**Census survey – a quaint way to collect data**

Census season is upon us. I just received my invitation in the mail to go online and complete the questionnaire. Bold letters informed me to complete the census — "it’s the law." The census remains the backbone of Canada’s official statistics.

However, change is sweeping across the world of official statistics. Collecting census data will soon experience fundamental revision, supported by big data, the "Internet of things," and an evolving sensibility of privacy by Canadians.

Big data will be the most important force changing census data in Canada. Self-report census surveys, such as those used in Canada, the United States and Australia, rely on an enumeration of occupied residences before they can count people. Maintaining this list of occupied residences can prove troublesome. The list of occupied homes is key to the current census exercise, and municipal water and sewer records offer accurate information on home occupancy. Increasingly, Statistics Canada will rely on municipal records to maintain the list of occupied houses.

Big data will also change data collection. Traditionally, census enumerators trudged from house to house, interviewing an adult representative who provided the requisite information on the entire household. Now, the "occupant" receives a letter containing a personal identification number (PIN) to unlock an online census form. Households that do not receive the letter can go online, secure a PIN for their address and complete the form. Online completion of the census form may appear modern, but it still relies on the willingness and accuracy of that single respondent to self-report accurately on themselves and the rest of the household. That is a major weakness in the Canadian census.

Contrast this approach with how Sweden and other Scandinavian countries construct census information. Some of these jurisdictions have never used a census survey to count population. Instead, population registers, the modern manifestation of the parish record, form the backbone of their system of official statistics.

Population registers are composed of diverse lists of persons. Examples include the list of social insurance numbers, property and income tax records, health insurance data and records on dwellings with an active water connection. Combining information from administrative databases supports the creation of highly accurate data on the population. Collectively, these lists support a detailed picture of the Canadian population. Most important is the fact that compared to the current census method, information from big data can be updated continuously, is much more comprehensive, covers the entire population and once the system for unifying these records is created, is much less expensive.

Of course, Statistics Canada does much more than count people, which is why the long form has value. It presents a picture of Canada’s social, economic and cultural mosaic. Countries using a register base for their official statistics develop the same, if not superior information using the registers as sample frames to target subsets of the population for specialized surveys on culture and social issues. Since these surveys are much smaller in scope than a census (and do not forget the long-form census only covers 20 per cent of the population), increased effort can go into the followup needed to obtain high response rates that boost accuracy. A series of sample surveys could offer much more detail than the long form, and with much less reporting lag.

The Internet of things will collect the routine activity of the household without the awareness of occupants. In the same way algorithms at Visa automatically record all my transactions, quickly interceding when it detects an anomalous purchase, so, too, does my water utility inquire when it detects I have supplied a meter reading that appears out of the ordinary. The water utility estimates how much water two senior citizens should consume. When the "Internet of things" supports a "smart water meter" for my home, water utilities will be able to accurately, quickly and continuously estimate the number of people living at an address. The constant feedback from appliance and utility-meter monitoring of household activity will open a torrent of new information on Canadian households.

Finally, our sense of privacy is evolving. Census 2016 will introduce that new world. Statistics Canada will not ask respondents to provide information on income. Instead, it will access income tax records to compile the income of tax filers in the home. Obviously, both the Canada Revenue Agency and the public must trust Statistics Canada will maintain confidentiality. In fact, data-sharing between CRA and Statistics Canada has existed for some time to support special studies. Evidence exists citizens are prepared to accept such data-sharing to improve services.

Big data, the Internet of things and changing sensibilities on privacy are transforming the census. In 10 or 15 years, we will look back on the way we currently collect census data as a quaint footnote in the history of official statistics, in the same way my grandchildren puzzle over the old rotary phone in my basement. The benefit will be a wider range of official statistics that are detailed, timely and less expensive to collect and compile.