

Netherlands 'suicide contagion' from assisted dying: Theo Boer's smoke and mirrors

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Background: Concerns had been raised about the scientific quality of a 2017 article by ethicist Theo Boer in which he theorised that lawful voluntary assisted dying (VAD) would potentially 'dampen' suicide rates, but drew the opposite conclusion: the suggestion that VAD cases have caused higher suicide rates.

Methods: A structured, forensic examination of the article was conducted.

Results: Numerous serious shortcomings were found, including (a) profound unfamiliarity with the complexity of suicide; (b) lack of a clear and specific pre-hoc methodology; (c) numerous unsupported speculations; (d) cherry-picked data and casual dismissal of data at odds with the conclusion; (e) a simple correlation interpreted as causation while failing to control for any confounding factors; (f) incoherent, contradictory and misleading statements; and (g) multiple editorial errors.

Conclusions: Boer's article is poorly conceived and carelessly assembled, revealing unfamiliarity with both the subject matter and with scientific principles. The conclusions drawn are not supported by the article's methodology or data. The article offers mere smoke and mirrors to conclude that VAD may increase suicide rates, at odds with wider evidence.

Key words: voluntary assisted dying, euthanasia, suicide contagion, Werther effect, Netherlands, methodology

INTRODUCTION

In 2017, Dr Theo Boer* published an article in the *Journal of Ethics in Mental Health* titled "Does euthanasia have a dampening effect on suicide rates? Recent experiences from the Netherlands".¹

Boer, a long-time sceptic though acceptor of assisted dying² was a member of one of the five Dutch euthanasia review committees from 2005 to 2014, and favoured the Dutch assisted dying model.² In 2014 he resigned from the euthanasia committee and took a strong stand against the Dutch model.³

Boer's 2017 article forms part of his ongoing and vocal critique of the Dutch model of assisted dying.

At the time of preparing this review, Boer's article was not indexed in SCOPUS but appeared in Google Scholar with five citations. Two of those citations were by Boer in his own subsequent articles,^{4,5} plus in two articles^{6,7} and a book⁸ by other authors.

The article was also adopted as an authoritative source in a formal submission by a professional medical association to a legislature for its consideration of assisted dying law reform.⁹

Several scholars had privately expressed reservations about the scientific quality of Boer's article, and I concurred. It was therefore determined to conduct a formal assessment of the article, its sources, methods and conclusions.

Terminology

The following abbreviations are used in this article:

- AVE Active voluntary euthanasia, where a physician administers a fatal dose.
- PAD Physician assisted dying, where the person self-administers a fatal dose.
- VAD Voluntary assisted dying; AVE and/or PAD.

METHODS

A structured, forensic examination of the article was conducted, including:

- Checking the use (or non-use) of scholarly citations;
- Checking that citations supported the claims the article made of them;
- Analysing arguments for logic, cohesion and consistency;
- Examining data presented in the article;
- Considering other official and peer-reviewed evidence; and
- Assessing the methods and conclusions for overall scientific merit.

RESULTS

Each main section of the article was examined in turn.

* Dr Boer is Professor of Ethics of Care at the Protestant Theological University in Groningen, the Netherlands, and a Fellow of The Center for Bioethics & Human Dignity within the evangelical Christian Trinity International University.

Article title

The article title references only the jurisdiction of the Netherlands, even though data from a neighbouring jurisdiction with legal VAD, Belgium, was included. The omission (as well as that of Luxembourg) is informative as will become evident.

“Abstract” section

The article abstract states that “there seems to be no causal link between the possibility of euthanasia and lower suicide rates”. However, the article did not examine any causal research: it examined only *correlations*, and with no attempt to control for any potential confounding factors. Thus, the document commences with the fallacy of drawing a conclusion unsupported by its methods.

Further, the abstract continues, in regard to the possibility of lower suicide rates due to legal VAD, that “the opposite seems to be the case: the suicide rates in the Netherlands are the fastest growing when compared to surrounding European countries, most of which lack the option of euthanasia”. This further claim, too, was from the same correlative research, with no attempt to control for any potential confounding factors. It also ignores clear contradictory evidence provided in the article, and other data available in Boer’s sources, but which he didn’t include.

Thus, while Boer uses ‘exploratory’ language (“seems to be”), the conclusions suggested in the abstract are invalid and misleading in the context of the article’s actual methodology and data. They reveal confirmation bias.

“Introduction” section

The introduction section, which should set a rigorous conceptual framework to underpin methodology and analysis, contains only a single citation — to a movie.

Boer states that he will offer four arguments for why VAD should lead to lower suicide rates, yet proceeds to produce six. While the given arguments, which he frames as “prima facie”, are more or less plausible, Boer offers no scholarly account of why *these* particular arguments (and no others) apply.

Further, he fails to demonstrate any of his chosen theories are real causes in practice. For example, he offers no evidence to show whether ‘fear of worse condition after a failed suicide attempt’ is a *significant* deterrent that would contribute to an *observable* decrease in the suicide rate.

