

# Data and Trends in Assisted Suicide and Euthanasia, and Some Related Demographic Issues

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*Although considerable gains in survival have been observed in developed countries, particularly in the last stretch of life, part of these additional years of life are lived in bad health. In this context, a number of actions/inactions that limit or may limit life span are becoming increasingly common. Demography and quantitative sociology are well-positioned to make a significant contribution to the measurement of the consistency of different end-of-life interventions, to the examination of differences over time, space and among different social groups, and to the analysis of the behaviors and attitudes of different stakeholders (the sufferers, their relatives, health care personnel, public opinion). We focus here on euthanasia and assisted suicide (EAS). First, we discuss changes in public opinion on EAS in developed countries. Second, we analyze the diffusion and temporal trends of EAS, with a particular focus on Switzerland, the Netherlands, and Belgium; three countries for which it is also possible to consider the connections between the diffusion of EAS and palliative care. Third, we consider several differential aspects of the spread of EAS (mainly by sex, age, and cause of death).*

Although considerable gains in survival have been observed in developed countries, particularly in the last stretch of life, part of these additional years of life are lived in bad health.<sup>1</sup> In fact, it is precisely the same medical-scientific discoveries that have lengthened life spans that have paradoxically also resulted, as a secondary effect, in a lengthening of the time spent in what many consider to be an unsustainable amount of pain or discomfort.

To add to this, an increasingly large portion of people believes that the duration of one's existence should not be determined by God, fate, external

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subjects or conditions over which it is not possible to exercise control, but should rather be in the hands of the single individual (Walter 2002; Cohen et al. 2006; Verbakel and Jaspers 2010; Norris and Inglehart 2011; Cohen et al. 2014; Inglehart 2018; Walter 2020; Dixon-Mueller 2021). Meanwhile, pain therapies, palliative care and remedies to mitigate mental suffering have significantly improved. Thus, unlike the past, medicine today is often able to limit, although not always eliminate, the excessive pain and physical discomfort that often affects the last stretch of life.

In this context, a series of actions/inactions that may limit the duration of the end-of-life is increasingly widespread. These can be implemented at the will of the sufferer, their relatives, and the social-health personnel who treat them. Such circumstances of suffering are not exceptional: in developed countries—the focus of this note—the proportion of deaths preceded by more or less prolonged suffering amounts to about 70 percent, as opposed to 30 percent for violent and sudden deaths (Van der Heide et al. 2003). Though differing with age, this proportion has, to the best of our knowledge, remained almost constant up to the present day.

Research on the end-of-life involves numerous disciplines, from medicine to psychology, from pharmacology to ethics. Demography and quantitative sociology are also well-positioned to make a significant contribution to this area. Among other aspects, scholars in these fields can measure the consistency of various end-of-life interventions, examine differential aspects (by sex, age, ethnicity, cause of death, etc.), and assess the behaviors and attitudes of the various subjects involved (sufferers, relatives, health personnel, the public). This multifaceted research material allows to glimpse future outcomes, facilitated by comparisons of different countries and social groups.

A complete overview requires consideration of two aspects. The first regards the set of medical practices that—without directly and voluntarily inducing death—can limit the duration of life. The second concerns deaths more or less directly resulting from human, mostly medical, intervention, defined here, following established usage, as euthanasia and assisted suicide (EAS). Though the boundary between the two is not always clear-cut, it provides a useful distinction for approaching the topic. In this note, we focus on EAS.

As we will see, the number of countries that have legalized EAS is rising, and in these places, the number of people who use them is also continuously increasing. In the light of the growing diffusion of EAS, it would certainly make sense to standardize the available information, thus allowing not only for comparative insights but also providing a means of making more in-depth and targeted quantitative analyses possible in the future.

First, we discuss changes in public opinion on EAS in developed countries. Second, we analyze the diffusion and temporal trends of EAS, with a particular focus on Switzerland, the Netherlands, and Belgium; three

countries for which it is also possible to consider the connections between the diffusion of EAS and palliative care. Third, we consider several differential aspects of the spread of EAS (mainly by sex, age, and cause of death).

