Lakehead
UNIVERSITY

OFFICE OF GRADUATE STUDIES

NAME OF STUDENT: Amanda Maranzan

DEGREE AWARDED: Ph.D.

ACADEMIC UNIT: Psychology

TITLE OF DISSERTATION: The Health Status and Needs of Aboriginal People Assessed for Home Care in Ontario

This dissertation has been prepared
under my supervision
and the candidate has complied
with the Doctoral regulations.

Signature of Supervisor

3 Oct 2008
Date

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Your file Votre référence
ISBN: 978-0-494-47149-4
Our file Notre référence
ISBN: 978-0-494-47149-4

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The Health Status and Needs of Aboriginal People Assessed for Home Care in Ontario

Ph.D. Dissertation

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Acknowledgments

As is usually the case when large projects are undertaken, the completion of this dissertation would not have been possible without the help and support of several key individuals. The first acknowledgement is to Dr. Michael Stones, who supervised not only this dissertation research but also my personal and professional development throughout the process. My interest in and appreciation for research have grown out of your enthusiasm. Thank you for your expert guidance and sense of humour, both of which made this process truly enjoyable.

I also acknowledge the contributions of Dr. Michel Bédard, Lakehead University, Dr. Dwight Mazmanian, Lakehead University, and Dr. Bruce Minore, Lakehead University, whose comments and feedback resulted in a stronger manuscript. A sincere thank you belongs to Dr. John Hirdes, University of Waterloo, who provided the RAI data used in this project. Dr. Jeff Poss, University of Waterloo, and Ms. Micaela Janzi, University of Waterloo, provided support for data analysis.

Finally, thank you to my husband and family, who supported my graduate experience in both measurable and immeasurable ways.

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Abstract

The health disparities experienced by Aboriginal populations in Canada have been an important topic for provincial and national health care. In general, the health status and resource utilization of Aboriginal groups have been lower than that of the Canadian population. Recently, an assessment tool called the Resident Assessment Instrument (RAI) was mandated for use in home care settings. This dissertation examined the health status (as measured by the RAI) of Aboriginal and non-Aboriginal clients assessed for home care in Ontario by analyzing client demographics, health status indicators, and summary scale scores. Sequential multilevel linear modeling analyzed the summary scale scores with respect to ancestry, sex, age, and socio-economic status; regional differences in outcome scores were observed. Aboriginal ancestry had a significant effect on depression, cognitive status, and activities of daily living scores when control variables were not considered. Once age, sex, and socio-economic status were accounted for, Aboriginal ancestry did not have an effect on these outcome measures. Aboriginal ancestry did have a significant effect on pain scores. Qualitative data obtained through key informant interviews identified several challenges to providing home care to Aboriginal peoples, including language, infrequent access to services in rural areas, and client transience. These findings support the recognition of individual demographic as well as regional factors as contributors to disease prevalence within the home care population. Further validation of the RAI-HC and development of an Aboriginal RAI tool would increase the utility of the RAI with Aboriginal clients and provide a higher quality of data with which to direct policy and funding.

The Health Status and Needs of Aboriginal People Receiving Home Care in Ontario

The health disparities experienced by Aboriginal populations in Canada has been an important topic for provincial and national health care. In general, the health status and health resource utilization of Aboriginal groups have been lower than that of the general Canadian population. The Aboriginal population is composed of people of First Nations, Métis, or Inuit ancestry and represents approximately one million Canadians.

The recent introduction and implementation of the Resident Assessment Instrument – Home Care (RAI-HC) provides an opportunity to explain the health status and needs of home care recipients, with comparisons between Aboriginal and non-Aboriginal clients possible. This dissertation will provide an overview of home care in Canada and Ontario, followed by a description of the RAI-HC and a summary of what is known about Canadian Aboriginal health. The purpose of this study is to compare Aboriginal and non-Aboriginal home care clients in Ontario on indicators included in the RAI-HC, and to identify challenges to providing culturally-appropriate home care from the perspective of care providers.

Home Care

Overview

Before provincial and national health insurance plans and the institutional sector were developed, most health care in Canada consisted of home care. Home care has now come full circle, as in recent decades new medical technology has enabled home care to deal with many problems previously managed in institutions (Sorochan, 1997). This development, augmented by recent health reform, has led to an expansion of home care services within provinces and territories across Canada. Home care has been defined by Health Canada as "an array of services which enables clients incapacitated in whole or in part, to live at home, often with the effect of preventing, delaying or substituting for long-term care or acute care alternatives" (Health Canada, 1990, p. 2). Home care services are frequently comprised of a health care component (e.g., nursing, physiotherapy) and/or a social service component (e.g., homemaking, assistance with bathing; Motiwala, Flood, Coyte, & Laporte, 2005).

Sorochan (1997) described four target groups for home care services in Canada. The first group consisted of certain clients discharged from hospital. These clients require relatively short-term help in recovering from an acute episode. The second and third groups consisted of clients who might otherwise require hospitalization or a long-term care bed. These groups require relatively long-term help in maintaining and improving their health status. The final target group for home care services consisted of clients who require support to prevent social or functional deterioration that would lead to long-term care admission (Sorochan, 1997). In accord with the definition of home care and the target client groups, three basic models of home care are used in Canada (Sorochan, 1997). The maintenance and preventive model aims to maintain clients' independence and prevent health and functional decline and institutionalization. The long-term care substitution model provides home care for clients who would otherwise require long-term institutionalization, and the acute care substitution model (or medical model) provides care to clients who would otherwise require acute care or hospitalization (Sorochan, 1997). The latter two models are truly substitution models aimed at caring for clients who would normally require institutionalization, in the community. Most provinces and territories utilize all three home care models to meet their populations' health needs.

The federal Canada Health Act ensures that necessary hospital, physician, and surgical-dental services are provided to all Canadians (Sharkey, Larsen, & Mildon, 2003) and provides standards that provincial health insurance plans must meet to qualify for federal funding (Motiwala et al., 2005). These standards apply to medically necessary and medically required services such as the ones mentioned above. Home care services are not included under this category of services; instead they are included under extended health care services. Although the Standing Senate Committee on Social Affairs, Science and Technology (Kirby Commission) and the Commission on the Future of Health Care in Canada (Romanow Commission) recommended the development of a national home care program with a basic package of funded services (Motiwala et al., 2005), this recommendation has yet to be implemented.

For the majority of the population, provision of health and social services is the responsibility of the provinces and territories. The federal government is responsible for certain client groups: home care services are provided to veterans at the national level, and Aboriginal communities are serviced by the First Nations and Inuit Home and Community Care Program (Sharkey et al., 2003). As there is not a national home care plan for the majority of the population, there are variations across provinces and territories regarding the policies, availability, and delivery of non-insured home care services (Sharkey et al., 2003). For example, there are provincial and territorial differences in the nature of fees charged to clients, referral source, and admission criteria (Sorochan, 1997). Some provinces have income assessment arrangements while others charge a flat rate for home care services (Motiwala et al., 2005).

In Ontario, administration of home care services to the general population is the responsibility of the Ministry of Health and Long-Term Care. In 1996 a managed competition model was introduced in efforts to promote affordability (Sharkey et al., 2003). The new "request for proposal" process allowed for-profit and not-for-profit providers to compete for service delivery. Although people receiving home care may choose to purchase services privately or use private health insurance, publicly funded home care services are coordinated by 43 Community Care Access Centres (CCACs) across Ontario. The CCACs represent a single-entry case management approach to home care; through this single entry process for all home care referrals, the CCAC is responsible for assessment and coordination of all home care clients in a specific geographical area. This approach ensures responsibility and accountability to the client and system in providing comprehensive, cost-effective care and allows for ongoing monitoring of clients with adjustments to the care plan as necessary (Sorochan, 1997).

Home care clients differ from Complex Continuing Care hospital patients and LTC patients in that the former tend to be a less severely impaired population. Community care clients typically have a medical condition that can be managed within the community setting and is not severe enough to warrant frequent daily on-site monitoring, hospitalization, or nursing care 24 hours a day. Before community care services are provided, clients are assessed to determine eligibility. To meet the eligibility criteria, clients must:

1. Reside in Ontario.
2. Hold a valid Ontario Health Card.
3. Have a medical condition that warrants community care, and can be managed safely in the community.

4. Consent to community care.
5. Have a home environment that supports community care requirements.
6. Be unable to access services as an outpatient.
7. Be willing to participate in a home care treatment plan (The Community Care Access Centre of the District of Thunder Bay, n.d.).

The First Nations and Inuit Health branch of Health Canada provides basic home and community care programs to eligible Aboriginal people through the First Nations and Inuit Home and Community Care Program (Health Canada, 2007). Eligibility requirements for recipients are the following:

1. First Nations and Inuit of any age;
2. Must live on a First Nations reserve, Inuit settlement, or First Nations community North of 60;
3. Must have a formal assessment of care service needs, and must require one or more of the essential services; and
4. Services can be provided with reasonable safety to the client and caregiver, within established service practices. (Health Canada, 2005b).

Clients receiving community care have access to services including nursing, physiotherapy, occupational therapy, speech language pathology, dietetics, social work, personal support, and homemaking. Community care services are provided until the client's plan of care and goals are met, or until service is no longer required due to amelioration or deterioration of the client's condition.

Why Home Care?

As previously mentioned, the development of new technology has allowed many conditions that were once managed only in acute or long-term care to be effectively treated in the home care setting (Sorochan, 1997). It is also likely that when given a choice, people would rather be cared for in their home environment than to undergo or lengthen hospital stays. Guy (2002/2003) summarized research conducted for the Romanow Commission and Health Canada regarding Canadians' preferences for home care. He reported that 58% of Canadians preferred to recover from an illness or surgery in their own home, and the same percentage viewed the quality of home care as equivalent or higher than hospital care.

Home care is also cost-effective. In a systematic review of the literature examining cost-effectiveness of home care in Canada and the United Kingdom, Fraser (2003) reviewed 11 studies utilizing experimental or comparative designs. Of these studies, six found that home care was cost effective compared with alternatives (acute or long-term care), while three studies found home care to be more costly and two studies were inconclusive. Other research has suggested that home care is cost effective for some medical conditions (e.g., hip and knee replacement) but not others (e.g., chronic obstructive airway disease; Shepperd, Harwood, Gray, Vessey, & Morgan, 1998). Determining cost-effectiveness is difficult in home care studies as it is difficult or impossible to capture all costs associated with care (e.g., travel to and from a clinic, caregiver burden, administrative costs; Fraser, 2003). It is even more difficult to evaluate the cost-effectiveness literature generated in other countries, as health care systems and costs are different from those in Ontario. In general, however, home care appears to be cost-effective for at least some treatments and services when compared to acute and long-term care.

Profiles of Home Care Recipients

The characteristics and needs of home care recipients can be determined in part by profiles of such clients. Such a profile was developed from 773 home care recipients admitted into one Ontario program (Alcock, Danbrook, Walker, & Hunt, 1998). In this study, 49% of home care clients were age 70 and older and 63% were female. Eighty-two percent of clients spoke English and 12% spoke French, with 92% of clients dwelling in an urban setting. The number of clients who required acute care (e.g., surgical care) was almost equivalent to those who required longer-term care (e.g., rehabilitation; 51% versus 47% respectively). Within the 70+ age group, the most common primary diagnoses were arthritis/osteoarthritis, stroke, fractures, and congestive heart failure (Alcock et al., 1998). Eighty-one percent of clients had a secondary diagnosis, and 44% had two or more secondary diagnoses.

Factors associated with receiving home care were derived from the 1994/95 National Population Health Survey (NPHS; Wilkins & Park, 1998). In the year prior to the NPHS, 8% of Canadians aged 65 to 79 and 22% of those aged 80 and older received home care. Two thirds of home care recipients were women, 39% lived alone, and 56% had two or more chronic conditions. There was an inverse relationship between income level and receipt of home care, even after controlling for health status and chronic conditions. Forty-six percent of home care recipients had arthritis/rheumatism. This study found that more than half of respondents who needed assistance with personal care received no formal home care (Wilkins & Park, 1998).

Forbes and Janzen (2004) compared urban and rural users and non-users of home care using the NPHS. There were some differences between rural and urban home care users; urban users were more likely to report lower education levels than urban non-users, yet these differences were not found in the rural sample (Forbes & Janzen, 2004). It is unknown whether this finding is due to true differences between urban and rural home care recipients or simply an artefact of the data; more research is required. Compared to non-users, both rural and urban home care users were more likely to be women, older adults, living alone, and report lower levels of income. Similar proportions of urban and rural participants received home care (Forbes & Janzen, 2004). Other research has not found this trend. For example, Coyte and Young (1999) found significant regional variation in home care use following inpatient care and same-day surgery.

Research that examined the needs and preferences for home care services of a sample of approximately 500 First Nations and Inuit clients found that approximately 80% of clients had low to moderate care needs (i.e., less than 2.5 hours of care per day; Health Canada, 2007). This sample consisted of Aboriginal clients receiving services through the First Nations and Inuit Home and Community Care Program. These home care clients were younger than home care clients from the general Canadian population. Housing was identified as a significant issue for the participants due to overcrowding, poor physical condition, and/or isolation. Clients indicated that home care services were often provided in a fragmented fashion (Health Canada, 2007).

Summary

Home care services typically consist of a health care component and/or a social services component, and are targeted at people discharged from acute stays in hospital, people who would otherwise require hospitalization or long-term care services, and people whose condition may deteriorate if home care services are not provided. In Ontario, home care services are administered by the Ministry of Health and Long-Term Care and coordinated by CCACs. Research has indicated not only that home care is cost-effective but that there is a public preference for home care. Approximately half of home care clients are females aged 70 and older, and acute and longer-term services are provided with the same frequency. Over 90% of home care recipients dwell in urban settings.

All Ontario CCACs use a standardized assessment system to track the health status and resource utilization of clients. This assessment system is the focus of the next section.

RAI-Home Care

Overview

The Resident Assessment Instrument (RAI) is a standardized assessment system designed for use in many care environments. The RAI is a series of integrated tools developed to track clients across service domains such as long-term care, home care, acute care, post-acute care, and institutional mental health care. To provide a comprehensive assessment of clients, it was designed as a minimum data set of items, definitions, and response categories (Hawes et al., 1995). All RAI's have the same structure and a core set of common assessment items, supplemented by items that are setting-specific. The RAI can be used to address needs and service delivery across institutional and community settings. The RAI is used in Canada, the United States, Japan, China, many countries in Europe, and has been translated into more than 11 languages (Sgadari et al., 1997).

The RAI-Home Care (RAI-HC) was developed and tested by an international group of clinicians. It was based on the RAI Version 2.0 for nursing homes, as the populations served by nursing homes and home care services overlap and many assessment items were believed to apply across both settings. Of the 223 MDS-HC items, 47% came from the MDS Version 2.0 with additional items created for areas encountered less frequently in nursing home settings (Morris et al., 1997). The RAI-HC guides and informs comprehensive care planning through evaluation of the needs, strengths, and preferences of elderly clients receiving home care (Morris et al., 1999).

The RAI-HC consists of two elements: the Minimum Data Set for Home Care (MDS-HC) and Client Assessment Protocols (CAPs). The 223 item MDS-HC provides screening across multiple domains of functioning, health status, social support, and health care service use (Morris et al, 1999). Table 1 displays the MDS-HC domains and number of items in each domain. Certain items act as triggers to identify specific risks or problem areas that could benefit from further assessment (e.g., cognition, falls, institutional risk). These triggers are linked to a series of problem-oriented CAPs that provide general guidelines for further assessment and care planning (Morris et al., 1999). The 30 CAPs (Table 2) cover a wide range of functional, clinical, and environmental problems. They include general background on the problem area (e.g., symptoms, prevalence data) and provide care planning guidelines that function as a reference and training manual for the home care professional (Morris et al., 1997). In addition, summary scales have been derived from sub-sets of MDS items and are described in greater detail further in this paper.

The RAI-HC was designed for use by physicians, nurses, social workers, and therapists (Morris et al., 1997). It is completed through client file review, observation, and clinician-directed questioning of the client and the client's family/support network. Items are scored according to the client's functioning over the previous 3 or 7 days. The assessment takes 1 hour and may be completed in one or two visits. The RAI-HC assessments are completed upon intake to the home care system, at quarterly intervals, and any time there is significant change in the client's status (Hirdes & Carpenter, 1997).

Psychometrics

The MDS offers improved reliability, validity, and comprehensiveness over other previously used assessment systems. For example, the MDS-HC was compared with other community care assessments traditionally used in England (Carpenter, Challis, & Swift, 2005). Assessments completed using the MDS-HC were associated with greater completeness (82.5% complete vs. 51.0%) and thoroughness even though the assessment lengths were similar (1.25 – 1.5 hours). As with any instrument, poor quality of data can be obtained if the MDS is not implemented appropriately or is used by untrained clinicians (Wodchis, Hirdes, & Feeny, 2003). However, when used appropriately by trained personnel, MDS data collected for administrative purposes is as reliable and valid as MDS data collected for research purposes by trained research assistants (Phillips & Morris, 1997).

Due to item overlap, the reliability and validity of the MDS-HC rely heavily on validation studies of the MDS Version 2.0. For example, in the areas of cognition, communication, vision, mood, behaviour, ADL self-performance, and continence, 30 of the 32 MDS-HC items come from the MDS 2.0 for nursing homes (Morris et al., 1997). MDS 2.0 reliability trials were held in two stages in the USA, with 13 facilities in 5 states participating (Hawes et al., 1995). In the first stage, independent dual assessments of 80 LTC residents were conducted by trained nursing staff. As some items were unreliable, these items underwent revision in terms of definitions and information-gathering protocol. In stage two, 43 residents were independently and dually assessed by trained nursing staff.

Eighty-nine percent of the final MDS 2.0 items achieved an intraclass correlation of 0.4 or higher, with 63% of items reaching 0.6 or higher (Hawes et al., 1995). Further inter-rater reliability of the MDS 2.0 was tested in studies conducted in the USA, Denmark, Iceland, Italy, Japan, Sweden, and Switzerland (Sgadari et al., 1997). Dual, independent assessments were completed by trained nursing personnel within the same 2-week period. Weighted Kappa scores and Spearman-Brown intraclass correlation coefficients were calculated for each country's data. In the USA, 88% of all RAI items achieved a weighted Kappa of 0.4 or higher (Sgadari et al., 1997).

Reliability of the MDS-HC was tested in a cross-national field trial involving 241 cases (Morris et al., 1997). Dual, independent assessments of older home care recipients were conducted in Canada, Australia, the Czech Republic, Japan, and the United States. Reassessments were completed within a 7-day period. Inter-rater agreement was calculated using weighted Kappa scores; the average weighted Kappa score across all MDS-HC domains was .72, with a high of .91 for ADL self performance continence and a low of .36 for food consumption. In general, the reliabilities of the MDS-HC were similar to those of the MDS 2.0 (Morris et al., 1997).

As previously mentioned, summary scales have been developed from sub-sets of MDS items. Reliability data for these summary scales are typically taken from studies of the overall reliability of the MDS. Validation of the summary scales typically consist of concurrent validity studies and are reported separately for each summary scale. Summary scales measure cognitive performance, activities of daily living, instrumental activities of daily living, depression, and frailty.

MDS Cognitive Performance Scale (MDS-CPS)

The MDS Cognitive Performance Scale (MDS-CPS) combines 5 items related to cognition to form a single scale with 7 categories of cognitive impairment (0 = intact, 6 = very severe impairment). It was derived to predict scores on Folstein's Mini Mental State Examination (MMSE) and the Test for Severe Impairment (TSI; Morris et al., 1994). The 5 MDS-CPS items consist of short-term memory, cognitive skills for daily decision making, making self understood, self-performance in eating, and comatose status. The average inter-rater reliability for these items was reported as 0.85 (Morris et al., 1994).

Validation studies of the MDS-CPS have mainly utilized LTC populations. In one LTC sample, the MDS-CPS explained 74% of the variance in MMSE scores and 75% of the variance in MMSE and TSI combined scores. Average MMSE scores dropped across the 7 MDS-CPS levels as expected. Independent judgements of residents' orientation status (e.g., oriented, partially disoriented, disoriented) were made by trained nurses and used to examine the sensitivity and specificity of the MDS-CPS; sensitivity in the validation sample was 0.86 and specificity was 0.93 (Morris et al., 1994). A cross-sectional study involving 200 LTC residents compared MDS-CPS scores against Global Deterioration Scale (GDS) scores (Hartmaier, Sloane, Guess, & Koch, 1994). Overall, the GDS tended to classify residents as more cognitively impaired than the CPS, and only fair agreement was reached between the two scales (weighted Kappa = 0.41). A revised MDS-CPS scale, designated the MDS Cognition Scale (MDS-COGS) included additional MDS cognitive items in an effort to increase agreement with the GDS. This study did not, however, compare MDS-CPS scores with the gold standard of cognitive status measurement, the MMSE.

To test the MDS-CPS validity in a home care population, independent cognitive performance assessments were conducted on 95 home care recipients using the MDS-CPS and the MMSE. Linear regression analysis revealed a Pearson correlation of 0.81 between these scales (Landi et al., 2000).

MDS Activities of Daily Living Scale (MDS-ADL)

The MDS Activities of Daily Living (ADL) Scale is based on self-performance across the categories of bed mobility, mobility to/from bed/chair, locomotion, dressing, eating, toilet use, and personal hygiene. Each ADL category is coded from 0 (independent) to 6 (total dependence) and summed to result in a total score.

To validate the MDS-ADL, independent ADL assessments were conducted on 95 home care recipients using the MDS-ADL scale and the Barthel ADL index. Linear regression analysis revealed a Pearson correlation of 0.74 between these scales (Landi et al., 2000). Carpenter and colleagues (2005) conducted a similar validation study with a sample of 384 people aged 65 and older receiving home care. A correlation of 0.81 was reported between the Barthel ADL index and the MDS-ADL.

MDS Instrumental Activities of Daily Living Scale (MDS-IADL)

The MDS Instrumental Activities of Daily Living (IADL) scale is based on self-performance across the categories of meal preparation, ordinary housework, managing finance, managing medications, phone use, shopping, and transportation. Each IADL category is coded from 0 (independent) to 3 (performed by others) and summed to result in a total score. Two validation studies have been carried out. Independent IADL assessments were conducted on 95 home care recipients using the MDS-IADL scale and the Lawton and Brody IADL index. Linear regression analysis revealed a Pearson correlation of 0.81 between these scales (Landi et al., 2000). Carpenter et al. (2005) found a correlation of 0.81 between the MDS-IADL scale and the Duke OARS.

MDS Depression Rating Scale (MDS-DRS)

The MDS Depression Rating Scale (MDS-DRS) combines 7 items related to mood and behaviour to form a single scale with a score range of 0 to 14 (Burrows, Morris, Simon, Hirdes, & Phillips, 2000). It was derived to predict scores on the Hamilton Rating Scale for Depression and the Cornell Scale for Depression. The 7 MDS items that comprise the MDS-DRS are (1) resident made negative statements, (2) persistent anger or irritability with self or others, (3) expressions of what appear to be unrealistic fears, (4) repetitive health complaints, (5) repetitive anxious complaints/concerns (non-health related), (6) sad, pained, worried facial expressions, and (7) crying, tearfulness in the last 30 days before assessment, with a cut-off of 3 points for depressed mood (Burrows et al., 2000).

There is mixed evidence regarding the validity of the MDS-DRS. Burrows and colleagues (2000) reported a 0.70 correlation with the Cornell scale and 0.71 with the Hamilton scale in a validation sample, with 91% sensitivity for detecting depression when tested against psychiatric diagnosis. However, Carpenter and colleagues (2005) did not find a statistically significant correlation between the MDS-DRS and the Geriatric Depression Scale (GDS; non-significant values not reported). Research comparing all of the scales (MD-DRS, Hamilton scale, Cornell scale, and GDS) would benefit the evaluation of the MDS-DRS scale.

Other researchers reported no differences in identification of depression between the GDS and MDS depression items when the MDS depression items were converted to self-report form and completed by LTC residents (Ruckdeschel, Thompson, Dallo, Streim, & Katz, 2004). In this study, a cut-point of 3 on the MDS-DRS resulted in optimal sensitivity (0.925) and specificity (0.713). Ruckdeschel and colleagues (2004) also used a modified version of the Schedule for Affective Disorders and Schizophrenia (SADS) to validate the self-report version of the MDS-DRS and the GDS. Using the SADS as the criterion measure, the MDS-DRS and GDS discriminated depressed and non-depressed LTC residents with equal success.

Other depression research has examined the ability of all MDS mood items to detect depression. For example, McCurren (2002) classified LTC residents as depressed or not depressed based on GDS scores (depressed if GDS ≥ 5). She then classified residents as depressed or not depressed based on the MDS mood items (depressed if one or more indicators were positive); there was only 50% agreement between the GDS and MDS mood items (McCurren, 2002).

Heiser (2004) conducted a similar study and found the GDS classified 35% of the LTC residents as depressed (GDS score ≥ 6) compared to 23% using MDS mood items. The SADS was used as a criterion measure to examine the sensitivity and specificity of the MDS mood items. The sensitivity of the MDS mood items was 0.75 and specificity was 0.83; on average the MDS mood items correctly identified true positives and true negatives 79% of the time (Heiser, 2004). When the GDS total score was 0, sensitivity of the GDS was 0.78 and specificity was 1.0; when the GDS total score was 10, sensitivity and specificity were 0.80 and 0.14, respectively (Heiser, 2004).

Given the discrepant findings among MDS-DRS validation studies, it is clear that more work is needed to establish the validity of this summary scale.

MDS Changes in Health, End-stage Disease and Symptoms and Signs Scale (MDS-CHESS)

The MDS Changes in Health, End-stage Disease and Symptoms and Signs (CHESS) Scale was developed to predict adverse outcomes associated with frailty (e.g., mortality) in institutionalized older people (Hirdes, Frijters, & Teare, 2003). It combined eight items including vomiting, dehydration, leaving 25% of food uneaten, weight loss, shortness of breath, deterioration in cognition, ADL decline, and end-stage disease. The result was a 6-point scale with scores ranging from 0 (no instability) to 5 (greatest instability.

Hirdes and colleagues (2003) examined the utility and validity of the CHESS scale. Single-point increments on the CHESS scale generated a hazard ratio (HR) of 1.68; patients with a score of 5 (greatest instability) had 13.5 times the risk of mortality than patients with a score of 0 (no instability). Regression models that included the CHESS scale, age, MDS-CPS, Activities of Daily Living Form, sex, and do-not-resuscitate order demonstrated that the CHESS scale was an independent predictor of mortality. The CHESS scale was appropriately associated with medical activities, treatments, and other health conditions (e.g., 52% of the most stable patients had an abnormal laboratory value, compared with 79.7% of the least stable patients) (Hirdes et al., 2003).

Utility of the MDS-HC

As previously discussed, the MDS-HC was designed to evaluate the needs, strengths, and preferences of clients receiving home care services. As such, it can be used to track clients across service domains. The MDS-HC is also a useful tool in the assessment of health among various client types; for example, Fletcher and Hirdes (2001) used the MDS-HC to assess the health and functional status of women with breast cancer aged 55 and older.

Preliminary research has also indicated that use of the MDS-HC may lower hospitalization rates and improve physical and cognitive functioning in clients. Landi et al. (2001) conducted a randomized, single-blind, controlled trial of the MDS-HC in two health districts in Italy. One district used the MDS-HC as a geriatric assessment instrument while the other used the Barthel ADL index, Lawton and Brody's IADL index, and the MMSE. The assessments were conducted upon entry to the home care program and every subsequent 3 months for 1 year. Clients who received the MDS-HC assessment demonstrated significant ADL and cognitive gains and reduced the number of days they spent in hospital over the follow-up period (Landi et al., 2001). Survival analysis indicated that clients assessed with the MDS-HC entered hospital less frequently than did clients not assessed with the MDS-HC. Although nursing care and physiotherapy service use did not differ between the groups, clients assessed with the MDS-HC received significantly more in-home help services than the control group. Finally, per capita healthcare costs for clients assessed with the MDS-HC were 21% less than the control group, mainly due to a substantial decrease in hospital expenses (Landi et al., 2001).

The MDS-HC has also been used to monitor the quality of home care services. An international team from Canada, the United States, and Japan developed 22 home care quality indicators (HCQIs) based on the MDS-HC (Hirdes et al., 2004). Risk adjustment methods were used to control for differences between organizations. These HCQIs included process items (e.g., lack of medication reviews) and outcome measures (e.g., decline in ADLs) and when examined in entirety provided a better indication of service quality than traditionally-used satisfaction surveys (Hirdes et al., 2004).

Summary

The RAI-HC is a comprehensive assessment system used to collect health information and resource usage in the home care setting; it allows for screening across multiple areas of functioning (MDS-HC) and identification of areas for further assessment (CAPs). The RAI-HC is completed by trained health care professionals and has demonstrated excellent reliability and validity. Several summary scales have been developed and can be used to track clients' cognitive status, affect, ADL's, IADL's, and frailty. Preliminary research has indicated that these summary scales are both reliable and valid, although further validation of the MDS-Depression Rating Scale is warranted.

Although the RAI-HC was developed by an international team and has been used in many countries across the world, there are no published Aboriginal Canadian data using this instrument. Health research using the RAI-HC can be used to guide policy in the improvement of Aboriginal health in Canada. The next section of this paper will explore what is known about the health of Aboriginal Canadians and potentially similar ethnic groups based on other measures of health.

Aboriginal Peoples and Health

Aboriginal health is an important topic for provincial and national health care in Canada. Over the past three decades the health of Canadians has improved significantly; however, regardless of the health outcome assessed – be it mortality rates, self-rated health status, disease diagnosis, or health behaviours such as smoking – disparities exist between the Aboriginal and general Canadian population (Frohlich, Ross, & Richmond, 2006). While morbidity and mortality associated with infectious diseases and starvation have decreased in the Aboriginal population, the disease burden has shifted and chronic diseases such as diabetes and cardiovascular disease have emerged (Harris et al.,1997). In general, Aboriginal peoples report greater numbers of health conditions compared to the general population (Grace, 2003), die earlier, and sustain a disproportionate amount of physical and mental illness (MacMillan, MacMillan, Offord, & Dingle, 1996).

This segment explores in detail the state of knowledge on Aboriginal health. The first section describes Canada's Aboriginal population in terms of composition, size, and age structure. Next, the historical context of Aboriginal health care in Canada is explored. As much of our knowledge about Aboriginal health comes from population health surveys, these key health surveys are described. Underlying the health of Canada's population are social and economic determinants of health such as: education, employment and income, housing, geography, and access to health care; these determinants are explored with regard to their influence on Aboriginal and non-Aboriginal health. Next, this segment examines the health outcomes of Aboriginal people as evidenced through vital statistics, health risk factors, self-reported health status, and disease diagnoses. It concludes with a summary of international Aboriginal health.

Who are Canada's Aboriginal peoples?

As previously mentioned, Canada's Aboriginal population consists of people of

First Nations, Métis, and Inuit ethnicity. There are more than 630 First Nations communities across Canada which represent heterogeneous cultures, including Haida, Squamish, Cree, Blackfoot, Ojibway, Mohawk, Han, Montaignais, and MicMac cultures.

According to the 2006 Canadian census, approximately 1.1 million Canadians (4% of the total population) reported Aboriginal ethnicity, either sole or in combination with one or more other ethnicities (Statistics Canada, 2008a). Of these people, 30% reported their ethnicity as "North American Indian" and an additional 43% reported their ethnicity as "North American Indian" plus one or more additional ancestries. Approximately 4% of Aboriginal peoples reported "Métis" as their ethnicity, with an additional 20% reporting "Métis" plus one or more additional ancestries (Statistics Canada, 2008a).

The same census found that 2% of Aboriginal peoples identified solely as "Inuit" and an additional 1% reported "Inuit" plus one or more additional ancestries (Statistics Canada, 2008a). These numbers reflect only those people who reported to Statistics Canada, and do not distinguish between on- and off-reserve or urban or rural status. Additionally, the census did not include data from 22 First Nations reserves due to incomplete enumeration; one of the bands not included was the Six Nations of the Grand River, the largest in Canada at 22,649 members. Some Aboriginal leaders have thus called into question the accuracy of Aboriginal data collected by the census ("Census reveals Aboriginals fastest growing population," 2008).

In Ontario the majority of Aboriginal people are of First Nations ancestry. In the 2006 Canadian census, 87,895 people living in Ontario reported their ethnicity as "North American Indian" and an additional 229,990 reported "North American Indian" plus one or more additional ancestries (Statistics Canada, 2008a). In total this represents approximately 2.6% of Ontario's total population. Ontario's Métis population consisted of 9,825 people who reported a single ethnicity and 77,270 people who reported "Métis" plus one or more additional ancestries (approximately 0.7% of Ontario's total population). 1,055 people reported "Inuit" ancestry and an additional 4,195 people reported "Inuit" plus one or more additional ancestries (approximately 0.04% of Ontario's total population; Statistics Canada, 2008c).

Age. In 2006, the average age of the Aboriginal population was 27 years. Almost half (48%) of the Aboriginal population was under 24 years of age, compared to 31% of the non-Aboriginal population (Statistics Canada, 2008a). The Aboriginal population's age distribution is shaped like a pyramid with the largest age groups near the bottom and a steady decline towards the upper age groups; the non-Aboriginal population's age distribution is more uniform with the exception of the "baby boom" bulge. Between 1996 and 2006 the Aboriginal population grew by 45%; thus, compared to the 8% growth of the non-Aboriginal population, the Aboriginal population grew six times faster (Statistics Canada, 2008a).

Although a higher birth rate and lower life expectancy has resulted in a younger Aboriginal population, there is a trend towards ageing in this population. Between 1996 and 2001 there was a 40% increase in the number of Aboriginal people aged 65 and older seniors (Adelson, 2005) and this trend is expected to continue due to increasing life expectancy among Aboriginal people. In 2006, approximately 4.8% of the Aboriginal population was aged 65 and older, compared to 13.4% of the non-Aboriginal population (Statistics Canada, 2008b).

Geography. Eighty percent of Aboriginal people live in Ontario and the western provinces (Statistics Canada, 2008a); the majority of which reside in Ontario and British Columbia (Dyck, 2001). Proportionally, however, the prairies and far north have the largest aboriginal populations (Dyck, 2001). In 2006, approximately 26% of Aboriginal peoples lived on reserve (Statistics Canada, 2008a). However, this number may be inaccurate due to incomplete enumeration of 22 reserves and settlements. According to the 2006 census approximately 53% lived in urban areas (i.e., minimum population concentration of at least 1,000 people with at least 400 people per square kilometre), and 21% lived in rural areas. In 2006 Winnipeg, Edmonton, and Vancouver were the cities with the highest number of urban Aboriginal people (Health Canada, 2008b).

Language. The 2006 census indicated that over 60 Aboriginal languages were spoken by First Nations peoples, and 29% indicated that they spoke an Aboriginal language well enough to carry on a conversation (Statistics Canada, 2008a). The Aboriginal language spoken by the largest number of First Nations people was Cree, followed by Ojibway, Oji-Cree, and Montagnais-Naskapi. The traditional language of the Métis is Michif, a combination of French and Cree; however the most common language spoken by Métis people, according to the 2006 census, was Cree. Approximately 4% of Métis people indicated they spoke an Aboriginal language. Approximately 70% of Inuit people reported they could speak Inuktitut, and 50% indicated they were likely to use it as a main language at home (Statistics Canada, 2008a).

From this data, a picture of the Aboriginal population emerges. This population is a relatively young population due to a higher birth rate and shorter life expectancy. The large majority of this population belongs to one of the First Nations groups, with the smallest segment of the population being of Inuit ancestry. While approximately half of the Aboriginal population live in urban areas, the remainder live in rural areas and/or on reserves. The number of different languages spoken by the Aboriginal population is only one indication of their diversity.

History of Aboriginal Health Care in Canada

The current health system for Canadian Aboriginal peoples was shaped by the country's social and political policies, as well as the changing demographics of the Canadian and Aboriginal populations (Waldram, Herring, & Young, 2006). In keeping with the historical context, terms previously used such as "Indian" are used in this section.

The 1876 Indian Act dealt with Indian status, governance, land, and government funding; it was meant to facilitate provision of governmental programs to Indians and to assimilate them into Western culture. The term “Indian” referred to any person who was deemed Indian by birth or blood, belonged to a particular band or body of Indians, married an Indian, or was adopted by an Indian (Indian Registration and Band Lists Directorate, 1999). Applications of the Act made cultural events such as the potlatch and sun dance illegal, restricted movement through the pass system, and created social identity categories through the defining of “status” and “non-status” Indians (Kirmayer, Simpson, & Cargo, 2003).

Those individuals legally identified as “Indians” for purposes of the Indian Act were called “status” or “registered” Indians. Those individuals who lost or never had “Indian” status (e.g., through enfranchisement) were called “non-status Indians.” Many Aboriginal groups signed treaties with the government which, from the government’s perspective, facilitated removal of Indian land claims and removal of the people to allow for European settlement; such individuals were called “treaty Indians” (Waldram et al., 2006).

Between 1871 and 1877 a number of treaties were signed between various Indian groups and the federal government. Most treaties enabled provisions for education and agricultural assistance within the context of encroaching Western settlement, starvation, and deprivation (Waldram et al., 2006). Treaty Six was the only treaty that specifically mentioned medical care, with a clause that a medicine chest be placed in the house of every Indian agent for use and benefit of the Indians. Another clause indicated that the federal government would grant assistance to the Indians in the face of famine or pestilence (Lux, 2000). These clauses have been the source of much debate regarding Aboriginal groups’ right to free and comprehensive health care

(Waldram et al., 2006).

In essence, the 1876 Indian Act made all registered and treaty Indians wards of the state. As such, the federal government carried the responsibility for legally recognized Indians including their education and health care (Waldram et al., 2006). In the 1880's many residential schools were developed and run by the churches to provide education to Indian children. Although day schools were also run, residential schools whereby children were separated from their families and cultures were preferred, in an effort to assimilate them into Western culture (Lux, 2000). Peak enrolment occurred in 1953 with approximately 11,000 students at 80 operating residential schools in Canada (Kirmayer et al., 2003). In the 1960's and for three decades following, Indian children were taken from their families and placed into foster care, eventually being adopted by non-Indian families; this practice was termed the "Sixties Scoop." By the 1970's one-in-three to one-in-four Indian and Métis children were separated from their parents due to these practices (Kirmayer et al., 2003).

Some children experienced physical, sexual, and emotional abuse within the residential school system, a fact that has recently been recognized by the Canadian government and several churches (Waldram et al., 2006). Kirmayer and colleagues (2003) described other psychological, social, and economic effects of residential schools on survivors: disruption of families and communities; loss of knowledge, language, and tradition; systematic devaluation of Aboriginal culture and identity; transmission of punitive parenting models based on experiences in punitive institutional settings. These effects have been linked to individual and group disempowerment and loss of self-esteem (Kirmayer et al., 2003). In 2007 an out-of-court settlement between the Government of Canada, churches, Assembly of First Nations, and legal counsel for former students was reached, called the Indian Residential Schools Settlement Agreement. This agreement included a lump-sum payment to be made to all eligible former students of residential schools, an abuse claims process, and measures to promote healing (Indian Residential Schools Resolution Canada, 2007)

In 1985 important changes to the Indian Act were made, to bring the Act into agreement with the Charter of Rights and Freedom (Indian Registration and Band Lists Directorate, 1999). These changes resulted in the restoration of Indian status to those that had otherwise lost or never had it, mainly women and their children. Currently the Constitution recognizes Indian, Inuit, and Métis peoples as Aboriginal peoples, and they continue to have special standing within Canada (Waldram et al., 2006). The Inuit and Métis did not have legislation comparable to the Indian Act; however, the federal government provides similar services to them.

At the present time, Aboriginal peoples are covered under the universal health insurance plans administered by the provinces and territories (Waldram et al., 2006). On-reserve medical services have traditionally been the responsibility of the federal First Nations and Inuit Health Branch (FNIHB; formerly the Medical Services Branch), particularly reserves located in remote and isolated areas where provincial services are not readily available (Health Canada, 2005a). The FNIHB also provides supplementary health benefits (e.g., drugs, dental care, patient transportation) to Aboriginal peoples. The trend in FNIHB's expenditures has been toward increased transfer payments; this trend reflects provision of fewer direct services and more financial contributions to Aboriginal governments (e.g., band councils) to provide health services (Waldram et al., 2006). Thus, Aboriginal communities have increasing control over their own health care.

