Health Canada Santé Canada

Health Policy
Working Paper Series

Immigration and Health

Working Paper 01-05
September 2001

Canada

Our mission is to help the people of Canada
maintain and improve their health.
Health Canada

This publication can be made available in/on computer diskette/large print/audio cassette/braille, upon request.

For additional copies or for an address change, please contact:

Health Canada
Policy Research Communications Unit
Tel.: (613) 954-8559
Fax: (613) 954-0813
rmddinfo@hc-sc.gc.ca

It is available electronically at the following address:
http://www.hc-sc.gc.ca/iacb-dgiac/nhrdp/index.html

Ce document est aussi offert en français sous le titre :
Immigration et santé

The Working Paper Series (WPS) supports evidence-based decision making by highlighting and promoting Health Canada's policy research to a broad number of policy analysts and decision makers in Health Canada and its partners in the external research community. The WPS is part of a larger policy research communications program that includes the *Health Policy Research Bulletin*.

Cat. N° H13-5/01-5E
ISBN 0-662-31029-2

IMMIGRATION and HEALTH

Ilene Hyman
Centre for Research in Women's Health
Sunnybrook and Women's College
Health Sciences and University of Toronto

Author Biography

Ilene Hyman, PhD (Public Health), is a Research Scientist at the Centre for Research in Women's Health, Sunnybrook and Women's College Health Sciences and an Assistant Professor in the Department of Public Health Sciences at the University of Toronto. Her doctoral and post-doctoral research both focused on acculturation, addressing methodological issues as well as exploring the mechanisms through which acculturation affects health status and health behaviours. She recently completed a literature review for the Ontario Ministry of Health and Long-Term Care on best mechanisms to influence health behaviour in women, which had a special focus on immigrant women. Current research projects include studies of mental health among Ethiopian immigrants and barriers to cancer screening and preventive health services for immigrant women in Toronto.

Resumé

L’objet du présent rapport est de passer en revue les recherches effectuées sur la santé et les déterminants de la santé chez les immigrants canadiens et d’examiner les répercussions de ces travaux pour les décideurs. Une attention particulière est apportée aux éléments de preuve corroborant l’hypothèse de l’« effet de l’immigrant en bonne santé ». La notion d’effet de l’immigrant en bonne santé découle de l’observation selon laquelle les immigrants, à leur arrivée dans leur pays d’accueil, sont souvent en meilleure santé que les natifs de celui-ci, mais perdent cet avantage avec le temps.

Les principaux résultats pour la santé examinés sont l’état de santé (auto-déclaré), le cancer, les cardiopathies, la tuberculose, le VIH/sida, la santé mentale, la santé périnatale, la santé bucco-dentaire et le diabète. Pour chaque catégorie, on a passé en revue les publications canadiennes afin de documenter l’existence éventuelle de l’effet de l’immigrant en bonne santé et de répertorier les principaux déterminants des résultats pour la santé au Canada. De même, on a effectué un relevé des publications canadiennes sur l’utilisation des services de santé (USS) par les immigrants et sur la promotion de la santé. Parfois, cette information a été complétée par des données provenant d’études internationales majeures.

Il ressort de la majorité des publications recensées que les immigrants canadiens, en particulier ceux qui sont arrivés récemment, se portent mieux que les immigrants de longue date et les Canadiens de naissance sur le plan de l’état de santé général et de la prévalence de certaines maladies chroniques comme le cancer et les cardiopathies. Au chapitre des maladies infectieuses, on observe des tendances différentes. Ainsi, contrairement à ce qui se produit pour les maladies chroniques, la plupart des immigrants souffrant d’une maladie infectieuse, par exemple la tuberculose, voient leur état de santé s’améliorer progressivement s’ils bénéficient d’un traitement et d’un suivi appropriés. Les résultats obtenus en matière de santé mentale sont contradictoires. Après une période de risque initiale, la santé mentale des immigrants s’améliore avec le temps, amélioration qui persiste souvent chez la deuxième génération. Plusieurs des études répertoriées indiquent que des sous-groupes comme les réfugiés, les femmes et les enfants, ont des besoins particuliers non comblés (besoins qui ne font que rarement l’objet de recherches). Dans l’ensemble, il ressort de la recension documentaire que les déterminants de la santé comme la pauvreté et le sous-emploi ont un impact considérable sur la santé, en particulier chez les femmes et les enfants.

Contrairement à une opinion très répandue, aucun élément de preuve n’établit que les immigrants surutilisent les services de soins de santé dans leur ensemble. On observe plutôt des profils semblables en matière d’utilisation des soins de santé chez les immigrants et les non-immigrants. Il y a par ailleurs une sous-utilisation très nette dans le cas des services

préventifs et de santé mentale. Au Canada, on a effectué peu de recherches visant à répertorier et à évaluer des systèmes de soins adaptés à la réalité culturelle (p. ex., modèles de prestation de soins de santé, réformes institutionnelles, ou pertinence et applicabilité des modèles théoriques couramment utilisés et des stratégies de promotion de la santé pour les populations immigrantes).

Les questions primordiales découlant des présentes observations, pour les décideurs, sont les suivantes :

1. Quelles sont les conditions (déterminants de la santé) qui contribuent aux changements dans l'état de santé des immigrants au fil du temps?
2. Comment les services et les programmes gouvernementaux peuvent-ils contribuer à maintenir et à promouvoir l'état de santé des immigrants avec le temps?

En ce qui concerne la première question, compte tenu du fait que la santé des immigrants est étroitement tributaire de leur environnement et de leurs conditions de vie et qu'elle peut changer en réponse aux pressions associées à la pauvreté, à la marginalisation et aux inégalités sociales, l'adoption d'approches multisectorielles s'impose. Les résultats des études mettent en lumière le rôle fondamental du soutien social dans la promotion et le maintien de la santé et du bien-être, ainsi que la nécessité de déployer des efforts d'éducation du public et de législation sociale dans le but de rehausser l'image et l'importance des immigrants dans la société canadienne. Il faut également élaborer des programmes et des politiques de nature à donner aux groupes d'immigrants les pouvoirs et les moyens de développer et de conserver leurs propres institutions adaptées à leur culture et leurs habitudes d'hygiène personnelle.

Quant à la deuxième question, si le fait que les immigrants utilisent moins les services de santé (notamment les services de santé mentale et de prévention) que la population canadienne de naissance peut être considéré comme une bonne nouvelle, on peut néanmoins se demander si cette situation ne serait pas attribuable à l'incapacité des services actuels de répondre aux besoins des immigrants, et non à la meilleure santé de ces derniers. En levant les obstacles à l'accès aux services et en améliorant la communication entre les paliers fédéral et provincial de gouvernement ainsi que le caractère approprié et exhaustif des services offerts, on contribuerait à assurer le maintien en bonne santé des nouveaux immigrants.

Les études recensées montrent également qu'une approche sélective doit être utilisée pour répondre aux besoins des sous-groupes d'immigrants qui risquent davantage de souffrir de la pauvreté et de problèmes de santé connexes, à savoir les réfugiés et les femmes. Il serait souhaitable d'accroître le financement accordé à des services spécialisés de soutien de la santé publique, notamment durant les cinq premières années.

Enfin, de nombreuses personnes au Canada font appel à des praticiens de médecine parallèle, y compris des guérisseurs religieux et traditionnels, pour traiter leurs problèmes de santé. Si les preuves empiriques sont limitées, il ressort cependant de la plupart des travaux que le renforcement des ressources communautaires et la valorisation des capacités des collectivités à s'attaquer aux problèmes de santé sont des stratégies très prometteuses.

Si la plupart des études recensées dans le présent rapport corroborent l'hypothèse de l'existence d'un effet de l'immigrant en bonne santé au Canada en ce qui concerne les maladies chroniques, il est difficile de tirer des conclusions définitives concernant cet effet pour de nombreux autres résultats pour la santé et pour la plupart des sous-groupes d'immigrants. Des recherches additionnelles s'imposent pour permettre d'établir de manière plus précise si l'état de santé des immigrants s'améliore, dans quelle mesure les déterminants de la santé évoluent au fil du temps et quel est l'effet exercé par l'acculturation sur la santé. On recommande de prendre les mesures voulues pour renforcer les bases de données existantes et pour en élaborer de nouvelles sur l'immigration et la santé au Canada.

Abstract

The purpose of this report is to review research on the health and determinants of health of Canadian immigrants and to discuss the implications of this research for policy makers. Specific attention is placed on reviewing evidence of the healthy immigrant effect. The healthy immigrant effect refers to the observation that immigrants are often in superior health to the native-born population when they first arrive in a new country, but lose this health advantage over time.

The main health outcomes reviewed were Health Status (self-reported), Cancer, Heart Disease, Tuberculosis (TB), HIV/AIDS, Mental Health, Perinatal Health, Oral Health and Diabetes. For each health outcome, Canadian literature was identified to document the extent of the healthy immigrant effect as well as to identify the main determinants of the health outcome in Canada. Canadian literature on immigrants' health service utilization and health promotion was likewise identified. At times, this information was supplemented with information from major international research studies.

Most of the literature reviewed suggests that Canadian immigrants, particularly recent arrivals, enjoy many health advantages over long-term immigrants and the native-born population in terms of their overall health status and the prevalence of certain chronic diseases such as cancer and heart disease. Different patterns were observed in the occurrence of chronic versus infectious diseases. For example, unlike chronic diseases, most immigrants with infectious diseases, such as TB, experienced improvements in health status over time given appropriate treatment and follow-up. Mixed evidence was provided with respect to mental health. After an initial risk period, immigrant mental health improves over time and often persists into the second generation. Among the studies reviewed, several identified refugees, women and children as sub-groups with specific unmet (and under-researched) needs. Much of the literature reviewed suggests that determinants of health such as poverty and underemployment have a strong impact on health, particularly for immigrant women and children.

Contrary to popular belief, the literature did not indicate that immigrants over utilize health care services as a whole. Rather, similar patterns of health service utilization were observed in immigrants and non-immigrants. In addition, there was strong evidence for underutilization, particularly in the use of preventive and mental health services. Little Canadian research was devoted to the identification and evaluation of culturally appropriate systems of care (e.g. health care delivery models, institutional reforms, or the relevancy and applicability of commonly used theoretical models and health promotion strategies for use with immigrant populations).

The critical questions for policy makers as a result of these findings are:

1. What conditions (determinants of health) contribute to changes in the health status of immigrants over time, and
2. How can government programs and services help to maintain and promote the health status of immigrants over time?

With respect to the first question, since the health of immigrants is largely shaped by environment and living conditions, and may change in response to pressures associated with poverty, marginalization and class inequity, multisectoral approaches are needed. Findings highlight the critical role of social support in promoting and sustaining health and well-being, the need for public education and social legislation efforts to improve the image and value of immigrants in Canadian society, and for programs and policies that empower immigrant groups to develop and maintain their own ethno-specific institutions and health-promoting practices.

Regarding the second question, although the evidence that immigrants use health services (particularly mental and preventive health services) less than the Canadian-born population may be viewed as a positive finding, it may also reflect the inadequacy of present services in meeting these needs, rather than the superior health status of immigrants. Removing barriers to health services, improving communication between federal and provincial levels of government, and improving the appropriateness and comprehensiveness of services would help to ensure the continued good health of new immigrants.

Findings further suggest that a selective approach is called for to address the needs of immigrant sub-groups, which are most likely to experience socio-economic disadvantages and associated health problems; namely, refugees and women. Increased funding for specialized public health support is indicated, especially during the first five years.

Finally, many individuals in Canada rely on alternative providers, including religious and traditional practitioners, to manage their health problems. Although empirical evidence was limited, much of the research suggests that strengthening community-based resources and building communities' capacity to address health issues are very promising strategies.

While much of the evidence reviewed in this report supports the existence of a healthy immigrant effect in Canada with respect to chronic diseases, it was difficult to draw firm conclusions regarding this effect for many health outcomes and within most immigrant sub-groups. More research is needed to better answer questions about whether the health status of immigrants is improving, how health determinants change over time, and the effect of acculturation on health. It is recommended that steps be taken to strengthen existing databases, and to develop new databases on immigration and health in Canada.

Table of Contents

Introduction

The purpose of this report is to review research on the health and determinants of health of Canadian immigrants and to discuss the implications of this research for policy makers. Specific attention is placed on reviewing evidence of the "healthy immigrant effect."

The healthy immigrant effect refers to the observation that immigrants are often in superior health to the native-born population when they first arrive in a new country, but lose this health advantage over time. It is believed to result from two processes:

1. a self-selection process that basically includes people who are able and motivated to move and excludes those who are sick, disabled and in institutions; and
2. an immigration process that selects the "best" immigrants on the basis of education, language ability and job skills — characteristics that facilitate social and economic integration and go hand-in-hand with healthy lifestyles.

In Canada, national health survey data show that recent immigrants, particularly those from non-European countries, are in better health than their Canadian-born counterparts. However, immigrants who have lived in Canada for more than 10 years experience a similar prevalence of chronic conditions and long-term disability as the Canadian-born population (Chen et al., 1996a, b).

This report builds on the 1999 Kinnon Report, commissioned by Health Canada, which provides an overview of Canadian research on immigration and health. Kinnon's review identifies several studies that show evidence in Canada of the healthy immigrant effect apparent in other countries. However, few of these studies examine changes in specific health indicators over time or attempt to explain why changes in health status occur. The earlier review also did not examine patterns of health service utilization (HSU) over time or whether such use was associated with factors such as changes in health status.

The Population Health model proposed by Health Canada serves as a framework for this review. According to this model, many broad determinants — including gender, income and social status, employment and working conditions, health practices, social and physical environments, and culture — influence the health of Canadians.

Acculturation — the process of incorporating new values, attitudes and behaviours — provides an additional framework for understanding the relationship between migration and changes in health following migration. According to this framework, acculturation influences health status indirectly via changes in health behaviours and changes in social support and stress (Zambrana et al., 1997; Hull, 1979).

Although some studies attempt to explain HSU based on health status (need), the classic model of HSU proposed by Andersen and Newman (1973) defines other broad and interrelated determinants of health service use, namely predisposing factors and enabling factors. This model was used to identify factors associated with immigrants' HSU.

Finally, since the organization of health services and approaches to health services delivery have a major impact on immigrants' patterns of HSU, Canadian systems of care (e.g. health care delivery models, institutional reforms and health promotion strategies) are discussed, and research gaps identified.

Recent Canadian Immigration Trends

Since the Second World War, approximately 7.8 million immigrants (almost 150,000 per year) have arrived in Canada (Citizenship and Immigration Canada, 1998). Since 1990, Canada has accepted approximately 230,000 immigrants per year, or about 0.7% of the Canadian population (Kessel, 1998). In 1996, almost 5 million people, or 17.4% of the Canadian population, were foreign-born (Kinnon, 1999). It has been estimated that “one in five children in Canada is either an immigrant or the child of immigrant parents” (Kinnon, 1999, 6).

The ethnic composition of Canada’s immigrants has changed dramatically since the 1950s. While in 1957, the top 10 immigrant source countries were European; in 1997, eight of the top 10 source countries were non-European (Kessel, 1998). In 1999, the top three regions of origin for immigration were Asia and Pacific (51%), Europe and the United Kingdom (21%), and Africa and the Middle East (18%). Furthermore, approximately 30% of immigrants were from China, Philippines, Korea, Taiwan and Hong Kong, and approximately 15% were from India, Pakistan and Sri Lanka (Citizenship and Immigration Canada, 1999).

The majority of immigrants to Canada settle in urban areas. Approximately 55% of immigrants reside in Canada’s three largest urban centres — Toronto, Vancouver and Montreal. The proportion of foreign-born residents in Toronto is 38%, in Vancouver 30%, and in Montreal 20%. Eighty percent of immigrants are found in cities with populations of more than 250,000 (Kessel, 1998). A large proportion of recent immigrants (less than 5 years) settle in large urban centres — Montreal (13%), Toronto (42%) and Vancouver (18%) — and account for up to 10% of the population in these centres (Statistics Canada, 2001).

Immigrants to Canada fall into several categories, depending on their reasons for immigrating: independent class (skilled worker or business immigrant), family class, refugees and “other” (caregivers, retirees, etc.). Sometimes these categories get blurred, for example, when family members of refugees reunite. In 1999, 56% of immigrants fell into the independent class category, 29% into the family class category, 13% into the refugee category, and 3% into the “other” category (Citizenship and Immigration Canada, 2000). The leading five source countries for refugees in 1999 were Bosnia Herzegovina, Sri Lanka, Afghanistan, Iran and Somalia (Citizenship and Immigration Canada, 2000).

Objectives

The objectives of this report are to:

1. update research findings on the healthy immigrant effect in Canada, including changes in specific health indicators over time.
2. identify determinants of changes in immigrant health status over time.
3. examine patterns of HSU among immigrants.
4. identify factors associated with immigrant HSU.
5. identify research gaps.
6. identify policy implications regarding future research directions.

Methodology

The first four objectives were accomplished by conducting a literature review. Objectives 5 and 6 were completed through a consultation process with members of the research team (Appendix I).

Scope of Literature Review

The main areas of the literature review included:

- Immigration and health outcomes
- Acculturation and changes in health behaviour
- Acculturation and changes in social support/stress
- Immigration and HSU, including use of alternative health services and issues related to the organization of health services

To update research findings on the healthy immigrant effect in Canada, health outcomes representing the major categories of chronic and infectious diseases, for which data on immigrants were available, were selected for review. These included Health Status (self-reported), Cancer, Heart Disease, Tuberculosis (TB), HIV/AIDS, Mental Health, Perinatal Health, Oral Health and Diabetes.

For each health outcome, Canadian literature was reviewed to document the extent of the healthy immigrant effect as well as to identify the main determinants (i.e. explanatory factors) of the health outcome in Canada. Canadian literature on immigrants' HSU and health promotion was likewise identified. At times, this information was supplemented with information from major international research studies.

Consultation Process

Members of the research team were involved with various phases of the research study. At the earliest phase, team members provided individual feedback on the research proposal. Later on, regular updates were provided electronically. Following the circulation of the first draft of the final report, two meetings were held and individual consultations took place to identify major omissions in the literature review, to clarify any misunderstandings/inconsistent findings in the text, and to discuss research gaps.

The section on policy implications and future research directions was prepared in consultation with members of the research team. It focused on two key questions:

1. What are the conditions (determinants) that contribute to changes in the health status of immigrants over time?
2. How can government programs and services help to maintain immigrants in good health over time?

Findings

This section starts with an overview of the main types of migration studies that contribute evidence on the healthy immigrant effect, and the advantages and limitations of each type of study. Next, findings from the literature review of selected health outcomes are presented. For each outcome, evidence of change over time, determinants of change, and research gaps are discussed. This is followed by a review of the literature on acculturation and the mechanisms through which it impacts on the health status of immigrants. Finally, literature on immigrant patterns of HSU over time and factors associated with use of health services are reviewed, and resulting research gaps identified.

Overview of the Main Types of Migration Studies

The main types of research studies found in the literature that contributed evidence on the healthy immigrant effect were migrant studies, population health surveys (usually cross-sectional) and generational studies. Each of these is reviewed. The final section briefly describes other types of research approaches that have been used to shed light on immigrant health.

Migrant Studies

Most studies of immigrant health describe health patterns without relating them to patterns in the country of origin. To determine whether immigration has an impact on the health of migrants, it is important to compare health indicators among immigrants, residents of the destination country and residents of the country of origin. Migrant studies rely on epidemiological methods to examine three contrasting groups: natives of the country of origin (CO), migrants (M), and natives of the country of adoption (CA). According to the model implicit in these studies, if change in environment is the explanation for the observed difference in health indicator rates, one would expect the CO rates to differ from M rates and that M rates would approximate CA rates. For example, change in environment (e.g. tobacco use and fat intake) is often used to explain why colon cancer rates among Japanese migrants to the United States are higher than those in Japan, and indeed approximate American rates. If genetic factors were of prime importance, CO rates would equal M rates and these would differ from CA rates (Lilienfeld & Lilienfeld, 1980). Thus, persistent low rates of breast cancer among female Japanese migrants compared to American-born females are often attributed to genetic factors.

While there is a certain elegance to determining the relative importance of nature versus nurture in disease development, several limitations to migrant studies have been identified (Kasl & Berkman, 1983; Yu & Liu, 1991; Kliewer, 1992; Friis et al., 1998).

- International variations in the recording of cause of death may contribute to differences in mortality rates between countries.
- Immigrants may not be representative of the general population of the country of origin due to selection effects.

- Immigrants are not homogeneous in terms of type and period of migration. For example, voluntary immigrants are probably healthier than involuntary immigrants and later immigrants may differ in social, educational and other demographic characteristics from earlier immigrants.
- Sample sizes need to be adequate to conduct multivariate analyses.
- A disease may be only partly under genetic influence.
- Early exposure in the native country may confer a lasting immunity.
- Immigrants may not be exposed (for whatever reason) to the environmental risk to which the host country natives are exposed.

Furthermore, these studies, most of which analyze data collected at a single point in time, assume that the experience of migration and resettlement itself has no adverse effect. As a result, many migration researchers now focus on the process of migration and acculturation to provide a conceptual bridge for understanding the relationship between migration and changes in health.

Population Health Surveys

Often, countries rely on population surveys to collect information on health and HSU. One of the advantages of these types of surveys for migration research is that data may be collected on health outcomes as well as health determinants. A major disadvantage is that population surveys are often cross-sectional and cannot be used to document changes over time. The use of self-reporting enables the gathering of information about people's beliefs and attitudes toward health, but also reduces the reliability of the data collected because verification is impossible. Other features that may limit the utility of population surveys to examine changes in immigrant health over time include:

- Immigrants are not necessarily a homogeneous group, and it is not always possible to analyze data for immigrant sub-groups (e.g. country of birth) due to small numbers. It is also not usually possible to compare the health status of immigrants versus refugees.
- Information on length of stay is not always collected. If it is, differences in health by length of stay may result from either the shift in immigrant source countries and/or from a diminishing of the healthy immigrant effect.
- Cultural factors and the use of proxy respondents may affect reporting of health problems.
- Surveys often use scales and measures developed for use with majority populations whose cross-cultural equivalency may not have been assessed for immigrant/ethnic populations (e.g. sense of coherence, dietary measures).
- Response rates may be affected by linguistic and cultural factors (e.g. few national surveys are conducted in languages other than the official languages of the host country).

(Chen et al., 1996a; Wen et al., 1996; Kliewer & Jones, 1997; Laroche, 2000; Parakulam et al., 1992).

Generational Studies

Generational studies are used to compare health outcomes between foreign-born and native-born members of an ethnic group. One of the main advantages of this type of study is that it permits observations of change as a result of length of stay in a country. The limitations of this type of study are largely similar to those of migration studies. Other limitations concern the sources of data used to make these comparisons. For example, vital statistics databases usually contain only limited information on immigrant characteristics. Since geographic, linguistic, cultural and financial barriers affect who is able to access services, clinical databases are affected by biases related to who may use the services.

Other Research Approaches

Some of the challenges identified in conducting research on the health of migrants have been addressed using other types of research designs and methods.

Longitudinal studies have been used to provide rich information on the health status and health determinants of immigrants over time. For example, the Longitudinal Survey of Immigrants to Australia (LSIA) followed approximately 2,300 immigrants and refugees 15 years of age or older over a five-year period, interviewing them three times. It collected detailed information on their physical and mental health status, service utilization, and demographic, social and economic characteristics, and permitted analyses by country of birth, English-language proficiency and immigration status (Kliewer & Jones, 1997).

The Longitudinal Survey of Immigrants to Canada (LSIC) proposes to collect extensive socio-demographic and resettlement information on approximately 18,000 immigrants at six months, two years and four years after arriving in Canada. It will also collect some health-related information (e.g. mental, physical and oral health, access to health services, perceptions of the health care system, use of non-traditional medical approaches etc., but not health behaviours or screening practices) (Statistics Canada, 2001)

Longitudinal studies are very expensive to conduct because they require careful tracking of respondents over time to prevent loss of follow-up. Translation of materials and/or the conducting of interviews in languages other than English also drive up the cost.

Research within immigrant communities may also be used to address the health problems and needs of specific immigrant groups. For example, the goal of “Pathways and Barriers to Health Care for Ethiopians in Toronto” was to examine the mental health and help-seeking behaviours of Ethiopian immigrants in Toronto (Hyman & Noh, PIs[1]). However, it must be kept in mind that most immigrant communities do not have representative sampling frames, so study findings cannot always be generalized to the larger community.

Finally, the advantages of multi-method studies, which combine both quantitative and qualitative approaches to data collection, are now being recognized. These types of studies are used to document the extent of a health problem within an immigrant community, as well as to

---

[1] PI = Principal Investigator; results not yet published.

further knowledge and understanding of health and health behaviours within ethno-specific immigrant groups.

Literature Review — Healthy Immigrant Effect in Canada

This section reviews evidence of the healthy immigrant effect in Canada for specific health outcomes, including Health Status, Cancer, Heart Disease, Tuberculosis (TB), HIV/AIDS, Mental Health, Perinatal Health, Oral Health and Diabetes. Canadian and international research documenting both the health status and whether changes in each outcome have been observed among immigrants is described, followed by a review of the evidence regarding the determinants of each health outcome and a summary identifying major research gaps.

Specific policy recommendations resulting from these findings are reviewed in the section "Policy Implications and Future Research Directions" in this report.

Health Status

Introduction

This section reviews findings from Canadian and selected international studies that analyze self-reported health status data, largely collected by population health surveys. These studies illustrate the healthy immigrant effect with data on both immigrant health status and changes in immigrant health status over time. Using Canada's Population Health model, some of the major determinants of immigrant health status are then described.

Canadian Research

The main sources of data used to examine the health status of immigrants were the National Population Health Survey (NPHS), Ontario Health Survey (OHS), Santé Québec (Quebec Health Survey - SQ) and the General Social Survey (GSS).

Chen et al. (1996a) used the 1994-95 NPHS to compare self-reported health status (e.g. chronic conditions, disability and health-related dependency) and health-related behaviours (e.g. smoking and leisure time physical activity) in immigrants with those of the Canadian-born population. Findings suggested that immigrants (particularly recent immigrants from non-European, non-traditional source countries) experienced better health status than individuals born in Canada. These findings were consistent with the Chen et al. (1996b) study using census data (1986 and 1991), vital statistics data (1985–87 and 1990–92), and data from the Health and Activity Limitation Surveys (1986-87 and 1991).

Chen et al. (1996a) also used this database to examine whether there were differences in health outcomes based on immigrants' length of stay in Canada. Findings indicated that the prevalence of chronic conditions, disability and smoking was lower among recent immigrants (less than 10 years in Canada) compared to long-term immigrants (more than 10 years in Canada), suggesting that immigrants to Canada lose their health advantage over time.

Cousineau (1991) examined data from the 1987 SQ survey and found that there were no overall differences in health status (as measured by “ridit” scores) between immigrants and native-born Québecois. However, recent immigrants (who arrived between 1980 and 1987) had significantly better health status scores than the native-born group.

Using earlier data from the 1985 GSS, Parakulam et al. (1992) found that, by and large, immigrants were healthier than native-born Canadians. Another interesting finding was that regardless of nativity status, men consistently reported being healthier than women, despite women’s greater longevity. The authors speculated that this was probably due to genetic, occupational and psychological factors. For example, women may report illness more frequently because they have a greater familiarity with health problems and more contact with the health system than men. On the other hand, men may report better health status to conform to socially accepted machismo beliefs of male strength and power.

By contrast, findings from Dunn and Dyck’s (2000) analysis of 1994-95 NPHS data differed from those of Chen et al. (1996a). They found that immigrants were more likely than non-immigrants to report poor health status, but were less likely to report unmet needs for care. Their findings could be partially explained by the fact that age was associated with poorer health status in the immigrant population, as is the case with older Canadians in general. Within the immigrant group, immigrants of European origin and long-term immigrants (more than 10 years) were more likely to report fair or poor health status than their non-European, recent immigrant counterparts.