Before beginning, it is helpful to define several terms. Article 1 of the law of Luxembourg on Euthanasia and Assisted Suicide of 2009 can be followed. *In assisted suicide* a doctor intentionally assists another person to commit suicide or provides another person with the means to that end, on the express and voluntary request of that person. *Euthanasia* refers to the act, performed by a doctor, intentionally ending the life of a person on the express and voluntary request of that person (Ministère de la Santé and Ministère de la Sécurité Sociale 2010). We do not consider as EAS deaths accelerated by the suspension or failure to implement vital treatments, nor those that occur prematurely, if they happen according to the bioethical principle of the so-called “double effect”. That is, whereby even a negative event such as death is tolerated, if it occurs during a treatment intended to diminish the patient’s suffering, for example, during appropriate palliative care (Comitato Nazionale per la Bioetica 2016).

### **From growing approval to polarization and diversification: Public opinion on EAS**

The adoption of EAS in some countries and heated debate over possible reforms in places where it has not yet been introduced have taken place in contexts of rapidly changing public opinion on the justifiability of these practices. This is, on the one hand, likely the effect of long-term transformations, which have influenced attitudes toward suicide in general, at least in developed countries<sup>2</sup>. Various penalized in the past, starting in the mid-eighteenth century, attitudes and subsequently norms slowly began to change<sup>3</sup>. Yet, an association between suicide-related penal legislation and cultural attitudes toward suicide at national level has been documented for Europe as of today: countries which punish the crimes harder have significantly less permissive cultural attitudes toward suicide (Mäkinen 1997). On the other hand, the lengthening of life, and in particular of the number of elderly in poor health, has meant that many people have indirect experience with the final stretch of life (e.g., the end-of-life of a relative or a friend), thus modifying attitudes toward the different forms of EAS.

Historical trends in views on aid for the voluntary suppression of life emerge from the longest available series on euthanasia approval levels. Since 1947, the Gallup sample survey in the United States has repeated this question every year: “When a person has a disease that cannot be cured, do you think that doctors should be allowed by law to end the patient’s life by some painless means if the patient and his or

her family request it?" The question has limitations because it does not specify either the characteristics of the patient or the forms of the procedure. However, change in the portion of positive responses over time are informative.

Support for this form of euthanasia grew from 37 percent in 1947 to 53 percent in the early 1970s. It subsequently continued to gain ground, up until the 1990s, when the share in favor of euthanasia reached two-thirds of the population. While the portion of positive responses reached a peak in 2005, when as many as three quarters of those interviewed declared themselves in favor, growth since then has stalled. In fact, the decade that followed even saw a slight decline before another rise, though without exceeding the previous high. Data from the General Social Survey in the United States, which started asking this question in 1977, confirm this trend. Growth in those in favor essentially came to a halt in the 1990s, settling between two-thirds and three-quarters of those interviewed.

Starting with its 1996 survey, Gallup added a new question aimed at revealing the public's support for medically assisted suicide that asks: "When a person has a disease that cannot be cured and is living in severe pain, do you think doctors should or should not be allowed by law to assist the patient to commit suicide if the patient requests it?" The data collected reveal two surprises. The first is that there is a gap between opinions on euthanasia and those on assisted suicide. The second is that support for assisted suicide is lower than for euthanasia.<sup>4</sup>

In contrast to the United States, European public opinion on EAS can only be traced back to the early 1980s, that is, starting from data from the World Values Survey and the European Values Survey. The time series that can be reconstructed using these two sources paints a mixed picture. Generally, a shift has occurred in two opposite directions. In the predominantly Protestant countries of Western and Northern Europe, there has been a strong increase in acceptance of both euthanasia and assisted suicide. Meanwhile, in the predominantly former communist countries—with mixed Catholic and Orthodox religious heritage—of Eastern and Central Europe, an initial period of rising approval was followed, starting in the late 1990s, by an interruption of this growth and then a decisive reversal (Emanuel et al. 2016; Inglehart et al. 2021). The result is a growing divergence between the two geographical areas (Tomka 2002; Tomka 2004; Carlson 1998; Carlson 2004; Laaksonen et al. 2001; Cohen et al. 2014; Halman and van Ingen 2015). Meanwhile, in some Mediterranean European countries—characterized by a Catholic prevalence and/or a strong Orthodox presence—the level of approval increased more slowly, its growth then stopped or even, as in the case of Greece, has declined (Inglehart et al. 2021).

An increasing polarization of attitudes toward EAS is similarly observed within Western European public opinion between 1981 and 2008

(Halman and van Ingen 2015). Analyses of these data also, however, show a reduction in pluralism on this and other “ethical” issues in the countries of Eastern Europe (Colombo 2022; Halman and van Ingen 2015).

