

### **Team: Log\_I\_rithms**

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In this project, we set out to investigate whether the Aboriginal demographic in Canada was susceptible to higher levels of drug use and abuse of prescription medication than the non-Aboriginal population. Literature on this topic indicates that a much larger percentage of the Aboriginal youths and women report abuse of prescription drugs compared to their non-Aboriginal counterpart[1, 2]. Our primary goal in this project was to test the hypothesis that the proportion of the Aboriginal population that uses or has used illegal drugs is higher than that of the non-Aboriginal population. Furthermore, as a general goal, we set out to study how various other demographic factors, such as income and location, may affect Aboriginal drug usage.

After cleaning the data, we started analysis with a linear regression model to predict the number of different types of drugs used by an individual based on their demographic details. As expected, the variable indicating whether the subject is aboriginal or non-aboriginal had a much higher impact on the prediction results, with a regression coefficient seven times larger the second largest. The data was then split into separate data frames for the Aboriginal and the non-Aboriginal partitions of the data. It was then found that about 76.7% of Aboriginals have abused prescription medication or taken other drugs, compared to 55.7% of non-aboriginals. After hypothesis testing at a significance level of 0.05, with a null hypothesis stating that *the proportion of Aboriginals who have consumed drugs in their lifetime is equal to that of non-Aboriginals*, we observed a test statistic with p-value  $< 10^{-5}$ , far under the rejection threshold. Hence, we conclude that in the broader population, there is a significant difference between drug abuse rates of the aboriginal and non-aboriginal sub-populations. Here, we would also like to comment that the size of the sample of Aboriginal people was about 4.327% of the entire sample size, which mirrors nicely to the estimated 4.9% of Canadian population being Aboriginal [5].

Next, we investigated the Aboriginal population to look for trends related to their drug usage. It was found that Aboriginals who have income between \$100,000 and \$160,000, have a higher rate of drug abuse as compared to Aboriginals in the other income brackets, as well as all the non-Aboriginals. Moreover, it was observed that most of the Aboriginals surveyed were located in Alberta. After separating the data for Alberta, it was found that almost all of the Aboriginals in Alberta had consumed, non-medically, all of the 15 drugs looked at in the survey. Additionally, most of the Aboriginals who consumed drugs in Alberta belonged to the age group of 25-34. By observing the relative difference between illegal drug usage rates of aboriginals and non-aboriginals it was observed that this difference was extremely high in Alberta, and positive in all provinces except Nova Scotia. Some drugs such as Ketamine, Mephedrone, Salvia, Anabolic steroids were popular among the Aboriginal surveyors, as compared to the non-Aboriginal surveyors.

The higher proportion of the Aboriginal population being dependent on drugs is expected to have negative consequences at both personal and societal levels. Indeed, we note that about 40% of the Aboriginal population suffer at least at a moderate level, and about 9% suffer at least at a substantial level based on the categories from their DAST-10 scores. The corresponding numbers for the non-Aboriginal population is 6.4% and 1.8% respectively. So, in conclusion, we would like to draw attention to relevant organizations to intervene and mitigate the drugs related crisis for the Aboriginal population of Canada.

## Citations:

1. Webster, Paul Christopher. "Prescription drug abuse rising among Aboriginal youths." *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne* vol. 184,12 (2012): E647-8. doi:10.1503/cmaj.109-4258
2. MacDonald, Shanna Farrell. "Comparing Substance Use Patterns of Aboriginal and Non-Aboriginal Women Offenders." *Correctional Service Canada* N° RS 14-26, October 2014
3. "Opioid and Substances of Misuse among First Nations People in Alberta" Alberta Health, The Alberta First Nations Information Governance Centre, Government of Alberta, November 6, 2017.
4. OECD (2020), *Linking Indigenous Communities with Regional Development in Canada*, OECD Rural Policy Reviews, OECD Publishing, Paris, <https://doi.org/10.1787/fa0f60c6-en>.