HEALTH HUMAN RESOURCES IN COMMUNITY-BASED HEALTH CARE: A REVIEW OF THE LITERATURE

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BUILDING A STRONGER FOUNDATION:
A FRAMEWORK FOR PLANNING AND EVALUATING
COMMUNITY-BASED HEALTH SERVICES IN CANADA

Component 1:

HEALTH HUMAN RESOURCES IN COMMUNITY-BASED HEALTH CARE: A REVIEW OF THE LITERATURE

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EXECUTIVE SUMMARY

INTRODUCTION

Although Canada has a well developed health care system, it also has one of the highest rates of institutionalization in the world. But it has become evident that health care is more than institutional care. It encompasses a much wider range of services and activities, including self-care, disease prevention, health promotion, community support, ambulatory care, acute and specialized treatment, long-term care and rehabilitative services. In many western societies, including Canada, the determination to control health care costs, the need to be more accountable and the attempts to make services more accessible, along with the realization that medical care is just one of many factors that sustain population health, have coalesced to reshape the health care system in substantial ways. The closing and downsizing of some hospitals and psychiatric institutions, reform of the long-term care system and the emphasis on primary health care have meant a greater reliance on community-based health care. At the same time, technological advances, changes in practice organization and a better informed public have made it possible for many medical services traditionally provided in institutions to be delivered in community settings.

While there is no universally accepted definition of community-based health care, most would agree that it means bringing health services as close as possible to where people live and work and providing health services outside hospitals and other institutions. It emphasizes consumer participation, holistic and team approaches, a more rational use of health resources, greater responsibility by individuals for their well-being and a prevention and health promotion orientation.

Health care is a labour-intensive industry and personnel account for 70 percent or more of health care cost. Human resources play an even more prominent role in and account for an even greater share of the cost of community-based health care as it relies less on facilities and advanced technologies. In developing a framework for evaluation and policy decisions in relation to community-based health care, it is, therefore, imperative to pay special attention to health human resources issues.

LITERATURE REVIEW APPROACH

The purpose of this literature review is to determine if there is documented evidence showing how health human resources are conceptualized, utilized, developed, regulated and managed affect the outcomes of community-based health care. To this end, an extensive literature review was conducted, involving on-line database keyword searches, additional searches for other studies, contacting knowledgeable individuals, screening of abstracts, assessing the methodological strength of the studies and integrating the findings. The findings of the literature review were organized and presented by means of a modality-outcome matrix. Modalities refer to the conceptual dimensions used in understanding or analyzing health workforce issues. Six modalities have been identified:

Health human resources continuum;
Roles of providers and role substitution, expansion and diversification;

Education and skills acquisition;
Models of personnel configuration and provider remuneration;
Statutory regulation of health occupations and
Management of the health workforce.

As the six dimensions are much-discussed themes in the health workforce literature, they represent the major issues or concerns for policy-makers, planners and researchers. Outcomes, on the other hand, refer to results expected or achieved. In this case, they are the criterion dimensions according to which community-based health care is evaluated. The five outcomes are:

Sense of control;
Fairness;
Value for money;
Quality of care and
Quality of worklife.

MAJOR REVIEW FINDINGS AND POLICY ISSUES

On the basis of the findings from the literature review, four major policy issues have been identified - health human resources continuum, human resources substitution, regulation of health occupations and human resources management and enhancement - and broad policy directions are suggested for consideration. While there is considerable empirical evidence to support the general thrust of these suggested policy directions, further policy developments around these four issues should be given top priority.

Health Human Resources Continuum

Literature Review Findings*: Self-care and informal caregiving are widespread phenomena. As medical technologies become more sophisticated and as health care consumers become better informed, individuals can now perform many health care tasks that were at one time the exclusive responsibilities of formal caregivers in institutional settings. In most of the studies reviewed, self-care and informal care have been shown to be useful and effective in response to a variety of health problems. Studies have shown that as long as they receive appropriate training, supervision and monitoring, informal caregivers can provide counselling, health education and promotion, rehabilitation, long-term care, etc. as effectively as formal caregivers. Since self-care and informal care are, by definition, free (at least from the perspective of governments and other third-party payers), they are cost effective as long as the care does not aggravate or prolong the health problem of the care recipient. However, it would be an over-generalization to say that self care or informal care is effective. It is necessary to specify what kind of self-care provider or informal caregiver is capable of doing what under what conditions*

Health human resources need to be reconceptualized if community-based health care is to become effective, holistic and client-focused. The traditional view of health human resources, which tends to focus almost exclusively on formal caregivers with extensive formal training, must be replaced by one that sees health human resources as a continuum, ranging from those who keep themselves healthy to those who look after their sick or disabled relatives and friends, and from indigenous health care workers with mostly on-the-job training to the highly qualified specialists.

The question is not whether self-care providers and informal caregivers form part of the health human resources continuum. The evidence that they play an important role in buttressing the health care system is substantial in certain areas and under certain conditions. Without them, the formal health care system would collapse because it is unlikely to have enough resources to meet all health care needs and demands of all citizens. As the focus of health care increasingly shifts to health promotion, disease prevention, rehabilitation, health maintenance, long-term care and psychosocial well-being, the role of self-care providers and informal caregivers become particularly important because they have been shown to be effective in many of these areas. A workforce policy framework to support community-based health care will not be effective without taking into consideration the whole spectrum of providers.

Instead, the question is how self-care, informal care and formal care should be integrated and how they can be made to complement each other. A related question is how providers of self-care and informal care can be supported. A comprehensive and integrated health workforce policy or planning framework that takes into account the entire human resources continuum does not exist in Canada. The development and implementation of such a framework must become one of the top priorities in community-based health care planning and implementation.

Human Resources Substitution

> **Literature Review Findings***: There is ample and strong evidence to support the use of mid-level providers, such as nurse practitioners and midwives, especially in primary care. It has been shown over and over again in many jurisdictions that the care provided by these practitioners, working under the supervision of or in cooperation with physicians, is safe and of high quality.*

> **Literature Review Findings***: Research has generally shown that it is cost effective to use mid-level providers such as nurse practitioners and midwives. But it should be noted that, with the exception of some studies of nurse practitioners in the 1970s, most of the research in this area has been conducted in other countries whose systems or approaches of health care financing and practitioner remuneration are quite different from those in Canada. Caution is needed in extrapolating the research evidence to the Canadian context.*

> **Literature Review Findings***: Role substitution is not restricted to mid-level providers. Although the amount of evidence available and the strength of the evidence vary from one occupational group to another, it is safe to say that considerable role substitution is feasible and effective when it is done properly.*

Compared to many other countries, Canada lags behind in using health human resources substitution as a policy tool in health care reform. Use of nurse practitioners in Canada is relatively rare except in isolated communities and in the far north. The official recognition of midwifery has occurred very recently and only in a few provinces. In fact, "reverse substitution" is often practised in this country. Highly qualified or extensively trained practitioners are taking over functions that have been adequately performed by lower-level personnel.

Much of the empirical evidence on role substitution pertains to mid-level providers. Evidence concerning role substitution in other areas or disciplines is less systematic and abundant. While more research and evaluation should be encouraged, the relative paucity of empirical evidence must not be used as an excuse to prevent experimentation on more innovative ways of using health human resources.

Human resources substitution is a policy instrument that can be used to achieve some of the goals of community-based health care like cost effectiveness, service accessibility and equitable distribution of resources. But it is important to ensure that substitution is adopted not just to save money. Substitution is done because it has been shown or can be demonstrated that the same function can be performed just as competently and efficiently by a provider with less extensive training or without formal credentials. If cost savings can be achieved at the same time, so much the better.

Regulation of Health Occupations

> **Literature Review Findings***: Although very little research on the statutory regulation of health occupations is directly related to community-based health care, the importance of occupational regulation must not be overlooked. If one of the hallmarks of community-based health care is a more flexible use of health human resources, related research findings suggest that this may be difficult to accomplish unless there are major changes in the way health occupations are regulated. A number of studies have found that rigid regulation inhibits the use of mid-level providers. The same could be true for other forms of role substitution and the use of multiskilled workers. There is also evidence that excessive regulation raises service costs and reduces service access. Where occupations are allowed to set restrictive entry-into-practice criteria and other practice conditions, costs of service tend to increase and service utilization tends to decrease.*

Reform of the existing system of occupational regulation is a *sine qua non* for developing and implementing a health human resources policy that supports community-based health care. This is particularly important because statutory regulation of health occupations is usually taken for granted and is seldom seen as an important policy tool for health system reform. Without changes to the way health occupations are regulated, it would be difficult to practise human resources substitution or use multiskilled workers. If community-based health care means becoming more responsive to the needs of the consumers, it is necessary to have a more flexible workforce. This, in turn, requires an occupational regulatory system that allows experimentation and innovative approaches in human resources utilization, development and management.

However, it must be noted that occupational regulation is just one aspect within a complex regulatory system that encompasses, among other things, program or facility accreditation, government policies and malpractice insurance. It would be quite futile to make changes to occupational regulation without at the same time adjusting the other aspects of this complex regulatory mechanism. Also, it is important to emphasize that reform of occupational regulation does not mean doing away with standards and safeguards. The challenge is to find alternatives to the present system, which enhance flexibility, appropriate use of human resources, consumer choice and quality assurance.

Health Workforce Management and Enhancement

> **Literature Review Findings***: If self-care providers and informal caregivers are seen as an integral part of the health human resources continuum, they must be given the opportunity to learn how to take care of themselves and others and to enhance their caring capability. Studies and demonstration projects have shown that some types of training are effective. But given divergent objectives, the wide range of training approaches used and the diversity of caregivers, it is understandably difficult to produce a consistent body of research evidence on this topic.*

> **Literature Review Findings***: With respect to the training of formal caregivers, the focus of this literature search and review is on preparing or reorienting formal caregivers to work in community settings. This includes redesigning educational programs or curricula, moving classrooms and practicum sites from institutional to community settings, providing opportunities to learn in a multidisciplinary environment and helping providers cope with job transfers from institutions to community agencies. Generally speaking, the studies show positive results.*

> **Literature Review Findings***: In relation to workforce management, one research finding that has special significance for community-based health care is the characteristics of work in community settings which are conducive to positive quality of worklife. Many studies have found that practitioners working in home care and community health like their work and they regard autonomy, flexibility, freedom to manage work and direct contacts with patients/clients as the most rewarding aspects of their job.*

The effectiveness of practitioners providing community-based health care and their quality of worklife could be improved by various management and educational measures. Similarly, the ways providers are organized, deployed and remunerated could affect the quality and cost effectiveness of their services. However, there is neither a magic formula nor a one-size-fits-all solution. The studies reviewed show that some measures are effective in one program or one health service centre or one community, but not necessarily in others. Likewise, the review of studies of education and skills acquisition suggests that while experts generally agree on a number of things that need to be done, there is not a consensus on how they should be done. As community-based health care encompasses a wide array of services, providers, agencies and organizational forms, it must experiment with different strategies, using experiences gained in other programs and jurisdictions as a guide and a source of inspiration. A trial-and-error approach and incremental improvements seem to be a prudent way to introduce appropriate educational models and management practices, at least until more definitive models and approaches can be identified.

1 INTRODUCTION

Over the past decade, Canadian provinces and territories have conducted extensive reviews of their health care systems. Current provincial and territorial reform initiatives linked to these reviews attempt to enhance the quality, cost effectiveness, accountability and equity of health care.

Although Canada has a well developed health care system, it also has one of the highest rates of institutionalization in the world. Institutionalization tends to be associated with or lead to unnecessary centralization, specialization and hierarchy, as well as an undue emphasis on curative care. However, it has become evident that health care is more than institutional care. It encompasses a much wider range of services and activities, including self-care, disease prevention, health promotion and protection, community support, ambulatory care, acute and specialized treatment, long-term care and rehabilitative services. In many western societies, including Canada, the determination to rein in cost escalation, the need to be more accountable to consumers and the attempts to make services more accessible, along with the realization that medical care is just one of many factors that sustain population health, have coalesced to reshape the health care system in substantial ways, one of which is the growing emphasis on community-based health care. For instance, major health care reforms implemented across Canada, such as community health strategies, hospital reform, mental health reform, reform of long-term care and rehabilitative services strategy, rely heavily on community-based services. Technological advances and changes in practice organization have also made it possible for many medical services traditionally provided in institutions to be delivered in community settings (Stoeckle, 1995). While there is not a universally accepted definition of community-based health care, most would agree that it means bringing health services as close as possible to where people live and work and providing health services outside hospitals and other institutions. Predicated on the belief that most health care needs can be met in community settings and do not require specialist interventions, the notion of community-based health care emphasizes decentralized decision-making and service provision, consumer participation, holistic and team approaches, a more rational use of health resources, greater responsibility by individuals for their well-being, self-help and a prevention and health promotion orientation. However, it is not easy to accurately assess the economic and other benefits of these models and approaches.

In order to more fully understand the nature of community-based health care and develop a useful framework for assessing future initiatives, the Federal/Provincial/Territorial Advisory Committee on Health Human Resources has commissioned a study entitled *A Framework for Evaluation and Policy Decisions for Community-based Health Care in Canada - Focus on Health Human Resources.* The objective is to develop a flexible and practical framework based on goals similar to those set out in *Planning for Health: Toward Informed Decision-Making* (Health and Welfare Canada, 1993):

Improvement of community health status;
Effectiveness and efficiency of services provided;
Integration and coordination;

Equity of access to health care;
Responsiveness to community needs and wants; and
Community involvement in health system management.

The entire project has three deliverables. The first is a systematic review of the literature on health human resources issues in relation to community-based health care. The second involves a similar review of the literature on community-based health care organizational models. The third entails the development of a framework for evaluating and establishing policies related to community-based health care. This Component I report examines issues pertaining to the health workforce in community-based health care, based on a selective review of relevant literature.

Health care is a labour-intensive industry and personnel account for 70 percent or more of health care costs. Human resources play an even more prominent role in and account for an even greater share of the costs of community-based health care as it relies less on facilities and advanced technologies. The shift to community-based health care inevitably affects how health human resources are conceptualized, utilized, managed and regulated. The way health human resources are handled, in turn, affects how community-based health care is delivered and how effective it will be. Thus, it is not coincidental that as the health care system undergoes major changes, many landmark reports of premier's councils, commissions and task forces have recommended review or reform of the health workforce (Angus, 1991). In developing a framework for evaluation and policy decisions for community-based health care, it is, therefore, imperative to pay special attention to health human resources issues.

Although this Component I report can be treated as a stand-alone document, it should be emphasized that it is an integral part of the entire project. Its primary purpose is to inform and guide the development of a framework for establishing and evaluating policies related to community-based health care. Because of the magnitude of the topic, it is not possible to conduct an exhaustive review of the literature on every aspect of community-based health care (see Section 2.2 for further discussion) and to assess the strength or weakness of the evidence *in toto* (although an assessment of individual comparative studies has been attempted). Instead, it seeks to find out, based on a fairly extensive review of the literature, what is generally known about health care providers working in community settings. More specifically, it examines how and the extent to which various aspects of health human resources contribute to achieving a number of community-based health care objectives. The findings of this study and the issues identified, together with those of the Component II study, are then used to help frame questions for the site visits and focus group session which are part of the Component III activities.

2 LITERATURE SEARCH AND REVIEW METHODOLOGY

In this section, the literature search strategies and process, as well as the various sources of information, are described. Also discussed is the inclusiveness or representativeness of the studies reviewed. Lastly, the presentation of the findings is discussed. The findings of the literature review are organized by means of a modality-outcome matrix.

2.1 Literature Search Process

The literature search process includes the following major steps:

Development of keywords and search strategies;

Review of the references sections of articles and books already in possession to identify potentially useful studies;

On-line searches of databases for potentially relevant articles;

Canvassing of selected academic experts, organizations and government departments for additional studies and/or unpublished documents;

Creation of a computerized database of potentially relevant articles;

Screening of the abstracts to identify studies for further review; and

Review of references sections of selected articles, books and reports for additional potentially useful studies.

Some of these steps are described in greater detail as follows.

2.1.1 Literature Search Strategies and Keywords

Literature search strategies were developed, in cooperation with librarians skilled in on-line searches, for the following substantive areas:

community-based care,

health human resources modalities and

outcomes.

The on-line searches were limited to the English and French languages, countries belonging to the Organization for Economic Cooperation and Development (OECD) and comparative studies. These criteria were used in order to make the literature search and review tasks manageable. Only studies conducted in member nations of the OECD were included as the health care systems of those countries tend to resemble that of Canada. Only comparative studies were selected through on-line searches because they are most likely to yield empirical results that are vigorous.

The search terms originally developed were refined during the course of the on-line searches to reflect the terms and keywords used by various on-line services. Several test runs were conducted before researchers and library specialists were satisfied that a sound initial on-line search strategy had been established. Appendix 1 shows the keywords used in the on-line searches.

Searches were conducted on the following databases: Medline (1966-1994), Healthplan (1974-1994) and CINAHL (1982-1994). Where possible, duplications were eliminated through the on-line process. Once the searches for all articles concerning each category had been completed, they were combined in the following way: community-based + health human resources modalities + outcomes + English/ French + comparative studies.

2.1.2 Screening of Abstracts

A total of 2,282 abstracts were identified for further screening from the health human resources combined search. This core body of literature was downloaded into Reference Manager, a computer software program specifically designed for handling literature searches. Reference Manager ensures the elimination of duplications in the database. A list of all entries in the database was generated. The screening of the abstracts was guided by the research team's understanding of what community-based health care meant. Three broadly-defined characteristics were used to determine if the service was community-based:

> **Close to Home**: This refers to services that are delivered within the context of daily life. This includes not only physical proximity (i.e., services close to where people live and work), but also services characterized by cultural, linguistic and other forms of affinity (e.g., native healing centres for aboriginal clients).
>
> **Non-Institutional**: This refers to services that are not delivered in hospitals, psychiatric institutions or long-term care facilities. Certain institution-initiated services that are delivered externally could be considered as falling within the parameters of community-based health care, such as hospital-based home care service, extra-mural hospitals, hospital-sponsored ambulatory care clinics.
>
> **Spectrum of Services**: This refers to two or more services within a continuum of health and related services with some demonstrable linkages among them.

The abstracts were blindly screened by two researchers. If there were disagreements regarding the inclusion or exclusion of an article, the researchers discussed and resolved their differences by consensus. Studies dealing with interventions that embodied the above-noted characteristics were chosen for review. Others were disregarded.

2.1.3 Other Searches

Realizing that the on-line searches would be constrained by the coverage of the databases and the keywords adopted by the databases, the research team identified other potentially relevant articles from existing hard-copies while the on-line searches were in progress. Furthermore, the references sections of articles selected for review were scrutinized for potentially useful studies. The titles of these studies were added to the Reference Manager database.

To find out if unpublished studies had been conducted on community-based health care, the research team selectively contacted the following categories of informants: research centres and researchers, provincial and federal government departments and provincial/state/national health service agencies in Canada and the United States. Appendix 2 lists the individuals and organizations contacted.

It is worth pointing out that the selection criteria used in the on-line keyword searches were considerably relaxed in the "other searches". This is particularly true with respect to two criteria, namely, "community-based health care" and "comparative studies". Although this research project is about community-based health care, many workforce studies are not conducted in community settings, but may have bearing on or policy implications for the health workforce in community-based health care. Similarly, while it is the conviction of the research team that comparative studies tend to offer the most vigorous empirical findings and the strongest evidence, it is recognized that the majority of health workforce studies are not comparative in design. If all non-comparative studies are disregarded, a lot of useful information and insights would be overlooked.

2.1.4 Review of Articles and Documents

Articles selected for review and synthesis were obtained from the following sources: the Northern Health Human Resources Research Unit, Laurentian University library, University of Western Ontario library, University of Alberta library, inter-library loan and, in the case of unpublished documents, individuals, research centres, associations and government departments. As of April 14, 1995, a total of 607 articles/documents have been identified as potentially useful, of which 231 have been reviewed and found to be useful for inclusion in the study. Appendix 3 presents the literature search statistics.

Each eligible article was then classified according to its methodology into one of the following categories: informed opinion article, descriptive study, quasi-comparative study and comparative study. This is intended as a hierarchical classification where, generally speaking, informed opinion articles are considered to provide the least valid evidence and comparative studies the most valid evidence for the relationship between an intervention and an outcome.

i. ***Informed opinion article***: This category includes articles of relevance to the study but whose purpose is not to describe the methods or results of original studies. Examples include articles which discuss the pros and cons of different approaches of training practitioners to work in interdisciplinary teams, but provide no original data. These articles may cite findings from other studies. Non-systematic review articles are also included in this category.

ii. ***Descriptive studies***: These are studies which describe the methods and results of original studies, but whose purpose is not to compare the outcomes of different interventions. This category includes a wide variety of study designs such as survey and case study.

iii. ***Quasi-comparative studies*** (without contemporaneous local comparisons): These are original studies whose purpose is to compare the outcomes of different interventions. In these studies, the outcomes occurring in the intervention group are compared with the outcomes in historical or non-local controls. Differences in group characteristic and data collection methodology, as well as other external factors, tend to decrease the validity of such studies.

iv. Comparative studies: These are original studies designed to compare the outcomes of different interventions. The outcomes are compared between groups, which are integral to the study, with similar selection criteria and measured in a similar manner. Comparative studies are further classified as follows:

> ***Cross-sectional***: Outcomes and interventions are measured at the same time.
>
> ***Case-control***: Participants with positive and negative outcomes are compared for differences in intervention.
>
> ***Cohort***: Participants with different interventions are followed longitudinally and compared for outcomes.
>
> ***Pre-/post-test***: Participants are compared for outcomes before and after interventions.
>
> ***Clinical trial***: Subjects are randomized to receive different interventions and are compared for outcomes.
>
> ***Community trial***: Community members or groups are randomized to receive different interventions and are compared for outcomes.
>
> ***Systematic review***: Results from several original comparative studies are systematically compared and synthesized.

Comparative studies were also rated according to their methodological strength. Two reviewers blindly assessed each comparative study for similarity of the comparison groups, explicitness of the definition, correctness of the allocation of the intervention, accuracy of outcome measurements, completeness of follow-up and sample size. Each article was qualitatively rated as methodologically strong, moderate or weak. The rating of the two reviewers were then compared. Differences were resolved by discussion and consensus. A methodologically strong study in this context is one that provides convincing evidence for the relationship between an intervention and an outcome, which is not due to bias, confounding factors or chance. This rating is not intended as a judgment on the quality or overall value of the article. The circumstances surrounding the study may have made it impossible to conduct a methodologically strong study. In addition, the study may provide other valid or useful information such as policy insights or practical recommendations.

2.2 Comprehensiveness of the Literature Review

The scope of this study is extremely broad. An examination of the modality and outcome dimensions (see Section 2.3) shows that most major aspects of health human resources are covered. The dilemma facing the research team was between comprehensiveness and manageability. In order that the research project was manageable, certain criteria were adopted for the on-line keyword searches. On the other hand, in order not to overlook many other studies that were potentially useful, some of the conditions imposed were later relaxed for additional literature searches. All comparative studies were included in the literature review. Informed opinion, descriptive and quasi-comparative studies judged most relevant to the objective of the present research project were also included. While it is possible to claim that a comprehensive search has been conducted for studies that meet all the selection criteria, no such claim can be made for additional studies due to the vastness of the scope of the project, the immensity of the literature and the constraints of time and resources.

Another strategy used to make the research manageable is to rely on existing review or meta-analysis studies that have summarized or integrated many individual studies.

No attempt was made in the literature review to include every study that had been selected or examined. Studies mentioned in Section 3 were intended for illustration purposes. Studies that report empirical findings and that were cited in the review section were summarized for setting, target population, research design, intervention and outcome. These brief descriptions of studies can be found in Appendix 4.

2.3 The Modality-Outcome Matrix

Human resources issues in relation to community-based health care were analyzed by means of the modality-outcome matrix (see Figure 1 on p. 10). Modalities refer to the conceptual dimensions used in understanding or analyzing health workforce issues. Six modalities (modality labels used in Figure 1 are shown in parentheses) were identified as follows:

i. Health human resources continuum (Human Resources Continuum)

ii. Roles of providers and role substitution, expansion and diversification (Provider Roles)

iii. Education and skills acquisition (Education)

iv. Models of personnel configuration and provider remuneration (Personnel Configuration and Remuneration Models)

v. Statutory regulation of health occupations (Occupational Regulation)

vi. Management of the health workforce (Workforce Management)

As these six dimensions are much-discussed themes in the health workforce literature, they represent the major issues or concerns for health human resources planners, policy-makers and researchers. It should also be noted that many of these modalities have been identified in the *Request for Proposals* as salient policy issues.

Outcomes refer to results expected or achieved. In this case, they are the dimensions according to which community-based health care is to be assessed. Not much has been written about how community-based health care should be evaluated, but a number of writers have commented on factors essential to the practice of primary health care. As there is considerable conceptual overlap between primary health care and community-based health care, some of the evaluation criteria suggested for the former could be applied to the latter. For instance, according to the Agency for Health Care Policy and Research (1993), quality in primary care may be characterized along three dimensions. First is the perception by the patient that health needs are being met. This is typically measured by patient satisfaction. Second is the achievement of optimal outcomes. Third is the judicious use of health care resources. Longo and Daugird (1994) have proposed to evaluate the quality of ambulatory primary health care by taking into consideration the following attributes: accessibility, accountability, availability, coordination, comprehensiveness and continuity. These and other ideas have been synthesized and modified to form the following outcome dimensions:

i. Sense of control

ii. Fairness

iii. Value for money

iv. Quality of care

v. Quality of worklife

"Sense of control" means accountability on the part of service providers and a sense of being in charge on the part of patients or clients, both individually and collectively. This outcome includes concepts such as citizen/consumer/lay participation in decision-making, consumer sovereignty, etc. "Fairness" refers to the supply or availability and equitable distribution of health services. This outcome includes concepts such as equity and service accessibility. "Value for money" refers to service costs, cost effectiveness and efficient service delivery. "Quality of care" denotes clinical or health status outcomes, quality and appropriateness of care, consumer satisfaction, etc. "Quality of worklife" refers to job satisfaction of the caregivers. While the other outcomes are patient/client-oriented, "quality of worklife" is provider-oriented. However, upon further analysis, one could see that "quality of worklife" is closely related to or could impinge on cost effectiveness, quality of care or equitable distribution of health human resources. For instance, low morale or dissatisfaction could lead to high staff turnover which, in turn, could adversely affect the quality of patient care or cost of service delivery. It should be pointed out that these five outcome dimensions are used in both Component I and Component II reviews.

It is worth noting that not every cell in the modality-outcome matrix contains pertinent information. Despite extensive literature searches, no or very few studies were found for some modality-outcome cells. For instance, no health workforce studies that pertain to "sense of control" were found. Thus, all the cells pertaining to "sense of control" are blank. This could mean that none of the modalities is related to "sense of control" or that "sense of control" has not been seen as an important issue by researchers. Similarly, very few studies of occupational regulation were identified and most of the studies found belong to two cells: "Occupational Regulation - Fairness" and "Occupational Regulation - Value for Money". There are at least two reasons. First, it seems that most studies of occupational regulation pertain to the health care system as a whole. Thus, when community-based health care is used as a selection criteria, most articles on occupational regulation are screened out. Second, it also appears that most studies of occupational regulation are published in social sciences, public policy and legal journals, not in health sciences/services journals. Since the computerized keyword searches were confined to Medline, CINAHL and Healthplan, it is not surprising that few studies have been located.

