Canadian Institutes of Health Research | Instituts de recherche en santé du Canada

CIHR IRSC

Research Spotlight

Institute of Health Services and Policy Research

Health Human Resources

Dr Gail Tomblin Murphy

CIHR Science Lead in Health Human Resources

At the beginning of 2004, I was appointed CIHR's Science Lead in Health Human Resources, a role developed in recognition of the need to foster greater interaction among researchers, policy makers and funders who share an interest in health human resources (HHR) planning.

My primary role is one of ambassadorship in representing CIHR and the health services and policy research community to HHR policy makers across Canada. My efforts to create opportunities for researchers to contribute to HHR policy and planning include working with them to find new sources of funding; working with decision makers to turn their pressing policy issues into workable research questions; and stimulating capacity building activities that will help create a cadre of highly skilled and eager HHR researchers.

Canada is currently experiencing shortages of many types of health care providers in many locations, or so the media stories would have us believe. Stories of physicians fleeing under-resourced communities, of people even in urban settings unable to find a primary care physician, and of operating rooms closed despite long wait lists because of shortages of skilled personnel, regularly make the news. Less immediately visible is the dearth of health professionals serving Aboriginal communities. On top of this, there are increasing numbers of warnings about what lies ahead—our aging and demoralized nursing workforce, an aging physician workforce, and so on. The stories reported by the media are usually relatively factual, as far as they go. But like all anecdotes, they provide a very limited perspective. What is seldom clear is how generalizable they are, or what forces and factors underlie the headlines.

HHR planning, such as it is, has a long and checkered history in Canada. People are the lynchpin of any health care system, yet HHR planning has traditionally been performed independently of other aspects of system planning, and more often than not in silos—planning for physician supply fails to take account of the potential of nurse practitioners, or the need for academic physicians; planning for nurses assumes particular rigid training models, and so on. It has tended to be supply-driven, with a focus on current utilization. Perceptions of adequacy of supply can swing rapidly from apparent surpluses, to dire shortages, in periods of less than a decade, without there being much understanding of how or why. The dramatic shift in perceptions of adequacy of physician supply in this country is but the most recent example of this. In the early- to mid-1990s, virtually every 'expert' one might have asked would have told us that there was a surplus of physicians. Today, one cannot find an 'expert' who would tell us anything other than that there is a shortage of physicians, and that it is going to get worse before it gets better. But the underlying numbers have changed almost not at all.

The common theme here is that we rarely have good research evidence to support health human resources planning. And this is not a phenomenon unique to Canada. Globally, it is increasingly recognized that planning and management of health human resources requires a stronger evidence base and a far more prominent focus on meeting population health needs, rather than relying on current or past utilization trends.

In Canada, there is a renewed commitment to a coordinated, national approach to HHR planning. The 2003 First Ministers' Accord on Health Care Renewal—with its explicit goal of providing timely access to quality health

Continued on page 2

In this Issue:

Continued from page 1

services for all Canadians—recognized that planning for the right number and mix of providers, when and where they are needed, is crucial. In the Accord, the federal government, provinces, and territories made a commitment to work together to improve HHR planning and management.

As part of this commitment, the Advisory Committee on Health Delivery and Human Resources (ACHDHR), which advises federal, provincial and territorial governments on evidence-based health systems and HHR policy and planning—and on which I have been proud to represent CIHR—is developing a proposed pan-Canadian framework to help shape the future of HHR planning and health service delivery.

This framework[1] if adopted, would represent an important step forward in the history of HHR planning in Canada. It explicitly departs from the traditional approach with a focus that places the priority on meeting population health needs. It provides an opportunity to identify the services needed, innovative ways to deliver those services, the types of professionals required, and how to deploy them so that the system makes the best use of their skills—rather than continuing to plan based on how and by whom services are delivered now. It also sets out specific actions that jurisdictions can take together to achieve a more stable, effective health care workforce.

The framework is, however, but a skeleton. Its flesh and blood will be innovative HHR research, on the basis of which policy development consistent with the framework goals can evolve. Despite the fact that a key challenge for the framework will be finding the research capacity to meet its information needs, there is already much excellent research being carried out in this country by CIHR-funded HHR researchers. This spotlight provides summaries of some of that CIHR-funded research, recent and current. It also features an interview with Dr. Stephen Birch, a McMaster University-based health economist with a long history in needs-based planning who has been involved in the development of the proposed pan-Canadian framework, and who kindly agreed to provide his perspective on new challenges and opportunities.

