ESTIMATES

Medical Research Council of Canada

Performance Report

For the period ending
March 31, 2000

Canada

Improved Reporting to Parliament
Pilot Document

The Estimates of the Government of Canada are structured in several parts. Beginning with an overview of total government spending in Part I, the documents become increasingly more specific. Part II outlines spending according to departments, agencies and programs and contains the proposed wording of the conditions governing spending which Parliament will be asked to approve.

The *Report on Plans and Priorities* provides additional detail on each department and its programs primarily in terms of more strategically oriented planning and results information with a focus on outcomes.

The *Departmental Performance Report* provides a focus on results-based accountability by reporting on accomplishments achieved against the performance expectations and results commitments as set out in the spring *Report on Plans and Priorities.*

Available in Canada through your local bookseller or by mail from

Canadian Government Publishing — PWGSC

Ottawa, Canada K1A 0S9

Catalogue No. BT31-4/46-2000
ISBN 0-660-61409-X

Foreword

On April 24, 1997, the House of Commons passed a motion dividing on a pilot basis the *Part III of the Estimates* document for each department or agency into two separate documents: a *Report on Plans and Priorities* tabled in the spring and a *Departmental Performance Report* tabled in the fall.

This initiative is intended to fulfil the government's commitments to improve the expenditure management information provided to Parliament. This involves sharpening the focus on results, increasing the transparency of information and modernizing its preparation.

The Fall Performance Package is comprised of 83 Departmental Performance Reports and the President's annual report, *Managing for Results 2000*.

This ***Departmental Performance Report,*** covering the period ending March 31, 2000 provides a focus on results-based accountability by reporting on accomplishments achieved against the performance expectations and results commitments as set out in the department's *Report on Plans and Priorities* for 1999-00 tabled in Parliament in the spring of 1999.

Results-based management emphasizes specifying expected program results, developing meaningful indicators to demonstrate performance, perfecting the capacity to generate information and reporting on achievements in a balanced manner. Accounting and managing for results involve sustained work across government.

The government continues to refine its management systems and performance framework. The refinement comes from acquired experience as users make their information needs more precisely known. The performance reports and their use will continue to be monitored to make sure that they respond to Parliament's ongoing and evolving needs.

This report is accessible electronically from the Treasury Board Secretariat Internet site: http://www.tbs-sct.gc.ca/rma/dpr/dpre.asp

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Medical Research Council of Canada

Performance Report

for the Period Ending March 31, 2000

Submitted to Parliament by the Minister of Health

Allan Rock

Date

Canada

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Executive Summary

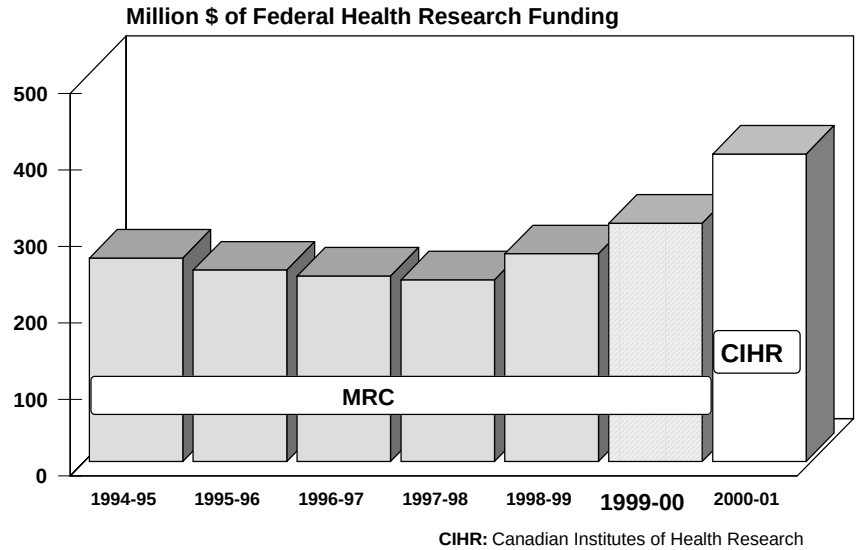
This is the last report on performance of the Medical Research Council (MRC), the agency through which the Federal government has been delivering support for university-based health research for forty years. In fiscal year 2000-2001, the Canadian Institutes of Health Research (CIHR) came into being and the Medical Research Council ceased to exist.

In 1999-2000, with a 14.4 % larger appropriation than in 1998-99, the MRC increased activity in its research programs in preparation for the significant growth in federal support for health research that will flow through the CIHR.

The funding agency's performance for 1999-2000 is reported in seven categories:

1. Delivering world-class health research
2. Addressing health priorities
3. Demonstrating impact on health
4. Capturing economic benefits
5. Developing researchers
6. Expanding capacity, and
7. Providing national perspectives on health research issues.

Federal health research investment delivered through MRC



CIHR: Canadian Institutes of Health Research

I MINISTER'S MESSAGE

Allan Rock
Minister of Health

This 1999-2000 Report to Parliament is the final performance accounting of the Medical Research Council (MRC). Following proclamation in June 2000 of the *Act to establish the Canadian Institutes of Health Research, to repeal the Medical Research Council Act and to make consequential amendments to other Acts*, the MRC became part of a new federal government organization that will transform the way we support, conduct and use health research in this country. The Canadian Institutes of Health Research will develop a health science enterprise that is innovative, inclusive and integrated across regions and across disciplines. It will expand our capacity to make discoveries, create knowledge and translate results into improved health for Canadians, more effective health services and products, and a strengthened health care system.

Earlier this year I participated in a celebration of the legacy that the MRC built through more than three decades as the principal agency supporting health research in Canada. It was a marvellous occasion, allowing us to pause and reflect upon Canadian achievements in the advancement of health knowledge and practice. We are proud of the accomplishments of Canadian researchers who have made important contributions to humankind`s knowledge about maintaining healthy environments and treating and curing illness. And we can look forward to even greater accomplishments through the CIHR as our research community addresses our health challenges with studies that are well-supported, focussed, multidisciplinary and aimed at ensuring maximal use of results.

During fiscal year 1999-2000, the Medical Research Council built momentum in its research support programs, readying for transition to the broader and higher level of activity that CIHR will bring. I am particularly pleased that a special transition program to promote interaction among disciplines and regions, operated by MRC on behalf of the CIHR Interim Governing Council, has elicited a tremendous response within our research community. The enthusiasm for transforming health research through CIHR is strong and growing stronger. Working together in partnerships that cross boundaries between governments, between nations and between research specialties, we can build the best health research agency in the world and make Canada the place to be for the world's best and brightest health researchers.

II AGENCY PERFORMANCE

Societal Context

One of our principal challenges as a country is to create a climate of research opportunity that will inspire our young people, support our researchers and enable us to attract research talent from around the world at a time when competition for it is fierce.

Good health and health care are priorities for Canadians and their governments, both provincial and federal. The importance of health and the need to seize opportunities for improved health care were key themes in the speech with which Governor General Adrienne Clarkson opened the 1999-2000 session of Parliament.

> *"Good health and quality care are essential to the well-being of all Canadians and are part of our strength in today's global marketplace. Advances in technology, research and information are opening tremendous new opportunities for improving the health and well-being of citizens."*

Health research illuminates new and better ways of achieving and maintaining health. It ensures a capacity not only to generate knowledge but also to appreciate the practical significance of the new knowledge produced elsewhere around the globe. Research is a critical element of any national strategy for innovation.

Canadian research has made important contributions to global understanding of threats to health and opportunities for improving health status but, by the mid 1990s, the breadth and depth of our health research activity had fallen far behind that of other highly developed countries. This jeopardized our ability to recruit research talent and put us at risk of losing Canadian researchers and hence our capacity to generate, absorb and use new knowledge of relevance to health. In his reply to the Speech from the Throne on October 13, 1999, Prime Minister Jean Chrétien set out the challenge facing Canadians.

> *"Today, our challenge as a country is to create a climate of opportunity for our graduate students and for our graduates. To provide exciting opportunities for Canadian researchers and to attract the best academic researchers in the world to Canadian universities. And to do so at a time when world-wide competition*

for them has never been so fierce. And particularly at a time when United States universities benefit from both permanent endowments and the generosity of private Foundations out of all proportion to those of our universities."

Over the past several years, the federal government has been rebuilding the foundation of physical infrastructure needed for a major expansion of Canadian capacity for knowledge creation and innovation. Through the Canada Foundation for Innovation, funding has been provided for renewal of research facilities in our universities and teaching hospitals. More recently the government has announced a program to expand support for Canadian researchers. A program of Canada Research Chairs will provide opportunities for top Canadian researchers to dedicate themselves fully to their research and for Canadian universities to recruit outstanding researchers from around the world. On June 7, 2000, the **Canadian Institutes of Health Research** was created to deliver an increased federal investment through a framework that integrates health research across disciplines, regions and sectors, and focuses efforts on issues shared broadly by Canadians, our researchers, the funders of research, health practitioners and others with an interest in creating new knowledge for better health and health care. Prime Minister Chrétien described the goals of CIHR in the fall of 1999:

"To ensure that Canada stays in the forefront of health research. To create a more integrated system of health research than in any other country. To ensure the pursuit of excellence in health research. To keep in Canada our best and brightest practitioners. To attract the best and brightest from elsewhere."

During fiscal year 1999-2000, the focus of the MRC was on preparing for absorption into the new organization, CIHR, of which its programs and staff would form the core. Programs for regional research development were expanded. Collaborating with other partners under the auspices of the CIHR Interim Governing Council, MRC helped develop programs to increase capacity for health services research, and for research in the social sciences and humanities related to health, and to bring communities into the formulation and conduct of health research. MRC was the lead organization in the implementation of the Interdisciplinary Health Research Teams program (IHRT), which brings together researchers from different perspectives (biomedical, clinical, health services and population health) and different institutions.

