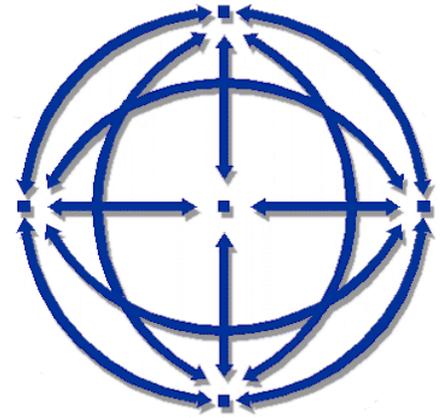## Latest Developments in the Canadian Economic Accounts

Preparing the statistical system for the legalization of cannabis

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Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued co-operation and goodwill.

Preparing the statistical system for the legalization of cannabis

1. Introduction

Canada's economy, and society more generally, continue to grow and evolve. Statistics Canada strives to keep its programs up-to-date with changing trends and circumstances to ensure Canadians are well informed about current developments. This means Statistics Canada has to continuously innovate and invest in the statistical system. The prospective legalization of cannabis for non-medical purposes means Statistics Canada needs to start preparing Canada's national statistical system to capture the associated economic and social implications.

On April 13, 2017 the Government of Canada tabled the *Cannabis Act* in Parliament, Bill C-45, "to provide legal access to cannabis and to control and regulate its production, distribution and sale." Annex 1 provides a brief summary of the Act. If legislation is approved by Parliament the drug's new status might come into effect by mid-2018.

Health Canada first established regulations on access to cannabis for medical purposes in 2001. This regulatory framework has undergone a number of changes since then, most notably in 2014 and 2016. The non-medical use of cannabis has been and continues to be illegal, although unlawful transactions in cannabis for non-medical use have undoubtedly existed in Canada for a long time. These illegal transactions are not well captured by the Canadian statistical system although Statistics Canada has, on a number of occasions, surveyed Canadian households about their usage of cannabis and other illicit drugs. Statistics Canada is currently making additional efforts to estimate the market value of illegal cannabis used for non-medical purposes, prior to legalization. Once cannabis is fully legalized much of the production, sale and use of the drug will move from 'underground' to 'above ground', making it easier to measure and report.

Statistics Canada is presently preparing the statistical system to be able to gauge the impact of the transition from illegal to legal non-medical cannabis use and to shed light on the social and economic activities related to the use of cannabis thereafter. While the system of social statistics captures some information on the use of cannabis, updates will be required to more accurately measure health effects and the impact on the judicial system. Current statistical infrastructure used to more comprehensively measure the use and impacts of substances such as tobacco and alcohol could be adapted to do the same for cannabis. However, available economic statistics are largely silent on the role illegal drugs play in the economy. Both social and economic statistics will need to be updated to reflect the legalization of cannabis and the challenge is especially great for economic statistics. This paper provides a summary of the work that is now under way toward these ends.

2. Framework

Statistics related to cannabis can be grouped in two broad categories: social and economic. The former refers to information about cannabis-related health effects, crime and social behaviour while the latter signifies information about cannabis-related production, distribution, sales, consumption, prices, employment, wages, corporate profits, international trade and other economic variables.

Social and economic statistics are structured around a variety of classification systems and these will first have to be updated to capture the range of social and economic activities related to the legalization of cannabis. Many different classification systems are affected and these are discussed in section 3. The focus is primarily on economic classification systems because the classifications for social statistics are already fairly well prepared for the transition.

Once the classification systems and related survey infrastructure have been updated, various data collection instruments need to be updated or expanded. Questions need to be added to survey questionnaires, survey samples must be adjusted and so on. Section 4 discusses the various statistical programs that will be revised.

The result of these changes to the statistical system will be new information about cannabis. The aim is to answer a range of questions that Canadians will have after the legalization of non-medical cannabis takes effect. For example, they will surely want to know whether cannabis prices are higher or lower after legalization, how much is

being spent on cannabis products and the extent to which driving under the influence of drugs is affected. These and other new types of forthcoming statistical information are discussed in section 5.

3. Statistical infrastructure

Three key parts of Statistics Canada's infrastructure will be updated to reflect the legal status of cannabis. The first is a variety of classification systems. The second is the business register – a database with records for all Canadian businesses of significant size. The third is the set of administrative databases[1] used by Statistics Canada for its statistical programs

3.1 Classification systems

Statistical classification systems are comprehensive structured lists of mutually exclusive categories. In practice, this means that for any given object within the scope of the classification there is always a category in the classification and the object can be classified in only one category. For example, the National Occupational Classification organizes the full range of kinds of work performed by Canadians into 10 broad occupational classes, 40 major groups of occupations, 140 minor groups of occupations and 500 unit groups of occupations.[2]

Classification systems are the backbone of the statistical system. They allow very complex and diverse groups of entities to be simplified and analyzed effectively. At one end of the statistical measurement process classification systems facilitate the drawing of survey samples and the calculation of survey results. At the other end they provide frameworks with which to present statistical results to users. The classification systems developed and maintained by Statistics Canada are also widely used by private citizens, businesses and government departments for many different purposes. With the legalization of non-medical cannabis, a variety of Statistics Canada's classification systems will need to be updated.