Most importantly, Boer fails to consider broader factors that might result in changes to suicide rates. He mentions not one well-established suicide risk or protective factor, of which there are many, as discussed in the Appendix to this article.

One of Boer’s premises is also incoherent: he states that “the professional that offers assistance in suicide may thus save the patient’s life”.

Boer’s introduction also makes several claims, for example “in many public discussions”, and “that explains the pressure from many patients and their relatives on physicians to

provide euthanasia for patients who are suicidal”, without reference to any evidence.

The introduction section is thus a collection of casual and unsubstantiated speculations, devoid of reference to extant scholarly frameworks and research literature. It is unknown how this passed peer review.

None of the title, abstract or introduction consider (or even mention) VAD for *psychiatric* reasons: they discuss VAD only in general. The relevance of this will become apparent.

“Methodology” section

The article lacks a methodology section: an introduction to and scientific justification of specific and robust methods that will be used in an attempt to answer the research questions raised.

It is unsurprising then, that the article then proceeds, as follows, to a poorly-coherent and laissez faire analytic schema that ultimately relies on correlation analysis and with no control of important confounding factors: methods that can’t hope to validly answer a causative hypothesis.

“Moral Concerns” section

This section of five concerns begins with a revealing anchoring bias: that while the previous points suggesting that VAD may dampen the suicide rate were framed as mere “prima facie” arguments, the arguments against VAD are both “*moral*” and “*strenuous*”.

The section also switches inexplicably for the first time, without introduction, from general VAD to discussion of VAD only for *psychiatric* reasons.

Point (1)

Due to badly structured argument, it takes some mental processing to discover the premise that Boer is advancing: the claim that VAD is offered in *psychiatric* cases so as to *prevent general suicide*. That’s a false premise: VAD is offered for a range of reasons, and “preventing suicide” is not a due care criterion under the Netherlands’ euthanasia Act.[†]

Boer’s discussion fails to establish whether legal VAD in psychiatric cases might even contribute to a *detectable* rather than mere *conceptual* decrease in the suicide rate: he offers no sources and no analysis of the extent to which suffering *in psychiatric cases that would qualify under VAD* had contributed to the Dutch suicide rate prior to legalisation.

Further, he fails to note that VAD in psychiatric cases was determined to be legal by the Dutch Supreme Court in 1994, long before legislation, and that cases regularly occurred in the 1990s.¹⁰ This further mitigates the likelihood of a detectable ‘dampening’ of general suicide rates after legislation of VAD.

Boer then produces data on the vastly longer time taken to approve cases of VAD for psychiatric suffering than for somatic suffering, surmising that the lengthy process is unlikely to prevent suicide cases. He fails to explain why this is a “strenuous moral” rather than a mere “prima facie” argument against VAD.

[†] More correctly, the *Termination of Life on Request and Assisted Suicide (Review Procedures) Act 2001*.

Further, Boer's proffered data relates only to cases in which VAD was granted, and therefore reported to a euthanasia commission. It does not take into account that, historically, most Dutch VAD requests in psychiatric cases (at least 95%) are declined.^{10‡}

The same study found that in 1996, approximately 320 psychiatric patients requested VAD, 16% of whom subsequently ended their lives without a physician's help (i.e. suicided). In 1996 there were 1577 suicides in the Netherlands (Bureau of Statistics Netherlands data). Therefore, psychiatric patients who had requested VAD contributed around 51 cases or 3.2% of all suicides. It is not known from the study specifically what proportion of that 3.2% were in respect of a refusal or occurred in any case without a refusal, but if 5% of those VAD requests had qualified under the law and been granted (as above), that would equate to 3 granted cases, or a potential dampening of the general suicide rate by just 0.16%.

The uncited data about VAD request refusal rates and potential suicide dampening, the fact that lawful psychiatric VAD cases occurred in the 1990s, and Boer's proffered data about lengthy qualification periods, would collectively and very significantly mitigate *against* his thesis that psychiatric VAD ought to detectably dampen the suicide rate.

Even his own key counter-argument is not mentioned in the abstract, which reports only the case for dampening: revealing confirmation bias.

Point (2)

In this section, Boer speculates on three kinds of fears of psychiatric patients who may be contemplating ending their lives. He merely plucks the fears from the air: he offers no sources, no justification for the 'framework' and no consideration of other fears.

Boer correctly notes that in the Netherlands there has been a much greater increase in the number of AVE than PAD cases. He argues this supports his 'immoral' case against VAD for several reasons.

Firstly, Boer speculates that patient autonomy ought to lead to much higher rates of PAD (than AVE). This is to misunderstand patient autonomy. The term refers to the principle that the patient makes their own *decisions* about courses of action. It doesn't mean that the patient carries out the procedure herself. Do we expect, in the face of the acceptance of surgery, that an increasing number of patients will feel compelled to perform their own operations?

Secondly, Boer speculates that doctors ought to greatly prefer PAD to AVE, because the jail penalty for falsely conducting an AVE case is much greater (maximum 12 years) than for a false case of PAD (maximum 3 years). This is a bizarre claim: that doctors would find going to jail for 3 years acceptable. On the contrary, doctors will assist in VAD when they conscientiously believe that all the due care criteria have been met, thus avoiding prosecution and incarceration altogether.

