

_____ **Research Report** _____

**Self-Reported Physical Health
Status of Newly Admitted
Federally-Sentenced Men
Offenders**

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Offenders**

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Executive Summary

Key words: *offender health conditions, health survey, aging offenders, Aboriginal offenders' health status*

International health studies indicate that offenders have higher rates of infectious diseases, chronic diseases, and physical and psychiatric disorders relative to the general population. Several factors could explain this finding. Offenders engage in more high-risk health behaviours and have a greater likelihood of being involved in activities that can result in physical injuries than members of the general population. Other socio-economic factors known to be associated with poorer health are also more common among offender populations, such as poverty, low education attainment, substandard housing, and unemployment or underemployment.

The Correctional Service of Canada (CSC) is responsible for the delivery of health services to inmates. In CSC, Commissioner's Directive 800 (and the 800 series) details the legal requirement of institutions to provide access to essential medical, dental, and mental health services and specifies the requirement for informed consent and the provision of drugs and medical supplies.

All incoming federal offenders in CSC are routinely approached to consent to medical services at intake. Health professionals interview offenders guided by standardized health assessment forms (1244 series) to determine their self-reported health conditions, medications, and health-related risk behaviours. For the current study, over a six-month period from April 2012 to September 2012, data from these forms completed on men offenders were manually entered into a database by regional personnel. Prevalence of chronic health conditions for the national sample, and for each region over a six month period ($N = 2,273$), was determined; results were also compared by Aboriginal ancestry and across two age bands. Further analysis compared the CSC results to that of the general population of Canadian men based on the Canadian Community Health Survey (CCHS) and to a health survey conducted on incarcerated men in Australia.

Results indicate that the most common health conditions cited by newly-admitted men offenders are head injury, asthma, and back pain. With the exception of blood-borne viruses (HIV/AIDS and hepatitis C) and asthma, rates of chronic health conditions do not appear to be significantly higher in incarcerated population of men than the general population of Canadian men; indeed, rates of high blood pressure and arthritis are lower, possibly due to a higher proportion of younger men in the incarcerated population. Rates of most chronic conditions are significantly higher for CSC men offenders over age 50 years. Compared to non-Aboriginal offenders, Aboriginal men have higher rates of head injury and blood-borne viruses at all ages. Federally sentenced men offenders in Canada appear to be healthier on a number of measures than men offenders sampled in an Australian study. This study provides a benchmark that could be used to examine health trends in CSC over time.

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List of Acronyms

AIDS	Acquired Immunodeficiency Syndrome
BMI	Body Mass Index
CCHS	Canadian Community Health Survey
CCRA	Corrections and Conditional Release Act
CoMHISS	Computerized Mental Health Intake Screening System
CSC	Correctional Service Canada
DFIA	Dynamic Factor Needs Identification and Analysis
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
NIIDRBS	National Inmate Infectious Diseases and Risk Behaviours Survey
NPHS	National Population Health Survey
OMS	Offender Management System
SES	Socioeconomic Status
STI	Sexually Transmitted Infection
TB	Tuberculosis

Introduction

International health studies indicate that offenders have higher rates of infectious diseases, chronic diseases, and physical and psychiatric disorders relative to the general population (Fazel & Baillargeon, 2011; Harris, Hek, & Condon, 2007; Robert, 2004; Wilper et al., 2009). Several factors could explain this finding. Offenders engage in more high-risk health behaviours such as intravenous drug use, tattooing, smoking, physical aggression, multiple sexual partners, and alcohol abuse than members of the general population. Offenders' higher rates of brain injury also suggest a greater likelihood to be involved in activities that can result in physical injuries (Harmon, 2012). Other socio-economic factors known to be associated with poorer health are also more common among offender populations, such as poverty, low education attainment, substandard housing, and unemployment or underemployment (Hamilton & Bhatti, 1996; Public Health Agency, 2003; World Health Organization, 2003). In some cases, incarceration itself, with the increased exposure to individuals with higher rates of infection and continued risky behaviours while in correctional facilities, may contribute to generally poorer health status of offenders.

Results of two comprehensive international studies of inmate health not only provide estimates of prevalence of health conditions, but highlight which of these conditions are particularly elevated in inmate populations relative to the general population (Indig et al., 2010; National Commission on Correctional Health Care, 2002). In Australia, the state of New South Wales has surveyed the health status of inmates on three occasions over the last ten years (Indig et al., 2010). The most prevalent chronic conditions among men offenders in the latest study in 2009 are asthma, back problems, and hypertension. A similar methodology was used over three time periods, allowing a comparison of trends. Researchers found a substantial drop in the proportion of men who were hepatitis C antibody positive from about 40% to 28% and a drop in the proportion of men with high blood pressure from 24% to 15%. In the US, a study extrapolated on data collected from various databases estimated the prevalence of acquired immunodeficiency syndrome (AIDS) among inmates to be 5 times higher than among the general US population, the prevalence of hepatitis C to be 9 to 10 times higher, and the prevalence of active tuberculosis (TB) between 4 and 17 times greater (National Commission on Correctional Health Care, 2004). Age-adjusted estimates of prevalence rates for some chronic

diseases such as hypertension, diabetes, asthma, and arthritis in prisoners are also higher than in the general American population (Wilper et al., 2009).

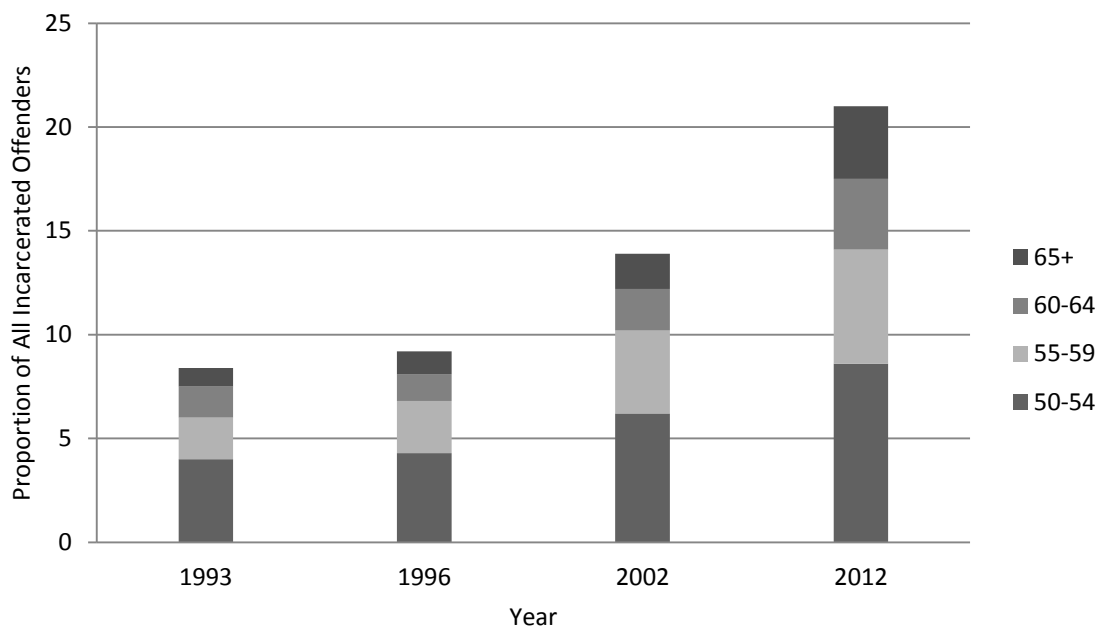
Canada has endorsed the United Nations Basic Principles for the Treatment of Prisoners (United Nations, 1990). This document declares that all prisoners shall have access to the same health services available in their country without discrimination on the grounds of their legal status. Health care is a provincial responsibility in Canada; however, the Canada Health Act legislates some exceptions to this responsibility. As legislated by Sections 86 of the Corrections and Conditional Release Act (CCRA), the Correctional Service Canada (CSC) is responsible for the delivery of essential health care to inmates. CSC's Commissioner's Directive 800 (and the 800 series; CSC, 2011a) details the legal requirement of institutions to provide access to essential medical, dental, and mental health services and specifies the requirement for informed consent and the provision of drugs and medical supplies. Additionally, guidelines and manuals detail the operational-level requirements and clinical elements of specific health services and programs (e.g., Management of Viral Hepatitis Guidelines, CSC, 2011b).

