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Short Communication

The Determinants of Annual Income in Aboriginal and Non-Aboriginal Communities: Comparative Statistical Analysis

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Abstract

Aboriginal people represent one of the fastest growing segments of Canada's population. Although more than half of Aboriginal people live off reserves, the majority of population-study research focuses on people living on reserves. Therefore, relatively less is known about the urban Aboriginal population. Our research project is conducted to address this gap. The goals of our project were to explore the relationship between educational attainment and employment with both Aboriginal and non-Aboriginal peoples living in Prince Albert, Saskatchewan. Prince Albert represents a unique urban environment, with Aboriginal Peoples comprising 38% of the population. In this paper, we outline the findings of the research project supported by University of Regina (Partnership Research Grant). The project was carried out in collaboration with the Prince Albert Grand Council in 2015-2016. Within the project, we administered the survey in Aboriginal and Non-Aboriginal communities of Prince Albert. The interviewees answered questions about their ethnic identity, educational attainment, employment status, and annual income. Classical statistical methods connected with stratified sampling were used to analyzing the correlation between the variables. Based on statistical analysis, we concluded that (1) Aboriginal and Non-Aboriginal people with Post-Secondary education completion have equal income; (2) Aboriginal people with a highest educational achievement level of a High School Diploma and lower have less income than Non-Aboriginal people with the same education completion.

Keywords: First Nations, education, income, family income, labour market, educational attainment, employment.

1. Introduction

According to the 2011 National Household Survey (NHS) results, 1,400,685 people declared an Aboriginal identity in 2011, representing 4.3% of the total Canadian population. Aboriginal people accounted for 3.8% of the population enumerated in the 2006 Census, 3.3% in the 2001 Census and 2.8% in the 1996 Census. The Aboriginal population increased by 232,385 people, or 20.1%, between 2006 and 2011, compared with 5.2% for the non-Aboriginal population. The largest numbers of Aboriginal people live in Ontario and the western provinces (Manitoba, Saskatchewan, Alberta, and British Columbia). Aboriginal people made up the largest shares of the population of Nunavut and the Northwest Territories (NHS 2011).

According to 2011 Census data, off-reserve Indigenous people constitute the fastest growing segment of Canadian society. In 2011, 56% of Indigenous peoples lived in urban areas, up from 49% in 1996. That is a 7% increase over 14 years (INAC, 2016). Aboriginal people are the focus of substantial policy attention: the federal government spends nearly \$10 billion per year on Aboriginal programs and affairs. In spite of this, rates of economic success for Aboriginal people have generally been poor (Pendakur 2011).

In 2006, the median income for Aboriginal peoples was \$18,962 — 30% lower than the \$27,097 median income for Non-Aboriginal Canadians. However, 2006's median income difference of \$8,135 was marginally smaller than the difference of \$9,045 in 2001 and \$9,428 in 1996. According to Wilson (2010) while income disparity between Aboriginal peoples and the rest of Canadians narrowed slightly between 1996 and 2006, at this rate it would take 63 years for the gap to be erased. This study reveals that income inequality persisted no matter where Aboriginal peoples live in Canada. In 2006, the income gap between Aboriginal peoples and Non-Aboriginal Canadians in urban settings was \$7,083 higher in urban settings and \$4,492 higher in rural settings. Non-Aboriginal people working on urban reserves earned 34% more than First Nation workers. On rural reserves, non-Aboriginal Canadians made 88% more than their First Nation colleagues (Wilson 2010).

In 2010, the median after-tax income for Aboriginal people was just over \$20,000 compared to \$27,600 for their Non-Aboriginal counterparts. Among the Aboriginal population, First Nations people had the lowest median after-tax income (\$17,620). Incomes were higher for Inuit people (\$20,400) and Métis people (\$24,550). The median after-tax income of Métis people was the most comparable to that of the non-Aboriginal population (Statistics Canada 2015a).

Furthermore, in 2010, among people 25 to 54 years of age, the income gap between all Aboriginal groups and Non-Aboriginal people is lessened with the completion of postsecondary school. Among First Nations people, the overall median income was \$23,600, and the median income for those with postsecondary qualifications was \$33,100. For Métis people, the overall median income was \$34,900. In contrast, Métis people with postsecondary qualifications had a median income of \$41,400. The overall median income for Inuit people was \$29,000 in 2011. However, for Inuit people with postsecondary qualifications, the median income was \$42,200. This is close to the median income of the non-Aboriginal population with postsecondary education (\$43,800) (Statistics Canada 2015a). Given the obvious connection between educational success and labor market outcomes, many consider education to be key to reducing group inequalities. In particular, schooling is thought to play a pivotal role in the success of racial/ethnic groups (Bobbitt-Zeher 2007).