Thirdly, Boer argues that there should be more cases of PAD because there are now more patients who are capable of taking the medication themselves, claiming without supporting citation that "many [cancer patients] can no longer swallow" (implying that other kinds of patients can, but which may not be true, especially those with degenerative neurological conditions or asthenia).

Even if Boer's premise were true, much of the *increase* in VAD cases in recent years is still in respect of cancer, with very little in respect of mental illness (Figure 1).

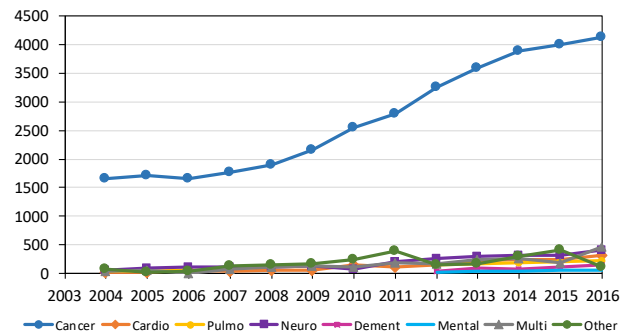


Figure 1: Underlying illness in Dutch VAD cases

Source: Euthanasia Commission annual reports

The text of the footnote to this claim neither substantiates the claim, nor provides a citation. It is unclear how this passed peer review.

Indeed, the evidence he *does* provide — based on a small sample size of unknown provenance — states that 42% of psychiatric VAD cases were PAD: a vastly higher rate than for all VAD cases (3.8% PAD). This is directly at odds with his argument about "the reluctance of patients to bring about their own deaths": a contradiction he doesn't expressly note.

Correspondence between us elucidated that the uncited data is his own and that he intends to publish it in the future.

After all this, Boer incoherently concludes that the reluctance among psychiatric patients to bring about their own deaths — a reluctance his provided data contradicted — is likely to mean that many psychiatric cases would not have taken their own lives (i.e. been a general suicide) if AVE had not been an option.

Point (3)

Without citation, Boer speculates that VAD may discourage patients from cooperating in burdensome therapy. Curiously for an ethicist, he offers no explanation as to why patients *ought* to subject themselves to unwanted and oppressive interventions they don't want; a position revealed by his choice of expression: "*cooperating* in therapy" (my emphasis).

Further, the argument ignores the Netherlands euthanasia Act's due care criteria, which stipulate that the physician must assess that no alternatives for treatment exist that are reasonable to the patient. In practice, if the physician is unsatisfied that the patient's refusal of treatment is reasonable, the physician will decline the request for VAD. More than one in five refusals is due to this criterion.¹¹

[‡] In 2% of cases, the psychiatrist honoured the patient's request and in a further 3% another physician honoured the request. Some cases honoured by other physicians may be related to non-psychiatric reasons because the study found somatic comorbidities were not uncommon.

Point (4)

Boer argues that there is a paradox in society working to prevent general suicides, yet also providing VAD to those who “insist”. This is a false equivalence: equating a rational, informed and tested decision with an irrational, uninformed and impulsive one. It’s also a misrepresentation of the law. The euthanasia Act does not permit VAD because the patient “insists”, but rather on a suite of specific due care criteria.

Boer then cites a single anecdotal case from a film to stake the claim that “death is increasingly seen as a remedy for all forms of severe suffering”. Again, this is a misleading claim because the euthanasia Act does not permit VAD merely on the basis of “all forms of severe suffering”.

Finally, Boer mentions that many studies have “reflected on” copycat suicides and the so-called Werther effect, without citing a single paper or demonstrating a specific knowledge and understanding of the subject. Some papers have found suicide clusters as a contagion effect, while others have not. Copycats reproduce the *method* of suicide, but Boer offers no insight that a general suicider doesn’t follow the requirements of the euthanasia Act. See the Appendix to this article for a summary of the professional ‘copycat’ literature.

Point (5)

Boer’s final “strenuous moral concern” is to speculate that VAD is not always a less traumatising alternative for relatives. Firstly, he fails to articulate any reason for the arbitrary standard of perfection (“always” rather than mostly, usually or even “similar”). Secondly, he fails to cite existing Dutch research that found relatives of cancer patients who died by VAD *coped better* in terms of both grief and post-traumatic stress, than relatives of those who died a natural death.¹²

Thirdly, to support his argument, Boer cites the single anecdotal case of Belgian Tom Mortier as reported in the New Yorker.¹³ Mortier’s mother was a psychiatric patient who was granted VAD, and son Tom has remained vocally hostile about her assisted death.

However, while Boer lauds his own values over this Belgian case (he opines that Mortier’s mother was “allowed to give up”), he makes no mention of the most compelling reason for son Tom’s feelings of trauma: that his mother wrote to him expressly to let him know that she had applied for VAD, *and he didn’t respond to her in the intervening months before her assisted death*. The series of events is clearly spelled out by Tom in the very source that Boer cites.