During fiscal year 1999-2000, the MRC focused on preparing for absorption into a new, broader organization, Canadian Institutes of Health Research, for which the programs and staff of MRC are to form the core.

Performance Results Expectations

The MRC understood that the people of Canada expected it to provide good advice to government concerning the national need for public investment in health research. Managing the resources that government was prepared to invest, and working in partnership with other funders of health research, MRC was expected to support research programs and projects that best serve the public.

Canadians expect health research funding to be delivered fairly, on the basis of the excellence of proposals and the need for new knowledge that research can provide. The MRC's research portfolio as a whole was to deliver results that have a positive impact on health and the economy. Funding was to be delivered with an eye to the future, ensuring that Canada was replenishing its research capacity by supporting the training and development of the next generation of health scientists. And MRC believed that Canadians expect the research funded by government to adhere to the highest ethical standards and to be conducted with care for the safety of all.

On Attributing Responsibility for Research Results

The research conducted by a scientist or group of scientists depends on an infrastructure which has provided them with the necessary education and training, facilitated their development as knowledge workers, given them time to think and work, and made available the research space and equipment they require. Less obviously, their research is enabled by a knowledge infrastructure created by the millions of men and women around the world who have contributed to the understanding of nature and societies over many hundreds of years. It is inappropriate to attribute the results of all these interacting variables to a particular grant provided by a particular agency.

The federal investment in health research may be viewed as an essential contribution to a reservoir whose potential drives the turbines of our system of health innovation.

The federal investment in health research may be viewed as a primary, essential contribution to a reservoir whose waters drive a Canadian generating station that produces not electric power but new knowledge and health innovation. The reservoir is also fed by charitable organizations to which the public has donated funds for research, by provincial governments, by the private sector and even by funders in other countries. When the system generates a major discovery about maintaining health, or a new method for preventing a troublesome illness, or a powerful new medicine with important economic potential, credit is due to all who have contributed.

Chart of Key Results Commitments

The Medical Research Council of Canada was committed		
to providing Canadians with . .	***as demonstrated by . .***	***as reported in sections . .***
world-class research aimed at ensuring good health and well being	international calibre research projects in institutions across Canada on fundamental processes underlying health and illness, prevention and treatment of disease, and health services	accomplishments III-1
	special research initiatives on health issues of particular concern to Canadians such as breast cancer, diabetes and AIDS	III-2
the social and economic benefits of health research discoveries	research results having an impact on illness prevention, identification and treatment of disease, or health services	III-3
	commercialization of health research discoveries with resultant creation of jobs and economic opportunity	III-4
a capacity to respond to needs for research and development in all areas related to health	trained and experienced researchers capable of responding to knowledge requirements in all health areas	III-5
	research resources and capacity generated by partnerships between MRC and other organizations	III-6
a national perspective on questions of health research priorities, ethics and safety	advice and guidance on research priorities, ethics and safety	III-7

Performance Accomplishments

Performance of the MRC program will be presented under seven headings, reflecting the areas listed in our chart of commitments to Canadians:

1. **Delivering world-class health research**
2. **Addressing health priorities**
3. **Demonstrating Impact on health**
4. **Capturing economic benefits**
5. **Developing researchers**
6. **Expanding capacity**
7. **Providing national perspectives on health research issues**

1. Delivering World-Class Health Research

The quality of Canadian health research will be reported from three perspectives. First, our health science will be measured against international benchmarks. Then we will describe the MRC's highly demanding review of proposals which ensures that funds flow to outstanding researchers. Finally, examples of projects will be presented to illustrate the quality and potential of Canadian health science.

Performance Relative to International Benchmarks

International comparisons of health research are often based on the number and scientific importance of health science articles published by a country's researchers. The Institute for Scientific Information in the United States has specialized in tracking scientific publications around the world and recording the number of times that each paper is cited by other researchers. These counts of citations by other scientists are considered a useful indicator of the impact of research publications on world science.

Using data from the Institute for Scientific Information, we examined the impact of Canadian work in 45 areas of health research relative to work by researchers in other countries. Data were compiled for two five-year time periods at the end of the 1980s and 1990s respectively. For 32 fields (71%), the world impact of Canadian science had improved, a positive indicator of growing research strength in which Canadians may take pride. For the majority of fields (34 fields of health science, or 76 % of the subject areas), the global impact of Canadian health science is now higher than the world average. Through initiatives such as the CIHR, we will be able not only to maintain the research strengths that we have built up over the years but also to strengthen capacity in those areas in which impact is below the world average.

International Excellence in Canadian Health Research

From the beginning to the 1980s until the end of the 1990s:

- Canadian health scientists increased their share of papers in the world health research literature
- the growth in their publication activity exceeded the G-7 average
- the number of Canadian articles in the world's foremost health research journals almost doubled
- patents resulting from health research discoveries increased almost 20-fold

International Awards and Prizes

International prizes and awards for Canadian health science indicate its quality as perceived by the rest of the world. Our health researchers, like most Canadians, tend to be modest about international recognition, but their research is highly valued. For example, the National Institutes of Health in the United States provides more funding for Canadian health researchers than for researchers in any other foreign country in the world. Likewise, the Howard Hughes Medical Institute, a US philanthropic organization

with an endowment of $13 billion, has awarded 20% of its prestigious International Scholar awards to Canadian health researchers.

Earlier Reports to Parliament have highlighted the Nobel prizewinning work of Dr. Michael Smith whose work and career development had been consistently recognized and supported by MRC over a period spanning three decades. This year, Dr. **Jack Hirsh**, a health researcher at McMaster University supported by the Medical Research Council and the Heart and Stroke Foundation of Ontario, was awarded a Gairdner prize for his world-class work on the prevention of internal blood clots. Since its creation in 1957, the Gairdner Foundation has recognized only 256 scientists worldwide. One in five Gairdner award winners has gone on to win a Nobel. Canadians may also be proud of the international honour bestowed upon Dr. **Jacques Simard** at Laval University. He received the Richard E Weitzman international prize which is awarded to the world's most outstanding young researcher in endocrinology. The prize recognized his MRC-funded work in three areas: understanding a disease in babies caused by hormone dysfunction; co-discovering breast cancer genes and determining their structure and problematic mutations; and, continuing explanation and study of the process by which sex hormones are formed and activated in the body.

Selecting the best

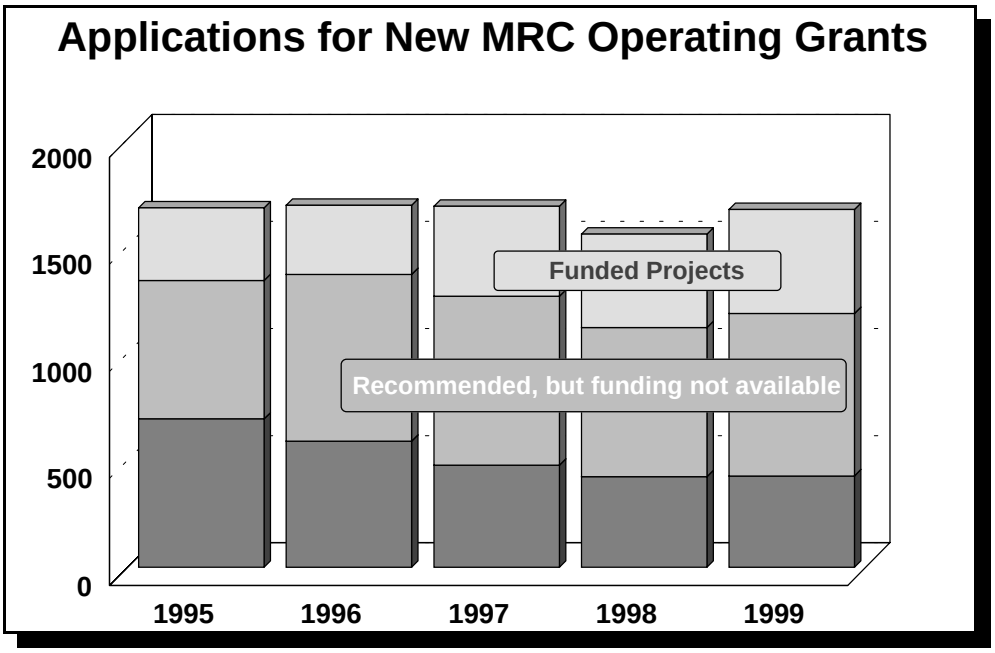
To appreciate the quality of health science projects supported by the Medical Research Council it is helpful to understand the highly-selective process through which applications for funding were screened, rated and put in order of priority for the funding available.

The typical proposal for a health research grant was the product of several months of work by the applicants. They had studied the literature related to their research idea, focussing on questions that remain unanswered. In the grant application they explained their hypothesis, its scientific and practical importance, and the methods through which they would seek new knowledge. A detailed budget explained how grant funds will be used to hire research technicians and student assistants and buy research equipment and supplies.

The vast majority of proposals described scientifically rigorous approaches to answering important questions. The MRC had to select from this pool of promising research ideas a relatively small proportion for which funds were available. Each application was sent to research experts in Canada or around the world for a written

assessment of strengths and weaknesses. Then, the applications were sent to panels of researchers with expertise in the same general area as the proposal. Panellists carefully examined the project description, the qualifications of the applicants, their past research efforts and achievements. Taking into consideration the written reviews provided by other researchers, panel members assessed the originality of the proposal, its likely impact and its feasibility.

