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ESTIMATING INSTITUTIONALIZATION AND HOMELESSNESS FOR STATUS FIRST NATIONS IN CANADA: A METHOD AND IMPLICATIONS

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Abstract

We propose an accessible and repeatable method for calculating rates of institutionalization and homelessness among Status First Nations in Canada by age and gender. We show that this calculation is possible through combining Census and administrative data and could be computed at regular intervals. We estimate extremely high rates of institutionalization and homelessness, especially among young Status men. Averaging over 2001 and 2006, an upper bound estimate of 12% of the Status male population was either institutionalized or homeless. We show that this high rate of institutionalization and homelessness results in a distortion in the male-female gender ratio which may have long-run implications for the continued legal existence of Status First Nations in Canada.

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Estimating Institutionalization and Homelessness for Status First Nations in Canada: A Method and Implications

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Abstract

We propose an accessible and repeatable method for calculating rates of institutionalization and homelessness among Status First Nations in Canada by age and gender. We show that this calculation is possible through combining Census and administrative data and could be computed at regular intervals. We estimate extremely high rates of institutionalization and homelessness, especially among young Status men. Averaging over 2001 and 2006, an upper bound estimate of 12% of the Status male population was either institutionalized or homeless. We show that this high rate of institutionalization and homelessness results in a distortion in the male-female gender ratio which may have long-run implications for the continued legal existence of Status First Nations in Canada.

There is a broadly recognized need to further develop indicators of Indigenous well-being, and in Canada there have been specific calls for a more complete set of well-being measures that can be assessed over time (Truth and Reconciliation Commission of Canada, 2015). There have also been independent calls for a more complete and consistent counting of the homeless (Belanger et al., 2013; Schiff et al., 2016) and institutionalized population (Millar and Owusu-Bempah, 2011).[1] In this work we propose that currently existing national census data and administrative data from Indigenous and Northern Affairs Canada can be used to construct national level estimates of the rate of homelessness and institutionalization among the largest Indigenous population in Canada – Status First Nations – by gender and age.[2] While our proposed measure cannot separately identity institutionalization and homelessness, it is easily accessible and repeatable, and represents a meaningful measure of social marginalization.

Our method provides the first and most comprehensive estimates of institutionalization and homelessness of Status First Nations in Canada by gender and age and may be useful for Indigenous people in other parts of the world.[3] Previous work on institutionalization and homelessness has relied on the use of specialized surveys in large, urban settings and/or focused on certain types of institutionalization or homelessness.[4] Measures of institutionalization and/or homelessness have also largely been flow-based. While targeted, flow-based measures of institutionalization and homelessness are likely more useful than our numbers in specific contexts, our method has several advantages. First, it relies on pre-existing data sets that will be maintained into the foreseeable future so it is relatively inexpensive and repeatable; second, it is a broadly inclusive measure of

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[1]Homeless and institutionalized population includes individuals in all forms of emergency shelters, individuals in group transitional housing, the unsheltered and all institutionalized individuals such as those who are in prison, jail, group homes or recovery facilities.

[2]Status First Nations are individuals who are governed under the *Indian Act*. "Indian Status" is determined through genetic relation to the first peoples classified by the federal government as "Indians."

[3]While the details of the method we propose here is specific to the Canada, it may prove useful any where Indigenous people are identifiable and systematically under-counted in official Censuses but are identifiable through other official or administrative records at the community, village or tribal level. For instance, India has explicit laws and programs for the Scheduled Tribes and Castes, Australia has programs for Aboriginal peoples and New Zealand for Maori peoples.

[4]See for example Belanger et al. (2013); Canada (2016); Schiff et al. (2016)

social marginalization available at the national level by gender and age; and third it has the ability to identify national-level demographic patterns and trends that more specific studies may miss. Some of these patterns and trends have important, and pressing, policy implications.

We find that as much as 12 percent of the Status First Nations population is either homeless or institutionalized at the time of the Census: this amounts to nearly 79,000 people on average between 2001 and 2006. While the bounds on this number are reasonably large, all our estimates suggest that the rates of institutionalization and homelessness are especially high for Status First Nations men between the ages of 25 and 45. In this age range, there are almost twice the number of Status men as Status women who are homeless or institutionalized. While the fact that young adult men suffer from homelessness and institutionalization more than young adult women may be unsurprising, these numbers are so large that they result in a meaningful imbalance in the number of Status First Nations men stably available for child-rearing and employment during prime family formation years.

Similar imbalances in the number of men to the number of women (the gender ratio) have been seen in the African American population in the United Status and this imbalance been shown to have significant implications for the well-being and choices of African American women (Angrist, 2002; Charles and Luoh, 2010; Chiappori, Fortin, and Lacroix., 2002; Mechoulan, 2011). Given the similar magnitude of the gender imbalance in the Status First Nations population, it may have the same implications for the well-being and choices of Status First Nations women. The fact that there are fewer Status First Nations men means Status First Nations women have few options for partners, weakening their bargaining power in relationships and encouraging their partnering with non-Status men. While exogamy in and of itself is not an issue if there is no preference for endogamy, out-marriage among Status First Nations women has significant legal and practical implications. In fact the continued existence of "Indians" as a legally defined population in Canada may be called into question. Given the current legal and social structures that

define "Indian Status" in Canada, a reduction in children by "Status Indian" males and females may reduce the "Status" population into the future.[5] At the current rates of out-marriage, the population eligible for First Nations Indian Status, and the associated rights and benefits, may cease to exist within five generations (Clatworthy, 2001, p 42). Our findings suggest that the social and legal structures in place that generate the high rates of institutionalization and homelessness among Status First Nations, may lead to their eventual disappearance.

In the next section, we describe the Canadian context and discuss the institutions that generate the data we use. In Section 2 we discuss the data itself. In Section 3 we discuss our method for estimating the number of Status women and men affected by institutionalization and homelessness. In Section 4 we present our main results and in Section 5 we expand upon these, discuss their implications, and conclude.

1 Background: The Canadian Context, Registered First Nations Indian Status, and the Indian Register

As of 2011, the Status First Nations Population in Canada was approximately 637,660 which represents roughly 75 percent of the total North American Indians in the country and two percent of the total Canadian population (Statistics Canada, 2013a).[6] There are two other legally defined "Aboriginal" peoples in Canada under *The Constitution Act 1982*: the Inuit and the Métis. While there are legal infrastructures surrounding these groups as well, to our knowledge there is nothing as systematic and pervasive as

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[5]Anderson and Saenz (1994); Hwang, Saenz, and Aguirre (1997); Pagnini and Morgan (1990) show the effects of the gender ratio on out-marriage and Angrist (2002); Charles and Luoh (2010); Chiappori, Fortin, and Lacroix. (2002); Mechoulan (2011) show the gender ratio and male incarceration rates have significant effects on family formation and female well-being.