Finally, Boer speculates that VAD is immoral because relatives may have serious doubts about whether the assistance in death was really necessary; whether additional treatments might have been beneficial. Again, he fails to provide any evidence that such concerns are more than theoretical, and ignores the due care criteria of considering other reasonable treatments. Nor does he offer an explanation as to why one person’s “concern” renders the possibility of someone else’s choice immoral.

Thus, the section of five “strenuous moral concerns” fails to articulate why these are not mere “prima facie” concerns,

as he describes those in favour of VAD; switches suddenly and without introduction from general to psychiatric VAD; plucks theories out of the air; fails to cite scholarly (or any) sources for multiple claims; and ignores readily available and highly relevant data in the extant, peer-reviewed literature.

“The VAD numbers” section

Boer again demonstrates anchoring bias (that VAD is the only significant factor influencing Dutch suicide rates) in commencing this section by stating that there’s an assumption that “euthanasia will lead to lower suicide rates” which is “not supported by the numbers”. It’s also telling that the conclusion appears before, and not after, the evidence.

Boer produces charts of Dutch VAD and general suicide rates. However, despite having just employed *psychiatric* VAD as his “strenuous moral” arguments against VAD, he now reverts again to comparing *total* VAD statistics (not *psychiatric* VAD statistics) with the general suicide rate. How this fundamental disconnect between hypothesis and analysis passed peer review is unclear.

The text refers to Boer’s two comparative charts as 3a and 3b, whereas the figures themselves are 4a and 4b. Further, the charts’ date axes are incoherent with non-linear date labels. The axes labels suggest that the first data is 2003 (which is the first full year of the euthanasia Act) but are in fact, without explanation, for 2006, while the explanatory text suggests 2002.

Further, Boer remains silent in respect of potential discrepancies in the proffered data with his theories. His charts show that in 2015-6, with record increased levels of total VAD, the general suicide rate had levelled off or dropped rather than increased.

Nor does Boer offer citations for the sources of any of this data. Clearly, neither Boer, the peer reviewers, nor the journal’s editors, paid proper attention to the coherence and quality of these charts or their interpretation.

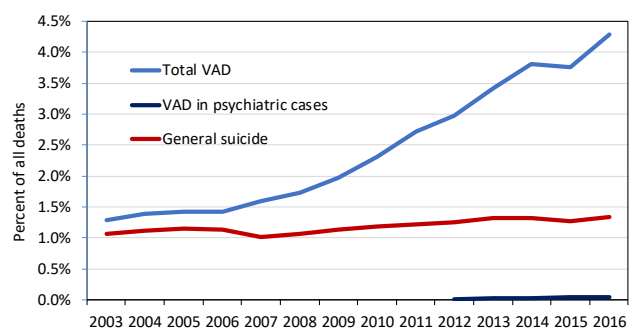


Figure 2: Dutch total and psychiatric VAD & general suicide rates
Sources: Annual Euthanasia Commission reports, Central Bureau of Statistics Netherlands

Using official Dutch data, Figure 2 represents the rate of total VAD, the rate of VAD in psychiatric cases, and the general suicide rate in the Netherlands.[§] Had Boer produced this chart, the tenuous nature of the psychiatric VAD relationship with general suicide would have been more clear.

[§] It is normal practice to analyse suicide data as rates per 100,000 population. However, in Figure 2 it is presented as a percentage of all deaths in order to produce a chart comparable to the original 4b in Boer’s article.

