Figure 3.2. DATA-BASED INVESTIGATING: Limitations Imposed by Study Error

Study error is the difference between (the values of) the target population and study population attributes. The two articles reprinted in this Figure illustrate the limitation imposed by study error on Answers to two Questions of interest:

∗ *How many sexual predators lived within 3 kilometres of a home in Toronto*?

∗ *Are the health risks associated with the responsible use of pesticides on suburban lawns high enough to justify municipal bans on these chemicals*?

EM0417: The Globe and Mail, May 8, 2004, page M4

One year after Holly Jones

Remember those 200 ‘sexual predators’ in the neighbourhood? We were misled.

BY GEORGE EMERSON

Just about a year ago, Toronto went ballistic over a statistic. It was May 14, 2003, the day after the remains of 10-year-old Holly Jones were found in Lake Ontario.

Police Chief Julian Fantino held a news conference to call for a better sex-offender registry – what the police call the SOR. Ontario had just created one, but he said we would be safer if it were nationwide. Even from Ontario's limited database, Chief Fantino's department revealed a startling figure: Within a three-kilometre radius of Holly's home lived 200 known sex offenders.

The statistic caused a collective stagger. Headlines across the country declared that Holly's neighbourhood, also my own, was reeling with this "second shock." Local and national broadcasters showed footage of fearful residents talking about moving. *The Globe and Mail* said, "These numbers have caused much alarm." *The National Post* repeatedly multiplied the number of sex offenders from 200 to "several hundred." Letters to the editor poured in, typified by one to *The Toronto Star* about the "alarmingly high density of violent criminals."

Ontario's Minister of Public Safety told us things were "pretty scary." The federal Opposition's justice critic said on a national TV debate that if Ontario's SOR had been copied by the feds, then Holly's death "would not have happened." Mayoral candidates held "Criminals Out!" rallies in the west end of Toronto near my home.

A friend who once lived in the area called from the regular traffic jam home to the suburbs. "How can you keep raising your kids there?" he demanded. I felt guilty, negligent.

My wife and I discussed moving. Two of our friends on the block decided, in the aftermath of Chief Fantino's news conference, that they would leave. They have asked me not to publish their names. I'll call them the Smiths. They are a couple who were pioneers in discovering the value of living in Parkdale, the economic and life-style gains to be had by staying in the diverse core of the city. Their semi-detached house, renovated from a seedy rooming house back to its century-old Victorian glory, had tripled its value. They are now in the suburbs.

Not long after the astonishing statistic came the extraordinary order by Chief Fantino that his officers would conduct a DNA canvass of men in the vicinity. I decided that, if asked, I would submit a sample of my DNA. I wouldn't want my neighbours speculating about me if I refused.

So the statistic had achieved this effect, provoking visceral feelings that rapidly overturned more sober, skeptical attitudes. But then a less credulous neighbour pointed out that three kilometres was an awfully large radius, encompassing a huge chunk of the of geography of two million urbanites. I began to get the feeling one has after buying the hype on certain technology or mining stocks. So I decided to trace the statistic to its root.

It turns out that in the hours after the discovery of Holly Jones's remains, a senior-ranking officer in the police department ordered the creation of a statistic from the SOR.

That order fell to Detective Sergeant Elizabeth Byrnes, an officer in the behavioural-assessment section of the sex- crimes unit. She declined to tell me which superior ordered the statistic, but within minutes of my arriving in her small office in police headquarters, Det. Sgt. Byrnes revealed her discomfort with it. She told me that, by design, very few police officers have access to the SOR since it takes training to properly access and interpret the registry, starting with knowing how to properly "build a query" to the database.

"That three-kilometre area is purely arbitrary. It's not logical," she said.

She explained that a much smaller radius of – at most – a few hundred, not thousands, of metres is the proper investigative approach. And then she talked about the other number, the 200 sex offenders who in the media and popular imagination had become equated with 200 sexual predators, "a high density of violent criminals" crawling the streets of my neighbourhood.

Det. Sgt. Byrnes said the 200 were not "predators," but included a wide range of people who had committed offences related to sex, from minor to serious. Reviewing the figure, she said most were offences against adults, not children. Of the relatively few involving children, most were not attacks by strangers, but by family members or trusted friends.

As well, an offender's presence in the database meant only that some time in the past couple of years the offender had at one time or another lived at an address in the meaninglessly large radius. It didn't mean they were still in the area. It also told us nothing about whether other sex offenders – those not in the database because they come from outside Ontario, or had offences predating 2001 – might be living in the area.