3.1.1 North American Product Classification System

The North American Product Classification System (NAPCS)[3] organizes the various products (goods and services) that are supplied and used throughout the economies of Canada, Mexico and the United States. Canada's version of this classification will need to be updated to include cannabis and cannabis products, in partnership with our two neighboring countries.

Since illegal goods and services are out of scope for NAPCS, legalization of cannabis will prompt Statistics Canada to review and revise the classification of goods and services associated with it. This happened recently with the clarification of the law regarding medical cannabis in late 2016. NAPCS Canada 2017 has clarified the coding of cannabis for medical purposes by adding examples to existing classes (the product is covered in the existing classification but is not broken out into its own class) as follows:

11513 Other miscellaneous crop products
115139 Other miscellaneous crop products, n.e.c.
1151393 Medical plants:Examples:

- Dried cannabis for medical use

- Cannabis seeds for medical use

- Cannabis plants for medical use

- Fresh cannabis buds and leaves for medical use

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1. Administrative data are collected by government agencies and private sector companies for their own organizational purposes. Statistics Canada draws upon these data to compile statistical information efficiently. A good example is tax-filer records compiled by the Canada Revenue Agency.
2. Statistics Canada, "Introduction to the National Occupational Classification (NOC) 2016" http://www.statcan.gc.ca/eng/subjects/standard/noc/2016/introduction.
3. Statistics Canada, "North American Product Classification System (NAPCS) Canada 2017" http://www.statcan.gc.ca/eng/subjects/standard/napcs/2017/introduction.

27311 Pharmaceutical and medical products
273111 Medical chemicals and vitamins, in bulk
2731111 Medical chemicals and vitamins, in bulk

Example:

- Cannabis oil for medical use, whether or not in bulk

Considering that under the current law, medical cannabis is to be delivered to users directly by the same entity that produced it (meaning no intermediaries for trade), no product has yet been identified at the wholesale and retail levels in NAPCS Canada.

When cannabis becomes legal for uses other than medical (non-medical, food processing, etc.) and wholesale and retail activities also become legal, NAPCS Canada will need to be adjusted.

It is possible to consider creating a new NAPCS Canada group (e.g., new code 213) for cannabis and cannabis products that can account for agricultural (cultivation, harvesting, preparation) and manufacturing aspects of producing cannabis products (including edibles), with the necessary breakdowns. For wholesale, it is possible to add a new class (5-digit) for Cannabis and cannabis products or detailed 7-digit codes for cannabis under Other farm products, Tobacco products, Medical products or something else.

For retail trade, it depends on how cannabis products will be retailed: as food (edibles), smoking products or other products. It will be possible to add subclass and detail levels for all retail cannabis and cannabis products under Miscellaneous products or to create a new class for Cannabis products at retail.

For the next revision of NAPCS Canada 2017, adding entirely new groups and classes with the necessary breakdowns will be the best strategy to take. It will be problematic to integrate cannabis and cannabis products within the existing product categories, since that will make cannabis products impossible to estimate separately in a lot of cases. Having new groups and classes for cannabis and cannabis products will also help to keep NAPCS Canada categories that are not part of trilateral agreements with the United States and Mexico separate.

Should cannabis product class definitions be based on the level of THC and CBD?[4] How are e-cigarettes or vaping devices that contain cannabis or THC dealt with, as opposed to those containing nicotine? Should they be split? How is the line drawn between hemp (a variety of cannabis with very low THC) and other cannabis products, considering that hemp has long been cultivated for use in commercial and industrial applications such as construction materials, rope, clothing and beverages? These questions need to be addressed from the perspective of Statistics Canada's price index programs and in the national accounts. How do we define categories found in Health Canada's questionnaires, such as, fresh and dried cannabis–parts of plants versus full live plants for growing, cannabis oil versus resins and other concentrates (what is considered oil?). Will it be possible or mandatory to always split between medical cannabis products, cannabis for research and non-medical cannabis products for producers, wholesalers and retailers? These questions need to be addressed from the perspective of the mutually exclusive categories in a standard product classification like NAPCS, the price index programs and the national accounts.

3.1.2 North American Industry Classification System (NAICS)

The North American Industry Classification System (NAICS)[5] is designed to provide common definitions of the industrial structures of Canada, Mexico and the United States. This classification system was also developed and is maintained in partnership with our two neighboring countries. In this classification businesses are grouped together based on the kinds of processes they use to make products. The criteria used to group business and government establishments into industries are similarity of input structures, labour skills required and production processes.

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4. Tetrahydrocannabinol (THC) is the principal psychoactive constituent, or cannabinoid, of cannabis. Cannabidiol (CBD) is a major phytocannabinoid of cannabis with many medical applications.
5. Statistics Canada, "North American Industry Classification System (NAICS) 2017". http://www.statcan.gc.ca/eng/subjects/standard/napcs/2017/introduction.