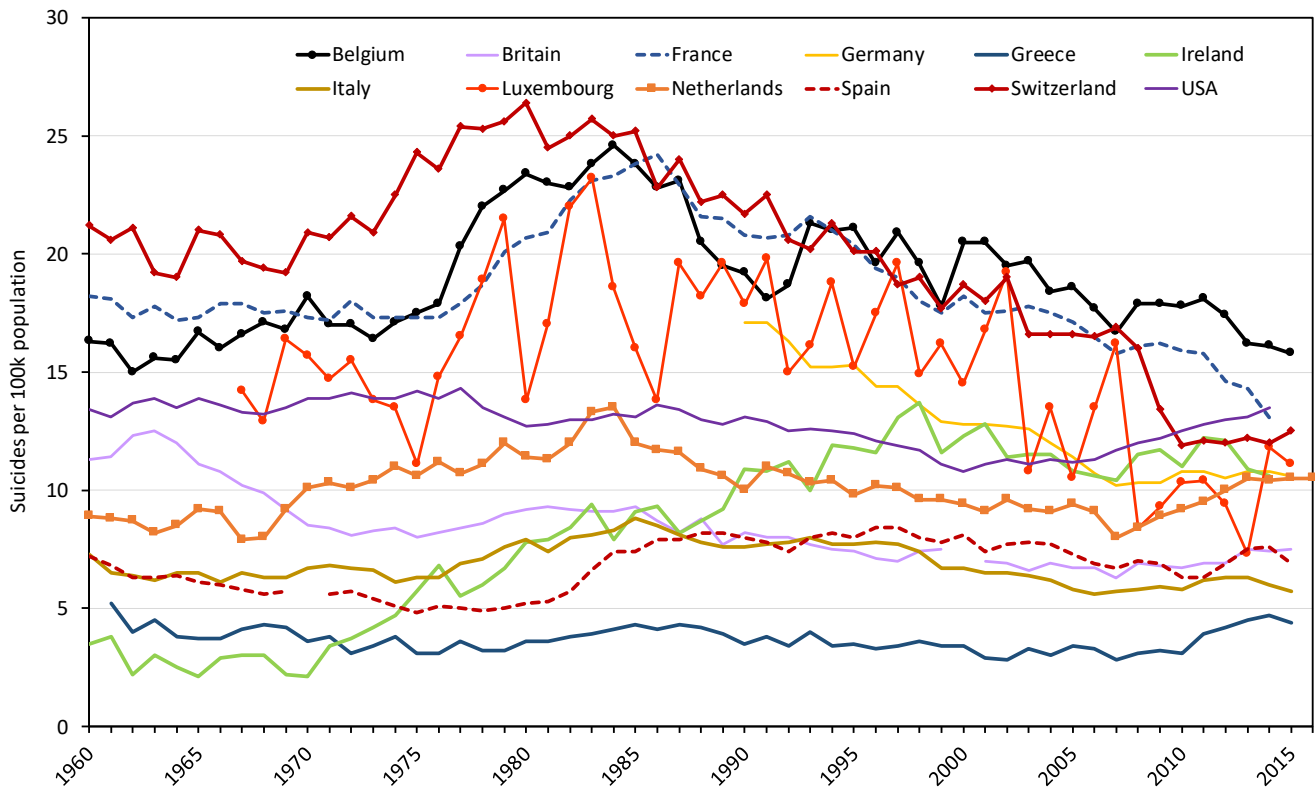


Figure 3: General suicide rates in selected OECD countries
 Source: <https://data.oecd.org/healthstat/suicide-rates.htm>

Boer also misleadingly states that “from 2007, euthanasia started becoming available to people with chronic and psychiatric illnesses, dementia, and other” illnesses. In fact, the euthanasia Act has not changed since it was passed in 2001, and VAD for psychiatric reasons had been legal and practiced since 1994.¹⁰ Further, the Act enshrined in statute other regulatory provisions that had been in effect since the 1980s. Thus, these kinds of VAD cases were possible and practiced under Dutch regulation long before the 2001 Act, and long before 2007 as Boer suggests.

Further selectivity is evident when Boer refers to a chart of just six European countries’ general suicide rate trends, saying “...the Netherlands of *all countries* [my emphasis] show the largest increase in suicide numbers.” The chart includes just six countries (hardly “all”) using an OECD (not just European) data source.

Figure 3 illustrates the same OECD data for a wider range of member countries, including all available historical back-data, as well as two more recent years’ data that was not available at the time Boer prepared his article.

Evident from Figure 3 is that:

- The general suicide rate in the Netherlands was higher prior to 1984 when the KNMG (Dutch medical association) first produced guidelines for VAD, which was when VAD practice changed from isolated to more regular cases.¹⁴ The suicide rate continued to fall from 1984 until 2007, as VAD cases increased.
- The rate in the USA increased from around the year 2000, when almost no citizens (only Oregon) had

access to PAD. (Washington state was next to legalise PAD in 2008, coming into effect in 2009.)

- The rate in Spain increased significantly in the 1980s. Spain has never had a VAD law.
- The rates in France and Italy increased significantly from the mid ’70s to the mid ’80s. Neither country has ever had a VAD law.
- The rate in Ireland increased very greatly over the last three decades of the twentieth century. Ireland has never had a VAD law.
- The rate in Greece increased over the same recent time period (since around 2007) as the Netherlands. Greece has never had a VAD law.

But perhaps the most egregious bias demonstrated in Boer’s article is his failure to expressly note that the general suicide rate in Belgium — data he presents — has dropped significantly since its VAD law came into effect in 2002. All he has to say about the Belgian data is an aside in the footnotes, remarking only that “the Belgian figures are far above the European average”.

That’s a facile remark since by definition, half the sample has to be above its average. Neither does he note that in 2013, European countries Latvia, Hungary, Slovenia and Lithuania had suicide rates greater than Belgium’s, and none of these other countries have VAD laws.¹⁴

Belgium’s VAD law came into effect the same year as the Dutch statute: 2002. Beforehand, VAD in Belgium was not legally or administratively sanctioned in any way, whereas it had been regulated and routinely practiced in the Netherlands

^{**} Confusingly, all the Figures in Boer’s article are labelled *Tables*, and referred to as either figures or tables in the text. Clearly, editorial quality is absent.

since 1984.¹⁴ Belgium’s euthanasia Act, like the Netherlands’, permits VAD in psychiatric (only) cases. Belgium has also been colourfully described by at least one psychiatrist as “the epicentre of psychiatric euthanasia”,¹⁵ and the Belgian euthanasia commission had expressly published statistics of “mental and behavioural disorder” euthanasia cases in its latest report available prior to Boer’s article.¹⁶

If any country were able to demonstrate dampening of suicide rates since legalisation of VAD, it would be Belgium.

