estimated to have amounted to $12 million in 1961. This amount excludes expenditures made by the Federal Government for intramural research amounting to $2.9 million. These latter expenditures were included as part of health expenditures made by public authorities. Research expenditures carried out by the pharmaceutical industry for the development of ethical drugs is discussed in Volume I, Chapters 16 and 17.

TABLE 4-10 ESTIMATED EXPENDITURES* ON MEDICAL AND DENTAL RESEARCH, BY SOURCE OF FUNDS, 1961, AND PROJECTED EXPENDITURES, BY SOURCE OF FUNDS, CANADA, 1966 AND 1971

(millions of dollars)

Source of Funds	1961	1966	1971
Federal Government†	10.2	23.5	44.5
Intramural Research	2.9	4.5	6.0
Extramural Research	7.3‡	17.0	34.5
Expenditures to Replace U.S. National Institutes of Health Grants in Canada	—	2.0	4.0
Provincial Agencies	0.3[a]	1.0	1.5
Voluntary Organizations	3.2	5.5	8.0
United States National Institutes of Health	1.4[b]	0.5	—
Total	15.1	30.5	54.0

*Includes both grants-in-aid of research and fellowships.

†In the case of the Federal Government expenditures, adjustments were made to convert data from a fiscal year basis to a calendar year basis.

‡Includes an estimated $130,000 for dental research.

[a]Province of Ontario.

[b]Estimates for a calendar year.

SOURCE: 1961 data based on Table 4-6.

annual average rate of growth of 13.6 per cent over the decade.[1] When we add to this the sums that would become available to the universities through the Health Professions University Grant[2] and through our recommendation that the costs of the hospital services rendered by medical school personnel in teaching hospitals be considered as part of the grants made under the Hospital Insurance and Diagnostic Services Act,[3] the increased amount of money available for research is substantial.[4]

[1] When comparing these projections with those made in Volume I, Table 20-4, the following points should be kept in mind. In Table 20-4, expenditures on health research exclude intramural expenditures of the Federal Government which are included in expenditures on public health. It should be noted that the estimate that appears in Table 4-10 for extramural research in 1971 is $48 million, the same as in Table 20-4 in Volume I. For the year 1966, the expenditures projected for research excluding Federal Government intramural research expenditures have been reduced to $26 million in Table 4-10 fom $32 million in Table 20-4 in Volume I. This reduction was made in view of the difficulty of expanding the supply of research personnel by 1966 and does not affect, in any significant way, the projections of total and per capita spending nor the percentages of GNE spent on health, set forth in Table 20-4, Volume I.

[2] *See* Volume I, Chapter 2, Recommendation 174, p. 77.

[3] *See* Volume I, Chapter 2, Recommendation 143, p. 71.

[4] The cost of social and operational research associated with the Health Services Grants and carried out by the Health Sciences Research Council would be met from the administrative costs portion of those grants.

This is a sizeable rate of growth of spending but it must be related to the projected growth of manpower if some indication of the sufficiency of these sums is to be obtained. We have estimated that between 1961 and 1971 the supply of qualified applicants for research funds, including medical and dental personnel, will rise from 1,600 to 2,900. With total expenditures rising from $15 million to $54 million this is the equivalent of an increase in the average amount available for potential research workers from about $9,400 to $18,620. In short, our projections permit research assistance to be given to almost double the number of persons while doubling the average amount of funds available for each applicant. The annual average growth rate of per capita funds is projected to amount to 7.1 per cent.

Yet this projection would still leave the average per capita sums available considerably below those projected for the United States even though the latter are projected to grow at approximately the same rate.[1] The only test of this projection will be if it is sufficiently high to prevent any substantial drain of qualified professional personnel to the United States and if it attracts increasing numbers of Canadians to enter a research career. If such a drain takes place or an insufficient number of Canadians embark on a research career, then the funds available for research must be increased. With present knowledge the rate of increase we have projected appears to be sufficient to minimize these possibilities.[2]

In view of the projected rapid rates of growth of medical and dental schools the research expenditures on intramural research conducted by the Federal Government are projected to increase at a slower rate. Thus, in 1961 federal intramural research accounted for about 20 per cent of total expenditures. By 1971, it is estimated that these expenditures will account for only a little more than 10 per cent. However, in view of the absolute increase in funds this should be sufficient to carry out the responsibilities of federal agencies.