[6]The more accepted term in Canada is First Nations but we use the terms consistent with legislation and the survey sources. Indigenous Canadians may not meet the legal requirement for Status based on ancestry yet still either ethnically, culturally or politically identify as First Nations.

that governing Status First Nations (Feir and Hancock, 2016). While ideally we would construct this measure for these groups as well, we are unable to do so using the method we propose here.

The legal definition of Status Indian confers certain rights and benefits. For example, First Nations Indian Status confers the right to live on reserve, vote in band elections, receive money from one's band, and own or inherit property on reserve (Furi and Wherrett, 2003). First Nations Indian Status has also historically limited other rights and access to benefits available to non-Status peoples in Canada. Finally, the legislation that determined who could be registered as a "Status Indian" was explicitly gender-biased against women who married non-Status men until the mid-1980s (Brownlie, 2006; Furi and Wherrett, 2003; Hurley and Simeone, 2014; The Government of Canada, 2011).[7]

Since confederation, the Canadian government has perceived Indigenous peoples as wards of the state for whom it has the responsibility to manage, define, and document. In 1951, a centralized Indian Register was established which consolidated all existing band membership data into a single list. Everyone who is classified as a Status First Nations is on the list no matter where they live and whether they are institutionalized or not. All death events must be reported to the Indian Register in order to execute a will of a Status First Nations or make other arrangements for the administration of their estate. First Nations Indian governments (bands) are also required to submit death certificates as part their funding requirements. Individuals are also required to report if they leave the country or move. The Indian Register provides the official record identifying all Status First Nations in Canada (Indigenous and Northern Affairs Canada, 2010).[8] Indigenous and Northern Affairs Canada (INAC) is the current Canadian Federal agency overseeing the Indian Register and responsible for enacting the terms and regulations set out under

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[7]The grandchildren of women who had formerly lost Status under the old legislation were differentially treated until 2010 (Hurley and Simeone, 2014) however the treatment did not different by the gender of the children.

[8]It is worth noting that "First Nations Indian Status" is a legal construction that may or may not have any bearing on Indigenous peoples own political or communal identities (Cornet, 2007). However, the benefits associated with First Nations Indian Status are non-trivial.

the *Indian Act*.

Differences in conditions between Aboriginal and non-Aboriginal peoples are well documented in Canada and elsewhere.[9] Status Indians, especially those living on-reserve, are systematically poorer than non-Aboriginal people or the Métis or Inuit, in terms of health and income (Pendakur and Pendakur, 2011; Tjepkema et al., 2009). However, current estimates of homelessness and institutionalization are incomplete (Belanger et al., 2013; Schiff et al., 2016; Truth and Reconciliation Commission of Canada, 2015).

To our knowledge, there are two national sources that estimate Aboriginal homelessness in Canada. First, Belanger et al. (2013) collected data from 18 Canadian cities with homeless counts where Aboriginal identity was reported. Their findings suggests that nearly 7 percent of Aboriginal people in cities experience homelessness, while less than one percent of the general population experiences homelessness. This leads to the conclusion that 1 in 15 Aboriginal persons in urban centers experiences homelessness or roughly 20,358 in 2006. However as Schiff et al. (2016) points out, these counts do not include any rural or smaller city Aboriginal homeless whose population counts could be non-trivial.

The second notable data collection effort, undertaken by Employment and Social Development Canada, is the National Shelter Study (Canada, 2016). This study collects anonymous information from 1.9 million shelter stays at over 200 of the 400 emergency shelters across Canada over 10 years. It uses a stratified cluster sample of emergency shelters in 2014 to estimate the demographics of the users. They estimate that between 38,080 and 45,820 separate Aboriginal individuals used a shelter during 2014. Note that this estimate is a "flow" (in total that many people used an emergency shelter in that year) and not a "stock" as in (Belanger et al., 2013) which may be thought of as a snap shot at a particular time. Thus these estimates are not comparable.

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[9]See Feir and Hancock (2016) for a list of citations documenting this for Canada. For the American case see Akee and Taylor (2014); Greenfeld and Smith (1999). For Australia, see Pink and Allbon (2008). Schulhofer-Wohl and Todd (2015) identifies counties in the US that have mortality rates for American Indians that exceed national averages.

The flow versus stock data distinction is also important for thinking about institution-alization data available. For example, to our knowledge information on incarceration data that identifies Aboriginal identity is only available on the number of sentenced admissions to provincial/territorial custody rather than on the number of incarcerated individuals at any given moment.[10] The sentenced admissions data would only provide the incar-ceration of flow into correctional facilities and it would not provide any information on the outstanding stock of incarcerated Status First Nations peoples. In the absence of a base year measure of the stock of people in provincial/territorial custody by Aboriginal identity, there is no way to identify the number of Aboriginal people incarcerated in any given year. Raw admissions data may potentially count the same individual multiple times if they are sentenced more than once (Brzozowski et al., 2006). In addition, re-gional reporting standards for the Aboriginal identity of individuals entering the system are not collected consistently or systematically by all districts or provinces (Millar and Owusu-Bempah, 2011). While available statistics suggest that Aboriginal peoples are heavily over-represented in the correctional system (Perreault, 2009), to our knowledge there are no comprehensive, national statistics available by age and gender of the number of Status First Nations (or Aboriginal individuals in general) institutionalized federally, provincially, in city jails, and in transitional homes.[11]

For both measures of homelessness and institutionalization there is significant room for improvement in accounting for the Indigenous population in Canada. While the re-cent studies mentioned above fill serious data gaps, we see our work as offering a more comprehensive, easily repeatable metric of marginalization for Status First Nations in Canada. Existing studies provide a relatively narrow accounting of homelessness. For example, in Canada (2016), the sample is based solely on emergency homeless shelters and does not include women shelters and transitional housing. In addition, neither study

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[10]While there is information on the number of incarcerated individuals by gender and age on the Census day, there is currently no information on Aboriginal identity (Kong and Beattie, 2005).

[11]The Adult Correctional Services Survey has collects the flow data mentioned above and the Inte-grated Correctional Services Survey collects more detailed demographics but all include all jurisdictions (Perreault, 2009).

mentioned above reports full breakdowns of homelessness by age and gender groupings,[12] nor are they able to include populations in transitional housing and more broadly at risk of homelessness. Our proposed method is inclusive of a broader definition of institution-alization and also is able to disaggregate these counts by age groups and gender. Indeed, it is these differences that are the most important for researchers and policymakers. As we will show the disparities in the incarceration and homeless population at various ages suggests a need for targeted interventions and policies.

To be clear, our measure is not a perfect substitute for those offered by other studies. First, previous analysis has focused on all peoples of Aboriginal identity while our measure is available for only Status First Nations. However, in the context of these other results, our work sheds light on the comprehensiveness of these other measures. Specifically, our method inherently includes all individuals in all forms of emergency shelters (like shelters for domestic violence), those individuals in group transitional housing, the unsheltered, and all institutionalized individuals such as those who are in prison, jail, group homes, or recovery facilities. Since we know the proportion of all Aboriginal peoples in Canada who are Status First Nations, our estimates could give us a basis for estimating rates among the Aboriginal population more generally.