Gail Tomblin Murphy
June 2005

[1] The proposed pan-Canadian framework is based on the HHR conceptual framework developed by Linda O'Brien-Pallas, Gail Tomblin Murphy, Stephen Birch, and Andrea Baumann (2001). Framework for analyzing health human resources (p.6). Canadian Institute for Health Information. *Future Development of Information to Support the Management of Nursing Resources.* Ottawa: CIHI, 2001.

Labour Force Participation, Labour Supply, and Unpaid Caregiving in Canada

Principal investigator: Meredith B. Lilly (PhD Cand.) (University of Toronto)
Co-investigators: Dr Audrey Laporte and Dr Peter C. Coyte (University of Toronto); Dr Pat Armstrong (York University)

As medical care increasingly moves from the hospital to the home, responsibility for care is also shifting, from the state and paid care, to the family and unpaid care. This study focuses on the relationship between unpaid caregiving and labour supply in Canada. Using Statistics Canada's 1996 and 2002 General Social Surveys, the economic, social, geographic, and health factors that influence individual caregivers' labour supply decisions are being examined. The results of this project may be used to inform such policy issues as financial supports for unpaid caregivers; financial losses incurred by caregiving families; and the influence of health care restructuring on labour compensation.

Meredith B. Lilly is supported by a CIHR IA/IHSPR/IGH Doctoral Research Award.

Equity and health human resources: Canada and the "brain drain" from sub-Saharan Africa

Principal investigator: Dr Ronald Labonte (University of Ottawa)
Co-investigators: Dr Thomas McIntosh (University of Regina); Dr Arminée Kazanjian, (University of British Columbia); Dr Jonathan Crush (Queen's University); Dr David Zakus (University of Toronto)

The exodus of health professionals—many migrating to high-income countries like Canada—undermines already fragile health systems in sub-Saharan Africa. This study is examining the causes, consequences and policy options of health professional immigration from a Canadian perspective, with the goal of ensuring that health inequalities between nations do not worsen as a consequence. Research involves assessing the data needed to estimate the benefits and costs of migration; interviews with foreign-trained health professionals practicing in Canada; interviews with policy and professional stakeholders; and policy colloquia (scheduled for Fall 2005) to debate how migration can be managed in a way that balances individual and collective rights, international obligations, and the ethical imperative of improving global health equity.

This project is funded under a CIHR Global Health Research Pilot Project Grant.

Interview with Dr Stephen Birch

Dr Stephen Birch is a Professor in the Department of Clinical Epidemiology and Biostatistics, and a member of the Centre for Health Economics and Policy Analysis and the Institute for Environment and Health, both at McMaster University.

His extensive background in the evaluation of models for the funding and delivery of health care includes the development of needs-based approaches to health care resource allocation, the evaluation of alternative delivery modalities for primary care in Ontario and the analysis of alternate payments for the provision of primary dental care. He has authored and provided expertise to a number of influential reports on health human resources planning in Canada and served as a consultant to the WHO and the World Bank on health human resource policies.

Q. You first started publishing on needs-based planning in the mid 1980s. What was the reaction at the time?

I first started working in this area in the UK. When I came to Canada in 1988, I was intrigued that all the talk of how Canada had the best health care system in the world was based on comparisons with the US. Researchers were saying that we'd achieved equity, based on the apparent removal of the social gradient (where the rich receive more care than the poor) in primary medical care. But this isn't very good if your needs don't follow a flat line across the different social groups. If your poor have greater needs, you'd want them to be making greater use of services, and what we were observing was that they weren't.

So we hadn't really solved the problem of inequity—all we'd actually done was get rid of payment at the point of delivery. But that's not the only thing that determines whether you get health care or not when you need it. Availability and the structure of service delivery are also very important.

That's what really got us into saying that how we allocate our resources ought to be in line with the relative needs of the population. This happened to coincide with an attempt at primary care reform in Ontario, where we recommended a needs-based approach to funding different communities under a pilot program for the Comprehensive Health Organizations. Ontario cancelled that program before it started, but the Ministry of Health in Saskatchewan picked up on our work and then involved me in developing a needs-based funding formula, which was implemented and is still in use today.

