

Heterogeneity in Prior Health and SES among Unemployment Insurance Recipients: Using History of Income Insurance Benefits as a Proxy

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ABSTRACT

We use histories of income insurance benefits to identify heterogeneity in prior health and SES among the unemployed, which likely accounts for at least part of the association between unemployment and health. Data come from the Longitudinal and International Survey of Adults (LISA), a biennial panel survey began in 2012 by Statistics Canada. The LISA surveys 32,133 respondents about employment, income and well-being, notably using a retrospective administrative data tax records linkage going back to 1982. Respondents who experienced only unemployment over the past 20 years did not exhibit higher odds of either poor health or disability relative to respondents who never received any income insurance benefits. In contrast, respondents who had any other combination of benefits (unemployment, and/or disability, and/or welfare) had higher odds of poor health and disability. Selective processes appear to play an important role in the association with later health among some unemployment insurance recipients.

Unemployment is associated with both morbidity and later mortality ([Roelfs et al. 2011](#)), but the extent to which this is a causal relationship, and if so, the mechanisms by which it operates have yet to be fully elucidated (see [O'Campo et al. 2015](#) for a realist review on possible theoretical mechanisms). One of the main hypothesised pathways is material, through income loss. This of course raises the possibility the deleterious effects of unemployment can be mitigated by unemployment insurance. And indeed, receipt of unemployment insurance income is purported to have a positive effect on the health of the unemployed, at least in the U.S. ([Cylus and Avendano 2017](#); [Cylus, Glymour and Avendano 2015](#)).

But while Cylus and Avendano (2017) provide a compelling model addressing selection biases just prior to each job loss episode, chances are that longer run effects are at play, and that for some individuals, unemployment episodes are not independent of one another. However, the possibility that the relationship between unemployment and poor health and mortality is due to selection bias where those with poor health are more likely to experience unemployment still looms large.

Furthermore, the unemployed are likely a heterogeneous group: those experiencing a job loss that is truly exogenous from their personal characteristics, and those for whom these personal characteristics are endogenous. Among those experiencing exogenous job loss, unemployment insurance should mitigate the negative effects on health of the financial loss of job income. But among those who are experiencing endogenous job loss, given that the association is spuriously determined by prior poor health, unemployment insurance will likely not exert a significant mitigating effect as the causal pathway lies outside the income loss to health relationship.

In particular, the interplay between different income insurance programs remains understudied in health research in North America, despite evidence of benefit substitution. And what if people are relying on other benefit programs to make up for the income loss? Is the effect on health the same? Beyond the level of income insurance which varies with a given program, receiving such benefits also probably signals some endogeneity that makes it more difficult for people to get and hold jobs (pre-existing or job-related physical and/or mental health limitations). Thus, we seek to get at benefit substitution here. Income insurance benefits trajectories are rarely taken into consideration in North American research on health inequalities, despite the fact that they can provide clues to the extent to which a given bout of unemployment is endogenous or exogenous to health.

Research questions

Receipt of various forms income insurance benefits as a proxy for selection effects. Few studies measure health prior to unemployment, especially when using administrative income data. But a history of different income benefits may provide an indirect handle on this problem: Receipt of disability benefits captures some health dimensions; Welfare receipt captures low income (a health determinant), as well as a potential benefit substitution. QUESTION: what can we learn about unmeasured heterogeneity among unemployment recipients by taking into account receipt of other benefits?

Furthermore, most studies look at one job loss/bout of unemployment->health, at best controlling for pre job loss characteristics (see Cylus and Avendano 2017). But what about history of job loss/unemployment or dynamics over the life course and long-run effects on older adult health and mortality (and what about retirement?). Thus, we seek to examine both timing and cumulative effects. (Note: forthcoming results using sequence analyses not included here; Results using confidential statistics Canada data must be vetted prior to release, and we were unfortunately unable to get these released in time for this submission)

Data and methods

This research uses the Longitudinal and International Survey of Adults (LISA), a biennial panel survey began in 2012 by Statistics Canada. The LISA contains panel survey data on income, work experience, education, skills and competencies, family composition, health and disability, and retirement, for approximately 32,000 respondents. Aside from this large sample size, the major advantage and innovation of LISA is its data replacement strategy using several administrative data sources. Detailed family and individual earnings, transfers and income information is available from the T1 Family File (T1FF) dating back to 1982. Historical and contemporary data of earnings and employers are made available by the T4 slip issued to all paid employees by their employer for the purposes of declaring income taxes. These data are available starting in 2000. Pension plan information from the Pension Plan in Canada (PPIC) file is also obtainable commencing in 2000. Additional years of administrative data will also be matched on an ongoing basis, including with mortality records.