Studies of trends in public opinion on EAS thus document the coexistence of different paths. Surveys conducted thus far do not identify univocal trends, but rather suggest that more collective changes determine variations in level of acceptance, and that these factors can vary greatly from country to country. Furthermore, acceptance levels are strongly influenced by individual and contextual variables. Support for EAS increases with social position and educational qualification and decreases as the importance attributed to religion and religious practice rises. Furthermore—contrary to what one might expect—people who have been exposed to high levels of physical suffering are not more in favor of EAS. Interesting as well is the fact that those more vulnerable from an economic and existential standpoint, *ceteris paribus*, express less favorable attitudes toward EAS (Verbakel and Jaspers 2010).

The results for contextual variables align with those just described at the microlevel. Favorable attitudes toward EAS are higher in countries characterized by higher life expectancy, infant survival, economic well-being, efficiency of the health system, average level of trust in the health system, and average level of approval of liberal democracy. They similarly vary according to the prevailing religious denomination: countries with a Muslim majority are less supportive of EAS, those with a Protestant majority are more favorable, while countries with a Catholic majority fall in between (Sprung et al. 2018; Halman and van Ingen 2015; Emanuel et al. 2016; Inglehart et al. 2021; Cohen et al. 2006; Verbakel and Jaspers 2010; Steck, Junker, and Zwahlen 2018; Bahník, Vranka, and Trefná 2021).

In sum—after controlling for variables such as gender and age—individuals more favorable toward EAS are more affluent, more educated, more secularized, and live in contexts where health care and liberal democracy function well. Conversely, those least supportive of these interventions are the most fragile, from an economic, cultural, and existential point of view, largely live in authoritarian contexts, and where health care is neither efficient nor reliable (Inglehart 2018).

Last but not least, it is important to consider the range of possible justifications for EAS. Motives for supporting EAS vary from intervening in situations of unsustainable physical or psychological suffering to arguments of another type, such as loss of dignity, erasure of personal identity, tiredness of living, reduction in autonomy, the feeling of having become a burden to others. Public opinion seems to substantially align with legislation that—albeit in a nonhomogeneous way, as we will see—characterizes EAS as ways to end unbearable pain rather than the exercise of an unconditional right to commit suicide with the assistance of a doctor (Bahník, Vranka, and Trefná 2021).

## Levels and trends in EAS

At the time of writing (middle 2023), 13 countries have legal forms of EAS. Eight are found in Europe, three are in the Americas, even if only in ten US states and District of Columbia, two in Oceania (Table 1).

The quantity and quality of data on EAS varies greatly from country to country. In some cases, it is possible to cautiously make a comparative assessment of size and trend over time. The analyses presented below are based on the aggregate data in government and ministerial reports, evaluation committee procedures, and control and assessment commissions (see Appendix 1 in the Supporting Information). These are the only sources available for comparative study as none of the procedures that define EAS are mentioned in the cause of death records. We discuss this point further at the end of the article. A limitation is thus a certain degree of heterogeneity in the methods of collection, systematization and publication of the data.

Table 2 shows considerable variability in the levels of EAS. Take, for instance, the proportion of EAS (indicated in the last row)—given by the ratio between EAS and total deaths, excluding those due to “external causes,” that is, not due to violent death—starting from the year of its introduction. The lowest values of this indicator are recorded in the US states, the highest in Canada and in Europe, with the exception of Luxembourg. The Netherlands top this ranking, with Belgium and Switzerland located midway between the “floor” constituted by the American states, and the Dutch “roof”. The gap between the different countries is very large. In the past decade, in the Netherlands, more than 3 percent of all nonviolent deaths can be attributed to some form of EAS, followed by somewhat lower percentages in Switzerland and Belgium. In contrast, this share was less than 0.4 percent in the US states of Oregon and Washington.<sup>5</sup>

A look at the various regulations in force helps to interpret these differences (return to Table 1). Indeed, the rules and procedures for accessing EAS are influenced by several main principles: “terminal phase of the disease,” “continuous and unbearable suffering,” and the “individual right to die”.<sup>6</sup> These three principles combine in varying proportions. The frequency of EAS tends to be minimal where the first principle prevails, as in the United States, higher when the latter principle prevails (Lewy 2010, 147ff). The rapid growth of EAS in Canada in part reflects the prevalence of the latter principle. In 2021 alone, more than 10,000 Canadians died from euthanasia, an increase of 32.4 percent from 2020. Of these, 36 percent cited “burden on family, friends or caregivers” as part of their decision and 17 percent “isolation or loneliness” (Health Canada 2021, 26).