Several health performance measurement systems have been implemented in Canada in order to measure goals of the health care system such as responsiveness to population expectations and contribution to good health (Smylie, Anderson, Ratima, Crengle, & Anderson, 2006). For example, the Aboriginal Health Reporting Framework was developed to centralize information relevant to Aboriginal health. The Inuksiutiin

Health Information Framework was developed based on the holistic view of Inuit health and outlines the requirements for Inuit-relevant and useful health data. However, Symlie and colleagues (2006) argued that these health performance measurement systems are underdeveloped in terms of local performance measurement which is most relevant to Aboriginal peoples and health care, and overly developed in terms of macro healthcare monitoring.

Description of Population Health Surveys

Health surveys provide self-reported information about health behaviours, practices, attitudes, and beliefs (Waldram et al., 2006). There have been many national health surveys in Canada, but until recent years few surveys enabled separation of information for Aboriginal peoples from the general population and most excluded Aboriginal people living on reserves. This section concludes with a critique of the use of population surveys and other types of research with Aboriginal peoples.

The National Population Health Surveys (NPHS) and Canadian Community Health Surveys (CCHS) included questions about ethnicity and race. The NPHS is an ongoing longitudinal survey that began in 1994/95 with a sample of approximately 17,000 people representative of the Canadian population (Statistics Canada, 2007). The same people were interviewed every two years about health status, use of health care services, health determinants, and changes in health status; people living on reserves, in remote areas, and people in the armed forces were excluded from participation (Statistics Canada, 2007). The 1994/95 NPHS included 28 Inuit, 855 Métis, and 1,821 First Nations peoples (Waldram et al., 2006).

The CCHS is an ongoing cross-sectional survey of Canadians' health status, health care access, and health determinants for 136 regions across the country (Statistics Canada, 2003). It was started in 2000 and data collection was conducted in two-year cycles with an approximate sample size of 130,000 at the health region level and 30,000 at the provincial level. The CCHS excluded participation of people living on reserves, in remote areas, and in the armed forces (Statistics Canada, 2003). The 2000/01 CCHS included 827 Inuit, 1,497 Métis, and 4,216 First Nations peoples (Waldram et al., 2006). As both the NPHS and CCHS excluded participation of people living on reserves, data from these surveys are only generalizable to the off-reserve Aboriginal population.

The 1991 Aboriginal Peoples Survey (APS) provided a much-needed supplement to the general population surveys described above. The APS was a weighted national survey of Aboriginal peoples aged 15 and older (Newbold, 1998). The sample consisted of 25,122 people of Aboriginal descent (First Nations, Métis, and Inuit) living on reserve, off reserve, and in settlements across Canada. The survey included questions regarding health status, physician and health professional use, and perceived community health problems.

In 2001 another Aboriginal Peoples Survey was conducted by Statistics Canada (APS-2). This sample included 53 Inuit communities, and 8 Métis settlements, 123 First Nations communities, 35 communities with a high Aboriginal population, and 9 urban areas (Waldram et al., 2006). The APS-2 had a low participation rate among First Nations peoples, with participation of only 44% of the self-identified Aboriginal population.

In 2002 the National Aboriginal Health Organization (NAHO) conducted a telephone poll of 1,209 First Nations people living on or near reserves. The NAHO Public Opinion Poll on Aboriginal Health and Health Care in Canada asked respondents about their perceived health, access to and use of the health care system, use of traditional healers and medicine, and ways to improve Aboriginal health. The results of the poll represent the opinions and general perceptions of the respondents regarding certain health and health care issues (National Aboriginal Health Organization, 2003).

The Ontario First Nations Regional Health Survey (OFNRHS) randomly sampled 23 First Nations communities in Ontario, with an 86.1% response rate among the adults selected to participate (MacMillan et al., 2003). Survey questions were similar to those on the NPHS and included questions regarding general health, chronic conditions, tobacco and alcohol use, and health service utilization.

Although these population surveys collected data in a manner that allowed for analyses of population sub-groups, there have been many criticisms of the type of health research conducted with Aboriginal peoples. For example, Young (2003) reviewed the research on Aboriginal health in Canada to determine if their health needs have been adequately examined. Of the 254 publications reviewed, 184 did not specify a comparison group. Few studies examined the geographic, cultural, or socioeconomical conditions that may underlie health disparities.

Additionally, the reliability and validity of Aboriginal data collected by national surveys have been questioned. Of concern is the cultural appropriateness of survey items, issues regarding translation of English surveys into an Aboriginal language, and interpretation of responses by non-Aboriginal researchers (Burhansstipanov, 1995). Underlying assumptions about health and illness have been based on Western understandings and are not necessarily compatible with Aboriginal understandings of these phenomena. There are also coding problems such as racial misclassification, undercounting, and use of non-representative sampling. Non-representative sampling may lead to data from one Aboriginal group being erroneously generalized to other Aboriginal groups.

As previously mentioned, there is great heterogeneity within the Aboriginal population; some researchers have suggested that there is greater heterogeneity between Aboriginal groups than between Aboriginal and non-Aboriginal groups (e.g., Waldram et al., 2006). Due to this heterogeneity, the combination of all Aboriginal peoples together into one "Aboriginal" category is problematic for most health research studies.

Although these problems with population surveys exist and are acknowledged, their data comprise much of our knowledge about the health of the Aboriginal population. The results of these population surveys are combined with findings from other areas of health research throughout the next sections, and should be interpreted with the above caveats in mind.

Social and Economic Determinants of Health

Social and economic inequities are the foundation for health disparities in a broad sense; income, employment, and education are inter-related and have a significant impact on health and well-being (Spitzer, 2005). Traditionally, socioeconomic status has been defined by education, income, and occupation, and has been linked to several health problems including low birthweight, cardiovascular disease, diabetes, and cancer (Adler & Newman, 2002). Over the last four decades these nonmedical factors have influenced Canadian policymakers and researchers, and population health divisions have emerged within federal and provincial health departments. The social and economic determinants of health have become well-researched phenomena within Canada and abroad (Lavis, 2002).

There have been many efforts to explain the underlying causes of health disparities, and many have focused on the contribution of behavioural and structural arguments (Frohlich et al., 2006). The behavioural argument suggests that health disparities are caused by differential distributions of health behaviours (e.g., smoking, obesity) while the structural argument posits that health disparities are caused by economic and social hierarchies (e.g., chronic stress associated with lower income). Frohlich and colleagues (2006) argued that each type of determinant is indicative of differential opportunities, resources, and constraints. Within the Aboriginal population, poor health outcomes are related to fewer educational and employment opportunities, insufficient housing and sanitary infrastructure, and reduced access to health information and resources (Frohlich et al., 2006).

In this section, the social and economic determinants of health are explored. The obvious linkages between education, employment, and income are discussed first, followed by an examination of the impact of housing, geography, and access to health care on health outcomes.

Education. Education is a fundamental component of SES as it significantly influences future employment opportunities, income potential, and life skills; these life skills enable people to access health information and resources (Adler & Newman, 2002). In general, levels of education are lower in Aboriginal peoples when compared to the general population. For example, the CCHS found lower levels of education among off-reserve Aboriginal people compared to the non-Aboriginal population (Tjepkema, 2002). Almost half (43.9%) of the off-reserve Aboriginal population had less than a high school education, compared to only 23.1% of the non-Aboriginal population. This difference varied by region; off-reserve Aboriginal people living in the territories were even less likely to have graduated from high school than those living in the provinces (Tjepkema, 2002).

Correspondingly, post-secondary education levels are lower among Aboriginal peoples; a sample of 301 First Nations people found that only 10% had completed a university education, compared to 33% of people of European descent (Anand et al., 2001). The 2001 Canadian Census indicated that on-reserve First Nations people had lower rates of educational attainment at all levels including secondary school, postsecondary admission, and completion of university degrees (Health Canada, 2005a).

Employment and income. Poverty is a key determinant of health in Canada and other countries around the world (Raphael et al., 2006). Higher earnings can supply better nutrition, housing, schooling, and recreation (Adler & Newman, 2002) which promote health and well-being. In general, Aboriginal household incomes are significantly below their non-Aboriginal counterparts. In 1991, the average income for the total Aboriginal population was $12,800, compared to the general population income of $24,100 (Adelson, 2005).

In their research sample, Anand and colleagues (2001) reported that 32% of First Nations people had an annual income of less than $20,000, compared to only 7% of non-Aboriginal people. Conversely, 60% of non-Aboriginal people had an annual income greater than $60,000 compared to 17% of the First Nations people. Employment rates were lower among First Nations people, with 51% employment compared to 69% of the non-Aboriginal sample (Anand et al., 2001).

Anand et al. (2006) used logistic regression to identify social and economic variables (income of below $20,000, income between $20,000 and $60,000, unemployment, and marital status) which predicted CVD. These variables combined to create a social disadvantage score that ranged from 0 (least social disadvantage) to 5 (most social disadvantage). In a sample of 1,285 men and women of European, Aboriginal, Chinese, and South Asian ancestry, Aboriginal people had the highest age-adjusted level of social disadvantage (2.69 for women, 2.18 for men). People of European ancestry had the lowest age-adjusted rate of social disadvantage (1.56 for women, 1.14 for men; Anand et al., 2006).

Berthelot, Wilkins, and Allard (2004) noted higher mortality rates in health regions characterized by high unemployment, low educational attainment, and low household income. These regions also had a 35% Aboriginal population. As these social and economic determinants of health were likely to affect the entire health region, it is likely that increased mortality rates were not due solely to the higher Aboriginal population

(Berthelot et al., 2004) but to low socio-economic status.

The CCHS found lower household income and lower employment rates among the off-reserve Aboriginal population (Tjepkema, 2002). Approximately 27% of off-reserve Aboriginal households had a low income, defined as less than $15,000 for one or two people in the household, less than $20,000 for three or four people, and less than $30,000 for five or more people; approximately 10% of the non-Aboriginal population had a low household income. Among the off-reserve Aboriginal population aged 15 to 75, 38.1% had worked the entire previous year, compared to 53.2% of the non-Aboriginal population (Tjepkema, 2002).

Other research has found a relationship between income inequality and mortality. For example, data from the United States showed a strong relationship between income inequality and mortality for the working age population; as income inequality increased mortality also increased (Ross et al., 2000). In Canada, however, this relationship was not significant, perhaps due to differences in social and economic resource distribution in Canada. Canadian provinces and metropolitan areas had lower income inequality and lower mortality compared to those in the United States (Ross et al., 2000).

Housing. While relatively little is known about the relationship between housing and health outcomes for ethnic minorities in Canada, there is evidence to suggest that substandard housing has a large health impact on Aboriginal groups. However, research in this area may be confounded, as it is difficult to separate the effects of housing, sanitation, and water supply from other determinants of health (i.e., socioeconomic status; Health Canada, 2005a). With these limitations in mind, Aboriginal people have been identified as a vulnerable population for whom attributes of housing are influential (Dunn, Hayes, Hulchanski, Hwang, & Potvin, 2006). Housing has a number of attributes which have the potential to influence health, and to which Aboriginal people are more likely to be exposed to (e.g., physical hazards, crowded living conditions).

For example, Adelson (2005) found that Aboriginal people were twice as likely to live in homes requiring significant repairs compared to the non-Aboriginal population. The 2006 census found that 28% of First Nations people, 14% of Métis people, and 28% of Inuit people lived in homes in need of significant repairs, compared to 7% of the non-Aboriginal population (Statistics Canada, 2008a). These figures increased on reserves. For example, Indian and Northern Affairs Canada (INAC) reported that in 2001, 55.8% of homes on First Nations reserves were considered adequate (i.e., did not require major repairs and was large enough for the size of the household), while 36.0% were in need of major repairs (Health Canada, 2005a).

Aboriginal people are 2 to 8 times more likely to experience crowded living conditions compared to the Canadian general population (Adelson, 2005). For example, the 2006 Canadian Census indicated that Aboriginal people were four times more likely to reside in crowded dwellings (i.e., more than one person per room) compared to non-Aboriginal people; three percent of Inuit and Métis people lived in crowded conditions. Crowding was especially common on First Nations reserves, where 26% of people lived in crowded conditions (Statistics Canada, 2008a). INAC found that 19% of homes on First Nations reserves had more than one person per room, compared with 2% of homes in the Canadian population (Health Canada, 2005a). As discussed later in this dissertation, overcrowding may increase the risk of transmitting infectious diseases such as tuberculosis.

Compared to the non-Aboriginal population, Aboriginal people are 90 times more likely to have no piped water, and 5 times more likely to have no bathroom facilities (Adelson, 2005). Many Aboriginal communities lack basic sanitary infrastructure (Frohlich et al., 2006). Enteric, food, and waterborne diseases such as giardiasis, shigellosis, verotoxigenic *Escherichia coli* (E. coli) and hepatitis A are more easily spread in communities with substandard water and sewage systems. The incidence of shigellosis was 29 times higher among First Nations Manitobans than among the rest of the Manitoba population, and was associated with substandard water delivery systems, inadequate sewage removal, and overcrowded housing (Rosenberg et al., 1997).

More research is needed to examine the consequences of unaffordable, inaccessible, and poor quality housing on Aboriginal health. Research is also needed to determine the health consequences of housing expenditures in low-income households, as money spent on housing reduces the amount that can be spent on other health-enhancing goods (Dunn et al., 2006). The picture that emerges from current data is one of poor living conditions, particularly on First Nations reserves.

Geography. Frohlich and colleagues (2006) suggested that geography sets the context for other determinants of health such as educational possibilities, available jobs, and income. A community's degree of isolation may impact its public, community, and emergency health services, and many First Nations and Inuit communities are not located within urban limits (Heath Canada, 2005). Approximately 64% of First Nations communities in Canada are considered "non-isolated" (i.e., accessible by road, less than 90 km. from physician services), 14.4% are "semi-isolated" (i.e., accessible by road, physician services are farther than 90 km. away), 17.9% are "isolated" (i.e., no road access, scheduled flights, good telephone service), and 3.5% are "remote isolated" (i.e., no road service, no scheduled flights, minimal telephone service). In Ontario, 24.1% of First Nations communities are considered isolated.

In Canada, health status is not distributed evenly among communities, but varies to some extent with socio-demographic differences between communities. Data from the CCHS indicated that people living in large metropolitan areas and urban centres, where education rates were high, had the highest life expectancies in Canada (Shields & Tremblay, 2002). Likewise, First Nations communities near urban areas do better economically than First Nations communities in rural areas (Health Canada, 2005a). In contrast, people living in remote northern communities, where education rates were low, had the shortest life expectancies in Canada; these communities also tended to have higher rates of Aboriginal people. In the northern remote communities, higher rates of smoking, heavy drinking, and obesity were observed (Shields & Tremblay, 2002).

Regardless of race, living in a rural location has been a barrier to sufficient health care (Marrone, 2007). For example, difficulty in recruiting health care providers to live and work in rural and remote communities lead to understaffing of health care facilities. Isolation from urban centres prohibits timely access to necessary medical services (Marrone, 2007). Thus, geography sets the context for access to health care, another significant determinant of health discussed below.

Access to health care. Findings from the OFNRHS indicated that while 81.4% of Ontario's general population had seen a generalist practitioner or family physician in the prior 12 months, only 64.6% of First Nations peoples did. Conversely, First Nations peoples had significantly more contact with a nurse, social worker, or alternative health care provider (MacMillan et al., 2003). The national APS found that 67% of Aboriginal peoples had seen a generalist physician in the prior 12 months (Newbold, 1998).

The CCHS found that 76.8% of off-reserve Aboriginal people saw a general practitioner in the previous 12 months, no different from the non-Aboriginal population (78.7%; Tjepkema, 2002). However, off-reserve Aboriginal people residing in the territories were significantly less likely to have contact with a general practitioner compared to non-Aboriginal northerners (58.8% vs. 75.9%, respectively). Off-reserve Aboriginal people were much more likely to have had contact with a nurse in the prior 12 months (16.8% vs. 9.8%), particularly northern off-reserve Aboriginal people (49.0%). Contact with dentists, who are not publicly funded, was less likely among off-reserve Aboriginal people (45.2%) compared to non-Aboriginal people (59.4%; Tjepkema, 2002).

The 2002 National Aboriginal Health Organization's (NAHO) Public Opinion Poll found that 59% and 78% of First Nations people endorsed "very easy" or "somewhat easy" access to family physicians and nurses, respectively, but greater difficulty accessing specialists. Forty-five percent endorsed "somewhat difficult" or "very difficult" for access to mental health workers, and 43% for access to paediatricians (National Aboriginal Health Organization, 2003).

However, access to health care is not necessarily an Aboriginal issue, but a rural issue. For example, Newbold (1998) suggested that physician use is confounded with location, as access to health care varies with geographic location (e.g., rural versus urban settings) and not necessarily Aboriginal group. Indeed, differences in physician contact were seen among various geographic locations on the APS; 73% of Aboriginal peoples who lived in an urban setting had contact with a physician, compared to 67% who lived in a rural location and 68% who lived on reserve (Newbold, 1998). On the CCHS significantly more off-reserve Aboriginal people indicated accessibility of health care (i.e., cost or transportation) was an unmet need compared to non-Aboriginal people (16.9% vs. 11.9%, respectively, Tjepkema, 2002). Similar findings were reported by the NAHO Public Opinion Poll; First Nations people living in isolated/remote and small communities reported more difficult access to health care professionals than those living in non- and semi-isolated communities (National Aboriginal Health Organization, 2003).

Comparisons of hospitalization and physician visit rates between Registered First Nations (RFN) and all other Manitobans (AOM) were conducted, taking into account the underlying differences in health status using premature mortality rates (Martens, Sanderson, & Jebamani, 2005a). RFN people had twice the premature mortality rate (6.61 deaths per 1,000) compared to AOM (3.30 deaths per 1,000). Perhaps due to the discrepancy in health status, RFN people had higher rates of hospitalization, physician usage, and total days of hospital care than AOM. However, consultation rates (i.e., first visit to a specialist) and overall specialist visit rates were lower for the RFN population. Although the elevated hospital rates reflected the poorer health of the RFN population, consultation and specialist visit rates did not reflect their health needs (Martens et al., 2005a).

Approximately three quarters of respondents (78%) in the NAHO Public Opinion Poll reported having received a health check-up or treatment in the previous year; this proportion varied with geography, with 81% of respondents in non-isolated, 82% in semi-isolated, and 70% in isolated/remote communities receiving a health check-up or treatment in the previous year (National Aboriginal Health Organization, 2003). First Nations people living in non- and semi-isolated communities were more likely to have a regular physician (85% and 81%, respectively) than First Nations people living in isolated/remote communities (52%).

Aboriginal groups have a strong tradition of traditional healers and medicines. The NAHO Public Opinion Poll included questions about the use and attitudes toward this type of health care. Approximately half of First Nations respondents (51%) indicated they had used a traditional Aboriginal healer or medicines, and 37% had done so in the previous six months. Respondents with a high school education or higher were more likely to report using a traditional healer or medicines (62%) compared to those with a high school education or less (47%). Sixty-eight percent indicated that they would use traditional healers and medicines more frequently if it was available through their local health care centre, and 62% indicated they would use it more frequently if it was covered by the health care system (National Aboriginal Health Organization, 2003).

In summary, education, employment, income, housing, geography, and access to health care influence health in a broad sense and have significant influence on health-related outcomes. Aboriginal peoples tend to have lower rates of education, lower levels of employment and income, poorer housing conditions, and less access to health care when compared to Canada's general population. These differences are amplified to a greater extent by geography, which sets the context for these health determinants.

Vital Statistics

Vital statistics are frequently used as a broad measure of health status for a population, and Canadian data show a significant disparity in life expectancy for Aboriginal people. In 1991 the average life expectancy at birth for Aboriginal men was 66.9 years, compared to 74.6 years for men in Canada's general population. For Aboriginal women life expectancy was 74.0 years compared to 80.9 years for the female general population (Trovato, 2001). In 2000, life expectancies for First Nations peoples were 68.9 years for men and 76.6 years for females (7.4 and 5.2 years shorter than the Canadian population's life expectancies; Health Canada, 2005a).

This reduced life expectancy for Aboriginal peoples is influenced by a higher infant mortality rate and higher rates of premature mortality. Infant mortality has been regarded as an important measure of population health, as it is influenced by the health of infants, children, and pregnant women. Over the past 30 years the Aboriginal infant mortality rate has been steadily declining; in 2000 the First Nations infant mortality rate was 6.4 deaths per 1,000 live births, compared to 5.5 per 1,000 for Canada (Health Canada, 2005a).

As mentioned above, Aboriginal populations have higher rates of premature mortality. Martens, Sanderson, and Jebamani (2005b) calculated premature mortality rates for First Nations Manitobans and all other Manitobans for the years 1995-1999. People of First Nations ancestry had twice the premature mortality rate (age- and sex-adjusted rate of death before age 75 years) of other Manitobans. They also experienced an eight-year gap in life expectancy and double the potential years of life lost due to disability (Martens et al., 2005b).

In 2000 the crude mortality rate for First Nations was 456.7 deaths per 100,000

(Health Canada, 2005a). The four leading causes of death for this group were circulatory diseases, injury and poisoning, cancer, and respiratory diseases. For Canada's general population the leading causes of death were cardiovascular diseases, cancer, injuries, and respiratory diseases. Injury and poisoning accounted for 23% of all deaths among First Nations, compared to 6% of all deaths among the general population (Health Canada, 2005a).

The crude death rate was higher among First Nations males than First Nations females in 2000, largely due to higher rates of death caused by injury and poisoning (the number one cause of death among First Nations males; Health Canada, 2005a). First Nations males had double the rate of death due to injury and poisoning when compared to females, and 2.3 times the Canadian male rate. Suicides, motor vehicle accidents, suffocations and drowning, and homicide were the types of injury that caused the most deaths. Circulatory diseases were the number one cause of death among First Nations females (Health Canada, 2005a). In British Columbia, the potential years of life lost due to motor vehicle accidents was 248% higher among registered First Nations people than among the general population, and 340% higher due to homicide (Bridges & Kunselman, 2005).

Although circulatory diseases and cancer were among the top three causes of death for all First Nations peoples, the rates were lower than for the Canadian population. Deaths from circulatory diseases were 2.2 times higher, and deaths from cancer were 3 times higher, among Canadian males when compared to First Nations males. For Canadian females, death from circulatory diseases was 2 times higher and death from cancer was 2.8 times higher than for First Nations females (Health Canada, 2005a).

In the year 2000 suicide was among the leading causes of death in First Nations and accounted for 22% of all deaths in youth (aged 10-19 years) and 16% of all deaths in early adulthood (aged 20-44 years; Health Canada, 2005a). As in the general population, First Nations males were at higher risk of completed suicide compared to First Nations females. Up to the age of 65 years, all First Nations age groups were at higher suicide risk than the general population (Health Canada, 2005a). In British Columbia, the potential years of life lost due to suicide for registered First Nations people was 224% greater than the general population (Bridges & Kunselman, 2005).

Research has found that socio-demographic and health risk factors are associated with life expectancy. Data from the CCHS found that socio-demographic factors such as the proportion of Aboriginal population, unemployment rate, income, and education accounted for 56% of the variance in life expectancy in the Canadian population (Shields & Tremblay, 2002). Life expectancy was negatively associated with the daily smoking rate and the percentage of the population who drink heavily (explained 8% and 1% of the variance in life expectancy, respectively).

From these vital statistics data, it is evident that the Aboriginal population has a shorter life expectancy than the non-Aboriginal population. While a higher infant mortality rate accounts for some of the variance in life expectancy, it is also influenced by high premature mortality rates. Although circulatory diseases, cancer, and respiratory diseases are leading causes of death for the population as a whole, death from injury and poisoning is significantly higher for the Aboriginal population (23% vs. 6%) and is the leading cause of death among First Nations men.

Health Risk Factors

Differences in health risk factors also exist between Aboriginal and non-Aboriginal populations in Canada. As previously mentioned, health disparities may be caused by differential distributions of health behaviours such as smoking and obesity in different populations. In general, higher distributions of health risk factors are found among Aboriginal groups. This section describes the research on smoking, hypertension, high cholesterol, obesity, and metabolic syndrome as they pertain to Aboriginal people.

Smoking. For Aboriginal peoples there is a strong history of ceremonial, spiritual, and medicinal tobacco use. However, its' non-traditional usage has important health implications for the Aboriginal population, as it does for the population as a whole (Health Canada, 2005a). In Canada smoking is the most preventable cause of death (Shields & Tremblay, 2002).

Smoking rates are generally higher among First Nations people compared to the general population. The OFNRHS found that 62.0% of the First Nations sample smoked cigarettes, compared to 24.0% of the general population (MacMillan et al., 2003). The rate was higher in First Nations males (68.9%) compared to First Nations females (55.4%). Eighty-one percent of the First Nations sample had smoked cigarettes at some point in their lives, compared to 59.0% of the general population. Finally, 50.9% of the First Nations sample experienced someone smoking regularly inside the house, compared to only 33.5% of the general population (MacMillan et al., 2003).

The CCHS found that the off-reserve Aboriginal population had smoking rates 1.9 times higher than the non-Aboriginal population (51.4% vs. 26.5%, respectively; Tjepkema, 2002). The majority of off-reserve Aboriginal smokers were light daily smokers (27.2%) followed by heavy daily smokers (14.3%) and occasional smokers (9.9%).

Anand and colleagues (2001) found higher smoking rates among people of First Nations ancestry (39% males, 42% females) compared to people of European ancestry (20% males, 13% females). Even higher rates were found in a sample of First Nations people from Northwestern Ontario; in this sample, rates ranged from 64.74% in females to 70.87% in males (Harris et al., 2002).

Hypertension. In the OFNRHS, 22.6% of the Aboriginal sample self-reported hypertension compared to 9.7% of the general population. When examined separately by gender, 26.0% of Aboriginal males and 19.2% of Aboriginal females reported hypertension (MacMillan et al., 2003). Anand et al. (2001) found that 20% of their Aboriginal sample had hypertension, compared to 12% of the non-Aboriginal sample. In the CCHS the prevalence of hypertension was significantly higher among off-reserve Aboriginal people (15.4%) compared to non-Aboriginal people (13.2%); this finding did not vary with geographical status (i.e., urban, rural, or territories; Tjepkema, 2002).

High cholesterol. Monslave, Thommasen, Pachev, and Frohlich (2005) conducted a retrospective review of all patient charts located in a rural British Columbia medical clinic. Data for Aboriginal (n = 1,120) and non-Aboriginal (n = 1,258) patients were compared on health status indicators; non-Aboriginal patients had statistically higher levels of total cholesterol (5.57 mmol/L) than non-Aboriginal patients (5.25 mmol/L; Monslave et al., 2005). In a comparison of Aboriginal and European people, the Aboriginal sample had a higher rate of high cholesterol as measured by conventional methods (11% vs. 6%, respectively; Anand et al., 2001).

Obesity. Being overweight or obese is associated with a greater risk of several chronic conditions such as diabetes mellitus, high blood pressure, and asthma and is negatively correlated with physical activity (Tjepkema, 2002). The CCHS indicated that 23.3% of off-reserve Aboriginal people were physically active (leisure time energy expenditure of 3.0 kcal/day or more) compared to 21.8% of non-Aboriginal people (no significant difference). There was no significant overall difference between inactive (leisure time energy expenditure of 1.5 kcal/day or less) off-reserve Aboriginal and non-Aboriginal people across the provinces; however, off-reserve Aboriginal people residing in the territories had higher rates of inactivity (61.6%) compared to their non-Aboriginal counterparts (47.0%; Tjepkema, 2002).

According to the CCHS rates of obesity (BMI of 30 or more) were higher among off-reserve Aboriginal people (24.6%) compared to non-Aboriginal people (14.0%). This difference was observed within the provinces, but in the territories off-reserve Aboriginal and non-Aboriginal people had similar rates of obesity (24.5% and 20.1%, respectively; Tjepkema, 2002).

The prevalence of obesity among the Keewatin District Inuit was determined by body mass index (BMI), waist-to-hip ratio (WHR), and skinfold thickness in a sample of 414 Inuit (Orr, Martin, Patterson, & Moffatt, 1998). Thirty-one percent of participants had a BMI greater than 27 and were considered overweight; 29% of male participants and 37% of female participants were considered overweight. The mean WHR was 0.92 for males and 0.84 for women, and this population had greater skinfold thickness than that reported for the general population. These findings indicated a high prevalence of obesity among the Inuit population (Orr et al., 1998).

Harris and colleagues (2002) found a high BMI and WHR among a sample of First Nations people in Northwestern Ontario; BMI was highest in women with type 2 diabetes mellitus (average BMI for women was 30.61) and WHR was highest among men with type 2 diabetes mellitus (average WHR for men was 0.99). In their research sample, Anand and colleagues (2001) found that 62% of Aboriginal men and 56% of Aboriginal women had a BMI greater than 30. In this sample, Aboriginal men had a higher WHR than Aboriginal women (90% vs. 41%, respectively; Anand et al., 2001).

Similar findings were reported in a rural and remote community in British Columbia. People with a BMI of 27 or higher were classified as overweight. A chart review of all people attending a medical clinic found that proportionally more Aboriginal people were overweight (65%) than non-Aboriginal people (47%). Accordingly, the prevalence of diabetes mellitus, hypertension, asthma, and coronary artery disease increased with obesity (Self, Birmingham, Elliott, Zhang, & Thommasen, 2005).

Metabolic Syndrome. Metabolic syndrome is a risk factor for diabetes and heart disease. It consists of metabolic abnormalities in the areas of waist circumference, triglyceride levels, HDL cholesterol, blood pressure, and fasting blood glucose (Kaler et al., 2006). The original criteria for identifying the syndrome were developed by the National Cholesterol Education Program (NCEP), but other organizations have slightly different diagnostic criteria and cut-points. To clarify identification, the International Diabetes Federation (IDF) issued a consensus definition (Kaler et al., 2006); research into metabolic syndrome typically uses one or both of these definitions.

Research has indicated that rates of metabolic syndrome are high in Aboriginal populations in Canada. Kaler and colleagues (2006) collected data from 176 adults (aged 18+) and 84 children and adolescents without diabetes living in a rural First Nations community in Alberta. Anthropometric measurements and metabolic data were collected using standardized procedures. The age-standardized prevalence of metabolic syndrome was 44.6% (95% CI: 31.4% - 61.3%) based on NCEP criteria and 49.9% (95% CI: 39.9% - 61.8%) based on IDF criteria. Hemoglobin A1c, LDL cholesterol, American Diabetes Association (ADA) risk score, and activity pattern were associated with metabolic syndrome in adults. More specifically, metabolic syndrome was 4.37 (95% CI = 2.10 – 9.11) times more likely in inactive adults compared to active adults (the authors did not specify how activity was measured), and a one-point increase in ADA score resulted in a 21% to 28% increase in the odds of having metabolic syndrome (Kaler et al., 2006).

Metabolic syndrome was examined in a sample of 360 non-diabetic First Nations people in a rural Ontario community (Liu et al., 2006). Anthropomorphic measurements were taken twice, and the average used in all analyses. Fasting blood samples were procured and analyzed according to standard procedures. Physical activity was assessed using the modifiable activity questionnaire, and fitness level was determined by maximum oxygen intake (VO_{2max}) during a validated submaximal step test (Liu et al., 2006). The overall age-standardized prevalence of metabolic syndrome in this sample was 27.5% (95% CI: 20.2% - 34.9%) based on NCEP criteria and 37.2% (95% CI: 28.4% - 45.9%) for IDF criteria. In men, higher percentage body fat and smoking were associated with metabolic syndrome, while in women older age, higher percentage body fat, and lower physical fitness were associated with metabolic syndrome (Liu et al., 2006).

Self-Reported Health Status

Self-reported health is commonly used in population health surveys as a measure of health status, and not surprisingly there are significant disparities in the self-reported health status of Canadian Aboriginal peoples. According to the CCHS Aboriginal people living off reserve rated their health as either fair or poor at a degree 1.9 times higher than non-Aboriginal people (23.1% vs. 12.2%). This finding was not significantly influenced by geographical region (i.e. urban, rural, or territories) but it did vary significantly with household income for both Aboriginal and non-Aboriginal people. People at the lowest level of household income had the highest proportion of self-rated fair or poor health; as household income increased these fair or poor health self-ratings decreased (Tjepkema, 2002).

Data from the CCHS indicated that self-reported fair or poor health was associated with higher rates of smoking, obesity, and depression. These predictors accounted for 4%, 10%, and 9% of the variance in self-reported health after controlling for socio-demographic factors (Shields & Tremblay, 2002).

The NAHO Public Opinion Poll found that 73% of respondents rated their health as good, very good, or excellent, and 27% rated their health as fair or poor. Those respondents who had higher annual incomes ($30,000 or more annually) were more likely to rate their health as very good or excellent compared to those who had lower annual incomes (50% vs. 34%, respectively). A similar pattern was observed for those with a high school education or higher (50% vs. 36% for those with less than a high school education; National Aboriginal Health Organization, 2003).

Disease Prevalence

Diabetes mellitus. The higher rate of diabetes mellitus among Aboriginal people is the most widely known and researched health disparity. Rates of non-insulin-dependent diabetes mellitus (NIDDM; or type 2 diabetes mellitus) are three to five times higher in Aboriginal populations when compared to the national average; the highest rates of NIDDM are found in women and people living on reserve (Adelson, 2005). Approximately two third of First Nations people diagnosed with diabetes are female; in the Canadian general population two thirds of diagnoses are in males (Health Canada, 2005a).

The CCHS found double the prevalence of diabetes within an off-reserve Aboriginal population compared to the non-Aboriginal population (8.7% vs. 4.3%, respectively). This finding was influenced significantly by geography, as this higher prevalence of diabetes was observed in both urban and rural areas, but not in the territories (4.3% prevalence for off-reserve Aboriginal people vs. 4.0% for non-Aboriginal people in the territories; Tjepkema, 2002).

A systematic review of Canadian research based on vital statistics, disease registries, health interview surveys, and screening surveys indicated that rates of type 2 diabetes mellitus are increasing in the First Nations population, along with a trend toward earlier age of onset (Young, Reading, Elias, & O'Neil, 2000). Table 3 summarizes the gender-specific prevalence of diabetes as reported by various Canadian studies; each study is discussed briefly below.

Health interview surveys provide a self-reported estimate of diabetes prevalence, and both the APS and OFNRHS included questions about diabetes (Young et al., 2000). In the OFNRHS, First Nations people were asked to report which chronic diseases they had been told by a health professional they have (MacMillan et al., 2003). Diabetes was the third most frequently reported condition; the difference in rates between males and females was not statistically significant. Self-reported rates of diabetes were statistically higher in Aboriginal men and women compared to the rates calculated from the National Public Health Survey for the general population (14.8% versus 3.4%, respectively; MacMillan et al., 2003). A much smaller proportion of Aboriginal people reported having diabetes on the APS; six percent of First Nations and Métis participants and two percent of Inuit participants reported having diabetes (Newbold, 1998). When examined by location, the highest rate of diabetes was reported by Aboriginal people living on reserve (8%) compared to those living in rural areas (7%), urban areas (5%), and by Inuit people (2%). In another research sample, Anand et al. (2001) found that 22% of Aboriginal people were being treated for diabetes, compared to 3% among people of European ancestry.

A survey was developed to determine the prevalence of diabetes mellitus in the First Nations populations of British Columbia (Martin & Yidegiligne, 1998). Nurses serving reserve communities were asked to report information regarding diagnosed cases of diabetes, and the survey was carried out in 1987, 1992, and 1995. Results indicated a small increase in overall rates, from 1.2% in 1987 to 2.2% in 1995. When rates were examined by age group, the 35 and older age group showed the largest increase, from 4.5% to 6.3%. Rates for females were higher than rates for males (Table 3) and regional variation was observed. Prevalence rates ranged from 1.5% in the Northeast zone to 2.7% o Vancouver Island.

Through medical chart review, Orr and colleagues (1998) determined the prevalence of diabetes mellitus to be 0.27% in an Inuit population. Historically, the prevalence of diabetes among the Canadian Inuit was reported to be low, yet recent research has suggested that the prevalence rate is increasing (Orr et al., 1998).

Measurement of plasma glucose levels, after fasting or with an oral glucose challenge, is another method to determine rates of diabetes. An oral glucose tolerance test and blood tests were utilized to determine the prevalence of NIDDM in a rural Ontario First Nations reserve where 72% of community members participated in the study (Sandy Lake Health and Diabetes Project; Harris et al., 1997). In this sample, rates of NIDDM were found to increase with age, and were higher in females than in males (Table 3). The age-standardized prevalence rate of impaired glucose tolerance was also higher in women (19.8%) than in men (7.1%; Harris et al., 1997). A later study of this same sample found a 22.7% prevalence of NIDDM and 12.5% prevalence of impaired glucose tolerance (rates not age-standardized; Harris et al., 2002).

A similar study was conducted on two Quebec First Nations communities located at a distance of 250 km from each other (Delisle, Rivard, & Ekoe, 1995). Community members were tested for NIDDM using a standard oral glucose tolerance test and blood samples. There was a statistically significant difference in women's rates of NIDDM between the two communities (48.6% versus 16.3%). In the community with higher rates of NIDDM, the women also had a statistically higher rate of upper-body obesity and waist-to-hip ratio. Prevalence rates for NIDDM were similar for men in both communities (16.3% and 23.9%). Overall, these findings suggest that both gender and location-specific factors influence the prevalence of NIDDM. However these findings must be viewed with caution, as the response rate was much lower in one of the communities (50.8% versus 86.9%) and small sample sizes were employed (Delisle et al., 1995).

As seen above and in Table 3, the reported rates of diabetes mellitus among Aboriginal people vary greatly. Some of these differences are likely due to methodological errors; population-based surveys are subject to errors associated with self-report, and information gleaned from chart review is typically incomplete. Prevalence rates obtained in studies measuring glucose levels can be seen as more accurate than studies using a self-report or chart review methodology and typically result in much higher reported rates of diabetes. This gross difference may be due to the identification of new cases in glucose test methodologies. For example, Harris and colleagues (1997) found that 41% of people classified with NIDDM by their study were newly diagnosed. It follows that these people would not self-report a diabetic condition on population-based surveys. Even so, different diabetes rates have been reported by studies employing sound methodology, and it appears that there are regional differences in rates within the Aboriginal population (Delisle et al., 1995; Newbold, 1998). While further research is needed, there is preliminary evidence that these differences are due to acculturation and adoption of non-traditional diets high in carbohydrates (Martin & Yidegiligne, 1998). Heterogeneity in diabetes risk factors between communities may also account for the discrepancies (Delisle et al., 1995).

Diabetes mellitus is a chronic condition which frequently results in hospitalization due to effects of the disease itself or complications. Thus, it is not surprising that hospitalization associated with diabetes mellitus is higher among First Nations people than in the general population (Jin, Martin, & Sarin, 2002b). From data collected by the British Columbia Ministry of Health, age- and sex-adjusted standardized morbidity ratios were calculated for First Nations people based on the general population of the province. For people under age 35 there was no difference in risk between First Nations people and the general population. However, after age 35, First Nations males were 1.7 times more likely to be admitted for diabetes-related conditions (95% C.I.=1.6-1.9). Non-pregnant First Nations females were even more likely to be admitted for diabetes-related conditions (2.7 times more likely, 95% C.I. = 2.4 – 3.1). Although rate of hospitalization is an indication of disease prevalence, it is also an indication of health care factors such as access to and use of hospital facilities (Jin et al., 2002b).

This higher prevalence of diabetes mellitus in Aboriginal people results in higher diabetes-associated mortality for this group. Jin, Martin, and Sarin (2002a) examined all diabetes-related deaths of residents of British Columbia for the period 1991-1996. Standardized mortality ratios, adjusted for age and sex, were calculated for First Nations people compared to the rest of the population. First Nations females had the highest standardized mortality ratio (2.2, 95% C.I. 1.5-4.5); First Nations males had a standardized mortality ratio of 1.5 (95% C.I. 1.0-2.6). This increased mortality from diabetes mellitus resulted in higher age-specific deaths from diabetes mellitus among First Nations people (Jin et al., 2002a).

Cardiovascular disease. Traditionally, it was thought that Aboriginal populations in Canada had lower rates of cardiovascular disease (CVD) than the general population (Dewailly, Blanchet, Gingras, Lemieux, & Holub, 2002). However, in recent years there has been increasing evidence to suggest that CVD rates are increasing among the Aboriginal population. This finding may be due to the increase in CVD risk factors such as smoking, hypertension, and metabolic syndrome, and diabetes seen among this population.