The significance of this data linkage for quantitative survey researchers cannot be overstated. The longitudinal and linked administrative data serve at least two major research functions: First, they allow us to construct from the outset, with only one wave of survey data collection, income and employment trajectories (not to mention family, disability, and other human capital trajectories) covering a substantial proportion of older respondents' life course. Second, the administrative data links represent a substantial improvement in data quality and validity. We can now measure with accuracy (i.e., correctness) and precision (to the dollar and cent) all elements of a respondent income amounts, sources, stability, and disruptions. This overcomes some of the most persistent methodological problems with the reporting of income in social and demographic research, such as respondent recall bias, social desirability bias, refusal, approximation, and deception. The linked administrative data are also rich with other relevant independent and control variables, such as receipt of disability, retirement and pension benefits, marital status, household composition and de-/re-composition, and income from federal and provincial programs. The construction of historical life course typologies from this data source achieves much higher validity than those used in other research constructed from self-reports.

We restricted the sample to respondents aged 40 to 64 years old in 2012, having received some employment income in the past. We used tax files to retrieve income measured annually 1993-2011 (~ 90% linkage) and relied on well-being measures from the 2014 wave. [confidentiality disclosure rules complicate the release of sample sizes with Statistics Canada, such that it is not

recommended to request release of sample sizes until closer to final results, because every release increases the constraints requirements for future releases, i.e. from a minimum of 10 cases per cell to 30 cases per cell. We can however assure the reader that the sample size is large enough to ensure that we are not facing power issues in these analyses].

Study Design

Using the LISA, we are looking at the association between up to 20 years of historical income tax records from different sources. Using MPlus, we have estimated household income classes, and identified receipt of Income from employment insurance, welfare, disability credit. Our outcome measures are well-being among Canadians 40 to 64 years old having worked in the past: poor self-rated health and disability status. The association of those outcomes with income exposures was assessed with binomial logistic models. All analyses were weighted and bootstrapped and stratified by sex, though no substantive differences emerged from these analyses. Analyses were controlled for the following covariates: Mother and father's level of education, Respondent born in Canada, Respondent living alone, Respondent's level of education, Age in 2014.

Results

Family income classes

Using MPlus, we estimated a synthetic measure of family income level between 1993 to 2011 (income measures were adjusted to 2011 consumer price index). To note: we also conducted sensitivity analyses using five-year average family income during this period, with similar results, so we elected to keep these classes as they represent a relative position of our respondents' family income in this sample. The four-class model presented in Figure 1 fit the data best for both men and women and offers an assessment of average levels of income over this period. The data show that the modal category of income is middle-high, which counts about half of male and female respondents. The next most common was middle-low, with about a quarter of respondents. Finally, less than 10% of men and women experienced persistent low family income over this period, with another 10% experiencing persistently high income levels. Gender differences were not significant in these measures, likely due to the fact that we considered only family income.

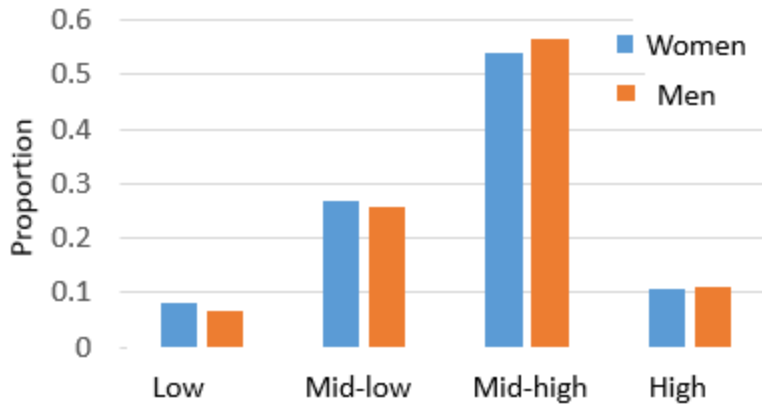


Figure 1. Proportion of respondents in each family income class, by sex/gender, 1993-2011.

