UNPACKING CANADIAN 'DEATHS OF DESPAIR'

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This paper was adapted from a presentation made during the panel *Aging, Income and Longevity* at the conference, Statistics Canada — 100 Years and Counting, Ottawa, December 6-7, 2018.

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"Deaths of despair" have become a widely cited and accepted phenomenon occurring in the United States. A large spike in mortality by suicide, drug overdose and alcohol-related disease beginning in the late 1990s altered the downward trajectory, from the 1970s onwards, of all-cause mortality rates of white, middle-aged working-class Americans. During this same time period, Hispanic and Black non-Hispanic mortality rates continued to fall (Case & Deaton, 2017). More specifically, Case and Deaton found that from 1999-2015, white non-Hispanic men and women aged 50-54 with an education of high school or less had a significant increase in mortality rates (Figure 1) (2017). The rate over time is illustrated with a comparison with other OECD countries whose mortality rates remain much lower during this time period (although they argue a similar trend is slowly emerging in some countries such as Canada, the UK and Australia). Case and Deaton ascribe the reversal in mortality rates to the cumulative disadvantage experienced by the white working-class as a consequence of social and economic changes brought on by globalization and technological change leading to crushed aspirations, fueling risky health choices and producing higher risk health behaviours.

DRUG, ALCOHOL AND SUICIDE MORTALITY, MEN AND WOMEN AGES 50-54

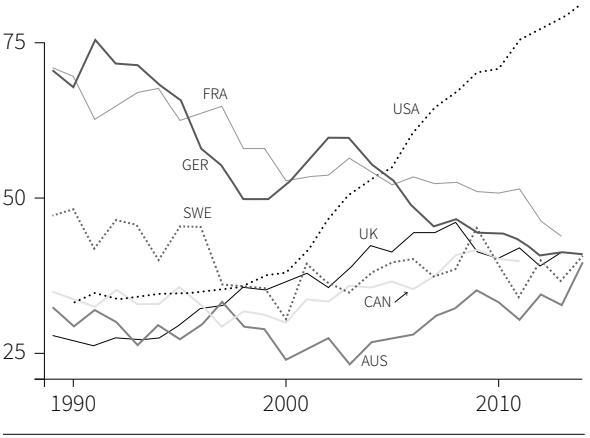
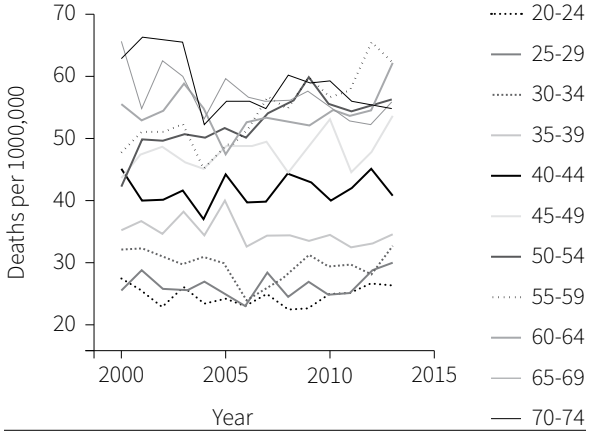


FIGURE 1: DEATHS OF DESPAIR ALL AGES, MEN FROM 2000 – 2013



Although some literature has identified dubious evidence indicating the presence of deaths of despair in Canada (Case and Deaton, 2017; Probst & Rehm, 2018), to the authors' knowledge no peer-reviewed studies analyzing whether or not the phenomenon has occurred in Canada have been published. This study fills the gap by examining linked mortality data to discover that middle-aged Canadians are not dying disproportionately due to deaths of despair attributable to economic change. In fact, all ages groups are experiencing increases in mortality rates due to drug poisoning, with middle-aged women's rates increasing at a faster rate than those of men.

METHODS

STUDY DESIGN

We conducted a retrospective, population-based, longitudinal cohort study of mortality due to alcoholic-liver cirrhosis, drug poisoning and suicide in adults aged 20-74 in Canada from 1979 to 2013. We constructed Canada-level five-year age groups to ensure our estimates would be comparable to the Case and Deaton findings (2015; 2017) and analyzed the change in mortality rates by age group, gender, and cause over time.

