

Does Legalization of Medical Assistance in Dying Affect Rates of Non-assisted Suicide?

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Introduction

In 2015, the Southern Medical Journal published a paper by Jones and Paton that explored the effects of legalizing physician-assisted suicide (PAS) on state-level suicide rates using empirical data from Oregon, Washington, Montana, and Vermont.⁽¹⁾ It is essential to assess this paper critically because: a) there is little literature on this topic and so any available papers may be given significant weight in public and policy debates on medical assistance in dying (MAiD) in Canada; b) the paper has been used in attempts to support particular policy positions in relation to MAiD in Canada (e.g., Sonier, 2016); and c) the paper may be referenced as an academic foundation for claims about the effects of legalization that will be made in the Charter challenge to the new Canadian MAiD legislation (*Lamb v. Canada (Attorney General)*, 2016) and ongoing debates in Canada (including the statutorily mandated independent reviews ⁽²⁾ commissioned by the government and being conducted by an independent expert panel appointed by the Council of Canadian Academies ⁽³⁾ on three outstanding issues regarding access to MAiD in Canada). We present a description of the

¹ At the time of their analysis, Oregon and Washington had legalized PAS and had data on PAS; Vermont had legalized PAS, but had no data on PAS; and the court in Montana had declared that PAS was not contrary to public policy or precedent, but data on PAS is not collected in Montana.

² These outstanding issues are on whether access to MAiD should be available under the federal legislation: 1) for mature minors; 2) for individuals whose sole underlying condition is a mental illness and who do not meet the eligibility criteria set out in s.241.2(2); and 3) through requests made in advance of loss of decision-making capacity (*An Act to amend the Criminal Code and to make related amendments to other Acts (medical assistance in dying)*, S.C. 2016, c.3, s. 9.1).

³ Information about the panel's mandate, scope, membership, and process to date is available at <http://www.scienceadvice.ca/en/assessments/in-progress/medical-assistance-dying.aspx>

Jones and Paton paper's objectives, methods, and results. We then explore its strengths and weaknesses, and illustrate the problems with interpreting the data as the authors have done. We conclude that the interpretations of the authors are not supported by the data presented and we caution against using the authors' conclusions for the purposes of informing public opinion, litigation, and law reform.

A quick comment about terminology is required here. "Medical assistance in dying" is the umbrella term used in the new Canadian legislation to capture both euthanasia ("the administering by a medical practitioner or nurse practitioner of a substance to a person, at their request, that causes their death") and assisted suicide ("the prescribing or providing by a medical practitioner or nurse practitioner of a substance to a person, at their request, so that they may self-administer the substance and in doing so cause their own death") (An Act to amend the Criminal Code and to make related amendments to other Acts (medical assistance in dying), S.C. 2016, c.3, s.3). Jones and Paton refer to "physician-assisted suicide" because, under the American model for assisted dying (4), only assisted suicide is permitted and only physicians are permitted to provide the assistance.

The Jones and Paton paper's objectives, methods, and results

Jones and Paton (2015) sought to "test the change in rates of non-assisted suicides and total suicides (including assisted suicide) before and after the legalization of PAS" (p. 599) as well as the association between PAS and the age of suicide. They expressed particular interest in Richard Posner's 1997 claim that "if physician-assisted suicide in cases of physical incapacity is permitted, the number of suicides will be reduced. Moreover, in the fraction of cases in which suicide does occur, it will occur later than if physician-assisted suicide were prevented" (Jones and Paton, 2015, p. 600).

