Examining Changes in Reported Work Conditions in Quebec, Ontario and Saskatchewan Between 1994 and 2003-05

Peter Smith, PhD,1,2 Sara Morassaei, BSc,1 Cameron Mustard, ScD1,2

ABSTRACT

Objectives: To examine changes in work hours, work schedules, the psychosocial work environment and job satisfaction in three Canadian provinces between 1994 and 2003-05.

Methods: The study sample consisted of 46,998 respondents over four cross-sectional surveys: 1994, 2000 and 2003/05 in Quebec, Ontario and Saskatchewan. Using regression models, we examined trends in work conditions across survey cycles both unadjusted, and after adjustment for differences in age, education, gender, immigration, and method of interview.

Results: Crude models observed increases in rotating shifts, long work hours and job security between 1994 and 2003-05, and decreases in physical demands and job satisfaction. When models were adjusted for changes in labour market demographics and educational capacity, we further observed decreases in skill discretion, decision authority, co-worker support and in regular scheduled work across survey cycles. We also noted differences in trends for two outcomes (decision authority and co-worker support) depending on interview method.

Conclusions: Employees in Quebec, Ontario and Saskatchewan were more likely to working longer hours, at non-standard time during the week, and to be less satisfied with their jobs between 1994 and 2003/05. In addition, it appears the labour market in these provinces has not adjusted sufficiently to accommodate the increasing number of workers with high levels of education and increasing age, with declines observed in decision authority, skill discretion and co-worker support once these changes were taken into account.

Key words: Job satisfaction; psychosocial factors; trends; Canada

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

Labour market experiences are an important determinant of health.1,2 Important dimensions of work related to health status include the psychosocial work environment, which has been associated with an increased risk in the development of a variety of physical and mental health problems.3–6 Physical work demands and psychosocial work exposures are also key determinants of musculoskeletal health.2,7 Various shift work schedules may also be associated with increased risk of injury, cardiovascular disease and possibly various types of cancer.8–12 As such, the ongoing monitoring of important aspects of the working environment in Canada is an integral part of a preventive population health agenda.

Two previous studies have examined changes in the psychosocial work environment of Canadians over the mid 1990s through to the early 2000s. Shannon and colleagues reported that between 1994 and 2000, most dimensions of the psychosocial work environment in Canada were stable for the most part, with the exception of job security, which increased, and self-reported physical demands, which decreased.13 Shields has also examined changes in dimensions of job strain (the ratio of job control to psychological demands) between 1994 and 2002, reporting small decreases in job strain, mainly due to small decreases in psychological demands and small increases in skill discretion.14 A limitation in the above studies is that neither took into account demographic and social changes in the working population over time when estimating if labour market conditions had changed or not. Labour force participants today are – in general – older, better educated, and more likely to be immigrants to Canada than they were 10 years ago.15 When assessing the change in self-reported dimensions of work over time, it is important to take these factors into account as they may influence reporting tendencies, as well as influence the natural expected course of some conditions (e.g., given levels of education in the labour market are increasing, we might expect a concurrent increase in the skill utilization among respondents as a result).16

The objective of this paper was to assess changes in various dimensions of work in three Canadian provinces between 1994 and 2003-05, while adjusting for changes in age, gender, immigration status, education and survey administration over time.

METHODS


The National Population Health Survey (NPHS): The NPHS collects information every two years on health conditions, health behav-
hours and labour market conditions from a longitudinal, nationally representative cohort of Canadians.17,18 Respondents over 15 years of age are asked questions on labour market experiences. For the purpose of this analysis, we used the cross-sectional component of the 1994 NPHS.

The Canadian Community Health Survey (CCHS): Similar to the NPHS, the CCHS collects information on health conditions, health behaviours, labour market conditions and injuries from a cross-sectional sample of over 130,000 respondents every two years, with smaller surveys examining specific topics of interest in the years in between. For our analysis, we used three cycles of the CCHS: 2000-01, 2003-04, and 2005-06. In general, each cycle of the CCHS has a household response rate of between 87% and 92%.19,20

Main outcomes
We examined dimensions of work across three broad areas: work schedules, work hours, and the psychosocial work environment.