Panels rated the applications on a scale of 1 to 4.9 in which any application rated 3.0 or higher is considered a good investment of public funds and clearly supportable. In 1999-2000 of 1671 applications for new operating grants received, 758 were rated as suitable for funding. Funds were available for the support of only 427 of the projects, each of which will last for two to five years.



Funded projects

In addition to new grants awarded in 1999-2000 the MRC supported continuing and renewed projects through a variety of mechanisms ranging from individual research grants to networks of centres of research excellence. These multi-year projects, more than 3,000 in total, covered the full spectrum of health questions, from those probing the structure of molecules that affect health in the human body to those that examine the relationship between community behaviours and health. It is through stories of some of these projects,

appearing throughout the rest of this report, that Canadians can really begin to get a sense of the quality of the work that they supported through the MRC. Below are samples of research that approaches improvement of health from four perspectives: increasing the effectiveness of health services, maintaining healthy populations; examining the results of new treatments and practices, and understanding the biological processes that underlie good health.

Research in health services aims to increase the effectiveness of the delivery of health care. The wide range of issues addressed by health services researchers includes questions on the basis for treatment decisions, geographic variations in the usage of health services, fairness in the establishment of waiting lists for services and balanced assessment of the performance of hospitals and health professionals. Findings from this type of research will help identify ways in which the health care system can be made more effective.

Research on health services: example of projects supported by MRC

Dr. Claude Sicotte and colleagues at the University of Montreal were engaged in two MRC-supported projects in 1999-2000. In a first they interviewed administrators, doctors and nurses in a large hospital to determine how changes in health care have changed the role of hospitals. Their work will provide a point of reference for better assessment of the performance of hospitals. In a second project, they examined a telemedicine network, a system for communicating medical information between a large hospital and smaller outlying hospitals. Their aim was to identify factors which helped successful implementation of the telemedicine network and factors which hindered. They also assessed the economic impact of the inter-hospital communications network.

Research in population health focuses on factors related to the maintenance of good health in our societies. In the past, such research has led to new thinking about factors that put our health at risk such as tobacco smoking, unhealthy eating and inadequate exercise. Population health researchers try to understand what influences people to adopt healthy practices. Findings can guide the development of effective health promotion programs.

Research on population health: example of projects supported by MRC

At the Institut Armand Frappier, Dr. Jack Siemiatycki and colleagues were engaged in a project to identify environmental factors which may increase the detrimental affects of smoking on the lungs. The researchers planned to interview 1100 persons with lung cancer about their jobs to see whether exposure to chemicals in their workplaces may have, in conjunction with their smoking, led to their ill-health.

Research on the effectiveness of different therapies, treatment regimes or health maintenance strategies aims to identify the best intervention for dealing with a health problem or for preventing illness from occurring. Clinical research typically compares the effect of a new treatment, the current best treatment and no treatment, in a trial in which neither patients nor their doctors know which treatment is being administered. The organizers of the clinical trial maintain records on which patients received which treatment and analyze the health outcomes, looking for the treatment that yielded the greatest health benefit.

Clinical research: example of projects supported by MRC

Blood transfusions are an essential intervention for some patients who are under intensive care in hospitals. On average, the blood used in transfusions is 18 days old, yet there is some evidence that blood loses its ability to carry oxygen with the passage of time. At the Ottawa Hospital, Dr. Paul Hebert and colleagues are conducting a pilot study on the effect of using fresh versus "standard" blood for transfusions.

Biomedical research focuses primarily on exploring the natural processes which underlie health and disease. It is by understanding the highly complex functioning of living systems that we are able to know what should be done when problems occur or, even better, how to prevent problems from occurring.

Biomedical research: example of projects supported by MRC

When a virus invades a human cell, it first attaches itself to the outside with the "lollipop-shaped" proteins that stick out from it surface. Dr. Patrick Lee and colleagues at the University of Calgary are studying the attachment process and have grown the attachment proteins in their lab to better understand how they are formed.

Some viruses show a preference for invading cancer cells and Dr. Lee's team has demonstrated the possibility of using viruses as an anti-cancer agent. Their studies have focussed on understanding what is unique about cancer cells that attracts the viruses to them rather than to normal cells.

2. Addressing health priorities

In partnership with other organizations, MRC focussed research on health issues that have been identified as special threats to the health of Canadians (e.g., HIV-AIDS, Hepatitis C, breast cancer and diabetes). In 1999-2000, MRC and partners earmarked over $18 million for research in those areas. It is important to recognize, however, that such funding represents only a small portion of the investment in research that is relevant to these health problems. Much of the research on health behaviours or basic mechanisms of human biology addresses fundamental questions whose answers will increase understanding of many illnesses.

Developing capacity for research in health services, population health and psycho-social health issues

Between 1996 and 1998, there was a welcome 141% increase in the number of applications for MRC training awards for research in health services, population health, psychosocial health issues and related areas.

MRC responded to this interest in critical research areas by approving 39% of the applications, thus supporting the development of another 103 potential researchers

The approval rate for applications for MRC training awards across all areas of health research during this period was 27%.

A 1998 survey of Canadians by Ekos Research Associates revealed that 82% attached a high priority to research into the prevention of disease. Since 1993, MRC has been expanding its support for such research, helping to build national capacity to generate new knowledge about the health of populations, the determinants of health and how to promote healthy behaviours. In 1999, MRC delivered more than any other single federal agency to research in these areas.

Council also worked with partners to promote special initiatives in research areas that offer exceptional potential for improving the health of future generations. A Genome research program is helping ensure that Canada participates more fully in the international effort to map the human genome (the template of human genes). This fifteen year study, which commenced in the late 1980s, is the biggest single biology project ever undertaken. The knowledge of human genetics enabled by a complete map of the genome will transform our approaches to health maintenance. Having Canadian researchers involved in the determination of genetic sequences and in studies of the social and ethical issues that surround increased knowledge of genetics, helps prepare us to benefit from wise and effective use of resultant new health knowledge and technologies. Global progress on the human genome project has been even faster than anticipated and a draft map was recently published. MRC investment in this area spurred the Canadian genomics research community to develop proposals for Genome Canada, announced in the February 2000 budget.

Research on Health Priorities: **: examples of projects on HIV-AIDS supported by MRC**

At the Jewish General Hospital affiliated with McGill University, Dr Mark Wainberg and colleagues were working intensively and from many angles on the problems posed by HIV-AIDS.

- Because current HIV-AIDS drugs are too expensive to be accessible in developing countries and because drug-resistant strains of HIV-AIDS are a continuing, they were looking for new ways in which the reproduction of the virus could be short-circuited by drugs.
- It is important to be able to quickly identify drug-resistant forms of the virus appearing in newly infected people. Dr. Wainberg's group was developing ultra-sensitive analyses of the virus to enable quick identification of drug-resistant strains and thence determination of their characteristics. It may even be that some existing HIV-AIDS drugs could actually enhance reproduction of drug-resistant virus.
- The group introduced mutations in the genes of the virus to understand the role played by various portions of genetic material and how those roles might be side-tracked by new compounds. They hoped to see if the mutations might weaken the virus to the extent that it could be considered for vaccine research.

Research in Areas of Opportunity for Health Improvement

Research on Medical, Ethical and Legal Issues related to Studies of the Human Genome

As part of the Canadian Biotechnology Strategy, the federal government delivered through MRC an amount of $350,000 to ensure that the most pressing issues for the Canadian public and policy makers were addressed as soon as possible. Eleven grants were awarded.

One pilot study led to a subsequent $3 million grant from the National Institutes of Research in the United States, thus bringing to Canada more than nine times the amount spent on the entire program!

In addition to findings published in journal articles, outcomes included information pamphlets and websites for patient groups and health professionals. One study developed and tested a booklet and audiotape providing information to women with a history of breast cancer. The Canadian Cancer Society has agreed to fund the distribution of this bilingual information aid, and an accompanying binder for health professionals. Another study developed professional guidelines for medical geneticists who have to deal with the disclosure to families that they are carrying a particular inherited disorder. One research project developed a valid and reliable scale for measuring the impact of disclosure to women that they are carrying breast cancer susceptibility genes.

Balanced reporting: Not all studies went as predicted. However, the difficulties encountered by one investigator in negotiating an acceptable protocol with a defined community led to a paper describing a new approach to these situations, which will benefit other researchers studying the genetics of restricted populations defined by geography or ethnicity.

Research on Health Priorities

Research on Diabetes : **: examples of projects supported by MRC**

Dr. Ray Rajotte and colleagues at the University of Alberta showed in 1989 that it was possible to transplant insulin-producing islets into the patients with long-term diabetes, thus freeing them from the need for insulin injections. However, most of the people who have received islet transplants have also received another organ transplant at the same time. This necessitates ongoing treatment with drugs to suppress the body's natural rejection of foreign materials, and this anti-rejection therapy itself has unwanted side effects. The research team's current project involves introducing new genes into the islets that will make them generate natural immuno-suppressive molecules to protect against rejection.

3. Demonstrating Impact on Health

The impact of research on health ca be direct and immediate: new knowledge is produced and that knowledge leads to an innovative approach to health maintenance or care, illness prevention, diagnosis or treatment. However, for most research projects, the impacts on health are revealed over time. The research will generate observations which in turn will point to other critical questions that need to be answered, thereby setting the stage for a future breakthrough. Research also provides a training ground for the next generation of health scientists and thus renews and sustains our Canadian research capacity. Very importantly, conducting research ensures that we have a window open to new ideas emerging from studies around the world: it gives us a capacity to absorb and use research findings generated elsewhere.

Research improves our health care indirectly when our university-based researchers teach students of medicine, nursing or other health professions, inspiring them to view knowledge as the product of individual curiosity and investigation rather than as static information from textbooks. Clear-thinking, critical health professionals deliver good health care. Also, since active research environments attract the best, most innovative and informed health care specialists, the excellence of Canadian health research helps ensure that cities, regions and the country as a whole are able to recruit high quality clinical expertise.

