



The Health Officers Council of British Columbia



Health Inequities in BC

April 2013



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Reducing health inequities is an ethical imperative. Social injustice is killing people on a grand scale.

Excerpt from the 2008 World Health Organization Commission on Social Determinants of Health

This discussion paper is being released by the Health Officers Council of BC.

Purpose of this Document:

The intent of this paper is to use BC data to describe Health inequities in this province. This paper is an update of an earlier paper released by Health Officers' Council in 2008. The 2008 paper also contained a detailed section on policy options to address BC's health inequities. To view the 2008 paper go to: <http://healthofficerscouncil.wordpress.com/> The Health Officers' policy positions for child and family poverty – 2009 paper "Taking Action on Child and Family Poverty" are found on the same website.

Acknowledgements:

This paper draws on many local, national and international sources for which we are grateful. We are thankful for the feedback and consultation provided by BC's public health community and the wide variety of stakeholders interested in addressing health inequities



Executive Summary

In August 2012 the Canadian Medical Association released its 2012 National Report Card that reported on the results of a national survey pertaining to the health of Canadians. The results of the 2012 survey indicated that the gap between higher and lower income Canadians had increased with respect to self-reported health status since their first survey of 2009- "This year, higher income respondents are 29 percentage points more likely to describe their health as excellent or very good in comparison to lower income respondents. In 2009, the gap between the two groups was 17 points (CMA 2012, pg 3)."

This short-term trend is consistent with a number of studies of longer term trends in health inequities. Most of these studies have examined trends in mortality and, most frequently, premature mortality. A number of studies have appeared during the past decade which have concluded that disparities in premature mortality have increased in a number of countries- Britain (Shaw, Davey & Dorling, 2000; Shaw, Dorling, Gordon & Davey Smith 2004), a number of European nations (Shaw, Orford, Brimblecombe & Dorling, 2000), New Zealand and Australia (Hayes, Quine, Taylor and Berry 2002; Pearce and Dorling, 2006) and the US (CDC 2011).

In Canada, similar trends were found in Manitoba (Martens et al 2010) and Quebec (Pampalon, Hamel and Gamache 2008). A few studies which analyzed longer term trends or which examined trends in earlier time periods have concluded that the increased disparity is a relatively recent phenomena that began in the late nineteen-eighties or nineties (Krieger, Rekopf, Chen, Waterman, Marcelli & Kennedy 2008; Pampalon, Hamel and Gamache 2008).

In 2008 the Health Officers Council of BC produced "Health Inequities in British Columbia: Discussion Paper". The report contained a variety of data which presented a profile of health inequities in the province. Included in this analysis was an examination of the relationship between life-expectancy in Local Health Areas and two regional indices which have been developed by BC Stats - the Index of Education Concerns and the composite Socio-Economic Index.





The index of Educational Concerns is composed of 10 indicators

- % of the population aged 0 to 24 without high school completion
- % of the population aged 0 to 24 without post-secondary credentials
- % of 18 year olds who did not graduate
- Grade 12 Provincial Exam Non-completion rates in Math
- Grade 12 Provincial Exam Non-completion rates in Chemistry
- Grade 12 Provincial Exam Non-completion rates in English
- % Below Standard in Grade 4 and 7 in Reading, Writing & Math
- Grade 10 Provincial Exam Non-Completion Rate

The composite Socio-Economic Index is created by combining the Index of Educational Concerns with five other regional indices-

- Economic Hardship
- Crime
- Health Concerns
- Children at Risk
- Youth at Risk

The report utilized life-expectancy figures which were based on five-year averages for the period 2002 to 2006. The BC Stats Regional Indices were for 2005. Since the publication of the report more recent indicators have become available for both sets of data. The purpose of the current report is to provide an update, based on more recent data. This update utilizes Life Expectancy figures for 2006-2010 and BC Stats Regional Indices for 2010 (see maps on Page 11 to 13). There was relatively little change in the groupings of Local Health Areas between the two time periods. The socio-economic gradient among Local Health Areas in life-expectancy has worsened since the 2008 report on health inequities in BC. A pronounced gradient in life expectancy continues to exist and the gaps have widened because larger gains were experienced among the higher SES areas than among the lower SES areas.

The analysis is divided into two sections. The first section provides the update on changes in life-expectancy by Local Health Area in BC, categorized by the two indices referenced above.

The second section examines the differences between the Local Health Areas with the highest SES Index scores and those with the lowest SES Index scores with respect to premature mortality rates. This analysis was carried out to better understand the factors which account for the identified differences in life expectancy.