Work Schedules
Respondents to each survey were asked to select a description that best reflects their current working schedule: regular daytime schedule or shift; regular evening shift; regular night shift; rotating shift (changing from days to evenings to nights); split shifts; irregular schedule or on-call schedules. We further collapsed these options into regular daytime; night or evening shifts; rotating shifts and irregular shifts (on call, irregular schedules and split shifts).

Work Hours
Respondents to each survey were asked to report “about how many hours a week” they usually worked, including extra hours or unpaid or paid overtime. Responses were categorized into 8 to 30 hours; 31 to 40 hours; 41 to 50 hours; and 51 or more hours per week. Respondents were also asked if they usually worked on weekends in their job or business (yes/no).

Psychosocial Work Environment
The psychosocial work environment was assessed using an abbreviated measure of the Job Content Questionnaire (JCQ).21,22 The JCQ contains self-reported information on decision latitude (3 questions), decision authority (2 questions), psychological demands (2 questions), social support from co-workers (2 questions), support from supervisor, job physical demands and job security (1 question each). Responses to decision latitude, decision authority, psychological demands and social support from co-workers were scored on a 0 to 10 scale, with higher scores indicating a more positive work environment. Responses to questions on supervisor support, physical demands and job security were collapsed to agree (strongly agree or agree) versus not (neither agree nor disagree; disagree or strongly disagree).

Job Satisfaction
As part of the module on the psychosocial work environment, respondents were also asked how satisfied they are with their job. Response categories included very satisfied, somewhat satisfied, not too satisfied and not at all satisfied. For the purpose of our analysis, these responses were grouped into those who were very satisfied compared to those who were not.

Questions on the psychosocial work environment are optional content in the CCHS, with individual health regions determining the administration of this survey module. Unfortunately, as a result the number and geographic representation of respondents who are asked questions on the psychosocial work environment has declined across CCHS survey cycles.23 For the purpose of our analysis of psychosocial working conditions, we only included health regions that opted to have psychosocial work questions included in the 2000 CCHS and in either the 2003 or 2005 CCHS surveys, removing from our sample for all survey years those health regions that had opted not to ask these questions at these time periods. The health regions included in our analysis were situated in Quebec, Ontario and Saskatchewan.

Covariates
Time trends in working conditions were adjusted for changes in age (grouped), gender, highest education level completed, immigrant status and length of time in Canada, and interview administration method (in person, by phone, or both), as well as province, given the unequal samples across survey cycles.
Table 2. Odds Ratios and 95% Confidence Intervals for Changes in Work Schedules in Ontario, Quebec and Saskatchewan, 1994 to 2003-05

<table>
<thead>
<tr>
<th>Model One*</th>
<th>1994</th>
<th>2000</th>
<th>2003-05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day shift ref</td>
<td>0.93 (0.83, 1.04)</td>
<td>0.98 (0.87, 1.11)</td>
<td></td>
</tr>
<tr>
<td>Irregular shift ref</td>
<td>0.84 (0.69, 1.01)</td>
<td>0.86 (0.71, 1.05)</td>
<td></td>
</tr>
<tr>
<td>Rotating shift ref</td>
<td>1.28 (1.06, 1.55)</td>
<td>1.13 (0.93, 1.37)</td>
<td></td>
</tr>
<tr>
<td>Night shift ref</td>
<td>1.07 (0.89, 1.30)</td>
<td>1.07 (0.88, 1.31)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model Two†</th>
<th>1994</th>
<th>2000</th>
<th>2003-05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day shift ref</td>
<td>0.87 (0.77, 0.98)</td>
<td>0.88 (0.77, 1.00)</td>
<td></td>
</tr>
<tr>
<td>Irregular shift ref</td>
<td>0.88 (0.73, 1.07)</td>
<td>0.93 (0.76, 1.14)</td>
<td></td>
</tr>
<tr>
<td>Rotating shift ref</td>
<td>1.30 (1.08, 1.57)</td>
<td>1.16 (0.96, 1.41)</td>
<td></td>
</tr>
<tr>
<td>Night shift ref</td>
<td>1.19 (0.98, 1.45)</td>
<td>1.31 (1.06, 1.60)</td>
<td></td>
</tr>
</tbody>
</table>

Estimates and 95% confidence intervals below p<0.05 have been bolded.
* Adjustment for province.
† Additional adjustment for education, gender, age, interview method and immigration status.