In 1999-2000 the steady progression from new knowledge to new health practices continued to yield improvements to our health care system. To illustrate the many impacts on health from a long-term research program, we present the work of Canadian researcher Philip Seeman, MD PhD, whose ideas and research results have changed thinking about the treatment of schizophrenia. The text box outlines Dr. Seeman's work on the mechanism of action of anti-psychotic drugs. The flow chart traces the links between the basic research supported by MRC and improvements in the quality of life of persons afflicted by mental illness and of their families.

Improving Quality of Life through Research

Case Study: Improved treatment for Schizophrenia

Mental illness is prevalent, costly, dangerous and extremely stressful, not only for persons afflicted but also for those who love and care for them. Of the ten leading causes of lifelong disability, five are mental disorders. Every day, one million Canadians take anti-psychotic drugs to alleviate the unsettling hallucinations and disorienting delusions that accompany schizophrenia, manic-depression, Huntington's and Alzheimer's.

Anti-psychotic medications were introduced into Canada in 1959. They seemed to work reasonably well, but no-one understood the biological mechanism involved. In 1967, **Philip Seeman**, then a young Canadian physician who had completed a PhD in the US and an MRC postdoctoral fellowship in England, set out to find the answer. A long series of discoveries emanating from his **MRC**-funded research at the University of Toronto has led to a recent finding that will change thinking around the world about how anti-psychotic drugs may be used more effectively with a minimum of side effects.

A first major discovery from Dr. Seeman's work was that all 25 or so of the anti-psychotic drugs on the world market work more or less the same way. They temporarily block sites in brain cells that are sensitive to a natural biochemical, dopamine. Essentially, the drugs protect the brain from overstimulation by excessive dopamine.

A second discovery was that two anti-psychotic drugs in particular need to be in contact with the dopamine receptor sites in the brain for just a few seconds to switch off the receptor for a day or so. Dr. Seeman's finding alters the world-wide view that anti-psychotic drugs must stay connected to the receptor to have their effect.

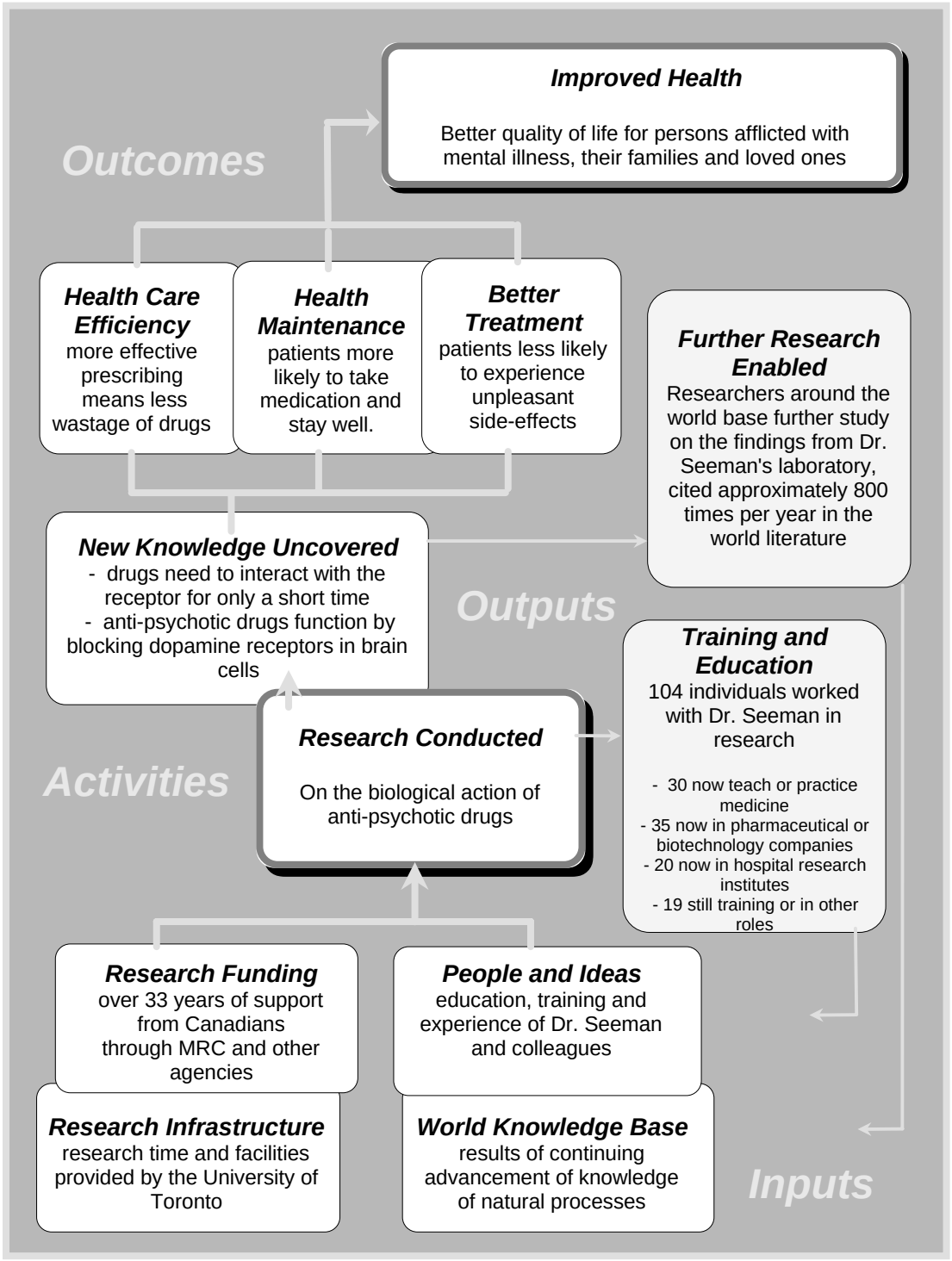
According to the old view it was important to have an anti-psychotic drug present in the patient's blood all the time so that as drug molecules were broken down at the receptor site, new molecules would be available to take their place. But a severe disadvantage of constant levels of drug in the blood is the unwanted side effects. Recipients of anti-psychotic drugs often complain of an unpleasant stiffness that makes them feel as if they have been placed in an imaginary straight-jacket.

Dr. Seeman's discovery tells us that, for two particular anti-psychotic drugs, once they have had a chance to switch off the dopamine receptors, they can be eliminated from the blood. This radically alters thinking about how these drugs should be prescribed. It now appears that the ideal regimen would be to take one of these drugs in the evening so that it would interact with a person's dopamine receptors while they sleep and be cleared from their blood by morning.

Federally-funded basic research on the mode of functioning of anti-psychotic drugs has thus pointed the way to more effective dosage levels and timing. This means less drug need be used and health care dollars can be reinvested. It means that patients feel better and are less likely to abandon their drug regime and relapse. And knowing that an effective anti-psychotic drug is one that attaches to the dopamine receptor for only a short period of time and is then quickly cleared from the bloodstream will focus the search for new and better treatments.

Tracing the Links Between Research and Improved Health:

Case Analysis: The Impact on Health of MRC-Funded Research by Dr.Philip Seeman at the University of Toronto

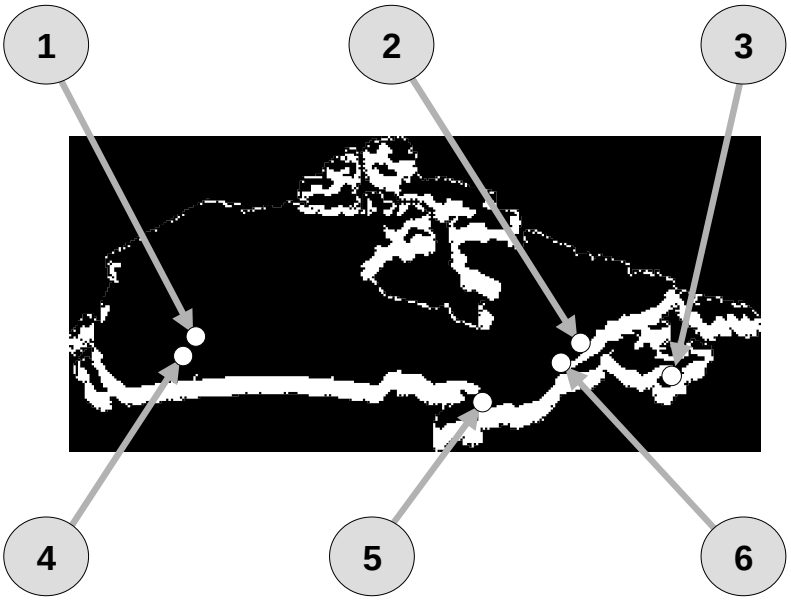


Cross-Canada Sweep: Research with an Impact on Health

1. Damage Control...
Researchers at the University of Alberta have shown that common antibiotics reduce the damage to heart muscle often seen after heart attacks.

2. Seeing Clearly...
Corneas, the transparent surface of the eye, have been painstakingly constructed from layers of human cells by researchers at Laval University in Quebec City, to provide material for eye surgery.

3. Treating the "untreatable"
Researchers at Dalhousie have found that combining two drugs has produced positive results in treating schizophrenia patients who had previously been considered "untreatable.".



4. Stopping Diabetes
University of Calgary researchers have taken a significant step towards building a strategy to block the onset and development of Type 1 diabetes.

