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No sense in Tories' approach to census

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I feel I am a tolerant person. I accept defects in my personality that others might have trouble accepting. But one thing I cannot tolerate as a mathematician is nonsense masquerading as mathematics.

And this is what came to the forefront as the government announced its plan to change the mandatory long form of the census into a "voluntary national household survey."

The aim of any census is to provide information about the entire population. But canvassing the entire population is onerous, both in terms of manpower and cost. Statistics has much to say

about sampling from a population in order to get accurate estimates for whatever you want to determine about the whole population.

Based on the theory of statistics, Statistics Canada has previously sent out the census to a random sample of 20 per cent of households. This may sound like a low number, but one of the beauties of statistics states that this is more than enough to get a highly accurate picture of Canadians. The types of conclusions that can be drawn from a census are along the lines of "with 99.99 per cent certainty, we know that 23.48 per cent of all Canadians are . . ."

But all of this is predicated on the fact that the sample is chosen randomly. You can't have your sample select themselves, or decide whether to participate. In a voluntary survey, those with an axe to grind about an issue are likely to be overrepresented. It doesn't matter that the federal government is sending the survey out to 30 per cent households rather than the 20 per cent of households for the previous mandatory survey. (The lack of randomness just leads to a larger batch of unreliable data.)

Now I could respect (but not agree with) the federal government if it came out and said that they are doing away with the mandatory long form of the census because they feel the data is intrusive, or that they have no use for the data. But they wanted Statistics Canada to say that the results of the voluntary survey would be as accurate as those acquired by the mandatory census, and that is unjustifiable.

Munir Sheikh, the former head of Statistics Canada, just had to resign. Not on policy issues, but under the pressure to recant the underlying mathematical truth. Any mathematician worth their salt would have to do the same.

While I am not a big fan of governments looking into my bedroom, I do feel it is important for governments to have accurate data available to make decisions. There might be yes/no questions to which respondents feel awkward about responding truthfully to, but statisticians have come up with a brilliant bit of insight.

They ask the census taker to flip a coin before answering the question; if the coin comes up heads, answer "yes," otherwise answer truthfully. For any one respondent, of course,

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the statistician would not know if the respondent answered truthfully.

But of course about 50 per cent of the yeses are just due to the coin coming up heads.

For example, if under this scenario 88 per cent of the respondents put down yes to a question, about 38 per cent (88 per cent minus 50 per cent) are truthful yes answers, out of a total of about 50 per cent truthful answers.

So the real percentage of yes answers in the population should be about 76 per cent (38 out of 50 as a percentage). Pretty clever, isn't it?

The mathematician in me says the truth in numbers is the higher good, and so I support having a mandatory census. I expect good decisions and policies from my government, and you can't do that without good information.

Jason I. Brown is a professor of mathematics at Dalhousie University in Halifax. His research that used mathematics to uncover how the Beatles played the opening chord of A Hard Day's Night has garnered worldwide attention. He is also the author of Our Days Are Numbered: How Mathematics Orders Our Lives.

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