CSC has conducted infectious disease surveillance since 1998, beginning with tuberculosis (TB) and expanding to include human immunodeficiency virus (HIV), hepatitis A, B and C (HCV), and sexually transmitted infections (STI). Offender participation in infectious disease screening is voluntary but well accepted, with 85% participating in TB assessments on admission. The most recent preliminary results for federal inmates from 2007-2008 have been compiled in an epidemiological report completed by the Health Services Sector (CSC, 2012). Hepatitis C (HCV) was the most common infectious disease among incarcerated men in 2008, with a HCV prevalence estimate of 30% compared to 1.7% for HIV.

There is reason to be concerned that rates of chronic physical health conditions of federal offenders may be increasing because of demographic shifts in the offender population. Partially due to the addition of mandatory minimum sentencing, the number of federal offenders over 50 years has been increasing (Robert, 2004). Figure 1 below illustrates the sharp increase in the proportion of the federal inmate population that is over 50 years old at intake over the last twenty years (see Appendix A for precise breakdowns of the proportion of the population at four age bands). This increase is particularly marked for incarcerated non-Aboriginal men, 23% of whom are now over 50 years (CSC, 2012). Older inmates generally require more health care services when compared to younger inmates since they are much more likely to suffer from chronic

diseases and disabilities (e.g., diabetes, high blood pressure, heart disease, cancer, arthritis, etc.; Aday & Krabill, 2013). They may have more specialised needs such as limitations in mobility and daily living due to the impact of impairments and diseases in older populations (Colsher, Wallace, Loeffelholz, & Sales, 1992; Merianos, Marquart, Damphousse, & Herbert, 1997; Potter, Cashin, Chenoweth, & Jeon, 2007). Nevertheless, despite the increase in the proportion of offenders over the age of 50 years, the overall inmate population is younger than that of the general population, where the latest census showed that 15% of the general population are 65 years and over, compared to 3.5% in CSC, and the median age is 40 years in the general population compared a median incoming age of 32 years in CSC, and 29 years for Aboriginal offenders (Public Safety, 2011; Statistics Canada, 2011). The younger age might contribute to overall lower rates of some chronic illnesses than may be expected given offenders' generally riskier lifestyle.

Figure 1. *Offenders over 50 years as a proportion of all incarcerated offenders over four time periods.*



Another factor that could affect the overall prevalence of health conditions among federal offenders is the increase in the proportion of the federally-sentenced population that is Aboriginal. Currently, Aboriginal offenders make up approximately 22% of the CSC inmate

population, up from 18% in 2002 (CSC, 2004). Overall, Aboriginal populations in Canada face a higher prevalence of health conditions and lower life expectancy (Bell & Crutcher, 2002; King, 2010; Gionet & Roshanafshar, 2013; Gracey & King, 2009). Many of the health conditions such as diabetes, obesity, and drug and alcohol abuse seen in the general population of Aboriginal Canadians are reportedly even more prevalent in Aboriginal inmate populations (Bell & Crutcher, 2002). Other areas that affect the relatively poorer health and lower life expectancy of Aboriginal offenders are the higher rates of youth suicide and injury from violence within some Aboriginal communities (Canada, Royal Commission on Aboriginal Peoples, 1996).

Offender health status presents a challenge to those mandated to provide health services while incarcerated. Investment in this area, however, can reap dividends for both infectious and chronic disease management. Identifying and treating offenders while they are in one location, have access to testing and treatment, and can be monitored for adherence, could improve the health outcomes for this high risk group, many of whom may have erratic contact with health services when they are in the community (National Commission on Correctional Health Care, 2002). Treating offenders in the criminal justice system is a public health opportunity to promote health in this vulnerable population (Herbert, Plugge, Foster, & Doll, 2012).

Infectious disease surveillance has been conducted since 1998 and the national introduction of Computerized Mental Health Intake Screening System (CoMHISS) in 2009 has facilitated the mental health assessment of incoming federal inmates, but in the absence of an electronic medical record, estimating chronic physical disease prevalence has been more challenging. A comprehensive profile of the health needs of federal inmates in Canada was compiled in 2004 (CSC, 2004). Data were drawn from multiple sources including pharmacy utilisation in two regions, inmate survey results, and the Offender Management System (OMS). Where possible, expected prevalence data for inmates were calculated and compared to results for the general Canadian population based on the National Population Health Survey (NPHS). Cardiovascular diseases, asthma, and diabetes were estimated to be higher among inmates than among the general public; however these conclusions were tentative due to the significant limitations from the lack of reliable data sources. The report's recommendation to collect inmates' health data more systematically has formed the basis for the current report on the physical health status of incoming federal offenders.

Method

Participants

The sample included all consecutive men offenders admitted to CSC institutions who consented to a health assessment interview between April 1, 2012 and September 30, 2012. The total sample consisted of 2,273 offenders, representing 96.2% of the new admissions for men offenders over this period. The average age of participating offenders was 35.5 years ($SD = 12.0$; Range = 18.2 – 82.4). Twenty-two percent ($n = 496$) self-identified as Aboriginal.

Procedure/Measures

Within the first 24 hours of admission to CSC custody, all offenders are routinely seen by a nurse to attend to immediate medical needs and to explain the health assessment process and seek informed consent for medical services. CSC utilizes a series of forms, referred to as the 1244 series, to assess and record the health information of inmates at intake. Section 1 of the 1244 series form assessing current medications, any acute health conditions, allergies, and risk for self-injurious behaviour is completed with consenting offenders at this time. Within two weeks of admission, a comprehensive health assessment questionnaire administered by a CSC nurse is offered to the offender. Offenders' responses are manually recorded in the 1244 Section II form along with weight, height and vital signs. Offenders are also offered a 1244-Infectious Disease assessment for TB, blood-borne, and sexually transmitted infections. With the offender's consent, the nurse may perform tuberculin skin testing, serological testing and urine collection for STI testing. For offenders aged 50 years and over, and for those who are under 50 years with a disability, an additional 1244 assessment details their needs for assistance with the activities of daily living. All completed 1244 forms are placed in the offender's chart for reference during their incarceration. The questions from each of the 1244 series forms that were used to collect the data in the present study are provided in Appendix E.

For this study, over a six-month period, data from all consecutive admissions extracted from the 1244 health assessment forms were recorded in Microsoft Office Excel spreadsheets by regional reception staff. The prevalence rates of chronic health conditions were then established by Research Branch staff. Rates were examined using the appropriate descriptive (i.e., frequency tables and graphs) and inferential statistics (i.e., chi-squared tests of association and

analysis of variance [ANOVA]). Rates were also compared by Aboriginal ancestry and age band. Effect sizes (i.e., Cramer's V^1 , r -squared²) were used to determine the overall strength of association between variables. The recommended minimum effect size representing a “practically” significant effect for social science data is usually .2, although lower values, when measures are established as highly valid, can be considered important (Ferguson, 2009). It should be noted that the statistical analyses presented in the tables are the effect size values (V or r) with the corresponding statistical test significance denoted by asterisks.

Lifestyle risk factor assessment included information on the 1244 Section II form, as well as need ratings for the employment and substance abuse domains that is derived from the Dynamic Factor Needs Identification and Analysis Revised (DFIA-R) completed at intake by specialised parole officers on all incoming offenders to CSC. This assessment combined with an assessment of the offenders' static risk has been shown to have a strong association with outcomes on release (Brown & Motiuk, 2005). Multiple indicators within a domain are used to categorize an offender's need level on a given domain. The indicators that make up the substance abuse and employment need domains are provided in Appendix D. For the purpose of the present study, “need” was considered having a rating of “moderate need for improvement” or “high need for improvement”.

¹ Cramer's V is used to measure the association between two categorical variables. The closer V is to 0, the smaller the association between the variables, and the closer V is to 1, the stronger the association between the variables. Values of .1 represent a small effect; values of .3 represent a medium effect; and values of .5 represent a large effect (Field & Miles, 2010).

² R -squared is the proportion of variance in one variable explained by a set of independent variables and can be used as a measure of effect size for an overall model involving continuous variables. Values of .02 represent a small effect size; values of .13 represent a medium effect size; and values of .26 represent a large effect size (Cohen, 1988).

Results

The total number of self-reported chronic health conditions of all participants is presented in Table 1.³ Over one-third of incoming offenders report having sustained head injuries resulting in loss of consciousness. Asthma, back pain, and blood-borne viruses, particularly hepatitis C, are conditions most commonly reported.