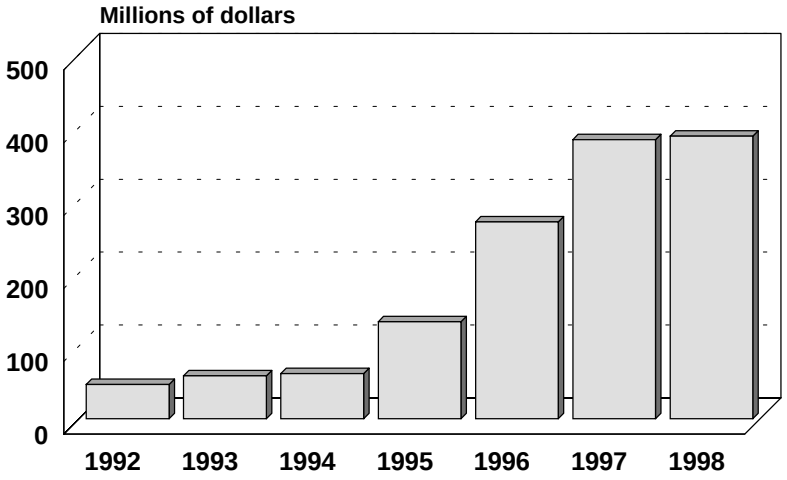
5. Detect and Protect
A Toronto research team has developed a test to detect nasopharyngeal cancer - the disease that killed baseball legend Babe Ruth - which is deadly if left undiagnosed but can be treated if detected early.

6. Breath of Relief...
Researchers at McGill have shown that regular use of inhaled steroids reduces the risk of an asthma patient dying from an asthma attack.

4. Capturing Economic Benefit

A Canadian health research discovery may, in addition to having an impact on health, have significant commercial potential. Realizing this potential requires venture capital for product research and development. If the capital is not available here, commercialization will likely take place elsewhere and Canada will lose the resultant jobs, exports and wealth creation. The Council was instrumental in the creation of the Canadian Medical Discoveries Fund which has become the largest provider of life science venture capital in Canada.

Canadian Venture Capital Investments in Life Sciences



Source: Mary MacDonald and Associates

Another way to bring the economic benefits of health research discoveries to Canadians is to foster close linkages between the generators of new knowledge and ideas, our academic health scientists, and Canadian companies that can enable the transition from idea to marketable product or service. In 1999-2000, the MRC invested more than $8.6 million in grants and personnel awards to support university research conducted in partnership with industry.

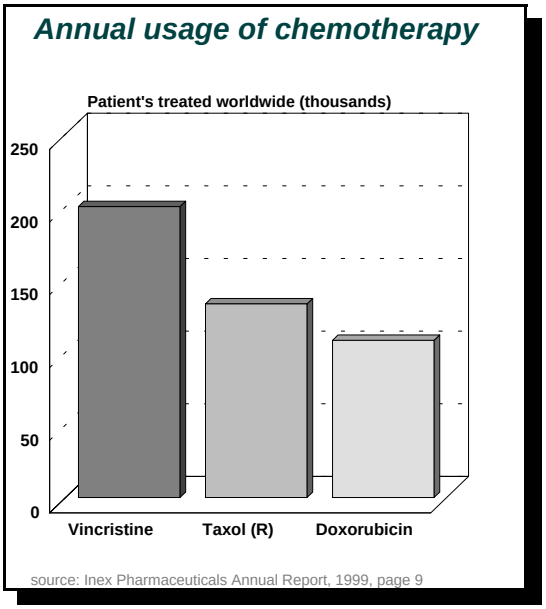
Registration of patents in the health area may be viewed as an indirect indicator of the success of strategic alliances between university researchers and industry R&D managers fostered by mechanisms such as the University-Industry program. In 1980, just before MRC's University-Industry program was launched, Canadians registered 50 health patents; in 1996, there were over 235 patent registrations.

Commercialization of research discoveries may be accomplished through partnerships with established corporations or through spin-off companies, that is, businesses created by universities or researchers specifically to commercialize inventions and technologies developed at a university. A recent study[1] of 83 spin-off companies in the health area found that those created since 1979 employ over 2,000 people and in 1997-98 sold $60 million worth of products, 75% to customers outside of Canada.

Improved health / new business : a better test for prostate cancer

Work by MRC Scientist Dr. Yves Fredet has led to a highly accurate test that can detect early signs of prostrate cancer. Recently patented by DiagnoCure Inc. in Quebec City, the test could reduce the need for biopsies in which cells are drawn from the prostate by a special needle, a process that is both painful for the patient and expensive for our health care system. The test will also correctly detect prostate cancer about 80% of the time whereas current blood tests fail to detect prostate cancer about 30% of the time and 60% of the time indicate cancer when there is none.

World market for anti-cancer pharmaceuticals



*(See profile on Canadian company **Inex**)*

[1]. Honsberger L. Biomedical and Medical Spin-off Companies. Draft Thesis. July 1999.

Case Study: new products and business resulting from MRC-funded research

Inex Pharmaceuticals in Burnaby BC is increasing the effectiveness and reducing the side-effects of anti-cancer drugs

One of the problems with anti-cancer drugs is that they are quickly swept from the bloodstream by the natural processes which clear our bodies of foreign substances. If we could somehow package the drug inside a carrier that could circulate for a longer period in the bloodstream and accumulate preferentially at tumour sites, our capacity to destroy tumours would be greatly enhanced.

Using a technology that was developed by MRC-funded researchers, Inex Pharmaceuticals in Vancouver is doing just that. Minute amounts of a potent anti-cancer drug, vincristine, are encapsulated in natural lipid particles. When these drug-loaded particles are injected into the blood stream of a person with cancer they are eventually carried to the capillaries which surround the tumour. These capillaries can be described as leaky. The lipid particles, which are only 1/100 the size of a blood cell, pass through the capillary walls into the cancer site. Then as the lipid slowly breaks down, the vincristine is released and goes to work, stopping division of the cancer cells.

Founded in 1992 by MRC researchers James Miller and Pieter Cullis, Inex now employs over sixty people and has more than $40 million in assets. Its lead product, lipid-encapsulated vincristine, has performed very well in an early trial with 68 patients suffering from non-Hodgkins lymphoma, a particularly difficult cancer to treat. About 45 % of the patients responded to the Inex product with at least a 50 % reduction in the size of their tumours. The patients experienced few side-effects and none had to be hospitalized during the treatment period. Further trials, involving patients at 20 medical centres in Canada and the United States, are in progress and it is expected that the product will be approved for marketing in 2002.

MRC supported the underlying basic research

After finishing a PhD program in physics, Pieter Cullis decided he was ready to take on the challenge of studying biological systems. He obtained a postdoctoral fellowship from MRC to study at Oxford, then won an MRC new-investigator Scholarship and grant to set up a research program at the University of British Columbia in 1978 . “Our main interest was in cell membranes... how they work, how they fuse with one another and how substances move through them. To investigate these problems we required “model membrane” systems, which are tiny spheres consisting of a lipid bilayer surrounding an interior aqueous space. So we devised ways to make them. One day we were observing how different cationic dyes would accumulate in these spheres if the interior was acidic. Just out of curiosity, we then tried using some of the cationic anti-cancer drugs on the shelf of our lab. They moved into the lipid spheres perfectly! That was the chance beginning of our 18-year MRC research program on encapsulating drugs.”

Now Vice President Research at Inex, Dr. Cullis divides his time between the research and development programs of the company and continuing basic research in his laboratory at UBC.

Health research can lead to highly significant long-term reductions in health costs by reducing the incidence, or length, of illness. Thus the discovery of vaccines has led not only to better health by reducing the occurrence of many diseases but also to a more productive workforce that need spend less on the hospitalization and treatment of disease victims. Likewise the research that led to antibiotics has not only saved lives and reduced suffering but has also made tremendous contributions to national economies.

Health research can also yield positive economic benefit by identifying situations in which health care may be delivered more efficiently and effectively with no reduction in quality of care. In a country as large as Canada, it is inevitable that without common guidelines on treatment procedures, there will be wide variation in the way different health professionals or different hospitals treat a given disease. If the most efficient and effective treatment can be identified and guidelines on its use consulted consistently across the country, health care resources can be saved or reallocated.

Health care cost savings resulting from MRC-funded research

Cost-effective treatment of pneumonia

Pneumonia is the leading cause of death from infectious disease in Canada. It accounts for some 7,400 deaths and about 60,000 hospitalizations per year at a cost of around $100,000,000. Treatment and length of stay varies from hospital to hospital.

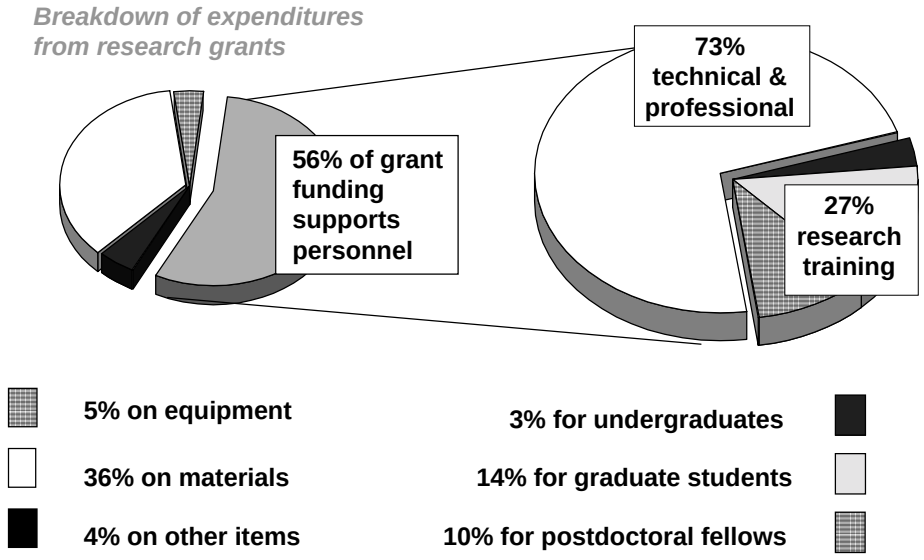
An MRC-funded study that involved more than 1,700 patients and 19 hospitals assessed the results of using guidelines for the treatment of pneumonia patients that included better initial assessments, treating milder cases at home, greater use or oral rather than intravenous antibiotics, and using only one antibiotic instead of several medications.