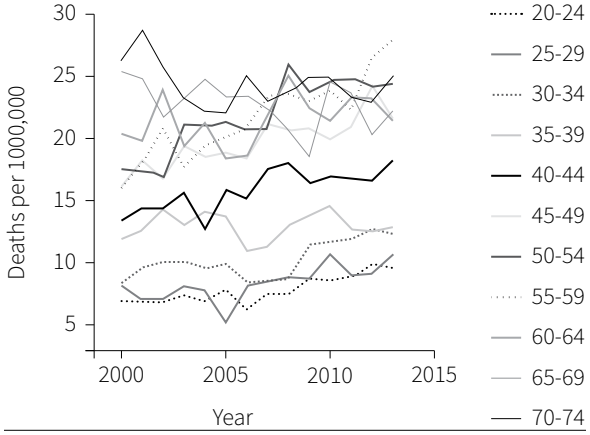
SETTING AND DATA SOURCES

We used mortality data from the Canadian Vital Statistics Death Database (CVSD) (1979-2013) and the pre-linked Canadian Community Health Survey (CCHS) (cycles 2000-2011) to the aforementioned database, both from Statistics Canada.

The CVSD is a census with a cross-sectional design; the data are extracted from administrative files. The dataset includes demographic and cause of death information collected annually from all provincial and territorial vital statistics registries on all deaths in Canada. The registration of all deaths within provincial and territorial jurisdictions is mandatory. Prior to 2010, some of the data include Canadians who died in the United States. The cause of death is classified according to the World Health Organization International Statistical Classification of Disease and Related Health Problems (ICD).

The linked dataset includes survey iterations from the CCHS from 2000 to 2011. The CCHS is a cross-sectional survey; it collects health information of the non-institutionalized household population aged 12 and older. It excludes members of the Canadian Forces, people living on reserve and some remote areas of Canada (approximately 4 per cent of the total population). Linkage involved: 1) data preparation; 2) record

FIGURE 2: DEATHS OF DESPAIR ALL AGES, WOMEN FROM 2000 – 2013



linkage; and 3) quality assessment. The linkage was approved by Statistics Canada's Executive Management Board. Respondents to the CCHS who consented to have their information linked to provincial and federal ministries of heath (85.3 per cent, n=614,774) are included in this dataset. Sampling weights were created by Statistics Canada to adjust for the number of participants who did not consent to linkage.

PARTICIPANTS

In our analysis of the CVSD, we included adults aged 20-74 who died due to alcohol-liver cirrhosis, drug poisoning and suicide in Canada from 1979 to 2013. In the subsequent analysis of the linked dataset to CCHS, we included minors and adults aged 15 and older who died due to alcoholic-liver cirrhosis, drug poisoning and suicide in Canada from 2000 to 2011 (n=925).

PRIMARY OUTCOME

The primary outcome was mortality rates due to drug poisoning, suicide, and alcoholic-liver cirrhosis. Causes of death were based on the ICD9 (1979-1999) and the ICD10 (2000-2013) codes. Categorization of cause of death was determined using the following codes:

- Drug poisoning was characterized by ICD9 codes: 850-860, 980 and ICD10 codes: X40-45, Y10-15, Y45, Y47, Y49;
- Suicide was characterized by ICD9 codes: 950-959 and ICD10 codes: X60-84, Y87.0;
- Alcoholic Liver Disease and Cirrhosis was characterized by ICD9 codes: 571 and ICD10 codes: K70, K73, K74.