Prevalence proportions by region can be found in Appendix B. Overall, the rates for many chronic health conditions appear quite similar across the regions with the exception of Quebec, where rates of head injury, asthma, back pain, and arthritis are lower than the other regions, and the Atlantic region, where rates of head injury, back pain, and arthritis are higher than other regions. Rates of self-reported HIV and HCV infection are highest in the Pacific region where there are also the highest rates of self-reported history of drug injection and substance abuse.

Lifestyle risk factors (presented in Table 2) may contribute to some of these conditions. Over 60% of incoming inmates are rated by intake parole officers as having moderate or high substance abuse needs related to their offending and 21% report injection drug use. Other reported lifestyle factors that could adversely affect health were employment problems (58%), drinking alcohol (53%), and being obese as measured by the body mass index (BMI; 21%).

³ It should be noted that for planning purposes, the percentage of chronic conditions is the best indicator of the prevalence of health conditions, not the number of cases because of missing data. Percentages were calculated based on the number of cases for whom data were available for each condition.

Table 1

Self-reported Chronic Health Conditions among Newly-Admitted Federal Men Offenders, 2012

Health Condition	Total N = 2,273	
	%	n
Any cancer	1.8	39
Central nervous system		
Head injury	34.1	738
Seizure activity	4.3	92
Spinal injury	2.6	56
Cardiovascular system		
High blood pressure	8.5	184
High cholesterol	5.3	114
Heart attack	2.0	44
Arrhythmia	1.6	34
Angina	1.4	30
Stroke	0.7	16
Respiratory system		
Asthma	14.7	318
Bronchitis	2.9	63
Pulmonary disease	1.8	38
Gastro intestinal		
Ulcers	3.2	69
Reproductive system		
Prostate problems	2.8	60
Endocrine system		
Diabetes	4.2	88
Musculoskeletal system		
Back pain	19.3	411
Arthritis	8.3	177
Prosthesis	7.7	180
Walking difficulty	5.1	108
Osteoporosis	0.4	9
Blood-borne viruses		
Hepatitis C	9.4	191
HIV/AIDS	1.3	27

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

Table 2

Lifestyle Risk Factors Related to Health Outcomes among Newly-Admitted Federal Men Offenders, 2012

Lifestyle Risk Factor	(N = 2,273)	
	%	n
Substance abuser ^a	61.4	1,232
Employment problems ^a	57.6	1,155
Drinks alcohol	52.6	1,049
Overweight (BMI 25–29.9) ^b	29.8	677
Obese (BMI 30+)	20.9	476
Cigarette smoker ^c	21.1	453
No physical exercise	21.1	407
Ever inject drugs	20.8	415

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

^a Criminogenic need ratings of moderate or high completed by intake parole officers.

^b BMI = body mass index. ^c Response to question “do you smoke”?

Table 3 compares the results of the offender health survey to the estimates of some major health conditions based on the 2011 Canadian Community Health Survey (CCHS; Statistics Canada, 2013). Most of the cited rates represent results from respondents who were Canadian men, ages 20 years and older, or, where indicated, include estimates based on respondents who were 12 years and older. For further comparison purposes, the table also presents the rates of chronic health conditions as reported by a stratified random survey of Australian inmates (Indig et al., 2010). This Australian sample from New South Wales includes 34% Aborigines and Torres Islanders. Of note, rates of self-reported HIV are more than nine times higher and HCV are four times higher among Canadian men offenders than among men in the general Canadian population. The increased prevalence of HIV and HCV among incarcerated populations has been well established in the literature (National Commission on Correctional Health Care, 2004). But, with the exception of these infectious diseases and asthma, chronic health conditions are not significantly higher among newly-admitted men offenders than the general population of Canadian men; in fact, rates of high blood pressure and arthritis are lower, possibly due to a higher proportion of younger offenders. At roughly 20%, the proportion of the offender and community samples who are obese is similar. On most measures, Australian prisoners' health

appears poorer than that of Canadians. Their higher reported rate of smoking and injection drug use may be contributing factors to their poorer health status.

Table 3

CSC Offenders' Self-Reported Health Status Compared with the Canadian Population and Australian Inmates

	CSC Men Offenders (<i>n</i> = 2,273) %	Canadian Population (<i>n</i> = varies) %	New South Wales Men Offenders ⁱ (<i>n</i> = 966) %
Lifestyle risk factors			
BMI - Overweight (25–29.9)	28.9	40.9 ^a	37.0
BMI - Obese (30+)	20.9	20.3 ^a	18.7
Cigarette smoker	21.1	24.0 ^a	75.0
No physical exercise	21.1	46.1 ^a	25.4 ^b
Ever inject drugs	20.8	-	40.1
Health Condition			
Head injury	34.1	-	52.3
Any cancer	1.8	2.5 ^c	3.1
Angina	1.4	-	10.3
Arrhythmia	1.6	-	8.3
Seizures	4.3	-	5.4
High blood pressure	8.5	19.6 ^a	14.7
Stroke	0.7	1.2 ^d	-
Asthma	14.7	6.9 ^a	26.3
Ulcers	3.2	2.9 ^d	5.0
Diabetes	4.2	7.6 ^a	4.3
Prostate problems	2.8	-	2.8
Arthritis	8.3	13.8 ^a	13.4
Back pain	19.3	18.5 ^e	24.7
HIV/AIDS ^f	1.3	0.3 ^g	-
Hepatitis C ^f	9.4	1.0 ^h	28.0

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

^a 2011, ages 20+, from CCHS, <http://66.240.150.17/cubes/data-cubes-eng.html>

^b Not very or not at all physically active in the year prior to incarceration.

^c 2004, from Cancer in Canada: Fast Facts, Canadian Cancer Society. (Diagnosed with any cancer within the last 15 years) http://www.cancer.ca/Canada-wide/About%20cancer/Cancer%20statistics.aspx?sc_lang=en

^d 2009/10, ages 12+ years, from CCHS: <http://66.240.150.17/cubes/data-cubes-eng.html>

^e 2007, ages 12+ years, from CCHS, reported in Public Health Agency (2009).

^f These rates are not confirmed through testing but only self-reported by offenders.

^g 2011, HIV prevalence from: <http://www.phac-aspc.gc.ca/aids-sida/publication/survreport/estim2011-eng.php>

2011, estimated population from: <http://www.statcan.gc.ca/daily-quotidien/110928/t110928a4-eng.htm>

^h 2007, from: www.phac-aspc.gc.ca/sti-its-surv-epi/model/pdf/model07-eng.pdf

ⁱ Taken from: Indig, D., Topp, L., Ross, B., Mamoon, H., Border, B., Kumar, S., & McNamara, M. (2010). *2009 NSW Inmate Health Survey: Key findings report*. Sydney: Justice Health.

As noted previously, CSC's offender population has been aging. The proportion of the

current population of newly-admitted offenders who were over aged 50 years at intake was 13.3% ($n=302$). This age trend is slightly less evident for Aboriginal offenders; only 9.3% ($n=28$) of offenders over the age of 50 years self-identified as being of Aboriginal descent. These age-related data are further presented with comparisons by Aboriginal ancestry in Appendix C. Given very low numbers of Aboriginal offenders in the sample who are over 50 years, this segment of the results should be interpreted with caution.

Table 4 presents the rates of self-reported health conditions for men offenders younger than, and older than, age 50 years. The age analysis indicates that chronic health conditions among Canadian men offenders are significantly higher in the group over 50 years old, with some exceptions (e.g., head injuries, asthma, and blood-borne diseases). Figure 2 illustrates the sharp increase of many chronic conditions after the age of 50 years.