Q. Can you tell me about the analytical framework you and your colleagues are developing?

In the past, much of health human resources planning has been based on how many providers per capita we have at the moment, estimating population growth, and applying the population:provider ratio to the future projected (sometimes age-adjusted) population, to determine how many providers we need in the future. That assumes that everything but the size and age distribution of the population is fixed in time, and of course it isn't.

What we've tried to do is to build in a needs component, which is independent of the current use of services. Where previous models had two components, one being the size of the population and the other being the population:provider ratio, we've expanded that population:provider ratio into three elements. Those elements are the productivity of providers, which is the number of services per provider; the needs of the population; and the level of services per unit of need, which is how we are going to meet those needs.

This means we can partition out what's happening with the supply of providers: to what extent is the increase in the number of doctors or nurses reflective of an increase in the size of the population, an increase in the needs of the population, or an increase in the level of services that is going into the same level of needs. And to what extent is that warranted.

Q. How effective are our current tools for carrying out needs-based planning? Where do you see deficiencies?

I think we have to be careful that we don't spend all our time at the very micro levels. What we're trying to say is whatever we choose to spend on health care—and that's a political decision—then we want to make sure we allocate those resources in line with relative needs. Assuming they're used efficiently, they'll have the greatest impact on population health. I think that's where we have to focus our attention.

We've got pretty decent measures at the moment. They might not be perfect, but you always face the trade-off between having reasonable measures that might not be quite perfect, but are based on data that are collected regularly, and are independent of service provision, and doing nothing while we continue to try to develop better measures. There's this temptation to say we need better measures, but how are we going to get those better measures, and at what cost? And to what extent will they remain independent of service provision?

Q. What do you consider to be the biggest barriers to implementing a needs-based approach to HHR planning in Canada?

I think most of our planning for health professionals is carried out in silos. So we plan for doctors, or we plan for nurses, instead of planning for services. And that planning tends to be done independently of other aspects of health care.

An example I've often used is from Ontario,

Continued on page 4

Continued from page 3

where we had a report nine or ten years ago that said we had too many hospital beds. There was a 20% reduction in beds virtually overnight, but none of the implications of that were considered for health human resources. There was a wholesale reduction in hospital beds, the level of severity of hospital patients went up, the length of stay went down, and yet there wasn't a substantive increase in the resources per patient day given to hospitals to deal with those increased severity cases. That led to nurses being given a dramatically increased workload, and not being supported by other resources to help them, resulting in nurse burnout.

Health human resources planning needs to be a continuous and iterative process. Instead, what happens is every time we think we face a crisis, we set up a committee to look at HHR. It's not a standing committee; it's not something that's done continually and iteratively. Yet to plan for future providers we have to guess at what the future is going to look like. Some of the time we're good at that and some of the time we're bad at that. But by having a continuous process, we can put in new information, and we can continually adapt our plans.

The question we have been asking is how many doctors we need in the future. But what we need to ask is how many doctors do we need in the future to do what, to whom, and how (e.g. with what complementary resources)? We've never really asked that question.

Q. Provincial, territorial and federal governments have recognized the benefit of needs-based planning since the 1980s. Why are we only now considering a pan-Canadian framework with that focus?

One reason is that needs-based approaches aren't necessarily in the best interest of provider groups, particularly in the way that governments might look to implement them. When governments decide to do physician payment reform, it tends to be at a time when they're looking to reduce costs. So it is not unreasonable for providers to be sceptical.

How much we should be paying a physician is separate from how we should be paying. But if providers think a different payment system is being brought in to reduce the level of their payments, then they are going to react. That's partly what has held back these reforms so far in many jurisdictions: the reforms tend to come at a time when ministries or governments are looking to constrain the increase in, or actually reduce the levels of health care expenditures.

Q. Do you think we are getting closer to implementing needs-based approaches in this country? Or is it still mostly rhetoric? Are there true partnerships in research projects among health services researchers and policy makers to attempt to get at needs?