As previously mentioned, health interview surveys provide a self-reported estimate of disease prevalence, and both the APS and OFNRHS included questions about heart health in general (Young et al., 2000). In the OFNRHS participants indicated if they experienced “heart problems”; there were no significant differences between the findings for Aboriginal people and the general population (as measured by the 1993 National Population Health Survey). Heart problems were identified by 11.7% of Aboriginal males and 7.1% of Aboriginal females (MacMillan et al., 2003). In the APS, heart problems were identified by similar percentages of First Nations people living on reserve (7%), in urban settings (6%), in rural settings (8%), and by Inuit people (6%; Newbold, 1998).

Anand et al. (2001) determined the frequency of single or combined cardiovascular events in a large sample of people with First Nations or European ancestry using standardized questionnaires. In the Aboriginal sample, 17% had a history of at least one CVD event (e.g., myocardial infarction, angina, coronary artery bypass grafting) compared to only 7% of the European people. There was an inverse gradient between income and CVD in both groups; the burden of cardiovascular risk factors was also greater among people of lower income. Although rates of CVD were negatively correlated with income in both populations, the absolute rate of CVD was significantly higher in the Aboriginal sample (Anand et al., 2001). Other research has also noted the relationship between SES and CVD. In a subsequent study, Anand and colleagues (2006) found that CVD prevalence increased with social disadvantage in all ethnic samples (Aboriginal, European, Chinese, South Asian). Every one-point increase on the social disadvantage index (described previously) increased CVD by 25% (odds ratio = 1.25, 95% C.I. = 1.06 - 1.47; Anand et al., 2006).

During the years 1991-1996, First Nations people in British Columbia experienced higher mortality from CVD than the general population. The standardized mortality ratio, adjusted for age and sex for First Nations men was 1.1 (95% C.I. 1.0-1.3) and was higher for women (1.4, 95% C.I. 1.2-1.6; Jin et al., 2002a).

Renal disease. The most significant cause of renal failure in Aboriginal peoples is diabetes (Hemmelgarn, 2006; Dyck, 2001). When end-stage renal disease (ESRD) is attributed to diabetes, it is called diabetic end-stage renal disease (DESRD). Examination of data provided by the Canadian Organ Replacement Registry (CORR) indicated that 41.3% of Aboriginal people with ESRD had DESRD, 23% of cases were attributed to a primary glomerulonephritis, 7% had interstitial nephritis, 4.5% of cases were attributed to multi-system disease, 4% had renovascular or hypertensive nephropathy, and 3.5% had a congenital/hereditary form of nephropathy (Dyck, 2001). In the remainder of cases the cause of ESRD was unknown or miscellaneous. Other data from a study in Manitoba, Saskatchewan, and Alberta indicated that 56.5% of Aboriginal patients had DESRD, compared to 26.8% of non-Aboriginal patients (Tonelli et al., 2004). These data were supported by an earlier study, which indicated 56% of Aboriginal renal patients had DESRD compared to 24% of non-Aboriginal people (Dyck & Tan, 1998).

In Saskatchewan, the number of cases of non-diabetic ESRD among Aboriginal people remained stable between 1982 and 1993; however, the number of cases of DESRD increased seven times. Aboriginal people contributed 42% of all new cases of DESRD during this time frame (Dyck, 2001). In contrast, the rate of DESRD increased approximately 2.5 times in non-Aboriginal people over this time period. Dyck (2001) linked the higher prevalence of DESRD in Aboriginal people to higher rates of type 2 diabetes mellitus; however, Aboriginal people with diabetes were more likely to develop DESRD than non-Aboriginal people with diabetes. Research has yet to confirm why these higher rates were observed among Aboriginal people. Some hypotheses include: faster progression of diabetic nephropathy, later diagnoses of type 2 diabetes mellitus, poorer glycaemic control, and higher smoking rates among Aboriginal people (Dyck, 2001).

Tonelli and colleagues (2004) followed all adult patients who commenced dialysis in Alberta, Saskatchewan, or Manitoba between 1990 and 2000 (n = 4333). Patients were followed until transplantation, death, loss to follow-up, or end of the study. The age-adjusted risk of death after commencing dialysis was 1.15 times higher among Aboriginal patients than non-Aboriginal patients (95% C.I. = 1.02 – 1.30). However, after adjusting for comorbid conditions (e.g., diabetes mellitus, hypertension, coronary disease) the greater risk of death among Aboriginal patients was no longer observed.

Kidney transplantation is considered the preferred treatment for patients with ESRD and is associated with better health outcomes, lower rates of death, and higher quality of life compared to dialysis (Hemmelgarn, 2006). Data from Tonelli and colleagues' (2004) study found that Aboriginal patients were less likely to receive a renal transplant after commencing dialysis (HR = 0.43, 95% C.I. = 0.35 – 0.53) regardless of comorbidity, socioeconomic status, and geographic factors. Data from CORR produced similar findings; Aboriginal people were approximately half as likely to receive a kidney transplant when compared to non-Aboriginal people (Tonelli et al., 2005).

Accordingly, Aboriginal people experience excessive mortality from renal disease compared to the general population. In British Columbia, the standardized mortality ratio for renal disease (adjusted for age and sex) was 2.4 (95% C.I. 1.5-5.9) for First Nations men and 2.7 (95% C.I. 1.6-10.5) for First Nations women (Jin et al., 2002a).

Respiratory diseases. Smoking (first- and second-hand smoke) and poor indoor/outdoor air quality are two preventable risk factors for respiratory diseases such as asthma and chronic obstructive pulmonary disease (COPD). Cigarette smoking is the underlying cause of COPD in 80% to 90% of cases, and those who reduce or quit smoking greatly reduce their risk of developing a respiratory disease (Health Canada, 2005a).

In 1997 respiratory diseases such as pneumonia, COPD and influenza accounted for 18.8% of all hospital separations for First Nations males, and 11.6% for First Nations females. Overall, respiratory disease rates were 3 and 3.5 times higher for First Nations males and females, respectively, than the rates for Canadian males and females (Health Canada, 2005a). In the year 2000, hospital separation rates for pneumonia and influenza were four times higher, and two times higher for COPD, among First Nations compared to the general Canadian population (Health Canada, 2005a).

At all ages, hospital admissions for respiratory diseases were higher for First Nations people than the general population; however, the gap widens after the age of 40 years. The highest rates for respiratory diseases were in the 80 to 84 year old age group for First Nations males, and in the 85+ age group for First Nations females (Health Canada, 2005a).

Cancer. In the recent past, studies of cancer incidence and mortality in Canadian Aboriginal populations have demonstrated lower patterns than those of the general Canadian population. In 1997, the cancer rate for Canadians was twice the First Nations rate (Health Canada, 2005a). Yet recent research has suggested that cancer incidence and mortality rates among Aboriginal and non-Aboriginal populations are converging (Marrett & Chaudhry, 2003), perhaps due to increased awareness and screening among Aboriginal peoples. In 2002 half of female respondents on the NAHO Public Opinion Poll reported having had a pap test in the previous 12 months; 22% reported having had a mammogram in the last 12 months (National Aboriginal Health Organization, 2003).

In 1997 the hospital separation rate for colorectal cancer was twice as high in the general population as in First Nations. For cervical cancer, the hospital separation rate was three times higher for First Nations females than Canadian females. Interestingly, the hospital separation rate for lung cancer was three times higher in the general population even though the First Nations population has a higher rate of smoking (Health Canada, 2005a).

Recently, a large-scale study of cancer incidence and mortality was undertaken in Ontario which also examined changes in cancer patterns over time (Marrett & Chaudhry, 2003). A cohort of 141,290 First Nations people registered with the federal government was identified based on status membership files. This cohort was linked to the Ontario Cancer Registry (OCR), Manitoba Cancer Registry, and mortality data. General population incident rates were calculated from the entire OCR.

Many site-specific cancer incidences were significantly lower for the Aboriginal population, including cancer of the colon/rectum, bladder, and stomach (Marrett & Chaudhry, 2003). However, cancer of the gall bladder was twice as prevalent in Aboriginal men and women, and cervical cancer incidence was 1.73 times higher in Aboriginal women. Across all years (1968-1991), age-standardized cancer rates for Aboriginal males (184.98 per 100,000) and Aboriginal females (180.14 per 100,000) were lower than the Ontario general population males and females (298.13 and 248.66 per 100,000, respectively). However, incident rates for the Aboriginal population increased significantly during this time period, resulting in the differences between Aboriginal and non-Aboriginal people growing smaller (Marrett & Chaudhry, 2003). It is not known if the increases in cancer incidence in the Aboriginal population are due to true changes in disease prevalence, or due to increased screening and diagnosis in this population.

For example, other research has found that Aboriginal ancestry, low income, and living in a rural area reduced women's likelihood of having a regular Pap test, an important screener for cervical cancer (Johnston, Boyd, & MacIsaac, 2004). Aboriginal women were 1.6 times less likely to receive a regular Pap test compared to non-Aboriginal women. Low income (OR = 1.19, 95% CI: 1.15 – 1.22) and living in a rural area (OR = 1.09; 95% CI: 1.07 – 1.11) also reduced women's likelihood of having a regular Pap test (Johnston et al., 2004).

Infectious diseases. In the early part of the twentieth century, infectious diseases such as tuberculosis, scarlet fever, and influenza plagued Aboriginal populations (Adelson, 2005). Although infectious diseases are no longer epidemic in Aboriginal communities, rates are still higher among Aboriginal populations. Some estimates of tuberculosis rates place the incidence at ten times higher in First Nations groups than the general population (Frohlich et al., 2006). Indeed, throughout the 1990's, age-standardized rates of tuberculosis in the First Nations population were 6 to 11 times higher than in the Canadian population (Health Canada, 2005a).

Overcrowded housing and higher substance abuse rates contribute to this problem (Clark, Riben, & Nowgesic, 2002). Overcrowding increases the risk of exposure to infectious tuberculosis, and there is a higher incidence of tuberculosis in communities with higher levels of crowding. In addition, communities with higher levels of crowding are more likely to have other risk factors for tuberculosis, including poverty, substance abuse, and remoteness (Health Canada, 2005a).

Clark and Vynnycky (2004) examined the epidemiology of tuberculosis in the First Nations population of British Columbia for the period 1926 – 2000. The annual risk of infection (ARI) was calculated using mortality data, and school screening (skin test) data using maximum likelihood modeling. During the period 1926-1948, the ARI was consistently high and ranged from 6% to 21%. During the period 1991-1992, 4.4% of 12-year-old children were tuberculin positive, and this proportion decreased to 0.9% by 2000 (Clark & Vynnycky, 2004). Overall, the ARI decreased from more than 10% during the period 1926-1948 to less than 0.1% in 2000. The number of transmissions also decreased over this time period. However, the risk of re-developing tuberculosis through re-infection was significantly higher in the First Nations population than reported elsewhere in the literature for other populations. These findings suggested that although risk of infection decreased over the period 1926-2000, the relative incidence of disease reactivation increased (Clark & Vynnycky, 2004).

As previously mentioned, infectious diseases are more easily spread in communities with crowded housing and inadequate water and sewage systems. Hepatitis A transmission occurs directly by the fecal-oral route, through contaminated food or drinking water, and through blood transfusion. Jin and Martin (2003) compared the incidence of hepatitis A in First Nations people living on reserve and the general population of British Columbia (BC). They found double the incidence of hepatitis A among First Nations people, with a higher incidence associated with more people per housing unit and community water supply problems (Jin & Martin, 2003).

The prevalence of HIV/AIDS among Aboriginal people has risen sharply over the last decade, from 1% in 1990 to 7.2% in 2001 (Adelson, 2005). Aboriginal people with HIV are more likely to be under 30 years of age, female, or injection drug users than the non-Aboriginal population (Health Canada, 2005a). Indeed, HIV/AIDS has been referred to as an epidemic among Aboriginal Canadians, particularly among injection drug using Aboriginal youth (Silversides, 2006). In recent years the Aboriginal population had a higher proportion of new HIV infections caused by injection drug use, 54% compared to 14% among non-Aboriginal Canadians. There was also a higher proportion of new HIV/AIDS infections in Aboriginal women (45% versus 20% in non-Aboriginal women; Silversides, 2006).

Musculo-skeletal diseases. Research has indicated that arthritis is more common in Aboriginal populations compared to the general population. Individual and regional-level data from the 2000/01 CCHS found that Aboriginal origin was positively associated with reporting arthritis in addition to age, sex, low income, low education, current smoking, and obesity (Cañizares, Power, Perruccio, & Badley, 2008). Aboriginal people were 40% more likely to report arthritis compared to Caucasian people. Independent of ancestry, residents of regions with a higher proportion of Aboriginal people were more likely to report arthritis. Interestingly, there was an interaction between individual ancestry and regional ancestry; Aboriginal people living in regions with higher proportions of Aboriginals were more likely to report arthritis than Aboriginal people living in regions with lower proportions of Aboriginals (Cañizares et al., 2008).

Oral and dental health. There has been relatively little research on oral and dental health in Canada's Aboriginal peoples. Some research has found higher rates of dental decay and oral disease in Canadian Aboriginal people, perhaps influenced by a change in diet to foods high in sugar, lack of access to dental services, and lack of water fluoridation (Wien & McIntyre, 1999). The NAHO Public Opinion Poll found that 57% of First Nations respondents reported having a dental exam in the previous 12 months (National Aboriginal Health Organization, 2003).

Substance abuse. Alcohol as a single topic has dominated Aboriginal mental health research, and research about other forms of substance abuse is similarly growing (Waldram, 2004). Research has consistently indicated that alcohol and other substance abuse are significant concerns among Aboriginal peoples. Seventy-three percent of respondents on the 1991 APS indicated that alcohol was a problem in their community and 59% endorsed the view that drug abuse was a problem in their community.

The CCHS indicated that significantly fewer off-reserve Aboriginal people were weekly drinkers (27.2%) compared to non-Aboriginal people (38.4%), a difference that was seen across the provinces and territories (Tjepkema, 2002). Off-reserve Aboriginal people living in the territories were significantly less likely to drink weekly than off-reserve Aboriginal people living in the provinces, a difference that may be due to liquor restrictions in the territories. Although off-reserve Aboriginal people reported less weekly drinking than the Canadian population, they did report higher levels of heavy drinking (consuming five or more alcoholic drinks on one occasion, once per month or more). The proportion of off-reserve Aboriginal heavy drinkers was similar across the provinces and territories (22.6%); in the territories this rate was similar to the rate of the non-Aboriginal population (Tjepkema, 2002).

Similar patterns of alcohol use were noted by MacMillan and colleagues (2008). First Nations women living on Ontario reserves had lower rates of alcohol use (55% reported drinking in the previous year) compared to Ontario non-Aboriginal women surveyed with the NPHS. More First Nations women living on reserves, however, reported consuming five or more drinks on one occasion (43%) than non-Aboriginal women reported on the NPHS.

Mental health. Waldram (2004) described the historical research approaches and findings of studies examining the mental health of North American Aboriginal peoples. He noted serious problems with cross-cultural research: the research methods and underlying theories of psychopathology were rooted in Western culture and thus did not have high cross-cultural validity. The historical research findings indicated that mental health problems were rampant among Aboriginal peoples, findings that may be misleading due to the problems with methodology and conceptual underpinnings (Waldram, 2004). Contemporary and specific information regarding the mental health of Aboriginal people is still affected by these problems inherent with cross-cultural research.

Thommasen, Baggaley, Thommasen, and Zhang (2005) conducted a study to determine depression prevalence rates for the Aboriginal and non-Aboriginal populations residing in a remote rural community in British Columbia. A retrospective chart review involving more than 2000 patient charts was conducted, and patients presenting to a family physician with affective depressive disorder, situation depression, bipolar disorder, mixed anxiety and depression, or a DSM-IV anxiety disorder diagnosis were identified. The 1-year prevalence rate of mood and anxiety disorders for this combined population was 7.5%; excluding patients with bipolar disorder and anxiety disorders resulted in a 1-year prevalence of 6.4% for depression. There were no significant differences in rates of depression or anxiety disorders between Aboriginal and non-Aboriginal patients in this sample (Thommasen et al., 2005).

Although this study suggested that depression and anxiety rates in Aboriginal and non-Aboriginal people are similar, there are several caveats. All data were collected retrospectively from charts and thus subject to interpretation of the data collector. Furthermore, it is unknown if patients classified as having a depressive disorder actually met the DSM-IV criteria for major depressive disorder, and classes such as "affective depressive disorder" and "situation depression" are not acknowledged by the DSM-IV. It is therefore unlikely that the prevalence rates reported by the researchers are accurate and likely that the prevalence rates are over-estimated. In addition, the cross-cultural reliability and validity of DSM-IV diagnoses for Aboriginal peoples are unknown.

The CCHS measured rates of depression by using a subset of questions from the Composite International Diagnostic Interview; from the responses, a probability estimate of a diagnosis of a major depressive episode was derived. Respondents were considered to have experienced a major depressive episode in the previous 12 months if the probability estimate was 0.9 (90%) or higher (Tjepkema, 2002). The data indicated that significantly more off-reserve Aboriginal people (13.2%; 1.8 times more) experienced a major depressive episode in the prior 12 months than non-Aboriginal people (7.3%). The prevalence rates were higher for Aboriginal people in urban and rural areas; however, prevalence rates were similar for both groups in the territories. Among low- and middle-income households, Aboriginal and non-Aboriginal people reported different levels of depression; an Aboriginal person was more likely to have experienced a major depressive episode. Among high income households there were no differences between the groups (Tjepkema, 2002).

Although it is understood that depression and other mental health difficulties have become significant problems for Aboriginal peoples, we know very little about the influence of culture and history on these phenomena (Waldram, 2004). For example, we do not know why suicide rates vary widely between communities. Further research is needed to examine the role of culture in Aboriginal mental health.

Cognitive status. While there have been few studies of the cognitive status of Aboriginal Canadians, the data that are available suggest a lower prevalence of dementias such as Alzheimer's among this population. Analysis of data from the CCHS indicated that a higher proportion of white Canadians had dementia, compared to Canadians from visible minorities (Forbes, Morgan, & Janzen, 2006).

Functional status. Shields and Tremblay (2002) calculated the disability-free life expectancy for the Canadian population using data from the CCHS. The data indicated that rates of daily smoking, obesity, heavy drinking, and depression were negatively associated with disability-free life expectancy after controlling for socio-demographic variables (accounted for 6%, 5%, 3%, and 8% of the variance in disability-free life expectancy, respectively). Interestingly, infrequent exercise was positively associated with disability-free life expectancy and accounted for 3% of the variance (Shields & Tremblay, 2002).

The CCHS measured long-term activity restriction by asking respondents if a long-term (i.e., at least six months duration) physical or mental condition or health problem reduced the amount or type of activity they could do. Respondents who indicated their activities were often affected were identified as having a long-term activity restriction (Tjepkema, 2002). According to this definition 16.2% of off-reserve Aboriginal people had a long-term activity restriction, a rate 1.6 times higher than the non-Aboriginal respondents. This finding was consistent for Aboriginal people living in rural and urban areas, but in the territories both groups reported similar levels of long-term activity restrictions (Tjepkema, 2002). When examined by household income, the middle-income Aboriginal respondents indicated higher levels of activity restriction compared to other middle-income Canadians; for low and high income groups the rates did not differ between Aboriginal and non-Aboriginal respondents (Tjepkema, 2002).

International Aboriginal Health

Aboriginal health has also been an important research and policy topic in the United States of America, Australia, and New Zealand. In the United States, Aboriginal peoples comprise several distinct groups, including American Indians and Alaskan

Natives (AI/AN), *Kanaka Maoli* (i.e., Native Hawaiians), and Pacific Islanders. Australia's Aboriginal population (termed the Indigenous population) is comprised of Aboriginal people from mainland Australia and Tasmania, as well as Torres Strait Islanders (Anderson et al., 2006). In New Zealand, Māori and Pacific people form the Indigenous population.

The extent to which Aboriginal status is reported in census and health survey data varies across and within countries, as does the approach to recording ancestry (Anderson et al., 2006). Thus, international comparisons of health data can be problematic as data collection methods might not be comparable between countries. Furthermore, and as mentioned numerous times throughout this dissertation, Aboriginal peoples comprise diverse traditions and cultures and are not a homogenous group in Canada and in other countries. For the purpose of this dissertation these generalizations must be made but should be regarded with these caveats in mind.

Life expectancy data from the United States, Australia, and New Zealand have indicated that Aboriginal peoples in these countries experience a gap similar to those in Canada. In the United States the life expectancy was approximately six years lower for AI/AN peoples than for the general population; for the Māori population of New Zealand life expectancy was approximately nine years lower (Health Canada, 2005a). The gap was largest for the Indigenous population of Australia at 17 years lower than Australia's general population (for Indigenous people born in 1996-2001; Thomson, Burns, Hardy, Krom, & Stumpers, 2008). Accordingly the infant mortality rates were highest for Aboriginal Indigenous people (almost three times the rate of the general population), 2.3 times higher among the Māori population, and 1.2 times higher for AI/AN peoples (Health Canada, 2005a).

American Indian/Alaskan Native Health. As in Canada, the poorer health status of AI/AN people has been attributed to their lower socio-economic status. Data from the

2000 US census indicated that urban AI/AN people were more than twice as likely to have an income below 100% of the federal poverty level and be unemployed than the general population (Castor et al., 2006). Only 70.9% of urban AI/AN people had a high school education, compared to 80.4% of the general population, and 1 in 4 urban AI/AN people reported a disability (compared to 1 in 5 in the general population). Older vital statistics (from 1981 through 1990) indicated that 24% of urban AI/AN people did not have a high school diploma, 8.4% were unemployed, and 26% lived below 100% of the federal poverty level (Grossman, Krieger, Sugarman, & Forquera, 1994). Higher rates were found among rural AI/AN people, as 34% did not have a high school diploma, 21% were unemployed, and 35% lived below 100% of the federal poverty level.

In recent years cardiovascular disease was the number one cause of mortality in both the AI/AN and general populations, followed by cancer (Castor et al., 2006). Under the age of 25 years accidents and unintentional injuries were the leading cause of death for the AI/AN population (Health Canada, 2005a). Although cancer rates decreased in the general population from 1990 to 1999, they increased in the urban AI/AN population. Mortality rates attributable to diabetes, alcohol use, chronic liver disease, and unintentional injuries were higher among the urban AI/AN population than in the general population (Castor et al., 2006).

Rousseau (1995) noted that cancer survival rates for AI/AN people were lowest among the US subpopulations, and that this population was less likely to receive routine screening such as breast examinations, mammograms, and pap smears. Although traditionally cancer rates among AI/AN people were reportedly lower than the general population, recent research has indicated that cancer rates are at least equivalent between these populations.

Hayward and Heron (1999) developed active life table models for several American ethnic groups to examine racial inequalities in morbidity and mortality.

Disability was defined as having a physical, mental, or other health condition that lasted for six or more months and (a) limited the kind or amount of work they could perform or (b) prevented them from working at a job. According to 1990 US census data, Native Americans (AI's, Eskimos, and Aleuts) experienced the highest disability rates across all ages compared to whites, African-Americans, Asian-Americans, and Hispanics.

Aboriginal data from the US Census 2000 Supplementary Survey/American Community Survey were examined for trends in functional limitations (Fuller-Thompson & Minkler, 2005). Functional limitation was defined as a substantial limitation in one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying. Of AI/AN's aged 45 and older in the sample, 27.9% were classified as having a functional limitation (18.7% in those aged 45-49, and 66.6% in those aged 85 and older). When compared to non-Aboriginal people, AI/AN's who were older, not currently married, less educated, and living at or near the poverty line had more functional limitations (Fuller-Thompson & Minkler, 2005).

Australian Indigenous Health. In Australia, approximately 2.4% of the population identified as Indigenous peoples in 2001 (Anderson et al., 2006). Of these, approximately 90% identified themselves as Aboriginal, 6% as Torres Strait Islander, and 4% as both. At this time the age structure of the Indigenous population was considerably younger than the general population, with half of the Indigenous population under the age of 20.5 years, compared to 36 years for the non-Indigenous population. Approximately 45% of the Indigenous population lived in very remote areas (Anderson et al., 2006).

As previously mentioned, the life expectancy for Australia's Indigenous peoples was approximately 17 years lower than for the general population. Indigenous peoples also have poorer socioeconomic status; in 2001 Indigenous peoples were half as likely to have completed high school, and 20.3% of the potential labour force was unemployed (compared to 5.8% of the general population). The average income for the working Indigenous population was $394 AUD per week compared to $665 AUD for the total Australian population (Anderson et al., 2006).

In Australia from 2000 to 2004, mortality rates for Indigenous males and females were respectively 2.6 and 2.9 times higher than those for the general population (Thomson et al., 2008). The 2001 National health survey found that diabetes occurred at four times the rate in Indigenous peoples compared to Australia's non-Indigenous population (Australian Bureau of Statistics, 2002). Several studies found higher rates of ESRD are in Indigenous populations, yet rates of kidney transplantation were approximately 50% of those for the non-Indigenous population (Yeates & Tonelli, 2006).

From the year 2000 to 2004 Cardiovascular disease was the leading cause of mortality and was 1.3 times more prevalent in Indigenous peoples (Thomson et al., 2008). Of Indigenous deaths from cardiovascular disease, ischemic heart disease was the most common cause (63% males, 50% females) followed by cerebrovascular disease (stroke; 15% males, 20% females). Data suggested that incidence rates of cancer were lower for the Indigenous population (regional incidence ratios of 0.4 to 1.0), but death rates from cancer were higher (regional incidence ratios of 0.9 to 1.7). The most common cancers for Indigenous people were lung cancer and prostate cancer for males and lung cancer followed by breast cancer for females (Thomson et al., 2008).

Age-adjusted prevalence of diabetes/high blood sugar was 3.4 times higher among Australian Indigenous people than the general population, and higher for Indigenous females (4.1) than males (2.9; Thomson et al., 2008). Rates of ESRD were 8.6 times higher in the Indigenous population. Infectious diseases were also more prevalent for the Indigenous population. Compared to the general population, Indigenous incidence rates were: 15 times higher for tuberculosis, 3 times higher for Hepatitis A and C, and 4 times higher for Hepatitis B. Rates of HIV/AIDS were similar for both populations. However, there was a greater proportion of Indigenous females and young people with HIV/AIDS compared to non-Indigenous people with HIV/AIDS (Thomson et al., 2008).

New Zealand Māori and Pacific Peoples Health. The 2006 New Zealand census indicated that 14.6% of the New Zealand population consists of people of Māori ancestry, representing approximately 565,000 people (New Zealand Ministry of Health, n.d.). As with other Aboriginal populations, the Māori population had a younger age structure, with a median age of 21.9 years compared to 34.8 years for the total New Zealand population. In 2001 the average life expectancy for Māori men was 66.3 years and 71.0 years for Māori women, compared to 75.7 years and 80.8 years for non-Māori men and women, respectively; Anderson et al., 2006).

In general, the Māori population has poorer socioeconomic status than the general population, with lower levels of education, employment, and income. In 2001 43.6% of Māori adults did not have an educational qualification (e.g., high school diploma) compared to 23.6% of the total population. In 2001 9.1% of the potential Māori labour force was unemployed, compared to 3.4% of the non-Māori labour force. The average annual income was $14,800 NZD for the Māori population compared to $18,500 NZD for the non-Māori population (Anderson et al., 2006).

For both Māori and non-Māori, the leading cause of death from 2000 to 2002 was ischemic heart disease (New Zealand Ministry of Health, n.d.). In the Māori population, the next leading cause of death was lung cancer, followed by diabetes for males and COPD for females. This pattern was different for the non-Māori population, whose next leading causes of death were cerebrovascular disease followed by COPD. Mortality due to CVD was 2.5 times higher for the Māori population. The relative risk of suicide in the Māori population (compared to the general population) was 1.6 (95% C.I. = 1.4 – 1.9; 2000-2002 data; New Zealand Ministry of Health, n.d.). The Māori age group at highest risk was youth aged 15 to 24 years, while in the general population it was adults aged 25 to 44 years.

In 2002-03 the self-reported prevalence of diabetes was 6.2% in the Māori population and 2.4% in the general population (New Zealand Ministry of Health, n.d.). Diabetic end-stage renal disease was 9.4 times higher in the Māori population, and rates of lower limb amputations due to diabetes occurred at five times the rate of the general population. Both populations had similar rates of tuberculosis notification, but the Māori population had higher notification rates of meningococcal disease and rheumatic fever.

The New Zealand Mental Health Survey provided in-depth information about the mental health of the New Zealand population. Compared to the general population, Maori and Pacific people had higher prevalence of mental disorder (Oakley Browne, Wells, & Scott, 2006). The one-year prevalence of mental disorder was 29.5% for Maori, 24.4% for Pacific people, and 19.3% for Others. After adjusting for socioeconomic differences, there was no difference in the prevalence of anxiety disorders between these three groups. However, the prevalence of bipolar disorder remained higher for Maori (3.4%) and Pacific people (2.7%) compared to Others (1.9%). Pacific people had a lower prevalence of major depression (3.5%) compared to Maori (5.7%) and Others (5.8%). Substance use disorder was higher in the Maori population (6.0% vs. 3.2% and 3.0% for Pacific people and Others, respectively; Oakley Browne et al., 2006).

Summary

The health disparities experienced by Aboriginal Canadians have been well documented. National and provincial surveys have revealed lower self-reported health status and higher self-reported diseases such as diabetes, cardiovascular disease, infectious diseases such as tuberculosis, and higher mortality associated with these diseases. Although the prevalence of tuberculosis in Aboriginal populations has decreased dramatically, rates are still significantly greater in this population. Rates of chronic disease have increased; Aboriginal people have three to five times the rates of diabetes and twice the rate of CVD. Cancer incidence and mortality has increased in Aboriginal populations. Little is known regarding the mental health of Aboriginal people; it is estimated that prevalence rates for depression and anxiety are similar to that of the general population, while suicide remains a significant problem.

Rates of disability are higher among Aboriginal people, and there is evidence to suggest that Aboriginal people suffer higher levels of disability at younger ages than the general population. Underlying these health disparities are poor socioeconomic conditions such as low education levels, unemployment, low income, crowded living arrangements, and poor housing conditions. There is mixed evidence regarding the use of health care services, with some studies reporting low physician and hospital visits, and other studies reporting average or higher physician and hospital usage. It is likely that these discrepancies are due to differences in provincial health care systems as well as regional and geographic variation.

While there has been increased interest in Aboriginal health research, most of the research in this area is descriptive in nature. For example, a MEDLINE and PsychLit database search revealed a significant increase in the total number of publications related to international Aboriginal health between 1987 and 2003. Most publications on Aboriginal health were descriptions of the size and nature of health and illness issues, with fewer publications providing data on how to facilitate health-related change (Sanson-Fisher, Campbell, Perkins, Blunden, & Davis, 2006). The next step in Aboriginal health research will be to examine the effectiveness of interventions and facilitation of change in this vulnerable population.

Purposes of Proposed Research

This dissertation is a two-part study. The main purpose of Study 1 is to identify the health status of Aboriginal people receiving home care in Ontario by analyzing a database of RAI-HC assessments. This study will improve on the Aboriginal health information already known by using a large sample size, examining both broad and specific areas of health, using the same measure and data collection methods with the comparison group, and considering geography and socio-economic status in analysis of the data. A secondary goal was to examine preliminary reliability data and determine the utility of the RAI's summary scales for Aboriginal clients. The objective of Study 2 is to identify the barriers to providing home care to Aboriginal people through a qualitative methodology.

Study 1: Analysis of Home Care Database

Methods

Database. This study consists of a retrospective population-based study using RAI-HC data. A database containing the first RAI-HC assessment of each unique client assessed in Ontario between April 1, 2004 and March 31, 2005 (*n* = 133,286) was analysed using SAS 9.1. Removal of all potentially identifying information from the database prior to the researcher's access protected personal health information. Use of approximate age protected client confidentiality without changing the age structure of the database.

A total of 133,286 clients were included in the database. Of these clients, 94.85% included information regarding ancestry. There were 1,458 Aboriginal clients (1.15% of clients with identified ancestry) and 124,965 non-Aboriginal clients (98.85% of clients with identified ancestry). Only clients with known ancestry were included in subsequent analyses. A description of clients whose ancestry information was missing (*n* = 6,863) is included in Appendix A.

Statistical Analyses. All data were analysed using SAS 9.1. Descriptive statistics were tabulated separately based on sex and age for Aboriginal and non-Aboriginal clients. For binary variables, Chi square and t-tests tested for statistical differences in the data; the Bonferonni technique was used to correct for number of comparisons.

For continuous variables, multilevel linear modeling using SAS mixed analysis version 9.1 was used to successively build models to fit the data, due to the nested structure of the dataset. For example, in this dataset depression scores (one of the variables of interest) were measured for clients who were nested within CCACs. As clients within a particular CCAC have access to similar resources and services, data for clients may not be independent of one another, affecting correlated error. Multilevel linear modeling does not require assumptions of independence of variance or regression (Tabachnick & Fidell, 2007) which are violated in hierarchical data sets. In addition, multilevel linear modeling allows examination of group (i.e., CCAC) effects on the outcomes of interest.

Variables. The individual outcomes of interest were scores on the MDS summary scales: cognitive performance, depression, activities of daily living, frailty, and pain. The items and scoring criteria are discussed in the introduction section of this dissertation. Ancestry was the independent variable of primary interest, and was conceptualized in two ways: individual ancestry and CCAC ancestry. At the level of the individual, ancestry was a dichotomous variable (i.e., Aboriginal, non-Aboriginal) and was referred to as "individual ancestry." However, ancestry was also a contextual variable, meaning the proportion of Aboriginal clients within a CCAC. This variable was referred to as "CCAC ancestry."

Results

This results section is divided into three sections. The first section contains a description of clients with known ancestry. The second section presents data from the MDS summary scales (CPS, DRS, CHESS, ADL-Hierarchy and Pain scale) and describes the data for these scales for Aboriginal and non-Aboriginal clients. The final section consists of multilevel linear models examining the relationships between MDS summary scales and ancestry, sex, age, and education while accounting for the hierarchical structure of the dataset.

Description of Clients with Known Ancestry. This section provides a description of clients in the CCAC database with known ancestry. Organized in the same way as the literature review on Aboriginal health, it begins with examination of client demographic characteristics (sex, age, marital status, language, living situation), reasons for referral, and non-medical determinants of health (education, economic trade-offs, housing). It then analyses the preventive health measures received by clients, medications, service utilization, health risk factors (smoking, obesity), and health outcomes (self-rated health status, disease diagnoses). For each area data are presented for Aboriginal and non-Aboriginal clients by sex and age group.

Sex. A significantly higher proportion of clients were female (Figure 1), a difference that was observed across the Aboriginal group (65.57% female, 34.43% male) and the non-Aboriginal group (68.38% female, 31.62% male), χ^2 [1] = 5.2566, $p = .0219$.

Age. The mean age of the Aboriginal group was significantly younger than the non-Aboriginal group, at 67.22 years (*SD* = 15.66) with minimum and maximum ages of 18.78 and 102.54 years, respectively. In contrast, the non-Aboriginal group had a higher mean age at 76.77 years (*SD* = 13.64) and ranged from 17.13 years to 113.69 years, t (126,335) = 28.740, $p < .0001$.

Due to the difference in age structure, three age groups were derived: under 65 years, 65 to 74.99 years, and 75 years and older. Chi square analysis revealed a statistically significant difference in age groups between Aboriginal and non-Aboriginal clients; there were proportionally more Aboriginal clients in the two youngest age groups and fewer in the oldest age group compared to non-Aboriginal clients, χ^2 [2] = 657.12, $p < .0001$ (Figure 2).

The age distribution among the Aboriginal group was somewhat uniform with equal representation of each sex within each age category (Figure 3). In contrast, the non-Aboriginal group tended to be older with unequal representation of the sexes in the 80-89 (more females) and 90-99 (more males) categories (Figure 4).

Marital Status. Tables 4 and 5 display the marital status and primary language for Aboriginal and non-Aboriginal clients, respectively. These tables show that marital status was contingent on gender, age, and ancestry. Females were more likely to be widowed, χ^2 [5] = 15,963.89, $p < .0001$, particularly those in the oldest age group, χ^2 [10] = 31,579.97, $p < .0001$. Aboriginal clients were more likely to be never married (15.16% vs. 8.22%), separated (7.27% vs. 2.24%), or divorced (10.15% vs. 5.36%), χ^2 [5] = 370.06, $p < .0001$.

Language. English was the primary language for the majority of both the Aboriginal and non-Aboriginal groups (87.93% and 82.28%, respectively). Significantly more non-Aboriginal clients spoke a primary language other than English or French compared to Aboriginal clients (14.64% vs. 7.20%, respectively), χ^2 [2] = 75.51, $p <$ .0001.

Living Situation. Tables 6 and 7 show where home care clients lived and with whom at the time of referral. Aboriginal clients were less likely to be living at a board and care/assisted living/group home (2.95%) when compared to non-Aboriginal clients (5.50%), χ^2 [5] = 34.46, $p < .0001$. Non-Aboriginal clients were more likely to be living in a nursing home at time of referral (2.30%) compared to Aboriginal clients (1.51%), χ^2 [1] = 4.04, $p = .04$.

Aboriginal clients were less likely to be living with only a spouse and more likely to be living with others who were not their spouse or children, χ^2 [5] = 46.76, $p < .0001$. Women were more likely to be living alone compared to men (43.04% vs. 24.25%, respectively) while men were more likely to be living with a spouse (45.35% vs. 22.44%, respectively), χ^2 [5] = 10,969.31, $p < .0001$.

Reason for Referral. The reasons for home-care referral and goals of care are presented in Tables 8 and 9 for Aboriginal and non-Aboriginal clients, respectively. Reasons for referral did not differ significantly between ancestry groups. Across all groups, determining eligibility for home care was the most common reason for referral (53%) followed by post-hospital care (32.89%) and home placement screen (9.15%).

Determining eligibility for home care was most common among male clients, χ^2 [5] = 354.77, $p < .0001$ and among clients aged 75 and older, χ^2 [10] = 1,948, $p < .0001$.

The goals of care for Aboriginal clients were more likely to be skilled nursing treatments, χ^2 [1] = 83.38, $p < .0001$, monitoring to avoid clinical complications, χ^2 [1] = 89.26, $p < .0001$, and client/family education, χ^2 [1] = 39.25, $p < .0001$, compared to non-Aboriginal clients. The goal of care for non-Aboriginal clients was more likely to be family respite, χ^2 [1] = 38.58, $p < .0001$. Both groups' goals of care were similar for rehabilitation and palliative care.

Education. Tables 10 and 11 display educational data by sex and age group for Aboriginal and non-Aboriginal clients, respectively. Within both ancestry groups an age effect was observed, with younger clients having higher levels of education, χ^2 [4] = 2,675.96, $p < .01$. As Figure 5 demonstrates, Aboriginal clients had lower levels of education than non-Aboriginal home care clients, χ^2 [2] = 169.41, $p < .01$.

Economic trade-offs. Information regarding client income was not included on the MDS-HC; however, it did ask whether clients made trade-offs due to limited funds in the purchase of prescribed medications, sufficient home heat, necessary physician care, adequate food, and home care. Aboriginal home-care clients made significantly more economic trade-offs compared to non-Aboriginal clients, χ^2 [1] = 148.14, $p < .01$. Figure 6 shows ancestry and age trends in economic trade-off data, with the highest percentage of economic trade-offs occurring among Aboriginal males (9.13%) and females (13.76%) under 65 years of age.

Housing. The MDS-HC includes items related to the home environment that can make it hazardous or inhabitable (e.g., inadequate lighting, holes in floor, slippery bathtub); this information is summarized in Tables 12 and 13. Aboriginal clients were more likely to have one or more environmental hazards (19.41%) when compared to their non-Aboriginal counterparts (14.01%), χ^2 [1] = 34.69, $p < .0001$ (Figure 7). A regional effect was also observed, with Northern clients more likely to have one or more environmental hazards (17.98%) when compared to non-Northern clients (13.33%), χ^2 [1] = 214.38, $p < .0001$ (Figure 8).