To these ends, the authors gathered US Centers for Disease Control and Prevention (CDC) data on suicides between 1990 and 2013 and compared the change in suicide rates pre and post legalization of PAS in each "PAS state," which included Oregon and Washington (non-assisted suicides, assisted suicides, and total suicides), and Montana and Vermont (non-assisted and total suicides), to the average change in suicide rates in all other states ("non-PAS states"). They used regression analysis to determine the association between non-assisted suicides and legalization of PAS, while accounting for some factors known to influence suicide rates, including:

the unemployment rate, annual per capital real income, percentage of the population that is Hispanic, percentage of the population that is black, percentage of the population that reports adhering to a recognized religion, whether possession of marijuana was decriminalized, whether marijuana was legalized for medical purposes, and whether a 0.08

⁴ Physician-assisted suicide is now legal in Oregon, Washington State, Montana, Vermont, California, Colorado, and the District of Columbia. http://eol.law.dal.ca/?page_id=236

blood alcohol law was in place (Jones and Patton, 2015, p. 600).

Jones and Patton also looked at the age at which suicides occur. Based on the claim that the majority of men over 65 who commit suicide in Oregon had an illness that would make them eligible for PAS, the authors divided their data into two groups: suicides occurring at ages younger than 65 and those occurring at age 65 or older. They then determined the change in the rates of suicide for each group pre and post PAS legalization. The authors also used logistic regression to look at the association between PAS and the mean age of non-assisted suicide (using the midpoint of each 10-year age bracket in their calculations).

Jones and Paton conclude: “Taken together, our results provide strong evidence that the legalization of PAS is associated with increases in the rate of suicide, if assisted suicides are included. We find no evidence that PAS is associated with reductions in the non-assisted suicide rate or with increases in the mean age of death for non-assisted suicide” (2015 p. 602).

Strengths and Weaknesses of Jones and Paton’s Paper

Strengths

Jones and Paton’s paper has some strengths; two are discussed here. First, in their regression analysis, the authors include a number of important independent variables known to be associated with suicide rates, thereby increasing the validity of the tests by reducing the risk of apparent differences between PAS and non-PAS states being attributed to the legalization of PAS rather than other variables between the states. The regression analysis also includes state-specific time trends, adding a dummy variable for each year to appropriately account for changes over time, which also increases the validity of their tests. This is demonstrated in Figure 2 in their paper (p. 602), which shows that non-assisted suicide rates were increasing some years prior to legalization of PAS in Washington and Montana. The change in non-assisted suicides pre and post PAS appeared significant without accounting for time trends, but was shown to not be statistically significant when state time trends were included.

A second strength is the inclusion of confidence intervals in the results, which allows readers to draw their own conclusions about statistical significance, rather than relying on reported p-values; there is a large body of literature available on the shortcomings of using p-values alone, which include the arbitrary nature of the 0.05 significance cut-off and the fact that a significant p-value does not itself mean that a result is significant (Gelman and Stern, 2006).

Weaknesses

Unfortunately, Jones and Paton’s paper has a number of weaknesses, both in its methodology and in its interpretation and expression of results. First, despite controlling for a number of important factors associated with suicide in their regression analysis, the authors failed to account for two important predictors of suicide: marriage rates and access to mental health services. Studies have consistently found marriage rates to be inversely correlated

with suicide rates (Statistics Canada, 2015; Kachur et al., 1995). Data also exists on the association between access to mental health services and suicide rates; in fact, Steck et al. (2016) described mental health as the most important risk factor for suicides. The authors needed to, but did not, control for these important independent variables as they did for race and other factors.

Another methodological weakness is the authors' analysis of the effect of legalizing PAS on the average age of suicide. They conclude that "estimates of the determinants of the mean age at suicide do not suggest that on average PAS leads to delays in non-assisted suicide" (p. 603). Unfortunately, this conclusion incompletely addresses the claim made by Posner that motivated their paper, as he suggested that PAS would lead to an increase in the average age of total suicide, including assisted and non-assisted suicides (1997). In the text and Table 4 in their results section, Jones and Paton showed a negative, non-significant association between PAS and the average age of non-assisted suicides, but failed to present any evidence on the average age of assisted or total suicides (2015, p.603). These data are necessary to completely evaluate Posner's claim.