I think there's an increasing interest in needs-based approaches, but the interest is split. Some of that interest is because of the principle—this is the way we should be going—but for others, the interest is in saving money. If we do it as a way of saving money, it won't work, because there'll be a reaction to it.

Part of the challenge is that decision makers would ideally like a quick and easy solution. Obviously we all would. And a lot of these things do not have quick and easy solutions. The data we struggle with to do needs-based approaches are poor—to do it better would require a large investment in new types of data collection. But that's a tough sell to politicians who are looking for quick solutions—it's not always the easiest way to go.

I think the key challenges are information and time, because I've not heard anybody actually say the needs-based approach is wrong. But I have heard lots of people say the needs-based approach is nice, but it's not feasible, or it could give rise to so many problems that it's not worth the effort. Well, if we want a policy that gives rise to a lot of problems, we only need think of a service-based approach to planning. That has provided us with no end of problems for decades! Do we want to continue to muddle along with something simple and wrong? Or do we want to try to develop a system that makes more sense, but will take a bit more thought, a bit more time, and a bit more investment?

Long-term Care Workers & Workplaces: Comparing Canada with Nordic Europe

Principal investigator: Dr Pat Armstrong (York University), CHSRF/CIHR Chair in Health Services and Nursing Research
Co-investigators: Dr Hugh Armstrong (Carleton University); Dr Tamara Daly (York University); Dr Michael Ornstein (York University); Dr Aleck Ostry (University of British Columbia)

This comparative survey of unionized long-term care workers brings together researchers and partner collaborators from Canada and Nordic Europe (Sweden, Denmark, Finland and Norway). The Canadian team aims to work in conjunction with the European team to distribute the survey to long-term care workers in Ontario, British Columbia, and New Brunswick. The survey instrument covers the organization of care, working conditions, the content of the working day, and workers' experiences of their paid and unpaid work, and includes a particular focus on gender.

This project is funded under CIHR's International Opportunity Program as a one-time Collaborative Research Project Grant.

Strengthening the Medical Workforce in Rural Canada: The Role of Rural/Northern Medical Education

Principal investigator: Dr Raymond W. Pong (Laurentian University)
Co-Investigators: Dr Stephen Bornstein, Dr Vernon Curran and Dr Michael Jong (Memorial University of Newfoundland); John Hogenbirk, Dr Geoffrey Tesson and Roger Strasser (Laurentian University)

Shortages of physicians in rural, northern and remote communities are a pervasive, persistent and perplexing problem in Canada. Governments have tried various ways to encourage physicians to work in underserved areas, with varying degrees of success. Increasingly, medical education is seen as a solution.

This study, a collaborative effort between researchers at the Centre for Rural and Northern Health Research at Laurentian University and those at the Memorial University of Newfoundland, examined the role of medical education in addressing this issue. The assumption was that the rural/northern medical workforce was the cumulative outcome of decisions made by pre-medical school students, medical trainees and practising physicians at various "choice-points" in their educational and professional careers.

The first component of the study was a comprehensive review and synthesis of the literature to find out what is known and identify knowledge gaps. The second component was an analysis of the 2001 National Family Physician Survey. This analysis showed that rural and urban physicians differed in significant ways. For instance, rural physicians tended to have a much wider scope of practice and work in more practice settings. These findings could help shape medical education curricula and the way physicians are prepared for rural practice.

The third and fourth components investigated how rural/northern medical education programs were designed. Medical schools in Canada were surveyed to find out what they were doing in the area of rural/northern medical education. In addition, top administrators in several rural medical education programs in Australia, Canada and the United States were interviewed. The findings suggest the need to adopt multiple strategies targeting different stages of the medical education process. These include encouraging rural youth to pursue a medical career; reshaping admission processes to give special consideration to applicants with rural backgrounds; devolving substantial aspects of medical training to rural medical practice settings; emphasizing primary care; and providing support to a growing network of rural doctors serving as preceptors to medical students and residents.

This project was funded under CIHR's Building Healthy Communities through Rural and Northern Health Research program.

Following the role of professional equity in the work of physicians

Principal investigators: Dr Allen M. Backman, Dr Roy Dobson, Dr David Keegan and Dr Rein Lepnurm (University of Saskatchewan).

