

Population Projections for Community Members

PART 1: Why provide an easy to understand method based on open data to create verifiable population projections ? (by William Warren Munroe, June 20, 2013)

At the 2013 Congress of Humanities and Social Sciences, I had an opportunity to present “Population Projections for Community Members” as part of the “Methods for Projections” session hosted by the Canadian Population Society.

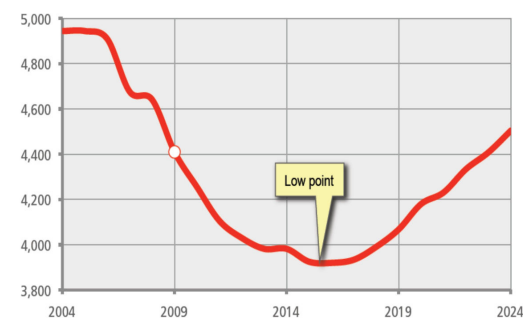
The methods described were developed to address the many questions from parents, guardians, and community members, asking how the population projections, used to justify school closures, were created. The following shows the results of searches for the historical estimates, and inquires regarding BC Statistics’ many unpublished, non peer reviewed changes to the methods used to estimate population.

We found that the methods provided by BC Statistics to community members and to Statistics Canada were not the methods used to create population numbers.

The introduction (with some additional information herein) starts with the justification for the recommendation to permanently close the only high school in the Town of Qualicum Beach.

On October 2, 2010, the Qualicum School District administrators and consultant presented the following chart of the enrolment counts used to justify a closure of the high school. This chart was printed on the front page of a local newspaper and also seen on TV.

FIGURE 1. Qualicum School District Enrolment Chart provided by consultant



The chart gives the impression that the enrolment will be dropping to less than half, less than a quarter, maybe less than 20% of its former high.

Taking a closer look you will notice that the vertical axis starts at 3,800 students. Also, the historical enrolment is provided for the years 2004 to 2009; therefore, I asked for the historical enrolment numbers at least as far back as when the high school was first opened, 1983.

The historical enrolment numbers, provided by the Ministry of Education and the School District administration, are shown in the following chart with the grey area representing Figure 1. Notice that the enrolment was lower when the High School was first opened than the forecast low.

The difference between the red and blue line is because two small schools and the international students were not included in the consultant’s report.

Also, 7 years prior to the recommendation to close the high school, the same high school opened a \$9.1 million expansion.



FIGURE 2: Qualicum SD Enrolment 1983 to 2024

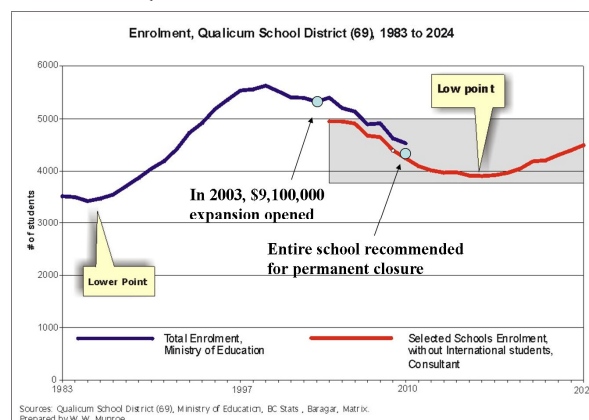


FIGURE 3: \$9.1 million expansion opened 7 years prior to recommendation for permanent closure of the expansion along with the entire public high school.

The consultant's report also referred readers to BC Statistics website for the post census population estimation methods. In October 2010, BC Statistics website provided the most recent population estimation methodology paper, published in 1998.

