**Reviewer’s report**

**Title:** In-hospital care prior to assisted and unassisted suicide in swiss older people: A state-level retrospective study.

**Version:** 0  **Date:** 25 May 2019

**Reviewer:** Anna Szücs

**Reviewer's report:**

This article describes a retrospective study exploring care intensity in the last year of life in elderly patients aged 65 and above who carried out assisted versus unassisted suicide in Geneva, Switzerland between 2010 and 2016. The authors find that, whereas unassisted suicide predominantly occurred in cases with mental disorders, assisted suicide was associated with more somatic disorders, namely cancers, neurologic and musculoskeletal illnesses. Hospitalizations, both with and without surgery, predicted the occurrence of assisted over unassisted suicide, as did older age, neoplasms and other somatic diseases as well as the absence of mental disorders.

I acknowledge the authors' important efforts of revision of their initial manuscript, which gained a lot in clarity and meaning. There remain however several additional points that must be addressed to enable publication. I would therefore recommend a conditional acceptance of the manuscript dependent on major revisions.

**Language:**

The manuscript needs English proofreading. Intelligibility is currently impacted by the manuscript's language (e.g. the second sentence of the abstract: "recent research suggests that care may be experienced as a burden or negative events that impact on request on assisted suicide"). Additionally, some terms have been erroneously transposed from French, such as "medico-legal" or the use of "concerning" when meaning "regarding".

Please, avoid unnecessary abbreviations, such as "coll." instead of colleagues.

The term "assisted suicide" should not be hyphenated. In the current manuscript, it is hyphenated half of the time.

**Title:**
The title of the manuscript could be shortened by one third. For example: "Experience of care during the last year of life in assisted versus unassisted suicide in a Swiss elderly population: a state-level retrospective study."

Abstract and main text:

The rationale outlined in the abstract's first paragraph and in the background section does not match the chosen study design. Since you are not comparing assisted suicide to non-suicidal death, findings cannot prove that health care intensity prompted more elderly to choose assisted suicide over not hastening death. It is only possible to assert that, in the subpopulation who chose to hasten their own death, individuals who received more intensive health care tended to achieve suicide by following the legal procedure rather than undertaking the suicidal act by themselves. Thus, the Background and Discussion should undergo major changes to match the results of the study. Below are some suggestions.

Background:

- The Background (including the background section of the abstract) should start by emphasizing the legal situation in Switzerland regarding assisted suicide (which is very different than in most countries). This should contain the criteria and general procedure for an individual to carry out assisted suicide, as well as how the choice's rational basis is evaluated in the process. I would also put here the major part of the Discussion's second paragraph, starting from "The Swiss Academy of Medical Sciences …"

- The driving hypotheses could then be the followings:

  a) Since assisted suicide is relatively easy to access in Switzerland, a lot of people who would carry out unassisted suicide in more limiting conditions now employ assisted suicide to end their suffering. If this hypothesis is true, a decrease in unassisted suicides is to follow the widening of indications by right-to-die organizations in 2014.

  b) Elderly prone to unassisted and assisted suicide are not identical. Assisted suicide is often considered a more "rational" choice, since people are evaluated for their capacity for discernment beforehand and are given a period of reflection time before making their final decision. On the other hand, it has been established that unassisted suicide in the elderly can follow impulsive/careless decision-making (1). A plausible hypothesis would thus be that assisted suicide is associated with more somatic health problems whereas unassisted suicide occurs in more cases with mental disorders.
c) Increased health care intensity would thus increase assisted suicide rates but not unassisted suicide rates since it adds to individuals' experienced burden but at the same time increases the opportunity to screen and treat elderly patients with severe mental illness who would carry out impulsive suicidal acts.

- I do not think that the paragraph about Joiner’s Interpersonal Theory is relevant here. First, because you are not evaluating interpersonal factors in suicide, second, because this theory offers a limited perspective on suicidal behavior and has been recently subject to important controversy (2).

- It would be important to explain why this study focused on an elderly population and how unassisted and assisted suicide are thought to differ from the general population in this particular age group. The existing literature about late-life suicidal behavior and assisted suicide/euthanasia has to be more thoroughly reviewed and reported to better contextualize hypotheses and findings. For example, it has been found in recent systematic reviews that physical illness and functional impairment are important suicide risk factors in the elderly (3) and that older adults who attempt or die by suicide tend to possess an overall more adaptive personality profile than their younger counterparts (4). They have an overall better mental health status than younger suicidal individuals (5). These findings suggest that the elderly who choose assisted suicide would be particularly sensitive to any worsening of their quality of life.