Figure 2. *Prevalence of self-reported chronic health conditions across age groups, CSC Men Offenders, 2012.*

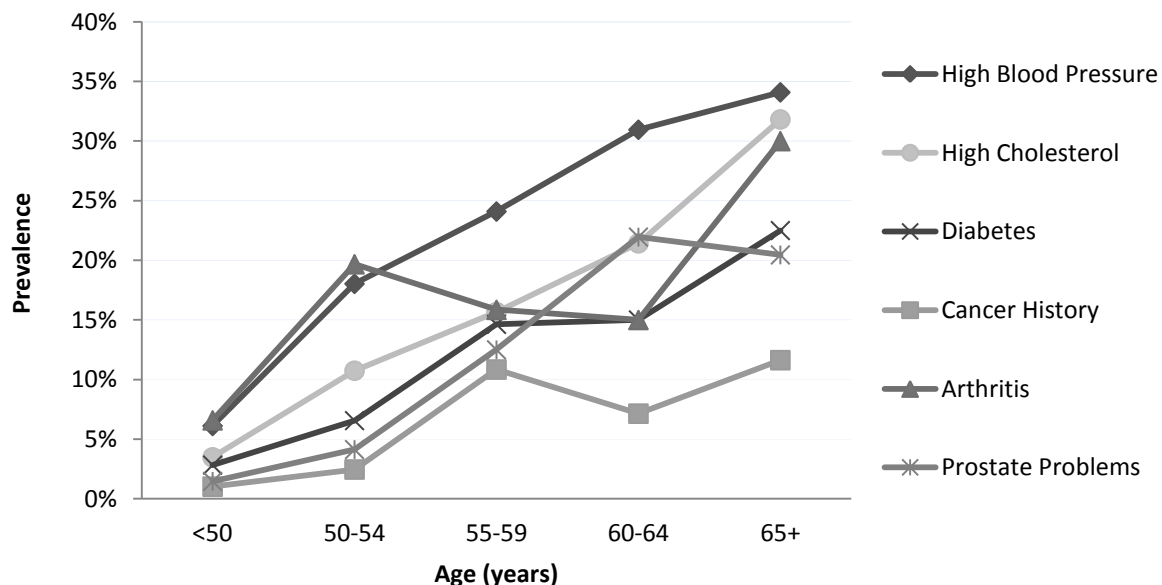


Table 4

Self-Reported Health Status of Newly-Admitted CSC Men Offenders by Age Group, 2012

Health Condition	<50 years (n = 1,970)		50 + years (n = 302)		V
	%	n	%	n	
Cancer history (any)	1.0	19	6.8	20	.15***
Central nervous system					
Head injury	34.6	648	30.7	90	.03
Seizure activity	4.0	75	5.8	17	.03
Spinal injury	2.5	47	3.1	9	.01
Cardiovascular system					
High blood pressure	6.1	114	23.8	70	.22***
High cholesterol	3.4	64	17.1	50	.21***
Arrhythmia	1.4	26	2.7	8	.04
Heart attack	1.3	24	6.8	20	.13***
Angina	0.6	12	6.1	18	.16***
Stroke	0.4	8	2.7	8	.09***
Respiratory system					
Asthma	15.1	284	11.6	34	.03
Bronchitis	2.9	55	2.7	8	.004
Pulmonary disease	1.2	23	5.1	15	.10***
Ulcers	3.0	56	4.4	13	.03
Prostate problems	1.4	26	11.8	34	.21***
Diabetes	2.9	54	11.9	34	.15***
Musculoskeletal system					
Back pain	18.0	332	27.5	79	.08***
Arthritis	6.6	122	19.2	55	.16***
Prosthesis	6.6	126	17.3	52	.14***
Walking difficulty	4.2	78	10.5	30	.10***
Osteoporosis	0.3	6	1.1	3	.04
Blood-borne viruses					
Hepatitis C	8.8	156	12.7	35	.05
HIV/AIDS	1.3	23	1.5	4	.005

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

^a BMI = Body Mass Index.

Table 4 continued

Lifestyle Risk Factor	<50 years (<i>n</i> = 1,970)		50 + years (<i>n</i> = 302)		<i>V</i>
	%	<i>n</i>	%	<i>n</i>	
Substance abuse	60.4	1,184	38.0	114	.15***
Employment problems	59.3	1,162	92	30.7	.20***
Drinks alcohol	53.1	917	50.1	136	.03
Overweight (BMI 25–29.9) ^a	37.5	589	42.3	99	.03
Obese (BMI 30+) ^a	26.1	410	28.2	66	.02
Ever inject drugs	21.3	368	17.6	47	.03
No physical exercise	19.2	321	33.1	86	.12***
Cigarette smoker	20.3	378	25.4	74	.04

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

^a BMI = Body Mass Index. ****p* < .001. ^{ns} = not significant.

An additional assessment of functional needs conducted at intake determines the number of offenders who require assistance with daily routines. As previously noted, this assessment is completed for offenders over 50 and for younger offenders who have a disability. These results presented in Table 5 indicate that fewer than 20 in the sample of 2,273 offenders (0.1%) required assistance with activities such as dressing, bathing, eating, or ambulation.

Table 5

*Newly-Admitted Men Offenders Over 50 Years or Younger Offenders with a Disability:
Assistance Required*

Requires assistance	Offenders Over 50 Years or with a Disability	
	%	<i>n</i>
Dressing	9.2	19
Physical ambulation	7.3	15
Bathing	6.3	13
Toileting	6.1	13
Food preparation	6.3	13
Eating	5.6	12
Housekeeping	5.3	11

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

Although there are exceptions to this pattern, Aboriginal Canadians generally report poorer health than non-Aboriginal Canadians (Gionet & Roshanafshar, 2013). Table 6 examines the prevalence of self-reported health conditions of newly-admitted offenders by Aboriginal ancestry. Rates are not significantly different for Aboriginal and non-Aboriginal offenders for most conditions with the exception of head injury and blood-borne viruses, with Aboriginal offenders reporting significantly higher rates. Rates of high cholesterol are actually lower among Aboriginal offenders. These unexpected differences may be due in part to the higher proportion of younger Aboriginal offenders in the sample relative to non-Aboriginal offenders. Although the sample is small for Aboriginal offenders over 50 years, as shown in Appendix C, we do see a relative increase in their self-reported health conditions with age, with a trend for arthritis and back pain to also be higher than among non-Aboriginal offenders; only rates of hepatitis C infection, however, are reliably higher.

Lifestyle issues may contribute to Aboriginal offenders' higher rates of blood-borne viruses and head injury. Rates of injection drug use, alcohol use and substance abuse in general are higher in Aboriginal offenders than among non-Aboriginal offenders. If the employment need domain can be seen as a proxy for socioeconomic status (SES), Aboriginal offenders are also dealing with lower incomes and the impact of poverty. On a more positive note, the data suggest that Aboriginal offenders may smoke less, and exercise more, than non-Aboriginal offenders.

Table 6

Self-Reported Health Status among Newly-Admitted Men Offenders by Aboriginal Ancestry

	Aboriginal (<i>n</i> = 496)		Other (<i>n</i> = 1,774)		<i>R</i> ²
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Average age (years)	32.8	10.1	36.3	12.4	.01***
Health Condition	%	<i>n</i>	%	<i>n</i>	<i>V</i>
Any cancer	0.9	4	2.0	35	.04*
Central nervous system					
Head injury	43.0	193	31.7	543	.10***
Seizure activity	5.1	23	4.0	68	.02*
Spinal injury	2.9	13	2.5	43	.01
Cardiovascular system					
High blood pressure	7.8	35	8.7	149	.01
Heart attack	2.0	9	2.0	35	.001
High cholesterol	2.4	11	6.0	103	.06***
Arrhythmia	1.3	6	1.6	28	.01
Angina	1.1	5	1.5	25	.01
Stroke	0.4	2	0.8	14	.02
Respiratory system					
Asthma	12.7	57	15.2	261	.03
Bronchitis	3.1	14	2.9	49	.01
Pulmonary disease	0.7	3	2.0	35	.04
Gastro intestinal					
Ulcers	2.7	12	3.3	57	.02
Reproductive system					
Prostate problems	2.5	11	2.9	49	.01
Endocrine system					
Diabetes	3.6	16	4.3	72	.01
Musculoskeletal system					
Back pain	16.4	73	20.0	338	.04
Arthritis	8.1	36	8.3	140	.003
Prosthesis	8.5	40	8.0	138	.01
Walking difficulty	4.1	18	5.3	89	.02
Osteoporosis	0.5	2	0.4	7	.002
Blood-borne viruses					
Hepatitis C	15.5	66	7.7	124	.11***
HIV/AIDS	2.4	10	1.1	17	.05*

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

p* < .05. *p* < .01. ****p* < .001.