Preventive health measures. Preventive health measures for the past two years are presented in Tables 14 and 15 for Aboriginal and non-Aboriginal clients, respectively. Preventive health measures consisted of blood pressure measurement, receipt of influenza vaccination, testing for blood in stool or screening endoscopy, and for females, receipt of a breast exam or mammogram. Aboriginal clients were less likely to receive an influenza vaccination (74.07% vs. 76.95%), χ^2 [1] = 6.69, $p = .0097$, and less likely to have testing for blood in stool/endoscopy (79.08% vs. 82.68%), χ^2 [1] = 13.02, $p = .0003$. Female Aboriginal clients were less likely to have a breast exam or mammogram (77.09% vs. 80.51%), χ^2 [1] = 10.73, $p = .01$, compared to non-Aboriginal clients.

Medications. The average number of medications (prescriptions and over the counter) taken regularly or on an occasional basis by Aboriginal clients in the seven days prior to assessment was 7.03 (SD = 2.58). For non-Aboriginal clients, the average number of medications was 6.64 (SD = 2.62); this difference was statistically significant, $t\,(126{,}412) = -5.68$, $p < .0001$. Tables 16 and 17 display medication data for Aboriginal and non-Aboriginal clients, respectively. Overall, more Aboriginal than non-Aboriginal clients were prescribed anxiolytics (20.10% vs. 17.02%, respectively), χ^2 [1] = 9.63, $p = .0019$, antidepressants (27.30% vs. 21.72%, respectively), χ^2 [1] = 26.34, $p < .0001$, and hypnotics (12.89% vs. 9.45%, respectively), χ^2 [1] = 19.87, $p < .0001$. Both groups had similar rates of medical oversight (i.e., discussion of medication with at least one physician). Aboriginal clients had lower rates of medication compliance; 86.28% were always compliant, compared to 90.45% of the non-Aboriginal group, χ^2 [3] = 29.79, $p <$ .0001.

Significantly more male clients were prescribed antipsychotic/neuroleptic medications (9.99%) compared to female clients (8.41%), χ^2 [1] = 91.70, $p < .0001$. In contrast, female clients were more likely to be prescribed anxiolytic (19.21% vs. 14.92%) antidepressant (23.11% vs. 19.88%), and hypnotic (9.95% vs. 8.80%) medications, χ^2 [1] = 364.15, $p < .0001$; χ^2 [1] = 175.83, $p < .0001$; χ^2 [1] = 44.47, $p < .0001$. Clients in the youngest age group (i.e., under 65) were more likely to be prescribed any of these psychotropic medications compared to those 65+, and were less likely to have medical oversight of their medications, χ^2 [2] = 13.11, $p = 0.0014$.

Service utilization. Service utilization rates in the 7 days prior to assessment are displayed in Tables 18 and 19. Non-Aboriginal clients received more days of care by home health aides (1.81 days) in the seven days before assessment compared to Aboriginal clients (1.55 days), t (126,413) = 4.29, $p < .0001$. This group also received more days of meal support (0.92 days vs. 0.60 days, t (126,413) = 5.566, $p < .0001$) and physical therapy (0.13 days vs. 0.09 days, t (126,413) = 2.50, $p = .0122$).

In contrast, Aboriginal clients received more days of care from visiting nurses (1.28 days) compared to non-Aboriginal clients (0.98 days), t (126,413) = -5.54, $p <$ .0001. They also received more days of care from social workers (0.04 days vs. 0.01 days), t (126,413) = -6.24, $p < .0001$. No differences in days of care from homemaking services, volunteer services, occupational therapy, speech therapy, and day care/day hospital were observed.

Tables 20 and 21 display the number and percentage of home care clients who were admitted to hospital, visited an emergency department, or had an unscheduled nursing/physician/therapeutic visit in the 90 days prior to assessment. Hospital admission rates were higher for Aboriginal clients (30.93% admitted in prior 90 days) compared to non-Aboriginal clients (26.55%), χ^2 [1] = 14.17, p = .0002. Similarly, Aboriginal clients visited an emergency room without an overnight stay more often (22.77% vs. 17.24%), χ^2 [1] = 30.86, $p < .0001$, and required emergent care more often (9.95% vs. 7.15%), χ^2 [1] = 16.84, $p < .0001$, compared to non-Aboriginal clients.

Smoking. Overall, Aboriginal home care clients had higher rates of smoking than non-Aboriginal clients did, χ^2 [1] = 372.73, $p < .01$ (Figure 9). An age effect was observed within smoking patterns, with smoking rates declining with age, χ^2 [2] = 6,708.37, $p < .01$. There was proportionally greater concern about Aboriginal clients' drinking habits (2.95%) compared to non-Aboriginal clients (1.25%; χ^2 [1] = 32.89, $p < .01$). Age and gender trends were also present; greater concern about drinking habits was present for males, χ^2 [1] = 827.03, $p < .01$ and clients aged 65 to 74, χ^2 [2] = 367.4992, $p < .01$.

Obesity. Aboriginal clients had higher rates of morbid obesity (2.16%) when compared to non-Aboriginal clients (1.12%), χ^2 [1] = 40.36, $p < .01$.

Self-rated health status. Table 22 displays the percentage of clients who indicated they had poor health by ancestry, sex, and age group. Overall, more Aboriginal clients rated their health as poor (27.43%) compared to non-Aboriginal clients (22.50%), χ^2 [1] = 20.13, $p < .0001$. However, when the data were examined by sex and age group, this significant difference remained only for females in the youngest (under 65) age category. Approximately 40% of Aboriginal females under 65 years of age rated their health as poor, compared to 31% of non-Aboriginal females, χ^2 [1] = 15.70, $p < .0001$. Interestingly, this difference was reversed for females in the oldest age category; more non-Aboriginal females aged 75+ rated their health as poor (19.48%) compared to non-Aboriginal females in the same age group (15.07%), χ^2 [1] = 4.25, p = .0393. There were no significant differences in self-rated health status for men.

Disease Prevalence. Tables 23 and 24 show the percentage of clients with a disease/infection present and that affected the client's status, and required treatment or symptom management. The Bonferonni technique corrected for number of comparisons throughout this section. For diseases of the heart and circulatory system that were monitored or treated by home care professionals, proportionally more Aboriginal clients had coronary artery disease (6.04% vs. 3.16%), χ^2 [2] = 41.57, $p < .0001$, hypertension (11.25% vs. 5.54%), χ^2 [2] = 94.09, $p < .0001$, and peripheral vascular disease (4.12% vs. 1.78%), χ^2 [2] = 87.76, $p < .001$ compared to non-Aboriginal clients. More non-Aboriginal clients had an irregularly irregular pulse (9.67% vs. 7.41%), χ^2 [2] = 19.50, $p < .0001$. Proportions of clients with cerebrovascular accident and congestive heart failure were the same.

For neurological diseases monitored or treated by home care professionals, significantly more Aboriginal clients had head trauma (0.41% vs. 0.19%), χ^2 [2] = 45.87, $p < .0001$ and hemiplegia/hemiparesis (1.51% vs. 0.60%), χ^2 [2] = 24.20, $p < .0001$. However, significantly more non-Aboriginal clients were being monitored or treated for Alzheimer's disease (0.97% vs. 0.21%), χ^2 [2] = 27.59, $p < .0001$ and dementia other than Alzheimer's (1.35% vs. 1.03%), χ^2 [2] = 14.10, $p = .0009$. Proportions of clients with multiple sclerosis and parkinsonism were the same.

Although the overall proportions of Aboriginal and non-Aboriginal clients with arthritis were the same, the proportion of Aboriginal clients being monitored or treated for this condition was significantly higher (7.41% vs. 4.70%), χ^2 [2] = 23.37, $p < .0001$. Proportions of clients with arthritis, hip fracture, other fractures (e.g., wrist), and osteoporosis were the same.

Significantly more Aboriginal clients were being treated or monitored for cataracts

(1.10% vs. 0.43%), χ^2 [2] = 15.12, p = .0005. Proportions of Aboriginal and non-Aboriginal clients with glaucoma were the same. Significantly more Aboriginal clients had a psychiatric diagnosis (1.92% vs. 1.36%), χ^2 [2] = 13.03, p = .0015.

For infectious diseases being monitored or treated by home care professionals, more Aboriginal clients had HIV infection (0.34% vs. 0.03%), χ^2 [2] = 39.89, $p < .0001$. Proportions of clients with tuberculosis, pneumonia, and urinary tract infection were the same.

Significantly more Aboriginal clients were being monitored or treated by home care professionals for diabetes (11.39% vs. 3.85%), χ^2 [2] = 358.95, $p < .0001$, emphysema/COPD/asthma (5.62% vs. 2.73%), χ^2 [2] = 74.23, $p < .0001$, and renal failure (2.26% vs. 0.84%), χ^2 [2] = 61.82, $p < .0001$. The proportions of clients with cancer and thyroid disease were the same.

Client Assessment Protocols. The second part of the RAI-HC are Client Assessment Protocols (CAPs) which consist of MDS-HC items that alert the assessor to potential problems or needs. The CAPs contain general guidelines for further assessment and care planning for clients who trigger them (e.g., follow-up questions, treatment options). Presented in tables 25 and 26 are the CAPs triggered by Aboriginal and non-Aboriginal clients. The Bonferonni technique corrected for number of comparisons throughout this section.

Significantly more Aboriginal clients triggered the alcohol dependence/hazard CAP (2.95% vs. 1.25%), χ^2 [1] = 32.89, $p < .0001$ and elder abuse CAP (2.19% vs. 1.17%), χ^2 [1] = 2.19, p =.0003. Proportionally more Aboriginal clients triggered the pain CAP (72.63% vs. 64.89%), χ^2 [1] = 37.99, $p < .0001$, pressure ulcers CAP (29.90% vs. 21.36%), χ^2 [1] = 62.50, $p < .0001$, and skin and foot conditions CAP, χ^2 [1] = 32.68, $p <$ .0001.

Regarding medical treatments, proportionally more Aboriginal clients triggered the adherence CAP (9.95% vs. 5.98%), χ^2 [1] = 40.03, $p < .0001$ and medication management CAP (46.71% vs. 38.96%), χ^2 [1] = 36.37, $p < .0001$. Consistent with the previous finding where Aboriginal clients had more hazardous home environments, proportionally more Aboriginal clients triggered the environmental assessment CAP (9.19% vs. 5.98%), χ^2 [1] = 26.29, $p < .0001$. Finally, more Aboriginal clients triggered the bowel management CAP (21.26% vs. 17.03%), χ^2 [1] = 18.19, $p < .0001$.

Although more Aboriginal clients triggered the above-mentioned CAPs, there were areas where non-Aboriginal clients were more likely to have identified problems. Proportionally more non-Aboriginal clients triggered the ADL CAP (34.18% vs. 30.25%), χ^2 [1] = 9.93, $p = .0016$, and IADL CAP (74.46% vs. 68.45%), χ^2 [1] = 27.38, $p < .0001$. Additionally, more non-Aboriginal clients triggered the institutional risk CAP (13.87% vs. 8.92%), χ^2 [1] = 29.68, $p < .0001$ and communication disorders CAP (46.25% vs. 39.71%) χ^2 [1] = 24.82, $p < .0001$. Finally, proportionally more non-Aboriginal clients triggered the urinary incontinence/catheter CAP (37.78 vs. 33.26%), χ^2 [1] = 12.50, $p = .0004$.

MDS Summary Scales

Cognitive Performance Scale (CPS). For 56.24% of Aboriginal clients and 54.23% of non-Aboriginal clients, no CPS items were endorsed (Tables 28 and 29). The distribution of scores was positively skewed with the large majority of clients having a score of 3 or less (Figure 10). Coefficient alpha (inter-item correlation) was similar for the Aboriginal and non-Aboriginal data (Table 27).

Activities of Daily Living Hierarchy Scale (ADL-Hierarchy). For 70.84% of Aboriginal clients and 68.45% of non-Aboriginal clients, no ADL-Hierarchy items were endorsed (Tables 30 and 31). The distribution of scores was positively skewed with

13.40% of Aboriginal clients and 12.43% of non-Aboriginal clients requiring extensive assistance or being totally dependent (Figure 11). Coefficient alpha (inter-item correlation) was 0.89 for the Aboriginal sample and 0.90 for the non-Aboriginal sample (Table 27).

Depression Rating Scale (DRS). For 63.79% of Aboriginal clients and 66.89% of non-Aboriginal clients, no DRS items were endorsed (Tables 32 and 33). The distribution of scores was positively skewed with the large majority of clients having a score of 3 or less (Figure 12). Coefficient alpha (inter-item correlation) was 0.76 for the Aboriginal sample and lower (0.69) for the non-Aboriginal sample (Table 27).

Changes in Health, End-Stage Disease and Symptoms and Signs (CHESS) Scale. For 36.97% of Aboriginal clients and 36.35% of non-Aboriginal clients, no CHESS items were endorsed (Tables 34 and 35). The distribution of scores was positively skewed with 1.75% of Aboriginal clients and 1.97% of non-Aboriginal clients at the two highest levels of instability (Figure 13). A measure of internal consistency was not calculated, as the CHESS scale is a grouping of dissimilar items, making internal consistency not applicable.

Pain Scale. Tables 36 and 37 display the distribution of scores for the Pain scale for Aboriginal and non-Aboriginal clients, respectively. Fewer Aboriginal clients did not endorse any Pain items compared to non-Aboriginal clients (26.87% vs. 35.12%, respectively). Scores were evenly distributed for both populations (Figure 14). Coefficient alphas (inter-item correlations) were 0.88 and 0.91 for the Aboriginal and non-Aboriginal samples, respectively (Table 27).

Multilevel Linear Modeling

For each MDS summary scale a series of multilevel linear models were built using the following sequence to arrive at a final model. Analyzed first, the null model was a test to see if there were different scores on the dependent variable across CCACs (i.e., to see if the intercepts varied). If the intraclass correlation was of adequate size, it was necessary to consider CCAC differences in subsequent models.

Introduced next was the primary variable of interest, individual ancestry. This variable was centred on CCAC means to reduce multicollinearity. At this step, individual ancestry was entered as both a random and fixed variable, a common procedure in multilevel linear modeling (Tabachnick & Fidell, 2007). This second model was a test to see if scores on the dependent variable differed with individual ancestry. It also allowed for examination of the fixed effect of individual ancestry on the dependent variable.

Subsequent models analysed the contribution of additional fixed predictors (e.g., CCAC ancestry, age, sex, education). These models were a test to see if CCAC and/or individual ancestry continued to have an effect on the dependent variable when other covariates were controlled for.

Models were built sequentially until there was failure to converge. Failure to converge meant a poor fit between the model and the data. In this case, the model was inappropriate and the variable that caused the convergence failure was removed from the model.

Cognitive Performance Scale (CPS). In the null model CCAC was entered as a random variable and it had a significant effect on CPS scores (Table 39). In other words, there were differences in CPS scores across CCACs. The CCAC variable accounted for approximately 1.3% of the variance in CPS scores (Table 38). The significance of this null model indicated the value of considering CCAC differences in subsequent models.

A second model was built with individual ancestry (centred on CCAC means) entered as a random and fixed variable. This model failed to converge, meaning that CPS scores did not differ with individual ancestry at the random level. As the model was not a good fit with the data, individual ancestry as a random variable was dropped from subsequent analyses. For all of the following CPS models, then, CCAC was the only random variable entered.

In a third model, individual ancestry (centred on the CCAC mean) had a significant fixed effect on CPS scores; Aboriginal clients had lower CPS scores (Table 40). This model did not explain more variance than the model in which only the intercepts were included, χ^2 [1] = 2.8, $p > .05$. When CCAC ancestry (centred on the grand mean) was added as a group-level fixed predictor in a third model, individual ancestry remained predictive of CPS score while the average ancestry of the CCAC was not (Table 41). According to this model, Aboriginal clients had lower CPS scores. This model explained significantly more variance than the null model, χ^2 [3] = 13.6, $p < .005$.

Finally, age, sex, and education were entered as control variables in a fourth and final model (Table 42). This model converged and age, sex, and education were significant predictors of CPS score while ancestry was not. Older clients and male clients had higher CPS scores, as did clients with less education. Once these covariates were entered into the model, the effect of ancestry disappeared. This model explained significantly more variance in CPS scores than the previous model, χ^2 [3] = 45,806.8, $p < .001$.

Table 43 summarizes the four models evaluated. The final model indicated that CPS scores differed among CCACs. Because CCAC was a nominal variable interpretation of this random effect was not relevant. Higher age, male sex, and lower educational attainment were predictive of greater cognitive impairment. Aboriginal ancestry did not have an effect on cognitive impairment.

Depression Rating Scale (DRS). In the null model CCAC was entered as a random variable and had a significant effect on depression scores (Table 44). The

CCAC accounted for approximately 1.5% of the variance in depression scores (Table 38). Thus, CCAC was included as a random variable in subsequent models.

In the second model, individual ancestry (centred on the CCAC mean) was entered as a random and fixed effect. This model converged, but individual ancestry did not have a random effect on depression scores (Table 45). It did, however, have a fixed effect on depression scores, with Aboriginal clients having higher DRS scores. This model predicted significantly more variance than one in which only the intercepts were included, χ^2 [3] = 16.8, $p < .001$.

A third model added CCAC ancestry (centred on the grand mean) as a fixed effect. Although this model converged, CCAC ancestry did not explain any variance in depression scores. However, the significant fixed effect of individual ancestry on DRS score remained; Aboriginal clients had higher depression scores (Table 46). Examination of the random variables revealed a significant covariance between CCAC and individual ancestry. This covariance indicated that the effect of individual ancestry on depression scores differed depending on average depression score of the CCAC. This model accounted for significantly more variance than the previous model, χ^2 [2] = 10.1, $p < .001$.

A fourth model added control variables (age, sex, and education) to the model as fixed effects (Table 47). These three covariates had significant fixed effects on depression scores. Clients of younger age, female sex, and less education had higher depression scores. Once these control variables were added to the model, individual ancestry no longer had a fixed effect on depression scores. This meant that ancestry did not have a significant fixed effect on depression scores outside of the effects of age, sex, and education. However, the covariance between CCAC and ancestry remained at the random level, indicating that the relationship between individual ancestry and depression score depended on the average depression score of the CCAC. This model was significantly improved over the previous model, χ^2 [3] = 46,602.6, $p < .001$.

To investigate possible explanations for the significant covariance between individual ancestry and CCAC, two other models were built. The first added identification of depression to the model (i.e., a score of three or higher on the DRS); this model did not converge. On a conceptual level this finding might have been predicted, due to the questionable predictive validity of the scale itself. Previous research has found that higher scores on the DRS are not necessarily indicative of diagnosable depression.

Next, the effect of antidepressant medication was examined, and this model converged (Table 48). Clients taking an antidepressant medication had higher DRS scores. A fixed interaction between individual and CCAC ancestry was observed. The covariance between CCAC and ancestry at the random level remained, consistent with the previous model. Thus, the relationship between ancestry and depression score depended on the average depression score of the CCAC outside of the effects of age, sex, education, and antidepressant use. This final model accounted for significantly more variance in depression scores than the previous models, χ^2 [1] = 2631.3, $p < .001$.

Table 49 summarizes the five models evaluated. According to the final model, clients of younger age, female sex, lower education, and clients taking antidepressant medication had higher depression scores. Neither individual ancestry nor CCAC ancestry was predictive of DRS score as fixed variables. At the random level, shared variance between CCAC and individual ancestry indicated the relationship between ancestry and depression score depended on the average depression score of the CCAC.

Changes in Health, End-Stage Disease and Symptoms and Signs (CHESS)

Scale. A null model was first built with CCAC entered as a random variable; CCAC had a significant effect on CHESS scores (Table 50). The intraclass correlation for the null model was calculated and is presented in Table 38. Approximately 2.5% of the variability in CHESS score was associated with differences between CCACs. Thus, CCAC differences were accounted for in subsequent models.

The second model added individual ancestry (centred on the CCAC mean) as a random and fixed effect. This model converged and indicated that ancestry had a fixed effect on CHESS scores (Table 51). At the random level, a significant covariance between CCAC and ancestry existed indicating that the relationship between ancestry and CHESS score depended on the average CHESS score of the CCAC. However this model did not differ significantly from the null model, χ^2 [3] = 366,625.0 – 366,620 = 5.0, $p > .05$.

A third model added CCAC ancestry (centred on the grand mean) to the model as a fixed effect. This model converged but there were no significant fixed or random effects on CHESS scores (Table 52). In a fourth model age, sex, and education were entered as control variables; this model failed to converge.

Table 53 summarizes the three models evaluated. At the end of this model-building process, there was no model that accounted for CHESS scores beyond the variance explained by differences between CCACs.

Activities of Daily Living Hierarchy (ADL-Hierarchy) Scale. In the null model CCAC was entered as a random variable and had a significant effect on ADL scores (Table 54). The CCAC accounted for approximately two percent of the variance in ADL scores (Table 38). Thus, CCAC differences were taken into account in subsequent model building.

A second model was built with individual ancestry (centred on the CCAC mean) entered as a random and fixed effect; this model failed to converge. Thus, all subsequent models had CCAC entered as the only random variable.

In the next model individual ancestry (centred on the CCAC mean) did not have a significant fixed effect on ADL scores (Table 55). Therefore, this model was not significantly better than the model in which only the intercepts were included, χ^2 [1] = -4.1, $p > .05$.

Next, CCAC ancestry (centred on the grand mean) was added as a fixed variable and was predictive of ADL scores (Table 56). This meant that CCACs with smaller proportions of Aboriginal clients had higher ADL scores. However, individual ancestry was not predictive of ADL scores. This model explained significantly more variance than the null model, χ^2 [3] = 12.3, $p < .010$.

Finally, age, sex, and education were entered as control variables in a fourth and final model (Table 57). This model converged and age, sex, and education were significant predictors of CPS score along with CCAC ancestry. Clients of younger age, male sex, and less education had higher ADL scores. CCACs with proportionally more non-Aboriginal clients had higher ADL scores. This model accounted for significantly more variance than the previous model, χ^2 [3] = 45,159, $p < .001$.

Table 58 summarizes the four models evaluated. In the final model, ADL scores differed across CCACs. The proportion of Aboriginal clients had a significant fixed effect on ADL scores; CCACs with proportionally more non-Aboriginal clients had higher ADL scores. Clients of younger age, male sex, and less education also had higher ADL scores.

Pain Scale. In the null model CCAC was entered as a random variable and CCAC had a significant effect on pain scores (Table 59), meaning that different CCACs had different pain scores. The CCAC accounted for approximately 0.6% of the variance in pain scores (Table 38) and thus CCAC effects were accounted for in subsequent models.

A second model was built with individual ancestry (centred on the CCAC mean) entered as a random and fixed effect; this model failed to converge. This failure to converge meant that the relationship between ancestry and pain score was not significant at the random level. Thus, all subsequent models had CCAC entered as a random component and ancestry entered only as a fixed effect.

In the next model individual ancestry had a significant fixed effect on pain scores (Table 60); Aboriginal clients had higher pain scores. This model explained significantly more variance than the model in which only the intercepts were included, χ^2 [1] = 26.5, $p < .001$.

In a fourth model CCAC ancestry (centred on the grand mean) was added as a fixed predictor and was predictive of pain scores, along with individual ancestry (Table 61). Aboriginal clients had higher pain scores, and CCACs with higher proportions of Aboriginal clients had higher pain scores. This model accounted for significantly more variance than the previous model, χ^2 [2] =11.1, $p < .005$.

Age, sex, and education were entered as control variables in a fourth model (Table 62). This model converged and age and sex were significant predictors of pain score along with individual and CCAC ancestry. Clients with younger age and female sex had higher pain scores, as did Aboriginal clients and CCACs with higher proportions of Aboriginal clients. This model explained more variance than the previous model, χ^2 [3] = 38,048, $p < .001$.

Since more Aboriginal clients were being treated or monitored for arthritis, a painful musculoskeletal condition, this variable was entered into the model (Table 63). Clients who were treated or monitored for arthritis had higher pain scores. Once arthritis was included in the model, the significant fixed effect of CCAC ancestry on pain scores disappeared. Age, sex, and individual ancestry remained predictive of pain scores.

Table 64 summarizes the five models evaluated. In the final model, CCACs had a significant random effect on pain scores, meaning there were differences in overall pain scores between CCACs. Upon examination of the fixed effects in the model, CCACs with higher proportions of Aboriginal clients had higher pain scores. Individual ancestry also had a significant fixed effect on pain scores, with Aboriginal clients having higher scores on this measure. Clients of younger age, female sex, and clients being monitored or treated for arthritis also had higher pain scores.

Study 2: Qualitative Study of Culturally Appropriate Home Care

Methods

The second part of the current study consisted of a phenomenological study to describe the challenges associated with providing culturally-sensitive home care to Aboriginal people. This study explored these barriers from the perspectives of the home care coordinator and provider.

Design. Key informant interviews with a theme guide were conducted with home care coordinators and providers in Northwestern Ontario. Two key agencies that coordinate home care services for Aboriginal peoples in Northwestern Ontario were identified, and managers were first contacted to describe the study's purpose and need for participants. The managers provided contact information for home care coordinators who coordinate services for Aboriginal clients and had one or more years of experience in their job. Snowball sampling then was used to identify additional information-rich potential participants.

A theme guide directed the semi-structured interview and included questions regarding occupational area, home care experience, and experience in providing service to Aboriginal clients. When necessary, questions were asked by the researcher in order to clarify what the participant was relating. The length of the interviews varied from 37 to 48 minutes.

Informed consent to participate in the study and tape record the interview group was obtained from all participants. Interviews were conducted until saturation occurred. In total, eight interviews were conducted. Five participants came from the publicly-funded provincial home care system, and three from Aboriginal organizations. Participants consisted of home care coordinators and home care providers with at least one year of experience in their current job; years of experience ranged from one year to eight years. All participants had additional years of experience working in health care prior to starting their current job in home care.

Data Analysis. The recorded data were transcribed verbatim for each participant. These transcriptions were subjected to analysis utilizing the latent qualitative content analysis method. The transcripts were first read to obtain an overall sense of the data. Common patterns in the data were searched for by using a common set of codes to identify data with similar content. These codes were then categorized to answer the research questions. All data were divided into meaningful units and categorized into topics outlined in the theme guide. Thereafter, a second content analysis was conducted for each category to identify meaningful sub-units.

Definition of Terms. For the purposes of this study, the following terms were defined.

Coordinator – a home care coordinator or community care coordinator. The focus of the coordinator's job is case management and coordination of services for clients outside of hospitals or other institutions. In this study the coordinator had experience working with Aboriginal home care clients.

Provider – a home care provider who delivers the necessary service directly to the client.

Client – any Aboriginal person who had interaction with a coordinator or provider for the receipt of home care services.

Interaction – Any reciprocal action between the coordinator or provider and the client.

Validity Checking. Creswell (1998) recommended engaging in at least two forms of validity checking in any given study. In the current study, themes and perspectives were corroborated with evidence from different sources (triangulation) by making use of multiple and different sources of information. Member checking was also used to solicit participants' views of the research findings' credibility (as described in Creswell, 1998);

the data, analyses, and interpretations were taken back to the participants so that they could judge the credibility of the findings.

Results

Examination of the qualitative data resulted in a description of home care provision to Aboriginal clients. As identified in Table 65 coordinators and providers identified several challenges to care. Table 66 indicates the ways in which these challenges were met. Language affected coordination and provision of care in several ways. Coordinators and providers who did not speak an Aboriginal language needed to arrange for a translator to be present when they met with the client, if the client did not speak English. This need for a translator added an additional layer of coordination to the process, as it was not only services that needed arranging but also the presence of someone to translate. More often than not, this translator was a family member or other care provider who spoke the language. As one coordinator described,

> Some [clients] speak only Ojibway, and I have a personal support worker who speaks the language. So I usually go with her if I need to see a client who I know may not understand what I'm saying or doesn't speak English.

Even when the coordinator or provider was able to speak an Aboriginal language, it could be a different language from that spoken by the client. As one coordinator described:

> Cree is my first language. But the ones [clients] that I work with are Ojibway. So I'm not able to speak with them fluently in Ojibway, even though I understand what they are saying sometimes. But I can't speak the language fluently enough to converse with them.

Coordinators and providers also experienced difficulty arranging for a translator to be present. To overcome this barrier, coordinators and providers often coincided appointments with other services where a translator was able to be present. One coordinator described this difficulty and how it was overcome for a particular client.

> With this particular lady, she's a renal client at the [hospital], so we're lucky enough to have their interpreter. She's an Aboriginal liaison and she provides interpreting services. And actually she's been kind enough to come out to the home when myself and the social worker have been there. Sometimes you have to piggy-back on with other service providers to get to have, like the, our every six months assessment. And it's less disruptive for the client, I think, that way. Sometimes it's difficult getting an interpreter.

Language was also a challenge when it came to describing the assessment process or procedures that needed to be done. "That's the difficult part," explained one coordinator, "especially when you're talking about a procedure. Sometimes they [clients] don't have a word for that, so we have to explain what it is, and go around that way." Coordinators also noted difficulty obtaining medical information directly from the client. Often a family member provided this information, or a support worker who was present and familiar with the client provided it.

This translation process and difficulty explaining procedures often lengthened the visit, making it more onerous for the client and provider. Coordinators did note, however, that their organizations were understanding of the need for longer visits with Aboriginal clients and allowed them the time needed.

When it came to the information required for the assessment (e.g., RAI-HC assessment), language was not only a barrier to the interaction between coordinators and clients, but also to the interactions between clients and other people/organizations. One coordinator described a particularly difficult interaction between a client and a bank:

> Medications are tough, banking is tough, sometimes getting around is difficult. The things that I take for granted, going into a bank and asking for a bank statement, for example. This one client was charged thirty dollars, and they got

> nothing for that. They were charged five dollars, these people, they both went in there, the daughter and the mother went into the bank and asked for a bank statement and they were charged five dollars and came out with a bank statement from May. What they needed was bank statements for the past six months for a housing application. They went back in, they were charged thirty dollars and were given nothing. We were given nothing. So, there we are in the conference, saying, well, what did you pay thirty dollars for? And they didn't know, they couldn't understand what they were paying for, 'cause they didn't walk out of there with any paperwork. So the social worker actually ended up going down to the bank and spoke on their behalf and said "this is what they need, this is what they wanted" and they were credited thirty dollars and they got the paperwork they wanted. But, you know, isn't that awful? Can you imagine what it's like ordering medication? I think this population probably goes without a lot or isn't aware of services or sources in this city that could help them make their life a bit easier, and they're not getting the support they need.

This story was one example of how some providers gave additional assistance to Aboriginal clients. Several coordinators commented about providers who, in their opinions, went beyond what was expected in order to provide better care to Aboriginal clients. For example, one coordinator stated:

> There's this one lady who only speaks Oji-Cree, she had difficulty ordering her medications. And one of our nurses actually went in, did some research on-line, and got how to order her certain meds in Oji-Cree. She actually did up a chart for her, so that when she wanted this medication, this is how she would, you know, like put the symbols on the blister pack for her so she would know what the medication was for. Above and beyond.

Another challenge to coordination and provision of care to Aboriginal clients was the infrequent/non-existent services in rural areas. In Northwestern Ontario, many Aboriginal clients lived in rural towns or First Nations communities where services like physiotherapy and occupational therapy were not available, or only available on a bi-weekly or monthly basis. Although smaller communities usually had local nursing support, their resources were limited and sometimes affected the care plans specified for clients. One coordinator said "if there was a request for daily dressing change two times daily, we would have to let the referral source know that we could only go once per day." In some cases the type of care required was not available in the community and so clients were forced to leave the community and seek treatment in a larger town/city.

This lack of service availability in rural/remote communities possibly contributed to the next challenge for coordinators and providers: a greater transience among Aboriginal clients. "There seems to be a lot of moving about when I'm setting up appointments or locations," stated one provider. "And providing service sometimes is hard if they don't have an address" shared another coordinator. "I've provided homemaking and nursing in hotels and in [a homeless shelter]."

This moving between larger towns/cities and First Nations communities made coordination of care especially difficult, as different organizations provide care depending on the residence of the client. Off-reserve non-status Aboriginal people received coordination of services through the provincial CCAC, while status Aboriginal people (on- and off-reserve) received coordination of services through a federally funded agency. As one coordinator said:

> The other thing is that some Aboriginal people, they have two homes, they'll come here [city] and they'll go back to the reserves, and we're providing service and we're not always kept up in the loop as to where they are at that time [laughs].

Continuity of services between and within the organizations thus becomes a challenge as clients move back and forth to receive care. As one coordinator described:

> they might only have [federally-funded agency] on the reserve, homemaking, but they've come into town just because of dialysis, or whatever. But they can get the homemaking back whenever they are back. So it does sort of go back and forth.

Finally, coordinators and providers identified their own uncertainty about culturally appropriate care as a challenge to provision of service. When describing her uncertainty about the types of services her Aboriginal clients would like/need, one coordinator stated:

> I'd like to know what they [clients] think, because in a way they're the ones that are needing the care. What is it that they need from us? I don't know what they need from us. I mean I could put in OT and speech and homemaking and whatever, but it's so fast and it just goes in and you know, it's tough ... What is it you need from me, so that I can provide that in the best way possible, culturally? .... Would they like an Aboriginal home maker, would they like an Aboriginal nurse, would they feel more comfortable? These are things we don't know.

Each study participant discussed the question of the importance of having Aboriginal professionals to provide care. Coordinators and providers shared stories of clients who preferred or requested Aboriginal workers, and clients who did not want same-ancestry workers. The study participants conceptualized this dilemma as a matter of client preference. However, the need for more Aboriginal health care providers was raised as a matter of importance by each coordinator and provider.

Coordinators and providers certainly identified the individual nature of providing services to clients, including Aboriginal clients. They highlighted the importance of tailoring their interventions to the needs and cultures of their clients, regardless of ancestry. Inclusion of bannock and other traditional foods was identified as a way to increase the cultural sensitivity of meal supports. As one coordinator described, it was a matter of "matching their needs with what they're used to."

Several coordinators who complete the assessments on Aboriginal clients wondered about the cultural appropriateness of asking certain questions. "[Clients] don't share a lot of information, which is a little challenging because our government assessment tool is like, full of [laughs] information that we try to gather ... [Aboriginal clients] tend to be more quiet and more private." Another coordinator wondered if there was a more culturally-appropriate way to ask Aboriginal clients about personal matters such as bowel movements and depression.

When it came to identifying appropriate services, several coordinators and providers talked about "Western" versus "traditional" medicine and ceremonies. Sometimes clients asked about smudging or traditional herbs, which are not coordinated or provided through the home care service. One coordinator stated

> a lot of my clients are on the Western medicine, but a lot of them will ask "when is this doctor coming?" when they know there's a medicine man coming, because he'll mix up his remedies or his, his medications. And they will ask "who are they?" and "when will they be here?" and you know, that type of question.

Participants discussed additional ways of meeting the challenges of Aboriginal home care. The coordinators frequently involved other community organizations in the care of their clients, such as legal clinics and Indian friendship centres. One coordinator said "This organization works really well with community partners to provide support for their clients." Described with particularly high regard were various Indian friendship centres, which provided cultural connections in addition to translation assistance.

Continuing education, such as organizational in-services, was useful to help coordinators and providers learn about Aboriginal culture and specific care needs. Participants at organizations without an Aboriginal liaison identified the potential usefulness of such a position; participants wanted to have someone knowledgeable of Aboriginal culture to consult with regarding their Aboriginal clients' care needs.

In summary, several challenges to coordination/provision of home care services were identified for Aboriginal clients. Coordinators and providers identified language and lack of services in rural communities as significant challenges they must work with. In addition, a greater transience in the Aboriginal population and discontinuity of services require a greater degree of coordination for these clients. Finally, participants identified their own uncertainty about culturally appropriate care as a barrier to optimal care provision. It should be noted, however, that several of these challenges were seen not only in work with Aboriginal clients, but also with rural clients and in those of other ancestries. Translation assistance and the use of alternate sources of information were resources used to help overcome these challenges, as was further education regarding Aboriginal culture. In addition, coordinators and providers relied on assistance from other community organizations.

Discussion

The present study examined data from the Resident Assessment Instrument for Home Care (RAI-HC). Clients were grouped into two dichotomous groups based on ancestry, and comparisons between Aboriginal and non-Aboriginal clients were made. The primary goal of this study was to generate information regarding the health status of Aboriginal peoples assessed for home care in order to identify specific care needs and gaps. A secondary goal was to examine preliminary reliability data and determine the utility of the RAI's summary scales for Aboriginal clients. A final goal of this study was to model summary scale data using ancestry and other demographics as predictor variables.

Health Status of Aboriginal Clients Assessed for Home Care

The demographic characteristics of the non-Aboriginal people in the database were consistent with those reported elsewhere in the home care literature (e.g., Alcock et al., 1998), with the majority of home care clients being females aged 70 years and older. However, the age structure of Aboriginal clients was considerably different from that of non-Aboriginal clients. In general, Aboriginal clients were ten years younger than non-Aboriginal clients. While the majority of non-Aboriginal clients were aged 75 and older, the majority of Aboriginal clients were aged 64 and under. These findings are consistent with those reported by the First Nations and Inuit Home and Community Care Program, where Aboriginal clients had a younger age compared to non-Aboriginal clients (Health Canada, 2007).

Hayward and Heron (1999) reported the disability rate of Native American males aged 60 to 64 years to be approximately 40%. In their data, this rate was the same as that of Caucasian males aged 75 and older, representing an approximate ten year difference in disability rates. This ten year difference in age was observed in the RAI data, and may indicate that Aboriginal clients have higher levels of disability (e.g., care needs) at younger ages.

In terms of demographic characteristics, the RAI data indicated that Aboriginal clients were more likely to be separated, divorced, or never married, and more likely to be living with others who were not their spouse or children, compared to non-Aboriginal clients. In addition, they were less likely to be living in a nursing home or in a board and care/assisted living/group home. These findings have implications for informal care giving, as they indicate that Aboriginal clients at the time of referral for home care assessment had fewer formal supports in place. This may indicate a higher level of care received from informal supports such as family and friends.

Long-term care research has found lower institutionalization rates among Aboriginal peoples. In Manitoba the institutionalization rate was only 1.9% among First Nations people, compared to 15.9% among non-First Nations people aged 65 and older (Kaufert & Shapiro, 1996). This low utilization of long-term care facilities was hypothesized to reflect Aboriginal cultural values of family care as well as reduced access to these facilities in remote regions. These same variables may impact on the use of home care services by Aboriginal peoples as well as the formal supports accessed prior to home care assessment.

Although Aboriginal clients received more days of care from visiting nurses and social workers (in the 90 days prior to first home care assessment) they received fewer days of care from home health aids, meal support, and physical therapists. Qualitative data from the present study indicated that clients in rural/remote areas were less likely to receive regular home care visits from physiotherapists, who had to travel from larger cities on a monthly basis to service clients.

Language and cultural values can also influence the type of care sought after and received by Aboriginal peoples. The cultural values and experiences of the client influence how they present and report symptoms and how they perceive feedback from the care provider (Marrone, 2007). It is therefore possible that Aboriginal clients received different care because of the language and cultural differences in reporting symptoms and adherence to care recommendations.

Although English was the primary language spoken by both Aboriginal and non-Aboriginal clients, Aboriginal clients spoke another primary language approximately twice as often as non-Aboriginals (15% vs. 7%). In health care settings, effective communication between the client and care provider is important, and language barriers have been suggested to be obstacles in accessing adequate health care (Marrone, 2007). The RAI data suggested that language was a more significant barrier to Aboriginals assessed for home care than for non-Aboriginals, which may make it more difficult for Aboriginals to have their care needs met. Furthermore, although a minority of Aboriginal clients assessed for home care spoke an Aboriginal language, the use of Aboriginal languages is on the rise (Kirmayer et al., 2003). The utility of an Aboriginal RAI is therefore plausible.

For Aboriginal clients the goals of home care were more likely to be skilled nursing treatments and monitoring to avoid clinical complications. Compared to non-Aboriginal clients, this indicated poorer health status at the time of assessment. As the literature indicated that urban Aboriginals and non-Aboriginals reported similar health care access (e.g., Newbold, 1998; Tjepkema, 2002), this poorer health status upon assessment is not likely to be due to differences in health care. Rather it may be an indication of the types of illness Aboriginal peoples are more likely to experience, namely chronic, longstanding conditions that require higher levels of medical intervention.

Female Aboriginal and non-Aboriginal clients had somewhat similar patterns of disease diagnoses, although they differed proportionally and Aboriginal women tended to have more chronic conditions than non-Aboriginal women. For example, the most common disease diagnoses for Aboriginal women aged 75 and older were arthritis

(66%), hypertension (57%), diabetes (32%), and coronary artery disease (29%). For non-Aboriginal women in the same age group, arthritis (62%), hypertension (56%), osteoporosis (28%), and coronary artery disease (24%) were the most common disease diagnoses. Osteoporosis, although present in 26% of Aboriginal women in this age group was replaced as the third most common disease by a more chronic disease: diabetes.

