Human Resources Development Canada | Développement des ressources humaine

A Situational Analysis of Human Resource Issues in the Pharmacy Profession in Canada

Detailed Report

July 2001

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For Human Resources Development Canada

CANADIAN PHARMACISTS ASSOCIATION | ASSOCIATION DES PHARMACIENS DU CANADA

Based on a Proposal by the Canadian Pharmacists Association

Canada

Table of Contents

Executive Summary i
1 Introduction 1
1.1 Methodology 2
1.1.1 Literature 2
1.1.2 Internet Sites 2
1.1.3 Interviews 3
1.1.4 Public Databases 3
2 Pharmacy Practice Environment 5
2.1 Employers of Pharmacists 5
2.2 Regulatory Environment 6
2.3 Trends in Pharmacy 7
3 Employee Profile of Pharmacists and Pharmacy Technicians 9
3.1 Occupational Definitions 9
3.1.1 Pharmacists 9
3.1.2 Pharmacy Technicians 9
3.2 Wages and Salaries 10
3.3 Pharmacists and Gender 11
3.4 Age Structure of Pharmacists 11
3.5 Union Membership 12
3.6 Working Conditions 13
3.7 Career Mobility 14
4 Human Resource Issues 16
4.1 The Shortage of Pharmacists 16
4.1.1 Indicators of Labour Shortage 18
4.1.2 Geographic Distribution of Vacancies 25
4.1.3 Trends in Pharmacists per Capita 27
4.1.4 Implications of the Shortage 28
4.2 The Demand for Pharmacists 30
4.2.1 Increased Demand for Pharmacy Services 31
4.2.2 Demographics of the Canadian Population 31
4.2.3 Complexity of Tasks 31
4.2.4 Time Use of Pharmacists 32
4.2.5 Non-Pharmacy Demand for Pharmacists 32
4.3 The Supply of Pharmacists 33
4.3.1 University Enrolments and Program Changes 34
4.3.2 Immigration 34
4.3.3 Emigration 36
4.3.4 Aging of the Workforce and Retirements 37
4.4 The Evolving Role of Pharmacists and Technicians 37
4.4.1 Changes in the Role of Pharmacists 37
4.4.2 Fees for Cognitive Services 40
4.4.3 Resistance to Change 42
4.4.4 Specialized Pharmacy Practices 44
4.4.5 The Role of Pharmacy Technicians 44
4.5 Education and Ongoing Training in Pharmacy 44
4.5.1 Availability of Faculty and other Educational Support Providers 47
4.5.2 Internships and Practicum 47

4.5.3 The PharmD Debate 47
4.5.4 Specialty Certifications 48
4.5.5 Continuing Education 49
4.5.6 Training for Pharmacy Technicians 50
4.5.7 Certification of Pharmacy Technicians 51
4.5.8 Remedies for Alleviating the Shortage of Pharmacists 52
5 Technology 53
5.1 Information Technologies 53
5.1.1 Patient Information Systems 54
5.1.2 On-line Pharmacy 55
5.1.3 Information Technology and Continuing Education 56
5.2 Other Technologies 56
5.2.1 Automated Dispensing and Central Filling 57
5.2.2 New Drugs and Issues of Ethics and Conscience 58
6 Sector Initiatives 59
7 Gaps in Information 60
7.1 Prospects for a More Detailed Employment Profile 60
7.2 Prospects for Developing an Employment Outlook 60
7.3 The Impact of Technologies on Skill Demand 60
7.4 Summary of Information Gaps 61
7.5 Conclusions 64
Bibliography 65
Appendix A: Key Study Contributors 71
Appendix B: Interviewees 72
Appendix C: Interview Guide 73
Appendix D: Provincial and Territorial Regulatory Authorities 74
Appendix E: Pharmacy Associations 76
Appendix F: Labour Market Data on Pharmacists 78
Appendix G: Published Profiles of Pharmacists and Technicians 88

Executive Summary

Viewed across a variety of characteristics, the pharmacist occupation is clearly in transition, though where this evolution is leading is not precisely clear. Increased numbers of drug therapies, an aging but more knowledgeable and demanding population, and deficiencies in other areas of the health care system seem to be driving increased demand for the clinical counseling skills of the pharmacist. At the same time much of the "count, pour, lick, and stick" functions traditionally associated with pharmacists are increasingly undertaken by a group of formally or informally trained pharmacy technicians with enhanced responsibilities.

In the wider world of retailing, sale of prescription drugs is no longer the exclusive province of the traditional community drugstore. Over the last decade, we have witnessed a significant increase in the number of pharmacies included in department and grocery store formats. In the hospital sector, pharmacists are becoming recognized members of the health care team, while trained pharmacy technicians largely handle dispensary functions. Moreover, the demand for pharmacists in hospitals appears to have grown despite cutbacks in other health care personnel over the 1990s.

This analysis, initiated by the Canadian Pharmacists Association, commissioned by Human Resources Development Canada and conducted with guidance and direction from the Canadian Pharmacists Association and the Canadian Society of Hospital Pharmacists, is primarily based on a review of the relevant literature on human resource issues among pharmacists, focusing on materials published in the last five years in paper or in electronic form on the Internet. Project research included a review of data on pharmacists from national and provincial associations, Statistics Canada, and the Canadian Institute for Health Information. In addition, twenty-three members of the pharmacy community were interviewed to provide views on a variety of topics affecting the labour market for pharmacists.

This literature review and information-gathering exercise shows that there is at least as much that is unknown about the future of pharmacy practice as is known, and that an attempt to forecast or model the demand for pharmacists requires more clarity on their emerging role in the health care system and the future of competition in pharmacy retailing.

Human Resource Issues in Pharmacy

Canada's 24,518 licensed pharmacists are distributed across three major employment groups: nearly four out of every five (80%)pharmacists work in community pharmacies, another 15 percent in hospital or institutional pharmacies, and the remainder work in situations that may not legally require licensed pharmacists such as associations, pharmaceutical companies, and consulting firms. Pharmacists are, by law, the professionals whose scope of practice includes the dispensing of prescription medications. Pharmacists obtain their license to practice through provincial licensing bodies that ensure that pharmacists meet established educational and practice requirements. In both community and hospital settings, pharmacists may be assisted by pharmacy aides or technicians.

Two major issues seem to dominate the human resource literature in pharmacy. The first concerns the current shortage of pharmacists in many parts of Canada; the second concerns the future role of pharmacists within the Canadian health care system. Canada is not alone in facing these issues: shortages and future roles of pharmacists are also major topics in the United States and the United Kingdom, as well as other countries.

The Current Shortage of Pharmacists

The view that dominates the surveyed literature is that there currently is a significant shortage of pharmacists not just in Canada, but in the United States, the United Kingdom and other English-speaking countries as well. Many observers and surveys report the traditional signs of labour shortage such as increased numbers of vacancies, longer times to fill vacancies, increases in overtime hours, and wages rising in excess of the cost of living. All of these indicate a tightening in labour markets created by a failure of labour supply to keep up with growing demand. The major unresolved questions are: What is the extent and nature of the shortage in human resources? What are the causes of the shortage? What *can* be done to address the problem? What *should* be done about it?

The other main perspective on the current shortage approaches the issue from the standpoint of the public and their interest in a smooth-functioning and efficient health care system. Viewed from this angle, the labour shortage would appear in the form of increased reports of clients unable to get prescriptions filled, in excessive waiting times, or worse, in increased incidence of dispensing errors due to pharmacist fatigue associated with excessive hours. To the credit of those practicing pharmacy in a difficult environment, the good news is that patients and clients do not appear to be bearing the brunt of problems due to the current excess demand for pharmacists. The major question here, however, is this: Is it possible to maintain or enhance the contribution of pharmacists to desired patient outcomes in the longer term if working conditions don't improve?

How severe is the shortage? How many positions are there for which no qualified pharmacist is available? The most-often quoted number for the shortfall in community pharmacists comes from a survey conducted by the Canadian Association of Chain Drugstores (CACDS), that reported in February 2000 that chain drugstores employ 6,240 full-time and 5,050 part-time pharmacists, "currently leaving the chain drug retailers short by approximately 1,000 pharmacists." Vacancies among independent pharmacies are excluded from these figures, but anecdotal evidence suggests that independents are having at least as much difficulty attracting pharmacists, because of traditionally lower wages and fewer benefits than those offered by chain drugstores.

Furthermore, data collected for the 1999/2000 Eli Lilly Survey of Hospital Pharmacy in Canada indicated that, as of March 2000, there were 150 vacant pharmacist positions in Canadian general-care hospitals with 100 beds or more, or roughly 10 percent out of a staff complement of 1408 pharmacists among reporting institutions. Given that the survey had a response rate of just over 40 percent, vacancies at non-responding "general" hospitals and among the special-care and small hospitals excluded from the survey might be very conservatively estimated at another 150 positions, for a total of 300 vacancies in hospital pharmacist positions among Canada's more than 600 hospitals.

Combining information from hospital and chain drugstore vacancy surveys suggests that roughly 10 percent of full or part time pharmacist positions in Canada were vacant early in the year 2000. Based on a total of roughly 24,000 practicing pharmacists in Canada, a 10 percent vacancy rate projected over all employers of pharmacists suggests that well over 2,000 additional pharmacists could readily find work in Canada.

What are the origins and root causes of this shortage? Is it based on temporary factors like a shift in retail pharmacy services from drug to grocery and department stores, or temporary snags in implementing more efficient information systems? Or is it based on long-term factors such as rising prescription volumes for an aging population, greater demand for information from consumers, or increased availability and complexity of drug therapies? All of these contributing factors to the current shortage have been discussed to varying degrees in the popular and professional press.

In our review of the Canadian literature on pharmacy labour markets we found no detailed study based on data collected in a consistent fashion across all jurisdictions and employers of pharmacists. Furthermore, we have found relatively little useful interpretation of how the predictable elements of future demand and supply are likely to unfold. In short, a comprehensive objective analysis of current and future human resource issues in pharmacy practice is not available.

The Future Role of Pharmacists

The issue of the role of pharmacists in the greater system of health care provision is central to developing a longer-term outlook on the demand for pharmacists. Confined to a role of dispensing medication, encroached upon by the availability of improving dispensing technologies and an expanded role of pharmacy technicians, the demand for pharmacists in the future could well decline, a conclusion similar to that reached by the Pew Foundation in the United States in 1995. Given the growing evidence of drug-related complications, however, and the well-documented ability of pharmacists to anticipate and forestall many of these problems, a more likely scenario is that pharmacists will be increasingly valued and demanded for their knowledge, skills, and cost-effective contribution to the health care system.

The Need for Further Study

We believe that it is extremely important to understand and address these issues more completely in the very near future. The emerging crisis in pharmacy human resources requires significant additional effort to gather knowledge and dependable data that can inform reasonable, effective, and coordinated responses from governments, industry, and professional associations. Perhaps our main finding is that currently available literature and data offer an inconsistent, incomplete, and therefore incoherent picture of the labour market for pharmacists. There are currently too many unknowns to support development of coherent and effective long-term strategies for dealing with shortages of pharmacists, and other current human resource issues.

For example, some have suggested that there is no real shortage of skilled pharmacists in Canada; instead, available skilled resources have been ineffectively and inefficiently deployed. If only the time that pharmacists spend on the job were carefully concentrated on those areas for which they are trained (and for which there are no ready substitutes), much of the current excess demand for pharmacists would disappear. Regulations imposed by governments, provincial licensing bodies and relevant professional associations, corporate practices, and inertia in fee systems are serious barriers to the kind of change needed to both relieve the current excess demand for pharmacists and to provide improved health care service at reduced costs for all Canadian consumers.

Clearly these are controversial topics that require broad-based analysis and discussion before any community-wide consensus on optimal strategies can be developed. There are other examples of major gaps in information as well. To date, there has been no comprehensive demographic profile of current pharmacists. Data from the 1996 Census provides some sense of the age and gender distribution of pharmacists, but relatively little seems to be available on career paths, retirement provisions and patterns, employee turnover rates, and occupational mobility into careers outside formal pharmacy practice.

Little information has been systematically gathered on the role of pharmacy technicians in Canada, including whether their current education and certification arrangements are sufficient to ensure that pharmacies efficiently and safely dispense medications. Another example of a major gap in information is the extent to which new technologies are being adopted in both community and hospital pharmacy and the implications of these technologies on skill and personnel requirements. Information of this type is crucial for an effective long-term strategy for dealing with human resource issues in pharmacy.

Next Steps

Any attempt to forecast or model the demand for and supply of pharmacists requires far more clarity on their emerging role in the health care system, the future of competition in pharmacy retailing, current and expected career paths, and geographic and occupational mobility. There appears to be a growing appetite within the pharmacist community for a national study of the human resource issues in pharmacy. Members of the pharmacy community interviewed for this situational analysis were eager to see a comprehensive study of the issues related to the role of pharmacists in the Canadian health care system and the development of a coherent strategy for dealing with longer-term labour market issues in pharmacy.

The current information base on the labour market for pharmacists is an inadequate foundation for health care system managers and the pharmacy community to manage current and future resources coherently. A broadly based, collaborative effort involving the contribution of data, ideas, and solutions from all stakeholders in the pharmacy community would almost certainly result in a better-managed system of drug prescription, dispensing, and counselling for Canadians in the coming decade.

1 Introduction

Labour markets are fickle and often difficult to predict. One year, job seekers are knocking on the doors of employers, eager to work at any reasonable wage; a few years later, qualified applicants are scarce, and companies have to work hard to retain the people they have and replace those they lose. Combine the cyclical nature of labour markets with longer term economic and social phenomena – such as technological change, occupational shifts, the rise and decline of new products, shifting consumer preferences, and trends in retail concepts – and one could argue that forecasting the future of the labour market is little more than guess work.

Of course, not every factor affecting the labour market is unpredictable. With appropriate and relevant data and thorough analysis, for example, the impact of an aging population and workforce on the labour market for pharmacists can be projected based on current or anticipated patterns of behaviour. Another predictable factor is the inflow of new entrants, particularly into professions such as pharmacy, because of the recognized and standard educational requirements to enter the field. These and other foreseeable elements contribute to the concerns of many involved in the pharmacy industry, because they suggest that the current shortage of pharmacists is more than a temporary, peak-of-the-cycle phenomenon.

This study is based largely on a review of the available literature on human resource issues in pharmacy, offering a situational analysis of relevant problems in the particular, if not unique, labour market for pharmacists. Viewed across a variety of characteristics the pharmacist occupation is clearly in transition, though where this evolution is leading is not precisely clear. Increased numbers of drug therapies, an aging but more knowledgeable and demanding population, and deficiencies in other areas of the health care system seem to be driving increased demand for the clinical counseling skills of the pharmacist.

At the same time much of the "count, pour, lick, and stick" functions traditionally associated with pharmacists are increasingly undertaken by a group of formally or informally trained pharmacy technicians with enhanced responsibilities. In the wider world of retailing, sale of prescription drugs is no longer the exclusive province of the traditional community drugstore. Over the last decade, we have witnessed a steady increase in the number of pharmacies included in department and grocery store formats. In the hospital sector, pharmacists are recognized members of the health care team, while trained pharmacy technicians largely handle dispensary functions. Moreover, the demand for pharmacists in hospitals appears to have grown despite cutbacks in other health care personnel over the 1990s.

Are these trends permanent or temporary? Is the competition for the consumer retail dollar expanding the number of pharmacies and hours of opening beyond what is sustainable in the long run, or is this expansion of service availability driven by increased prescription volumes and greater demand for cognitive services from pharmacists? Is this increased demand for pharmacy services driven by a better informed, Internet-using public, or rather, by current and possibly temporary strains in the health care system in which doctors and nurses are not available in sufficient quantities to provide the advice and clinical services now being demanded of pharmacists? This literature review and information-gathering exercise shows that there is at least as much that is unknown about the future as is known, and that an attempt to forecast or model the demand for pharmacists requires more clarity on their emerging role in the health care system and the future of competition in pharmacy retailing.

This report reviews the literature relevant to the current and future labour market for pharmacists and pharmacy technicians in Canada. After reviewing the methodology of this study, we take a closer look at the regulatory and practice environment of pharmacists. After setting the institutional and

community practice context of pharmacy, we review the literature on the current pharmacist workforce in Canada and the demand and supply factors affecting the pharmacist labour market. In the following section we examine new technologies in pharmacy and their impact on the pharmacist labour market in Canada. We then review some of the initiatives and studies underway that promise to shed more light on these issues, and we conclude with our analysis of the gaps in information relative to that needed to develop an effective strategy for dealing with current and future issues in the market for pharmacists in Canada.

1.1 Methodology

This situational analysis was conducted under the auspices of a steering group of representatives from the Canadian Pharmacists Association, the Canadian Society of Hospital Pharmacists and Human Resouces Development Canada. The group provided research guidance, useful literature and references, suggested names for the interviews, and reviewed draft materials and reports. A list of key study contributors, including steering group members, is provided in Appendix A.

Our research for this study relied primarily on secondary materials from published literature and public data, augmented with information from twenty-three interviews with key informants across the country. These interviews dealt with labour markets for pharmacists and technicians, their evolving roles, training and practice patterns. They provided an important view from the various fields that constitute pharmacy in Canada and we used the experiences, observations, and opinions expressed by the interviewees to validate and enhance the picture that emerged from our review of the recent literature.

1.1.1 Literature

The literature review involved searches of major periodical indexes for materials published since 1995 on the business environment and labour market for pharmacists and pharmacy technicians. This work included reviewing major periodicals in pharmacy in Canada, including the *Canadian Pharmaceutical Journal, Impact*, *Pharmacy Practice*, *Pharmacy Connects,* and periodicals published by provincial pharmacist associations. American periodicals were also consulted to assess the dynamics of the US labour market for pharmacists and their implications for the Canadian market.

The American research, understandably far more extensive than the corresponding work done in Canada, not only provides useful information on features of pharmacy that are trans-national in nature, but also provides us with models and suggestions of the kinds of studies required to fill out the picture for the Canadian scene. Nevertheless, important differences between pharmacy in the two countries — differences in education and training patterns, the impact of third party payers, all against the background of two contrasting health care systems and health care system policies — should not be underestimated.

1.1.2 Internet Sites

With the rapid expansion of information publicly available on the Internet, no information review would be complete without consulting the websites of major organizations and institutions related to the pharmacy profession. Wherever possible, we include weblinks for organizations and literature references. In addition, Health Canada and provincial sites include important information on pharmaceutical products and on regulatory issues surrounding these products. Finally, a number of important pharmacy journals are available to readers only in electronic format accessible from their websites.

It is important to point out that due to various constraints, we did not have access to the "Members Only" sections of websites of most pharmacy organizations. If further work were conducted, it would be

useful to negotiate such access with participating organizations to ensure that the most current information is available to the researchers.

1.1.3 Interviews

Twenty-three interviews were conducted with key informants, validating our understanding of the pharmacist profession from the literature review, probing for additional issues or information that may not be reflected in the literature, and soliciting additional literature or information on initiatives affecting the market for pharmacists that may not be included in the periodical indexes.

Information obtained in these interviews provided an incomplete picture of the regulatory, labour market, and training and education systems in various provinces. This incomplete picture was unavoidable at this stage of the research, but served to identify key issues and gaps in information that might be addressed in future work.

Interviews were conducted primarily by phone, though in-person where convenient, using a semi-structured interview format. An interview guide was developed in both French and English, and submitted for review to the steering group to ensure that information required for this stage of the research was solicited. The project steering group also developed a list of 24 key informants, and 23 interviews were completed between November 2000 and January 2001. A list of those interviewed and their affiliations is included in Appendix B. A copy of the interview guide is included in Appendix C.

1.1.4 Public Databases

While the intent of this review was not to provide a comprehensive portrait of the pharmacy profession and the business environment, we did review the data sources currently used in public reports and databases. Data sources reviewed included:

- *Canadian Occupational Projection System* (COPS) and Human Resources and Devlopment Canada's (HRDC) *Job Futures* available on HRDC's Website (www.hrdc-drhc.gc.ca), provides historical data and the current outlook for most professions and occupations, and similar information for many university and college fields of study.
- *Census data* for 1996 contains information on a wide variety of demographic and labour market characteristics of the pharmacist occupation.
- *Labour Force Survey* (LFS), Statistics Canada's monthly snapshot of the Canadian labour market, which though the sample is limited, provides the most current view of a changing labour market.
- *National Graduate Survey* (NGS) provides information on people two and five years after graduation and at the time of graduation. Four cohorts are available (1982, 1987, 1992 and 1997). Due to resource limitations, we relied on the analysis provided by *Job Futures 2000* for those who pursued university studies in Pharmacy.
- *Survey of Consumer Finance* (SCF) and *Survey of Labour Income Dynamics* (SLID) data allows comparison of the employment and financial situation of pharmacists with other professions. We did not find information on pharmacists that used these data sources, and due to resource constraints, we did not carry out custom analysis using these sources.
- *HRDC's Administrtive Files* can be used for a variety of purposes, including mobility analysis, employment and unemployment spells. There are limited available data on pharmacists in this file since occupations are only coded on Employment Insurance Claims, but we will describe the strengths and weaknesses of these data sources, including estimates of the cost and value of adding occupational coding to the Record of Employment file (occupation is captured on the original form

completed by the employer but it is not one of the fields computerized). We did **not** analyze the micro data files in the course of this project, though future phases of research may wish to do so.

- *The Enhanced Student Information System* (ESIS) provides data on post-secondary enrolments and graduations, including the number of students enrolled in programs related to the pharmacist profession. The Canadian Institute for Health Information (CIHI)publishes data on numbers of degree graduates from Schools of Pharmacy through the year 1997 in their Health Personnel 2000 publication.

Where possible, we provide summary tables of data from those sources that document the labour market and human resources situation of pharmacists in Canada.

2 Pharmacy Practice Environment

Pharmacists are by law the only professionals permitted to dispense prescription medications and sell selected medications without a prescription. In both community and hospital settings, pharmacists may be assisted by pharmacy aides or technicians. The website of the National Association of Pharmacy Regulatory Authorities (NAPRA) notes:

> Pharmacy in Canada is a self-governing profession, with professional regulation the responsibility of the Provinces. Persons who engage in the provision of pharmaceutical services to the public such as the dispensing and sale of drugs and the operation of pharmacies are licensed or registered to do so by Canada's 12 provincial and territorial Regulatory Authorities (PRAs)(www.napra.ca/protect/regulated.html).

Thus, each Canadian province and territory has a professional licensing body that regulates pharmacists within its jurisdiction:

> To discharge their responsibilities appropriately, the provincial regulatory authorities have specific functions to carry out in such areas as licensing, quality assurance, the handling of public complaints and taking disciplinary action when necessary. This role is distinct from that of Faculties of Pharmacy, which are the academic teaching institutions, and the various national and provincial pharmacy associations, which are voluntary associations of pharmacists who advocate on behalf of their members. However, all three groups share an interest in the development of standards of practice with the regulatory bodies having responsibility for their establishment and in assuring compliance (www.napra.ca/protect/regulated.html.).

The mission of NAPRA, formed in 1995, is to enhance the activities of the pharmacy regulatory authorities by:

- representing the common interests of the member organizations;
- serving as a national resource centre; and
- promoting the national implementation of progressive regulatory programs and standards.

2.1 Employers of Pharmacists

The two major employers of pharmacists are community pharmacies and hospital pharmacies. NAPRA reports that in 2001 there were 309 hospital pharmacies accredited by a licensing body, and 7,084 community pharmacies.

Hospital pharmacists may conveniently be defined as pharmacists employed in hospitals and other health care facilities that provide services and programs to patients in support of optimal drug use.

Community pharmacies are retail pharmacies that fill physician prescriptions, with limited or more extensive product offerings including over-the-counter medications, other non-regulated health preparations such as nutraceuticals and vitamins, toiletries, and other products. Community pharmacies are conventionally divided into three major groups:

- Independent pharmacies are typically pharmacist-owned and operated, though other pharmacists may be employed on a full or part-time basis;

- Chain, Banner, and Franchise drugstores are pharmacies operating under a common name, though the ownership of the pharmacy may be corporate or individual through a franchise relationship;
- Pharmacies located in grocery and department stores are the most recently introduced type of pharmacy. Pharmacists in these settings are typically employed on an hourly paid basis.

Exhibit 1 shows the distribution of community pharmacies among the three major types in 1995 and 2000. While chains, banner, and franchise pharmacies retain the largest share of pharmacy outlets, food stores and mass merchandiser locations have been growing quickly, largely at the expense of chains and banners.

Exhibit 1: Distribution of Pharmacy Outlets by Type, 1995 and 2000

	1995		2000		Change 1995 to 2000	
	Number	**% of outlets**	**Number**	**% of outlets**	**Number**	**% of outlets**
Chains, Banners & Franchises	3,914	60%	3,958	55%	+44	-5%
Independents	2,069	32%	2,103	29%	+44	-2%
Food stores & Mass Merchandisers	544	8%	1,114	16%	+470	7%
Total	**6,527**	**100%**	**7,175**	**100%**	**558**	**0%**

Source: IMS Health Data, 2001. http://www.imshealthcanada.com/htmen/3_2_2.htm.

According to HRDC's *Job Futures 2000* profile of pharmacists, nearly 80 percent of pharmacists work in community pharmacy settings, 15 percent work in hospitals and extended care facilities, and most of the remaining work in wholesale trade, the pharmaceutical industry, and other health practice settings (HRDC, 2000a).

2.2 Regulatory Environment

Federal and provincial legislation mandates that all prescription drugs must be obtained through a licensed pharmacist. Pharmacists obtain their license to practice through provincial licensing bodies of pharmacy who ensure that pharmacists meet established educational and practice requirements. A detailed list of provincial regulatory authorities is provided in Appendix D.

The literature does not provide strong evidence that regulatory pressures on pharmacies are particularly onerous or that much activity is detected on this front. Beyond ongoing discussions on fees and reimbursements, already discussed, there appear to be few restrictions on the number of pharmacies that can open beyond requirements in many provinces that the owner or manager of a pharmacy ought to be a pharmacist. In Quebec and Nova Scotia, regulations require that all pharmacies must be owned by a pharmacist. In turn this limits the degree to which large, centrally controlled pharmacy companies might want, or be able to, move into these markets.

Governments' control of pharmacy practice rests both in their ability to negotiate prescription fees and their willingness to pay for cognitive services through provincial drug plans. Cognitive services include

advice and counselling on the appropriate use of medications, potential interactions and adverse effects, and appropriate non-prescription medications and therapies. Legislation in all provinces requires pharmacists to offer and provide counselling as part of their provision of prescription medications, but compensation is currently largely tied to the actual dispensing of the medication through regulated or unregulated prescription fees.

2.3 Trends in Pharmacy

The central dynamic in the community pharmacy business environment continues to be the competition for pharmacy customers between traditional drugstores (independent and chain) and pharmacy outlets in grocery and department stores. The overall growth in the number of pharmacy outlets was roughly two percent per year in the 1997 to 1999 period. Grocery and department stores led in new store openings in 1997 and 1998, while chains, banners and franchises were most active in 1999 (Rogers Media 2000, p. 10).