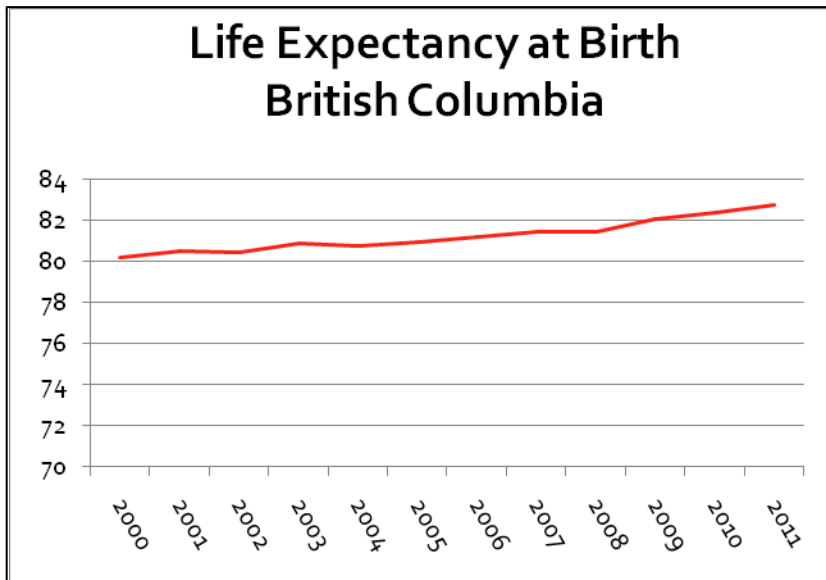


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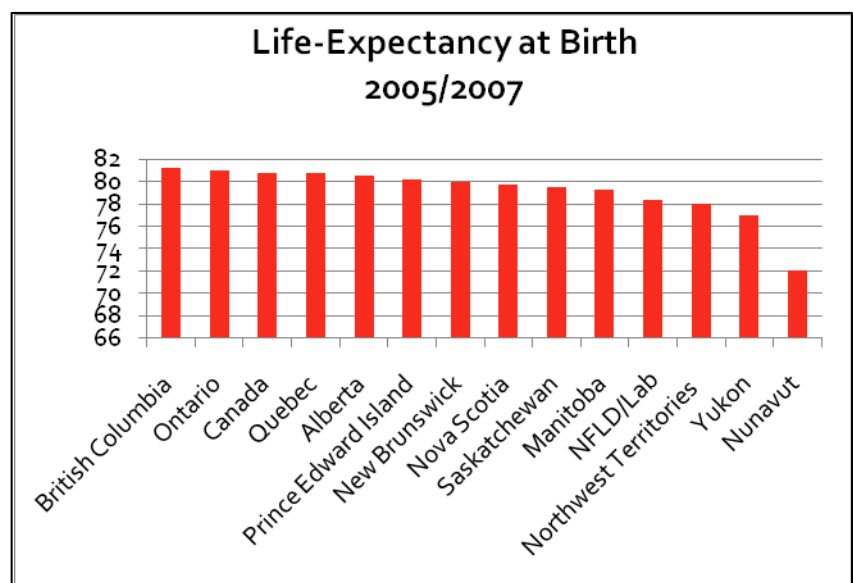


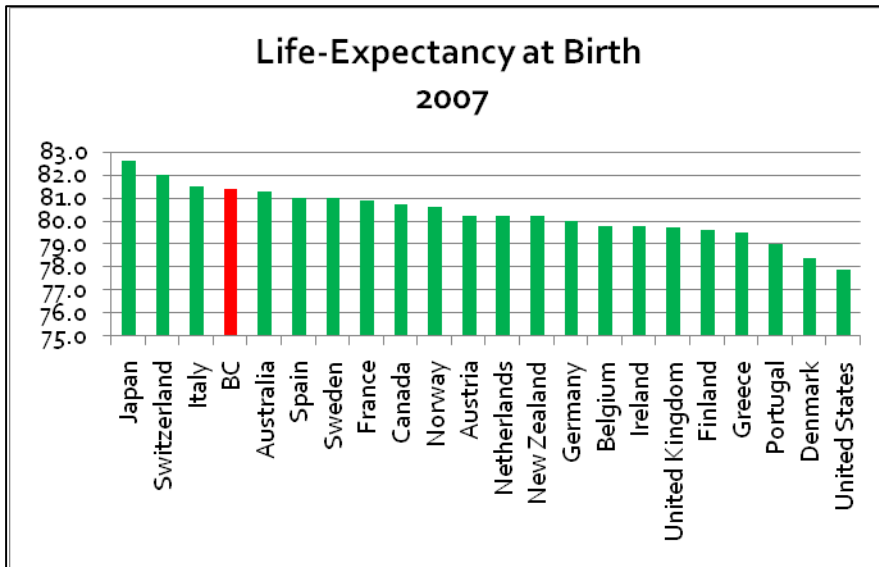
Life-Expectancy and Socio-Economic Status of Local Health Areas



Life-expectancy at birth increased by almost two and a half years during the past decade in BC. This is a continuation of a long-term trend that has seen a fourteen year increase in life-expectancy since 1950.