A similar pattern was observed in the other age groups; while arthritis, hypertension, and diabetes were among the four most common disease diagnoses for all women aged 65 to 74 years, coronary artery disease for Aboriginal women and osteoporosis for non-Aboriginal women completed this list. In the youngest age group once again arthritis, hypertension, and diabetes were among the most common disease diagnoses with emphysema/COPD/asthma the fourth most common diagnosis for Aboriginal women and psychiatric diagnosis the third most common diagnosis for non-Aboriginal women.

Hypertension, arthritis, coronary artery disease, and diabetes were the four most common disease diagnoses for male clients of all age groups, regardless of ancestry. Other literature (e.g., Alcock et al., 1998; Wilkins & Park, 1998) has indicated that arthritis, stroke, fractures, and congestive heart failure were common primary diagnoses among home care clients.

As in the general population, Aboriginal clients assessed for home care had lower socio-economic status than non-Aboriginals did. Across both groups, the lowest rates of education were observed in clients aged 75 and older and Aboriginal clients were 2.6 times more likely to have no education compared to non-Aboriginals. Another indicator of socio-economic status is income; although the RAI did not include items regarding income it did ask whether clients made trade-offs due to limited funds in the purchase of prescribed medications, sufficient home heat, necessary physician care, adequate food, and home care. Having to make an economic trade-off is an indication of low income. Compared to non-Aboriginals, Aboriginal clients made significantly more economic trade-offs compared to non-Aboriginal clients. Proportionally, Aboriginal clients aged less than 65 years made the most economic trade-offs.

Having a hazardous or uninhabitable home environment (e.g., holes in floor, inadequate lighting) may be another indicator of low income. Aboriginal clients and clients living in Northern regions were more likely to have an environmental hazard present in their home. Including socioeconomic indicators in the present study's analytical strategy was an important contribution to the literature on Aboriginal health, as previous studies have not included this information thus not accounting for this significant contributor to health.

Utility of MDS Summary Scales for Aboriginal Clients

The reliability of each MDS summary scale was evaluated separately for Aboriginal and non-Aboriginal clients. By calculating coefficient alpha for each summary scale the intercorrelations among scale items were determined. If the summary scale was designed to measure a single construct (e.g., pain), and all items were good measures of that construct, then coefficient alpha would be high. Conversely, if one or more of the items was a poor measure of that construct, coefficient alpha would be lower and represent the lower bound of the summary scale's reliability (Hogan, 2007).

Coefficient alphas for the ADL Hierarchy and Pain scales were highest, at 0.90 and 0.91 for Aboriginal clients and 0.89 and 0.88 for non-Aboriginal clients, respectively. Coefficient alphas of these magnitudes indicated that items on the ADL Hierarchy and Pain scales were good measures of these constructs and functioned similarly for Aboriginal and non-Aboriginal clients. On the CPS and DRS the coefficient alphas were lower, at 0.73 and 0.76 for Aboriginal clients and 0.76 and 0.69 for non-Aboriginal clients. These lower numbers indicated that one or more scale items was a poor measure of the construct. However, the items appeared to function similarly for Aboriginal and non-Aboriginal clients; that is, the reliability of these scales was less than desirable regardless of ancestry.

Coefficient alphas for the CHESS scale were lowest, at 0.35 for Aboriginal clients and 0.38 for non-Aboriginal clients. As the CHESS scale is less a grouping of similar items and more a grouping of dissimilar items, these poor internal consistencies were not surprising.

Overall the MDS summary scale internal consistencies were similar for Aboriginal and non-Aboriginal clients. The internal consistencies of the ADL Hierarchy and Pain scales were within acceptable limits, but those of the CPS and DRS indicated lower agreement among scale items. Further validation of the CPS and DRS in both populations is warranted.

There is a large body of research highlighting the difficulties inherent in cross-cultural assessment, diagnosis, and treatment of physical and mental health needs (c.f. Castillo, 1997; Waldram et al., 2006). One of the most significant methodological concerns is cross-cultural validation of instruments (Kaufert & Shapiro, 1996). Of question is whether the presence of unfamiliar words or concepts on the RAI compromises its reliability and validity when used with an Aboriginal population. Qualitative data from the present study indicated that describing the RAI assessment process and subsequent indicated procedures was a challenge for some coordinators and their clients. When there was not a word for a particular procedure, coordinators improvised by describing the procedure.

When necessary, translation of RAI items and the client's responses was through a family member or Aboriginal liaison. The person who serves as translator and/or interpreter affects the process and quality of interpretation. For example, it is desirable for interpretation to be conducted properly, relevantly, and meaningfully for clinical purposes. The deletion or omission of information, exaggeration, minimization, and distortion of meaning needs to be reduced as much as possible (Tseng, 2003) and is more likely to occur when interpretation is done by a family member or untrained interpreter. Kaufman and Shapiro (1996) found that 75.3% of non-First Nations respondents had satisfactory understanding of the questions on a mental status survey, compared to only 48.3% of First Nations respondents. Although these findings may indicate a higher level of impairment by First Nations respondents, they may also indicate linguistic and cultural accessibility barriers (Kaufman & Shapiro, 1996).

Of further question is the cultural appropriateness of constructs evaluated by the RAI, particularly for the summary scales. Hall and colleagues (1993) described a process called "harmonization" which they used to modify a dementia screening tool for use with Cree-speaking Manitoban elders. This process involved modification of the tool to be consistent with the language and culture of the First Nations population. The tool was subsequently evaluated for its reliability and validity. Hendrie (2006) and Kaufert and Shapiro (1996) reported a similar process in modification of dementia screening tools for non-Caucasian populations. Without such evaluation of each RAI summary scales' validity, either as is or modified for Aboriginal cultures, observed inter-group differences may be real or may be artefacts of inappropriate assessment tools (Kaufert & Shapiro, 1996).

In summary, the RAI summary scales had similar coefficient alphas for Aboriginal and non-Aboriginal clients, indicating that the scales functioned similarly for both groups of clients. However, coefficient alphas for the DRS and CPS were below acceptable limits, indicating potential value in revision of these scales. Although similarities of coefficient alphas between the ancestry groups was a positive indicator of reliability for the summary scales, future validation of these scales is warranted for the Aboriginal population. With this caveat in mind, the following conclusions were drawn from the data.

Multilevel Linear Models

Using an explicit multilevel linear modeling approach, this research demonstrated that individual and contextual variables contribute to variations in health status, although significant unexplained variance remains. Understanding CCAC differences in disease prevalence can provide valuable information for planners, who use RAI data to determine the allocation and provision of home care services. Examination of regional differences may also help identify regions to target for disease prevention and/or management programs (Cañizares et al., 2008). Following is a discussion of the present study's findings and the implications of each.

Cognitive Status. Previous research indicated the prevalence of Alzheimer's disease was lower in Aboriginal populations. Without taking into account age, sex, or education, proportionally more non-Aboriginal clients had diagnoses of Alzheimer's disease and other dementias. However, multilevel linear modeling accounting for CCAC differences as well as these control variables indicated otherwise. Entering education as a control variable was particularly important in analysis of CPS data, as previous research has found a significant relationship between mental status scores and educational attainment (Kaufert & Shapiro, 1996).

Early models with data from the present study indicated that Aboriginal clients had lower CPS scores, indicating better cognitive status when compared to non-Aboriginal clients. However, after sex, age, and education were entered into the model, ancestry was no longer predictive of CPS score. Clients of older age, male sex, and lower educational attainment had higher CPS scores, indicating poorer cognitive status.

Kaufert and Shapiro (1996) described the significant cultural, linguistic, and contextual factors that influence the assessment of Aboriginal peoples' cognitive status. Observations from interviews using a culturally adapted version of the Mental Status

Questionnaire found that questions measuring awareness of place and time were not accurate indices of mental status, as things such as postal address and calendar time were not significant to elderly First Nations people living in remote northern communities.

Tests of cognitive status frequently ask about the patient's age; Kaufert and Shapiro (1996) found that only 51.4% of the First Nations respondents could specify their age, compared to 81.7% of the non-First Nations respondents. Qualitative data indicated that birth dates were not culturally relevant to First Nations elders. Although specification of year of birth is important for people with treaty status, in many communities only missionaries or band officials kept birth registries and most elders did not have their own birth certificates (Kaufert & Shapiro, 1996).

These linguistic, cultural, and contextual factors in determination of mental status may also have affected RAI data for Aboriginal clients. For example, one of the CPS items references procedural memory; that is, the client's ability to perform all or almost all steps in a multitask sequence without cues. The data analysed in the present study do not indicate whether this multitask sequence was culturally and contextually relevant to Aboriginal clients and thus may not be a relevant indicator of cognitive functioning. Furthermore and as previously mentioned, the internal consistency of this scale was questionable, indicating potential value in revision of this scale for both populations.

Depression. Previous community-based research suggested that Aboriginal people experienced depression at a greater prevalence than the general population (e.g., Tjepkema, 2002). Early models with data from the present study indicated that Aboriginal clients had higher depression scores, but this effect was no longer significant after controlling for age, sex, and education. Clients of younger age, female sex, and lower educational attainment had higher depression scores. Although at the random level the relationship between ancestry and depression score depended on the average depression score of the CCAC, this finding was likely due to higher depression scores among people with lower educational attainment, the larger proportion of whom were Aboriginal.

When diagnosable depression (operationalized as a score of three or higher on the DRS) was entered into the model, the model did not converge indicating a poor fit between the variables and the data. Other researchers have found the predictive validity of the DRS to be questionable (e.g., Carpenter et al., 2005; McCurren, 2002) and therefore the inability of this variable to predict depression scores was not a surprise. As already mentioned the internal consistency of this scale was also questionable, indicating the need for further evaluation and revision of the DRS. Several items on the DRS have questionable theoretical value. For example, while a feeling of sadness is a key indicator of depression and is included on the DRS, another key indicator, loss of interest/pleasure, is not. Previous research has indicated that older adults tend to experience more anhedonic depression (Beck & Koenig, 1996; Norris, Arnau, Bramson, & Magher, 2003) and non-inclusion of this variable is questionable.

Clients who were taking antidepressant medications also had higher depression scores. It is important to note that while antidepressants are considered a first-line treatment for depression, they are also used to treat other mental health issues (e.g., anxiety) and behaviours (e.g., smoking cessation). Therefore, the finding that clients with higher depression scores were being treated with antidepressants should be considered a nonspecific indicator of treatment in the broadest sense. A better indicator of treatment could come from longitudinal data where depression scores could be examined over time.

Activities of Daily Living. The MDS Activities of Daily Living (ADL) Scale is based on self-performance across the categories of bed mobility, mobility to/from bed/chair, locomotion, dressing, eating, toilet use, and personal hygiene. In the final multilevel model, ADL-Hierarchy scores differed across CCACs. The CCACs that had proportionally fewer Aboriginal clients had higher ADL-Hierarchy scores, as did clients of younger age, male sex, and lower educational attainment.

Previous research found higher rates of disability among Aboriginal peoples. For example, data from the CCHS indicated the rate of long-term activity restriction was 1.6 times higher for Aboriginal participants, compared to the non-Aboriginal respondents (Tjepkema, 2002). However, it is hypothesized that data from the CCHS were less indicative of ADL performance and more indicative of IADL performance. A long-term activity restriction was defined as a long-term (i.e., at least six months duration) physical or mental condition or health problem that reduced the amount or type of activity respondents could engage in. Thus, it is reasonable to suggest that the sensitivity of this CCHS item to ADL performance was questionable.

Frailty. The CHESS scale was designed as a measure of frailty, predictive of adverse health outcomes such as mortality (Hirdes et al., 2003). Because the CHESS scale is a grouping of dissimilar items which indicate instabilities in health, internal consistency is not relevant and coefficient alpha was not calculated. Results of a multilevel linear modeling process indicated that differences between CCACs account for 2.5% of the variance in CHESS scores. Addition of further variables to the model, including ancestry, age, sex, and education, did not explain further variance.

This lack of convergence in the more sophisticated models of CHESS data was surprising. Previous research found that CHESS scores were predictive of mortality beyond the effects of age and sex (Hirdes et al., 2003) and thus it was expected that these two variables would have a fixed effect on CHESS scores. The heterogeneity in CHESS items may have contributed to the model's convergence failure, as heterogeneous scales with few items tend to have lower predictive validity.

Pain. Appropriate pain management and relief is a reasonable expectation for clients assessed for home care services. The data indicated that clients of Aboriginal ancestry, younger age, and female sex had higher pain scores. While there were CCAC differences in overall pain scores, it was those CCACs with higher proportions of Aboriginal clients that had higher pain scores. These effects remained after controlling for arthritis in the model. These findings could have several meanings. Aboriginal people could have a lower threshold for pain and therefore have higher pain scores. Previous research, however, has indicated that Aboriginal peoples might have a higher threshold of pain and be less likely to complain (McGrath, 2006).

These findings could also mean that Aboriginal people have higher levels of pain because they have more severe/progressed diseases. For example, although the proportion of clients with arthritis was similar, proportionally more Aboriginal clients were being monitored or treated for this condition. Thus, it is likely that Aboriginal clients had more severe/progressed arthritis, resulting in higher pain. Although arthritis was controlled for, and the effect of ancestry on pain scores remained, it is possible that Aboriginal people had more severe/progressed diseases that were not accounted for in the model and resulted in higher pain.

There is an extensive literature on pain management for Caucasian peoples, yet there are no articles that focus on pain and/or pain management for Canadian Aboriginal peoples. Qualitative research from Australia suggested that postoperative pain for Aboriginal women was mismanaged due to nursing knowledge deficit (i.e., pain management strategies that were culturally unreliable and inappropriate) and cultural conflict (Fenwick & Stevens, 2004). Additional cultural barriers were identified including language and role interpretation. Nurses tried to understand Aboriginal patients' pain from the nurses' culture, and the Aboriginal patients expected the nurses to conduct assessments and treatment in the same way as their traditional healers (Fenwick & Stevens, 2004).

The qualitative data from the present study indicated that language and cultural expectations were barriers to service coordination and provision. Although this research did not enquire about pain management specifically, it is likely that language and cultural expectations of the provider and client impact on pain management. Future research could identify general and specific aspects of pain expression and management for Aboriginal people. This research would be of particular importance as 73% of Aboriginal clients triggered the Pain CAP; this information could generate appropriate assessment and care planning guidelines for Aboriginal clients through the Pain CAP.

Future research should also focus on pain management for Aboriginal clients. Longitudinal RAI data could indicate if Aboriginal clients with high Pain scores on intake into the home care system have lower pain scores at the subsequent assessment, indicating reduction in or management of their pain.

To summarize, scores on all of the MDS summary scales varied across CCACs. Contrary to previous findings, Aboriginal and non-Aboriginal clients had similar mental status scores once age, sex, and educational attainment were entered into the model. Also contrary to previously reported data, Aboriginal clients did not have higher depression scores once the effects of age, sex, and education were taken into account. Although previous research had indicated higher levels of disability for Aboriginals, individual ancestry did not have an effect on ADL-Hierarchy scores. The CCACs that had proportionally fewer Aboriginal clients had lower ADL-Hierarchy scores. Although CHESS scores varied across CCACs, there were no significant fixed effects of ancestry, age, sex, or educational attainment. Finally, Aboriginal clients had higher pain scores even after controlling for age, sex, education, and arthritis diagnosis.

Implications for RAI Policy and Development

The findings of the present study have implications for RAI policy and development. As previously mentioned the internal consistencies of the DRS and CPS summary scales were found to be questionable for both the Aboriginal and non-

Aboriginal populations. Thus, there is significant value in further revision of these scales. Accurate assessment and diagnosis of depression and dementia is essential to targeting appropriate treatment and improving home care clients' quality of life. It is particularly concerning that neither of these scales had high validity as the potential for recognition of comorbid depression and dementia would be greatly reduced.

The prevalence of depression in people with vascular dementia is typically higher than in people with Alzheimer's disease (e.g., 21.2% vs. 3.2%, respectively; Newman, 1999). Comorbidity of depression and dementia has been associated with higher risk of adverse outcomes including institutionalization (Bartels et al., 2003; Steeman, Abraham, & Godderis, 1997). Thus it is concerning that the present study's preliminary data indicated neither the DRS nor the CPS demonstrated adequate validity.

Apart from the questionable validity of some of the summary scales, the cross-cultural validity of the RAI is also uncertain. Qualitative data from the present study indicated that home care coordinators and providers were uncertainty whether the ways they interacted with clients and services they provided were culturally appropriate and relevant to their clients. For example, coordinators wondered if there was a culturally-appropriate way to collect personal information from their Aboriginal clients, such as information about mood and bowel movements. They also expressed uncertainty about cultural differences in behaviours (e.g., eye contact) and the impact of such behaviours on the assessment process.

Although questions about cultural appropriateness and awareness could be addressed by the CCACs through educational in-services, language was also a concern. Home care coordinators and providers often relied on family members and Aboriginal liaisons to translate RAI items and describe procedures. The desirability of using a trained interpreter has already been discussed and therefore it won't be repeated here. An argument can be made, however, for translation of the RAI into one or more

Aboriginal languages.

The 2006 census indicated that the Aboriginal language spoken by the most First Nations and Métis people was Cree, while Inuktitut was the most common Aboriginal language spoken by Inuit people (Statistics Canada, 2008a). Translation of the RAI into at least one of these languages could improve its utility for part of the Aboriginal population. An issue that would be raised with this translation, however, is a potential lack of people to administer the RAI in another language. This issue would also need to be addressed.

An interesting finding from the qualitative data was the finding that more home care coordinators and providers who worked for federally-funded agencies spoke an Aboriginal language, compared to those who worked for the provincially-funded CCACs. The federally-funded agencies do not use the RAI to assess their home care clients and instead use their own process. It is hypothesized that translation of the RAI into at least one Aboriginal language would make the RAI's utility more attractive to federally-funded agencies and increase its use with the Aboriginal population.

Underlying all of these implications is an even greater issue; the cross-cultural validity of the constructs underlying the items and the MDS summary scales is currently unknown. To date there have been no studies of the reliability or validity of the MDS summary scales in any Aboriginal population. In fact, this area is completely undeveloped even outside of the RAI research arena. For example, in the area of mental health, there are no published studies on the validity of assessment or diagnosis of depression in Aboriginal peoples. These large questions need to be addressed in order to validate information obtained from the RAI for Aboriginal peoples.

If the reliability and validity of RAI data were established for Aboriginal peoples, there would be a tremendous opportunity to direct culturally appropriate interventions for this population through the CAP's. For example, many coordinators indicated that inclusion of traditional foods such as bannock in meal support services could be a simple way to complement service with cultural awareness.

In summary, data from the present study support further refinements in the RAI-HC for the general home care population. The data also suggest that further validation of this tool is needed for the Aboriginal population, particularly for the MDS summary scales. Development of an Aboriginal-specific RAI tool, in one or more Aboriginal languages, could direct culturally-appropriate care and interventions for this population.

Research Limitations

Despite the contribution to knowledge about Aboriginal health, there are several limitations to the current study. The most significant limitation is inherent in all cross-cultural research and is related to the artificiality of assigning people to ancestry categories. Grouping all clients into two dichotomous categories (Aboriginal and non-Aboriginal) ignores the significant variations inherent in both groups. Waldram and colleagues (2006) wondered if it is appropriate to cluster all Aboriginal people into one category, and whether these groups equivalently "Aboriginal" for purposes of analysis? Contemporary ethnographers view culture as a dynamic entity with great variation among individuals within a cultural group (Kirmayer et al., 2003). For example, there is constant flux in knowledge, attitudes, and beliefs within and external to a particular culture (Kirmayer et al., 2003). Due to this heterogeneity within cultural groups, combining all Aboriginal peoples together into one "Aboriginal" category is problematic (Waldram et al., 2006).

Another limitation to this study is that the quantitative data were collected only for Aboriginals accessing services through CCACs. Previous research has indicated that the large majority of clients who receive home care lived in an urban setting (Alcock et al., 1998), thus it is reasonable to hypothesize that the Aboriginals reported on in this study were urban-dwelling. This hypothesis implies that data for Aboriginals who live too far from an urban centre to easily access home care services through a CCAC (e.g., in an isolated community or reserve) were not captured in this database. As previous research has indicated that the health status of reserve-dwelling Aboriginals is poorer than urban-dwelling Aboriginals, this study likely did not include the Aboriginal people with poorest health status and in greatest need of home care services.

The qualitative data from the present study suggested that the quality of RAI data collected for Aboriginal people may be questionable. Language and cultural expectations on the part of the RAI assessor and Aboriginal client likely contributed to a lower quality of collected data.

As the data for the quantitative study were from clients assessed for home care, these results are generalizable only to the home care population and are not representative of the Aboriginal or non-Aboriginal population as a whole. The cross-sectional nature of this data limits the ability to make causal inferences. Additionally, these data are from the first assessment and therefore the effects of home care services on the outcomes of interest are unknown.

In summary, findings from the present study support the recognition of individual demographic as well as CCAC factors as contributors to disease prevalence within the home care population. The present study's findings indicated that apart from social and economic variables, ancestry was not predictive of mental status or depression; ancestry was predictive of pain scores. Although the proportion of variance explained by CCAC factors was modest, Cañizares and colleagues (2008) suggested many strategies that address the social and economic determinants of health may be most easily addressed at the regional level. Further validation of the RAI-HC and development of an Aboriginal RAI tool would increase the utility of the RAI with Aboriginal clients and provide a higher quality of data with which to direct policy and funding.

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Appendix A

Description of home care clients with unknown ancestry

(Tables A1 – A17)

Table A1

Marital status and primary language of home care clients with unknown ancestry by sex and age group

Demographic Characteristic	Male			Female		
	<65	65-74	75+	<65	65-74	75+
	(*n* = 320)	(*n* = 468)	(*n* = 1,910)	(*n* = 249)	(*n* = 471)	(*n* = 3,445)
Marital Status						
Never married	132 (41.25%)	72 (15.38%)	151 (7.91%)	75 (30.12%)	37 (7.86%)	170 (4.93%)
Married	84 (26.25%)	233 (49.79%)	982 (51.41%)	70 (28.11%)	168 (35.67%)	577 (16.75%)
Widowed	12 (3.75%)	59 (12.61%)	635 (33.25%)	23 (9.24%)	195 (41.40%)	2,571 (74.63%)
Separated	25 (7.81%)	39 (8.33%)	49 (2.57%)	26 (10.44%)	22 (4.67%)	28 (0.81%)
Divorced	59 (18.44%)	58 (12.39%)	78 (4.08%)	49 (19.68%)	45 (9.55%)	92 (2.67%)
Other	8 (2.50%)	7 (1.50%)	15 (0.79%)	6 (2.41%)	4 (0.85%)	7 (0.20%)
Unknown	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Primary Language						
English	288 (90.00%)	396 (84.62%)	1,591 (83.30%)	225 (90.36%)	401 (85.14%)	2,908 (84.41%)
French	6 (1.88%)	20 (4.27%)	49 (2.57%)	7 (2.81%)	8 (1.70%)	100 (2.90%)
Other	26 (8.12%)	52 (11.11%)	270 (14.13%)	17 (6.83%)	62 (13.16%)	437 (12.69%)
Unknown	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table A2

Living situation at time of referral for home care clients of unknown ancestry by sex and age group

Living situation	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
	(*n* = 320)		(*n* = 468)		(*n* = 1,910)		(*n* = 249)		(*n* = 471)		(*n* = 3,445)	
Location												
Private home/apartment, no HC	190	(59.38%)	281	(60.04%)	1,157	(60.58%)	134	(53.82%)	279	(59.24%)	1,730	(50.22%)
Private home/apartment, HC	42	(13.13%)	108	(23.08%)	481	(25.18%)	52	(20.88%)	121	(25.69%)	1,006	(29.20%)
Assisted living/group home	34	(10.63%)	24	(5.13%)	117	(6.13%)	25	(10.04%)	15	(3.18%)	380	(11.03%)
Nursing home	18	(5.63%)	28	(5.98%)	76	(3.98%)	15	(6.02%)	27	(5.73%)	199	(5.78%)
Other	36	(11.25%)	27	(5.77%)	79	(4.14%)	23	(9.24%)	29	(6.16%)	130	(3.77%)
Missing	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Who lived with												
Alone	98	(30.63%)	142	(30.34%)	550	(28.80%)	64	(25.70%)	169	(35.88%)	1,578	(45.81%)
Spouse only	47	(14.69%)	175	(37.39%)	777	(40.68%)	54	(21.69%)	128	(27.18%)	459	(13.32%)
Spouse and others	24	(7.50%)	32	(6.84%)	82	(4.29%)	18	(7.23%)	17	(3.61%)	68	(1.97%)
Child (not spouse)	8	(2.50%)	19	(4.06%)	165	(8.64%)	19	(7.63%)	69	(14.65%)	575	(16.69%)
Other(s)	69	(21.56%)	31	(6.62%)	138	(7.23%)	54	(21.69%)	32	(6.79%)	252	(7.31%)
Group setting	74	(23.13%)	69	(14.74%)	198	(10.37%)	40	(16.06%)	56	(11.89%)	513	(14.89%)
Missing	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)

Table A3

Reasons for referral and goals of care for home care clients of unknown ancestry by sex and age group

Item	Male			Female		
	<65 (*n* = 320)	65-74 (*n* = 468)	75+ (*n* = 1,910)	<65 (*n* = 249)	65-74 (*n* = 471)	75+ (*n* = 3,445)
Reason for referral						
Post-hospital care	20 (6.25%)	46 (9.83%)	152 (7.96%)	23 (9.24%)	49 (10.40%)	293 (8.51%)
Community chronic care	250 (78.13%)	336 (71.79%)	8 (0.42%)	2 (0.80%)	2 (0.42%)	13 (0.38%)
Home placement screen	46 (14.38%)	74 (15.81%)	1,412 (73.93%)	175 (70.28%)	326 (69.21%)	2,487 (72.19%)
Eligibility for home care	1 (0.31%)	1 (0.21%)	276 (14.45%)	45 (18.07%)	86 (18.26%)	564 (16.37%)
Day care	3 (0.94%)	11 (2.35%)	1 (0.05%)	4 (1.61%)	1 (0.21%)	2 (0.06%)
Other	0 (0%)	0 (0%)	61 (3.19%)	0 (0.00%)	7 (1.49%)	86 (2.50%)
Goal of care						
Skilled nursing treatments	95 (29.69%)	121 (25.85%)	497 (26.02%)	59 (23.69%)	140 (29.72%)	895 (25.98%)
Monitoring to avoid clinical Complications	121 (37.81%)	158 (33.76%)	689 (36.07%)	92 (36.95%)	180 (38.22%)	1,246 (36.17%)
Rehabilitation	67 (20.94%)	93 (19.87%)	402 (21.05%)	47 (18.88%)	99 (21.02%)	787 (22.84%)
Client/family education	52 (16.25%)	94 (20.09%)	333 (17.43%)	45 (18.07%)	102 (21.66%)	649 (18.84%)
Family respite	23 (7.19%)	52 (11.11%)	227 (11.88%)	19 (7.63%)	38 (8.07%)	316 (9.17%)
Palliative care	6 (1.88%)	13 (2.78%)	32 (1.68%)	11 (4.42%)	11 (2.34%)	61 (1.77%)

Table A4

Educational attainment of home care clients with unknown ancestry by sex and age group

Educational attainment	Male						Female					
	<65 (*n* = 320)		65-74 (*n* = 468)		75+ (*n* = 1,910)		<65 (*n* = 249)		65-74 (*n* = 471)		75+ (*n* = 3,445)	
Missing	320	(100%)	468	(100%)	1,910	(100%)	249	(100%)	471	(100%)	3,445	(100%)

Table A5

Environmental hazards present in the homes of home care clients with unknown ancestry by sex and age group

Environmental hazard	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
	(*n* = 320)		(*n* = 468)		(*n* = 1,910)		(*n* = 249)		(*n* = 471)		(*n* = 3,445)	
Lighting in evening	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Flooring and carpeting	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Bathroom	3	(0.94%)	2	(0.43%)	15	(0.79%)	2	(0.80%)	4	(0.85%)	18	(0.52%)
Kitchen	3	(0.94%)	3	(0.64%)	13	(0.68%)	3	(1.20%)	5	(1.06%)	25	(0.73%)
Heating and cooling	2	(0.63%)	2	(0.43%)	7	(0.37%)	2	(0.80%)	2	(0.42%)	5	(0.15%)
Personal safety	5	(1.56%)	3	(0.64%)	22	(1.15%)	2	(0.80%)	5	(1.06%)	28	(0.81%)
Access to home	17	(5.31%)	29	(6.20%)	130	(6.81%)	26	(10.44%)	52	(11.04%)	224	(6.50%)
Access to rooms in home	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
None of above	295	(92.19%)	433	(92.52%)	1,741	(91.15%)	220	(88.35%)	411	(87.26%)	3,183	(92.39%)

Table A6

Preventive health measures taken in the last two years for home care clients of unknown ancestry by sex and age group

Preventive health measure	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
	(*n* = 320)		(*n* = 468)		(*n* = 1,910)		(*n* = 249)		(*n* = 471)		(*n* = 3,445)	
Blood pressure measured	320	(100%)	468	(100%)	1,910	(100%)	249	(100%)	471	(100%)	3,445	(100%)
Received influenza vaccine	320	(100%)	468	(100%)	1,910	(100%)	249	(100%)	471	(100%)	3,445	(100%)
Test for blood in stool or endoscopy screening	320	(100%)	468	(100%)	1,910	(100%)	249	(100%)	471	(100%)	3,445	(100%)
Received breast exam/mammography	-	-	-	-	-	-	249	(100%)	471	(100%)	3,445	(100%)
None of above	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)

Table A7

Medication data for clients with unknown ancestry by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Medication Data	(*n* = 320)		(*n* = 468)		(*n* = 1,910)		(*n* = 249)		(*n* = 471)		(*n* = 3,445)	
Type of psychotropic medication												
Antipsychotic/neuroleptic	140	(43.75%)	159	(33.97%)	524	(27.43%)	92	(36.95%)	127	(26.96%)	773	(22.44%)
Anxiolytic	120	(37.50%)	168	(35.90%)	566	(29.63%)	107	(42.97%)	169	(35.88%)	1,074	(31.18%)
Antidepressant	120	(37.50%)	180	(38.46%)	463	(24.24%)	106	(42.57%)	166	(35.24%)	855	(24.82%)
Hypnotic	35	(10.94%)	67	(14.32%)	209	(10.94%)	31	(12.45%)	56	(11.98%)	375	(10.89%)
Lack of medical oversight*												
Compliance												
Always compliant	279	(87.19%)	425	(90.81%)	1,733	(90.73%)	222	(89.16%)	426	(90.45%)	3,146	(91.32%)
More than 80% of time	34	(10.63%)	36	(7.69%)	163	(8.53%)	23	(9.24%)	39	(8.28%)	253	(7.34%)
Less than 80% of time	6	(1.88%)	6	(1.28%)	14	(0.73%)	4	(1.61%)	6	(1.27%)	41	(1.19%)
No medications prescribed	1	(0.31%)	1	(0.21%)	0	(0%)	0	(0%)	0	(0%)	5	(0.15%)

*Note: This data was missing for all clients with unknown ancestry.

Table A8

Average (SD) days of service utilization in the last 7 days by home care clients of unknown ancestry by sex and age group

Service	Male			Female		
	<65 (*n* = 320)	65-74 (*n* = 468)	75+ (*n* = 1,910)	<65 (*n* = 249)	65-74 (*n* = 471)	75+ (*n* = 3,445)
Home health aides						
Visiting nurses						
Homemaking services						
Meals						
Volunteer services	This data was missing for all clients of unknown ancestry					
Physical therapy						
Occupational therapy						
Speech therapy						
Day care/hospital care						
Social worker						

Table A9

Health-related visits in the last 90 days for home care clients of unknown ancestry by sex and age group

Type of visit	Male			Female		
	<65 (*n* = 320)	65-74 (*n* = 468)	75+ (*n* = 1,910)	<65 (*n* = 249)	65-74 (*n* = 471)	75+ (*n* = 3,445)
Hospital admission	271 (84.69%)	411 (87.82%)	1,756 (91.94%)	216 (86.74%)	424 (90.02%)	3,166 (91.90%)
Emergency room visit	59 (18.44%)	77 (16.45%)	343 (17.96%)	52 (20.88%)	93 (19.74%)	640 (18.58%)
Emergent care*						

*Note: This data was missing for all clients with unknown ancestry.

Table A10

Proportion of clients with unknown ancestry who reported poor health status by sex and age group

	Male			Female		
Item	<65 (*n* = 320)	65-74 (*n* = 468)	75+ (*n* = 1,910)	<65 (*n* = 249)	65-74 (*n* = 471)	75+ (*n* = 3,445)
Client feels he/she has poor health	69 (21.56%)	123 (26.28%)	416 (21.78%)	66 (26.51%)	139 (29.51%)	802 (23.28%)

Table A11

Disease diagnoses for home care clients of unknown ancestry by sex and age group

Disease diagnosis	Male			Female		
	<65	65-74	75+	<65	65-74	75+
	(*n* = 320)	(*n* = 468)	(*n* = 1,910)	(*n* = 249)	(*n* = 471)	(*n* = 3,445)
Cerebrovascular accident	74 (23.15%)	187 (39.96%)	614 (32.15%)	52 (20.88%)	143 (30.36%)	959 (27.84%)
Congestive heart failure	29 (9.06%)	69 (14.74%)	384 (20.10%)	20 (8.03%)	74 (15.71%)	736 (21.36%)
Coronary artery disease	48 (15.00%)	125 (26.71%)	637 (33.35%)	35 (14.06%)	85 (18.05%)	1,002 (29.09%)
Hypertension	107 (33.44%)	214 (45.73%)	858 (44.92%)	83 (33.33%)	237 (50.32%)	1,956 (56.78%)
Irregularly irregular pulse	7 (2.19%)	52 (11.11%)	335 (17.54%)	10 (4.02%)	50 (10.62%)	568 (16.49%)
Peripheral vascular disease	27 (8.44%)	59 (12.61%)	180 (11.62%)	20 (8.03%)	33 (7.01%)	223 (6.47%)
Alzheimer's	7 (2.19%)	27 (5.77%)	222 (32.30%)	6 (2.41%)	39 (8.28%)	359 (10.42%)
Dementia (other than Alzheimer's)	36 (11.25%)	114 (24.36%)	617 (2.98%)	34 (13.65%)	94 (19.96%)	1,005 (29.17%)
Head trauma	30 (9.38%)	16 (3.42%)	57 (0.37%)	19 (7.63%)	7 (1.49%)	62 (1.80%)
Hemiplegia/hemiparesis	33 (10.31%)	68 (14.53%)	115 (6.02%)	29 (11.65%)	47 (9.98%)	197 (5.72%)
Multiple sclerosis	15 (4.69%)	2 (0.43%)	0 (0%)	13 (5.22%)	6 (1.27%)	5 (0.15%)
Parkinsonism	10 (3.13%)	44 (9.40%)	135 (7.07%)	7 (2.81%)	28 (5.94%)	112 (3.25%)
Arthritis	29 (9.06%)	89 (19.02%)	598 (31.31%)	57 (22.89%)	181 (38.43%)	1,530 (44.41%)
Hip fracture	9 (2.81%)	24 (5.13%)	148 (7.75%)	11 (4.42%)	34 (7.22%)	527 (15.30%)
Other fractures (e.g. wrist, vertebral)	25 (7.81%)	31 (6.62%)	137 (7.17%)	22 (8.84%)	50 (10.62%)	486 (14.11%)
Osteoporosis	9 (2.81%)	15 (3.21%)	116 (6.07%)	22 (8.84%)	75 (15.92%)	860 (24.96%)

Table A11 continued

Disease diagnosis	Male			Female		
	<65 (*n* = 320)	65-74 (*n* = 468)	75+ (*n* = 1,910)	<65 (*n* = 249)	65-74 (*n* = 471)	75+ (*n* = 3,445)
Cataract	10 (3.13%)	46 (9.83%)	248 (12.98%)	8 (3.21%)	62 (13.16%)	526 (15.27%)
Glaucoma	2 (0.63%)	13 (2.78%)	132 (6.91%)	4 (1.61%)	15 (3.18%)	284 (8.24%)
Psychiatric diagnosis	112 (35.00%)	108 (23.08%)	197 (10.31%)	105 (42.17%)	133 (28.24%)	477 (13.85%)
HIV infection	4 (1.25%)	0 (0%)	0 (0%)	1 (0.40%)	1 (0.21%)	1 (0.03%)
Pneumonia	27 (8.44%)	32 (6.84%)	205 (10.73%)	12 (4.82%)	28 (5.94%)	273 (7.92%)
Tuberculosis	2 (0.63%)	2 (0.43%)	8 (0.42%)	0 (0%)	1 (0.21%)	6 (0.17%)
Urinary tract infection	15 (4.69%)	56 (11.97%)	214 (11.20%)	33 (13.25%)	60 (12.74%)	620 (18.00%)
Cancer	26 (8.13%)	69 (14.74%)	330 (17.28%)	28 (11.24%)	72 (15.29%)	409 (11.87%)
Diabetes	98 (30.63%)	172 (36.75%)	503 (26.34%)	80 (32.13%)	145 (30.79%)	739 (21.45%)
Emphysema/COPD/asthma	47 (14.69%)	108 (23.08%)	438 (22.93%)	45 (18.07%)	103 (21.87%)	596 (17.30%)
Renal failure	23 (7.19%)	47 (10.04%)	208 (10.89%)	22 (8.84%)	47 (9.98%)	235 (6.82%)
Thyroid disease	12 (3.75%)	25 (5.34%)	177 (9.27%)	32 (12.85%)	101 (21.44%)	642 (18.64%)
Pressure ulcer	39 (12.19%)	80 (17.09%)	315 (16.49%)	34 (13.65%)	66 (14.01%)	502 (14.57%)
Stasis ulcer	14 (4.38%)	26 (5.56%)	38 (1.99%)	14 (5.62%)	17 (3.60%)	102 (2.96%)

Table A12

Client Assessment Protocols (CAPs) triggered by clients of unknown ancestry by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
CAP	(*n* = 320)	(*n* = 468)	(*n* = 1,910)	(*n* = 249)	(*n* = 471)	(*n* = 3,445)
ADL/Rehabilitation potential	218 (68.13%)	348 (74.36%)	1,489 (77.96%)	180 (72.29%)	364 (77.28%)	2,780 (80.70%)
IADLs	306 (95.63%)	462 (98.72%)	1,881 (98.48%)	237 (95.18%)	458 (97.24%)	3,387 (98.32%)
Health promotion	116 (36.25%)	161 (34.40%)	736 (38.53%)	108 (43.37%)	220 (46.71%)	1,508 (43.77%)
Institutional risk	121 (37.81%)	247 (52.78%)	1,136 (59.48%)	95 (38.15%)	236 (50.11%)	2,047 (59.42%)
Communication disorders	193 (60.31%)	310 (66.24%)	1,523 (79.74%)	139 (55.82%)	282 (59.87%)	2,565 (74.46%)
Visual function	82 (25.63%)	148 (13.89%)	690 (36.13%)	63 (25.30%)	138 (29.30%)	1,355 (39.33%)
Alcohol dependence/hazardous	46 (14.38%)	65 (5.56%)	81 (4.24%)	13 (5.22%)	25 (5.31%)	49 (1.42%)
Cognition	234 (73.13%)	368 (78.63%)	1,464 (76.65%)	169 (67.87%)	323 (68.58%)	2,537 (73.64%)
Behaviour	91 (28.44%)	130 (27.78%)	515 (26.96%)	56 (22.49%)	94 (19.96%)	694 (20.15%)
Depression and anxiety	106 (33.13%)	163 (34.83%)	505 (26.44%)	117 (46.99%)	194 (41.19%)	1,095 (31.79%)
Elder abuse	91 (28.44%)	137 (29.27%)	607 (31.78%)	70 (28.11%)	118 (25.05%)	963 (27.95%)
Social function	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Cardio-respiratory	56 (17.50%)	115 (24.57%)	601 (31.47%)	42 (16.87%)	126 (26.75%)	1,094 (31.76%)
Dehydration	20 (6.25%)	44 (9.40%)	176 (9.21%)	17 (6.83%)	47 (9.98%)	384 (11.15%)