To take account of the legalization of cannabis products, new examples will be added to NAICS, in addition to the existing example, to clarify the coding of agricultural, retail and wholesale activities related to cannabis and to be consistent with the current United States NAICS coding of these activities. These examples are:

- Under 111419 Other food crops grown under cover, add Cannabis, grown under cover
- Under 111999 All other miscellaneous crop farming, add Cannabis, grown in an open field
- Under 411190 Other farm product merchant wholesalers, add Cannabis merchant wholesalers
- Under 453999 All other miscellaneous store retailers (except beer and wine-making supplies stores), add Cannabis stores, medical or non-medical

If, prior to the NAICS 2022 revision, it is determined that the importance of a NAICS activity demands a specialized industry, this could be dealt with through the creation of an 'extension variant' to existing industries. For example, if it is necessary to measure the activities of a cannabis retailing industry consisting of specialized stores, this could be achieved using a 7-digit NAICS extension industry, 4539991 Cannabis retailers. Similar extensions of the base classification could be created in other sectors as needed.

It is not yet clear where manufacturing sector (31-33) activities related to cannabis will be coded. These could include:

- Cannabis processing
- Cannabis oil extraction
- Cannabis edibles production
- Medical cannabis products production

Cannabis processing might be found under 3122 Tobacco manufacturing, Cannabis oil extraction under 311224 Oilseed processing, Cannabis edibles production under 311 Food manufacturing and Medical cannabis products production under 325410 Pharmaceutical and medicine manufacturing. These hypothetical coding decisions will require consultation and ideally agreement with Statistics Canada's trilateral partners, the United States and Mexico.

3.1.3 Other classification systems

In addition to NAPCS and NAICS, a number of other classification systems will also need to be updated.

The classification of goods and services at the base of the Consumer Price Index (CPI) will need to be updated. One option is to include cannabis products within the major component Alcoholic beverages and tobacco products. This component already has sub-components for Alcoholic beverages and Tobacco products and smokers' supplies with further sub-sub-components for these. Cannabis products could be another sub-component.

The CPI also classifies products according to purpose. This classification is used in the Bank of Canada's preferred measures of core inflation. Three categories are included: Alcoholic beverages served in licensed establishments, Alcoholic beverages purchased from stores and Tobacco products and smokers' supplies. Statistics Canada will need to partner with the Bank of Canada on how the calculation of the core inflation measures might be updated to include cannabis products.

Statistics Canada also uses the international standard Classification of Individual Consumption by Purpose (COICOP) and the Classification of the Functions of Government (COFOG). The former is used to compile and tabulate the national accounts estimates of household final expenditure. The latter is used by the Government Finance Statistics (GFS) program to produce internationally comparable government expenditure statistics by function. Government expenditures classified by function provide an important picture of the role governments play in delivering services such as health, education, social protection and public order and safety to citizens.

COICOP and COFOG have already been slightly adjusted to meet Canada's specific needs. Additional adjustments may be needed to include expenditures related to cannabis. In the case of COICOP the Alcoholic beverages and tobacco category may be expanded to include cannabis products. In COFOG the Health category may be expanded to include explicitly health care expenditures related to cannabis abuse, the Public order and

safety category to include law enforcement expenses related to driving under the influence of cannabis and the administration and enforcement of the cannabis regulations and the Education category to include government expenditures related to public education about the safe use of cannabis products.

The classifications of revenue sources and expense types that form the basis of the inter-governmentally comparable Canadian GFS system will also need to be updated. Government revenues resulting from cannabis-related taxes, including the HST/GST and any new excise taxes, will be separately identified. Similarly, government cannabis-related expenses associated with health care, law enforcement and education will be tabulated.

The Survey of Household Spending collects detailed information on household expenditures along with income data and demographic and dwelling characteristics of the household. It uses a classification of expenditures on goods and services that is specifically designed for the survey. This classification will need to be adjusted to include cannabis products, perhaps in the higher-level category Tobacco products and alcoholic beverages.

The Harmonized Commodity Description and Coding System (HS) is used internationally to classify traded products for purposes of both tariff and statistical systems. Statistics Canada will likely specify a new HS code for cannabis products. According to the proposed Cannabis Act, import/export of cannabis will remain illegal except, as is the case now, when permits to import/export are issued for limited purposes (medical or scientific purposes, or industrial hemp). Import/export of cannabis for other purposes is prohibited under the terms of the international drug treaty. In the case of exports of cannabis products to the United States, it will be necessary consult with the authorities in that country about possible changes to their classification systems since under the existing data exchange agreement Statistics Canada uses US import data to measure Canadian exports to that country.

The Canadian Community Health Survey and the Canadian Tobacco, Alcohol and Drugs Survey (CTADS) collect information about the health of Canadians and their use of drugs, by means of household interviews. Among many other topics, the surveys already collect information about cannabis use. The surveys will need to consider possible adjustments to their questionnaires in light of the legalization of cannabis. The agency will work towards developing 'standard' questions on cannabis consumption and use, building on what already exists. This would include determining standard consumption units (e.g. grams, joints) and frequency of use units (e.g. days, weeks, months). These standards will serve to improve understanding of consumption patterns and will help in devising measures to assess potential impacts, good and bad, on health (dose response effects).