Using data from the 1985 and 1991 GSSs, Laroche (2000) did not find that the health status of immigrants significantly differed from that of native-born Canadians, nor were there changes in self-reported health status over time. Compared to Canadians, immigrants born in Europe or Asia had fewer long-term activity limitations.

International Research

Evidence of a healthy immigrant effect has been observed in other countries, notably the United States (Stephen et al., 1994) and Australia (Donovan et al., 1992). Analysis of vital statistics data in the United States showed that for virtually every health status indicator and socio-demographic characteristic, recent immigrants (less than 10 years) were healthier than long-term immigrants (more than 10 years) and the American-born population. Of particular note was that differences in health outcomes between recent and long-term immigrants were more prominent than those between long-term immigrants and the US-born population.

LSIA collected data on four measures: self-rated health, mental health, prevalence of long-term conditions, and use of medical services at 6 and 18 months after arrival (Kliewer & Jones, 1998). This particular data source permitted the researchers to investigate changes in health status among immigrant sub-groups. English-language fluency, being employed, using one’s qualifications at work and being satisfied with job and life in Australia were all associated with better scores on all four measures. Furthermore, immigrants with a Humanitarian visa had poorest health while those with a Business Skills or Employer Nominated visa were the healthiest.

Determinants of Health Status

According to the Population Health model proposed by Health Canada, many broad determinants — including gender, education, income and social status, employment and working conditions, health behaviours and practices, and culture — influence the health of Canadians.

Dunn and Dyck (2000) used the 1994-95 NPHS to investigate the effect of social determinants of health, notably social and economic factors, on Canada's immigrant population. While the researchers did not find a consistent pattern of association between socio-economic characteristics and health status, they could not conclude that socio-economic factors were not important determinants of health status. Rather, the results of the logistic regression models suggested that socio-economic factors were more important for immigrants than for non-immigrants and that there was no simple explanation for the complexity of immigrants' experiences.

Laroche (2000) found that immigrants and Canadian-born persons who were female, of low income or had not completed secondary education were more likely to suffer from long-term disabilities than men with a high household income or high educational attainment.

A study of Korean Canadians suggested social and psychological resources were important for the successful adaptation of immigrants and were significant predictors of health outcomes (Noh & Avison, 1996). Findings from Renaud et al.'s (2001) longitudinal study of immigrants to Montreal highlighted the role of neighbour as important sources of social support. The study also found that economic class immigrants reported higher levels of satisfaction with social support than family class immigrants and refugees.

Noh et al. (1999) also explored the effect of discrimination on health using data from the Refugee Resettlement Project (RRP) (described in more detail in the section "Mental Health"). They found that rates of depression were higher among Southeast Asian refugees who reported that they had experienced racial discrimination compared to those who had not.

Outside of Canada, Stephen et al. (1994) speculated on the role of environmental factors on changes in immigrant health. They suggested that immigrants may have had or acquired physical conditions or behaviours that put them at risk in their new environment. In other words, either recent immigrants were inherently healthier than the American-born population and continued to be healthier over time, or their health declined over time due to environmental exposures as demonstrated by poorer health among long-term immigrants.

In a review of critical health issues faced by immigrants and refugees, Fowler (1998, 389), asserted that "of paramount importance are the social determinants of health, including age, social isolation, language barriers, separation from family, change in family roles and norms, and lack of information about available resources and unemployment." He also proposed that cross-cultural differences in information-seeking patterns, communication styles, perceptions of health risk, and ideas about prevention of disease had an impact on health.

Few Canadian studies have examined changes in determinants of immigrant health. Renaud et al.'s (2001) longitudinal survey of 1,000 immigrants who arrived in Montreal in 1989 examined socio-demographic characteristics at four points of time between 1990 and 1999. By the fourth wave, the majority of immigrants who were re-interviewed at that time (N=429) reported improvements in housing, employment, French-language use and overall living conditions. However, significant differences were observed by gender, education and immigrant class. For example, males were more likely to be employed and to earn higher salaries than females. Immigrants with some post-secondary education were significantly more likely to report improvements in living conditions than immigrants with a university degree or with lower levels of education. Refugees were more likely to be poor and have inadequate social support than other immigrant classes. However, changes in social support could not be examined over time as this information was collected only during the fourth wave. Since information on health status was not included at any point, this database could not be used to provide specific evidence regarding the healthy immigrant effect in Canada.

Immigrant Sub-Groups Children

Little research has been conducted on the health status of immigrant children in Canada. The main source of data has been the National Longitudinal Survey of Children and Youth (NLSCY) which is a longitudinal survey of the health and development of Canadian children from birth until age 18, but it does not specifically address the experiences of immigrant children (i.e. the number of immigrant children included in the NLSCY was too small to perform analyses for many less frequent outcomes and for immigrant sub-groups). Funding has recently been awarded to the New Canadian Children and Youth Study (NCCYS) to trace the adaptation and development of immigrant and refugee children in Canada (Beiser, PI).

Kobayashi et al. (1998) used data from the NLSCY to investigate the health status of immigrant children, children of immigrants and non-immigrant children. They found that, by and large, the health of immigrant children did not differ significantly from Canadian-born children. However, children who lived in areas with the highest proportion of recent immigrants were less likely to have their health rated as poor (Kobayashi et al., 1998). The researchers attributed these findings to the "selection" process. Moreover, regardless of immigrant status, children of lone parents were more likely to be in poor health. The researchers speculated that poor health was the result of the socio-economic status of lone parents and barriers to health services, which might be increased in the case of immigrant families which lacked fluency in the official language and/or knowledge of the health care system.

Evidence on the effect of socio-economic status on children's health status is contradictory. An analysis of NLSCY data found that Canadian immigrant children were more likely to be living in low-income families but experienced superior mental health outcomes compared to their Canadian-born counterparts (Beiser et al., in press). The authors suggested that the effect of poverty might be different in immigrant families. Moss et al. (1992) examined the effect of international migration on the health of immigrant children in Belize and found that migration contributed little to health status. Rather, "the poverty of migrants — irrespective of legal status, origin, or length of time in country — may override migration" (Moss et al., 1992, 161).

Women

A review of Canadian research on immigrant and refugee women's health was recently completed for the Women's Health Bureau of Health Canada (Mulvihill & Mailloux, 2000). With the exception of reproductive and mental health, there were few studies that used health surveys to specifically examine immigrant women's health status.

More literature was available on the determinants of immigrant women's health. Vissandjee et al. (in press) proposed that gender gaps and the social processes which reinforced them (e.g. exposure to violence, lack of or reduced autonomy, lack of recognition of foreign credentials, and cultural and systemic barriers to care) prevented women and immigrant women from achieving optimum health status. For immigrant women who worked outside the home, occupational health and safety concerns emerged as other important health issues. However, little research examined the role of gender as a determinant of health or as an enabling factor in migration and resettlement (Vissandjee et al., 1998). In addition, there were few empirical studies that examined the effects of poverty, underemployment, language, multiple role burden, social isolation and loss of pre-existing social support systems and discrimination on immigrant women's health and well-being (Janzen, 1998; Mulvihill & Mailloux, 2000).

Refugees

Several publications suggested that refugees were at an increased risk of experiencing health problems, particularly related to mental health (Erickson & Hoang, 1980, Misri, 1986; Canadian Task Force, 1988; Barudy, 1989; Clinton-Davis & Fassil, 1992; Karmi, 1992; Chi-Ying & Kagawa-Singer, 1993). However, only two Canadian studies specifically examined the physical health status of refugees.

Dillmann et al. (1993) examined the health status of 1,104 refugees who arrived in Calgary between January 1989 and October 1990. This group included refugees from Central America (30%), Southeast Asia (25%), Middle East (25%), Africa (10%) and Eastern Europe (10%). Overall, 34% of the refugees required a referral to a health practitioner. Common health problems included respiratory infections, impaired visual capacity, dental problems (extremely common among children), ear infections, hearing problems, gynecological problems and emergency hospitalizations. Dillmann et al. (1993) concluded that refugees need special care and protection in a new country, particularly in their early stages of resettlement.

A Quebec study collected information from nurses and doctors on 2,099 applicants for refugee status between August 1985 and March 1986 (Thonneau et al., 1990). Most of the refugees were from Iran (17.7%), Sri Lanka (14.4%), Dominican Republic (12.9%) and Central America (11.9%). The researchers reported that, in general, refugee health status was satisfactory. However, since in this study health was very broadly classified as either good or poor, little additional information was available on the specific health problems experienced by this group.

Summary

Most studies reviewed in this section suggest that Canadian immigrants, particularly recent immigrants, enjoy a health advantage over long-term immigrants and the Canadian-born population. However, methodological limitations, particularly the use of cross-sectional studies, self-reported data and small sample sizes rendered it difficult to draw firm conclusions about whether the health status of immigrant groups improves or deteriorates over time. There was also little Canadian research on the health status of immigrant sub-groups (e.g. children, refugees and women).

More literature was available on determinants of immigrant health in Canada, but these studies rarely addressed how these determinants changed over time. Some of the literature reviewed suggests that determinants such as underemployment and the lack of recognition of foreign credentials may have a strong impact on health, particularly for immigrant women. There was also a tendency for the literature to focus more on the negative versus positive determinants of health. For example, few studies focused on the identification of personal and social resources (e.g. coping strategies) that allow immigrants to deal with adversity and successfully adapt to their new environment.

Canadian research on the determinants of immigrant health did not usually address heterogeneity within the immigrant population, for example, whether variables such as country of origin, visa category (immigrant or refugee), or English-language proficiency in addition to socio-economic status influence health status (Chen et al., 1996b; Kliewer & Jones, 1997). The Australian longitudinal study found that there were substantial variations in immigrant health status according to these characteristics (Kliewer & Jones, 1997).

Finally, some evidence suggests that Canada's Population Health model may need to be modified to reflect some of the unique challenges faced by recent immigrants. As stated in the Final Report of the Metropolis Health Domain Seminar, "if today's immigrants have higher rates of illness than the native-born, the increased risk probably results from an interaction between personal vulnerability and resettlement stress, as well as lack of services, rather than from diseases they bring with them to Canada" (Health Canada, 1998a).

Cancer

Introduction

In 1996, cancer was the second leading cause of death in Canada and was responsible for almost one third of all potential years of life lost. The most common site of new cancer among men was the prostate and among women, the breast. However, the leading cause of death for both men and women was lung cancer (Federal, Provincial and Territorial Advisory Committee, 1999a). There is strong evidence that healthy eating, physical activity and healthy body weight play a key role in the prevention of many cancers (Cancer Care Ontario, 2000).

The main sources of cancer information used by the studies included in this review were vital statistics, clinical data and cancer registries. Information from vital statistics databases has typically been used to examine cancer mortality rates among migrants. However, these databases collect information only on cause of death and country of birth, not length of stay. No information on immigration or ethnicity is routinely collected by hospital databases. Most countries also have cancer registries that collect information on cancer incidence and monitor trends over time; however, these rarely include information on ethnicity or country of birth. Information on determinants of health, other than age and gender, is generally not available in any of these three sources.

Two types of studies were prominent in the literature. Migration studies, comparing mortality information using three cohorts (described in the previous section), were frequently used to test the convergence hypothesis (i.e. that "exposure to the physical, social, cultural and environmental factors in the destination country results in a shift in the mortality rates of migrants toward the rate of the native-born population in the destination country") (Kliewer & Smith, 1995a). Generational studies, comparing mortality rates of first- and second-generation immigrants, were used to further understand the role of genetic versus environmental factors in disease development.

Canadian Research

Few Canadian studies examined changes in cancer incidence and mortality rates in immigrants over time.

Migration studies have tested the convergence hypothesis using mortality rates for benign prostatic hyperplasia (BPH) (Kliewer, 1996), ovarian cancer (Kliewer & Smith, 1995a), breast cancer (Kliewer & Smith, 1995b) and all cancers (Sheth et al., 1999).

Kliewer (1996) compared age-standardized mortality rates (SMRs) for BPH, a non-cancerous enlargement of the prostate gland, among numerous immigrant groups in Australia and Canada with SMRs in the country of origin and destination country (1984–88). A general pattern of convergence was observed in that the SMRs for the majority of immigrant groups (91.7% in Canada and 70% in Australia) shifted toward the host population rate. Differences in diagnosis, medical treatment, autopsy rates and recording of death certificates between countries may have accounted for some of the inter-country differences in cancer rates.

The studies on ovarian and breast cancer built on previous research limited to migration from low- to high-risk countries. Kliewer & Smith (1995a, b) compared the SMRs for ovarian cancer (1984–88) and breast cancer (1964–89) for numerous immigrant groups in Australia and Canada, from both high-risk and low-risk countries, with rates in the countries of origin and destination country. The researchers also examined changes in ovarian cancer rates by length of residence in Australia.

Findings from the ovarian cancer study provided mixed support for the convergence hypothesis. Among immigrants from low-risk countries, mortality rates increased and converged with those of the native-born in the destination country. However, among immigrants from high-risk countries, convergence was less evident. In fact, in Canada the majority of immigrant groups displayed a pattern of divergence. The researchers suggested that convergence was more likely in cases where cancer rates in the countries of origin were at least 40% higher than those in the destination country.

The Kliewer and Smith (1995a) study also investigated changes in cancer incidence and mortality over time and found that there was a relationship between ovarian cancer rates and length of stay. The SMRs for immigrants residing in Australia for 30 years or more approached SMRs in the native-born Australian population. However, it was not possible to examine differences between immigrant groups because the data were necessarily aggregated (i.e. too few deaths in each immigrant country group).

Changes in cancer mortality rates were also observed in the breast cancer study. SMRs among 50% of the immigrant groups in Australia and 38% in Canada changed to approximate those of the host country population (Kliewer & Smith, 1995b).

Sheth et al. (1999) used data from the Canadian Mortality Database to compare SMRs for cancer among South Asian immigrants, Chinese immigrants and the Canadian-born population over a 15-year period (1979–93). SMRs were calculated for the period 1979 to 1993 and for five-year intervals (1979–83, 1984–88 and 1989–93). For males, cancer mortality was highest among the Canadian-born group, intermediate among Chinese immigrants and lowest among South Asian immigrants. For females, cancer mortality was higher among Canadian-born women and lower in both immigrant groups. Over time, cancer mortality increased among the Canadian-born group but remained the same or decreased among the Asian and Chinese immigrants. Variations in cancer mortality were also observed by cancer site and ethnicity.

Balzi et al. (1995) conducted a generational study to analyze the cancer risk in Italian immigrants, their offspring (born in Canada) and the Canadian host population. Odds ratios (OR) and 95% confidence intervals (CI) were used to assess risk. They found that the cancer risk among the offspring was intermediate to that of the host population and of the Italian-born immigrant parents. Similar results were obtained when comparing cancers for which Italian immigrants had low risk (e.g. colon, lung and breast cancers) and high risk, namely stomach cancer. Balzi et al. (1995) further suggested that age of migration is critical. Previous research on Italian immigrants to Australia indicated that the risk of stomach cancer among Italians who migrated to Australia as children (below the age of 15) was indistinguishable from that of the host population. However, the risk of stomach cancer among immigrants who migrated to Canada as adults remained high (Balzi et al., 1995).

International Research

The majority of generational studies on immigrants have been conducted in the United States. This is partly because of migration patterns that permit comparisons between foreign- and American-born residents within various ethnic communities, including Japanese, Chinese, Black, Hispanic, etc. (King & Locke, 1980; King et al., 1985; Shimizu et al., 1987, 1991; Otero-Sabogal et al., 1995; Zambrana et al., 1997; DeSantis, 1998; Acedevo, 2000), and partly due to the inclusion of ethnicity data in their major databases. In Canada, these types of studies could be possible within many of the long-term European immigrant communities but not within more recent immigrant communities.

In their review of the literature on the health problems of immigrants in the United States, Flaskerud & Kim (1999) reported that “deaths due to cancer increased at faster rates among Asian and Pacific Islanders than any other racial or ethnic group.” Although Asian women had a lower incidence of breast cancer and better survival rates in comparison to other ethnic groups, there was well-documented evidence that incidence and mortality rates were increasing among second-generation women.

Maskarinec (2000) compared breast cancer risk among women of Japanese ancestry living in Asia and in the United States, including Hawaii, and found that while the first generation experienced only a small change in breast cancer rates, the second and third generations experienced considerable changes. Saphir (1997, 1573) cited similar findings (i.e. "Asian American women whose grandmothers were born in the United States are more likely to get cancer than new immigrants from Asian countries."). Time sequence data from a literature review of health issues affecting migrants in the European Union also indicated that patterns of breast cancer among immigrant women began to approximate those of the country of adoption. This was especially the case among women who immigrated early in life (Carballo et al., 1998).

Determinants of Cancer

Research on the determinants of cancer in the general population has been quite extensive. Of particular relevance to this review are studies that demonstrate a relationship between determinants of health, particularly health behaviours and environmental factors, and cancer, since these are often subject to change after migration.

Kliewer & Smith (1995b) suggested that differences in the degree to which various immigrant groups adopted the destination country's lifestyles and behaviours could be used to explain why cancer rates of immigrants tended to converge with those of the native-born population. For example, several studies cited by Kliewer (1996) found that dietary changes following migration were associated with an increased cancer risk (Hopkins et al., 1980; Araki et al., 1983; Hankin et al., 1983; Ubukata et al., 1987; Oishi et al., 1988; Powles et al., 1988). Saphir (1997) also speculated on the role of dietary and other exposures to explain increases in cancer rates among second-generation Asian Americans.

Sheth et al. (1999) suggested that lower smoking rates accounted for the lower rates of lung cancer observed among South Asian immigrants but factors other than smoking were necessary to explain the high rates of lung cancer mortality among males of Chinese origin. They further speculated that differences in environmental risk exposures over time may explain the increase in SMRs among the Canadian-born group, and the decrease in SMRs among the Chinese and South Asian immigrant populations.

Acculturation has been used to explain the findings from generational studies demonstrating increases in cancer rates among the offspring of migrants and subsequent generations (Ziegler, 1993; Balzi et al., 1995; Maskarinec, 2000). For example, Maskarinec (2000) ascribed the dramatic increase in cancer risk among second- and third-generation Japanese to a relatively slow initial rate of acculturation among women of Japanese ancestry. Other studies demonstrating the relationship between acculturation and health behaviours, social support and stress are discussed in greater detail in later sections.

On the other hand, numerous cultural, linguistic and systemic barriers to cancer prevention, screening and treatment programs have been identified for immigrant populations, particularly newcomers, and these may be associated with late detection and increased mortality (Flaskerud & Kim, 1999).

Summary

Most of the literature reviewed in this section found that immigrants' cancer rates shifted toward rates of the host population. Convergence was most evident when there were large enough differences in rates between the host population and the country of origin, otherwise, divergence was displayed. Evidence from generational studies suggests that immigrants' offspring experience cancer risk somewhere in between that of the native-born of the destination country and their immigrant parents, and that the risk increases over several generations. Factors such as level of risk in the country of origin and length of stay were considered when observing the extent to which cancer rates in specific immigrant groups changed following migration.

At present, cancer registry data in Canada are inadequate to examine cancer trends among immigrants or within immigrant sub-groups. Of particular concern is the incidence of cancer among Asian Canadians and whether, like their American counterparts, there is a "false sense of security" in this community that they are healthier than their White counterparts (Saphir, 1997, 1572).

Although research on the determinants of cancer is now extensive, there has been comparatively less research on the determinants of cancer in immigrant populations. For example, many studies suggest that acculturative changes in health behaviour (e.g. smoking, diet) might explain reported changes in cancer rates, but these types of studies have not been conducted in Canada. There is also a need for research to investigate changes in other cancer risk factors following migration, particularly the role of protective factors that can reduce cancer risk.

Heart Disease

Introduction

Heart disease is the major cause of illness, disability and death in Canada. It has two main components, ischemic health disease, including myocardial infarction or heart attack, and cerebrovascular disease (stroke). Heart disease is also the leading cause of death throughout the world. Compared to other selected developed countries in the world in the mid-1990s, Canada had the fifth lowest rate of heart disease mortality (Federal, Provincial and Territorial Advisory Committee, 1999b). The impact of heart disease can be decreased through reduction of risk factors, the promotion of health, and effective use of intervention and health services (Heart and Stroke Foundation of Canada, 1999).

Since there is no provincial or national registry that tracks the incidence or prevalence of heart disease in Canada, the major sources of data used in this review were vital statistics, hospital morbidity files and population surveys.

Canadian Research

Few studies investigated changes in rates of heart disease among immigrants to Canada and most of these examined ischemic heart disease.

Nair et al. (1990) used data from the census and the Canadian Mortality Database (CMDB) to compare SMRs for heart disease between immigrants and the Canadian-born population. Two five-year time periods, 1969–73 and 1984–88, were selected as the data spanning these periods were considered to be most complete. Findings suggested that mortality rates for both immigrants and the Canadian-born population decreased over time; however, the SMRs were consistently lower among immigrants compared to the Canadian-born population. Differences in mortality rates by immigrant country of origin were also observed. Rates were highest for Scandinavian and African immigrants and lowest for immigrants from Latin America, China and Asia. South Asian immigrants in Canada experienced lower mortality rates compared to South Asians living in Asia and in non-Asian countries (Hughes et al., 1989; McKeigue et al., 1989).

Sheth et al. (1999) also used data from the census and the CMDB to examine differences in heart disease mortality rates among Canadian-born, South Asian-born and Chinese-born populations. Findings indicated that for males, mortality from ischemic heart disease was higher in the South Asian-born and the Canadian-born population and significantly lower in the Chinese-born population (320/100,000, 320/100,000, 107/100,000, respectively). For females, mortality was higher among South Asians than in the Canadian-born group and Chinese immigrants (134/100,000, 109/100,000, 40/100,000, respectively). A significant decline in mortality was observed in all three groups over the study period.

Pomerleau and Ostbye (1997) used data from the 1990 OHS to examine differences in health characteristics, including self-reported rates of heart disease and hypertension, by immigrant place of birth (e.g. region, sub-region and country of birth). No differences were observed between immigrant groups once other risk factors were controlled for in the analysis, suggesting that place of birth did not exert an independent effect on disease occurrence.

International Research

Previous studies of heart disease among migrants have used the traditional migration study framework (Dunn & Dyck, 2000). One of the earliest studies compared rates of heart disease among Japanese immigrants to California and Hawaii to Japanese in their country of origin. Findings demonstrated that heart disease prevalence and mortality rates for the subjects in the cohort approached those of the region to which they immigrated — their new social environment. This suggests that environmental factors play a role in heart disease and other chronic diseases. However, an immigrant's early environment may continue to play a role. Reported ethnic variations in heart disease rates among immigrants have also been attributed to persisting high-risk health behaviours and conditions imported from their countries of origin. For example, traditional Finnish dietary habits are believed to account for the above average rates of obesity and heart disease among Finnish immigrants in Sweden (Carballo et al., 1998).

Determinants of Heart Disease

As in the case of cancer, research on the determinants of heart disease in the population has been extensive. Again, it is particularly relevant to review studies examining changes in cardiovascular risk and protective factors for heart disease among immigrants over time. These protective factors include smoking, diet, physical activity, obesity, alcohol use, stress, and use of preventive health practices (e.g. screening for hypertension and blood lipids) (Heart and Stroke Foundation of Canada, 1999).

Pomerleau and Ostbye (1997) used the data from the 1990 OHS to compare risk factors for heart disease by immigrant place of birth. Findings suggested that immigrants were less likely to be obese than their Canadian-born counterparts. Similar findings were found using data from the NPHS (Beiser et al., 1997). Place of birth has been associated with differences in risk factors such as body mass index (BMI). For example, immigrants from Asia and sub-regions of Asia (e.g. Hong Kong, China, Vietnam) had significantly lower BMI compared to native-born Canadians. This was consistent with findings mentioned earlier of lower mortality rates among Chinese-born immigrants.

Jolly et al. (1996) investigated why there appeared to be an increase in the risk and severity of heart disease among South Asians in Canada, urban India and the United States. They cited various studies that did not find the prevalence of risk factors such as smoking, hypertension, and levels of total and low density lipoprotein (LDL) cholesterol to be higher among South Asians compared to other groups with lower rates of heart disease. They speculated that ethnic differences in insulin resistance may play a role (i.e. “South Asians have been shown to have a high prevalence of glucose intolerance and high insulin levels even in the presence of ‘normal’ blood sugars”) (McKeigue et al., 1993 in Jolly et al., 1996).

Anand et al. (2000) conducted a population-based study of three ethnic groups in Canada (South Asians, Chinese and Europeans) to establish whether variations in heart disease between ethnic groups could be explained by differences in conventional risk factors, genetic markers or sub-clinical atherosclerosis. Although there were differences in risk factors between groups, the authors speculated that the increased risk of heart disease among South Asians was due to genetic factors (e.g. factors affecting plaque rupture, the interaction between prothrombic factors and atherosclerosis) or as yet undiscovered risk factors.

Another voluminous area of research has been based on the hypothesis that migration to Western, industrialized societies is stressful and that this is associated with increases in blood pressure (Kasl & Berkman, 1983).

Findings from the Whitehall I and II studies of British civil servants may have important implications for immigrant populations. Briefly, these studies found that lower grade civil servants whose work environment was characterized by low control and low satisfaction were more likely to experience heart disease mortality, risk factors and symptoms than higher grade administrative staff. There were also clear employment-grade differences in health risk behaviours, economic circumstances and social support (Marmot et al., 1991). Immigrants, whose lives are characterized by underemployment and socio-economic marginalization, may also experience a higher risk of heart disease (Vissandjee et al., in press).

On the other hand, attachment to the culture of one's country of origin may exert a protective effect on heart disease. A classic migration study by Marmot and Syme (1976) compared rates of heart disease among Japanese migrants to Hawaii and found that coronary heart disease was three to five times more prevalent among the sub-group considered to be the most acculturated to Western culture. Acculturation, rather than differences in the major coronary risk factors (dietary intake, serum cholesterol, blood pressure and smoking), was believed to account for these findings.

Finally, some of the health advantages experienced by immigrants compared to the Canadian-born population have been attributed to the selection process and the Canadian health care system. For example, Nair et al. (1990) suggested that South Asian immigrants to Canada may not be representative of the South Asian population as a whole and that extensive health services allow these immigrants to live longer in Canada as compared to their country of origin.

Immigrant Sub-Groups — Women

The study conducted by Nair et al. (1990) reported higher rates of heart disease mortality among males than females in both the immigrant and Canadian-born populations. However, another Canadian study suggested that there might be differences in cardiovascular disease risk among immigrant women from different countries. Sheth et al. (1999) compared SMRs for the period 1973 to 1993 for immigrant women aged 35 to 74 years. They found that South Asian immigrant women (India, Pakistan, Bangladesh and Sri Lanka) experienced the highest rates of ischemic heart disease (145/100,000) — more than three times the rate of Chinese-born women (40/100,000).

Summary

Few Canadian studies examined changes in heart disease in immigrants or over time. This was partially due to the paucity of data sources that examine immigration and heart disease. Among the studies reviewed in this section, findings suggest that immigrants have lower rates of heart disease mortality than the Canadian-born population and that differences exist by gender and country of origin. Although heart disease is a major issue for Canadian women, much of the earlier research excluded women and did not address gender-specific issues or ethnicity. Rates of heart disease were reportedly high among South Asian immigrants.

To obtain a complete picture of heart disease among immigrant populations in Canada, more research is needed on the incidence of heart disease, particularly among immigrant sub-groups such as women. It is still unclear to what extent risk profiles continue to reflect those of the country of origin or change to those of the country of adoption. There is also a need for more information about the determinants of heart disease in specific immigrant groups (e.g. genetics, stress and diet). Of particular importance is research on risk factors associated with heart disease in the South Asian community.