While obviously individuals experiencing different forms of institutionalization and forms of homelessness are all in fundamentally different circumstances, these situations are not disconnected. For example, the definition of homeless often also includes those at risk of homelessness (Gaetz et al., 2013) and it is well documented that those who have been incarcerated are at greater risk of homelessness and that residential instability is a risk factor in re-incarceration (Bird, Goulet, Oelke, Thurston, Turner, and Woodland, 2010; Brown, Wingert, Higgitt, Knol, Block, Barkman, and Charette, 2008; Metraux and Culhane, 2004; Metraux, Roman, and Cho, 2007; Walsh, MacDonald, Rutherford,

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[12] Canada (2016) does offer relative rates of homeless between Aboriginal and non-Aboriginal peoples in four broad age categories: Children (0-15 years old) are 9.2 times more likely to use a shelter than non-Aboriginal people, youth (16-24 years old) are 6.4 times more likely, Adults (25-64 years old) are 12.9 times more likely, and Seniors (65+ years old) are 20.5 times more likely)

Moore, and Krieg, 2011). In addition, all these phenomena have been linked to the historic institutionalization of large numbers of Status First Nations children in residential schools (Patrick, 2014; Rand, 2011).

2 Description of Primary Data Sources

The two primary sources of data are administrative data from the Indian Register and from the Canadian Long-Form Census. The Indian Register data is collected by INAC and is available to researchers; the Canadian Long-Form Census is available publicly on-line. While here we use the confidential-use long-form Census data available in Canada's research data centers and confidential Indian Register data for as much accuracy as possible, in principle appropriately categorized public data could be used. Below we describe the two data sources and indicate who is and is not included in each data source. It is these systematic differences in coverage that allow us to use these data to infer the size of the homeless and institutionalized population by gender and age.

2.1 The Indian Register Population Counts

We use confidential administrative data from the Indian Register at INAC. The data are Indian Register population counts for all Status First Nations for each year from 1975 to 2015 in 5-year age groups, gender, place of residence (on or off reserve) and First Nation citizenship.[13] Thus all Status First Nations will be included in the register whether they are institutionalized, homeless or living outside of Canada.

While the Indian Register should contain the official count of Status First Nations, there are often delays in the reporting of births or deaths that may lead to some discrepancies in the data. The register relies on band governments[14] to report births or

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[13]The 5-year age groups are not available for 1987 and 1989.

[14]An First Nations Indian band is defined "as a body of Indians for whose collective use and benefit lands have been set apart or money is held by the Crown, or who have been declared to be a band for the purpose of the Indian Act. Many Indian bands have elected to call themselves a First Nation and have changed their band name to reflect this" (Statistics Canada, 2013b, p 22).

deaths to the federal government (INAC). In the cases where registered members live off-reserve, or are hard to trace, the band authorities may not receive their birth or death certificates. Because the delay in reporting births averages about 3 years, we view our information in this age range as quite poor. We also exclude individuals over the age of 65 since previous work suggests under-reporting of deaths in these age ranges (Akee and Feir, 2016). For these reasons we focus on ages 5 to 64, as we believe that within these ranges, the reported births and deaths represent a reasonably accurate picture of actual events and therefore an accurate count of the Status First Nations population at a point in time.

2.2 The 2001 and 2006 Censuses and the 2011 National Household Survey

We use the 2001 and 2006 confidential long-form Census to establish the Status First Nations population counts. The 2001 and 2006 Canadian Censuses enumerate all households and provide a snapshot of the Canadian population on census day. We do not use the more recent 2011 Canadian Census data (known as the National Household Survey) because the survey methodology and completion requirements changed dramatically in that enumeration.[15] However, the mandatory long form Census has been re-instituted as of the 2016 Census and thus our method should apply to future censuses as they become available.

The Canadian Census contains a long and a short-form survey. All households and

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[15]The National Household Survey (NHS) in 2011 was entirely optional and replaced the mandatory Canadian Census questionnaire in 2011. Approximately one-third of the Canadian population were invited to participate in the National Household Survey in 2011 while 100% of the population on First Nations Indian reserves were invited to participate. As a result of this change between the long-form Census and the NHS, the response rate for the NHS was only 69% (a weighted response rate of 77%) while it had been approximately 94% for the long-form Census (Statistics Canada, 2012). Additionally, there was a change in the eligibility to qualify as a Status First Nations starting in 2011 which would confound any comparisons between previous Status First Nations populations. These factors work in conflicting directions and would affect our estimates of institutionalization and homelessness in unknown ways. Thus, due to the lower response rate, the possibility of selection-bias, and the change in the Status First Nations population, we do not use the 2011 NHS in the analysis that follows other than in Section 5 to compute gender ratios; its inclusion does not affect the results.

communal dwellings receive the short-form which collects only the most basic demographic information such as gender and age. While the short-form Census is distributed to everyone in the population including those in institutions and shelters, the long-form Census is distributed to only 20% of households off First Nations Indian reserves and outside remote areas. The population counts are weighted upwards according the likelihood of being sampled based on the short-form. The long-form Census is provided to 100% of the households on First Nations Indian reserves and in other remote areas. The long-form includes a rich set of information on households including whether the individuals are be categorized as Status First Nations. We use Census years that ask whether each person in the household is a Treaty Indian or a Registered Indian as defined by the *Indian Act* of Canada. A Treaty Indian is someone who is a member of a First Nation who has a treaty with the Crown. Treaty or Registered Indians are also called Status First Nations which is the term that has been used throughout this paper (Statistics Canada, 2013a). Since the long-form Census is not administered to those residing in institutions such as correctional institutions, shelters, institutions for people with psychiatric conditions, or long-term care facilities, it does not include a count of Status First Nations residing in these places. People without a fixed address also do not receive the long-form Census (or short-form for that matter). As such, the Census count of Status First Nations will miss those who are located in institutions or are without a fixed-address.

While censuses are intended to enumerate the entire population, an individual may not be included for a number of reasons. First, individuals may decide not to complete the Census form or they may misreport information on the form. In both 2001 and 2006, not responding and misreporting information were illegal in Canada and we assume that any information reported in the Census data for these years is accurate. Those who do not complete their census forms or who misreport face fines up to 500 dollars or 3 months in prison. One exception to this is the non-participation of a number of entire First Nations Indian reserves, most noticeably in Ontario. A number of reserves and settlements refused enumerators entry to their communities in 2001 and 2006 based largely on sovereignty

grounds and thus entire reserves were not enumerated. The size of these communities by gender and age can be inferred from INAC administrative data and we account for the non-enumerated reserves in the analysis that follows.

Individuals who have migrated abroad will also not be enumerated and counted in the Census. While there are many potential destinations for Canadians, the United States is the most frequent. Examining the migration flow of Canadians to the US indicates that these migrants are highly educated and tend to be concentrated in the knowledge-based industries (Dion and Vézina, 2010). Given the average characteristics of both groups, it is unlikely that Status First Nations men comprise a large proportion of migration from Canada to the US. While we cannot speak directly to the characteristics of the Status population living in the United States or elsewhere, we will form some estimates of the degree to which Status peoples may migrate to the US using some administrative records from INAC by gender and using estimates of immigration rates by age to infer the size of this population.