Both the literature and interviewees characterized the current business environment in pharmacy as competitive, but the rise in prescription volumes and values and profits, suggest that there is ample room for the variety of pharmacy categories currently supplying the market. Over the last decade or two, the most notable development has been the sharp rise in the number of pharmacy outlets in grocery and department stores. Despite the shortage of pharmacists, however, the business of retail pharmacy still appears to be a profitable business for most retail formats (Canadian Association of Chain Drugstores (CACDS) 2000a).

We did not find a single, detailed economic analysis of the structure, conduct, and performance of retail pharmacy in Canada, though there are several publications that regularly report on the number of community pharmacies by format. The three dominant reports are the so-called “Taro Report,” undertaken by Rogers Media (Rogers Media 2000); the State of the Industry Report carried out by the Canadian Association of Drugstores (CACDS 2000a), and *Pharmacy Post*’s annual “Pharmacy on the Map” Report (2000b). According to the Taro Report, the top five pharmacy banners across Canada are (in alphabetical order) IDA, Jean Coutu, Pharmasave, Shoppers Drug Mart, and Uniprix (p. 12).

Not all of these names appear in every list of provincial top five pharmacy banners, however, reflecting variations in local and regional competition. Publication of specific market share data by banner appears to be avoided by the reviewed publications. *Pharmacy Post* 2000b reports that Quebec has a relatively high concentration in pharmacy retail with the top five banners controlling 72 percent of all prescriptions. Independent pharmacies account for just 11 percent of the drugstores in Quebec. More detailed information on retail pharmacy conditions in all provinces can be obtained from the *Pharmacy 2000 Sourcebook* (Canadian Wholesale Drug Association 2000).

Concerns about the concentration of pharmacy retailing in other countries (Reekie 1997) would not appear to apply to Canada. The advent of competition from grocery and department stores has spurred an increase in pharmacy outlets and a redistribution of market share that, for now, alleviates typical concerns associated with concentration of market power in most jurisdictions.

The growth of pharmacies within grocery stores is somewhat uneven across the country, with British Columbia having the greatest proportion of grocery store based pharmacies, and Quebec the lowest. *Pharmacy Post* 2000a notes, “Until recently, grocery store pharmacies were a novelty in Quebec. One reason for the concept’s late development was the failure of the first few trial stores in the 1980s. Another damper was a regulation which stipulates pharmacies must be owned by pharmacists, meaning that potential investors could only be franchisees, not corporate store owners” (p. 12).

The Taro Report indicates that between 1994 and 2000 the proportion of number of pharmacy outlets shifted somewhat from chains, banners and franchises toward food stores and mass merchandisers, while independents largely held a stable proportion of the number of outlets.

By most accounts, the financial picture for most pharmacies appears to be healthy. The Taro Report (p. 30) notes that the proportion of drugstores reporting a loss has steadily declined from 15 percent in 1997 to an estimated seven percent in 2000. Over the same period, the proportion of stores that reported increasing profits rose from one in three in 1997 to 60 percent in 2000.

3 Employee Profile of Pharmacists and Pharmacy Technicians

While various sources provide portions of an employment profile of pharmacists in Canada, there is no comprehensive document that provides a detailed view of the workforce in all jurisdictions. Given the implementation in July 2001 of the mobility agreement negotiated through the National Association of Pharmacy Regulating Authorities (NAPRA), trends toward a national labour market for pharmacists in Canada could be expected to increase, not to diminish. As a result, stakeholders in the pharmacy community are likely to require a more comprehensive approach to labour market information for planning purposes than is currently available.

3.1 Occupational Definitions

Researchers interested in data that are comparable across industries and occupations are generally compelled to rely on data provided by Statistics Canada, which uses a set of occupational definitions that have both the virtue and the drawback of only changing every decade or so. The virtue is that occupational groups remain comparable to allow comparison of characteristics over time. The drawback is that the definitions or descriptions do not necessarily keep up with current practices, descriptions, or skill requirements.

3.1.1 Pharmacists

The 1991 Standard Occupational Classification (SOC), used by Statistics Canada, provides the following description for the pharmacist occupation (D031) which is equivalent to the National Occupational Classification (NOC) 3131 used by HRDC in their *Job Futures* database:

> Occupations in this unit group are primarily concerned with compounding and dispensing prescription drugs and medicine. Pharmacists formulate and conduct non-clinical testing of newly developed pharmaceutical products.

HRDC's *Job Futures 2000* website provides the following description of the pharmacist occupation:

> Pharmacists work in community and hospital pharmacies, pharmaceutical firms, government departments and agencies and pharmacies and other retail organizations.
>
> Community, hospital and retail pharmacists compound and dispense prescribed drug products for customers and health care professionals. They advise on the administration, use and effects of medications and maintain medication profiles of customers.
>
> Industrial pharmacists participate in the research, development and manufacture of drug products. They test new drug products; co-ordinate clinical investigations of new drug products; control the quality of drug products during production to make sure that they meet standards of potency, purity, uniformity, stability and safety; and evaluate the labelling, packaging and advertising of drug products.

The same HRDC profile indicates that nearly four out of five pharmacists are employed in the retail trade, that is, in community pharmacies operating as individual retail operations or attached to grocery or department stores.

3.1.2 Pharmacy Technicians

Occupational definitions for pharmacy technicians are not as well defined as those for pharmacists, reflecting the variation in duties and responsibilities across hospitals and community pharmacies, and within community pharmacy settings. There is no single occupational classification for pharmacy technicians in the SOC system used by Statistics Canada. Instead, pharmacy technicians are included

with a group of health care system technicians under the SOC code D313, equivalent to the NOC code 3414:

> **D313 - Other Aides and Assistants in Support of Health Services**
>
> Occupations in this unit group are those, not elsewhere classified, primarily concerned with providing technical and clerical support to surgeons, pharmacists and pathologists. These aides and assistants are employed in hospitals, medical pathology laboratories and pharmacies. Supervisors are included in this unit group.
>
> **Exclusions**
>
> Pathologists' assistants are classified in unit group D211 - Medical Laboratory Technologists and Pathologists' Assistants. Operating room technicians are classified in unit group D233 - Registered Nursing Assistants.
>
> **Example Titles**
>
> Acupuncture assistant; Autopsy assistant; Cast room technician; Dispensary assistant, pharmacies; Fracture room attendant; Herbal medicine assistant; Laboratory maintenance supervisor, anatomical pathology; Morgue attendant; Mortuary supervisor; Optical laboratory technician; Orthopaedic assistant; Orthopaedic technician; Orthopaedic technologist; **Pharmacy aide; Pharmacy assistant; Pharmacy technician**; Registered orthopaedic technologist; Senior morgue technician [emphasis added].

This list clearly indicates that data from this group would not likely reveal much about the pharmacy technician specifically, and for this reason we cannot provide more detailed information on this occupational category.

3.2 Wages and Salaries

Wage and salary data on pharmacists and pharmacy technicians appear to be extensive, but some information appears to be restricted to fee or dues-paying members of organizations. The Taro Report offers wage and salary data for community pharmacists and technicians across Canada, and the Eli Lilly survey, *Hospital Pharmacy in Canada Survey 1999/2000,* provides similar data for hospital pharmacy employees. In addition, various provincial associations survey their members annually on salary, benefits and other working conditions.

Exhibit 2 provides recent wage and salary data from both the community and hospital pharmacy. Community pharmacy wages are reported in hourly form, but they could easily be converted to annual full-time income levels by multiplying by 2,000 (a standard figure for the number of annual hours worked in a full-time job). Exhibit 2 indicates that pharmacists employed in community pharmacies tend to earn more than those employed in hospitals. Assuming 2000 hours of work in a year, community pharmacists in Canada would earn $58,200, excluding overtime, nearly 10 percent more than the estimated average of $53,447 earned by hospital pharmacists with a Bachelor's (BSc) degree. Pharmacy technicians, on the other hand, appear to earn much less when employed in community pharmacies compared to those employed in hospitals. A college-trained technician working 2,000 hours in a year would earn an estimated $22,800 annually in community pharmacy, 25 percent less than the estimated $30,722 average among technicians employed in hospital pharmacies.

Exhibit 2: Wages and Salaries in Pharmacy

<table>
<tr><th>Jurisdiction</th><th colspan="3">Community Pharmacy (Hourly)</th><th colspan="3">Hospital Pharmacy (Annual)</th></tr>
<tr><th></th><th>Pharmacists</th><th>Technicians trained on-the-job</th><th>Technicians college-trained or certified</th><th>Pharmacists (BSc)</th><th>Pharmacist (PharmD/ MSc)</th><th>Technician</th></tr>
<tr><td>Canada</td><td>$29.10</td><td>$10.40</td><td>$11.40</td><td>$53,447</td><td>$55,221</td><td>$30,722</td></tr>
<tr><td>Nfld</td><td rowspan="4">$27.00</td><td rowspan="4">$9.20</td><td rowspan="4">$9.10</td><td>$58,788</td><td>---</td><td>$33,598</td></tr>
<tr><td>NS</td><td>$47,540</td><td>$60,587</td><td>$28,873</td></tr>
<tr><td>PEI</td><td rowspan="2">$50,003</td><td rowspan="2">$55,792</td><td rowspan="2">$25,536</td></tr>
<tr><td>NB</td></tr>
<tr><td>Que</td><td>NA</td><td>NA</td><td>NA</td><td>$51,175</td><td>$51,326</td><td>$27,131</td></tr>
<tr><td>Ont</td><td>$32.10</td><td>$10.70</td><td>$11.60</td><td>$55,836</td><td>$59,747</td><td>$33,124</td></tr>
<tr><td>Man</td><td rowspan="3">$26.20</td><td rowspan="3">$9.40</td><td rowspan="3">$10.90</td><td>$50,662</td><td>$60,568</td><td>$26,572</td></tr>
<tr><td>Sask</td><td>$47,672</td><td>---</td><td>$26,909</td></tr>
<tr><td>Alta</td><td>$54,304</td><td>---</td><td>$37,748</td></tr>
<tr><td>B.C.</td><td>$29.30</td><td>$12.00</td><td>$13.70</td><td>$58,691</td><td>$60,020</td><td>$38,692</td></tr>
</table>

Sources: *The Taro Report,, p.29*; Eli Lilly Canada 2001, *Table XIV.*

Like many other professionals, but unlike most hourly paid employees, retail pharmacists are typically not entitled to overtime pay. The Wage and Benefit Survey 2000, conducted by the Ontario Pharmacists' Association (OPA) indicated, "88% percent of respondents reported being paid at their regular rate for overtime work. Four percent are paid one and a half times their regular hourly rate, and eight percent are given time off in lieu of overtime pay" (OPA, 2000, p.10).

3.3 Pharmacists and Gender

Though we found no complete study of the demographics of pharmacists, provincial pharmacist licensing bodies are likely have the information required to compile this information. NAPRA is currently assembling a database that would probably allow a very detailed demographic profile of those currently registered with provincial licensing bodies.

Recent data from the Labour Force Survey as published in *Job Futures 2000* suggests, however, that the proportion of women in pharmacy has not changed all that much in recent years. Data from the National Graduates Survey as published in *Job Futures 2000* indicates that about two-thirds of pharmacy students are women. Some interviewees suggested that the feminization of the pharmacy profession has played some role in the current shortage, suggesting that women are less likely to work full-time and are more likely to take time away from the labour force to raise children and care for their families.

3.4 Age Structure of Pharmacists

Over at least the last decade the average age of retirement in Canada has been dropping, and is now below the age of 60. This trend, combined with the arrival of the leading edge of the baby boom in their mid-50s, suggests that a significant proportion of the pharmacy workforce may well be retiring in the near future.

Exhibit 3: Age Distribution of Pharmacists (NOC 3131)

Age	Pharmacists	All Occupations
15 – 29	26.2%	26.5%
30 – 39	27.7%	28.5%
40 – 54	33.5%	35.2%
55 & over	12.7%	9.8%

Source: HRDC 2000a

The fact that more than one quarter of pharmacists are under the age of 30 (but over the age of 22 in view of educational requirements) suggests that the pharmacy workforce is relatively young compared to other professional occupations. Nevertheless, nearly thirteen percent of pharmacists are currently at or above the age of 55, indicating that retirements could play an important role in the labour market for pharmacists over at least the next decade.

3.5 Union Membership

While most pharmacists in Canada are members of pharmacist associations rather than unions, pharmacists working in institutional settings are more likely to be part of a collective bargaining unit, often represented by a public sector union, than pharmacists working in community pharmacies. As members of a recognized health profession, pharmacists have traditionally belonged to professional associations. In Canada such associations are both nationally and provincially based. They typically deliver a variety of services to their members, including such benefits as participation in group insurance plans, professional information through magazines and websites, and negotiation with provincial authorities on prescription and other fees.

Significant number of pharmacists working in larger hospitals are represented by unions, though coverage rates appear to vary substantially by province. Steve Long, documenting the findings of the most recent Eli Lilly Survey of Hospital Pharmacy (2001), reports that

> pharmacists were part of a union in 67% (77/115) of respondent's facilities including 100% of facilities in B.C., Saskatchewan, and NB/PEI. Only 24% (5/21) of respondents from Ontario indicated their pharmacists belonged to a union. Of respondents with pharmacists in the union, 39% (30/77) believed the collective agreement hindered recruitment and retention of pharmacists, 25% (19/77) believed the collective agreement supported recruitment and retention and 31% (24/77) believed it had no impact. Respondents from teaching hospitals were more polarized in their view of the impact of the union than their non-teaching counterparts. Forty three percent (15/35) of teaching hospital respondents believed the union environment hindered recruitment, 31% (11/35) believed it supported recruitment, and 20% believed union status had no impact on recruitment. Thirty six percent (15/42) of non-teaching hospital respondents believed the union environment hindered recruitment, 19% (8/42) believed it supported recruitment, and 40% (17/42) believed it had no impact.

Pharmacists' participation in unions, particularly among community pharmacists has long been a source of controversy, but interest among pharmacists in the United States appears to have been sparked by recent deterioration in working conditions. The American Pharmaceutical Association (APhA) looked at its long-standing resolution against unions with its 1998-99 Policy Committee Report on Collective Bargaining/Unionization. The report notes that:

> "…[p]harmacist involvement in labor unions dates back to the end of the 19th century. At that time, employee pharmacists began their involvement in unions because they were

> restricted from joining the state associations that represented pharmacy owners. These organizations were called Drug Clerk's Associations and formed to discourage the employment of non-pharmacists as "clerks", to obtain representation on the state boards of pharmacy, to improve working conditions, and to decrease working hours (APhA 2000)

Little remains of the “Drug Clerk’s Association” but it is interesting to note that some of the original impetus for the movement is echoed in much of the recent discussion of pharmacists. The APhA (2000) document notes:

> In 1998, it is estimated that 7% of the nation's 170,000 practicing pharmacists are members of labor organizations. There are just a handful of unions in the United States that solely represent pharmacists, the remainder of organized pharmacists are represented by unions such as the Oil, Chemical and Atomic Workers and the United Food and Commercial Workers.

In Canada, unions representing pharmacists are likely to be those that represent provincial and municipal workers, such as the provincial affiliates of the National Union of Provincial Government Employees (NUPGE) and Canadian Union of Public Employees (CUPE). Based on our search of existing collective agreements, it appears that bargaining units consisting entirely of pharmacists are rare or non-existent. Instead pharmacists in health institutions appear to bargain collectively with other specialized health professionals including physical and occupational therapists, psychologists, and dieticians.

3.6 Working Conditions

One interviewee suggested that higher health care loads result in lower job satisfaction in both ambulatory care and in primary care situations, such as community and hospital pharmacy. Development of clinical skills and the opportunities to practice them are key to job satisfaction. In hospital settings, technicians take on dispensing roles (including compounding). The “tech-check-tech” (the pharmacy technician checks the pharmacy technician) is widely used and is found to produce fewer errors than dispensing carried out by pharmacists alone. There is inconsistency in the level of pharmacist supervision of technicians. Some provide a great deal of independence to technicians. Others insist on “supervising every stroke of the spatula.”

Driver (1999) reports that the Alberta Pharmaceutical Association surveyed all 3,000 pharmacists in the province last summer about their employment conditions. About 700 pharmacists filled in the self-reporting questionnaires and, in a section reserved for additional comments, about 100 respondents noted some dissatisfaction with their work environment. Huyghebaert and Farris (1999) also discuss changes in the practice of pharmacy and the problem of job satisfaction among pharmacists in Alberta.

One interviewee summarized information from a recent survey of Nova Scotia pharmacists in response to the question: *“What could we do to make your life easier?”* The fact that only 10% of respondents answered this question could be interpreted as a measure of comfort with working conditions. Complaints raised in the survey include the following (in order of frequency):

- Inability to get regular breaks;
- Excessive administrative tasks;
- Too few supporting pharmacy technicians;
- Staff shortages;
- Excessive phone inquiries;

- Inadequate time to advise patients.

One interviewee noted that anecdotes of 12 hours shifts without lunch or bathroom breaks, and sole pharmacists and single technicians handling excessive script volumes are common. While these hectic positions commonly pay the most, pharmacists are more often burned out in these positions, which contributes in turn to a decreased ability to stay current with new developments in drug design and use, and a higher degree of frustration and hence early retirement. Job satisfaction is being exchanged for higher salaries. Hospital pharmacy has traditionally been associated with higher job satisfaction but lower wages. A growing gap in wages between the retail and hospital sectors is believed to be affecting the ability of hospitals to recruit and retain pharmacists.

One interviewee suggested that current working conditions of pharmacists in Quebec are not very good:

> Working conditions have improved somewhat over the last five to ten years, because of the *Guide de pratique* sets guidelines limiting pharmacists to dispensing a maximum of 30 prescriptions per hour. This means that more pharmacists are required to be on duty at peak hours. Pharmacists in community pharmacies are now entitled to group insurance coverage. However, working conditions are still difficult in a lot of ways. Pharmacists often work twelve-hour shifts with no lunch break. Administering the new medical insurance regime has added extra time to client contact without added compensation. Technicians are leaving because they are fed up with administrative work. Demand for pharmacy services has been rising because of increased ambulatory and out-patient care and increased use of drug therapies instead of hospital stays. Patients with certain ailments used to be provided with free medications in the hospital now have to buy them in pharmacies. All these factors have increased the workload of pharmacists.

Working conditions in hospital pharmacies also appear to have deteriorated with staff shortages. One interviewee noted that short staffing means that the remaining pharmacists must be more closely tied to the dispensary instead of engaging in clinical practice on the ward, where their expertise is most valuable.

Another interviewee indicated that with 20 to 40% fewer staff in a hospital pharmacy, it is obvious that the workload of pharmacists has considerably increased and that their working conditions have deteriorated. “There has been a substantial increase in the number of nights pharmacists worked. We see a deterioration in job satisfaction when we talk to people, but this situation needs to be documented.”

Gaither (1999) suggests that strategies should be developed to increase the career commitment of pharmacists. Increased commitment can reduce the negative effects of job stress and improve work-related attitudes. This research suggests that attracting new pharmacists to the profession purely through increased compensation may create future problems by increasing mobility out of the profession when working conditions deteriorate.

3.7 Career Mobility

We found little documentation in the literature about the flows of pharmacists into and out of community pharmacy and hospital pharmacy. Some interviewees suggested that hospital residencies are excellent preparation for community pharmacy, and hospitals tend to lose pharmacists to jobs in community pharmacy that generally pay more.

For technicians, the much higher rates of pay offered by most hospitals (due to collective bargaining) means that technicians much prefer working in hospitals to community pharmacies (where there is no collective bargaining), so the flows tend to move in that direction, according to one interviewee. As was the case with pharmacists, however, we found no estimates of the flows of employees from hospitals to community pharmacy, nor among varying types of community pharmacy settings.

Understanding mobility patterns is important for a labour market analysis because it gives the analyst more clues on where to look for labour market imbalances. Further, positions in practice areas that tend to be viewed as less desirable by recent graduates such as rural practices, might be more attractive if such positions eventually lead to longer-term advantages in the labour market. Hospital pharmacies, for example, may pay less than community pharmacy, but the hospital environment may lead to a wider variation of practice and intervention opportunities that recent graduates might find attractive.

4 Human Resource Issues

While the current shortage of pharmacists appears to be the top-of-mind issue in the pharmacy community, that issue has its roots in a number of other human resource issues that will directly and indirectly affect the labour market for decades to come. In this section, we review the literature and opinion on the shortage of pharmacists, examine underlying causes in the demand and supply for pharmacists, and then look deeper into issues such as the emerging roles of pharmacists and pharmacy technicians, and their supporting education and training systems.

In December 2000, the Bureau of Health Professions in the Department of Health and Human Services (DHHS, 2000) released a report on the labour market for Pharmacists in the United States entitled *The Pharmacist Workforce: A Study of the Supply and Demand for Pharmacist*s. Many of the themes of this report also appear in this review of the Canadian market for pharmacists. The US study indicates that:

> "…[t]he evidence clearly indicates the emergence of a shortage of pharmacists over the past two years. This shortage is considered a dynamic shortage since it appears to be due to a rapid increase in the demand for pharmacists coupled with a constrained ability to increase the supply of pharmacists. The factors causing the current shortage are of a nature not likely to abate in the near future without fundamental changes in pharmacy practice and education (p. i)".

Though the US health care system is clearly structured very differently than the Canadian, much of the analysis of the factors driving the demand and supply for pharmacists are similar in the two countries. Furthermore, the US analysis is relevant because American labour market shortages inevitably spill into Canada as recruitment efforts from south of the border intensify in Canada.

4.1 The Shortage of Pharmacists

Over time, pharmacy has experienced cycles of surplus and shortage, like most other labour markets. What concerns many observers, however, is the possibility that this is not just the market crying "wolf" yet again – that this time the wolf really has arrived. The crucial aspect of the problem lies in the lack of a deep analysis of the true underlying demand for pharmacists in Canada. Cooksey (1999), writing about the shortage of pharmacists in the US before the recent comprehensive American study (DHHS, 2000) notes, "…[t]here is relatively limited data available to assist assessment of the adequacy of the pharmacy workforce. This has led to contradictory claims of a surplus of pharmacists only several years ago and a shortage at this time." What makes the discussion of the pharmacist shortage different from most labour shortages is that much of the debate revolves around the role of the pharmacist in the provision of health care in Canada, as well as other countries, and whether this role is likely to expand in the future.

The first indications of the current episode of acute shortage of pharmacists date to late 1998 when members of the Canadian Association of Chain Drugstores (CACDS) began indicating that they were having increased difficulty filling vacancies. In January 1999, a CACDS (2000a) membership survey indicated that approximately 1,000 pharmacist positions were unfilled among their members at the time of the survey (McLeod, 2000). Vacancy data from the hospital sector suggest perhaps another 300 positions are vacant in acute care settings, and anecdotal news reports and interviews suggest that independent pharmacies are also having difficulty filling positions.

> Staffing woes are getting worse. Pharmacy owners and managers say the pharmacist shortage is their second biggest challenge, after fair compensation for professional services, according to *Pharmacy Post*'s survey. The biggest reasons for the difficulty in hiring are: the shortage of pharmacists overall, according to 89% of respondents, the shortage of pharmacists who are good enough (47%) and the remote location of the hiring pharmacy (42%) (The Taro Report, pp 4-5).

The Taro Report also reports that:

> According to numbers kept by provincial pharmacy licensing bodies, 7,011 pharmacies were open for business in Canada during the summer months of 2000. That's up from 6,851 a year ago. (IMS Health Canada, meanwhile, reports 7,263 community pharmacies as of September 2000, up from about 6,810 a year earlier.) However, the number of pharmacists has declined to 18,452 from 18,923. When you add to that the fact that prescription volume is climbing (by 8% for 1999, according to IMS Health Canada), it's no wonder that a shortage of pharmacists is one of this profession's biggest challenges.

The other dimension of the shortage issue concerns whether or not the public has adequate access to the medicines and pharmacist services they require. On this issue, the literature is largely silent. The lack of newspaper articles or editorials on long wait times or denial of pharmacy services suggests at least that this has not become a conscious issue, and that the public appears to be reasonably well served from a public health perspective. Some interviewees expressed concern, however, that this strong performance in the face of inadequate help is bought at the expense of increased and excessive working hours, increased stress among pharmacists, and is not likely sustainable in the long term. There were reports of an increased unwillingness of pharmacists to work increased hours at the expense of time for family and recreation, but again, we found no systematic study of the issue of overtime hours and the rumoured decline in willingness to work added hours.

The pharmacist profession is probably unique among the health professions in that the demand for pharmacists is driven both by the demand for service and by competition in the retail market for the consumer dollar. This raises the question: Is the growth in demand for pharmacists driven by a fundamental, underlying growth in demand for the services that pharmacists are trained to deliver or by competitive circumstances in the retailing world? Primary indicators of adequate client service would be pharmacist to population ratios, changes in the number of prescriptions filled, and growth in the average time spent by the pharmacist per prescription in ensuring that practice standards are upheld.

A fear of some interviewees is that the demand for pharmacists in the current environment is largely epiphenomenal to a shift in the dispensing market from traditional, stand-alone drugstores to one-stop-shopping grocery or department store settings. Markets with excess profits tend to attract new entrants, often with some new competitive advantage or attraction that may partially or completely displace traditional business. Wal-Mart, for example, has had a profound impact on the Canadian retail scene, and had driven some competitors in overlapping retail segments out of business or forced them to revamp their marketing strategies.

Lytle, Sandu and Hill (2000) have argued that increased numbers of pharmacies, longer hours of operation, increased volume of prescription, and non-traditional opportunities for pharmacy graduates, such as employment with pharmaceutical companies, are the key demand factors in human resources, while enrolment levels, immigration, emigration, demographics, and increased administrative duties are important supply factors. Strategies in coping with labour shortages must therefore emerge from the regulatory, operations and educational perspectives, simultaneously.

One interviewee believes that the concept of "shortage" is inadequate to describe the complexity of the current human resources problem. He cites formal studies (as well as his own informal observations) of the everyday activities of pharmacists that suggest a pharmacist's time is poorly rationalized and their skills underutilized. According to the interviewee, proper rationalization of the time and skills of pharmacists would necessarily involve the expansion of their clinical roles, and a reduction of administrative and managerial functions.

Will this competition in the pharmacy retail market eventually lead to some culling of pharmacies that lose the battle for customers, in turn releasing a supply of pharmacists on the market resulting in a future oversupply? Some observers believe that many of the closing pharmacies are independently owned and operated by individual pharmacists , whose pharmacies cease operations when they retire. We found no profile that characterizes the births and deaths of pharmacies, so, the underlying causes of turnover are not well documented. Possible indicators here would be profitability of pharmacy operations of major types, trends in the number of pharmacists per pharmacy, number of pharmacists in closing pharmacies, and the number of pharmacies per capita.