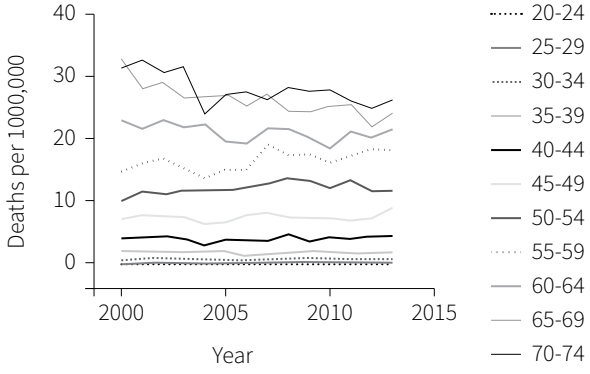
For comparison purposes these are the same codes used in the Case and Deaton study (2017).

STATISTICAL ANALYSIS

We first constructed Canada-level age groups, and gender specific five-year alcoholic-liver cirrhosis, drug poisoning and suicide mortality rates for 20-74 year olds for the years 1979 to 2013. We split the years this way to ensure our estimates are comparable to the Case and Deaton (2017) findings. We analyzed time trends of mortality rates of deaths of despair (all three causes combined) by age cohort and gender. We then repeated the process disaggregated by cause. Mortality rates over time were compared between age groups, gender and cause.

Using the linked dataset to the CCHS (2000 –

FIGURE 3: ALCOHOL MORTALITY, MEN AND WOMEN, 2000 – 2013



2011), we analyzed education and income source of respondents ages 15 and older by cause. Education was categorized as the highest completed level of school: primary school, secondary school and post-secondary school. Income source was categorized as wages, pension or social assistance.

RESULTS

We found that mortality rates attributable to deaths of despair increased for 45-64 year olds from the late 1990s onwards with the biggest increases being among 55-59 year olds. When disaggregated by gender, for men, the biggest increase occurs among 45-64 year olds (see Figure 1). For women, this is among 40-59 year olds (see Figure 2). When disaggregated by cause of death, there was no significant change in mortality rates due to suicide or alcohol from 2000 to 2013 for either men or women in all age groups (see Figures 3 & 4). However, we did find an increase in mortality rates due to drug poisoning across all age groups, increasing faster for 45-64 year olds (see Figure 5). Although absolute numbers remain higher for men, both genders see increasing rates due to drug poisoning, with a larger increase in the rate for women. Taken together, Canada does not have a 'deaths of despair' problem, but rather a drug poisoning problem. The implications of this result are discussed below.

Furthermore, we looked at the source of income and education levels of individuals who died from drug poisoning between 2000 and 2011 (see Figures 6 & 7). We found that a majority have secondary education with income sources being wages or social assistance.

This study has concluded that middle-aged Canadians are not dying disproportionately due to deaths of despair caused by economic change. The increase in mortality rates due to deaths of despair for 45-64 year olds from the late 1990s onwards is owed to an increase in drug poisoning mortality rates for men and women across all age groups.

FIGURE 4: SUICIDE MORTALITY, MEN AND WOMEN, 2000 – 2013

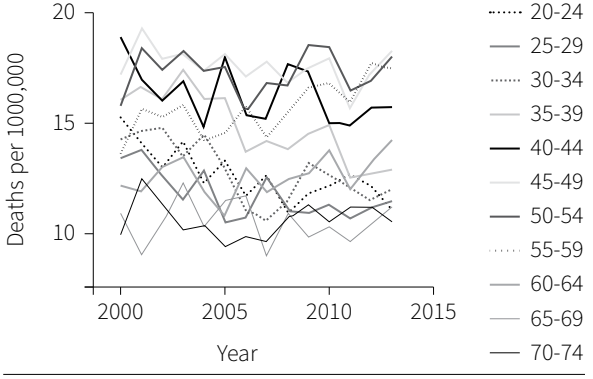
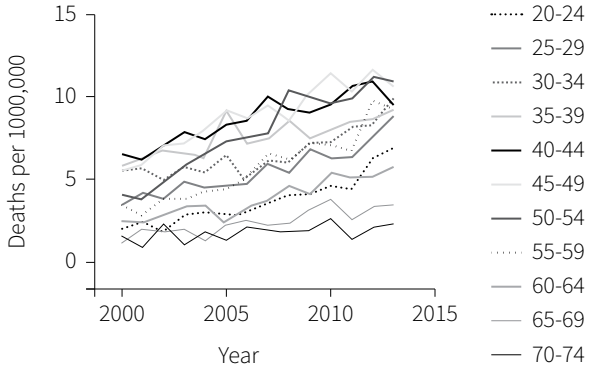