"1998 Generalized Estimation System (GES) Small Area Population Estimation Methodology" (BC Stats website, October 2010)

Having served as the Population Analyst for BC Statistics from January 2002 to February 2006, I asked the new Executive Director of BC Statistics about the many changes to the methods that had been made since 1998; particularly the use of telephone along with electrical landline hookups as indicators of population change. The new Executive Director replied:

"An updated (long overdue) GES methodology paper is scheduled for release at the end of August." (Executive Director, A. Cocco, August 8, 2011)

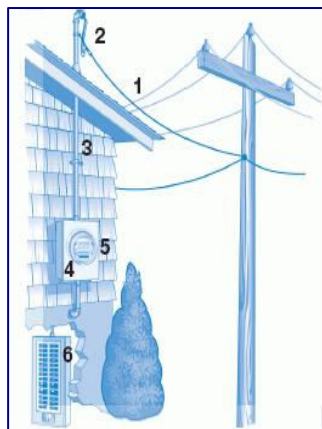
In the updated GES methodology paper published in 2011, some of the many changes since 1998 were described including the use of telephone lines, to be used along with electrical lines as an indicator of population change:

"After extensive analyses it was later determined that telephone line data (Telus) was a suitable indicator and was subsequently added to the model in 2000."

(GENERALIZATION ESTIMATION SYSTEM (GES) Small Area Population Estimation, Method and Error Evaluation, August 2011, (GES 2011), P. 8)

What was the reason for not updating the 1998 GES methods in 2000 when Telus data was added to the model? The fact that BC Statistics did not update the GES methodology paper in 2000, announcing the addition of telephone line data, means that the real methods did not accompany the population numbers from 2000 to 2011.

FIGURE 4: Telephone and Electrical line hookups used to estimate population



Did the "extensive analyses" mean there was a peer review? I asked Statistics Canada and the Canadian Population Society if they were aware of BC Statistics' use of telephone line data. Neither were aware of this fact. Also, when I served as BC Statistics' Population Analyst, I asked to see the write-up of the testing of Telus data, only to be told "DS did the analysis, and you are no DS".

The lack of peer review along with not publishing changes to the methods highlights differences between BC Statistics practices and accepted/expected practices. Also, an "extensive analyses" would have uncovered the problems I raised regarding collinearity and growing cell phone use.

As you know, (speaking to an audience of population projection methods specialists, many of whom teach statistical methods) multivariable regressions require that the independent indicators be independent. Telephone and electrical lines are not independent indicators; therefore, they should not have been used together to estimate population change. Also, the rapid increase in the use of cell phones in the 1990s, particularly among young urban adults, made this an unsuitable indicator.

The determination that telephone line data (Telus) was a suitable indicator was one of the more glaring errors committed by BC Statistics, but not the only error. For example, municipalities that did not fit the model – outliers – were removed from the model in an effort to reduce the error; subprovincial geography was error prone as municipalities were missing from tables, some repeated, or incorrectly coded. The underlying effort was to make the procedures so convoluted and unorganized as to create error prone work. Also, the projection numbers were changed by the Ministry of Finance without

informing clients; only the GVRD and the Capital Regional District were asked to comment on the projections numbers for their area. Comments disparaging of the “dirt ministries” and glorification of the Ministry of Finance reflected a preference away from ground truthing in favor of ecological fallacies.

The point here is that a small group of people were moved into positions of authority (for example restricting otherwise open competition to only the few) within BC Statistics made many non-statistical and substandard method changes to the population estimation methods without publishing the changes to accompany the findings, without peer review, and without the rigor necessary to meet basic, sound, statistical standards and practices.

Back in Qualicum where a possible public school closure loomed, concerns about BC Statistics changing the methods many times without informing the public, as well as concerns about the use of telephone along with electrical line hookups to estimate population were raised with community members, the School District administration staff, the elected Member of the Legislative Assembly, as well as the Minister responsible for BC Statistics, Margaret MacDiarmid, Minister of Labour, Citizens’ Services, and Open Government.

On November 22, 2011, replying to letters sent to the Minister, an Assistant Deputy Ministry asserted the “integrity” of BC Statistics quoting “a 2005 feasibility study by Statistics Canada”:

“The integrity and objectivity of the population estimation procedures and methods are guarded by BC Stats, and the quality of the resulting estimates is unparalleled. Statistics Canada, Canada's national statistics agency, holds in high regard the methodology and estimates produced by BC Stats:

In a 2005 feasibility study prepared by Statistics Canada (STC) for Finance Canada, the agency concluded that:

“...population estimates produced by British Columbia were found to be of better quality when compared with Statistics Canada’s methods.””