Health care professionals are working harder and spending more time negotiating for resources in order to do their jobs well. At the same time, expectations for quality performance of duties, complete with documentation and accountability requirements, are at an all-time high. For some professionals, working harder has resulted in a greater sense of accomplishment, recognition by peers and increased financial benefits. For others, working harder has not led to the expected rewards. We hypothesize that those physicians who achieve an equitable balance between duties performed and rewards received, through the ability to allocate their time and manage the structures of their practices, will achieve high levels of career satisfaction.

This project is funded under a CIHR Operating Grant.

Understanding the Costs of Outcomes of Nurses' Turnover in Canadian Hospitals

Principal investigators: Dr Linda O'Brien Pallas (University of Toronto), CHSRF/CIHR National Chair in Nursing/Health Human Resources; Dr Gail Tomblin Murphy (Dalhousie University); Dr Judith Shamian (Victorian Order of Nurses, Canada).

Governments face significant challenges in ensuring that sufficient nursing services are provided to meet the needs of the population and the goals of the health care system. Understanding the factors related to turnover is crucial in designing mechanisms and policies to effectively recruit and retain nurses.

The purpose of this project is to determine how the rate and intensity of nursing turnover (lost human capital as experienced nurses leave, and lost productivity as new hires are trained) affect patient satisfaction and safety; nurse satisfaction, health and safety; and system outcomes (turnover costs) in hospital settings.

This project will form the Canadian arm of an international nursing turnover study being carried out in six countries: Australia, Canada, New Zealand, Scotland, United Kingdom, and United States. Significant financial support and commitment has been provided from health care organizations across ten provinces, third party co-sponsors, provincial governments and provincial funding agencies.

Nurse, patient, unit and hospital level data will be collected in two waves. Each wave is three months in duration and twelve months apart. Data will be analyzed using: a) a multi-level longitudinal design to measure the effects of turnover and other inputs/throughputs on patient, nurse and system outcomes; and b) simulation modeling to investigate outcomes on units and systems and to explore potential interventions. Across Canada, 185 units in 43 hospitals from ten provinces are currently collecting data for Wave I. Wave II data collection will begin in March 2006. A final report will be available in March 2007.

The project will provide an important tool in measuring the costs of nursing turnover in Canada, and will also contribute to the HHR modeling activities at the Nursing Health Services Research Unit, University of Toronto and partner universities. Through its strong links with decision-making partners, this project's findings are expected to be rapidly incorporated into policy at all levels.

This project was originally funded under the Canadian Health Services Research Foundation Open Grants Competition, and has since been transferred to CIHR.

Physician Labour Supply in Canada: A Cohort Comparison

Principal Investigator: Dr Jeremiah Hurley (McMaster University)
Co-investigators: Dr Sung-Hee Jeon, Dr Thomas Crossley, Dr Brian Hutchison (McMaster University); Owen Adams and Shelley Martin (Canadian Medical Association)

Using national physician survey data from the Canadian Medical Association, this project seeks to understand the relative importance of different factors underlying changes in the hours Canadian family physicians spend in direct patient care. We have found that male physicians who graduated in the 1980s and 1990s work fewer hours in direct patient care than those who graduated in the 1950s and 1960s. However, these cohort differences are not observed among female physicians. On average, all full-time physicians across all provinces, regardless of age or time since graduation, have decreased hours of direct patient care during the 1980s and 1990s.

This project is funded under a CIHR Operating Grant.

Mental Illness Trajectories Among a Cohort of Health Care Workers

Principal investigator: Dr Mieke Koehoorn (University of British Columbia)
Co-investigators: Mr. Fan Xu, Dr Clyde Hertzman and Dr Aleck Ostry (University of British Columbia); Dr. Donald Cole and Dr. Selahadin Ibrahim (Institute for Work & Health)

Restructuring of delivery systems, a critical shortage of nurses, and problems with recruitment and retention have led to unprecedented challenges and pressures for health care workers in the Canadian health care system. Research has demonstrated associations between the demands of the work environment and the health status of health care workers, including the risk of injury, self-rated health, absenteeism and mental illness.

The WHO has identified mental illness as one of the largest contributors to disability worldwide. But early detection and intervention are shown to reduce the severity, burden and complexity of mental illness. The purpose of this study was to investigate mental illness among a cohort of health care workers and to investigate the relationships between these illness patterns and work characteristics.