Table 7

Lifestyle Risk Factors Related to Health Outcomes by Aboriginal Ancestry, Newly-Admitted Men CSC Offenders, 2012

Lifestyle Risk Factor	Aboriginal (<i>n</i> = 466)		Other (<i>n</i> = 1,774)		<i>V</i>
	%	<i>n</i>	%	<i>n</i>	
Drinks alcohol	62.1	257	49.8	786	.10***
Employment need ^a	72.1	356	50.9	898	.18***
Substance abuse ^a	84.0	415	50.1	884	.28***
Ever inject drugs	27.6	1114	18.9	299	.09**
Cigarette smoker	19.7	89	21.5	364	.02
No physical exercise	15.1	61	22.7	346	.08**
Overweight (BMI 25–29.9) ^b	37.4	134	38.3	553	.01
Obese (BMI 30+) ^b	30.5	109	25.3	366	.05

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

^a Moderate or high need on these domains in the Offender Intake Assessment.

^b BMI = Body Mass Index.

p* < .05. *p* < .01. ****p* < .001.

Given the role of social determinants and lifestyle in contributing to health status, we profiled chronic health conditions by some lifestyle risk factors (see Table 8). Notably, self-reported injection drug use appears to be associated with head injury, seizures, back pain, and arthritis, as well as with HIV and HCV infection. Rates of HCV are 10 times higher among this group than among non-injection drug users. Obesity appears to be associated with high blood pressure, angina, asthma, diabetes, and back pain. Smoking as assessed for this survey does not appear to be associated with any health condition in the sample of newly-admitted offenders.

Table 8

Self-Reported Health Status of Newly-Admitted Men Offenders in Higher Risk Groups, 2012

	Ever Inject Drugs		Substance Abuser ^a		Obese		Smoker	
	Yes <i>n</i> = 415	No <i>n</i> = 1,582	Yes <i>n</i> = 1,232	No <i>n</i> = 775	Yes <i>n</i> = 476	No <i>n</i> = 1,797	Yes <i>n</i> = 453	No <i>n</i> = 1,697
Any cancer	1.7	1.9	1.6	2.2	1.7	1.8	1.6	1.8
Central nervous								
Head injury	44.6	31.4	37.0	29.9	33.3	34.3	31.2	34.7
Seizures	8.3	3.2	5.7	2.3	5.3	4.0	4.9	4.0
Cardiovascular								
High blood pressure	8.3	8.2	6.8	11.0	18.1	5.8	6.3	8.9
Angina	1.2	1.5	1.0	2.0	4.3	0.6	1.1	1.5
Arrhythmia	2.2	1.5	1.6	1.9	1.9	1.5	0.9	1.8
Stroke	1.0	0.8	0.6	0.9	1.1	0.7	0.5	0.9
Respiratory								
Asthma	19.0	13.9	15.6	13.2	19.5	13.3	13.9	14.9
Gastro-intestinal								
Ulcers	5.4	2.7	3.5	3.1	3.6	3.1	2.2	3.5
Reproductive								
Prostate problems	3.2	2.7	2.2	4.2	3.2	2.7	2.3	2.9
Endocrine								
Diabetes	3.7	4.2	3.2	5.3	8.4	2.9	3.3	4.2
Musculoskeletal system								
Arthritis	11.6	7.8	8.7	7.1	10.9	7.6	9.4	7.7
Back pain	25.3	18.4	18.8	19.4	24.9	17.7	19.5	19.1
Blood-borne viruses								
HIV/AIDS	3.0	0.9	1.8	0.7	0.5	1.6	1.2	1.4
Hepatitis C	33.7	2.8	13.8	4.5	8.9	9.5	9.7	9.5

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

^a Moderate or high need on the Substance Abuse domain of the Offender Intake Assessment (OIA).

Discussion

This study provides an overview of the self-reported chronic physical health conditions of men offenders admitted to CSC institutions during a six-month period in 2012. Health conditions that are most frequently reported are head injury, asthma, and blood-borne viruses, particularly HCV.

Newly-admitted Aboriginal offenders are more than twice as likely as their non-Aboriginal counterparts to report HIV and HCV infections. Further research could examine the extent to which these conditions may be linked to lifestyle and risky behaviours and are, therefore, higher in certain subpopulations of men offenders. Preliminary analysis points to men offenders who report injection drug use as having higher rates of head injury and HIV and HCV infection. Aboriginal offenders report higher rates of substance abuse, particularly injection drug use. It should be noted that the presence of serious health conditions for more specific subsamples of Aboriginal offenders may differ. The group of Aboriginal offenders in this study, for example, was not disaggregated by First Nations, Métis or Inuit status, or whether they lived on or off reserves. There is evidence from a recent Statistics Canada report based on the CCHS (Gionet & Roshanafshar, 2013) that when estimates of health conditions are analysed by First Nations and Métis ancestry, there are higher rates of diabetes relative to the general Canadian population for First Nations people only. Rates of high blood pressure were actually lower for Métis respondents relative to the rest of the Canadian population.

Older offenders (over 50 years) now comprise over 21% of CSC's incarcerated population (23% of non-Aboriginal men). In the present study, they report generally higher rates of physical health conditions than younger offenders. However, the most frequently reported conditions (head injury, asthma and blood-borne viruses) are not significantly different between older and younger offenders. Aboriginal offenders are younger on average and they have a much lower representation among offenders over 50 (9.3%). This may explain why we do not see an expected difference in health status between Aboriginal and non-Aboriginal offenders for many conditions. Future research may want to explore this relationship further, controlling for age.

Fewer men offenders (21%) reported that they smoke compared to the Canadian general population, and smoking was not related to any chronic health condition. This lack of relationship may be related to the relatively young age of the sample or the ambiguity of the

question on smoking on the forms. It is possible that some offenders were responding to their current smoking status, which may reflect federal and provincial/territorial correctional policies prohibiting smoking in the institutions, not their smoking status prior to incarceration.

One in five incoming offenders is obese and obese offenders in this sample had higher rates of high blood pressure, angina, asthma, and diabetes than those who were not obese. This proportion is similar to that observed in the general Canadian population with similar associated chronic conditions. Lower SES, reflected in the current study in high rates of employment problems, is also associated with poorer health (Public Health Agency of Canada, 2003). In addition, the health status of the sample and of the general Canadian population may not adequately be reflected for marginalized individuals whose health conditions are undetected given their potentially more limited access to medical services.

The rates of self-reported chronic health conditions among newly-admitted Canadian federal offenders presented in the current study do not appear to be higher than those reported for prisoners in most other countries. Citing the Bureau of Justice Statistics, Fazel and Baillargeon (2011) found that reported rates of HIV in jails and prisons in the United States was approximately 1.5% in 2007-2008 and they cite estimates of prevalence of HCV from prison systems in individual states in the US ranging from 23% to 34%. Reported rates of high blood pressure and asthma are higher in the US prisons than in this CSC population; rates of diabetes appear to be comparable. The study of Australian offenders in New South Wales prisons found much higher rates of self-reported health conditions than in our Canadian federal sample (Indig et al., 2011).

A limitation of the present study is that only BMI and vital signs were objectively measured by health care professionals; all other data are provided through the offenders' self-report. However, this is similar to the methodology of the CCHS that collects data through a questionnaire of self-reported health conditions and lifestyle factors. There is reason to believe that the self-reported rates of blood-borne viruses, in particular, may represent an under-estimation of the true prevalence of newly-admitted federal offenders. CSC currently offers testing and treatment to all consenting offenders within 14 days of intake. The latest report for the 2007-2008 period reported a 58% uptake of testing for HIV at intake and found that 1.7% of these offenders tested positive (CSC, 2012). Given that the screening process may detect previously undiagnosed infection among new admissions, the self-reported data reported in the

current report may be an underestimate of the true prevalence. Alternatively, offenders from higher risk groups, with reason to be concerned about their health status, may be more likely to agree to testing, thus over-estimating rates in the general offender population. Another study using self-reported rates of blood-borne viruses obtained from the National Inmate Infectious Diseases and Risk Behaviours Survey (NIIDRBS), a self-administered questionnaire completed by a representative sample of Canadian federal inmates ($n = 3,370$), provided a higher estimate of the prevalence of HIV but a comparable rate for HCV compared to figures obtained through systematic infectious disease surveillance (Zakaria, Thompson, Jarvis, & Borgotta, 2010). It is not clear therefore whether the bias introduced by self-report may over- or under-inflate the true prevalence of blood-borne viruses among newly-admitted inmates. It is important to note that both the NIIDRBS and routine infectious disease surveillance agree that virtually all of the offenders were infected prior to their current incarceration (Zakaria et al., 2010).

