Long-term Employment and Health Inequalities in Canadian Communities

Jalil Safaei, PhD

ABSTRACT

Objectives: This study examines the long-term unemployment rate and various health outcomes across Canadian communities to estimate employment-related health inequalities in these communities.

Methods: The study uses cross-sectional community-level health data along with data on the long-term employment rate for various communities across Canada to quantify health inequalities among these communities. The health outcomes that are considered in this study include total and disease specific mortality rates; health conditions such as high blood pressure, diabetes, injuries, and self rated health; and life expectancies at birth and at age 65. Health inequalities are estimated using the concentration index, which is used to measure health inequalities along socioeconomic dimensions. The concentration index is estimated by a regression of weighted relative health (ill health) over weighted cumulative relative rank of the populations. All the estimates are provided separately for males and females.

Results: The findings of the study support the existence of inequalities in community health outcomes as related to the long-term employment rates in those communities. Communities with lower long term employment rates (higher unemployment rates) have poorer health outcomes in terms of higher mortality rates, worse health conditions, and shorter life expectancies.

Conclusion: Health inequalities related to long-term employment have important policy implications. They call for policies that would increase and maintain long term employment rates as part of a broader socioeconomic approach to health. Long term employment ensures income security and prevents the psychosocial experiences leading to mental and physical ill health.

Key words: Employment; health; inequality; community; Canada

La traduction du résumé se trouve à la fin de l'article.

Economics Program, University of Northern British Columbia, Prince George, BC

Correspondence and reprint requests: Jalil Safaei, Economics Program, University of Northern British Columbia, 3333 University Way, Prince George, BC V2N 4Z9, Tel: 250-960-6698, Fax: 250-960-5345, E-mail: safaeij@unbc.ca

Health inequalities along various socio-economic and political dimensions have been well documented.13-15 These dimensions have been variously measured by income,13,16-23 wealth,24,25 education,26,27 occupation,27,28 social class,13,29-31 type of political regime,33-40 and the extent of democracy.41-44 However, income has been the dominant dimension along which health inequalities are estimated. Income is usually measured at the individual or household levels for estimation of health inequalities. Although many studies consider the connection between income and its inequality and health outcomes in Canada,45-53 there are only a few studies that have estimated income-related health inequalities.54,55

Even though income provides a useful summary measure of economic position or command over material resources, it is subject to short-term variations and may not give a good picture of longer-term (permanent) economic conditions, which is presumably more relevant for the health of people than transitory (current) income. In the absence of data on permanent income, the long-term rate of employment may be considered a suitable proxy for the permanent economic conditions of communities. The long-term employment rate also captures some of the enduring structural features of communities that are not necessarily captured in income, whether transitory or permanent. For example, issues of job insecurity, job control, and job satisfaction are not captured in average measures of income. Moreover, the experience of lasting unemployment goes well beyond income loss and poverty and directly affects the mental as well as physical health of the unemployed. The links between unemployment and health have been vastly researched.56-67 Therefore, long-term employment rate in a community would probably give us a better indication of the enduring economic conditions with their consequent impacts on the health of communities.

This study uses cross-sectional population health data along with data on the long-term employment rate for various communities across Canada to estimate, for the first time, health inequalities that are related to the long-term employment in these communities. Communities in this study are health regions that are administrative boundaries for which data are collected by Statistics Canada.68
TABLE I

Average Mortality Rates (per 100,000 population) for Communities According to Long-term Employment Rates