4.1.1 Indicators of Labour Shortage

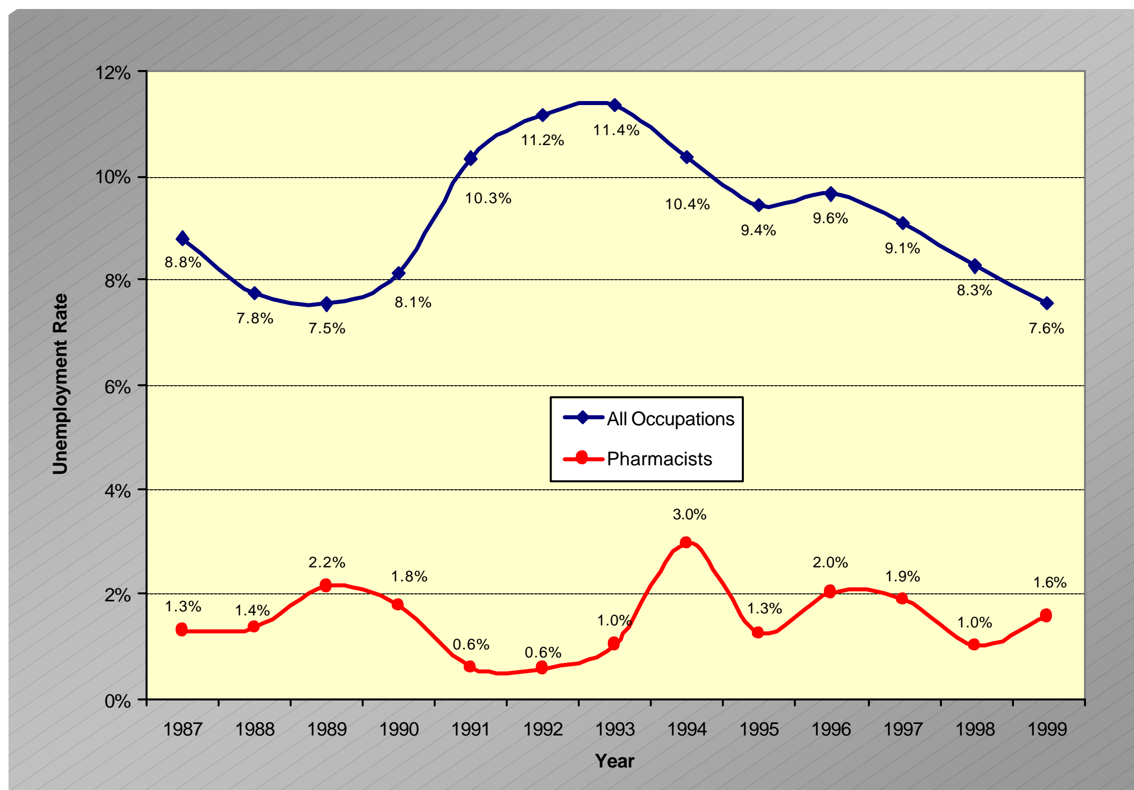
Though a list of indicators of shortage may vary somewhat by labour market as a result of convention or restrictions on various labour market practices, labour market economists customarily look at the patterns in certain indicators over time to obtain evidence of tightness in the labour market. Included among these indicators are a low rate of unemployment, increased incidence and hours of overtime, an increase in vacancies and the time required to fill vacancies, an increase in employee turnover, increasing wages, decreased job satisfaction attributable to increased stress, and changed behaviour on the part of employers in order to deal with hiring difficulties .

Unemployment Rates

A low unemployment rate is perhaps the most obvious indicator of a possible labour shortage. Data from the Labour Force Survey indicate that as of 1999, the unemployment rate for pharmacists was below 2 percent, and interviewees suggested that the rate has declined in 2000.

The HRDC *Job Futures 2000* profile on Pharmacy education (included in Appendix G) reports that, based on the National Graduates Survey, 97 percent of 1995 pharmacy graduates were in the labour force in 1997 and only four percent of those in the labour force were unemployed, compared to a 10 percent unemployment rate among all university graduates. "This was the lowest unemployment rate for all graduates at the bachelor's level." The profile of recent graduates also notes that, "Almost all graduates found work as pharmacists. They worked in pharmacies, hospitals or the pharmaceutical and medical industry."

Exhibit 4: Unemployment Rate Among Pharmacists



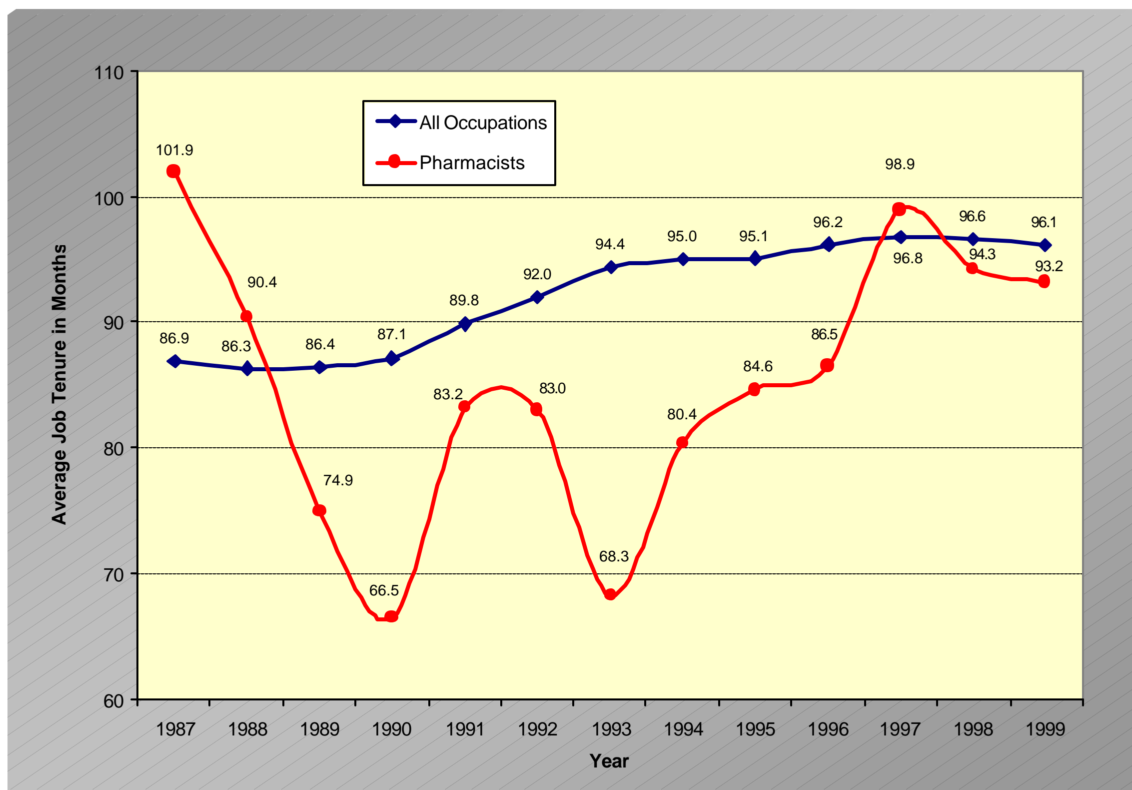
Source: Statistics Canada: Labour Force Survey, Annual Averages.

Turnover Rates – Recruitment and Retention

We found no studies of the turnover rates among recent graduates or established pharmacists. Tight labour markets are generally characterized by significant job-hopping, particularly among the younger age groups whose mobility is often less constrained by factors such as mortgages, children, and community attachment. Employment tenure information can provide some indication of turnover rates, though variations in hiring patterns can confound the link between lower average tenure and high turnover rates. For example, if an industry had recently experienced a surge in employment, the average tenure rate would decline even if no employee in the industry left an existing job to work for another employer.

Exhibit 5 shows that job tenure has declined somewhat in the last several years, but has not dropped to the extent seen in the last episode of extremely tight labour markets in the early 1990s. More information on the number of new pharmacists entering the market and other labour market data would be required to analyze these trends before firm conclusions could be drawn.

Exhibit 5: Average Job Tenure in Months



Source: Statistics Canada: Labour Force Survey, Annual Averages.

According to Mott (2000), pharmacists' job turnover was fairly steady across the 1983-1997 averaging 11% annually, among the 541 pharmacists who responded to a 1997 survey mailed to 1600 pharmacists from four states (Massachusetts, Ohio, Oregon, and Alabama):

> The average median tenure of pharmacists who left jobs was 32 months. The percentage of pharmacists leaving jobs and ranking stress as the reason for leaving increased, and the percentage of leavers ranking salary as the reason decreased. Women had a significantly higher annual turnover rate (15%) than men (9.7%), and they stayed in jobs for significantly less time (25.2 months) than men (56.5 months). There were no differences in turnover rates across practice settings. A larger percentage of pharmacists leaving jobs in large chain and institutional settings ranked stress as a reason for leaving than pharmacists leaving independent or small chain pharmacies. A larger percentage of pharmacists leaving independent or small chain pharmacies ranked salary as a reason than pharmacists in the other two settings. Pharmacists who left jobs typically stayed less than three years (p. 975).

Mott notes that the proportion of job leavers citing stress as one of the top five reasons for leaving rose significantly from 17 percent in the 1983-87 period to 28 percent of leavers in the 1993-97 period. All changes cited by Mott were judged to be statistically significant. We found no comparable study of the pharmacist labour market in Canada.

Time Required to Fill Vacancies

Another concrete measure of tightness in labour markets is change in the amount of time it takes to fill a vacancy. Many surveys try to get at this issue by asking employers whether they have difficulty in hiring, which is a less than precise means of getting the information required. Surveys that ask whether

employers have difficulty hiring are hard to interpret, and often require more analysis than that typically provided. What does "trouble hiring" mean? Are these employers in tune with recent changes in the wage and working expectations of current employees? Are these employers offering less attractive working situations? The more useful measure of labour market tightness is to ask how long it takes to fill a vacancy of a particular type and to compare those figures over time.

Welds (1999) reported that "…[I]t's a 'seller's market' for pharmacy graduates and pharmacists looking for a change in their job scene, according to *Pharmacy Post's* 1999 Survey of Pharmacy Owners & Managers. More than half (56%) of respondents say they've had trouble hiring new staff pharmacists in the recent past. It's especially tough in Quebec (63%) and Ontario (58%), and for food store/mass merchandiser ('food/ mass') pharmacies (67%), franchises (65%) and chains (65%). The article does not provide information on the number of survey respondents or the response rate, making it difficult to know how much weight to give this information. The value of these data is also compromised by the vagueness of the wording "had trouble hiring new staff" because the interpretation of the question can vary according to the individual's expectations, and the underlying cause of the trouble is not necessarily an overall shortage of pharmacists.

The Ontario Pharmacists' Association (OPA) Wage and Benefit Survey 2000 reported that among the 340 out of 998 total respondents, it took on average 4.6 months to replace pharmacy staff. The report notes that this is the first time the question was asked, so, no comparable data are available for previous years, but even the inclusion of the question may be taken as an indication that the shortage is on the minds of pharmacists. The 2000 OPA survey reported a response rate of 21.7 percent from the 4600 active OPA members who were mailed a copy of the survey.

The 1999/2000 survey carried out by Eli Lilly indicates that the average reported vacancy lasted 122 days or about 4 months, though it is not clear if this reporting is on filled or unfilled vacancies or some combination (Eli Lilly 2001). The Atlantic Provinces and Manitoba reported the longest vacancy durations, ranging from nearly six months to a year.

Overall, the available data on the incidence and duration of employment vacancies in pharmacy is insufficient to support strong conclusions either supporting or refuting a shortage in pharmacy.

Overtime Hours and Other Working Conditions

One of the first ways that employers cope with increased demand or reduced supply is to ask employees to work additional hours beyond the traditional 35 to 40 hour workweek, or to ask part time employees to increase their hours of work.

Data from the Labour Force Survey suggest that the incidence and number of overtime hours rose between 1997 and 1998, but actually dropped between 1998 and 1999, falling from 6.8 hours to 5.3. These figures corroborate the perception of many interviewees that it is becoming increasingly difficult to entice many employees to work additional hours.

Exhibit 6: Average Weekly Overtime Hours

	1997	1998	1999	1997-1999 Growth
Percentage of Employees Working Overtime (%)				
• **In All Occupations**	14.1	13.9	14.2	0.4
• **Among Pharmacists**	12.2	16.1	15.5	27.2
Average Weekly Overtime Hours				
• **In All Occupations**	9.3	9.2	9.2	-1.1
• **Among Pharmacists**	5.5	6.8	5.3	-3.6

Source: Statistics Canada: Labour Force Survey, Annual Averages.

The OPA (2000) Wage & Benefit Survey reported that two-thirds of responding pharmacists reported working overtime, and the average among those working overtime was 9.2 hours in addition to a 40-hour week. Unfortunately, no time series is provided, so it is not possible to conclude whether the proportion of pharmacists working overtime, or their average hours of overtime, have increased in recent years.

High and Increasing Wages

If the labour market is working according to prevailing theory, excess demand should trigger higher wages that would induce more students to enter the field, encourage those working part time to work more hours, and those working full time to work overtime. One pharmacy company placed an ad in a Winnipeg newspaper in the fall of 2000 for a pharmacist offering a salary of up to $130,000. The ad did not specify how many hours of work would be expected to earn that amount, but pharmacists have been known to log 80 hours per week.

Mott and Keling (1994) use internal rates of return to examine the status of pharmacist supply in the United States between the years 1987 and 1991. Briefly stated, the idea of such a study is to calculate the return to investment in education for various courses of study. In this case, the results indicated that pharmacists enjoyed a relatively high rate of return on their educational investments, suggesting that excess demand over supply was driving wages for pharmacists to a level of return that made pharmacy a relatively attractive occupation to enter.

To our knowledge no comparable comprehensive study focussing on pharmacy has been conducted using Canadian data, though this would be possible using data from the National Graduates Survey (NGS). The most recent data available is the 1997 employment outcomes for 1995 graduates, and NGS data from cohorts graduating at four to five year intervals could be analyzed to indicate whether, from a market return perspective, there has been a chronic undersupply of pharmacists in Canada.

The *Job Futures 2000* profile of pharmacists reports that pharmacists two years out of university in 1997 received 40 percent higher wages than all university graduates at the bachelor's level, and "remained among the highest paid of all health graduates at this level." Those with a Master's degree earned 10 percent less compared to all graduates at this level, indicating that a Master's degree is not necessarily a financially rewarding proposition on its own. This may also be due to the fact that hospital pharmacists are expected to have a Master's degree in Quebec and hospitals generally pay less than community pharmacies. Finally, the wage advantage of pharmacists tends to erode with time and experience, relative to other university graduates. The 40 percent average wage premium measured two years after graduation with a bachelor's degree erodes to 24 percent after five years.

While some data are available from Statistics Canada's monthly Labour Force Survey (LFS), the sample size for most detailed occupations is so small that sampling variation is a major problem. Nevertheless, data from the LFS show that wages among all those that indicated pharmacy as their profession were stagnant between 1997 and 1998, but rose more than four percent between 1998 and 1999.

Exhibit 7: Earnings and Earnings Growth

	1997	1998	1999	1997-1999 Growth
Average Weekly Earnings ($)				
• **In All Occupations**	572.2	579.9	595.6	4.1 %
• **Among Pharmacists**	785.5	782.3	817.5	4.1 %

Source: Statistics Canada: Labour Force Survey, Annual Averages.

The Taro Report indicates that average wages in community pharmacy increased seven percent or almost $2 per hour between 1998 and 1999, rising to $29.10 from $27.20. The report indicates this is the largest increase in the last five years, and considerably exceeds the 2.7 percent average wage growth in Canada in 1999, as derived from the LFS.

Wage surveys are conducted by various provincial associations on an annual basis to monitor trends in compensation for pharmacists. In some cases, the results of these surveys are available only to members and, to our knowledge, no one has produced a summary of results from these surveys across jurisdictions. The Ontario Wage and Benefit Survey 2000 (OPA, 2000) reports that Ontario wage increases averaged 5.5 percent in 2000, noting that wages in some areas of Northern Ontario exceed those in Toronto.

Job Satisfaction

In the throes of a severe shortage, employees are often asked to work more overtime than they are willing to give, and job stress rises as work shifts are more often run at a hectic pace. Employee surveys often detect decreased job satisfaction as employees find it difficult to cope with the pace at work, and find it more difficult to deal with other life issues away from work. The current literature in pharmacy is somewhat mixed on this point, but the evidence suggests that the most recent data indicate a drop in job satisfaction.

The most recent comprehensive data are from the 1997 National Graduates Survey of 1995 graduates. Results from this survey as published in HRDC's *Job Futures 2000* suggest a relatively high degree of satisfaction with their educational choice and employment, two years after graduation. The *Job Futures* profile of pharmacy (included in Appendix G) reports that 80 percent of those who completed a pharmacy program indicated they would make the same choice again, compared to 71 percent of all university graduates, and 94 percent of pharmacy graduates said they were satisfied with their work, compared to 90 percent of all graduates. Further, 94 percent of pharmacists indicated that their work matched their training compared to 51 percent of all graduates. Only 12 percent felt overqualified for the work they were doing, compared to 33 percent of all graduates.

More recently, however, comments of respondents in the OPA (2000) survey seem to indicate a deterioration in the situation more recently:

> Written comments indicate that employee pharmacists continue to be frustrated about their working conditions and the increased time pressures. Conditions that continue to place pressure on pharmacists are: longer store opening hours, increased administrative burden from 3rd party plans, and the pharmacist shortage in Ontario (p. 12).

Many interviewees suggested that job satisfaction was deteriorating with the onset and persistence of the shortage. Many indicated that the initial and continuing education pharmacists receive is geared to promoting their role as clinical professionals whose main role is to ensure that clients receive the appropriate medications and understand how they are to be used properly and safely. As a result, pharmacists are increasingly frustrated by administrative and clerical work that consumes large blocks of time, but is essentially unrelated to the skills and expertise their education and experience provides.

Recent data from Eli Lilly's Survey of Hospital Pharmacists shows that hospital pharmacists are spending just under half of their time on distribution of drugs, 38 percent of their time on clinical activities, seven percent on teaching and research, and six percent of the time on other non-patient duties.

Thus, some work has been done to show how various activities consume the time of pharmacists, but no comprehensive national study appears to be available on precisely how the time of pharmacists is used during working hours. One interviewee contends that less than five percent of pharmacists' time is currently spent in delivering cognitive services.

Buzz and Activity in the Profession

Actions speak louder than words and one indicator of shortage is the degree to which the industry devotes its time and resources to diagnosing the underlying problems, discussing the issues, and developing and implementing initiatives to resolve the issues. Without formal and comprehensive studies at hand to present the relevant data and explain the underlying dynamics, many in the industry concentrate unhelpfully on high profile but relatively rare cases of, for example, departures to the United States, and conclude that a mass exodus is underway. Similarly, there may be a newspaper story of a small-town independent pharmacy closing due to an inability to sell the pharmacy or find a pharmacist willing to work there, but the underlying cause may be the long hours or the fear of reduced mobility from a remote location. While newspaper stories are often a leading indicator of an issue, they are not always backed by careful analysis required to accurately diagnose the issues.

Evidence of industry mobilization to discuss and resolve an issue like a labour shortage may be taken to be a better indicator of a problem on the assumption that few would want to waste time debating unimportant and irrelevant issues. In recent years, virtually every provincial pharmacists association has held discussions or studies of the shortage question and some have developed strategies or recommendations to deal with the issue.

Woods (1999) reported that at the B.C. Pharmacy Association's conference in October, 1999, a group of about 50 attendees - which included leaders of pharmacy associations, regulatory bodies and faculties of pharmacy - joined with pharmacist-owners, chain and banner executives and students to create a list of issues and recommendations that they felt germane to an adequate response to the shortage of pharmacists.

The May 2000 issue of *Pharmacy Post* included a listing of initiatives underway in the four Western provinces and Nova Scotia to deal with the pharmacist shortage issue:

- In response to its members' concerns, the B.C. Pharmacy Association has decided to devote its entire B.C. Pharmacy 2000 conference program to the shortage crisis.
- The Alberta Pharmaceutical Association is tabulating almost 400 responses to its recent human resources survey, which was sent to community and hospital pharmacies. The association asked about the current supply and demand for pharmacist positions and hired an economist to look at the expected trends in the next five to ten years.
- Saskatchewan Health has commissioned a healthcare administration professor, Allen Backman to research the challenges facing the entire health professional workforce in that province.
- In Manitoba, a shortage of pharmacists has forced Winnipeg's Health Sciences Centre (HSC) pharmacy to reduce its hours and lose up to 60 percent of its revenue from outpatient medication sales.
- In Halifax, a study commissioned by the Pharmacy Associations of Nova Scotia (PANS) shows that between 2000 and 2005, the number of pharmacist positions in the four Atlantic Provinces will increase 12 percent to 2,840 from the current 2,540.

Each of these efforts demonstrates that the shortage of pharmacists is sufficient to motivate the relevant professional associations to devote time and attention to the issue. What appears to be lacking at this stage, however, is a concerted national effort to deal with a situation that is quite clearly affecting all jurisdictions.

4.1.2 Geographic Distribution of Vacancies

One important dimension of the shortage, both for diagnosing the cause and designing a solution, is the distribution of vacancies across various regions of the country. Interviews and newspapers ads suggest that the problem is more acute in Manitoba, British Columbia, Ontario, and Quebec, and particularly so in rural areas of those provinces. Like other health professionals, rural areas appear to have more difficulty attracting and retaining pharmacists, but this phenomenon is not very well documented or systematically analyzed in the case of pharmacists.

Shih (1999) suggests the issue of local shortages can exist even when there is no widespread shortage. The difficulties of attracting physicians to rural locations are quite well documented, but we found no literature that describes the nature and extent of the problem among pharmacists. One interviewee noted that many rural areas are serviced by small owner-operator pharmacies that close when the owner retires. On the other hand, urban areas see many new store openings, often in big-box or grocery store formats open 24 hours a day, 365 days a year. The number of pharmacies per province, as a result, will not show the apparent decline in services available to rural areas relative to what is perceived as several pharmacies in every strip mall in urban areas.

Exhibit 8 shows the most recent data on the number of pharmacies and pharmacists in Canada. Clearly there is a significant variation in the number of pharmacists and pharmacies per population across provinces. The population per pharmacy ranges from one for every 2,800 people in Saskatchewan to one in 5,200 in B.C. in 2000, according to the *2000 Community Pharmacies Trends Report*. B.C. pharmacies are staffed with 3.5 pharmacists on average, however, second only to the 3.7 pharmacists per store in New Brunswick, while Newfoundland has the lowest number of pharmacists per store at 2.0.

Exhibit 8: Pharmacies, Pharmacists, and Ratios in 2000

	Can-ada	Nfld	PEI	NS	NB	Que	Ont	Man	Sask	Alta	B.C.	Terri-tories
Total Pharmacies	7,011	176	32	255	164	1,575	2,603	277	367	781	764	17
Community Pharmacists	18,452	356	97	940	447	4,015	6,010	679	791	2,371	2,683	63
Pharmacistsp er Pharmacy	2.6	2.0	3.0	3.7	2.7	2.5	2.3	2.5	2.1	3.0	3.5	3.7
Population per Pharmacy	4,349	3,074	4,313	3,686	4,604	4,664	4,423	4,128	2,801	3,796	5,266	4,247
Population per Pharmacist	1,652	1,520	1,423	1,000	1,689	1,829	1,916	1,684	1,299	1,250	1,500	1,146

Source: The Taro Report, p. 29.

Exhibit 9: Trends in Pharmacists and Population Ratios

	Canada	Nfld	PEI	NS	NB	Que	Ont	Man	Sask	Alta	B.C.	Terri-tories
Total Pharmacists												
1997	22,799	489	113	818	533	5,148	7,928	906	1,080	2,686	3,032	66
1988	17,374	402	73	650	377	3,978	5,783	752	883	2,133	2,301	42
% change 1988 to 1997	31.2%	21.6%	54.8%	25.8%	41.4%	29.4%	37.1%	20.5%	22.3%	25.9%	31.8%	57.1%
Pharmacists per 100,000 Population												
1997	75.6	89.0	82.7	87.5	70.7	70.3	69.9	79.7	105.6	93.5	75.9	66.2
1988	64.3	69.8	56.1	72.2	51.5	57.8	58.0	68.3	86.4	86.1	72.8	50.5
% change 1988 to 1997	17.6%	27.4%	47.3%	21.2%	37.4%	21.7%	20.6%	16.8%	22.2%	8.6%	4.3%	31.3%
Population per Pharmacist												
1997	1,323	1,124	1,209	1,143	1,414	1,422	1,430	1,254	947	1,069	1,317	1,510
1988	1,556	1,432	1,781	1,385	1,943	1,731	1,725	1,465	1,157	1,161	1,373	1,981
% change 1988 to 1997	-15.0%	-21.5%	-32.1%	-17.5%	-27.2%	-17.9%	-17.1%	-14.4%	-18.2%	-7.9%	-4.1%	-23.8%

Source: CIHI, 2000, p.61. Data refers to Licensed Pharmacists in 1987 and 1997, excluding Non-Practicing and Honorary Pharmacists and Certified Clerks.

The population per pharmacist also varies considerably across provinces, ranging from one pharmacist per 1000 persons in Nova Scotia to one in 1,916 in Ontario. How much of the variation can be explained on the basis of the urban/rural split of the province is not clear. Anecdotal evidence from interviews suggests that provincial and regional difference in the hours of store openings may also explain some of the variation in pharmacists per pharmacy across the country.

Most of the provinces where shortages are reported to be most acute – Ontario, Quebec, Manitoba - do appear to be at the upper end of the population/pharmacists ratio. British Columbia appears to be an

exception, with a lower than average population to pharmacist ratio, though it has the highest population to pharmacy ratio in Canada.

4.1.3 Trends in Pharmacists per Capita

Exhibit 9 shows data from the Canadian Institute for Health Information on the number of pharmacists per 100,000 population for 1998 and 1997. While the previous exhibit included only community pharmacists, Exhibit 9 includes pharmacists in hospitals. In Canada, the number of pharmacists per 100,000 population rose from 64 to 76 in the course of a decade, an increase of 18%. The rates ranged in 1997 from a low of just under 70 in Ontario to a high of nearly 106 per 100,000 people in Saskatchewan.

Similar growth in pharmacists per capita in the United States is noted by Cooksey (1999, 1), who reports that between 1970 and 1995 the number of pharmacists per 100,000 population rose from 54 to 69. Based on the US Bureau of Health Professions Pharmacy Workforce Supply Model, Cooksey reports that the number of pharmacists per 100,000 population is projected to rise to 74 in 2010 from 70 in the year 2000.

How do trends among pharmacists compare to other medical professionals? Exhibit 10 provides CIHI data on the number of health professionals in 1988 in 1997. The third and fourth columns give the share of each profession out of the total number of all 17 listed professions. The number of pharmacists increased by 31 percent in the decade between 1988 and 1997, increasing their share from 3.5 percent to 4.2 percent. This may be taken as a broad indication that demand for pharmacist services is increasing, possibly in response to slow growth in nursing services.