Among the thirteen Provinces and Territories, BC reports the highest life-expectancy- six months longer than the national average and more than nine years longer than the life-expectancy in Nunavut.





BC enjoys one of the longest life-expectancies in the world.

As demonstrated in the 2008 report on health inequities in BC, however, these high levels of life-expectancy are not shared across all regions of the province. Among the 75 Local Health Areas in BC, the range in life expectancy at birth is substantial- ten years separates the life-expectancy in Richmond (85.63) and Hope (75.54). The 2008 report also demonstrated that there was a relationship between the socio-economic indices and life-expectancy. Local Health Areas which

performed poorly on the indices tended to have lower life-expectancies than LHA which performed well on the indices.

In updating these results, a relatively simple analysis was carried out. The Local Health Areas were ranked according to their scores on each index and then divided into quintiles. The average life expectancies for the two time periods (2002-2006 and 2006 to 2010) were calculated for each of the five groups. The results for the Socio-Economic Index are presented below.

Socio-Economic Index			
Quintile Group	2002-2006	2006-2010	Change in Months
Highest SES	81.26	82.45	14.31
2	80.68	81.45	9.26
3	79.76	80.39	7.56
4	79.49	79.25	-2.98
Lowest SES	77.68	77.76	0.95

The LHAs which had the highest scores on the socio-economic index realized a gain of just over fourteen months in life-expectancy between the two periods. By contrast, the LHAs with the lowest scores gained less than a month and the LHAs in the second lowest quintile experienced an average reduction in life-expectancy of almost 3 months. With the exception of this group, each drop in socio-economic quintile was associated with a drop in average life-expectancy and in the gains experienced in life-expectancy between the two periods.

Index of Education Concerns			
Quintile Group	2002-2006	2006-2010	Change in Months
Highest SES	81.44	82.70	15.05
2	80.30	81.08	9.46
3	79.82	80.40	6.91
4	78.76	78.70	-0.74
Lowest SES	78.07	78.08	0.10

A similar gradient was apparent in the results pertaining to the Index of Education Concerns. The LHAs which reported the highest scores on this index had the highest average life-expectancies in both periods and the largest gain between periods (15 months). At the other end of the continuum, the second lowest and lowest groupings had the lowest average life-expectancies and either a small decrease or negligible increase in life-expectancy between the two periods.

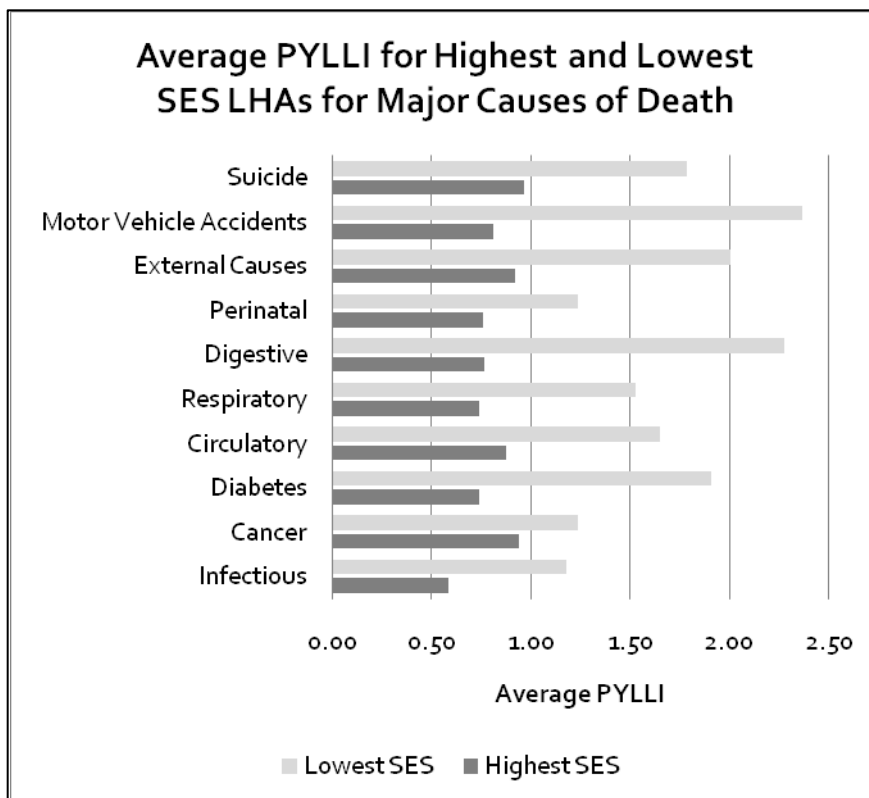
In conclusion, the socio-economic gradient among Local Health Areas in life-expectancy has worsened since the 2008 report on health inequities in BC. A pronounced gradient in life-expectancy continues to exist and the gaps have widened because larger gains were experienced among the higher SES areas than among the lower SES areas.