Figure 1

THE MODALITY - OUTCOME MATRIX

MODALITY		OUTCOME				
		A	**B**	**C**	**D**	**E**
		Sense of Control	**Fairness**	**Value for Money**	**Quality of Care**	**Quality of Worklife**
I	Human Resources Continuum					
II	Provider Roles					
III	Education					
IV	Personnel Configuration & Remuneration Models					
V	Occupational Regulation					
VI	Workforce Management					

3 FINDINGS FROM THE LITERATURE REVIEW

The purpose of this literature review is to determine if there is documented evidence that interventions based on any of the human resources modalities achieve any of the desired outcomes. The findings of the literature review are organized and presented according to the cells in the modality-outcome matrix (see Figure 1). Each cell refers to the relationship between a modality and an outcome. In addition, policy issues that have been identified by the authors are noted following the presentation of the review findings.

3.1 Modality I: Health Human Resources Continuum

Health human resources continuum refers to the range of practitioners or caregivers relied upon to deliver health care or to achieve health objectives. This is an important issue because although the number of health occupations has increased substantially as new technology develops and occupations splinter, the formal health care system traditionally recognizes a small segment of the potential health human resources supply. What has largely been overlooked are self-care providers and informal or lay caregivers. Similarly, in the health workforce research and planning literature, very little attention has been paid to examining the roles, contributions and limitations of such caregivers, as well as their linkages with the formal health care system. When institutional care is the dominant concern of the health care system, this "benign neglect" is understandable as attention is usually on acute care, specialist intervention, medical technology, etc. The emerging salience of primary health care and community-based services requires a new and broader understanding of health human resources as more emphasis is being placed on health promotion, disease prevention, continuing care and health maintenance.

A broader point of view is, however, slowly emerging in health human resources discourse. For instance, the World Health Organization (1990) has declared: "The term 'human resources for health' encompasses all those who contribute to the objectives of the health system, whether or not they have formal health-related training or work in the organized health sector" (p. 45). In a similar manner, Frenk (1993) has convincingly argued that "...the concept of human resources is broad enough to include not just health personnel but all individuals, families, and groups who do something for health. Indeed, the self care movement is predicated on the notion that every individual is a fundamental human resource for its own care. In addition, families are the setting for the domestic production of health services, which in every country represents a substantial proportion of the total health care product" (p. 316). Likewise, the Community Health Framework project of the Ontario Ministry of Health, in its statement on health system reform, asserts:

> "In terms of health human resources, physicians will continue to play a key role in delivering the full range of essential health services, but other providers, with other skills, must also be involved. And more attention must be given to coordinating these services in the community. It also emphasizes self-help, mutual aid, and other support services run by volunteers and professionals" (Ontario Ministry of Health, 1994).

Self-care and care provided by volunteers, including family members, are very common. Dean *et al.* (1983), Hickey *et al*. (1986) and Russell and Iljon-Foreman (1985) have pointed out that about 70 percent of all health care is provided by lay persons without the involvement of formal caregivers. The National Birth Centre Study, which was conducted by the National Association of Childbearing Centres between 1985 and 1987 and which involved nearly 18,000 women in the United States, found that three-quarters of the women participated in and assumed responsibility for some aspects of their own prenatal care (Rooks *et al.*, 1992). In a Danish study of 1,462 persons, the most frequent behavioral reaction to six common illnesses was some form of nonmedication self-treatment. Approximately 80 percent of the respondents who reported influenza, depression, lumbar pain and cold practised one or more nonmedication self-treatment. Responses in the form of medication and professional consultation were reported more often than nonmedication self-treatment only for skin rash. Chest pain, on the other hand, was the condition for which the largest proportion of the respondents, 29 percent, did nothing (Dean *et al.*, 1983).

The growing recognition of self-care is also reflected in the proliferation of self-care health groups. Such groups generally provide assistance, encouragement and needed services for persons suffering from chronic, disabling conditions. The growth of the self-help movement in the United States was tracked by Gussow and Tracy (1976). The authors examined a number of self-help organizations including the International Laryngectomee Association, United Ostomy Clubs and Alcoholic Anonymous and found that the number of chapters of these organizations grew at an average rate of three percent per year over the three decades since 1942.

The literature on family members who look after their aging, disabled or sick spouses, parents, children and relatives is equally sizeable. For example, health diary studies have found that many mothers make decisions about their young children's minor health problems one or more times per week, usually with no medical advice. Thus, mothers constitute an important health human resource in the care of young children's illnesses (Rasmussen, 1989). A study by Dahlquist *et al*. (1987), conducted in a Stockholm suburb, has reported similar findings. Data from the 1982 National Long-Term Care Survey conducted in the United States show that in 1982, approximately 2.2 million caregivers aged 14 or over were providing unpaid assistance to 1.6 million noninstitutionalized older persons with one or more limitations in activities of daily living (Stone *et al.* 1987).

In light of all this, it is suggested that the health human resources continuum in the context of community-based health care should be seen as comprising three main categories: self-care providers, informal caregivers and formal caregivers. The difference between informal and formal caregivers is not necessarily based on training, competency or the nature of the work. The most important differentiating factor is gainful employment status. Whereas formal caregivers are remunerated for their work, informal caregivers provide their services on a voluntary basis. Another factor is legal sanction. While many health occupations are legally recognized by the state through licensure, certification or registration, informal caregivers receive no such form of recognition. Within the formal caregiver category, providers range from highly qualified specialists to workers who have received minimal on-the-job training. Not surprisingly, much of the health workforce literature focuses on formal caregivers, particularly those who are highly qualified.

The inclusion of formal caregivers in the health human resources continuum is obvious and does not require further justification. In order to counter-balance the traditional but one-sided emphasis given to formal caregivers by health care policy-makers and researchers, Modality I pays special attention to those at the other end of the health human resources continuum.

3.1.1 Human Resources Continuum - Value for Money/Quality of Care (I-C and I-D)

Because many studies examine cost effectiveness and quality of care together, these two outcome dimensions are discussed in the same section. The results are reported separately for self-care providers and informal caregivers.

3.1.1.1 Self-care Providers

Self-care serves at least four functions: to alleviate illness, to alleviate symptoms, to prevent diseases and to regulate bodily processes (Barofsky, 1978). According to Dean *et al.* (1983), although few studies have been done to evaluate self-care practices, those that have done so show that they are generally appropriate and effective.

The use of self-care in handling minor, symptomatic health conditions is a common occurrence. Ondrejka (1983) reported a self-care medication program in an industrial plant. Data collected over a 33-month period suggested that there was negligible risk in implementing such a program in dealing with minor health conditions like headaches, colds, sore throats, sinus congestion and stomach upset even with very little health education being provided to assist the self-treatment process. The self-care medication program resulted in a reduction in non-occupational health-related visits by 65 percent and it appeared to be a viable alternative capable of saving significant amounts of money in terms of time saved and freeing up the time of formal providers for other purposes. It should be noted that the health outcomes of the program were not evaluated.

But technological advances and better patient education have enabled self-care to go beyond the management of minor symptoms. Increasingly, self-care is used to replace care formerly provided almost exclusively by formal caregivers and often in institutional settings. There is a growing body of literature on self-care in relation to a number of chronic diseases such as asthma, diabetes, arthritis, hypertension and cystic fibrosis. Generally speaking, these studies show that, given appropriate training (to be discussed under Modality III) and support, most patients can adequately manage their conditions. For example, a study compared changes in asthma symptoms, knowledge about asthma, metered-dose inhaler (MDI) technique and self-management behaviours for 323 patients with moderate to severe asthma who were randomly assigned to self-management or control groups. Subjects in the intervention groups showed significant improvements in control of asthma, MDI technique and environment control practices (Wilson *et al.*, 1993). In another study, 12 children with primary immunodeficiency were enrolled in a 9-month study to evaluate the feasibility and safety of home self-infusion of intravenous immunoglobulin (IVIg). The children or their parents were taught the techniques of home administration of IVIg and the recognition and management of adverse reactions. All 12 children completed the study according to protocol and no adverse reactions occurred. It was estimated that the cost saving was $195 to $355 per infusion (Kobayashi *et al.*, 1990). Other similar controlled trials to test the efficacy of self-care include Cohen *et al.* (1986), Glasgow (1992) and Rubin *et al.* (1989).

There are many studies on the clinical and cost effectiveness of home intravenous antibiotic therapy. For instance, Wiernikowski and Dawson (1991) conducted a study to see whether intravenous antibiotic therapy for the management of febrile neutropenic episodes among children with cancer, which was traditionally administered in hospital, could be delivered at home. During a six-month period, 13 children/families participated in the successful treatment of 22 episodes of infection. The program proved to be considerably cheaper than in-hospital treatment and was well-received by participating parents. Other studies of a similar nature (e.g., Grizzard, 1985; Kind *et al*., 1985; Rehm and Weinstein, 1983) have shown that home intravenous antibiotic therapy can be undertaken safely and effectively and results in substantial cost savings.

Other types of monitoring, treatment and care that have generally been shown to be safe and effective procedures in the hands of self-care providers include taking blood pressure, physical therapy for arthritis, breast self-examination, cervical self-examination, total parenteral nutrition, home haemodialysis, self-administration of anti-hemophilic globulin, intravenous chemotherapy and continuous ambulatory peritoneal dialysis.

3.1.1.2 Informal Caregivers

Like self-care providers, informal caregivers have been shown to be effective in many health care tasks. Because the literature on informal caregiving is very extensive, only selected studies in a few areas are reported.

After reviewing more than 80 studies of the use and effectiveness of volunteers in programs serving the mentally ill, Carkhuff (1968) concluded that volunteers could be trained in a relatively short time to facilitate constructive changes in mental patients and that the support of volunteers was particularly effective in helping patients develop skills for productive functioning in the community. His review study also found that patients who worked with selected lay people demonstrated changes as great as, or greater than, those who worked with formal caregivers.

Volunteers have been shown to be able to provide health information and counselling to the public. Trained volunteers were used in the Heart Information Service, a community-based telephone information and referral service in Los Angeles designed to disseminate information about cardiovascular diseases. The information service was evaluated by means of a retrospective analysis of 4,351 calls, a mail survey of information recipients and an analysis of responses to simulated calls. The results indicated that lay volunteers could effectively provide telephone information about heart disease, its prevention and treatment, and limited psychosocial support to cardiac patients and their families (Dracup and Frerichs, 1986). A similar study was conducted to assess the effectiveness of trained volunteers who provided crisis and mental health counselling. It compared volunteers, formal caregivers and control-group subjects with respect to the effectiveness of responses to simulated telephone calls. The results suggested that carefully selected and trained volunteers could function as effectively as formal caregivers in counselling distressed callers and community mental health centre clients (O'Donnell and George, 1977).

Many innovative projects have attempted to use lay persons to undertake health promotion and education. One such project was initiated in Hamilton, Ontario, which targeted immigrants and refugees. Public health nurses worked with English-as-a-second-language (ESL) teachers to help them incorporate a preventive and promotive health focus in their classes and develop the skills of the students as health advocates for their immigrant communities. Although a formal evaluation of the initiative was hampered by language barriers and other technical difficulties, the study reported

anecdotal evidence of ESL students acquiring new health knowledge and behaviours (Edwards *et al.*, 1992).

The ability of ordinary citizens to save lives is documented in a series of studies of bystander cardiopulmonary resuscitation (CPR). One such investigation was done in Belgium which examined over 3,000 cases of out-of-hospital cardiac arrests between 1983 and 1987. The survival rate was significantly higher among cardiac arrest victims who had received bystander CPR. In cardiac arrest events where response time of advanced life support exceeded 8 minutes, the beneficial effect of bystander CPR was especially evident (Bossaert *et al.*, 1989). Similar findings have been reported by Eisenberg *et al.* (1979), Ritter *et al.* (1985) and Sobel (1991), among others. The options to reduce the time lapse between cardiac arrest and initiation of CPR include increasing the number of ambulances staffed by emergency medical technicians and increasing the number of citizens who can perform CPR. In the opinion of Eisenberg *et al.* (1979), the latter option is economically much more feasible as citizen CPR training can be done inexpensively in a three-hour session. Other studies have gone one step further in demonstrating the feasibility of using lay persons to operate automatic external defibrillators. They have shown that lay persons can learn to safely operate these devices and that the acquired skills appear to have good retention.

Several comparative studies have been conducted to examine the relative effectiveness of using informal and formal providers to treat aphasic or dysphasic patients. One such study was conducted by Meikle *et al.* (1979). Two groups of stroke patients with serious communication difficulties were compared. One group received conventional treatment from qualified speech therapists in outpatient clinics and the other from volunteers working in the patient's home under the guidance of a speech therapist. Patients were randomly assigned to the two treatment groups. The volunteers received some brief training on the nature of stroke and dysphasia. Results of the trial showed no significant differences in outcome between the two groups. The volunteers were no less effective than the speech therapists. The authors, however, advised caution in generalizing the findings since their study involved relatively few subjects. But similar results have been reported by Shewan and Kertesz (1984) and Wertz *et al.* (1986), among others.

3.1.2 Human Resources Continuum - Fairness (I-B)

Health resources, including human resources, are often unevenly distributed. Those who could benefit most from the services provided by formal caregivers - the disadvantaged, minorities, residents in remote communities - often have the greatest difficulty accessing services. Indigenous caregivers, particularly those from the same backgrounds, can play an important role in redressing the balance as they appear to be better suited to bridge the socioeconomic, ethnic, linguistic or cultural gaps. A number of pilot projects have been conducted which utilize indigenous health care workers to reach the hard-to-reach populations. Generally speaking, indigenous health care workers are informal or formal caregivers who are given limited training and are used to deliver health services to their peers or within their own communities. Many different titles have been used to describe them: neighbourhood outreach worker, peer health worker, indigenous counsellor, village health worker, community health aide, community health representative, etc. Varying from situation to situation and from program to program, their roles include advocacy, community empowerment, outreach, health promotion, disease prevention and direct care provision (Pew Health Professions Commission, 1994a).

An Hispanic outreach worker program was established in a large midwestern metropolitan area in the United States in the late 1980s. Bilingual and bicultural workers were given three weeks of training and periodic in-service refresher courses. Working within the framework of primary health care, the outreach workers offered basic health information to Hispanic residents and facilitated their access to community resources. An evaluation showed that the program resulted in increased numbers of individuals receiving services, more women registering earlier for prenatal care and increased numbers of infants receiving regular medical attention. There were increases in knowledge and positive changes in people's health behaviours. As well, with the help of the outreach workers, the public health nurses were able to care for more families without sacrificing quality of care (Bray and Edwards, 1994). Birkel *et al.* 1993; Herbert *et al.* (1974), Kahn (1981), May *et al.* (1991) and Warrick *et al.* (1992) have reported similar experiments or initiatives with varying degrees of success.

A community-based mental health program started in 1981 to serve six Indian reserves in northwestern Ontario. The objective of the program was to foster the transfer of mental health services to native people by teaching local residents diagnostic and counselling skills. These indigenous counsellors, most of whom had little or no formal schooling, gradually assumed control of mental health services that had previously been offered by non-Indian and non-resident providers. According to Timpson (1983), the program enjoyed enthusiastic acceptance by local residents.

Although these and other similar programs are mostly experimental in nature and the evaluation of their effectiveness is, in many cases, not very vigorous, they offer some initial evidence to support the use of indigenous health care workers to complement the work of formal caregivers and to deliver health care to special population groups that have difficulties accessing services.

3.1.3 Policy Issues

i. It is important to ensure that self-care and informal care are in fact effective. There is some evidence to suggest that self-care is not always without problems. For example, self-medication with both over-the-counter and prescription drugs has been found to be problematic in some cases (Dean, 1986). Ondrejka (1983) has noted that it is uncertain how much knowledge a lay person would need in order to adequately treat himself or herself. It is, therefore, important to make sure that people know when to and when not to rely on self-care and self-medication. Levin (1976) has half-jokingly pointed out that one device not available in self-care is malpractice insurance! Health education may have a crucial role to play in this regard.

ii. Self-care is ubiquitous and should be encouraged. But Hickey *et al.* (1986) have likened it to a "two-edged sword" that presents a potential dilemma for society. For the healthier and better-off people, self-care is a means of prevention and health maintenance. But for the chronically-impaired, the very old and the more vulnerable, self-treatment may be their only, and often inadequate, recourse. Particularly at difficult economic times when spending is under control and services are cut back, self-care initiatives and self-help movements may only contribute to widening inequities in access to care.

iii. Another policy consideration is the kind and extent of support that is needed to encourage or sustain informal care. Informal caregiving often results in physical, psychological, social and/or financial strain for the caregivers, particularly if care is provided for a protracted period of time or if the recipient of care is severely handicapped or cognitively impaired.

Many studies have examined the physical and psychiatric morbidity effects of informal caregiving (e.g., Baines, 1984; Baumgarten *et al.*, 1992; Bull, 1990; Jutras and Veilleux, 1991). On the basis of a literature review, Schulz *et al.* (1990) have found evidence showing increases in self-reported psychiatric symptomatology and increases in psychiatric illness among informal caregivers when they are compared to the general population or control groups. The care burden of those who are employed is particularly heavy (Stone and Short, 1990; Stone *et al*. 1987). The failure to provide adequate support could result in the discontinuation of caregiving or the unnecessary institutionalization of the dependant (Jones and Salvage, 1992).

Support services for informal caregivers, in the form of home care, adult day-care and respite care, tend to be episodic in nature and uncoordinated. Some corporations and organizations have introduced workplace support programs for their employees who have assumed the informal caregiver role, such as policies for leave time, flexible work schedules, and information and referral services (Barr *et al.*, 1992). But overall and consistent policies are often lacking. Even researchers have rather superficial views on this matter. After reviewing 21 studies of the relationship between social support and the well-being of informal caregivers, Levesque and Cossette (1991) have found that researchers tend to have a very limited notion of social support. The weakness of their research is reflected in their measurement tools which typically consist of a few *ad hoc* questions on social support.

The National Advisory Council on Aging (1990) has made a series of recommendations on informal caregiver support. It has strongly advocated, among other measures, the linking of informal caregivers and the formal service network. This involves preparing and assisting health care practitioners to work with informal caregivers and apprising informal caregivers of the roles and limitations of the formal service sector. Equally important is the development of community-based support services, such as counselling, skills development and self-help support groups, to enhance informal caregiving.

iv. Demographic trends and socioeconomic changes are likely to pose a threat to informal caregiving, particularly in view of the fact that the majority of those who provide hands-on care are women. Researchers (e.g., Gee, 1990; Gee and McDaniel, 1993; Stone *et al.*, 1987) have identified a number of factors that could limit the extent of informal caregiving: an increasingly unfavourable dependency ratio created by declining birth rates and longer life span, a surging labour force participation rate among women, rising incidence of divorce resulting in the separation of spouses and the possible attenuation of the sense of filial responsibility on the part of children, etc. As a result, major reconsideration of taxation and pension policies is needed (National Advisory Council on Aging, 1990).

v. With respect to indigenous health care workers, the Pew Health Professions Commission (1994a) has identified a number of barriers to their expanded use. These include the lack of a standard definition and conceptualization of what they are and what they do. On the other hand, the institutionalization or standardization of programs may threaten what makes indigenous health care workers unique and effective. The strength of these programs and providers appears to be their flexibility and innovative approaches to meeting changing health needs and circumstances of the community. Structural and other constraints may minimize the effectiveness of these workers. Other barriers are their lack of legitimacy in the health care system and distrust of their work by some formal providers.

3.2 Modality II: Provider Roles and Role Substitution, Expansion and Diversification

The previous section argues that because self-care providers and informal caregivers have an important role to play in the health care system, they should be seen as an integral part of the health human resources continuum. In this section, the focus is on the roles of formal caregivers. Current changes and reforms in the health care system have ushered in a state of uncertainty among many health occupations. As a result, some have called for the reaffirmation of accepted occupational roles. But as sociologists have maintained all along, occupational roles are neither a given nor immutable. Instead, they evolve and are often vigorously contested among various occupational groups, resulting in incessant turf battles over occupational title, scope of practice, jurisdiction, qualifications and standards.

The shifting of emphasis from institutional health care to community-based health care will likely intensify the debate over provider roles because compared to the former, the latter is less rigid in structure and less formalized in approach. This relative fluidity may encourage the emergence of new providers and provider roles, which may arouse opposition from more established occupational groups. Hutchison (1994) captures the essence of this situation when he offers this observation:

> "The issue of who should and will provide primary care is currently the subject of active -and sometimes acrimonious - debate. In Canada, family physicians and general practitioners have been the dominant providers in the formal primary health care system. The medical dominance is being strongly challenged by other health care providers and policy-makers alike. Research evidence is frequently cited in discussions of this issue... The 'haves' (i.e., physicians) tend to interpret the available evidence as woefully inadequate to justify system-level changes, while the 'have nots' (i.e., other health care providers) are likely to see the evidence as justifying full steam ahead..." (p. 21; parentheses added).

Two themes dominate this area of research: role substitution and expansion and role diversification. With respect to role substitution and expansion, research efforts have tended to focus on what many American writers call "mid-level providers", e.g., nurse practitioners, physician assistants and midwives. Recent discussions on role diversification, on the other hand, focus on multicompetent or multiskilled workers. A multiskilled worker refers to a health care practitioner who is cross-trained to perform procedures and functions in two or more disciplines.

3.2.1 Provider Roles - Quality of Care (II-D)

The number of studies of mid-level providers is very large. Edmunds (1978) reported that as of 1978, there were well over 600 articles and books dealing with some aspects of the nurse practitioner role. Today, the number of studies dealing with all types of mid-level providers is bound to be many times larger. There is no need for this review to revisit the issue of effectiveness of mid-level providers since several major review studies, including some using meta-analysis methodology, have synthesized many comparative studies and have explored this issue in depth.

According to Abelson and Hutchison (1994), studies evaluating the impact of using nurse practitioners in primary care delivery settings are both abundant and of high methodological quality. The same can be said about physician assistants and midwives. For instance, after reviewing 21 studies in which care given by nurse practitioners or physician assistants was compared with that given by physicians, Sox (1979) concluded that office-based care provided by these mid-level practitioners was indistinguishable from physician care. However, the author cautioned that because the studies were limited in scope, there was no basis for extrapolating the conclusion to care given outside the office setting, unsupervised care or care of the seriously ill. These views were shared by the Office of Technology Assessment (1986) which, after reviewing many studies of physician assistants, nurse practitioners and nurse midwives, concluded that when practising within their areas of competence, they could deliver primary care that was equivalent to the care provided by physicians, often more cost-effectively. Other review studies include Brown and Grimes (1993), Edmunds (1978) and Record *et al*. (1980).

Role substitution and expansion is not confined to the delegation of certain medical acts to mid-level providers by physicians. Some of the functions or roles of other practitioners can also be delegated or substituted. For example, some of the work performed by audiologists, physical therapists, occupational therapists and speech-language pathologists can be delegated to rehabilitation technicians or assistants (Hagler *et al.*, 1993). Studies have examined the roles and effectiveness of dental nurses in New Zealand. On the basis of a number of studies, Larkin (1980) concluded that despite opposition from organized dentistry, entrusting dental nurses with primary responsibility for school children had been a success. School dental nurses in New Zealand worked without immediate supervision from dentists and undertook local infiltration anaesthesia, fillings, extractions and preventive dentistry. Similar findings on dental assistants with expanded functions in the United States and on native dental therapists in the Northwest Territories (NWT) have been reported by Abramowitz and Berg (1973) and McDermott *et al.* (1991), respectively. The latter study, however, contains no detailed data on the assessment of quality of care.

Similarly, some roles of registered nurses could be assumed by registered/licensed practical nurses. In 1989, the Intravenous Nurses Society supported integrating licensed practical/vocational nurses (LP/VNs) into the specialty of intravenous therapy nursing. The rationale was that by allowing LP/VNs to do certain intravenous therapy tasks, registered nurses would be able to devote more time to more complex aspects of intravenous therapy care. Roth (1993) examined the training needs for LP/VNs to do intravenous therapy nursing, but did not examine the effectiveness of such role substitution.

Young (1988) performed a "natural experiment" by comparing the health status of residents in two types of native communities in the Sioux Lookout Zone in northwestern Ontario: those with nursing stations and those without (the "satellites"). Residents in both types of community belonged to the same cultural group and lived in comparable conditions. The nursing stations were staffed by nurses and had far better equipment and facilities than the health stations in the satellite communities. In the satellites, primary care services were provided by health aides who had considerably less training. The author found no statistically significant differences in the mean crude death, infant mortality, accidental death, hospital admission and tuberculosis incidence rates between the two groups in the 1970s. The mean number of physician-days per 1,000 population per year was 90 days in communities with nursing stations, compared with 50 days in the satellites. While acknowledging the crudeness of the indicators used, the author concluded that the less sophisticated medical care available to residents of satellite communities did not seem to have a noticeable effect

on their health status. Young's findings appear to suggest that the care provided by health aides was as effective as that provided by nurses in the environment described.

Even health care providers with minimal training can provide effective care under certain conditions. The effectiveness of "health assistants" in a Boston diabetes clinic was evaluated. Health assistants were individuals with no medical background but were given four weeks of training to learn a limited range of clinical skills. A study comparing the care given by these providers using clinical algorithms for diabetes, hypertension and related diseases with care provided in a "traditional" system where physicians delegated few clinical tasks found that both groups provided care with little difference in quality (Komaroff *et al.*, 1976). According to a meta-analysis conducted by Berman and Norton (1985), paraprofessionals with no formal training were no more and no less effective in psychotherapy than professionally trained therapists.

An extensive review of the literature on health human resources substitution has been done by Manga and Campbell (1994). By marshalling evidence from a large number of studies and controlled trials, the authors have been able to show that many forms of role substitution are possible and in many instances role substitution is safe and cost effective. The authors have concluded that nurse practitioners, dental hygienists, midwives, pharmacy technicians, nurse anaesthetists and chiropractors can all safely and effectively provide some expanded functions that are typically provided by practitioners with considerably more extensive training. For example, pharmacy technicians can function in a broad range of non-judgmental tasks in community and hospital pharmacies, thus freeing pharmacists to be more appropriately used in patient counselling and clinical pharmacy activities. In the case of nursing, the authors have noted that while there is a dearth of research regarding appropriate nursing skill mix, registered/licensed practical nurses have substituted for registered nurses in varying degrees for many years. In addition, some of the work typically done by physician specialists can be done just as effectively by general practitioners.

3.2.2 Provider Roles - Fairness (II-B)

There is also considerable evidence that role substitution by mid-level providers can partly overcome the effects of physician shortages in some underserviced areas, resulting in a somewhat more equitable distribution of services. According to Robyn and Hadley (1980), the proportions of nurse practitioners and physician assistants practising outside standard metropolitan statistical areas in the United States exceeded the percentage of physicians located in those areas. A study of the use of nurse practitioners, physician assistants and nurse-midwives in rural communities and migrant health centres in the United States by Shi *et al.* (1993) showed that 77 percent of the 243 centres surveyed employed such providers. The fact that the number of physicians was inversely proportional to the number of mid-level providers except physician assistants suggest that the predominant role of nurse practitioners and nurse-midwives was physician substitution. The authors concluded that mid-level providers could help mitigate the consequences of physician shortages in underserviced areas.