Our projections of the sources of funds for research also appear in Table 4-10. The projections of spending by provincial agencies and

---

[1] *See Resources for Medical Research,* Report No. 3, Manpower for Medical Research Requirements and Resources, 1965-1970, U.S. Department of Health, Education, and Welfare—Public Health Service, January 1963. The estimated average amount available to professionally trained research workers in the United States in 1961 was $18,000; this is projected to increase to $40,000 in 1971. It should be noted that it is not possible directly to compare average Canadian expenditures with average American expenditures since the former exclude personnel employed by pharmaceutical companies while the latter do not. In addition, the proportions of full-time and part-time research personnel may differ and thus affect average expenditures.

[2] In view of these projections it should be noted that the Canadian Dental Association has estimated that expenditures on dental research and the training of research personnel could amount to $3 million in 1978 compared with the amount of $2.8 million estimated here for 1971. *See The Canadian Dental Association,* brief submitted to the Royal Commission on Health Services, Ottawa, March 1962, Appendix XXIV, p. 7. To the extent that dental research expenditures were less than $2.8 million, the average sums available for medical research would be higher than $18,620.

voluntary organizations are, to a large extent, based on the rapid rate of growth of spending that took place in the period 1952-1962. Whether or not this rate of increase can be maintained by these agencies is not within our power to say. Nor are we saying that voluntary organizations must raise this much for health research. However, if these funds are not provided by these organizations they must be provided by somebody if health research—and with it the education of health personnel—is to increase at a rate which this country requires. If these funds are not forthcoming from voluntary organizations or other sources then they must be provided by the Federal Government.

The same situation exists with respect to the grants made in Canada by the United States National Institutes of Health. If the funds from this source were to continue to grow in the future at somewhat the same rate as they have done in recent years they could amount to about $4 million by 1971. However, in view of the reduction in funds made available by the National Institutes of Health, this $4 million would have to come from other sources. It may be that voluntary or provincial government grants-in-aid of research would rise by an amount sufficient to compensate for the withdrawal of grants by the National Institutes of Health. But if this does not happen, then the Federal Government would have to provide an additional $4 million for extramural research in 1971. In our projection of federal spending on extramural research as shown in Table 4-10, we have made this assumption and federal spending to replace NIH grants is projected to amount to $2 million in 1966 and to $4 million in 1971.

Our recommendations relating to the financial support of extramural medical and dental research by the Federal Government were two: that the Medical Research Council Grant be increased by an additional $2 million each year during the five-year period 1961-1966 and that these funds be transferred to the Health Sciences Research Council; and that extramural research now supported by the National Health Grants Programme, the Associate Committees on Dental Research and Psychology of the National Research Council and the Queen Elizabeth II Fund also be transferred to the Health Sciences Research Council.[1] Since it is evident that $2 million a year will not be a sufficiently large annual increase for the Medical Research Council after 1965, we recommend that for the quinquennium 1966-1971 these funds be increased by an additional $3 million a year. Further, since it is evident that extramural support from the Departments of Health, Veterans Affairs, the Defence Research Board and other federal granting agencies would continue to increase if it remained the responsibility of the relevant department, we have projected that it would continue to grow after it has been transferred to the Health Sciences Research Council. As shown in

[1] *See* Volume I, Chapter 2, Recommendations 178 and 197(c), p. 81 and p. 91.

Table 4-10 the extramural support of medical and dental research by the Federal Government through the agency of the Health Sciences Research Council would amount to $38.5 million in 1971, an increase over 1961 of over $31 million.[1]

The need to support health research is so great that expenditures of less than $48 million on health research by 1971 excluding Federal Government intramural research expenditures almost certainly would have an adverse effect on Canada's research programme. The reduction of financial support from the National Institutes of Health and a slower rate of increase in the supply of funds available from voluntary agencies would seriously limit the amount of health research that must be undertaken. In these circumstances, we now recommend that where the funds available from other sources are insufficient to offset the decline in research funds from the National Institutes of Health or where the rate of growth of funds from voluntary organizations is less than that projected here, such funds must be provided by the Federal Government.[2]

FUTURE CAPITAL EXPENDITURES FOR MEDICAL AND DENTAL RESEARCH

Since medical and dental research are intimately associated with the education of physicians and dentists the costs of facilities for these activities are included in the cost of expansion of medical and dental schools and the hospitals associated with such schools.[3]

The crash programme that we have recommended in Volume I for the expansion of facilities for the education of health personnel in universities and teaching hospitals recognizes the need for adequate research facilities associated with educational facilities in both these areas. In this sense the recommendations we made relating to facilities and personnel were interdependent. The expansion of the facilities and staff to educate health personnel will also provide the facilities and the staff for an expanded Canadian health research programme.