Table 3. Odds Ratios and 95% Confidence Intervals for Changes in Work Hours in Ontario, Quebec and Saskatchewan, 1994 to 2003-05

<table>
<thead>
<tr>
<th>Model One*</th>
<th>1994</th>
<th>2000</th>
<th>2003-05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-30 ref</td>
<td>0.83 (0.73, 0.95)</td>
<td>0.91 (0.79, 1.04)</td>
<td></td>
</tr>
<tr>
<td>31-40 ref</td>
<td>0.78 (0.71, 0.86)</td>
<td>0.74 (0.67, 0.82)</td>
<td></td>
</tr>
<tr>
<td>41-50 ref</td>
<td>1.45 (1.28, 1.65)</td>
<td>1.53 (1.34, 1.74)</td>
<td></td>
</tr>
<tr>
<td>&gt;50 ref</td>
<td>1.41 (1.17, 1.70)</td>
<td>1.28 (1.06, 1.54)</td>
<td></td>
</tr>
<tr>
<td>Works on weekends ref</td>
<td>1.20 (1.08, 1.34)</td>
<td>1.19 (1.07, 1.33)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model Two†</th>
<th>1994</th>
<th>2000</th>
<th>2003-05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-30 ref</td>
<td>0.83 (0.72, 0.95)</td>
<td>0.92 (0.78, 1.08)</td>
<td></td>
</tr>
<tr>
<td>31-40 ref</td>
<td>0.78 (0.71, 0.86)</td>
<td>0.76 (0.68, 0.84)</td>
<td></td>
</tr>
<tr>
<td>41-50 ref</td>
<td>1.46 (1.28, 1.66)</td>
<td>1.50 (1.31, 1.73)</td>
<td></td>
</tr>
<tr>
<td>&gt;50 ref</td>
<td>1.43 (1.19, 1.73)</td>
<td>1.26 (1.04, 1.54)</td>
<td></td>
</tr>
<tr>
<td>Works on weekends ref</td>
<td>1.23 (1.10, 1.37)</td>
<td>1.24 (1.10, 1.39)</td>
<td></td>
</tr>
</tbody>
</table>

Estimates and 95% confidence intervals below p<0.05 have been bolded.
* Adjustment for province.
† Additional adjustment for education, gender, age, interview method and immigration status.

ANdALYSIS

For the purpose of our analyses, we only selected respondents who were paid employees, over the age of 25 and working eight hours or more per week in the provinces of Quebec, Ontario and Saskatchewan (N = 47,700 across four survey cycles; 1994 NPHS = 2,816; 2000 CCHS = 26,471; 2003 CCHS = 15,604; and 2005 CCHS = 2,810). Of this sample, 666 respondents (1.4%) were missing information on working hours or their work schedule, leaving 46,998 respondents. Respondents with missing values were less likely to be from later survey cycles and to have higher levels of education; and were more likely to be recent immigrants, working irregular shift work, and be interviewed in French (in the 1994 NPHS, not all eligible respondents were asked work stress questions in the French interview).

Preliminary analyses examined the distribution of covariates, psychosocial work conditions, work schedules and work hours across survey cycles for all respondents. Regression analyses then examined changes in work schedules and work hours across survey cycles. Initial models included only adjustment for province of residence (given changes in sample sizes across provinces across survey years), with a second model adjusting for changes in age groups, gender, interview methods, immigration and educational attainment across survey cycles. A further analysis examined changes in the psychosocial work environment among respondents from those health regions that opted into these questions in 1994, 2000 and either 2003 or 2005. Given the changes in interview methods across surveys – from predominantly in-person to both in-person and over the phone – we further examined interactions between interview method and time trends for each work stress measure. To adjust for the complex survey design of the NPHS and CCHS, confidence intervals around each point estimate were adjusted using a bootstrap procedure with 500 replicate weights, in accordance to guidelines specified by Statistics Canada.24