A number of studies have been done to gauge the human resources impact of mid-level providers in rural areas and their acceptance by rural residents. Voltmann (1975) showed that comprehensive health care could be provided in rural and poor areas despite a decreasing number of physicians in rural America, because by using nurse practitioners as the main "person of contact" for patients, physicians could delegate 50-75 percent of their usual tasks, thereby increasing the number of patients they could see. Ramsey *et al.* (1993) studied patient satisfaction with nurse practitioners in

a rural Tennessee community by means of a survey. They found that nurse practitioner-managed care was highly rated by 97 percent of the survey respondents.

In a retrospective study using health status and administrative data, Levy *et al.* (1971) examined newborn health indices before, during and after a demonstration nurse-midwife program that was introduced to relieve personnel shortage in a rural county in California. During the program, prenatal care increased and prematurity and neonatal mortality rates fell. After the termination of the three-year program, prenatal care decreased while prematurity and neonatal mortality rose. No significant changes occurred in the same indices for births elsewhere in the county throughout the entire study period. The researchers concluded that the discontinuation of nurse-midwifery services was the major factor in these changes as the termination of the program created new human resources shortages which, in turn, brought about both lower quantity and probably lower quality of care for mothers and infants. Another study, by Reid and Morris (1979), also showed that the implementation of a nurse-midwife program helped reduce neonatal mortality and low birthweight in rural Georgia.

Although the use of nurse practitioners in Canada has not been as extensive as in the United States, Spitzer and Kergin (1973) have pointed out that the deployment and use of outpost nurses as the principal providers of health care have been documented extensively by the Department of National Health and Welfare in remote northern communities, by the International Grenfell Association in Newfoundland, by the United Church of Canada in British Columbia and by most provincial ministries of health.

Some research on nurse practitioners in rural areas was done in the 1970s before they more or less retreated from the mainstream Canadian health care system. For example, a household survey in a medically underserviced region in south-central Ontario was conducted in 1971 to find out people's attitudes toward nurse practitioners as primary care providers. The survey found that people were supportive of nurse practitioners giving services in health maintenance and sickness surveillance situations. The authors (Chenoy *et al.*, 1973) suggested that the introduction of nurse practitioners to medically underserviced areas could be one approach to filling known gaps in health care. A related study by Batchelor *et al.* (1975) showed that the introduction of a copractitioner arrangement involving family physicians and nurse practitioners into Smithville, Ontario made health services more accessible and convenient to rural residents and generally enhanced their satisfaction.

The Saskatchewan Nurse Practitioner Demonstration Project was established by the provincial government in 1973. Four nurses with special preparation were placed for a two-year period in selected rural communities where there were no resident physicians to function as the health care provider of first contact. A program evaluation showed that residents were quite enthusiastic about this arrangement. Some communities saw the nurse's role as that of a substitute physician, while others wanted her to become involved in coordinating community health services (Cardenas, 1975).

An evaluation study by Chambers *et al.* (1977) compared rural Newfoundland communities with and without nurse practitioners. Primary care visits increased by 186 percent after the establishment of the family practice nurse community clinic and attendance at the hospital decreased by 35 percent. Acute care days in the hospital decreased five percent in the intervention community but increased by 39 percent in the control community. Acceptance of the nurse by patients and other health care providers was very good and there was no measurable change in the quality of care provided. In another pilot project in Newfoundland, Black *et al.* (1976) found that the use of a nurse practitioner appeared to have improved greatly the quality and availability of primary medical care in rural

communities. It turned medical services that were often distant and impersonal into ones that were readily available and highly personalized. It also put greater stress on preventive medicine.

Although many of these and other similar studies are small scale, sometimes involving only one subject, together they have demonstrated the feasibility of using mid-level providers to deliver many primary care services in rural areas. In communities with insufficient physicians, they could supplement physician services; and in small, isolated communities, they could function as physician surrogates.

In very isolated, aboriginal communities, indigenous health care workers are very often the only resident health care providers available. In the NWT and other native communities in Canada, for example, there are community health representatives (CHRs). In rural Alaska, there are community health aides (CHAs). According to a survey of the graduates of the Alberta Vocational College Community Health Representative Program by Adebayo (1995), the majority of the CHRs surveyed were employed in remote areas of Alberta. In 1990, there were about 440 CHAs serving some 45,000 people living in 171 communities scattered over 586,585 square miles (Caldera *et al*., 1991). Also, because they are often selected from and by the communities in which they live and work, they have cultural and linguistic affinity with the people they serve. In many ways, they are similar to the indigenous health care workers described in Section 3.1.2, but CHRs and CHAs are part of the formal health care system and are considered as formal caregivers.

Although most of the published studies of CHRs and CHAs are descriptive in nature (Adebayo, 1995; Caldera 1991; Caldera *et al*., 1991; McLean, 1991) and do not contain detailed evaluation data, according to these and other authors, CHRs and CHAs provide quality care and are well accepted by members of their communities and other health care practitioners. Service users responding to a survey conducted by Quick and Bashshur (1991) indicated that the care provided by CHAs compared favourably to that provided by other practitioners in terms of quality. It is worth noting that although CHRs and CHAs receive similar amount of training, their responsibilities are very different. While CHAs in Alaska provide basic primary health care, including emergency care, for 85 to 90 percent of the patients seeking services, CHRs in Canada typically do not get involved in direct, hands-on treatment. Instead, they serve a secondary health care role by engaging in health education and health promotion.

3.2.3 Provider Roles - Value for Money (II-C)

The cost effectiveness of using alternative providers has received considerable research attention. The Reid and Morris (1979) study, reported in Section 3.2.2, shows that besides demonstrating clinical effectiveness, nurse-midwives helped reduce the costs of perinatal care. Similarly, a randomized controlled trial conducted by Giles *et al.* (1992) demonstrated the cost effectiveness of using midwives to provide antenatal care in Australia. But it did not examine the health outcomes of midwifery care. The cost effectiveness of using clinical nurse specialists to deliver low risk prenatal care was examined by Graveley and Littlefield (1992). Three prenatal clinic staffing models were compared: physician-based, mixed staffing and clinical nurse specialists with physicians available for consultation. The last staffing model had the greatest client satisfaction and the lowest cost per visit.

An evaluation of the cost effectiveness of physician assistants in the Kaiser-Portland Health Maintenance Organization (HMO) concluded that each physician assistant saved the system at least $15,000 annually by providing outpatient care that otherwise would have been rendered by a

physician. Further savings were considered possible through more efficient use of the physician assistants (Robyn and Hadley, 1980). Bentley *et al.* (1984) compared three types of dental practice with respect to costs of delivering dental care to children. The first was a school-based team practice using two expanded function dental auxiliaries, together with a dentist, receptionist and chair-side assistant. The second was a school-based solo practice, involving only a dentist, receptionist and chair-side assistant. The third was a group of unrelated private dental practices operating independent of the school system. In terms of relative value units, the school-based practice using expanded function dental auxiliaries was more economical than the two other practices. However, the use of dental auxiliaries may not be the only reason. The differences in cost could also be due to differences in types of dental procedures performed in the school-based versus the private practices.

An analysis was conducted by Begley *et al.* (1989) to determine the cost effectiveness of nine primary health care projects serving low-income persons in Texas. The study compared the average cost per encounter of diagnosis, treatment, emergency, family planning and preventive health screening services. After adjusting for differences in input price and patient volume, cost differences were found to be a function of personnel mix models. Personnel mix refers the ratio of physicians to alternative providers (e.g., registered nurses, nursing assistants, health educators, physical therapists and nutritionists). The results indicated a tendency for projects with high physician-to-non-physician personnel mix to have higher average costs. According to the authors, this strong correlation of cost with personnel mix suggested that substituting alternative providers for physicians would result in cost savings. However, standard of care was not examined in this study. Thus, it is not determined whether the lower cost attributed to role substitution was achieved at the expense of quality of care.

The cost effectiveness of using alternative providers is due largely to the enhancement of physician productivity (Office of Technology Assessment, 1986). On the basis of an exploratory study, Golladay *et al.* (1973) suggested that the productivity of a physician could increase by as much as 74 percent by using a physician assistant. Spitzer (1978), likewise, believed that nurse practitioner-physician teams could augment primary care resources. On the basis of the Burlington controlled trials, he concluded that such teams could assume responsibility for 41 percent more patients and increase the volume of services by 24 percent while holding cost constant. Citing other studies, Lomas and Stoddart (1985) noted that 40-90 percent of primary care physician visits could be delegated to nurse practitioners. They further estimated that 20-32 percent of general practitioners in Ontario in 1980 could have been replaced by nurse practitioners. If the replacements were to be phased in over a 20-year period, reductions in the number of general practitioners were in the 10-16 percent range in 1991 and in the 20-32 percent range by 2001. The potential cost savings of human resources substitution of such a magnitude could be substantial. Using econometric modelling, Denton *et al.* (1983) were able to show that the use of nurse practitioners could bring about substantial savings. They estimated that 10 percent of all medical costs and 15.9 percent of the costs of ambulatory care could have been saved in 1980 had nurse practitioners been used in the provision of all services for which the substitution of physicians by nurse practitioners had been shown to be safe and feasible.

Although the concept of multiskilling is not without its critic (see, e.g., Cameron, 1995), it appears that the use of multiskilled workers is growing. But possibly because official recognition of multiskilling is a fairly recent phenomenon, its human resources implications have not been extensively researched, particularly in relation to community-based health care. A few studies, however, have shed some light on the extent to which multiskilled workers are utilized. Blayney *et*

al. (1989) have cited a 1980 survey of family medicine practices conducted by the American Medical Association, which found that 70 percent of the 703 respondents utilized multiskilled personnel. The most sought after skills for multiskilled practitioners were nursing, laboratory, ECG testing, medical records, patient education, radiology, vision and pulmonary function testing and audiometry. Over 69 percent of the respondents indicated they would hire multiskilled workers if they were available. A more recent survey conducted in South Carolina sought to identify the need for multiskilled allied health workers (Hernandez and Samuels, 1990). Although the majority of those surveyed were institutions such as hospitals, the sample included many specialty clinics, free-standing clinics and multiple physician practices. Close to half of those surveyed indicated they employed some cross-trained providers. The most frequently utilized and desired skill combinations were multicompetent practical nurses, respiratory therapy technicians, ultrasound technicians and radiography technicians.

A survey of group and staff model HMOs found that the multiskilled workers most frequently employed by HMOs were medical assistants, medical technologists, radiologic technologists and nursing personnel. Radiologic technology, medical technology and nursing were most frequently mentioned by the survey respondents as basic skills possessed by multiskilled practitioners in HMOs. Some HMO administrators indicated that they were not content with single-skilled practitioners because they were not cost-effective (Rudmann, 1989). In another study, Gibeau (1993) described the needs for psychiatrically skilled home care aides who were competent not only in providing personal care but also in the mental health area. Other studies of multiskilled providers in the United States which have yielded similar results include Beachey (1988); Hedrick (1987) and Low and Weisbord (1987). Most of these studies conclude that cost effectiveness is one of the main reasons for using multiskilled workers.

A survey was conducted in Alberta in 1994 to determine the extent of utilization of multiskilled personnel in that province (Billey, 1994). Questionnaires were sent to hospitals, medical clinics, community health units, home care agencies, long-term care facilities and outpatient medical services. Results of the survey showed that slightly less than half of the agencies and institutions employed multiskilled workers. Community health units employed the greatest number of such personnel, followed by home care agencies and medical clinics. Cost effectiveness, staff flexibility and staff efficiency were the three main reasons given by the respondents for using multiskilled providers. Agencies and organizations that employed multiskilled workers indicated that their needs for such personnel would either remain unchanged or increase.

It should be noted that the literature searches did not find any large-scale evaluation of the quality of care provided by multiskilled workers. Also, although the cost saving potential of using multiskilled workers has been alluded to by some authors (e.g., Hernandez and Samuels, 1990), because there is no vigorous research comparing various personnel models, conclusions on the cost effectiveness of multiskilled workers should be seen as tentative at this time. Finally, with a few exceptions, most of the studies and surveys of multiskilled workers have focused on hospitals. Thus, the applicability of multiskilling to community-based health care is still largely unknown.

3.2.4 Provider Roles - Quality of Worklife (II-E)

The expansion of community-based health care is likely to bring about major changes in role definition as new providers enter the scene and as traditional roles and functions are cast aside or challenged. Role confusion and disagreements could engender conflicts among practitioners and occupational groups, which, in turn, could lead to low morale and antagonistic working relationships.

Kethley *et al.* (1982) conducted a survey of role perceptions of nurses and social workers employed in home care in Washington state. The survey results pointed to potential turf battles between these two groups of providers. Nurses tended to see themselves as capable of handling all patient-directed tasks and saw few home care tasks as the unique domain of social work. This was in sharp contrast to the views held by social workers, particularly regarding tasks in the psychosocial realm.

In a study of role perceptions, Davidson *et al.* (1981) attempted to determine the amount of agreement concerning patient care roles that existed among physicians and nurse practitioners working together in ambulatory care settings. Agreements on roles were assessed by asking nurse practitioners and physicians working together to comment on the appropriateness of each clinician providing care for patients described in a series of vignettes. Disagreements on the role of the nurse practitioner was most often in the direction of the nurse practitioner feeling capable of providing more care than the physician felt she could provide. Another important finding was that agreement on patient care roles was strongly correlated with job satisfaction. The authors speculated that workers might be more satisfied with their job if their roles were more clearly delineated.

On the other hand, Spitzer (1978) found that in the southern Ontario controlled trial, there was no observed decline in job satisfaction among physicians and nurse practitioners who worked together. Job satisfaction of physicians and nurses in both experimental and control groups was assessed by means of a questionnaire with 67 items that explored, among other things, relationships with colleagues, challenges, achievements, prestige and remuneration. With the exception of remuneration, satisfaction scores were high in all dimensions for physicians and nurses of both experimental and control groups.

3.2.5 Policy Issues

i. As Manga and Campbell (1994) have observed, role substitution as a strategy to improve efficiency and contain costs has not been seriously attempted in Canada despite considerable evidence of its effectiveness and cost saving potentials. According to these authors, there are four major obstacles to role substitution: occupational governance and regulation, workforce supply policies, delivery organization and financing and public attitudes. They believe that since role substitution does not occur by itself, it is up to governments to implement human resources substitution policies. Instruments at the disposal of governments include reform of occupational regulation, changes to the structure and financing of health care delivery and the promotion of a strong, coordinated primary health care system.

ii. To date, the quality of care provided by multiskilled workers has not been researched extensively and systematically, particularly in community settings. It appears that the introduction of multiskilled providers is often driven by cost concerns. This view is supported by Billey's (1994) observation that "the quality of patient care and improved

patient service are not the prime reasons for implementing multiskilled personnel in health care organizations. Cost containment and overall operational cost effectiveness are the forces influencing the staffing role changes" (p. 4 of Executive Summary). In light of this, it is critical to demonstrate that the use of multiskilled workers is not only cost effective, but also conducive to quality care and efficiency in the health care system.

iii. Assuming that multiskilling is compatible with community-based health care, there are a number of implementation issues that still need to be addressed. Various impediments have been identified, such as "territorial imperatives" in organizations which prevent the sharing of personnel across departmental lines, "turf guarding" and fear of encroachment by practitioners in various affected disciplines, restrictive accreditation standards, practice restrictions arising from licensure, liability implications and administrative problems that discourage the development of common training courses (Bamberg and Blayney, 1984; Beachey, 1988; Hedrick, 1987). Unless these and other obstacles are removed, the use of multiskilled workers is likely to be highly circumscribed. There are other yet to be answered questions: What are the job descriptions of multiskilled workers? Should multiskilled workers emerge as a new occupation or should existing practitioners expand their knowledge and skills to become multicompetent?

iv. Traditional health workforce planning has tended to focus on one occupational group at a time. But the supply and demand of different types and levels of providers are interrelated as occupations are in many instances interdependent and substitutable. Some authors (e.g., Lomas and Stoddart, 1985) have suggested that over-production of high-level providers hinders the use of human resources substitution. For instance, an ample supply of physicians may make the use of mid-level providers less likely. On the other hand, as some of the studies cited earlier have shown, if mid-level providers are used optimally, fewer physicians would be needed to provide the same amount or level of services, as a result of human resources substitution or enhancement of physician productivity. Golladay *et al.* (1973), therefore, see the need to redirect discussions of human resources requirements from an emphasis on practitioner-to-population ratios to an emphasis on efficient systems of health care delivery and the implied personnel requirements.

v. Role substitution and redefinition in community-based health care settings are bound to generate unease among practitioners and disagreements, or even hostility, between occupational groups. For example, Kethley et al. (1982) have documented turf battles between nurses and social workers in home health care (see Section 3.2.4). Langsley and Barter (1983) have discussed the "marginalization" of and dissatisfaction among psychiatrists in community mental health centres as a result of the taking over of many of their traditional roles by psychologists, social workers and other mental health practitioners. The ability to limit or resolve such conflicts will become an important issue in community-based health care management. There are no hard and fast rules in dealing with inter-occupational rivalry. Kethley *et al.* (1982), for instance, have urged that groups involved in turf disputes be encouraged to dialogue and have recommended the use of conflict management models aimed at assisting team members to resolve their differences.

3.3 Modality III: Education and Skills Acquisition

The formation and continuing development of the health workforce depend on the acquisition of knowledge, skills and competency by those engaging in the production of health care. In the health workforce literature, attention focuses primarily on the education and continuing education of formal caregivers. But, as it has been pointed out earlier, the health workforce comprises more than formal caregivers. Self-care providers and informal caregivers are equally important, particularly from the perspective of community-based health care. Therefore, in reviewing the literature on education and skills acquisition and their relationship to community-based health care, one must pay equal attention to providers of formal care, informal care and self-care.

Most of the studies from the literature searches are related to the "quality of care" dimension, although a few studies address the "fairness" issue. There are also studies that deal with policy concerns in the area of health workforce development.

3.3.1 Education - Quality of Care (III-D)

The findings on the relationship between education and quality of care are reported separately for self-care providers, informal caregivers and formal caregivers.

3.3.1.1 Self-care Providers

Research in this area yields conflicting results. While many studies show that health or patient education leads to more extensive or appropriate self-care, others find no evidence that education produces desirable health behaviours or benefits in health status. Because there is a large body of literature on this topic, the following discussion relies mostly on a number of review studies to synthesize the major research findings. A few typical case studies are reported as illustrations.

Glasgow *et al.* (1992) reported a 10-session self-management training program that was designed for persons over 60 years of age with Type II diabetes. The eight-week training program was led by an interdisciplinary team including psychologists, a dietician, certified exercise leaders and other educators. One hundred and two adults were randomly assigned to the intervention and control groups. At posttest, subjects in the intervention group showed statistically significant reductions in caloric intake and percent of calories from fat, in comparison to the control-group subjects. The program was generally judged to be effective in producing desirable behavioral changes. The effectiveness of using a diabetes education videotape was tested by Brown *et al.* (1992) on a sample of 30 Hispanic diabetic adults. A moderate effect size was found when comparing knowledge results between the experimental and control groups, indicating that the videotape was somewhat successful in increasing knowledge about diabetes. A similar study of the effects of self-study educational approach on diabetes self-management techniques was conducted by Jones (1990).

Vickery *et al.* (1983) examined the impact of a self-care education program on medical care utilization in a Rhode Island HMO. Over 1,600 households took part in the randomized controlled trial. Participants were divided into three experimental and one control groups. The three experimental groups differed in the intensity of intervention. All experimental groups showed statistically significant decreases in total ambulatory care utilization as compared with the control group. The authors concluded that an inexpensive system of written communication could produce substantial impact on utilization behaviours. Other studies that show a positive impact of health or

patient education on self-care behaviours include Bush *et al.* (1989), Goeppinger *et al.* (1989), Jenkinson *et al.* (1988), Roberts *et al.* (1983) and Rubin *et al.* (1989).

A number of other studies, on the other hand, fail to show the effects of education on self-care behaviours. A controlled trial conducted by Webb (1980) randomly assigned 123 low-income, black, rural, hypertensive patients to one of three intervention groups: patient education in group and regular physician visits; individual psychosocial counselling and regular physician visits or regular physician visits only. The last group was the control group. Results show that neither vigorous patient education nor psychosocial counselling, both in addition to high quality baseline medical care, was found to improve compliance or diastolic blood pressure control better than baseline medical care alone. In other words, education and counselling did not in themselves significantly improve patient compliance or blood pressure control when they occurred in addition to regular medical care by family physicians.

In another study by Redman *et al.* (1991), 142 women and their partners participated in antenatal classes in Australia and were surveyed before and after the intervention. The antenatal education program was intended to increase informed participation in decision-making during labour, early parenting skills and performance of preventive health behaviours. Increases in knowledge were evident following the program and satisfaction with the program was high. But, overall, antenatal education did not appear to have an impact on preventive behaviours, such as intention to breast-feed or feelings of control during childbirth. Other studies belonging to this category include Cohen *et al.* (1986) and Parcel *et al.* (1994).

Several review studies were conducted which assessed and synthesized many empirical studies of the role of health or patient education in changing behaviours and clinical outcomes. Like the individual trials cited, these review studies yielded no clear-cut conclusions. According to Mazzuca (1982), patient education was most effective in altering compliance. Among the more successful interventions was daily self-care rituals. However, the effect of the intervention tended to diminish over time. Another meta-analysis of 23 evaluations of patient education also showed that compliance was most strongly affected by the programs (Posavac, 1980).

A meta-analysis of studies dealing with diabetes patient education found that structured education improved patient knowledge, compliance with prescribed treatment modalities and metabolic control (Brown, 1988). Another meta-analysis of studies of educational and psychosocial interventions in the treatment of diabetes mellitus was conducted by Padgett *et al.* (1988). The review indicated moderate but significant improvements for all intervention subjects. Physical outcomes and knowledge gain were most affected, followed by psychological status and compliance.

Mullen *et al.* (1985) conducted a quantitative synthesis of 70 published evaluations of educational programs for people with long-term health problems and regimens that included drugs. The effects of seven types of educational techniques were compared. The effect-size values derived were sufficiently large to convince the authors that there were substantial benefits from patient education programs among the chronically ill. Bartlett (1980) conducted a major review of empirical studies of the effects of health education for such conditions as hypertension, diabetes, congestive heart disease and streptococcal infections. Some of these studies showed that health education contributed to parents taking their children requiring dental work for appropriate care, following therapeutic regimen by patients, improving follow-up for families of pediatric patients, adhering to antihypertensive regimen, etc. Education was also shown to be effective in reducing delays in

seeking medical care for serious symptoms. However, some of the reviewed studies measured no significant effects of health education activities. In another review, Rasmussen (1989) found that studies of the effects of self-care educational material, such as booklets, showed conflicting results.

3.3.1.2 Informal Caregivers

Studies in this category generally show that education has a positive effect on informal caregivers. For instance, The Clark Institute of Psychiatry in Toronto established a volunteer program with a 10-week intensive training component as part of a multidisciplinary approach to rehabilitate chronic psychiatric patients in the community. Using films and lectures, the training program imparted information on psychiatric illness and community resources. Although no detailed data were presented, the authors (Brooks *et al*., 1989) reported that pre- and post-training survey scores showed gain in knowledge. As well, some of the volunteers indicated increased tolerance for the mentally ill. A similar approach was used by the Mid-Eastern Iowa Community Mental Health Centre to train "natural helpers" to support rural mental health delivery (Kelley *et al*., 1977). The trainees included housewives, high school students, a general practitioner, a public health nurse, a high school guidance counsellor and a service station manager. The training involved 24 sessions. The effectiveness of the training was measured in a number of ways including the use of the Personal Orientation Inventory and a mail survey of the trainees. Again, no detailed evaluation data were presented, but it was the opinion of the authors that the training demonstrated that lay persons could be trained to function effectively in rural mental health service delivery.

Seltzer *et al.* (1992) evaluated the effectiveness of a training program designed to enhance the case management ability of family caregivers. It found that family members who had received the training performed a greater number of case management tasks on behalf of their elderly relatives than untrained family members. A study by O'Donnell and George (1977) examined the effectiveness of volunteers who provided telephone counselling services in a community mental health centre. Volunteers initially received 15 hours of didactic and experiential training in crisis theory, effective interpersonal communication and use of community resources. This was followed by another 15 hours of closely supervised on-line experience with callers. Refresher training was then made available at regular intervals. The evaluation showed that carefully selected and trained volunteers could function as effectively as formal caregivers in providing supportive and emergency telephone services for distressed callers and clients of the community mental health centre. Nicoletti and Flater (1975) have reported similar findings in their study.

The benefit of a mass-distributed booklet and a discussion session about young children's minor illnesses was investigated in a controlled trial conducted by Rasmussen (1989) in Sweden. Knowledge about care of their children was measured by the mothers' answers to questions based on seven vignettes. The mothers who had read the child care booklet would follow the recommendations about when to seek and when not to seek medical care significantly better than those who had not read it. Those who had read the booklet were less prone to seek medical care when not recommended. The mothers who had read the booklet and participated in a session were, however, more prone to rely on self-care when medical attention was recommended, compared to those in the control group. Casey *et al.* (1984) conducted a controlled trial of an educational intervention to improve parental understanding and management of fever in a private group practice. Parents in the intervention group received an interview in which the management of fever was discussed, demonstrated and practised. In addition, they received an information sheet for reinforcement two months later. Parents in both the control and intervention groups showed an

increase in knowledge about fever, but only in the intervention group was there a reduction in medication errors and contacts with physicians for minor, transient febrile illnesses.

A community-based program for family caregivers of impaired older adults was developed to teach caregivers skills and techniques with a view to enhancing their sense of competency and reducing their risk of physical strain. Skills ranged from giving a bed bath to solving complex care-management problems. All participants were interviewed by telephone between the first and second sessions of the training program and three and six months following program completion. All participants responded positively to the overall program and the curriculum content. But no behavioral outcome measurements were reported (Mahoney and Shippee-Rice, 1994). Sheehan (1989) evaluated the Caregiver Information Project which was designed to provide religious leaders and social service workers with information concerning the elderly and their caregivers. Results of the evaluation showed that the training was successful in improving knowledge about aging and caregiving issues. The project also succeeded in increasing the number of caregiver support activities.

3.3.1.3 Formal Caregivers

Formal caregivers are mostly trained to work in institutions since institutional care has been and still is the mainstay of the health care system in most countries. But as more health services shift to community-based settings, there is a need to give formal caregivers a broader understanding of health care issues, to familiarize them with community-based care and to prepare them to work in the community sector, if necessary. Recognition of such a need is growing. For instance, Hamad (1991), a World Health Organization consultant, commented on the shortcomings of conventional medical education:

> "The usual state of affairs is that not more than 10% of patients visit the hospital and not more than 1% are admitted. Why do we then continue to limit our clinical teaching within the walls of the hospital and claim to be producing competent doctors? For these doctors to be competent it is vital that they receive a balanced training in all levels of health care: primary, secondary and tertiary as well as having familiarity with the culture, traditions and other psychosocial aspects of the families and communities within which they are to practise medicine" (p. 20).

The inadequacy of conventional medical training in preparing physicians to work in the community setting is illustrated by a study of 30 primary care physicians involving in or supervising home care services as part of their daily work with HMO patients in the United States (Polich *et al.*, 1990). In the interviews, the physicians repeatedly mentioned that they had minimal knowledge about and understanding of Medicare home health care criteria, that they were inadequately trained in home health care and that they tended to be uncomfortable outside the office or hospital setting.