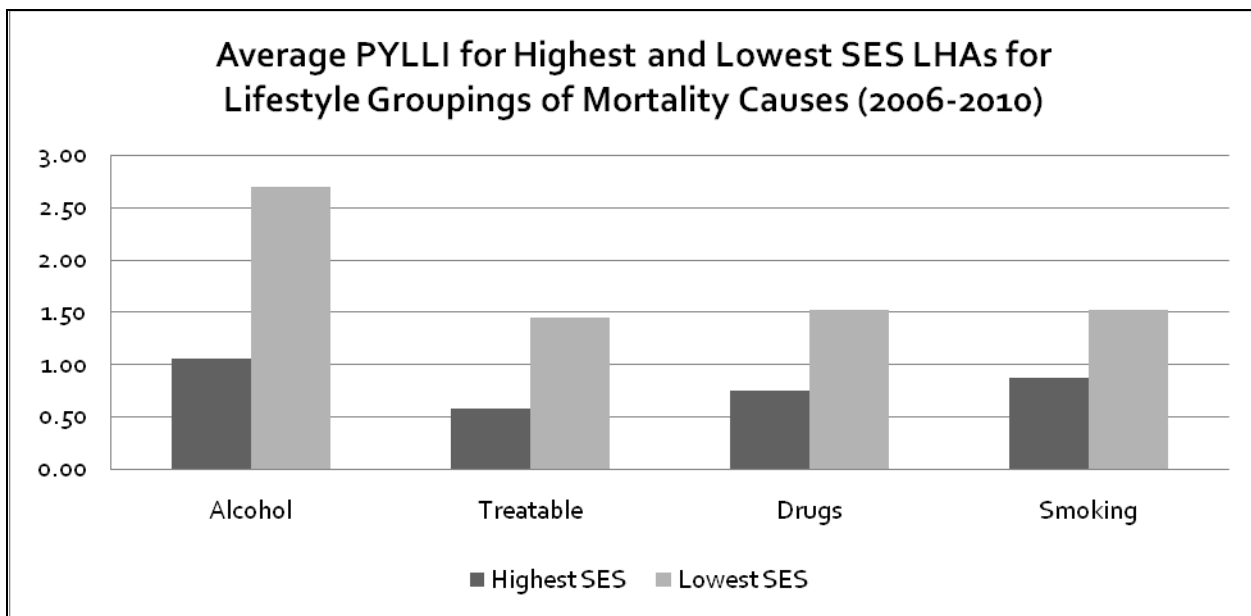


The Causes of Premature Mortality in High and Low SES Local Health Areas

To examine the causes of mortality which were associated with these trends, further analysis was carried out which involved comparing the LHAs in the highest SES quintile (N=15) and the LHAs in the lowest SES quintile (N=15) with respect to the causes of premature mortality. Of particular interest was the issue of whether there were particular causes of premature mortality which appear to be responsible for the substantial differences in life-expectancy between the two sets of LHAs. The Potential Years of Life Lost Index (PYLLI) was used for the analysis. This index represents the ratio between the premature mortality rate for each LHA and the provincial average. For example, a rate of 1.50 indicates that the premature mortality rate for the LHA in question is 50% higher than the provincial rate. A rate of .25 indicates that the local rate is 75% lower than the provincial rate. The PYLLI rate provides an immediate indication of whether rates are high or low compared to the provincial norm. Analyses at the level of LHAs often encounter problems due to small numbers which can cause dramatic fluctuations in single-year rates. To address this issue in the current analysis, five-year averages were used. The results indicated that the differences in premature mortality between the highest and lowest SES areas were apparent across disease groupings and not confined to any particular causes of death. The largest differences were apparent in motor vehicle accidents, digestive diseases and diabetes, and the smallest differences appeared in cancer, perinatal causes and suicide. The term "external causes" of death relate to cases where the underlying cause of death is determined to be one of a group of causes external to the body (for example suicide, transport accidents, falls, poisoning etc).



Causes of death can also be grouped according to the underlying causes of the disease. In BC, the groups which are routinely used are alcohol-related, smoking related and drug-induced causes of death. Mortality is also reported as a category entitled “medically treatable”, which refers to a range of causes of death which are amenable to medical treatment and, consequently, should not result in death if the appropriate medical services are received in a timely manner. The list of conditions associated with each of these groupings is presented in the Methodological Appendix to this report. The results comparing premature mortality between the high and low SES areas indicated that substantial differences occurred across all groupings, with the most dramatic difference apparent in the alcohol-related causes.



Source: Quantum Analyzer

In summary there did not appear to be any specific causes of mortality which accounted for the pronounced differences in premature mortality and life-expectancy between highest and lowest SES areas of the province. Residents of the lowest SES areas were substantially more likely to die prematurely due to a variety of diseases and external conditions.