Tuberculosis

Introduction

TB is a bacterial infection that mainly affects the lungs but can affect any organ systems in the body. While relatively common and a leading cause of death in the last century, TB has become less common in Canada as a result of improvements in housing, nutrition and the introduction of antibiotics. Although rates of TB have not increased in Canada, concerns have been expressed about the increasing proportion of TB among immigrants as a result of immigration from TB-endemic countries and increases in multidrug-resistant TB (MDR-TB).

Although immigration regulations require medical screening and prevent the entry of immigrants and refugees with active TB, immigrants account for a large proportion of TB cases in Canada. Most Canadian experts assert that the majority of TB in immigrants and refugees results from reactivation (i.e. previous infections becoming reactivated post-migration) and a smaller proportion from primary infection just prior to or post-migration (Styblo, 1989; Wilkins, 1996; Gardam, pers. comm.; Hershfield, pers. comm.).

A dramatic increase in the proportion of foreign-born cases of TB has been observed over the past 20 years in Canada. Between 1980 and 1995, there was a decrease from 50% to 22% of cases among the Canadian-born non-Aboriginal population, and an increase from 35% to 64% of cases among immigrants (Health Canada, 1998b). After decades of decline, the reported TB incidence rate in Canada has essentially leveled off since 1987 (Brancker, 1991).

A five-year Alberta study that included 351 cases of TB diagnosed in southern Alberta between 1990 and 1994 indicated that immigrants accounted for 70.6% of these cases. The majority of these immigrants (73.4%) were from Asian countries (e.g. China, Hong Kong, Vietnam, Philippines and Indian sub-continent) (Cowie & Sharpe, 1998). In Toronto, public health data indicate that immigrants account for 92% of TB cases (Gardam, pers. comm).

A recent study in Alberta and British Columbia reported that MDR-TB was increasing and this was not due to acquiring the disease from recent contact with MDR-TB in Canada (Hersi et al., 1999). A similar study is currently under way in Toronto (Gardam, PI).

Although public concern has been expressed about the transmission of TB from foreign-born to native-born populations, evidence regarding the extent of transmission is limited. A cross-sectional study tuberculin survey among non-BCG-vaccinated Canadian-born children and young adults in Montreal found no association between individual tuberculin reactions and neighbourhood settings with a high proportion of immigrants from endemic areas (Menzies et al., 1997).

On the other hand, the risk of TB transmission within immigrant communities may be considerable (Carballo et al., 1998). According to these authors, not only do many immigrants originate from economically less developed countries where TB is still prevalent, but many move into living conditions that offer little protection from TB.

The determinants of TB are discussed in greater detail in another section.

Canadian Research

Since TB appears to present following migration, much of the Canadian research in this area has attempted to identify the latency period during which immigrants who arrive without active TB develop the disease. Other Canadian research has focused on the identification of specific immigrant groups at risk.

The five-year Alberta study reported that the mean latency period between immigration and diagnosis was 11.2 years (standard deviation [SD] 13.9 years) and 50% of immigrants presented within 7 years of arrival. The latency period varied according to the disease type: patients with superficial lymph node disease presented after 7.6 years [SD 6.9] of arrival, those with extra-pulmonary disease after 10.1 years [SD 12.1], and those with pulmonary disease after 14.2 years [SD 17.2]. The study also found that the latency period was significantly shorter for Asian immigrants (mean of 9.1 years) compared to immigrants from other countries (mean of 17.2 years). The authors cautioned that "the apparently longer median period between immigration and diagnosis of TB in this study relative to previous studies from North America suggests that if any change has occurred, it is an increase in the delay of diagnosis" (Cowie & Sharpe, 1998, 602). Factors associated with early detection and treatment are further discussed in the next section.

Kerbel (1997) investigated the latency period for TB among immigrants and refugees to Ontario between 1989 and 1995. It was reported that the mean period between immigration and diagnosis was nine years, and 53% of patients presented within five years of resettlement. The study also suggested that the latency period might be shorter for refugees as compared to immigrants. Immigrants from the Philippines, Hong Kong and South Asia had latency periods of seven, seven and eight years, respectively, compared to refugees from Somalia, Ethiopia, Sri Lanka and Afghanistan who had latency periods of two, three, four and four years, respectively. An analysis of TB data from Toronto revealed that the highest rates of TB occurred among immigrants within five years of arrival in Canada (PHRED, 2000).

With respect to groups at risk, Wobeser et al. (2000) suggested that world region of origin was among the most important determinants of TB among individuals who immigrated within the 10 preceding years in Ontario. Other Canadian studies indicated that individuals born in countries with a high TB prevalence represent a high-risk group (Alberta study; Brancker, 1991).

International Research

TB trends similar to Canada's have been observed in the United States and elsewhere (Carballo et al., 1998; Walker & Jaranson, 1999). Several U.S. and U.K. studies have also shown that apparently healthy immigrants present with TB in the few years after migration. Refugees represent a sub-group at particular high risk (Walker & Jaranson, 1999). McKenna et al. (1995) reported that 55% of U.S. immigrants with TB were diagnosed within their first five years of migration, although incidence rates decreased with increasing length of stay (Walker & Jaranson, 1999). Binkin et al. (1996) found that 30% of immigrants who developed TB in the United Kingdom were diagnosed within a year of arrival and an additional 23% were diagnosed between one and five years after arrival.

Previous treatment and originating from a country with a high prevalence of drug-resistant TB were among the risk factors associated with MDR-TB in the United States identified by Kent (1993). Increased awareness by medical practitioners and more aggressive treatment (e.g. directly observed therapy) were recommended.

Determinants of TB

Research on the determinants of TB in immigrants addressed two important themes:

1. hypothetical factors associated with TB reactivation, and
2. barriers to detection and treatment.

There was strong evidence that living conditions after migration, characterized by poverty, homelessness, substandard housing, substance abuse, poor sanitation and malnutrition, contribute to the reactivation of TB in immigrants (Kent, 1993; McSherry & Connor, 1993). A literature review of health issues affecting immigrants to the European Union highlighted the importance of social and economic conditions, especially housing, in the transmission of TB (Carballo et al., 1998). A Montreal-based study found that residence in a poor neighbourhood was significantly associated with tuberculin reactivity, suggesting that the risk of TB was not uniform among immigrants even in those from countries with high rates of this disease (Menzies et al., 1992).

Other research examined linkages between resettlement stress and TB (Proust, 1971; Grenville-Mathers & Clark, 1979; Powell et al., 1981; Davies, 1995). Resettlement stress is believed to compromise the immune system and help explain the development of TB in early years of resettlement. A Canadian study is currently under way that investigates the role of stress in the reactivation of TB (Beiser, PI).

Poor access to health services is also another contributory factor (McSherry & Connor, 1993; Carballo et al., 1998). McSherry & Connor (1993) proposed that three factors contribute to the increased number of infected immigrants in the United States: undocumented immigration, lack of tuberculin skin testing and poor adherence to therapy regimens for TB infection. Health care professionals are often unaware that certain immigrant groups remain at risk of TB (often at an extra-pulmonary site) for many years after they immigrate to low-prevalence countries.

In Canada, cultural factors, including stigma and lack of awareness of services and lack of coordination between levels of government, continue to represent major barriers to TB surveillance and treatment (Gardam, pers. comm.). Cultural barriers are discussed in greater detail in a later section.

With respect to coordination, Wobeser et al. (2000) discovered that only 40% to 60% of immigrants referred for medical surveillance during their immigration screening examination (federal) were captured in provincial databases. Montreal researchers suggested that focusing TB detection efforts on the identification and treatment of close contacts was more cost-effective than medical surveillance (Dasgupta et al., 2000).

Although all immigrants are eligible for health coverage, this is not immediately available in all provinces. Immigrants who do not yet have provincial health cards may be required to pay out-of-pocket expenses. Essential health services for refugees are covered by the Interim Federal Health Program; however, problems such as bureaucratic intransigence, lack of adequate coverage, delayed reimbursement and lack of knowledge of the program on the part of hospital emergency rooms, doctors and pharmacies have been cited (Citizenship and Immigration Canada, 2001). An additional 15% to 20% of individuals who require treatment for TB do not have any health insurance (e.g. visitors and temporary workers).

Summary

Although much of the literature reviewed in this section suggests that TB develops post-migration, it differs from other health outcomes reviewed under the healthy immigrant effect conditions in that it may not be associated with declining health status. In fact, most immigrants with active TB (similar to immigrants with most other infectious diseases) experience improvements in health status over time given appropriate treatment and follow-up.

Most of the evidence reviewed in this section suggests a latency period of less than 10 years. Individuals born in countries with high TB prevalence represent a high-risk group.

Three important research gaps were identified. First, more research is needed on why immigrants and refugees develop TB during the early resettlement years, specifically the role of contributory factors such as psychological distress, substandard housing and failure to use health care services effectively. Second, more community-based research is needed that addresses how to increase awareness and decrease the stigma associated with TB in immigrant communities. Finally, there is a need to evaluate public health initiatives such as TB screening in order to develop more appropriate and coordinated outreach and follow-up activities.

HIV/AIDS

Introduction

In 1999, an estimated 33.6 million people were infected with HIV/AIDS worldwide (UNESCO/UNAID, 2000). The adult prevalence rate varied from a high of 8.8% in the Sub-Saharan African region to a low of 0.07% in the East Asia and Pacific region (UNAIDS/WHO, 2000). In North America, the estimated prevalence in 1998 was 0.56%. Since 1995, widespread access to anti-retroviral therapy has dramatically decreased AIDS mortality.

AIDS treatment represents a major economic and social burden to Canadian society, and concerns have been expressed about health risks to the Canadian public and excess demands on the health care system. From the public health standpoint, priorities include the development of effective screening and prevention programs that can be tailored to different population groups.

In Canada, an estimated 49,800 people were living with HIV at the end of 1999, representing an increase of 24% since the end of 1996. Although the estimated incidence of HIV has remained unchanged since 1996, the distribution of “exposure categories” has changed significantly (e.g. men having sex with men [MSM], injection drug users [IDUs], heterosexuals and HIV-endemic). From 1996 to 1999, there was a 30% increase in the number of new infections per year attributable to MSM and a 27% decline in the number of infections among

IDUs. There has also been a 45% increase in the number of prevalent infections and a 26% increase in the number of incident infections among heterosexuals. Of particular relevance to this review, immigrants from a country where HIV was endemic were estimated to account for 20% to 30% of the heterosexual exposure category (Health Canada, November 2000).

In 1999, women accounted for 14% of the prevalent HIV infections compared to 11% in 1996. Over 50% of all new HIV infections among women were attributed to IDU and 46% to heterosexual exposure (Health Canada, November 2000). Since the majority of reported AIDS cases in females were among females in their childbearing years, the risk of viral transmission to newborn children is increasing. Even though pediatric cases accounted for only a small percentage of the total reported AIDS cases, 82.7% of AIDS cases in children were attributed to perinatal transmission. Heterosexual contact with individuals from an endemic country and heterosexual contact with a person at risk represented the two main exposure categories among adult females (Health Canada, April 2000a).

Finally, it is important to recognize that individuals who present for HIV testing and test positive represent only a small portion of the HIV-infected population. At the end of 1996, the Bureau of HIV/AIDS, STD and TB estimated that of the 40,100 Canadians living with HIV, 1,500 (4%) were HIV infected but unaware of their infection (Health Canada, April 2000b).

Canadian Research

Since information on HIV or AIDS among immigrants to Canada is not routinely collected by national or provincial HIV/AIDS surveillance systems, little data are available on its prevalence in immigrant populations. Canadian estimates have been based largely on computer-modelling programs such as the one developed by Health Canada to assess the public health risks for 47 communicable diseases. Using this program, it was estimated that one in 1,000 immigrants (0.1%) arrive annually with HIV, accounting for 37 transmissions each year (Hurst, Dec. 2000; St. John, pers. comm., 2000).

Unlike data on immigrant status, since 1982, information on ethnicity and HIV/AIDS has been routinely collected in Canada. A recent report using this database indicated that the proportion of AIDS cases among Whites decreased from 1990 to 1999 while the proportion of cases among Blacks and Aboriginal people increased. The proportion of AIDS cases among Asians remained constant. Limitations, including misclassification (based on physician's categorization of ethnicity) and under-representation of certain ethnic groups, reduce the utility of this database for immigration research (Health Canada, 2000a).

There was some evidence that HIV/AIDS is increasing among immigrants to Ontario who were born in HIV-endemic countries. In 1997 and 1998, 14% of cases in the provincial surveillance system were attributed to immigrants from HIV-endemic countries, compared to 2.9% of cases from 1981 to 1995. At the same time, the proportion of AIDS cases attributed to MSM declined from 86% in 1985 to 50% in 1998 (Remis & Whittingham, 1999).

Research on the prevalence of HIV and AIDS among Ontario immigrants from two HIV-endemic regions, the Caribbean and sub-Saharan Africa, was recently conducted using a two-stage modelling technique:

1. a demographic profile incorporating immigration, census, birth and mortality data for the Ontario immigrant population from 74 HIV-endemic countries; and
2. a statistical model using HIV and AIDS data from several sources to obtain plausible estimates of the gender-specific incidence and prevalence of HIV, AIDS and AIDS-related mortality.

Findings suggested that between 1985 and 1998, 11.4% of HIV diagnoses in Ontario were attributed to immigrants from HIV-endemic countries. HIV prevalence rates for immigrants from HIV-endemic countries also showed an increase between 1980 and 1998, notably in the late 1980s. The HIV prevalence rate among people from sub-Saharan Africa was 0.89% and from the Caribbean it was 0.54%, substantially lower than rates in the countries of origin. The finding that these rates were higher than rates in the non-MSM and non-IDU Ontario population generated negative public reaction, even though this was not necessarily the most appropriate comparison group.

It was also estimated that 46% of HIV infections among immigrants from the Caribbean and 30% of infections among immigrants from Sub-Saharan Africa were acquired in Canada. This has important implications since policies and programs now in place in Canada could potentially prevent these infections. Of the 281 HIV-infected mothers reported to the Ontario HIV Paediatric Network, 41% were born to immigrant women from HIV-endemic countries (Remis & Whittingham, 1999). Another study reported that 70% of the mother–infant HIV transmissions in recent years were among immigrant women from sub-Saharan Africa and the Caribbean (Remis et al., 1998).

International Research

In 2000, UNESCO/UNAIDS (2000) conducted a literature review on immigrant populations and HIV. Some caution was advised in interpreting results of these epidemiological studies because of differences in national reporting systems. For example, some countries reported the incidence and/or prevalence of HIV, some reported the incidence and/or prevalence of AIDS and some (e.g. United States) included data on immigrants together with native-born ethnic minorities. National differences in the major source countries of immigrants were also acknowledged (i.e. in many European countries, the majority of immigrants with HIV/AIDS were from other European countries or the United States, not from developing countries).

A great deal of variation was observed in the incidence of AIDS and HIV among European immigrants. For example, by 1990 immigrants or foreign residents represented 45% of AIDS cases in Belgium, 20% in the Netherlands and 7% in Norway. Immigrants were also significantly over-represented in the proportion of the population with HIV (e.g. 52% in Belgium, 20% in Sweden and 10% in Norway). Between 1988 and 1991, 0.12% of pregnant women in Amsterdam were diagnosed with HIV and the majority of this group was foreign-born (63%). In

1996, immigrants from Ethiopia represented 50% of all HIV sero-positive adults in Israel and this prevalence was reported to be increasing.

Much attention has focused on the burden placed on health services attributed to immigrants with HIV/AIDS. Although there was little evidence, the United States has maintained and enforced an HIV-testing policy which excludes HIV-positive immigrants or immigrants with AIDS. Furthermore, no research has examined whether the prevalence of AIDS in immigrant populations increases or decreases in prevalence with duration of stay. It has been suggested that certain sub-groups of immigrants (e.g. refugees, seasonal migrant workers and travellers who seek sexual experimentation) are at higher risk for HIV. Canada is presently introducing legislation for mandatory screening and exclusion of immigrants (except family class immigrants) who test positive for HIV.

Determinants of AIDS

Remis & Whittingham (1999) suggested that the lower rate of HIV infection among Canadian immigrants compared to natives in the country of origin was because some HIV screening of a discretionary nature may already be occurring in some countries (i.e. selection bias).

Although few studies provided reliable data on the specific factors that facilitate transmission of HIV in the context of migration, global patterns of migration (especially frequent travel to and from endemic regions) are still believed to contribute to the problem (HIVInsite, 2000). For example, the risk of AIDS may be elevated in cases where the sex-selected nature of migration has produced predominantly male migrant groups (Carballo et al., 1998).

A review by Montreal researchers, Decostas & Adrien (1997), suggested that human mobility is associated with the risk of HIV infection but cautioned that this relationship may be better explained by the conditions of life during the voyage and at the site of destination than by the origin of the migrant. They further advised that distinctions be made between labour migration, refugee migration, internal migration and resettlement migration. In the case of the latter, vulnerability to HIV was found to be largely determined by poor working and living conditions and reduced access to health care, conditions similar to those associated with other infectious and chronic health problems common to migrants.

A review of epidemiological and behavioural evidence conducted by UNESCO/USAIDS (2000) also suggested that the risk for HIV infection among immigrant populations is attributable to variables associated with living conditions which, when corrected, can eliminate the increased risk. For example, single male migrants under isolated conditions in the host country contracted more sexually transmitted diseases and were at greater risk for HIV because they tended to have multiple partners and commercial sex as a result of their marital status, geographic mobility and lower chances of creating stable relationships with women in the host culture. However, when they lived with families, their incidence was similar to that of the host population.

Other factors contributing to the risk of HIV infection among immigrant populations included demographic and behavioural differences within the immigrant community, difficulties in interactions with and/or integrating into the host society, less access to medical services, and communication problems with health care personnel. Since immigrants who are HIV-positive are subject to stigmatization and discrimination, available support services may not always be used (Flaskerud & Kim, 1999; UNESCO/USAIDS, 2000).

Most of the research on immigration and AIDS in Canada has focused on the development of prevention efforts (e.g. increasing community awareness, reducing barriers to care and developing culturally appropriate materials).

A study of the South Asian community in Vancouver found risk perception to be very low even though 75% of single South Asian men reported initiation of new sexual relationships in the past year (Manson-Singer et al., 1996). A similar finding was reported in a 1994 study conducted by the Immigrant Women's Health Centre which included interviews with 140 Chinese, Vietnamese, Central South American and Caribbean immigrant women in Toronto (Immigrant Women's Health Centre, 1994).

Stigma, the isolation of HIV-positive individuals, and cultural and linguistic barriers to treatment were identified as particularly critical issues by members of five East African communities in Toronto (Calzavara et al., 2000; Tharao et al., 2000).

The Canadian Study on Determinants of Ethnoculturally-specific Behaviours related to HIV/AIDS focused on the need for culturally appropriate materials (Adrien et al., 1996). This community-based participatory project resulted in several recommendations for HIV prevention and the promotion of condom use (Maticka-Tyndale et al., 1996).

Summary

The literature reviewed in this section suggests that findings regarding the extent to which immigrants were HIV-positive prior to arriving in Canada or acquired the infection here are inconclusive. It is still unclear what proportion of immigrants arrive with HIV/AIDS or develop the disease post-arrival.

To identify immigrant populations at risk and to validate some of the findings obtained through modelling studies, more accurate and complete HIV data are required. Of particular concern is the increasing incidence of HIV among immigrant women (Umeh, 1997; Morrison et al., 1999).

Additional studies are necessary to define the psychological, social and behavioural determinants of HIV transmission, especially regarding infections occurring in Canada, as these are theoretically preventable. Determinants of HIV/AIDS include poor working and living conditions and barriers to appropriate health care. However, little research has been conducted on the role of supportive social networks in the prevention of high-risk sexual behaviour. The need for evidence-based community awareness and prevention campaigns targeting specific immigrant groups is critical.

Mental Health

Introduction

Arrival and resettlement in a new country often involves a period of significant readjustment and stress (Canadian Task Force, 1988; Canadian Council on Multicultural Health, 1989). Some theories emphasize the negative and stressful aspects of the process on health, while others propose that immigrants are a self-selected and resilient group who are less likely to experience psychological problems (Beiser, 1990; Flaskerud & Kim, 1999).

Some of the issues involved in examining data on the mental health of immigrants over time are similar to those already discussed. For example, there are limitations to the type and quality of immigrant health information available from provincial and national health surveys. As well, differences in help-seeking behaviour may confound the validity of clinical and health record data. Most of the research in this area has been cross-sectional, and, while this can provide comparative information on the mental health of immigrant compared to native-born populations, it cannot be used to examine changes in mental health over time.

Canadian research devoted to identifying the determinants of immigrant mental health has been more extensive than research on the healthy immigrant effect with respect to mental health. The latter has been informed primarily by findings from the Canadian Task Force on Mental Health of Immigrants and Refugees (1988), a longitudinal study of Southeast Asian (SEA) refugees, and a number of migrant studies on suicide.

This section reviews Canadian research on the mental health of immigrants and looks at both Canadian and non-Canadian research investigating changes in immigrant mental health over time. Canadian research on the determinants of immigrant mental health is reviewed, followed by the mental health of immigrant sub-groups (e.g. refugees, youth and women).

Canadian Research

In 1986, the Canadian Task Force on Mental Health Issues Affecting Immigrants and Refugees reviewed evidence from more than 1,000 national and international research studies. Approximately half of these studies found that immigrants suffered higher rates of distress than native-born residents, and half either reported that immigrants and refugees had the same rates of mental disorder as their majority culture counterparts, or they had lower rates. The Task Force concluded that it was not migration per se, but the contingencies surrounding displacement and resettlement that determined the mental health of immigrants and refugees (Canadian Task Force, 1988). This is discussed in greater detail in the next section.

The Refugee Resettlement Project (RRP) was a 10-year longitudinal study of the resettlement and mental health of SEA refugees in Canada. The RRP began in 1981 with a one-in-three probability sample of 1,348 refugees who resettled in Vancouver between 1979 and 1981. Two years later, 86.7% of the original sample participated in the second wave follow-up survey and 62.5% were located after 10 years. At the time of the first survey, rates of depression among the refugees approximated those of majority culture North American communities. However, refugees who were living in Canada for 10 to 12 months at the time of the survey scored higher on the depression scale than the others, suggesting that certain phases of resettlement are characterized by greater mental health risk. After a decade, depression rates were far lower in the study population than in the general population. Over this time period, there were also changes in the characteristics of the population at highest risk of depression. For example, during the early resettlement years this group consisted of young males. Later, seniors became increasingly prone to develop mental health problems the longer they were in Canada (Beiser et al., 1994; Beiser & Hyman, 1997; Beiser, 1999).

Since the migration process is often stressful, suicide rates have also been used as an indicator of migrant mental health. In addition, suicide has been identified as a particularly sensitive and critical issue by several newcomer communities. A migration study conducted by Kliewer and Ward (1988) investigated factors influencing 1969 to 1973 suicide rates among 25 immigrant groups in Canada. Their findings, based on age-standardized suicide rates, suggested that the suicide rates of immigrants converged with those of the destination native-born population. Among immigrants from low-risk countries (i.e. countries with lower suicide rates than Canada), suicide rates increased to those of Canada, and among immigrants from high-risk countries, suicide rates decreased. Length of residence was also positively related to the degree of convergence. A subsequent study confirmed these results and further suggested that migration may be more deleterious for females than males (Kliewer, 1991). Strachan et al. (1990) examined suicide rates in the Canadian-born population and first-generation immigrants and found that in every age group except 65 years or over, suicide rates were higher in the Canadian-born group. Only first-generation immigrant women had higher suicide mortality rates than their Canadian-born counterparts.

International Research

As mentioned, findings from international studies on immigrant mental health have been mixed. Some studies have demonstrated negative psychological effects of migration on mental health while others have suggested that immigrants have a mental health advantage over their native-born counterparts. For example, studies of Mexican immigrants to the United States found that this group experienced a significantly lower prevalence of depression and post-traumatic stress disorder (PTSD) compared to individuals of Mexican descent born in the United States (Burnam et al., 1987a; Escobar, 1998).

The literature review of health issues among immigrants to the European Union also found evidence of variation of mental health problems with time, the majority within the first five years (Carballo et al., 1998).

Determinants of Mental Health

Theories of transition and adoption typically portray immigration as a process beginning with an initial period of joy and relief, followed by a period characterized by regrets, feelings of loss and adjustment difficulties, and ultimately ending with a stage of acceptance and reorganization (Adler, 1975; Pedersen, 1995; Smart & Smart, 1995). According to a popular model, the risk for developing mental disorders is not particularly high immediately after resettling in a foreign country, but increases after an initial "incubation" period (Beiser & Hyman, 1997). Clinical and/or cross-sectional studies suggest that this risk period occurs during the first 10 to 24 months after arrival and subsequently declines (Beiser, 1988; Beiser et al., 1989). A review of psychiatric problems among Iranian immigrants in Canada identified similar stages of adjustment, beginning with excitement and euphoria, followed by adaptation difficulties (2–3 years after arrival) and somatization of the illness (Bagheri, 1992).

According to the Canadian Task Force (1988), there is nothing inherent in the process of migration and settlement that jeopardizes mental health. Rather, it is the contingencies surrounding the resettlement experience that determine the risk of developing a mental health problem. These contingencies, drawn from the stress process model and adapted to the immigrant experience (Beiser, 1990), include personal strengths, pre- and post-migration stresses, and the availability of family and community support. Pre-migration stresses such as catastrophic experiences, refugee camp internment, together with post-migration stresses such as poverty, unemployment and separation from family — frequent components of the refugee and resettlement process — jeopardize mental health. Personal resources such as fluency in the host country language, ethnic pride and positive attitudes toward acculturation, together with social resources, such as family and ethnic community support and a positive reception by the host society, not only exert a beneficial effect on mental health, but may buffer the impact of stressful experience. Socio-demographic characteristics such as age, gender, education and ethnicity affect the chances of being exposed to stressful situations, as well as the availability of personal and social resources.

The relationships between the contingencies and mental health are presented diagrammatically in the Refugee Resettlement Model (Figure 1).

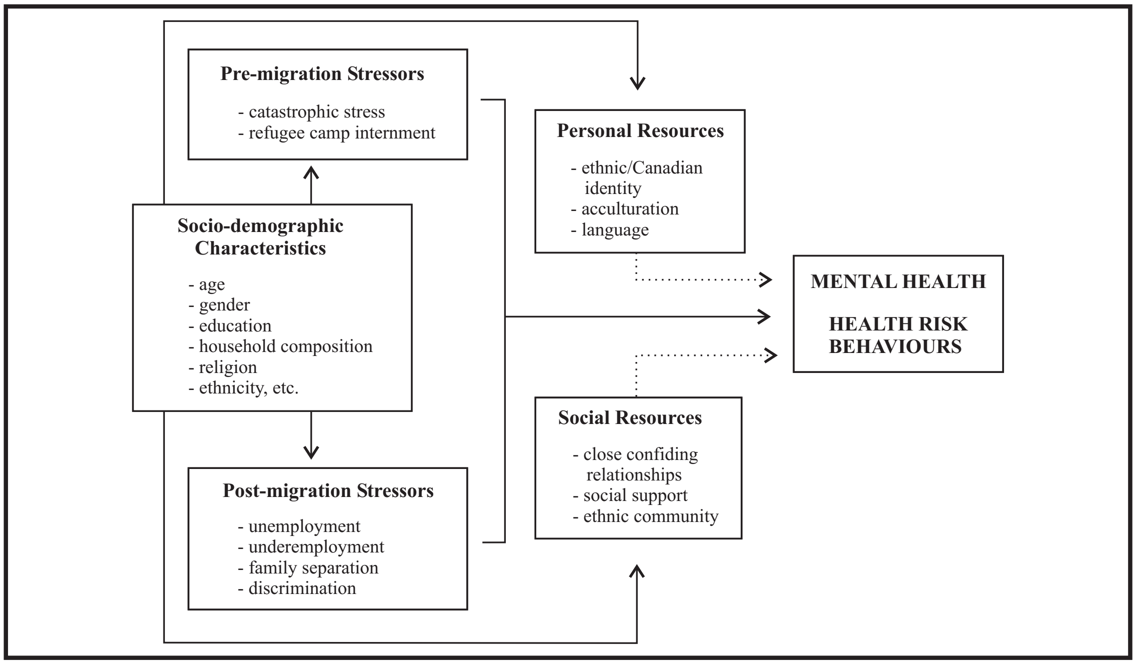

Figure 1: Model for Determinants of Mental Health

Note: The solid lines indicate direct effect while the broken lines suggest the possibility of effect modification.