---

[1] The recommendations relating to expansion of the funds available to the Medical Research Council and through other departmental extramural grants would involve an increase in spending by the Federal Government of about $27 million. The remaining $4 million arise from the substitution of federal funds for United States Institutes of Health funds.

[2] *See* Volume I, Chapter 21, p. 869, Table 21-3. In this table all expenditures in support of research in universities or research foundations are envisaged as coming from government. Thus the projected public expenditures for 1966 are $32 million (now revised to $26 million) and for 1971, $48 million. This followed from our belief that these sums must be available. The projected expenditures on intramural research conducted by the Federal Government are included with expenditures on Public Health.

[3] No evidence is available from which to project the capital costs of any expansion of intramural research conducted by the Federal Government or by provincial governments. The omission of such expenditures does not seriously affect the over-all estimates presented here.

In Volume I of our Report we limited our projection of expenditures to the years 1966 and 1971 and for those years we projected that the total outlays for hospital construction (including teaching hospitals), medical schools and dental schools would amount to $159 million and $204 million.[1] Of these sums, in 1966, $144 million were projected for hospital expenditures, $10 million for expenditures on medical schools and associated research facilities and $5 million for dental schools and associated research facilities. The figures for 1971 were $186 million, $10 million and $8 million respectively.

Hospitals

In Volume I of our Report we recommended that the provisions of the Hospital Construction Grant be amended to provide one-half the cost of hospital facilities for new university hospitals or for expansion or renovation of existing university-affiliated teaching hospitals, or teaching units in non-university hospitals to a maximum of ten beds per student in the graduating classes of Canadian medical schools.[2] No attempt was made, however, to estimate what proportion of new hospital construction would be represented by this type of construction. We did, however, allow for an increase in the average cost of a hospital bed in our projections—from $18,000 at the beginning of the decade to $20,000 in 1966 and to $24,000 in 1971—because many of the hospitals built will be teaching hospitals associated with universities and thus will need more extensive and expensive facilities.

In its recommendations to the Government of Canada, the Association of Medical Colleges recommended that about $97 million of new construction was needed to provide university medical schools with the hospital teaching facilities needed.[3] Whether each of the projects they recommend is desirable we cannot say. However, we do accept the general recommendation relating to hospital research facilities and our projections of expenditures on hospital construction are sufficiently large to include this amount. Projected expenditures on new and replacement construction over the period 1966 to 1971 inclusive are around $900 million, sufficient to meet the needs for hospital space associated with clinical research.

Medical Schools

Unlike spending on hospital construction, which is primarily related to population growth and the increased urbanization of the population, ex-

---

[1] *See* Volume I, Chapter 20, p. 851, Table 20-26.
[2] *See* Volume I, Chapter 2, Recommendation 142, p. 71.
[3] MacFarlane, J. A., *et al., op. cit.*, Chapter 12.

penditures for the construction of new medical schools and the reconstruction and addition of research facilities in existing medical schools are not projected to grow steadily over time. Rather, in view of the crash programme that we recommend, they increase to a peak in the late nineteen sixties and then fall back. The expenditures of $10 million for the specific years 1966 and 1971, therefore are an incomplete guide to total spending over the period to 1971. No attempt has been made to separate the research component from that of education in the projected expenditures.

The projection of expenditure on new construction within existing medical schools is based on the recommendation in this area made by the Association of Canadian Medical Colleges and suggested by Dr. MacFarlane. Including the new medical school at Sherbrooke, expenditures on these facilities were estimated to be $93 million.[1] With regard to new medical schools, we have recommended that in addition to the University of Sherbrooke four new medical schools be built in the second half of the nineteen sixties.[2] The cost of these medical schools, including all the laboratory and research space associated with them, has been projected at $12 million for the first to be built, rising to $14 million for the fourth.[3] The total sums projected for the decade of the nineteen sixties would be about $144 million.

It is further estimated that by the beginning of 1966, about $32 million of these projects would be completed. In 1966, another $10 million would be undertaken. As the crash programme got under way, expenditures would average about $25.3 million in the years 1967 to 1969, fall to about $16 million in 1970 and to $10 million in 1971 as the crash programme is completed.[4]

Dental Schools

The proportion of capital outlays for new and expanded dental schools which would be attributable to research facilities has not been estimated separately. However, the projected cost of these schools appears to be sufficient to cover both education and research.