Conklin (1991) notes that changes in dispensing practices in hospitals reduced the time and intervention by nurses, evolving into a computer-linked central hospital pharmacy service responsible for intravenous (IV) and unit dose preparations. Conklin notes that as of 1991, "…[m]any Ontario hospitals have not yet converted to unit dose practises." If most hospitals in Canada have now converted to this practice, it seems reasonable to conclude that some growth in demand for hospital pharmacists, and reduced demand for nurses, has resulted from this newer practice.

Exhibit 10: Number of Health Professionals[1,2] and Percentage Distribution, by Occupational Group, Canada, 1988 and 1997.

	COUNTS		% of TOTAL		% change
	1988	1997	1988	1997	1988-97
Medical and Treatment Services	73,094	86,068	14.6%	15.7%	17.7%
Chiropractors	3,188	4,472	0.6%	0.8%	40.3%
Optometrists	2,826	3,554	0.6%	0.6%	25.8%
Pharmacists	**17,374**	**22,799**	**3.5%**	**4.2%**	**31.2%**
Physicians	49,706	55,243	9.9%	10.1%	11.1%
Dental Services	21,003	29,524	4.2%	5.4%	40.6%
Dental Hygienists	7,261	13,284	1.5%	2.4%	83.0%
Dentists	13,742	16,240	2.8%	3.0%	18.2%
Nutrition and Dietary Services	5,548	6,524	1.1%	1.2%	17.6%
Dieticians	5,548	6,524	1.1%	1.2%	17.6%
Administrative Services	2,857	2,965	0.6%	0.5%	3.8%
Health Record Professionals	2,857	2,965	0.6%	0.5%	3.8%
Nursing Services	332,806	340,743	66.6%	62.2%	2.4%
Licensed Practical Nurses	83,133	76,810	16.6%	14.0%	-7.6%
Registered Nurses	249,673	263,933	50.0%	48.2%	5.7%
Laboratory and Therapeutic Technological Services	33,072	34,885	6.6%	6.4%	5.5%
Medical Laboratory Technologists	18,443	16,444	3.7%	3.0%	-10.8%
Medical Radiation Technologists	11,337	12,797	2.3%	2.3%	12.9%
Respiratory Therapists	3,292	5,644	0.7%	1.0%	71.4%
Rehabilitation Services	12,875	21,914	2.6%	4.0%	70.2%
Occupational Therapists	3,322	7,558	0.7%	1.4%	127.5%
Physiotherapists	9,553	14,356	1.9%	2.6%	50.3%
Psychological and Social Services	18,348	24,958	3.7%	4.6%	36.0%
Psychologists	8,346	11,328	1.7%	2.1%	35.7%
Social Workers	10,002	13,630	2.0%	2.5%	36.3%
TOTAL	499,603	547,580	100.0%	100.0%	9.6%

1. For 17 selected health professions.
2. Reflects either licensed professionals or association memberships depending on the profession.
Sources: Health Personnel in Canada, Canadian Institute for Health Information/Statistics Canada (Demography Division).

4.1.4 Implications of the Shortage

If there truly is a shortage of pharmacists, what is its extent? According to mainstream economic theory markets self-correct, generating signals and incentives to make more of the item in shortage. The mechanics of this response to a shortage is that tight markets tend to drive up the price or wages in labour markets, and new supply is thereby enticed into the market. This works well in some labour markets where new employees recruits can be trained, such as those for fast food workers, but is more complicated in markets where the required skill development can take years. Accordingly, increasing wages now may only generate more supply in four or five years. Even that supply response may be hampered, however, by the capacity constraints of Canada's nine schools of pharmacy. Economists are fond of saying that in the long run markets return to equilibrium. John Maynard Keynes declared,

however, "Long run is a misleading guide to current affairs. In the long run, we are all dead" (Bartlett, 1992).

The analysis of the 2000 CACDS Membership survey cites some implications of the current shortage of pharmacists:

> It is therefore not surprising that both traditional drugstores and grocery/mass merchandisers pulled back in the provision of a number of consumer services. The shortage of personnel has also led many chains to investigate and implement labour-saving technologies, such as integrated voice response prescription filling, central prescription filling locations and robotics in the dispensary. These new technologies will help professionals to free up some time and dedicate it to consumer counselling (CACDS 2000, p. 2).

Thus, while pharmacies are pursuing means to ease the demand for pharmacists, shortages do appear to be constraining the counselling services that many see as the true value that pharmacists add to the health care system, and is required by pharmacy regulations in all provinces.

One interviewee carefully catalogued the effects for hospital pharmacies of the overall pharmacist shortage:

- There have been cuts in the time available to counsel patients.
- Some institutions have decreased their participation in university education.
- Some pharmacies have reduced their opening hours.
- The workload of pharmacists in health institutions has increased considerably.
- Some pharmacists have worked up to 40 nights in a row.
- There have been health institutions without a pharmacist.
- There has been an increase in the number of pharmacists on sick leave.
- There have been many cases of burnout.
- An increasing number of pharmacists have left the health network.
- There has been an increase in the risk of errors.

Increased demand for pharmacists in community pharmacy has had predictable repercussions for other elements of the pharmacist labour market. Conklin notes that: "…[t]he hospital pharmacy is directly affected by the need for pharmacists in the community pharmacies. If the latter are able to reduce their staff, then hospital pharmacies may no longer experience the same shortages as in the past" 1991, 25. Yet in recent years, exactly the opposite has happened – community pharmacists have increased the demand for pharmacists, putting significant constraints on the ability of hospital pharmacies to hire staff. One interviewee from Quebec noted that hospital pharmacies tend to prefer pharmacists holding Master's degrees, but the current demand for community pharmacists tends to draw away Bachelor of Science in Pharmacy (BSc(Pharm)) graduates who might otherwise consider continuing on to a graduate degree. This observation is corroborated by data that show a decrease in the number of hospital pharmacy residency applicants across Canada in recent years.

The shortage of pharmacists has also raised concerns that those characteristics of pharmacist jobs leading to reduced staff morale are being accentuated. Long hours and excessive numbers of prescriptions to fill leave less time available for patient counselling, the very aspect of the occupation that gives most pharmacists the greatest job satisfaction. Pharmacies are also coping by asking

pharmacists to work more overtime hours, which some fear will lead to increased burnout among pharmacists.

Among hospital pharmacists, short staffing means that pharmacists are more tied to the dispensary and have less time to participate in clinical services on hospital wards. In short, the excess demand for pharmacists seems to be undoing much of the slow progress toward clinical pharmacy achieved over the last decade.

Kahaleh and Siganga (1998) conducted a study of pharmacists in the US who had lived through the reduction in health care system pharmacy jobs in the US in the 1990s. While these layoffs were largely generated by industry rationalization, the implications for working pharmacists are very much like those for hospital pharmacists in Canada today: being asked to do more with fewer resources. Pharmacists who lived through the downsizing rated mergers, the impact of managed care, and the profit motive as the most influential causes of downsizing of pharmacist positions. The three most common negative comments about the impact of downsizing cited reduction in the quality of patient care, increased stress and lowered morale.

Earlier in the decade, Conklin (1991) suggested that provincial governments, eager to reduce the costs in the medical system, might eliminate positions of pharmacists in hospitals. While that possibility appears remote today, history shows that hiring patterns are subject to major cycles and those who were in the hospital setting might be looking to community pharmacy for jobs at some point in the future. Kahaleh and Siganga (1998) indicate that most pharmacists in their study believed that communication skills, education, cross-training, and clinical skills are keys to surviving downsizing. Most pharmacists whose positions were downsized said they went on to jobs with similar or higher salaries and substantially different responsibilities.

4.2 The Demand for Pharmacists

Our literature survey and interviews both point to a number of significant explanatory factors - some professional and some business-related - driving an increase in the number of positions for pharmacists in Canada.

Professional

- Increased prescription demand.
- Increased complexity associated with new drugs and multiple prescriptions.
- Increased demand for counselling services from a better-informed public.
- Restrictions on the role and use of pharmacy technicians.
- Increased demand for health care system pharmacists.
- Strains elsewhere in the health care system (including shortages of nurses and physicians).

Business Related

- Increased number of pharmacies.
- Increased hours that pharmacies are open.
- Increased time to deal with third party payers/adjudicators.

These factors are discussed in the remainder of this section.

4.2.1 Increased Demand for Pharmacy Services

Recent data on prescriptions reported by IMS Health (2001) show a substantial increase in the growth rate of prescriptions. From the two to three percent annual increase through most of the 1990s, the number of prescriptions filled increased by 5.4 percent in 1998, 6.3 percent in 1999, and 7.6 percent in 2000. A recent publication of the Canadian Institute for Health Information (CIHI 2001) indicates that expenditures on prescribed and non-prescribed drugs was $12.4 billion in 1998, and were anticipated to reach $14.7 billion in 2000. CIHI estimates that demand rose roughly 10% annually in recent years. Assuming there is a strong correlation between drug expenditures and demands on pharmacists, a corresponding increase in the demand for pharmacist services may also be inferred.

Not only is the volume of prescriptions rising, but the customer appetite for information is increasing as well. A roundtable discussion in the May 1999 issue of *Pharmacy Post* suggested that "…[t]he business of pharmacy has changed the profession of pharmacy. And that's come about because of customers' demands - they don't just want to go in and have the prescription handed to them, they want counselling on the proper use of the medication."

Another respondent in the *Pharmacy Post* roundtable discussion observed that the "most important expansion of pharmacy services is the increased focus on nutritional products and counselling. As consumers' interest in this area has risen and there is so much conflicting information that is available, consumers have turned to the pharmacist for trusted advice." This view echoes the findings of many studies in the United States and Canada indicating that pharmacists are the most trusted professionals in the health care system.

4.2.2 Demographics of the Canadian Population

An aging population combined with an ever-increasing array of drug therapies promise to continue to increase the demand for prescription drugs in Canada in the coming decades. Elderly patients account for a large proportion of prescriptions and with the leading edge of the baby boom currently in their mid-fifties, many believe that the next 20 years will see continued rapid growth in demand for prescription drugs.

Precisely how soon the rapid expansion of demand for prescription drugs will be realized is the subject of some debate, since aging baby-boomers may be in better health than the previous generation, who lived through the depression and World War II. Better nutrition, exercise, greater health awareness, and improved information may well allow aging Canadians to live longer with fewer health problems than previous generations. We did not find a detailed analysis of the implications of an aging population on prescription drug use, though the standard assumption in the literature appears to be that the number of scripts per person is likely to rise as baby boomers enter the phase of life where drug therapy becomes more prevalent in the population.

4.2.3 Complexity of Tasks

Both the literature and interviews suggest that better information systems allow pharmacists to be more aware of interaction issues. While most believe that this information allows for better detection of problems, both the complexity and the time required to properly evaluate the potential risks rise as well. Furthermore, the pharmacist may be more aware of the potential complication than the prescribing physician. Increased use of walk-in clinics and fewer family doctor relationships mean the doctor is less likely to be aware of other issues and complications. According to the OPA, average time spent per prescription by the pharmacist is now approaching 15 minutes, compared to five minutes as little as a decade ago.

4.2.4 Time Use of Pharmacists

Is there evidence of increased questioning of the prescription by pharmacists, requiring more time in consultation with the prescribing physician? According to one interviewee, studies of the typical work day of pharmacists show that 80% of pharmacy work is administrative and clerical, and thus uses little of the skills acquired in university pharmacy programs. The interviewee estimates that, on average, only 2% of the pharmacist's time is devoted to the clinical practice, which is just the aspect of pharmacy stressed in pharmacy curricula and frequently cited as a key to job satisfaction.

Though technicians often handle issues of illegible scripts and insurance coverage, these issues also consume significant time for pharmacists. While important, deciphering handwriting and dealing with insurer data issues do not necessarily take advantage of the skills of pharmacists. The Canadian Pharmacists Association (CPhA 1997) produced a booklet summarizing the findings of a study of the time spent on administrative services in pharmacies, that is, time spent other than counselling or explanations required to dispense the prescription. These administrative activities really have little to do with clinical counselling or proper use of the medication:

> If you've noticed an increase in the number of prescriptions that require additional administrative services, you're not alone. A CPhA study found that 31.3% of all prescriptions processed by pharmacists involve additional services such as explaining terms of coverage, establishing whether a medication is covered or submitting a claim to multiple payers. At 8.7 minutes per prescription, that costs your pharmacy $28,900 annually.

One interviewee in Quebec suggested that the roles of pharmacists and their assistants have changed substantially since the implementation of the new medical insurance system (*Régime d'assurance maladie du Québec*). Administrative duties are far heavier than before since pharmacists now have to explain the intricacies of the new system without additional compensation. In addition, problems with longer waiting times and access to physicians has led to some clients skipping the physician and consulting the pharmacist for advice instead.

Clinical counselling on appropriate therapies, potential interactions and side effects, and proper intake of medications is something that most pharmacists would like to provide more regularly. Direct payment for this work remains sporadic in pharmacies across the country. To our knowledge, however, there has been no comprehensive survey documenting the extent or growth of fees for clinical services beyond prescription fees.

4.2.5 Non-Pharmacy Demand for Pharmacists

Although absolute numbers remain relatively small, several interviewees reported that there have been increased opportunities for those trained in pharmacy in employments outside pharmacies, including a notable increase in opportunities with pharmaceutical companies and third-party insurers. Perceptions of poor working conditions in community pharmacy tend to make jobs outside the dispensary more attractive. We were unable, however, to find a systematic study of the extent to which pharmacists have left traditional pharmacy positions to pursue positions elsewhere.

Exhibit 11 shows the industry distribution of those who reported they were pharmacists in Statistics Canada's monthly Labour Force Survey. Ninety-four percent of these persons indicated that they were employed either in retail, that is, community pharmacy, or in hospitals. Those indicating they worked in the wholesale trade could be working for pharmaceutical companies. To what extent have more pharmacists been drawn to non-dispensing occupations such as advocacy groups, pharmaceutical companies, third party insurers, or consulting?

Exhibit 11: Industry Distribution of Pharmacists (NOC 3131)

Industry Sector	Percentage of Employment
Retail Trade	78.8%
Hospitals	15.1%
Wholesale Trade	2.7%
Chemicals Manufacturing	0.8%
Other Health and Social Services	0.7%
Physicians and Health Practitioners and Medical Labs	0.3%
Education	0.2%

Source: HRDC 2000a.

Many interviewees suggested that a contributing cause of the shortage of pharmacists is the increased opportunity for work outside traditional jobs in community or hospital pharmacies. Figures from the Labour Force Survey, averaged over the years 1996 to 1998, indicate that 94% of those identifying themselves as pharmacists work in retail stores or in hospitals. This suggests that there is not a great deal of migration of pharmacists out of the pharmacy setting.

This conclusion may be entirely wrong, however, if trained pharmacists who now work in non-traditional occupations for pharmacists do not identify themselves as working as pharmacists in surveys or the Census. For example, a trained pharmacist may be working for a pharmaceutical company as a sales representative, and identify herself as a salesperson and thus not be included in the pharmacist occupation in Statistics Canada's surveys or in the Census.

Statistics Canada's Labour Force Survey data on pharmacists may not, therefore, be very useful in identifying the extent to which trained pharmacists are migrating to non-pharmacist occupations. NAPRA's efforts to assemble a national database of provincial pharmacist registration information should allow further investigation of this question. Another useful source of information would be the National Graduate Survey which documents graduate labour market outcomes two and five years after graduation. The five year follow-up on 1995 graduates should be released soon.

4.3 The Supply of Pharmacists

Interviewees and the literature point to a number of issues or factors affecting the supply side of the pharmacist labour market, all of which have contributed in some way to the current shortfall in the supply of pharmacists relative to demand.

- Some reduction in the number of graduates due to increased program length (temporary).
- Anticipated reduced availability of foreign pharmacists.
- Increased incidence of those wanting to work only part time.
- Reduced willingness to work overtime especially among females with families.
- Increased opportunities for pharmacists outside pharmacies.
- Earlier age of retirement.
- An increased emphasis on continuing education which may lead some to retire earlier from the profession.

According to Hill (1999), there are about 23,000 pharmacists in Canada. The Taro Report indicates that the number of pharmacists practicing in community pharmacy is 18,452, and most of the remainder work in hospitals or other health care centres. The Eli Lilly survey stops short of estimating the total number of pharmacists employed in hospitals in Canada due to the fact that not all hospitals were included in the survey, and the response rate among those included was only about 40 percent.

4.3.1 University Enrolments and Program Changes

Though some university pharmacy programs have recently begun significant expansions, the standard estimate of the annual number of graduates from Bachelor of Science in Pharmacy (BSc Pharm) programs is approximately 800. The University of Toronto is in the process of doubling its annual graduating class from 120 to 240, and other pharmacy schools appear to be in the process of expanding their programs as well. We found no summary of anticipated changes or program capacity levels over the next decade. There were no reports that schools were having difficulty attracting suitable candidates to fill available spaces. Expanding pharmacy programs as well as attracting suitable candidates to pharmacy have been discussed extensively in recent years, but no comprehensive or conclusive studies have yet become available.

Employers in the United States are also dealing with a shortage of pharmacists, due in part, to the now implemented decision of schools of pharmacy to move to the Doctor of Pharmacy (PharmD) degree as the mimimal requirement for entry to practice. This change in program requires one to two additional years of university attendance. The effect, like the addition of one year to the University of Toronto BSc Pharm program in the mid 1990s, is to create a reduction in the number of graduates entering the labour market for a period equal to the extended length of the program. Though the change was phased-in over a ten-year period and therefore its effect on the number of US graduates was somewhat smoothed, one of the factors cited in the American pharmacist shortage is the current transition to a longer entry-to-practice education regime.

Several interviewees reported that large American drug retailers have been appearing at job fairs and recruiting events for Canadian pharmacy students, armed with signing bonuses and attractive wage offers. One interviewee suggested that for the foreseeable future between one quarter and one-third of University of British Columbia pharmacy graduates would likely end up working in the United States, chiefly in the state of Washington.

The US decision to require the PharmD degree as the entry standard for new pharmacists to support the move to enhanced clinical services has been also been discussed in Canada and rejected, at least for now. To the extent there is a brain drain - and this, by most accounts is not significant from Canada, except in British Columbia - the new, longer training requirements in the United States may create a barrier to pharmacists emigrating from Canada. The barrier is not rigid, however, since many state licensing agencies in the US will grant licenses to those who can pass the equivalence exams, whether or not they hold a PharmD degree. Some interviewees suggested that program differences between the Canadian BSc Pharm and the American PharmD were relatively minor, and graduates of Canadian programs should have little difficulty meeting US licensing requirements.

4.3.2 Immigration

Immigration has been the safety valve for labour shortages in many Canadian labour markets for many years. Reports indicate that recently, pharmacists have come to Canada from South Africa and the United Kingdom, but several interviewees suggest that the flow from these sources has slowed and is not likely to resume in the near future. In general, flows of pharmacists seem to emanate from countries

that have recently suffered political upheaval, a severe economic downturn, or other deterioration in the quality of life, or new opportunities to leave underdeveloped or slow-growth economies.

Exhibit 12 provides data from the 1996 Census on the immigrant status of those classified to the pharmacist occupation. The immigrant population did not necessarily obtain their pharmacist training abroad; the number of foreign trained pharmacists is not available in Census data. Further, there may be Canadian-born pharmacists who obtained their pharmacy education outside Canada. Despite these caveats, immigration status provides a proxy for how heavily the pharmacist profession relies on foreign sources for labour supply.

Exhibit 12: Period of Immigration Among Pharmacists

Immigrant status and period of immigration	Count	Percent of Total
Total Labour Force	20,625	100.0
Non-immigrant population	15,090	73.2%
Immigrant population	5,485	26.6%
Before 1961	455	2.2%
1961-1970	855	4.1%
1971-1980	2,100	10.2%
1981-1990	1,570	7.6%
1991-1996	505	2.4%
Non-permanent residents	50	0.2%

Source: Census of Canada, 1996, Statistics Canada.

In 1996, just over one quarter of pharmacists were born outside Canada. Of the 20,625 pharmacists in 1996, 10.2 percent had immigrated to Canada in the 1970s, and another 7.6 percent came to Canada in the 1980s. The proportion that immigrated to Canada in the first half of the 1990s was relatively low (even after adjusting for the change in the reference period from five to ten years), but it should be remembered that the first half of the 1990s was a period of relatively low economic growth.

Though we found no complete study of the role of immigration in meeting the demand for pharmacists, pharmacist licensing bodies are likely to have the details required to compile this information. NAPRA is currently assembling a database that would likely allow a very detailed demographic profile of pharmacists currently registered with provincial licensing bodies. Analysis of this database should provide more evidence on the educational origins of pharmacists practicing in Canada, as well as the national and international mobility of pharmacists.

Migration of pharmacists is an important source of supply for Ontario, with two-thirds of newly registered pharmacists coming from out of province or country annually. According to the Ontario College of Pharmacists, out of 385 new registrations in 2000, 224 were educated in Canada, including 122 from the University of Toronto and 102 from other Canadian schools of pharmacy. The remaining 161 new registrations were educated in pharmacy outside the country, but at least some were Canadian citizens. Last year, 21 persons educated at US pharmacy schools were registered in Ontario. Some of these may be Canadians who choose to study at pharmacy schools near the border such as SUNY-Buffalo, and Wayne State in Detroit. The Ontario College of Pharmacists has recently implemented a bridging program to facilitate the entry and integration of foreign-trained pharmacists into Canadian pharmacy practice.

Exhibit 13: Mother Tongue of Pharmacists, 1996

Mother tongue	Pharmacists	Percent of Total
Total labour force	20,625	100.0%
Single response	20,390	98.9%
English	10,630	51.5%
French	4,505	21.8%
Non-official languages	5,260	25.5%
Italian	190	0.9%
Chinese	1,860	9.0%
German	235	1.1%
Portuguese	25	0.1%
Polish	200	1.0%
Ukrainian	210	1.0%
Other languages	2,550	12.4%
Multiple responses	235	1.1%
English and French	20	0.1%
English and non-official language	165	0.8%
French and non-official language	35	0.2%
English, French and non-official language	0	0.0%

Source: Census of Canada, 1996, Statistics Canada.

While we found no published data on recent certifications of foreign-trained pharmacists and their countries of origin or training, the data are almost certainly available from the various pharmacist licensing bodies.

4.3.3 Emigration

While a few sources suggested that the flow of pharmacists to the United States contributed to a shortage in Canada, we found no study that documented the magnitude of this flow. Most other interviewees doubted that the flow of *established* pharmacists was large enough to make a significant contribution to current problems, but several thought that more aggressive recruiting by US pharmacy chains on Canadian campuses could result in a significant drop in new graduates available to Canadian employers and put upward pressure on wages.

We found little in the literature that offered a systematic look at the number of pharmacists leaving Canada for employment elsewhere. Most of those interviewed indicated that they had little personal evidence of a large number of pharmacists leaving the country, with the major exception of British Columbia, where the issue has received far more attention than any other jurisdiction. Neighbouring Washington State is reported to lack the educational capacity to provide for its own demand for pharmacists, and drug chains operating in Washington have recruited aggressively at University of B.C.

One interviewee suggested that job satisfaction among pharmacists in the US is likely lower than in Canada because the factors that contribute to job dissatisfaction - increased time in purely administrative functions, decreased time in real clinical practice - are intensified in the US. This greater administrative burden arises from the large number of third party payers, each with their own distinct reimbursement protocols and regulations.

Despite the significant shortage of pharmacists in the US and some aggressive recruiting efforts, there is yet no systematic evidence that suggests that large numbers of Canadian pharmacists are heading south. One knowledgeable source indicated that only four percent (two students) of the graduating class at the University of Manitoba were heading to the United States this year, and both of those were leaving to

pursue further education rather than more lucrative employment. Again, anecdotal evidence is an insufficient base for even a short-term strategy, and a more comprehensive examination of the mobility of pharmacy graduates and pharmacists is required for human resources planning in this profession.

4.3.4 Aging of the Workforce and Retirements

While there is some documentation on the age structure of those currently practicing community pharmacy in Canada, we were not able to find a detailed study on the retirement patterns of this occupation, nor a detailed look at the age structure of the workforce. Information on age and retirement eligibility of hospital pharmacists in Canada is provided in the Eli Lilly Report, though data on actual retirement rates are limited. Retirement patterns are an important component of any model attempting to forecast supply and demand in labour markets, so this is an important gap in an outlook of the pharmacy labour market in the foreseeable future.

The Eli Lilly Survey Report notes that only about 10 percent of the hospital pharmacy staff are over the age of 50, suggesting that retirement will not be a major factor in creating vacancies in the near future. This preliminary assessment requires further study, however, because some hospital pharmacists can qualify for pensions with a combination of age and service totalling as little as 70 years. For someone obtaining a bachelor's degree at 22, an age/service factor of 70 would allow retirement at age 48, though no survey respondent indicated an earliest age of retirement below age 55. Service durations of 25 to 35 years also qualify for pension benefits, depending on the institution. Survey respondents indicated that 208 pharmacists will be eligible for benefits in the next five years, and 367 will be eligible to retire within ten years, out of a reported staff of 2887. If the average career lasts 33 years, the steady-state retirement rate would be about three percent per year. The survey indicates that projected retirement eligibility is less than two percent per year over the next 10 years.

4.4 The Evolving Role of Pharmacists and Technicians

The boundaries between one occupation and close substitutes are often shifting and flexible, and not as rigid as occupational definitions might suggest. No one would suggest that a pharmacy technician and a pharmacist are the same occupation, despite the fact that they sometimes perform the same tasks. Similarly, the physician and the pharmacist are quite different occupations, but there are areas where their respective skills intersect. A growing literature suggests that this skill boundary results in better patient outcomes and lower costs if it is managed as a collaborative overlap rather than a rigid barrier.

4.4.1 Changes in the Role of Pharmacists

The issue of the role of pharmacists in the greater system of health care provision is central to developing a longer-term outlook on the demand for pharmacists. Confined to a role of dispensing medication, encroached upon by the availability of improving dispensing technologies and an expanded role of pharmacy technicians, the demand for pharmacists in the future could well decline - a conclusion reached by the Pew Foundation in the United States in 1995. Given the growing evidence of drug-related complications and the ability of pharmacists to anticipate and forestall many of these problems, however, a more likely scenario is that pharmacists are increasingly valued and demanded for their clinical skills and cost-effective role in the health care system.

The practice of pharmacy has been evolving toward a more clinical role that emphasizes pharmacists' knowledge of pharmacology to improve patient health outcomes, and away from simple assurance that the drug dispensed is what the doctor ordered. This evolution characterizes pharmacy in most Western countries, and is at the root of the move of American schools of pharmacy to move to the PharmD degree as their entry program to licensed pharmacy practice, a similar move in the United Kingdom, and curriculum revisions in most Canadian BSc Pharm programs.

A major white paper from the American College of Clinical Pharmacy entitled "A Vision of Pharmacy's Future Roles, Responsibilities and Manpower Needs in the United States," examines the changing philosophy of practice, factors influencing the evolution of professional roles and responsibilities, preparation for future roles, future leadership and management needs, workforce manpower projections and qualifications for practice (American College of Clinical Pharmacy 2000). Much of this discussion is also relevant to the situation in Canada. Though the paper provides little concrete analysis of the employment implications of the changing role of pharmacists in the health care system, it nevertheless generates a program and research agenda geared to facilitating a more rapid move toward an enhanced clinical role for pharmacists.