Table A12 continued

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
CAP	(*n* = 320)	(*n* = 468)	(*n* = 1,910)	(*n* = 249)	(*n* = 471)	(*n* = 3,445)
Falls	181 (56.56%)	317 (67.74%)	1,464 (76.75%)	150 (60.24%)	320 (67.94%)	2,571 (74.63%)
Nutrition	80 (25.00%)	152 (32.48%)	697 (36.49%)	61 (24.50%)	159 (33.76%)	1,100 (31.93%)
Oral health	124 (38.75%)	249 (53.21%)	910 (47.64%)	96 (38.55%)	198 (42.04%)	1,469 (40.64%)
Pain	146 (45.63%)	235 (50.21%)	969 (50.73%)	155 (62.25%)	291 (61.78%)	2,198 (63.80%)
Pressure ulcers	175 (54.69%)	295 (63.03%)	1,177 (61.62%)	136 (54.62%)	266 (56.48%)	2,052 (59.56%)
Skin and foot conditions	131 (40.94%)	203 (43.38%)	951 (49.79%)	120 (48.19%)	210 (44.59%)	1,621 (47.05%)
Adherence	27 (8.44%)	39 (8.33%)	143 (7.49%)	17 (6.83%)	30 (6.37%)	250 (7.26%)
Brittle support system	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Medication management	154 (48.13%)	236 (50.43%)	1,055 (55.24%)	129 (51.81%)	250 (53.08%)	1,835 (53.27%)
Palliative care	11 (3.44%)	14 (2.99%)	40 (2.09%)	11 (4.42%)	14 (2.97%)	68 (1.97%)
Immunization and screening	320 (100.00%)	468 (100.00%)	1,910 (100.00%)	249 (100.00%)	471 (100.00%)	3,445 (100.00%)
Psychotropic drugs	222 (69.38%)	328 (70.09%)	1,114 (58.32%)	189 (75.90%)	303 (64.33%)	1,965 (57.04%)
Reduction in formal services	16 (5.00%)	12 (2.56%)	38 (1.99%)	7 (2.81%)	13 (2.76%)	52 (1.51%)
Environmental assessment	10 (3.13%)	7 (1.50%)	46 (2.41%)	5 (2.01%)	12 (2.55%)	52 (1.51%)
Bowel management	147 (45.94%)	251 (53.63%)	1,042 (54.55%)	104 (41.77%)	222 (47.13%)	1,696 (49.23%)
Urinary incontinence and catheter	160 (50.00%)	302 (64.53%)	1,295 (67.80%)	129 (51.81%)	304 (64.54%)	2,432 (70.60%)

Table A13

Cognitive Performance Scale (CPS) scores for home care clients of unknown ancestry by sex and age group

CPS Score	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
	(*n* = 320)		(*n* = 468)		(*n* = 1,910)		(*n* = 249)		(*n* = 471)		(*n* = 3,445)	
0 - Intact	57	17.81%	72	15.38%	307	16.07%	54	21.69%	102	21.66%	634	18.40%
1 – Borderline intact	59	18.44%	68	14.53%	246	12.88%	54	21.69%	95	20.17%	522	15.15%
2 – Mild impairment	29	9.06%	38	8.12%	232	12.15%	24	9.64%	50	10.62%	452	13.12%
3 – Moderate impairment	120	37.50%	179	38.25%	748	39.16%	71	28.51%	140	29.72%	1,265	36.72%
4 – Moderate/severe impairment	13	4.06%	35	7.48%	114	5.97%	7	2.81%	20	4.25%	128	3.72%
5 – Severe impairment	26	8.13%	52	11.11%	200	10.47%	19	7.63%	42	8.92%	316	9.17%
6 – Very severe impairment	16	5.00%	24	5.13%	63	3.30%	20	8.03%	22	4.67%	128	3.72%
Missing	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

Table A14

Activities of Daily Living (ADL) Hierarchy scores for home care clients of unknown ancestry by sex and age group

ADL Score	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
	(*n* = 320)		(*n* = 468)		(*n* = 1,910)		(*n* = 249)		(*n* = 471)		(*n* = 3,445)	
0 - Independent	53	16.56%	45	9.62%	163	8.53%	41	16.47%	52	11.04%	293	8.51%
1 – Supervision required	60	18.75%	61	13.03%	191	10.00%	40	16.06%	67	14.23%	360	10.45%
2 – Limited impairment	44	13.75%	78	16.67%	375	19.63%	45	18.07%	93	19.75%	732	21.25%
3 – Extensive assistance (I)	53	16.56%	75	16.03%	280	14.66%	28	11.24%	58	12.31%	460	13.35%
4 – Extensive assistance (II)	38	11.88%	87	18.59%	450	23.56%	33	13.25%	89	18.90%	811	23.54%
5 – Dependent	47	14.69%	90	19.23%	360	18.85%	37	14.86%	86	18.26%	649	18.84%
6 – Total dependence	25	7.81%	32	6.84%	91	4.76%	25	10.04%	26	5.52%	140	4.06%
Missing	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

Table A15

Depression Rating Scale (DRS) scores for home care clients of unknown ancestry by sex and age group

DRS Score	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
	(*n* = 320)		(*n* = 468)		(*n* = 1,910)		(*n* = 249)		(*n* = 471)		(*n* = 3,445)	
0	159	49.69%	228	48.72%	1,096	57.38%	104	41.77%	215	45.65%	1,832	53.18%
1	55	17.19%	77	16.45%	309	16.18%	20	11.24%	62	13.16%	518	15.04%
2	48	15.00%	79	16.88%	243	12.72%	35	14.06%	77	16.35%	473	13.73%
3	20	6.25%	28	5.98%	93	4.87%	19	7.63%	34	7.22%	191	5.54%
4	14	4.38%	25	5.34%	69	3.61%	34	13.65%	27	5.73%	178	5.17%
5	3	0.94%	9	1.92%	32	1.68%	4	1.61%	11	2.34%	74	2.15%
6	9	2.81%	8	1.71%	32	1.68%	10	4.02%	19	4.03%	76	2.21%
7	3	0.94%	2	0.43%	11	0.58%	2	0.80%	7	1.49%	36	1.04%
8	5	1.56%	9	1.92%	13	0.68%	1	0.40%	8	1.70%	35	1.02%
9	2	0.63%	1	0.21%	4	0.21%	5	2.01%	3	0.64%	10	0.29%
10	1	0.31%	1	0.21%	7	0.37%	2	0.80%	2	0.42%	9	0.26%
11	0	0%	1	0.21%	0	0%	0	0%	1	0.21%	4	0.12%
12	1	0.31%	0	0%	0	0%	4	1.61%	3	0.64%	6	0.17%
13	0	0%	0	0%	0	0%	0	0%	1	0.21%	1	0.03%
14	0	0%	0	0%	1	0.05%	1	0.40%	1	0.21%	2	0.06%
Missing	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

Table A16

Changes in Health, End-Stage Disease and Symptoms and Signs (CHESS) Scale scores for home care clients of unknown ancestry by sex and age group

CHESS Score	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
	(*n* = 320)		(*n* = 468)		(*n* = 1,910)		(*n* = 249)		(*n* = 471)		(*n* = 3,445)	
0 – No instability	91	28.44%	69	14.74%	141	7.38%	61	24.50%	63	13.38%	203	5.89%
1	65	20.31%	99	21.15%	417	21.83%	69	27.71%	125	26.54%	809	23.48%
2	98	30.63%	173	36.97%	792	41.47%	65	26.10%	159	33.76%	1,379	40.03%
3	49	15.31%	91	19.44%	386	20.21%	40	16.06%	91	19.32%	743	21.57%
4	15	4.69%	34	7.26%	163	8.53%	11	4.42%	32	6.79%	294	8.53%
5 – High instability	2	0.63%	2	0.43%	11	0.58%	3	1.20%	1	0.21%	17	0.49%
Missing	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

Table A17

Pain Scale scores for home care clients of unknown ancestry by sex and age group

Pain Score	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
	(*n* = 320)		(*n* = 468)		(*n* = 1,910)		(*n* = 249)		(*n* = 471)		(*n* = 3,445)	
0 – No pain	174	54.38%	233	49.79%	941	49.27%	94	37.75%	180	38.22%	1,247	36.21%
1 – Less than daily pain	35	10.94%	63	13.46%	310	16.23%	35	14.06%	56	11.89%	509	14.78%
2 – Daily pain, not severe	85	26.56%	140	29.91%	519	27.17%	85	34.14%	164	34.82%	1,296	37.63%
3 – Severe daily pain	26	8.13%	32	6.84%	140	7.33%	35	14.06%	71	15.07%	392	11.38%
Missing	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

Table 1

Data domains on the Minimum Data Set – Home Care (MDS-HC)

Data domain
Personal items
Referral items
Assessment information
Cognitive patterns
Communication/hearing patterns
Vision patterns
Mood and behaviour patterns
Social functioning
Informal support services
Physical functioning
Continence
Disease diagnoses
Health conditions and preventive health measures
Nutrition/hydration status
Dental status (oral health)
Skin condition
Environmental assessment
Service utilization
Medications

Table 2

List of Client Assessment Protocols (CAP's)

CAP
ADL/Rehabilitation potential
IADLs
Health promotion
Institutional risk
Communication disorders
Visual function
Alcohol dependence/hazardous
Cognition
Behaviour
Depression and anxiety
Elder abuse
Social function
Cardio-respiratory
Dehydration
Falls
Nutrition
Oral health
Pain
Pressure ulcers
Skin and foot conditions
Adherence
Brittle support system
Medication management

Table 2 continued

CAP
Palliative care
Immunization and screening
Psychotropic drugs
Reduction in formal services
Environmental assessment
Bowel management
Urinary incontinence and catheter

Table 3

Rates of diabetes mellitus in Aboriginal people by study and gender

Study	Male	Female	Total
OFNRHS	14.4%	15.1%	14.8%
APS	n.r.**	n.r.	6%
Martin & Yidegiligne, 1998	2.0%	2.6%	n.r.
Harris et al., 1997	24.2%*	28.0%*	26.1%*
Harris et al., 2002	n.r.	n.r.	22.7%
Delisle et al., 1995, sample 1	16.3%*	23.9%*	n.r.
Delisle et al., 1995, sample 2	23.9%*	48.6%*	n.r.
Orr et al., 1998	n.r.	n.r.	0.27%

**n.r. = not reported

*age-adjusted rate

Table 4

Marital status and primary language of Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Demographic Characteristic	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
Marital Status						
Never married	77 (33.48%)	18 (14.29%)	10 (6.85%)	88 (21.62%)	15 (7.35%)	13 (3.77%)
Married	95 (41.30%)	61 (48.41%)	67 (45.89%)	141 (34.64%)	75 (36.76%)	54 (15.65%)
Widowed	8 (3.48%)	23 (18.25%)	55 (37.67%)	53 (13.02%)	82 (40.20%)	251 (72.75%)
Separated	24 (10.43%)	12 (9.52%)	6 (4.11%)	46 (11.30%)	9 (4.41%)	9 (2.61%)
Divorced	21 (9.13%)	12 (9.52%)	8 (5.48%)	70 (17.20%)	21 (10.29%)	16 (4.64%)
Other	5 (2.17%)	0 (0.00%)	0 (0.00%)	9 (2.21%)	2 (0.98%)	2 (0.58%)
Unknown	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Primary Language						
English	220 (95.65%)	104 (82.54%)	111 (76.03%)	380 (93.37%)	185 (90.69%)	282 (81.74%)
French	6 (2.61%)	9 (7.14%)	9 (6.16%)	11 (2.70%)	8 (3.92%)	28 (8.12%)
Other	4 (1.74%)	13 (10.32%)	26 (17.81%)	16 (3.93%)	11 (5.39%)	35 (10.14%)
Unknown	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Translator needed	8 (3.48%)	15 (11.90%)	21 (14.38%)	15 (3.69%)	11 (5.39%)	32 (9.28%)

Table 5

Marital status and primary language of non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Demographic Characteristic	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
Marital Status												
Never married	2,603	(32.06%)	680	(8.99%)	1,055	(4.43%)	2,622	(20.60%)	723	(5.61%)	2,590	(4.33%)
Married	3,713	(45.74%)	4,951	(65.45%)	14,636	(61.41%)	5,774	(45.36%)	5,612	(43.55%)	12,749	(21.31%)
Widowed	255	(3.14%)	972	(12.85%)	7,098	(29.78%)	1,221	(9.59%)	4,921	(38.19%)	42,410	(70.88%)
Separated	459	(5.65%)	261	(3.45%)	373	(1.56%)	857	(6.73%)	365	(2.83%)	489	(0.82%)
Divorced	923	(11.37%)	626	(8.28%)	573	(2.40%)	1,994	(15.67%)	1,159	(8.99%)	1,427	(2.38%)
Other	165	(2.03%)	74	(0.98%)	99	(0.42%)	261	(2.05%)	106	(0.82%)	169	(0.28%)
Unknown	0	(0.00%)	0	(0.00%)	0	(0.00%)	0	(0.00%)	0	(0.00%)	0	(0.00%)
Primary Language												
English	7,340	(90.42%)	6,125	(80.98%)	18,981	(79.64%)	11,339	(89.08%)	10,342	(80.26%)	48,700	(81.39%)
French	225	(2.77%)	293	(3.87%)	708	(2.97%)	416	(3.27%)	430	(3.34%)	1,765	(2.95%)
Other	553	(6.81%)	1,146	(15.15%)	4,145	(17.39%)	974	(7.65%)	2,114	(16.40%)	9,369	(15.66%)
Unknown	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Translator needed	381	(4.69%)	639	(8.45%)	2,771	(11.63%)	597	(4.69%)	1,292	(10.03%)	6,663	(11.14%)

Table 6

Living situation at time of referral for Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Living situation	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
Location						
Private home/apartment, no HC	185 (80.43%)	101 (80.16%)	120 (82.19%)	341 (83.78%)	161 (78.92%)	264 (76.52%)
Private home/apartment, HC	18 (7.83%)	21 (16.67%)	19 (13.01%)	52 (12.78%)	38 (18.63%)	55 (15.94%)
Assisted living/group home	14 (6.09%)	1 (0.79%)	2 (1.37%)	8 (1.97%)	2 (0.98%)	16 (4.64%)
Nursing home	4 (1.74%)	1 (0.79%)	3 (2.05%)	3 (0.74%)	3 (1.47%)	8 (2.32%)
Other	9 (3.91%)	2 (1.59%)	2 (1.37%)	3 (0.74%)	0 (0%)	2 (0.58%)
Missing	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Who lived with						
Alone	69 (30.00%)	43 (34.13%)	49 (33.56%)	125 (30.71%)	78 (38.24%)	170 (49.28%)
Spouse only	59 (25.65%)	45 (35.71%)	49 (33.56%)	100 (24.57%)	67 (32.84%)	55 (15.94%)
Spouse and others	36 (15.65%)	15 (11.90%)	14 (9.59%)	55 (13.51%)	9 (4.41%)	9 (2.61%)
Child (not spouse)	6 (2.61%)	8 (6.35%)	20 (13.70%)	55 (13.51%)	35 (17.16%)	73 (21.16%)
Other(s)	43 (18.70%)	12 (9.52%)	8 (5.48%)	61 (14.99%)	11 (5.39%)	21 (6.09%)
Group setting	17 (7.39%)	3 (2.38%)	6 (4.11%)	11 (2.70%)	4 (1.96%)	17 (4.93%)
Missing	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 7

Living situation at time of referral for non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Living situation	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
Location												
Private home/apartment, no HC	6,532	(80.46%)	6,352	(83.98%)	19,100	(80.14%)	10,593	(83.22%)	10,691	(82.97%)	46,171	(77.17%)
Private home/apartment, HC	1,024	(12.61%)	844	(11.16%)	2,667	(11.19%)	1,617	(12.70%)	1,653	(12.83%)	7,194	(12.02%)
Assisted living/group home	372	(4.58%)	213	(2.82%)	1,339	(5.62%)	343	(2.69%)	295	(2.29%)	4,313	(7.21%)
Nursing home	113	(1.39%)	112	(1.48%)	588	(2.47%)	106	(0.83%)	191	(1.48%)	1,766	(2.95%)
Other	77	(0.95%)	43	(0.57%)	139	(0.58%)	70	(0.55%)	56	(0.43%)	389	(0.65%)
Missing	0	(0%)	0	(0%)	1	(0%)	0	(0%)	0	(0%)	1	(0%)
Who lived with												
Alone	1,923	(23.69%)	1,690	(22.34%)	5,794	(24.31%)	3,249	(25.52%)	4,630	(35.93%)	28,920	(48.33%)
Spouse only	2,270	(27.96%)	4,006	(52.96%)	11,943	(50.11%)	3,628	(28.50%)	4,727	(36.68%)	11,109	(18.57%)
Spouse and others	1,544	(19.02%)	915	(12.10%)	1,980	(8.31%)	2,398	(18.84%)	975	(7.57%)	1,936	(3.24%)
Child (not spouse)	246	(3.03%)	338	(4.47%)	1,895	(7.95%)	1,364	(10.72%)	1,677	(13.01%)	10,683	(17.85%)
Other(s)	1,704	(20.99%)	353	(4.67%)	1,048	(4.40%)	1,747	(13.72%)	553	(4.29%)	3,329	(5.56%)
Group setting	431	(5.31%)	262	(3.46%)	1,173	(4.92%)	343	(2.69%)	324	(2.51%)	3,857	(6.45%)
Missing	0	(0%)	0	(0%)	1	(0%)	0	(0%)	0	(0%)	0	(0%)

Table 8

Reasons for referral and goals of care for Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Item	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
Reason for referral						
Post-hospital care	104 (45.22%)	50 (39.68%)	44 (30.14%)	148 (36.36%)	81 (39.71%)	97 (28.12%)
Community chronic care	7 (3.04%)	2 (1.59%)	4 (2.74%)	13 (3.19%)	4 (1.96%)	12 (3.48%)
Home placement screen	8 (3.48%)	11 (8.73%)	20 (13.70%)	6 (1.47%)	8 (3.92%)	34 (9.86%)
Eligibility for home care	106 (46.09%)	61 (48.41%)	76 (52.05%)	229 (56.27%)	104 (50.98%)	195 (56.52%)
Day care	1 (0.43%)	0 (0%)	0 (0%)	2 (0.49%)	2 (0.98%)	0 (0%)
Other	4 (1.74%)	2 (1.59%)	2 (1.37%)	9 (2.21%)	5 (2.45%)	7 (2.03%)
Goal of care						
Skilled nursing treatments	136 (59.13%)	54 (42.86%)	61 (41.78%)	201 (49.39%)	78 (38.24%)	95 (27.54%)
Monitoring to avoid clinical Complications	140 (60.87%)	63 (50.00%)	64 (43.84%)	196 (48.16%)	96 (47.06%)	126 (36.52%)
Rehabilitation	78 (33.91%)	55 (43.65%)	50 (34.25%)	170 (41.77%)	75 (36.76%)	112 (32.46%)
Client/family education	123 (53.48%)	66 (52.38%)	74 (50.68%)	176 (43.24%)	81 (39.71%)	138 (40.00%)
Family respite	35 (15.22%)	21 (16.67%)	35 (23.97%)	48 (11.79%)	36 (17.65%)	65 (18.84%)
Palliative care	7 (3.04%)	4 (3.17%)	4 (2.74%)	10 (2.46%)	2 (0.98%)	4 (1.16%)

Table 9

Reasons for referral and goals of care for non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Item	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
Reason for referral												
Post-hospital care	3,315	(40.84%)	3,192	(42.20%)	7,952	(33.37%)	4,898	(38.48%)	4,989	(38.72%)	18,382	(30.72%)
Community chronic care	244	(3.01%)	181	(2.39%)	662	(2.78%)	418	(3.28%)	377	(2.93%)	1,928	(3.22%)
Home placement screen	222	(2.73%)	297	(3.93%)	1,909	(8.01%)	225	(1.77%)	379	(2.94%)	4,092	(6.84%)
Eligibility for home care	4,176	(51.44%)	3,706	(49.00%)	12,771	(53.59%)	6,969	(54.75%)	6,898	(53.53%)	34,264	(57.27%)
Day care	28	(0.34%)	58	(0.77%)	140	(0.59%)	24	(0.19%)	60	(0.47%)	235	(0.39%)
Other	133	(1.64%)	130	(1.72%)	399	(1.67%)	195	(1.53%)	183	(1.42%)	933	(1.56%)
Goal of care												
Skilled nursing treatments	4,257	(52.44%)	3,264	(43.15%)	7,431	(31.18%)	5,706	(44.83%)	4,524	(35.11%)	14,389	(24.05%)
Monitoring to avoid clinical complications	4,031	(49.66%)	3,380	(44.69%)	8,208	(34.44%)	5,679	(44.61%)	4,930	(38.26%)	17,627	(29.46%)
Rehabilitation	3,035	(37.39%)	2,814	(37.20%)	7,975	(33.46%)	5,116	(40.19%)	5,038	(39.10%)	20,614	(34.45%)
Client/family education	3,752	(46.22%)	3,356	(44.37%)	8,977	(37.67%)	5,554	(43.63%)	5,060	(39.27%)	19,728	(32.97%)
Family respite	1,535	(18.91%)	1,953	(25.82%)	6,582	(27.62%)	2,498	(19.62%)	2,840	(22.04%)	13,805	(23.07%)
Palliative care	302	(3.72%)	311	(4.11%)	464	(1.95%)	393	(3.09%)	317	(2.46%)	677	(1.13%)

Table 10

Educational attainment of Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Educational attainment	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
No schooling	2 (0.87%)	11 (8.73%)	12 (8.22%)	13 (3.19%)	15 (7.35%)	35 (10.14%)
Grade 8 or less	52 (22.61%)	60 (47.62%)	75 (51.37%)	98 (24.08%)	97 (47.55%)	156 (45.22%)
Grades 9-11	75 (32.61%)	29 (23.02%)	18 (12.33%)	112 (27.52%)	38 (18.63%)	61 (17.68%)
High school	34 (14.78%)	11 (8.73%)	10 (6.85%)	71 (17.44%)	14 (6.86%)	32 (9.28%)
Technical/trade school	13 (5.65%)	4 (3.17%)	6 (4.11%)	22 (5.41%)	9 (4.41%)	14 (4.06%)
Some university/college	25 (10.87%)	3 (2.38%)	4 (2.74%)	42 (10.32%)	8 (3.92%)	16 (4.64%)
Diploma/Bachelor's degree	10 (4.35%)	2 (1.59%)	6 (4.11%)	31 (7.62%)	7 (3.43%)	7 (2.03%)
Graduate degree	4 (1.74%)	0 (0.00%)	4 (2.74%)	3 (0.74%)	4 (1.96%)	3 (0.87%)
Missing	15 (6.52%)	6 (4.76%)	11 (7.53%)	15 (3.69%)	12 (5.88%)	21 (5.80%)

Table 11

Educational attainment of non-Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Educational attainment	(*n* = 8,118)	(*n* = 7,564)	(*n* = 23,834)	(*n* = 12,729)	(*n* = 12,886)	(*n* = 59,834)
No schooling	198 (2.44%)	138 (1.82%)	406 (1.70%)	233 (1.83%)	364 (2.82%)	1,565 (2.62%)
Grade 8 or less	1,080 (13.30%)	2,012 (26.60%)	7,254 (30.44%)	1,544 (12.13%)	3,388 (26.29%)	17,851 (29.83%)
Grades 9-11	1,477 (18.19%)	1,284 (16.98%)	3,813 (16.00%)	2,250 (17.68%)	2,659 (20.63%)	11,540 (19.29%)
High school	1,749 (21.54%)	1,213 (16.04%)	3,766 (15.80%)	3,072 (24.13%)	2,622 (20.35%)	11,845 (19.80%)
Technical/trade school	811 (9.99%)	833 (11.01%)	2,422 (10.16%)	818 (6.43%)	743 (5.77%)	4,045 (6.76%)
Some university/college	1,052 (12.96%)	532 (7.03%)	1,539 (6.46%)	1,970 (15.48%)	986 (7.65%)	3,829 (6.40%)
Diploma/Bachelor's degree	716 (8.82%)	490 (6.48%)	1,551 (6.51%)	1,496 (11.75%)	769 (5.97%)	2,981 (4.98%)
Graduate degree	288 (3.55%)	302 (3.99%)	919 (3.86%)	279 (2.19%)	171 (1.33%)	607 (1.01%)
Missing	746 (9.18%)	760 (10.03%)	2,164 (9.08%)	1,067 (8.37%)	1,184 (9.18%)	5,571 (9.29%)

Table 12

Environmental hazards present in the homes of Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Environmental hazard	(*n* = 230)		(*n* = 126)		(*n* = 146)		(*n* = 407)		(*n* = 204)		(*n* = 345)	
Lighting in evening	2	(0.87%)	1	(0.79%)	2	(1.37%)	6	(1.47%)	1	(0.49%)	0	(0%)
Flooring and carpeting	7	(3.04%)	5	(3.97%)	12	(8.22%)	21	(5.16%)	8	(3.92%)	16	(4.64%)
Bathroom	10	(4.35%)	5	(3.97%)	4	(2.74%)	17	(4.18%)	4	(1.96%)	8	(2.32%)
Kitchen	1	(0.43%)	3	(2.38%)	3	(2.05%)	5	(1.23%)	1	(0.49%)	0	(0%)
Heating and cooling	1	(0.43%)	1	(0.79%)	4	(2.74%)	4	(0.98%)	0	(0%)	2	(0.58%)
Personal safety	8	(3.48%)	1	(0.79%)	0	(0%)	8	(1.97%)	1	(0.49%)	2	(0.58%)
Access to home	23	(10.00%)	14	(11.11%)	11	(7.53%)	48	(11.79%)	15	(7.35%)	36	(10.43%)
Access to rooms in home	11	(4.78%)	6	(4.76%)	5	(3.42%)	31	(7.62%)	12	(5.88%)	20	(5.80%)
None of above	185	(80.43%)	99	(78.57%)	123	(84.25%)	313	(76.90%)	167	(81.86%)	288	(83.48%)

Table 13

Environmental hazards present in the homes of non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Environmental hazard	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
Lighting in evening	53	(0.65%)	30	(0.40%)	96	(0.40%)	64	(0.50%)	50	(0.39%)	162	(0.27%)
Flooring and carpeting	220	(2.71%)	239	(3.16%)	757	(3.18%)	361	(2.84%)	409	(3.17%)	1994	(3.33%)
Bathroom and toiletroom	211	(2.60%)	178	(2.35%)	569	(2.39%)	256	(2.01%)	255	(1.98%)	960	(1.60%)
Kitchen	47	(0.58%)	43	(0.57%)	107	(0.45%)	55	(0.43%)	52	(0.40%)	208	(0.35%)
Heating and cooling	55	(0.68%)	32	(0.42%)	91	(0.38%)	72	(0.57%)	35	(0.27%)	137	(0.23%)
Personal safety	97	(1.19%)	77	(1.02%)	193	(0.81%)	154	(1.21%)	88	(0.68%)	442	(0.74%)
Access to home	607	(7.48%)	500	(6.61%)	1357	(5.69%)	948	(7.45%)	802	(6.22%)	3215	(5.37%)
Access to rooms in home	508	(6.26%)	404	(5.34%)	1191	(5.00%)	817	(6.42%)	775	(6.01%)	2919	(4.88%)
None of above	6,856	(84.45%)	6464	(85.46%)	20532	(86.15%)	10,693	(84.01%)	10993	(85.31%)	51907	(86.75%)

Table 14

Preventive health measures taken in the last two years for Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Preventive health measure	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
Blood pressure measured	223 (96.96%)	125 (99.21%)	142 (97.26%)	399 (98.03%)	201 (98.53%)	335 (97.10%)
Received influenza vaccine	148 (64.35%)	100 (79.37%)	108 (73.97%)	282 (69.29%)	166 (81.37%)	267 (77.39%)
Test for blood in stool or endoscopy screening	46 (20.00%)	33 (26.19%)	33 (22.60%)	91 (22.36%)	49 (24.02%)	53 (15.36%)
Received breast exam/mammography	- -	- -	- -	173 (42.51%)	77 (37.75%)	82 (23.77%)
None of above	4 (1.74%)	0 (0%)	3 (2.05%)	5 (1.23%)	3 (1.47%)	4 (1.16%)

Table 15

Preventive health measures taken in the last two years for non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Preventive health measure	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
Blood pressure measured	7,701	(94.86%)	7,359	(97.29%)	23,219	(97.42%)	12,243	(96.18%)	12,635	(98.05%)	58,489	(97.75%)
Received influenza vaccine	4,786	(58.96%)	5,732	(75.78%)	19,573	(82.12%)	7,982	(62.71%)	9,911	(76.91%)	48,167	(80.50%)
Test for blood in stool or endoscopy screening	1,554	(19.14%)	1,702	(22.50%)	4,289	(18.00%)	2,342	(18.40%)	2,657	(20.62%)	9,098	(15.21%)
Received breast exam/mammography	-	-	-	-	-	-	5,551	(43.61%)	5,086	(39.47%)	13,604	(22.74%)
None of above	296	(3.65%)	136	(1.80%)	352	(1.48%)	285	(2.24%)	151	(1.17%)	794	(1.33%)

Table 16

Medication data for Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Medication Data	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
Type of psychotropic medication						
Antipsychotic/neuroleptic	20 (8.70%)	10 (7.94%)	12 (8.22%)	41 (10.07%)	18 (8.82%)	28 (8.12%)
Anxiolytic	40 (17.39%)	13 (10.32%)	16 (10.96%)	119 (29.24%)	50 (24.54%)	55 (15.94%)
Antidepressant	50 (21.74%)	32 (25.40%)	21 (14.38%)	165 (40.54%)	68 (33.33%)	62 (17.97%)
Hypnotic	26 (11.30%)	19 (15.08%)	18 (12.33%)	69 (16.95%)	27 (13.24%)	29 (8.41%)
Lack of medical oversight	11 (4.78%)	5 (3.97%)	4 (2.74%)	15 (3.69%)	7 (3.43%)	16 (4.64%)
Compliance						
Always compliant	199 (86.52%)	104 (82.54%)	124 (84.93%)	363 (89.19%)	172 (84.31%)	296 (85.80%)
More than 80% of time	20 (8.70%)	17 (13.49%)	16 (10.96%)	32 (7.86%)	29 (14.22%)	36 (10.43%)
Less than 80% of time	8 (3.48%)	4 (3.17%)	5 (3.42%)	8 (1.97%)	1 (0.49%)	8 (2.32%)
No medications prescribed	3 (1.30%)	1 (0.79%)	1 (0.68%)	4 (0.98%)	2 (0.98%)	5 (1.45%)

Table 17

Medication data for non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Medication data	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
Type of psychotropic medication												
Antipsychotic/neuroleptic	842	(10.37%)	699	(9.24%)	1,863	(7.82%)	1,359	(10.68%)	1,182	(9.17%)	3,998	(6.68%)
Anxiolytic	1,405	(17.31%)	1,164	(15.39%)	2,880	(12.09%)	2,983	(23.44%)	2,698	(20.94%)	10,139	(16.95%)
Antidepressant	1,948	(24.00%)	1,736	(22.95%)	3,943	(16.55%)	4,502	(35.37%)	3,557	(27.60%)	11,451	(19.14%)
Hypnotic	808	(9.95%)	713	(9.43%)	1,864	(7.82%)	1,490	(11.71%)	1,460	(11.33%)	5,477	(9.15%)
Missing	0	(0%)	0	(0%)	3	(??)	1	(<0.01%)	0	(0%)	0	(0%)
Lack of medical oversight	346	(4.26%)	262	(3.46%)	853	(3.58%)	507	(3.98%)	437	(3.39%)	2,323	(3.88%)
Compliance												
Always compliant	7,221	(88.95%)	6,846	(90.52%)	21,587	(90.58%)	11,499	(90.34%)	11,731	(91.04%)	54,134	(90.48%)
More than 80% of time	576	(7.10%)	520	(6.88%)	1,637	(6.87%)	914	(7.18%)	891	(6.91%)	4,220	(7.05%)
Less than 80% of time	148	(1.82%)	125	(1.65%)	391	(1.64%)	150	(1.18%)	179	(1.39%)	1,020	(1.70%)
No medications prescribed	173	(2.13%)	72	(0.95%)	216	(0.91%)	165	(1.30%)	85	(0.66%)	456	(0.76%)
Missing	0	(0%)	1	(<0.01%)	0	(0%)	0	(0%)	0	(0%)	4	(??)

Table 18

Average (SD) days of service utilization in the last 7 days by Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Service	(*n* = 230)		(*n* = 126)		(*n* = 146)		(*n* = 407)		(*n* = 204)		(*n* = 345)	
Home health aides	1.38	(2.42)	1.38	(2.28)	1.86	(2.56)	1.36	(2.18)	1.67	(2.11)	1.74	(2.29)
Visiting nurses	1.99	(2.45)	1.48	(2.20)	1.10	(1.82)	1.48	(2.34)	0.87	(1.75)	0.80	(1.72)
Homemaking services	0.92	(2.03)	0.94	(2.03)	1.19	(2.08)	0.83	(1.75)	0.80	(1.54)	0.98	(1.79)
Meals	0.45	(1.65)	0.69	(1.91)	0.71	(1.88)	0.40	(1.53)	0.46	(1.55)	0.91	(2.22)
Volunteer services	0.02	(0.22)	0.10	(0.63)	0.04	(0.26)	0.05	(0.30)	0.06	(0.36)	0.04	(0.23)
Physical therapy	0.10	(0.40)	0.16	(0.46)	0.08	(0.34)	0.09	(0.36)	0.07	(0.31)	0.09	(0.46)
Occupational therapy	0.09	(0.29)	0.10	(0.29)	0.03	(0.16)	0.07	(0.25)	0.07	(0.25)	0.05	(0.22)
Speech therapy	0.01	(0.07)	0.01	(0.09)	0	(0)	0.01	(0.07)	0.01	(0.07)	0	(0)
Day care/hospital care	0.14	(0.77)	0.13	(0.61)	0.06	(0.34)	0.09	(0.51)	0.03	(0.20)	0.06	(0.40)
Social worker	0.09	(0.35)	0.02	(0.13)	0.02	(0.14)	0.07	(0.35)	0.02	(0.16)	0.01	(0.12)

Table 19

Average (SD) days of service utilization in the last 7 days by non-Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Service	(*n* = 8,118)	(*n* = 7,564)	(*n* = 23,834)	(*n* = 12,729)	(*n* = 12,886)	(*n* = 59,834)
Home health aides	1.56 (2.44)	1.44 (2.16)	1.69 (2.28)	1.65 (2.26)	1.63 (2.08)	2.01 (2.31)
Visiting nurses	1.61 (2.37)	1.22 (2.10)	0.97 (2.01)	1.19 (2.09)	0.88 (1.86)	0.84 (1.98)
Homemaking services	0.74 (1.76)	0.67 (1.54)	0.94 (1.77)	0.86 (1.71)	0.84 (1.59)	1.15 (1.87)
Meals	0.53 (1.79)	0.49 (1.70)	0.97 (2.31)	0.41 (1.56)	0.48 (1.67)	1.22 (2.53)
Volunteer services	0.05 (0.42)	0.03 (0.28)	0.03 (0.29)	0.04 (0.38)	0.04 (0.33)	0.04 (0.36)
Physical therapy	0.16 (0.58)	0.14 (0.48)	0.11 (0.44)	0.17 (0.56)	0.16 (0.54)	0.11 (0.45)
Occupational therapy	0.12 (0.38)	0.10 (0.33)	0.08 (0.30)	0.12 (0.38)	0.08 (0.30)	0.06 (0.26)
Speech therapy	0.01 (0.15)	0.01 (0.13)	0.01 (0.08)	0.01 (0.11)	0.01 (0.07)	0.01 (0.08)
Day care/hospital care	0.14 (0.71)	0.10 (0.52)	0.08 (0.45)	0.10 (0.57)	0.08 (0.45)	0.06 (0.39)
Social worker	0.05 (0.29)	0.02 (0.22)	0.01 (0.12)	0.05 (0.28)	0.02 (0.13)	0.01 (0.12)

Table 20

Health-related visits in the last 90 days for Aboriginal clients by sex and age group

	Male			Female		
Type of visit	<65 (*n* = 230)	65-74 (*n* = 126)	75+ (*n* = 146)	<65 (*n* = 407)	65-74 (*n* = 204)	75+ (*n* = 345)
Hospital admission	72 (31.30%)	50 (39.68%)	45 (30.82%)	134 (32.92%)	67 (32.84%)	83 (24.06%)
Emergency room visit	43 (18.70%)	23 (18.25%)	50 (34.25%)	116 (28.50%)	42 (20.59%)	58 (16.81%)
Emergent care	25 (10.87%)	7 (5.56%)	16 (10.96%)	54 (13.27%)	14 (6.86%)	29 (8.41%)

Table 21

Health-related visits in the last 90 days for non-Aboriginal clients by sex and age group

	Male						Female					
Type of visit	<65		65-74		75+		<65		65-74		75+	
	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
Hospital admission	2,635	(32.46%)	2,652	(35.06%)	6,897	(28.94%)	3,632	(28.53%)	3,857	(29.93%)	13,505	(22.57%)
Emergency room visit	1,544	(19.02%)	1,419	(18.76%)	4,164	(17.47%)	2,558	(20.10%)	2,218	(17.21%)	9,635	(16.10%)
Emergent care	652	(8.03%)	585	(7.73%)	1,677	(7.04%)	1,149	(9.03%)	946	(7.34%)	3,930	(6.57%)

Table 22

Proportion of clients who reported poor health status by ancestry, sex, and age group

	Male			Female		
Ancestry	<65	65-74	75+	<65	65-74	75+
Aboriginal	58 (25.22%)	30 (23.81%)	30 (20.55%)	164 (40.29%)	66 (32.35%)	52 (15.07%)
Non-Aboriginal	2,000 (24.64%)	1,958 (25.89%)	4,775 (20.04%)	3,951 (31.04%)	3,773 (29.28%)	11,653 (19.48%)

Table 23

Disease diagnoses for Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Disease diagnosis	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
Cerebrovascular accident	27 (11.74%)	43 (34.13%)	42 (28.77%)	49 (12.04%)	43 (21.08%)	74 (21.45%)
Congestive heart failure	22 (9.57%)	20 (15.87%)	34 (23.29%)	35 (8.60%)	29 (14.22%)	66 (19.13%)
Coronary artery disease	53 (23.04%)	49 (38.89%)	51 (34.93%)	77 (18.92%)	70 (34.31%)	101 (29.28%)
Hypertension	89 (38.70%)	70 (55.56%)	68 (46.58%)	176 (43.24%)	110 (53.92%)	199 (57.68%)
Irregularly irregular pulse	12 (5.22%)	9 (7.14%)	17 (11.64%)	25 (6.14%)	19 (9.31%)	26 (7.54%)
Peripheral vascular disease	44 (19.13%)	30 (23.81%)	25 (17.12%)	54 (13.27%)	20 (9.80%)	38 (11.01%)
Alzheimer's	0 (0%)	12 (9.52%)	8 (5.48%)	2 (0.49%)	3 (1.47%)	24 (6.96%)
Dementia (other than Alzheimer's)	8 (3.48%)	13 (10.32%)	13 (8.90%)	7 (1.72%)	12 (5.88%)	43 (12.46%)
Head trauma	20 (8.70%)	4 (3.17%)	4 (2.74%)	9 (2.21%)	7 (3.43%)	6 (1.74%)
Hemiplegia/hemiparesis	26 (11.30%)	13 (10.32%)	6 (4.11%)	15 (3.69%)	9 (4.41%)	5 (1.45%)
Multiple sclerosis	3 (1.30%)	0 (0%)	0 (0%)	23 (5.65%)	0 (0%)	1 (0.29%)
Parkinsonism	1 (0.43%)	4 (3.17%)	8 (5.48%)	6 (1.47%)	8 (3.92%)	12 (3.48%)
Arthritis	63 (27.39%)	45 (35.71%)	74 (50.68%)	217 (53.32%)	131 (64.22%)	226 (65.51%)
Hip fracture	5 (2.17%)	7 (5.56%)	7 (4.79%)	11 (2.70%)	12 (5.88%)	26 (7.54%)