Realizing the changing needs in health care and the limitation of conventional medical education, the World Federation for Medical Education, in its Edinburgh Declaration, has called for a substantial transfer of undergraduate medical education from teaching hospitals to the community. In the World Summit, the Federation has again recommended the use of wider settings to enlarge and enrich the hospital experience (see Murray *et al.*, 1995).

Many studies have reported on demonstration projects and new initiatives conducted in various jurisdictions. But the majority of these studies are descriptive in nature or lack vigorous evaluation of their effectiveness or impact. A sample of these are mentioned in order to illustrate the types and scope of educational programs with a community-based health care orientation.

Since 1991, the University College London Medical School has instituted a community-based general medical practicum to replace a hospital-based junior medical practicum for first-year clinical students. This new approach has the same objectives of teaching medical students the basic skills of history-taking, physical examination and communication skills (Murray *et al*., 1995). Cermak (1976) described a program introduced by Boston University to provide senior occupational therapy students with a community-based field work experience. Focusing on prevention and early intervention for young children and their parents, the program gave the students an opportunity to experience the complexity of health service delivery in the community and to develop skills for effective intervention.

A similar approach in dental education was reported by Balzer *et al.* (1980). Five dental schools in the United States developed training programs for dental and dental auxiliary students in planning and delivering preventive dental services in a community setting using the team approach. A team consisted of, at a minimum, one dental student and three auxiliaries. The evaluation results were generally positive. The students reported that the program offered an excellent interdisciplinary training experience and that the programs offered strong management training opportunities. But another initiative developed by the Department of Community Dentistry, University of Texas at San Antonio was less successful, in the opinion of Miller and Heil (1976). The program, a combined 20-hour course including classroom instruction and field experience, was introduced with a view to modifying dental students' attitudes toward patients with special needs. Based on pre-and post-intervention results, it appears that the program failed to produce the desire attitudinal changes in the students.

As more health services are being provided in non-institutional settings, an increasing number of formal caregivers will have to shift their employment from institutions to community settings. The resultant career changes and the adjustments required may be difficult for some practitioners, and education could play a part in facilitating the transition. Ceslowitz and Loreti (1991) examined the experience of 80 registered nurses with exclusively hospital experience who were recruited into home care nursing. The study described the nurses' concerns and the six-week home care rotation that was designed to facilitate the career transition. Concerns expressed included fear of the unknown, the complexity and scope of the required patient assessments, the need to function as a generalist and personal safety during home visits. The authors proposed a comprehensive orientation program, coupled with continued support for staff members.

Another study examines the training of family physicians to conduct home visits (Neale *et al.*, 1992). As an emphasis on community-based care may increase the demand for home visits by physicians, there is a need for systematic training of family physicians in the proper use of the home visit as an integral part of patient care. The Department of Family Medicine, Wayne State University developed a structured and supervised home visit experience for its residency curriculum. It required each resident to perform between six and eight supervised home visits during each three-month rotation in the second and third years of residency training. Program evaluation data suggested that after the training, the residents had less concern about personal safety and were more likely to agree that home visits were important. However, whether the positive effects of such training would manifest in subsequent medical practice is not known. Studies of similar training initiatives in community

settings include Couser *et al.* (1990), Gravdal and Glasser (1987), Key *et al.* (1973), Osborn *et al.* (1986) and Osterweis *et al.* (1980).

As community-based health care tends to emphasize the multidisciplinary or interdisciplinary team approach, formal caregivers need to learn how to work cooperatively with practitioners in other health fields. According to G. Szasz, a pioneer of interdisciplinary learning at the University of British Columbia, interdisciplinary education is a means to prepare students for collaborative service relationships (Szasz, 1974). Many attempts have been made to introduce or strengthen multidisciplinary training of health care providers. A survey was done in the United States of all physician assistant and nurse practitioner programs recognized by the National Commission on Certification of Physician Assistants in 1975. The results showed that mixing of students in the classroom was a commonly used technique in mid-level provider programs. McCally *et al.* (1977) reported that 70 percent of the physician assistant programs and 38 percent of the nurse practitioner programs had at least one classroom activity shared with at least one other health discipline. Baldwin and Baldwin (1978) described the development of an interdisciplinary health sciences program at the University of Nevada, Reno, which featured a common core curriculum for all students in the health field. Szasz (1974), likewise, described the attempts at the University of British Columbia to introduce the Interdisciplinary Education in the Health Sciences program.

In 1984, the Department of Family and Community Medicine of the Eastern Virginia Medical School introduced a year-long interdisciplinary continuity-of-care elective for students in a medically underserviced inner-city neighbourhood. This elective required each participating student to spend one evening a week in the project over an entire year to learn the skills needed in long-term health care. The student provider teams consisted of pre-clinical medical, third-year medical, social work, nursing and nurse practitioner students. An evaluation showed that the students strongly supported the team approach. The success of the program from the patients' perspective was assessed by a survey administered to a random sample of the patients at the end of the year. All reported that the care was generally better than the care they had previously received (Berger and Shaffer, 1986). Other studies of multidisciplinary training involving medical students include those by Bassoff (1983), Howard and Byl (1971) and Tanner *et al.* (1972).

3.3.2 Education - Fairness (III-B)

Shortages of certain types of health personnel or the uneven distribution of personnel are important issues in health workforce planning. A few studies have examined the effects of formal education on the supply and distribution of health human resources in relation to community-based health care.

The lack of primary care physicians in the United States has been a longstanding concern and efforts have been made to encourage more medical students to become primary care physicians who are more likely to practise in community settings and rural areas. A study by Rabinowitz (1988), using educational data from 123 medical schools in the United States, showed that students who attended medical schools with a required third-year clerkship in family practice were significantly more likely to enter family practice residency training (16.8 percent) than students who attended schools with a required fourth-year clerkship (14.5 percent), or who attended a school with no required family practice clerkship (12.1 percent). But, as recently as 1986, only 27 percent of American medical schools had a required third-year clerkship in family medicine.

In response to the new requirements of the National League for Nursing and the American Nurses Association, many nurse practitioner programs in the United States have converted from the certificate to the master's degree level. Such a change could become a barrier to enrolling certain types of students, such as nurses in rural areas and those who are members of minority groups and who may also be the ones most likely to practise in underserviced areas. An analysis was done by Fowkes *et al.* (1994) to examine the effect of the graduate level programs on deploying graduates to underserviced areas. Programs were defined as successful if more than 60 percent of their graduates were in primary care practice and a substantial number were in medically underserviced areas. The results showed that only three (or 14 percent) of the 22 graduate-level programs were classified as successful. The two non-graduate level nurse practitioner programs were both successful. In other words, graduates of certificate programs were much more likely than their graduate-level program counterparts to work in primary care or underserviced areas. The same study also showed that nurse practitioner, certified midwife and physician assistant programs need to use comprehensive strategies to encourage their graduates to practise in underserviced areas. Such strategies include recruiting students who are committed to underserviced populations, providing classroom and clinical experiences that support their goals and prepare them for work in these communities and hiring faculty members who model similar practice. The students and graduates interviewed identified clinical experience in underserviced areas, curriculum on other cultures and public health, faculty role models and the program's emphasis on primary care as providing the preparation they would need to practise in underserviced areas.

3.3.3 Policy Issues

Various policy issues related to the education and training of health care providers have been identified.

i. Although no consensus exists on the kind of educational model that would help foster community-based health care, there is a general realization that existing approaches are flawed in a number of ways. The above review has identified a number of problems, such as compartmentalized training, training that is mostly confined to institutional settings and lack of emphasis on primary health care.

In addition to these issue-specific criticisms, there are critiques that aim at health human resources training in general. Slayton (1978), for instance, has assailed "traditional professional education" as an inflexible model unable to respond to changing circumstances. According to him, the requirement that such education be consisted of liberal education and extensive training in a body of theoretical knowledge may result in ignorance of or lack of interest in lower-level, practical activities. The presumption of autonomy may result in practitioners who are unable or unwilling to engage in certain kinds of work which require interdisciplinary skills. He also points out that over-education tends to put such careers beyond the grasp of many, produce a uniform and narrow range of skills and lead to high costs of services. While Slayton's broad concerns may not be shared by everybody, his idea of appropriate learning with multiple entry and exit points and interdisciplinary and service-oriented curricula appears to be compatible with the objectives of community-based health care.

ii. One of the most critical issues is the lack of community-based training. While there are some innovative initiatives, some of which have been described previously, much of formal education in the health field is still firmly entrenched in the traditional paradigm. In the case of medicine, as Woolliscroft and Schwenk (1989) have opined, a model of ambulatory teaching of medical students has yet to exist. Their view is echoed by Murray *et al.* (1995) who have noted that there has been little attempt to develop genuine community-based medical education. They believe that a three- to six-week attachment to general practice is not adequate.

Realizing the often inadequate preparation of health care providers to work in community settings, the Pew Health Professions Commission (1994b, 1994c) has advocated increased opportunities for undergraduate and graduate medical education in ambulatory, rural and other community settings and the use of restricted state funding to redirect the current individual, curative orientation of health care education toward more community- and prevention-oriented curricula.

iii. In order to give medical trainees educational experience beyond the walls of teaching hospitals, many medical schools look for ambulatory teaching sites. Such sites are thought to be more suitable for learning the skills of physician-patient communication and for developing collaborative working relationships with other health personnel. Thus, it is not surprising that of the 77 HMOs surveyed in the United States in 1977, 48 (or 62 percent) were involved in medical student teaching programs. Many also taught students in other disciplines (Osterweis *et al.*, 1980). But, as Gordon *et al.* (1977) have discovered, there are educational and practical problems associated with community-based teaching. These include using community-based instructors who typically are not closely connected to the university and who have limited background in instruction, ensuring comparability of the experiences of students who are in different learning sites and monitoring students' performances in widely dispersed locations.

iv. A related issue is the appropriateness of existing educational curricula. In the case of medical education, it has been suggested out that what is taught in medical schools may not correspond to what is needed most in medical practice, particularly in community settings. Bartlett (1980), for example, noted that the percentage of direct patient care time devoted to health education and counselling by primary care physicians ranged from 19.3 to 35.4 percent. Physicians also viewed patient education as an important therapeutic modality. Thus, Bartlett found it ironic that health education was not taught as a separate required course in any of the 120 medical schools in the United States, according to the 1979/80 curriculum directory of the Association of American Medical Colleges.

v. Multidisciplinary training has become trendy. But as Kindig (1975) has pointed out, although a wide variety of didactic and experiential interdisciplinary initiatives have been carried out, certainly nothing as concrete as educational principles are in place. Bassoff (1983) is equally sceptical. He has noted that empirical studies that could justify the cost effectiveness of the team approach are conspicuous by their absence. According to the author, there is little evidence that the movement has had any substantial impact on health sciences education.

On the other hand, Shepard et al. (1985) have been able to distil from existing research ideas for organizing and implementing effective multidisciplinary training. Similarly, Kindig (1975) has offered a number of practical suggestions on strengthening multidisciplinary training. These include placing different disciplines in close proximity in order to increase social interaction, integrating the teaching and learning of basic sciences and making available interdisciplinary clinical experiences for interested students. More experimentation and research in this area are called for.

vi. The broadening of community-based health care will likely require caregivers with a broader range of skills. But, how should multiskilled providers be trained or how should existing caregivers be retrained to be multicompetent? Rudmann *et al.* (1989) have offered a number of possible models, such as combining two or more programs into a single program, developing a new program with unique training for specific health care delivery settings and adding basic skills to existing single-discipline curricula. Other alternatives include continuing education programs, apprenticeships and on-the-job training. To date, very little discussion on this and related issues has taken place in Canada. The survey in Alberta conducted by Billey (1994) has shown that informal, on-the-job training is most frequently used by agencies and facilities to cross-train their workers. But such an approach may not be adequate if the demand for multiskilled workers continue to increase.

vii. As noted earlier, the evidence is inconclusive with respect to the effectiveness of health or patient education for self-care. The same can be said about strategies for health or patient education. Russell and Iljon-Foreman (1985) have pointed out that no one educational strategy has been consistently shown to have a clear advantage. While there is a growing interest in transferring information, knowledge and skills to service consumers, there is no clear guidance about which techniques are most effective for particular problems and patients. Bartlett (1980) has identified a number of factors that may explain the ineffectiveness of some health educational efforts, such as the unwarranted assumption that knowledge alone leads to behavioral changes, over reliance on one or two educational strategies and efforts directed solely at the individual patient when the target behaviour is not under his/her complete volitional control. In designing health education strategies and programs, some of these factors need to be taken into consideration.

3.4 Modality IV: Models of Personnel Configuration and Provider Remuneration

Although there are many possible models of personnel configuration in community-based health care, such as solo practice, group practice, partnership, hierarchical structure and team, the model that has captured the attention of many researchers and planners is the multidisciplinary or interdisciplinary team model. Also, because of the way community-based health care is defined by the present study and the way the literature searches were conducted, most of the studies selected for review emphasize the multidisciplinary team approach. The World Health Organization defines the primary health care team as a "group of persons who share a common health goal and common objectives determined by community needs, to which the achievement of each member of the team contributes, in a coordinated manner, in accordance with his/her competence and skills and respecting the functions of others" (quoted in Abelson and Hutchison, 1994: p. 28).

With respect to how providers are remunerated, much of the discussion in the research literature focuses on the differences between fee-for-service and non-fee-for-service payment schemes in relation to service utilization, health outcomes and health care costs.

There are many studies that describe personnel configurations in community-based health care organizations or programs. For example, the Reach Community Clinic in Vancouver had five part-time physicians, two nurse practitioners, two licensed practical nurses, one pharmacist, one nutritionist and three medical receptionists. One of physicians was the medical coordinator (Sheps and Robertson, 1984). The Extra-Mural Hospital in New Brunswick has a service mandate that combines traditional long-term, low-intensity home care with more active hospital-at-home type of care (Ferguson, 1993). Its services include short-term active care, continuing active care, sustaining care and palliative care. As of 1993, it had 514 employees, of whom 422 were involved in direct patient care. The visiting staff comprised clinical nutritionists, nurses, occupational therapists, physical therapists and respiratory therapists. Social workers also became an increasingly important part of the health care teams. Although physicians were not employees of the Extra-Mural Hospital, each patient had a designated attending physician. As in conventional hospitals, physicians had to apply to the Extra-Mural Hospital board for admitting privileges.

Reinke and Greenley (1986) examined three community mental health programs that used different types of personnel and that organized personnel in different ways. Three personnel configurations were identified: the "caseworker model", the "paraprofessional-extender model" and the "team model". A study of 12 community support programs for mental health clients in small cities and rural areas of Wisconsin revealed considerable variations in the use of paraprofessional caregivers. The authors (Hollingsworth *et al.*, 1993) found that programs ranged from having no paraprofessionals to having the vast majority of the caregiving staff in that category. Also, it was found that the use of paraprofessionals was much more prevalent in rural programs. Paraprofessionals were defined by the authors as workers in supportive roles such as case aides and psychiatric attendants.

Haig *et al.* (1994) described the "Quick Program" in the United States, which specialized in outpatient assessment and planning for rehabilitative treatment of persons with various disabilities. The assessment and treatment planning were conducted by community-based multidisciplinary teams consisting of such disciplines as physical therapy, occupational therapy, social work, rehabilitation nursing, physiatry, speech-language therapy, therapeutic recreation, psychology and dietetics. Community-based rehabilitation programs also exist in Canada. Sullivan *et al.* (1993) described 17 out-reach rehabilitation programs in various Canadian provinces. Some of these programs consisted of teams of providers who were based in urban rehabilitation institutions and travelled to rural communities to provide services. Others were not based in urban institutions but functioned primarily by coordinating the delivery of regionally-based or urban-based specialized rehabilitation services. The composition of these out-reach teams reflected the range of rehabilitation disciplines found in urban rehabilitation centres. Physical therapy, occupational therapy and speech therapy were the most commonly represented disciplines. Other disciplines such as medicine, nursing, orthotics, social work and psychology were also present in some of the programs.

In addition to these descriptive studies which look at individual or a small number of agencies or programs, there are several studies using national or large-scale surveys to identify personnel configurations in community-based health care agencies or programs. For example, the National Birth Centre Study by Rooks *et al.* (1992) surveyed 84 birth centres in 35 states in the United States

between 1985 and 1987. Major primary care providers in these birth centres were: certified nurse-midwives (70.2 percent), obstetricians (13 percent), family practitioners (4.8 percent), obstetricians and certified midwives (4.8 percent), lay/licensed midwives (3.6 percent), physicians other than obstetricians and family practitioners (2.4 percent) and certified midwives and lay/licensed midwives (1.2 percent). According to another survey conducted in the United States by the National Association of Community Health Centres (1994), community and migrant health centre staff included physicians, mid-level practitioners (i.e., nurse practitioners, nurse midwives and physician assistants) and dentists. On the average, these centres employed 5.8 full-time equivalent (FTE) physicians, 2.2 FTE mid-level practitioners and 1.1 FTE dentists. But the numbers and types of providers varied widely. Urban centres were more likely to employ a wide array of practitioners including social workers, health educators and outreach workers.

Similar national or large-scale surveys have been conducted in Canada. In a study of 365 local community health and social service centres in Canada in 1988, Robichaud and Quiviger (1991) reported that these centres had an average of 24.5 positions. Centres offering integrated services generally had more staff than those providing health or social services only. Community centres employed various types of personnel. The 36 centres with an exclusive health mandate employed primarily nurses (40 percent), physicians (8 percent) and other health care providers (8 percent). In addition to paid staff, there were volunteers who provided community services. Community social service centres (with a ratio of 2.6:1) made more extensive use of volunteers than do health care centres (0.9:1) or integrated services centres (1.1:1). According to Bozzini (1988), centres locaux des services communautaires (CLSCs) or local community services centres in Quebec had an average staff of 56, including formal caregivers and administrative personnel, varying from 25 in the smallest ones to 75 in the largest ones. Personnel included physicians, nurses, nutritionists, dentists, dental hygienists, laboratory technicians, social workers, psychologists and domestic aides.

3.4.1 Models of Personnel Configuration and Provider Remuneration - Quality of Care

3.4.1.1 Models of Personnel Configuration -Quality of Care (IV-D)

Besides descriptive studies, there is a body of literature that examines the effectiveness of multidisciplinary teams. Readers should be reminded that many of the comparative studies that examine the effectiveness of mid-level practitioners (reported in Section 3.2.1) also indirectly assess the effectiveness of using multidisciplinary teams since most mid-level practitioners work under the direction of or in close cooperation with physicians. A study can be cited as an illustration. Duttera and Harlan (1978) studied 14 primary care practices in the rural southwest of the United States. The researchers observed three practice patterns involving physicians and physician assistants: (1) the physician assistants saw virtually all patients initially, and the physician followed; (2) both physicians and physician assistants handled patients relatively independently, with the physicians seeing patients of the assistants only when consultation was solicited and (3) patients were selectively assigned to the physician assistant by the physician. The results showed that when properly managed, each of these practice patterns resulted in competent care.

Seven antenatal care programs in British primary care settings - health centres, general practitioner surgeries or community clinics - were examined by Wood (1991). Each program used a multidisciplinary team consisting of, e.g., general practitioners, community midwives, health visitors, social workers, part-time obstetricians and dietitians. In each case, comparisons with

respect to pregnancy outcomes were made between two groups of women, one receiving integrated community-based care and the other receiving traditional shared care. Results of the evaluation showed that integrated care improved accessibility, uptake, communication between women and caregivers and client satisfaction. As well, pregnancy outcomes for both mother and infant were at least as good as those of traditional shared care. Baldwin *et al.* (1993) evaluated a multidisciplinary care centre in Seattle. A multidisciplinary approach to provide care to the elderly was developed with the hope of maintaining them in their homes. Service providers included internists, physician assistants, home health nurses, part-time psychiatrists, mental health counsellors and rehabilitation podiatric and laboratory personnel. The intervention group patients made significantly more annual visits to their primary care physicians than the control group subjects. But both emergency room use and inpatient care were higher in the control group. Various indices suggested that quality of care and satisfaction were comparable or superior among the intervention group subjects. It is the view of the authors that coordination rather than the availability of multidisciplinary services might be largely responsible for differences in utilization between the two groups.

Vohlonen *et al.* (1989) evaluated the "Personal Doctor Program" in Finland. The goal of this large demonstration project, conducted between 1983 and 1987, was to achieve the clinical advantages and performance incentives of enrolling individuals on a specific general practitioner's list, but within the broader team-based framework of a primary health centre. By re-structuring primary medical services so that one particular physician became the provider of all primary care to the patient, policy-makers hoped to move from an episodic to a more holistic approach of patient care. Three experimental groups representing three separate organizational models were compared. In addition, the population outside the demonstration project was used as a control group. Results of this comparative study suggested that the program was most successful in health stations where service delivery was based on small teams consisting of a general practitioner, two nurses and a social worker. The change from an "assembly line" approach to a team model appeared to have improved the quality of primary care.

This brief review can be summed up by the conclusion reached by Abelson and Hutchison (1994) who have reviewed studies that examine different forms of practice organization, e.g., solo, group and partnership practice, community health centre/health service organization/CLSC and HMO. They conclude that the "review of the literature evaluating physician-centred models of primary health care delivery has revealed findings of decreased hospital utilization among vertically-integrated health care organizations that have a strong primary care base. In addition, group (as compared with solo or partnership) practice was found to be associated with features of practice organization that are likely to promote the delivery of quality and appropriate care" (p. 15).

3.4.1.2 Models of Remuneration - Quality of Care (IV-D)

There are some indications that physicians in community health centre settings provide better patient care. Several groups of Quebec primary care physicians were examined by Battista and Spitzer (1983) with respect to preventive activities related to cancer: fee-for-service physicians in rural settings, salaried CLSC physicians and physicians on sessional payment in Family Medicine Teaching Centres (FMCs). The results showed that physicians in CLSCs and FMCs followed patterns of preventive practice that were closer to those recommended and practised prevention in a wider spectrum of patient-physician encounters than did fee-for-service physicians. In a similar study, Renaud (1980) attempted to determine whether physicians practising in CLSCs managed a medical problem differently than those in private group practice clinics in the Montreal area. Results showed that CLSC physicians provided a higher quality of care than did private clinic physicians.

However, both studies failed to isolate the cause(s) of the differences between the various groups of physicians. The authors of both studies suggested that multiple causes might be operating, including reimbursement schemes, use of multidisciplinary teams, self-selection factors that attracted physicians to one or the other practice settings and ideological differences surrounding these practice settings. Equally noteworthy is the fact that the number of Canadian studies is too small to allow definitive conclusions be drawn at this time.

3.4.2 Models of Remuneration - Value for Money (IV-C)

Hastings *et al.* (1973) compared the one-year utilization of medical and hospital services by some 3,300 steelworkers and their families in Sault Ste. Marie, Ontario who belonged to a prepaid group practice plan (Sault Ste. Marie and District Group Health Association) with utilization by members of the same union local and their families whose care was provided by independently practising physicians. Whereas physicians of the Group Health Association (GHA) were on salary, the independently practising physicians received a fee for each item of service they provided. Benefits covered under the two plans were almost identical. Although the study did not examine costs and health outcomes, some of the findings have "value for money" implications. Compared with those who received their medical care from fee-for-service physicians, members of the GHA were found to spend 24 percent less time in hospital, to have fewer surgeries, more likely to receive immunizations and check-ups, more likely to have seen a physician at least once during a 12-month period and to undergo more radiologic and laboratory investigations. The GHA was more likely to delegate specific tasks to non-physicians. For example, whereas practically all the refractions for GHA members were performed by optometrists, almost two-thirds of the refractions for the other group were performed by ophthalmologists. On the other hand, general practitioners provided 38 percent of the obstetric care given in independent practice, compared with only 15 percent in the GHA. Similarly, 22 percent of surgical operations on patients of independently practising physicians were performed by general practitioners compared with less than one percent of the operations on GHA members.

In addition to testing the team approach, the Personal Doctor Program in Finland (see Section 3.4.1.1) was intended to examine the differences between salaried physicians and their self-employed counterparts. The three experimental groups represented different organizational and reimbursement models. In Model 1, physicians worked in public health stations on a fixed salary system. Model 2 introduced a new salary framework involving a basic allowance for education and experience, a capitation allowance and a coverage allowance. Model 3 used private practice general practitioners, but with no co-payment requirements for patients. Results of the demonstration project showed that publicly employed physicians produced at least the same overall value as did physicians in private practice. In the words of the authors (Vohlonen *et al.*, 1989), "public physicians can provide as high a quality and as cost-effective patient care as private physicians once the impediments created by inappropriately bureaucratic administrative structures have been eliminated" (p. 78).

3.4.3 Models of Personnel Configuration -Quality of Worklife (IV-E)

There is not a lot of research on how different models of personnel configuration affect the quality of worklife of the caregivers. One study by Spitzer *et al*. (1973) involved a small number of primary care practices in southern Ontario. The nurses of 14 family practices applied for training as nurse practitioners. Seven applicants were randomly selected to received training and their corresponding practices became the intervention group, while the remaining nurses and practices were the controls. During the subsequent year of investigation, important changes occurred in the professional roles of the intervention group. The physician and the nurse practitioner worked as copractitioners, and their job satisfaction did not decline after the adoption of the new practice model.

A randomized design was used to examine the cost effectiveness of a Veterans Administration hospital-based home care program. The intervention model was different in several ways from conventional home care. First, the physician was an active participant in planning and implementing the home care plan. Second, the team members (primarily nurses and social workers) also actively participated in inpatient care, facilitating hospital discharge planning and monitoring continuity of care. Third, care provided in the intervention group was more comprehensive and continuous. Initially, caregivers in the intervention group reported significantly lower satisfaction with care at the baseline than control group caregivers. But at one- and six-month posttests, the satisfaction level was reversed. Intervention group caregivers were significantly more satisfied with care (Cummings *et al.,* 1990).

3.4.4 Policy Issues

i. While the multidisciplinary team approach is almost universally praised, particularly for community-based health care, the successful implementation of such an approach is often easier said than done. Baldwin and Baldwin (1978) have pointed out a number of challenges, including the difficulty in explicating the concept of teamwork in primary care, the fact that leadership is not vested in any one discipline and the problem of occupational turf-guarding or territorial imperatives.

The most problematic aspect of this body of literature is the failure in many studies to isolate the effects of the team approach. While most researchers are convinced of the desirability of the team approach, it is not clear if the beneficial effects are due to the multidisciplinary nature of the team, to some other characteristics or to a combination of factors including the team approach. Similarly, it is not clear how it produces the observed effects. The multidisciplinary team approach is not unique to community-based health care. It is not known, for example, how community-based health care teams differ from, say, operating room teams or teams in private dental practices.