While colleges and faculties of pharmacy throughout Canada have supported and facilitated this evolution, it should not be seen as a move to protect or expand the pharmacist occupation's monopoly over the dispensing of drugs. Instead, the changing role is at least partly driven by particular issues in the medical system and in the increasing complexity of drug therapies, increased likelihood of drug interactions, and the sheer numbers of prescription drugs available.

At the heart of the discussion is some blurring of the boundary between physicians and pharmacists in the chain of events including the diagnosis of malady, the prescription of drug therapy, the dispensing and review of the appropriateness of the medication, and the monitoring of therapeutic and non-therapeutic outcomes of the drug.

The paper written by Stanley Morgen for the National Forum on Health (which completed its report to the Prime Minister in 1997) notes that the current system does not necessarily provide the incentives for achieving the best possible outcomes for patients at the most reasonable cost:

> *Physicians* make decisions on behalf of the consumer about which therapies are required. Two systemic factors seem to adversely affect the prescribing practices of physicians. First, time constraints make it difficult for physicians to keep up with clinical evidence on the appropriate use of new drugs. Doctors therefore rely heavily on pharmaceutical companies, whose primary interest is to sell their products, as sources of information. Thus, marketing -- not science -- plays a major role in influencing prescribing patterns. Secondly, because Canada's fee-for-service system provides financial incentives to see as many patients as possible, prescribing drugs may be used as a strategy to end patient visits. This strategy may be demanded by patients who have come to expect a "pill for every ill."
>
> *Pharmacists* hold a monopoly over the retailing of both prescription and non-prescription drugs. It has long been acknowledged that pharmacists are the professionals best trained in pharmacology and that these skills have been grossly under-used. Community pharmacists, however, do not have access to diagnoses and medical records. This limits the scope of their therapeutic advice and all incentives to question physician prescribing practices or consumer choices of non-prescription drugs (Morgan 1997).

Interviews and the literature provided ample evidence of the factors underlying an expanding demand for the services pharmacists provide. For example, a Canadian Newswire article summarized the issues driving the changing role of pharmacists in Ontario and their central role in the health care system.

> Pharmacists, as the most accessible of the primary health care providers, have a wealth of information and expertise to share. Pharmacists also offer solutions to some of the challenges facing the health care system. A serious problem, magnified by Canada's aging and expanding population, is the costs associated with patients' non-compliance

> with their drug therapy. A 1995 report estimated that the economic costs of non-compliance in Canada were $7-9 billion per year. Seniors, who make up only 12% of the population, take over 40% of the medicine prescribed, which often includes multiple and complex medications. According to Health Canada, 19 to 28% of hospital admissions for patients over the age of 50 are for medication problems. Anywhere from 18-50% of seniors are estimated to use their medications inappropriately. Through one-on-one consultation with their patients, pharmacists can change these staggering numbers (Canadian Newswire Service 2000a).

Many in the pharmacy community believe that cost pressures in the health care system will drive administrators to an increased reliance on the services of pharmacists to provide more cost-effective and improved patient outcomes. Jean-Francois Bussieres notes in the most recent Eli Lilly Survey that:

> "…[m]any evaluative research and economic studies were published showing the positive clinical and economic impact of clinical pharmacists in their milieu. It is clear that pharmacists are key players in health care and that they can make a difference through the implementation of inpatient and outpatient clinical pharmacy services. A literature review of economic studies published between 1988 and 1995 showed an average benefit:cost ratio of 16.7:1 for clinical pharmacy services."

Zunker (2000) describes an educational program designed to help physicians control the overall cost of drugs and total health care, along with its effectiveness at one managed health care plan. Prime Therapeutics Inc., developed and manages an ongoing physician education program designed to help primary care physicians control drug and total health care costs. The program was evaluated by comparing per member per month (PMPM) total health care and drug costs for 1996 and 1997 at 12 general medicine clinics in a managed health care plan. In general, the clinics with more interaction between pharmacists and physicians had lower PMPM costs for total health care and drugs than the clinics with less interaction. Pharmacists acting as advisers to primary care physicians in general medicine clinics helped lower PMPM costs for drugs and total health care.

O'Loughlin and others indicate that there is considerable interest among community pharmacists in the United States to expand their role to include more prevention, but there are many barriers to realizing this role (O'Loughlin et al 1999). These authors believe that further work should focus on ways to overcome these barriers because pharmacists are particularly well situated to make an important contribution to prevention.

In Canada, the results of a yearlong study of the effectiveness of ongoing pharmacist counselling services were released in late January 2001 by the New Brunswick Department of Heath and Wellness and the Canadian Association of Chain Drugstores (2001):

> Called the Fredericton Pharmacy Initiative (FPI), the study offers a measurement of the benefits of ongoing pharmacist services. The year-long project included all 21 local pharmacies in the Fredericton-Oromocto area and studied 262 patients diagnosed with asthma or gastrointestinal (GI) disease. Pharmacists provided advice, education on drug use and lifestyle related to their disease states, and ongoing follow-up. An overwhelming 95% of participants were satisfied with the program, and a significant majority said they would like to see this type of care included in their drug plan benefits.

Another key research study, a Health Transition Fund project entitled the Seniors Medication Assessment Research Trial (SMART), linked family physicians (FP) and Expanded Role Pharmacists (ERP) to optimize drug therapy in seniors (Sellors 2001).

> Pharmacists were trained to identify and resolve drug-related problems (DRPs). The trial involved 24 ERP and 893 senior patients on five or more medications in 16 rural and urban areas in Ontario. A mean of 3.2 DRPs were identified by the ERPs in 87.7% of the intervention patients and FPs intended to implement 84.2% of the suggested changes. At five months 56.5% of the recommendations had been implemented by the FPs. The potential of this integrated health care service to impact on DRPs and long term health and economic outcomes is promising.

Changes in the role of the community and hospital pharmacist are well reported in the literature, though the full impact of these developments on human resource issues remain largely undocumented, especially with regard to hospital pharmacists (Spalek and Gong 1999). According to the literature, these developments include the effects of institutional downsizing (LeTouze 1998, Kahelah et al. 1998), and an expected reallocation of the tasks of pharmacists to pharmacist technicians.

Nimmo and Holland (1999) have published a series of papers documenting the changes necessary for hospital pharmacists to assume roles in cognitive services and patient contact. Graham (1997) argues that Canadian hospital pharmacists have decades of research and experience at their disposal to argue for pharmacy's role in assuring patient safety through decreased risk. Some would argue that an increased use of pharmacists in a medical care team would add cost to the treatment. But Graham asks, in the context of the medication use cycle, which of these carries the inherent potential for harming every patient admitted to our hospitals, and what is the real meaning of "too expensive"?

With an increased use of pharmacist expertise in the medical team, much of the dispensary work has devolved to hospital pharmacy technicians. Those interviewed who are familiar with current practices in hospital pharmacy in Canada suggest, however, that extension of the role and functions of hospital pharmacy technicians have been nearly exhausted, having reached the limits that current training programs and skill sets allow.

Both the literature and interviews point to ongoing change in the role of pharmacists, with mounting evidence to suggest that an expanding role for and use of pharmacists can be an effecient means of relieving stresses elsewhere in Canada's health care system. There are, however, barriers to this emerging role, including the current fee structure used to compensate community pharmacists, acceptance by other health professionals, lack of standards and certification for pharmacist technicians, and pharmacists' own fears and assumptions about their role in the health care system.

4.4.2 Fees for Cognitive Services

One of the barriers to an expanded role for pharmacists, particularly at the community pharmacy level, is the difficulty in receiving compensatation for activities beyond traditional dispensing. Pharmacists have struggled for years to convince both governments and the public that additional compensation tied to clinical counselling services can have enormous benefits in patient outcomes and cost savings associated with fewer drug-related problems. Recently, a number of developments in the area of fees for clinical services may be characterized as a "beachhead" for changes in the compensation for the skills of pharmacists. *Pharmacy Post* (2000c) reported, "It looks as if all those years of pilot projects and studies are finally paying off. As our annual state of the industry report shows, pharmacy is finally getting recognition from government and private payers."

Huyghebaert and Farris (1999) suggest that there are problems with the present system of practicing pharmacy that are not conducive to practicing pharmaceutical care:

> We are paid on a per prescription basis. It is difficult to change this way of thinking. There is a perception of pharmacists' work and most pharmacists feel that if they are doing research on a patient's drug related problems that it is viewed as just sitting there, not actually working. It is difficult for pharmacists to delegate tasks, whether it is because they are familiar with their old responsibilities or they do not feel that someone else is capable of doing as good of a job with it as they were before. There are definitely barriers to pharmaceutical care, but are they actual or perceived? Perceived barriers are perhaps more difficult to overcome than actual barriers. It takes a certain type of pharmacist to practice pharmaceutical care. There has to be total commitment from the management as well as the staff pharmacists. Maintaining change is much more difficult than implementing change. We need constant reinforcement as with any changes we face in life. There needs to be a support system set up, whether it be within the pharmacy itself or through the unification of the profession.

Thatcher (2001) reports on the current state of reimbursement for cognitive services in Canada. He observes an increased acceptance of fees for such services, making special reference to fee schedules charged by several B.C. pharmacies and the June 1999 introduction of the Ontario Pharmacists Association Fee Guide.

Exhibit 14 provides a summary of fees allowed by governments and third-party payers beyond traditional dispensing fees as reported in *Pharmacy Post* in July 2000. Several provinces now support trial prescription programs geared especially to the older population, where pharmacists are paid to dispense small "trial" prescriptions of those drugs that are especially expensive and often cause intolerable side effects. Pharmacists are then paid a second dispensing fee if the patient responds favourably and tolerates the medication. Fees from trial prescriptions may mean the total prescription fees are higher, but in most cases the cost is easily recovered in reduced waste and better patient outcomes.

Alberta is unbundling "the dispensing part of the pharmacist's fee from the business cost, but it has also announced a strategic, four-part plan to improve drug utilization in the province, using and paying pharmacists for their expertise" (Pharmacy Post 2000b). Alberta also provides an inventory allowance to offset the cost of maintaining expensive drugs in stock.

Since December 2000, B.C. women have been able to access emergency contraceptive pills (ECP) directly from their community pharmacist. ECP continues to be a prescription drug, but pharmacists have gained the authority to prescribe it. Pharmacists' participation in the ECP program is voluntary and they are required to be certified by the College of Pharmacists of B.C. Pharmacists charge the patient a $25 consultation fee for professional services in addition to the drug cost and dispensing fee. This initiative involves an extensive research component.

In Ontario, a new provincially funded anti-smoking campaign has established pharmacists as primary care providers for the first time. The province will now pay pharmacists for providing anti-smoking counselling. Extended hours for pharmacies have also helped position pharmacies as clinical care providers, since patients whose only alternative may be hospital emergency rooms, may seek advice at pharmacies instead. Ontario's new program of free flu shots may be extended to include pharmacies as providers. While pharmacists have the authority to refuse to fill a prescription that is inappropriate for a patient, Ontario still does not provide fees for such refusals, as allowed in B.C. and Quebec under certain circumstances.

Exhibit 14: Pharmacy Permitted Dispensing and Service Fees

	Maximum Prescription Fee			Fees for Denial	Cognitive Service Fees	
Nfld	$5	plus 10% if cost over $30			None	
PEI	$7 Regular	$7.85 Seniors plan	$7.25 Social Assistance		None	
NS	$8.82 if cost less than $115	$13.48 if more			Aero chamber counselling $10	
NB	$7.40, more for some				None	
Que	$7.00 for first 23,400	$6.54 thereafter		$7	Pharmaceutical Opinions $15.45	Trial prescriptions $7+ $7
Ont	$6.47				Trial Prescriptions	Stop smoking counselling
Man	No cap				None	
Sask	$7.15				Documented Trial prescriptions up to $14.65	
Alta	$9.70 to $19.70	plus inventory allowance			$10 for trial prescriptions	
B.C.	$7.55			Double fee for forged prescription	Trial Prescriptions	ECP Prescriptions
Territories	$8.75 Yukon	$9.33 NWT/ Nunavut			None	

Source: Pharmacy Post 2000b.

The pharmacy community considers these fees for cognitive services, however small, to be especially important because they establish a basis for charging fees beyond those tied to the drug itself, and thus place a direct value on the clinical skills and knowledge of the pharmacist. Further development along these lines would assist the profession in establishing a new service and revenue model, based on the value they provide to the Canadian health care system.

4.4.3 Resistance to Change

Woodward (1998) and Ukens (1997b) describe how shifts in the division of tasks between the pharmacists and physicians have in fact compelled pharmacists to perform 'cognitive services,' which in turn has drawn sharp challenges from both American and Canadian physicians. Breu (1997) reports that at its annual meeting in Chicago, the American Medical Association (AMA) took a strong stand against the expansion of the clinical side of pharmacy practice. The delegates adopted a resolution that calls for the AMA to be proactive in working with appropriate state and federal agencies and legislatures to define the limits on the scope of practice by pharmacists for all aspects of health care delivery, including patient education.

Similarly, Conlan (1997b) reports on opposition to an increased clinical role for pharmacists, indicating that pharmacy's struggle to redefine its mission and secure an expanded role in patient care is drawing resistance from the brand-name drug industry, physicians and the manufacturers of over-the-counter medicines. For example, the American Medical Association (AMA) and two other physicians' associations told federal officials that there is little evidence that retail pharmacies are routinely providing cognitive services or, in fact, are capable of providing these services. The AMA, joined by the American Academy of Family Physicians and the American College of Obstetricians & Gynecologists, suggested that pharmaceutical care is an effort by pharmacists to supplant physicians as the primary drug counsellors.

The issue of the role of pharmacists in the health care system is not confined to North America. A recent study by Gilbert (1998) examines the role expansion of community pharmacy in South Africa against the background of phenomena such as professional dominance and boundary encroachments. The study demonstrates pharmacy's thrust towards an extended and more meaningful role, making a clear distinction between the role extension concerning the granting of additional powers to prescribe medications, and that of a wider range of activities. It confirms previous claims that the opposition from the medical profession is particularly fierce when it relates to the pharmacist's ability to prescribe. The successful granting of special permits to a selected group of pharmacists to practice an extended role can be explained by the fact that such special permission has been restricted to rural, under-served areas. The developments to date signify a partial success by the pharmacy profession towards its role extension. However, this is likely to remain limited due to the forces operating against it. Considering this context, the development of "health centres" might prove to be an alternative avenue for the integration of pharmacists into the health care team.

Leufkens and others (1997) draw out some of the longer-term implications of an expanded role for pharmacists.

> The role of clinical pharmacy in the health care system is changing rapidly. This change is almost universal among different countries and is related to developments in medical technology, health economics, informatics, socio-economic status, and professional relations. Transitions to new systems of clinical pharmacy are difficult to anticipate. Even with well-defined targets, it remains uncertain what the future of clinical pharmacy will bring us. The construction of plausible scenarios may help us better in preparing for the 'new world' ahead. …After we identified the driving forces behind the future of clinical pharmacy, various sets of assumptions were made and from them scenarios were constructed which are plausible: they 'could' happen. This analysis provided a logical framework in which we ultimately depicted three alternating stories of the future of clinical pharmacy, named 'CLERK', 'CONTROLLER' and 'CARE MANAGER'. These scenarios are intended to help clinical pharmacists to break free of familiar mental maps and to stimulate creative thinking on the future.

Relatively little has been written or said about the likelihood of an expanded role for pharmacists in the Canadian health care system, or the development of scenarios that project the demand for pharmacists under different practice regimes. Some interviewees indicated that various associations of medical professionals tend to jealously guard the turf of their disciplines, but that, in practice, the general shortage of resources in the system and the demonstrated value of pharmacists on the clinical team in hospitals tends to melt this opposition in practice.

4.4.4 Specialized Pharmacy Practices

Reports in the Canadian literature suggest that some community pharmacies have developed specializations in the treatment of certain ailments or diseases, suggesting that their role has gone well beyond a simple filling of a doctor's prescription. For example, in the past few years, the Association québécoise des pharmaciens propriétaires (AQPP 2000) has noted the emergence of specialized practices in pharmacies including: house calls; travel, fertility, and breast-feeding clinics; parenteral (injectable) therapies; AIDS treatment; public health clinics to conduct tests and do follow up on problems such as diabetes, hypertension, and unhealthy cholesterol levels. This development of specialized practices is part of the profession's overall objective of ensuring correct use of medications.

Cardinale (1997b) notes that four university professors, addressing hospital pharmacists attending ASHP's recent annual meeting, contended that alternative medicine is already well entrenched around the world, especially in places like Europe and Latin America. All four experts agreed that there are opportunities for pharmacists willing to learn about this unique and sometimes controversial type of health care. According to Mary L. Chavez, interim assistant chair for clinical education at Midwestern University Chicago College of Pharmacy, acceptance should continue to grow, not only among pharmacists, but also by the population at large.

4.4.5 The Role of Pharmacy Technicians

Many interviewees and articles suggest that technicians can play an important role in alleviating the current excess demand for pharmacists. In many hospitals, where there are fewer barriers on the use of pharmacy technicians, much of the dispensing function has been given over to technicians, freeing pharmacists to take a more active role in the medical team and advising on appropriate drug therapies. In short, the role of pharmacy technicians is expanding and becoming more formalized as various provinces move toward mandatory training and/or certification. Now, however, practices in the training, certification, and use of pharmacy technicians appear to vary significantly across jurisdictions and practice settings. Many in the pharmacy community believe the lack of standards in this area inhibits an expanded role for technicians to relieve the current shortage of pharmacists.

According to one interviewee, the role of the technician in community pharmacy has also evolved in the last ten years, moving from just counting pills to entering prescriptions and demographic information in the computer system (for later verification by the pharmacist), and taking phone and fax orders from regular customers. At times, the technician may be alone behind the counter, while the pharmacist is on the floor giving advice to consumers on over-the-counter medications, or counselling patients on their prescription medication. Prescriptions still need to be checked by the pharmacist, however, before they can be given to the customer.

Standardized data on pharmacy technicians is difficult to obtain because the occupation is combined in Statistics Canada data with that of other technicians employed in Canada's health care system. Thus, neither Statistics Canada nor the pharmacy community can provide much data on which a demographic profile of pharmacy technicians could be based. There appear to be no current efforts to generate additional information. This information gap could only be filled, therefore, by a survey of pharmacies and/or pharmacy technicians.

4.5 Education and Ongoing Training in Pharmacy

All Canadian pharmacist licensing bodies effectively require a Bachelor of Science (Pharmacy) degree or equivalent to become a registered pharmacist, in addition to an expectation of continuing education throughout the years of practice.

The NAPRA website offers a summary of the general requirements to become a licensed pharmacist in Canada:

> With the signing of the Mutual Recognition Agreement for the Profession of Pharmacy in Canada on April 9th, nine provincial regulatory authorities agreed to adopt the "National Model Licensing Program" requirements on July 1, 2001. While the pharmacy licensing authorities in Northwest Territories, Quebec and the Yukon are not signatories to the Agreement at this time, discussions are underway to bring all Canadian provinces and territories into the Agreement. The requirements of the National Model Licensing Program are as follows:
>
> **Academic Qualifications**
> As established as a prerequisite for the national competencies in the *"Professional Competencies for Canadian Pharmacists at Entry-to-Practice"*:
>
> "…completion of a degree program in Pharmacy, accredited by the Canadian Council for Accreditation of Pharmacy Programs (CCAPP) or a body recognized by CCAPP; or determined to be equivalent to a CCAPP-accredited program by a Provincial Pharmacy Regulatory Authority; or determined to be equivalent to a CCAPP-accredited program by the Pharmacy Examining Board of Canada."
>
> **Language Fluency Requirements**
> This Competency Unit states that:
>
> "Pharmacists educate and communicate with groups and individuals to support optimal patient care and promote health"
>
> Element #4.5 of this Competency Unit requires pharmacists to:
>
> "Demonstrate comprehension and fluency in written and verbal English or French" (See "Language Fluency Requirements for Licensure as a Pharmacist in Canada".)
>
> **Pharmacy Jurisprudence Requirements**
> This Competency Unit states that:
>
> "Pharmacists practise within legal requirements, demonstrate professional integrity and act to uphold professional standards of practice and codes of ethics." (See "Pharmacy Jurisprudence Competencies for Licensure as a Pharmacist in Canada.")
>
> **Practical Experience/Training Requirements**
> See "A Framework for Assessing Canadian Pharmacists' Competencies at Entry-to-Practice Through Structured Practical Training Programs".
>
> **National Licensing Examination**
> The final step in approving the Pharmacy Examining Board of Canada's revised Qualifying Examination as a component of the National Model Licensing Program was completed by NAPRA Council on July 13, 2000. This revised licensing examination will now consist of two components: a written portion and an OSCE (Observed Structured

Clinical Examination), both designed to test NAPRA's "Professional Competencies for Canadian Pharmacists at Entry-to-Practice".

There are currently nine schools of pharmacy in Canada, accredited by CCAPP, offering the Bachelor of Science (Pharmacy) degree, the educational standard for pharmacy practice in Canada in all jurisdictions:

- Memorial University of Newfoundland, School of Pharmacy
  www.pharm.mun.ca
- Dalhousie University, College of Pharmacy, Nova Scotia
  www.dal.ca/pharmacy
- Université de Montréal, Faculté de Pharmacie, Quebec
  www.pharm.umontreal.ca
- Université Laval, Faculté de Pharmacie, Quebec
  www.pha.ulaval.ca
- University of Toronto, Faculty of Pharmacy, Ontario
  www.utoronto.ca/pharmacy
- University of Manitoba, Faculty of Pharmacy
  www.umanitoba.ca/faculties/pharmacy
- University of Saskatchewan, College of Pharmacy and Nutrition
  www.usask.ca/nutpharm/
- University of Alberta, Faculty of Pharmacy and Pharmaceutical Sciences
  www.pharmacy.ualberta.ca
- University of British Columbia, Faculty of Pharmaceutical Sciences
  www.ubcpharmacy.org

Programs are available in at least one university in each province except New Brunswick and Prince Edward Island. Quebec offers the required program at both Laval and the University of Montreal. Several interviewees indicated that reductions in federal and provincial funds to higher education make it difficult to respond to shortages through increased enrolment in pharmacy programs.

Many teaching hospitals offer residency programs in association with Faculties of Pharmacy leading to a certificate. These programs expose recent graduates to a wide range of patient care/drug therapies and counselling situations, considered to be essential for clinical practice in both hospital and community pharmacy settings.

One interviewee suggested that pharmacy programs tend to be geared to the hospital setting with an emphasis on clinical aspects of the job that tend to be more heavily practiced in hospitals than in community pharmacies. Another interviewee suggested that regulations that require pharmacists to be the owners or managers of pharmacies are not really reflected in pharmacy training programs. These programs rarely include business or management skills in spite of the fact that time-use studies indicate that a significant portion of the community pharmacist's time is devoted to these functions. Indications are, therefore, that there is some disconnect between the skills and knowledge acquired through formal education requirements, and what most community pharmacists currently do on the job.

4.5.1 Availability of Faculty and other Educational Support Providers

A number of interviews as well as the literature indicated that the general shortage of pharmacists also put more pressure on the market for academic pharmacists to serve on pharmacy faculties as well as those supervising internships. Interviews with representatives of the Canadian pharmacy community suggest that anticipated or desired expansion of pharmacy program capacity would also be hindered by a scarcity of qualified teaching faculty. Wage increases for pharmacists at entry levels tend to reduce the economic advantage associated with further education to the Masters, Doctor of Pharmacy (PharmD), or PhD level.

Jorgenson et al (1998) note a related issue that is making it more difficult to deliver both academic and clinical dimensions of the education of pharmacists.

> Academic medical centers continue to bear the burden of the additional costs of professional education. Such institutions and their affiliated colleges of pharmacy are challenged to sustain the degree of professional staffing required to deliver quality education and patient care services. Historically, these relationships have not always proven to be cooperative and mutually beneficial. As managers and deans attempt to maximize the productivity of their financial and human resources, they will need to creatively structure relationships that effectively meet those diverse professional missions that sometimes seem to exist in conflict or that each seem to be successful only at the expense of the other. Pharmacists who act as both faculty, delivering experiential education, and clinical staff providing patient care, are significantly stressed in their attempts to meet the sometimes conflicting objectives of these multiple missions.

Reports suggesting that Canadian hospitals are finding it difficult to fill pharmacist positions also suggest that shortages could also threaten the development of the next generation of pharmacists. Without adequate staffing, pharmacists may find it difficult to provide both good instruction as well as expected levels of patient care.

4.5.2 Internships and Practicum

Letendre, et al (1995) note that practice-based pharmacy training has a long history, particularly in institutional pharmacy practice. Formal pharmacy residency training programs and accreditation standards were first developed in the early 1960s. Practitioners now practice in a much different environment, and residency programs and accreditation standards have changed dramatically to meet the needs of practitioners, patients, and employers. The authors trace the evolution of programs from general internships through clinical practice and specialty residencies and fellowships and the development of standards and competency-based training.

Middleton (1999) reports that both pharmacists and pharmacy students are giving high marks to a unique externship program at the University of Toronto that offers pharmacy students first-hand experience practising pharmaceutical care (PC).

4.5.3 The PharmD Debate

The PharmD debate is a largely internal discussion within the pharmacy community about the optimum educational requirement for the practice of pharmacy. In Canada the current educational standard is a Bachelor of Science in Pharmacy (BSc Pharm). The debate concerns the question whether a bachelor's degree is a sufficient preparation for the increasingly clinical role of the pharmacist. Faculties of pharmacy in the US have agreed to phase out the BSc Pharm as the entry-to-practice degree in favour of the Doctor of Pharmacy (PharmD) degree.

The PharmD debate is relevant to the pharmacist supply issue because any increase in educational requirements will, all other things equal, temporarily reduce the flow of new pharmacy graduates. As the American experience shows, adding a year to a program has the effect of removing one years' worth of graduates from the labour pool, though a phase-in period can spread this impact over several years. The supply impact of the ten-year phase-in period in the United States has been mitigated through increased enrolment.

Hitchens (1997) reported that the Standards 2000 adopted by the American Council on Pharmaceutical Education in June govern accreditation of academic colleges of pharmacy after July 1, 2000. They effectively discontinue the BSc Pharm degree for students admitted into pharmacy school after June 30, 2000. Thus, depending upon the academic structure of the school, all accredited schools of pharmacy will graduate the last baccalaureate class by 2004, and all future students intending to practice pharmacy will only have the PharmD program available to them.

A similar move in Canada has been discussed and debated, but there appears to be no strong support for following the US lead on this issue. Hill (1999) explores the question of whether Canadian schools of pharmacy should follow the American lead and convert existing BSc Pharm degree programs - typically five years of post-secondary education divided into general and specialized pharmacy training as "1+4" or "2+3" into "entry-level" Doctor of Pharmacy degree programs. PharmD programs typically require six years of post-secondary education in a 2+4 format. The University of British Columbia and University of Toronto currently offer a PharmD program.