While the urbanization of Aboriginal people is an identified trend, surprisingly little is known about the makeup of this group and the research done so far has not clearly shown what impact urbanization has had on it (Parriag 2013). Within the presented project, we examined the correlation between the annual income and educational attainment in Aboriginal and Non-Aboriginal communities of Prince Albert, Saskatchewan.

2. Methodology

Previously, we studied the relationship between annual income and educational attainment in Kahkewistahaw, Muskeg Lake and Fairchild (Lac La Ronge) First Nations communities (Sardarli 2017). Our results indicated a very weak correlation between the annual income and educational attainment in the communities. It was observed that the employment rate depended significantly on the educational level of the family members. One also concluded that the higher the educational level, the higher the percentage of employees working off reserves. The higher percentage of off reserve employees among the community members with a higher educational level might be caused by the deficit of on reserve jobs requiring higher employee qualification.

To compare income vs. educational attainment dependence in Aboriginal and Non-Aboriginal communities, we decided to continue our studies in Prince Albert, Saskatchewan. Prince Albert represents a unique urban environment, with Aboriginal Peoples comprising 38% of the population. According to recent population studies, by the year 2045, Aboriginal people will make up approximately 33% of Saskatchewan's population compared with 13% in 1995 (PREMOS 2000). From this point of view, the current population pattern of Prince Albert can be considered a model of population of future Saskatchewan.

Within the presented project, we administered the survey in Aboriginal and Non-Aboriginal communities of Prince Albert. 95 Aboriginal and 105 Non-Aboriginal residences of Prince Albert were interviewed within the survey. All interviewees were selected using simple random sampling. Two research assistants were appointed for selecting interviewees. Each of them had to interview hundred (approximately fifty Aboriginal and fifty Non-Aboriginal) adults. The research assistants selected interviewees in the Gateway Mall of Prince Albert Thursdays and Saturdays between 2 pm and 5 pm, local time. First, the potential interviewees were given the Consent Letters containing the information about the project. Then, those who agreed to participate in the project were given the questionnaires. The questionnaires contained four multiple-choice questions about their ethnical identity, educational attainment, employment status, and annual income. All interviews were anonymous. The interviewees were asked to put their initials on the attendant list.

Classical statistical methods connected with stratified sampling were used to analyze the correlations between variables. Our main technique was based on nonparametric testing. Since the data distributions were abnormal and skewed, we characterized the dataset in terms of median and interquartile range. The relationships income vs. education and ethnical identity vs. income were examined using hypothesis testing.

3. Results

The relative frequency of educational attainment in Aboriginal and Non-Aboriginal communities of Prince Albert is shown in Figure 1. 1% of Aboriginal interviewee questionnaires and 1% of Non-Aboriginal interviewee questionnaires were not counted, because the interviewees had chosen more than one answer regarding education. In general, the Non-Aboriginal interviewees had higher education than Aboriginal interviewees, which is typical for the entire population of Canada (Statistics Canada, 2015b). As one can see, less than half (45%) of Aboriginal interviewees had post-secondary education, whereas about two-third (62%) of Non-Aboriginal interviewees reported post-secondary educational completion. 7% of Non-Aboriginal interviewees did not complete high school; among Aboriginal interviewees this number reached 27%. Approximately one third of Non-Aboriginal interviewees completed university or college certificate programs. Significantly less (23%) Aboriginal interviewees graduated from certificate programs. The educational gap between Aboriginal and Non-Aboriginal interviewees, whose highest educational attainment is a high school diploma, was not

significant (about 3%). Interestingly, the same percentage (18%) of Aboriginal and Non-Aboriginal interviewees self-estimated their highest educational attainment at the level of bachelor degree.