Income insurance histories

Our main exposure variable measures whether respondents ever received any of the following income insurance benefits from 1993 to 2011, as reported in their administrative income tax files: unemployment insurance, social welfare, and disability benefits. In Figure 2, we report the proportions of recipients for all the possible combinations of benefits (e.g. never received any of those benefits, unemployment insurance only, etc). The modal category is those having never received any benefit (about 40% of men and women), with the next largest group being those having only ever received unemployment insurance (26% and 32% of men and women, respectively). Welfare only and Welfare and Disability recipients had to be combined in one category because of small cell size.

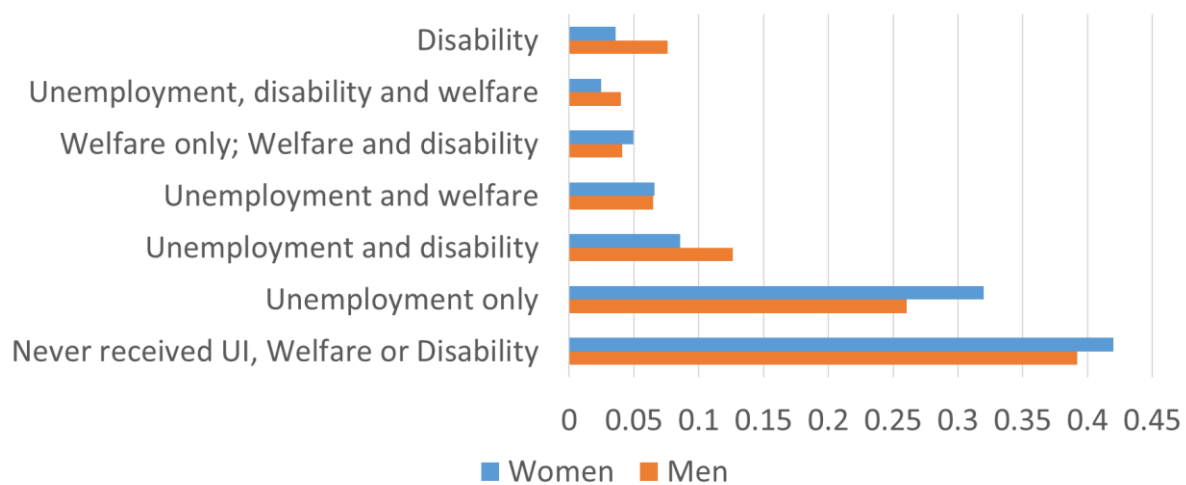
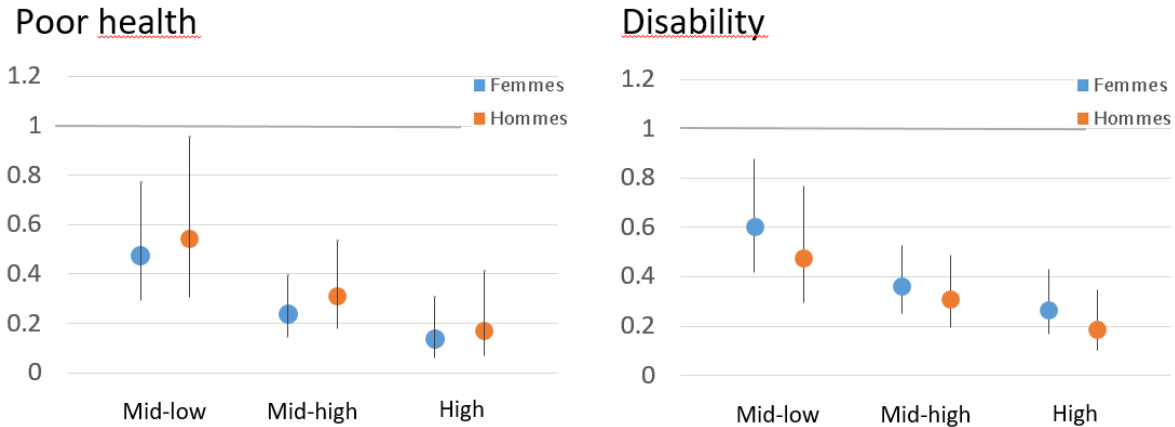


Figure 2. Proportion of respondents having ever received any of the income insurance benefits, by sex/gender, 1993-2011