This was a retrospective cohort study where existing employee records, provincial health care billing records, hospitalization records and extended health benefits records were linked to investigate mental illness among health care workers. Longitudinal analyses were conducted to identify five mental illness trajectories: no mental illness during follow-up (78% of the study population), chronic mental illness (4%), increasing mental illness (5%), decreasing mental illness (8%) and an "episode" of mental illness (5%). The study population included unionized nursing and support workers employed in the acute sector of the BC health care industry for a minimum of three years between 1992 and 2000.

Chronic mental illness was associated with being a support services worker and the particular health authority for which the employee worked, as well as being female and increasing age. Being in the rising mental illness trajectory was also associated with being a support services worker, particular health authority, and being female. Age was no longer associated, but living in the poorest socioeconomic neighbourhood was.

Working with stakeholders in the health care industry, findings from this research will help direct the provision of mental health resources to health care workers at risk of mental illness. Further work will investigate specific workplace characteristics such as workload and changing financial climate on mental illness outcomes among workers.

This project was funded under a CIHR Operating Grant.

Developing an Understanding of Costing Strategies Employed in Nursing

Principal investigator: Dr Linda McGillis Hall (University of Toronto)
Co-investigators: Dr George H. Pink (University of North Carolina); Dr Ian McKillop (University of Waterloo); Dr Linda O'Brien-Pallas (University of Toronto); Donna Thomson (St. Peter's Hospital, Hamilton)

Throughout the late 1990's, health care system changes aimed at decreasing hospital costs led to a number of initiatives that involved restructuring nursing work environments. These included mergers, reengineering, job change, the development of strategic alliances between hospitals and downsizing. One of the purposes of this study was to identify the strategies used in Ontario hospitals to restabilize the nursing workforce following this period of restructuring.

Health care nursing executives in 140 adult acute care hospitals in Ontario were surveyed in 2002 to: a) identify the strategies that were determining nursing costs following restructuring; and b) identify processes that were being employed to strengthen nursing after the restructuring had been completed.

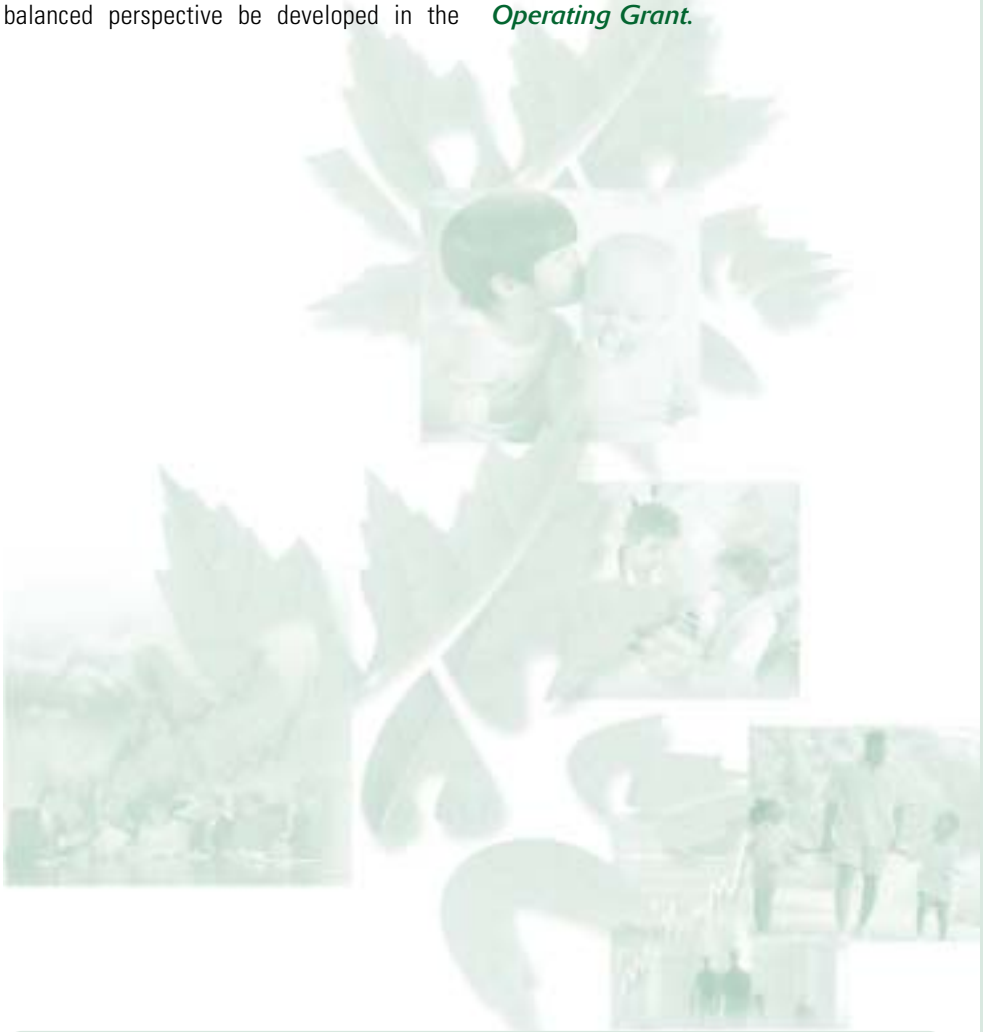
The most common restructuring strategies had been to change the nursing staff mix through layoffs, offering voluntary retirement packages to senior nurses, cross training registered and floating staff nurses to other clinical areas, decreasing the number of full-time nurses, increasing the utilization of part-time, casual, temporary and agency nursing staff and increasing the use of unregulated workers.