Third, and most importantly for our purposes, the long-form Census excludes individuals with no fixed address and does not collect information on individuals living in shelters or in other institutions. This means Status First Nations men or women in these institutions or who are homeless will not be included in official Census population counts.

3 Methodology: Estimating the Institutionalized and Homeless Population

Our analysis focuses on identifying two combined areas of marginalization for Status First Nations in Canada: institutionalization and homelessness. While we are not able to separately identify these outcomes, we believe that this analysis provides an improvement in the current accounting of this marginalized Status First Nations population. We show that there is a direct mathematical relationship between the Status First Nations

population reported in the Indian Register and the Census data. While the Indian Register includes all individuals who are Status First Nations regardless of whether they are institutionalized or homeless, the long-form Census data does not. Therefore, the Census data is a subset of the Indian Register data for the Status First Nations population in Canada.

In order to account for these population counts, let us define $\eta_{a,g,t}^{R}$ and $\eta_{a,g,t}^{C}$ as the Indian Register and Canadian Census population counts respectively which are allowed to vary by gender, age and time period. Note that for our purposes $a \in [0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60]$ where each number denotes the lower bound of each age group; $g \in [male, female]$; and, $t \in [2001, 2006, 2011]$. We do not estimate the institutionalized or homeless for those over the age of 65 or under the age of 5.[16]

Given this, we can express the relationship between the population counts in these two data sets as:

$$\eta_{a,g,t}^{R} = \eta_{a,g,t}^{C} + \eta_{a,g,t}^{H} + \eta_{a,g,t}^{A} + \eta_{a,g,t}^{NE}, \tag{1}$$

In words, this equation says that the count of Status First Nations in age group a for gender g at time t in the Indian Register data is equal to the equivalent group in the Census data with the addition of the counts of homeless or incarcerated, those who migrated abroad and those who were not enumerated in the Census. These three additional measures are denoted by $\eta_{a,g,t}^{H}$, $\eta_{a,g,t}^{A}$ and $\eta_{a,g,t}^{NE}$ respectively. Thus, given administrative data for both those Status First Nations living abroad, and the population sizes of those reserves that did not participate in the Census by gender and age group, simple algebra implies we can infer $\eta_{a,g,t}^{H}$ given the Indian Register and Census population counts.[17] In the appendix we discuss how we construct estimates of those living abroad ($\eta_{a,g,t}^{A}$) and

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[16]Please see Section 2 for a discussion of the rationale.

[17]Note that in the appendix we describe an additional potential component, over-count of First Nations Indians in the Indian Register due to non-reporting of deaths to the federal agencies. Our analysis does not change substantially due to the addition of this addition component. See Appendix Table A1 for these estimates.

those not enumerated in the Census using administrative data. Once we have these estimates, we are able to infer the number of institutionalized and homeless individuals by gender and age group by re-arranging Equation 1 into the following:

$$\widehat{\eta^H_{a,g,t}} = \eta^R_{a,g,t} - \eta^C_{a,g,t} - \widehat{\eta^{NE}_{a,g,t}} - \widehat{\eta^A_{a,g,t}}, \tag{2}$$

where the estimates of the variables in Equation 1 are denoted with hats. We use Equation 2 to estimate of the institutionalized and homeless population. In our results section and in the appendix, we also show how our estimates of the homeless and institutionalized population would change if we allowed for varying degrees of non-compliance in filling out the long-form Census.

Therefore,the accuracy of our measure is based on the underlying accuracy of the existing administrative and Census data. It is our intention to use these two well-established data sources to create a simple and transparent method for counting the Status First Nations population.

4 Estimates of Institutionalization and Homelessness for Canadian Status First Nations

Table 1 reports the estimates constructed using Equation 2 and averaged over 2001 and 2006 under various assumptions regarding Census participation rates. The first two columns of Table 1 assume full compliance with the Census; the next two columns assume a 95 percent compliance rate (which is approximately the compliance rate of the population as a whole); and the last two columns assume a 90 percent response rate. Appendix Table A3 repeats the assumptions about response rates, but now assumes that only band members who lived on reserve (and are from a First Nation that decided not to participate in the Census enumeration) did not fill out the long-form Census.

Determining the true size of the Status institutionalized and homeless population

Table 1: Estimates of Institutionalized Population or those without a fixed Address

	Average of 2001 & 2006 for all of Canada		Assuming a 95% Response Rate		Assuming a 90% Response Rate	
	Male	Female	Male	Female	Male	Female
05 to 09	1205	1330	*	*	*	*
	(170)	(65)				
10 to 14	2760	2370	990	675	*	*
	(445)	(315)	(585)	(230)		
15 to 19	4015	3735	2475	2255	770	615
	(130)	(885)	(75)	(720)	(310)	(535)
20 to 24	6880	4165	5730	2910	4455	1525
	(430)	(315)	(300)	(195)	(150)	(60)
25 to 29	6570	3605	5530	2420	4375	1095
	(730)	(210)	(720)	(185)	(705)	(150)
30 to 34	6285	3340	5240	2130	4080	780
	(55)	(550)	(45)	(555)	(30)	(565)
35 to 39	5885	3575	4835	2350	3665	985
	(460)	(315)	(430)	(320)	(400)	(325)
40 to 44	4660	3170	3680	2005	2595	705
	(260)	(625)	(120)	(785)	(35)	(960)
45 to 49	3085	2870	2270	1900	1365	820
	(335)	(60)	(145)	(140)	(70)	(365)
50 to 54	1675	2250	1045	1500	345	670
	(20)	(105)	(160)	(270)	(320)	(455)
55 to 59	1065	1870	590	1305	60	680
	(240)	(190)	(350)	(325)	(475)	(475)
60 to 64	955	1360	625	935	255	465
	(130	(305)	(60)	(235)	(15)	(155)
Total	**45050**	**33640**	**32415**	**20010**	**18375**	**4860**
	(1555)	**(1005)**	**(440)**	**(85)**	**(795)**	**(1295)**

Notes: ** Negative numbers are suppressed and represented by a blank cell. The estimated population numbers are calculated using Equation 2 under various assumptions of non-reporting to the Census. All these estimates assume no response from those who live on reserves that did not participate in the Census. The results here are averaged over 2001 and 2006. The average count rounded to the nearest five is listed in the first row with its standard deviation below it in parenthesis.*

depends heavily on which Census response rate we choose. Given that the Census non-response rates were approximately 94 percent for the general population (Statistics Canada, 2012) and we have already accounted for non-enumerated reserves and settlements, we believe that the sensible estimates are given by the first four columns. However, we can glean further information on the most plausible estimates from other less comprehensive studies.

