



Archduke Franz Ferdinand and Sophie, Duchess of Hohenberg in Sarajevo in 1914, which sparked World War 1). Some analysts argue that access to weapons, or material for producing weapons, is an important factor. Others reason that man is evil by nature or that misunderstanding in communication or lack of understanding can lead to war.

War is often preceded by tensions, of which there are many potential sources. Tensions can arise from shortages of water, energy, and, not least, food. For example, as Torreon Creekmore,<sup>3</sup> of the Intelligence Advanced Research Projects Activity in the USA, reflected: "When crops fail and prices rise, people don't have the money to purchase food, which can lead to stealing, then riots, social unrest, and mass migrations."

Agricultural production in relation to need is a security factor, and future forecasts indicate challenges. The world's population is expected to increase to 9.6 billion by 2050,<sup>4</sup> and many people will also change their diet. According to the UN,<sup>5</sup> society needs to increase food production radically until 2050; this at a time when increasing food production will become more difficult. Soil degradation and climate change are two reasons. Therefore, to reduce the number of victims of conflict, society must ensure food production and the supply of water and energy. Innovation in agricultural methods is one approach that could be taken.

I declare no competing interests

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- 1 Wagner Z, Heft-Neal S, Bhutta ZA, Black RE, Burke M, Bendavid E. Armed conflict and child mortality in Africa: a geospatial analysis. *Lancet* 2018; **392**: 857–65.
- 2 Cashman G. What causes war? An introduction to theories of international conflict. Plymouth, UK: Rowman & Littlefield, 2013.
- 3 Kaplan MDG. Autonomous agronomy. Feb 9, 2017. <http://trajectorymagazine.com/autonomous-agronomy/> (accessed Sept 2, 2018).

- 4 Food and Agriculture Organization of the United Nations and Intergovernmental Technical Panel on Soils. Status of the world's soil resources. 2015. <http://www.fao.org/3/a-bc590e.pdf> (accessed Sept 2, 2018).
- 5 Alexandratos N, Bruinsma J. World agriculture towards 2030/2050: the 2012 revision. June, 2012. [http://www.fao.org/fileadmin/templates/esa/Global\\_perspectives/world\\_ag\\_2030\\_50\\_2012\\_rev.pdf](http://www.fao.org/fileadmin/templates/esa/Global_perspectives/world_ag_2030_50_2012_rev.pdf) (accessed Sept 2, 2018).

### Authors' reply

We appreciate the comment by Per Frankelius, in which he notes the role of agriculture in the origins of conflict.<sup>1</sup> We focus on the consequences of conflict, not its causes. Both are important issues worthy of investigation. We agree that evidence suggests that variations in the economy and climate, including those related to food production, could be important drivers of conflict.<sup>2,3</sup> Given the major consequences of conflict for child health documented in our work,<sup>1</sup> further inquiries into the causes of war, into understanding how to intervene to reduce conflict risk, and how to deliver health services in conflict situations are all urgent areas for future research.

We declare no competing interests.

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- 1 Wagner Z, Heft-Neal S, Bhutta ZA, Black RE, Burke M, Bendavid E. Armed conflict and child mortality in Africa: a geospatial analysis. *Lancet* 2018; **392**: 857–65.
- 2 McGuirk E, Burke M. The economic origins of conflict in Africa. November, 2017. <https://www.nber.org/papers/w23056.pdf> (accessed Jan 29, 2019).
- 3 Hsiang S M, Burke M, Miguel E. Quantifying the influence of climate on human conflict. *Science* 2013; **341**: 1235367.

## Regulation of assisted suicide limits the number of assisted deaths

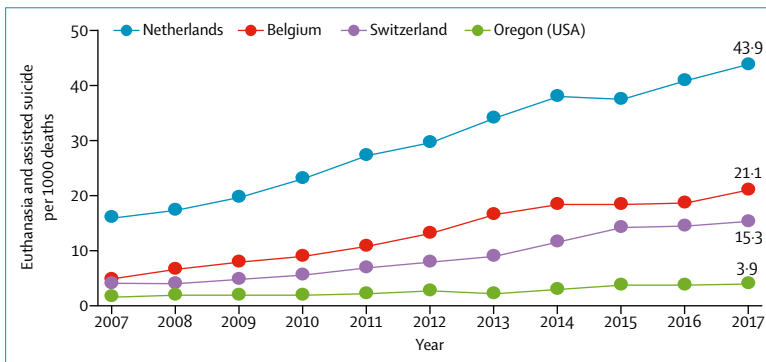
Several countries and US states have recently legalised euthanasia, assisted suicide, or both, including Canada and California, USA. In 2017, more than 13 000 patients died through either method of assisted death in countries where these practices are permitted. Euthanasia and assisted suicide have been legal in the Netherlands and Belgium since 2002, whereas assisted suicide has been legal in Switzerland since 1918 and in Oregon, USA, since 1997.