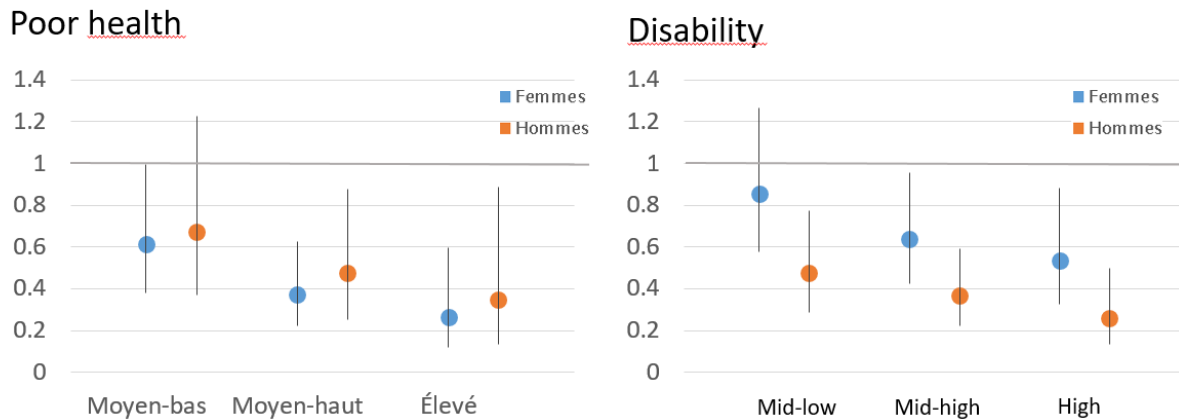
Logistic models

First, we present results for the association between the income classes and our outcomes, which show a declining risk gradient as income class increase.



Note: [estimates for models including all controls](#)

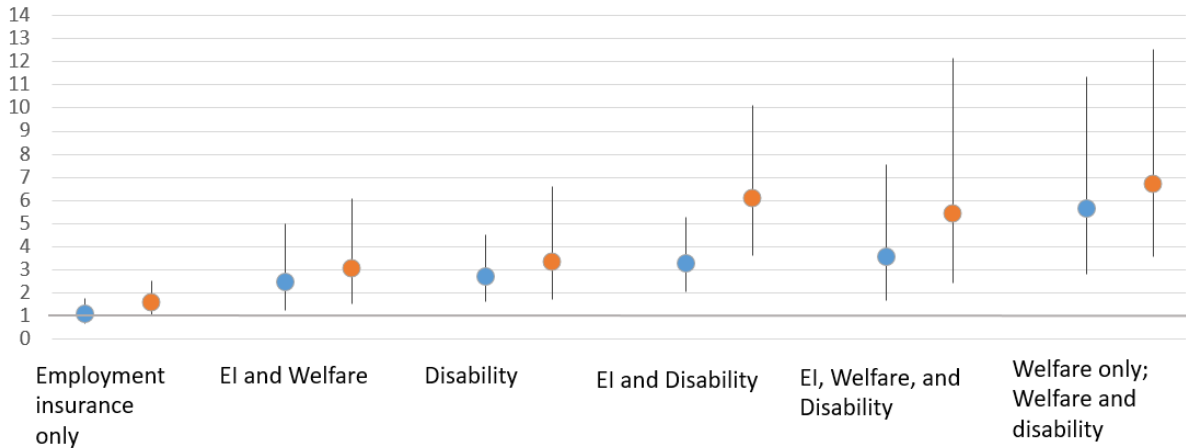
Adding the income insurance history variable explains some of this association, particularly for the lowest income class. The likelihood ratio test supported the addition of this variable.



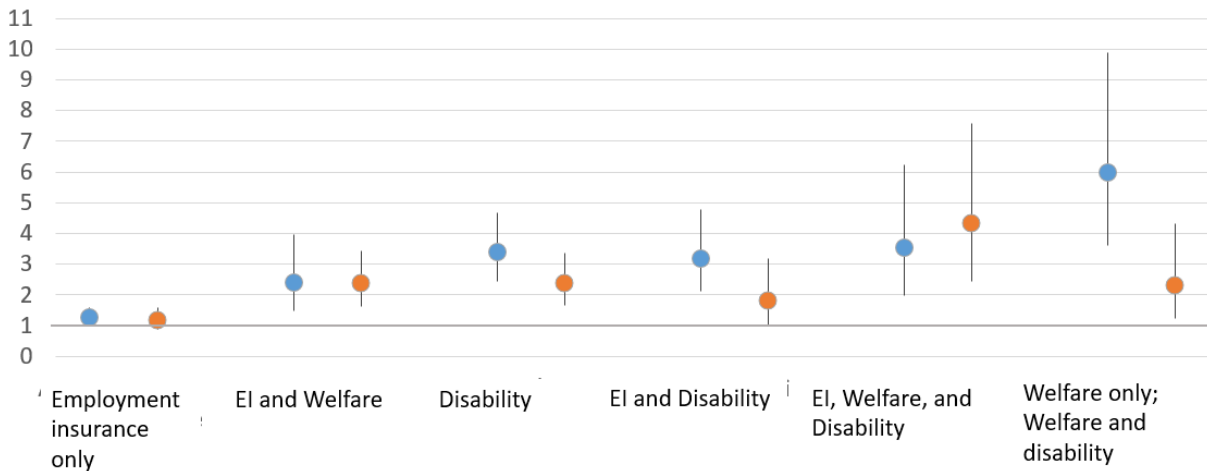
Note: [estimates for models including all controls](#)