For example, we can infer a lower bound estimate of homelessness using the data compiled by Belanger et al. (2013). They use data collected from 18 Canadian cities' homeless population counts to estimate the urban Aboriginal homeless population. The study counted a total of over 20,360 homeless people of Aboriginal identity. If one assumes that 50 percent of these individuals were Status First Nations (which is the same rate as in the general Aboriginal population) (Statistics Canada, 2007) and 47.5 percent were men (Gaetz et al., 2013), then this would mean there are approximately 4,835 Status homeless men and 5,345 Status homeless women in these cities alone. These lower bound homeless numbers exceed our lowest estimate for the number of Status First Nations women and girls institutionalized or homeless. This suggests that our lower bounds on institutionalization and homelessness are likely a conservative estimate, at least for women.

We can also infer a lower bound on institutionalization using data from Juristat and survey data. First, we use survey data from admissions to provincial custody on Aboriginal identity and gender (CANSIM Tables 251-0022) to infer the percent of Status First Nations who are admitted to custody under the assumption that 50 percent of individuals who identified as Aboriginal were Status First Nations (Statistics Canada, 2007). From that we estimate the percentage of Status First Nations who are incarcerated from multiplying the percentage of Status First Nations we inferred were admitted to custody by the total number of Federally or Provincially youth and adults incarcerated (collected from CANSIM Tables 251-006 and Tables 251-005 in 2001/2002 and 2005/2006). We acknowledge that this is a strong assumption – if Aboriginal peoples serve longer sentences,

then their percentage of the incarcerated will be higher than their percentage of those who are admitted to custody. However, under the above assumptions, averaging between 2001 and 2006 suggests that 2,765 Status First Nations men and 340 Status First Nations women were incarcerated in this time period. This does not account for anyone in local city jails.[18] This suggests that provincial and federal incarceration may account for only a small part of our estimates.

Two patterns are noticeable in Table 1 regardless of which assumptions are maintained. about the response rate level, at least two patterns are noticeable. These patters are depicted clearly in Figure 1 where we show the estimated institutionalization and homelessness rates by gender and 5-year age groups for Status First Nations and assuming full compliance with the long-form Census. This figure is based on data from the first two columns in Table 1.

The first observable pattern is that institutionalization and homelessness for the Status First Nations population peaks around the ages of 20 to 44. This result holds broadly for both males and females in the population.

The second pattern that emerges, and is perhaps most striking, is that institutionalization and homelessness differ dramatically in magnitude by gender (as shown in Figure 1). While men and women below the age of 19 are institutionalized or homeless in similar numbers and women are institutionalized or homeless at slightly higher numbers after 50, between the ages of 20 to 44 we find that Status First Nations men are far more likely than Status First Nations women to be counted as institutionalized or homeless. In this age range Status First Nations men are almost twice as likely as Status First Nations women to be either homeless or institutionalized. This has non-trivial implications for the population which we discuss in Section 5.

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[18]The estimated flow of custodial admissions to the provincial system of people that were Status First Nations was approximately 18,890 males and 2,320 females averaged between 2001/2002 and 2005/2006. These numbers count admissions rather than individuals. Re-offenders may be counted multiple times.

Figure 1: Estimated Average Number of Status First Nations by Gender and Age Institutionalized or without a Fixed Address from 2001 and 2006
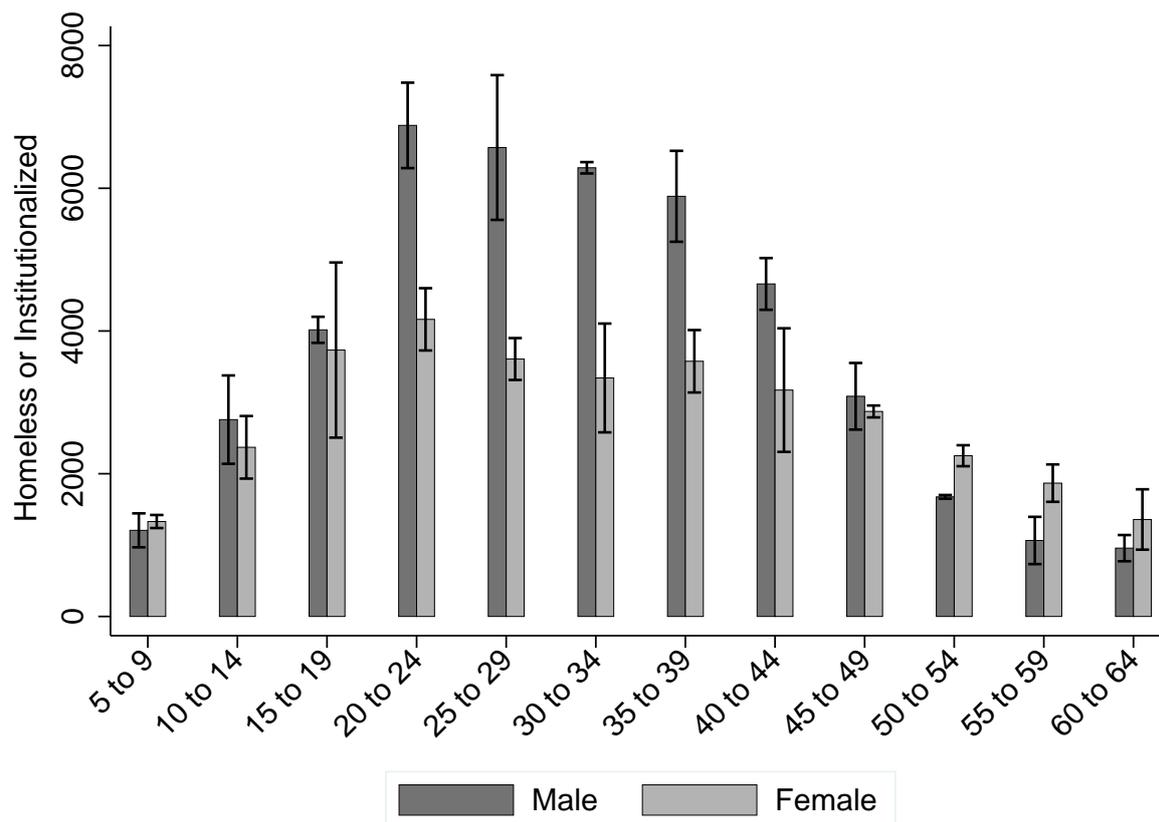
Notes: These results are calculated using Equation 2 assuming full compliance with the law after assuming that all members of bands who refused entry to their respective communities refused to participate in the long-form Census. The results here are averaged over 2001 and 2006. The average count rounded to the nearest five. The 95 percent confidence interval is given for each data point in the histogram.