Summary

The substantial differences between life-expectancies in high and low SES areas of the province which were identified in the 2008 report on health inequities in BC have increased since the publication of the report. While the higher SES areas of the province continued to experience gains in life-expectancy, the lower SES areas did not and, as a consequence, the gap between the areas increased.

The analysis of premature mortality indicated that the higher rates of premature mortality among the lowest SES areas occurred across a number of causes of death and could not be attributed to one or two causes.

This is not an issue that is unique to British Columbia. The trends identified in this report are consistent with the trends that have been identified in a number of other countries and two other provinces- Manitoba and Quebec. A number of potential explanations have been suggested for this trend but the underlying factors are not clearly understood. Among the explanations are the increasing rates of income inequality which have occurred in many countries, reductions in social programs, and the differential levels of uptake of health promoting behaviours that have occurred across income classes. (Krieger et al 2008; Pampalon et al 2008; Martens et al 2010).

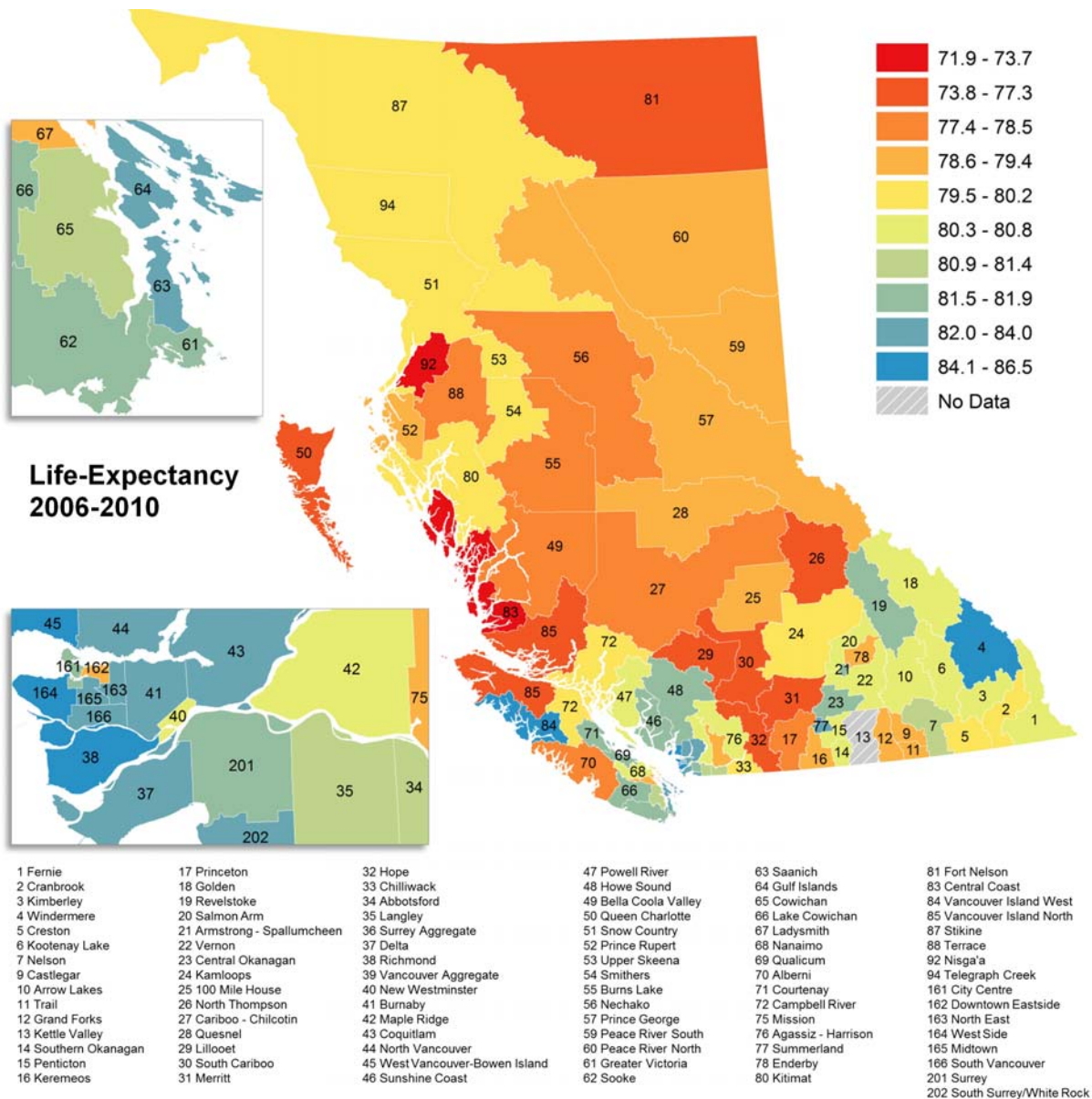




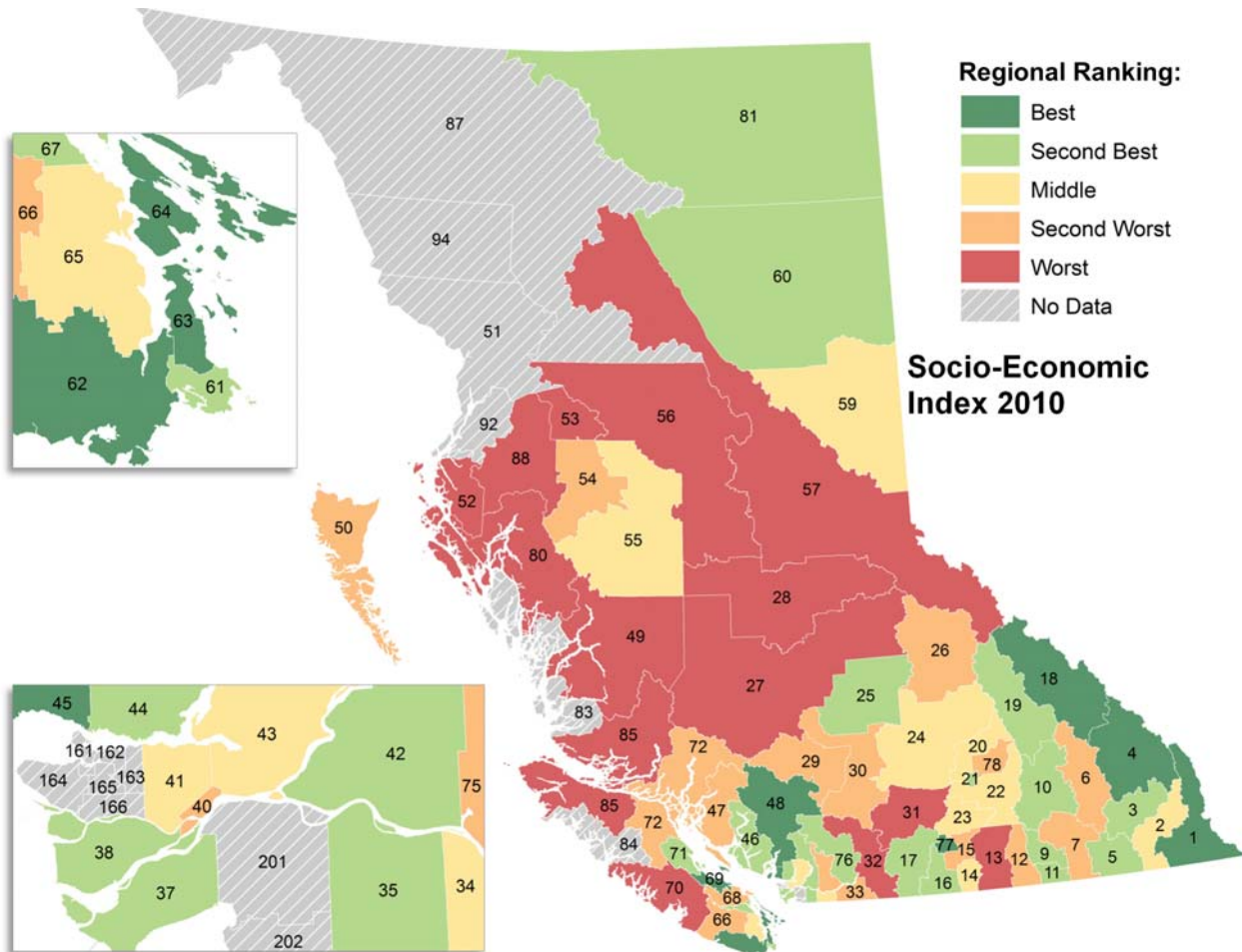
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Maps



Data was not available for LHA 13 (Kettle Valley) because the small number of deaths during the period prevented the computation of reliable life-expectancies.