Continued on page 8

Continued from page 7

Focused initiatives to rebuild nurse staffing levels following restructuring included attempts to increase the employment of full-time nurses, as well as enhancing the support roles in place for nurses in the health care system. As nurse executives are faced with the challenge of accountability, mechanisms for monitoring nursing costs have been instituted that examine absenteeism, staffing levels, workers' safety claims, overtime, turnover and vacancies. While all of these are important areas to assess, it is imperative that a more balanced perspective be developed in the future. The challenge for nurse executives and managers will be to balance the monitoring of nursing expenditures which focuses solely on negative cost outcomes (e.g. overtime utilization, absenteeism rates, safety claims) with more positive cost outcomes (e.g. ongoing education, reimbursement for courses taken toward degree education, bursaries and scholarships), costs that contribute to improved patient outcomes and nurse retention.

This project was funded under a CIHR Operating Grant.



IHSPR MANDATE

The CIHR Institute of Health Services and Policy Research is dedicated to supporting outstanding research, capacity-building and knowledge translation initiatives designed to improve the way health care services are organized, regulated, managed, & financed, paid for & used and delivered, in the interest of improving the health and quality of life of all Canadians.

Contacts

Morris Barer,
Scientific Director
Tel: (604) 222- 6872
Fax: (604) 224-8635
mbarer@ihspr.ubc.ca

Diane Watson,
Associate Director
Tel: (604) 222-6871
Fax: (604) 224-8635
dwatson@ihspr.ubc.ca

Craig Larsen,
Institute Manager
Tel: (604) 222-6874
Fax: (604) 224-8635
clarsen@ihspr.ubc.ca

Heidi Matkovich,
Associate – Communications and Knowledge Translation
Tel: (604) 222-6870
Fax: (604) 224-8635
hmatkovich@ihspr.ubc.ca

Lindsay Hedden,
Special Projects Officer
Tel: (604) 222-6873
Fax: (604) 224-8635
lhedden@ihspr.ubc.ca

Shareen Khan,
Finance and Administration Officer
Tel: (604) 222-6875
Fax: (604) 224-8635

CIHR – Ottawa
Michelle Gagnon,
Assistant Director
Partnerships and Knowledge Translation
Tel: (613) 952-4538
Fax: (613) 941-1040
mgagnon@cihr-irsc.gc.ca

Michèle O'Rourke,
Associate Strategic Initiatives
Tel: (613) 952-4539
Fax: (613) 941-1040
morourke@cihr-irsc.gc.ca

Kim Gaudreau,
Project Officer
Tel: (613) 957-6128
Fax: (613) 941-1040
kgaudreau@cihr-irsc.gc.ca