Turning now to the estimates of the income histories, we see that recipients of only unemployment insurance do not experience higher odds of poor health or disability, relative to those who never received any of the benefits we assessed. Aside from disability recipients in the disability model, we do not see evidence of significant sex differences (and even in the disability model, these differences are largely not significant).

Poor health by receipt of income benefits history, ORs and 95% CIs



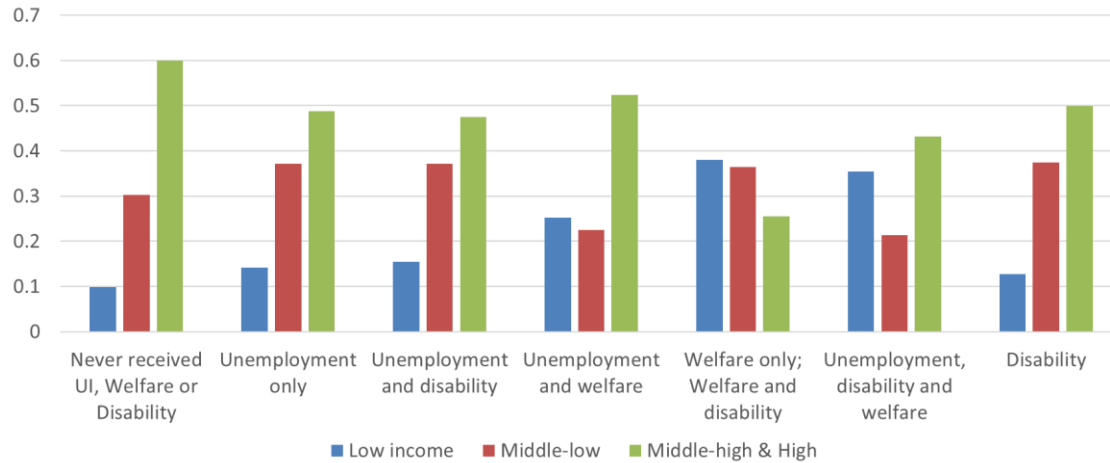
Disability by receipt of income benefits history, ORs and 95% CIs



Exploring heterogeneity

Administrative data offer gold standard data in some ways, but also may mask some underlying heterogeneity: we can only observe *recipients* of income benefits, and thus there may a possibility that the non-recipients were in fact of need of support, but either didn't apply or didn't qualify. If that were the case, our non-recipients would in fact be potentially more socioeconomically disadvantaged, and at risk of poorer health outcomes. To rule out this possibility, we cross-tabulated the income trajectories measure with the income histories

measures. What we find corroborates our expectation that the non-recipients are in fact more advantaged, as well as those who were only ever unemployed, as we see not only a larger proportion with higher incomes, but also much lower proportions than other categories with lower income trajectories.



[Forthcoming analyses: we are currently working on sequence analyses to unpack further what the sequence of benefit receipt is, with the hypothesis that in some cases, as with the recipients of all three forms of benefits, a spiral of declining health could be evidenced by a sequence leading from unemployment to disability to welfare. Such trajectories could potentially be detected from administrative data and averted with appropriate services]

Discussion

We find that a history of income benefits is associated with health in older adults, net of historical levels of income. Those with a history of only unemployment insurance are not different from those with only employment income. All other combinations of benefits are associated with increased likelihood of poor health or disability.

This suggests that important heterogeneity exists in the association between unemployment and health in older adulthood, likely reflecting strong selective processes that should be taken into consideration in future studies.