The additional number of places required in existing and new dental schools and the timing of such addition has been described in Volume I.[5]

---

[1] *Ibid.*

[2] *See* Volume I, Chapter 13, p. 529, Table 13-4.

[3] MacFarlane, J. A., *et al., op. cit.*, Chapter 12, estimates that the cost of a new medical school could be $9 to $10.5 million. In view of future increases in the cost of construction and the likelihood of increased research facilities in medical schools, the projected cost was raised to $12 million and then to $14 million.

[4] To the extent that the expansion of new facilities is accelerated or is not completed in the projected time period, expenditures would have to be redistributed.

[5] *See* Volume I, Chapter 13, pp. 555-557.

Over the period 1963 to 1975, provision has to be made for the construction of four new dental schools and the expansion of six existing schools. The cost of constructing one place in a dental school has been estimated at about $20,000.[1] In view of the increasing costs likely to be experienced, this estimated cost has been progressively increased to $22,000 by 1971.

On the basis of these assumptions, the total outlays for dental facilities over the period 1963-1971 are projected to amount to about $34 million. Of this, $8.6 million of construction is estimated to be completed before 1966 and another $5 million to be completed in 1966. Over the period 1967 to 1970 inclusive, expenditures are projected at an average of $3.2 million a year. In 1971, with the commencement of the two schools that must be in operation by 1975 and the completion of schools that must be in operation by 1971, expenditures are projected at $7.5 million to $8 million.

The timing of these expenditures of course is subject to a considerable degree of uncertainty. One of the new schools projected for the nineteen seventies almost certainly will be built before that period while another may not expand until after 1970. On the whole, the amounts projected appear sufficient to meet the research needs of dental schools. In addition, our recommendations relating to the establishment of Departments of Dentistry in major general hospitals and the establishment of centres for the treatment of cleft palate cases will provide facilities for clinical research in teaching hospitals.[2]

RESEARCH AND THE QUALITY OF HEALTH CARE

The discoveries that have stemmed from scientific research and particularly from research in those areas that affect the lives and health of Canadians are well known. Support of research in the field of health is warranted on these grounds alone. Yet it must not be forgotten that the quality of health care, in terms of the number of physicians, dentists and other health personnel available as well as the quality of their practice, is, in the last resort, also dependent on the amount of research conducted in Canada.

The education of health personnel is dependent on the instructional staff available in universities. Here the ability of the universities to attract

---

[1] Paynter, K. J., *op. cit.*, Chapter 9. The cost of providing a place in a dental school is estimated by Paynter at $20,000. The Faculty of Dentistry of the University of Toronto estimated that to construct a school that would provide for a graduating class of 60 students, or a total of 240 places at any one time, would not cost less than $4 million or $16,600 per place. *The Faculty of Dentistry, University of Toronto,* brief submitted to the Royal Commission on Health Services, Toronto, May 1962, p. 1.

[2] *See* Volume I, Chapter 2, Recommendations 54-57, p. 39.

and retain highly qualified teaching staff depends on the facilities available for research and the provision of sufficient funds to finance the research activities of university personnel. Since the supply of health personnel must expand to meet the needs of the Canadian people, there must also be available the appropriate laboratories, libraries, equipment and ancillary personnel that will enable the supply of qualified instructors to be expanded.

The quality of medicine is also improved by the expansion of clinical research. The quality of health care, as exemplified in the treatment that patients receive, is vitally dependent on the clinical research carried out in the teaching hospitals of the universities or those hospitals associated with medical schools. It is here that standards of care are set, improved and tested. It is therefore also necessary that the facilities for clinical research be expanded and that funds be made available to support this type of research.

Finally, even though students may not themselves enter a full-time teaching or research career, there is great value in participating in research in the health sciences since it broadens their minds, increases their comprehension, and by its inherent discipline helps to raise the level of all aspects of their subsequent practice. It is self-evident that experience and training in scientific investigation are essential at an early stage in the education of those students who intend to spend their lives either in fundamental research or in the investigations of disturbances of body and mind.