- The Background should end with clearly stated hypotheses. The current hypothesis is a little lost in the text and is not precise enough. As mentioned above, the current study could only determine whether intensity of health care is a positive predictor of assisted suicide relatively to unassisted suicide, not in general.

Methods:

- The way the multivariate logistic regression was developed would need further details: how were variables retained/removed from the model? In what way were the included variables and model selection hypothesis-driven?

- If possible, age should be analyzed as a continuous, not a categorical variable in the regression model.

- Still in the regression model, it is unnecessary to code Mental and behavioral disorders in the negative direction and makes interpretation harder for readers.

Results:

- Please report full statistics everywhere, not just naked p-values.
- A "than" is missing on the second paragraph of p. 9: "Mental and behavioral disorders represented the main underlying conditions in 2/3 individuals carrying out unassisted suicide and were significantly more frequent [than] in assisted suicide decedents (p<0.001)".

- The increase in assisted suicide and concomitant decrease in unassisted suicide from 2015 should be tested for significance.

- I am not sure the part about palliative care hospitalization is worth keeping, given the particular system in Geneva with the mobile palliative care teams, as you detail them in the discussion. Given these conditions, the number of palliative care hospitalizations is quite uninformative and does not match starting hypotheses.

- The multivariate logistic regression model is not simply there to verify previous findings, it adds an essential extra piece to the analysis as I outlined in my suggestion for hypothesis "c" above.

Discussion:

- The authors should make the discussion even more hypothesis-driven, even though there has been improvement in this regard compared to the first version of the manuscript. This is much easier to do when one has precise hypotheses. Here are some thoughts about the interpretation of findings based on the hypotheses outlined above:

  a) It would seem that, by making assisted suicide more accessible in Switzerland since 2014, older adults tend to engage less in unassisted suicide. By leading to a decrease in unassisted suicides, assisted suicide may have long-term impacts on the broader financial and health consequences of suicide. Important health-care costs related to suicidal behavior can indeed arise from unsuccessful attempts as well as treatment of surviving family members (6).

  b) The findings further suggest that in countries where assisted suicide is not an option, older suicide victims may be a heterogeneous group, with an important proportion of them making the choice of taking their own life based on reasons related to their quality of life rather than psychiatric disorders. It has been found in the USA that most older adults would be against legalizing assisted suicide (7). It would thus be interesting to identify determinants of assisted suicide versus the decision of not hastening one's own death in future studies.

  c) The results of the logistic regression found that hospitalization tend to increase assisted suicides but not unassisted suicides. Given that mental disorders were predominantly found in the latter group, this could suggest that screening elderly hospitalized individuals for depressive symptoms may not suffice. One would need to assess and reduce their experienced burden of
diseases as much as possible even in the absence of a clear impact on their mental health. Experiences of lack of agency and autonomy on one's life during hospital care could be worth exploring in future research as precipitators of assisted suicide, which would then be a way to regain control.

- Throughout the discussion, assisted suicide should be treated in a non-judgmental way, not as a negative outcome to be prevented. This point is subject to a very sensitive ethical debate that is not the focus of this article. Thus, I would suggest focusing the discussion more on the fact that assisted suicide suggests important levels of suffering, and consequently improving health care and quality of life conditions could provide older people with viable alternatives to suicide.

- To better contextualize the findings of the intensity of health care, it would be good to cite statistics of the general elderly population in Switzerland. For example, what is the mean hospitalization rate in the elderly? Is the intensity of health care higher than this number in the assisted and unassisted groups?

- How do we know from the reported results that the individuals who died by assisted suicide were mainly living alone? The differences in marital status were non-significant in Table 1. Additionally, the fact that there were more assisted suicides than unassisted suicides in nursing homes could not only be explained by better social connectedness in nursing homes, but also a narrower contact with health care professionals, as well as the generally worse level of functioning of elderly in nursing homes that would prevent them from planning and carrying out a suicidal act on their own.

- The paragraph starting with "Our results also demonstrate..." is extremely confusing, since again, in the study, assisted suicide cases were only compared to unassisted suicide cases who happened to have a much higher rate of mental and behavioral disorders.

- As mentioned earlier, the palliative care paragraph does not add anything to the message.

- I am not sure the very broad diagnostic categories reported in this article could be called "a deep description of all comorbidities". The study's novelty resides in the quantitative comparison of assisted and unassisted suicide in a large state-level sample.

- Specifying the factors that may prevent generalizability is an important piece of the limitations and it is good the authors included it.

References:


**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

No

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

No

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6. I started a position in another department of the Geneva University Hospitals on May 1st 2019. I do not know the authors personally and have never collaborated with them in any research or clinical setting. I have no competing interests to declare regarding points 1 to 5.

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