Figure 1 shows annual trends in EAS rates from 1998 up to the latest year available. First, significant heterogeneity in EAS is confirmed, with the values for the US states being far lower than those for the other countries. Second, in almost all countries where some form of EAS has been

**TABLE 1 Assisted suicides and euthanasia by rule, year of approval, eligibility criteria; 1942–2022**

Country	State	Rule	Year approval	PAS (Physician assisted suicide)	E (euthanasia)	Are minors eligible?	Are	
							patients without a terminal illness eligible?	Are patients affected by psychiatric conditions only eligible?
Austria		Court Ruling and Legislation	2022	Y	N	N	Y	Y
Belgium		Legislation	2002	Y <sup>a</sup>	Y	Y	Y	Y
Germany		Court Ruling	2020	Y	N	na	na	na
Italy		Court Ruling	2019	Y	N	na	na	na
Luxembourg		Legislation	2009	Y	Y	N	Y	Y
The Netherlands		Legislation	2001	Y	Y	Y	Y	Y
Spain		Legislation	2021	Y	Y	N	Y	Y
Switzerland		Decriminalization (art. 115 penal code)	1942	Y <sup>b</sup>	N	N	Y	Y
Canada		Legislation (and Reforms)	2016	Y	Y	N	Y	Y <sup>c</sup>
USA	Oregon	Legislation	1994	Y	N	N	N	N

/...



TABLE 1 (Continued)

Country	State	Rule	Year approval	PAS (Physician assisted suicide)	E (euthanasia)	Are minors eligible?	Are patients without a terminal illness eligible?	
							Are patients affected by psychiatric conditions only eligible?	Are patients without a terminal illness eligible?
USA	Washington	Legislation	2008	Y	N	N	N	N
USA	Montana	Court Ruling	2009	Y	N	na	na	na
USA	Vermont	Legislation	2013	Y	N	N	N	N
USA	California	Legislation	2015	Y	N	N	N	N
USA	Colorado	Legislation	2016	Y	N	N	N	N
USA	D. of Columbia	Legislation	2016	Y	N	N	N	N
USA	Hawaii	Legislation	2018	Y	N	N	N	N
USA	New Jersey	Legislation	2019	Y	N	N	N	N
USA	Maine	Legislation	2019	Y	N	N	N	N
USA	New Mexico	Legislation	2021	Y	N	N	N	N
Colombia		Court Ruling	1997	Y	Y	N	Y <sup>d</sup>	N
Australia	Victoria	Legislation	2017	Y	Y	N	N	N
Australia	Western Australia	Legislation	2019	Y	Y	N	N	N
Australia	Tasmania	Legislation	2021	Y	Y	N	Y <sup>e</sup>	N
New Zealand		Legislation (followed by a referendum)	2019	Y	Y	N	N	N

NOTE: na: not available for countries where EAS are not permitted by law but sanctions for some forms of AS or E have been decriminalized by court rulings.

<sup>a</sup> Condoned.

<sup>b</sup> Assisted suicide.

<sup>c</sup> Temporary exclusion.

<sup>d</sup> Starting 2022, court ruling.

<sup>e</sup> Exemptions provided by law.

SOURCE: See Appendix 2 in the Supporting Information.



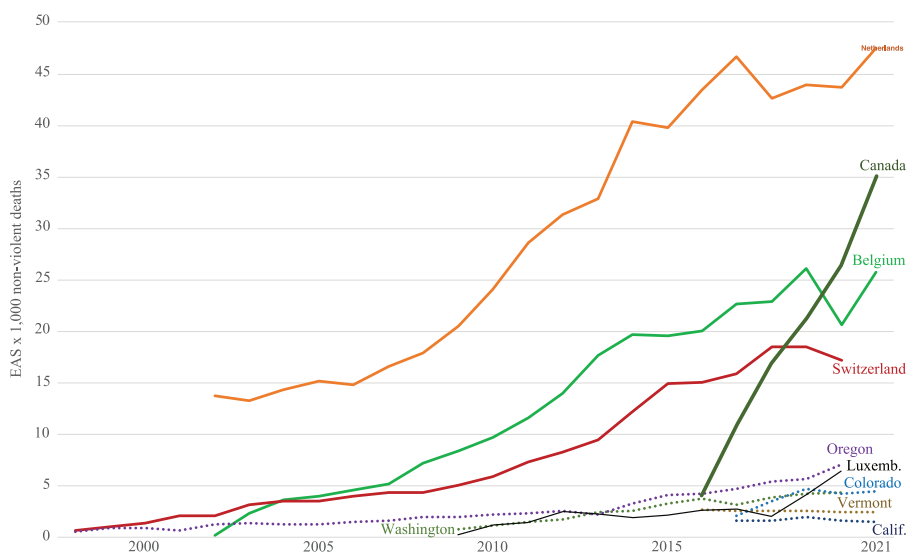
**TABLE 2 EAS by 1,000 deaths not due to external causes, average value in decade in Switzerland, Belgium, the Netherlands, Luxembourg, Canada, and five US states; 1998–2021**