The universities are the focus of fundamental investigation and of scientific instruction in Canada. At this stage of Canada's development, few health scientists would quarrel with the view that research should be concentrated in these institutions. Universities are more than the custodians and communicators of knowledge; they are the well-springs of new knowledge. The relationship between the transmission and the advancement of knowledge must be a close one. There must be an appropriate balance in education in the health sciences with proper stress on research and an emphasis on the function of teaching and training health personnel.

If this is not maintained, both the quality of the work of health professionals as well as the number available to care for Canadians will be reduced. If such a situation is to be avoided there must be sufficient funds forthcoming to ensure that the facilities and operating revenues are provided both to attract young Canadians into health research and to ensure that our eminent scholars do not go elsewhere for lack of opportunity at home. Our recommendations are such as to ensure that the quality of Canadian health care, in so far as it is dependent on health research, continues to improve. To achieve this goal the facilities and the manpower must be made available with all possible speed.

HEALTH SCIENCES RESEARCH COUNCIL

Organization

Because of the importance that we attach to health research and because of the interdisciplinary implications of health research associated with the Health Services Programmes, we recommended in Volume I of this Report that the Medical Research Council be broadened by appropriate legislation to include all fields of health research and renamed the Health Sciences Research Council.[1] As so reconstituted the Council would become the principal advisor to the Government of Canada in the planning and support of health research and the allocation of research funds, and its expanded services would be available to provincial governments, voluntary health associations, and universities.

Since many new disciplines have been added to the traditional health team, we also recommended that there be provision in the membership of the Council for the appointment of outstanding persons from the health and other professions.[2] We further recommended that an outstanding "layman", not connected with any particular health service programme or agency, should be appointed chairman when a vacancy occurs.[3] The advantage to the Council of such an arrangement would be that not only would the chairman be completely objective and impartial as between disciplines, but as one who has no financial or professional interest in the budget which he presents, he could press the case for the funds the Council thought necessary.

One essential aspect of the organization of the Council is to ensure its independence with respect to the many institutions, agencies and government departments now involved in the health field. If the Council is objectively to evaluate health programmes, whether public or private, the activities of individuals, whether scientist or administrator, and health institutions, whether voluntary, government or otherwise, it must be independent.

We can depend upon the chairman and the members of the Council to protect its independent status, but rather than place the Council under the direction of a federal minister we feel that the chairman should report to the Committee of the Privy Council on Scientific and Industrial Research. This Committee, which was established in 1916 under the same Order in Council as the National Research Council, consists of ten Ministers of the Crown, and has specific responsibility for the supervision and co-ordination of

---

[1] *See* Volume I, Chapter 1, pp. 79-81, and particularly Recommendations 177-185.

[2] This pattern is also followed by the National Institutes of Health (U.S.A.), and by the Medical Research Council of Great Britain.

[3] While the Chief Executive Officer of the Medical Research Council in Great Britain, Sir Harold Himsworth, is a medical scientist, the Chairman has invariably been a prominent layman.

government research, and for the foundation of broad policies on government research and development expenditures. Although there would be no direct organizational link between the Council and the Department of National Health we envisage that there would be, in practice, a close working relationship between the two agencies. We envisage also the closest co-operation with all other health agencies and organizations, particularly the Health Planning Council of Canada, the provincial departments of health, health services commissions and health planning councils, the professional bodies representing health personnel, and the Dominion Bureau of Statistics. The success of the Council will be evident in the free flow of information between all these bodies and the results that will flow from their united efforts.

Finally, we have recommended that the Council should be authorized to appoint its own research director (or directors), medical, dental, and other professional staff and to set up any technical advisory committees it requires.

Functions

As we outlined in Volume I, without restricting the general terms of reference we proposed for the Council, we envisaged the following as among its specific functions:

(1) Be responsible for the administration of research grants in the health sciences.

(2) Conduct, and provide grants for research in the medical, dental, biological and related sciences, basic drug research, public health and any other scientific research including research in the social sciences relating to health, and the publication of research results.

(3) Conduct and provide grants for research into alcoholism and drug addiction including psychological and social research.

(4) Provide an increased number of research fellowships, research associateships and assistantships in medical, dental, pharmacy, public health and university nursing schools.

(5) Support research concerning the most effective training and use of health workers.

(6) Participate in developing and maintaining a continuing system of health statistics in Canada including a dental health index and special studies for the assessment of current health problems and their trends.

(7) Carry out medium-term and long-term projections of Canada's needs for health personnel, facilities, research and organization on behalf of the Health Planning Council of Canada.

(8) Evaluate intramural research conducted by departments of the Government of Canada in the area of medical and related scientific research.