(Betty Jo Hughes, Assistant Deputy Minister, Ministry of Labour, Citizens’ Services, and Open Government, November 22, 2011)

FIGURE 5: BC Statistics’ unpublished “extensive analyses” of telephone lines missed young adults



How could the use of telephone and electrical landline hookups produce population estimates of better quality than Statistics Canada’s methods? Was Statistics Canada informed about the “extensive analyses” and addition of telephone line data?

I requested a copy of the 2005 feasibility study or at least the title of the study, many times over the next many months. In May 2012, having not received any reply, I made a request through Freedom of Information for the citation for the quote used to assert BC Statistics’ “integrity”. The request was denied June 22, 2012:

“Please be advised the records [title / copy of feasibility study] you requested are withheld in their entirety pursuant to section 16 (Disclosure harmful to intergovernmental relations or negotiations) of FOIPPA.”

(Cindy Elbahir, Manager, Central Agency Team, Information Access Operations, June 22, 2012)

What? How could disclosure of the methods sent to Statistics Canada for the assessment of methods be considered harmful? There is obviously a difference between the Ministry’s definition of “integrity” and the publicly accepted/dictionary definition: “the quality or state of being complete or undivided”. Complete means “having all necessary parts, elements, or steps; brought to an end : concluded” (Merriam-Webster). Not only is a necessary element, (the reference for the quote) missing, but the need to address “integrity” is not concluded.

Four days prior to being informed that disclosure of the citation for the quote used to assert the “integrity” of BC Statistics is “harmful”, Statistics Canada provided the 2005 feasibility study, titled “The Equalization Program and the Property Tax Base: Feasibility Study Conducted by Statistics Canada”. Of course, the people working at Statistics Canada wanted to know more about BC Statistics’ use of telephone along with electrical lines as well. The 2005 feasibility study (conducted from September 2004 to February 2005) by Statistics Canada for Finance Canada states:

“BC Stats produces its CSD-level population estimates using regression methods with specific symptomatic indicators (number of residential electrical connections and Old Age Security (OAS) recipients). For more details on the methodology, see Generalized Estimation System (GES), Small Area Population Estimation Methodology published by BC Stats in 1998 and available on their website.”

(“The Equalization Program and the Property Tax Base: Feasibility Study Conducted by Statistics Canada”, February 28, 2005 (study conducted Sept. 23, 2004 to Feb. 28, 2005) received June 18, 2012)

To be clear, during the feasibility study conducted from September 2004 to February 2005, BC Statistics did not tell Statistics Canada the truth about BC Statistics’ real CSD-level population estimates using regression methods with symptomatic indicators (number of residential electrical connections and telephone (Telus) connections). Just like community members attending meetings regarding school closures, Statistics Canada had accepted BC Statistics information on good faith.

Now we know why the Ministry of Labour, Citizens’ Services, and Open Government decided that “disclosure” of Statistics Canada’s assessment of methods reported in the 2005 feasibility study is considered “harmful to intergovernmental relations and negotiations”.

If Statistics Canada were told the truth, Statistics Canada would know that BC Statistics’ methods were not as good as Statistics Canada’s and if Community Members were told the truth, Community Members would reject BC Statistics findings.

Now I know why, after having raised concerns and provided solutions to reduce error (while serving as BC Statistics’ Population Analyst), I was no longer invited to section meetings and removed from the contacts list, and why shortly after submitting a grievance describing the non-statistical and substandard methods and practices, I was dismissed from the BC Public Service.

Now I know why the Ministry continues to block mediation and arbitration. The Minister of Labour, Citizen Services’, and Open Government has the authority to remove the block on disclosure of the real methods used by BC Statistics, allowing arbitration to proceed.

The Population Projection Project was designed to provide population projections for community members, using an easy to understand method referring to open data, to create verifiable population projections. This project provides community members with an opportunity to understand the strengths and weaknesses of methods used to create population projections.

Post script: The same people from BC Statistics who provided false reports to British Columbians addressing school closures and Statistics Canada addressing equalization payments were in the audience at this presentation. During the revelation of false reporting, the people from BC Statistics **turned darker and darker shades of red**, shifting nervously and uncomfortably side to side in their seats. They did not object nor say anything even during the question period.

Be sure to validate Statistics Agencies’ products. The Population Projection Project can be validated.