Nine of the hospitals in the study used the new guidelines. The other ten hospitals offered conventional treatment. Those using the new guidelines reduced hospital admission of low-risk patients by 18% and discharged hospitalized patients almost two days sooner. The savings amounted to approximately $2,000 per patient treated under the guidelines yet the rate of subsequent health complication or hospital readmission were the same as for those whose treatment cost more.

5. Developing Researchers

Health research means bright, committed, well-trained people dedicating their talents and abilities to the pursuit of new knowledge - people with ideas. Of course, researchers need accommodation, equipment, materials and supplies, but without people, everything else - the research office or laboratory, the computer or magnetic resonance spectrometer, the boxes of health behaviour survey forms or the chemical reagents - stands idle. About 56% of the typical MRC grant supports people: graduate students, research technicians and postdoctoral fellows who assisted researchers with their work.

Health Research Provides Jobs and Knowledge-Intensive Training



In addition to providing jobs for an estimated 2,730 students and 370 postdoctoral fellows through research grants, MRC supported a further 800 students and 450 fellows through its research training awards programs. Awards provide personal support and research allowances to persons who exhibit exceptional potential to pursue careers as independent researchers. The Council has conducted studies of the subsequent careers of students and fellows whose training had been supported through personal awards. Findings revealed high rates of completion of study programs and showed that large percentages of award holders went on to careers in research, characterized by scientific brilliance and influence on the development of future scientists.

The Council also provided salaries for some of Canada's best health scientists, to enable them to work full-time at research. Programs were targeted at all stages of career development, from the recently-trained researcher setting up her or his first independent research project, to the distinguished scientist for superb research and as a role model for young Canadians. In 1999-2000, MRC invested over $22 million in career awards for more than 430 of Canada's most outstanding health researchers.

Building Capacity for Product Development

The development of Canadian biotechnology companies requires people with research skills and experience. **MRC research training awards contributed to the development of a national capacity to create and expand businesses in the health care area.**

For example, at *Inex Pharmaceuticals* (see case study on new products resulting from MRC-funded research) four key positions are staffed by persons who received support from MRC as developing scientists:

David Saltman MD PhD, Director of Medical Affairs, received a Fellowship from MRC for doctoral studies in Edinburgh on the molecular genetics of lymphoma.

Tom Madden PhD, Director of Product Development, held an MRC Fellowship for postdoctoral studies at the University of British Columbia.

Ian MacLachlan PhD, Project Leader, Gene Therapy, was supported by MRC for postdoctoral studies in the United States.

Pieter Cullis PhD, Vice President, Research, received both training and research career development awards from the MRC.

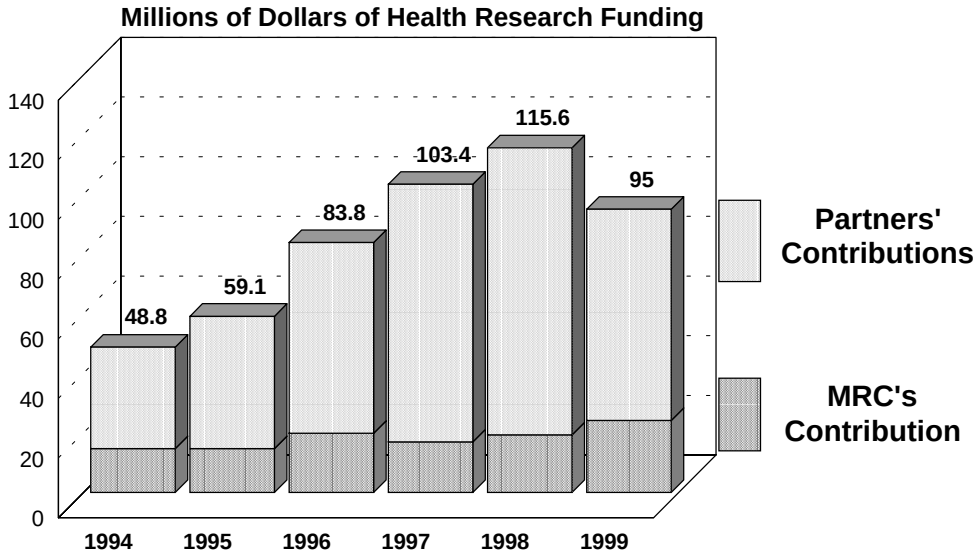
6 Expanding Capacity

Partnerships between MRC and other funders of health research have three major benefits for Canadians. First, partnerships bring more resources to bear in a given research area. They concentrate funding on specific issues, often permitting the development of a critical mass of researchers which enables results that would never have been achieved if the partners had gone it alone. Partnerships can increase the overall impact of the public investment in research through MRC. Second, partnerships help bring

funders, researchers, health professionals and interested Canadians together over a common issue, be it the improvement of life for diabetics or the assurance of Canadian capacity in human genetics. Different perspectives on health issues often generate ideas for new research approaches. Third, partnerships can increase the total Canadian health science effort. This occurs when MRC's partner would not have funded the research unless in concert with MRC, or when the partner would have supported the research, but at a greatly reduced level.

The Council has been investing a significant portion of its budget in partnered programs of research grants and personnel awards. In 1999-2000, MRC delivered *over $24 million, more than 8 %* of its funding, through shared initiatives. Partners have been generous with their contributions. In 1999-2000 they invested *$2.90 for every $1.00* from MRC, representing an additional investment of $70.8 million in high quality research projects and personnel awards adjudicated through MRC's peer review system.

Research Funding Delivered Jointly with Partners



Council is proud of its partners in health science research funding and greatly values the varied perspectives they bring to joint initiatives. Representing more than 130 organizations, MRC's partners include Canadian and international health charities, provincial health organizations, companies with specialties ranging from pharmaceutics to medical devices to biotechnology, professional organizations and federal departments and agencies.

MRC Partnerships for Canadian Health Science

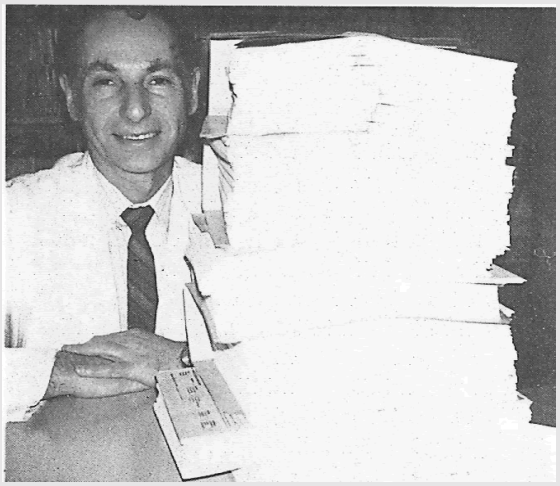
	Estimated Financial Contributions of Partners ($thousands)		
	1998-99	**1999-00**	cumulative *1994 to 2000*
Industry Partners *(85)*			
MRC-PMAC / RX+D Health Program	46,071	**15,054**	170,608
University-Industry Program	3,686	**3,146**	28,819
Voluntary Health Organizations *(15)*			
Juvenile Diabetes Fund International	1,000	**1,600**	4,600
Burroughs Wellcome Fund	719	**740**	2,831
Other voluntary health organizations	2,700	**1,828**	5,934
Other Partners (25)			
Canadian Health Services Research Fund	11,000	**11,000**	44,000
Networks of Centres of Excellence	11,455	**18,875**	30,330
Hepatitis C		**557**	557
AIDS Strategy Research	5,440	**4,500**	33,918
Canadian Breast Cancer Research Initiative	9,268	**8,026**	39,212
Genome Analysis and Technology	371	**0**	5,127
Other	4,498	**5,440**	24,663
Total Contribution of Partners	96,208	**70,766**	390,599
MRC Contributions	19,354	**24,153**	109,599
Ratio of MRC Funding to Partners' Funding	1 to 4.9	**1 to 3**	1 to 3.6
Percent of MRC Budget Invested in Partnerships	9.0	**8.2**	7.6

Note 1: Partnerships can take many possible configurations. Data may reflect: amounts that a) were expended through the partnership, b) have been contributed to the partnership or c) have been contributed to the partnership but not yet fully invested through research grants or awards.

Balanced reporting: areas for performance improvement

Why So Much Paper?

Do we really want our best scientists to spend large amounts of time writing voluminous applications for research grants when they could be creating new knowledge about maintaining health and preventing illness?



As Dr. Philip Seeman at the University of Toronto points out (see profile on Dr. Seeman in the section on research impacts) researchers must apply to many agencies to raise enough funding to pursue their work. "Because research is expensive, grant applications are being written almost constantly. Over a six month period, this lab typically produces a pile of applications that is two to three feet thick! ".

Some solutions?

First, more public money for research. Good researchers should be able to obtain with one grant application the funds required for their project instead of having to write up many each year to keep their research program moving forward.

Second, increase the duration of funding for researchers with a consistent track record of high-quality research..

Third, greater cooperation among research funding agencies. When agencies pool funding through partnership agreements, researchers need submit only one application.