Arguments in favour of moving to the PharmD designation centre on supporting and enhancing the role of pharmacists as clinical health professionals as drug therapies become more complex, and to support public perceptions of the value of pharmacy services. Hill concludes his review of the US and Canadian contexts, however, by noting:

> Significant differences between the two countries in matters such as the historical development of various degree programs, financing of health care systems, private enterprises and competitive markets permitted in the respective health care systems, government roles, schools of pharmacy budgets and resources, approval process for new degree programs in post-secondary institutions, and in other areas suggest that Canadian pharmacy academic and professional leaders will have to assess the merits of the entry-level PharmD and its implications for the profession from a unique Canadian perspective (p.16).

The vision paper recently released by the ACCP (2000) suggests that the PharmD versus BSc Pharm was a major distraction and divisive debate that continues to cause confusion and concerns in the US. With some exceptions perhaps concentrated in the hospital sector, the Canadian pharmacy community seems disinclined to pursue the same course as the United States (Jamali 1999). Few of those interviewed commented on this issue and indications are that no major modifications to the educational requirements for pharmacists are likely in the foreseeable future.

4.5.4 Specialty Certifications

We found no comprehensive source of information on the availability and incidence of specialty certifications in Canada. Typically, these certifications indicate that the holder has passed a course in some specialized areas such as management of diabetes, asthma, hypertension, or smoking cessation or practice areas such as industrial pharmacy. According to the Taro Report (p. 18), 56 percent of community pharmacists consider themselves specialists in some area, though this does not necessarily mean they are certified in these areas.

Vecchione (1997) reports that the need for specialized pharmacists is growing in all practice settings, thanks in part to the cost-conscious nature of managed care in the United States. Barner and Bennett (1999) report on a Pharmaceutical Care Certificate Program that prepares pharmacists to perform enhanced patient counselling, though lack of time seems to be one of the major barriers for actual implementation of the certification program. One proposed solution is the development of partnerships between pharmacists and schools of pharmacy.

Barnette et al (1996) describe the design and development of two unique clinical skill development programs at the University of Illinois at Chicago. They outline the patient focused services in community pharmacy that participants established upon completing the training. The programs successfully enhanced participants' therapeutic knowledge base and facilitated development of the clinical skills necessary for direct patient care.

Cardinale (1997b) reports that at the National Community Pharmacists Association's recent annual meeting in Denver, the message delivered to independent pharmacy owners was that pharmacist care programs can be financially as well as professionally rewarding. Richard A. Jackson of Mercer University's Southern School of Pharmacy observed that the National Institute for Pharmacist Care Outcomes has developed several professional education programs tailored to specific disease states, including hypertension, hyperlipidemia, and diabetes, all of which can have a positive economic effect on a pharmacy.

The extent and importance of specialty certifications in Canadian pharmacy have not been well researched. Standards, certification, and recognition for pharmacy specialties appear not to be well developed. More extensive discussion and activity would be required to develop a more formal program of specialties in Canada, though it is not clear that this is a priority for the Canadian pharmacy community at this time.

4.5.5 Continuing Education

Continuing education (CE) has long been a vital component of training in pharmacy, allowing pharmacists to remain current on new drug therapies and standards of practice in both Canada and the United States. Faculties of Pharmacy in Canada routinely provide CE programs to practicing pharmacists, including evening program, day or weekend workshops, and home study programs.

The OPA Wage and Benefit Survey reports that about three out of every four hospital pharmacists receive regular pay while attending continuing education courses, and 80 percent of hospital employers pay registration fees. Support for continuing education for community pharmacists is somewhat less common, though it varies by type of pharmacy. Just over one third of pharmacists employed by chains reported that they were paid while on continuing education, while only 12 percent of those working as pharmacists in department and grocery stores received such support. Between 40 and 50 percent of community pharmacists have their registration fees paid by the employer.

Trinkle (1999) asserts that access to interesting and pertinent continuing education material would be expected to encourage pharmacists to pursue postgraduate professional development. The Internet is one means of providing accessible and timely instructional material. Twenty-nine Internet sources of continuing education available for pharmacists were identified. Criteria for inclusion included free educational credit and accreditation by a recognized body. Evaluation criteria were currency of the offerings, author and sponsor identification, software requirements in addition to a browser, and methods for submitting examination answers and receiving certificates of credit.

The Mutual Recognition Agreement for the Profession of Pharmacy in Canada will soon bring changes to continuing competency requirements in many provinces. In the past, most provinces required 15-20 continuing education units (i.e., hours) annually to maintain a pharmacist license. With the implementation of the Mutual Recognition Agreement in July 2001, the provincial licensing authorities will be moving away from CE units to competency assessment and review. Some have speculated that this transition could inspire some older pharmacists to retire rather than face a competency assessment or pursue remedial training, further reducing the supply of pharmacists. Others believe that since competency assessments are conducted on only a small proportion of practicing pharmacists in any given year, the new system of competency assessments is unlikely to have a major impact on pharmacist supply. We found no systematic or detailed study of the likely impacts of this change.

4.5.6 Training for Pharmacy Technicians

Training for pharmacy technicians has been available since the early 1970s, but remains underdeveloped compared to programs for pharmacists. Despite the pressures in the pharmacy and the increasing role of technicians in filling prescriptions, there are no formal training requirements for pharmacy technicians in any Canadian jurisdiction, though some employers, notably hospitals, clearly prefer candidates with some formal pharmacy education, typically acquired in community colleges.

Though many employers appear reluctant to recognize the certification of graduates, a number of community colleges continue to provide pharmacy technician training. The following list is drawn from the Pharmacy 2000 Sourcebook supplemented with information from our interviews and Internet research:

National

- Canadian Association of Pharmacy Technicians (CAPT) www.capt.ca
- Tech Lectures (On-line training) www.techlectures.com

Nova Scotia

- Nova Scotia Community College www.nscc.ns.ca

Quebec (Vocational High Schools)

- Centre de formation professionnelle du Trait-Carré
- Centre Pierre-Dupuy
- École de formation professionnele de Chateauguay
- Riverside Park Academy

Ontario

- Algonquin College www.algonquinc.on.ca
- Cambrian College www.cambrianc.on.ca
- Centennial College www.cencol.on.ca
- Fanshawe College www.fanshawec.on.ca
- Humber College www.humberc.on.ca
- Mohawk College www.mohawkc.on.ca
- Niagara College www.niagarac.on.ca
- Sheridan College www.sheridanc.on.ca
- St. Clair Community College www.stclairc.on.ca

Manitoba

- Winnipeg Technical College www.wtc.mb.ca
- Robertson Career College www.robertsoncollege.com

Alberta

- Red Deer College www2.rdc.ab.ca/pharmtech

British Columbia

- Sprott Shaw Community College www.sprottshaw.com
- Vancouver Community College www.vcc.bc.ca

One interviewee suggested that community colleges are reluctant to train technicians in the current environment because there appears to be little recognition of the training among employers. Wages are low and those with college training do not necessarily get higher wages than those without training. Nevertheless, the Taro Report indicates that college-trained pharmacy technicians' wages average about $1 per hour, or 10 percent more than those without a college certificate.

Hospitals are more likely to require college training in their technicians and wages in hospitals are often double those paid technicians in community pharmacy. One interviewee from a hospital setting noted that they have always insisted on college training for their technicians, indicating that this was a more reliable indicator of competence than the voluntary certification offered in Ontario.

Beavers (1997) reports that a home study course developed by the Iowa Pharmacists Association and the Wisconsin Pharmacists Association should soon provide pharmacy technicians nationwide with a more affordable means of preparing for the national technician certification examination. Currently, most technicians pay up to $80 to attend 1-day workshops, generally organized by state pharmacy associations.

4.5.7 Certification of Pharmacy Technicians

Pharmacy regulatory authorities in several provinces are looking at introducing or enhancing certification programs for pharmacy technicians. At the moment, however, there are no mandatory certification programs, and the skills and training of pharmacy technicians are currently left to an informal amalgam of high school and community college programs, training programs provided by pharmacy chains, training provided by supervising pharmacists, and skills obtained by technicians through experience.

Interviewees reported that regulatory authorities in pharmacy in several provinces are working actively on certification programs. Both Ontario and Alberta currently have voluntary certification programs. Wage data suggest that employers have not yet recognized significant value from such certification.

Murer (2000) notes that in the United States four founding organizations established the Pharmacy Technician Certification Board (PTCB) to create a single, consolidated, voluntary national certification program in 1994. Thanks to a strong, multifaceted plan and a commitment to partnership, in January 1995 PTCB was established as the national credential granting organization for pharmacy technicians. Some chains have come out in support of technician certification so that their pharmacists can spend more time counselling patients (Fleming 1997a). The ACCP reports that more than 54,000 pharmacy technicians are currently certified by the Pharmacy Technician Certification Board in the United States (American College of Clinical Pharmacy 2000, p.1006).

Ukens (2000c) reported that the creation of a national competency assessment program for technicians by the National Association of Boards of Pharmacy (NAPB) received a thumbs-up from state pharmacy board delegates at their recent annual meeting. The resolution ultimately adopted by the delegates noted that use of pharmacy technicians is becoming more widespread, and it called on the NABP to create a national program on technician competency and regulation changes that would recognize the right of technicians to assist in the pharmacy. The resolution will be forwarded to the NABP advisory committee on examinations in August. Following deliberations, that group will send its recommendations to the executive committee for further consideration.

Ness and Grauss (1997) suggest that if pharmacy is to evolve into a more patient-focused, outcome-oriented service, it will be necessary to expand the use of technicians. One expanded role of trained technicians in hospitals may be performing the final check of the unit-dose cart filling done by other technicians, or tech-check-tech (TCT). The use of hospital technicians in this capacity is voluntary, and responsibility and liability for these programs are held by the director or manager of the pharmacy.

Chi (1997) reports that Texas has already mandated that by the year 2001, all technicians working in the state must be certified. Other states, such as North Dakota and Utah, have either passed technician licensure or registration requirements or updated their pharmacy practice act, with provisions that also encourage certification. Meanwhile, Chi reports that employers in the United States are also fuelling the growth of tech certification.

4.5.8 Remedies for Alleviating the Shortage of Pharmacists

The obvious remedy for a shortage of pharmacists is to make more. In pharmacy, as with all forms of highly skilled labour, this solution is not so simple because it takes at least four to five years between the time of order and the date of delivery. Further, major expansion of pharmacy programs often take investments in additional physical space and infrastructure, as well as recruitment of additional faculty, both of which clearly add to lead times.

In the shorter term, the literature and interviewees suggested there were things that could be done to alleviate the shortage.

- Focus the efforts of pharmacists on those areas of activity for which they are uniquely qualified.
- Expand the use of pharmacy technicians, including a “tech check tech” program, where technicians can check each other’s work to ensure the prescription is filled properly, rather than the pharmacist.
- Expand the use of “Lock and leave” provisions for pharmacies co-located in all-night grocery or department stores.
- Improved working conditions for pharmacists and technicians, including scheduled meals and breaks, will make employees happier, feel more appreciated and less likely to leave.
- Improvements in technology including improved phone systems, better ergonomics and work flow arrangements, and automatic dispensing machines. (The Taro Report, p. 8).

Many of these initiatives require at least a coordinated approach, while some require changes in regulatory regimes or standards. In every case, these initiatives require some form of coordinated action or strategy among various elements of the pharmacy community.

5 Technology

Historically, industrial or business technological advance, as distinct from purely scientific technological advance, generally emerges for the purpose of labour management (taken in the broadest sense) and appears in two forms: as machine power or as automation. Physical dispensing of medicines, the traditional central operation of pharmacists, has now become routine enough to render portions of it susceptible to automated control. In recent years, computer-automated dispensing technology has been developed that is low cost enough to be in the reach of many community and hospital pharmacy operations. As discussed below, automated dispensing is increasing in Canada, but this is more likely to reduce the demand for technicians than clinical pharmacists.

What seems curious, however, is that, despite the promise of reduced use of labour that technology typically offers (which is especially promising in the context of labour shortage), there is relatively little attention paid in the literature to the human resource potentials of automation. The recently published overview of pharmacy human resource issues (commissioned by the American College of Clinical Pharmacy) mentions technology only briefly, and places the main driver for adoption of automated dispensing, and data retrieval and storage, not in labour-saving, but in external social forces: "society will become increasingly technology literate and technology driven." (ACCP 2000, p. 993). However true this may be as a general assessment of society, this cannot stand as a reasonable motivation for technological change in the particular instance of pharmacy. Technological changes only emerge in a sector when they provide a clear economic advantage either through reduced cost or increased price via greater value to the end user or customer.

In a recent Canadian roundtable dealing with human resource issues in pharmacy, participants similarly spent very little time discussing the potentials and problems of using technology to address general problems on the labour front, a fact ruefully observed at the end of the roundtable (*Pharmacy Post* 1999). Without a doubt, the issue of technology does not appear to pharmacists to be among the most pressing factors when discussing human resources in pharmacy. There may be perfectly sound reasons for this: for instance, the second motivation for the emergence of new technology in pharmacy - especially the sharing of patient information and pharmaceutical data - is not motivated by human resource concerns at all, but by the duty of pharmacy to provide the best possible service to its patients and clients. Technology of this sort appears to represent an intensification of the workload of pharmacists rather than a lightening. It may not be surprising, therefore, that any technological advance in pharmacy is met by those in the front lines of the profession with at least some scepticism.

This section examines the literature on these two sources of technological innovation - technology introduced to manage and use labour and skilled resources more effectively, and technology introduced to provide better care - and surveys the various potentially helpful forms technology can take and is taking in modern Canadian pharmacies.

5.1 Information Technologies

Without a doubt, the most widespread new development in pharmacy is information technology. In general, these styles of technology are directed primarily toward providing either the client or the pharmacist with information relevant to particular drugs and their uses, or to providing pharmacists with individual patient histories. The former category undoubtedly aids pharmacists, particularly in the purely clinical dimension of their professional exercise (Etreby and Pavlovich 1997). In the latter category, the information provided by electronic data systems is helpful in avoiding dispensing by different pharmacies of contra-indicated medications to a single patient, as well as forestalling patient

abuse of the health-care system. Beyond these data systems, however, the Internet also promises to be a useful vehicle for information sharing and continuing education.

Information technology in support of clinical practice appears on the basis of our interviews to enjoy the support of pharmacists in the field—as will anything done in support of clinical practice. Most interviewees view such systems, augmented by mobile access equipment such as palm pilots, as a key part of the equipment of the new pharmacist (replacing the mortar and pestle of the traditional pharmacist), and thus central to the development of pharmacists as important members of the clinical team. Pharmacists will undoubtedly be helped by mobile access to information systems, but will additionally need to develop roles as the best placed interpreters of that information.

Further study to discover strategies for implementing these new information technologies would assist in ensuring that this technology complements rather than threatens the growing clinical aspect of pharmacist practice.

5.1.1 Patient Information Systems

Exhibit 15 shows the extent of networks of prescription payment and/or patient data by province. While the amount of patient information available varies widely, pharmacy networks are certainly an aspect of daily life for the majority of Canadian pharmacists. Though the benefit to the health-care aims of pharmacy are obvious and indisputable, our interviewees (the literature is silent on this point) claim that these patient data networks have had two principal negative effects on the practice of pharmacy. First, they represent an additional administrative layer to a pharmacy operation—connectivity of even a limited scope brings this about. Second, the imperative by government and professional associations to use these systems, while reasonable from the perspective of health care delivery, thrusts the local pharmacist into a gatekeeper role without the governmental and associational support for this new function. In short, technology has been introduced with little thought of how it might be used most effectively. As a result, observers indicate that the technology tends to create more work and more unsupported responsibility in the long run, instead of using existing labour resources more efficiently.

It would clearly be helpful to have a more detailed study of the impact of patient data systems on human resources in pharmacy. Precisely how much more work do such data systems represent for the pharmacist? What measures can government and professional associations provide in support of the emerging gatekeeper role? Is it, in fact, the goal of governments and associations to redefine the role of pharmacists in just this way, or was this development not actually foreseen when the patient data systems were implemented?

Exhibit 15: Drug Plan Coverage and Claims Networks

	Provincial Drug Plan	Pharmacy Network
Nfld	Partial	None
PEI	Partial	Pharmaceutical Informatics Project
NS	Partial	Pharmacare Net
NB	Partial	ClaimNet
Que	Yes, if not otherwise covered	Tactik
Ont	Partial	Health Network
Man	Yes	Drug Programs Information Network
Sask	Yes	Taltek Pharm. Network
Alta	Yes	Alberta Wellnet
B.C.	Yes	PharmaNet
Territories	Partial	None

Source: Data compiled from *Pharmacy Post* 2000.

5.1.2 On-line Pharmacy

From its very limited reach even seven or eight years ago, the Internet has developed into an important new avenue for retailing worldwide. Statistics Canada recently reported that more than half of Canadians over the age of 15 now have access to the Internet. By and large, the public shows an expanding appetite for making purchases online as a reasonable alternative or adjunct to store purchasing. As a result, it seems sensible to assume that the conveniences of online purchasing is already or soon will be demanded by consumers of pharmacy retail in the future.

Accordingly, as retail operations, community pharmacies experience pressure to take advantage of the Internet to increase their business because of the potentially significant new market the Internet represents for an individual retail pharmacy. In anticipation of increased commercial opportunities online, InfoPharm, Quebec's leading supplier of information-technology tools for pharmacies, recently announced its intentions to focus on providing e-commerce solutions for retail pharmacy (InfoPharm 2000).

One example of the potential expansion of markets represented by the Internet is the Glebe Apothecary, a pharmacy in Ottawa, which has recently teamed up with Peachtree Network Online Food Channel to sell over-the-counter pharmacy products (along with gift baskets, cookware, and specialty foods) in the North American market (Kuske 2000, www.feelbest.com). Given the importance of over-the-counter sales to the total revenue of retail pharmacies, such ventures are expected to expand rapidly in the next few years. Almost a year ago, a CACDS-sponsored conference was held to investigate the effects of the Internet on pharmacies, with particular attention to government and sector regulations to protect online consumers (Canada Newswire Service 2000a). Access to the results of the conference were not available at the time of this writing, but the topics remain important for pharmacists and pharmacy owners.

In the United States, a study commissioned by Schering Laboratories concluded that online pharmacies would experience sharp increases in profits, especially those who also had physical storefronts - the so-called “click-and-mortar” pharmacies (Cardinale 2000). Why combined physical-cyber pharmacies do better than just cyber-pharmacies is unclear.

Current regulations in Canada largely prohibit on-line or electronic prescriptions. Interviewees noted that one of the barriers to on-line dispensing is the issue of the required interaction between the pharmacist and the client, so that the appropriate questions may be asked and the opportunity for counselling or advice on proper use of the drug may be offered. Another barrier is public's lack of trust and confidence in the security of private information transmitted or stored via web-connected computers. The National Association of Pharmacy Regulatory Authorities recently released a study entitled "A Secure System for Transmitting Prescriptions and Related Patient Information Between Prescribers and Pharmacists" (NAPRA 2000). The paper discusses "options that are available to electronically deliver prescriptions from a prescriber to a pharmacist, taking advantage of the Internet". It also discusses the security aspects of electronic transmissions and makes recommendations regarding the process of transmitting a prescription electronically.

5.1.3 Information Technology and Continuing Education

In spite of the immense commercial side of the Internet, the origins of the Internet are in the facilitation of research and education, not the sale of goods and services. Educational services on the Internet are expanding rapidly, providing a cost and time-effective means to provide updates to skills and knowledge. Pressures to deliver course materials more efficiently (which turned out to mean high student to teacher ratios) have compelled post-secondary educational institutions — vocational, professional, and academic — to develop technological protocols for course support and even entire course and program delivery (such as the WebCT environment).

The principal use of Internet education in pharmacy has been in postgraduate professional development and training upgrades. A survey published in *Pharmacotherapy* documenting these resources identified 29 Internet sites providing continuing education to pharmacists in the field, though clearly that number has increased since the study (Trinkle 1999). On the Canadian scene, Sparling Capital Corporation recently announced its purchase of Summit College and Red-Tail Information Technologies (both located in Kelowna, B.C.) to provide Internet programs aimed (among other things) at training Pharmacy Technicians (Sparling Capital Corporation 2000). This venture and others like it will be increasingly important as government and professional associations look to formally certify pharmacy technicians in the future.

5.2 Other Technologies

Software developers have also developed products to automate pharmacy management and to facilitate electronic prescriptions. While current regulations appear to hinder the widespread implementation in Canada of e-scripts, the practice is growing in the United States, and thus will no doubt lead to facilitating regulation changes in Canada, especially as secure data transmission and relevant working software become more available.

Innovium Capital Corporation announced last summer its readiness to launch the first out-of-the-box solution for the secure wireless creation and transmission of electronic prescriptions (Innovium Capital Corporation 2000). The technology allows RxRite to deploy their e-prescription service directly into the hands of physicians, without requiring computers and Internet connectivity. The development mirrors the software vendor Proxymed's 1997 plans to have its electronic prescribing software installed in 33,000 community pharmacies across the United States (Muirhead 1997). When combined with other automated elements in the overall dispensing process, such technology can conceivably cut down on dispensing functions of pharmacy technicians and pharmacists to the extent that will make a significant impact on the human resource picture in pharmacy.

There is corresponding growth in the development of software management tools. Last year, Medisolution expanded the client list for its Simplicity Plus retail pharmacy management system to include a major chain in Western Canada. Two more Ontario hospitals became clients for its Human Resource Management System (Medisolution 2000). Meanwhile Quintiles announced that their next product in the Quinternet series, “Rx Dosage Insight,” is scheduled for beta testing shortly, and their real-time market intelligence products, “Pharmacy Cost Analyzer” and “MD Profiler,” are nearing completion.

The implications for human resources of software management products such as these are not, as far as we can tell, dealt with in the literature. Because of their advertised functions, however, these products must necessarily introduce some impact on the use of labour in the pharmacy. Studies on the extent to which these software programs increase labour productivity or, on the other hand, add complexity to the life of pharmacists as well as requiring the development of certain skills would clearly be helpful at this stage, especially in view of their potentially rapid implementation in Canada when and if current regulatory barriers are removed.

5.2.1 Automated Dispensing and Central Filling

Without a doubt, the most promising appearance of automation-style technology in pharmacy is in dispensing. ScriptPro's SP 200, the first fully automated dispensing system designed for community pharmacies, appeared in the United States three years ago (Ukens 1997a). The capacity of ScriptPro to dispense 60 prescriptions per hour made it intensely interesting to pharmacies seeking to boost efficiency, reduce prescription errors, and free pharmacists for clinical work.

Automated dispensing seems to be most helpful, however, in large scale, bulk-dispensing operations, such as retail pharmacies in large urban settings or larger hospital pharmacies. To create the scale required to take advantage of the technology, some chains and some hospitals have been transferring all dispensing functions to central locations (Brookman 2000).

Some interviewees also singled out central filling as a reasonable strategy for using technology to address labour shortages. One after another remarked on the positive potential of automated dispensing (and the same potential would naturally hold for increased use of pharmacy technicians) to free pharmacists to develop and practice the clinical aspect of their profession. Central filling and clinical practice could clearly combine to introduce labour efficiencies while generally not inconveniencing the patient, though one imagines a number of particular instances where that would not be the case.

But those interviewed also saw definite limits on the effectiveness of automated dispensing (and related centralization strategies). There are still a small but significant number of prescriptions, especially in paediatrics, that are generally not accommodated by automated systems. Compounded prescriptions, the physical mixing of two or more production medications, and intravenous preparations are two further examples of activities that lie outside the scope of automated dispensing systems (Terlach 1997).

In some cases, interviewees observed that current dispensing technology is actually inefficient enough to increase the pharmacist’s workload with tasks that in fact keep them from providing cognitive services. They further remarked that better, more suitable dispensing systems could be developed that not only did not add administrative work but truly cut down on keystrokes in such a way that would benefit all dispensing operations, not simply those that functioned to exploit operations of scale. For many dispensaries, a more cost effective option may be that pharmaceutical companies provide some of the more commonly prescribed drugs in containers with the more frequently required counts and dosages, rather than in bulk formats that require repackaging at the pharmacy level.

There appears to be significant gap between conclusions of published studies of automated systems — which tend to focus purely on the positive aspects of automated dispensing—and the experiences of pharmacists who deal with the technology in practice settings. Clearly, it would be important to a study of human resource issues in Canadian pharmacy (not to mention to the development of future dispensing systems) to be able to grasp all the implications of implementing technology of this sort. Furthermore, some human resource problems arising from implementing dispensing systems could be at least partially addressed by developing workable and flexible protocols for using dispensing systems to create labour efficiencies.

5.2.2 New Drugs and Issues of Ethics and Conscience

Pharmacists are clearly not insulated from the broad social debate on the ethics of new medical technologies generated by genetic and medical research. As the direct provider or purveyor of drug therapies to patients, pharmacists are the final link in the chain between medical research and the consumer, and this direct contact raises issues of conscience for some pharmacists in the dispensing of some drugs. To deal with the rights of both pharmacists and patients, some provinces have discussed or implemented "conscience clauses" that allow pharmacists to refuse to fill prescriptions on the basis of their religious or ethical beliefs. Some such clauses respect the beliefs of the pharmacist by permitting a refusal, while still allowing patients to access treatments approved by regulatory authorities by requiring a referral to a pharmacist prepared to dispense the drug.

One interviewee suggested that issues over conscience clause implementation is becoming more of a problem with the emergence of the Hormonal Emergency Contraceptive Pill (ECP), often called the morning-after pill, and its deregulation. Pharmacists who have undergone a short training course will be able to prescribe ECP. Yet some pharmacists have very strong religious objections to ECP, even to directing patients to other pharmacists who will carry out the requested duties. The problem will only intensify with the appearance in the future of the so-called abortion pill (RU-486).

6 Sector Initiatives

Based on our review of the literature and our interviews with key stakeholders in the pharmacy community, there is no other national effort to assess the extent and likely duration of the current shortage for pharmacists. The May 2000 issue of *Pharmacy Post* indicates that a number of provinces are looking at remedies for shortages in their own jurisdictions, but the issues appear to be common enough across all provinces and territories to warrant a nationally-based approach. Furthermore, the recent agreement on mobility of pharmacists across Canada suggests that regional issues or solutions will be even more likely to affect other Canadian jurisdictions than in the past.

Concerns have been expressed about shortages in a number of other health care professions and studies supported by HRDC that are underway for nurses and physicians. As noted earlier, there is some danger in looking at health professions in an isolation since, here too, there are spill over effects generated by migration of skill sets and occupational boundaries that have important consequences for other health professions. In an attempt to take a more comprehensive approach to shortages of health professionals, the Ontario Pharmacists' Association is participating in the Ontario Health Providers Alliance (2000) that released a strategy paper for discussion in December 2000.

The Ontario Hospitals Association is also conducting a study on hospital management issues that would include the role of hospital pharmacists and pharmacy technicians.