This uncertainty is shared by others. For example, Seacat (1977) states that the "neighbourhood health centres have invested considerable efforts in developing the team approach. However, there has been little documentation on the effectiveness of this approach in terms of costs, improvements in the quality of care, or improvements in patient compliance as a consequence" (p. 158). Langsley and Barter (1983) express similar sentiments when they say, "Despite the popularity of the term 'mental health team', there is no accepted definition of the composition of the team or roles of the team members, and no clear conceptual model for the team's operation. Thus team function often gives way to an individual practice model or competitive struggles over turf and authority" (p. 731). Abelson

and Hutchison (1994) are somewhat more charitable when they comment, "Despite widespread support for multidisciplinary and collaborative approaches to primary health care delivery across numerous jurisdictions, only weak evidence exists to indicate that this approach leads to the delivery of more effective or efficient care" (p. 30).

ii. Some studies have offered suggestions on how the team approach can be made workable. In reviewing the work of the Quick Program (see Section 3.4), Haig *et al.* (1994) have attributed the success of its team approach to a number of factors. For instance, individual team members are educated on the team concept prior to the development of the program. As well, a communication meeting with all team members and a meeting with the patient and family assure a coordinated approach. According to Rubin and Beckhard (1972), some attempts to help team members look at their goals, tasks, relationships, decision-making norms and backgrounds are essential for team effectiveness. They point out that it is naive to bring together a highly diverse group of individuals and expect a team to become reality. The authors further suggest that certain team members will need to develop membership skills such as listening and collaborating. The importance of training practitioners in the requirements of team work and the inappropriateness of traditional training of physicians and nurses to work as team members have also been emphasized by Wise (1972).

iii. Having examined the reimbursement of mid-level providers in the United States, Robyn and Hadley (1980) raise a number of questions. For instance, should there be universal reimbursement for services provided by nurse practitioners and physician assistants or should there be reimbursement only for mid-level providers working in underserviced areas? If the services of nurse practitioners and physician assistants qualify for reimbursement, the issue then becomes at what rate. A number of approaches have been suggested, including full reimbursement, fractional reimbursement, modified full reimbursement and cost-based reimbursement. Other related issues concern direct versus indirect reimbursement. The latter refers to mid-level providers receiving payment through physicians under or with whom they work. There are pros and cons for each of these options. It is the view of the authors that the most feasible method for employing nurse practitioners and physician assistants may be through public or quasi-public facilities such as Area Health Education Centres, Neighbourhood Health Centres or National Health Service Corps sites - facilities that are capable of using such providers efficiently and have the explicit objective of serving populations with inadequate access to health care. As some Canadian provinces have introduced nurse practitioners and midwives, such payment issues need to be addressed because research conducted in the United States has shown that inappropriate reimbursement policies often inhibit the optimal use of mid-level providers.

iv. Bicknell *et al.* (1974) have argued that the fee-for-service medical care model may not be conducive to the effective and large-scale use of physician assistants and nurse practitioners in the United States. Mid-level providers can perform one of two possible functions: in concert with the physician, they can broaden the scope of the care provided, affording time to manage each patient's medical conditions and psychosocial needs or they can become mere technicians who see a narrow range of cases. Fee-for-service reimbursement encourages the latter and mid-level providers may inadvertently aggravate the negative aspects of the fee-for-service system. This is because since most mid-level providers are on salary, they represent a fixed cost to their physician-employers. Their financial value is, therefore, directly proportional to the number of patient encounters they can generate.

3.5 Modality V: Statutory Regulation of Health Occupations

The conventional health human resources literature pays limited attention to occupational regulation or the statutory regulation of the health workforce. This is surprising because occupational regulation can have major impacts on health human resources and, indirectly, on service delivery and service users. It dictates who can do what; it sets entry-into-practice requirements; it often stipulates conditions under which practitioners must perform their functions; it specifies who can use what kind of title; etc. All this affects, directly or indirectly, the supply and distribution of providers, cost, availability and quality of service, as well as how occupational groups relate to one another.

Occupation regulation seldom works in isolation, particularly in health care which is one of the most regulated sectors of the economy. As Gaumer (1984) has observed, occupational regulation often goes hand in hand with or is reinforced by accreditation requirements, granting of practice privileges by institutions, peer reviews, malpractice actions, and the like. Together, they create a complex and often overlapping array of regulations. While these measures are ostensibly justified by the need to protect the health and safety of the public, many authors (e.g., Economic Council of Canada, 1981; Freidson, 1970; Gaumer, 1984; Gross, 1984; Ministère de la Santé et des Services sociaux, 1989; Muzondo and Pazderka, 1980; Olley, 1978; Ostry, 1978.) have noted the negative consequences of inappropriate or excessive regulation, including occupational monopoly, barriers to entry and mobility, rigidity in the occupational structure, inefficient use of human resources, higher service costs, personnel shortages, lack of accountability, stifling of innovation, etc. Tallying up the balance sheet on occupational regulation, the Economic Council of Canada (1981) has concluded that "occupational regulation in Canada is not working as well as it could, or should. The evidence that we have gathered suggests that a number of regulatory restrictions are imposing costs in excess of the benefits provided" (p. 118). In view of all this, it is important to examine how community-based health care could be aided or impeded by occupational regulation.

The literature search has found very few studies that specifically address the relationship between occupational regulation and community-based health care. Writers tend to discuss the effects of occupational regulation on the health care system as a whole or on a particular health occupation, regardless of whether the formal caregivers work in institutional or community settings. Furthermore, few studies of occupational regulation are comparative in nature. Thus, only a small number of studies meet the rather stringent inclusion criteria of the present review. But because of the importance of occupational regulation, several studies concerning non-institutional services have been selected for review. Also selected are a number of more general studies which have raised important policy issues that are relevant to community-based health care.

3.5.1 Occupational Regulation - Fairness (V-B)

A number of studies have examined the reasons behind considerable inter-state variations in the availability and use of nurse practitioners, physician assistants and nurse-midwives in the United States. The results of these studies indicate that legal constraints are a major determining factor. Legal constraints refer to, among other things, the legal recognition of the practitioners, conditions for certification, requirements for physician supervision, whether practice location is defined by law and whether practitioners are allowed to prescribe certain drugs. Weston (1980) found that states liberal in legal sanctions attracted more mid-level providers. Similarly, Sekscenski *et al.* (1994) discovered that there were wide variations in both state practice environment scores and

practitioners-to-population ratios for three categories of mid-level provider. For example, practice-environment scores for nurse practitioners ranged from 100 in Oregon to 14 in Ohio and Illinois. States with restrictive practice environments had fewer practitioners per 100,000 population. Conversely, states with favourable practice environments tended to have higher practitioner-to-population ratios.

A nation-wide survey of nurse practitioners in primary care and their employers was conducted between 1973 and 1976 by Sullivan *et al.* (1978). The purpose of the survey was to identify barriers to the employment and utilization of nurse practitioners in the United States. Legal restriction was the barrier mentioned most often by both nurse practitioners and employers. Robyn and Hadley (1980) identified excessive restrictions on what nurse practitioners and physician assistants could do as a major problem. For instance, some states failed to legally recognized physician assistants, thereby virtually precluding their practice. In other states, the scope of duties that physicians could delegate was often so vaguely or narrowly defined as to make hiring a physician assistant problematic, or even risky from the standpoint of malpractice threat. Dean (1973) documented attempts by some occupational groups in the United States to restrict what physician assistants were allowed to do. The fear was that physicians might delegate functions considered to be the "turf" of other health occupations. To prevent the usurping of roles, some occupational groups introduced provisions in their own statues, forbidding physician assistants from performing certain functions. Optometric associations were most active in limiting the functions of physician assistants. Other groups followed suit. For example, five statues prohibited them from practising pharmacy, six from practising dental hygiene and two from practising chiropractic.

The difficulties created by rigid occupational regulation are not confined to mid-level providers. It poses similar impediments to the introduction and use of multiskilled workers. Blayney et al. (1989), for instance, suggested that the relative absence of rigid licensure and certification requirements in the 1950s encouraged the use of cross-trained personnel.

Occupational regulation invariably means the setting of educational and other requirements that must be met by those seeking admission to the occupation. One consequence of occupational regulation, particularly self regulation, is "credential creep" or the incremental elevation of educational requirements. Although this is often justified by the need for better-prepared providers, there are prices to pay for raising the entry-into-practice requirement. One of the consequences is that highly-qualified providers tend not to practise outside major urban centres, resulting in the unequal distribution of personnel and service access difficulties for rural residents. A study by Fowkes *et al.* (1994), reported in greater detail in Section 3.3.2, has looked at the effects of the conversion of nurse practitioner training from certificate level to master's degree level, in response to the new requirements set by the National League for Nursing and the American Nurses Association. The authors have found that graduates of the master's degree programs were much less likely to work in underserviced areas than their certificate program counterparts.

3.5.2 Occupational Regulation - Value for Money (V-C)

A study by Shepard (1978) looked at how licensing practices by state dental licensing boards in the United States influenced the costs of dental services. Special attention was paid to the refusal of some boards to recognize licences granted in other states. Average fees for 12 dental services were compared between states that recognized out-of-state licences and those that did not. For 11 of the 12 most common services, fees were found to be higher in states that did not have reciprocity.

Dentists in nonreciprocity states also tended to have higher net income. This study showed that where regulatory authorities used competition barriers to limit the entry of nonresident practitioners, dentists systematically raised fees to increase their earnings. It was estimated that the price of dental services and mean dentist income were between 12 and 15 percent higher in nonreciprocity jurisdictions when such other factors as cost of living were accounted for.

In a similar study, Conrad and Emerson (1981) analyzed the effects of dental practice acts on dental fees and dentist incomes in the United States. Three types of practice act provisions were examined: restraints on advertising and soliciting of patients, limits on the scope of practice and number of dental hygienists per dentist and restrictions on the form of organization and ownership of dental practices. The results indicated that limits on the number of offices per dentist and absence of reciprocal licensing arrangements were associated with higher fees and net incomes among dentists. Restrictions on the number of hygienists per dentist were positively related to dental fees, but not with net income. Restrictions on advertising, on the other hand, were associated with higher net income, but not fees. It should be noted that neither the study by Shepard (1978) nor the one by Conrad and Emerson (1981) looked at quality of dental care.

Begun (1979) examined the effect of professionalization of optometry on the price and content of optometric services in the United States. One of the factors examined by the author was "structural professionalization" which refers to the extent to which a state imposes restrictions on type of employment, prohibition of price advertising by optometrists and opticians and continuing education requirements. The data showed that price differences of over 20 percent existed between states that were categorized as high and those that were low in structural professionalization.

The effects of occupational regulation on the practice of optometry were also examined by a number of other writers (Begun and Lippincott, 1980; Benham and Benham, 1975; Bond, 1983). More specifically, they studied the effects of ethical prohibitions on the cost and quality of and access to optometric care. Ethical prohibitions refer to restrictions placed by occupational associations or the state on commercial practices such as advertising and price competition. Generally speaking, these studies and the one by Begun (1979) showed that ethical prohibitions and professionalization efforts increased service complexity and raised costs quite substantially. Higher prices for optometric services eventuated even after controlling for the increased length and complexity of eye examinations. These higher prices were, in turn, associated with reductions in service utilization.

3.5.3 Occupational Regulation - Quality of Care (V-D)

The relationship between occupational regulation and quality of care is an important one since the need for quality control and consumer protection is the justification most frequently used by practitioners and policy-makers. A number of authors have maintained that occupational regulation does not guarantee service quality. For instance, Frech (1974) has stated that "it has not yet been clearly demonstrated that licensure regulation really does result in higher quality" (p. 121). Shepard (1978) has also challenged the claim that licensing examinations increase the proficiency of practitioners. However, these authors have offered no empirical evidence to support their assertions.

In a study conducted in the United States, Bond *et al.* (1983) investigated the effects of advertising and commercial practice on the price and quality of optometric services. Data were collected by actually purchasing eye examinations and eyeglasses from optometrists in "restrictive cities" and "non-restrictive cities". In restrictive cities, optometrists were not allowed to advertise in the media or work for large chain firms. Non-restrictive cities, on the contrary, allowed advertising and

working for chain firms. Results of the study showed that advertising and chain-firm optometrists produced prescriptions no less appropriate than those of non-advertising optometrists, in both restrictive and non-restrictive cities. Also, adequate eyeglasses were prescribed with about the same frequency in both types of cities. Lastly, such commercial practices did not adversely affected the accuracy or quality of eyeglasses. On the basis of their findings, the authors concluded that such commercial practices lowered prices but did not lower the quality of eye care.

3.5.4 Policy Issues

i. The Pew Health Professions Commission (1994b) has stressed the importance of occupational regulation in reforming the health workforce in the United States. While it recognizes the success of occupational licensing in weeding out incompetent practitioners and bad apples, it has raised a number of concerns:

> "The (occupational regulatory) system is... coming under increased scrutiny over its effectiveness in protecting the health and welfare of the public. Regulatory processes deal imperfectly with complex issues of professional jurisdiction, the proliferation of new health occupations and changing models of care delivery. Furthermore, a review of the literature suggests that licensure brings higher costs to consumers, reduced access to health care services, and reduced managerial flexibility. Moreover, it demonstrates a weak relationship to outcome quality" (p. 10, parentheses added).

If the success of community-based health care is partly contingent upon a more rational use of health human resources through appropriate task delegation and interdisciplinary cooperation, Quebec's experience in regulatory reform illustrates the kinds of problem that occupational self regulation could create. According to the Ministère de la Santé et des Services sociaux (1989),

> "...the mission of the Office des professions has proved difficult to put into practice. Some 15 years after the legislator's decision to make the delegation of acts mandatory, only three of the seven corporations involved had adopted regulations in this regard. Contrary to what had been intended, the delegation of acts has allowed some delegating corporations to enlarge and strengthen their fields of practice. Whereas this mechanism was intended to introduce flexibility in the definition of exclusive fields, it has rather had the effect of maintaining the hierarchy of professions and encouraging turf-battles and legal conflicts between professions. As a result, professional regulations have very often been a constraint in the organization of work, and an obstacle to cooperation and multi-disciplinary work, and have sometimes even disrupted the labour climate" (p. 69).

One of the most important policy issues is to determine the kind of occupational regulation that is compatible with the objectives of community-based health care.

ii. A number of alternatives have been proposed to improve the way health occupations are regulated. These include replacing individual regulatory boards with a composite board with responsibility for oversight of the individual occupations, regulatory bodies with a higher proportion of public members and consumers to represent the public's interest, institutional credentialing, abolition of exclusive scopes of practice for occupational groups, regulation of potentially risky procedures instead of occupations, replacing credentialism with a competency-based approach in assessing qualification, ensuring the adoption of the least restrictive form of regulation consistent with the protection of public health and safety, etc. (see Castonguay, 1978; Cohen, 1980; DeVries, 1986; Economic Council of Canada, 1981; Fulton, 1988; Gross, 1984; Ministère de la Santé et des Services sociaux, 1989; Pew Health Professions Commission, 1994b).

iii. As Manga and Campbell (1994) have correctly pointed out, merely amending occupational regulation legislation is not enough. For instance, while the *Regulated Health Professions Act* of Ontario has moved one step in the right direction by replacing exclusive scopes of practice with control over potentially harmful acts and procedures, it does not ensure a more efficient use of personnel. It merely allows providers, both licensed and unlicensed, to legally perform tasks and procedures that are not designated as controlled acts. But if employers and service consumers insist on hiring or using only licensed, credentialed or the most highly qualified practitioners, even if other providers can be shown to be just as effective, a more rational and cost-effective use of personnel is unlikely to eventuate. For a similar reason, the Economic Council of Canada (1981) believes that although, as a form of regulation, certification is less restrictive than licensure, the consequences of certification could be just as serious and negative if employers are compelled to hire those with the appropriate certification. In short, reform of the occupational regulatory system is a necessary but not a sufficient condition for effecting a more efficient use of health human resources.

iv. Ensuring quality of care is the ultimate justification for occupational regulation. But as many studies have shown, existing systems of regulation have not come close to eliminating professional judgment errors, careless practice and even fraud and abuse (Gaumer, 1984; Pontell *et al.*, 1982; Rayack, 1983; Wilson *et al*, 1986). It is imperative to ask if the existing occupational regulatory system is suitable for safeguarding quality of care. Also, since existing regulatory regimes are put in place to deal mostly with issues arising from conventional service delivery approaches, what changes would be needed in view of the shift toward community-based health care? Fooks *et al.* (1990) have conducted a Canada-wide survey of five self-regulating health occupations (dentistry, medicine, nursing, optometry and pharmacy) on their quality assurance activities. Two types of activities -complaints program and routine audit program - were most prevalent. Both programs assess care provided by individuals rather than care delivered by teams of providers. The emphasis is on competency and safety rather than on outcomes. The authors described this as the "bad apple" approach which tends to look for poor performers and direct remedial actions only at them. They advocate a complementary approach, the emphasis of which is on understanding and continually revising the process of health care provision. It also focuses on different aspects of care, a wider population and using a different knowledge base to determine appropriateness. It is worth examining if this broader and outcome-oriented approach would be more suitable for community-based health care.

3.6 Modality VI: Management of the Health Workforce

Workforce management, as used in the present context, is a broad concept, encompassing such aspects as leadership, management style, administrative process and personnel deployment. The way health care workers are managed has important human resources implications. For instance, personnel deployment could make a program or service more or less efficient and could affect quality of care. In particular, workforce management can influence quality of worklife in many ways. In fact, it is possible that the impact of workforce management on service outcome is mediated through quality of worklife. In other words, poor management could adversely affect quality of worklife. Low morale and dissatisfaction among workers may lead to high turnover of employees which, in turn, could cause personnel shortages and poor quality of care.

The literature searches did not find many studies on workforce management in community-based health care. Most of the studies identified deal with quality of worklife issues, particularly concerning the satisfaction or dissatisfaction of workers providing home care. This is not surprising since home care is one of the fastest growing sectors in health care as a result of population aging and the shift toward community-based care.

3.6.1 Workforce Management - Quality of Worklife (VI-E)

Review findings on the relationship between workforce management and quality of worklife are presented separately for formal caregivers and informal caregivers.

3.6.1.1 Formal Caregivers

It is interesting to note that despite the growth in the number of community health centres in Canada and other countries, there have been relatively few published studies on workforce management issues in such organizations. One study examines the turnover and retention of physicians in neighbourhood health centres in the United States. Although the study did not explicitly deal with quality of worklife issues, a high turnover rate could be seen as a symptom of discontent among physicians with working conditions. Having examined the records of 1,055 physicians in 40 centres, Tilson (1973) found that two administrative characteristics were associated with the likelihood of physicians remaining in a neighbourhood health centre for at least 24 months. Physicians who worked more than half time but less than full time were found to have lower turnover rates. Also, heavy involvement of para-medical personnel teams in the provision of services and extensive involvement of consumers in centre policy matters also contributed to physician retention. The author, however, did not explore why these factors were related.

There are a number of studies dealing with working conditions of and quality of worklife in home care. This relatively new research interest is a welcomed phenomenon since research on job satisfaction has traditionally targeted hospital personnel (Juhl, 1993; Riordan, 1991; Shuster, 1992). With the growing emphasis on community-based health care, more and more health care workers are expected to shift employment from hospitals and nursing homes to community and home care settings. The transition from a familiar to a new environment could be unsettling to some. As reported earlier (Section 3.3.1.3), a study by Ceslowitz and Loreti (1991) looked at the concerns of home care nurses whose prior work experience was exclusively with hospitals. Besides proposing a comprehensive orientation program for nurses who were making a career transition to home care,

the authors recommended continued supervisory support, including letting the new home care nurses know how their initial adjustment process was viewed by supervisors and preceptors.

The importance of feedback from supervisors is emphasized in another study (Beck-Friis *et al.*, 1991). The entire staff, comprising five physicians, nine registered nurses and 21 nurse's aides, of a home care program that served terminal patients participated in a study concerning work stress and job satisfaction. Although caring for dying patients could be stressful, most of the staff members found their work meaningful and stimulating, and there were few sick leaves and low job turnovers. They identified positive management measures as the factor contributing to job satisfaction. Such measures included feedbacks from supervisors, freedom to provide care in the manner the practitioners saw fit and the practice of distributing "boring" tasks equally among all team members.

A number of studies have examined job satisfaction or dissatisfaction among home care nurses. Factors that have been found to contribute to positive quality of worklife include independence and autonomy of practice (Chubon, 1991; de Savorgnani *et al.*, 1993; Riordan, 1991), flexibility and freedom to manage work (Baldwin and Price, 1994; Chubon, 1991; de Savorgnani *et al.*, 1993), concern for practitioners expressed by the agency or employer (Hood and Smith, 1994), respect, acceptance and prestige accorded by peers and other practitioners (Baldwin and Price, 1994; Chubon, 1991; Riordan, 1991), client contacts (Baldwin and Price, 1994; de Savorgnani *et al.*, 1993; Shuster, 1992), ability to make a difference in clients' lives (Baldwin and Price, 1994) and rapport developed with clients and their families (Chubon, 1991). On the other hand, home care nurses tend to be frustrated by administrative and management chores that are not directly related to the care of clients such as paperwork, documentation and supervision of aides (Baldwin and Price, 1994; Shuster, 1992; Walcott-McQuigg and Ervin, 1992). Some complain about heavy workload that does not permit appropriate attention to each case (Baldwin and Price, 1994; Walcott-McQuigg and Ervin, 1992).

There are also a number of studies concerning the quality of worklife of home care support workers (i.e., home care aides, home care workers, home-makers, community care workers, personal care workers, personal support workers, etc.). The research attention received by these workers is fairly recent and is likely due to the fact that they are growing rapidly and that there are serious recruitment and retention problems. According to Gilbert (1991), there were approximately 300,000 home care support workers in the United States in the early 1990s and their average annual growth rate is over 30 percent. At the same time, the turnover rate is estimated to be about 60 percent industry-wide. This is largely due to the fact that their employment is characterized by low wages, minimal fringe benefits, job insecurity and lack of opportunity for advancement. As well, most are hired on a temporary basis with minimal training and supervision (Donovan, 1989).

Despite such dismal employment conditions, many home care workers are satisfied with and find personal fulfilment in their work (Roberts and Sarvela, 1989). Aspects of home care work that contribute to their job satisfaction include autonomy and ability to set their own pace and deciding how work is to be done (Donovan, 1989), flexible work hours (Gilbert, 1991), one-to-one relationships with clients (Chichin, 1992; Gilbert, 1991), opportunity to help others (Gilbert, 1991; Roberts and Sarvela, 1989), appreciation by their clients (Roberts and Sarvela, 1989), supportive leadership and concern expressed by the agency for workers (Hood and Smith, 1994; Smith *et al.*, 1994), tangible results from their work (Donovan, 1989) and belief that their work is important to the health care industry (Donovan, 1989). According to several researchers, these positive aspects of home care work contribute to job retention. Conversely, the negative aspects of home care work include low wages and poor fringe benefits (Donovan, 1989; Roberts and Sarvela, 1989), lack of

advancement opportunities (Donovan, 1989; Gilbert, 1991), unstable working hours (Gilbert, 1991) and lack of influence in shaping care plans and agency policies (Donovan, 1989; Gilbert, 1991).

Feldman (1993) reported four worklife demonstration projects designed to upgrade the employment of home care support workers and reduce personnel turnover. The evaluation was conducted using randomly selected experimental and control groups in home care agencies in Milwaukee, New York, San Diego and Syracuse. Differing from one agency to another, the interventions included specialized training in serving difficult cases, a guaranteed 35-hour week, subsidized health insurance, status enhancement (e.g., special titles, badges), on-going support from the program's trainer and increased supervision. The interventions achieved a 10- to 44-percent reduction in personnel turnover in the experimental group agencies, but added from $.09 to $1.43 to the hourly wages of the workers.

Community health nurses also work in non-institutional settings. Temple-Smith *et al.* (1989) surveyed community nurses in Victoria, Australia regarding their working conditions and job satisfaction. Community nurses in Australia were responsible for the delivery of health promotion and primary care. Subjects reported a high degree of job satisfaction. The three things the nurses liked most about their job were patient contacts, independence and working conditions. On the other hand, the difficult aspects of their job were excessive workloads, inadequate staffing levels, unhelpful management and lack of contact with other workers. Weber *et al.* (1993) compared the nursing employees of a hospital and a non-profit community health care organization in an eastern Ontario city with respect to job satisfaction. Compared to their hospital counterparts, nurses working in the community health care organization had more autonomy in their work, had more control over their work schedules and received more information about their jobs. They were more satisfied with their work environment, their co-workers and their work as a whole than nurses in the hospital. The hospital nurses, however, expressed greater satisfaction with pay. Fairly similar findings have been reported in another study of public health nurses in South Carolina by Lucas *et al.* (1988).

3.6.1.2 Informal Caregivers

Quality of worklife is important not only for formal caregivers, but also for informal caregivers as the latter provide most of the care for those who are not institutionalized but who cannot look after themselves. Many informal caregivers require support to enable them to continue to provide care at home or in the community. The Informal Caregivers Survey, conducted as part of the 1982 Long-term Care Survey in the United States, showed that the typical informal caregiver of the frail elderly was a 57-year-old married woman who was in poor health. Many also experienced emotional stress and social isolation (Oktay and Volland, 1990). Similarly, a survey using a convenience sample of 89 francophone wife caregivers of men with chronic obstructive pulmonary disease in Montreal showed that nearly 40 percent of the wives used psychotropic drugs. The need for constant supervision caused the caregivers to feel trapped and this, in turn, might affect their mental well-being (Cossette and Levesque, 1993).

There are many programs to support family caregivers, such as respite care, adult day programs, information and counselling services, in-home support services, self-help support groups for caregivers and workplace programs. But many of these programs have not been evaluated, using a rigorous methodology. Oktay and Volland (1990) described a study that was designed to determine the effectiveness of a support program for informal caregivers. A coordinated approach was provided by a nurse-social worker team. Services included assessment, case management, counselling, respite, education, support group, medical back-up and on-call help. The focus was on

the caregiver-patient configuration and not primarily on the patient. A comparison between caregivers in the intervention group and those in the control group showed that the program was only partially successful. There was evidence of some reduction in caregiver stress, but it was not impressive.

A controlled trial conducted by Drummond *et al.* (1991) in southern Ontario examined the effectiveness of a support program for informal caregivers of the demented elderly. Caregivers in the control group received education about dementia and caregiving. The intervention included a four-hour block of scheduled weekly in-home respite, with additional respite on demand. Caregivers were also encouraged to attend a monthly two-hour self-help support group. In the control group, conventional community nursing was provided, which focused on the care of the demented patient, rather than on the caregiver. The quality of life of the informal caregivers increased in the experimental group, but decreased in the control group. At the end of the trial, there was a substantial difference between the experimental and the control groups.

3.6.2 Workforce Management - Value for Money (VI-C)

Few studies have been found which examine how workforce management contributes to cost efficiency in community-based health care. In one study (Balinsky and LaPolla, 1993), the notion of cluster care is explored. Cluster care, which originated in Sweden, refers to the deployment of home care support worker teams to serve clusters of clients. As a member of a home care team, an individual worker's job is arranged to focus around specific tasks (e.g., bedmaking, cooking and bathing) performed for a number of clients, rather than around a block of time spent one-on-one with an individual client. Where a cluster care program has been implemented and work divided by tasks rather than by time, a reduction of 20-35 percent in hours of services needed has occurred, resulting in major cost savings. By reducing the worker-to-client ratio, the cluster care approach also helps address the issue of labour shortage in the home care industry.

It has been well documented that job satisfaction is related to personnel turnover and that excessive turnover could adversely affect the cost of service provision since it is expensive to recruit and orient new staff. A survey of registered nurses in home care was conducted in Illinois and Ohio by de Savorgnani *et al*. (1993) to look at job satisfaction, recruitment and retention issues. The home care nurses were asked to identify factors that they thought were related to recruitment and retention. The respondents emphasized the areas of autonomy, paperwork reduction, positive staff interaction, evaluation and career advancement. The factor most conducive to job satisfaction and personnel retention was autonomy in the work place. Other studies cited in Section 3.6.1.1, although not dealing specifically with "value for money", indirectly support the notion that good management practices help achieve cost efficiency by enhancing worker morale and lowering personnel attrition.