<table>
<thead>
<tr>
<th>Employment Rate</th>
<th>TMR</th>
<th>Male</th>
<th>Female</th>
<th>SUIC-MR</th>
<th>Male</th>
<th>Female</th>
<th>CANC-MR</th>
<th>Male</th>
<th>Female</th>
<th>RESPD-MR</th>
<th>Male</th>
<th>Female</th>
<th>CIRCD-MR</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;94%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>909.75</td>
<td>558.31</td>
<td>26.05</td>
<td>5.26</td>
<td>253.46</td>
<td>150.12</td>
<td>80.90</td>
<td>47.06</td>
<td>284.67</td>
<td>191.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>27</td>
<td>27</td>
<td>25</td>
<td>25</td>
<td>29</td>
<td>26</td>
<td>27</td>
<td>26</td>
<td>27</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>94%-96%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>807.11</td>
<td>510.31</td>
<td>20.32</td>
<td>5.16</td>
<td>228.34</td>
<td>151.42</td>
<td>73.19</td>
<td>40.99</td>
<td>272.71</td>
<td>165.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>37</td>
<td>37</td>
<td>26</td>
<td>26</td>
<td>27</td>
<td>26</td>
<td>27</td>
<td>26</td>
<td>27</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>96%-97%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>576.45</td>
<td>503.24</td>
<td>17.67</td>
<td>4.32</td>
<td>226.24</td>
<td>153.72</td>
<td>68.42</td>
<td>36.77</td>
<td>268.90</td>
<td>165.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>25</td>
<td>25</td>
<td>28</td>
<td>28</td>
<td>29</td>
<td>28</td>
<td>29</td>
<td>28</td>
<td>29</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>97%-98%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>66.49</td>
<td>38.51</td>
<td>4.35</td>
<td>2.20</td>
<td>216.27</td>
<td>149.13</td>
<td>63.76</td>
<td>35.63</td>
<td>264.67</td>
<td>169.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>13</td>
<td>13</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;98%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>84.19</td>
<td>494.06</td>
<td>16.02</td>
<td>3.93</td>
<td>207.59</td>
<td>147.92</td>
<td>66.66</td>
<td>35.41</td>
<td>273.71</td>
<td>168.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The p-values for all male/female differences are all extremely small (<0.0005) and therefore are not reported in the table. SE = standard errors.

n = number of communities in each employment category.

METHODS

Socio-economic health inequalities have been estimated using a variety of measures. One of these measures, the Concentration Index (CI), has been used most frequently, given its desirable features that meet the three basic requirements of an index of inequality in health, namely i) being reflective of the socio-economic dimension to inequalities in health; ii) being reflective of the experiences of the entire population; and iii) being sensitive to the changes in the distribution of population across socio-economic groups.69 Although a recent study on the welfare economics foundation of health inequality measures questions the acceptability of the equity weights implied in the CI,70 it is still widely in use. The CI is defined in terms of a concentration or relative frequency of each socio-economic group.

By doing so, we abstract from the experiences of the entire community and focus on the inter-community inequalities and focus on the concentration of health among the lowest socio-economic status. This study uses the most recent data on health indicators and long-term employment at the health region level provided by the Canadian Institute for Health Information and Statistics Canada. The data for mortality rates and life expectancies are those of 2001. There were 130 health regions in 2001. Mortality rates include total mortality rates, health conditions, and life expectancies. Mortality rates include total
mortality rate, and cause-specific mortality rates due to respiratory disease, circulatory disease, cancer, and suicide. Health conditions include prevalence of diabetes and high blood pressure and self-rated poor health. Life expectancies are those estimated at birth and at age 65. These health measures are considered separately for males and females. The ranking variable is the long-term employment rate for each region. It is obtained by subtracting the long-term unemployment rate from 1. The latter captures those who did not have a job during the current or previous year.  

**RESULTS**

**Descriptive summary of data**

Tables I, II and III provide summaries of health measures for health regions, categorized into different ranges of long-term employment rates (from less than 94% to more than 98%). Table I shows the average values and standard deviations of total mortality rates (TMR) along with those for cause-specific mortality rates due to suicide (SUIC-MR), cancer (CANC-MR), respiratory diseases (RESPD-MR), and circulatory diseases (CIRCD-MR) for both males and females for each of the five categories of long-term employment rate.

As can be seen from Table I, both total and cause-specific mortality rates generally appear to decline as we move from lower employment categories to higher ones. The mortality gradients are particularly noticeable between the lowest and the second lowest employment categories. However, given the large standard errors of the mortality rates, in part due to small sample sizes, such variations across the employment categories are not statistically significant. The average mortality rates are all consistently higher for men than for women. Such differences are highly significant, as evidenced by extremely small p-values not reported in the table.