As the vehicle for increased federal funding for research and with a clear mandate from Parliament to develop funding partnerships, the Canadian Institutes of Health Research will be in a good position to begin, in partnership with other organizations, increasing the size of grants to researchers and their duration.

7. Achieving National Perspectives

The Medical Research Council has played a lead role in coordinating and focussing Canada-wide consideration of issues that bear on the safety and desirability of research. While new research techniques and technologies may open up tremendous possibilities for advancing our understanding of health, they may also introduce new risks for researchers and the public. Thus when techniques for manipulating genes were acquired by Canadian researchers, the MRC coordinated the development of guidelines for safe practice. The Council has likewise served as a Canadian focal point for consideration of ethical issues raised by research.

The MRC published *Ethics in Experimentation* in 1978. This seminal report led to the establishment of local committees across Canada to judge the ethical acceptability of research work conducted within universities and hospitals. These committees, known as **Research Ethics Boards**, form a national network of Canadians who have thought deeply and critically about ethical issues. A good measure of their performance is the rarity with which stories of suspect Canadian research appear in the media. Proposals for unethical research are rejected by local research ethics boards.

In 1987, MRC published *Guidelines on Research Involving Human Subjects*. Recognizing the need for ongoing guidance and support for Research Ethics Boards, MRC organized a **National Council on Ethics in Human Research.** In 1999-2000 remained a major source of funding for the NCEHR which provides a Canadian forum for members of research ethics boards and others to express their questions and views and to understand the thinking of some of our best ethicists.

Tri-Council Policy Statement on
Ethical Conduct for Research Involving Humans

Guiding Ethical Principles

Respect for Human Dignity
Respect for Free and Informed Consent
Respect for Vulnerable Persons
Respect for Privacy and Confidentiality
Respect for Justice and Inclusiveness
Balancing Harms and Benefits
Minimizing Harm
Maximizing Benefit

In 1994 MRC instigated the development of a joint policy (with the federal councils for research in science and engineering and social science) published in 1998 as the **Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans** and has set about embedding its principles in the research community.

Balanced performance reporting

Two experts in bioethics were invited to comment for Parliament on the achievements of the Medical Research Council in the area of ethics:

+ MRC Achievements in Ethics

+ implementation of local Research Ethics Boards across the country
+ national leadership in production of a Tri-Council policy
+ national conferences and consensus documents on other issues of research safety and ethics
+ co-creation of the National Council for Ethics in Health Research
+ overall, Canada on par with other developed countries in terms of ensuring that health research is ethical

- Areas Still to be Addressed in Research Ethics

- coordination of Research Ethics Boards, especially on protocols for multi-centre trials of new treatments
- accreditation and monitoring of Research Ethics Boards
- public assurance of the quality of ethical review
- overload on some Research Ethics Boards
- need for specialized Research Ethics Boards
- creation of a single, non-partisan national clearing house on issues of ethics in research
- training researchers to clearly perceive ethical issues
- ongoing monitoring of approved research to ensure continuing ethical acceptability
- expansion of the Tri-Council statement to cover specific research issues such as stem cell research
- harmonization of relevant provincial and federal legislation
- ensuring non-federally funded research is ethical

Humane treatment of animals in research has been a priority for the MRC throughout its history. In 1968, the MRC helped form the **Canadian Council on Animal Care** (CCAC) and in 1999-2000 continued to support and monitor its activities. The CCAC examines and certifies the animal care facilities in universities and research centres across the country. It has developed a model curriculum for courses to train researchers on the proper care and treatment of animals.

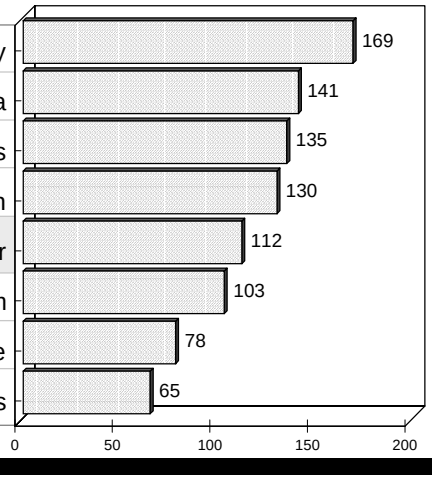
International perspectives

Health science is an international activity and rare is the Canadian health scientist who is not in some way closely connected with researchers in other countries. One of MRC's roles as a facilitator of national perspectives is to expand and fortify these natural collaborations through ongoing linkages with funding agencies in other countries and the development of special programs and projects. MRC has joint programs established with Argentina, Brazil, China, France, and Italy. It also has agreements with Singapore and with the Wellcome Trust in England. Further, MRC is an active partner in the International Human Frontier of Science program.

International Collaboration is Increasing

Publications resulting from collaborations between Canadian health researchers and researchers in other countries

in 1990	in 1996		percent increase
106	285	Germany	169
51	123	Australia	141
68	160	Netherlands	135
94	216	Japan	130
399	844	All Other	112
233	473	United Kingdom	103
238	424	France	78
1702	2809	United States	65



Source: L'Observatoire

In 1999, MRC joined with the Veteran's Administration in the USA and the British Medical Research Council to launch a program for support of clinical trials conducted in all three countries simultaneously, thus allowing more rapid recruitment of subjects and an earlier result. The first such tri-national trial, on a novel HIV therapy, is in the final stages of review.

Presentation of Financial Information

1999-2000 Financial Data for the Medical Research Council of Canada		
Planned Spending	$302, 519, 000	as in 1999-2000 Main Estimates
Total Authorities	*$310, 545,422*	*as in 1999-2000 Public Accounts*
Actual Spending	**$310, 504,413**	**as in 1999-2000 Public Accounts**

III CONSOLIDATING REPORTING

The MRC was not among the departments and agencies required to report on the following cross-governmental issues: modernizing comptrollership, procurement and contracting, special travel policies, matériel management or sustainable development strategies, storage tanks, regulatory initiatives.

The entire Grants and Scholarships appropriation for the Council was a **transfer payment** since all funding was delivered to research performers outside of government. Thus, apart from the appropriation for operating of the agency, the **entire MRC program** was a transfer payment program. The section of this report on performance accomplishments covers program results.

The Medical Research Council was required to submit an **annual report** to Parliament. A report for fiscal year 1999-2000 will be submitted separately.

IV FINANCIAL PERFORMANCE

Financial Performance Overview

Efficiency in research . . . Canadian scientists produce more publications per unit of R&D funding than do those in Australia, the United States, France, Italy, Germany or Japan.

The Medical Research Council of Canada has for more than 30 years consistently provided prudent, effective and efficient management of its appropriations from Parliament. Deployment of a wide variety of grants and scholarships mechanisms, each designed to contribute to the overall impact of the federal research investment, has ensured continuing achievement of program objectives. Expenditures on the administrative operations that support program delivery have been kept relatively low, thanks in part to the many hundreds of Canadian scientists who freely offer their time and expertise to assist the Council in its review of proposals.

Efficient use of funds by Canadian researchers is indicated by international comparisons of the number of scientific publications produced relative to funding available for research and development (R&D). An analysis reported in the journal *Science* in July 1998 reveals that Canadian scientists produce more publications per unit of R&D funding than do those in Australia, the United States, France, Italy, Germany or Japan.[2]

In 1999-2000, expenditures on administration of the MRC program ($13.2 million including contributions to employee benefit programs) account for only 4.3% of the total MRC appropriation. Further, MRC provides extensive administrative support for the many research programs that it funds in partnerships with others. Taking into consideration the $70.8 million provided by funding partners in 1999-2000, the $13.2 million expenditure on administration accounts for only 3.5 % of the total investment in health administered by MRC.

. . . and efficiency in research program delivery. When partnered funding is taken into consideration, the $13.2 million expenditure for operation of the agency accounts for only 3.5 % of the combined investment in research that it administers.

[2] May, RM. (1998). The Scientific Investments of Nations. *Science.* Volume 281, pages 49-51

Value for Money

The Return on Investment in Research

Research has an impact on productivity, usually through the new products or processes that result from new knowledge and/or through reductions in the cost of supplying an existing service such as health care.

Economists assess the value of this impact by calculating the returns delivered by the research investment. Those specializing in R&D assessment agree that private investment in R&D provides an average 20 to 30% annual rate of return and a much greater return to society overall. Social rates of return from research average about 50%.

Source: National Science Foundation, Science and Engineering Indicators, 1996. Chapter 8. Economic and Social Significance of Scientific and Engineering Research.

Financial Summary Tables

List of tables presented

	Title of Table	*Notes*
1.	**Summary of Voted Appropriations**	**√**
2.	**Comparison of Total Planned Spending to Actual Spending**	**√**
3.	**Historical Comparison of Total Planned Spending to Actual Spending**	**√**
4.	Crosswalk between Old Resource Allocation and New Allocation	n/a
5.	Resource Requirements by Organization and Business Line	n/a
6.	Respendable Revenues	n/a
7.	**Non-Respendable Revenues**	**√**
8.	Statutory Payments	n/a
9.	**Transfer Payments**	**√**
10.	Capital Spending	n/a
11.	Capital Projects	n/a
12.	Status of Major Crown Projects	n/a
13.	Loans, Investments and Advances	n/a
14.	Revolving Fund Financial Summaries	n/a
15.	Contingent Liabilities	n/a

n/a: not applicable to the MRC

Financial Table 1

Summary of Voted Appropriations

Vote		1999-2000 Spending		
		Millions of dollars		
		Planned Spending	**Total Authorities**	**Actual**
	Medical Research Council			
15	Operating expenditures	10.6	*13.2*	**13.2**
20	Grants and Scholarships	291	*296.3*	**296.3**
(S)	Contribution to employee benefit plans	0.9	*1*	**1**
	Totals	302.5	*310.5*	**310.5**

Note: Figures in the table may not appear to add correctly because of rounding.