Stress, burnout and attrition tend to be major personnel problems associated with health care delivery in remote and isolated communities, largely as a result of isolation, lack of collegial support and sometimes excessive workload. A study by Morewood-Northrop (1994) discusses staff turnover of community health nurses in the NWT. Nurses play an important role in health care in northern Canada since they are among the few health care providers in small, isolated communities and they are often the point of entry into the health care system. At the time of the transfer of health services from the federal to the NWT government, the turnover rate of nurses within a six-month period was about 70 percent. A recruitment and retention survey was conducted in 1989 to find out why this rate was so high and what could be done about it. The three priority recommendations were to

introduce in-service training programs, job sharing and independent living quarters for nurses. Since the implementation of the recommendations, there was a 30-percent reduction in turnover. It should be noted, however, that because no data were reported in the study and no control group was used, it is not possible to determine if the improvement was due to the implementation of the recommendations, other factors or a combination of both.

3.6.3 Policy Issues

i. Many of the policy issues raised by the authors pertain to quality of worklife enhancement, particularly for home care support workers. Although constituting the largest segment of the home care workforce, home care support workers tend to experience recurrent recruitment and retention problems due mostly to unfavourable employment conditions. Given growing demands for home care and the need to contain costs, substantial pay increases and incentives may not be feasible. Realizing this, some researchers have considered other approaches to enhance the job satisfaction of home care support workers. For instance, career laddering have been recommended by Gilbert (1991). He has also suggested using a team or shared delivery approach in order to reduce worker isolation while increasing mentoring possibilities. Since many home care support workers find their helping relationships with clients rewarding, Chichin (1992) has proposed that agencies provide opportunities for the nurturing of such relationships. In a similar vein, Roberts and Sarvela (1989) have suggested that attitudinal tests be administered to prospective employees in order to help managers screen applicants as to their disposition toward the elderly.

With respect to nurses, the other major group of home care providers, it appears that, besides retraining and reorientation, career transition assistance is needed to encourage and help nurses move from institutional to community or home care settings. The objective of such assistance is to help overcome or reduce nurses' apprehension about functioning as a generalist, dealing with a wide range of health and related problems and working independently. In view of research findings showing that nurses enjoy the autonomy and flexibility associated with community-based care and that they are averse to paperwork, agencies must find innovative approaches to promote autonomous practice and flexible work arrangements, and to reduce unnecessary administrative chores.

4 SYNTHESIS OF FINDINGS AND POLICY ISSUES

The major findings from the review of the literature and the important policy issues identified are summarized and synthesized in this concluding section.

4.1 Summary of Major Research Findings

i. Self-care and informal caregiving are widespread phenomena. As medical technologies become more sophisticated and as health care consumers become better informed, individuals can now perform many health care tasks that were at one time the exclusive responsibilities of formal caregivers in institutional settings. In most of the studies reviewed, self-care and informal care have been shown to be useful and effective in response to a variety of health problems. Studies have shown that as long as they receive appropriate training, supervision and monitoring, informal caregivers can provide counselling, health education and promotion, rehabilitation, continuing care, etc. as effectively as formal caregivers. Since self-care and informal care are, by definition, free (at least from the perspective of governments and other third-party payers), they are cost effective as long as the care does not aggravate or prolong the health problem of the care recipient. While some of the studies are descriptive in nature, there are many quasi-comparative and comparative studies that offer strong evidence of the effectiveness of self-care and informal care.

However, it would be an over-generalization to say that self care or informal care is effective. It is necessary to specify what kind of self-care provider or informal caregiver is capable of doing what. Most of the studies and controlled trials in this area deal with specific health problems and caregiving tasks. It cannot be assumed that a caregiver who is effective in doing one thing is equally effective in performing other functions. It is equally important to specify the conditions under which self-care and informal care are efficacious.

ii. The use of indigenous health care workers as both informal and formal caregivers has been shown to be quite successful in dealing with some service access problems facing ethnic, linguistic and cultural minorities and residents of remote and isolated communities. In this sense, indigenous health care workers help overcome an endemic problem in the health care system, namely, the unequal distribution of resources, including human resources. They are especially successful in bridging the chasm between minority groups and the mainstream health care system. However, most of the studies are descriptive in nature and assessment of effectiveness either does not exist or tends not to be vigorous. Many of the indigenous informal caregiver initiatives appear to be pilot or demonstration projects that may be too small-scale or ephemeral to yield systematic and generalizable findings. The CHR and CHA programs in Canada and Alaska, on the other hand, have longer history and are more established. But while CHRs and CHAs have been shown to provide useful services and to be well received by the people they serve, vigorous and systematic evaluation of their effectiveness is lacking.

iii. There is ample and strong evidence to support the use of mid-level providers, such as nurse practitioners, physician assistants and midwives, especially in primary care. It has been shown over and over again in many jurisdictions that the care provided by these practitioners, working under the supervision of or in cooperation with physicians, is safe and of high quality.

iv. Much of the research on the cost effectiveness of role substitution pertains to mid-level providers. Research has generally shown that it is cost effective to use mid-level providers such as nurse practitioners, physician assistants and midwives. But it should be noted that, with the exception of some studies of nurse practitioners in the 1970s, most of the research in this area has been conducted in other countries whose systems or approaches of health care financing and practitioner remuneration are quite different from those in Canada. Also, since physician assistants do not exist in Canada and midwifery has been in official existence in this country for a very short period of time, caution is needed in extrapolating the research evidence to the Canadian context.

v. Role substitution is not restricted to mid-level providers. Although the amount of evidence available and the strength of the evidence vary from one occupational group to another, it is safe to say that considerable role substitution is feasible and effective when it is done properly.

vi. Role diversification in the form of multiskilling is gaining in popularity and the demand for practitioners who are competent in more than one discipline appears to be growing. Cost saving potentials seem to be one of the major reasons for using multiskilled workers. But, to date, there are few published studies showing that multiskilled workers are more cost effective than conventional providers, particularly in community-based health care. Also, systematic and vigorous assessment of the quality of care provided by multiskilled practitioners is lacking. This could be due to the fact that multiskilling is a fairly new concept and there is insufficient time to allow the idea to crystallize and for systematic evaluation to take place.

vii. Studies of the effect of health or patient education on self-care produce no consistent results. While some studies show that education leads to more extensive or appropriate self-care, others find no relationship between education and positive health behaviours or status. This is not surprising in view of the fact that the research effort in this area is very diffused. The scope of patient or health education ranges from changing attitudes to altering behaviours, from coaching healthy young children to instructing disabled older persons, from distributing promotional pamphlets to using conventional classroom approaches. It appears that the outcomes depend on what training model or technique is used, the content of the training and who is doing the training and who is being trained. It is an over-generalization to say that health or patient education is or is not effective in promoting high-quality self-care.

viii. It stands to reason that if informal caregivers are seen as a part of the health human resources continuum, they must be given the opportunity to learn how to provide care or to enhance their caring capability. Many studies and demonstration projects have shown that training can motivate individuals to become informal caregivers or can help informal caregivers improve the quality of their care. But given divergent objectives, the wide range of training

approaches used and the diversity of caregivers, it is understandably difficult to produce a consistent body of research evidence on this topic.

ix. With respect to the training of formal caregivers, the focus of this literature search and review is on the experience of preparing or reorienting formal caregivers to work in community settings. This includes redesigning educational programs or curricula, moving classrooms and practicum sites from institutional to community settings, providing opportunities to learn in a multidisciplinary environment and helping providers cope with job transfers from institutions to community agencies. Generally speaking, the studies show positive results, but there are few vigorous and large-scale comparative studies.

x. Although there are many possible models of personnel configuration in community-based health care, the one that has received most research attention is the multidisciplinary team. There is considerable evidence that the multidisciplinary team approach is workable and effective in providing quality care in community settings. Besides specific studies of the team approach, research on the effectiveness of mid-level providers lends indirect empirical support since most mid-level providers work with physicians, and possibly other practitioners, as a team. The problem in this area of research is with the all-encompassing concept of team. The team approach is not unique to community-based health care. It is not clear how does a team in a community mental health centre or a home care program differ from that in, say, an operating room or a dentist's office. It is also not clear from the literature what makes a team tick. Is it because of its multidisciplinary composition? Is it because of the way decisions are made? Is it because of internal group dynamics? Unless the factors that make a multidisciplinary team successful can be teased out, the term is quite meaningless because in modern day health care, solo practice, in the strict sense of the term, does not exist.

xi. There is some evidence that the care provided by physicians in community health centres or comparable settings is as good as, if not better than, the care given by fee-for-service physicians. However, because very few Canadian studies have been reviewed and because of the inability of the researchers of these studies to rule out competing hypotheses, such as self selection of physicians working in community health centres, any conclusion reached at this time must be accepted with caution.

xii. Although very little research on the statutory regulation of health occupations is directly related to community-based health care, the importance of occupational regulation must not be overlooked. If one of the hallmarks of community-based health care is a more innovative or flexible use of health human resources, related research findings suggest that this may be difficult to accomplish unless there are major changes in the way health occupations are regulated. A number of studies have found that exclusive scope of practice provisions or regulations designed to protect occupational turfs inhibit the use of mid-level providers. The same could be true for other forms of role substitution, role expansion and the use of multiskilled workers. There is also evidence that where occupations are allowed to set restrictive entry-into-practice criteria and other practice conditions, costs of service tend to increase and service utilization tends to decrease. In addition, excessive or inappropriate occupational regulation tends to exacerbate unequal distribution of health personnel, inhibit workers' career and geographic mobility, rigidifies the occupational structure and create management and labour relations problems. All this has major implications for community-based health care.

xiii. In relation to workforce management, one research finding that has special significance for community-based health care is the characteristics of work in community settings which are conducive to positive quality of worklife. Many studies have found that practitioners working in home care and community health like their work even though they are generally paid less than comparable hospital workers, and they regard autonomy, flexibility, freedom to manage work and direct contacts with clients as the most rewarding aspects of their job.

Research findings have also pointed to the likelihood of conflicts between providers and occupational groups as a result of role substitutions, role redefinitions and the use of new types of providers in community-based health care. How this problem is managed will affect the quality of worklife, productivity and the success of a truly interdisciplinary approach. Although a number of strategies have been suggested, there is as yet no tried recipe.

4.2 Major Policy Issues

Four major policy issues have been identified and some broad policy directions are suggested for consideration. Although there is considerable empirical evidence to support the general thrust of these suggested policy directions, further policy developments around these four issues should be given top priority. Other issues raised by various authors have been presented in previous sections.

i. **Health Human Resources Continuum**

Health human resources need to be reconceptualized if community-based health care is to become effective, holistic and client-focused. The traditional view of health human resources, which tends to focus almost exclusively on formal caregivers with extensive formal training, must be replaced by one that sees health human resources as a continuum, ranging from those who keep themselves healthy to those who look after their sick or disabled relatives and friends, and from indigenous health care workers with mostly on-the-job training to the highly qualified specialists.

The question is not whether self-care providers and informal caregivers form part of the health human resources continuum. The evidence that they play an important role in buttressing the health care system is substantial in certain areas and under certain conditions. Without them, the formal health care system would collapse because it is unlikely to have enough resources to meet all health care needs and demands of all citizens. Instead, the question is how self-care, informal care and formal care should be integrated and how they can be made to complement each other. A related question is how providers of self-care and informal care can be supported. Self-care and informal care have received mostly lip-service recognition. But, as Robinson (1980) has astutely observed, "Self-help is misperceived, however, if it is seen as a poor second best to 'fill the gap' for people who are starved of 'real' services. In fact, it is the professional services which should be seen as the stop-gaps, filling in where basic mutual self-help needs specific technical, organizational or expert assistance" (p. 420).

A workforce policy framework to support community-based health care will not be effective without taking into consideration the whole spectrum of providers. As the focus of health care increasingly shifts to health promotion, disease prevention, rehabilitation, health maintenance, long-term care and psychosocial well-being, the role of self-care providers

and informal caregivers become particularly important because they have been shown to be effective in many of these areas. The concept of human resources continuum is also congruent with the concept of continuity of care.

A comprehensive and integrated health workforce policy or planning framework that takes into account the entire human resources continuum does not exist in Canada. The development and implementation of such a framework must become one of the top priorities in community-based health care planning and implementation.

ii. Human Resources Substitution

Compared to many other countries, Canada lags behind in using health human resources substitution as a policy tool in health care reform. Use of nurse practitioners in Canada is relatively rare except in isolated communities and in the far north. The official recognition of midwifery has occurred very recently and only in a few provinces. In fact, "reverse substitution" is often practised in this country. Highly qualified or extensively trained practitioners are taking over functions that have been adequately performed by lower-level personnel. The gradual displacement of registered/licensed practical nurses by registered nurses in many hospitals, the demise of the Dentacare Program in Saskatchewan which relied mostly on dental therapists and the shifting of an increasing proportion of uncomplicated births from family physicians to obstetricians are just a few cases in point. The usual justification is that adequate care can only be provided by those with more extensive training. This literature review has shown that this is not necessarily true in many cases.

Much of the empirical evidence on role substitution pertains to mid-level providers. Evidence concerning role substitution in other areas or disciplines is less systematic and abundant. While more research and evaluation should be encouraged, the relative paucity of empirical evidence must not be used as an excuse to prevent experimentation on more innovative ways of using and deploying health human resources. The failure to adopt human resources substitution could result in higher costs to the health care system, the educational system, consumers and society at large. It could also mean less occupational mobility for health care workers, an increasingly rigid workforce and lack of service providers in many rural and more remote areas.

Human resources substitution is a policy instrument that can be used to achieve some of the goals of community-based health care like enhancing cost effectiveness, service accessibility and equitable distribution of resources. But it is important to ensure that substitution is adopted not just to save money. Substitution is done because it has been shown or can be demonstrated that the same function can be performed just as competently and efficiently by a provider with less extensive training or without formal credentials. If cost savings can be achieved at the same time, so much the better.

iii. Regulation of Health Occupations

Reform of the existing system of occupational regulation is a *sine qua non* for developing and implementing a health human resources policy that supports community-based health care. This is particularly important because statutory regulation of health occupations is usually taken for granted and is seldom seen as an important policy tool for health system reform. As this literature review has shown, there is some evidence indicating that

inappropriate occupational regulation could result in higher service costs and personnel shortages or maldistribution.

Without changes to the way health occupations are regulated, it would be difficult to practise human resources substitution or use multiskilled workers. It may not be a coincidence that midwifery was officially recognized in Ontario right after the introduction of the *Regulated Health Professions Act* which replaced exclusive scopes of practice with controlled acts. If community-based health care means becoming more responsive to the needs of the consumers, it is necessary to have a more flexible workforce. This, in turn, requires an occupational regulatory system that allows experimentation and innovative approaches in human resources utilization, development and management.

However, it must be noted that occupational regulation is just one aspect within a complex regulatory system that encompasses, among other things, program or facility accreditation, government policies and malpractice insurance. It would be quite futile to make changes to occupational regulation without at the same time adjusting the other aspects of this complex regulatory mechanism. Also, it is important to emphasize that reform of occupational regulation does not mean doing away with standards and safeguards. The challenge is to find alternatives to the present system, which enhance flexibility, appropriate use of human resources, consumer choice and quality assurance.

iv. **Human Resource Management and Enhancement**

The effectiveness of practitioners providing community-based health care and their quality of worklife could be improved by various management and educational measures. Similarly, the ways providers are organized, deployed and remunerated could affect the quality and cost effectiveness of their services. However, there is neither a magic formula nor a one-size-fits-all solution. The studies reviewed show that some measures are effective in one program or one health service centre or one community, but not necessarily in others. Likewise, the review of studies of education and skills acquisition suggests that while experts generally agree on a number of things that need to be done, there is not a consensus on how they should be done. As community-based health care encompasses a wide array of services, agencies, providers and organizational forms, it must experiment with different strategies, using experiences gained in other programs and jurisdictions as a guide and a source of inspiration. A trial-and-error approach and incremental improvements seem to be a prudent way to introduce appropriate educational models and management practices, at least until more definitive models and approaches can be identified.

4.3 Concluding Remarks

If community-based health care is to provide quality and accessible services, to achieve economic efficiency in service delivery and to forge effective community linkages, it cannot afford not to pay special attention to various health workforce issues. The community-based health care system in Canada is still evolving and its defining characteristics will largely be shaped by how it mobilizes and manages health human resources, its most important asset. Health human resources are the means by which it can contribute to improving individual and population health.

In developing a concept of coordinated health and human resources development, the World Health Organization (1990) has identified various problems that characterize traditional health human resources policies, planning and practices:

> "During the 1960s and 1970s, much human resources policy and planning tended to be overly concerned with numerical targets to the detriment of qualitative aspects such as competency levels, assigned tasks, conditions of employment, motivation, and management capabilities. Economic, distributional, and political realities were often overlooked or minimized to such an extent that planned targets were manifestly unrealistic. Workforce profiles tended to resemble an hourglass, with large numbers of high-level professionals at the top and support personnel with limited training at the bottom, and relatively few with intermediate technical and nursing skills.... Many participants in the human resources development process tended to maintain their commitment to traditional patterns of service delivery and professional training. There was excessive emphasis on hospital-based training, on high technology, and on curative services. There was too much reliance on didactic teaching methods and slow adoption of more effective community-based and student-centred methods. Training for the different occupational categories was compartmentalized even though they were expected to work as teams. It was almost as if the health services system and the human resources system, despite their seeming interdependence, were unalterably independent of each other, with each sector free to develop according to its own traditions and priorities" (pp. 14-15).

This is a powerful indictment. Unfortunately, many of the shortcomings identified by the World Health Organization are also evident in Canada. In order to rectify or avoid these problems, there is a need to revisit such salient issues as the production, continuing development, utilization, deployment, regulation, management and financing of health human resources. Even the most fundament question - What constitutes health human resources? - needs rethinking. The growing recognition and expansion of community-based health care offer not only an opportunity to deliver health services in a different way, but also an opportunity to consider health workforce issues in a different light.

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APPENDICES

APPENDIX 1

SEARCH STRATEGIES AND RESULTS OF ON-LINE SEARCH FOR HEALTH HUMAN RESOURCE MODALITIES

I. Database: Medline 1990 to December 1994

Set	Search	Results
1	*deinstitutionalization/	277
2	exp *primary health care	2575
3	community based.tw.	1742
4	exp community health centers/	1072
5	exp community mental health centers/	307
6	maternal-child health centers/	90
7	*community health services/	1170
8	exp *community health services/	11198
9	*ambulatory care facilities/	426
10	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9	16986
11	*health promotion/	2249
12	*health education/	2550
13	health fairs/	51
14	exp *health behavior/	1865
15	*holistic health/	462
16	*self care/	903
17	*preventive medicine/	325
18	*primary prevention/	518
19	*primary health care/	2073
20	caregivers/	1016
21	exp *home nursing	773
22	*preventive health services/	536
23	exp *school health services	846
24	11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19	12903
25	area health education centers/	26
26	competency-based education/	70
27	exp*education/	29752

Set	Search	Results
28	ed.fs	15996
29	exp inservice training/	1494
30	25 or 26 or 27 or 28 or 29	37172
31	exp *"fees and charges"/	705
32	capitation fee/	157
33	exp group practice/	911
34	exp “salaries and fringe benefits”/	1545
35	exp reimbursement mechanisms/	1963
36	physician incentive plans	57
37	single provider$.tw.	2
38	exp income	2998
39	fees, medical	626
40	user fee$.tw.	27
41	program funds$.tw.	34
42	exp budgets/	749
43	31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39	6487
44	program development/	831
45	total quality management/	151
46	program design.tw.	85
47	program organization.tw.	5
48	organizational objectives/	1762
49	exp organizational innovation/	1071
50	organizational culture/	443
51	product line management/	70
52	“organization and administration”/	78
53	models, organizational	476
54	*public health administration/	445
55	exp *personnel management	4916
56	44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52	9194
57	exp credentialing/	3250
58	exp *legislation/	1880
59	exp peer review/	928
60	57 or 58 or 59	5928

Set	Search	Results
61	exp *patient care team/	2268
62	*allied health personnel/	475
63	community health aides/	180
64	exp dental auxiliaries/	828
65	exp *nurses' aides	210
66	pharmacists' aides/	35
67	exp physician's assistants/	154
68	*nurse midwives/	727
69	*nurse anesthetists/	280
70	nurse clinicians/	802
71	midlevel practitioner$ or mid level practitione	8
72	physical therapist$.tw.	217
73	chiropract$.tw.	344
74	exp *social work/	567
75	61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69	5847
76	71 or 72 or 73 or 74 or 75	6906
77	24 or 30 or 43 or 56 or 60 or 76	66276
78	77 and 10	7857
79	exp *health services accessibility	2809
80	*waiting lists/	180
81	79 or 80	2964
82	*self care/	903
83	exp *consumer satisfaction/	1247
84	accountability.tw.	357
85	consumer advocacy/	213
86	empowerment.tw.	309
87	82 or 83 or 84 or 85 or 86	2994
88	cost allocation/	151
89	cost-benefit analysis/	3804
90	exp cost control/	2389
91	economic value of life/	219
92	88 or 89 or 90 or 91	6279
93	exp peer review/	928

Set	Search	Results
94	program evaluation/	2471
95	patient satisfaction/	2358
96	provider satisfaction.tw.	9
97	exp *quality assurance, health care/	6676
98	*quality of health care/	1706
99	exp *"outcome and process assessment (health care)"	1600
100	98 or 99 or 93 or 94 or 95	8658
101	evaluation studies/	18917
102	100 or 101	27329
103	81 or 87 or 92 or 102	37496
104	103 and 78	1345
105	comparative study/	187044
106	program evaluation/	2471
107	cross-sectional studies/	8631
108	exp case-control studies/	37269
109	exp evaluation studies/	55036
110	exp cohort studies/	81367
111	reproducibility of results/	12443
112	105 or 106 or 107 or 108 or 109 or 110 or 111	311726
113	104 and 112	798
114	limit 104 to clinical trial	79
115	113 or 114	814
116	limit 115 to English language	725
117	limit 115 to French	16
118	116 or 117	739

II. Database: Health 1975 to November 1994

Set	Search	Results
1	*deinstitutionalization/	856
2	exp *primary health care/	6493
3	community based.tw.	2670
4	exp community health centers/	2279
5	exp community mental health centers/	1507
6	maternal-child health centers/	272
7	*community health services/	4490
8	exp *community health services/ec,ma,mt,og,st,sn	25951
9	*ambulatory care facilities/	1295
10	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9	40589
11	*health promotion/	4829
12	*health education/	8486
13	health fairs/	168
14	exp *health behavior/	1711
15	*holistic health/	855
16	*self care/	1813
17	*preventive medicine/	1050
18	*primary prevention/	884
19	*primary health care/	5852
20	caregivers/	998
21	exp *home nursing/	1768
22	*preventive health services/	1433
23	exp *school health services/	2400
24	11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19	29810
25	area health education centers/	167
26	competency-based education/	343
27	exp *education/	65713
28	ed.fs.	38329
29	exp inservice training/	5813
30	25 or 26 or 27 or 28 or 29 85	555
31	exp *"fees and charges"/	3603

Set	Search	Results
32	capitation fee/	701
33	exp group practice/	8027
34	exp “salaries and fringe benefits”/	7882
35	exp reimbursement mechanisms/	8584
36	physician incentive plans/	207
37	single provider$.tw.	3
38	exp income/	12987
39	fees, medical/	2258
40	user fee$.tw.	53
41	program fund$.tw.	82
42	exp budgets/	3653
43	31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39	32076
44	program development/	1230
45	total quality management/	423
46	program design.tw.	161
47	program organization.tw.	35
48	organizational objectives/	3557
49	exp organizational innovation/	3005
50	organizational culture/	947
51	product line management/	656
52	“organization and administration”/	3568
53	models, organizational/	987
54	*public health administration/	1533
55	exp *personnel management/	19918
56	44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52	32586
57	exp credentialing/	11699
58	exp *legislation/	8928
59	exp peer review/	2936
60	57 or 58 or 59	22871
61	exp *patient care team/	4385
62	*allied health personnel/	2922
63	community health aides/	722
64	exp dental auxiliaries/	4636

Set	Search	Results
65	exp *nurses' aides	595
66	pharmacists' aides	172
67	exp physicians' assistants	1365
68	*nurse midwives/	1030
69	*nurse anesthetists/	466
70	nurse clinicians/	1414
71	midlevel practitioner$ or mid level practitioner	34
72	physical therapist$.tw.	433
73	chiropract$.tw.	285
74	exp *social work/	2415
75	61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69	17353
76	71 or 72 or 73 or 74 or 75	20336
77	24 or 30 or 43 or 56 or 60 or 76	183548
78	77 and 10	19180
79	personnel loyalty/	208
80	personnel turnover/	833
81	*workload/	411
82	*burnout, professional	744
83	exp personal satisfaction/	4958
84	*life style/	1213
85	*health status/	2872
86	*"outcome assessment (health care)"/	737
87	*attitude of health personnel/	7329
88	79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87	18291
89	88 and 78	449
90	exp peer review/	2936
91	program evaluation/	3185
92	patient satisfaction/	2376
93	provider satisfaction.tw.	17
94	exp *quality assurance, health care/	20021
95	*quality of health care/	5057
96	exp *"outcome and process assessment (health care)"/	3402
97	95 or 96 or 90 or 91 or 92	16179

Set	Search	Results
98	evaluation studies/	18690
99	97 or 98	34057
100	99 and 78	1755
101	89 not 100	393
102	comparative study/	50690
103	program evaluation/	3185
104	cross-sectional studies/	7550
105	exp case-control studies	18329
106	exp evaluation studies/	47940
107	exp cohort studies/	42867
108	reproducibility of results/	3676
109	102 or 103 or 104 or 105 or 106 or 107 or 108	138673
110	101 and 109	41
111	limit 101 to clinical trial	3
112	110 or 111	41
113	limit 112 to English language	38
114	limit to French	0

III. Database: Cinahl 1982 to October 1994

Set	Search	Results
1	exp *community health services /	16753
2	deinstitutionalization/	196
3	community based.tw.	453
4	exp ambulatory care facilities/	725
5	home health agencies/	299
6	primary health care/	1064
7	1 or 2 or 3 or 4 or 5 or 6	18580
8	health promotion/	1698
9	exp *health behavior/	1672
10	holistic health/	336
11	wellness/	252
12	*preventive health care/	490
13	exp health education/	8256
14	*self care/	1088
15	*caregivers/	812
16	*home nursing/	504
17	exp health information/	412
18	patient centered care/	191
19	*health beliefs/	283
20	health belief model/	200
21	8 or 9 or 10 or 11 or 12 or 13 or 15 or 16 or 17	13618
22	18 or 19 or 20 or 21	13995
23	exp *allied health personnel/	4204
24	community health workers/	30
25	health personnel, unlicensed/	70
26	home health aides/	103
27	multiskilled health pratitioners/	56
28	volunteer workers/	446
29	practical nurses/	430
30	first assistants/	32
31	*nursing assistants/	414

Set	Search	Results
32	nurse midwives/	237
33	nurse anesthetists/	376
34	exp *nurse practitioners/	1247
35	physical therapy assistants/	33
36	physicians' assistants/	528
37	chiropractic/	33
38	exp *patient care team/	823
39	exp interprofessional relations/	1644
40	practitioner.hw.	26
41	practitioners.hw.	2028
42	exp nursing manpower/	17687
43	exp *health manpower/	19242
44	23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31	5502
45	33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41	24822
46	44 or 45	25055
47	manpower.hw.	606
48	46 or 47	25074
49	legislation, medical/	68
50	exp legislation, nursing/	586
51	exp credentialing/	2501
52	exp peer review/	322
53	49 or 50 or 51 or 52	3383
54	exp "fees and charges"/	458
55	capitation.tw.	14
56	exp "salaries and fringe benefits"/	1356
57	provider mix.tw.	0
58	reimbursement.tw.	523
59	exp income/	1487
60	user fees.tw.	4
61	54 or 55 or 56 or 57 or 58 or 59 or 60	2419
62	organizational.hw.	1596
63	decision making, organizational/	51
64	organizational policies/	111

Set	Search	Results
65	allied health organizations/	72
66	*management styles/	254
67	*shared governance/	178
68	organizational objectives/	237
69	governing boards/	63
70	product line management/	54
71	program planning/	707
72	administration.hw.	3443
73	organization.hw.	333
74	*management/	446
75	“health and welfare planning”/	236
76	health resource allocation/	364
77	*marketing/	523
78	*national health programs/	610
79	exp strategic planning/	728
80	62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70	2767
81	72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80	8767
82	part time study/	14
83	adult education/	237
84	education, clinical/	397
85	refresher courses/	109
86	*educational status/	68
87	skill acquisition/	68
88	exp *professional competence/	1278
89	multiskilled health practitioners/	56
90	exp *staff development/	1741
91	exp *teaching methods, clinical/	484
92	exp education, continuing/	1888
93	education, allied health/	487
94	education, nurse midwifery/	198
95	82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90	4131
96	92 or 93 or 94 or 95	6349
97	22 or 48 or 53 or 61 or 81 or 96	51370

Set	Search	Results
98	7 and 97	9197
99	cost benefit analysis/	722
100	exp *"costs and cost analysis"/	2104
101	exp cost control/	807
102	cost savings/	132

APPENDIX 2

CONTACTS

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APPENDIX 3

LITERATURE SEARCH AND REVIEW STATISTICS
(As of April 14, 1995)

1.	Total number of references/abstracts from on-line literature search	2282
2.	Total number of articles selected from #1 through screening	304
3.	Total number of articles/reports/documents from other sources (i.e., from references sections of articles, telephone contacts, etc.)	303
4.	Total number of articles from #2 and #3 reviewed and found to be useful for inclusion in the study as of April 14, 1995	231

SUMMARY OF SELECTED STUIDES[1]

Author[2]/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study[3]
Abelson, J/1994	Review study	Provider role	n/a	Primary health care delivery models	The review shows that the literature fails to point to an "ideal" primary health care delivery model and there is a paucity of rigourous evaluation research in this area	Strong
Abramowitz, J/1973	Comparative study	Provider roles	-United States -Dental auxiliaries	Use of dental teams with expanded function dental auxiliaries	The study's findings indicate that employment of expanded function auxiliaries was feasible in terms of quality, amounts and types of service, and economic considerations.	Moderate
Adebayo, AB/1995	Descriptive study	Provider roles	Graduates of the Community Health Representative Program at Alberta Vocational College at Lac La Biche	Characteristics of community health representatives	Study shows employment status, location of employment and scope of duties were consistent with the original purpose of the training program.	