In 2014, we presented aggregated data for 2003–12 comparing the frequency of assisted deaths in countries or states that allowed both euthanasia and assisted suicide (the Netherlands and Belgium) with the frequency of assisted deaths in countries or states that only allowed assisted suicide (Switzerland and Oregon).<sup>1</sup> Here, we present aggregated data for 2007–17 from the same jurisdictions (figure; appendix). Assisted deaths continue to rise substantially in Belgium and the Netherlands, with assisted suicide constituting 3.5% of assisted deaths in the Netherlands in 2016.<sup>2</sup> The frequency of assisted deaths in Oregon is increasing at a much more reduced rate than in the Netherlands and is currently at less than 10% of Dutch numbers (3.9 per 1000 deaths in Oregon vs 43.9 per 1000 deaths in the Netherlands in 2017). The rate of increase in assisted suicides in Switzerland, where this practice is tolerated without legal safeguards or monitoring, is similar to the rate of increase in Belgium and the Netherlands, with a frequency that is approaching that of Belgium.

In assisted suicide, patients take the lethal drug themselves, whereas doctors administer the drug in euthanasia. In 2012, this appeared to be a main reason for the higher frequency of assisted deaths in the Netherlands

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See Online for appendix



**Figure:** Change in number of assisted deaths in countries and US states that have legalised these practices. The Netherlands and Belgium allow both euthanasia and assisted suicide. Switzerland and Oregon, USA, allow assisted suicide only. Raw data and sources are available in the appendix.

and Belgium, compared with Oregon and Switzerland. Yet data from the past 5 years suggest that the lack of legislation in Switzerland could also explain the higher frequency of assisted suicide, particularly since an increasing number of patients without terminal illness obtain permission for assisted suicide in Switzerland. By contrast, the lower frequency in Oregon might be explained by the requirement of a maximum life expectancy of 6 months and by the requirement that patients obtain a lethal dose from the pharmacy for auto-administration. On average, 36% of these patients in Oregon end up not using the lethal drug and die of their illness.<sup>3</sup>

Euthanasia is quickly approaching 5% of all deaths in the Netherlands, which is a higher proportion than in Belgium (although underreporting is suspected in Belgium).<sup>4</sup> In 2016, Canada legalised euthanasia, and California regulated assisted suicide as in Oregon. In 2017, euthanasia already represented almost 1% of all deaths in Canada,<sup>5</sup> whereas only 374 Californians died by assisted suicide (0.14% of deaths).

Legalising only assisted suicide with stringent procedural rules that exclude patients who are not terminally ill, as has been the case in Oregon, therefore seems to limit the number of assisted deaths and their increase with time. This hypothesis will be validated further when assisted deaths are legalised in more countries in the future.

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- Gamondi C, Borasio GD, Limoni C, Preston N, Payne S. Legalisation of assisted suicide: a safeguard to euthanasia? *Lancet* 2014; **384**: 127.
- Regional Euthanasia Review Committees. Annual report 2016. March, 2017. [https://english.euthanasiecommissie.nl/binaries/euthanasiecommissie-en/documents/publications/annual-reports/2002/annual-reports/annual-reports/RTE\\_annual\\_report\\_2016.pdf](https://english.euthanasiecommissie.nl/binaries/euthanasiecommissie-en/documents/publications/annual-reports/2002/annual-reports/annual-reports/RTE_annual_report_2016.pdf) (accessed Feb 15, 2019).
- Oregon Public Health Division, Center for Health Statistics. Oregon Death with Dignity Act: 2017 data summary. Feb 9, 2018. <https://www.oregon.gov/oha/PH/PROVIDERPARTNERRESOURCES/EVALUATIONRESEARCH/DEATHWITHDIGNITYACT/Documents/year20.pdf> (accessed Feb 15, 2019).
- Cohen J, Diericckx S, Penders YWH, Deliens L, Chambaere K. How accurately is euthanasia reported on death certificates in a country with legal euthanasia: a population-based study. *Eur J Epidemiol* 2018; **33**: 689–93.
- Government of Canada. Medical assistance in dying. <https://www.canada.ca/en/health-canada/services/medical-assistance-dying.html> (accessed Feb 15, 2019).

## Global health and cancer

Richard Horton (Sept 8, 2018, p 806)<sup>1</sup> hits the nail painfully hard on its head regarding the inexplicable indifference to cancer in low-income and lower middle-income countries (LLMICs). Non-communicable diseases, such as diabetes and hypertension, are easy to diagnose and low cost, effective

treatments are available; primary prevention of non-communicable diseases does not require medical interventions. By contrast, cancer treatment requires adequate diagnostic, pathology, and imaging services and surgical, medical, and radiation oncology capability which are often only available in a rudimentary form (sometimes not at all) in LLMICs, particularly in rural areas where most people live. Long distances to oncology clinics, serious financial limitations, and scarcity of oncologists and oncology nurses pose further obstacles. These enormous constraints might explain why the global health community has neglected cancer care, but these problems cannot be an excuse to do little or nothing.

In high-income countries, oncology is increasingly focused on targeted therapies, molecular diagnostics, and advanced imaging methods, which are not achievable in LLMICs because of their high cost, need for sophisticated equipment, and other impediments. Therefore, LLMICs need to develop their own affordable and feasible approaches to cancer detection, diagnosis, and treatment. The challenge for the global health community is to help LLMICs to develop clinical trials that can identify the most effective, practical, and affordable drug treatments and schedules, simple imaging (ultrasound), pathology diagnostics, and palliative treatments in low-resource settings to reduce suffering of all patients with cancer.

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- Horton R. Offline: Why has global health forgotten cancer? *Lancet* 2018; **392**: 806.

Richard Horton<sup>1</sup> vividly points out the current and growing deficiency in global cancer care, and the relative inattention this problem receives compared with infectious diseases. Repeated