Finally, a number of justice statistics classification systems will also need to be updated such as the classification of offences given the sale and consumption of non-medical cannabis will no longer be an illegal offence.

3.2 Business register

Statistics Canada's business register is a large database containing information about over two million Canadian businesses of significant size. The information includes contact details for each business as well as the NAICS code, employment and some other profiling information for each business. The business register is a key piece of infrastructure for use in designing and conducting business surveys.

At the time of writing, 58 businesses were licensed by Health Canada to produce and sell cannabis for medical purposes. While licenses obtained under the Access to Cannabis for Medical Purposes Regulations will continue to be valid after the Cannabis Act takes effect (until expiry or revocation), the terms of those licenses will remain the same. Some of the businesses already licensed to produce cannabis for medical purposes may want to produce non-medical cannabis as well and they will need new licenses. The number of licensed businesses may grow substantially as the date for legalization of non-medical cannabis approaches and there also may be some consolidation in the 'industry'.

Statistics Canada will take steps to ensure the business register includes all licensed producers of cannabis products, no matter how large they may be, and is kept up to date as the nascent 'industry' continues to grow and transform. This will be accomplished in partnership with Health Canada, the federal department that is responsible for regulating all cannabis producers.

3.3 Administrative databases

A number of other government agencies and businesses supply administrative data to Statistics Canada for statistical purposes. These data are used to update the business register and where possible, to substitute for what would otherwise be survey data. Data sharing partnerships of this kind, between Statistics Canada and numerous other government departments and agencies and businesses, are crucial to the 21st century statistical system.

The increasing use of administrative data in preference to surveys means that the response burden on households and businesses is far smaller that it would otherwise be. Some of the key administrative data that Statistics Canada uses include personal and corporate income tax files, goods and services tax records, harmonized sales tax records and payroll deduction data from Canada Revenue Agency, customs import and export records from the Canada Border Services Agency, employment insurance data from Employment and Social Development Canada, financial reporting data from Canada's federal, provincial, territorial and municipal governments, and industry specific administrative data from agencies such as the Office of the Superintendent of Financial Institutions, the Canadian Radio-Television and Telecommunications Commission and the Bank of Canada.

In this respect, Statistics Canada is currently collaborating with the cannabis regulatory authorities at Health Canada. Statistics Canada will have on-going and timely access to the information collected by Health Canada about each individual licensed producer of cannabis products. This will allow Statistics Canada to produce useful statistics about the cannabis 'industry' without duplicating the reporting burden already imposed on these businesses via the regulatory process and without adding unnecessarily to the costs of data collection. As provincial and territorial regulatory systems are being established to control the distribution of cannabis products, Statistics Canada will also be seeking to partner with the responsible governments and to make good use of their administrative data for statistical purposes.

Statistics Canada will also work, through the Canadian Centre for Justice Statistics, to acquire additional policing data related to cannabis from the Royal Canadian Mounted Police and other relevant policing authorities that could further help inform understanding of the cannabis market in Canada.

Statistics Canada also receives health administrative data on health service use and vital statistics from national organizations and provincial registrars. These data represent a valuable source of information to track health impacts of cannabis use, particularly when linked to survey data containing information on cannabis use. Statistics Canada will work with external partners including Health Canada, Canadian Institute for Health Information and the Canadian Centre for Substance Abuse to adopt coding standards to identify adverse events related to cannabis using classification systems such as the International Classification of Disease.

4. Updates to data collection instruments

4.1 Price indexes

Market prices for medical cannabis will be collected from the medical cannabis producers starting later in 2017, via the Survey of Producer Prices. By regulation, medical cannabis products must be sold directly by the producer to the consumer, so there appear to be no additional wholesale or retail margins involved beyond the producer level at present. The ways in which cannabis products are reflected in the Industrial Product Price Indexes will depend on the changes to NAPCS and NAICS as discussed in section 3.

Once non-medical cannabis becomes legal, some of the then-existing medical cannabis producers may begin serving the new market as well, so the data collection by the survey will simply continue. However, at that point the retail price may start to diverge from the factory gate price, depending on the distribution systems put in place by the provinces and territories and on the taxes levied on cannabis products by the different levels of government. Statistics Canada will also add one or more representative products for cannabis to the CPI survey in order to measure retail prices, consistent with whatever changes are made to the CPI classification of goods and services.

There is also a need for price statistics for the illegal non-medical cannabis products that some Canadians are currently consuming. Although it is of course difficult to measure prices in an illegal market, the website Price Of Weed (www.priceofweed.com) has since 2010 been collecting a sample of such transaction prices by

crowd-sourcing from anonymous volunteer cannabis transactors. Statistics Canada is presently working to develop a price index using these data and is also considering whether to experiment with crowd-sourcing[6] itself to collect price and quantity information.