In a second analysis of the age at which suicides occur, the authors compared the change in rates of non-assisted suicide in individuals under 65 years of age and those 65 or older. This age cut-off was based on data from an Oregon report, which found that between 2003 and 2012, "physical health problems were notable circumstances reported among older adults aged 65 years and older who died by suicide, but were not prevalent among people aged less than 45 years" (Shen & Millet, N/A, p. 18). It is important to note, however, that the report defines a case of physical illness as "A suicide circumstance in which the victim was experiencing terminal disease, debilitating condition, or chronic pain, that was relevant to the suicide event" (p. 53). Only the first measure, terminal illness, meets the criteria for PAS in Oregon and Washington; a debilitating condition or chronic pain does not. Therefore, the 65 and older cut-off is inappropriate and likely includes too many individuals who do not meet the criteria for PAS, thereby undermining Jones and Paton's results.

In addition to suffering from incomplete and/or inappropriate methodology, the authors' interpretation of their results overreaches the data. A cardinal rule of epidemiology is that association does not prove causation, yet Jones and Paton state, "the introduction of PAS seemingly induces more self-inflicted deaths than it inhibits" (2015, p. 603). There is no basis for claiming that PAS "induces" deaths. Their regression analysis, which in this case misses at least two important factors, does not and cannot provide evidence of a direct causal relationship between PAS and suicide rates. Furthermore, it is important to note that any associations found between PAS and non-assisted suicide are statistically non-significant when state time trends are included. This means that non-assisted suicide rates were already changing in states with PAS before it was legalized, and that legalization had no effect. In response to this finding, Jones and Paton state, "the available evidence does not support the conjecture that legalizing assisted suicide would lead to a reduction in non-assisted suicides. This suggests either that PAS does not inhibit (nor acts as an alternative to) non-assisted suicide or that it acts in this way in some individuals but is associated with an increased

inclination to suicide in others” (2015, p. 603). Again, Jones and Paton seem to interpret their results in a way that confirms their hypotheses, but for which evidence does not exist. Their claim ignores the possibility that the legalization of PAS inhibits non-assisted suicide, but this inhibitory effect is outweighed by other disinhibitory variables. Furthermore, the evidence itself does not suggest any reasons for the absence of a statistically significant association between legalizing PAS and rates of non-assisted suicide.

A consequence of the methodological weaknesses and inappropriate interpretation of results in this paper is its vulnerability to misunderstanding and misrepresentation by the media and PAS opponents. Many media outlets and PAS opponents, with varying degrees of reputability, have referred to the paper as evidence of the damaging effects of legalizing PAS. Some imply or directly state — incorrectly — that legalization of PAS leads to an increase in non-assisted suicides (Kheriaty, 2015a; Kheriaty, 2015b; Wood & Anderson, 2015; Sonier, 2016). Moreover, despite a lack of direct evidence in the paper, some have claimed that Jones and Paton’s paper provides evidence of a social contagion effect, wherein acceptance of some forms of suicide (PAS) leads to an increase in others (non-assisted) (Kheriaty, 2015a; Kheriaty, 2015b). Jones and Paton demonstrated an increase in total suicide rates, with no association between the legalization of PAS and non-assisted suicide rates.

While the authors of a paper cannot control how their research is represented by others, they can influence its reception and should do so with great care. Unfortunately, the paper is presented in such a way as to invite or allow misunderstanding and misrepresentation. For example, Figure 2 in the Jones and Paton paper (2015, p. 602) plots the increase in non-assisted suicide rates for Oregon, Washington, and Montana that appear to be associated with PAS legislation. However, as mentioned previously, the association disappears once state-specific time trends are taken into account. This non-significance is stated in the text and in the caption for Table 2, but the large figure reflecting non-significant results makes this important distinction easy to miss.

Similarly, at the end of their results section, Jones and Paton include the following statement “the association [between the legalization of PAS and non-assisted suicide] is found to be positive and significantly so when we do not include state-specific trends” (2015, p. 602). It is reasonably foreseeable that non-statisticians would take this statement to mean that the paper’s statistical analysis showed that legalization of PAS leads to an increase in non-assisted suicide and, when state-specific trends are not included, to a large increase. A clearer statement, such as “when state-specific time trends are taken into account, there is no statistically significant association between legalization of PAS and non-assisted suicide,” would likely have increased the accuracy of media and others reporting on this finding.

