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Legalization of cannabis and the effects on the life insurance industry in Canada

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Well, October 17, 2018, came and went, and it seems like the world, or at least the small part we Canadians occupy, hasn't fallen apart yet. The only thing I noticed one cold day in January, as I wandered through the PATH in Toronto, was the pungent smell of burnt grass wafting in from the outdoors. It was during the lunch hour, after all.

Seriously though, should we be concerned about the legalization of cannabis in Canada? Is smoking cannabis any different than consuming alcohol? Is the insurance industry ready for the multitude of potential policyholders about to acknowledge on their insurance applications that they enjoy the occasional puff? What are the long-term effects on mortality as a result of smoking cannabis? How are we, as actuaries, going to assess this new risk?

Understanding what cannabis is

Cannabis (a.k.a. marijuana) is a plant that can grow in varied climates and produces a psychoactive chemical called tetrahydrocannabinol (THC). This chemical is found within the flower buds of the plant. The bud itself can be smoked or the active ingredient can be extracted as an oil. Both can also be used in food or drink as an "edible". THC, once in your blood system, acts on certain brain cell receptors, and provides euphoria and a sense of relaxation. Other common effects (NIDA 2018), which may vary dramatically among different people, include heightened sensory perception, laughter, altered perception of time, and increased appetite (but I don't think I needed to explain that to anyone!).

Cannabis use in Canada

According to a recent study by Statistics Canada, cannabis use has not increased since its legalization (Statistics Canada 2019a). One reason could be that the legalization is fairly recent and it will take time before we see its impact. Another reason is that the legal supply and distribution of cannabis is still limited. It will be interesting to see how these stats compare a year or two from now.

Table 1 shows cannabis use in 2018 by quarter in Canada. The results are based on self-reported use. Although not explicitly stated in the documentation, one needs to consider that these results have an element of under-reporting. The table shows cannabis use by province, gender, and age groups.

Is there going to be a large increase in the use of cannabis now that it is legal?

My own view is there will not be a large increase in usage. Those who have never used it may try it once because they are curious. However, the likelihood that these people will use cannabis on a consistent basis in the future will probably be low. Figure 1 shows the percentage of the Canadian population using cannabis from 1960 to 2015. As you will notice, there was an increasing trend in cannabis use starting in 2010. This was primarily driven by the age 25–44 cohort (see Figure 2). The increasing trend occurred well before cannabis became legal.

Can recreational cannabis use lead to addiction?

Just like any substance we use or eat, in order to gain a certain level of satisfaction you may need to consume more each time, and use can lead to abuse. Alcohol, nicotine, cannabis, caffeine, and even sugar can be addictive.

According to the National Institute on Drug Abuse, it would seem that cannabis can be psychologically addictive but not physically addictive (Canadian Public Health Association 2018). Cannabis withdrawal symptoms can include moodiness, sleeplessness, decreased appetite, and anxiety … sounds like me without

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my morning coffee. In addition, quitting the drug may cause various forms of physical discomfort such as abdominal pain, tremors, sweating, fever, chills, and headache that can last up to two weeks.

Impact of the legalization of cannabis use on the insurance industry

Do cannabis users exhibit the same mortality as non-smokers?

According to a few studies, cannabis smoking does not lead to higher mortality relative to a non-smoker.

In one study, Cannabis Smoking and Lung Cancer Risk (Zhang et al. 2015), cannabis users within a group of lung cancer cases were compared with cannabis users within a control group. The results showed only a weak relationship between cannabis use and lung cancer.

The second study, Associations between Cannabis Use and Physical Health Problems in Early Midlife (Meier et al. 2016), involved a cohort of just over 1,000 individuals born in New Zealand in 1972 and 1973 who were tracked from birth to age 38. The study measured the change in certain health indicators between the ages of 18 and 38. Other

than poor periodontal health among cannabis smokers, there were no negative impacts on other health indicators such as lung function, systemic inflammation, and metabolic health.