4.2 Production, sales and inventories of cannabis producers

Statistics on the value of production, sales and inventories of legal producers of cannabis will be collected via Statistics Canada's existing agriculture, manufacturing, wholesale and retail surveys. Initially these statistics will be derived from Health Canada administrative data (although these data are in physical terms only, not value terms) and corporate tax administrative records. As legalization day approaches and the new regulatory regime becomes clear, Statistics Canada will also consider whether the collection of cannabis-related production, sales and inventories statistics is necessary within existing monthly, quarterly and annual survey programs. The affected programs include the annual Greenhouse, Sod and Nursery Survey, the monthly and annual surveys of manufacturers,[7] the monthly and annual Wholesale Trade Survey, the monthly and annual Retail Trade Survey and the quarterly Retail Commodity Survey.

In addition, new methodologies will be developed in the monthly, quarterly and annual national accounts to derive estimates of production, sales and inventories of cannabis products that are consistent with national accounts concepts and classifications. In particular, the quarterly income and expenditure accounts will include estimates of household expenditure on cannabis at current and constant prices.

Changes to these programs will be driven by the classification changes. For example, if a new cannabis product class is added to NAPCS then the Retail Commodity Survey will need to be updated or if a new cannabis manufacturing industry is created the monthly and annual surveys of manufacturers will need to be updated.

4.3 Labour and other production costs and profits

Employment and wages associated with cannabis-related economic activity will be measured automatically in the Labour Force Survey (LFS), which estimates employment by interviewing households about their involvement in the labour market. Consideration will be given to the possibility of extending the industry-of-employment questions on that survey to include a specific category for cannabis, using the updated NAICS classification.

The Survey of Employment, Payrolls and Hours (SEPH) will also automatically include the employment and earnings of persons engaged in cannabis-related activities. This survey estimates these variables on the basis of payroll deduction administrative forms submitted to the government by employers combined with results from a relatively small survey of those employers. Again consideration will be given to breaking out cannabis-related employment and earnings using the updated NAICS classification.

The production and other costs of cannabis producers will also be collected by Statistics Canada's annual production survey programs, such as the Farm Financial Survey and the Annual Survey of Manufacturing and Logging Industries, as will their profits in the quarterly Survey of Financial Statistics for Enterprises. Corporate income tax records, available with a longer time lag, will provide benchmark information.

4.4 Business investment

It is expected that cannabis producers will be making substantial investments in new facilities and equipment over the coming years in order to serve the new non-medical cannabis market. These expenditures will be tracked by means of the annual Capital and Repair Expenditures Survey.

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6.   The term crowd-sourcing refers to a method of gathering information or ideas from the general public using the Internet. According to Wikipedia, the term "was coined in 2005 as a portmanteau of crowd and outsourcing." The method has a number of advantages including some related to cost, speed and flexibility, although it also may suffer from a number of biases from the perspective of statistical theory.
7.   These include the Monthly Survey of Manufacturing and the Annual Survey of Manufacturing and Logging Industries.

4.5 Government revenues and expenditures

Statistics Canada's existing GFS program will be expanded to include information about expenses incurred and tax revenues received by governments that are related to cannabis. These changes will correspond to the alterations made to the GFS classification of government expenses and revenues.

The federal government will incur costs to administer the non-medical cannabis regulatory system. These costs will be in addition to those already being incurred due to medical cannabis regulation. The government also sustains law enforcement costs and expenses associated with cannabis-related public education. The provincial, territorial and local governments will also incur administration and enforcement costs once non-medical cannabis is legal, since they will be responsible for regulating the cannabis distribution systems. They may also incur additional health and law enforcement costs. Statistics Canada will identify these costs, measure them using administrative data from the general ledger databases of the different governments and estimate them.

It is also expected that some of the governments may impose excise taxes on non-medical cannabis products and the GST or HST will also apply. The revenues from these taxes will also be reported in the GFS program.

4.6 International trade

At present, non-medical cannabis is not legal in any country other than Uruguay.[8] However, medical cannabis is legal in several countries. Statistics Canada will search its international trade database for cannabis-related transactions in medical cannabis that may have occurred. It will also monitor authorized exports and imports of cannabis going forward, though such transactions are expected to be small in the foreseeable future. Any new statistical series for trade in cannabis products will be consistent with the revised HS classification of traded goods.

4.7 Medical cannabis producer characteristics

Statistics Canada is conducting a special survey and obtaining previously collected regulatory information about the full set of licensed producers of medical cannabis in 2017. This regulatory information and survey information will be used to estimate the industry structure, production, sales, employment, investment and other economic characteristics of these producers in fiscal years 2015-16 and 2016-17.

4.8 Cannabis consumption in 2017

Statistics Canada in partnership with Health Canada is conducting the Canadian Tobacco, Alcohol and Drug survey (CTADS) in 2017. This household survey enquires about the frequency of usage of a number of drugs, including cannabis, whether legal or illegal. It will provide a benchmark for cannabis usage in Canada for the period prior to legalization.