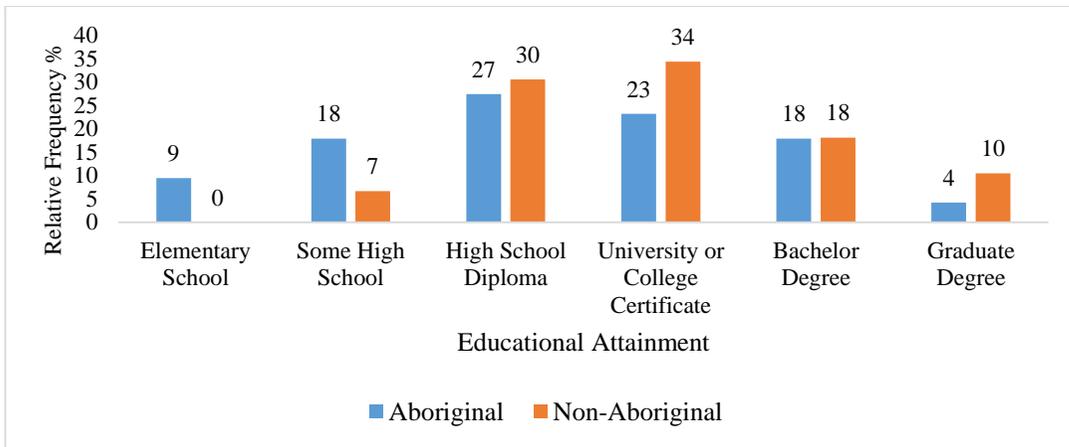
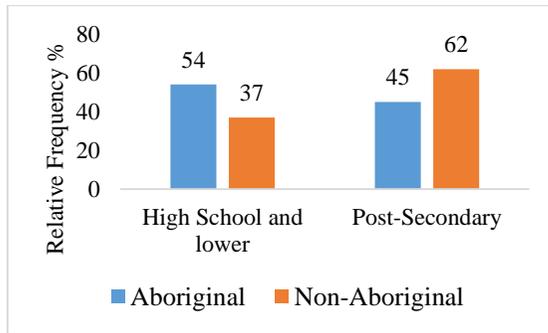


Figure 1 Relative frequency of educational attainment in Aboriginal and Non-Aboriginal communities of Prince Albert, Saskatchewan

The relative frequency of annual income in Aboriginal and Non-Aboriginal communities is shown in Figure 2. In general, the results of our survey confirmed the existence of an income gap between Aboriginal and Non-Aboriginal people (Statistics Canada, 2015a). The grouped median annual incomes for Aboriginal and Non-Aboriginal groups were \$21,666.67 and \$32,608.70, respectively. The median income evaluated for all interviewees was (joint sample) \$24,797.23.

As shown in Figure 2, 58% of Aboriginal interviewees had an annual income below the median, whereas only 21% of Non-Aboriginals had an annual income above the median.

Figure 3 presents the relative frequency of the employment status of Aboriginal and Non-Aboriginal people. 60% of Aboriginal people have full time (permanent or temporary) employment; whereas 75% of Non-Aboriginal people have full time (permanent or temporary) employment.