The broader context

Given the significance of the topic, it is also worth situating Jones and Paton’s review of the data from Oregon, Washington, Montana, and Vermont in the broader international context.

A 2012 Swiss report (Actualités OFS, 2009) compared rates of assisted and non-assisted

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suicide from 1995 to 2009. The authors found that while the number of total suicides has increased, the total rates of suicide per 100,000 people have continuously decreased: they are half what they were in 1980. Another study (Steck et al., 2015) also compared trends in non-assisted and assisted suicide from 1991-2008 in Switzerland. They found that rates of suicide decreased in men, with a dramatic decrease in rates in young men, while rates of suicide increased in older women but remained unchanged in younger women.

In the Netherlands, non-assisted suicide rates reached their lowest level in 2007, five years after passing legislation that regulated PAS and euthanasia (Figure 1, Centraal Bureau voor de Statistiek, 2014). It should be noted that total suicide rates have increased in recent years, but are still not at the levels of the 1980s.

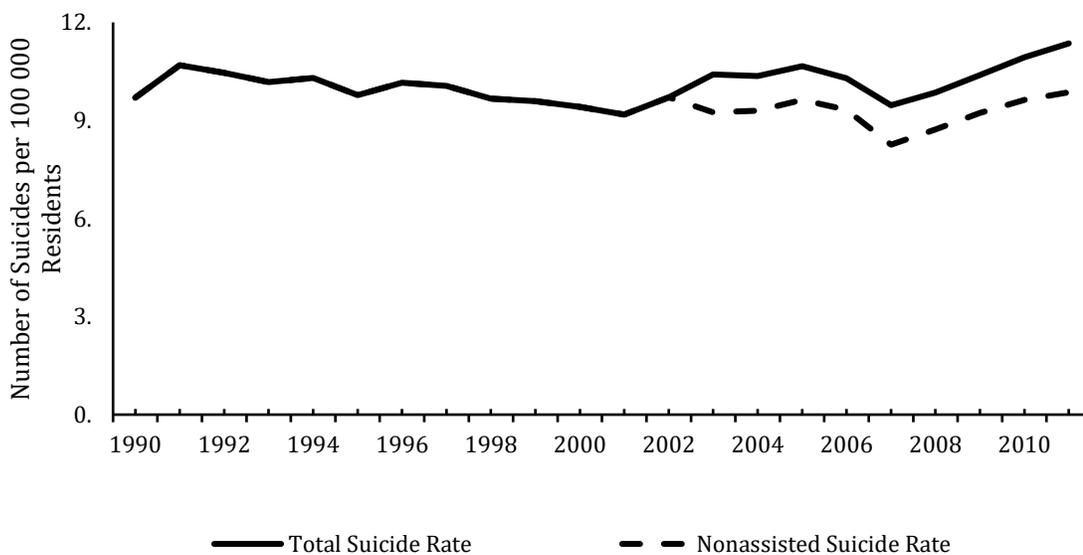


Figure 1. Trends in total suicide rates (solid line) and non-assisted suicide rates (total suicides – assisted suicides; dashed line) per 100,000 residents from 1990-2011 (Centraal Bureau voor de Statistiek, 2014; Nicol et al., 2013). In 2002, PAS legislation was passed and reporting PAS became mandatory in the Netherlands.

In Belgium, assisted suicide is treated as a form of euthanasia by the Federal Control and Evaluation Committee on Euthanasia, so a comparison between assisted and non-assisted suicides is not possible. However, despite the increase in the number of euthanasia cases since 2002, according to OECD Data (2016), non-assisted suicide rates in Belgium have been on a downward trend since 1993. In Luxembourg, where PAS and euthanasia was legalized in 2009, rates of non-assisted suicide have also seen a downward trend over that timeframe (OECD Data, 2016). No assisted suicides have been reported since the passing of the legislation in Luxembourg, although there have been cases of euthanasia (Nicol et al., 2013).