Table II shows the average prevalences of diabetes and high blood pressure in males and females, along with those for self-rated poor health, for the 5 employment categories.

Generally speaking, the patterns of data in Table II indicate a reduction of ill health conditions (diabetes and high blood pressure) and self-rated poor health at higher levels of employment. However, as in Table I, the variations across employment categories are not statistically significant. The prevalence of high blood pressure appears higher for women than men across the employment categories. This is evident from the p-values for 4 of the 5 employment categories.

Similarly, Table III shows average life expectancies at birth and at age 65 for both males and females for each of the five employment categories. Here, too, a systematic pattern of improvement in health (increase in life expectancies) is generally apparent as we move to higher employment categories. But again, the patterns of change are not statistically significant. As expected, average life expectancies (at birth and at age 65) are consistently higher for women than for men. Again, the extremely small p-values (not reported in the table) strongly support such differences between men and women.

The summary data in the above tables imply a positive association between the long-term employment rate and better population health outcomes at the health region level, which is not statistically significant. However, when weighted data from individual communities are used to estimate health inequalities as related to the long-term employment rates in these communities, the results are statistically significant for most of the health outcomes, as reported in the next section.

### TABLE II

<table>
<thead>
<tr>
<th>Employment Rate</th>
<th>Diabetes Prevalence Male</th>
<th>p-value</th>
<th>High Blood Pressure Male</th>
<th>p-value</th>
<th>Self-rated Poor Health Male</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;94%</td>
<td>5.80</td>
<td>0.499</td>
<td>14.22</td>
<td>0.002</td>
<td>13.06</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>2.37</td>
<td>4.53</td>
<td>5.01</td>
<td></td>
<td>3.90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.37</td>
<td>0.017</td>
<td>0.001</td>
<td></td>
<td>0.025</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.05</td>
<td>13.15</td>
<td>15.42</td>
<td></td>
<td>12.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.17</td>
<td>2.13</td>
<td>2.66</td>
<td></td>
<td>2.56</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.92</td>
<td>1.85</td>
<td>1.59</td>
<td></td>
<td>2.14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.91</td>
<td>14.15</td>
<td>15.68</td>
<td></td>
<td>1.35</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.150</td>
<td>0.125</td>
<td></td>
<td>9.83</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.37</td>
<td>2.56</td>
<td>3.40</td>
<td></td>
<td>2.95</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.32</td>
<td>12.33</td>
<td>15.34</td>
<td></td>
<td>10.79</td>
<td></td>
</tr>
<tr>
<td>&gt;98%</td>
<td>0.85</td>
<td>3.09</td>
<td>2.39</td>
<td>0.015</td>
<td>1.16</td>
<td>9.17</td>
</tr>
<tr>
<td></td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
<td>1.72</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td></td>
<td></td>
<td></td>
<td>0.80</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE III

<table>
<thead>
<tr>
<th>Employment Rate</th>
<th>Life Expectancy at Birth Male</th>
<th>Female</th>
<th>Life Expectancy at Age 65 Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;94%</td>
<td>74.28</td>
<td>79.83</td>
<td>15.72</td>
<td>19.02</td>
</tr>
<tr>
<td></td>
<td>2.92</td>
<td>3.24</td>
<td>0.90</td>
<td>2.08</td>
</tr>
<tr>
<td></td>
<td>75.84</td>
<td>81.19</td>
<td>16.60</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td>1.38</td>
<td>1.33</td>
<td>0.99</td>
<td>1.01</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>76.55</td>
<td>81.74</td>
<td>16.91</td>
<td>20.36</td>
</tr>
<tr>
<td></td>
<td>1.49</td>
<td>1.71</td>
<td>0.89</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>76.90</td>
<td>81.65</td>
<td>17.01</td>
<td>20.33</td>
</tr>
<tr>
<td></td>
<td>1.32</td>
<td>0.87</td>
<td>0.66</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>76.91</td>
<td>81.88</td>
<td>17.13</td>
<td>20.42</td>
</tr>
<tr>
<td></td>
<td>1.23</td>
<td>0.60</td>
<td>0.62</td>
<td>0.41</td>
</tr>
</tbody>
</table>