I asked her to tap the database for comparative figures. The rate of post-2001 convicted sex offenders in the database for Toronto was not above, but rather below the rates for the suburbs of Halton and Peel Regions, as well as those for Ottawa, the province's second-largest city. Parkdale does not have a disproportionate number of sex offenders in the registry, she said.

I asked her to tell me, bottom line, even in the wide radius of three kilometres, how many of the offenders might properly be described as having a history of behaviour that would qualify them as "child predators."

She scrutinized the list. Again. I waited. As many as 100? I asked. "No," she said. Fifty? "No." Twenty? Ten? "No. No." She paused.

How many? I asked again. "Maybe four or five," she said. "Maybe four. Maybe."

I read in her face a mixture of embarrassment and frustration. She declared that she wouldn't again be party to what happened at the May 14 news conference. "I'm going to stop giving our a number, any number, the media, or even to anyone in our police service."

(*continued overleaf*)

The numbers that caused much alarm ultimately added up to nothing. "That number was erroneous. It should never have been given out", she said.

Det. Sgt. Byrnes is no longer with the sex-crimes unit. She is in the detective support unit.

On June 20, just days after my meeting with her, Michael Briere was charged with first-degree murder in the death of Holly Jones. He lived within a one-block radius of the victim – a tiny fraction of the wide net of fear cast on May 14. He was not in the sex-offender registry. He had no prior offences on record.

Holly Jones was once a student at my children's school. Since her death, I see memorial pictures of her in places we frequent – every day in our school's lobby as well as on a 12-metre-high mural of her on our local playground wall. A year later, we feel the senselessness of her death.

Chief Fantino held his news conference to press for the creation of a national registry of sex offenders. Databases and statistical analysis can be useful tools in crime solving. But they can also easily be abused and distorted to advance an agenda, however well-intentioned. In the end, in addition to a cruel death, that is what is really chilling about the Holly Jones case.

George Emerson is the technology columnist for Report on Business magazine.

EM0418: The Globe and Mail, May 15, 2004, page A14

Pesticide group challenges data used to justify curbs

BY RICHARD MACKIE

Political agendas are overshadowing scientific realities in the growing campaign to curtail the use of pesticides, says Peter MacLeod, executive director of an association that is challenging arguments that the chemicals can pose a risk to health.

"Any time that scientific data is misused to promote a particular agenda, it's troubling to the science community," said Mr. MacLeod, who works at CropLife Canada, a trade association representing companies that manufacture pest-control products. His attack drew a sharp response from Cathy Vakil, one of the authors of a study by the Ontario College of Family Physicians that questioned the safety of pesticides. She defended the study and stressed it reviewed 250 analyses of the impacts the chemicals can have on humans.

'Any time that scientific data are misused to promote a particular agenda, it's troubling to the science community.'

Mr. MacLeod told a news conference at Queen's Park yesterday: "The motivation for [anti-pesticide] bylaws are, in my opinion, not based on science. If the municipalities want to ban a particular product, and are legally allowed to do that, that's their prerogative. But to do so based on science is simply false."

Toronto City Council is debating how to enforce a bylaw passed last year as a public-health measure that would prevent homeowners from using pesticides to battle weeds. But the association's real target was a study released three weeks ago in the same media studio by the Ontario College of Family Physicians, which was described as the most comprehensive study ever done in Canada on the chronic effects of pesticide exposure at home, in the garden and at work.

"The review found consistent evidence of the health risks to patients with exposure to pesticides", the study said, naming brain cancer, prostate cancer, kidney cancer, pancreatic cancer and leukemia among many other acute illnesses.

Mr. MacLeod said the study is "unnecessarily frightening."

"The public needs to know that Canada has exemplary risk- and safety-assessment procedures in place for pesticides", he said. "People can rest assured that the responsible use of pest-control products poses no undue risk."

The CropLife Canada association is establishing an independent review of the College of Family Physicians study, he said.

Carol Burns, an epidemiologist with Dow Chemical Co., said the study is open to challenge because it is "based on selective studies and incomplete data rather than the full scope of available science."

Ms. Vakil defended the study. "The studies we looked at, generally speaking, were of good quality and they were on humans. They reflect very well the way pesticides affect humans because a lot of the studies [cited by the industry] are done on animals in laboratories where there are very controlled situations."

Studies done by the industry "don't reflect what happens in real life", Ms. Vakil said.

"For one thing, they are not on humans. And they don't reflect the breakdown products [that are created] when a lot of these chemicals change when they are in different acidities of soil and when they are in the presence of light."

1 Both the articles reprinted in this Figure mention one or more sources of study error; for each article, list these sources in point form, identifying the paragraph where each is mentioned.

- For each source of study error you list, suggest how the limitation it imposes might be made less severe, and explain briefly how difficult your suggestion would be to implement in practice.