Given this information, it seems that a non-smoker and a cannabis smoker are expected to have the same mortality outcome. I was just as surprised when our medical director tried to explain this to a group of actuaries … though I would like to see a few more pieces of evidence to support this fact before I'll be fully convinced.

What are the long-term effects of cannabis use and how will it impact mortality improvement and overall health status?

One could argue that some of these effects may already be built into our experience data, either within the

Figure 1, from 1970 to 2010, the percentage usage of cannabis remained fairly stable, hovering between 10 per cent and 14 per cent, with the exception for the period around 1992.

Will the easy access to cannabis lead to an increase in accidental death or injury?

One of the biggest concerns I keep hearing is the dangers of people driving "high". Studies (Aydelotte et al. 2017; Tefft et al. 2016) were performed on the number of driving deaths as a result of cannabis use shortly after the drug was legalized in the states of Colorado and Washington. The first study, conducted one year after legalization, showed a bump in fatalities. However, a follow-up study a few years later showed no significant change compared to pre-legalization.

they parallel a typical mortality study we would conduct within our companies. Another question is whether the prevalence will increase. Just because cannabis is now legal, will more people use it?

For example, if we assume that an additional 15 per cent of the population use cannabis on a repeated basis, and their mortality is equivalent to that of a smoker and there was no correlation to tobacco use, it would require an additional 25 per cent load to non-smoker life insurance premium rates. This would include in-force business as well.

To answer these questions properly, we need to start analyzing the data we are already collecting, so that more refined mortality studies can be performed. We also need to develop key leading indicators on the business we accept to determine if any action is required during the underwriting assessment phase or if changes are needed to mortality assumptions. As risk management practitioners, we can start by tracking whether we see an increase in cannabis use via the information provided on insurance applications and cross-reference this information with publicly available data on cannabis use.

Other possible indicators may be changes to causes of deaths and frequency, including asking for additional information at time of claim, such as alcohol use, cannabis use, and exercise. As we move towards an age of digitalization, I wonder whether predictive analytics and machine learning can be used to help us get ahead of the curve in analyzing the risk of cannabis use, instead of being stuck in the "weed"s.

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general population or within a company's own book of business. Although the insurance industry has been accepting healthy "occasional" cannabis smokers as non-smokers only in recent years, there may be some undeclared use within the insured population. The two studies referred to above would lead you to conclude that if there was an impact it would be small. Finally, referring back to

What are some of the risks that we need to address in the life insurance industry?

The biggest risk we face is trying to deal with the unknowns or the soft data. We need to question the data on usage and how reliable it can be. Despite the studies on cannabis use and mortality, due to the level of subjectivity I don't think

Table 1: Cannabis use in Canada (% of population)

	2018 Q1	2018 Q2	2018 Q3	2018 Q4
Canada	**14.0**	**15.6**	**15.2**	**15.4**
Newfoundland and Labrador	16.4	18.1	16.1	19.2
Prince Edward Island	14.1	19.2	15.0	17.9
Nova Scotia	20.0	21.0	23.0	21.6
New Brunswick	14.3	17.3	13.8	18.9
Québec	10.4	10.6	10.1	13.6
Ontario	13.5	17.8	15.1	15.4
Manitoba	16.6	15.1	18.9	15.1
Saskatchewan	15.1	9.9	15.7	16.5
Alberta	16.6	15.6	17.0	16.2
British Columbia	17.1	17.3	20.0	15.3
By gender				
Male	15.8	19.1	17.5	19.4
Female	12.2	12.2	12.5	11.3
By age group				
15–24 years	23.2	32.7	27.0	27.4
25–34 years	26.1	26.9	24.5	23.2
35–44 years	15.9	14.9	16.5	17.5
45–54 years	8.2	10.6	12.0	12.8
55–64 years	9.4	10.0	9.9	10.4
65 years and over	4.0	3.4	4.9	5.2

Source: Statistics Canada 2019b.

Figure 1: Cannabis usage (% of population) 1960–2015

Figure 2: Cannabis usage (% of population) 2000–2015 by age group

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