Adapted from: Beiser M. 1990. Migration: opportunity or mental health risk. Triangle *29 (2/3).*

Data from the RRP have been used to examine many of these relationships. Pre-migration factors mostly had an impact on mental health immediately after arrival (Beiser et al., 1989); however, the impact of post-migration factors such as unemployment were most strongly felt 10 to 12 years after arrival (Beiser & Hou, working document). In 1991, the unemployment rate among the SEA refugees was lower than the national average (8% and 10.3%, respectively); however, refugees who were not working were becoming part of a chronically unemployed, poor and depressed group. Other studies suggest that unemployment becomes more of a major threat to mental well-being over time (Westermeyer, 1989; Aycan & Berry, 1996). However, some studies suggest that SEA refugees who were eventually able to bring their relatives to Canada experienced improvements in mental health (Beiser et al., 1993).

Personal resources include language fluency, acculturation and ethnic/Canadian identity. Although improvements in English-language proficiency were observed over time, no direct relationship was observed with mental health. Levels of acculturation have been hypothesized to relate linearly both negatively and positively with mental health (Rogler et al., 1991; Acedevo, 2000). Low acculturation due to the lack of host country language skills has been associated with social isolation and low self-esteem. However, increases in acculturation may result in alienation from traditional supports, internalization of negative host-society beliefs, and increased exposure both socially and ecologically to the risk of increased alcohol and drug abuse (Rogler et al., 1991). The relationship between ethnic identity and self-esteem can also be either positive or negative depending on the social status of the ethnic group with whom an individual identifies. According to Berry (1995), minority group members who choose to maintain their cultural identity and characteristics and, at the same time, become part of the larger societal framework, have the best mental health outcomes.

There was substantial evidence that support provided by a like ethnic community was associated with positive mental health outcomes, but this effect may dissipate over time (Beiser, 1988; Beiser et al., 1989). For example, data from the RRP suggested that Chinese refugees enjoyed an initial mental health advantage compared to non-Chinese refugees. However, over time the non-Chinese integrated more quickly with the larger society and learned English faster (Beiser, 1999). Escobar (1998) speculated that the mental health advantages of Mexican-born immigrants over their American-born counterparts might be due to a “protective” or “buffering” effect of traditional culture. Retention of cultural traditions may also contribute to healthier habits (e.g. better eating and less substance use) that may be associated with better health and mental health outcomes.

There was little evidence that resettlement policies that stressed the geographic dispersal of immigrants were effective. In fact, a literature review suggested that these often contributed to isolation and impeded social integration (Carballo et al., 1998).

Finally, the superior mental health of SEA refugees in Canada and immigrants to the United States has also been attributed to selection effects (i.e. the SEA refugees chosen for resettlement in Canada were probably an exceptionally healthy and resourceful group) (Beiser & Hyman, 1997; Escobar, 1998; Beiser, 1999).

Immigrant Sub-Groups — Children and Youth

Research about immigrant and refugee children is scant, and the results are inconsistent and sometimes conflicting (Beiser et al., 1995). A review of the literature in this area identified reports from treatment settings and small community-based samples suggesting that immigrant and refugee children experience a greater risk for alcohol abuse, drug addiction, delinquency, depression, PTSD and psychopathology than their host country counterparts (Beiser et al., 1995). By contrast, according to some large-scale community surveys, the rate of psychiatric disorder among immigrant children was no higher than for Canadian-born children. Other studies reported that in comparison with majority culture peers, SEA students achieved higher than average scores on national achievement tests and were less likely to get suspended or drop out of school.

Few longitudinal studies have examined changes in the mental health of children and youth over time. The one area in mental health where there has been evidence of increased psychopathology with increased length of stay is substance use and abuse. Generational studies have shown increases in the use of illegal drugs by second- and third-generation youth, particularly among youth experiencing acculturation and/or identity-related problems (Cheung, 1993; Guarnaccia & Lopez, 1998).

Data from the NLSCY were used to investigate the relationship between poverty and mental health in recent immigrant children in Canada (Beiser et al., in press). Immigrant children (4–11 years old) who had been in Canada less than 10 years experienced lower rates of mental health problems (i.e. conduct disorder, hyperactivity and emotional disorder) than children in the national population, despite the fact that over 30% of new immigrant families were poor compared to 13.2% of native Canadian families. Findings further suggested that in Canadian-born families, the effect of poverty on mental health was mediated through associated parental and family characteristics such as depression, single-parent family status and family dysfunction. The study concluded that for new immigrants, poverty was part of the process of resettlement that most eventually overcame, not the end result of a cycle of disadvantage as in the general population. Although many immigrant families struggle during the first decade in Canada, eventually the average income of immigrants at least equals and in some cases exceeds that of the national population (deVoretz, 1995).

However, the literature review suggested that refugee children might be at higher risk of mental health problems than other immigrant children. The results of a 1991–93 study with 204 adolescents from refugee families in Montreal found that rates of depression and anxiety were one and a half to two times higher in the refugee group compared to rates using data from SQ. Previous trauma, refugee camp conditions and family separation of more than one year were believed to produce long-term effects on the mental health of children (Tousignant, 1997).

The Refugee Youth Project (RYP) investigated the mental health of 281 SEA refugee youth (10–20 years old) who were the offspring of participants in the RRP and a comparison sample of non-SEA refugee youth living in the same neighbourhood. Results indicated that rates of depression were significantly higher in the SEA group compared to the control group. Post-migration stresses, primarily negative life experiences, were significantly associated with this outcome. In-depth interviews with SEA youth were used to identify these experiences. These included communication problems at school, intergenerational conflicts at home, ambivalence about ethnic identity and perceived discrimination (Hyman et al., 2000b). English proficiency, the availability of social support from family and non-family, and strong ethnic and Canadian identities were associated with good mental health and school performance (Beiser & Hyman, 1998).

Other studies have focused on the determinant of immigrant and refugee children's mental health. A study of the needs of immigrant youth (16–20 years old) was conducted by the Joint Centre of Excellence for Research on Immigration and Settlement (CERIS) (Anisef & Kilbride, 2001). It included a review of the literature and in-depth personal interviews. The final report identified family stability and ethnic resilience as having a significant impact on the mental health of immigrant children. It also highlighted some of the major stresses faced by newcomer youth, particularly language-related. The multiple and interrelated stresses immigrant and refugee youth encounter with respect to school, family and ethnic identity have been well documented (Beiser et al., 1995; Hyman et al., 2000a, b). The report concluded that early intervention in the education of newcomer children was critical to later well-being. Other research suggested that programs that promoted integration and family stability were critical, particularly in the prevention of substance abuse (Carballo et al., 1998).

In summary, according to the results of the studies reviewed, immigrant children did not experience worse mental health outcomes than non-immigrant children. However, the research suggested that there were particular sub-groups at higher risk (e.g. refugee children).

Refugees

The research literature suggests that refugees who have experienced traumatic events such as war, famine and forced migration are at an increased risk of mental health problems, such as lasting depression, PTSD and suicide (Lin, 1986; Stein, 1986; McSpadden, 1987; Boehnlein & Kinzie, 1995).

One type of mental health problem that may present in refugees is PTSD. PTSD is an anxiety disorder characterized by specific symptoms which present following a direct personal exposure to an event that involves actual or threatened death or serious injury, witnessing such an event or learning that such an event was experienced by a family member or close associate. Characteristic symptoms include a persistent re-experiencing of the event (e.g. recurrent thoughts and nightmares), avoidance of stimuli associated with the trauma and general numbing of responsiveness (e.g. diminished interest in people and activities). The prevalence of PTSD has been reported to be as high as 90% in highly traumatized groups such as Cambodians, and may persist for many years following migration (Kinzie et al., 1990; Hauff & Vaglum, 1994; Sack et al., 1994).

Aside from data from the RRP, few Canadian studies examined changes in refugee mental health over time.

Women

According to Canadian Task Force (1988) findings, immigrant and refugee women have more mental health needs than their male counterparts. However, few Canadian studies have specifically examined the changing mental health of immigrant women in Canada. Franks and Faux (1990) found a high rate of depression among women of four ethnic groups (Chinese, Vietnamese, Portuguese and Latin American). More recent arrivals had the lowest scores, suggesting that a group's past hardships make their present conditions seem more tolerable in the short run. A review of the literature on childbearing and mental health cited high rates of post-partum depression among immigrant women (Vissandjee et al., in press). A recent review of Canadian research on immigrant and refugee women's health identified psychiatric symptoms attributable to trauma and multiple trauma such as rape as an important mental health issue for many refugee women (Mulvihill & Mailloux, 2000).

Many of the determinants of mental well-being among Canadian immigrant women were systemic and included cultural, linguistic, economic and informational barriers to care, inadequate social support and violence (Sodhi, 1995; Bottorff et al., 1998; George, 1998; Hyman et al., 2000c; Mulvihill & Mailloux, 2000). Vissandjee et al. (in press) speculated on the role of multiple burden and stress. However, the effects of determinants such as discrimination, gender role strain, marginalization in employment and educational disadvantages remain largely unexplored (Oxman-Martinez et al., 2000). Other research suggested the need to refocus attention on immigrant women's capacities to maintain their mental health and well-being, despite adversity, and on how isolating factors such as neighbourhood organization, climate, housework and the lack of employment opportunities have an impact on mental health (Dossa, 1999; Tastsoglou & Miedema, 2000).

Summary

The literature reviewed provided mixed evidence on the healthy immigrant effect with respect to mental health. Findings from the RRP and suicide studies suggested that after an initial risk period, immigrant mental health improved over time and often persisted into the second generation. However, other literature suggested that certain sub-groups experienced an increased mental health risk following migration. These included refugees (children and adults), seniors and women.

Methodological limitations and the tendency for research to be ethno-specific (e.g. SEA refugees) limit the generalizability of findings in this section to all immigrant groups. There is a need for more longitudinal studies on the mental health of immigrant and refugee adults and children in Canada and for more research on changes in the determinants of immigrant and refugee mental health over time.

Perinatal Health

Introduction

This section reviews literature on the perinatal (maternal/child) health status of immigrant and refugee women. Perinatal health outcomes include infant and perinatal mortality rates, low birthweight (LBW), prematurity and selected infant care behaviours (e.g. breastfeeding).

Infant and perinatal mortality rates are used to measure the overall economic and social development of a population. Infant mortality rates compare infant deaths (less than 1 year) to the total number of livebirths in a year and perinatal mortality rates compare infant deaths (less than 1 month) to the total number of livebirths in a year. Infant birthweight is considered to be the single most important factor affecting neonatal mortality and is a significant determinant of post-neonatal infant mortality, as well as infant and later childhood morbidity (Michielutte et al., 1992). LBW is defined as an infant birthweight of less than 2500 grams. Its causes are multifactorial and include race/ethnicity, maternal height and weight, general morbidity, and health behaviours such as gestational weight gain, caloric intake, cigarette smoking and alcohol consumption, social support and stress (Oakley et al., 1982; Norbeck and Peterson Tilden, 1983; Newton & Hunt, 1984; Kramer, 1987; Reeb et al., 1987; Hyman & Dussault, 1996). Infant care behaviours, such as breastfeeding, have a demonstrated relationship to infant health status.

Canadian Research

Few Canadian studies compared infant or perinatal mortality rates between immigrants and non-immigrants, or within immigrant or ethnic populations. Data presently are being analyzed from a study of 3,000 immigrant and refugee women who delivered at St. Joseph's Hospital in Toronto, the largest regional birthing centre with the lowest percentage of Canadian-born women in Ontario. Stillbirth and neonatal mortality rates will be examined for immigrant women by country of birth and length of time in Canada (Ford-Jones, PI). Wen and Kramer (1997) used secondary data to compare perinatal mortality between ethnic Chinese and White women. The lower perinatal mortality rate found in the ethnic Chinese group was similar to that reported in other studies and was attributed to a favourable birthweight distribution and lower risk of exposure to factors associated with perinatal death.

Two studies examined the prevalence of LBW and/or prematurity among immigrant women in Quebec. Doucet et al. (1992) used data collected by CLSC nurses during postnatal visits to examine whether the risk of LBW and prematurity was higher among foreign-born compared to Canadian-born mothers, and to determine the impact of length of stay on outcome. In total, 2,913 singleton live births were included in the logistic regression model. The researchers concluded that foreign-born mothers did not experience a higher risk of LBW or prematurity compared to native-born mothers, and length of stay was not significantly associated with birth outcomes. The second study provided evidence that the risk of LBW in immigrant women may vary by acculturation status (Hyman & Dussault, 1996). Using Quebec birth certificates (1979–1988), two birth cohorts were defined to control for the effects of repeat pregnancies. In both birth cohorts, the more acculturated mothers — as measured by two variables, place of birth (Canada/Other country) and knowledge of English/French (Yes/No) — experienced significantly higher rates of term LBW compared to their less acculturated counterparts.

Edwards and Boivin (1997) compared differences in infant care behaviours between recent immigrants (less than 3 years in Canada) and less recent immigrants (more than 3 years in Canada) using data from participants recruited from five regional hospitals in the Ottawa-Carleton region. Although there were no significant differences in infant care behaviours between the two groups, there were differences in maternal variables associated with these behaviours. Of note, in the more recent group, a significant interaction between immigration status and parity indicated that previous childbearing provided a protective effect for refugees. The researchers hypothesized that the lack of prior experience among primiparas may contribute to diminished self-efficacy, lack of knowledge about health-promoting infant care practices and lack of family support for behaviours such as prolonged breastfeeding. However, data from the NPHS and NLSCY suggested that mothers who identified themselves as immigrants and mothers who spoke a language other than English and/or French were more likely to breastfeed compared to their non-immigrant, English/French-speaking counterparts (Maclean, 1998; Health Canada, 1999). Another Ottawa-based study confirmed that women who spoke other languages were more likely to breastfeed than English-speaking mothers (Green-Finestone et al., 1989). However, since breastfeeding rates in Canada could not be compared with breastfeeding rates in the countries of origin, no conclusions could be drawn regarding whether or not breastfeeding rates had increased or decreased after migration.

In Quebec, some data on perceived changes in health status following migration were collected using exploratory interviews with 91 immigrant mothers (Battaglini et al., 1999). The majority of respondents did not perceive a change in health status following immigration. However, approximately 19% of the respondents reported an improvement in health, which they attributed to improvements in diet, living conditions and sense of security. At least one quarter of respondents reported deterioration in health status. This was related primarily to family separation and stress, but also to the lack of healthy food choices and the weather.

Some evidence suggested that refugee women may be at an increased risk of poor pregnancy outcomes. An evaluation of the health status of 59 pregnant refugee women seeking asylum in Canada reported urinary tract infections, monilial infections, scabies, head lice, otitis media, intestinal parasites, other vaccine-preventable infections, low pregnancy weight gain, anemia, and female genital mutilation preventing pelvic examination in this group (Kahler et al., 1996). However, the extent to which these conditions occurred among refugee women in Canada or persisted following migration was not determined. Preliminary data from Ford-Jones et al. (2000) suggested that rates of hepatitis and rubella were more common among pregnant refugee women as compared to their Canadian-born counterparts, and that these conditions often went undetected for up to 10 years after migration.

International Research

Many European studies found a negative association between immigration and health status (Carballo et al., 1998). Studies suggested that immigrant women in France and Britain experienced higher risks of perinatal morbidity and mortality compared to native-born women (Donovan, 1984; Huraux-Rendu et al., 1984; Stengel et al., 1986; Balajaran & Botting, 1989). However, reported variations in perinatal mortality varied according to ethnicity and country of birth. For example, in the United Kingdom several studies reported that perinatal mortality rates were higher among babies born to immigrants from Pakistan and the Caribbean (Balajaran & Botting, 1989; Chitty & Winter, 1989; Carballo et al., 1998). In Belgium, the highest perinatal and infant mortality rates were recorded for babies born to women from Morocco and Turkey. In Germany, rates of perinatal and neonatal mortality were higher in foreign-born groups, especially babies born to Turkish mothers. However, few of the European studies documented whether mortality differentials persisted with increasing length of stay in a country, or among second-generation ethnic women. Furthermore, most of these studies did not control for socio-economic disadvantage, a major determinant of birth outcome.

In their review of the literature on immigration and refugee health, Walker and Jaranson (1999) cited several studies suggesting that hepatitis-carrier rates among first-generation refugee and immigrant populations in the United States remained similar to individuals in the country of origin. Without immunization, infants born to carrier mothers have a greater than 85% chance of becoming infected.

Research findings on immigration and LBW have been very inconsistent. Most European studies documented higher rates of LBW among immigrant compared to native-born women. For example, in Britain, higher proportions of LBW were reported among the infants of immigrant mothers compared to infants born to U.K. mothers (Balarajan & Botting, 1989). In Spain, LBW was more common among immigrant women from Sub-Saharan Africa, Central and South America (Carballo et al., 1998). However, U.S. generational studies comparing the birth outcomes of foreign- and U.S.-born Asian, Hispanic and Black mothers have consistently found LBW rates among the mothers born outside the United States to be much lower than those of their American-born counterparts (Shiono et al., 1986; Cabral et al., 1990; Rumbaut & Weeks, 1996). This has been labelled a “public health enigma” because many of these immigrant women experience adverse socio-economic circumstances and multiple maternal risk factors such as large families, short birth spacing and late prenatal care.

Several studies reported that breastfeeding rates among immigrant women declined following immigration when compared to breastfeeding rates in their countries of origin (Ghaemi-Ahmadi, 1992; Tuttle, 2000). In a study of SEA immigrant women in California, 94% of women reported that they exclusively breastfed their infants in their home countries, while only 22.4% of these same women breastfed in the United States. Furthermore, only 3.8% of pregnant mothers were planning to breastfeed at all (Romero-Gwynn, 1989). This pattern was observed among Indian immigrants in England and among Asian and African immigrants in Scotland as well.

Determinants of Perinatal Health

Some of the research reviewed suggests that changes in perinatal health outcomes following migration are attributable to changes in risk factors associated with these outcomes, notably health behaviours (e.g. diet, smoking and alcohol consumption), social support and stress. A study conducted by Hyman & Dussault (2000) used semi-structured interviews with a sample of SEA immigrant women to understand the relationship between migration and LBW. Findings suggested that higher levels of acculturation were associated with dieting during pregnancy, inadequate social support and stressful life experiences. According to data from the Culture et Grossesse project in Quebec, only 2.1% of new immigrant mothers smoked compared to

21.2% of mothers in the control group (Doucet et al., 1996). NPHS data further suggested that smoking and drinking rates increased with increasing length of stay in Canada (Beiser et al., 1997).

Many of the studies cited by Carballo et al. (1998) suggested explanations for changes in breastfeeding behaviour following migration. For example, living in communities with few other Vietnamese families or experienced women to turn to for support explained why Vietnamese women in the United Kingdom reported that they lacked confidence to initiate and maintain breastfeeding. Inadequate resources were allocated when health care workers assumed that women from traditional societies would persist with breastfeeding following migration.

Other Canadian studies documented hypothetical risk factors for pregnant immigrant women, including isolation due to loss of family support, low income, communication problems and mental health problems (Henneman et al., 1994; Battaglini et al., 1997, 1999). Linguistic, cultural and informational barriers to prenatal health care were well documented (Pepin, 1990). There was also some evidence to suggest that immigrant women may not be benefiting from short-stay hospital post-partum programs (Gagnon et al., 1999).

Several U.S. studies provided strong evidence of changes in maternal and infant risk factors following migration.

In an attempt to explain the superior birth outcomes of foreign versus American-born ethnic women in the United States, Rumbaut & Weeks (1996) analysed data from the Comprehensive Perinatal Program (CPP) at the University of California. This dataset consisted of nearly 500 variables (including most of the medical, nutritional and psychosocial factors identified in the literature as determinants of pregnancy outcome) for a sample of 1,464 foreign- and American-born women giving birth between 1989 and 1991. The findings suggested that despite the socio-economic advantages of American-born mothers, immigrant women were “superior health achievers.” They were more likely to have social support for the pregnancy even if economic resources were deficient, less likely to smoke, drink alcohol or use drugs, and their diets, even if calorically deficient, tended to emphasize carbohydrates and vegetables rather than fats, oils and sweets. Other studies showed that American-born Hispanics, Blacks and Asians were more likely to engage in health-risk behaviours such as smoking, drinking and using drugs during pregnancy, and were less likely to breastfeed compared to their foreign-born counterparts (Zambrana et al., 1997; DeSantis, 1998; Acedevo, 2000).

In their review of immigrant health problems, Flaskerud and Kim (1999) identified other risks that were higher among recent (less acculturated) immigrants compared to long-term immigrants in the United States. Lack of sanitation, vaccinations and immunizations in the country of origin were associated with increased susceptibility to childhood illnesses and infection.

Other research suggested that length of stay in the host country affected time of entry into prenatal care. In the United States, recent immigrants initiated care after the first trimester while immigrant women who had been living in that country for longer periods of time began prenatal care earlier (Chavez et al., 1985). The under-utilization of preventive health services by new immigrants is well documented (Stein & Fox, 1990; Vernon et al., 1990; Harlan et al., 1991; Naish et al., 1994; Haitt et al., 1996; Luke, 1996; Meyerowitz et al., 1998).

Summary

The literature reviewed in this section did not provide abundant evidence that immigrant women and children experience worse health outcomes than their Canadian-born counterparts, with the possible exception of refugee women. However, Canadian generational studies are needed that can compare perinatal outcomes such as infant and perinatal mortality rates, LBW rates and breastfeeding between foreign-born and Canadian-born ethnic women.

The review of determinants of perinatal health suggested that changes in risk factors, including health behaviours, social support and stress, were associated with health outcomes. Immigrants, especially newcomers, were more likely to experience barriers to preventive services (e.g. immunization and prenatal care). More research is needed on how and why risk factors and barriers change over time, and to develop perinatal health interventions (e.g. maintenance of healthy lifestyle, prevention and barriers to care) which are appropriate to the phase of resettlement.

Oral Health

Two of the major issues affecting the dental health of new immigrants are access to appropriate dental care and fluoridated water supplies which may have been inadequate in their countries of origin; and language, culture, lack of information and lack of financial resources/dental insurance which may impede access to dental care in Canada.

In their review of the literature in this area, Locker et al. (1998) noted that in a number of countries, immigrants and refugees had lower rates of dental service utilization and higher rates of caries than non-immigrants. However, few studies collected information on the extent to which oral health status improved or deteriorated following immigration.

The study population in the Locker et al. (1998) study consisted of all students aged 13 and 14 years from a random sample of schools in North York, Ontario, in 1995-96 (N=721). Data were obtained by a self-completed questionnaire and a clinical exam. Overall, immigrant students had poorer oral hygiene, more gingivitis involving bleeding, and more dental caries than native-born students. However, the findings also suggested that there was a relationship between oral health status and length of stay in Canada. Students who had been in Canada for six years or more had better dental health than those who immigrated two years ago or less. The oral health of students who came to Canada six or more years ago was more similar to their Canadian-born counterparts than that of students who arrived more recently. These findings suggest that oral health status improves and treatment needs decline over time.

The authors speculated that selection may have accounted for some, but not all, of the patterns observed. Determinants of dental health, including upward social mobility of immigrant families and/or the influence of private and public dental health programs since arriving in Canada, may have contributed also to these improvements (Locker et al., 1998).

Longitudinal data from the RRP were used to examine acculturative factors associated with changes in the utilization of dental services over time. Results suggest that structural factors, especially interaction with Canadian society through work or while in training, significantly increase the likelihood of using mainstream preventive dental health services, while receptional factors, such as perceived prejudice, militate against service use (Hyman, 1997).

Summary

There was little Canadian research on the dental health of immigrants or immigrant sub-groups. Access factors such as knowledge, cost and perceived discrimination appear to be associated with dental health services use.

Diabetes

National surveys show that the prevalence rates for diabetes are increasing in Canada. The etiology of diabetes is multifactorial and complex. Diabetes is related to poverty and other risk factors such as diet, obesity, physical inactivity and stress (Federal, Provincial and Territorial Advisory Committee, 1999a; Flaskerud & Kim, 1999).

According to Chen et al. (1996a), the prevalence rates of chronic conditions, including diabetes, increased from 37% among recent immigrants to 51% among long-term immigrants. The distribution of diabetes by racial/ethnic group in the Canadian population aged 12 or over is as follows: 3.2% of Whites, 3.8% of Blacks and 5.4% of Aboriginal peoples not living on reserves. However, samples were too small for other racial/ethnic groups for population estimates to be made.

Few Canadian or international studies specifically focused on changing patterns of diabetes in immigrant populations. Some studies suggested an increase among second-generation Japanese (Iunes et al., 1994). Other research examined selected determinants of diabetes in immigrant and marginalized populations.

In Canada, analysis of NPHS data found that the prevalence of excess weight (BMI > 25) among immigrants increased with length of stay in Canada for both males and females. Recent female and Asian male immigrants (less than 5 years) were less likely to be obese than their Canadian-born counterparts (Cairney & Ostbye, 1999). Pilot interviews conducted with South Asian and Chinese immigrants identified loss of social support, increased work burden and decline in status as significant contributors to their onset of diabetes (Young et al., 1999).

International research has also examined changes in risk factors associated with the development of diabetes, including health behaviours (notably diet), obesity, social support and stress. Studies of South Asian immigrants in the United Kingdom found that diabetes in this group was associated with elevated levels of psychosocial stress precipitated by low socio-economic status and poor living and working conditions (Williams et al., 1994; Greenhalgh, 1997). In the United States, higher than expected diabetes rates for childbearing women were observed among immigrants and other populations undergoing lifestyle changes (e.g. physical activity and diet) (Flaskerud & Kim, 1999). Internalized responses to racism were also associated with an increased risk of diabetes (Helman, 1990; Auslander et al., 1997).

Summary

More research is needed on diabetes or on its determinants (e.g. the role of chronic stress, changes in socio-economic status, and changes in health behaviours) among Canadian immigrants.

Acculturation and the Healthy Immigrant Effect

Introduction

Interest in the sociopsychological ramifications of migrant adaptation has led many migration researchers to focus on acculturation as a possible explanatory variable for changes in mortality and morbidity rates following immigration (Zambrana et al., 1997). Acculturation is probably best thought of as "a multidimensional process, resulting from intergroup contact, in which individuals whose primary learning has been in one culture take over characteristic ways of living (attitudes, values and behaviour) from another culture" (Hazuda et al., 1988). It has also been suggested that the need to choose between old and new ways may give rise to four different modes of adaptation:

1. assimilation: the relinquishment of cultural identity and movement into the larger society (exemplified by the U.S. "melting pot"),
2. integration: simultaneous adherence to traditional culture and adoption of some dominant societal values (exemplified by Canada's "cultural mosaic" model),
3. separation: the self-imposed withdrawal from the dominant society while maintaining a traditional cultural identity, and
4. marginalization: alienation from the dominant society together with loss of cultural identity (Berry et al., 1986).