Financial Table 2

Comparison of Planned and Actual Spending, 1999-2000

Medical Research Council of Canada

		Planned	*Total Authorities*	**Actual**
Full-time Equivalents	*number*	88	*105*	**103**
Millions of dollars				
Operating (includes contributions to employee benefit plans)		11.5	*14.2*	**14.2**
Capital		-	-	**-**
Voted Grants and Contributions		291	*296.3*	**296.3**
Subtotal (Gross Voted Expenditures)		302.5	*310.5*	**310.5**
Statutory Grants and Contributions		-	-	**-**
Total Gross Expenditures		302.5	*310.5*	**310.5**
Less: Respendable Revenues[4]		-	-	**-**
Total Net Expenditures		302.5	*310.5*	**310.5**
Less: Non-Respendable Revenues[5]		-0.5	*-0.5*	**-0.6**
Plus: Cost of Services Provided by other Departments		0.6	*0.6*	**0.7**
Net Cost of the Program		302.6	*310.6*	**310.6**

Note: Figures in the table may not appear to add correctly because of rounding.

4 These revenues were formerly called “Revenues Credited to the Vote”.

5 These revenues were formerly called “Revenues Credited to the (CRF)”.

Financial Table 3

Historical Comparison of Total Planned Spending to Actual Spending

Medical Research Council of Canada

millions of dollars

1997-98	**1998-99**	**1999-2000**		
Actual	**Actual**	Planned	*Authorized*	**Actual**
237.3	**271.4**	302.5	*310.5*	**310.5**

Tables 4, 5 and 6 do not apply to the MRC

Financial Table 7

Non-Respendable Revenues[6]

Medical Research Council of Canada

millions of dollars

1997-98	**1998-99**	**1999-2000**		
Actual	**Actual**	Planned Spending	*Total Authorities*	**Actual**
0.9	**0.7**	0.5	*0.5*	0.6

Table 8 does not apply to the MRC

6 These revenues were formerly called “Revenues Credited to the (CRF)”.

Financial Table 9

Transfer Payments

Medical Research Council of Canada

Grants and Scholarships

millions of dollars

1997-98	**1998-99**	**1999-2000**		
Actual	**Actual**	Planned Spending	*Total Authorities*	**Actual**
228.1	**259.2**	291	*296.3*	**296.3**

V AGENCY OVERVIEW

Mandate

- **To promote, assist and undertake basic, applied and clinical research in Canada in the health sciences.**
- To advise the Minister of Health in respect of matters relating to such research [...]
- To expend any money appropriated by Parliament for the work of the Council or received by the Council through the conduct of its operations; and, to publish and sell or otherwise distribute such scholarly, scientific and technical information relating to the work of the Council as the Council considers necessary.

Mission

To build and sustain, in partnership with others, a national capacity to create and use new knowledge for maintaining and improving health and preventing, curing and treating illness, for the social and economic benefit of Canadians and the well-being of people everywhere.

Vision

An internationally-competitive Canadian health research community generating new knowledge that contributes to improvements in quality of life and supports the growth and expansion of Canadian industry in the health area.

MRCCRM

Agency Organization

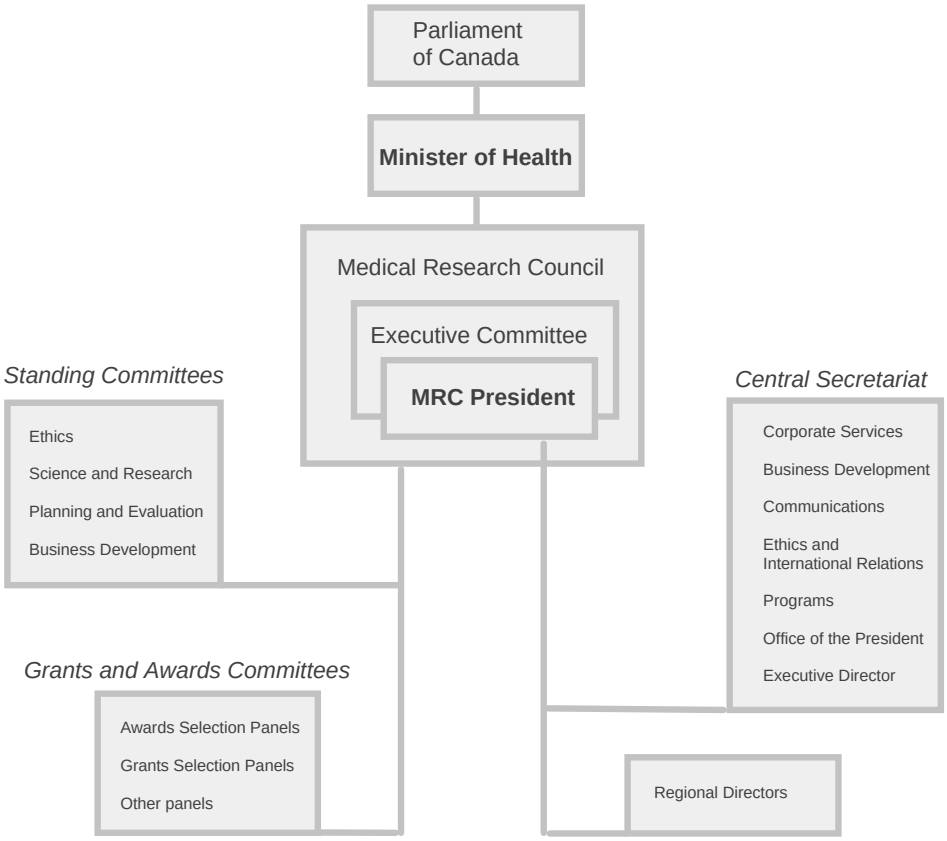
The Medical Research Council was governed by a board of eminent Canadians appointed by Order in Council and serving without remuneration. The Council provided government with advice on how it could best promote, assist and support research for the benefit of Canadians and the improvement of quality of life for all. Members brought to the Council table their wisdom and expertise in matters of science, health, administration, business and ethics. As an arms-length agency of government, the Council reported to Parliament through the Minister of Health.

Delivery of the Council's program was supported by a Secretariat of approximately 100 persons based in the National Capital Region. A network of volunteer Regional Directors in health science centres across the country provided the Council with a channel for communication with stakeholders from sea to sea.

The Council received advice on policy, priorities, strategies and development from Standing Committees comprised of experts drawn from the health research community and other groups of Canadians with special expertise and a strong commitment to health research.

Advice on the quality of research proposals submitted to the MRC, or advice on the merits of proposals for the training and development of research personnel, was provided by panels of specialists. These 50 grants and awards selection committees involved over 550 Canadians who offered their expertise freely to help MRC ensure that public resources for health research are invested in the most promising projects and training programs.

The Council had only one business line. The reporting relationship was as follows: Branch Directors -> Executive Director -> President -> Minister of Health.


Parliament of Canada
Minister of Health
Medical Research Council
Executive Committee
MRC President
Standing Committees
Ethics
Science and Research
Planning and Evaluation
Business Development
Grants and Awards Committees
Awards Selection Panels
Grants Selection Panels
Other panels
Central Secretariat
Corporate Services
Business Development
Communications
Ethics and International Relations
Programs
Office of the President
Executive Director
Regional Directors

VI OTHER INFORMATION

Contacts for Further Information

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Legislation

The Council was created by an Act of Parliament through the *Medical Research Council Act (R.S., C. M-9).*

Following proclamation in June 2000 of the *Act to establish the Canadian Institutes of Health Research, to repeal the Medical Research Council Act and to make consequential amendments to other Acts*, the MRC became part of a new federal government organization, the Canadian Institutes of Health Research.

Agency Reports

The Council was required to submit to Parliament an Annual Report of the President.

A full list of MRC publications is available from the CIHR Communications Branch.

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Grants and Awards by Type, 1999-2000

Category of Support	Type of Grant or Award	Amount $ thousands
GRANTS	Operating	164,842
	Clinical Trials	7,113
	Maintenance and Equipment	6,526
	Health Services Research Fund	2,000
	Regional Partnerships	1,183
	Breast Cancer Research Initiative	2,000
	Special Projects	1,649
	MRC Genome	3,537
	University-Industry Grants	4,404
	General Research Grants	-
	Opportunities Fund	2,373
	subtotal	*195,627*
MULTI-DISCIPLINARY	MRC Groups	27,649
	Program Grants	590
	Development Grants	-
	subtotal	*28,239*
SALARY SUPPORT	MRC Groups	714
	Development Grants	886
	Distinguished Scientists/Career Investigators	1,517
	MRC Scientists and Senior Scientists	7,206
	Scholarships	9,772
	Clinician Scientists Phase 2	1,047
	Regional Partnerships	281
	U-I Salary Support Programs	1,293
	subtotal	*22,716*
RESEARCH TRAINING	Clinician Scientists Phase 1	1,019
	Fellowships including Centennial and Dental	12,156
	Studentships	11,097
	Undergraduate Scholarships	508
	Regional Partnerships	14
	Partnerships Challenge Fund	
	U-I Training Awards	1,043
	subtotal	*25,837*
TRAVEL AND EXCHANGE	Visiting Scientists and Professorships	140
	Symposia & Workshops, Travel Grants	155
	subtotal	*295*
OTHER ACTIVITIES	President's Fund	504
	Grants to Other Organizations	1,992
	subtotal	*2,496*
	TOTAL, CORE PROGRAMS	275,210
	Networks of Centres of Excellence	*21,075*
	TOTAL ALL PROGRAMS	296,285

Some additions may not agree due to rounding