RESULTS

Table 1 presents the distribution of demographics, education, interview methods, psychosocial work conditions, work schedules and work hours across survey cycles. Across surveys, age of respondents, educational attainment and female labour market participation increased, while Canadian-born labour market participation decreased. Survey administration methods changed to predominantly being phone interviews. Due to the administration of labour market questions to a survey subsample in 2005, the number of respondents from Quebec and Saskatchewan in later survey cycles decreased. In addition, the proportion of respondents from Saskatchewan in all surveys was smaller, given the smaller percentage of the Canadian population within this province.

Table 2 presents odds ratios for changes in work schedules between surveys, in models adjusted only for province of residence, and a second model adjusted for age, gender, education, interview method and immigration status. Limited changes were observed on our base model, although after adjustment for labour market changes, we observed declines in the prevalence of regular daytime schedules and increases in night shift work.

Table 3 presents odds ratios for work hours across survey cycles. Increases across surveys were observed in the prevalence of long working hours (41 to 50 hours, and 51 or more hours) and working on weekends in both crude and adjusted models. Declines were observed in working 31 to 40 hours per week across survey cycles. Table 4 presents the unadjusted and adjusted beta coefficients for continuous outcomes and odds ratios for dichotomous outcomes for psychosocial working conditions. In models with adjustment for province, we observed increases in job security and declines in job physical demands and job satisfaction across survey cycles. In our fully adjusted models, we further observed declines in decision authority and co-worker support across survey conditions. Respondents with missing values were less likely to be from later survey cycles and to have higher levels of education; and were more likely to be recent immigrants, working irregular shift work, and be interviewed in French (in the 1994 NPHS, not all eligible respondents were asked work stress questions in the French interview).
cycles. Adjustment for labour market changes also attenuated the observed trend in declining job physical demands. The downward trend in job satisfaction was not attenuated by additional adjustment for work schedule, work hours and psychosocial work responses across surveys.

Table 5 presents differences in trends observed for 2 of the 17 outcome measures assessed across interview method (phone versus in-person). In each case, declines in decision authority and co-worker support were only observed among respondents interviewed in person, with relative stability in trends observed for respondents being interviewed by phone.

**DISCUSSION**

The objective of this paper was to assess changes in various dimensions of work in the provinces of Quebec, Ontario and Saskatchewan between 1994 and 2003-05, while adjusting for labour market changes associated with age, gender, immigration status, and education as well as survey administration changes. In our base models, we observed increases in the prevalence of longer working hours, working on weekends and job security, and decreases in working 31 to 40 hours per week and job satisfaction. After adjustment for demographic and educational changes in the labour market across survey samples, additional declines were observed in decision authority, co-worker support and working a regular day-time shift schedule. In addition, we observed an interaction between trends observed for decision authority and co-worker support depending upon interview method, with declines in each of these conditions only observed when comparing respondents who had completed their interviews in person.

Our results suggest employees in Quebec, Ontario and Saskatchewan are working both longer hours and at non-standard times during the week (e.g., rotating shifts and on weekends). Increasing work hours have also been observed in Denmark and the US throughout the 1990s. Conversely, decreasing number of total work hours, and decreasing percentage of weekend work were recently reported across 15 European Union member states between 1995 and 2005. Future research should examine the effect of longer and non-standard work schedules on health, particularly in terms of work injury, in the Canadian context, as well as extend research to examine the impact of longer working hours on social and family participation.

Adjustment for labour market changes in age, gender, educational level and survey administration between survey cycles also enabled us to put these trends into the context of the changing labour market. While we observed limited changes in work schedules in our base regression models, after adjustment for covariates – in particular, age and education – we observed declines in regular work schedules over our time period. In short, older and well-educated workers are more likely to be employed in non-regular schedules in today’s labour market, compared to 1994.