This study reinforces the importance of implementing a comprehensive surveillance of federal offenders' health status. The long-term goal would be to create an electronic medical record that would provide case management capacity as well as administrative data on the burden of chronic health conditions to better estimate costs and allocate resources. The current study with incarcerated men offenders provides benchmarks from which trends in prevalence of chronic health conditions in CSC at intake can be monitored. A second report on newly-admitted women offenders will also be completed when sufficient data are available.

Conclusions

Of the chronic health conditions assessed in this study, head injury, asthma, HIV/AIDS, and HCV are the most prevalent. Asthma and blood-borne viruses are more prevalent among federal men offenders at intake than in the general population of Canadian men. We do not have reliable population estimates to compare rates of head injury among adult Canadians to the offender population, but it is possible that the rates among offenders are higher.

CSC will continue to address infectious diseases by education, and offering testing and treatment to offenders who are infected. Efforts to effectively reduce drug and alcohol abuse have previously been shown to be successful in reducing general and violent recidivism related to substance abuse for both Aboriginal and non-Aboriginal offenders (CSC, 2009; Usher & Stewart, 2012), and may also have a beneficial effect in preventing chronic health conditions.

Aging offenders have much higher rates of health conditions than younger offenders, suggesting that it may be important to examine the overall management of health care services for this group of offenders. Health promotion and preventive health service provision for younger offenders may assist in the prevention of serious chronic health conditions.

References

- Aday, R. H., & Krabill, J. J. (2013). "Older and geriatric offenders: Critical issues for the 21st century". in L. Gideon (Ed.), *Special needs offenders in correctional institutions*. Thousand Oaks, CA: Sage Inc.
- Bell, A., & Crutcher, N. (2002). Health issues for Aboriginal offenders. *Forum on Correctional Research*, 14, 20-23.
- Brown, S. L., & Motiuk, L. L. (2005). *The Dynamic Factors Identification and Analysis (DFIA) component of the Offender Intake Assessment (OIA) process: A meta-analytic, psychometric and consultative review* (Research report R-164). Ottawa, ON: Correctional Service Canada.
- Canada. Royal Commission on Aboriginal Peoples (1996). *People to people, nation to nation: Highlights from the report of the Royal Commission on Aboriginal Peoples* (Cat. no. Z1-1991/1-6E). Ottawa, ON: Supply and Services Canada.
- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed.). Hillside, NJ: Lawrence Erlbaum.
- Correctional Service Canada (2004). A health care needs assessment of federal inmates in Canada. *Canadian Journal of Public Health*, 95, supplement 1, 1-68.
- Correctional Service Canada (undated). *Infectious disease surveillance in Canadian federal penitentiaries: 2008-2009 pre-release report*. Ottawa: Health Services Sector. Retrieved from <http://www.csc-scc.gc.ca/text/pblct/infdsclf-2007-08/index-eng.shtml>
- Correctional Service of Canada (2009). *Evaluation report: Correctional Service Canada's correctional programs*. Ottawa, ON: Author.
- Correctional Service Canada (2011a). *Commissioner's Directive (CD) Number 800: Health Services*. Retrieved from <http://www.csc-scc.gc.ca/text/plcy/cdshtm/800-cde-eng.shtml>.
- Correctional Service Canada (2011b). *Management of viral hepatitis guidelines*. Ottawa, ON: Health Services, Author.
- Correctional Service Canada (2012). [Offender Management System data retrieved November 23, 2012]. Unpublished raw data.
- Corrections and Conditional Release Act* (S.C. 1992, c. 20).
- Colsher, P. L., Wallace, R. B., Loeffelholz, P. L., & Sales, M. (1992). Health status of older male prisoners: A comprehensive survey. *American Journal of Public Health* 82, 881-886.

- Fazel, S., & Baillargeon, J. (2011). The health of prisoners. *Lancet*, 377(9769), 956–65. doi : 10.1016/S0140-6736(10)61053-7
- Ferguson, C. J. (2009). An effect size primer: A guide for clinicians and researchers. *Professional Psychology: Research and Practice*, 40(5), 532–538. doi: 10.1037/a0015808
- Field, A., & Miles, J. (2010). *Discovering statistics using SAS*. London: Sage.
- Gionet, L., & Roshanafshar, S. (2013). *Health at a Glance: Select health indicators of First Nations people living off reserve, Métis and Inuit*. Statistics Canada Catalogue no. 82-624-X. Retrieved from <http://www.statcan.gc.ca/pub/82-624-x/2013001/article/11763-eng.htm>
- Gracey, M., & King, M. (2009). Indigenous health part 1: Determinants and disease patterns. *Lancet*, 374(9683), 65-75. doi: 10.1016/S0140-6736(09)60914-4
- Hamilton, N., & Bhatti, T. (1996). *Population health promotion: An integrated model of population health and health promotion*. Ottawa, ON: Health Canada.
- Harmon, K. (2012, February). Brain injury rate 7 times greater among U.S. prisoners. *Scientific American*. Retrieved from <http://www.scientificamerican.com/article.cfm?id=traumatic-brain-injury-prison>
- Harris, F., Hek, G., & Condon, L. (2007). Health needs of prisoners in England and Wales: The implications for prison healthcare of gender, age and ethnicity. *Health and Social Care in the Community*, 15, 56-66.
- Herbert, K., Plugge, E., Foster, C., & Doll, H. (2012). Prevalence of risk factors for non-communicable diseases in prison populations worldwide: A systematic review. *Lancet*, 379(9830), 1975-1982. doi: 10.1016/S0140-6736(12)60319-5
- Indig, D., Topp, L., Ross, B., Mamoon, H., Border, B., Kumar, S., & McNamara, M. (2010). *2009 NSW Inmate Health Survey: Key findings report*. Sydney: Justice Health.
- King, M. (2010). Chronic diseases and mortality in Canadian Aboriginal peoples: Learning from the knowledge. *Chronic Diseases in Canada*, 31, 2-3.
- Merianos, D. E., Marquart, J. W., Damphousse, K., & Herbert, J. L. (1997). From the outside in: Using public health data to make inferences about older inmates. *Crime & Delinquency*, 43(3), 298-313. doi: 10.1177/0011128797043003004
- National Commission on Correctional Health Care (2004). *The health status of soon-to-be-released inmates: A report to Congress* (Volume 1). Document No.: 189735. Chicago, IL: Author.

- Potter, E., Cashin, A. J., Chenoweth, L., & Jeon, Y. H. (2007). The healthcare of older inmates in the correctional setting. *International Journal of Prisoner Health*, 3, 204-213. doi: 10.1080/17449200701520115
- Public Health Agency of Canada (2003). *What makes Canadians healthy or unhealthy?* Retrieved from <http://www.phac-aspc.gc.ca/ph-sp/determinants/determinants-eng.php>
- Public Health Agency of Canada (2012). *Report from the Canadian Chronic Disease Surveillance System*. Retrieved from <http://www.phac-aspc.gc.ca/cphorsphc-respcacsp/2012/chap-1-eng.php>
- Public Safety (2011). *Corrections and conditional release statistical overview* (Cat. No.: PS1-3/2011E-PDF). Ottawa, ON: Public Works and Government Services Canada. Retrieved from <http://www.publicsafety.gc.ca/res/cor/rep/2011-ccrso-eng.aspx#c5>
- Robert, D. (2004). Understanding health care utilization in custody: Situation of Canadian penitentiaries. *Journal of Correctional Health Care*, 10, 239-256. doi: 10.1177/107834580301000208
- Smith J. M., Bouchard, F., Sierolawski, A., & Ellis, E. (2007, September). Screening for HIV and HCV among new admissions to CSC. Canadian Public Health Association Annual Conference, Ottawa, ON.
- Statistics Canada (2011). *Population data 2011 census*. Retrieved from <http://www12.statcan.gc.ca/census-recensement/2011/as-sa/98-310-x/98-310-x2011001-eng.cfm>.
- Statistics Canada (2013). *Data from the Canadian Community Health Survey*. Retrieved from <http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=1050513&paSer=&pattern=&stByVal=1&p1=1&p2=31&tabMode=dataTable&csid=>
- United Nations (1990). *Basic Principles for the Treatment of Prisoners; General Assembly resolution 45/111*. New York: United Nations. Retrieved from <http://www2.ohchr.org/english/law/pdf/basicprinciples.pdf>.
- Usher, A., & Stewart, L. A. (2012). The effectiveness of correctional programs with diverse offenders: A meta-analytic study. *International Journal of Offender Therapy and Comparative Criminology*. doi: 10.1177/0306624X12469507
- Wilper, A. P., Woolhandler, S., Boyd, J. W., et al. (2009). The health and health care of US prisoners: Results of a nationwide survey. *American Journal of Public Health*, 99, 666–672.
- World Health Organization. (2003). *Social determinants of health: The solid facts* (2nd ed.) Denmark: World Health Organization.