5 Discussion and Conclusion

## 5.1 Implications for the gender ratio, the well-being of women, and the continued legal existence of Status First Nations Populations

The high rates of institutionalization and homelessness of Status First Nations males compared to Status First Nations females between the ages of 20 to 44 produce gender imbalances in the housed and non-institutionalized population. Existing research in other countries suggests that gender imbalances can result in increased criminality, alcohol, drug and physical abuse, as well as a reduction in marital status and fertility levels.[19] There is evidence that gender imbalances in either direction (skewed towards males or towards females) can have significant negative societal consequence. Our results indicate that there are more Status First Nations men than women that are incarcerated or homeless which may have significant implications for marital rates, female labor force participation, and female bargaining power (Angrist, 2002; Charles and Luoh, 2010; Chiappori et al., 2002; Mechoulan, 2011). Documenting the magnitude and persistence of these effects is an important step in identifying a serious problem, exacerbating the already serious conditions in First Nations communities in Canada.

Figure 2 contains the gender ratio for the Canadian population and the Status First Nations population in the 2001 and 2006 Census and in the 2011 National Household Survey. In each year there are significant differences between the gender ratios in the Status population relative to the general Canadian population. However, these gender ratios are skewed in favour of women. In the figure below, there are approximately 93 Status males for every 100 Status females, while in general there are 97 Canadian males for every 100 Canadian females.

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[19]For evidence of the effect of gender ratios on marriage rates, single parenthood, female bargaining power and labour force participation see Amuedo-Dorantes and Grossbard (2007); Angrist (2002); Brainerd (2007); Charles and Luoh (2010); Chiappori et al. (2002); Mechoulan (2011). For evidence regarding the effects of gender ratios on crime, see Edlund et al. (2013); South et al. (2014).

Figure 2: Male/Female Gender Ratio from 2001, 2006 Census and 2011 National Household Survey in Canadian Population and Status Population
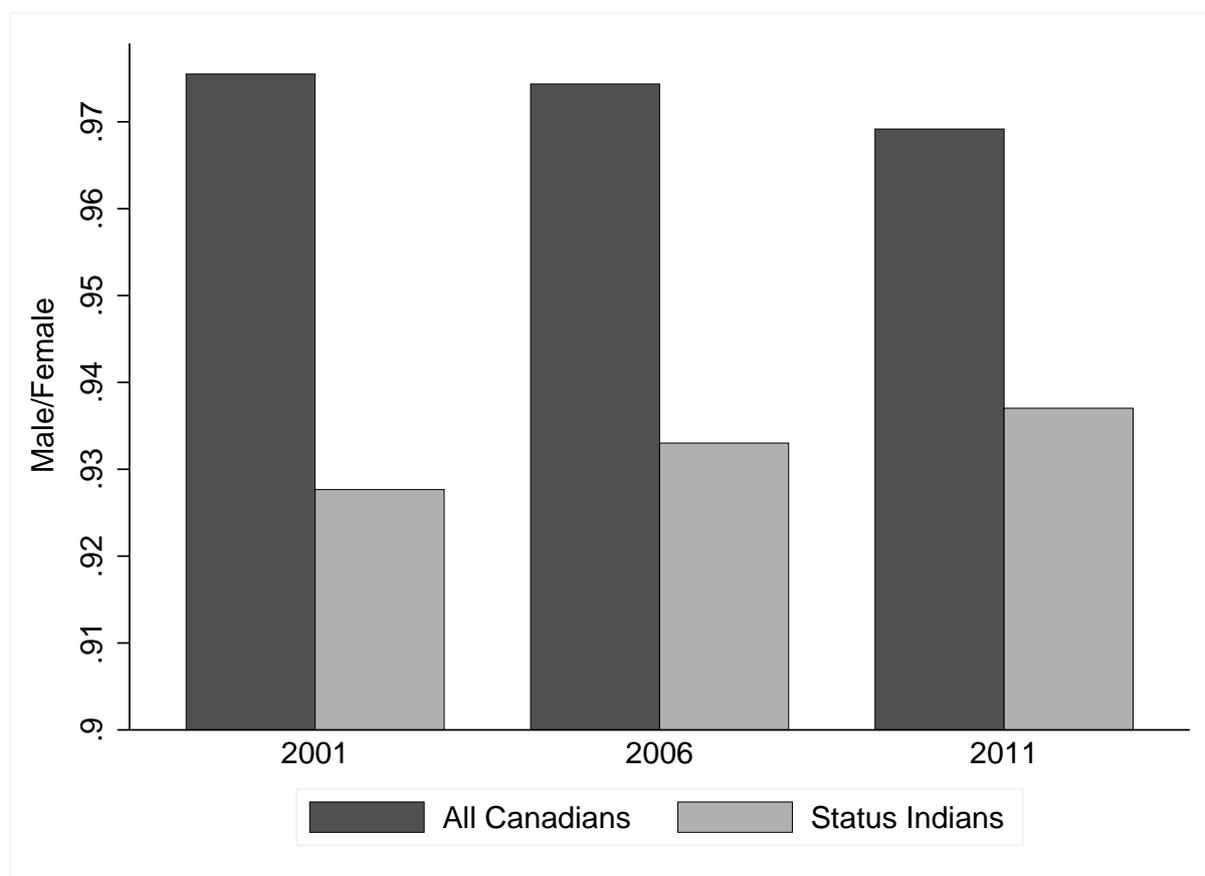
Notes: The data for these male/female gender ratios were acquired from the 2001 and 2006 Census and the 2011 National Household Survey.

Since males tend to be born at higher rates than females and thus there are more males than females at young ages(Dyson, 2012), and the Status First Nations population is substantially younger than the Canadian population on average, we would expect the Status First Nations gender ratio to be *higher* than Canadian average. To illustrate how the gender ratio varies by age, in Figure 3 we calculate the average gender ratio in 5-year age groups averaged over the Census years 2001, 2006 and 2011 for all of Canada and Status First Nations. The results indicate that there is relative parity in Canadians and Status First Nations gender ratios up to 19 years of age. Above these ages, there is a drop in the Status First Nations male-female ratio. The ratio reaches 0.8 by retirement ages, while it is still above 0.95 for the Canadian population in general. This means that

there is a precipitous drop in the number of men relative to women by age cohort in this population.