Table 23 continued

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Disease diagnosis	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
Other fractures (e.g. wrist, vertebral)	14 (6.09%)	5 (3.97%)	15 (10.27%)	33 (8.11%)	21 (10.29%)	36 (10.43%)
Osteoporosis	6 (2.61%)	5 (3.97%)	11 (7.53%)	58 (14.25%)	55 (26.96%)	88 (25.51%)
Cataract	16 (6.96%)	21 (16.67%)	42 (28.77%)	45 (11.06%)	45 (22.06%)	90 (26.09%)
Glaucoma	4 (1.74%)	4 (3.17%)	10 (6.85%)	17 (4.18%)	16 (7.84%)	32 (9.28%)
Psychiatric diagnosis	29 (12.61%)	10 (7.94%)	6 (4.11%)	98 (24.08%)	26 (12.75%)	20 (5.80%)
HIV infection	6 (2.61%)	0 (0%)	0 (0%)	1 (0.25%)	0 (0%)	0 (0%)
Pneumonia	4 (1.74%)	9 (7.14%)	6 (4.11%)	9 (2.21%)	7 (3.43%)	6 (1.74%)
Tuberculosis	0 (0%)	1 (0.79%)	0 (0%)	1 (0.25%)	2 (0.98%)	2 (0.58%)
Urinary tract infection	12 (5.22%)	4 (3.17%)	4 (2.74%)	21 (5.16%)	11 (5.39%)	15 (4.35%)
Cancer	21 (9.13%)	20 (15.87%)	32 (21.92%)	52 (12.78%)	27 (13.24%)	31 (8.99%)
Diabetes	91 (39.57%)	74 (58.73%)	46 (31.51%)	178 (43.73%)	101 (49.51%)	110 (31.88%)
Emphysema/COPD/asthma	31 (13.48%)	27 (21.43%)	43 (29.45%)	104 (25.55%)	64 (31.37%)	73 (21.16%)
Renal failure	19 (8.26%)	22 (17.46%)	9 (6.16%)	30 (7.37%)	19 (9.31%)	18 (5.22%)
Thyroid disease	11 (4.78%)	7 (5.56%)	14 (9.59%)	53 (13.02%)	40 (19.61%)	72 (20.87%)
Pressure ulcer	37 (16.09%)	10 (7.94%)	12 (8.22%)	33 (8.11%)	10 (4.90%)	14 (4.06%)
Stasis ulcer	37 (16.09%)	16 (12.70%)	10 (6.85%)	29 (7.13%)	13 (6.37%)	15 (4.35%)

Table 24

Disease diagnoses for non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Disease diagnosis	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
Cerebrovascular accident	1,021	(12.58%)	1,963	(25.95%)	5,844	(25.15%)	1,287	(10.11%)	2,341	(18.17%)	10,300	(17.21%)
Congestive heart failure	426	(5.25%)	949	(12.55%)	4,010	(17.26%)	628	(4.93%)	1,401	(10.87%)	9,244	(15.45%)
Coronary artery disease	1,104	(13.60%)	2,032	(26.86%)	7,226	(31.10%)	1,267	(9.95%)	2,813	(21.83%)	14,841	(24.80%)
Hypertension	2,320	(28.58%)	3,411	(45.10%)	10,946	(47.11%)	3,719	(29.22%)	6,765	(52.50%)	33,624	(56.20%)
Irregularly irregular pulse	314	(3.87%)	586	(7.75%)	2,897	(12.47%)	573	(4.50%)	1,020	(7.92%)	6,694	(11.19%)
Peripheral vascular disease	745	(9.18%)	977	(12.92%)	2,425	(10.44%)	773	(6.07%)	1,078	(8.37%)	4,071	(6.80%)
Alzheimer's	90	(1.11%)	420	(5.55%)	2,303	(9.91%)	144	(1.13%)	680	(5.28%)	4,774	(7.98%)
Dementia (other than Alzheimer's)	194	(2.39%)	683	(9.03%)	3,285	(14.14%)	198	(1.56%)	712	(5.53%)	6,756	(11.29%)
Head trauma	385	(4.74%)	125	(1.65%)	277	(1.19%)	353	(2.77%)	150	(1.16%)	406	(0.68%)
Hemiplegia/hemiparesis	578	(7.12%)	591	(7.81%)	820	(3.53%)	582	(4.57%)	517	(4.01%)	993	(1.66%)
Multiple sclerosis	419	(5.16%)	126	(1.67%)	59	(0.25%)	1,293	(10.16%)	301	(2.34%)	199	(0.33%)
Parkinsonism	157	(1.93%)	520	(6.87%)	1,585	(6.82%)	152	(1.19%)	501	(3.89%)	1,886	(3.15%)
Arthritis	1,628	(20.05%)	2,611	(34.52%)	10,159	(43.72%)	4,542	(35.68%)	7,049	(54.70%)	37,057	(61.93%)
Hip fracture	118	(1.45%)	188	(2.49%)	822	(3.54%)	209	(1.64%)	498	(3.86%)	3,720	(6.22%)

Table 24 continued

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
Disease diagnosis	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
Other fractures (e.g. wrist, vertebral)	532	(6.55%)	355	(4.69%)	1,136	(4.89%)	936	(7.35%)	1,128	(8.75%)	5,599	(9.36%)
Osteoporosis	315	(3.88%)	358	(4.73%)	1,508	(6.49%)	1,672	(13.14%)	2,957	(22.95%)	16,579	(27.71%)
Cataract	335	(4.13%)	907	(11.99%)	4,193	(18.05%)	837	(6.58%)	2,279	(17.69%)	13,610	(22.75%)
Glaucoma	176	(2.17%)	298	(3.94%)	1,762	(7.58%)	278	(2.18%)	687	(5.33%)	5,469	(9.14%)
Psychiatric diagnosis	1,021	(12.58%)	717	(9.48%)	1,457	(6.27%)	2,699	(21.20%)	1,810	(14.05%)	4,959	(8.29%)
HIV infection	76	(0.94%)	9	(0.12%)	4	(0.02%)	27	(0.21%)	2	(0.02%)	16	(0.03%)
Pneumonia	183	(2.25%)	237	(3.13%)	862	(3.71%)	252	(1.98%)	304	(2.36%)	1,294	(2.16%)
Tuberculosis	10	(0.12%)	12	(0.16%)	42	(0.18%)	14	(0.11%)	26	(0.20%)	83	(0.14%)
Urinary tract infection	250	(3.08%)	222	(2.93%)	714	(3.07%)	604	(4.75%)	563	(4.37%)	2,383	(3.98%)
Cancer	1,530	(18.85%)	1,667	(22.04%)	4,195	(18.06%)	2,452	(19.26%)	2,128	(16.51%)	5,953	(9.95%)
Diabetes	2,053	(25.29%)	2,614	(34.56%)	5,871	(25.27%)	2,608	(20.49%)	3,963	(30.75%)	11,409	(19.07%)
Emphysema/COPD/asthma	856	(10.54%)	1,397	(18.47%)	4,520	(19.45%)	2,211	(17.37%)	2,543	(19.73%)	8,599	(14.37%)
Renal failure	408	(5.03%)	532	(7.03%)	1,385	(5.96%)	456	(3.58%)	664	(5.15%)	1,766	(2.95%)
Thyroid disease	298	(3.67%)	387	(5.12%)	1,861	(8.01%)	1,486	(11.67%)	2,090	(16.22%)	10,601	(17.72%)
Pressure ulcer	718	(8.84%)	414	(5.47%)	985	(4.24%)	625	(4.91%)	433	(3.36%)	1,613	(2.70%)
Stasis ulcer	646	(7.96%)	519	(6.86%)	971	(4.18%)	481	(3.78%)	467	(3.62%)	1,454	(2.43%)

Table 25

Client Assessment Protocols (CAP's) triggered by Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
CAP	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
ADL/Rehabilitation potential	62 (26.96%)	46 (36.51%)	58 (39.73%)	116 (28.50%)	60 (29.41%)	99 (28.70%)
IADLs	142 (61.74%)	85 (67.46%)	120 (82.19%)	263 (64.62%)	136 (66.67%)	252 (73.04%)
Health promotion	150 (65.22%)	67 (53.17%)	75 (51.37%)	278 (68.30%)	136 (66.67%)	203 (58.84%)
Institutional risk	6 (2.61%)	12 (9.52%)	19 (13.01%)	31 (7.62%)	16 (7.84%)	46 (13.33%)
Communication disorders	76 (33.04%)	63 (50.00%)	89 (60.96%)	98 (24.08%)	68 (33.33%)	185 (53.62%)
Visual function	53 (23.04%)	46 (36.51%)	47 (32.19%)	147 (36.12%)	63 (30.88%)	115 (33.33%)
Alcohol dependence/hazardous	14 (6.09%)	7 (5.56%)	2 (1.37%)	8 (1.97%)	7 (3.43%)	5 (1.45%)
Cognition	75 (32.61%)	53 (42.06%)	80 (54.79%)	123 (30.22%)	65 (31.86%)	160 (46.28%)
Behaviour	13 (5.65%)	10 (7.94%)	13 (8.90%)	27 (6.63%)	12 (5.88%)	24 (6.96%)
Depression and anxiety	43 (18.70%)	27 (21.43%)	25 (17.12%)	141 (34.64%)	42 (20.59%)	69 (20.00%)
Elder abuse	4 (1.74%)	2 (1.59%)	3 (2.05%)	11 (2.70%)	2 (0.98%)	10 (2.90%)
Social function	48 (20.87%)	30 (23.81%)	31 (21.23%)	149 (36.61%)	37 (18.14%)	76 (22.03%)
Cardio-respiratory	59 (25.65%)	40 (31.75%)	55 (37.67%)	159 (39.07%)	76 (37.25%)	114 (33.04%)
Dehydration	13 (5.65%)	3 (2.38%)	4 (2.74%)	35 (8.60%)	6 (2.94%)	9 (2.61%)

Table 25 continued

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
CAP	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
Falls	89 (38.70%)	67 (53.17%)	68 (46.58%)	185 (45.45%)	88 (43.14%)	163 (47.25%)
Nutrition	42 (18.26%)	30 (23.81%)	41 (28.08%)	104 (25.55%)	40 (19.61%)	50 (14.49%)
Oral health	48 (20.87%)	26 (20.63%)	29 (19.86%)	79 (19.41%)	29 (14.22%)	57 (16.52%)
Pain	156 (67.83%)	87 (69.05%)	88 (60.27%)	336 (82.56%)	153 (75.00%)	239 (69.28%)
Pressure ulcers	96 (41.74%)	36 (28.57%)	45 (30.82%)	123 (30.22%)	53 (25.98%)	83 (24.06%)
Skin and foot conditions	86 (37.39%)	49 (38.89%)	61 (41.78%)	178 (43.73%)	74 (36.27%)	111 (32.17%)
Adherence	36 (15.65%)	12 (9.52%)	16 (10.96%)	40 (9.83%)	16 (7.84%)	25 (7.25%)
Brittle support system	51 (22.17%)	28 (22.22%)	25 (17.12%)	98 (24.08%)	38 (18.63%)	69 (20.00%)
Medication management	91 (39.57%)	59 (46.83%)	65 (44.52%)	216 (53.07%)	101 (49.51%)	149 (43.19%)
Palliative care	7 (3.04%)	2 (1.59%)	2 (1.37%)	9 (2.21%)	0 (0%)	1 (0.29%)
Immunization and screening	197 (85.65%)	98 (77.78%)	119 (81.51%)	345 (84.77%)	160 (78.43%)	299 (86.67%)
Psychotropic drugs	58 (25.22%)	35 (27.78%)	30 (20.55%)	194 (47.67%)	80 (39.22%)	100 (28.99%)
Reduction in formal services	21 (9.13%)	15 (11.90%)	24 (16.44%)	53 (13.02%)	31 (15.20%)	42 (12.17%)
Environmental assessment	24 (10.43%)	10 (7.94%)	15 (10.27%)	46 (11.30%)	14 (6.86%)	25 (7.25%)
Bowel management	42 (9.13%)	21 (16.67%)	30 (20.55%)	95 (23.34%)	39 (19.12%)	83 (24.06%)
Urinary incontinence and catheter	44 (10.43%)	20 (15.87%)	42 (28.77%)	135 (33.17%)	77 (37.75%)	167 (48.41%)

Table 26

Client Assessment Protocols (CAP's) triggered by non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
CAP	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
ADL/Rehabilitation potential	2,489	(30.66%)	2,825	(37.35%)	8,996	(37.74%)	4,135	32.48%	4,488	(34.83%)	19,783	(33.06%)
IADLs	5,566	(68.56%)	5,774	(76.34%)	19,204	(80.57%)	8,524	66.97%	9,206	(71.44%)	44,782	(74.84%)
Health promotion	4,633	(57.07%)	4,132	(54.63%)	12,220	(51.27%)	7,942	(62.39%)	8,386	(65.08%)	36,331	(60.72%)
Institutional risk	472	(5.81%)	831	(10.99%)	3,834	(16.09%)	1,099	(8.63%)	1,361	(10.56%)	9,733	(16.27%)
Communication disorders	2,374	(29.24%)	3,272	(43.26%)	15,004	(62.95%)	2,933	(23.04%)	3,742	(29.04%)	30,476	(50.93%)
Visual function	1,649	(20.31%)	1,857	(24.55%)	7,439	(31.21%)	2,913	(22.88%)	3,312	(25.70%)	19,783	(33.06%)
Alcohol dependence/hazardous	278	(3.42%)	257	(3.40%)	435	(1.83%)	117	(0.92%)	169	(1.31%)	312	(0.52%)
Cognition	2,527	(31.13%)	2,940	(38.87%)	12,041	(50.52%)	3,450	(27.10%)	3,731	(28.95%)	25,133	(42.00%)
Behaviour	602	(7.42%)	711	(9.40%)	2,460	(10.32%)	567	(4.45%)	636	(4.94%)	4,013	(6.71%)
Depression and anxiety	1,793	(22.09%)	1,618	(21.39%)	4,300	(18.04%)	3,885	(30.52%)	3,313	(25.71%)	11,079	(18.52%)
Elder abuse	136	(1.68%)	86	(1.14%)	207	(0.87%)	296	(2.33%)	145	(1.13%)	593	(0.99%)
Social function	1,786	(22.00%)	1,542	(20.39%)	4,693	(19.69%)	3,398	(26.69%)	3,092	(24.00%)	13,979	(23.36%)
Cardio-respiratory	1,829	(22.53%)	2,396	(31.68%)	8,321	(34.91%)	3,262	(25.63%)	4,245	(32.94%)	19,280	(32.22%)
Dehydration	402	(4.95%)	309	(4.09%)	907	(3.81%)	710	(5.58%)	539	(4.18%)	1,935	(3.23%)

Table 26 continued

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
CAP	(*n* = 8,118)	(*n* = 7,564)	(*n* = 23,834)	(*n* = 12,729)	(*n* = 12,886)	(*n* = 59,834)
Falls	3,177 (39.14%)	3,535 (46.73%)	12,403 (52.04%)	5,104 (40.10%)	5,367 (41.72%)	26,713 (44.65%)
Nutrition	2,137 (26.32%)	2,262 (29.90%)	5,970 (25.05%)	3,378 (26.54%)	3,042 (23.61%)	9,975 (16.67%)
Oral health	1,678 (20.67%)	1,471 (19.45%)	4,142 (17.38%)	2,420 (19.10%)	1,969 (15.28%)	8,455 (14.13%)
Pain	4,988 (61.44%)	4,459 (58.95%)	12,866 (53.98%)	9,172 (72.06%)	9,267 (71.92%)	40,336 (67.41%)
Pressure ulcers	2,728 (33.60%)	2,122 (28.05%)	5,388 (22.59%)	3,267 (25.67%)	2,577 (20.00%)	10,610 (17.73%)
Skin and foot conditions	2,627 (32.36%)	2,448 (32.36%)	7,970 (33.44%)	4,088 (32.12%)	3,829 (29.71%)	18,214 (30.44%)
Adherence	616 (7.59%)	524 (6.93%)	1,447 (6.07%)	849 (6.67%)	821 (6.37%)	3,215 (5.37%)
Brittle support system	1,437 (17.70%)	1,107 (14.64%)	3,617 (15.18%)	2,373 (18.64%)	2,608 (20.24%)	14,036 (23.46%)
Medication management	2,785 (34.31%)	3,145 (41.58%)	9,722 (40.79%)	5,010 (39.36%)	5,442 (42.23%)	22,579 (37.74%)
Palliative care	268 (3.30%)	245 (3.24%)	391 (1.64%)	286 (2.25%)	214 (1.66%)	524 (0.88%)
Immunization and screening	7,031 (86.61%)	6,116 (80.86%)	20,003 (83.93%)	10,982 (86.28%)	10,613 (82.36%)	51,837 (86.63%)
Psychotropic drugs	2,327 (28.66%)	2,399 (31.72%)	6,160 (25.85%)	4,970 (39.04%)	4,586 (35.59%)	17,680 (29.55%)
Reduction in formal services	813 (10.01%)	877 (11.59%)	2,696 (11.31%)	1,271 (9.99%)	1,383 (10.73%)	6,404 (10.70%)
Environmental assessment	537 (6.61%)	474 (6.27%)	1,474 (6.18%)	804 (6.32%)	767 (5.95%)	3,416 (5.71%)
Bowel management	1,583 (19.50%)	1,322 (17.48%)	4,205 (17.64%)	2,598 (20.41%)	2,004 (15.55%)	9,574 (16.00%)
Urinary incontinence and catheter	1,601 (19.72%)	1,802 (23.82%)	7,143 (29.97%)	4,387 (34.46%)	4,861 (37.72%)	27,417 (45.82%)

Table 27

Internal consistency (coefficient alpha) for summary scales by ancestry

	Ancestry	
Summary scale	Aboriginal	Non-Aboriginal
Cognitive Performance Scale	0.73	0.76
Activities of Daily Living Hierarchy	0.89	0.90
Depression Rating Scale	0.76	0.69
CHESS	0.35	0.38
Pain	0.88	0.91

Table 28

Cognitive Performance Scale (CPS) scores for Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
CPS Score	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
0 - Intact	142 (61.74%)	66 (52.38%)	57 (39.04%)	267 (65.60%)	125 (61.27%)	163 (47.25%)
1 – Borderline intact	34 (14.78%)	26 (20.63%)	32 (21.92%)	77 (18.92%)	36 (17.65%)	73 (21.16%)
2 – Mild impairment	20 (8.70%)	12 (9.52%)	21 (14.38%)	28 (6.88%)	23 (11.27%)	49 (14.20%)
3 – Moderate impairment	23 (10.00%)	17 (13.49%)	32 (21.92%)	20 (4.91%)	17 (8.33%)	47 (13.62%)
4 – Moderate/severe impairment	2 (0.87%)	2 (1.59%)	1 (0.68%)	1 (0.25%)	2 (0.98%)	5 (1.45%)
5 – Severe impairment	5 (2.17%)	1 (0.79%)	3 (2.05%)	10 (2.46%)	1 (0.49%)	6 (1.74%)
6 – Very severe impairment	4 (1.74%)	2 (1.59%)	0 (0%)	4 (0.98%)	0 (0%)	2 (0.58%)
Missing	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 29

Cognitive Performance Scale (CPS) scores for non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
CPS Score	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
0 - Intact	4,996	(61.54%)	4,072	(53.83%)	10,213	(42.85%)	8,591	(67.49%)	8,445	(65.54%)	31,448	(52.56%)
1 – Borderline intact	1,208	(14.88%)	1,215	(16.06%)	4,354	(18.27%)	1,840	(14.46%)	1,891	(14.67%)	10,282	(17.18%)
2 – Mild impairment	528	(6.50%)	729	(9.64%)	3,114	(13.07%)	827	(6.50%)	905	(7.02%)	6,290	(10.51%)
3 – Moderate impairment	824	(10.15%)	1,041	(13.76%)	4,444	(18.65%)	903	(7.09%)	1,154	(8.96%)	8,585	(14.35%)
4 – Moderate/severe impairment	128	(1.58%)	148	(1.96%)	400	(1.68%)	123	(0.97%)	127	(0.99%)	646	(1.08%)
5 – Severe impairment	287	(3.54%)	309	(4.09%)	1,149	(4.82%)	293	(2.30%)	303	(2.35%)	2,167	(3.62%)
6 – Very severe impairment	147	(1.81%)	50	(0.66%)	160	(0.67%)	152	(1.19%)	61	(0.47%)	416	(0.70%)
Missing	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)

Table 30

Activities of Daily Living (ADL) Hierarchy scores for Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
ADL Score	(*n* = 230)		(*n* = 126)		(*n* = 146)		(*n* = 407)		(*n* = 204)		(*n* = 345)	
0 - Independent	150	(65.22%)	90	(71.43%)	93	(63.70%)	311	(76.41%)	160	(78.43%)	248	(71.88%)
1 – Supervision required	20	(8.70%)	11	(8.73%)	22	(15.07%)	24	(5.90%)	15	(7.35%)	27	(7.83%)
2 – Limited impairment	16	(6.96%)	9	(7.14%)	12	(8.22%)	29	(7.13%)	20	(9.80%)	29	(8.41%)
3 – Extensive assistance (I)	23	(10.00%)	11	(8.73%)	10	(6.85%)	19	(4.67%)	5	(2.45%)	19	(5.51%)
4 – Extensive assistance (II)	10	(4.35%)	3	(2.38%)	5	(3.42%)	7	(1.72%)	3	(1.47%)	10	(2.90%)
5 - Dependent	6	(2.61%)	0	(0%)	4	(2.74%)	10	(2.46%)	1	(0.49%)	8	(2.32%)
6 – Total dependence	5	(2.17%)	2	(1.59%)	0	(0%)	7	(1.72%)	0	(0%)	4	(1.16%)
Missing	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)

Table 31

Activities of Daily Living (ADL) Hierarchy scores for non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
ADL Score	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
0 - Independent	5,062	(62.36%)	4,624	(61.13%)	14,704	(61.69%)	8,935	(70.19%)	9,311	(72.26%)	42,901	(71.70%)
1 – Supervision required	665	(8.19%)	764	(10.10%)	2,801	(11.75%)	799	(6.28%)	996	(7.73%)	5,118	(8.55%)
2 – Limited impairment	765	(9.42%)	944	(12.48%)	3,015	(12.65%)	1,115	(8.76%)	1,183	(9.18%)	5,733	(9.58%)
3 – Extensive assistance (I)	766	(9.44%)	647	(8.55%)	1,800	(7.55%)	877	(6.89%)	638	(4.95%)	2,710	(4.53%)
4 – Extensive assistance (II)	338	(4.16%)	324	(4.28%)	880	(3.69%)	435	(3.42%)	422	(3.27%)	1,842	(3.08%)
5 - Dependent	299	(3.68%)	184	(2.43%)	445	(1.87%)	312	(2.45%)	260	(2.02%)	1,087	(1.82%)
6 – Total dependence	223	(2.75%)	77	(1.02%)	187	(0.78%)	256	(2.01%)	76	(0.59%)	441	(0.74%)
Missing	0	(0%)	0	(0%)	2	(0.01%)	0	(0%)	0	(0%)	2	(0%)

Table 32

Depression Rating Scale (DRS) scores for Aboriginal clients by sex and age group (No., %)

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
DRS Score	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
0	159 (69.13%)	87 (69.05%)	105 (71.92%)	204 (50.12%)	138 (67.65%)	237 (68.70%)
1	28 (12.17%)	12 (9.52%)	16 (10.96%)	62 (15.23%)	24 (11.76%)	39 (11.30%)
2	16 (6.96%)	9 (7.14%)	12 (8.22%)	49 (12.04%)	19 (9.31%)	25 (7.25%)
3	8 (3.48%)	8 (6.35%)	6 (4.11%)	20 (4.91%)	8 (3.92%)	18 (5.22%)
4	8 (3.48%)	5 (3.97%)	1 (0.68%)	30 (7.37%)	7 (3.43%)	13 (3.77%)
5	4 (1.74%)	2 (1.59%)	2 (1.37%)	10 (2.46%)	3 (1.47%)	5 (1.45%)
6	1 (0.43%)	0 (0%)	3 (2.05%)	12 (2.95%)	3 (1.47%)	5 (1.45%)
7	1 (0.43%)	0 (0%)	0 (0%)	3 (0.74%)	0 (0%)	0 (0%)
8	3 (1.30%)	2 (1.59%)	0 (0%)	6 (1.47%)	0 (0%)	3 (0.87%)
9	0 (0%)	0 (0%)	1 (0.68%)	1 (0.25%)	0 (0%)	0 (0%)
10	1 (0.43%)	0 (0%)	0 (0%)	3 (0.74%)	0 (0%)	0 (0%)
11	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
12	1 (0.43%)	0 (0%)	0 (0%)	2 (0.49%)	1 (0.49%)	0 (0%)
13	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.49%)	0 (0%)
14	0 (0%)	1 (0.79%)	0 (0%)	5 (1.23%)	0 (0%)	0 (0%)
Missing	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 33

Depression Rating Scale (DRS) scores for non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
DRS Score	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
0	5,321	(65.55%)	4,939	(65.30%)	16,563	(69.49%)	7,199	(56.56%)	7,911	(61.39%)	41,650	(69.61%)
1	1,004	(12.37%)	1,007	(13.31%)	2,970	(12.46%)	1,645	(12.92%)	1,662	(12.90%)	7,105	(11.87%)
2	773	(9.52%)	687	(9.08%)	2,061	(8.65%)	1,410	(11.08%)	1,307	(10.14%)	4,866	(8.13%)
3	331	(4.08%)	290	(3.83%)	775	(3.25%)	703	(5.52%)	674	(5.23%)	2,116	(3.54%)
4	290	(3.57%)	278	(3.68%)	663	(2.78%)	618	(4.86%)	552	(4.28%)	1,705	(2.85%)
5	98	(1.21%)	117	(1.55%)	251	(1.05%)	275	(2.16%)	203	(1.58%)	663	(1.11%)
6	149	(1.84%)	116	(1.53%)	264	(1.11%)	357	(2.80%)	261	(2.03%)	778	(1.30%)
7	38	(0.47%)	39	(0.52%)	84	(0.35%)	109	(0.86%)	90	(0.70%)	254	(0.42%)
8	46	(0.57%)	40	(0.53%)	96	(0.40%)	167	(1.31%)	99	(0.77%)	291	(0.49%)
9	18	(0.22%)	16	(0.21%)	25	(0.10%)	58	(0.46%)	35	(0.27%)	100	(0.17%)
10	23	(0.28%)	20	(0.26%)	38	(0.16%)	83	(0.65%)	40	(0.31%)	161	(0.27%)
11	10	(0.12%)	6	(0.08%)	22	(0.09%)	29	(0.23%)	13	(0.10%)	39	(0.07%)
12	8	(0.10%)	6	(0.08%)	13	(0.05%)	43	(0.34%)	25	(0.19%)	62	(0.10%)
13	4	(0.05%)	0	(0%)	1	(<0.01%)	11	(0.09%)	3	(0.02%)	16	(0.03%)
14	5	(0.06%)	3	(0.04%)	7	(0.03%)	22	(0.17%)	11	(0.09%)	28	(0.05%)
Missing	0	(0%)	0	(0%)	1	(<0.01%)	0	(0%)	0	(0%)	0	(0%)

Table 34

Changes in Health, End-Stage Disease and Symptoms and Signs (CHESS) Scale scores for Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
CHESS Score	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
0 – No instability	106 (46.09%)	49 (38.89%)	46 (31.51%)	149 (36.61%)	80 (39.22%)	119 (34.49%)
1	65 (28.26%)	40 (31.75%)	48 (32.88%)	124 (30.47%)	70 (34.31%)	127 (36.81%)
2	34 (14.78%)	23 (18.25%)	39 (26.71%)	81 (19.90%)	41 (20.10%)	65 (18.84%)
3	20 (8.70%)	9 (7.14%)	10 (6.85%)	48 (11.79%)	12 (5.88%)	27 (7.83%)
4	5 (2.17%)	4 (3.17%)	3 (2.05%)	5 (1.23%)	1 (0.49%)	6 (1.74%)
5 – High instability	0 (0%)	1 (0.79%)	0 (0%)	0 (0%)	0 (0%)	1 (0.29%)
Missing	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 35

Changes in Health, End-Stage Disease and Symptoms and Signs (CHESS) Scale scores for non-Aboriginal clients by sex and age group

	Male						Female					
	<65		65-74		75+		<65		65-74		75+	
CHESS Score	(*n* = 8,118)		(*n* = 7,564)		(*n* = 23,834)		(*n* = 12,729)		(*n* = 12,886)		(*n* = 59,834)	
0 – No instability	3,667	(45.17%)	2,677	(35.39%)	7,946	(33.34%)	5,198	(40.84%)	4,400	(34.15%)	21,540	(36.00%)
1	2,364	(29.12%)	2,320	(30.67%)	7,513	(31.52%)	3,992	(31.36%)	4,321	(33.53%)	19,958	(33.36%)
2	1,349	(16.62%)	1,611	(21.30%)	5,419	(22.74%)	2,387	(18.75%)	2,832	(21.98%)	12,675	(21.18%)
3	559	(6.89%)	712	(9.41%)	2,317	(9.72%)	970	(7.62%)	1,127	(8.75%)	4,646	(7.76%)
4	156	(1.92%)	215	(2.84%)	585	(2.45%)	152	(1.19%)	185	(1.44%)	948	(1.58%)
5 – High instability	22	(0.27%)	29	(0.38%)	52	(0.22%)	29	(0.23%)	21	(0.16%)	65	(0.11%)
Missing	0	(0%)	0	(0%)	2	(0.01%)	1	(0.01%)	0	(0%)	2	(0%)

Table 36

Pain Scale scores for Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Pain Score	(*n* = 230)	(*n* = 126)	(*n* = 146)	(*n* = 407)	(*n* = 204)	(*n* = 345)
0 – No pain	74 (32.17%)	39 (30.95%)	58 (39.73%)	71 (17.44%)	51 (25.00%)	106 (30.72%)
1 – Less than daily pain	36 (15.65%)	22 (17.46%)	28 (19.18%)	40 (9.83%)	29 (14.22%)	55 (15.94%)
2 – Daily pain, not severe	77 (33.48%)	40 (31.75%)	45 (30.82%)	162 (39.80%)	84 (41.18%)	141 (40.87%)
3 – Severe daily pain	43 (18.70%)	25 (19.84%)	15 (10.27%)	134 (32.92%)	40 (19.61%)	43 (12.46%)
Missing	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 37

Pain Scale scores for non-Aboriginal clients by sex and age group

	Male			Female		
	<65	65-74	75+	<65	65-74	75+
Pain Score	(*n* = 8,118)	(*n* = 7,564)	(*n* = 23,834)	(*n* = 12,729)	(*n* = 12,886)	(*n* = 59,834)
0 – No pain	3,130 (38.56%)	3,104 (41.04%)	10,966 (46.01%)	3,556 (27.94%)	3,619 (28.08%)	19,496 (32.58%)
1 – Less than daily pain	894 (11.01%)	977 (12.92%)	3,181 (13.35%)	1,301 (10.22%)	1,533 (11.90%)	8,444 (14.11%)
2 – Daily pain, not severe	2,671 (32.90%)	2,486 (32.87%)	7,483 (31.40%)	4,728 (37.14%)	5,082 (39.44%)	23,766 (39.72%)
3 – Severe daily pain	1,420 (17.49%)	990 (13.09%)	2,193 (9.20%)	3,136 (24.64%)	2,648 (20.55%)	8,092 (13.52%)
Missing	3 (0.04%)	7 (0.09%)	11 (0.05%)	8 (0.06%)	4 (0.03%)	36 (0.06%)

Table 38

Intraclass correlations for null models

DV	Intercept estimate	*SE*	*p*	intraclass correlation (*p*)
CPS	0.02761	0.006367	<.0001	0.0133
DRS	0.04680	0.01084	<.0001	0.0154
ADL Hierarchy	0.03653	0.008259	<.0001	0.0196
CHESS	0.02742	0.006181	<.0001	0.0252
Pain	0.00774	0.001848	<.0001	0.0064

Table 39

Multilevel modeling: Results for null model (DV = MDS-Cognitive Performance Scale)

Model	Estimate	*SE*	*p*
Random effects			
Intercept (CCAC)	0.02761	0.006367	< .0001
Residual	2.0419	0.008123	< .0001

Table 40

Multilevel modeling: Results for partial model (DV = MDS-Cognitive Performance Scale) with individual ancestry added as a fixed effect

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	1.0109	0.02616	< .0001
Ancestry (individual)	-0.1070	0.03804	.0049
Random effects			
Intercept (CCAC)	0.02761	0.006367	< .0001
Residual	2.0418	0.008122	< .0001

Table 41

Multilevel modeling: Results for partial model (DV = MDS-Cognitive Performance Scale) with individual and CCAC ancestry added as fixed effects

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	1.0214	0.02650	< .0001
Ancestry (individual) [A]	-0.1535	0.04508	.0007
Ancestry (CCAC) [B]	-1.9499	1.2229	.1108
Interaction [A X B]	2.5211	3.3139	.0550
Random effects			
Intercept (CCAC)	0.02659	0.006210	< .0001
Residual	2.0417	0.008122	< .0001

Table 42

Multilevel modeling: Results for final model (DV = MDS-Cognitive Performance Scale) with age, sex, and education as control variables

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	0.3622	0.03723	<.0001
Ancestry (individual) [A]	-0.08309	0.04595	.0705
Ancestry (CCAC) [B]	-1.9167	1.2013	.1106
Interaction [A X B]	2.3016	1.3123	.0795
Age	0.009300	0.000308	<.0001
Sex	0.2999	0.008959	<.0001
Education	-0.09503	0.004981	<.0001
Random effects			
Intercept (CCAC)	0.02562	0.005987	<.0001
Residual	1.9643	0.008202	<.0001

Table 43

Comparison of multilevel models for the Cognitive Performance Scale

Model	-2 Log Likelihood	*df*	χ^2 Difference Test
M1 (Null)	449,174.0	3	
M2	449,171.2	1	M1 – M2 = 2.8
M3	449,160.4	3	M1 – M3 = 13.6*
M4 (Final)	403,353.6	3	M3 – M4 = 45,806.8**

**p* < .005

***p* < .001

Table 44

Multilevel modeling: Results for null model (DV = MDS-Depression Rating Scale)

Model	Estimate	*SE*	*p*
Random effects			
Intercept (CCAC)	0.04680	0.01084	< .0001
Residual	2.9858	0.01188	< .0001

Table 45

Multilevel modeling: Results for partial model (DV = MDS-Depression Rating Scale) with individual ancestry added as a random effect

Model		Estimate	*SE*	*p*
Fixed effects				
Intercept		0.8452	0.03396	< .0001
Ancestry (individual)		0.1778	0.05691	.0033
Random effects				
Intercept (CCAC)	[A]	0.04680	0.01084	< .0001
Ancestry	[B]	0.03306	0.03134	.1457
Covariance	[A X B]	0.02349	0.01250	.0602
Residual		2.9851	0.01188	< .0001

Table 46

Multilevel modeling: Results for partial model (DV = MDS-Depression Rating Scale) with individual and CCAC ancestry added as random and fixed effects

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	0.8420	0.3543	< .0001
Ancestry (individual)	0.2348	0.06399	.0007
Ancestry (CCAC)	0.6347	1.6307	.6971
Interaction	-3.5764	2.1156	.0909
Random effects			
Intercept (CCAC) [A]	0.04783	0.01120	< .0001
Ancestry [B]	0.03162	0.03251	.1654
Covariance [A X B]	0.02635	0.01296	.0421
Residual	2.9851	0.01188	< .0001

Table 47

Multilevel modeling: Results for partial model (DV = MDS-Depression Rating Scale) with age, sex, and education as control variables

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	2.1086	0.04794	<.0001
Ancestry (individual)	0.1212	0.06897	.0865
Ancestry (CCAC)	0.2413	1.6139	.8811
Interaction	-4.4197	2.3109	.0558
Age	-0.01435	0.000379	<.0001
Sex	-0.1412	0.01101	<.0001
Education	-0.07083	0.006119	<.0001
Random effects			
Intercept (CCAC) [A]	0.04675	0.01090	<.0001
Ancestry [B]	0.04408	0.03765	.1208
Covariance [A X B]	0.02831	0.01365	.0381
Residual	2.9642	0.01238	<.0001

Table 48

Multilevel modeling: Results for partial model (DV = MDS-Depression Rating Scale) with age, sex, education, and antidepressant medications as control variables

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	1.7634	0.04840	<.0001
Ancestry (individual)	0.1186	0.06847	.0907
Ancestry (CCAC)	0.1252	1.6283	.9837
Interaction	-4.5891	2.2995	.0460
Age	-0.01184	0.000378	<.0001
Sex	-0.1109	0.01090	<.0001
Education	-0.07136	0.006050	<.0001
On antidepressant(s)	0.6318	0.01231	<.0001
Random effects			
Intercept (CCAC) [A]	0.04770	0.01114	<.0001
Ancestry [B]	0.04420	0.03628	.1115
Covariance [A X B]	0.02858	0.01380	.0383
Residual	2.8976	0.01210	<.0001

Table 49

Comparison of multilevel models for the Depression Rating Scale

Model	-2 Log Likelihood	*df*	χ^2 Difference Test
M1 (Null)	497,214.3	3	
M2	497,197.5	3	M1 – M2 = 16.8**
M3	497,187.4	2	M2 – M3 = 10.1*
M4	450,584.8	3	M3 – M4 = 46,602.6**
M5 (Final)	447,953.5	1	M4 – M5 = 2,631.3**

*p < .01

**p < .001

Table 50

Multilevel modeling: Results for null model (DV = MDS-CHESS)

Model	Estimate	*SE*	*p*
Random effects			
Intercept (CCAC)	0.02742	0.006181	< .0001
Residual	1.0627	0.004228	< .0001

Table 51

Multilevel modeling: Results for partial model (DV = MDS-CHESS) with individual ancestry added as a fixed and random effect

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	1.0694	0.02581	< .0001
Ancestry (individual)	-0.07335	0.02965	.0176
Random effects			
Intercept (CCAC) [A]	0.02739	0.006173	< .0001
Ancestry [B]	0.004674	0.007359	.2627
Covariance [A X B]	0.01046	0.005212	.0448
Residual	2.0418	0.008122	< .0001

Table 52

Multilevel modeling: Results for partial model (DV = MDS-CHESS) with individual and CCAC ancestry added as fixed effects

Model		Estimate	*SE*	*p*
Fixed effects				
Intercept		1.0678	0.02696	< .0001
Ancestry (individual)	[A]	-0.06240	0.03555	.0866
Ancestry (CCAC)	[B]	0.3066	1.2350	.8039
Interaction	[A X B]	-0.4493	1.1261	.6899
Random effects				
Intercept (CCAC)	[C]	0.02799	0.006373	< .0001
Ancestry	[D]	0.006217	0.008243	.2254
Covariance	[C X C]	0.01057	0.005563	.0574
Residual		1.0626	0.004228	< .0001

Table 53

Comparison of multilevel models for CHESS scores

Model	-2 Log Likelihood	*df*	χ^2 Difference Test
M1 (Null)	366,625.0	6	
M2	366,620.0	3	M1 – M2 = 5.0
M3	366,615.5	2	M1 – M3 = 10.0*

$^*p < .01$

Table 54

Multilevel modeling: Results for null model (DV = MDS-ADL Hierarchy Scale)

Model	Estimate	*SE*	*p*
Random effects			
Intercept (CCAC)	0.03653	0.008259	< .0001
Residual	1.8277	0.007271	< .0001

Table 55

Multilevel modeling: Results for partial model (DV = MDS-ADL Hierarchy Scale) with individual ancestry added as a fixed effect

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	0.6941	0.02990	< .0001
Ancestry (individual)	0.03056	0.03599	.3957
Random effects			
Intercept (CCAC)	0.03653	0.008259	< .0001
Residual	1.8277	0.007271	< .0001

Table 56

Multilevel modeling: Results for partial model (DV = MDS-ADL Hierarchy Scale) with individual and CCAC ancestry added as fixed effects

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	0.7175	0.02778	< .0001
Ancestry (individual) [A]	-0.00089	0.04265	.9834
Ancestry (CCAC) [B]	-4.2286	1.2783	.0009
Interaction [A X B]	1.7076	1.2431	.1696
Random effects			
Intercept (CCAC)	0.02939	0.006760	< .0001
Residual	1.8277	0.007271	< .0001

Table 57

Multilevel modeling: Results for partial model (DV = MDS-ADL Hierarchy Scale) with age, sex, and education as control variables