Figure 2 plots the non-assisted suicide rates for Belgium, Luxembourg, the Netherlands, and Switzerland from 1990 to 2013 (OECD Data, 2016). On average, non-assisted suicide rates have remained constant or decreased since 1990.

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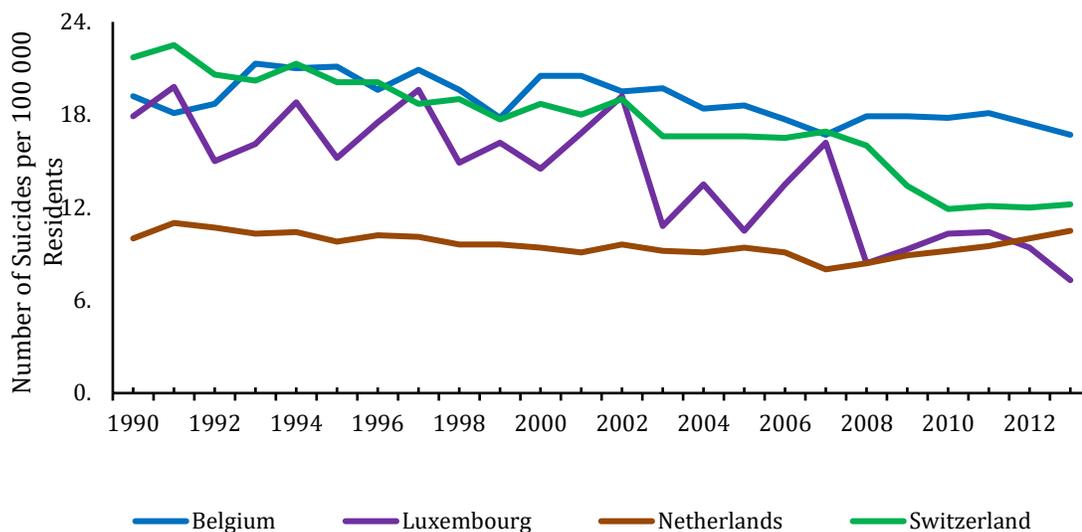


Figure 2. Trends in non-assisted suicide rates per 100,000 residents in Belgium (Blue), Luxembourg (Purple), Netherlands (Orange), and Switzerland (Green) from 1990-2013 (OECD Data, 2016). Belgium, Luxembourg, and Switzerland have had, overall, continuously declining rates of non-assisted suicide since 1990.

Data from Switzerland, Belgium, Netherlands, and Luxembourg contrast the trends in rates of non-assisted suicide observed in the United States, and this must be borne in mind whenever contemplating using the Jones and Paton paper in the context of the public, academic, and legislative debates about medical assistance in dying in Canada and elsewhere.

Conclusion

As there continues to be litigation and legislative reform about medical assistance in dying in Canada, there will continue to be a need for a valid and reliable empirical evidence to support empirical claims made in support of various positions on the topic. In their paper, Jones and Paton attempted to provide empirical research on which to base future arguments; however, a number of weaknesses in the paper undermine its claims. Omission of important suicide risk factors, incomplete analysis of the age issue, and misleading passages and figures that lead to misunderstanding and misrepresentation by the media and others mean that caution must be exercised when considering the claims made in the paper. Law and policymakers should also bear in mind the fact that suicide trends in Oregon and Washington do not necessarily reflect or predict the effects of the legalization of medical assistance in dying in other countries. Much more research is required before definitive claims about the effects of legalization of medical assistance in dying on non-assisted suicide can be made.

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- Member of plaintiffs' legal team in *Carter v. Canada* (Attorney General)
- Member of Provincial-Territorial Expert Advisory Group on Physician-Assisted Dying
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