Zakaria, D., Thompson, J. M., & Borgatta, F. (2010). *Rates of reported sexually transmitted infections since admission to Canadian federal prison and associated incarceration characteristics and sexual risk-behaviours* (Research Report R-196). Ottawa, ON: Correctional Service of Canada.

Zakaria, D., Thompson, J. M., Jarvis, A., & Borgatta, F. (2010). *Summary of emerging findings from the 2007 National Inmate Infectious Diseases and Risk-Behaviours Survey* (Research Report R-211). Ottawa, ON: Correctional Service of Canada.

Appendices

Appendix A: Percentage of Federal Inmates by Age Ranges over Four Time Periods

Percentage of Federal Inmates by Age Ranges over Four Time Periods

	1993 ^a	1996 ^b	2002 ^c	2012 ^d
	%	%	%	%
Less than 50	91.6	90.7	86.1	79.0
50-54	4.0	4.3	6.2	8.6
55-59	2.0	2.5	4.0	5.5
60-64	1.5	1.3	2.0	3.4
65 plus	.9	1.1	1.7	3.5
Total > 50	8.4	9.3	13.9	21.0

Note. ^{abc} reported in CSC (2004). ^d OMS data extracted November 18, 2012.

Appendix B: Self-Reported Physical Health Status of Incoming Men Offenders by Region

Self-Reported Physical Health Status of Incoming Men Offenders by Region

Condition	Atlantic N=418		Quebec N=464		Ontario N=625		Prairies N=697		Pacific N=229		Total N = 2,273	
	%	n	%	n	%	n	%	n	%	n	%	n
Any cancer	1.9	7	2.9	12	1.3	7	1.0	6	3.4	7	1.8	39
Central nervous system												
Head injury	48.7	183	11.5	48	34.1	184	38.1	238	40.9	85	34.1	738
Seizure activity	6.4	24	1.7	7	5.2	28	3.4	23	4.8	10	4.3	92
Spinal injury	3.2	12	0.7	3	4.1	22	2.1	13	2.9	6	2.6	56
Cardiovascular system												
High blood pressure	10.4	39	7.7	32	9.1	49	7.3	46	8.7	18	8.5	184
Heart attack	1.9	7	2.2	9	2.4	13	1.4	9	2.9	6	2.0	44
High cholesterol	5.6	21	9.6	40	5.0	27	2.5	16	4.8	10	5.3	114
Angina	2.4	9	1.4	6	1.5	8	0.8	5	1.0	2	1.4	30
Stroke	0.8	3	1.0	4	0.4	2	0.6	4	1.4	3	0.7	16
Arrhythmia	0.8	3	0.7	3	3.5	19	1.0	6	1.4	3	1.6	34
Respiratory system												
Asthma	15.7	59	7.9	33	20.2	109	14.2	89	13.5	28	14.7	318
Bronchitis	4.5	17	1.2	5	2.6	14	3.4	21	2.9	6	2.9	63
Pulmonary disease	0.3	1	1.2	5	3.9	21	1.1	7	1.9	4	1.8	38
Gastro intestinal												
Ulcers	3.7	14	1.7	7	3.0	16	3.7	23	4.3	9	3.2	69
Reproductive system												
Prostate problems	4.3	16	4.1	17	1.7	9	1.6	10	3.9	8	2.8	60
Endocrine system												
Diabetes	4.3	16	3.6	14	6.3	34	3.2	20	1.9	4	4.2	88
Musculoskeletal system												
Walking difficulty	8.5	32	2.4	11	5.6	30	2.9	18	8.2	17	5.1	108
Prosthesis	14.1	54	2.1	9	8.2	44	5.7	37	16.0	34	7.7	180
Arthritis	16.8	63	1.0	4	7.0	38	7.5	47	12.0	25	8.3	177
Osteoporosis	0.8	2	0.3	1	0.6	3	0.2	1	0.5	1	0.4	9
Back pain	30.6	115	8.3	32	20.1	112	17.7	110	20.2	42	19.3	411
Blood-borne viruses												
HIV/AIDS	0.0	0	1.0	4	1.5	8	1.7	9	3.0	6	1.3	27
Hepatitis C	8.7	32	4.3	17	10.6	57	9.3	50	17.2	35	9.4	191
Lifestyle Factors												
Drinks alcohol	60.5	217	39.7	153	45.5	238	61.6	330	58.0	112	52.6	112
Substance abuser	60.7	193	54.4	258	50.5	244	71.6	436	82.1	101	61.4	1,232

Appendix B continued

	Atlantic <i>N</i> =418		Quebec <i>N</i> =464		Ontario <i>N</i> =625		Prairies <i>N</i> =697		Pacific <i>N</i> =229		Total <i>N</i> = 2,273	
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>
Ever inject drugs	23.9	86	12.8	49	17.8	93	20.0	108	41.2	79	20.8	415
Cigarette smoker	25.0	95	43.4	185	9.4	49	16.0	99	12.3	25	21.1	453
No physical exercise	21.4	76	30.0	115	20.5	106	16.7	81	15.0	29	21.1	407
Overweight (BMI 25–29.9)	33.9	131	26.0	136	32.1	177	34.4	233	33.8	72	29.8	677
Obese (BMI 30+)	29.0	112	19.2	86	22.1	122	23.0	156	37.6	80	20.9	476

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

Appendix C: Physical Health Conditions by Aboriginal Ancestry and Age Groups

Health Conditions by Aboriginal Ancestry and Age Groups

Health condition	<50 years (n = 1,970)					50 + years (n = 302)				
	Aboriginal (n = 468)		Other (n = 1,500)		V	Aboriginal (n = 28)		Other (n = 273)		V
	%	n	%	n		%	n	%	n	
Any cancer	0.7	3	1.1	16	.02	3.6	1	7.2	19	.04
Central nervous system ^a										
Head injury	43.4	183	32.1	464	.10***	37.0	10	29.8	79	.05
Seizure activity	5.2	22	3.6	52	.04	3.6	1	6.0	16	.03
Spinal injury	2.6	11	2.5	36	.00	7.1	2	2.6	7	.08
Cardiovascular										
High blood pressure	6.4	27	6.0	87	.01	28.6	8	23.4	652	.03
Heart attack	1.7	7	1.2	17	.02	7.1	2	6.8	18	.00
High cholesterol	2.1	9	3.8	55	.04	7.1	2	18.2	48	.09
Angina	1.0	4	0.6	8	.02	3.6	1	6.4	17	.04
Stroke	0.2	1	0.5	7	.02	3.6	1	2.6	7	.02
Arrhythmia	1.2	5	1.5	21	.01	3.6	1	2.6	7	.02
Respiratory system										
Asthma	12.8	54	15.8	230	.04	10.7	3	11.7	31	.01
Bronchitis	3.3	14	2.8	41	.01	0.0	0	3.0	8	.05
Pulmonary disease	0.5	2	1.5	21	.04	3.6	1	5.3	14	.02
Gastro intestinal										
Ulcers	2.4	10	3.2	46	.02	7.1	2	4.2	11	.04
Reproductive										
Prostate	2.4	10	1.1	16	.05	3.6	1	12.7	32	.08
Endocrine system										
Diabetes	3.4	14	2.8	40	.01	7.1	2	12.4	32	.05
Musculoskeletal										
Walking difficulty	3.6	15	4.3	62	.02	10.7	3	10.5	27	.00
Prosthesis	8.1	36	6.2	90	.03	14.3	4	17.7	48	.03
Arthritis	6.5	27	6.6	94	.00	32.1	9	17.8	46	.11
Osteoporosis	0.5	2	0.3	4	.01	0.0	0	1.2	3	.03
Back pain	14.9	62	18.9	270	.04	39.3	11	26.4	68	.09
Blood-borne viruses										
HIV/AIDS	2.3	9	1.0	14	.05	3.6	1	1.2	3	.06
Hepatitis C	14.3	57	7.2	98	.10***	32.1	9	10.6	26	.20**

Appendix C continued

	<50 years (<i>n</i> = 1,970)					50 + years (<i>n</i> = 302)				
	Aboriginal (<i>n</i> = 468)		Other (<i>n</i> = 1,500)		<i>V</i>	Aboriginal (<i>n</i> = 28)		Other (<i>n</i> = 273)		<i>V</i>
	%	<i>n</i>	%	<i>n</i>		%	<i>n</i>	%	<i>n</i>	
Lifestyle										
Drinks alcohol	62.8	243	50.4	674	.10***	51.9	14	49.2	118	.02
Ever inject drugs	27.5	106	19.5	261	.08**	29.6	8	15.9	38	.11
Cigarette smoker	19.9	84	20.5	294	.007	17.9	5	26.3	69	.06
No physical exercise	14.6	55	20.6	266	.06*	23.1	6	34.2	80	.07

Note. Percentages represent numbers with valid data for each item; numbers vary due to missing data.

p* < .05. *p* < .01. ****p* < .001.