Individuals and groups may hold varying attitudes toward the four ways of acculturating and their actual behaviours may vary accordingly (Berry, 1997). For example, integrated Chinese immigrants may choose to reside in Chinese neighbourhoods rather than the suburbs.

Although often thought of as a unidimensional and unilinear process, acculturation is actually much more complex (Palinkas & Pickwell, 1995; Guttman, 1999). For example, two people who become fluent in the language of the host country and adopt its manner of dress may appear equally acculturated. However, the first person may remain attached to values and committed to carrying out religious and other practices derived from his or her traditional culture, while the second chooses to give these up in pursuit of becoming as much as possible like mainstream Canadians. Language acquisition, dress, values and religious observances may be relatively independent aspects of the acculturative process. The fact that the relationship between taking on host country culture and relinquishing the culture of origin is not reciprocal, as a strict assimilation model would imply, demonstrates that acculturation is not a linear process. Therefore, new settlers must balance and combine heritage and host cultures, creating diverse acculturative patterns, some of which probably invoke health risk, and others that may be protective.

Three important themes emerged from our review of the acculturation literature. First, levels and rates of acculturation affect many different domains of daily activity — social roles, social relationships, language use and food preferences (Cuellar et al., 1980; Wells et al., 1989; Liebkind, 1996). Levels and rates of acculturation also have differential effects depending on the situational context (e.g. rejection in terms of marriage partner preference or religion, assimilation in terms of dress and integration in terms of food or holidays) (Sodowsky et al., 1991). Second, the research increasingly portrays acculturation as a bidirectional and orthogonal process, as a result of which individuals acquire, retain or relinquish behaviours and values of both their traditional culture and the new one to which they are adjusting (Sodowsky and Plake, 1992; Berry, 1995). Third, different dimensions of acculturation were associated with different types of outcomes. For example, language acquisition almost certainly affected political and economic behaviour, but had less impact on food preferences (Hazuda et al., 1988).

Measurement Issues

There was no consistent approach to measuring acculturation in the literature reviewed. Many studies relied on proxy measures such as education, wages, employment, urbanization, media use, political participation, religion, language, daily practices and social relations (Berry et al., 1986), any one of which fails to do justice to the concept's scope. Most of the scales developed to measure the construct relied heavily on language (e.g. preferences for, and/or familiarity with the host country language). Aside from this component which seems to be a consistent cross-study core, scales also incorporated use/preference for host country media, cultural values and attitudes, cultural practices, ethnic identity, patterns of social interaction with own and host society, and perceived discrimination (Hyman, 1997). However, many previous research efforts were probably compromised by a tendency to lump all aspects of acculturation into a single composite index, rather than recognizing that acculturation is a multidimensional process and that different aspects of that process may affect different areas of individual functioning (Zambrana et al., 1997).

Variables such as age at migration, length of stay and generational status, each of which has demonstrated consistent positive associations with acculturation, were sometimes used as proxy measures of the construct. However, the use of socio-demographic characteristics as measures rather than correlates of acculturation has been criticized (Marin, 1992). Many of these variables could be more accurately described as mediating or moderator variables since they influence, but are not inherently part of, the acculturation process. Other identified moderator variables, including education, income, age and Western religion, demonstrated positive correlations with acculturation (Burnam et al., 1987b; Sodowsky et al., 1991; Marin, 1992; Anderson et al., 1993; Cortes et al., 1994; Aponte & Barnes, 1995). Findings have not been consistent relative to gender (Sodowsky et al., 1991; Anderson et al., 1993).

Several operational issues emerged from the review. First, it was recognized that acculturation cannot be measured with a single index or dimension (Sadowsky & Plake, 1991); if language is used, one may falsely conclude that a minority person who speaks, reads and writes English is highly acculturated; similarly, country of origin or generational status may fail to account for the dynamic nature of the acculturation "process." Depending on the region of the country, neighbourhood and immigrant experience, a first-generation Hispanic American may be more acculturated than a second- or third-generation Hispanic American (Negy & Woods, 1992). Second, acculturation measures encompass a combination of many cultural, cognitive and behavioural dimensions, factors and constructs, not all of which have been clearly specified or identified (Sodowsky & Plake, 1992). Third, acculturation scales have traditionally cast home and host cultures as competing and mutually exclusive domains (Ward, 1996). In most instruments, respondents are required to rate a behaviour, value or attitude using an unidimensional answer scale, such as rating their friendship preferences from mostly Hispanic to mostly American, without allowing for the independent determination of the degree to which individuals may be involved in each of the two cultures (Cortes et al., 1994). In addition, little effort has been directed to studying the psychometric qualities of the items used to measure acculturation. Often, disparate items related to attitudes or behaviours believed to be associated with the acculturation process (e.g. language use and preference, patterns of contact with ethnic media and ethnicity of peers) are scored together as if they formed a scale (Marin, 1992).

Acculturation and Changes in Health Behaviour

According to Berry et al. (1986), virtually every human behaviour is a candidate for change as a result of migration. Many Canadian studies suggest that immigrant health behaviours change over time to resemble those of the majority culture. Previous research using data from the NPHS demonstrated that new immigrants smoked less, used less alcohol and were less likely to be obese than longer term immigrants (more than 10 years) and resident Canadians. Data from a survey of newcomers to Windsor indicated that newcomer males and females consumed less alcohol than their Canadian-born counterparts, but that alcohol use was more prevalent among newcomers with higher income and education (Matuk, 1996a). New immigrants were also less likely to engage in health-enhancing behaviours such as regular physical activity and cancer screening than their majority culture counterparts (Beiser et al., 1997). According to the OHS, women who immigrated to Canada more than 10 years ago had higher breast and cervical cancer screening rates than recent immigrants (Goel, 1994; Goel & Mercer, 1999).

Many non-Canadian studies have also reported changes in other immigrant health behaviours, notably diet, sedentary lifestyle, substance use and use of preventive health services (Flaskerud & Kim, 1999). Japanese and Greek immigrants to America consume a greater intake of saturated fats and a lower intake of cereals compared to residents of their countries of origin (Kouris-Blazos et al., 1996; Cardoso et al., 1997). Several studies comparing prenatal health behaviours of American- and foreign-born mothers have shown that the latter group has better birth outcomes (Otero-Sabogal et al., 1995; Zambrana et al., 1997; DeSantis, 1998; Acedevo, 2000). High acculturation has also been associated with cancer screening uptake among Chinese and Vietnamese women in Australia and in the United States (McPhee et al., 1997; Yi, 1998; Lesjak et al., 1999).

According to proponents of cultural models, cultural beliefs, values and attitudes determine the delicate balance between the maintenance of traditional health behaviours and the adoption of new health behaviours. Cultural retention has been associated with maintaining health-enhancing behaviours such as a traditional high-fibre diet, non-smoking and non-use of alcohol (Marmot & Syme, 1976; Scribner & Dwyer, 1989). Familism, or feelings of loyalty, reciprocity and solidarity toward members of the family, widely upheld in many Asian communities, has been associated with social support and other positive health behaviours (Sabogal et al., 1987; Suarez, 1994; Alvidrez et al., 1996; Acedevo, 2000).

On the other hand, the cultural incongruity that many immigrants experience may deter the utilization of services, especially those not considered to be essential (e.g. preventive screening and mental health services). Culture-specific beliefs about mental illness and emotional problems may impede entry into treatment and subsequent course and outcome (Aponte & Barnes, 1995). Preferences for cultural congruity in terms of provider ethnicity, and for alternative providers, including religious leaders and folk healers, are other documented determinants of service utilization (Snowden, 1996).

Acculturation and Changes in Social Support/Stress

It has been proposed that acculturation also affects health by virtue of being a source of stress, or by affecting individual responses to stress (Hull, 1979; Berry et al., 1986). Janes and Pawson (1986, 821) noted that “many studies have produced results that suggest that migration to new social and cultural environments may be stressful for some individuals, and this stress may be, in turn, a major risk factor for hypertension and coronary heart disease.” There were many models that explained how stress occurred as a result of immigration and marginalization. According to the model of cultural incongruity, individuals find it difficult to cope with social situations and cultural values with which they have no prior knowledge or experience and this produces stress. The model of status inconsistency states that stress is derived from situations in which an individual either occupies a status which is unfamiliar, or desires a status but his or her aspirations are blocked or continually frustrated. It is highest when there is a strong desire for success, but the skills required to achieve this success (e.g. language and job) are lacking. It has also been proposed that events, such as migration, that cause a significant change in lifestyle, role or status, or conflict (e.g. between host and cultural group values) are stressful (Janes & Pawson, 1986). Social support, however, is believed to buffer the negative health effects of stress (Marmot & Syme, 1976; Hazuda et al., 1988).

In Canada, visible minority migrants were more likely to be undervalued in the workplace and to earn lower salaries than Euro-Canadians, even when controlling for factors such as education (Li, 1998). Lack of recognition of foreign credentials or work experience, loss of investment income, linguistic isolation and experiences of racism and discrimination further contributed to feelings of disillusionment that accompanied resettlement in Canada (Young et al., 1999).

Some Canadian research on acculturation and health showed that this relationship could be explained by changes in social support and stress following migration. More acculturated study subjects were more likely to exhibit conventional risk factors for low birthweight, such as intense work activity during pregnancy, stress and inadequate social support, than their less acculturated counterparts (Hyman & Dussault, 1996, 2000).

Data from pilot interviews with South Asian and Chinese respondents in Edmonton indicated that characteristics of the migration experience, including loss of social support, increased work burden and decline in status, contributed to or exacerbated the onset of diabetes (Spitzer et al., 2000).

Models have also been proposed to explain the increase in use of alcohol and drugs by U.S. immigrants. For example, the learning model suggests that immigrants learn these new behaviours as a part of an assimilation process, and the acculturative stress model proposes that many immigrants turn to artificial support when they find the experience of immigration stressful and disorienting (Rebhun, 1998).

Summary

Acculturative changes in health behaviours and changes in social support and stress are among the determinants of health which have been least explored in relation to changes in immigrant health status in Canada.

Although some of the research reviewed suggests that different dimensions of acculturation may be associated with different types of outcomes (Hazuda et al., 1988), surprisingly few researchers have attempted to define and articulate which aspects of acculturation relate to specific health behaviours. The feasibility of a three-dimensional model of acculturation was tested with data from the RRP. Results suggested that structural factors, especially interaction with Canadian society through work or while in training, significantly increased the likelihood of using mainstream preventive dental health services, while receptional factors, such as perceived prejudice, militated against service use. Cultural factors such as high ethnic salience had no association with service use but were strongly associated with changes in diet (Hyman, 1997).

Health Service Utilization

Introduction

It has been presumed that if the healthy immigrant effect is operative in Canada, then the HSU of immigrants will increase over time as their health declines. The third and fourth objectives of this report are to examine patterns of HSU by immigrants in Canada and to identify factors associated with immigrants' HSU.

In this section, HSU is broadly defined to include medical services (e.g. physician and specialist consultations, hospital use), mental health services, preventive health services and CAM.

Canadian and international literature is first reviewed on immigrants' use of each type of health service. Next, the Andersen and Newman (1973) model of HSU is used to examine the evidence on individual determinants of HSU, namely declining health status (need), predisposing factors and enabling factors. The final section identifies major research gaps.

Canadian Research

The main sources of data used to examine the use of health services by immigrants were the NPHS, the OHS, SQ, the GSS and provincial health records. Few studies collected primary data, and these dealt primarily with the use of mental and preventive health services.

Chen et al. (1996a) used data from the 1994-95 NPHS to compare rates of HSU between immigrants and the Canadian-born population. HSU indicators included self-reported contacts with physicians and dentists, hospitalization rates and unmet needs for health services. Few differences were observed in HSU rates in immigrants and the Canadian-born population. Age-adjusted rates of individuals who reported six or more contacts with a medical doctor during the 12 months prior to their interview were similar among immigrants and non-immigrants and within immigrant groups categorized by region of origin (Europe, Non-Europe) and length of stay in Canada (0–10 years, 11 years or over). In both the immigrant and Canadian-born populations, household income (low), gender (female) and education (low) were associated with a higher frequency of physician contacts. Other researchers have found that individuals with low income have higher rates of HSU compared to high-income individuals, regardless of whether they are foreign- or native-born (cited in Laroche, 2000). Chen et al. (1996a) also found that the hospitalization rates of immigrants from non-traditional source countries (i.e. non-European) were slightly lower compared to the Canadian-born population (7% and 10%, respectively), and similar in European immigrants and the Canadian-born population. The majority of Canadians reported that their health needs were met and this did not vary between foreign-born and native-born respondents.

Globerman (1998) used the 1994-95 NPHS data to examine differences in the use of health care professionals among four groups of immigrants to Canada: U.S./Mexico, South America/Africa, Europe/Australia and Asia. He found that differences between Canadian-born respondents and respondents from the four groups were quite modest. There was no significant difference in visits to physicians; Canadian-born individuals and European immigrants were marginally more likely to make frequent visits to specialists.

Wen et al. (1996) used the 1990 OHS data to examine whether contact with physicians and specialists and use of hospital emergency departments varied between immigrants and the Canadian-born population in Ontario. Overall, the use of health services was similar between the two groups. Immigrants and other ethnic/cultural groups reported slightly more visits to physicians in the 12 months preceding the interview, a similar number of visits to specialists and fewer visits to hospital emergency departments. Recent Asian immigrants in particular had lower HSU rates for all three services compared to long-term Asian immigrants (more than 10 years). These differences persisted even after controlling for differences in health status and age. However, because the sample sizes in some immigrant groups were small, many of these differences were not significant.

Laroche (2000) used data from the 1985 and 1991 GSS to examine HSU among immigrants and the Canadian-born population. Similar rates of HSU were observed in the two groups and, in some cases, such as physician contacts, immigrants demonstrated lower rates of HSU. In 1991, immigrants were less likely than the Canadian-born population to consult a physician. Country of origin was not associated with length of stay in hospital or with contacts with a specialist or nurse. However, age was found to be an important determinant of service use (i.e. there was an increase in both length of stay in hospital and contacts with health professionals with increasing age in both the foreign-born and native-born populations). Contrary to Chen et al.'s (1996a) findings, education was not a determinant of HSU and, in 1985, high-income immigrants had higher rates of contacts with physicians than non-immigrants.

Kliewer and Kazanjian (2000) had a unique opportunity to examine patterns of HSU between immigrants (who landed in 1995 or 1996 and had a stay of one year or less in British Columbia and Manitoba) and non-immigrants, using provincial health records for hospital discharges and physician claims and Citizenship and Immigration Canada data. Unlike the studies cited above, this study found that immigrants had 40% fewer physician contacts compared to the general population in both provinces, and lower rates of hospitalization. However, compared to the general population, immigrants had higher HSU rates for a number of health conditions. For example, male immigrants in Manitoba had substantially higher rates of physician contact for infectious and parasitic diseases, and female immigrants had higher rates for pregnancy-related conditions. Immigrants also had higher rates of hospitalization for eye surgery. The Kliewer and Kazanjian (2000) study was also unique in that it was able to examine HSU among immigrant sub-groups (e.g. country of origin and refugee status). For example, in the first year of landing, males born in the Middle East had higher hospitalization rates than the general Manitoba male population, while those born in North Africa and South Asia had higher rates between 7 and 12 months of landing. Immigrants with Refugee or Family visas had the highest HSU rates while those with Economic-Business visas had the lowest rates.

Kirmayer et al. (1996) conducted a study of the help-seeking behaviours of 2,246 Anglophone Canadian-born, Francophone Canadian-born, Vietnamese, Caribbean and Filipino immigrants in an ethnically diverse neighbourhood in Montreal. The research found that overall rates of medical HSU were similar in the immigrant (78.1%) and non-immigrant (76.4%) groups. However, rates of HSU for mental health problems were significantly lower among immigrants. Immigrants were less likely to make use of primary care mental health services, and still less likely to be referred to or to seek out specialty mental health care. These differences could not be accounted for by lower levels of need or by the use of alternative health providers.

Roberts and Crockford (1997) examined clinical records of Asian immigrants admitted to an adolescent inpatient psychiatric unit in Calgary over a five-year period. Findings were similar to Kirmayer et al. (1996) in that far fewer Asian immigrants were admitted than expected based on Calgary's demographics. They also tended to be older and problems to be more severe than their White Canadian peers.

Although Kirmayer et al. (1996) did not find length of stay in Canada to be related to mental health services use, Hyman et al. (1997), using data from the NPHS, found service use increased with duration of residence in Canada. The proportion of immigrants who had talked to a health professional about mental health in the 12 months preceding the NPHS interview increased from 3.6% among immigrants who had been in Canada less than five years to 6.5% for mid-term immigrants (5–9 years) to 7.6% for long-term immigrants (10 or more years).

Similar patterns of underutilization were seen when comparing immigrants' use of preventive health services and mental health services.

Using data from the OHS (1990), Hyman et al. (2000d) did not find large differences in the proportion of immigrant women and Canadian-born women who consulted a general practitioner about their health each year, or within groups of immigrant women by region of origin (Western Europe, Eastern Europe, South Asia, Southeast Asia, Caribbean). However, rates of cervical cancer screening among immigrant women from certain regions (notably Southeast Asia) were well below those of Canadian-born women (Hyman et al., 2000d). Using the same dataset, Goel (1994) and Goel and Mercer (1999) determined that having been in Canada less than 10 years and speaking a language other than English or French at home were significant predictors of never having had a Pap test or mammogram. Findings from the Newcomer's Health Survey conducted in Windsor, Ontario, and the Toronto Chinese Health Survey, a representative sample of 720 Toronto Chinese households, suggested similar patterns of underutilization of cancer screening (e.g. Pap, mammography) among newcomer and non-English-speaking women (Matuk, 1996b; Yuan et al., 1998).

With respect to prenatal care, Vissandjee et al. (1998) identified several studies that suggested that service use was low among immigrant women in Quebec. According to the Culture et Grossesse database, only 32% of immigrant women attended prenatal courses compared to 57% of Quebec-born women overall (Doucet et al., 1996).

Little quantitative information was available on the use of TB and HIV screening services among immigrants in Canada. However, as previously mentioned, approximately half of immigrants targeted for post-landing TB surveillance never made contact with their local public health unit.

Few Canadian studies examined the use of CAM among immigrants. Boon & Wong (in press) adopted the following definition of CAM proposed by the National Institute of Health Panel on Definition and Description:

> *"Complementary and alternative medicine is a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period. CAM includes all such practices and ideas self-defined by their users as preventing or treating illness or promoting health and well-being. Boundaries within CAM and between the CAM domain and the domain of the dominant system are not always sharp or fixed."*

The literature indicated that the use of CAM is increasing in Canada. According to the 1995-96 NPHS, an estimated 7% of Canadians age 12 or older (1.7 million) reported using some form of alternative health care in the 12 months preceding the survey compared to 5% of Canadians in 1994-95 (Federal, Provincial and Territorial Advisory Committee on Population Health, 1999a). Females were 1.5 times more likely to have used alternative care providers in the previous year and rates were highest among females aged 25 to 44 (11%) and 45 to 64 (10%) (Federal, Provincial and Territorial Advisory Committee on Population Health, 1999b). Higher usage was associated with higher levels of education and income. Among persons free of chronic diseases, 9% consulted alternative health care providers compared to 26% among individuals with three or more chronic conditions (Millar, 1997). However, the overwhelming majority of respondents in all four immigrant categories (United States/Mexico, South America/Africa, Europe/Australia and Asia) included in Globerman's (1998) study had not seen or talked to an alternative health provider in the previous 12 months.

Some interprovincial variations have been observed in rates of CAM use. The highest rates were reported in British Columbia (11%) (Federal, Provincial and Territorial Advisory Committee on Population Health, 1999a). Fries and Menzies (2000) have suggested that this might reflect the diverse ethnocultural characteristics of this province.

Some data on the use of CAM by immigrants was collected by Kirmayer et al. (1996) in their study of Anglophone, Francophone and Vietnamese, Caribbean and Filipino immigrant populations in Montreal. They reported that immigrant groups generally had lower rates of consultation with any kind of alternative medicine practitioner than the Canadian-born groups. Rates of use of any kind of alternative medicine varied from a low of 6% among Vietnamese immigrants to a high of 19.7% among Francophones.

Other data suggested that CAM utilization was similar among immigrants and the Canadian-born population. Muhajarine et al. (2000) found that Saskatchewan study respondents seeking alternative care tended to do so in conjunction with conventional medical care. A Toronto study of inner-city Cantonese and Caribbean immigrants also found that traditional medicine was used in combination with Western medicine (Fuller-Thompson et al., 1997).

International Research

Findings from international studies in the United States and Australia suggest similar HSU patterns as in Canada, but provide additional insight on immigrant sub-groups.

Using data from the 1990 National Health Interview Survey, Leclere et al. (1994) found that recent immigrants to the United States reported fewer contacts with physicians in the previous 12 months than either native-born or long-term immigrants.

Using clinical data in Australia, Kliewer and Butler (1995) found that immigrants experienced significantly lower rates of hospitalization compared to native-born Australians (males 28% lower, females 18% lower), and this pattern was consistent for most immigrant groups. However, differences among sub-groups raised concerns. For example, senior immigrants had higher emergency hospitalization rates than native-born seniors and immigrant women had higher hospitalization rates for pregnancy and childbirth-related diagnoses compared to native-born females.

Many studies attest to the fact that immigrant women are less likely to be screened for cancer compared to the general population (Stein & Fox, 1990; Harlan et al., 1991; Haitt et al., 1996; Luke, 1996; Vernon et al., 1996; Meyerowitz et al., 1998). Vissandjee et al. (1998) cited studies indicating lower rates of prenatal care utilization for immigrant compared to native-born women in the United States, France, Denmark and Belgium.

In their review of the literature on the use of alternative health services by immigrants, Boon and Wong (in press) cite several studies suggesting that the use of CAM by immigrants increases with increasing length of stay in the United States. In fact, recent immigrants appeared to use complementary medicine less than long-term immigrants. This was attributed to preferences for Western medical care to which they did not have access in their countries of origin, or immigration factors that selected highly educated immigrants who were highly acculturated to Western ideals, including conventional medicine. As in Saskatchewan (Mahajarine et al., 2000) and Toronto (Fuller-Thompson, 1997), a U.S. study found low rates of exclusive utilization of Western or traditional Chinese treatments among immigrants (Ma, 1999).

In summary, the Canadian and international studies reviewed in this section suggest that immigrants and non-immigrants show very similar patterns of medical HSU. However, many studies failed to differentiate recent from long-term immigrants, precluding our ability to comprehend what is happening during the first five years of resettlement. The greatest differences between immigrants and native-born Canadians were observed in the use of preventive and mental health services. Few Canadian studies examined how and why immigrants use complementary medicine, the effect of acculturation on use or interactions between different forms of medical care. There were also few Canadian studies that looked at changing patterns of HSU over time (e.g. does "accessibility" change over time?) or at differences in HSU within immigrant sub-groups.

Individual Factors Associated with HSU

Although some studies attempt to explain HSU based on health status/health need, the classic model of HSU proposed by Andersen and Newman (1973) defines other broad and interrelated determinants of HSU, namely predisposing factors and enabling factors (Figure 2).

Predisposing factors include gender, age and education as well as attitudes and beliefs regarding health and illness. Relationships between gender, age and education and HSU seen in the general population were observed in immigrant groups as well (Hamilton et al., 1994; Chen et al, 1996a; Laroche, 2000). However, in cross-cultural situations there was a greater likelihood of inconsistencies in values and cultural norms between users and providers of services. For example, immigrants, especially those from non-traditional source countries, often held beliefs that differed from those of Western health professionals about the causes and treatment of mental illness (Landrine & Klonoff, 1994; Millet et al., 1996; Edman & Kameoka, 1997). Cultural beliefs influenced the presentation, recognition and interpretation of health problems, particularly mental health-related (Suchman, 1964; Berkanovic & Reeder, 1973; Woodward et al., 1992;

Aponte & Barnes, 1995). Preventive health practices were not always perceived to be essential, especially if immigrants were preoccupied with stresses related to unemployment, isolation, displacement and discrimination (Matuk, 1996b; Hyman & Dussault, 2000).

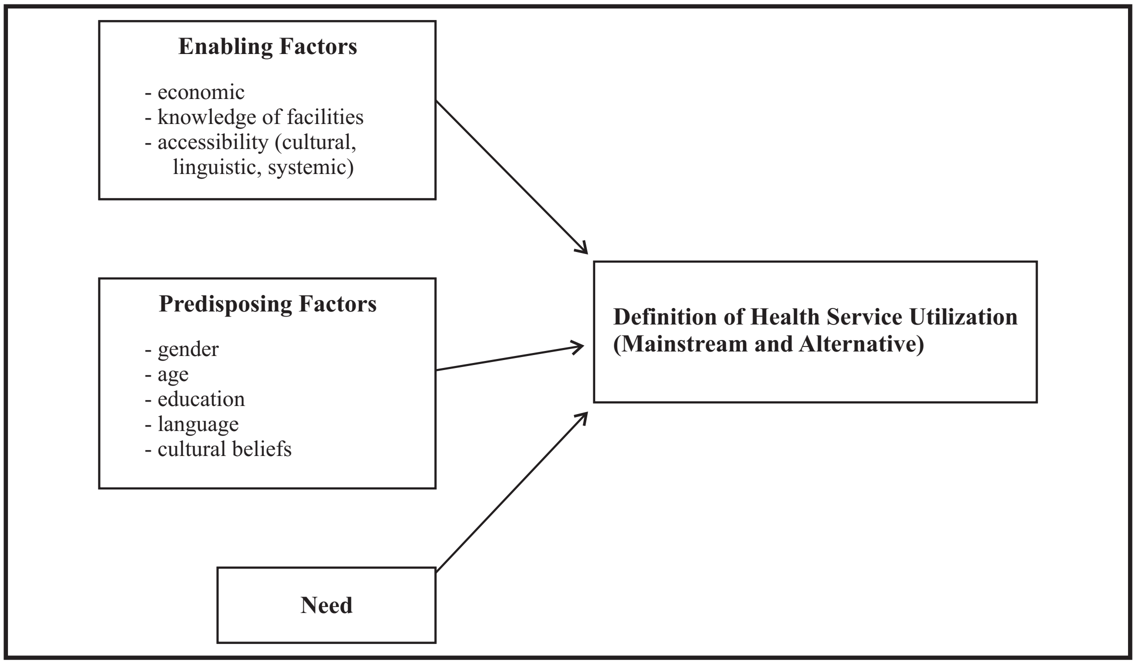

Figure 2: Immigration and Health Service Utilization

Source: Andersen and Newman, 1973; adapted by Portes et al., 1992

Enabling factors include knowledge, availability of appropriate services, affordability and cultural, linguistic and systemic accessibility (Suchman, 1964; Berkanovic & Reeder, 1973; Woodward et al., 1992; Aponte & Barnes, 1995; Alvidrez et al., 1996). Lack of previous exposure to Western hospital care was used to explain lower physician and hospitalization rates among certain groups of immigrants (Wen et al., 1996; Laroche, 2000). Lack of cultural sensitivity and information often compromised access to mainstream services (Canadian Task Force, 1988; Fowler, 1998; Yuan et al., 1998). For many minority groups, the family was the primary source of treatment, especially for mental health problems, and outside help was sought only after all family resources were exhausted (Flaskerud, 1984). Other studies discussed the negative impact of racism and distrust of majority institutions on entry into the health care system and during the subsequent treatment process (Aponte & Barnes, 1995).

Primary data on barriers to care for immigrants and non-immigrants was collected by Kirmayer et al. (1996) using an open-ended question followed by a list of 23 potential barriers. The three immigrant groups involved (Vietnamese, Caribbean and Filipino) reported significantly more barriers to care than the two Canadian-born groups. The most important factors were a tendency to minimize, normalize and deal with problems on one's own (common to all groups but especially marked among immigrant groups), and perceived ethnic mismatch among the immigrants. The latter included the perception that health professionals would not understand, or be prejudiced against, the respondent's culture, and/or that health professionals from their cultural background were not available. Other important barriers to care were fear of stigmatization, mistrust of the health care system, and practical obstacles including getting time off work.