The Office of the Parliamentary Budget Officer has demonstrated a method to convert these frequency of usage data into estimates of consumption volumes and consumption in nominal dollar terms. Their methodology[9] drew on the Canadian Community Health Survey – Mental Health (CCHS-MH), conducted in 2012, to estimate the volume of cannabis consumed and on the Price Of Weed (www.priceofweed.com) website for information about market prices for cannabis. Statistics Canada will develop a similar methodology to measure illegal cannabis consumption. These data will be combined with the price information obtained from various sources to develop household expenditure estimates at current and constant prices in the pre-legalization period.[10] This project will use CTADS results for the year 2017.

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8. In the Netherlands, cannabis is a controlled substance and its production and consumption are misdemeanors, punishable by fines. However the country has not actively enforced these laws for many years. A recent policy change in Israel fines first-time cannabis offenders but criminal charges are only brought if a person offends five times. In the United States, the cultivation, transportation, sale, possession and use of cannabis are illegal under federal law, but legal in several states. The federal government presently allows that if a state passes a law to decriminalize and regulate cannabis it can do so. In Uruguay cannabis is fully legal, although its production is subject to some regulation.
9. Office of the Parliamentary Budget Officer, *Legalized Cannabis: Fiscal Considerations,* November 1, 2016.
10. Assuming the Statistics Canada surveys measure total cannabis consumption in volume terms, illegal consumption can be derived by subtracting legal consumption for medical purposes, measured by Health Canada regulatory data. Since the Price Of Weed (www.priceofweed.com) prices do not distinguish between legal and illegal transactions and probably include both, it will be necessary to measure the average price for legal medical cannabis, probably through the Producer Price Index survey, and net this out from the Price Of Weed (www.priceofweed.com) price average.

4.9 Value added by cannabis producers and distributors

The monthly GDP by industry program will include value added by cannabis producers and distributors, at constant prices, in its estimates of GDP. Regulatory data from Health Canada will be the primary data source for these estimates. The annual supply and use tables will also measure value added by these producers and these estimates will be used to benchmark the monthly value added statistics. In addition, the pre-legalization cannabis market will be studied in an effort to develop historical time series for value added by unlawful cannabis producers and distributors.

4.10 Cannabis satellite account

As a transition measure, Statistics Canada will also develop a cannabis satellite account within the framework of the national accounts. See Annex 2 for a brief explanation of the term. The cannabis satellite account will provide statistics on both the supply of and the demand for cannabis products.[11] This account will enable data users to more clearly determine the economic impact related to the legalization of cannabis. Once the data sources and methods have matured the account will be integrated into Statistics Canada's standard economic products.

The cannabis satellite account will include information about the industrial organization and product lines of the businesses engaged in producing, distributing and selling cannabis products. This will include information such as their size and geographical distributions and the variety of products they sell. It will also include facts about the extent of vertical integration in the growing, production, wholesaling and retailing of cannabis products. The structure of cannabis-related economic activity will be measured through time as the businesses merge and increase or decrease in number. This information will be obtained partially from administrative sources such as Health Canada and the Canada Revenue Agency, and partly from a special survey referred to in section 4.7.

5. Some questions to be answered

The updated surveys and other statistical work described will yield new statistical products in the form of time series for cannabis-related production, sales, inventories, capital expenditures, labour and other costs, profits, employment, price indexes, international trade and government expenses and revenues. These time series will be consistent with the updated classification systems discussed in section 3. They will be released along with similar time series for other industries and products in the statistical tables of the corresponding programs. These statistics are intended to provide answers to many of the important questions that Canadians will have about the effects of legalized non-medical cannabis on the economy and society. In this section a number of the key questions are identified and the ways in which Statistics Canada will provide answers are discussed.

On average, how much cannabis do Canadians consume each month?

The number of grams of cannabis consumed by an average Canadian consumer can be estimated using frequency of use data from Statistics Canada's CCHS-MH in 2012 and also from data collected by the CTADS in 2017, although these surveys do not directly measure volumes consumed. After cannabis becomes legal, sales of cannabis products will be reported by producers to regulatory authorities and these data will be used by Statistics Canada to estimate consumption by Canadian households.

What is the price of cannabis products before legalization? After legalization?

It is of considerable analytical interest to determine whether cannabis legalization leads to an increase or a decrease in the retail prices paid for the drug by users who consume it both before and after legalization. It might lead to a price increase, due to new excise taxes for example, or possibly a price decrease due to lower risk premiums for producers, economies of scale and more competition.

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11. Cannabis products potentially include not just plant buds and leaves, but also a wide variety of other edible and non-edible products such as cannabis-infused teas, baked goods, cooking oils, drinks, ointments and creams. There are also a variety of cannabis-related paraphernalia. Some service-providing industries will also be affected by cannabis legalization such as transportation and wholesale and retail distribution.