In Quebec, the Association Québécoise des Pharmaciens Propriétaires and Association des pharmaciens des établissements de santé du Québec and the Ordre des pharmaciens du Québec are participating in a Working Group on Human Resource Planning initiated by the Quebec Ministry of Health and Social Services and the Ministry of Education. A report is still being prepared and no preliminary information is available on the contents.

In general, interviewees welcomed an opportunity to study human resource issues in pharmacy from a national perspective, recognizing the important role played by provincial regulatory authorities. Many would welcome a comprehensive view of the issues and expect the information to be useful when dealing with other health care system organizations at the provincial level.

7 Gaps in Information

This review has summarized the literature and results from a series of twenty-three interviews with persons with a stake in pharmacy in Canada. We believe that two things are clear:

- First, there are significant issues related to the market for and role of pharmacists in Canada that promise to endure for at least a decade, and
- Second, that the information available is not likely to allow the development of a comprehensive strategy to deal with current and looming issues.

In this section we offer an analysis of the current gaps in information on human resource issues for Canadian pharmacists and suggest research efforts that could be undertaken to address these gaps.

7.1 Prospects for a More Detailed Employment Profile

Overall, we found the available information documenting the nature of the workforce in pharmacy to be inadequate for a model that could project the hiring needs of the industry into the future. Generally, such models require good information about the flows of employees into various segments of the industry as their careers progress, turnover rates among various types of employers, the rate of outflow out of the pharmacy or pharmacy technician occupations into other occupations, and the expected retirement rates of pharmacists and technicians.

Licensing bodies for pharmacists maintain data on individual pharmacists that could provide a wealth of information and fill some information gaps at relatively low cost. Given suitable assurances of confidentiality, it may be possible for participating licensing bodies to grant permission to use these databases for a more complete view of the current pharmacist workforce, career patterns, and turnover rates.

The outlook for a more comprehensive profile of pharmacy technicians is less positive, since there is no complete central registry for technicians in any province. A survey to gather data on employment and turnover may cost far more than the resulting data would be worth, unless the larger employers in the industry maintain detailed employment records for pharmacy technicians.

7.2 Prospects for Developing an Employment Outlook

This situational analysis has provided a summary view of the current shortage of pharmacists in Canada, reviewing the available evidence from both the demand and supply perspective, and exploring some of the underlying factors that contribute to the current situation and may bring change in the future.

Assessing the outlook for the labour market for pharmacists and pharmacy technicians depends on a host of factors that are not clear at this point and continue to depend on the acceptance of fees for cognitive services among the public in general, and governments and third-party payers in particular.

7.3 The Impact of Technologies on Skill Demand

Surveying the available literature on human resource impacts of new technology in pharmacy, we have seen that such technology has (as in other sectors) often meant more rather than less work and has changed job roles in unpredictable and in some cases unwanted ways.

The impact of these technologies—from data systems to automated dispensing—has not been examined in any comprehensive way in the relevant literature. This may be a result of the relatively recent

appearance of most of the technology. We do have, however, the comments and observations of our interviewees to show that the generally optimistic reports for human resources and health care delivery one finds in the published academic literature and in news releases from relevant software developers, ought to be seen as partial and one-sided. According to the interviewees, the situation is far more complex.

First, the interviewees believe that technology can only provide short-term benefits for the current labour shortage in pharmacy. While to some, technology appears to free the pharmacist to engage in clinical duties (which are important not only to job satisfaction but also to patient health), to others the technology frees the pharmacist from dispensing routines only to bind him with new kinds of administrative duties, duties he often has little or no training to carry out. Furthermore, technology (at least initially but there are clearly long range implications here, too) always requires specific new implementation training. Finally, some pharmacists are concerned that technology can be used to eliminate the entire practice of pharmacy altogether. Automated dispensing (especially in conjunction with electronic prescription systems) will develop the sophistication required to avoid errors, contra-indicated prescriptions, and even highly specific compounding or unique dosage tasks. Information systems, developed to support the cherished clinical side of the profession might be developed so that physicians alone will carry out clinical services traditionally associated with pharmacy. These are reasonable fears. Pharmacists, through the advocacy of their professional associations, will need to understand the forces at work in technology development and implementation in order to respond appropriately.

7.4 Summary of Information Gaps

As noted in Exhibit 16, in some cases the relevant information required does exist, but needs to be gathered, standardized, and analyzed. In some cases, primary research involving surveys, focus groups and interviews would have to be conducted to gather the required information. If additional information is to be gathered by way of a national survey, it will be important to minimize confusion and response burden by working, to the extent possible, with organizations that currently conduct regular surveys of their members or client groups. One strategy might be to piggyback existing surveys with a standard set of questions, with the results compiled on a national basis. This approach has the added virtue of assisting the industry to develop ongoing monitoring of patterns in human resource issues long after the initial study has been completed.

Exhibit 16: Summary of Current Knowledge and Gaps

Issue	Current Knowledge	Suggested Additional Sources
Current Demand for Pharmacists	Fair. Vacancy data are patchy by industry segment, better for chain pharmacies and hospitals.	A more comprehensive industry or sector survey on vacancies, anticipated employment growth, and employment turnover patterns.
Future Demand for Pharmacists	Fair. Have sense that demand is expanding, but how much depends on some unknowns including fee arrangements and labour markets for other health professionals.	Requires the development of a model of demand based on various scenarios of cognitive fees, demographics, prescription demand, retirement and other turnover rates. Incidence of multiple prescriptions and increased interaction risk may also be useful to examine.
Supply of Pharmacists	Good. Have reasonable information on capacity of domestic schools. Data on immigration and emigration are poor.	More information may be available from provincial pharmacist licensing bodies, and schools of pharmacy alumni records.
Future Supply of Pharmacists	Fair. Based on enrolment capacity and projections. Data on expansion plans of pharmacy schools incomplete.	Requires canvass of schools of pharmacy on capacity expansion plans, and barriers to expansion.
Profile of Pharmacists	Fair. Basic demographic information based on 1996 Census is available, though not analyzed.	Could use 1996 Census data to develop profile but this information is dated. Data from 2001 Census likely not available until 2003. Surveying employers for this data imposes heavy response burden. Would require data from pharmacist licensing bodies or a survey of individual pharmacists.
Profile of Pharmacy Technicians	Poor. Virtually nothing is known about this workforce except anecdotal observations.	No current source for these data though might be able to get something on those currently holding voluntary certifications in Ontario and perhaps Alberta. Would require survey of pharmacy technicians.
Availability of Training Programs	Very good for pharmacists, though some compilation necessary, particularly for continuing education. Fair for technicians.	Programs for pharmacists are concentrated at nine schools of pharmacy and information that is more detailed could readily be gathered. Technician training programs are more diffuse and not clear whether any systematic standards guide this training.
Career Paths of Pharmacists	Fair. No systematic study in Canada, though Job Futures has a brief profile based on NGS data.	Explore National Graduate Survey data on pharmacy graduates, particularly in comparison to graduates of other health programs. NGS data are readily available. Latest 5-year data are on 1990 graduates. The latest data on graduates two years after graduation data are on 1995 graduates, though 5-year data from this cohort should be available soon.
Career Paths of Technicians	Poor. Little is known beyond impressions.	Survey of pharmacists and pharmacy technicians. Could be difficult to track those who have left pharmacy setting, particularly technicians.
Work patterns/ hours of work	Fair. Mostly anecdotal information. Statistics Canada's monthly Labour Force Survey data is too thin to support significant analysis of pharmacist labour market.	Survey of pharmacists and pharmacy technicians. Survey of Labour and Income Dynamics could be used for data on pharmacists, but not technicians.

Exhibit 16: Summary of Current Knowledge and Gaps (Continued)

Issue	Current Knowledge	Suggested Additional Sources
Number and profile of pharmacists working in various settings	Fair. Distribution between community and hospital is quite well known, though outside pharmacy setting is not. Demographic profile in hospital pharmacy is good, poor in community pharmacy.	Post-secondary institutions with pharmacy-related programs could assist in tracking down career movements of graduates and registered pharmacists.
Recruitment and retention costs and associated issues	Poor. Literature provides little information beyond suggestions that turnover appears to be rising.	Survey pharmacists and technicians to provide data on turnover as well as estimates of time and cost associated with recruiting new personnel.
Factors prompting employer and occupational mobility	Fair on pharmacists, mostly anecdotal perceptions of what pharmacists want. Some studies on recruitment and retention but mostly dated. Poor on technicians.	Interviews, focus groups, and a survey of pharmacists and pharmacy technicians.
Factors prompting mobility in Canada and North America	Poor. No systematic study of the numbers involved in inter-provincial and international mobility.	Licensing bodies, and Faculties or Schools of Pharmacy may offer basic flow data across provinces, and to and from other countries.
Level of studies, percent pursuing graduate studies	Poor, data have not been compiled nationally.	Could likely be obtained from alumni and enrolment records of schools of pharmacy, as well as licensing body registrations. National Graduates Survey could provide data on class of 1990 and 1995.
Technology impact on HR needs	Poor. Analysis has not been done.	Survey and focus groups of pharmacy managers and pharmacists.
Domestic technology trends	Fair. Seems to be some survey based information on use of information technologies, but not much on impacts.	Interviews, focus groups, and survey of pharmacies.
Definition and structure of pharmacy industry	Fair, data on numbers and trends in pharmacy formats, but not much on underlying economics and future role in health care system. Not sure if adoption is slow or information is poor.	Interviews, focus groups and survey of pharmacies.
Regulatory Pressures	Fair. Does not seem to be a lot happening on business specifically, though rules for number of pharmacists and role of technicians appear to be under discussion.	Systematic review of nature, scope and progress of discussions between industry, associations and governments would be a useful contribution. Regulations are barriers to changing practice of pharmacy.
Sector Initiatives	Good. Those interviewed seemed to be aware of provincial initiatives to address shortages in pharmacy or the health care system more generally.	Does not appear to be another forum or initiative taking a broad look at the various issues underlying the current shortage nor on human resource planning for pharmacy more generally.

7.5 Conclusions

The overall impression we have gained from our review of the relevant literature is that relatively little effort, compared to the American scene in recent years, has been devoted to developing a comprehensive and standardized information base on human resource issues for pharmacists and pharmacy technicians in Canada.

Many of the issues that arise in the US analysis of the labour market for pharmacists would be likely to also appear in the Canadian context. Clearly the different regulatory and business climate of health care in Canada, however, most significantly with respect to Canada's different system of health care management and the rapidly increasing private heath and health education sector, suggests that a significant knowledge gap exists in many human resource issues facing the Canadian pharmacy practice.

Identification of these gaps in the knowledge does not mean that they will all be easily filled. The recently released study on the supply and demand for pharmacists in the United States (Department of Health & Human Services 2000) noted several data limitations some of which may also apply to a study of pharmacy in Canada. These include:

- Lack of reliable quantitative measures concerning the increased roles and responsibilities of pharmacists in both retail and institutional settings;
- Lack of current data on the number and distribution of pharmacists;
- Lack of reliable current data on pharmacist salaries;
- Limited data on number of hospital pharmacists; and
- No centralized reporting of applicants to pharmacy schools, an important measure for judging the likelihood of future increases in class size.

As noted at the outset of the paper, there is at least as much that is unknown about the future of the pharmacist profession as is known. Any attempt to forecast or model the demand for and supply of pharmacists requires far more clarity on their emerging role in the health care system, the future of competition in pharmacy retailing, current and expected career paths, and geographic and occupational mobility.

There appears to be a growing appetite within the pharmacist community for a national study of the human resource issues in pharmacy. Members of the pharmacy community interviewed for this situational analysis were eager to see a comprehensive study of the issues related to the role of pharmacists in the Canadian health care system and the development of a coherent strategy for dealing with longer-term labour market issues in pharmacy.

Prescription drugs and other medications clearly have a significant role to play in an efficient and effective Canadian health care system. Pharmacists play a crucial role in ensuring that appropriate and cost-effective medications are provided to Canadians. The current information base on the labour market for pharmacists, however, is an inadequate foundation for health care system managers and the pharmacy community to manage current and future resources coherently. A broadly based, collaborative effort involving the contribution of data, ideas, and solutions from all stakeholders in the pharmacy community would almost certainly result in a better managed system of drug prescribing, dispensing, and counselling for Canadians in the coming decade.

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Appendix A: Key Study Contributors

Canadian Pharmacists Association

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Canadian Society of Hospital Pharmacists

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Regional Director of Pharmacy
Winnipeg Regional Health Authority

Human Resources Development Canada

Zeinab Farah, Analyst

Barbara Martin, Analyst

Peartree Solutions Inc.

Bert Pereboom, President and his team.

Appendix B: Interviewees

1. M. Normand Cadieux, Directeur général, Association Québécoise des Pharmaciens Propriétaires
2. Professor Rita Caldwell, Director, Dalhousie University, College of Pharmacy
3. Mr. Greg Eberhart, Registrar-Treasurer, Alberta College of Pharmacists
4. Mr. Tim Fleming, President, Canadian Association of Pharmacy Technicians
5. M. Claude Giroux, Directeur général, Ordre des Pharmaciens du Québec
6. Mr. Ron Guse, Registrar, Manitoba Pharmaceutical Association
7. Ms. Beverley Hales, Director of Pharmacy, The Hospital for Sick Children, Toronto
8. Mr. Roland Halil, President, Canadian Association of Pharmacy Students and Interns
9. Dr. Kevin Hall, Regional Director of Pharmacy, Winnipeg Regional Health Authority
10. Dr. David Hill, Associate Dean, Faculty of Pharmaceutical Sciences, University of British Columbia
11. Dr. Wayne Hindmarsh, President, Association of Deans of Pharmacy of Canada, Faculty of Pharmacy, U of Toronto
12. Mr. Neil Johnson, London Health Sciences Centre
13. Mr. J. Patrick King, Executive Director, Pharmacy Association of Nova Scotia
14. Mr. Bob Kucheran, Executive Director, British Columbia Pharmacy Association
15. Mme Manon Lambert, Directrice générale, Association des pharmaciens des établissements de santé du Québec
16. Ms. Deanna Laws, Registrar, Ontario College of Pharmacists
17. Dr. Christopher W. Loomis, Director, School of Pharmacy, Memorial University of Newfoundland
18. Dr. Linda Muzzin, Professor, Ontario Institute for Studies in Education, University of Toronto
19. Dr. John Pugsley, Registrar-Treasurer, Pharmacy Examining Board of Canada
20. Ms. Linda Poloway, Director, Regional Pharmacy Services, David Thompson Health Region
21. Ms. Barbara Stuart, Executive Director, Ontario Pharmacists' Association
22. Ms. Monika Simon, President & CEO, Canadian Association of Chain Drugstores
23. Ms. Barbara Wells, Executive Director, National Association of Pharmacy Regulatory Authorities

Appendix C: Interview Guide

Guide for Interview with Key Informants

All information provided is considered not-for-attribution.

Human Resources

As you know, this is a preliminary study aimed at gathering the information currently available on human resource issues concerning pharmacists, focusing on issues of supply and demand and the factors underlying the current shortage of pharmacists.

1. Could you talk about the current shortage of pharmacists in your area of responsibility?
    - What do you see as the causes of the current shortage? (we should clearly differentiate between supply and demand issues) What do you see as the implications of the current shortage?
    - What do you see as the major gaps in knowledge that need to be addressed before solutions to the shortage/demand issues can be developed?
2. Could you comment on the current working conditions of pharmacists and the implications for pharmacist job satisfaction and the quality of service to the public? Do you know of any studies or published evidence on these issues or is most of this based on informal, insider knowledge.
3. Do you see any recent changes in the role of pharmacists and others assisting in the provision of pharmacy services? Do these changes represent a viable, longer-term solution to the current shortage or do you see problems getting worse in the future?

Technology

4. Do you see technological change as helping meet the demand for pharmacists or making the current shortage worse? (Possible examples: full use of computer and information technology -- linked data bases or smart cards with full list of drug prescriptions, internet/email based prescriptions, counting machines.
5. In what ways will technology affect the skills required by pharmacists and those assisting in dispensing medicines, and how will those skill needs be addressed?

Business Environment

6. How has the practice environment changed in the pharmacy business in the last few years?
7. What are the implications of these changes on the number of pharmacists needed and the skills required? Two questions should separate.

Sector Initiatives

8. Are you aware of any other studies or initiatives that are investigating or attempting to remedy issues related to the supply, demand, and training of pharmacists or assistants? If so, could you give us any background information or contacts?
9. Are you aware of any studies, literature or publications that would help define or document the human resources issues facing pharmacists? If so, please give details.

Thank you very much for your willingness to assist us in this work. If you would like to receive a copy of the report when it is available, we will indicate your interest to the HRDC/CPhA/CSHP steering group with whom we are working on this preliminary study.

Appendix D: Provincial and Territorial Regulatory Authorities

Source: CPhA Pharmacy Directory 2001; updated and augmented by authors.

College of Pharmacists of British Columbia
#200-1765 West 8th Avenue
Vancouver, British Columbia
V6J 1V8 (604) 733-2440
FAX (604) 733-2493
info@collegepharmacists.bc.ca

Alberta College of Pharmacists
1200 – 10303 Jasper Avenue
Edmonton, Alberta
T5J 3N6 (780) 990-0321
FAX (780) 990-0328
chelsey.cabaj@altapharm.org
www.altapharm.org

Saskatchewan Pharmaceutical Association
#700 - 4010 Pasqua Street
Regina, Saskatchewan
S4S 7B9 (306) 584-2292
FAX (306) 584-9695
saskpharm@sk.sympatico.ca

Manitoba Pharmaceutical Association
187 St. Mary's Road
Winnipeg, Manitoba
R2H 1J2 (204) 233-1411
FAX (204) 237-3468
info@mpha.mb.ca

Ontario College of Pharmacists
483 Huron Street
Toronto, Ontario
M5R 2R4 (416) 962-4861
FAX (416) 962-1619
email@ocpharma.com
www.ocpharma.com

Ordre des Pharmaciens du Québec
266, rue Notre-Dame ouest
Bureau 301
Montréal, Québec
H2Y 1T6 (514) 284-9588
FAX (514) 284-3420
ordrepharm@opq.org
www.opq.org

New Brunswick Pharmaceutical Society
Burbank Complex
30 Gordon Street, Suite 101
Moncton, New Brunswick
E1C 1L8 (506) 857-8957
FAX (506) 857-8838
nbphs@nbnet.nb.ca

Nova Scotia Pharmaceutical Society
P.O. Box 3363(S), 1526 Dresden Row
Halifax, Nova Scotia
B3J 3J1 (902) 422-8528
FAX (902) 422-2619
nsps@ns.sympatico.ca

Prince Edward Island Pharmacy Board
P.O. Box 89
Crapaud, Prince Edward Island
C0A 1J0 (902) 658-2780
FAX (902) 658-2198
peipharm@auracom.com

Newfoundland Pharmaceutical Association
Apothecary Hall, 488 Water Street
St. John's, Newfoundland
A1E 1B3 (709) 753-5877
FAX (709) 753-8615
npha@nf.sympatico.ca

Northwest Territories and Nunavut Territory
Registrar, Health Professional Licensing
Health and Social Services
Gov't of the Northwest Territories
P.O. Box 1320
Yellowknife, NWT
X1A 2L9 (867) 920-8058
FAX (867) 873-0281
jeannette_hall@gov.nt.ca

Consumer Services, Dept. of Justice
Gov't of the Yukon Territory
P.O. Box 2703
Whitehorse, Yukon
Y1A 2C6 (867) 667-5257
FAX (867) 667-3609
consumer@gov.yk.ca/

Appendix E: Pharmacy Associations

Source: CPhA Pharmacy Directory 2001; augmented by authors.

CANADIAN NATIONAL PHARMACY ORGANIZATIONS

Association of Faculties of Pharmacy of Canada (AFPC) www.pharmacy.ualberta.ca/afpc

Canadian Association of Chain Drugstores (CACDS) www.cacds.com

Canadian Association of Pharmacy Students and Interns (CAPSI)

Canadian Association of Pharmacy Technicians (CAPT) www.capt.ca

Canadian College of Clinical Pharmacy (CCCP) hamelin@biochempharma.com

Canadian Council for Accreditation of Pharmacy Programs (CCAPP) bruce.schnell@sask.usask.ca

Canadian Council on Continuing Education in Pharmacy (CCCEP) nmcbean@cableregina.com

Canadian Foundation for Pharmacy (CFP) mbrown@glenngroup.com

Canadian Pharmacists Association (CPhA) www.cdnpharm.ca

Canadian Society of Consultant Pharmacists (CSCP) dhindman@shoppersdrumgmart.ca

Canadian Society of Hospital Pharmacists (CSHP) www.cshp.ca

National Association of Pharmacy Regulatory Authorities (NAPRA) www.napra.org

Pharmacy Examining Board of Canada (PEBC) www.pebc.ca

PROVINCIAL REGULATORY PHARMACY ORGANIZATIONS – see Appendix D

PROVINCIAL VOLUNTARY PHARMACY ORGANIZATIONS

Association des Pharmaciens d'Établissement de Santé (APES) www.apesquebec.org

Association professionnelle des pharmaciens salariés du Québec appsq@hotmail.com

Association québécoise des assistant(e)s-techniques en pharmacie (ATP) www.total.net/~atppharm

Association quebecoise des pharmaciens proprietaires pharma@aqpp.qc.ca

Atlantic Provinces Pharmacy Council (APPC) nbpa@nbnet.nb.ca

British Columbia Pharmacy Association (BCPhA) bcpharm@bcpharm.ca

Manitoba Society of Pharmacists www.msp.mb.ca

New Brunswick Pharmacists Association Inc. nbpa@nbnet.nb.ca

Ontario Pharmacists' Association www.ontpharmacists.on.ca

Pharmacists Association of Alberta www.altapharm.org/

Pharmacy Association of Nova Scotia (PANS) www.pans.ns.ca

Prince Edward Island Pharmaceutical Association martin@auracom.com

Representative Board of Saskatchewan Pharmacists (RBSP) dean.bradley@sk.sympatico.ca

AMERICAN PHARMACY ORGANIZATIONS

The American College of Clinical Pharmacy (ACCP) www.accp.com

American Pharmaceutical Association (APhA) www.aphanet.org

American Association of Health System Pharmacists (CSHP) www.ashp.org

National Community Pharmacists Association (NCPA) www.ncpanet.org

The National Association of Chain Drugstores (NACDS) www.nacds.org

OTHER RELEVANT ORGANIZATIONS

BioteCanada www.biotech.ca/

Biotechnology Human Resource Council (BHRC) www.bhrc.ca

Canadian Drug Manufacturers Association (CDMA)

Canada's Research-Based Pharmaceutical Companies (Rx&D) www.canadapharma.org

Canadian Medical Association (CMA) www.cma.ca

Canadian Society for Pharmaceutical Sciences (CSPS) www.ualberta.ca/~csps/

Canadian Wholesale Drug Association (CWDA) www.cwda.com

Efficient Consumer Response for the Pharmacy Supply Chain (ECRx) http://www.ecrx.org/

Appendix F: Labour Market Data on Pharmacists

Table A1: Distribution of The Labour Force in Pharmacy and Other Selected Health Occupations (000's), 1987-1999

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1989-1999 Growth
Population in All Occupations (000's)	13,512	13,779	14,047	14,241	14,330	14,362	14,504	14,626	14,750	14,900	15,153	15,418	15,721	11.9%
Population of Pharmacists (000's)	15.4	14.7	18.6	16.8	16.4	17.1	19.1	20.1	23.8	24.6	20.9	19.5	19.0	2.2%
Population of Physicians, Dentists and Veterinarians (000's)	61.3	69.5	71.1	68.7	72.8	76.4	80.6	85.9	79.3	81.0	80.0	82.3	93.3	31.2%
Proportion of Pharmacists to Physicians, Dentists and Veterinarians (%)	25.1	21.2	26.2	24.5	22.5	22.4	23.7	23.4	30.0	30.4	26.1	23.7	20.4	---

Source: Statistics Canada: Labour Force Survey, Annual Averages.

Table A2: Population Employed and Participation Rate, Pharmacists and All Occupations, 1987-1999

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1989-1999 Growth
Population Employed (000's)														
• In All Occupations	12,321	12,710	12,986	13,084	12,851	12,760	12,858	13,112	13,357	13,463	13,774	14,140	14,531	11.9%
• As Pharmacists	15.2	14.5	18.2	16.5	16.3	17.0	18.9	19.5	23.5	24.1	20.5	19.3	18.7	2.7%
Participation Rate (%)														
• For All Occupations	91.2	92.2	92.5	91.9	89.7	88.8	88.6	89.6	90.6	90.4	90.9	91.7	92.4	0.0%
• For Pharmacists	98.7	98.6	97.8	98.2	99.4	99.4	99.0	97.0	98.7	98.0	98.1	99.0	98.4	0.6%

Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Table A3: Population and Proportion of Self-Employed, Pharmacists and All Occupations, 1987-1999

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1989-1999 Growth
Population of Self-Employed (000's)														
• In All Occupations	1696	1772	1803	1843	1887	1919	2027	2036	2098	2169	2354	2425	2463	36.6
• Among Pharmacists	2.6	2.9	3.5	2.2	2.0	3.1	2.2	3.6	4.6	4.3	4.0	4.1	2.8	-20.0
Percentage of the Labour Force Self-Employed (%)														
• In All Occupations	12.5	12.9	12.8	12.9	13.2	13.4	14.0	13.9	14.2	14.6	15.5	15.7	15.7	22.0
• Among Pharmacists	16.9	19.7	18.8	13.1	12.2	18.1	11.5	17.9	19.3	17.5	19.1	21.0	14.7	-21.7

Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Table A4: Population of Employed Women and Percentage of Female Employment, Pharmacists and All Occupations, 1987-1999

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1989-1999 Growth
Population of Employed Women (000's)														
• **In All Occupations**	5,300	5,532	5,699	5,806	5,791	5,790	5,828	5,934	6,058	6,117	6,266	6,479	6,665	17.0
• **As Pharmacists**	8.3	7.6	9.5	9.2	9.6	9.2	10.5	11.8	13.7	13.6	11.4	11.1	10.9	14.7
Percentage of Female Employment														
• **In All Occupations**	43.0	43.5	43.9	44.4	45.1	45.4	45.3	45.3	45.4	45.4	45.5	45.8	45.9	4.5
• **Among Pharmacists**	54.6	52.4	52.2	55.8	58.9	54.1	55.6	60.5	58.3	56.4	55.6	57.5	58.3	11.7

Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Table A5: Average Job Tenure and Average Actual Hours, Pharmacists and All Occupations, 1987-1999

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1989-1999 Growth
Average Job Tenure (in Months)														
• For All Occupations	86.9	86.3	86.4	87.1	89.8	92.0	94.4	95.0	95.1	96.2	96.8	96.6	96.1	11.2
• For Pharmacists	101.9	90.4	74.9	66.5	83.2	83.0	68.3	80.4	84.6	86.5	98.9	94.3	93.2	24.4
Average Actual Hours (Main Job)														
• For All Occupations	36.9	37.4	37.8	37.6	36.8	36.2	36.5	37.0	36.7	36.9	37.1	36.9	37.0	-2.1
• For Pharmacists	36.6	35.9	38.1	37.1	36.3	37.7	35.9	35.5	36.5	36.4	36.1	35.9	34.6	-9.2

Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Table A6: Population Part-Time Employed and Percentage of The Labour Force Part-Time Employed, Pharmacists and All Occupations, 1987-1999

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1989-99 Growth
Population Part-Time Employed (000's)														
• In All Occupations	2,065	2,153	2,178	2,233	2,346	2,383	2,483	2,495	2,523	2,580	2,635	2,674	2.682	23.1
• Among Pharmacists	2.9	3.1	2.8	3.7	3.3	2.7	3.7	4.8	4.3	4.3	4.2	3.6	4.9	75.0
Percentage of Labour Force Part-Time Employed														
• In All Occupations	16.8	16.9	16.8	17.1	18.3	18.7	19.3	19.0	18.9	19.2	19.1	18.9	18.5	10.1
• Among Pharmacists	19.1	21.4	15.4	22.4	20.2	15.9	19.6	24.6	18.3	17.8	20.5	18.7	26.2	70.3

Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Part time is defined as working less than 30 hours per week.