Figure 3: Male/Female Gender Ratio by Age Group Averaged Over 2001, 2006 Census and 2011 National Household Survey
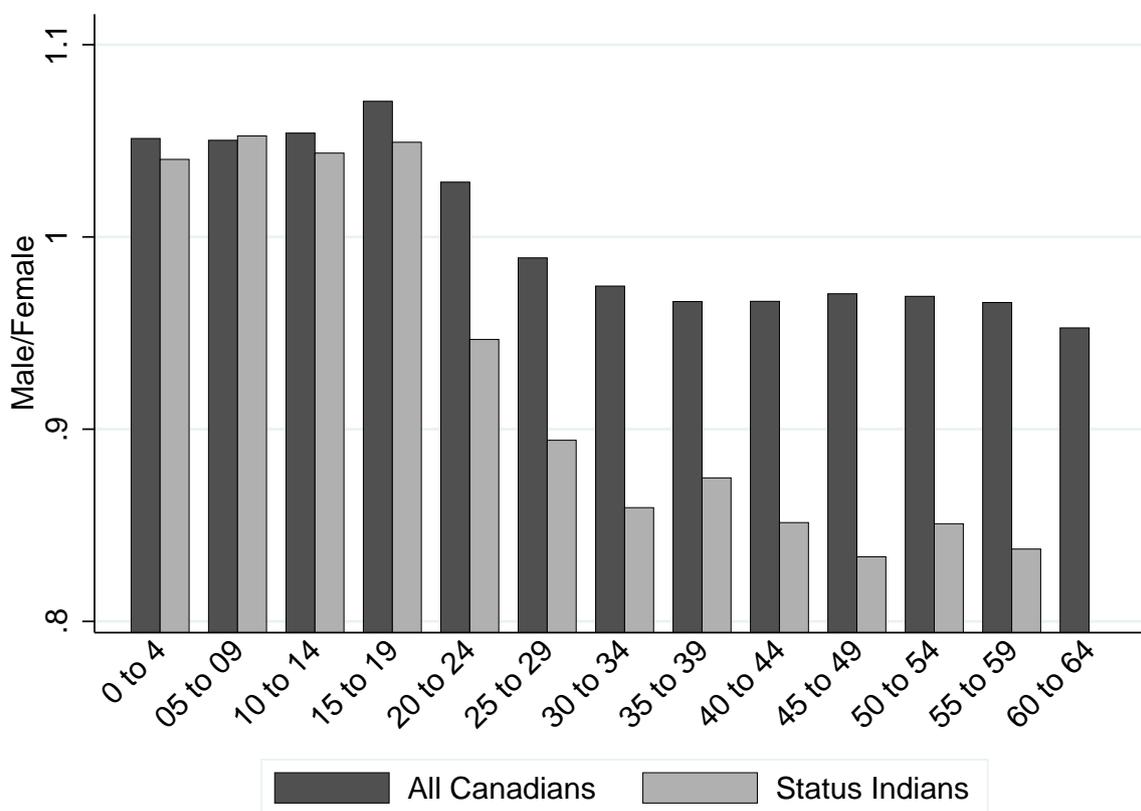
Notes: The data for these male/female gender ratios were acquired from the 2001 and 2006 Census and the 2011 National Household Survey.

It is immediately obvious from this figure that the skew in the Status First Nations gender ratio relative to the general population is attributable to the population over the age of 20, and this skew in the gender ratio becomes more dramatic in older age groups. Between the ages of 25 to 54 there are about 8.5 non-institutionalized and housed men for every 10 non-institutionalized and housed women. Similar gender imbalances are observed in the African American population in the United States (Wolfers et al., 2015) and have been shown to have significant effects on family formation and female well-being (Angrist, 2002; Charles and Luoh, 2010; Chiappori et al., 2002; Mechoulan, 2011).

The skew observed in the above gender ratios by age group can be almost completely accounted for by institutionalization and homeless rates among Status First Nations men. These gender ratio imbalances could plausibly explain the high rates of out-marriage of Status First Nations women given the effects of the gender ratio imbalances on exogamy (Anderson and Saenz, 1994; Hwang et al., 1997; Pagnini and Morgan, 1990). Thus, the rates of institutionalization and homelessness of Status First Nations men could have implications for the continued existence of "Indians" as a political category in Canada.

5.2 Limitations and Conclusion

We construct a new measure of social and economic deprivation for Status First Nations in Canada: institutionalization and homelessness. We believe a reasonable estimate of the percent of the Status First Nations population that was institutionalized or homeless on average between 2001 and 2006 is 8 percent.[20] This estimate is extremely large when compared to the non-Indigenous population's institutionalization rate. In addition, since institutionalization and homelessness seem to disproportionately affect men, these channels of marginalization result in a gender imbalance in the non-institutionalized and housed population. This gender imbalance has the potential to make available Status First Nations partners more scarce for Status First Nations women and may have long-run implications for the legal existence of Status First Nations in Canada. Any substantial revisions of the *Indian Act* in the future should take this into account.

This work does not investigate the causes of high rates of institutionalization and homelessness among Status First Nations peoples in Canada and provides only a very broad estimate of the number of individuals facing this form of marginalization. However, a large literature exists on both the intergenerational trauma experienced by Status First Nations peoples and the systematic historic policies and practices that have contributed

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[20]The estimate of 8 percent is constructed by adding the third and fourth column of the last row of Table 1 and dividing by the average population size between 2001 and 2006 calculated from the Indian Register between the ages of interest as 630,110.

to the marginalization of Indigenous peoples throughout the world.[21] Further work to disentangle the nuances of the broad numbers we estimate here would be valuable. It would also be very valuable if institutionalization and homelessness could be estimated separately from these sources. If the short-form Census collected information on First Nations Status in collective dwellings and institutions this could be corrected.

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[21]Patrick (2014) outlines a good deal of this literature in relation to Indigenous homelessness.

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Appendix

1 Non-Enumeration in the Census (Estimating $\eta_{a,t}^{NE}$)

We adjust the Indian Register counts by excluding population counts of Status Indians that did not participate in the Canadian Census. The confidential-use Census data allows us to identify the communities and bands that are not enumerated in the Census, and we are thus able to remove these individuals from the Indian Register data. In 2001, 30 reserves were not included in the Census and in the 2006 Census, 22 reserves were not included. Some of the excluded reserves are quite large, including the reserve with the largest population in Canada; Six Nations 40 which has over 25,000 members with approximately half living on-reserve. The vast majority of individuals who chose not to participate are from the province of Ontario.

Table A2 reports the number of individuals excluded from the register. Depending on the year we exclude as many as 48,350 individuals. In our estimates, we make various assumptions regarding response rates. While our baseline estimates assume only those living on reserves did not fill out the Census, in the appendix we make the extreme assumption that all individuals who were members of bands who were associated with reserves that were not enumerated did not fill out the Census. We show these results for two reasons. First, it provides more conservative estimates of the homeless and institutionalized population. Second, it seems to be a plausible assumption given the observed response rates of communities when the Census is viewed as optional.[22] If band members interpret their reserves not participating in the Census as giving them legal immunity from filling out the census, then they may be less likely to participate.

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[22]The 2011 NHS is an optional survey and thus Statistics Canada published non-response rates by Census subdivision for this survey. These non-response rates can be matched to reserves. In the communities that did not participate in the Census the year before, response rates were extraordinarily low: sometimes as low as 6% (?).

2 Migration Abroad (Estimating $\eta_{a,t}^A$)

We also adjust the Indian Register data to account for individuals who are living outside of Canada. The Indian Register provides information on population counts by band, gender, place of residence, and year (but not age group) of the numbers of Status Indians living outside of Canada. We use these counts to estimate the number of Status Indian people who are included in the Indian Register data but would not be included in the Census since they are outside of the country. In order to estimate this by age group, we use recent reports on the age distribution of Canadians living in the United States to back out the Status Indian counts. Finnie (2006) reports that 1 in 1,000 Canadians leave Canada in a given year. While not strictly comparable, the Indian Register data suggest that in 2006, approximately 16,000 Status Indians were residing outside Canada or nearly 2% of all Status Indians. For these numbers by gender and age group, see Table A4.[23]

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[23]Once one excludes reserves that did not participate in the Census from these migration counts, the estimated Status Indians living outside of Canada falls to only approximately 9000 individuals. It is these adjusted numbers that are reported in Table A4.