(9) Conduct or provide grants for research studies evaluating the effectiveness of the various elements of the health services programme as a way to improve the quality of health care Canadians receive.

Most of these functions need no further comment. For a few some further explanation is necessary.

First, our recommendations relating to the support of health research indicate that the Council should conduct and provide grants for research in the medical, dental, biological and related sciences, basic drug research, public health and other scientific research including research in the social sciences relating to health. We do not, however, envisage that the Council would conduct its own research programme in the areas of medical, dental or pharmaceutical research in the immediate future.[1] The shortage of trained personnel is such that the needs of the universities must be met before developing any type of health institute. When the new and expanded medical and dental schools are staffed appropriately, the Council could then review the advisability of developing a national institute of health. This does not mean that medical, dental, or drug research will not be conducted at the federal level. Those federal departments, such as the Department of National Health and Welfare, which now conduct research would continue to do so in the future and the Health Sciences Research Council will participate in this development by evaluating intramural research conducted by departments.

Second, although the ability of the Council to perform its functions in the area of medical, dental and drug research is evident, the same may not be true for some time in the areas of the behavioural sciences.

With the broadening of its functions from medical to health research the Council must conduct or support research into the extent of illness and the measurement of good health, the social aspects of health and illness, their economic implications, and particularly the evaluation of health services and programmes. This evaluation must become an integral part of the Health Services Programmes and all their component programmes in order to achieve and maintain a high quality of the services rendered. In these areas the Council should look forward to conducting some of its own research and would therefore require staff from a variety of fields including medicine, dentistry, psychiatry, psychology, sociology, nursing, economics, statistics

[1] Although it is difficult to classify public health research into medical or social research we envisage that the Council, in the initial stages of its operations, would limit its activities to the latter.

and mathematics, and others, all of whom would need to be trained in the method of evaluation of health research. These methods are not those of the basic science laboratory, but have been developed mainly in the area of the behavioural sciences. For example, the evaluation of the effect on the population of a particular health education programme would require the research skills of the sociologist; but to estimate the impact of, say, the National Hospital Insurance Programme on hospital standards and utilization, would require the combined knowledge and research skills of a physician, an economist and a sociologist. In time the nucleus of the skills required to undertake such research could be available to the Council within its own staff but in order to facilitate its research operations, the Council should provide grants to suitably qualified persons or groups of persons outside the Council who would undertake specific projects either within a university or in some other context. A fellowship programme should also be instituted in order to train qualified personnel in the skills required for this type of research.[1]

Third, the Council which will form an essential part of the future health organization must be responsible to a large extent for the flow of information among the various health organizations. Among the information vitally necessary for research in the sciences as well as operational research, we have singled out one area, that of statistics. This is a field we found sadly neglected in this country,[2] and in the following chapter we have outlined our views regarding the development of a systematic and co-ordinated approach to the problem of health statistics in Canada.

In this context we also envisage that the Council either carry out, or have carried out on its behalf, medium- and long-term projections of Canada's need for personnel, facilities, research and organization on behalf of the Health Planning Council of Canada. In the development of these projections, the Council will have the assistance of the Department of National Health and Welfare, provincial health planning councils, and health services commissions, but the over-all needs of Canada must be assessed by the Health Sciences Research Council which would be the only body with access to all available data.

Private Donations for Health Research

We have already outlined the sources of funds available to the Health Sciences Research Council for the conduct of its activities.[3] With the increased funds available through the Medical Research Council Grant, with the extramural research grants of various government agencies now allocated through the Health Sciences Research Council and with the funds avail-

---

[1] The publication of worthwhile research results should be encouraged.
[2] *See* Volume I, Chapter 2, Recommendations 184 and 186-189.
[3] *See* p. 119.

able from the administrative budgets of the Health Services Programmes, the Council would have the financial resources to carry out its responsibilities.