Table A7: Employees Working Overtime, Pharmacists and All Occupations, 1997-1999

	1997	1998	1999	1997-1999 Growth
Employees Working Overtime (000's)				
• In All Occupations	1943.5	1963.6	2057.9	5.9%
• Among Pharmacists	2.5	3.1	2.9	16.0%
Percentage of Employees Working Overtime (%)				
• In All Occupations	14.1	13.9	14.2	0.4%
• Among Pharmacists	12.2	16.1	15.5	27.2%

Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Table A8: Average Weekly Overtime and Weekly Earnings, Pharmacists and All Occupations, 1997-1999

	1997	1998	1999	1997-1999 Growth
Average Weekly Overtime (hours)				
• In All Occupations	9.3	9.2	9.2	-1.1
• Among Pharmacists	5.5	6.8	5.3	-3.6
Average Weekly Earnings ($)				
• In All Occupations	572.2	579.9	595.6	4.1
• Among Pharmacists	785.5	782.3	817.5	4.1

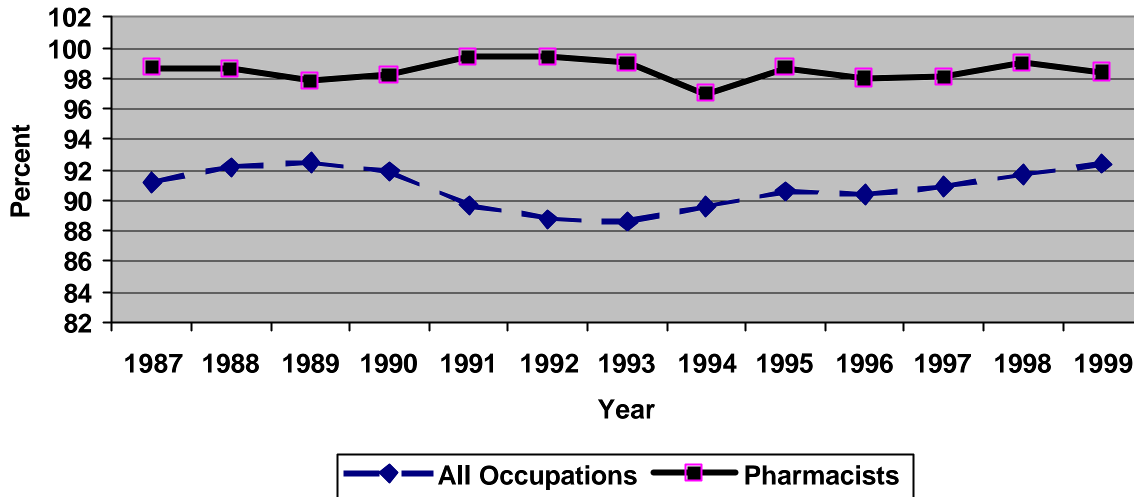
Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Table A9: Average Weekly Earnings, Men, Women and Women to Men Ratio, Pharmacists and All Occupations, 1997-1999

	1997	1998	1999	1997-1999 Growth
Average Weekly Earnings, Men ($)				
• In All Occupations	670.8	680.5	698.5	4.1
• Among Pharmacists	919.4	902	887.6	-3.5
Average Weekly Earnings, Women ($)				
• In All Occupations	463.6	470.7	484.5	4.5
• Among Pharmacists	704.8	720	770.8	9.4
Average Weekly Earnings, Women /Men ($)				
• In All Occupations	69.1	69.2	69.4	0.4
• Among Pharmacists	76.7	79.8	86.8	13.3

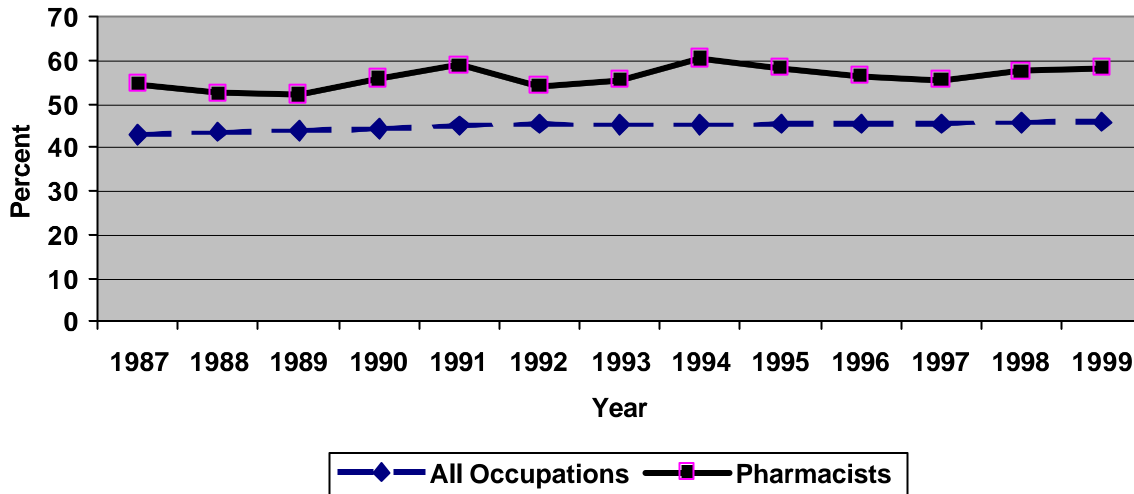
Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Figure A1: Percentage of Female Employment for Pharmacists and All Occupations, 1987 to 1999



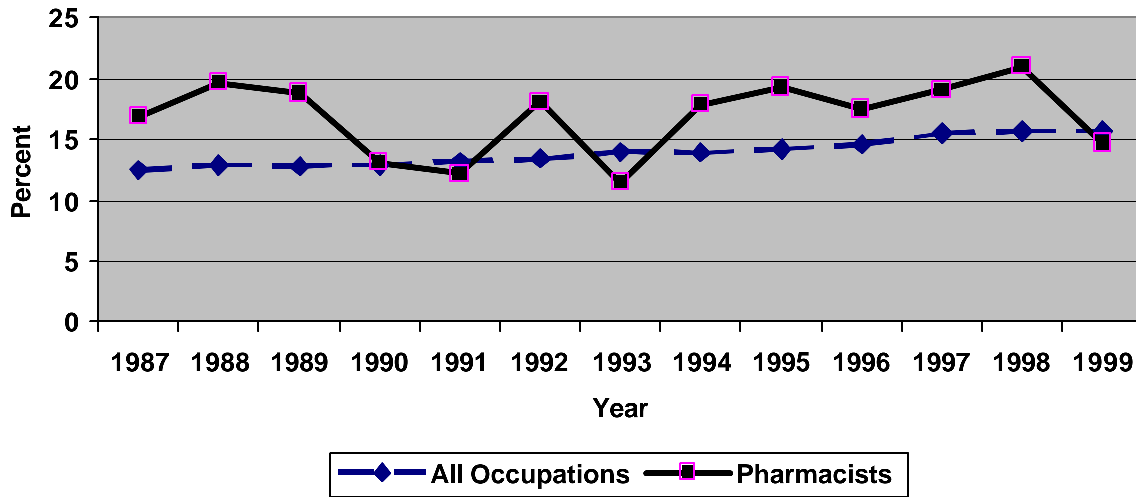
Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Figure A2: Participation Rate for Pharmacists and All Occupations, 1987 to 1999



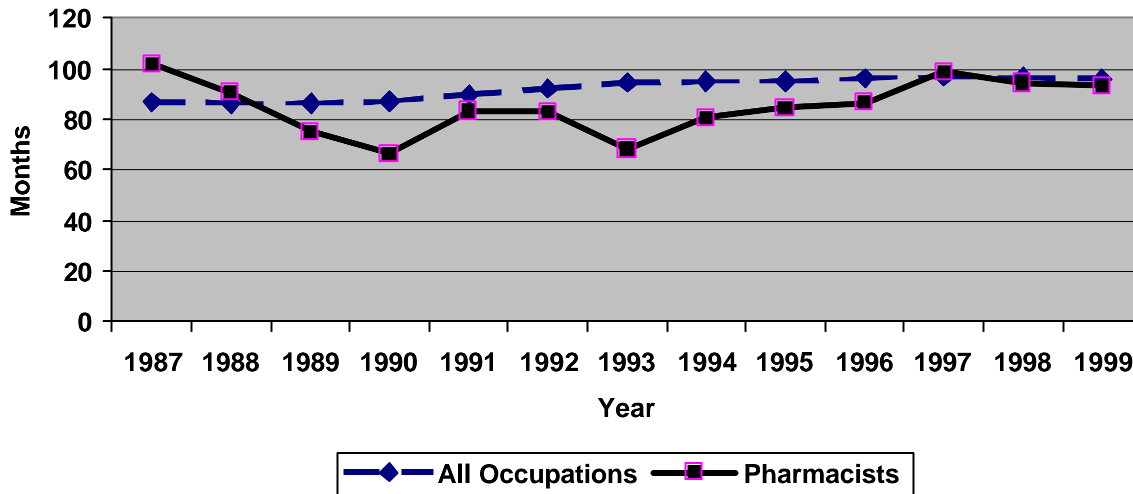
Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Figure A3: Percentage of the Labour Force that is Self-Employed for Pharmacists and All Occupations, 1987 to 1999



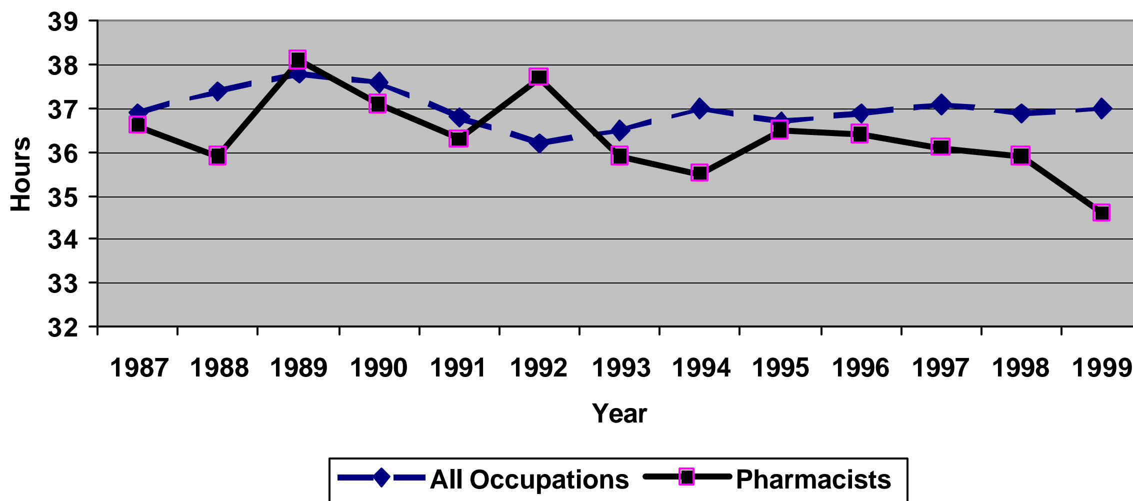
Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Figure 4: Average Job Tenure, for Pharmacists and All Occupations, 1987 to 1999



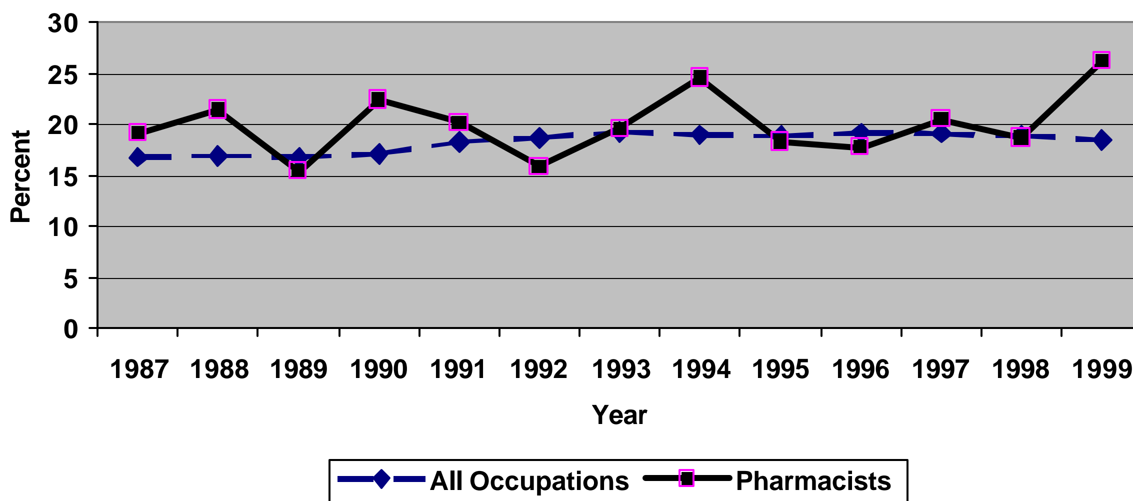
Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Figure 5: Average Actual Hours (Main Job), for Pharmacists and All Occupations, 1987 to 1999



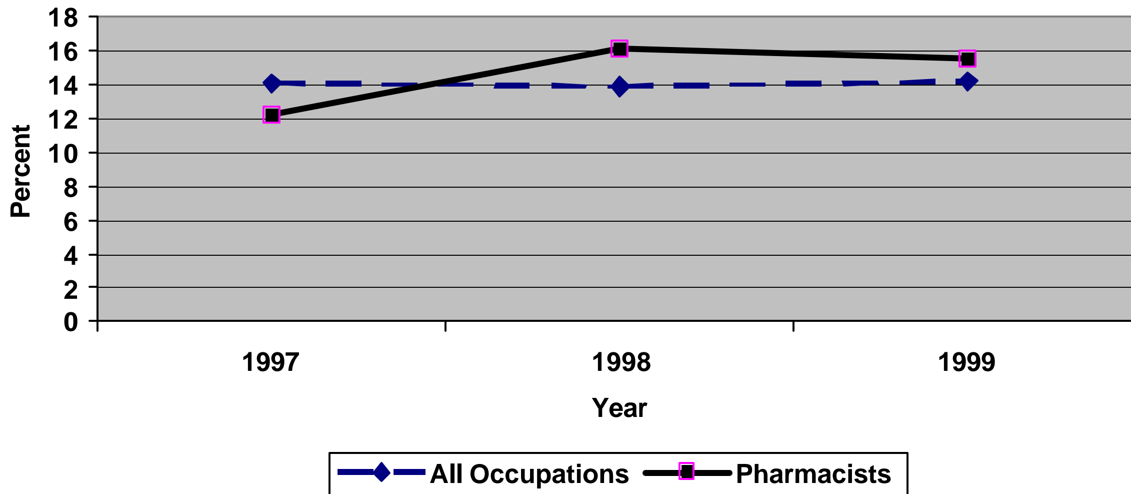
Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Figure 6: Percentage of the Labour Force Part-Time Employed for Pharmacists and All Occupations, 1987 to 1999



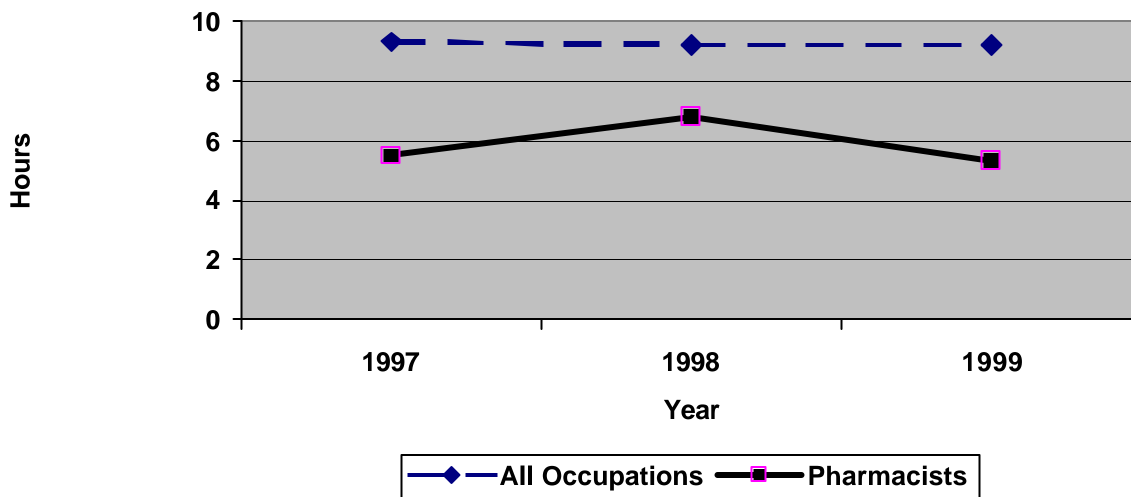
Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Figure 7: Percentage of Employees Working Overtime for Pharmacists and All Occupations, 1997 to 1999



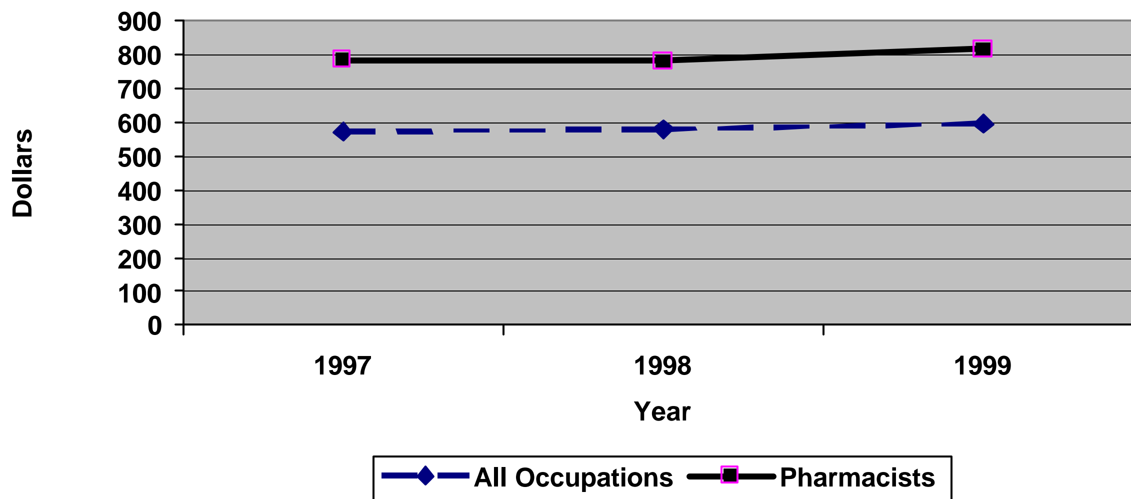
Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Figure 8: Average Weekly Overtime, for Pharmacists and All Occupations, 1997 to 1999



Source: Statistics Canada: Labour Force Survey, Annual Averages.
Note: Due to small sample sizes, pharmacist estimates are subject to substantial sampling error.

Figure 9: Average Weekly Earnings, for Pharmacists and All Occupations, 1997 to 1999



Source: Statistics Canada: Labour Force Survey, Annual Averages.

Appendix G: Published Profiles of Pharmacists and Technicians

HRDC's *Job Futures 2000* offers the following profile of employment available with a degree in pharmacy. Full webpage is available at: http://jobfutures.ca/jobfutures/noc/3131.html

Pharmacists (3131)

At Work

Pharmacists work in community and hospital pharmacies, pharmaceutical firms, government departments and agencies and pharmacies and other retail organizations.

- Community, hospital and retail pharmacists compound and dispense prescribed drug products for customers and health care professionals. They advise on the administration, use and effects of medications and maintain medication profiles of customers.
- Industrial pharmacists participate in the research, development and manufacture of drug products. They test new drug products; co-ordinate clinical investigations of new drug products; control the quality of drug products during production to make sure that they meet standards of potency, purity, uniformity, stability and safety; and evaluate the labelling, packaging and advertising of drug products.

Education, Training and Experience

- Pharmacists must have a university degree in pharmacy. Most recent entrants have an undergraduate university degree.
- Community and hospital pharmacists require supervised practical training and licences in their province or territory.
- In Quebec, they must be members of the Ordre des pharmaciens du Québec.
- Managers of pharmacies or pharmacy departments must usually have experience as pharmacists.

In These Occupations ...

- 22,000 people were employed in 1998, an increase of 43.0% from 1988. After employment gains of 16.8% from 1988 to 1993, employment grew 22.5% from 1993 to 1998. In comparison, employment in all occupations grew 12.3% over the same ten years, and 8.2% over the last five.
- 19% work part-time, equal to the average for all occupations.
- 13% are self-employed, compared to an average of 17% for all occupations.
- 56% are women, well above the average of 45% for all occupations.
- the unemployment rate averaged 1.3% from 1996 to 1998, compared to the national average of 6.0%. This rate is among the lowest for professional occupations.
- the average earnings are comparable to those for other professional occupations and for other occupations in the health sector.

National Outlook to 2004

- Currently, chances of finding work in this occupation are rated "Good", since employment opportunities and earnings are both well above average.
- Over the next five years, this outlook is not expected to change, as the number of job openings is expected to be matched by the number of qualified job seekers.
- An aging population will increase demand for prescription drugs, favouring growth in the number of pharmacists. Restructuring in the health care sector may mean a loss of jobs in hospital pharmacies, however. Mail order pharmacies, discount chains and substitution of pharmaceutical assistants for pharmacists are other trends which may decrease the demand for pharmacists.
- The rapid development of new drugs for treatment and diagnosis means that pharmacists must update their knowledge continually. Use of computerized customer and pharmaceutical databases will require pharmacists to develop appropriate skills.
- Almost all of the increase in employment requirements through 2004 for this occupation is expected to occur in the retail trade industry and in hospitals.

HRDC's *Job Futures* offers the following profile of employment available with a degree in pharmacy. Full webpage is available at: http://jobfutures.ca/jobfutures/fos/U570.html

Pharmacy (U570)

Undergraduate University (4 or 5 years)
Various national surveys of post-secondary graduates, conducted two and five years after graduation, reveal the following:

Recent Trends

Graduates from this program of study often find work in the same occupations as bachelor's graduates in other health, chemistry and biology, as well as master's graduates in pharmacy.

Almost all graduates found work as pharmacists. They worked in pharmacies, hospitals or the pharmaceutical and medical industry.

A relatively low proportion of these graduates changed occupations between the second and fifth year after graduation, although there was some occupational movement between pharmacist and chemist.

Earnings

After two years in the labour force, these graduates earned on average 40% more than all university graduates at the bachelor's level. Although they earned less than dentists, they remained among the highest paid of all health graduates at this level. They earned 10% less than those with a similar master's degree. After five years, they earned 24% above the average for all graduates at the bachelor's level.

Labour Market Facts

Two years after graduation, 97% of these graduates were in the labour force; 84% of graduates who entered the labour force were working full-time, which was higher than the average of 74% for all bachelor's graduates; and 4% were unemployed, compared to 10% of all graduates at this level. This was the lowest unemployment rate for all health graduates at the bachelor's level.

Latest Available Statistics

In 1997, 690 students received an undergraduate degree in pharmacy. This reflects no growth from 1987 to 1997, compared to an increase of 20% for all graduates at this level. After increasing an average of 4.8% per year over the 1987-1991 period, the number of pharmacy graduates remained almost unchanged between 1991 and 1996, then fell by 18% in 1996-1997. In 1997, 65% of these graduates were women, compared to 66% ten years earlier.

Exhibit A1: Average Earnings of Graduates

	1995 Graduates in 1997	1990 Graduates in 1992	1990 Graduates in 1995
Highest 20%	62,300	63,800	66,000
Average	47,100	47,500	50,000
Lowest 20%	30,000	36,300	36,000
Overall Average at this level of study	33,600	32,200	40,200

Source: HRDC 2000.

The Career Directions web page (supported by HRDC) offers the following occupational profile for Pharmacy Technicians. Full webpage is available at:
http://www.careerccc.org/careerdirections/eng/e_ho_set.htm

Pharmacy Technicians

Description of the work

Pharmacy technicians provide technical and clerical support to pharmacists in hospitals or in retail pharmacies. You measure, mix, package, label and deliver drugs. You maintain computerized lists of medications taken by patients and you ensure that the right drugs have been prescribed. You also look after home health-care products such as canes, vision aids and hearing aids.

Depending on your position you may also manage third party billing, answer telephones, direct customers to items or the pharmacist for medication consultation, receive written prescriptions, clean and sterilize dispensing bottles and instruments, answer questions regarding non-drug products, and operate a cash register.

Work conditions and training

Pharmacy technicians are employed in pharmacies in retail chain stores, independently owned and operated pharmacies, hospital and clinic pharmacies, related organizations such as pharmaceutical companies, life and health insurance companies, drug wholesalers and pharmacy supply companies.

Working as a pharmacy technician also means working with people. At most retail operations your tasks will often be interrupted with telephone calls, staff questions and customer inquiries. At a retail operation you will be paid on an hourly basis at a level starting just above minimum wage. Hospitals tend to pay slightly more. You may have to work long and irregular hours, sometimes under stressful conditions. The work is demanding and requires accuracy; there is no room for error. You spend most of your day standing and you might be required to lift and move objects weighing up to 10 kilograms.

The work environment is usually clean and well lit but often crowded and busy. Pharmacy technician programs are available at community colleges and usually take one year to complete. There are no provincial/territorial or national regulations governing who can work as a pharmacy technician. In rural areas or in smaller centres where it is difficult to find people with certificates, hospitals may be willing to hire you without a certificate and train you.

Who's the right person?
Pharmacy technician is an exact occupation that calls for good concentration, precision, reliability and neatness. You have a caring attitude towards others, have a good memory for things like patients' allergies and are calm and well-organized. You are quick and have good manual dexterity, and you can manage long periods on your feet. You have excellent communication skills, both oral and written, and a willingness to keep up-to-date with new products and changes in old products.

What does it take?
- a high school diploma with courses in Chemistry or Biology
- completed senior level Mathematics
- computer literacy and keyboarding skills
- most hospitals require you to complete a one-year pharmacy technician program at a community college

Next steps?

- supervisory positions
- pharmacist