A price index for legal medical cannabis will be estimated by Statistics Canada starting sometime in 2017. A price index for illegal non-medical cannabis is currently being developed using data from the Price Of Weed (www.priceofweed.com) website as discussed in section 4.1. After non-medical cannabis products become legal their price will be measured by the Industrial Product Price Index (factory gate price) and the CPI (retail price).

What is the size of the non-medical market in 2017? In 2018?

The size of the non-medical market in 2017, prior to legalization, will be measured by combining cannabis price information obtained from Price Of Weed (www.priceofweed.com) with consumption volume estimates calculated from frequency of use data in CTADS. In 2018, after legalization, the market will be gauged using sales information obtained as described in section 4.2.

What happens to the 'underground' cannabis market after legalization?

The 'underground' market for cannabis products that currently exists will be greatly affected by the introduction of the legal market. The impact is likely to be spread out over time. It will be challenging to measure this impact but Statistics Canada will make an effort to do so by continuing to conduct household surveys of all cannabis use and comparing those statistics with use as measured by legal production and sales data.

What is the economic performance of the cannabis 'industry'?

Sales, employment and profits earned by the cannabis 'industry' will be measured by Statistics Canada as discussed in section 4. Stock market price indexes for public cannabis producers will also provide an indication of how healthy the 'industry' is.

How many people are employed in the cannabis-related 'industries' in 2017? In 2018?

The Labour Force Survey and the SEPH will provide estimates of cannabis-related employment after legalization, as discussed in section 4.3. It is not feasible to collect information about employment in the illegal non-medical cannabis market in 2017, but information about employment in the medical cannabis industry will be collected for that year by the special survey of licensed cannabis producers mentioned in section 4.7.

How many cannabis producers are there in 2017? In 2018?

Cannabis producers must obtain licenses from Health Canada. The number of legal cannabis producers, both medical and non-medical, will be measured in both years using administrative data from Health Canada. It is not feasible to measure the number of illegal cannabis producers.

How much did the legalization of non-medical cannabis add to GDP?

The national accounts will break out the contribution of cannabis production and distribution activity to GDP. However, some of the observed increase in GDP in the initial quarter after legalization will be artificial, since illegal cannabis production in the previous quarter will not have been included in GDP. Statistics Canada will estimate how much this 'legalization effect' is contributing to the growth of GDP in the initial quarter by estimating illegal non-medical cannabis production for the prior period and will inform the public accordingly.

How many Canadians are growing their own cannabis?

At present, Canadians wishing to grow their own cannabis for medical purposes are required by Health Canada to obtain a certificate authorizing them to do so. The certificate can be shown to police or other authorities to verify their entitlement to grow the plant. The number of Canadians growing their own medical cannabis will therefore be estimated based on the number of certificates issued.

To date, no process has been determined to regulate the growing of cannabis for non-medical purposes. If certificates are required, they can be used to provide the required information just as for medical cannabis plants. If no certificates are required, Statistics Canada may use a survey vehicle such as CTADS to count the number of Canadians choosing to grow their own cannabis. The 2017 edition of this survey asks where the

respondent usually gets the cannabis used and the response categories for this question include "I grow my own". Alternatively, the amount of cannabis grown at home might be estimated using plant and seed sales information.

How much are governments spending to enforce cannabis-related laws and regulations?

Expenditures by Canadian governments on cannabis-related laws and regulations will be estimated using data from the general ledgers of the various governments, in Statistics Canada's GFS program, as described in section 4.5.

How much did governments raise in tax revenues from the sale of cannabis?

Revenues raised by Canadian governments from sales and excise taxes on cannabis will be estimated using data from the general ledgers of the various governments, in Statistics Canada's Government Finance Statistics Program, as described in section 4.5.

How many cannabis-related "driving under the influence" charges were laid in 2017? In 2018?

Drug-impaired driving is currently an offence under the *Criminal Code of Canada.* Statistics Canada's Uniform Crime Reporting Survey collects and reports statistics on this kind of offence. As with any changes to federal legislation, once the Cannabis Act is passed the survey will add any new criminal offences to the survey questionnaire and communicate the change to respondents. This process is typically in place 2-3 months after legislation comes into force. In addition, the CTADS is being conducted in 2017 and it is asking the question: "In the past 12 months, have you driven a motor vehicle within 2 hours of using marijuana?"

6. Conclusions

This paper reports on Statistics Canada's plans to develop statistical information responding to the likely needs of Canadians as a consequence of the legalization of cannabis for non-medical purposes.

The plan begins with a number of steps to adjust the infrastructure underlying various surveys and other statistical programs. Classification systems must be updated to identify cannabis products, the groups of business establishments that produce and distribute them, government expenditure and revenue types, and a number of other statistical categories. Particular effort needs to be focused on ensuring the business register includes the growing and evolving set of businesses engaged in producing and distributing cannabis products. New sources of administrative data will be needed, most notably those associated with the regulatory activities of the federal, provincial and territorial governments, and Statistics Canada will be partnering with the responsible organizations.