Belgium’s data is consistent with (but doesn’t causatively prove) the ‘dampening’ hypothesis (Figure 4). But Boer merely dismisses Belgium with a facile remark in the footnotes.

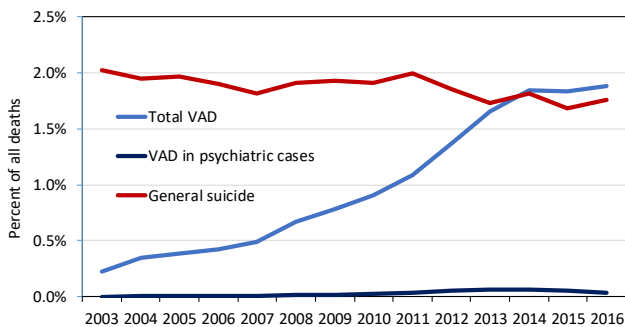


Figure 4: Belgian total & psychiatric VAD, & general suicide rates
Sources: Belgian Euthanasia Commission reports, Statista, Belgian Bureau of Statistics

Another scientific offence, omission, is committed here too. Luxembourg’s euthanasia Act of 2009 also permits VAD in psychiatric (only) cases. Boer fails to include this critically relevant jurisdiction in his analysis, even though it is a “European neighbour” of the Netherlands and whose data was available in his cited source (Luxembourg is an OECD member). Luxembourg’s data shows higher variability due to the country’s small population (Figure 3), but the suicide rate generally appears to remain at historical lows, at odds with Boer’s ‘contagion’ conclusions.

Thus, in a curious trifecta, Boer homes in on the recent rise in the Dutch suicide rate, arbitrarily dismisses Belgium’s concomitant drop because the underlying rate is “high”, and omits the data (from the same data set) for Luxembourg, whose rate is *not* “high” and hasn’t significantly risen.

Boer’s carelessness goes further. He offhandedly dismisses, without citation of any authoritative source or conducting any kind of analysis, the fact that the Dutch economy, in particular the unemployment rate, was more deeply affected by the Global Financial Crisis (GFC) than was Belgium’s. Unemployment is a significant risk factor for suicide.

A separate, detailed analysis discusses how the Netherlands was severely impacted by the GFC, with unemployment explaining 80% of the variation in Dutch suicide rates.^{14 ††}

That same report also details how data from Switzerland — with only a single criterion for lawful assisted suicide, assistance for non-selfish reasons — is consistent with Boer’s ‘dampening’ theory (but doesn’t prove causality). Also

consistent with ‘dampening’ is Oregon’s ranking for the suicide rate amongst USA states.

The “Conclusion” section

In the conclusion, Boer finally makes it clear, despite incoherently switching between total and psychiatric VAD throughout his article, that he is connecting *psychiatric* VAD cases with a dampening of general suicide cases:

“In public opinion, there is widespread opinion that the option of euthanasia **for patients with a psychiatric condition** will have a dampening effect on suicide rates.”

and

“Evidence from the Netherlands suggests that the option of euthanasia **for people with psychiatric conditions** does not reduce the number of non-assisted suicides and rather contributes to a rise in their numbers.” [my emphases]

He doesn’t explain why only *psychiatric* cases might contribute to that dampening. For example, in the UK it has been estimated that around one in ten suicides is in the context of a terminal or severe chronic illness,¹⁷ and 1 in 10 suicides in the USA has been determined to occur without an identifiable mental disorder.¹⁸

Given the article was published in the *Journal of Ethics in Mental Health*, it is appropriate that psychiatric VAD be considered. However, that mental health is not mentioned in the title, the abstract or the introduction, being first introduced only under “strenuous moral concerns” yet not analysed in “the numbers” section, contributes to the article’s incoherence as well as an appearance, rightly or wrongly, of being ‘retrofitted’ to the journal’s interests.

Critically, Boer’s conclusion has nothing to say about that disconnect between theory and analysis: the argument regarding *psychiatric* VAD but analysis using *total* (not *psychiatric*) VAD data.

Also in contravention of scholarly practice regarding conclusions, Boer also introduces a new citation: a reference to Holmes and Paton (2015).¹⁹ However, the correct citation is Jones and Paton (2015), demonstrating Boer’s (and peer reviewers’) unfamiliarity with the published literature and lack of attention to accuracy and quality.

Jones and Paton’s study is an econometric modelling of suicide in Oregon which suggests suicide contagion from that state’s Death With Dignity Act. The study has been found to be flawed.²⁰ Another forensic analysis found it to contain ten major ‘scientific offences, any one of which was enough to dismiss its authority and veracity.²¹

Curiously, Boer’s approach in the reviewed article is strikingly similar to Jones and Paton’s: suggesting a dampening of the suicide rate and then purporting to (tentatively) establish the opposite by advancing speculative and incoherent hypotheses, failing to appreciate the

†† Indeed, while Belgian unemployment varied modestly and briefly (two years), unemployment in the Netherlands (normally much lower than Belgium’s) rose dramatically (slightly exceeding the Belgian rate) and has taken a decade to return to pre-GFC levels (data from www.Statista.com).

complexity of suicide or consider the voluminous professional literature on it, cherry-picking data, ignoring or casually dismissing presented data at odds with theories, overlooking further readily-available but contradictory data, and 'softly' concluding suicide contagion from weak correlative data in the absence of controlling for important confounding factors: that is, implying causation from methods and data that could not possibly establish it, and indeed in places contradicts it.