Although there were few other empirical studies, many of the Canadian studies reviewed were concerned with the identification and discussion of barriers to health care. These studies often addressed sub-groups of immigrants, including immigrants from specific source countries, immigrant women, visible minority immigrants and seniors. For example, linguistic and cultural barriers (e.g. stigmatization, shame, distrust of professionals, fear of hospitalization, lack of Serbo-Croatian physicians) were identified as major barriers to mental health care by immigrants from the former Yugoslavia in Toronto (Hyman et al., 2000e). Differences in attitudes toward the health care system, accessibility (cultural, geographic, linguistic, financial), appropriateness and comprehensibility were considered to be particularly important barriers for immigrant women (Vissandjee et al., 1998; Hyman & Guruge, 2000; Mailloux & Mulvihill, 2000). Discrimination represented a critical barrier for visible minority immigrants and could have an impact on the quality of care provided (Beiser et al., 1993). Cultural and linguistic factors were identified as a major problem for ethnic seniors, and often led to inappropriate treatment, extended hospital stays and premature discharge (Saldov, 1991; Meier et al., 1997). As well, immigrants who lacked fluency in the official languages were less likely to be exposed to public health promotion programs (since most health promotion materials are available only in English or French).

Research Gaps

The organization of health services and approaches to health services delivery have a major impact on immigrants' patterns of HSU. Less research in Canada has been devoted to the identification and evaluation of culturally appropriate systems of care (e.g. health care delivery models, institutional reforms, health promotion strategies).

At the present time, health and social services in Canada respond to diversity using three types of delivery models:

1. multicultural mainstream services that enhance the cultural appropriateness of their services by providing cultural sensitivity training, recruiting bilingual/bicultural workers, and engaging in outreach efforts;
2. parallel services provided by immigrant and ethnocultural organizations to their own communities; and
3. multicultural health services, provided by independent agencies, developed to serve the needs of broad ethnic categories rather than specific immigrant or cultural groups.

However, none of these models is without fault. Many of the barriers that limit the accessibility of mainstream services have already been identified (e.g. inadequate interpreter services, Euro-centric orientation, cultural insensitivity, lack of awareness, utilization of existing social networks) (Landrine & Klonoff, 1994; Stephenson, 1995; Millet et al., 1996; Edman & Kameoka, 1997; Laroche, 2000). Parallel services are typically underfunded, staffed by non-professional volunteers, and incapable of providing specialized services (e.g. mental health) to community members. Multicultural services often function under the assumption that immigrants as diverse as Africans and Southeast Asians form coherent groups whose needs can be met through one organization (Matsuoka & Sorenson, 1991). Kliewer and Jones (1997) further caution that none of these models specifically addresses the major determinants of immigrant health, such as social isolation and socio-economic disadvantage.

Many of the key features of successful models of care have been identified by the Symposium on Models of Care in a Pluralistic Canada and other researchers. These include the encouragement of local initiatives, community involvement and community development (Barwick & Campbell, 1993; Matuk, 1996c; Meier et al., 1997). However, Canadian research on exemplary models of service delivery has been scant.

At the institutional level, many Canadian hospitals are responding to diversity by adopting programs of institutional change. These programs have been designed to address policies and structures, education and training, communications, human resources, programs and services, and research and knowledge base. A detailed description of these programs is beyond the scope of this report, but recommended policy changes have included:

- partnership approaches;
- increased representativeness of staff at all levels;
- staff training in cultural competency and anti-racism;
- the development of institutional environments that are non-racist, approachable, and welcoming to all clients;
- community education using linguistically and culturally appropriate formats (e.g. community-based centres, newspapers, radio stations); and
- the development of culturally appropriate assessment tools and treatment models.

(United Way of Greater Toronto, 1991; York Regional Multicultural Tri-Hospital Project, 1993; Hastings Institute, 1994).

However, the effectiveness and impact of institutional change on service accessibility and satisfaction has not been routinely assessed. For example, health outcomes, patient satisfaction and cost-effectiveness could be used to measure the quality of culturally and linguistically competent care. Standards for interpretation services could be based on empirical evidence that demonstrates that certain aspects of the translation result in better outcomes (Pérez-Stable & Nápoles-Springer, 2000).

Finally, health promotion has been identified as critical to preventing the adoption of health-risk behaviours and maintaining health-enhancing behaviours in immigrant groups (Matuk, 1996c). However, it cannot be assumed that health promotion strategies grounded in majority culture-based research apply equally well to immigrant populations for whom cultural, linguistic, economic and informational barriers and access factors influence health choices (Choudhry, 1998; Vissandjee et al., 1998).

In a recent critical appraisal of the health behaviour literature conducted for the Ontario Ministry of Health and Long-Term Care, specific attention was given to the identification of theoretical constructs and health promotion strategies appropriate for new immigrant women (Hyman, 1999). Among the successful health promotion programs identified were strategies that included the community in the development, planning and delivery of the health promotion programs, outreach strategies that used culturally and linguistically appropriate educational materials, and multiple settings for program delivery. Other promising approaches involved the use of link or lay leaders (trained personnel from different immigrant communities) to increase the relevancy of health messages, and a recognition that health choices are often a rational response to real pressures associated with gender, race and class inequity (Nakyonyi, 1993; Haitt et al., 1996; Kernohan, 1996; Bird et al., 1998).

At the present time, little research has been conducted in Canada on the relevancy and applicability of commonly used theoretical models and health promotion strategies for immigrant populations.

Policy Implications and Future Research Directions

There has been a great deal of public debate regarding whether or not immigrants represent a burden to Canada's social welfare system. Some believe immigrants experience more health problems than native-born Canadians and take unfair advantage of Canada's universal health care system. Others claim that immigrants threaten the health of Canadians by bringing infectious diseases (e.g. TB, AIDS) into the country. By contrast, the healthy immigrant effect identified in other countries holds that immigrants, particularly recent arrivals, enjoy many health advantages over long-term immigrants and the native-born population of the host country. If this effect exists in Canada, it would counter the "overuse" perception and may point to new directions for the screening of immigrants for health problems that may potentially place excessive demands on the system. As well, evidence of the deterioration of immigrant health status over time suggests the need to direct funding toward the maintenance and promotion of immigrant health.

Evidence

Finding evidence of the healthy immigrant effect was hampered by a marked paucity of routinely gathered data on immigrant health in Canada. Much of the evidence came from research institutions and individual researchers using health survey data collected for other purposes and/or small-scale studies using different methodologies and reflecting different interests and objectives.

Important distinctions were noted by type of health outcome. For example, differences were observed between chronic and infectious diseases. The literature suggested that most immigrants with infectious diseases experienced improvements in health status over time, given appropriate treatment and follow-up. However, the likelihood of developing chronic diseases was highly dependent on acculturation-related changes in determinants of health — notably income, employment, health practices and social resources.

Other important differences in health outcomes were observed among immigrant sub-groups. Among South Asian immigrants, for example, there was strong evidence of heart disease being a critical problem, while refugee youth were at increased risk for mental health problems.

Evidence of HSU presented a paradox. Contrary to popular belief, there was no evidence that immigrants overutilized health care services as a whole. Rather, similar patterns of HSU were observed in immigrants and non-immigrants, and underutilization was seen in the use of preventive and mental health services. Again, important differences were apparent among immigrant sub-groups (e.g. there was some evidence that the HSU of recent immigrants was lower than for long-term immigrants).

It was also apparent that, in Canada, little attention has been given to the organization of health services for immigrants. In particular, there was a notable lack of research on culturally appropriate systems of care (e.g. health care delivery models, institutional reforms and health promotion strategies).

Policy Implications

The critical questions for policy makers as a result of these findings are:

3. What conditions (determinants of health) contribute to changes in the health status of immigrants over time?
4. How can government programs and services help to maintain and promote the health status of immigrants over time?

With respect to the first question, it is important to recognize that the health of immigrants is largely shaped by environment and living conditions, and may change in response to pressures associated with poverty, marginalization and class inequity. Although no Canadian studies specifically examined housing, there was a clear relationship between determinants of health such as income and employment, and ill health. This is particularly true in the case of infectious diseases such as TB. New immigrants, on average, have lower incomes than long-term immigrants and the native-born population due to factors such as underemployment and the lack of recognition of foreign credentials, and are therefore more likely to live in substandard housing.

It is evident that multisectoral approaches are needed to promote and sustain good health, which in Canada requires the cooperation and coordination of different levels of government. Settlement services (federal), for example, need to broaden their scope to address the determinants of health identified in this review, to coordinate and support services provided by provincial and municipal levels of government, and to ensure communication and information sharing between all jurisdictions.

Other findings highlight the critical role of social support in promoting and sustaining the health and well-being of immigrants and their families. Policy makers need to re-evaluate policies that limit family reunification and immigrants' choice of where to reside. Public education and social legislation efforts are also necessary to improve the image and value of immigrants in Canadian society, based on current research linking host country attitudes and mental health.

Finally, some evidence suggests that programs and policies that empower immigrant groups to develop and maintain their own ethno-specific institutions and health-promoting practices have positive long-term effects.

Regarding the second question, although the evidence that immigrants use health services (particularly mental and preventive health services) less than the Canadian-born population may be viewed as a positive finding, it may also reflect the inadequacy of present services in meeting these needs, rather than the superior health status of immigrants. Removing barriers to services is of particular importance in the area of infectious diseases such as HIV/AIDS and TB because with early intervention and treatment these conditions can be controlled. Improved communication between federal and provincial levels of government would help to ensure that immigrants at highest risk of TB receive appropriate treatment and follow-up. However, efforts must be made to reduce some of the "bureaucracy" immigrants and refugees presently encounter in the receipt of health care.

The literature also indicated that improvements in the accessibility, appropriateness and comprehensiveness of health services would help to ensure the continued good health of new immigrants and to reduce the development of long-term chronic diseases such as diabetes, cancer and heart disease. Funding for health programs focusing on immigrant health promotion, maternal and child health, and screening (e.g. PTSD) is key to identifying and implementing effective solutions. Food security programs may help to combat the impact of poverty and change in environment.

Findings further suggest that a selective approach is called for to address the needs of immigrant sub-groups, which are most likely to experience socio-economic disadvantages and associated health problems, namely, refugees and women. Increased funding for specialized public health support is indicated, especially during the first five years. Policies that facilitate better integration, especially of children and youth, may prevent the looming problem of substance abuse observed in other countries.

Finally, many individuals in Canada rely on alternative providers, including religious and traditional practitioners, to manage their health problems. Although empirical evidence was limited, much of the research suggests that strengthening community-based resources and building communities' capacity to address health issues are very promising strategies.

Future Research

While much of the evidence reviewed in this report supports the existence of a healthy immigrant effect in Canada with respect to chronic diseases, it was difficult to draw firm conclusions regarding this effect for many health outcomes and within most immigrant sub-groups. More research is needed to better answer questions about whether the health status of immigrants is improving, how health determinants change over time, and the effect of acculturation on health. It is recommended that steps be taken to strengthen existing databases and develop new databases on immigration and health in Canada.

At present, most national and provincial surveys collect some immigration and ethnicity-related information (e.g. country of birth, length of stay in Canada, ethnicity, language proficiency). However, immigrants, particularly new immigrants and immigrants who do not speak English or French, are usually underrepresented in population sampling frames. Other features that limit the utility of population surveys to examine changes in immigrant health were discussed in the Overview section. It is recommended that national and provincial surveys attempt to increase the amount of information available on immigrants by over sampling immigrant sub-groups and conducting interviews in languages other than English and French. Better collaboration between federal and provincial data collection systems would also facilitate micro-level comparisons in disease indicators (e.g. rates of TB).

Many Canadian databases, including vital statistics, cancer registries and hospital records, collect only minimal or no immigration and ethnicity-related information. It is recommended that discussions be initiated with government and community stakeholders regarding the inclusion of information on country of birth, length of stay in Canada, ethnicity and language fluency for health planning purposes. Policies and procedures to maintain the confidentiality of this information would have to be put in place.

Kliewer and Kazanjian (2000) demonstrated the feasibility of linking provincial health records for hospital discharges and physician claims with the Citizenship and Immigration Canada database. It is recommended that this type of record linkage, permitting the examination of the health status and HSU of recently arrived immigrants to Canada over time, be continued and expanded to include all Canadian provinces.

Most of the existing databases in Canada cannot be used to examine changes in health status, determinants of health or HSU of immigrants over time, or specific health outcomes of immigrant sub-groups. It is recommended that new databases be developed to enhance existing information on immigrant health in Canada. These should include, but not be limited to:

- longitudinal studies, to provide rich information on the health status and health determinants of immigrants over time. LSIC, currently being conducted by Statistics Canada and Citizenship and Immigration Canada, will provide an excellent source of information on the mental, physical and oral health and HSU of immigrants at 6 months, 2 years and 4 years after arriving in Canada. Some of the questions included in this survey parallel information collected by the NPHS; however, questions on health behaviours and health screening practices do not appear at present. The LSIC will also provide valuable information on determinants of health such as income, employment and social networks. Sample sizes will permit comparisons to be made between immigrant classes, provinces and regions of origin (Statistics Canada, 2001);
- research within specific immigrant communities to address health problems and needs of specific immigrant groups, as well as the personal and social resources used to deal with adversity and successfully adapt to their new environment;
- multi-method studies (which combine both quantitative and qualitative approaches to data collection), to document the extent of a health problem within immigrant communities and further our knowledge and understanding of health and health behaviours within different immigrant groups; and
- interdisciplinary research approaches.

Appendix 1:
Biographical Sketches — Research Team Members

Farah Ahmad, MBBS (Medical Doctor), MPH (International Health), is a Research Associate in the University Health Network Women's Health Program (UHNWHP). Dr. Ahmad is a public health researcher with a primary focus on preventive health behaviours and related social factors. Her recent projects on mainstream and ethnic women include promotion of breast cancer screening, incentives and barriers to cancer screening and gender preferences for family physicians. Her experience in health behaviours and health practices of immigrants stems from medical practice (Pakistan) and previous research on immigrants' health (Austria and Canada).

Catherine Chalin, PhD, is an Associate Professor in the Department of Public Health Sciences at the University of Toronto. She has spent many years working in international settings with women, children, political prisoners, dissidents and their families. She has also worked as an advisor and consultant on numerous projects addressing the health needs of immigrants and refugees in Canada.

Angela M. Cheung, MD, PhD (Health Policy), FRCP(C), is an Assistant Professor in the Departments of Medicine, Public Health Sciences and Health Administration at the University of Toronto. She is also Associate Director of the UHNWHP and serves as a consultant to the Ontario Ministry of Health on women's health issues. Her research interests are in the area of postmenopausal health, especially as they relate to the prevention of breast cancer, osteoporosis and cardiovascular diseases. Her recent projects include health behaviours in Chinese immigrants, risk and preference assessments and informed medical decision making.

Michael Gardam, MSc, MD, CM, FRCP(C), is Medical Director of the Multidisciplinary Tuberculosis Clinic at the Toronto Western Hospital and an Infectious Disease Specialist and Associate Hospital Epidemiologist at the University Health Network. He is also a Lecturer in the Faculty of Medicine at the University of Toronto. His research interests include the epidemiology of TB in immigrants and refugees and analysis of health care delivery models to treat TB in this population.

Ilene Hyman, PhD (Public Health), is a Research Scientist at the Centre for Research in Women's Health, Sunnybrook and Women's College Health Sciences and an Assistant Professor in the Department of Public Health Sciences at the University of Toronto. Her doctoral and post-doctoral research both focused on acculturation, addressing methodological issues as well as exploring the mechanisms through which acculturation affects health status and health behaviours. She recently completed a literature review for the Ontario Ministry of Health and Long-Term Care on best mechanisms to influence health behaviour in women, which had a special focus on immigrant women. Current research projects include studies of mental health among Ethiopian immigrants and barriers to cancer screening and preventive health services for immigrant women in Toronto.

Nazilla Khanlou, RN, PhD, is an Assistant Professor in the Faculty of Nursing at the University of Toronto and a Research Scientist with the Culture and Community Health Studies (CCHS) program of the Centre for Addiction and Mental Health (CAMH). Her clinical background is in psychiatric nursing. Dr. Khanlou's research interests are centred around mental health promotion among youth, with a focus on self-esteem development and cultural identity formation among adolescents who live within multicultural contexts and the role of gender, migration and culture.

Heather Maclean, EdD, is the Director of the Centre for Research in Women's Health at the University of Toronto and the Sunnybrook and Women's Health Sciences Centre. She is also an Associate Professor in the Department of Nutritional Sciences, Family and Community Medicine, Public Health Sciences, Health Administration and the Faculty of Nursing. Her area of research is psychosocial influences on health, behaviour, self-care and women's health.

Joanna Rummens, PhD, is a multilingual anthropologist and sociologist whose research focuses primarily on identity issues. She is an Assistant Professor with the Department of Psychiatry, Faculty of Medicine, at the University of Toronto and a Research Scientist in CCHS. Her current research focuses on identity formation and negotiation among newcomer immigrant and refugee youth. She is also a Research Associate with and former Academic Coordinator of CERIS in Toronto.

Laura Simich, PhD, is an anthropologist with CCHS. Her research interests include social determinants of health, psychosocial wellness, and the use of using qualitative research to enhance evidence-based policy making for immigrant and refugee populations. She has extensive experience in immigration and settlement processes and supports, settlement service provision, and access and equity in health and social services.

Research Assistant

Kamlesh Minocha has a BSc in Life Sciences and a BA in Sociology from McMaster University, and an MSc in Planning from the Department of Geography at the University of Toronto. She has experience in health care and social services consulting, both at system-wide and provider levels. Ms. Minocha is currently a Client Services Manager at THiiNC Information Management Inc., a service company providing a broad range of health information services to health care providers, governments and other health care stakeholders.

Appendix 2:
Description of Collaborating Institutions

Centre for Research in Women's Health (CRWH) — The CRWH is a partnership of the University of Toronto and the Sunnybrook and Women's Health Sciences Centre. Established in 1996, the CRWH conducts and fosters research in all aspects of women's health and receives $10 million per year in research grants. It is committed to excellence in research, bridging social science and biomedical research and translating and disseminating research findings for a range of user groups. Members of the CRWH span all disciplines and sectors and many research programs have close ties with community groups.

Culture and Community Health Studies (CCHS) — Centre for Addiction and Mental Health (Clarke Division) — CCHS is a research, training and outreach program focusing on the health of immigrants, refugees and First Nations peoples, cultural influences on the expression and course of illness, and developing models of care for a pluralistic society. The CCHS interdisciplinary team consists of experts in the fields of cross-cultural psychiatry, epidemiology, sociology and cultural psychology.

Department of Public Health Sciences - Faculty of Medicine, University of Toronto — The Department of Public Health Sciences was formed through a merger of the Department of Behavioural Science and the Department of Preventive Medicine and Biostatistics. The department draws upon the expertise of a core group of faculty members who focus on multicultural and inner-city health issues. The department is also affiliated with the Centre for Health Promotion, and is committed to improving the health and well-being of Canadians through basic and applied health promotion research, education and service.

University Health Network Women's Health Program (UHNWHP) — UHNWHP is involved in local, provincial, national and international projects related to women's health. Initiated in 1994, it is a multidisciplinary program dedicated to health research, health promotion, education, health services, and policy in women's health. The program has expertise in the area of multicultural health research. It has been involved in studies of barriers and incentives to cancer screening among Tamil, Caribbean, Chinese and Vietnamese women. Other projects have addressed health beliefs and behaviour of Hispanic, Italian, Indian and Pakistani women.

Glossary

Acculturation	…a multidimensional process, resulting from intergroup contact, in which individuals whose primary learning has been in one culture take over characteristic ways of living (attitudes, values and behaviour) from another culture (Hazuda et al., 1988)
Age-standardized mortality rates (SMRs)	…a summary statistic that takes into account differences in the age composition of the populations being compared by applying the age-specific mortality rates of the populations being compared to a "standard population"
Body mass index (BMI)	…a valid measurement of weight in relation to height. BMIs can be estimated on a chart by locating the point where height and weight intersect or calculated using the following formula: BMI = weight(kg)/height(m2).

BMI	**Health Effects**
< 20	May be associated with health problems for some people
20–25	Good weight for most people
25–27	May lead to health problems in some people
>27	Increased risk of developing health problems

Business immigrants	…entrepreneurs, investors and self-employed persons who will make a significant economic contribution by establishing, purchasing or investing in a business or commercial venture in Canada, with their spouses and children.
Census	…a government's official count of all members of a population
Complementary/ alternative medical services (CAM)	…a broad domain of healing resources that encompasses all health systems, modalities and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period
Convention refugee	…someone who has been found to fear persecution in his or her country of origin because of race, religion, nationality, membership in a social group or political opinion. In Canada, the Immigration and Refugee Board (IRB), Convention Refugee Determination Division (CRDD), decides who is a Convention refugee.

Cross-sectional study	…a type of study in which observations (i.e. measurements of cause and effect) are made at the same point in time. For example, population health surveys (e.g. National Population Health Survey) are usually cross-sectional.
Determinants of health	…at every stage of life, health is determined by complex interactions between social and economic factors, the physical environment and individual behaviour. These factors are referred to as determinants of health. According to Health Canada's Population Health framework, determinants of health include Income and Social Status, Social Support Networks, Education, Employment/Working Conditions, Social Environments, Physical Environments, Personal Health Practices and Coping Skills, Healthy Child Development, Biology and Genetic Endowment, Health Services, Gender and Culture.
Excessive demand	…the significant burden placed on Canada's health or social services due to ongoing hospitalization or medical, social or institutional care for physical or mental illnesses, or special education or training. Individuals may be denied admittance to Canada due to the high costs of their care.
Family immigrant class	…relatives of a Canadian or permanent resident who is at least 18 years of age and has agreed to provide for lodging, care and maintenance of said family members for a period of up to 10 years
Health service utilization (HSU)	…the degree to which a community accesses available health services. In this report, HSU was broadly defined to include medical services (e.g. physician and specialist consultations, hospital use), mental health services, preventive health services and complementary/alternative medical services (CAM).
Healthy immigrant effect	…the observation that immigrants, particularly recent arrivals, often enjoy health advantages over long-term immigrants and the native-born population
Immigrant	…a person who comes to settle in Canada as a permanent resident.
Incidence	…the number of new cases of a disease in a defined population during a specified period of time
Independent immigrant class (skilled/business)	…retirees, entrepreneurs, investors and others applying on their own initiative, and assisted relatives (immigrants, other than members of the family class, with close relatives in Canada)

Indicator	…an indirect measure of an event or condition (e.g. a baby's weight-for-age is an indicator of the baby's nutritional status). A population health approach recognizes that any analysis of the health of the population must extend beyond an assessment of traditional health status indicators like death, disease and disability. A population health approach establishes indicators related to mental and social well-being, quality of life, life satisfaction, income, employment and working conditions, education and other factors known to influence health.
Infant mortality rate	…the number of deaths in the first year of life per 1,000 live births
Latency	…the period of time elapsed between exposure to a disease-causing agent or process and the appearance of symptoms
Longitudinal study	…a type of study in which observations of cause and effect are made at two or more different points in time
Low birthweight (LBW)	…infants weighing 2500 grams or less at birth; a significant contributor to perinatal morbidity and mortality
Mainstream	…characteristic of the established, general community
Mental health	…refers both to mental disorders and positive mental health
Morbidity	…disease
Mortality	…death
Perinatal	…early infancy
Perinatal mortality rate	…number of deaths in the first seven days after delivery per 1,000 live births
Potential years of life lost (PYLL)	…a measure giving emphasis to those conditions causing death in younger age groups, quantified as (number of deaths from cause) x (70 - age at death)
Prevalence	…the total number of cases of a disease in a defined population at a specified point in time
Refugee	…*See Convention refugee.*
Refugee claimant	…a person who has arrived in Canada and who requests refugee status. If a refugee claimant receives a final determination that he or she has been determined to be a Convention refugee, he or she may then apply for permanent residence.

Relative risk (RR)	…the incidence of a disease in an exposed group versus the incidence of that disease in a non-exposed group (e.g. the RR of smokers vs. non-smokers re: developing lung cancer is 4.0 [or “four times” the risk]). An RR of 1.0 means there is no risk associated with a factor.
Risk factor	…a characteristic of an individual or group associated with an increased chance of disease or death
Screening	…the presumptive identification of unrecognized disease or defect by the application of tests, examinations or other procedures which can be applied rapidly to sort out apparently well persons who probably have a disease from those who probably do not. Persons with positive or suspicious findings must be referred to their physician for diagnosis and necessary treatment.
Skilled workers	…immigrants selected for their suitability for the Canadian labour force, with their spouses and children
Standardized mortality ratio	…a summary rate in which statistical procedures are applied to remove the effect of differences, usually age, between the two populations being compared. It is defined as the sum of number of deaths occurring within a given age group expressed as a percentage of deaths that might have been expected to occur within each age group for a standard population.
Surveillance	…the collection of information about cases of disease
Underemployment	…work that does not fully use a person’s abilities, especially when the work is not in the trade or profession for which the person was trained
Visitor	…someone who has been lawfully admitted to Canada and who is in Canada as a tourist, student or worker

References

Acevedo, M. 2000. The role of acculturation in explaining ethnic differences in the prenatal health-risk behaviours, mental health, and parenting beliefs of Mexican American and European American at-risk women. *Child Abuse & Neglect* 24(1): 111–127.

Adler, P.S. 1975. The transitional experience: An alternative view of culture shock. *Journal of Humanistic Psychology* 15(4): 13–23.

Adrien, A., Godin, G., Cappon, P., Manson-Singer, S., Maticka-Tyndale, E., & Willms, D. 1996. Overview of the Canadian study on the determinants of ethnoculturally specific behaviours related to HIV/AIDS. *Canadian Journal of Public Health* 81(Suppl 1): S4–S10.

Alvidrez, J., Azocar, F., & Miranda, J. 1996. Demystifying the concept of ethnicity for psychotherapy researchers. *Journal of Consulting and Clinical Psychology* 64(5): 903–908.

Anand, S., Yusuf, S., Vuksan, V., & Devanesen, S. 2000. Differences in risk factors, atherosclerosis, and cardiovascular disease between ethnic groups in Canada: The Study of Health Assessment and Risk in Ethnic groups (SHARE). *The Lancet* 356: 279–284.

Andersen, R., & Newman, J.F. 1973. Societal and individual determinants of medical care utilization in the United States. *Milbank Memorial Fund Quarterly* 51: 95–124.

Anderson, J., Moeschberger, M., Chen, M.S., Jr., Kunn, P., Wewers, M.E., & Guthrie, R. 1993. An acculturation scale for Southeast Asians. *Social Psychiatry and Psychiatric Epidemiology* 28(3): 134–141.

Anisef, P., & Kilbride, K.M. 2001. *The Needs of Newcomer Youth and Emerging "Best Practices" to Meet Those Needs - Final Report*. Settlement Directorate, Ontario Region, Citizenship and Immigration Canada, from the Joint Centre of Excellence for Research on Immigration and Settlement, Toronto. http://ceris.metropolis.net

Aponte, J.F., & Barnes, J.M. 1995. Impact of acculturation and moderator variables on the intervention and treatment of ethnic groups. In J.F. Aponte, R.Y. River, & J. Wohl (eds.), *Psychological Interventions and Cultural Diversity*, 19–39. Boston: Allyn & Bacon.

Araki, H., Watanabe, H., Mishina, T., & Nakao, M. 1983. High-risk group for benign prostatic hypertrophy. *Prostate* 4: 253–264.