The second major step in the plan is to review and update a wide range of surveys and other statistical programs in order to include explicitly within them information related to cannabis. For product-oriented statistical programs such as those measuring prices, production, household expenditures and international trade, this implies adjusting survey designs and sample sizes, developing new ways of using administrative data and creating new methodologies for national accounting purposes. For government statistics it involves reorganizing and aggregating financial reporting data from government general ledgers. In social surveys it means adding new questions to existing household surveys and possibly modifying some existing questions. It might also mean adding content from one survey to another, for example some cannabis-related questions from CTADS or selected questions from CCHS-MH could be added to CCHS annual surveys. In the case of justice statistics it means analyzing modified flows of information from law enforcement authorities and aggregating them to produce useful and reliable statistics.

Statistics Canada will also conduct special studies related to cannabis. In particular, efforts will be made to estimate production, value added, consumption and price patterns in the historical period prior to the time non-medical cannabis becomes legal. Such statistical estimates, though inevitably imprecise given the difficulty of measuring illegal activities, will be useful for purposes of comparison with similar information after legalization. Statistics Canada will also focus on a broad range of social and health issues related to the use of cannabis, through its social statistics programs as well as its analytical and research activities.

The third step in the plan is to consider the structure of the associated statistical reports to ensure they clearly address the questions Canadians most want to see addressed. For example, a dedicated 'cannabis statistics hub' might be created on the Statistics Canada website to bring together in one place a broad range of cannabis-related information. The goal will be to provide easy and timely access to relevant information for all Canadians.

The plan, as just described, will be carried out over the next year or so, as cannabis legalization day approaches. Interim reports on some of the activities described here will be released during that time. Once non-medical cannabis is legal, the various statistical programs will begin releasing updated reports that include cannabis-related information on a regular basis.

Annex 1 Summary of Bill C-45, the *Cannabis Act*

"The Act

a. establishes criminal prohibitions such as the unlawful sale or distribution of cannabis, including its sale or distribution to young persons, and the unlawful possession, production, importation and exportation of cannabis;

b. enables the Minister to authorize the possession, production, distribution, sale, importation and exportation of cannabis, as well as to suspend, amend or revoke those authorizations when warranted;

c. authorizes persons to possess, sell or distribute cannabis if they are authorized to sell cannabis under a provincial Act that contains certain legislative measures;

d. prohibits any promotion, packaging and labelling of cannabis that could be appealing to young persons or encourage its consumption, while allowing consumers to have access to information with which they can make informed decisions about the consumption of cannabis;

e. provides for inspection powers, the authority to impose administrative monetary penalties and the ability to commence proceedings for certain offences by means of a ticket;

f. includes mechanisms to deal with seized cannabis and other property;

g. authorizes the Minister to make orders in relation to matters such as product recalls, the provision of information, the conduct of tests or studies, and the taking of measures to prevent non-compliance with the Act;

h. permits the establishment of a cannabis tracking system for the purposes of the enforcement and administration of the Act;

i. authorizes the Minister to fix, by order, fees related to the administration of the Act; and

j. authorizes the Governor in Council to make regulations respecting such matters as quality, testing, composition, packaging and labelling of cannabis, security clearances and the collection and disclosure of information in respect of cannabis as well as to make regulations exempting certain persons or classes of cannabis from the application of the Act."[12]

Annex 2 Satellite Accounts

The term 'satellite account' originated with *System of National Accounts 1993,*[13] the international standard for national accounting that was released in that year. It refers to an approach in national accounting that is intended to allow new or hybrid frameworks to be introduced that are broadly consistent with the accounting concepts of the standard System of National Accounts while allowing additional flexibility.

"In certain types of analysis, the basic intention is not to use alternative economic concepts, but simply to focus on a certain field or aspect of economic and social life in the context of national accounts. The intent is to make apparent and to describe in more depth aspects that are hidden in the accounts of the central framework or surface only in a limited number of points. Tourism is a good example. Various aspects of producing and

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12. House of Commons of Canada, *Bill C-45*, An Act respecting cannabis and to amend the *Controlled Drugs and Substances Act*, the *Criminal Code* and other Acts, April 13, 2017.
13. Commission of the European Communities, International Monetary Fund, Organization for Economic Cooperation and Development, United Nations and World Bank (1993), *System of National Accounts 1993*, Brussels/Luxembourg, New York, Paris, Washington, D.C.

consuming activities connected with tourism may appear in detailed classifications of activities, products and purposes. However, specific tourism transactions and purposes appear separately only in a few cases. In order to describe and measure tourism in a national accounts framework, it is necessary to make a choice between two approaches: either subdivide many elements in the accounts of the central framework to get the required figures for tourism and pay the price of overburdening and unbalancing the various components of the accounts, or elaborate a specific framework for tourism. The latter approach, the only feasible one actually, also allows adaptation of the various classifications and measurement of additional aggregates, such as national expenditure on tourism, which may cover intermediate as well as final consumption." (SNA 1993, para 2.246, p. 65)

Statistics Canada is developing a cannabis satellite account that will aggregate information about the full set of licensed cannabis producers, even though those producers are classified to a diverse range of different industries.