Lastly, it's worth considering that Boer's article, in taking a highly negative stance against VAD, doesn't similarly note or criticise another significant type of decision at end of life: in 20% of Dutch deaths, a *non-treatment* decision was the most significant decision at end of life. These decisions have no specifically mandated statutory standards of conduct to ensure informed decision making, absence of coercion, or a slippery slope from deliberate hastening of death by refusal of medical treatment, to general suicide.²²

Peer review

The published article notes that it is peer reviewed. Correspondence with the journal's Editor in Chief confirmed that the article was reviewed by two peers: both of them internal to the journal's editorial and advisory bodies. The discipline area of expertise of the reviewers was unable to be revealed.

DISCUSSION

Despite its superficial simplicity, this was a complex article to forensically analyse. Numerous shortcomings made comprehension laboursome and slowed progress.

Several fatal flaws were found in the article:

1. *Failure to analyse the hypothesised variable* (psychiatric VAD) and analysing another variable instead (total VAD);
2. *Failure to control for any confounding variables* in the analysis, rendering any correlation meaningless;
3. *Cherry-picking data*, arbitrarily dismissing presented data that was at odds with the hypothesis; failure to include data from the cited data set that was at odds with the hypothesis; failure to consider extant research containing multiple sources of relevant data at odds with the hypothesis; and

4. *Confusing a simple correlation with causation* in reaching the conclusion.

Many other serious scientific flaws were also found, including:

5. Numerous sweeping assertions made without citation: that is, appropriate reference to an acknowledged framework or the scholarly literature, and some with only reference to anecdotes;
6. Incoherent and contradictory arguments;
7. False implication that VAD practice in the Netherlands changed dramatically around 2007, when such practices were legal and occurring at least as early as the 1990s;
8. Misleading implications about what the Netherlands' euthanasia Act permits;
9. Missing citations for items that were cited;
10. Mis-citing another article which supposedly furnished additional evidence supporting the conclusion, but which didn't, and which suffered from surprisingly similar scientific and academic failures;
11. Charts whose data was misleading and didn't match the explanatory text, and whose subsets at odds with conclusions were ignored; and
12. Multiple editorial errors such as wrongly-labelled figures and count of arguments.

In summary, Boer's article contains a litany of scientific and scholarly failures. Its speculations are ill-informed, poorly-assembled, incoherent in places and mostly uncited, the data cherry-picked and invalidly interpreted, and the laissez faire methodology incapable of validly supporting its conclusion.

Boer conjures up mere smoke and mirrors to argue suicide contagion from VAD in the Netherlands. The article should be retracted.

AUTHORS' RELEVANT AFFILIATIONS

Relevant affiliations and interests statement: Neil Francis is a former primary medical researcher. He runs DyingForChoice.com. He is a past President and CEO of Dying With Dignity Victoria, past and Foundation Chairman and CEO of YourLastRight.com, and a past President of the World Federation of Right To Die Societies.

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APPENDIX: SIGNIFICANT SUICIDE FACTORS

Suicide risk factors

There are many complex risk factors for suicide, including mental illness,²³⁻²⁵ impaired decision-making particularly in diminished threat sensitivity to adverse outcomes,²⁶⁻²⁸ potentially heritable personality traits including borderline personality disorder,²⁹ neuroticism³⁰ and impulsiveness³¹⁻³⁷ including impulsive/aggression,^{27,38} drug³⁹⁻⁴¹ and alcohol abuse,^{42,43} domicile in rural or remote areas,⁴⁴⁻⁴⁷ unemployment and economic hardship⁴⁸⁻⁵⁶ especially when long-term⁵⁷⁻⁶¹ and related to multiple debts,⁶² sexual orientation,⁶³⁻⁶⁵ legal problems,^{56,66,67} significant physical illness,^{25,68-70} adverse events such as relationship breakdown including divorce and family stressors,^{23,44,56,71-75} household firearm ownership⁷⁶ and other possible factors such as arsenic exposure.⁷⁷

There can also be many complex interactions between factors, such as bullying and depression,⁷⁸ sexual minority and family/relationship problems,⁷⁹ bullying and drug use,⁸⁰ multiple-drug use and diminished mental wellness,⁸¹ drug use and legal problems,⁸² physical and psychiatric illness,⁸³ psychiatric illness and unemployment,⁸⁴ low income and ill health,⁸⁵ and declining physical health and divorce.⁸⁶ Rural residents are more likely to use a firearm, which is more frequently lethal than other suicide methods.^{87,88}

The US Surgeon General has enumerated key risk factors for suicide:

- Previous suicide attempt or family history
- Mental disorders
- Alcohol and substance abuse
- Hopelessness and isolation
- Impulsive and/or aggressive tendencies
- Barriers to accessing mental health treatment
- Relational, social, work or financial loss
- Physical illness
- Easy access to lethal means, especially firearms
- Stigma of seeking help for mental health
- Belief that suicide is noble
- Suicide contagion⁸⁹

Strong links have been found between unemployment and the suicide rate across UK and Europe,^{49,51,55} Asia^{48,51,52} and American countries.⁵¹

Larger increases in unemployment have greater impacts on the suicide rate⁴⁹ but may be moderated by appropriate state policy responses, especially a safety net of financial assistance to help meet basic living costs.^{49,50}

Financial hardship and unemployment has a greater effect on suicide rates amongst males^{49,51} and ages younger than 65 years,⁴⁹ particularly of 14-24 year-old males in Europe, and 45-64 year-olds in American countries.⁵¹

One trend worth noting is the change in the relationship between marriage and suicide rates. Marriage has traditionally been considered a protective factor, and statistically was so in the USA at least until the 1980s.^{90,91} A more recent study in Europe found recent change in marriage status (including getting married) to be a risk factor for suicide,⁹² and being married is a suicide risk factor in Iran.⁹³

This study confirms marriage as a risk rather than protective factor at the state level in the USA. This may be due to less stable long-term relationships than in previous decades, since higher new-marriage rates also correlate with higher divorce rates (adjusted $r^2 = 0.31$, $p < 0.001$).

Suicide protective factors

The US Surgeon General notes important factors that help protect against suicide:

- Good clinical care for physical, mental and substance abuse disorders
- Easy access to support to seek help
- Restricted access to highly lethal suicide methods
- Family and community support
- Learned skills in problem solving and non-violent conflict resolution
- Religious or cultural beliefs that discourage suicide.⁸⁹

Strong religious belief, but far less so religious attendance, correlates negatively with strong suicide tolerance.⁹⁴ (No significant association *at the state level* was found in this study, although one was found in relation to Black/African American percent of population.)

In the USA, higher educational attainment correlates negatively with suicide rates,^{95,96} as do preventative intervention strategies such as higher proportions of state budget allocations to health and welfare.⁹⁷

USA Airforce suicides significantly reduced with intervention strategies including leadership involvement, role modelling and a community approach to reducing deaths from suicide.⁹⁸

Obtaining direct metrics for protective factors is sometimes more difficult than for risk factors, for example to quantify how 'available' crisis help lines are across the jurisdiction, or how skilled the population is in problem solving.

Nevertheless, some proxy measures do serve as useful surrogates, such as population density to indicate how easy or difficult it is for individuals to access the right kind of care and interventions at the right time, and highest educational attainment as an indication of problem-solving skills.

Suicide clusters versus contagion

Suicide clustering

It can be difficult to reliably demonstrate or rule out that a particular individual's suicide was motivated by another's.^{99, p. 188} Consequently, analysis of suicide statistics is used as a proxy measure.¹⁰⁰ Statistics are assessed for spatial and temporal proximity of attempted or completed suicides, referred to as clusters. Some clusters may occur incidentally via factors such as presence of existing personal risk factors, proximal precipitating events (either independent, or common such as economic downturn), lack of social support, and the tendency for like-minded people to form assortative relationships.¹⁰¹

Some studies have found no clustering, for example on the Hong Kong railway, the Golden Gate bridge, and in jail.¹⁰⁰ At least one study produced conflicting results, with statistical clustering demonstrated using one choice of analytical parameters, but not with other parameters.¹⁰² Another study examined five apparent clusters of teenage suicides and found three of the clusters were consistent with an epidemic model, while two were not.¹⁰³

Suicide contagion

When a suicide cluster occurs, in which subsequent suiciders either personally know the precedent suicider (point clustering¹⁰¹) or become aware of the suicide through media, online or other exposure (mass clustering¹⁰¹), then it is possible to impute an infection-like influence mechanism: clustering can *only then* be described as contagion.¹⁰⁴

Suicide contagion is sometimes referred to as the 'Werther effect', after a spate of 18th century suicides said to be inspired by the fictional lead character of Goethe's *The Sorrows of Young Werther*; the copycats dressing similarly and suiciding by pistol at their desk (Werther on the basis of unrequited love), leading to several countries banning the book.^{105, p. 2} A contemporary analysis of *Werther* has found a handful of imitation cases, though no convincing evidence of the claimed widespread epidemic.¹⁰⁶

In this copycat suicide contagion it is the *method* of suicide that is duplicated, such as railway suicides in Austria¹⁰⁷ and Germany;^{108,109} falls from high places in Switzerland;¹¹⁰ carbon monoxide poisoning in the UK,¹¹¹ Hong Kong¹¹² and Korea;¹¹³ hydrogen sulphide poisoning in Japan;¹¹⁴ hanging/suffocation in UK prisons;¹¹⁵ and drug overdose in the UK.¹¹⁶ The copycat effect is greater if the initial suicide is of an entertainment or political celebrity.¹¹⁷