Auslander, W.F., Thompson, S.J., Dreitzer, D., & Santiago, J.V. 1997. Mother's satisfaction with medical care: Perceptions of racism, family stress, and medical outcomes in children with diabetes. *Health and Social Work* 23(3): 190–199.

Aycan, Z., & Berry, J.W. 1996. Impact of employment-related experiences on immigrants' psychological well-being and adaptation to Canada. *Canadian Journal of Behavioural Science* 28(3): 240–251.

Bagheri, A. 1992. Psychiatric problems among Iranian immigrants in Canada. *Canadian Journal of Psychiatry/Revue canadienne de psychiatrie* 37(1): 7–11.

Balajaran, R., & Botting, B. 1989. Perinatal mortality in England and Wales: Variations by mother's country of birth. *Health Trends* 51: 79–84.

Balzi, D., Geddes, A., Brancker, A., & Parkin, D.M. 1995. Cancer mortality in Italian immigrants and their offspring in Canada. *Cancer Causes and Control* 6(1): 68–74.

Barudy, J. 1989. A program of mental health for political refugees: Dealing with the invisible pain of political exile. *Social Science & Medicine* 28(7): 715–727.

Barwick, C., & Campbell, J. 1993. *Implementing a Shared Vision: A Symposium on Models of Care in a Pluralistic Canada*. Toronto: Culture, Community, and Health Studies, Centre for Addiction and Mental Health, Faculty of Medicine, University of Toronto.

Battaglini, A., Fortin, A., Heneman, B., Laurendeau, M.C., & Tousignant, M. 1997. *Bilan des interventions en soutien parental et en stimulation infantile auprès de clientèles pluriethniques*. Direction de la santé publique de Montréal-Centre, Rapport de recherche.

Battaglini, A., Gravel, S., Poulin, C., Brodeur, J., Duranc, D., & DeBlois, S. 1999. *Identification des facteurs de vulnerabilité propres aux mères immigrantes en periode périnatale*. Projet CESAF.

Beiser, M. 1988. Influences of time, ethnicity, and attachment on depression in Southeast Asian refugees. *American Journal of Psychiatry* 145: 46–51.

_____. 1990. Migration: Opportunity or mental health risk. *Triangle* 29(2/3): 83–90.

_____. 1999. *Strangers at the Gate: The "Boat People's" First Ten Years in Canada*. Toronto: University of Toronto Press.

Beiser, M., Cargo, M., & Woodbury, M.A. 1994. A comparison of psychiatric disorder in different cultures: Depressive typologies in Southeast Asian refugees and resident Canadians. *International Journal of Methods in Psychiatric Research* 4: 157–179.

Beiser, M., Devins, G., Dion, R., Hyman, I., & Lin, E. 1997. *Immigration, Acculturation and Health. Final Report*. Ottawa: National Health Research and Development Program.

Beiser, M., Dion, R., Gotowiec, A., Hyman, I., & Vu, N. 1995. Immigrant and refugee children in Canada. *Canadian Journal of Psychiatry/Revue canadienne de psychiatrie* 40(2): 67–72.

Beiser, M., Gill, K., & Edwards, R.G. 1993. Mental health care in Canada: Is it accessible and equal? *Canada's Mental Health* 41(2): 2–7.

Beiser, M., & Hou, F. In press. “A Longitudinal Study of Acculturation, Perceived Prejudice and Depression Among Southeast Asian Refugees in Canada.” Working document. Culture, Community and Health Studies, Centre for Addiction and Mental Health, Faculty of Medicine, University of Toronto.

Beiser, M., Hou, F., Hyman, I., & Tousignant, M. In press. Family process and the mental health of new immigrant children. *American Journal of Public Health*.

Beiser, M., & Hyman, I. 1997. Southeast Asian Refugees in Canada. In I. Al-Issa & M. Tousignant (eds.), *Ethnicity, Immigration, and Psychopathology*, 35–56. New York: Plenum Press.

_____. 1998. *The Mental Health of Southeast Asian Refugee Youth in Canada: The Determinants of Risk and Resilience*. Final Report. Ottawa: Health Canada. NHRDP project No. 6606-5065-63.

Beiser, M., Turner, R.J., & Ganesan, S. 1989. Catastrophic stress and factors affecting its consequences among Southeast Asian refugees. *Social Science & Medicine* 28: 183–195.

Berkanovic, E., & Reeder, L.G. 1973. Ethnic, economic and social psychological factors in the source of medical care. *Social Problems* 21: 246–259.

Berry, J.W. 1997. Immigration, acculturation and adaptation. *Applied Psychology: An International Review* 46(1): 5–34.

_____. 1995. Psychology of Acculturation. In N.R. Goldberg & J.B. Veroff (eds.), *The Culture & Psychology Reader*, 457–488. New York: New York University Press.

Berry, J.W., Trimble, J.E., & Olmedo, E.L. 1986. Assessment of acculturation. In W.J. Lonner & J.W. Berry (eds.), *Field Methods in Cross-Cultural Research*, 291–327. Beverley Hills, Calif.: Sage.

Binkin, N.J., Zuber, P.L., Wells, C.D., Tipple, M.A., & Castro, K.G. 1996. Overseas screening for tuberculosis in immigrants and refugees to the United States: Current status. *Clinical Infectious Diseases* 23(6): 1226–1232.

Bird, J.A., McPhee., S.J., Ha, N.T., Le, B., Davis, T., & Jenkins, C.N. 1998. Opening pathways to cancer screening for Vietnamese-American women. *Preventive Medicine* 27(6): 821–829.

Boehnlein, J.K., & Kinzie, J.D. 1995. Refugee trauma. *Transcultural Psychiatric Research Review* 32: 223–252.

Boon, H.S., & Wong, A.H.C. In press. Complementary medicine use among ethnic minority groups and recent Canadian immigrants. In J. Rummens, M. Beiser, & S. Noh (eds.), *Immigration, Health and Ethnicity*. Toronto: University of Toronto Press.

Bottorff, J.L., Johnson, J.L., Bhagat, R., Grewal, S., Balneaves, L.G., Clarke, H., & Hilton, B.A. 1998. Beliefs related to breast health practices: The perceptions of South Asian women living in Canada. *Social Science & Medicine* 47(12): 2075–2085.

Brancker, A. 1991. Tuberculosis in Canada, 1989. *Health Reports* 3(1): 82–96.

Burnam, M.A., Hough, R.L., Karno, M., Escobar, J.I., & Telles, C.A. 1987a. Acculturation and lifetime prevalence of psychiatric disorders among Mexican Americans in Los Angeles. *Journal of Health and Social Behavior* 28: 89–102.

Burnam, M.A., Telles, C.A., Karno, M., Hough, R.L., Escobar, J.I. 1987b. Measurement of acculturation in a community population of Mexican Americans. *Hispanic Journal of Behavioral Sciences* 9(2): 105–130.

Cabral, H., Fried, L.E., & Levenson, S. 1990. Foreign-born and US-born Black women: Differences in health behaviours and birth outcomes. *American Journal of Public Health* 80: 70–72.

Cairney, J., & Ostbye, T. 1999. Time since immigration and excess body weight. *Canadian Journal of Public Health* 90(2): 120–124.

Calzavara, L., Tharao, E., & Myers, T. 2000. *HIV/AIDS in East African Communities Living in Toronto: Results of a Feasibility Study, Final Report*. Toronto: HIV Social, Behavioural and Epidemiological Studies Unit, Faculty of Medicine, University of Toronto.

Canadian Council on Multicultural Health. 1989. Proceedings of the Canadian Council on Multicultural Health. In: *First Nations Conference*. Toronto: Author.

Canadian Task Force on Mental Health Issues Affecting Immigrants and Refugees. 1988. *After the Door Has Opened: Mental Health Issues Affecting Immigrants and Refugees*. Ottawa: Minister of Supply and Services Canada.

Cancer Care Ontario. 2000. *Cancer Incidence and Mortality in Ontario, 1964–1996*. Cancer Care Ontario.

Carballo, M., Divino, J.J., & Zeric, D. 1998. Migration and health in the European Union. *Tropical Medicine and International Health* 3(12): 936–944.

Cardoso, M.A., Hamada, G.S., de Souza, J.M., Tsugane, S., & Tokudome, S. 1997. Dietary patterns in Japanese migrants to southeastern Brazil and their descendants. *American Journal of Epidemiology* 7:198–204.

Chavez, L., Cornelius, W., & Jones, O. 1985. Mexican immigrants and the utilization of U.S. health services: The case of San Diego. *Social Science & Medicine* 21(1): 93–102.

Chen, J., Ng, E., & Wilkins, R. 1996a. The health of Canada's immigrants in 1994–95. *Health Reports* 7(4): 33–45.

_____. 1996b. Health expectancy by immigrant status. *Health Reports* 8(3): 29–37.

Cheung, Y.W. 1993. Ethnic identification and alcohol use among Canadian-born and foreign-born high school students in Toronto. *International Journal of Aging & Human Development* 28(11): 1095–1109.

Chi-Ying Chung, R., & Kagawa-Singer, M. 1993. Predictors of psychological distress among Southeast Asian refugees. *Social Science & Medicine* 36(5): 631–639.

Chitty, L.S. & Winter, R.M. 1989. Perinatal mortality in different ethnic groups. *Archive of Disease in Childhood* 64(7): 1036–1041.

Choudhry, U.K. 1998. Health promotion among immigrant women from India living in Canada. *Image - The Journal of Nursing Scholarship* 30(3): 269–274.

Citizenship and Immigration Canada. 1998. *The Canadian Immigration System*. Ottawa: Minister of Public Works and Government Services Canada.

_____. 1999. *Citizenship and Immigration Statistics*, 1996. Ottawa: Minister of Public Works and Government Services Canada.

_____. 2000. *Facts and Figures 1999, Immigration Overview*. Ottawa: Minister of Public Works and Government Services Canada.

_____. 2001. "A Report on the Experience of Sponsors of Kosovar Refugees in Ontario." Unpublished report conducted by the Centre for Refugee Studies, York University and the Joint Centre of Excellence for Research on Immigration and Settlement (CERIS), April.

Clinton-Davis, L., & Fassil, Y. 1992. Health and social problems of refugees. *Social Science & Medicine* 35(4): 507–513.

Cortes, D.E., Rogler, L.H., & Malgady, R.G. 1994. Biculturality among Puerto Rican adults in the United States. *American Journal of Community Psychology* 22(5): 707–721.

Cousineau, D. 1991. Relation être la santé globale et la consommation des soins chez les immigrants du Québec. *Revue canadienne de santé publique* 82: 341–343.

Cowie, R.L., & Sharpe, J.W. 1998. Tuberculosis among immigrants: Interval from arrival in Canada to diagnosis: A 5-year study in Alberta. *Canadian Medical Association Journal* 158(5): 599–602.

Cuellar, I., Harris, L., & Jasso, R. 1980. An acculturation scale for Mexican American normal and clinical populations. *Hispanic Journal of Behavioral Sciences* 2: 199–217.

Dasgupta, K., Schwartzman, K., Marchand, R., Tennenbaum, T.N., Brassard, P., & Menzies, D. 2000. Comparison of cost effectiveness of tuberculosis screening of close contacts and foreign-born populations. *American Journal of Respiratory Critical Care Medicine* 162: 2079–2086.

Davies, P.D. 1995. Tuberculosis and migration. The Mitchell Lecture 1994 [see comments]. [Review]. *Journal of the Royal College of Physicians of London* 29(2): 113–118.

Decostas, J., & Adrien, A. 1997. Migration and HIV. *AIDS* 11(Suppl A): S77–S84.

DeSantis, L. 1998. Reproductive health. In S. Loue (ed.), *Handbook of Immigrant Health*, 449–475. New York: Plenum Press.

DeVoretz, D. 1995. *Diminishing Returns: The Economics of Immigration Policy*. Toronto: University of Toronto Press.

Dillmann, E., Pablo, R., & Wilson, A. 1993. Patterns of health problems observed among newly arrived refugees to Canada. In Masi, R., Mensah, L., & McLeod, K.A. (eds.), *Health and Cultures. Exploring the Relationships. Vol 2. Programs, Services and Care*, 253–258. Oakville, Ont.: Mosaic Press.

Donovan, J.L. 1984. Ethnicity and health: A research review. *Social Science & Medicine* 19: 663–670.

Donovan, J., d'Espaignet, E., Metron, C., van Ommeren, M. (eds.). 1992. *Immigrants in Australia: A Health Profile*. Canberra: AGPS.

Dossa, P. 1999. *The Narrative Representional of Mental Health*. Vancouver: Research on Immigration and Integration in the Metropolis.

Doucet, H., Baumgarten, M., & Infante-Rivard, C. 1992. Risk of low birthweight and prematurity among foreign-born mothers. *Canadian Journal of Public Health* 83(3): 192–195.

Doucet, H., Fortier, M., Gravel S., et al. 1996. *Méres et mondes*. Montréal: Direction de la santé publique, Régie régionale de la santé et des services sociaux de Montréal-Centre; CLSC Côte-des-Neiges; CLSC René-Cassin.

Dunn, J.R., & Dyck, I. 2000. Social determinants of health in Canada's immigrant population: Results from the National Population Health Survey. *Social Science & Medicine* 51: 1573–1593.

Edman, J.L., & Kameoka, V.A. 1997. Cultural differences in illness schemas: An analysis of Filipino and American illness attributions. *Journal of Cross-Cultural Psychology* 28(3): 252–265.

Edwards, N.C., & Boivin, J.F. 1997. Ethnocultural predictors of postpartum infant-care behaviours among immigrants in Canada. *Ethnicity & Health* 2(3): 169–176.

Erickson, R.V. & Hoang, G.N. 1980. Health problems among Indochinese refugees. *American Journal of Public Health* 70(9): 1003–1006.

Escobar, J.I. 1998. Immigration and mental health: Why are immigrants better off? *Archives of General Psychiatry* 55(9): 781–782.

Federal, Provincial and Territorial Advisory Committee on Population Health. 1999a. *Statistical Report on the Health of Canadians*. Ottawa: Minister of Public Works and Government Services Canada.

_____. 1999b. *Toward a Healthy Future: Second Report on the Health of Canadians*. Ottawa: Minister of Public Works and Government Services Canada.

Flaskerud, J.H. 1984. A comparison of perceptions of problematic behaviour by six minority groups and mental health professionals. *Nursing Research* 33(4): 190–197.

Flaskerud, J.H., & Kim, S. 1999. Health problems of Asian and Latino immigrants. *Nursing Clinics of North America* 34(2): 359–380.

Ford-Jones, L. Associate Professor, Hospital for Sick Children, Toronto, personal communication.

Ford-Jones, L., Kelly, E., Wilk, E., Harding, M.J., Fearon, M., Wallace, E., Feldman, M., Naus, M., Bentsi-Enchill, A., & Members of the Congenital and Perinatal Infections Study Group. 2000. “Hepatitis B Status at Delivery in a Predominantly Immigrant Population.” Presented at the 4th National Immigration Conference.

Fowler, N. 1998. Providing primary health care to immigrants and refugees: The North Hamilton experience. *Canadian Medical Association Journal* 159(4): 388–391.

Franks, F., & Faux, S.A. 1990. Depression, stress, mastery, and social resources in four ethnocultural women’s groups. *Research in Nursing and Health* 13: 283–292.

Fries, C.J., & Menzies, K.S. 2000. Gullible fools or desperate pragmatists? A profile of people who use rejected alternative health care providers. *Canadian Journal of Public Health* 91(3): 217–219.

Friis, R., Yngve, A., & Persson, V. 1998. Review of social epidemiologic research on migrants’ health: Findings, methodological cautions, and theoretical perspectives. *Scandinavian Journal of Social Medicine* 26(3): 173–180.

Fuller-Thomas, E., Lee, J., Lawson, E., Chaudhuri, N., & Thompson, M. 1997. Self-care strategies for managing respiratory illness in south-east Toronto: Life histories of Chinese and Caribbean immigrants. *Canadian Journal of Regional Science* 20(1): 255–268.

Gagnon, A.J., Dougherty, G., Jimenez, V., & Leduc, N. 1999. [abstract] A randomized trial of postpartum care following hospital discharge. *Paediatric Research Program Issues*.

Gardam, Dr. Michael, MD, Medical Director, Tuberculosis Clinic, Associate Hospital Epidemiologist, Division of Infectious Diseases, University Health Network, personal communication.

George, U. 1998. Caring and women of colour: Living the intersecting oppressions of race, class, and gender. In Anonymous (ed.), *Women's Caring*. Oxford University Press.

Ghaemi-Ahmadi, S. 1992. Attitudes toward breast-feeding and infant feeding among Iranian, Afghan, and Southeast Asian immigrant women in the United States: Implications for health and nutrition education. *Journal of the American Dietetic Association* 92: 354–355.

Globerman, S. 1998. *Immigration and Health Care Utilization Patterns in Canada*. Vancouver: Research on Immigration and Integration in the Metropolis.

Goel, V. 1994. Factors associated with cervical cancer screening: Results from the Ontario Health Survey. *Canadian Journal of Public Health* 85: 125–127.

Goel, V., & Mercer, S. 1999. *Factors Associated with Mammography Utilization: Results from the Ontario Health Survey*. Toronto: Institute for Clinical Evaluative Sciences.

Green-Finestone, L., Feldman, W., Heick, H., & Luke, B. 1989. Infant feeding practices and socio-demographic factors in Ottawa-Carleton. *Canadian Journal of Public Health* 80: 173–176.

Greenhalgh, P. 1997. Diabetes in British South Asians: Nature, nurture and culture. *Diabetic Medicine* 14(1): 10–18.

Grenville-Mathers, R., & Clark, J.B. 1979. The development of tuberculosis in Afro-Asian immigrants. *Tubercle* 60: 25–29.

Guarnaccia, P.J., & Lopez, S. 1998. The mental health and adjustment of immigrant and refugee children. *Child and Adolescent Psychiatric Clinics of North America* 7(3): 537–553.

Guttman, M.C. 1999. Ethnicity, alcohol and acculturation. *Social Science & Medicine* 48: 173–184.

Haitt, R.A., Pasick, R.J., Perez-Stable, E.J., McPhee, S.J., Engelstad, L., Lee, M., Sabogal, F., D'Onofrio, C.N., & Stewart, S. 1996. Pathways to early cancer detection in the multiethnic population of the San Francisco Bay Area. *Health Education Quarterly* 23(Suppl).

Hankin, J.H., Kolonel, L., Yano, K., Heilbrun, L., & Nomura, A. 1983. Epidemiology of diet-related diseases in the Japanese migrant population of Hawaii. *Proceedings of the Nutrition Society of Australia* 8: 22–40.

Harlan, L.C., Bersten, A.B., & Kessler, L.G. 1991. Cervical cancer screening: Who is not screened and why? *American Journal of Public Health* 81(7): 885–890.

Hastings Institute. 1994. *A Model for Organizational Change and Working Towards Cultural Competence*.

Hauff, E., & Vaglum, P. 1994. Chronic posttraumatic stress disorder in Vietnamese refugees. A prospective community study of prevalence, course, psychopathology, and stressors. *Journal of Nervous & Mental Disease* 182(2): 85–90.

Hazuda, H.P., Stern, M.P., & Haffner, S.M. 1988. Acculturation and assimilation among Mexican-Americans: Scales and population-based data. *Social Science Quarterly* 69: 687–706.

Health Canada. 1998a. *Metropolis Health Domain Seminar, Final Report*. Ottawa: Author.

_____. 1998b. *Tuberculosis in Canada*. Ottawa: Minister of Health. Cat. H49-108/1998. http://www.hc-sc.gc.ca/hbp/lcdc

_____. 1999. *Breastfeeding in Canada. A Review and Update*. Ottawa: Minister of Health. Cat. H39-335/1998E.

_____. April 2000a. *HIV/AIDS Epi Update: AIDS and HIV in Canada*. Bureau of HIV/AIDS, STD and TB Update Series, Centre for Infectious Disease Prevention and Control. http://www.hc-sc.gc.ca/hpb/lcdc/bah/epi/ahcan_e.html

_____. April 2000b. *HIV/AIDS Epi Update: AIDS and Ethnicity in Canada*. Bureau of HIV/AIDS, STD and TB Update Series, Centre for Infectious Disease Prevention and Control. http://www.hc-sc.gc.ca/hpb/lcdc/bah/epi/hiveth_e.html

_____. November 2000. *HIV/AIDS Epi Update: National HIV Prevalence and Incidence Estimates for 1999: No Evidence of a Decline in Overall Incidence*. Bureau of HIV/AIDS, STD and TB Update Series, Centre for Infectious Disease Prevention and Control. http://www.hc-gc.gc.ca/hpb/lcdc/bah/epi/hivestm99_e.html

Heart and Stroke Foundation of Canada. 1999. *The Changing Face of Heart Disease and Stroke in Canada, 2000*. Ottawa: Author.

Helman, C. 1990. *Culture, Health and Illness*. London: Butterworth Heinemann.

Henneman, B., Legault, G., Gravel, S., Fortin, S., & Alvarado, E. 1994. *Adequation des services aux jeunes familles immigrantes*. Écoles de service social, Université de Montréal et Direction de la santé publique, Rapport de recherche.

Hershfield, E.S., Professor, Dept. of Medicine and Community Health Services, University of Manitoba, and TB consultant to Health Canada and to the World Health Organization, personal communication.

Hersi, A., Elwood, K., Cowie, R.L., & Kunimoto, D.L.R. 1999. Multidrug-resistant tuberculosis in Alberta and British Columbia, 1989 to 1998. *Canadian Respiratory Journal* 6(2): 155–160.

HIVInsite 2000. *Monitoring the AIDS Pandemic, HIV and AIDS in the Americas: An Epidemic with Many Faces*. Joint United Nations Programme on HIV/AIDS, World Health Organization & Pan American Health Organization.

Hopkins, S., Bargetts, B.M., & Armstrong, B.K. 1980. Dietary change among Italians and Australians in Perth. *Community Health Studies* 4: 67–75.

Hughes, L.O., Cruickshanks, J.H., & Wright, E.B. 1989. Disturbances of insulin in British Asian and white men surviving myocardial infarction. *British Medical Journal* 299: 537–541.

Hull, D. 1979. Migration, adaptation, and illness: A review. *Social Science & Medicine* 13A: 25–36.

Huraux-Rendu, C., Attali-Marot, C., & Bourdillon, F. 1984. La migration familiale: a pathologie de la femme migrante et des nouveau-nés, étude des facteurs de risque et recherche de mesures preventives. *Journal de Pathologie des Migrants* 34: 3231–3239.

Hurst, L. 2000, December 3. Immigrants face new screening for disease. *Toronto Star*: A1–A6.

Hyman, I. 1997. *Changes in Health Behaviour Following Immigration — An Acculturation Model*. NHRDP. Final Report — National Health Post-Doctoral Fellowship: File no. 6606-5529-48.

_____. 1999. *Best Mechanisms to Influence Women's Health Behaviour*. Toronto: Report to the Ontario Ministry of Health. Women's Health Council. http://www.womenshealthcouncil.com/E/index.html

Hyman, I., Beiser, M., Noh, S., & Vu, N. 2000a. Perceptions of stress in Southeast Asian refugee youth: Implications for the development of culturally appropriate measures. In F. Ahearn (ed.), *Psychosocial Well-Being of Refugees: Qualitative and Quantitative Research Issues*. New York: Berghahn Books.

Hyman, I., Beiser, M., & Vu, N. 2000b. Post-migration stress among Southeast Asian refugee youth in Canada: Universal, culture-specific and situational. *Journal of Comparative Family Studies* 31(2): 281–294.

Hyman, I., & Dussault, G. 1996. The effect of acculturation on low birthweight in immigrant women. *Canadian Journal of Public Health* 87(3): 158–162.

_____. 2000. Negative consequences of acculturation: Low birthweight in a population of pregnant immigrant women. *Canadian Journal of Public Health* 91(5): 357–361.

Hyman, I., & Guruge, S. 2000. *Health Promotion for Immigrant Women — Findings from a Critical Appraisal. Vancouver: Removing Barriers II — Inclusion, Diversity and Social Justice in Health*. May.

Hyman, I., Guruge, S., Ahmad, F., & Stewart, D.E. 2000c. Primary prevention of violence against women. *Women's Health Issues* 10(6): 288–293.

Hyman, I., Hou, F., Dion, R., & Beiser, M. 1997. *Depression and Mental Health Care Utilization of Immigrants during the Course of Resettlement*. Toronto: Poster at Harvey Stancer Research Day, Centre for Addiction and Mental Health.

Hyman, I., Stewart, D.E., Cameron, J.I., & Singh, M. 2000d. "Physician-Related Determinants of Cervical Cancer Screening among Chinese and Vietnamese Women in Toronto." Ottawa: Canadian Public Health Association Conference, October.

Hyman, I., Peters, C., & Allen, R. 2000e. Community Mapping Initiatives: Caribbean Community in Toronto, Former Yugoslavian Community in Toronto. Final Report of the Ethnoracial Services Committee of the Joint General Psychiatry Program, Centre for Addiction and Mental Health, Mount Sinai Hospital, Toronto.

Immigrant Women's Health Centre. 1994. *Immigrant Women and AIDS*. Toronto.

Iunes, M., Franco, L., Ferreira, S., Iochida, L., Osiro, K., Fujimoto, W., and Japanese-Brazilian Diabetes Study Group-JBDS. "Prevalence of NIDDM and impaired glucose tolerance in first and second-generation Japanese-Brazilians." Abstracts, 15th International Diabetes Federation Congress, Kobe, Japan, 1994, p. 118 (presented).

Janes, C.R., & Pawson, I.G. 1986. Migration and biocultural adaptation: Samoans in California. *Social Science and Medicine* 22: 821–833.

Janzen, B.L. 1998. *Women, Gender and Health: A Review of the Recent Literature*. Prairie Women's Health Centre of Excellence. http://www.pwhce.ca

Jolly, K.S., Pais, P., & Rihal, C.S. 1996. [editorial] Coronary artery disease among South Asians: Identification of a high risk population. *Canadian Journal of Cardiology* 12(6): 569–571.

Kahler, L., Sobota, C., & Hines, C. 1996. Pregnant women at risk: An evaluation of the health status of refugee women in Buffalo, New York. *Health Care for Women International* 17(1): 15–23.

Karmi, G. 1992. Refugee health. *British Medical Journal* 305: 205–206.

Kasl, S.V., & Berkman, L. 1983. Health consequences of the experience of migration. *Annual Review of Public Health* 4, 69–90.

Kent, J.H. 1993. The epidemiology of multidrug-resistant tuberculosis in the United States. *Medical Clinics of North America* 77(6): 1391–1409.

Kerbel, D. 1997. Epidemiology of tuberculosis in Ontario, 1995. *Public Health Epidemiology Report Ontario (PHERO)* 8(4): 81–93.

Kernohan, E.E.M. 1996. Evaluation of a pilot study for breast and cervical cancer screening with Bradford's minority ethnic women: A community development approach, 1991–1993. *British Journal of Cancer* 74(Suppl #XX1X): S42–S46.

Kessel, G.C.J. 1998. *The Canadian Immigration System*. http://www.cic.gc.ca/english/refugee/kessel-e.html

King, H., Li, J.Y., Locke, F.B., Pollack, E.S., & Tu, J.T. 1985. Patterns of site-specific displacement in cancer mortality among migrants: The Chinese in the United States. *American Journal of Public Health* 75: 237–242.

King, H., & Locke, F.B. 1980. Cancer mortality among Chinese in the United States. *Journal of the National Cancer Institute* 65: 1141–1148.

Kinnon, D. 1999. *Canadian Research on Immigration and Health*. Ottawa: Health Canada.

Kinzie, J.D., Boehnlein, J.K., Leung, P.K., Moore, P.J., Riley, C., & Smith, D. 1990. The prevalence of posttraumatic stress disorder and its clinical significance among Southeast Asian refugees. *American Journal of Psychiatry* 147: 913–917.