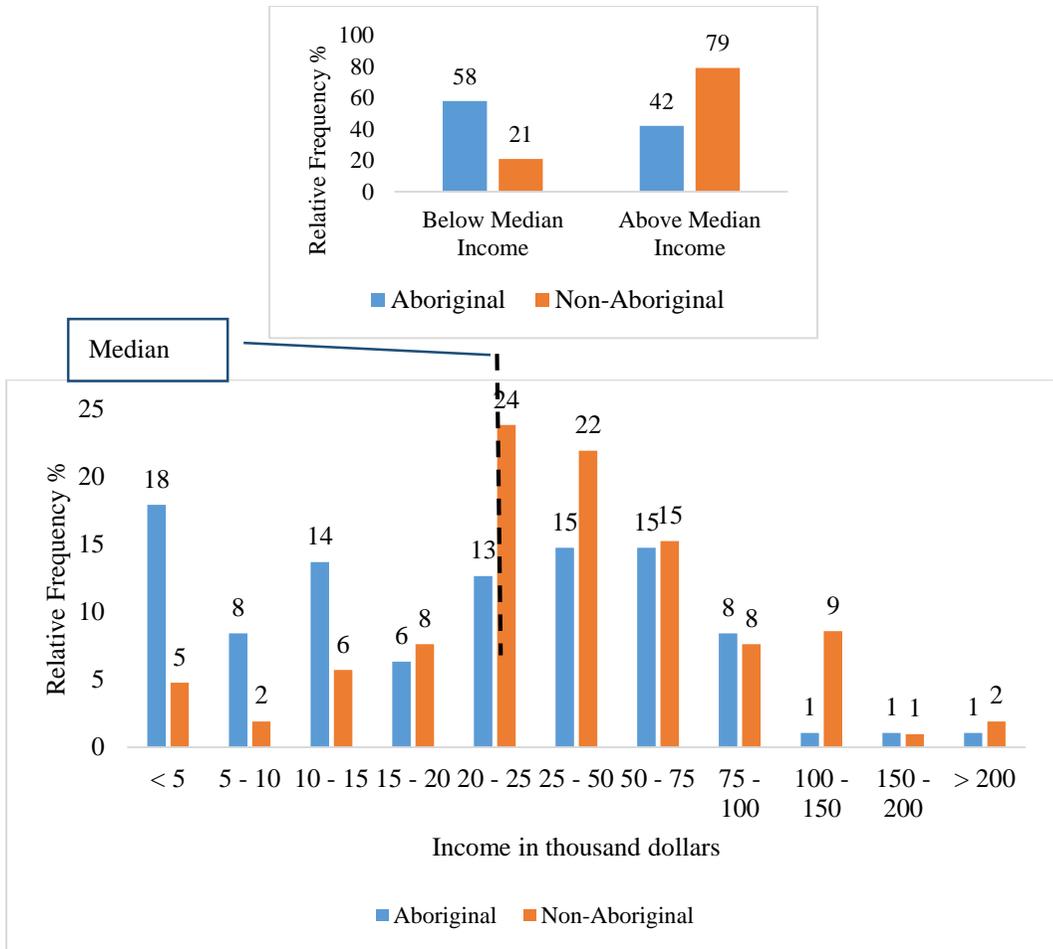


Figure 2 Relative frequency of annual income in Aboriginal and Non-Aboriginal communities of Prince Albert, Saskatchewan

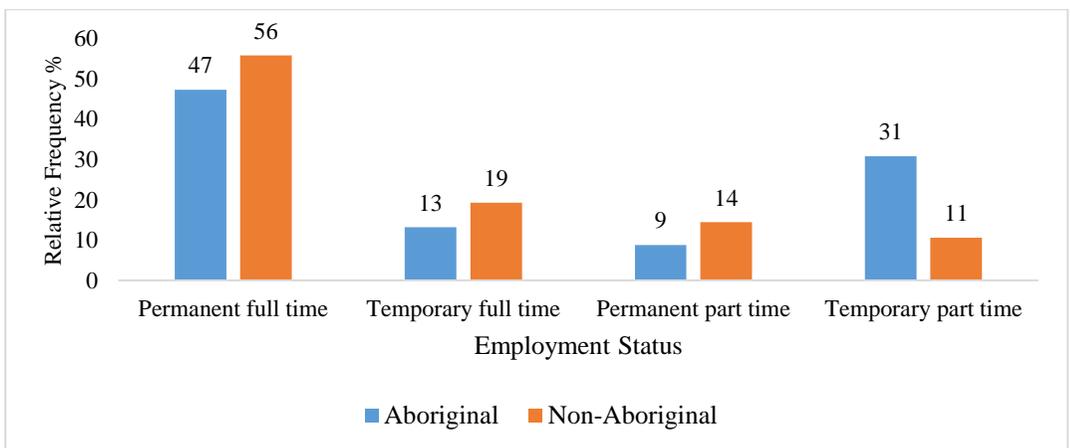


Figure 3 Relative frequency of employment status in Aboriginal and Non-Aboriginal communities of Prince Albert, Saskatchewan

4. Discussions

The statistical analysis of the relationships income vs. education and ethnical identity vs. income were examined using hypothesis testing. Hypothesis testing was carried out for Non-Aboriginal, Aboriginal and joint samples.

Income vs. Education

a) Spearman's rank correlation coefficient for the joint sample. Sample estimates $\rho = 0.6495$. Hypothesis testing shows that there is a strong significant positive correlation (higher education implies higher income) with p-value = 5.386×10^{-13} .

b) Spearman's rank correlation coefficient for the Aboriginal sample. Sample estimates $\rho = 0.6216$. Hypothesis testing shows that there is a strong significant positive correlation (higher education implies higher income) with p-value $< 2.2 \times 10^{-16}$.

c) Spearman's rank correlation coefficient for the Non-Aboriginal sample. Sample estimates $\rho = 0.5163$. Hypothesis testing shows that there is a strong significant positive correlation (higher education implies higher income) with p-value = 8.635×10^{-9} .