As was the case for Shannon and Shields, we observed limited changes in psychosocial work conditions in our unadjusted models with only job security increasing in each survey cycle. Between 1994 and 2003-05, we observed declines in physical work demands and job satisfaction. Changes in job security are inversely related to changes in unemployment rates across the same time periods, which decreased from 10.4% in 1994 to 6.8% in both 2000 and 2005. However, after adjustment for demographic and educational differences across survey cycles, we also observed decreases in decision authority and co-worker support, as well as a complete attenuation of declining physical demands. This highlights the importance of accounting for the labour market context when assessing if particular types of working conditions have changed. Education is generally associated with higher decision authority at work. Our results suggest that the labour market in Canada has not changed to accommodate the increasing education of labour market participants between 1994 and 2003-05. Additionally, while older age is associated with greater co-worker support, our results suggest that if the aging of the Canadian labour market is taken into account, we observe declines in co-worker support across survey cycles.

We also observed declines in job satisfaction across survey cycles, in all models. Adjustment for demographic and educational differences across survey cycles did not attenuate this relationship appreciably. Additional adjustment for work schedules, work hours and the psychosocial work environment also did little to change observed point estimates, although work hours and aspects of the psychosocial work environment (with the exception of physical demands) were associated with job satisfaction levels. The lack of attenuation after adjustment for work factors suggests that the factors that are primarily driving declines in job satisfaction are either poorly measured or not measured by the questions currently assessed in our survey.
included in this paper. Broader examinations of trends in other work-related factors (e.g., perceptions of balance between efforts and rewards or organizational justice) or updating the measures used to assess the psychosocial work environment should be undertaken to further understand these downward trends in job satisfaction.

As noted in table one, there have been changes in the administration of population health surveys in Canada from being predominantly in person to a mixture of both in person and over the phone. These changes are related to the dual sampling frames utilized in the CCHS, which includes an area frame – based on the Labour Force Survey sampling frame – and a telephone frame – based on the Canada Phone Directory. We observed differences in trends for 2 of our 17 outcomes based on whether the sample was conducted in person or over the phone. In each case, the overall negative trends observed in our complete sample – for both decision authority and co-worker support – were greater among respondents sampled using the more representative Labour Force Survey area frame. More research is required to better understand the implications of these findings. Given the number of outcomes assessed, we might expect one significant interaction by chance alone. In addition, given the similarity in the wording and content of all the psychosocial work stress questions, we might expect that these interactions, if truly generalizable, should have occurred among all similar work stress questions. However, these results do suggest caution is warranted when comparing data sources within different administrative methods over time.

The changes observed in our paper cannot be generalized to the Canadian labour market as we unfortunately only have information across survey cycles for three Canadian provinces (representing approximately 65% of the total Canadian labour market). The measures used to assess the psychosocial work environment in Canada are an abbreviated version of the Job-Content Questionnaire. This abbreviated version has lower reliability than the original scale; and the ability of these questions to detect change when it has occurred (referred to as responsiveness) has never been assessed. Given the importance of the work environment in shaping the health of Canadian workers and their families, we suggest that both more extensive and more detailed monitoring of working conditions among all Canadians is required, especially in our flagship population health surveys.

REFERENCES


Received: July 26, 2010
Accepted: November 6, 2010

RÉSUMÉ


régression, nous avons examiné les tendances dans les conditions de travail d’un cycle d’enquête à l’autre, en ne tenant pas compte, puis en tenant compte des différences d’âge, de niveau d’instruction, de sexe, de statut d’immigration et de méthode d’entrevue.


Conclusion : Les employés du Québec, de l’Ontario et de la Saskatchewan étaient plus susceptibles de travailler de longues heures, d’avoir des horaires hebdomadaires atypiques et d’être moins satisfaits de leur emploi en 2003-2005 qu’ils ne l’étaient en 1994. De plus, il semble que le marché du travail dans ces provinces ne s’est pas suffisamment adapté au nombre croissant de travailleurs très scolarisés et plus âgés; quand on tient compte de ces changements, on s’aperçoit que le pouvoir de décision, la distinction des compétences et le soutien des collègues ont diminué.

Mots clés : satisfaction professionnelle; facteurs psychosociaux; tendances; Canada