[1]Only studies containing empirical findings are summarized. Studies that are mostly of an informed opinion nature are excluded.

[2]Only first author of the study is shown.

[3]Only comparative studies are assessed in terms of their methodological strength.

[4]n/a = not applicable.

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Angus, D/1991	Descriptive study	n/a	n/a	n/a	Study summarizes major findings and recommendations of provincial commissions and task forces on health care.	
Baines, E/1984	Descriptive study	Human resources continuum- Southeastern United States	-Nonrandom sample of 50 family caregivers -Average age 73 years, male and female	Effects of caregiving on family caregivers	The study identifies a series of stressors experienced by older family caregivers of the physically disabled older adult. But for this sample, the stressors were within tolerable limits.	
Baldwin, DC /1978	Descriptive study	Education/ Personnel configuration- Remuneration	School of Medical Sciences of the University of Nevada, Reno	Interdisciplinary education and health team training	The study contains some information on the effect of interdisciplinary education, but no detailed evaluation data are reported. Some useful ideas on health care teams.	
Baldwin, DR/1994	Descriptive study	Workforce management	-Southeastern United States -176 registered nurses	Factors contributing to work excitement	The study suggests certain management innovations which could lead to better quality of worklife.	
Baldwin, LM/1993	Cohort Study	Personnel configuration - Remuneration/ Workforce management	-Seattle, Washington -109 patients at the Pike Clinic and 164 of their near-neighbours -Aged 60 years or older	Use of muti-disciplinary care team	Clinic patients made more annual visits but both emergency room and inpatient use were lower than their neighbours. Quality of care and satisfaction were high among clinic patients. The study suggests that it is coordination of care that is responsible for differences in utilization.	Moderate
Balinsky, W/1993	Descriptive study	Workforce management	Home care programs and workers in New York City	Shared Aide Program in home care	The study shows that the shared aide program was effective in terms of cost efficiency and job satisfaction.	

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Balzer, JA/1980	Descriptive study	Education	228 dental and 576 dental auxiliary students in 5 U.S. dental schools	Interdisciplinary training of dental and dental auxiliary students	The study concludes that the interdisciplinary preventive dentristry programs were successful. The students thought that the programs offered an excellent interdisciplinary training experience.	
Bamberg, R/1984	Descriptive study	Provider roles / Education	-University of Florida College of Health Related Professions -264 allumni of baccalaureate programs	Multicompetent allied health professionals	The study examines graduates from baccalaureate programs in dietetics, medical technology, occupational therapy and physical therapy. Most graduates stated they felt a need to be competent in areas outside their disciplines. The article also describes current approaches to the education of multicompetent allied health professionals and suggests new strategies for educating these personnel.	
Barr, JK/1992	Descriptive study	Human resources continuum	Employees of mayor companies in the U.S.	-Workplace programs for employed caregivers	The study discusses workplace programs for family caregivers of the elderly who are employed and describes such programs offered by some major companies.	
Bartlett, EE/1980	Review study	Education	n/a	Consumer health education in primary care	The article reviews empirical studies of the role of health education in improving outcomes for some diseases. Some educational efforts were found to be successful.	
Bassoff, BZ/1983	Descriptive study	Education	University of Pennsylvania -Students in six health-related professional schools	Interdisciplinary education	The study suggests that interdisciplinary training had some positive effects. No empirical data were presented.	

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Batchelor, GM/1975	Comparative study	Provider roles	-Smithville-McMaster Family Medical Centre and Township of West Lincoln, Ontario -Primary health care patients	Introduction of nurse practitioner as co-practitioner with physician in a family medical centre	The study demonstrated certain positive shifts in public attitudes toward nurse practitioners after 2 years of exposure.	Weak
Battista, RN/1983	Comparative study	Personnel configuration-remuneration	-Quebec -fee-for-service urban practitioners(165), fee-for-service rural practitioners(165), CLSC salaried physicians(81), and physicans of Family Medicine Centres paid on a session basis(69)	Physicans providing adult cancer preventive medicine in primary care settings	The study shows that CLSC physicans provided better and more preventive care. Remuneration and a multi-disciplinary approach may be possible explanations.	Weak
Baumgarten, M/1992	Descriptive study	Human resources continuum	Family caregivers of dementia patients and family members of cataract patients	Effects of caregiving on psychological and physical well-being of caregivers	Caregivers had significantly higher levels of depression and physical symptoms than non-caregivers.	
Beachey, W/1988	Descriptive study	Provider roles	Employers of health care personnel in Kansas	Multicompetent health professionals	The study examines the need for multicompetent practitioners, the relationship between hospital size and perception of this need and feasible combinations of skills from the employer's perspective. A general approach to multi-competency curriculum development was also suggested.	

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Beck-Friis, B/1991	Descriptive study	Workforce management	-Motala Hospital, Sweden -35 staff members, including 21 nurse's aides, 9 registered nurses and doctors	Work stress and job satisfaction	The study shows that those who were allowed to take initiatives of their own more often regarded their jobs as stimulating, resulting in low job turnover.	
Begley, CE/1989	Description study	Provider roles/ Personnel configuration and renumeration	9 primary health care projects serving low income persons in Texas	Effects of organizational model and personnel mix on cost-effectiveness	Those projects with the highest ratio of non-physicians to physicians proved to be more cost-effective.	
Begun, JW/1979	Descriptive study	Occupational regulation	Optometric profession in the U.S.	Professionalization in optometry and service costs	Price of optemetric services correlated with professionaliza-tion. The financial costs of professionalization were huge.	
Begun, JW/1980	Descriptive study	Occupational regulation	Optometrists in 4 U.S. states	Optometry and occupational regulation	Practice standard controls imposed by professional associations increased service complexity and price.	
Benham, L/1975	Descriptive study	Occupational regulation	Optometrists in U.S.	Ethical prohibitions imposed by professional associations	The study indicates that ethical prohibitions imposed by the optometric profession raised prices and reduce utilization.	
Bentley, JM/1984	Comparative study	Personnel configuration-remuneration	-Pennsylvania -1859 school-aged children	Dental treatment for children delivered by expanded function dental auxiliaries and private practice dentists.	The study finds that private practice dentists provided more economical dental care to school children than school-based practice.	Moderate

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Berger, A/1986	Descriptive study	Education	Preclinical medical students at Eastern Virginia Medical school	Interdisciplinary education	The study found that both students and patients reacted positively to the interdisciplinary training.	
Berman, JS/1985	Review study	Provider roles	n/a	Paraprofessional therapists vs professionals.	The review study found that paraprofessionals and professionally trained therapists were equally effective in doing psychotherapy.	Strong
Billey, V/1994	Descriptive study	Provider roles	Health care facilities and agencies in Alberta	-Use and training of multiskilled practitioners	The study's purpose is to determine whether health care organizations in Alberta employed multiskilled practitioners, and what professions are currently engaging in multiskilling activities. Results suggest that cost containment and overall operational effectiveness are the forces influencing staffing role changes.	
Birkel, RC/1993	Comparative study	Human resources continuum	-Laredo, Texas; San Diego, California; San Juan, Puerto Rico -1616 Hispanic drug users -Aged 13 to 82 years	Use of indigenous outreach workers to educate targeted group on AIDS prevention	The study demonstrates that the use of indigenous outreach workers is somewhat effective.	Weak
Black, DP/1976	Descriptive study	Provider roles	Family practice nurses in the Baie Verte Peninsula Health Centre, Newfoundland	Use of family practice nurses in primary care	The involvement of nurse practitioners appears to greatly improve the quality and availability of primary medical care.	
Blayney, KD/1989	Descriptive study	Provider roles	n/a	n/a	The study discusses the historical development of multiskilling in health care.	

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Bond, RS/1983	Comparative study	Occupational regulation	-United States -Optometrists	Ethical prohibitions in optometry	The study shows that advertising and commercial practice in optometry lowered price but did not lower quality of care.	Moderate
Bossaert, L/1989	Descriptive study	Human resources continuum	Cardiac arrest patients and lay people with CPR training in Belgium	Bystander CPR	The study shows that bystander CPR increased survival rates for cardiac arrest victims.	
Bozzini, L/1988	Descriptive study	Personnel configuration-remuneration	CLSCs in Quebec	n/a	The study describes the Local Community Service Centers in Quebec, including human resources characteristics.	
Bray, ML/1994	Descriptive study	Human resources continuum/ Provider roles	-Outreach workers -Prenatal women -Public health nurses	Use of Hispanic outreach workers as nurse extenders	The study shows the effectiveness of the Hispanic outreach workers in improving service access and utilization.	
Brooks, S/1989	Descriptive study	Human resources continuum/ Education	-Volunteers at Clarke Institute of Psychiatry, Toronto	Training of volunteers to work with the chronic mentally ill	The study describes a volunteer training program and its results.	
Brown, SA/1988	Review study	Education	n/a	Effects of patient teaching on know-ledge, self-care behaviours and metabolic control	Results of a meta-analysis of 47 studies support the notion that patient teaching has positive outcomes in diabetic adults	Moderate
Brown, SA/1992	Comparative study	Education	-Rural Texas-Mexico border community -30 diabetic patients, over 18 years of age	Diabetes education using videotape	The study demonstrates that videotape health education is effective.	Weak

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Brown, SA/1993	Review study (meta-analysis)	Provider roles	n/a	Care provided by mid-level providers	Nurse practitioners and nurse-midwives had patient outcomes equivalent to or slightly better than those of physicians. Study concludes that nurses practising in advanced practice roles are cost-effective providers of primary care services.	Strong
Bull, MJ/1990	Comparative study	Human resources continuum	-Northeastern United States -Caregivers of ill persons discharged from hospital -45 years of age or older -55 caregiver-recipient dyads	Caregiver burden	The discharged patient's health, the caregiver's health and functional ability, etc. were found to be inversely related to caregiver burden.	Moderate
Bush, PJ/1989	Comparative study	Education	-District of Columbia, United States -1041 black students, male and female -Average age 10.5 years	A course on cardiovascular risk factor prevention	The study shows that health education improves health status.	Weak
Caldera, D/1991	Descriptive study	Provider role	Community health aides in Alaska	Use of community health aides	The study describes the development of the community health aide program and the impact of community health aides.	
Caldera, D et al./1991	Descriptive study	Provider roles	Community health aides in Alaska	Use of community health aides	The study describes the roles and characteristics of community health aides in Alaska.	

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Cardenas, BD /1975	Descriptive study	Provider roles	-Residents in rural southern Saskatchewan -Nurse practitioners	Nurse practitioners providing primary care in a rural setting	Impressionistic results suggest that nurse practitioners were well accepted by the residents.	
Carkhuff, RR/1968	Review study	Human resources continuum	n/a	Lay helpers vs. professionals in helping people with mental health problems	The review shows that generally speaking, lay caregivers were just as effective as professionals in helping people with mental health problems.	
Casey, R/1984	Comparative study	Education	-Children's Hospital of Philadelphia -108 children and their parents	Educational intervention for parents in the management of fever	The study found that patient education reduces unnecessary physician contacts.	Moderate
Cermak, SA/1976	Descriptive study	Skills acquisition	-Senior students of an occupational therapy program at Boston University	Community-based field work experience	20 students participated in the community-based field work experiences at the time of the study. No evaluation data were reported.	
Ceslowitz, SB/1991	Descriptive study	Education/ Workforce management	-United States -80 registered nurses	Training nurses in home health care	The study suggests ways to ease the transition of nurses from hospital setting to home care setting.	
Chambers LW/1977	Comparative study	Provider roles	-Rural Newfoundland -Two groups of patients: experimental group (1167) and control group (1146)	Introduction of a family practice nurse in a rural primary care setting	The study shows that the introduction of the family practice nurse resulted in more primary care services being provided to the experimental group, a shift in the location of services from hospital to community, and a greater emphasis on preventive services. There was no measurable change in the quality of service.	Moderate

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Chenoy, NC/1973	Descriptive study	Provider roles	-Rural south-central Ontario -1616 subjects, male and female	Nurse practitioner in a primary care setting	People accepted nurses providing services in health maintenance and sickness surveillance situations. Personal primary care delivered in homes was highly acceptable, while physican services were preferred in worry-inducing situations.	
Chichin, ER/1992	Descriptive study	Workforce management	-New York City -487 home care workers	Management practices in home care	The study discusses possible management approaches to enhancing job satisfaction.	
Chubon, SJ/1991	Descriptive study	Workforce management	-Southeastern United States -25 nurses and 7 homemaker/home health aides	Job satisfaction among home care workers	The study examines useful management strategies for improving working conditions for home care workers.	
Cohen, JL/1986	Comparative study	Education	-Chapel Hill, North Carolina -Arthritis patients, male and female -Mean age 65.5 years	An arthritis self-management course delivered by laypersons vs. a course delivered by health professionals	The study found that patient education led to differences in knowledge, but no difference in behaviour and outcomes.	Moderate
Conrad, DA/1981	Descriptive study	Occupational regulation	Dental practice acts in U.S.	Effects of dental practice act provisions on dental costs and dentist income	Limits on number of offices per dentist, absence of reciprocal licensing arrangements, restraints on number of hygenists per dentist and restrictions on advertising were found to be related to higher dental fees and/or higher net incomes among dentists.	

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Cossette, S/1993	Descriptive study	Human resources continuum	-Montreal, Quebec, -89 French-speaking wife caregivers of men with chronic ob-structive pulmonary disease living at home	Stress factors experiences by informal caregivers	The study examines the mental health/stress factors associated with informal caregiving as predictors of satisfaction. The number of supervision tasks and amount of disturbance were related to mental health of family caregivers.	
Couser, S/1990	Descriptive study	Education	-Santa Clara County, California -12 community health nurses	Training for community health nurses working with frail elderly	The study shows that continuing education produces desired outcomes.	
Cummings, JE/1990	Comparative study	Personnel configuration-remuneration	-The Edward Hines Jr VA Hospital -244 severely disabled patients -Mean age 66	Hospital-based home care services	The study compares different models of human resources managment. Different levels of caregiver satisfaction are reported.	Strong
Dahlquist, G/1987	Descriptive study	Human resources continuum	185 suburban families in Sweden	Actions taken to deal with health problems	Families handled a huge amount of health problems without communication with health professionals.	
Davidson, RA/1981	Descriptive study	Provider roles	-North Carolina, Tennessee, and New York -Physicians and nurse practitioners	Disagreement in roles between nurse practitioners and physicians	The study found that there were disagreements between physicians and nurse practitioners over their roles and that clear role definition could lead to greater job satisfaction.	
Dean, KJ/1983	Descriptive study	Human resources continuum	-Denmark -Random sample of 2236 citizens, male and female -Aged 18 - 78 years	Self-care illness behaviours	Age, sex, perceived health status, and a reliant attitude toward physicians were the more important variables related to the illness behaviours.	

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Dean, WJ/1973	Descriptive study	Occupational regulation	State laws and regulations in relation to physician assistants in U.S.	Effects of state laws and regulations on functions, supervision, etc. of physician assistants	Restrictive regulations limit the use and effectiveness of physician assistants. Study recommends that all states should consider enacting legislation that will permit physician assistants to be utilized to their greatest capacity.	
Denton, FT/1983	Descriptive study (econometric modelling)	Provider roles	n/a	Use of nurse practitioners	The study shows that the use of nurse practitioners in Canada could effect quite substantial health care cost savings.	
de Savorgnani, AA/1993	Descriptive study	Workforce management	Homecare nurses in U.S.	Factors influencing job satisfaction	Autonomy in practice, freedom to manage work, client contacts etc. were found to be conducive to job satisfaction and personnel retention.	
Donovan, R/1989	Descriptive study	Workforce management	-New York City -404 home care workers	Working conditions of home care workers	The paper presents data on working conditions in the home care industry and suggests that reform is urgently needed in the employment system.	
Dracup, K/1986	Descriptive study	Human resources continuum	-Los Angeles, California -Trained volunteers	A community-based health information service specializing in cardiovascular diseases.	The study shows that volunteers can effectively provide health information on cardiovascular diseases.	
Drummond, MF/1991	Comparative study	Workforce management	-Southwestern Ontario -42 subjects, male and female -60 caregivers, male and female	Lay caregiver support	The study shows that caregiver support programs provide needed assistance to lay caregivers and are cost effective.	Moderate

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Duttera, MJ/1978	Comparative study	Personnel configuration-remuneration	-Rural southeastern United States -14 primary care practices using physician assistants	Different practice patterns involving physicians and physician assistants	The study shows that physican assistants can provide competent care when properly supervised.	Weak
Economic Council of Canada/1981 (Chapter 10)	Descriptive study	Occupational regulation	Provincially regulated occupations, including health occupations	n/a	Report concludes that although there are benefits attached to occupational regulation, the cost of the most restrictive form of regulation - licensure - apears to be significant. This applies as well to certification, when it is accompanied by restrictions that compel employers to hire those with appropriate certification.	
Edmunds, MW/1978	Review study	Provider roles	n/a	Use of nurse practitioners in U.S.	The study summarizes studies on nurse practitioners, identifying research trends and shortcomings.	
Edwards, N/1992	Descriptive study	Human resources continuum	-Hamilton, Ontario, -94 ESL students, male and female -Mean age 29.5	Health promotion/ advocacy for and by immigrants in ESL classes	ESL teachers and immigrants could be used to promote health. Study did not provide detailed evaluation data.	
Eisenberg, MS/1979	Descriptive study	Human resources continuum	927 cardiac arrest patients in King County, Washington State	Relationship between time receiving cardio-pulmonary resuscitation and survival from cardiac arrest	If CPR was initiated within 4 minutes and if definitive care was provided within 8 minutes, 43% of cardiac arrest victims survived. Author suggests that a realistic option to improve cardiac arrest survival rate is widespread citizen CPR training.	

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Feldman, PH/1993	Comparative study	Workforce managment	-San Diego, New York, Milwaukee, and Syracuse -11 home care agencies	Four worklife demonstration projects	The study found that work life enhancement initiatives could reduce staff turnover and improve continuity of care.	Moderate
Ferguson, G/1993	Descriptive study	Personnel configuration-renumeration	Extra-Mural hospital in New Brunswick	n/a	The study describes the New Brunswick Extra-Mural Hospital, particular personnel use and service delivery.	
Fooks, C/1990	Descriptive study	Occupational regulation	5 self-regulating health professions in Canada	Quality assurance activities are done in 5 professions	The study shows that current approaches to assuring quality of care are too strongly focused on identifying poor performers. The authors argue that this is insufficient and suggest alternatives.	
Fowkes, VK/1994	Descriptive study	Education	Mid-level provider training programs in U.S.	Preparation for practice in underserviced areas	The study describes strategies to encourage graduates of mid-level provider education programs to practise in underserviced areas.	
Gaumer, GL/1984	Review study	Occupational regulation	n/a	Regulation of health care practitioners	The study summarizes many studies dealing with the adverse effects of excessive regulation. The review concludes that tighter controls do not necessarily lead to improvements in quality of service. Restricitve practices invariably contribute to higher fees and practitioner incomes. As well, existing systems of regulation do not effectively control initial or subsequent competency of practitioners.	

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Gee, EM/1990	Descriptive study	Human resources continuum	-Canada -4 birth cohorts in 1860, 1910, 1930, and 1960	Demographic changes and informal caregiving	The four birth cohorts are examined from two points of view - as children and as parents. The analysis highlights the ways in which demographic change influences care-giving and care-receiving in an aging society.	
Gee, EM/1993	Descriptive study	Human resources continuum	n/a	Issues pertaining to informal caregiving	This study discusses the general issues associated with population aging. Selected social policy issues related to an aging society are examined, including intergenerational equity, child care policy and informal care-giving.	
Gibeau, JL/1993	Descriptive study	Provider roles/Education	-Franklin Medical Center, Massachussetts and Bridgeport Visiting Nurse Association, Connecticut -homecare aides	The training of paraprofessionals for psychiatric support in the home	The study shows that home care aides can successfully be trained to deal with some psychiatric problems.	
Gilbert, NJ/1991	Descriptive study	Workforce management	-Western Massachusetts -66 participants -Aged 20-68 years	Turnover among home care workers	The study discusses various factors that influenced homecare workers' decision to resign. The findings have implications for practice, education, research and public policy.	
Giles, W/1992	Comparative study	Provider roles	89 women receiving antenatal care at an antenatal clinic in Sydney, Australia	Midwives vs. obstetricians in providing antenatal care	The midwives' clinic achieved a 28% to 68% saving in salary cost. Patients cared for by midwives appreciated the continuity of care and the information given by the midwives.	Moderate

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Glasgow, RE /1992	Comparative study	Education	-University of Oregon Slocum Sports Medicine Laboratory -102 patients with diabetes, male and female -Aged over 60 years	A 10-session, self-management training program for persons over 60 with Type II diabetes	Study indicates that patient training improves self-care management.	Strong
Goeppinger J/1989	Comparative study	Education	-United States -374 arthritis patients, male and female -Aged 27 - 88	Self-care education for persons with arthritis	The study finds that patient education supports self-care behaviour.	Moderate
Golladay, FL/1973	Descriptive study (simulation modelling)	Provider roles	n/a	Impact of physician extenders on the productivity of primary care practices	The simulation model reveals that physician extenders could increase the productivity of a representative primary care practice by up to 74%. Substantial increases in physician productivity might be obtained through delegation of functions.	
Gordon, MJ/1977	Descriptive study	Education	University of Washington School of Medicine	Undergraduate clerkship in family medicine	The study argues that community-based medical teaching can be effective.	
Gravdal, J/1987	Descriptive study	Education	-The Community Health Center of the University of Illinois College of Medicine at Rockford -Undergraduate medical students	Training program for students in ambulatory primary care	The study presents a model of ambulatory primary care education in medicine.	

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Graveley, EA/1992	Comparative study	Provider roles	-3 clinics in U.S. serving a predominantly Hispanic clientele of low socioeconomic status -156 pregnant women	Delivery of low-risk prenatal care by physicans and clinical nurse specialists	Use of clinical nurse specialists substantially reduced the cost of providing prenatal care while maintaining quality, thereby saving valuable resources.	Weak
Gussow, Z/1976	Descriptive study	Human resources continuum	Self-help groups in U.S.	Establishment, growth and services for self-help health groups and their articulation with the institution of medicine	Self-help health groups have proliferated rapidly, apparently in response to the increasing importance of chronic illnesses and the failure of the health care system to develop an adequate coninuous form of care.	
Hagler, P/1993	Descriptive study	Provider roles	Rehabilitation therapists in Canada	Support personnel in rehabilitation	The study presents the views of rehabilitation therapists on the roles and use of support personnel in rehabilitation, as well as how such personnel should be trained.	
Haig, AJ/1994	Descriptive study	Personnel configuration-remuneration	-United States -41 patients, 13 men and 28 women -Aged 27 to 87	Multidisciplinary rehabilitation team	The study concludes that comprehensive rehabilitation planning for patients who have limited access to a multidisciplinary rehabilitation team can be accomplished in a single visit.	
Hastings, JEF/1973	Comparative study	Personnel configuration-remuneration	-Sault Ste. Marie, Ontario -3300 steelworkers and their families belonging to GHA and steelworkers who did not	Prepaid group practice vs. fee-for-service practice	The study found that, on comparing the frequency of different types of service rendered under the two systems, the Group Health Association placed greater emphasis on health protection. The two types of practice utilized human resources differently.	Moderate

Author/ Year	Study Design	Modality	Participants	Intervention/ Exposure	Outcomes	Strength of Study
Herbert, GK/1974	Descriptive study	Provider roles	-Rio Grande State Center for Mental Health and Mental Retardation in Harlingen, Texas -31 indigenous health workers	Use of indigenous mental health workers	The study reports that the use of indigenous mental health workers was successful.	
Hernandez, R/1990	Descriptive study	Provider roles	Health service provider organizations in South Carolina	Usage of and future need for multicompetent providers	Survey results show that multicompetent workers were used in about half of the agencies surveyed and that there was a large potential market for such workers. There were also indications of potential savings in using multicompetent workers.	
Hollingsworth, EJ/1993	Descriptive study	Personnel configuration-remuneration	-Wisconsin -12 community support programs	Use of para-professional and professional staff	The survey findings show that 38% of all caregivers were paraprofessionals and that use of these personnel were more common in rural programs .	
Hood, JN/1994	Descriptive study	Workforce management	-Southwestern United States -146 registered nurses, licencensed practical nurses and home-makers	Effect of management's concern for staff	Personal concern for workers by management increased job satisfaction and personnel retention.	
Howard, J/1971	Descriptive study	Education	University of California Medical Center in San Francisco	Interdisciplinary teaching	The study highlights some of the problems in interdisciplinary education of health care providers.	