Appendix D: Employment and Substance Abuse Need Domain Indicators

Employment	Substance Abuse
<ul style="list-style-type: none"> • Has less than grade 10 or equivalent • Has less than high school diploma or equivalent • Employment history is absent? • Unemployed at time of arrest? • Job history has been unstable? • Marketable job skills obtained through experience are limited? • Job skills obtained through formal training are limited? • Dissatisfied with job skills? • Co-operative work skills are limited? • Belief in oneself to improve employability is low? • Work ethic can be described as poor? • Has previously been referred to programs addressing deficit(s) 	<ul style="list-style-type: none"> • Early age alcohol use? • Frequently engages in binge drinking? • Has combined the use of alcohol and drugs? • Alcohol use interferes with employment? • Alcohol use interferes with interpersonal relationships? • Alcohol use interferes with physical or emotional well-being? • Excessive alcohol use is part of the offender's lifestyle? • Early age drug use? • Has gone on drug-taking bouts or binges? • Has combined the use of different drugs? • Drug use interferes with employment? • Drug use interferes with interpersonal relationships? • Drug use interferes with physical or emotional well-being? • Regular drug use is part of the offender's lifestyle? • Alcohol or drug use has resulted in law violations? • Becomes violent when drinking or using drugs? • Alcohol and/or drugs is part of the offence cycle? • Has previously been referred to programs addressing deficit(s)

Appendix E: Questions Used from Each of the 1244 Series Forms

Intake Health Status Assessment: Section I

Current Medical Health		
Draining Wound	<input type="checkbox"/> No	<input type="checkbox"/> Yes
Current Smoker	<input type="checkbox"/> No	<input type="checkbox"/> Yes
If yes, Discussed smoking ban and cessation option:		
<input type="checkbox"/>		
Alerts		
Prosthesis Required	<input type="checkbox"/> No	<input type="checkbox"/> Yes
Pregnant	<input type="checkbox"/> No	<input type="checkbox"/> Yes
If yes, Due Date:		

Intake Health Status Assessment: Section II

Anthropometrics and Current Vital Signs			
Height:	(m)	Weight:	(kg)
Cancer History			
Have you ever had cancer?		<input type="checkbox"/> No	<input type="checkbox"/> Yes
If yes, specify:			
Central Nervous System			
Do you have or have ever had problems with:			
Head Injury	(specify):		
Seizure Activity	(specify) :		
Spinal Cord Injury	(specify) :		
Cardiovascular System			
Do you have or have ever had problems with:			
High Blood Pressure	(specify) :		
Heart Attack	(specify) :		
Elevated Cholesterol	(specify) :		
Angina	(specify) :		
Stroke	(specify) :		
Other:	Arrhythmia		
Otolaryngeal System, Respiratory System and Eyes			
Do you have or have ever had problems with:			
Asthma	(specify) :		
Chronic Bronchitis	(specify) :		
Chronic Obstructive	(specify) :		
Pulmonary Disease			

Gastro Intestinal		
A) Stomach/Oesophagus		
Do you have or have ever had problems with:		
Ulcers	(specify) :	
Urinary/Reproductive Systems		
A) Male Health Issues		
Prostate Problems?	<input type="checkbox"/> No	<input type="checkbox"/> Yes
If yes, specify:		
B) Female Health Issues		
Previous Reproductible Problems		
Cervical/Uterine/Ovarian Cancer		
Endocrine System		
Do you have or have ever had problems with:		
Diabetes	(specify):	
Musculoskeletal System		
Do you have or have ever had problems with:		
Difficulty Walking	(specify):	
Arthritis/Rheumatism	(specify):	
Osteoporosis	(specify):	
Back Pain	(specify):	
Blood/Immune Systems		
Do you have or have ever had problems with:		
Hodgkin's Disease	(specify):	
Leukemia	(specify):	

Health Status Admission Assessment: For Those Aged Fifty and Older and/or Those with Self Care Needs

Activities of Daily Living	
Eating	
<input type="checkbox"/>	Eats without assistance
<input type="checkbox"/>	Eats without assistance but requires special devices
<input type="checkbox"/>	Requires assistance (specify):
Toileting	
<input type="checkbox"/>	Needs no assistance. Is independent with or without equipment
<input type="checkbox"/>	Requires someone to bring equipment or to assist to bathroom
<input type="checkbox"/>	Equipment required (specify):
<input type="checkbox"/>	Assistant required (specify):
Transferring	
<input type="checkbox"/>	Needs no assistance. Is independent with or without equipment
<input type="checkbox"/>	Depends on equipment and needs another person to position wheelchair, walker, etc. but otherwise manages transfer alone
<input type="checkbox"/>	Equipment required (specify):
<input type="checkbox"/>	Assistance required (specify):
Dressing	
<input type="checkbox"/>	Dresses without assistance; may use special devices
<input type="checkbox"/>	Needs help assembling clothes or equipment
<input type="checkbox"/>	Special devices required (specify):
Bathing	
<input type="checkbox"/>	Bathes self (tub, shower, sponge) without help
<input type="checkbox"/>	Bathes self with help getting in and out of tub/shower
<input type="checkbox"/>	Requires reminding to bathe
<input type="checkbox"/>	Assistance required (specify):
Physical Ambulation	
<input type="checkbox"/>	Walks around all areas of the prison, including stairs, without any assistive device
<input type="checkbox"/>	Walks around all areas of the prison but is unable to climb stairs (for any reason), does not require an assistive device
<input type="checkbox"/>	Walks independently for short distances only i.e., can ambulate in own living area but requires wheelchair or vehicle to go outside of living unit
<input type="checkbox"/>	Requires assistance:
<input type="checkbox"/>	Walking with another person
<input type="checkbox"/>	Wheelchair, independent
<input type="checkbox"/>	Wheelchair, not independent
<input type="checkbox"/>	Cane
<input type="checkbox"/>	Walker

Food Preparation	
<input type="checkbox"/>	Able to prepare own meals (could manage in environment with small group feeding)
<input type="checkbox"/>	Able to prepare own meals but requires assistive devices (structural changes to kitchen, personal assistive devices)
<input type="checkbox"/>	Needs to have meals prepared (specify):
Housekeeping	
<input type="checkbox"/>	Able to maintain own cell
<input type="checkbox"/>	Able to do light tasks only (sweeping, washing dishes)
<input type="checkbox"/>	Unable to maintain an acceptable level of cleanliness of environment (specify):
Laundry	
<input type="checkbox"/>	Does personal laundry completely
<input type="checkbox"/>	Must have laundry done for him/her (specify):
Communication	
<input type="checkbox"/>	Communication is unimpaired
<input type="checkbox"/>	Impaired communication (specify):
	Impaired communication is due to:
<input type="checkbox"/>	Physical impairment
<input type="checkbox"/>	Language barrier
<input type="checkbox"/>	Cognitive impairment

Intake Health Status Assessment: Infectious Disease Screening (1244-ID)

Screening History			
		Outcome	
		Positive	Negative
<input type="checkbox"/>	HIV/AIDS	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Hepatitis C	<input type="checkbox"/>	<input type="checkbox"/>
Lifestyle			
Yes	No	Unknown	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do you do any physical exercise?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do you drink alcohol?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have you ever injected drugs (including steroids)?