Kirmayer, L., Galbaud du Fort, G., Young, A., Weinfeld, M., & Lasry, J.C. 1996. *Pathways and Barriers to Mental Health Care in an Urban Multicultural Milieu: An Epidemiological and Ethnographic Study*. Culture & Mental Health Research Unit, Sir Mortimer B. Davis - Jewish General Hospital. Report No. 6 (Part 1).

Kliewer, E.V. 1991. Immigrant suicide in Australia, Canada, England and Wales, and the United States. *Journal of the Australian Population Association* 8(2): 111–128.

_____. 1992. Epidemiology of diseases among migrants. *International Migration Quarterly Review* 30: 141–165.

_____. 1996. Benign prostatic hyperplasia morbidity and mortality among immigrants in Australia and Canada. *The Prostate* 28: 211–218.

Kliewer, E.V., & Butler, J.R.G. 1995. *Hospital Morbidity Patterns and Costs of Immigrants in Australia*. Australia: The National Centre for Epidemiology and Population Health, The Australian National University.

Kliewer, E.V., & Jones, R. 1997. *Immigrant Health and the Use of Medical Services: Results from the Longitudinal Survey of Immigrants to Australia*. Australia: Department of Immigration and Multicultural Affairs.

_____. 1998. *Changing Patterns of Immigrant Health and Use of Medical Services. Results from the Longitudinal Survey of Immigrants to Australia (LSIA)*. Australia: Department of Immigration and Multicultural Affairs.

Kliewer, E.V., & Kazanjian, A. 2000. *Health Status and Medical Services Utilization of Recent Immigrants to Manitoba and British Columbia: A Pilot Study*. Vancouver: BC Office of Health Technology Assessment.

Kliewer, E.V., & Smith, K.R. 1995a. Breast cancer mortality among immigrants in Australia and Canada. *Journal of the National Cancer Institute* 87(15): 1154–1161.

_____. 1995b. Ovarian cancer mortality among immigrants in Australia and Canada. *Cancer Epidemiology, Biomarkers and Prevention* 4(5): 453–458.

Kliewer, E.V., & Ward, D. 1988. Convergence of immigrant suicide rates to those in the destination country. *American Journal of Epidemiology* 127(3): 640–653.

Kobayashi, A., Moore, E., & Rosenberg, M. 1998. *How Healthy Are Immigrant Children?* Ottawa: Human Resources Development Canada.

Kouris-Blazos, A., Wahlgvist, M.L., Trichopoulou, A., Polychronopoulos, E., & Trichopoloulos, D. 1996. Health and nutritional status of elderly Greek migrants to Melbourne, Australia. *Age Ageing* 25: 177–189.

Kramer, M.S. 1987. Interuterine growth and gestational determinants. *Paediatrics* 80: 502–511.

Landrine, H., & Klonoff, E.A. 1994. The African American Acculturation Scale: Development, Reliability, and Validity. *Journal of Black Psychology* 20(2): 104–127.

Laroche, M. 2000. Health Status and Health Services Utilization of Canada's Immigrant and Non-Immigrant Populations. *Canadian Public Policy* XXVI(1): 51–73.

Leclere, F.B., Jensen, L., & Biddlecom, A.E. 1994. Health care utilization, family context, and adaptation among immigrants to the United States. *Journal of Health & Social Behavior* 35(4): 370–384.

Lesjak, M., Hua, M., & Ward, J. 1999. Cervical screening among immigrant Vietnamese women seen in general practice: Current rates, predictors and potential recruitment strategies. *Australia and New Zealand Journal of Public Health* 23(2): 168–173.

Li, P. 1998. The market value and the social value of race. In V. Satzewich (ed.), *Racism and Social Inequality in Canada*, 115–130. Toronto: Thompson Publishing.

Liebkind, K. 1996. Acculturation and stress: Vietnamese refugees in Finland. *Journal of Crosscultural Psychology* 27(161): 180.

Lilienfeld, A.M., & Lilienfeld, D.E. 1980. *Foundations of Epidemiology*. New York: Oxford University Press.

Lin, K.M. 1986. Psychopathology and social disruption in refugees. In C.L. Williams & J. Westermeyer (eds.), *Refugee Mental Health in Resettlement Countries*, 61–73. Washington, D.C.: Hemisphere.

Locker, D., Clark, M., & Murray, H. 1998. Oral health status of Canadian-born and immigrant adolescents in North York, Ontario. *Community Dentistry and Oral Epidemiology* 26(3): 177–181.

Luke, K. 1996. Cervical cancer screening: Meeting the needs of minority ethnic women. *British Journal of Cancer* 74(XX1X (Suppl): S47–S50.

Ma, G.X. 1999. Between two worlds: The use of traditional and western health services by Chinese immigrants. *Journal of Community Health* 24(6): 421–437.

Maclean, H. 1998. Breastfeeding in Canada: A demographic and experiential perspective. *Journal of the Canadian Dietetic Association* 59(1): 15–23.

Manson-Singer, S., Willms, D., Adrien, A., Godin, G., Maticka-Tyndale, E., & Cappon, P. 1996. *South Asian Immigrants' Risk Factors for HIV Transmission in Vancouver, Canada*. Vancouver: Centre for Human Settlements.

Marin, G. 1992. Issues in measurement of acculturation among Hispanics. In K.F. Geisinger (ed.), *Psychological Testing of Hispanics*, 235–251. Washington, D.C.: American Psychological Association.

Marmot, M.G., Smith, G.D., Stansfeld, S., Patel, C., North, F., Head, J., White, I., Brunner, E., & Feeney, A. 1991. Health inequality among British civil servants: The Whitehall II Study. *Lancet* 337: 1387–1393.

Marmot, M.G., & Syme, S.L. 1976. Acculturation and coronary heart disease in Japanese Americans. *American Journal of Epidemiology* 104(3): 225–247.

Maskarinec, G. 2000. Breast cancer — Interaction between ethnicity and environment. *In Vivo* 14: 115–124.

Maticka-Tyndale, E., Godin, G., & LeMay, G. 1996. Canadian ethnocultural communities facing AIDS: Overview and summary of survey results from Phase III. *Canadian Journal of Public Health* 87(Suppl 1): S38–S43.

Matsuoka, A., & Sorenson, J. 1991. Ethnic identity and social service delivery: Some models examined in relation to immigrants and refugees from Ethiopia. *Canadian Social Work Review* 8(2): 255–268.

Matuk, L.C. 1996a. Alcohol use by newcomers. *American Journal of Health Behavior* 20(2): 42–49.

_____. 1996b. Pap smear screening practices in newcomer women. *Women's Health Issues* 6(2): 82–88.

_____. 1996c. Health status of newcomers. *Canadian Journal of Public Health* 87(2): 52–55.

McKeigue, P.M., Ferrie, J.E., & Pierpoint, T. 1993. Association of early onset coronary heart disease in South Asian men with glucose intolerance and hyperinsulinemia. *Circulation* 87: 142–161.

McKeigue, P.M., Miller, G.J., & Marmot, M.G. 1989. Coronary heart disease in South Asians overseas: A review. *Journal of Clinical Epidemiology* 42(7): 597–609.

McKenna, M.T., McCray, E., & Onorato, I. 1995. The epidemiology of tuberculosis among foreign-born persons in the United States. *New England Journal of Medicine* 332: 1071–1076.

McPhee, S., Bird, J.A., Davis, T., Ha, N.T., Jenkins, C., & Le, B. 1997. Barriers to breast and cervical cancer screening among Vietnamese-American women. *American Journal of Preventative Medicine* 13(3): 205–213.

McSherry, G., & Connor, E. 1993. Current epidemiology of tuberculosis. *Pediatric Annals* 22(10): 600–604.

McSpadden, L.A. 1987. Ethiopian refugee resettlement in the Western United States: Social context and psychological well-being. *International Migration Review* 21(3): 796–819.

Meier, R., Sadavoy, J., Ong, A., & Ramalingam, N. 1997. "Barriers to Accessing Mental Health Services for Ethnoracial Seniors." Toronto: Invitational conference, April.

Menzies, R., Chan, C.H., & Vissandjee, B. 1997. Impact of immigration on tuberculosis infection among Canadian-born schoolchildren and young adults in Montreal. *American Journal of Respiratory Critical Care Medicine* 156: 1915–1921.

Menzies, R., Vissandjee, B., & Amyot, D. 1992. Factors associated with tuberculin reactivity among the foreign-born in Montreal. *American Review of Respiratory Disease* 142: 752–756.

Meyerowitz, B.E., Richardson, J., Hudson, S., & Leedham, B. 1998. Ethnicity and cancer outcomes: Behavioural and psychosocial considerations. *Psychological Bulletin* 123(1): 47–70.

Michielutte, R., Ernest, J.M., & Moore, M.L. 1992. A comparison of risk assessment models for term and preterm low birthweight. *Preventive Medicine* 21: 98–109.

Millar, W.J. 1997. Use of alternative health care practitioners by Canadians. *Canadian Journal of Public Health* 88(3): 154–158.

Millet, P.E., Sullivan, B.F., Schwebel, A.I., & Myers, L.J. 1996. Black Americans' and white Americans' views of etiology and treatment of mental health problems. *Community Mental Health Journal* 323: 235–260.

Misri, S. 1986. Mental health and immigration. *Canadian Family Physician* 32: 1311–1313.

Morrison, L., Guruge, S., & Snarr, K. 1999. Sri Lankan Tamil immigrants in Toronto: gender, marriage patterns, and sexuality. In G. Kelson & B. Delaureat (eds.), *Gender, Immigration, and Policy*, 144–160. New York: New York University Press.

Moss, N., Stone, M.C., & Smith, J.B. 1992. Child health outcomes among Central American refugees and immigrants in Belize. *Social Science & Medicine* 34(2): 161–167.

Muhajarine, N., Neudorf, C., & Martin, K. 2000. Concurrent consultations with physicians and providers of alternative care: Results from a population-based study. *Canadian Journal of Public Health* 91(6): 449–453.

Mulvihill, M.A., & Mailloux, L. 2000. *Canadian Research on Immigrant and Refugee Women's Health: Linking Research and Policy, First Draft*. Ottawa: Health Canada.

Nair, C., Nargundkar, H., Johansen, H., & Stachan, J. 1990. Canadian cardiovascular disease mortality: First generation immigrants versus Canadian-born. *Health Reports* 2(3): 203–228.

Naish, J., Brown, J., & Denton, B. 1994. Intercultural consultations: Investigation of factors that deter non-English speaking women from attending their general practitioners for cervical screening. *British Medical Journal* 309: 1126–1128.

Nakyonyi, M.M. 1993. HIV/AIDS education participation by the African community. *Canadian Journal of Public Health* 84 (Suppl 1): S19–23.

Negy, C., & Woods, D.J. 1992. The importance of acculturation in understanding research with Hispanic-Americans. *Hispanic Journal of Behavioral Sciences* 14: 224–247.

Newton, R.W., & Hunt, L.P. 1984. Psychosocial stress in pregnancy and its relation to lower birth weight. *British Medical Journal* 288: 1191–1194.

Noh, S., & Avison, W.R. 1996. Asian immigrants and the stress process: A study of Koreans in Canada. *Journal of Health and Social Behaviour* 37(2): 192–206.

Noh, S., Beiser, M., Kaspar, V., Hou, F., & Rummens, J. 1999. Perceived racial discrimination, depression, and coping: A study of Southeast Asian refugees in Canada. *Journal of Health and Social Behavior* 40: 193–207.

Noh, S., Hyman, I. & Fenta, F. *Pathways and Barriers to Health Care for Ethiopians in Toronto*. Centre of Excellence for Research in Immigration and Settlement (CERIS). http://www.ceris.metropolis.net/virtual library/health/hyman1.html

Norbeck, J.S., & Peterson Tilden, V. 1983. Life stress, social support, and emotional disequilibrium in complications of pregnancy. *Journal of Health and Social Behavior* 24: 30–46.

Oakley, A., MacFarlane, A., & Chalmers, I. 1982. Social class, stress and reproduction. In A.R. Rees & H. Purcell (eds.), *Disease and the Environment*, 11–49. Toronto: Wiley.

Oishi, K., Okado, K., & Yoshida, O. 1988. A case-control study of prostatic cancer with reference to dietary habits. *Prostate* 12: 179–190.

Otero-Sabogal, R., Sabogal, F., Perez-Stable, E.J., & Hiatt, R.A. 1995. Dietary practices, alcohol consumption, and smoking behavior: Ethnic, sex, and acculturation differences. *Journal of the National Cancer Institute Monographs* 18: 73–82.

Oxman-Martinez, J., Abdool, S.N., & Loiselle-Leonard, M. 2000. Immigration, women and health in Canada. *Canadian Journal of Public Health* 91(5): 394–395.

Palinkas, L.A., & Pickwell, W.M. 1995. Acculturation as a risk factor for chronic disease among Cambodian refugees in the United States. *Social Science & Medicine* 40(12): 1643–1659.

Parakulam, G., Krishnan, V., & Odynak, D. 1992. Health status of Canadian-born and foreign-born residents. *Canadian Journal of Public Health* 83(4): 311–314.

Pedersen, P. 1995. *The Five Stages of Culture Shock: Critical Incidents Around the World*. Westport, Conn.: Greenwood Press.

Pepin, Y. 1990. *L'utilization des services perinataux du CLSC*. Le partage des eaux, CRSSSAT, Direction de la recherché et de l'evaluation.

Pérez-Stable, E.J., & Nápoles-Springer, A. 2000. Interpreters and communication in the clinical encounter. *American Journal of Medicine* 108: 509–510.

PHRED (Public Health Research and Evaluation Division). 2000. *Report on the Health Status of the Residents of Ontario*. Toronto: Ontario Ministry of Health.

Pomerleau, J., & Ostbye, T. 1997. The relationship between place of birth and some health characteristics in Ontario. *Canadian Journal of Public Health* 88(5): 337–345.

Portes, A., Kyle, D., & Eaton, W. 1992. Mental illness and help-seeking behavior among Mariel Cuban and Haitian refugees in South Florida. *Journal of Health and Social Behavior* 33: 283–298.

Powell, K.E., Meador, M.P., & Farer, L.S. 1981. Foreign-born persons with tuberculosis in the United States. *American Journal of Public Health* 71: 1223–1227.

Powles, J., Ktenas, D., & Sutherland, C. 1988. Food habits in Southern-European migrants: A case-study of migrants from the Greek island of Levkada. In A.S. Stewart & M.L. Wahlqvist (eds.), *Food Habits in Australia*, 201–223. North Balwyn, Victoria: Rene Gordon Pty Ltd.

Proust, A.J. 1971. The Australian screening programme for tuberculosis in prospective migrants. *Medical Journal of Australia* 2: 35–37.

Rebhun, L.A. 1998. Substance use among immigrants to the United States. In S. Loue (ed.), *Handbook of Immigrant Health*, 493–519. New York: Plenum Press.

Reeb, K.G., Graham, A.V., Zyzanski, S.J., & Kitson, G.C. 1987. Predicting low birthweight and complicated labour in urban Black women: A biopsychosocial perspective. *Social Science & Medicine* 25: 1321–1327.

Remis, R.S., King, S.L., Vernich, L., & Vermeulen, M. 1998. *Preventing HIV Transmission from Mothers to Infants in Ontario 1994 to 1996: A Missed Opportunity*. 12th World AIDS Conference - Abstract 23288, Geneva.

Remis, R.S., & Whittingham, E.P. 1999. *The HIV/AIDS Epidemic among Persons from HIV-endemic Countries in Ontario, 1981–98: Situation Report*. Toronto: Department of Public Health Science, University of Toronto.

Renaud, J., Gingras, L., Vachon, S., Blaser, C., Godin, J.F., & Gagné, B. 2001. *Ils sont maintenant d'ici!, Les dix premières anneés au Québec des immigrants, admis en 1989*. Numero 4. http://publicationsduquebec.gouv.qc.ca

Roberts, N., & Crockford, D. 1997. Psychiatric admissions of Asian Canadians to an adolescent inpatient unit. *Canadian Journal of Psychiatry* 42: 847–851.

Rogler, L.H., Cortes, D.E., & Malgady, R.G. 1991. Acculturation and mental health states among Hispanics: Convergence and new directions for research. *American Psychologist* 46: 585–597.

Romero-Gwynn, E. 1989. Breast-feeding pattern among Indochinese immigrants in Northern California. *American Journal of Diseases of Children* 143: 804–808.

Rumbaut, R.G., & Weeks, J.R. 1996. Unraveling a public health enigma: Why do immigrants experience superior perinatal health outcomes? *Research in the Sociology of Health Care* 13B: 337–391.

Sabogal, F., Marin, G., Otero-Sabogal, R., Marin, B.V., & Pérez-Stable, E.J. 1987. Hispanic familism and acculturation: What changes and what doesn't? *Hispanic Journal of Behavioral Sciences* 9: 397–412.

Sadkowsky, G.R., Lai, E.W., & Plake, B.S. 1991. Moderating effects of sociocultural variables on acculturation attitudes of Hispanics and Asian Americans. *Journal of Counseling and Development* 70: 194–204.

Sadkowsky, G.R., & Plake, B.S. 1992. A study of acculturation difference among national people and suggestions for sensitivity to within-group differences. *Journal of Counseling and Development* 71: 53–59.

Sack, W.H., McSharry, S., Glarke, G.N., Kinney, R., Seeley, J., & Lewinsohn, P. 1994. The Khmer Adolescent Project. I. Epidemiologic findings in two generations of Cambodian refugees. *Journal of Nervous & Mental Disease* 182(7): 387–395.

Saldov, M. 1991. The ethnic elderly: Communication barriers to health care. *Canadian Social Work Review* 8(2): 269–277.

Saphir, A. 1997. Asian Americans and cancer: Discarding the myth of the "model minority," *Journal of the National Cancer Institute* 89(21): 1572–1574.

Scribner, R., & Dwyer, J.H. 1989. Acculturation and low birthweight among Latinos in the Hispanic HANES. *American Journal of Public Health* 79(9): 1263–1267.

Sheth, T., Nair, C., Nargundkar, M., Anand, S., & Yusuf, S. 1999. Cardiovascular and cancer mortality among Canadians of European, South Asian and Chinese origin from 1979 to 1993: An analysis of 1.2 million deaths. *Canadian Medical Association Journal* 161(2): 131–138.

Shimizu, H., Mack, T.M., Ross, R.K., & Henderson, B.E. 1987. Cancer of the gastrointestinal tract among Japanese and white immigrants in Los Angeles County. *Journal of the National Cancer Institute* 78: 223–228.

Shimizu, H., Ross, R.K., Bernstein, L., Yatani, R., Henry, C.J., & Mack, T.M. 1991. Cancers of the prostate and breast among Japanese and white immigrants in Los Angeles County. *British Journal of Cancer* 63: 963–966.

Shiono, P.H., Klebanoff, M.A., Graubard, B.I., et al. 1986. Birth weight among women of different ethnic groups. *Journal of the American Medical Association* 255: 48–52.

Smart, J.F., & Smart, D.W. 1995. Acculturative stress of Hispanics: Loss and challenge. *Journal of Counselling and Development* 73: 390–396.

Snowden, L.R. 1996. Ethnic minority populations and mental health outcomes. In D.M. Steinwachs & L.M. Flynn (eds.), *New Directions for Mental Health Services*, No. 71, 79–87. San Francisco: Jossey-Bass Inc.

Sodhi, S. 1995. "Breaking down the barriers: Communication of breast cancer to the recently immigrated South Asian community." Unpublished report.

Sodowsky, G.R., & Plake, B.S. 1991. Psychometric properties of the American-International relations scale. *Educational and Psychological Measurement* 51: 207–216.

Spitzer, D.L., Raine-Travers, K., & Young, D.E. 2000. "Immigration as a Determinant of a Stress-Related Disorder: Focus on Diabetes Project Proposal." Pilot study funded by Social Sciences and Humanities Research Council of Canada.

St. John, Ron. Laboratory for Disease Control, Health Canada, Ottawa: personal communication.

Statistics Canada. 2001. Longitudinal Survey of Immigrants to Canada. (Update on Wave I). J. McAuley, Chief Special Survey Division, Ottawa: personal communication.

Stein, B.N. 1986. The experience of being a refugee: Insights from the research literature. In C.L. Williams & J. Westermeyer (eds.), *Refugee Mental Health in Resettlement Countries*, 5–23. Washington, D.C.: Hemisphere.

Stein, J.A., & Fox, S.A. 1990. Language preference as an indicator of mammography use among Hispanic women. *Journal of the National Cancer Institute* 82(2): 1715–1716.

Stengel, B., Saurel-Cubizolles, M., & Kaminski, M. 1986. Pregnant immigrant women: Occupational activity, antenatal care and outcome. *International Journal of Epidemiology* 15: 533–539.

Stephen, E.H., Foote, K., Hendershot, G.E., & Schoenborn, C.A. 1994. Health of the foreign-born population. *Advance Data from Vital and Health Statistics* 241: 1–10.

Stephenson, P.H. 1995. Vietnamese refugees in Victoria, B.C.: An overview of immigrant and refugee health care in a medium-sized Canadian urban centre. *Social Science & Medicine* 40(12): 1591–1596.

Strachan, J.H., Johansen, C., & Nair. C. 1990. Canadian suicide mortality rates: First-generation immigrants versus Canadian-born. *Health Reports* 2(4): 327–341.

Styblo, K. 1989. Overview and epidemiologic assessment of the current global tuberculosis situation with an emphasis on control in developing countries. *Review of Infectious Diseases* 11(2[Suppl]): S339–S346.

Suarez, L. 1994. Pap smear and mammogram screening in Mexican-American women: The effects of acculturation. *American Journal of Public Health* 84(5): 742–746.

Suchman, E.A. 1964. Sociomedical variations among ethnic groups. *The American Journal of Sociology* 70: 319–331.

Tastsoglou, E., & Miedema, B. 2000. *Immigrant Women Organizing for Change: Integration and Community Development by Immigrant Women in the Maritimes*. Edmonton: Prairie Centre of Excellence for Research on Immigration and Integration (PCERII).

Tharao, E., Calzavara, L., & Myers, T. 2000. *What Service Providers Need to Know to Provide Effective HIV/AIDS Programs and Services for African Immigrants in Canada: Findings from the East African HIV/AIDS Study*. Toronto.

Thonneau, P., Gratton, J., & Desrosiers, G. 1990. Health profile of applicants for refugee status (Admitted into Quebec between August 1985 and April 1986). *Canadian Journal of Public Health* 81: 182–186.

Tousignant, M. 1997. Refugees and immigrants in Quebec. In I. Al-Issa & M. Tousignant (eds.), *Ethnicity, Immigration and Psychopathology*, 57–70. New York: Plenum Press.

Tuttle, C.D. 2000. Determinants of infant feeding choices among South-East Asian immigrants in North California. *Journal of the American Dietetic Association* 94: 282–286.

Ubukata, T., Oshima, A., & Morinaga, K. 1987. Cancer patterns among Koreans in Japan, Koreans in Korea and Japanese in Japan in relation to life style factors. *Japanese Journal of Cancer Research* 78: 437–446.

Umeh, D.C. (ed.). 1997. *Confronting the AIDS Epidemic: Cross-Cultural Perspectives on HIV/AIDS Education*. Laurenceville, N.J.: Africa World Press, Inc.

UNAIDS/WHO. 2000. Joint United Nations Programme on HIV/AIDS (UNAIDS). World Health Organization (WHO). UNAIDS/00.44E - WHO/CDS/CSR/EDC/2000.9 (English original, December 2000) ISBN: 92-9173-008-4.

UNESCO/UNAIDS 2000. *Migrant Populations and HIV/AIDS. The Development and Implementation of Programmes: Theory, Methodology and Practice*.

United Way of Greater Toronto. 1991. *Action Access Diversity! A Guide to Multicultural/Anti-Racist Organizational Change for Social Service Agencies*.

Vernon, S.W., Laville, E.A., & Jackson, G.L. 1990. Participation in breast screening programs: A review. *Social Science & Medicine* 30: 1107–1118.

Vissandjee, B., Carignan, P., Gravel, S., & Leduc, N. 1998. Promotion de la santé en faveur des femmes immigrant au Québec. *Revue epidemiologique et santé public* 43: 124–133.

Vissandjee, B., Weinfeld, M., Dupéré, S., & Abdool, S. In press. Gender, ethnicity and health: Research and policy challenges for immigrant women in Canada. *Journal of International Migration and Integration*.

Walker, P.F., & Jaranson, J. 1999. Refugee and immigrant health care. *Medical Clinics of North America* 83(4): 1103–1120.

Ward, C. 1996. Acculturation. In D. Landis & R.S. Bhagat (eds.), *Handbook of Intercultural Training*, 124–147. Thousand Oaks, Calif.: Sage.

Wells, K.B., Golding, J.M., Hough, R.L., Burnam, M.A., & Kango, M. 1989. Acculturation and the probability of use of health services by Mexican Americans. *Health Services Research* 24(2): 237–357.

Wen, S.W., Goel, V., & Williams, J.E. 1996. Utilization of health care services by immigrants and other ethnic/cultural groups in Ontario. *Ethnicity and Health* 1(1): 99–109.

Wen, S.W., & Kramer, M.S. 1997. A comparison of perinatal mortality between ethnic Chinese and ethnic Whites: Why the Chinese rate was lower. *Ethnicity and Health* 2(3): 177–182.

Westermeyer, J. 1989. *Mental Health for Refugees and Other Migrants: Social and Preventive Approaches*. Springfield, Ill.: Charles C. Thomas.

Wilkins, K. 1996. Tuberculosis 1994. *Health Reports* 8(1): 33–39.

Williams, R., Bhopal, R., & Hunt, K. 1994. Coronary risk in a British Punjabi population: Comparative profile of non-biochemical factors. *International Journal of Epidemiology* 23(1): 29–37.

Wobeser, W.L., Yuan, L., Naus, M., Corey, P., Edelson, J., Heywood, N., & Holness, D.L. 2000. Expanding the epidemiologic profile: Risk factors for active tuberculosis in people immigrating to Ontario. *Canadian Medical Association Journal* 163(7): 823–828.

Woodward, A.M., Dwinell, A.D., & Bernard, S.A. 1992. Barriers to mental health care for Hispanic Americans: A literature review and discussion. *The Journal of Mental Health Administration* 19(3): 224–236.

Yi, J.K. 1998. Acculturation and Pap smear screening practices among college-aged Vietnamese women in the United States. *Cancer Nursing* 21(5): 335–341.

Young, D., Spitzer, D., & Pang, F. 1999. *Understanding the Health Care Needs of Canadian Immigrants*. Report to Prairie Centre of Excellence for Research on Immigration and Integration (PCERII).

Yu, E.S., & Liu, W.T. 1991. Methodological problems and policy implications in Vietnamese refugee research. *International Migration Review* 20(2): 483–501.

Yuan, L., Permaul-Woods, J., Barnsley, J., & Cockerill, R. 1998. *Toronto Chinese Health Survey Final Report*. Toronto: Department of Family Medicine, Mount Sinai Hospital.

York Regional Multicultural Tri-Hospital Project Year 1 - Report. 1993. Prepared by Z. Ramji Associates Inc.

Zambrana, R.E., Scrimshaw, S.C.M., Collins, N., & Dunkel-Schetter, C. 1997. Prenatal health behaviours and psychosocial risk factors in pregnancy in women of Mexican origin: The role of acculturation. *American Journal of Public Health* 87(6): 1022–1026.

Ziegler, R.G., Hoover, R.N., Pike, M.C., Hildensheim, A., Nomura, A.M., West, D.W., Wu-Williams, A.H., Kolonel, L.N., Horn-Ross, P.L., Rosenthal, J.F., et al. 1993. Migration patterns and breast cancer risk in Asian-American women. *Journal of the National Cancer Institute* 17; 85(22): 1819–1827.