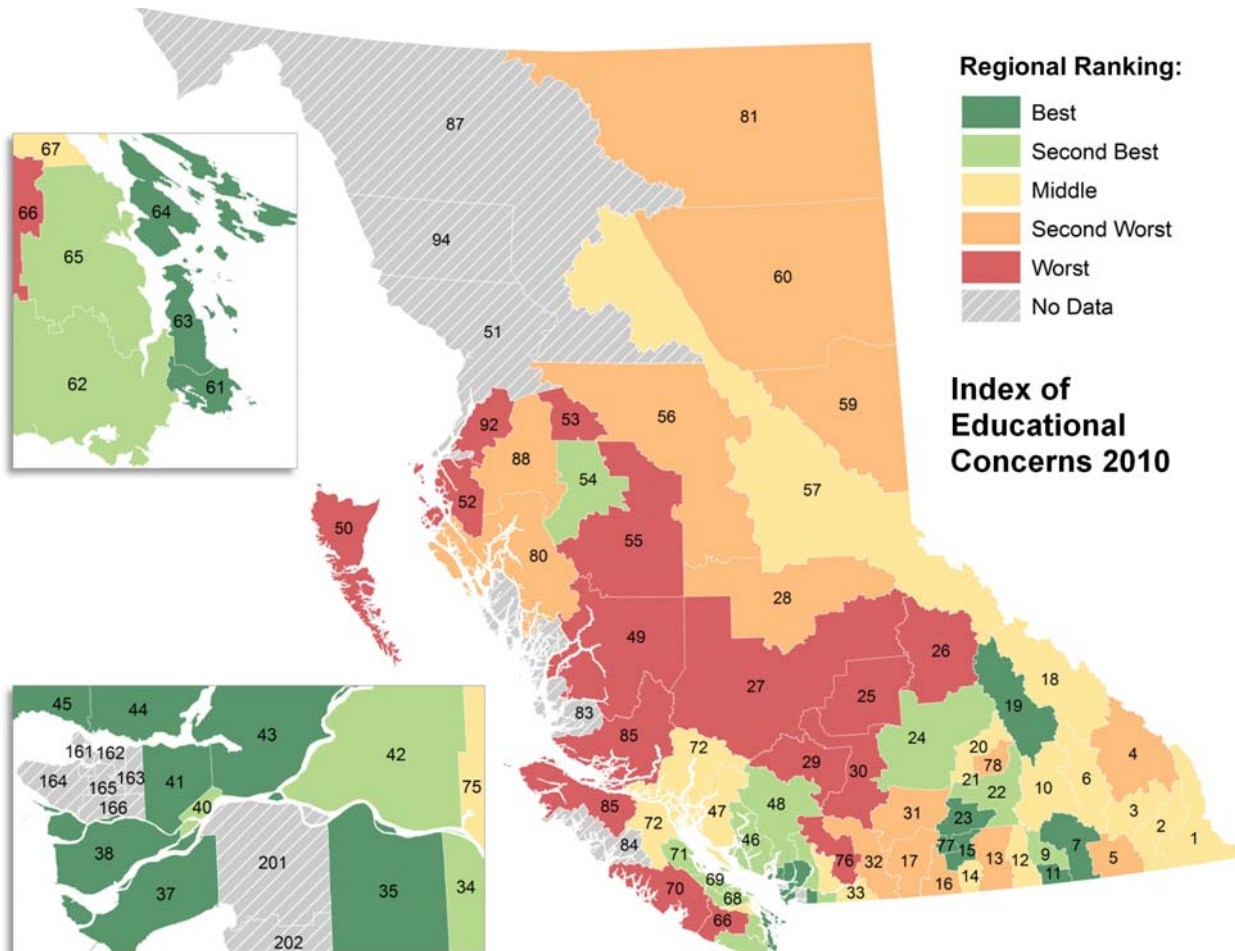


Regional Ranking:

- Best
- Second Best
- Middle
- Second Worst
- Worst
- No Data

Socio-Economic Index 2010

- | | | | | | |
|----------------------|-----------------------------|--------------------------------|-----------------------|-----------------------|-----------------------------|
| 1 Fernie | 17 Princeton | 32 Hope | 47 Powell River | 63 Saanich | 81 Fort Nelson |
| 2 Cranbrook | 18 Golden | 33 Chilliwack | 48 Howe Sound | 64 Gulf Islands | 83 Central Coast |
| 3 Kimberley | 19 Revelstoke | 34 Abbotsford | 49 Bella Coola Valley | 65 Cowichan | 84 Vancouver Island West |
| 4 Windermere | 20 Salmon Arm | 35 Langley | 50 Queen Charlotte | 66 Lake Cowichan | 85 Vancouver Island North |
| 5 Creston | 21 Armstrong - Spallumcheen | 36 Surrey Aggregate | 51 Snow Country | 67 Ladysmith | 87 Stikine |
| 6 Kootenay Lake | 22 Vernon | 37 Delta | 52 Prince Rupert | 68 Nanaimo | 88 Terrace |
| 7 Nelson | 23 Central Okanagan | 38 Richmond | 53 Upper Skeena | 69 Qualicum | 92 Nisga'a |
| 9 Castlegar | 24 Kamloops | 39 Vancouver Aggregate | 54 Smithers | 70 Alberni | 94 Telegraph Creek |
| 10 Arrow Lakes | 25 100 Mile House | 40 New Westminster | 55 Burns Lake | 71 Courtenay | 161 City Centre |
| 11 Trail | 26 North Thompson | 41 Burnaby | 56 Nechako | 72 Campbell River | 162 Downtown Eastside |
| 12 Grand Forks | 27 Cariboo - Chilcotin | 42 Maple Ridge | 57 Prince George | 75 Mission | 163 North East |
| 13 Kettle Valley | 28 Quesnel | 43 Coquitlam | 59 Peace River South | 76 Agassiz - Harrison | 164 West Side |
| 14 Southern Okanagan | 29 Lillooet | 44 North Vancouver | 60 Peace River North | 77 Summerland | 165 Midtown |
| 15 Pentiction | 30 South Cariboo | 45 West Vancouver-Bowen Island | 61 Greater Victoria | 78 Enderby | 166 South Vancouver |
| 16 Keremeos | 31 Merritt | 46 Sunshine Coast | 62 Sooke | 80 Kitimat | 201 Surrey |
| | | | | | 202 South Surrey/White Rock |