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Jenkinson, D/1988	Comparative study	Education	-United Kingdom -177 asthmatic patients -Aged 3 - 49	Use of a booklet and audiocassette to teach asthmatic patients self-management techniques	The study finds that increase in the patient's knowledge of asthma helped in self- management of the condition. Specially prepared book or tape can be used to increase knowledge of use of drugs.	Weak
Jones, DA/1992	Descriptive study	Provider roles	-United Kingdom -1066 elderly people, aged 70 years and over -256 informal carers	Perceived stress by informal caregivers of the elderly	The study found that carers who felt that their caring role caused them high levels of stress were more likely to accept institutional care for their dependents.	
Jones, PM/1990	Comparative study	Education	-United States -34 patients with diagnosis of diabetes mellitus -Aged 25-65, male and female	A course on techniques for self-monitoring of blood glucose	The study demonstrates the effectiveness of a self-study course in increasing patients' capacity for self-care.	Moderate
Juhl, N/1993	Descriptive study	Workforce management	-Rural midwestern United States -258 registered nurses practicing in public health and home health settings	Job satisfaction among rural public and home health nurses	The study compares home health nurses to public health nurses. It identifies a number of manage-ment and job satisfaction issues.	
Jutras, S/1991	Descriptive study	Human resources continuum	294 informal caregivers in Quebec	Factors influencing caregiver burden	The level of assistance provided, participation in personal care activities of daily living, interaction with professionals on behalf ot the elderly, the elderly person's functional independence and health status, the caregiver's age, etc. all were found to contribute to informal caregiver's burden	

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Kahn, MW/1981	Descriptive study	Provider roles	Indigenous mental health workers in U.S.	Use of indigenous mental health workers	The study examines the use of indigenous mental health technicians on an Indian Reservation and argues that it is an effective approach.	
Kelley, VR/1977	Descriptive study	Human resources continuum/education	20 “natural helpers” in a community mental health centre in rural Iowa	Training of non-mental health providers to deliver mental health services	Community helpers can be trained to function effectively in rural mental health service delivery.	
Kethley, A/1982	Descriptive study	Workforce management	-Washington state -31 home health care agencies	Perceptions of provider roles by nurses and social workers	The study shows potential turf conflicts between nurses and social workers. Strategies for identifying and overcoming potential professional turf conflict in home care agencies are discussed.	
Key, JC/1973	Descriptive study	Education	Medical education program in North Carolina	Community-based medical education	The study discusses initial efforts to develop community-based educational experiences in a rural setting for medical and other health science students.	
Kind, AC/1985	Descriptive study	Human resources continuum	-Park Nicolet Medical Center in Minneapolis -315 patients with various infectious diseases	Outpatient intravenous therapy	The study shows that self-administered IV antibiotic therapy is feasible and cost efficient with no adverse health effects.	
Kindig, DA/1975	Review study	Provider roles/ Skills acquisition	n/a	Interdisciplinary education for primary care team	The study argues that the effectiveness of the team approach has not been well demonstrated and suggests ways to enhance interdisciplinary education.	

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Kobayashi, RH/1990	Comparative study	Human resources continuum	12 children, aged 2 - 17 with primary immunodeficiency in U.S.	Home self-adminstration of intravenous immunoglobulin therapy	The study found no difference in frequency of infection and antibiotic use during study compared with previous period.	Weak
Komaroff, AL/1976	Descriptive study	Provider roles	Physician assistants in Diabetes Clinic, Boston City Hospital	Use of physican assistants for the management of diabetes and hypertension	The study found that physician assistants could perform tasks adequately.	
Langsley, DG/1983	Descriptive study	Provider roles/ Workforce management	n/a	Changing roles of psychiatrists in community mental health centres	Psychiatrists increasingly played a “marginal” role in community mental health centres as their former functions were taken over by other mental health providers.	
Larkin, GV/1980	Descriptive study	Occupational regulation/ Provider roles	-Dental profession -Dental auxiliaries -Britain	Use of dental auxiliaries	The study examines the strategies employed by the dental profession in Britain to shape the dental division of labour. The elimination and controlled re-introduction of dental auxiliaries are discussed, together with an analysis of some of the consequences of role restriction.	
Levesque, L/1991	Review study	Human resources continuum	n/a	Informal caregivers of people suffering from dementia	The study examines the relationship between social support and well-being of informal caregivers and raises a number of policy and research issues.	
Levy, BS/1971	Quasi-comparative study	Provider roles	Madera County Hospital, California -Women seeking prenatal care	Midwives vs. physicians in providing prenatal care	The study demonstrated the effectiveness of prenatal care provided by midwives.	

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Lomas, J/1985	Descriptive study	Provider roles	n/a	Using nurse practitioners to provide services currently provided by general practitioners	Authors have developed a relatively simple method of estimating potential replacement of general practitioners by nurse practitioners. The model suggests that 20-32% of Ontario GPs in 1980 could have been replaced.	
Low, G/1987	Descriptive study	Provider roles	14 directors of community health organizations and 12 private practice physicians	Use of multi-competent practitioners	The study's results indicate that multicompetent practitioners are already working in some health care agencies. There is support for the development of multi-competent practitioner training.	
Lucas, MD/1988	Descriptive study	Workforce management	-South Carolina -741 public health nurses	Factors related to job satisfaction among public health nurses	The study measures the level of job satisfaction among public health nurses. Important factors conducive to job satisfaction were job importance, interpersonal relations and achievement.	
Mahoney, DF/1994	Descriptive study	Education	-United States -Family caregivers, mostly white, female and married	Training program for family care-givers of older adults	Study demonstrates usefulness of lay caregiver training.	
Manga, P/1994	Review study	Provider roles	n/a	Health human resources substitution	The review examines studies of the efficacy and cost-effectiveness of human resources substitution. It supports the appropriate use of role substitution in health care.	
May, KM/1991	Descriptive study	Human resources continuum	-Arizona -9 volunteers, aged 22-45	A community-based prenatal programme using volunteer neighbourhood outreach workers	The authors argue that the use of neighbourhood volunteers seems desirable but that a number of difficulties have been encountered.	

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Mazzuca, SA/1982	Review study	Education	n/a	Patient education in treatment of chronic disease	The study shows that patient education programs can assist patients with their self-management plan.	Moderate
McCally, M/1977	Descriptive study	Education	-United States -54 physician assistant programs and 60 nurse practitioner programs	Interprofessional training of physician assistants and nurse practitioners	70% of physician assistant students and 38% of nurse practition students had at least one classroom activity shared with another health profession group. But there was a lack of evaluation of such inter- disciplinary training activities.	
McDermott, PT/1991	Descriptive study	Provider roles/ Education	Dental therapists in Northwest Territories	Use of dental therapists in remote communities	The study examines the use and training of indigenous dental therapists to overcome manpower shortages in northern Canada. The authors argue that native people can be successfully trained to perform a variety of dental procedures.	
McLean, CL/1991	Descriptive study	Provider roles	Community health representatives in Canada	Use of community health representatives	The study describes the roles and characteristics of para-professional indigenous community health workers.	
Meikle, M/1979	Comparative study	Provider roles	-University College Hospital, London, UK -31 patients -Speech therapists and volunteers	Professional vs volunteer treatment of dysphasia	The study found that volunteers and speech therapists yielded similar outcomes in treating patients of dysphasia.	Moderate
Miller, SL/1976	Comparative study	Education	-Department of Community Dentistry, University of Texas Health Center at San Antonio -Senior dental students	20-hour course on dental care for chronically ill and aged patients	The results suggest that the program failed to produce the desired attitudinal changes in the student in relation to provision of care.	Weak

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Morewood-Northrop, M/1994	Descriptive study	Workforce management	Nurses in Northwest Territories	Training and other initiatives to improve quality of worklife	Besides providing a general description of the roles and work of nurses in NWT, the study reports that various initiatives such as job-sharing and inde-pendent living quarters for nurses helped reduce turnover by 30%.	
Mullen, PD/1985	Review study	Education	n/a	Patient education	The study reviews a number of studies dealing with educational programs for people with long-term health problems. Different educational techniques are compared. Educational rating score is found to be the strongest predictor of effect size of both knowledge and drug errors.	
Murray, E/1995	Descriptive study	Education	University College London Medical School, U.K.	Cost of community-based medical education	Teaching basic clinical skills in the community is not cheap, but there are a number of benefits.	
Muzondo, TR/1980	Descriptive study	Occupational regulation	n/a	Occupational licensing and professional incomes	The study suggests that ethical prohibitions such as restrictions on advertising and price competition raise the incomes of practitioners.	
Neale, AV/1992	Comparative study	Education	Family medicine residents	Home visit training for physicians	The study suggests that the program was generally successful. Residents were more likely to view home visits as an important part of medical practice.	Weak

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Nicoletti, J/1975	Comparative study	Education	-Arvada, Colorado -11 female volunteers at the Jefferson County Mental Health Center, -Aged 24-40	Intensive training in communication and other aspects in a community mental health center	Study indicates that training increases volunteer effectiveness.	Weak
O'Donnell JM/1977	Comparative study	Human resources continuum/ Education	-Ben Gordon Community Mental Health Center, DeKalb, Illinois -40 subjects, male and female	Volunteer vs professional staff delivering mental health emergency telephone services	The study shows the effectiveness of volunteer mental health emergency services.	Weak
Office of Technology Assessment/1986	Review study	Provider roles	n/a	Use of nurse practitioners, physician assistants and nurse-midwives	The review study examines quality of care, access to care, cost effectiveness, etc. It concludes that mid-level providers provide care where quality is equivalent to that of care provided by physicians.	Strong
Oktay, JS/1990	Comparative study	Workforce management	-Johns Hopkins Hospital, Baltimore, Maryland -93 comparison group patient/caregiver pairs -98 treatment group pairs -Aged 65 or over	Post-hospital support program for the frail elderly and their caregivers	The study shows that the support program produced conflicting outcomes, although it was effective in reducing utilization.	Weak

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Ondrejka, D/1983	Descriptive study	Human resources continuum	Workers in industrial plant in the United States	Self-care medication program in industry	The study shows that self-care medication program was successful in saving time for workers and nurses.	
Osborn, EHS/1986	Descriptive study	Education	Public health students from University of California School of Public Health at Berkeley and School of Medicine at San Francisco	Training in community-oriented primary care	The author claims that the students involved in the program have increased their knowledge base.	
Osterweis, M/1980	Descriptive study	Education	Georgetown University Community Health Plan Inc., United States	Training medical and nursing students for primary care team in an HMO setting	Students trained in the project acquired good clinical skills and developed skills in professional role negotiation and communication.	
Padgett, D/1988	Review study	Education	n/a	Educational and psycho-social interventions	The results based on a review of 93 studies demonstrate the positive effects of patient education.	Strong
Parcel, GS/1994	Comparative study	Skills acquisition	199 patients and their primary caregivers at 2 cystic fibrosis centres in U.S.	Self-management of cystic fibrosis	The study shows that knowledge alone is insufficient to encourage self-management.	Weak
Polich, C/1990	Descriptive study	Education	-HMOs in United States with Medicare contracts -HMO physicians	Provision of home health care through HMOs	The study examines the problems faced by physicians in home care including their lack of training in this area.	

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Pontell, HN/1982	Descriptive study	Occupational regulation	California's Medi-Cal program	Process dealing with abuse by physicians	The study reveals the problems associated with the influence of physicians' professional power on the enforcement of ethical behaviours.	
Posavac, EJ/1980	Review study (meta-analysis)	Education	n/a	Patient education programs	The Review Study Shows That Patient Education Programs Have Effects in a number of areas.	Weak
Quick, R/1991	Descriptive study	Provider roles	Community health aides in Alaska, U.S.	Use of community health aides	The study describes the characteristics of community health aides. Community health aides are well received by consumers and other providers.	
Rabinowitz, HK/1988	Descriptive study	Education	-United States -31,652 medical school graduates	Family practice clerkships	The study demonstrates, through statistical analysis of administrative data, that a family practice clerkship has an influence on choice of family practice and practice in underserviced areas.	
Ramsey, P/1993	Descriptive study	Provider roles	Mountain City Extended Hours Health Center, Tennessee -101 subjects	Use of nurse practitioners	Family nurse practitioners provided effective and satisfactory health care in a clinic setting.	
Rasmussen, F/1989	Comparative study	Education	-Uppsala county, Sweden -572 mothers with children 6-12 months of age	A self-care booklet and educational session for mothers about young children's minor illnesses	The study shows that education improves self-care appropriateness.	Weak

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Record, JC/1980	Review study	Provider roles	n/a	Use of nurse practitioners and physician assistants	The review examines studies of the clinical and cost effectiveness of nurse practitioners and physician assistants. Review shows that these providers perform a large percentage of primary care services at a high level of quality and productivity.	Moderate
Redman, S/1991	Comparative study	Education	-Australia -360 women	Antenatal education programme	The study's findings suggest that health education fails to lead to behavioral change.	Weak
Rehm, SJ/1983	Descriptive study	Human resources continuum	-Cleveland Clinic Hospital -Patients suffering from various forms of infection -Aged 24-44, male and female	Home intravenous antibiotic therapy	Study shows the positive effects and cost effectiveness of home IV antibiotic therapy.	
Reid, ML/1979	Comparative study	Provider roles	A nurse-midwife program in rural Georgia	Implementation of a nurse-midwife program	As the program developed, infant mortality rate of the 4 affected countries showed a decrease. There were also decreases in the rate of neonatal mortality, low birthweight and short gestational age.	Moderate
Reinke, B/1986	Descriptive study	Personnel configuration-renumeration	3 indigenous community support programs in U.S.	Different personnel organizational models	The 3 models (caseworker model, paraprofessional-extender model and team model) all have their strengths and limitations. Each program has tailored its organizational process to suit the types of clients it sees, the size of its catchment area and the availability of other human resources.	

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Renaud, M/1980	Comparative study	Personnel configuration-remuneration	-Montreal area, Quebec -111 general practitioners from CLSCs and private group practice clinics	Different forms of physician renumeration	The study shows that CLSC physicians performed better than their private group practice counterparts.	Weak
Riordan, J/1991	Descriptive study	Workforce management	-Midwestern United States -104 nurses	Job satisfaction among community health nurses	The study shows that prestige was highly correlated with job satisfaction among community health and home care nurses. Other factors contributing to job satisfaction included autonomy and social interaction.	
Ritter, G/1985	Descriptive study	Human resources continuum	-Lucas County, Ohio and Kent County and Southfield, Michigan -2142 cardiac arrest patients	Bystander cardiopulmonary resuscitation	The study demonstrates that bystander CPR improves survival rate of cardiac arrest patients.	
Roberts, CR/1983	Comparative study	Skills acquisition	433 families attending a family practice clinic in Columbia, Missouri	Introduction of a brief health education program	The subsequent rate of unnecessary clinic visits for upper respiratory tract infections was 44% lower in the intervention groupas compared with the control group. No increase was seen in complications.	Moderate
Roberts, DN/1990	Descriptive study	Workforce management	-Rural southern Illinois -393 community care workers, female and male	Job satisfaction and retention among community care workers	The study suggests certain management strategies for improving workers' job satisfaction.	
Robichaud, JB/1991	Descriptive study	Personnel configuration-renumeration	365 local community health and social service centres in Canada	Relationship between types of services offered and personnel use	Besides describing staffing patterns, the study shows that number and type of workers in a centre was related to the types of services provided.	

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Rooks, JP/1992	Descriptive study	Human resources continuum/ Personnel configuration-renumeration	18,000 women in 89 birth centres in U.S. were surveyed	n/a	Study describes characteristics of women using birth centres, types of services used, number and types of prenatal care providers in birth centres, etc.	
Roth, D/1993	Descriptive study	Provider roles/ Education	-United States -Licensed Practical Nurses and Licensed Vocational Nurses	A proposed education program to train LPNs and LVNs to perform intravenous therapy	Study discusses how licensed practical/vocational nurses can be trained to perform IV therapy.	
Rubin, RR/1989	Comparative study	Education	-Johns Hopkins Diabetes Center, Baltimore -165 diabetes patients	Self-care education program for diabetes patients	Study shows that diabetes education increases self-care.	Moderate
Rudmann, SV/1989	Descriptive study	Provider roles	-United States -197 group and staff model HMOs	Use of multi-competent allied health care workers in HMOs	Many group and staff model HMOs employed multicompetent workers, most of whom received “in-house” training.	
Russell, EM/1985	Review study	Human resources continuum	n/a	Self-care or self-help groups	The study offers a number of policy implications in relation to self-care.	
Schulz, R/1990	Review study	Human resources continuum	n/a	Stress experienced by informal caregivers	The study examines prolonged or cumulative consequences of exposure to the stress of caregiving. The findings suggest increased vulnerability to physical illness among care- givers.	

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Seacat, M/1977	Descriptive study	Personnel configuration-renumeration	n/a	n/a	Study describes the nature, organization and staffing problems of neighbourhood health centres in U.S. Evaluation studies generally show that centres compare favourably with other methods of providing similar care.	
Sekscenski, ES/1994	Descriptive study	Occupational regulation	Regulations governing the practice of mid-level providers in 50 states of U.S.	Effects of practice environment on supply of mid-level providers	There are wide variations in state regulation (i.e., legal status, reimbursement approach and authority to write prescriptions) of physician assistants, nurse practitioners and nurse-midwives. Favourable practice environments were found to be strongly associated with a larger supply of these practitioners.	
Seltzer, MM/1992	Comparative study	Education	175 outpatient elderly patients and their family members at the Beth Israel Hospital in Boston	A program to train family members to serve as case managers for their elderly relatives	Study shows that the experimental group family members performed significantly more case management tasks on behalf of their elderly relatives than did family members in the control group and there was not an increase in caregivers' level of caregiving burden.	Moderate
Sheehan, NW/1989	Comparative study	Education	Hartford, Conn. -200 clergy, volunteers and social service providers	Training in ways of disseminating information to family caregivers	Project was successful in mobilizing participants to respond to the information needs of caregivers and increasing their knowledge about aging and caregiver issues.	Weak
Shepard, L/1978	Descriptive study	Occupational regualtion	State licencing authorities in U.S.	Effects of licensing practices by state authorities	The study argues that licensing restrictions raise dental service costs and reduce dental manpower supply.	

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Sheps, S/1984	Descriptive study	Personnel configuration-renumeration	-The Reach Community Clinic in Vancouver, B.C.	Use of the Burlington Randomized Controlled Trial criteria and rating system for evaluation	The method of primary care assessment used was found to be both practical and inexpensive.	
Shewan, CM/1984	Comparative study	Provider roles	-Ontario -100 aphasic patients, male and female -Aged 29 - 85	Speech pathologists vs. volunteers in treatment	The study shows that there were few differences between speech therapists and trained volunteers in the effectiveness of treating aphasic patients.	Moderate
Shi, L/1993	Descriptive study	Provider roles	-United States -243 rural community and migrant health centers	The use of nurse practitioners, physician assistants and nurse midwives in rural community and migrant health centers	The study shows that demands, geographic location and the centers' staffing policies were significant determinants of the use of nonphysician providers.	
Shuster, GF/1992	Descriptive study	Workforce management	-Southeastern United States -129 nurses from urban and rural home health care agencies	Job satisfaction in home health care nursing	The study shows that the type of work nurses do affects their job satisfaction.	
Smith, HL/1994	Descriptive study	Workforce management	-United States -52 nurses, 94 homemakers and 41 support staff	Leadership and quality of work life in home health care	The study shows that leadership behaviour is strongly associated with staff members' job satis-faction, job involvement and propensity to remain with the organization. These, in turn, are related to higher job performance.	

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Sox, HC/1979	Review study	Provider roles	n/a	Use of nurse practitioners and physician assistants	The review study shows that NPs and PAs provide office-based care that is indistinguishable from physician care in quality.	Moderate
Spitzer, WO & DJ Kergin/1973	Descriptive study	Education	-Nurse practitioner training program at McMaster University, Ontario -Students of the program	Educational program for nurse practitioners	22 of 23 students fulfilled the overall training criteria.	
Spitzer, WO et al./1973	Comparative study	Personnel configuration-remuneration/ Education/ Provider roles	-South-central Ontario -Nurses of 14 family practices	Care provided by nurse practitioners and family physicians	The study found that important changes occurred in the experimental group. NPs spent more time in clinical activities than control group nurses. The shift was not at the expense of time devoted to clinical work by physicians. Doctors delegated more professional activities to NPs than to other nurses.	Moderate
Spitzer, WO/1976	Comparative study	Provider roles	-Ontario, Canada -Nurse practitioners	Use of nurse practitioners	The results show the effectiveness, cost-savings and provider/patient satisfaction associated with the use of nurse practitioners.	Moderate
Spitzer, WO/1978	Descriptive study	Provider roles	Burlington and Smithville, Ontario	Nurse practitioners vs physicians in service provision	The study shows that physician-nurse practitioner teams are cost efficient, and that the model could survive in a fee-for-service environment.	
Stone, R/1987	Descriptive study	Human resources continuum	-United States -1924 caregivers	Lay caregivers of the frail elderly	The study describes the characteristics of informal caregivers. Informal caregivers are predominantly female, a sizeable proportion of whom is over age 65. A minority uses formal services.	

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Stone, RI/1990	Descriptive study	Human resources continuum	-United States -1003 nonspousal caregivers, younger than age 65	Effects of caring on informal caregivers	The competing demands of work and elder care are the subject of this study. Those caring for elders with greater care needs are more likely to take unpaid leave, reduce work hours or rearrange their work schedule to assume elder care responsibilities.	
Sullivan, JA/1978	Descriptive study	Occupational regulation	-State University of New York at Buffalo -1101 nurse practitioners	Employment and use of nurse practitioners	The perception of the nurse practitioner's legal status held by NPs and employers is the major barrier to their employment and utilization.	
Sullivan, MJL/1993	Descriptive study	Personnel configuration-renumeration	Outreach rehabilitation programs in Canada	Activities and organization of out-reach rehabilitation programs	Most respondents to the survey noted that the primary responsibility for treatment provision remained at the community level. A need to expand both the types of service offered and the number of communities served by out-reach programs was also identified.	
Szasz, G/1974	Descriptive study	Education	An interdisciplinary education program at University of British Columbia	Interdisciplinary education	The study describes an interdisciplinary education program at University of British Columbia and identifies problems in developing interdisciplinary education.	
Tanner, LA/1972	Comparative study	Education	-University of Miami Department of Family Medicine and School of Nursing -61 students	Interdisciplinary training of health team	The study shows that training is effective in changing or developing certain attitudes.	Moderate

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Temple-Smith, MJ/1989	Descriptive study	Workforce management	-Australia -689 community nurses	Reasons for becoming community nurse	The study reports on the areas of job entry, job satisfaction, job mobility and perceived career options, as well as educational preparation.	
Tilson, HH/1973	Descriptive study	Workforce management	-United States -40 neighbourhood health centers -1055 physicians	Factors influencing physician retention	The study shows that the organizational characterisitics of neighbourhood health centers have a bearing on physician retention. This could have management implications.	
Timpson, J /1983	Descriptive study	Education	Federal Sioux Lookout Zone Hospital, Sioux Lookout, Ontario	Training program for indigenous mental health workers	The study describes training of and services provided by indegenous mental health workers.	
Vickery, DM/1983	Comparative study	Education	1,623 households enrolled in the Rhode Island Group Health Association	Self-care educational programs	All 3 experimental groups showed statistically significant decreases in medical care utilization as compared with the control group. The average decrease was 36.4%	Weak
Vohlonen, I/1989	Comparative study	Personnel configuration-remuneration	Residents and physicians of 4 cities in Finland	Different methods of reimbursing physicians	The study found that salaried physicians produced at least the same overall value as their privately employed counterparts.	Strong
Voltmann, JD /1975	Descriptive study	Provider roles	6 nurse practitioners in Jamestown, New York	Use of nurse practitioners in rural and poor areas	The study argues that rearranging MD and NP roles and responsi-bilities could help to deal with MD shortages.	
Walcott-McQuigg, JA/1992	Descriptive study	Workforce management	-Midwestern United States -67 community health nurse	Stress factors affecting community health nurses	The study shows that management issues are related to community nurses' stress.	

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Warrick, LH/1992	Descriptive study	Human resources continuum	-Southwest Arizona -Mexican-American females, aged 15 - 38 years	Prenatal care and outreach by peer health worker	The study indicates that the program was generally effective, but no detailed data were reported.	
Webb, PA/1980	Comparative study	Education	-United States -123 low income, black hypertensive patients, male and female -Mean age 30 years	Patient education vs. psychosocial counselling vs. family physician care	The study demonstrates that patient education does not lead to improved health outcomes over and above the care provided by family physicians.	Weak
Weber, CL/1993	Quasi-comparative study	Personnel configuration-remuneration	-Canada -120 employees of community health care organization and 1365 hospital employees, female and male	Job satisfaction in hospital vs. community healthcare organization	The study found that workers in a community health care organization were generally more satisfied with their jobs than their counterparts in hospitals.	
Wertz, RT/1986	Comparative study	Human resources continuum	-United States -121 aphasic patients, aged 75 years or younger	Speech therapists vs. trained volunteers	The study found that speech therapists and trained volunteers produced similar improvements in aphasic patients.	Strong
Weston, JL/1980	Descriptive study	Occupational regulation	n/a	State variations in legal contraint and reimbursement of nurse practitioners and physican assistants	There is a correlation between state policies on reimbursement and legal constraints and the distribution of nurse practitioners and physician assistants.	

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Wiernikowski, JT /1991	Descriptive study	Human resources continuum/ Education	-Chedoke-McMaster Hospitals, Hamilton, Ontario -13 children and their families	Home intravenous antibiotic therapy in pediatric oncology	The study points to the effectiveness of a home intravenous antibiotic program.	
Wilson, PR/1986	Descriptive study	Occupational regulation	n/a	n/a	Study suggests that policing of fraud and abuse by peer review processes has not worked well with medical practitioners.	
Wilson, SR/1993	Comparative study	Human resources continuum	-Northern California -323 adult Kaiser Permanente patients with moderate to severe asthma -Aged 18-50	Two forms of self-management education for adults with asthma	The study demonstrates that patient education is effective in enhancing self-management of asthma symptoms.	Strong
Wise, H/1972	Descriptive study	Personnel configuration-remuneration	Health care teams of the Dr. Martin Luther King Jr. Health Center, Bronx, New York	Training and functioning of primary health care team	The study suggests that inappropriate traditional training of physicians and nurses leads to poor health care team functioning.	
Wood, J/1991	Descriptive study	Personnel configuration-remuneration	6 antenatal care initiatives in the United Kingdom	Antenatal care delivery in primary care settings	The results of the study indicate that integrated community-based antenatal care improved pregnancy outcomes.	
Young, TK/1988 (Chapter 7)	Quasi-comparative study	Provider roles	Native communities in the Sioux Lookout Zone, Ontario	Differences in the availability of health resources, including health human resources	Communities with health stations and nurses and communities with only health aides have no significant differences in various measures of health status.	