Identity vs. Income

a) Identity vs. income for elementary school level of education cannot be done because only Aboriginal responders self-identified in this category.

b) Identity vs. income for some high school level of education. Sample estimates $\rho = 0.2937$. Hypothesis testing shows that there is a weak positive correlation with p-value = 0.0818. There is some weak evidence that Aboriginal people have lower income than Non-Aboriginal people with the same some high school level of education.

c) Identity vs. income for high school diploma level of education. Sample estimates $\rho = 0.3352$. Hypothesis testing shows that there is strong significant positive correlation with p-value = 0.0051. There is strong evidence that Aboriginal people have lower income than Non-Aboriginal people with the same high school diploma level of education.

d) Identity vs. income for university or college certificate level of education. Sample estimates $\rho = 0.0792$. Hypothesis testing shows that there is no significant positive correlation with p-value = 0.2772. There is no evidence that Aboriginal people have lower income than Non-Aboriginal people with the same university or college certificate level of education.

e) Identity vs. income for bachelor degree level of education. Sample estimates $\rho = -0.2565$. Hypothesis testing shows that there is a weak negative correlation with p-value = 0.0655. There is weak evidence that Aboriginal people have more significant income than Non-Aboriginal people with the same bachelor degree level of education.

f) Identity vs. income for graduate degree level of education. Sample estimates $\rho = -0.4288$. Hypothesis testing shows that there is a weak negative correlation with p-value = 0.0554. There is weak evidence that Aboriginal people have lower income than Non-Aboriginal people with the same graduate degree level of education.

5. Conclusions

Statistical analysis shows that in both, Aboriginal and Non-Aboriginal communities people with higher educational attainment have a higher income. Aboriginal people with High School and lower education completion have less income than Non-Aboriginals with the same education completion. This discrepancy could be explained by the fact that according to the results of our survey, the

unemployment rate among Aboriginal people with high school and lower education is higher than among Non-Aboriginal people with the same educational attainment (Figure 3).

Our studies show that Aboriginal people with high school and lower education were paid less than Non-Aboriginal people with the same educational level. However, we can conclude that Aboriginals and Non-Aboriginals with Post-Secondary education completion have fairly equal income. Moreover, there is slight evidence that Aboriginal people with a post-secondary degree have higher income than Non-Aboriginal people with the same educational attainment. Potentially, this phenomenon is caused by the fact that some Aboriginals pay less income tax. It is remarkable that this result is in good agreement with studies presented in Wilson, 2010, where authors reported about the diminishing trend of the income gap between Aboriginal and Non-Aboriginal Canadian with a completed bachelor degree.

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References

- Bobbitt-Zeher D. The gender income gap and the role of education. *Sociol Educ.* 2007; 80(1): 1-22.
- INAC. Urban Indigenous peoples [serial on the Internet]. 2016; Available from: <https://www.aadnc-aandc.gc.ca/eng/1100100014265/1369225120949>.
- NHS. Aboriginal People in Canada: First Nations People, Métis and Inuit, National Household Survey [serial on the Internet]. 2011; Available from: <http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-011-x/99-011-x2011001-eng.cfm>.
- Parriag A, Chaulk P. The urban Aboriginal middle-income group in Canada: a demographic profile. *Aboriginal Pol Studies.* 2013; 2(2): 34-63.
- Pendakur K, Pendakur R. Aboriginal income disparity in Canada. *Can Public Pol.* 2011; 37(1): 61-83.
- PREMOS. Provincial Economic Model of Saskatchewan, The Impact of Saskatchewan's Growing Aboriginal Community. *Saskatchewan Indian.* 2000; 30(2): 18; Available from: <http://www.sicc.sk.ca/archive/saskindian/a00spr18.htm>.
- Sardarli A, Ngamkham T, Volodin A. Impact of education on family income in first nations communities. *Thail Stat.* 2018; 16(2): 213-220.
- Statistics Canada. Income, Aboriginal Statistics at a Glance [serial on the Internet]. 2015; Available from: <http://www.statcan.gc.ca/pub/89-645-x/2015001/income-revenu-eng.htm>.
- Statistics Canada. Education, Aboriginal Statistics at a Glance [serial on the Internet]. 2015, Available from: <http://www.statcan.gc.ca/pub/89-645-x/2010001/education-eng.htm>.
- Wilson D, Macdonald D. The income gap between Aboriginal peoples and the rest of Canada. Canadian Centre for Policy Alternatives; 2010. Available from: http://ywcacanada.ca/data/research_docs/00000121.pdf.