Regional Ranking:

- Best
- Second Best
- Middle
- Second Worst
- Worst
- No Data

Index of Educational Concerns 2010

- | | | | | | |
|----------------------|-----------------------------|--------------------------------|-----------------------|-----------------------|-----------------------------|
| 1 Fernie | 17 Princeton | 32 Hope | 47 Powell River | 63 Saanich | 81 Fort Nelson |
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Methodological Appendix

Background Information on BC Stats Regional Indices

"In general, data and information on socio-economic conditions are not as well developed at regional levels compared to the provincial or national levels. Given the fact that economic and social conditions that are summarized through provincial level statistics are not likely to accurately reflect all regions within the province, a data gap existed with respect to our knowledge and understanding of regional conditions. In support of this initiative, BC Stats, in co-operation with the social ministries, has developed a comprehensive set of over 80 indicators describing socioeconomic conditions across various regions within British Columbia.

However, compounding the problem of data quality and availability at the regional level is the difficulty faced by decision-makers to effectively synthesize large volumes of data across many regions. Hence, a method was needed to summarize the various indicators into a useful and accessible package for policy makers.

The weights currently used are as follows:

- Economic Hardship (*weight = 30 per cent*)
- Crime (*weight = 20 per cent*)
- Health Problems (*weight = 20 per cent*)
- Education Concerns (*weight = 20 per cent*)
- Children at Risk (*weight = 5 per cent*)
- Youth at Risk (*weight = 5 per cent*)

<http://www.bcstats.gov.bc.ca/StatisticsBySubject/SocialStatistics/SocioEconomicProfilesIndices/ArticlesOtherResources.aspx>

Alcohol-related Deaths

Alcohol-related deaths include deaths where alcohol was a contributing factor (indirectly related) as well as those due to alcohol (directly related). Alcohol-related and drug overdose deaths are the only cause of death categories that are not based entirely upon underlying causes of death.

If any of the conditions listed as directly related to alcohol are noted on the Medical Certificate as antecedent causes giving rise to the underlying cause or as other significant conditions contributing to the death, the death is considered to be indirectly related to alcohol.

<http://www.vs.gov.bc.ca/stats/annual/2010/pdf/glossary.pdf>



Deaths due to Medically Treatable Diseases

The disease categories are ones for which mortality could potentially have been avoided through appropriate medical intervention. It should be noted that the causes are considered to have been medically treatable only if the death occurred to persons within a specified age range. The incidence of deaths from medically treatable diseases can be used by public health professionals as a way of monitoring the effect of health promotion programs.

Deaths due to medically treatable diseases exclude all deaths less than age 5 years old.

Deaths due to medically treatable diseases also exclude

- deaths aged 65 or more from hypertensive disease.
- deaths aged 50 or more from pneumonia and unqualified bronchitis.
- deaths aged 65 or more from cervical cancer.
- deaths aged 65 or more from tuberculosis.
- deaths aged 50 or more from asthma.
- deaths aged 45 or more from chronic rheumatic heart disease.
- deaths aged 50 or more from acute respiratory infections and influenza.
- deaths aged 65 or more from bacterial infections.
- deaths aged 35 or more from Hodgkin's disease.
- deaths aged 65 or more from abdominal hernias, cholecystitis and cholelithiasis, appendicitis.
- deaths aged 65 or more from deficiency nutritional anemias.

<http://www.vs.gov.bc.ca/stats/annual/2010/pdf/glossary.pdf>

Smoking Attributable Mortality

The absence on death certifications of complete and reliable data on smoking requires the use of estimation techniques to approximate the extent of smoking-attributable deaths. Estimation methods, while not precise, may at least provide a general indication of the extent of such deaths. This report uses an estimation method based on the concept of attributable risk. Smoking-attributable deaths are derived by multiplying a smoking-attributable mortality percentage by the number of deaths aged 35+ in specified cause of death categories. These categories are comprised of selected malignant neoplasms, circulatory system diseases, and respiratory system diseases.

<http://www.vs.gov.bc.ca/stats/annual/2010/pdf/glossary.pdf>