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	1.1350	0.03570	<.0001
Ancestry (individual) [A]	-0.07062	0.04335	.1033
Ancestry (CCAC) [B]	-4.0849	1.1699	.0005
Interaction [A X B]	1.6065	1.2382	.1945
Age	-0.00600	0.000291	<.0001
Sex	0.2333	0.008453	<.0001
Education	-0.02931	0.000291	<.0001
Random effects			
Intercept (CCAC)	0.02440	0.005676	<.0001
Residual	1.7486	0.007301	<.0001

Table 58

Comparison of multilevel models for ADL Hierarchy scores

Model	-2 Log Likelihood	*df*	χ^2 Difference Test
M1 (Null)	435,165.1	3	
M2	435,169.2	1	M1 – M2 = -4.1
M3	435,152.8	3	M1 – M3 = 12.3*
M4 (Final)	389,993.8	3	M3 – M4 = 45,159**

$^*p < .01$

$^{**}p < .001$

Table 59

Multilevel modeling: Results for null model (DV = MDS-Pain Scale)

Model	Estimate	*SE*	*p*
Random effects			
Intercept (CCAC)	0.007740	0.001848	< .0001
Residual	1.2057	0.004798	< .0001

Table 60

Multilevel modeling: Results for partial model (DV = MDS-Pain Scale) with individual ancestry added as a fixed effect

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	1.3150	0.01413	< .0001
Ancestry (individual)	0.1646	0.02923	< .0001
Random effects			
Intercept (CCAC)	0.007741	0.001848	< .0001
Residual	1.2054	0.004797	< .0001

Table 61

Multilevel modeling: Results for partial model (DV = MDS-Pain Scale) with individual and CCAC ancestry added as fixed effects

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	1.3070	0.01374	< .0001
Ancestry (individual) [A]	0.1945	0.03464	< .0001
Ancestry (CCAC) [B]	1.5706	0.6446	.0148
Interaction [A X B]	-1.6220	1.0096	.1081
Random effects			
Intercept (CCAC)	0.006852	0.001659	< .0001
Residual	1.2054	0.004796	< .0001

Table 62

Multilevel modeling: Results for partial model (DV = MDS-Pain Scale) with age, sex, and education as control variables

Model	Estimate	*SE*	*p*
Fixed effects			
Intercept	1.9344	0.02455	< .0001
Ancestry (individual) [A]	0.1405	0.03555	< .0001
Ancestry (CCAC) [B]	1.5110	0.6283	.0162
Interaction [A X B]	-1.7580	1.0154	.0834
Age	-0.00686	0.000239	< .0001
Sex	-0.3205	0.006933	< .0001
Education	0.003976	0.003854	.3022
Random effects			
Intercept (CCAC)	0.006462	0.001574	< .0001
Residual	1.1759	0.004911	< .0001

Table 63

Multilevel modeling: Results for partial model (DV = MDS-Pain Scale) with age, sex, education, and arthritis as control variables

Model		Estimate	*SE*	*p*
Fixed effects				
Intercept		1.9181	0.02511	< .0001
Ancestry (individual)	[A]	0.1317	0.03534	.0002
Ancestry (CCAC)	[B]	1.0360	0.6794	.1273
Interaction	[A X B]	-1.7765	1.0093	.0784
Age		-0.00712	0.000237	< .0001
Sex		-0.3086	0.006900	< .0001
Education		0.004574	0.003831	.2325
Arthritis monitored/treated		0.5659	0.01529	< .0001
Random effects				
Intercept (CCAC)		0.007732	0.001855	< .0001
Residual		1.1619	0.004853	< .0001

Table 64

Comparison of multilevel models for Pain Scale scores

Model	-2 Log Likelihood	*df*	χ^2 Difference Test
M1 (Null)	382,335.6	3	
M2	382,309.1	1	M1 – M2 = 26.5**
M3	382,298.0	2	M2 – M3 = 11.1*
M4	344,250.0	3	M3 – M4 = 38,048**
M5	342,895.9	1	M4 – M5 = 1,354.1**

*p < .005

**p < .001

Table 65

Challenges to coordination and provision of home care services to Aboriginal clients

Challenge
Language
Infrequent/non-existent services in rural areas
Greater transience in the Aboriginal population
Discontinuity of services
Participants' uncertainty about culturally-appropriate care

Table 66

Resources used to coordinate and provide home care services to Aboriginal clients

Resource
Translation assistance
Time flexibility
Alternate sources of information
Community partners
Continuing education

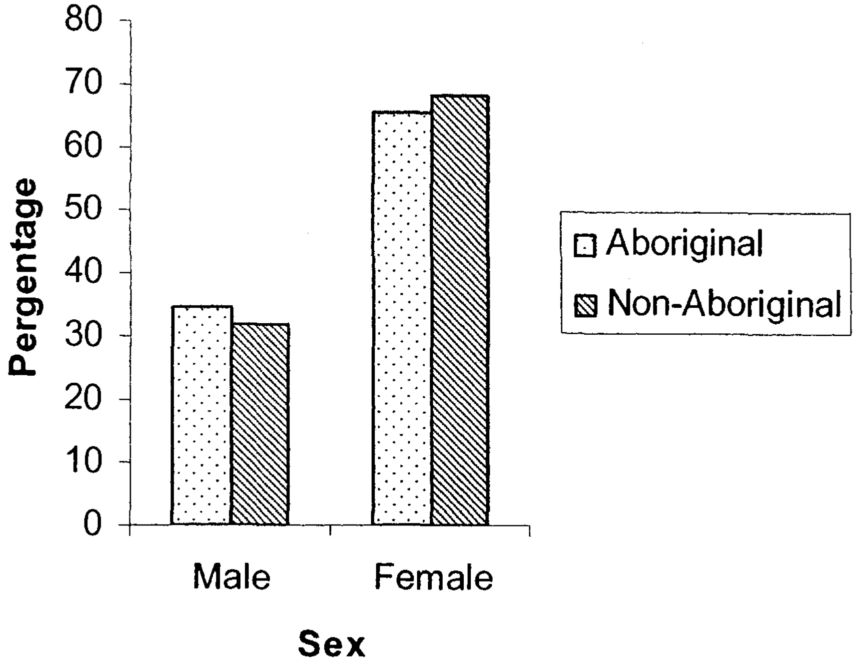

Figure 1. Percentage of Aboriginal and non-Aboriginal clients by sex.

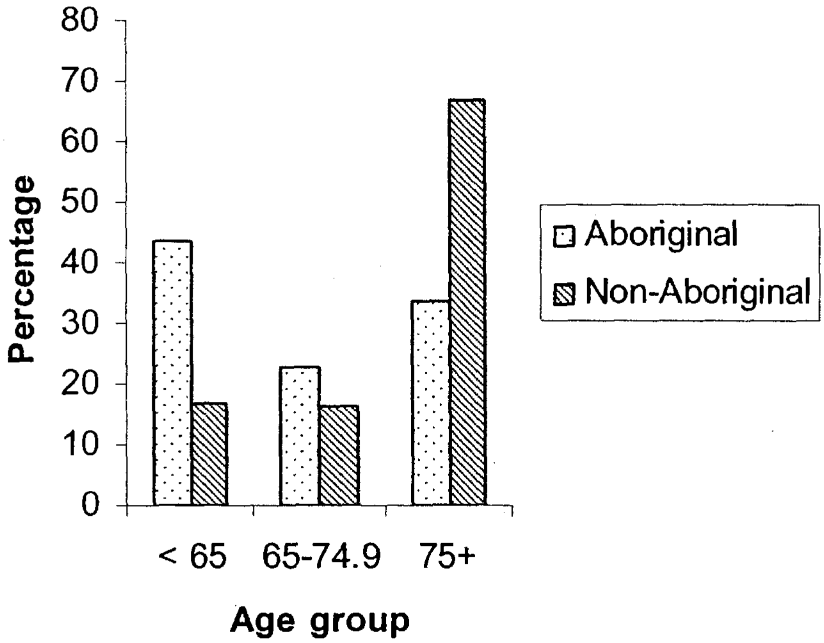

Figure 2. Percentage of Aboriginal and non-Aboriginal clients by age group.

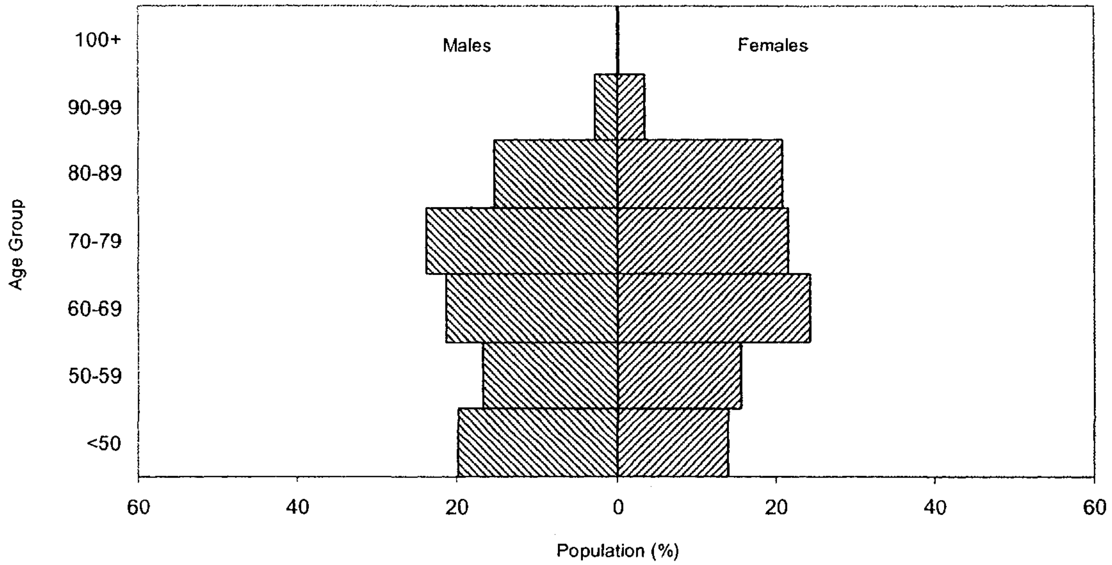

Figure 3. Age structure of male and female Aboriginal clients.

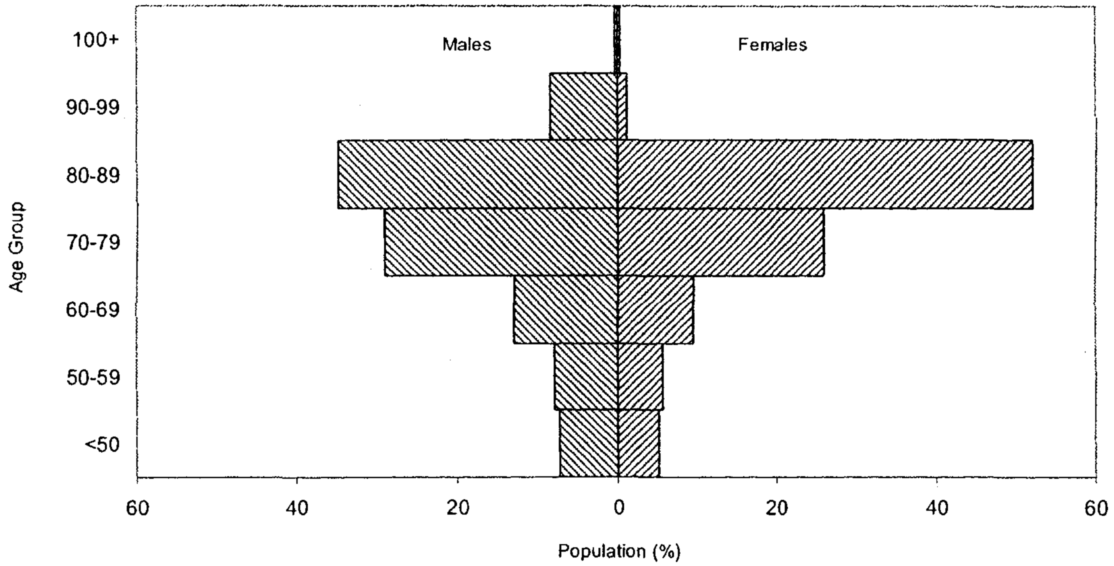

Figure 4. Age structure of male and female non-Aboriginal clients.

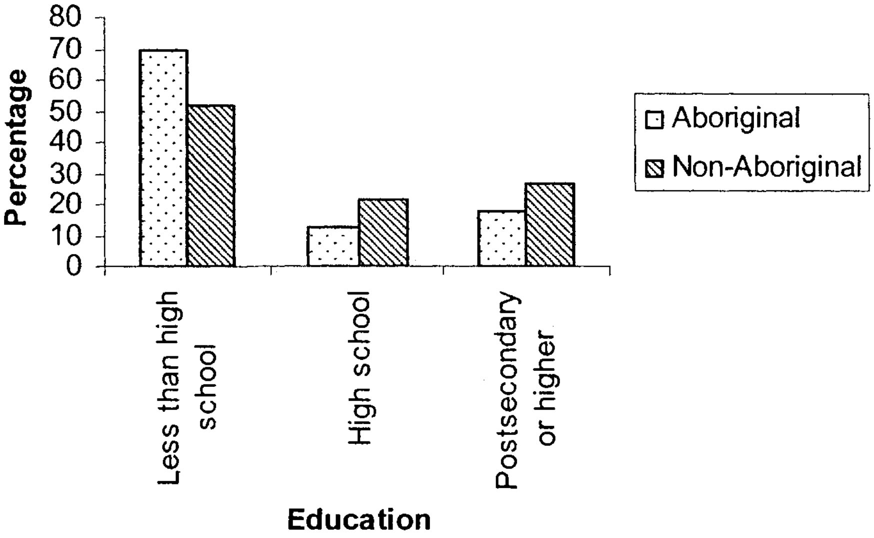

Figure 5. Educational attainment of Aboriginal and non-Aboriginal clients.

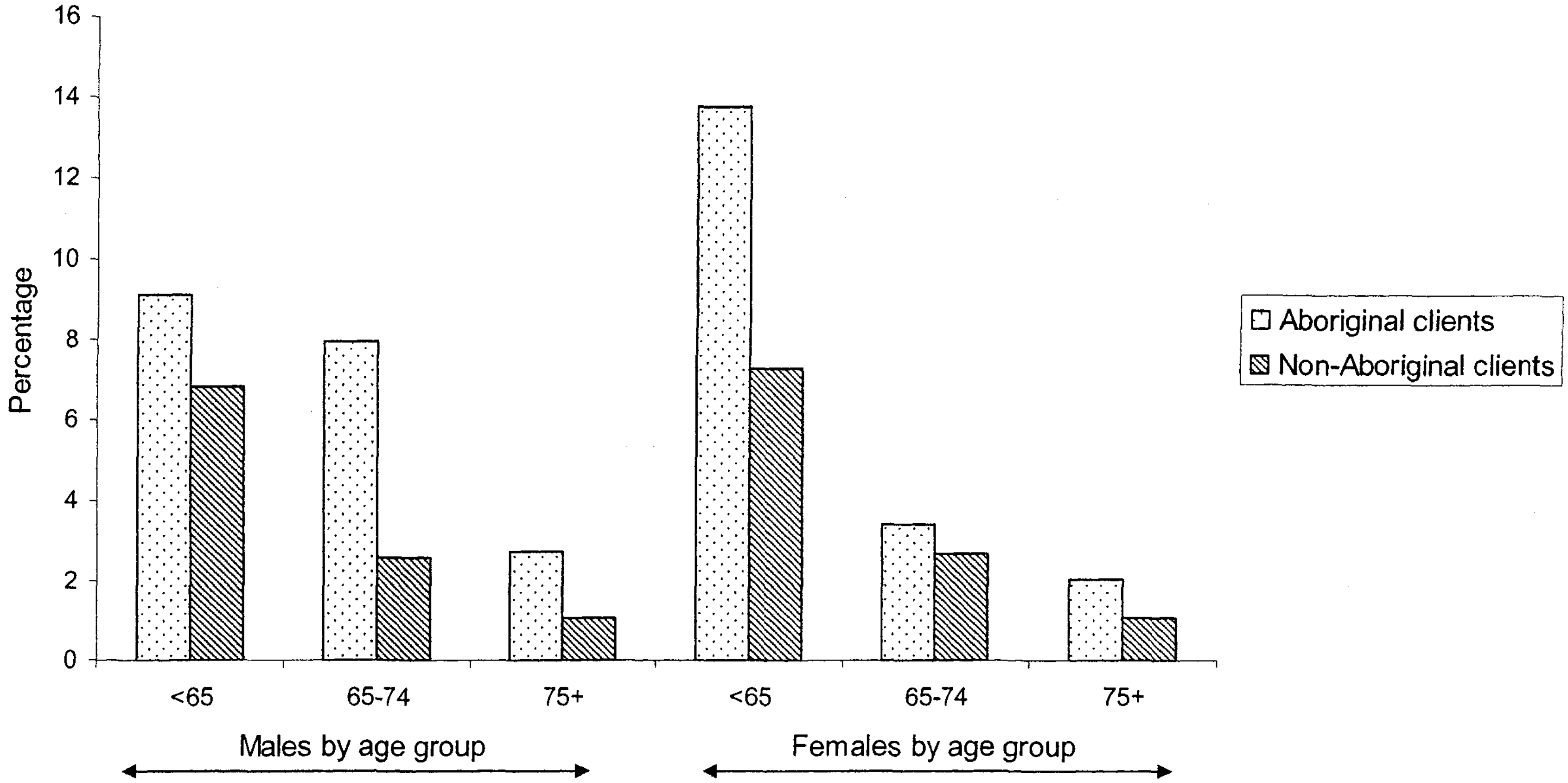

Figure 6. Percentage of clients who made economic trade-offs by ancestry, sex, and age group.

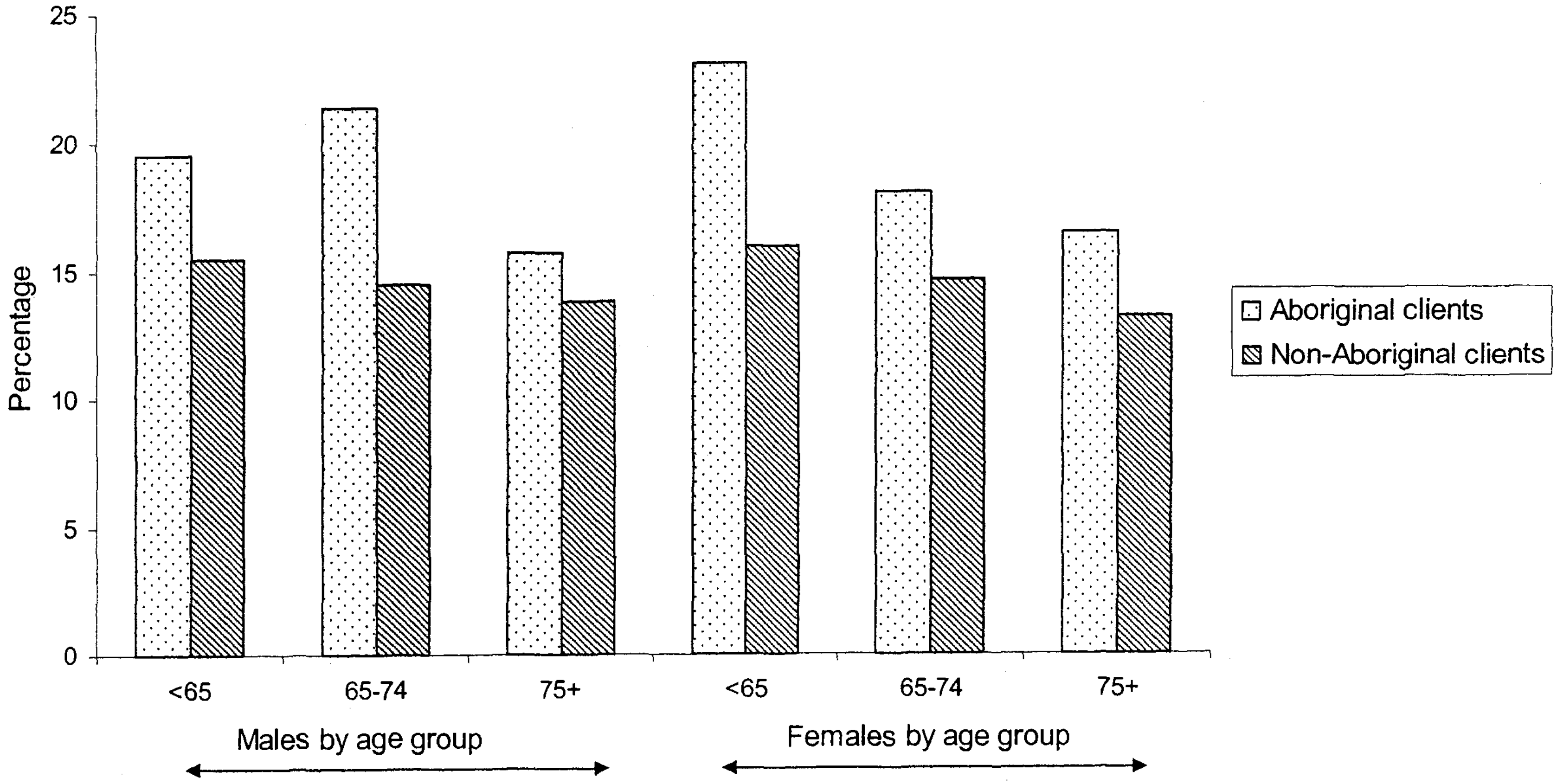

Figure 7. Percentage of clients with uninhabitable home environments by ancestry, sex, and age group.

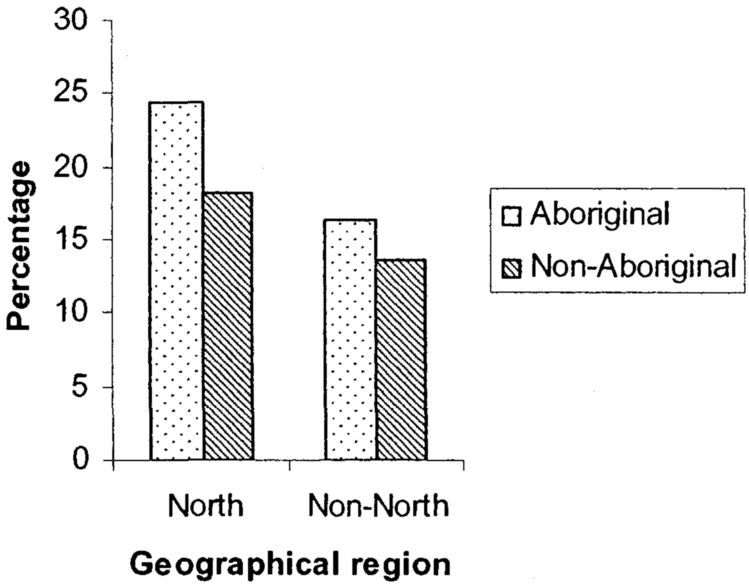

Figure 8. Percentage of Aboriginal and non-Aboriginal clients with one or more hazardous home environments by geographical region.

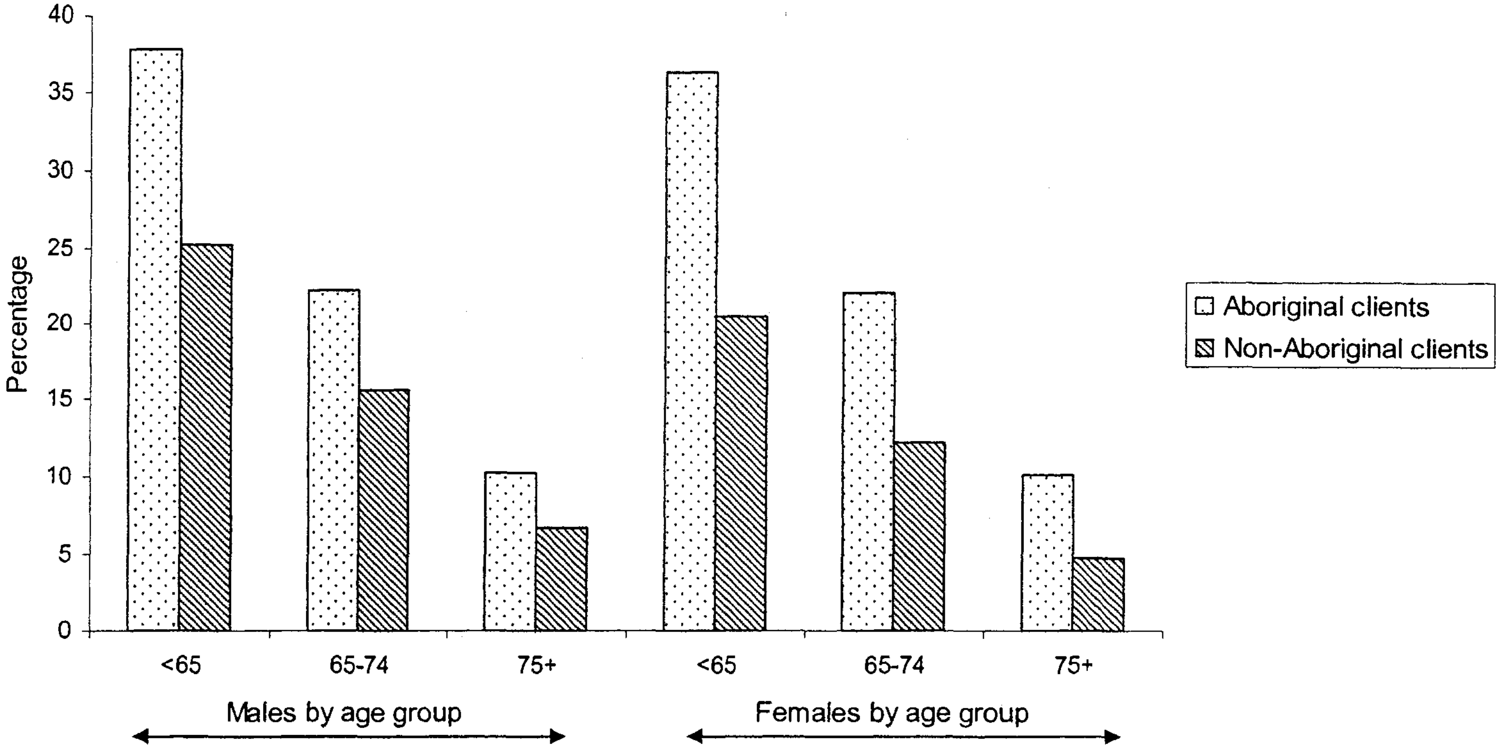

Figure 9. Smoking rates among Aboriginal and non-Aboriginal clients by sex and age group.

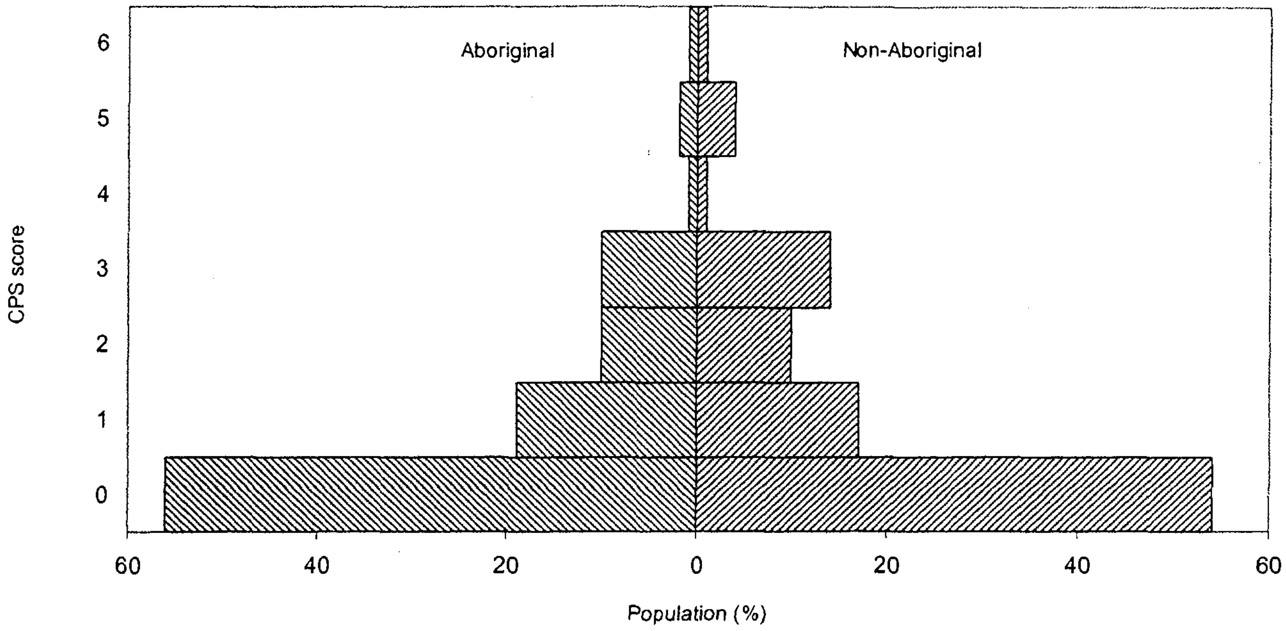

Figure 10. Cognitive Performance Scale (CPS) score distributions among Aboriginal and non-Aboriginal clients.

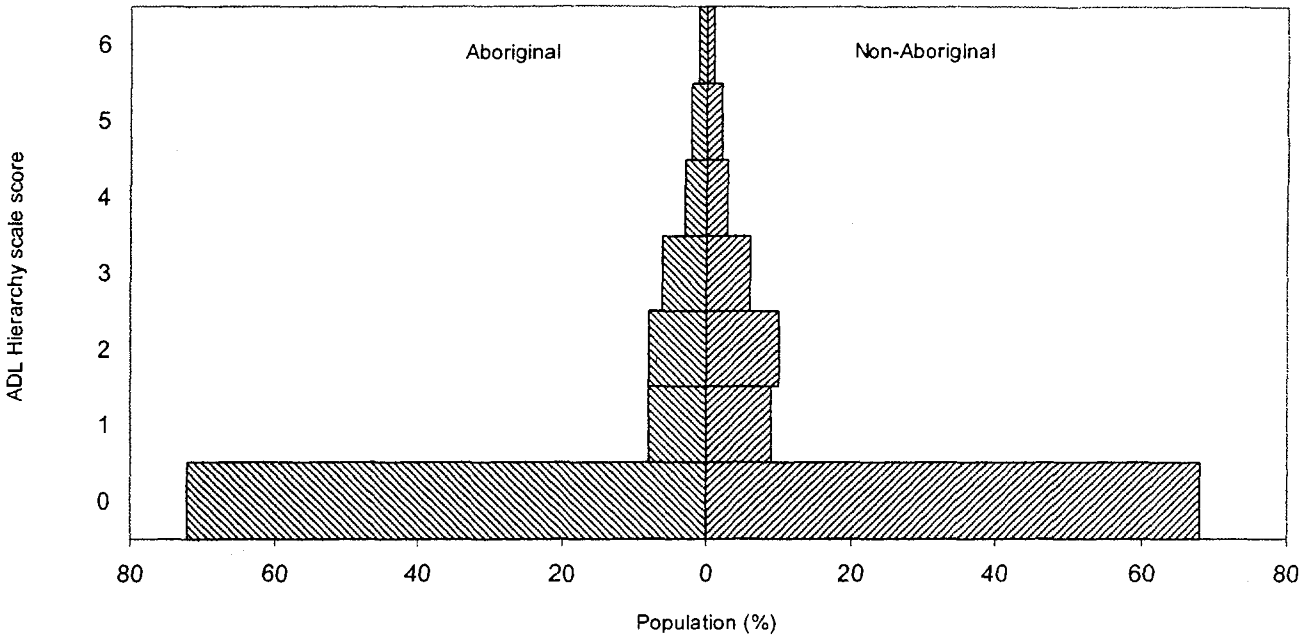

Figure 11. Activities of Daily Living (ADL) Hierarchy scale score distributions among Aboriginal and non-Aboriginal clients.

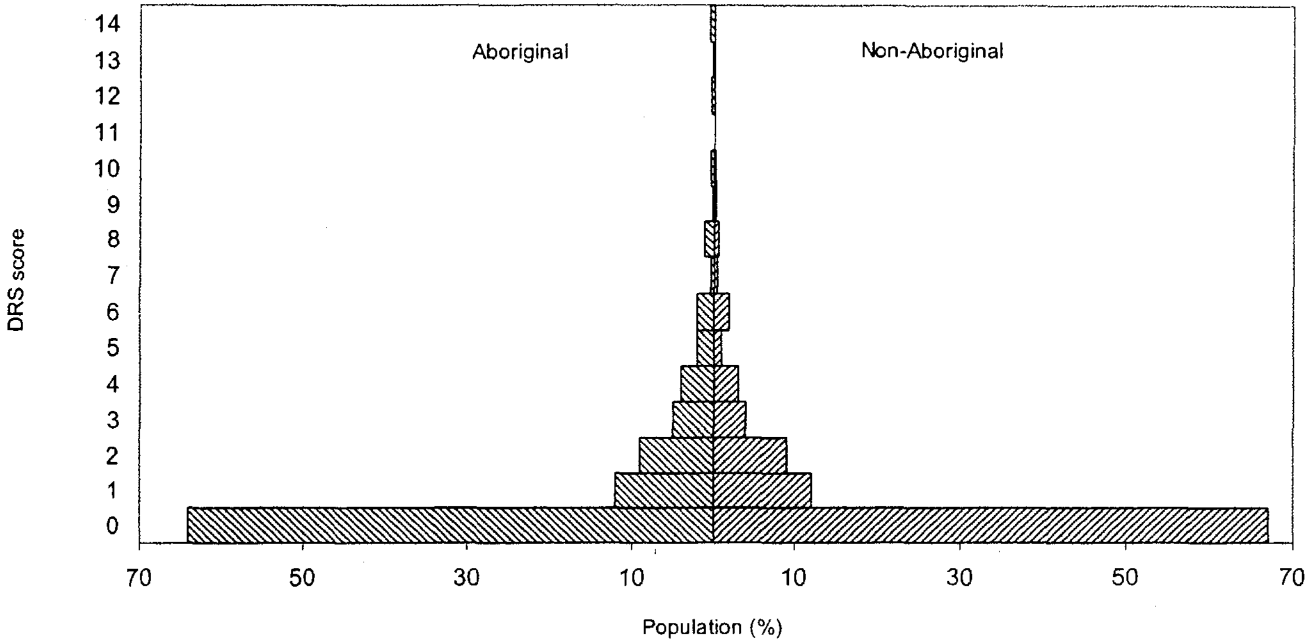

Figure 12. Depression Rating Scale (DRS) score distributions among Aboriginal and non-Aboriginal clients.

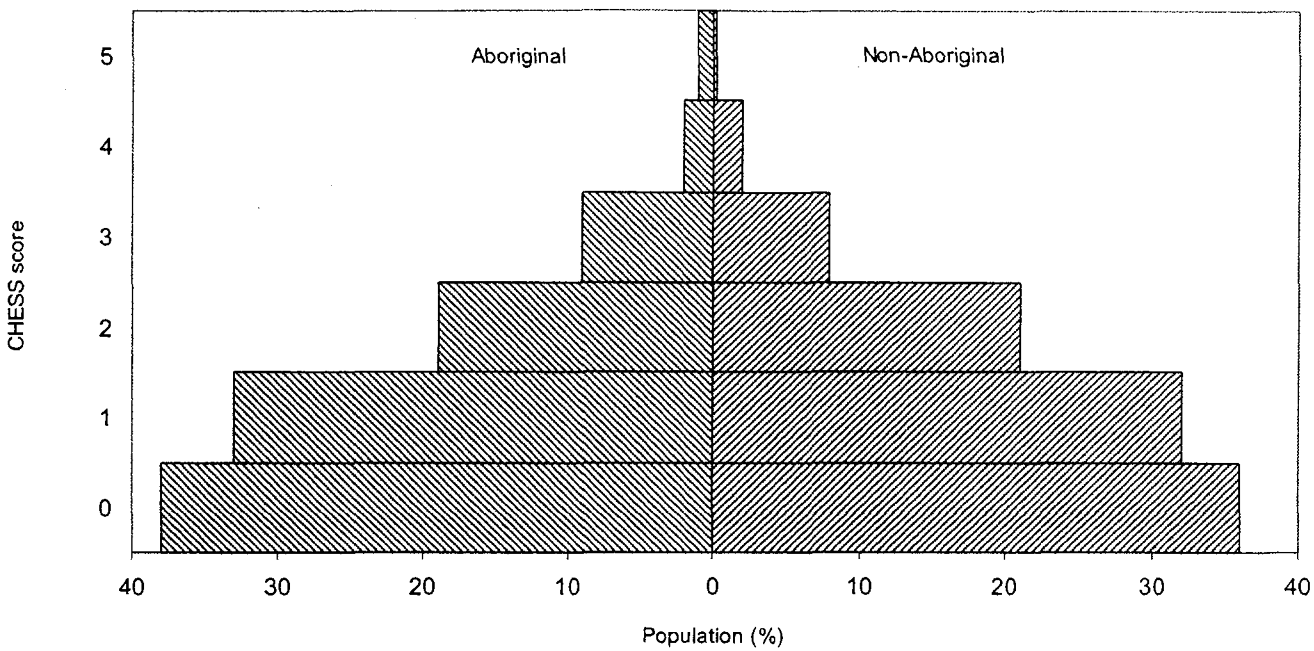

Figure 13. Changes in Health, End-Stage Disease and Symptoms and Signs (CHESS) Scale score distributions among Aboriginal and non-Aboriginal clients.

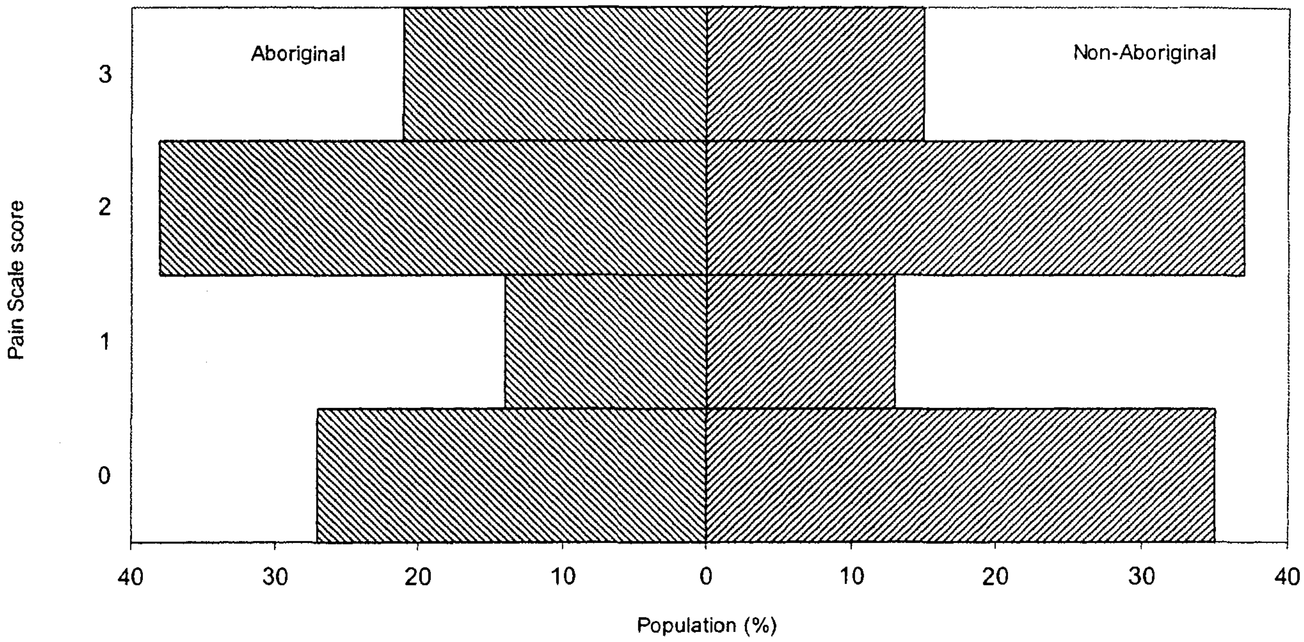

Figure 14. Pain Scale score distributions among Aboriginal and non-Aboriginal clients.