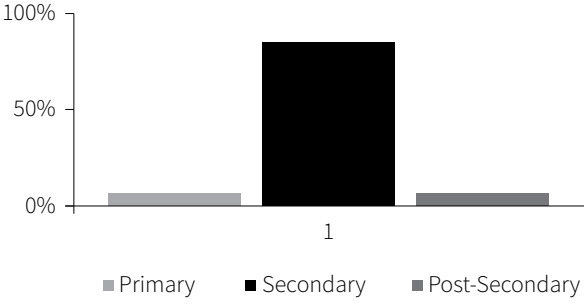
FIGURE 5: DRUG MORALITY ALL AGES, MEN AND WOMEN 2000 – 2013



The rates have increased faster for 45-64 year olds with a larger increase observed in women and a disproportionate number of people on social assistance.

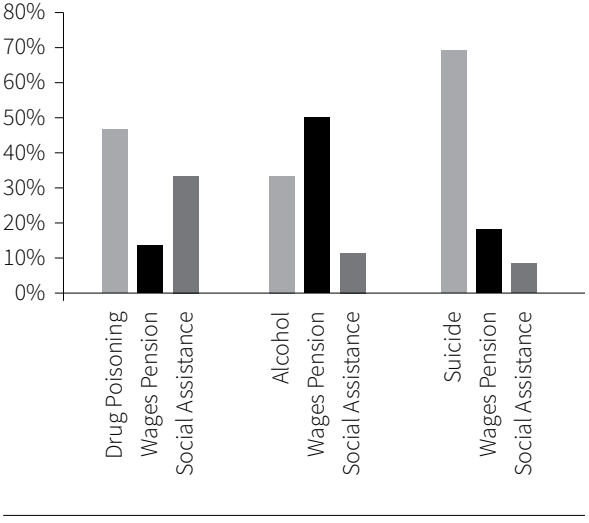
While a recent cross-country comparative study of drug-related mortality rates determined that the U.S. was the only country experiencing a drug-related mortality crisis, their analysis failed to include Canada (Barbieri, 2018). It is clear from this study that Canada is facing a similar crisis. This has important policy implications. Instead of concentrating on solving the economic issues of the "disenfranchised middle-aged white working class", policies should aim to curb the increasing trajectory of drug-related deaths. For instance, prescribed pharmaceuticals should be examined more closely given that people living on social assistance have pharmaceutical coverage and a disproportionate number of drug-related deaths were of people on social assistance. It is possible this is contributing to the opioid crisis.

FIGURE 6: LEVEL OF EDUCATION: DRUG MORTALITY AGE 15 AND OLDER, 2000-2011



The term "deaths of despair" has become a generally accepted phenomenon. The language/notion/idea has seeped into our everyday way of thinking. It can be found in media sources, and is referred to

FIGURE 7: SOURCE OF INCOME: DEATHS OF DESPAIR AGE 15 AND OLDER, 2000-2011



in explaining certain cultural phenomena of the current "uncertain" era. Given alcohol and suicide deaths follow completely different patterns from drug-related deaths, their aggregation into a "deaths of despair" theory as presented by Case and Deaton does not reflect the Canadian reality. It is possible our results reveal the beginnings of the drug crisis. Prescribed pharmaceuticals need to be examined more closely. The most important takeaway message is that middle-aged Canadians are not dying disproportionately due to deaths of despair. To confuse the overwhelming increase in drug-related deaths with the notion of deaths of despair due to economic change is to confuse possible/appropriate approaches/solutions/ to solving the problem.

In conclusion, even though we find that the drug mortality rate is increasing faster for women, more statistical analysis would be necessary to confirm this. It is possible that the deaths are not categorized properly — that some of the cases of drug poisoning would otherwise be categorized as suicide.

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