**Note:** The p-values for male/female differences for both LEB and L65 are extremely small (<0.0005) and therefore are not reported in the table.
EMPLOYMENT AND HEALTH INEQUALITIES

Estimates of health inequalities

Long-term employment-related health inequalities as measured by the concentration index are estimated for mortality rates, health conditions, and life expectancies. These estimates are reported in Table IV. In each case, estimates are provided for males and females separately.

The estimated CIs in Table IV for total mortality rate and cause-specific mortality rates reported on the left side of this table are all negative, which indicate that higher rates of mortality are concentrated in communities with lower long-term employment rates. Inequalities as measured by the CIs are highest for suicide mortality rates and lowest for circulatory mortality rates. The estimated inequalities for mortality rates are all statistically significant at 5%, except for CIRCD_MR. The inequalities are higher (in absolute terms) for men for TMR, CANC_MR, and RESPD_MR, but higher for women for SUIC_MR. The corresponding p-values are extremely small (less than 0.0005).

Estimates of CIs for health conditions – diabetes (DIAB) and high blood pressure (HBLP) – as well as self-rated poor health (SRPH) as reported in the upper right portion of Table IV, are also negative. That is, prevalence of diabetes, high blood pressure, and self-rated poor health is higher in communities with lower rates of employment. Inequalities in health conditions (DIAB and HBLP) are greater (in absolute terms) for women, whereas inequalities in SRPH are greater for men. Such differences are supported by very small p-values. Inequality estimates for DIAB and HBLP for men are not statistically different from zero, however.

Employment-related inequalities in life expectancies at birth (LEB) and at age 65 (LE65), as measured by the respective CIs are reported in the lower right portion of Table IV. All the estimates are positive, which indicate that lower life expectancies are concentrated in communities with lower long-term employment rates. The estimated CIs for both measures of life expectancy are statistically significant at 5%. As was the case with most mortality rates, inequalities in life expectancies are larger for men than for women. Again, the relevant p-values are extremely small for both LEB and LE65. The inequalities in life expectancies are generally smaller in magnitude than those for mortality rates and health conditions, however.

DISCUSSION

The findings of the study as reported in Table IV support the existence of inequalities in population health across Canadian communities along the socio-economic dimension represented by the long-term employment rate. Communities with lower rates of long-term employment (or higher rates of unemployment) appear to have higher mortality rates, poorer health conditions both subjectively as measured by self-rated poor health and objectively as measured by prevalence of diabetes and high blood pressure, and shorter life expectancies at birth as well as at age 65. These inequalities are between-community inequalities and do not capture within-community inequalities in health that may be more substantial. Moreover, since these communities (health regions) are administratively defined, they may not be considered as “natural” communities that evolve over time by common modes of life, shared sense of geography, and distinct economies. Consequently, aggregate measures of health for these communities may be mitigated by administrative delineation of communities.

Although summary measures of community health such as mortality rates and life expectancies do capture population health in a broad sense, an examination of specific health conditions or morbidities, in particular those presumed to be most related to unemployment, may provide us with a better understanding of the extent of health inequalities as related to long-term employment. Long-term unemployment is associated with high levels of psychosocial stress that could initiate suicidal behaviour and increase risk of suicide. Psychosocial stress could also initiate other physical health conditions such as adult diabetes, hypertension, atherosclerosis, and autoimmune disorders.

The findings of the current study are consistent with the aforementioned findings. Nevertheless, further research using mental health outcomes at the community level is needed to better inform the nature of relationships between health and long-term employment.

REFERENCES


---continues---

Received: February 20, 2007
Accepted: November 12, 2007