In addition to these government sources of funds we have also recommended that the Council be authorized to hold and to disburse funds received from other sources such as individuals, corporations or foundations.[1]

In this area we visualize legislation similar to that governing the Canada Council which is empowered to "acquire money, securities or other property by gift, bequest or otherwise and may . . . expend, administer or dispose of any such money, securities or other property . . ., subject to the terms, if any, upon which such money, securities or other property was given, bequeathed or otherwise made available to the Council".[2]

The various types of benefactions to the Canada Council comprise: (1) *unconditional grant* where both the principal and income may be disbursed at the discretion of the Council; (2) *conditional as to principal* which specifies that the principal be kept intact though merged for investment purposes with the capital of the Endowment Fund while the income may be spent as the Council sees fit; (3) *conditional as to purpose* where the benefactor stipulates the particular art form or academic discipline on which the funds are to be disbursed; and (4) *conditional as to identity of fund* where the terms specify that the proceeds be given as an award designated by the name of the donor or some other of his choice.[3]

It is implicit in our Recommendation 178 that the cost of administering donations and bequests from private sources be borne by the Health Sciences Research Council, thus assuring donors that the full amount of the fund will be devoted to research. With the implementation of these measures there will no doubt be a further stimulus to the support of health research on the part of corporations and private citizens.

The role of the Health Sciences Research Council in establishing the priorities for health research will be very great. With its responsibility for the allocation of funds and through its advisory committees representative of all health sciences, it cannot but be aware of the areas in which research effort must be intensified. The co-operation of those organizations concerned with research already has been achieved to a considerable extent by the informal consultation between university research workers, government research personnel and the staff of voluntary organizations concerned in these areas.[4] The Council will provide the framework within which future research activities can continue to be co-ordinated. Canadians thus will be

---

[1] *See* Volume I, Chapter 2, Recommendation 178.

[2] Statutes of Canada, 5-6 Elizabeth II, Chapter 3, Canada Council Act.

[3] The Canada Council, *Private Benefactors and the Canada Council,* Ottawa: Queen's Printer, 1962, pp. 8 and 9.

[4] *See* pp. 100 and 101.

assured that they are getting the greatest possible return from their investment in health research.

CONCLUSION

Health research is essential to health progress. We need in Canada more and better research and a fully integrated programme to advance our knowledge and to train the scientists and professional personnel we shall require. We thereby set into motion a cumulative process: more research, greater knowledge, new means of maintaining health and combating illness, improved and higher quality health services, better health, rising levels of living and incomes, which in turn enables us to devote more of our income to health research, starting a new spiral of the cumulative process.

The benefits of this cumulative process are so numerous to the individual, to the professions and to the nation as a whole that we cannot afford disorganization, lethargy or improvisation in the development of a health research programme in Canada; instead, we need vision, initiative, co-operation and long-term planning to guide us in implementing a health research programme comparable in breadth and scope, though not necessarily in extent, with the best pursued by other economically advanced countries.

We have scientists and we will develop more of them. We have the economic means and we will develop even greater wealth in the future. All we need is the will to proceed with a programme of comprehensive health research which will bring manifold benefits to the Canadian people.

To indicate the importance which we are attaching to the role of health research in a health care programme for Canadians, 58 of the 200 recommendations which we have made in Volume I have a bearing both on this subject and the education and the training of the professions who will be entrusted with the implementation of a continually expanding and effective health research programme in Canada.[1] We now make three additional recommendations to ensure that the funds available will be sufficient to support the expanding research programme in the health field.

The Commission recommends:

220. That, in the provision of educational facilities for health professional personnel at research institutions, medical schools, dental schools, schools of public health and schools of nursing, adequate library facili-

[1] The measures we propose pertaining to construction of health research facilities in universities and hospitals, and to the need to discover, train and support investigators in the health field will be found in Volume I, Chapter 2, Recommendations 2-6, 13, 21-23, 28, 80, 93, 94, 115, 128, 129, 132-136, 138-150, 152-159, 161-167, 172-176, 179-182.

ties be provided to be financed from the Health Facilities Development Fund and the Health Professions University Grant.

221. That, over the period 1966-1971, the grants made by the Federal Government towards the operating budget of the Health Sciences Research Council be progressively increased by $3 million a year.

222. That, where funds are not available from other sources to offset the decline in research funds from the National Institutes of Health, or if sufficient funds are not forthcoming from voluntary organizations and foundations to meet the projected needs in 1971, the deficiency be met by a further expansion of federal grants to the Health Sciences Research Council.

We recognize that our recommendations will require a substantial effort on the part of the federal and provincial governments both in the provision of research funds and the facilities required for research and the education of health personnel. A particularly heavy responsibility will rest with the universities and the Health Sciences Research Council to develop and to implement the type of broad programme we have outlined by participating actively and determinedly in a health research programme. These institutions, as well as the many others which we have mentioned, will be able to help build a healthier nation, thus making an important contribution to its future growth, development and happiness.