A   Appendix Tables and Figures

Table A1: Estimated Over Counting in the Indian Register

	2001		2006		2011	
	Male	Female	Male	Female	Male	Female
05 to 09	0	5	0	5	0	0
10 to 14	0	5	0	5	0	5
15 to 19	5	5	5	5	5	5
20 to 24	5	10	10	10	5	10
25 to 29	10	10	5	10	10	10
30 to 34	10	20	10	15	10	15
35 to 39	20	25	20	25	20	25
40 to 44	55	25	55	25	50	25
45 to 49	65	50	80	50	80	55
50 to 54	80	60	95	70	115	75
55 to 59	115	65	125	80	150	90
60 to 64	120	85	145	95	165	115
Total	490	360	550	390	610	430

Notes: These estimates constructed via the procedure Section **??**. *These numbers of "over-counting" in the register due to under reporting of deaths are estimated using the number of deaths in the register by age and gender back until 1972 and the mortality rates for five year age cohorts estimated in each year until 2011 averaged over each five year period. Scaling factors for sub-geographies between the vital statistics data and the INAC data were used to form national level rates of under reported deaths ("over-counted persons") in the register.*

Table A2: Bands Excluded from the Register Counts to Make the Register Comparable to the Census

	2001			
	Female		**Male**	
Age Group	**On Reserve**	**Off Reserve**	**On Reserve**	**Off Reserve**
0 to 4	1790	680	1930	640
05 to 09	2420	1070	2570	1140
10 to 14	2140	1050	2360	1150
15 to 19	1910	1230	2010	1130
20 to 24	1740	1240	1770	1250
25 to 29	1740	1450	1860	1430
30 to 34	1890	1590	1890	1500
35 to 39	1840	1620	1770	1410
40 to 44	1550	1510	1410	1080
45 to 49	2530	1000	2590	1100
50 to 54	1150	1320	1060	920
55 to 59	890	1070	790	690
60 to 64	770	830	580	480
65 +	2030	2370	1370	1340
All	24380	18040	23970	15250
Total	42420		39220	

	2006			
	Female		**Male**	
Age Group	**On Reserve**	**Off Reserve**	**On Reserve**	**Off Reserve**
0 to 4	1280	530	1360	510
05 to 09	2320	1110	2390	1180
10 to 14	2210	1200	2320	1250
15 to 19	1880	1190	2100	1230
20 to 24	1640	1310	1800	1170
25 to 29	1560	1280	1620	1240
30 to 34	1580	1490	1700	1410
35 to 39	1760	1670	1770	1490
40 to 44	1740	1680	1660	1420
45 to 49	2040	940	2140	910
50 to 54	1470	1530	1320	1100
55 to 59	1100	1280	1010	900
60 to 64	860	1050	720	680
65 +	2360	2910	1560	1550
All	23770	19150	23450	16030
Total	42920		39480	

Notes: All counts are rounded to the closest 10. These are the number of individuals excluded from the Indian Register counts in order to make them comparable to the Census.

Table A3: Estimates of Institutionalized Population or those without a fixed Address: High Non-Response Assumption

	Average of 2001 & 2006 for all of Canada		Assuming a 95% Response Rate		Assuming a 90% Response Rate	
	Male	Female	Male	Female	Male	Female
05 to 09	205	360				
	(40)	(110)				
10 to 14	1595	1285	130			
	(480)	(290)	(185)			
15 to 19	2820	2605	1280	1125		
	(60)	(780)	(150)	(615)		
20 to 24	5705	2955	4555	1705	3280	315
	(360)	(350)	(225)	(230)	(80)	(95)
25 to 29	5360	2335	4320	1145	3165	
	(790)	(165)	(780)	(135)	(765)	
30 to 34	4950	1975	3905	765	2740	
	(80)	(425)	(90)	(435)	(105)	
35 to 39	4435	2035	3380	810	2210	
	(520)	(390)	(490)	(390)	(460)	
40 to 44	3210	1525	2235	470	1145	
	(205)	(660)	(65)	(660)	(90)	
45 to 49	1835	1280	1020	310	170	
	(95)	(60)	(95)	(260)	(240)	
50 to 54	665	825	115	185		
	(140)	(250)	(165)	(260)		
55 to 59	275	695	75	230		
	(385)	(330)	(105)	(325)		
60 to 64	375	420	50	25		
	(10)	(145)	(70)	(35)		
Total	**31425**	**18295**	**18790**	**4660**	**4750**	**315**
	(1050)	**(495)**	**(60)**	**(595)**	**(1300)**	**(95)**

Notes: These results are calculated using Equation 2 under various assumptions of non-reporting to the census. All these estimates assuming no response for everyone who belonged to a band whose reserve did not participate in the census whether they lived on or off reserve. The results here are averaged over 2001 and 2006. Negative numbers are suppressed and represented by a blank cell. The average count rounded to the nearest five is listed in the first row with its standard deviation below it in parenthesis.

Table A4: Estimates of Migration by Age Group, Gender and Year

Age Group	% Assumed	2001 Female	2001 Male	2006 Female	2006 Male
0 to 4	5.75%	280	220	350	270
05 to 09	5.75%	280	220	350	270
10 to 14	5.75%	280	220	350	270
15 to 19	5.75%	280	220	350	270
20 to 24	10.60%	520	410	640	510
25 to 29	10.60%	520	410	640	510
30 to 34	10.60%	520	410	640	510
35 to 39	10.60%	520	410	640	510
40 to 44	10.60%	520	410	640	510
45 to 49	5%	240	190	300	240
50 to 54	5%	240	190	300	240
55 to 59	3.50%	170	130	210	170
60 to 64	3.50%	170	130	210	170
65 & over	0.60%	290	230	360	290
All	100%	4860	3850	6020	4780

Notes: All counts are rounded to the closest 10. These are the number of individuals subtracted from the Indian Register counts in order to make them comparable to the Census since these individuals are not living in Canada. Notes: The age distribution of Status First Nations no longer living in Canada was assumed to be the age distribution recent migrants to the united states and was taken from Statistics Canada publication (2010) estimated from the 2006 American Community Survey, catalogue no. 11-008-X Retrieved from: http : //www.statcan.gc.ca/pub/11 − 008 − x/2010002/c − g/11287/c − g004 − eng.htm. All counts in the table are rounded to the nearest 5. The distribution of emigrants is: 0-19, 23%; 20 to 44, 53%; 45-54, 10%; 55 to 64, 7%, and 65 years and over, 6%. We then divide up these percentages into equal parts for our age groupings. For example, we have 4 age groups from 0-19, so there is 5.75% in each group. We then divide this by 100 and multiply for each gender and year, the population counts living outside of Canada we derived from the Indian Register.