Decade	Belgium (2002–2021)	Switzerland (1998–2020)	The Netherlands (2002–2021)	Luxembourg (2009–2020)	Washington (2009–2021)	Oregon (1998–2021)	California (2016–2021)	Vermont (2017–2021)	Colorado (2017–2020)	Canada (2016–2021)
Years '90	-	0.9	-	-	-	0.8	-	-	-	-
Years '00	4.5	3.4	15.7	0.3	0.8	1.5	-	-	-	-
Years '10	18.5	12.8	38.0	2.4	2.9	3.7	1.5	2.7	3.5	13.5
Years '20	23.0	17.2	45.6	6.5	4.4	7.1	1.6	2.5	4.3	30.8
Total period	13.6	8.1	30.3	2.6	2.9	2.7	1.5	2.7	3.7	19.6

NOTE: “-” = EAS not permitted. Deaths not due to external causes = “external causes excluded.” ICD-10: S00-T98; V01-Y89.

SOURCE: See Appendix 1 in the Supporting Information.

**FIGURE 1 EAS per 1,000 deaths not due to external causes, in Switzerland, Belgium, the Netherlands, Luxembourg, Canada, and five US states; 1998–2021**

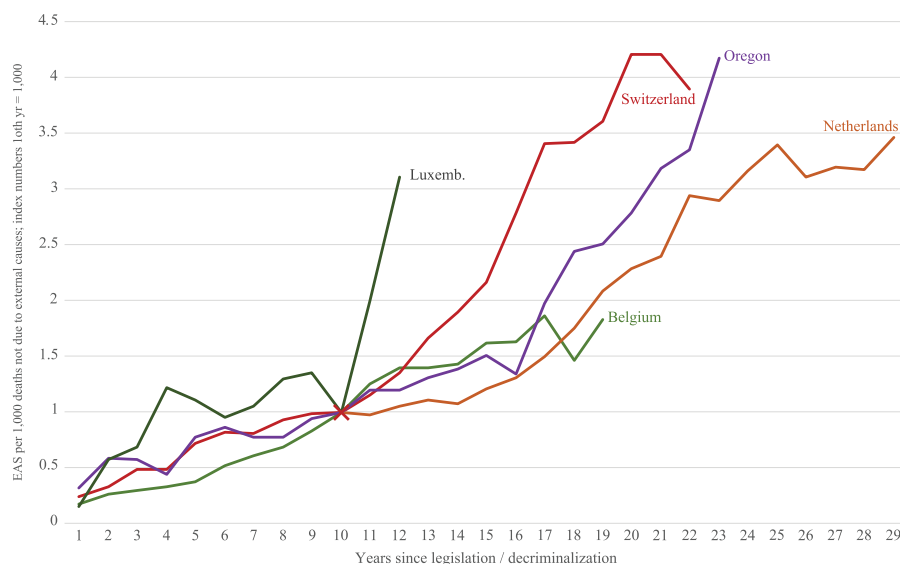


introduced, the proportion of nonviolent deaths increases over time, with some small-scale exceptions.

In addition to size, the speed of growth also differs from state to state. Representation of the simple trend over time does not, however, allow to take into account the different number of years that have passed since legalization, nor very different starting values. In particular, the Netherlands presents values far from those of all the other countries from the first year for which official data have been released<sup>7</sup>. To better observe similarities and differences between the time trends of the various series, we redesign them in Figure 2, considering the different timing of introduction of EAS and eliminating the level differences. Here, trends in the proportions of EAS are shown as index numbers, set equal to 1,000 ten years after legalization. In the Dutch case, we use the year of legalization, as EAS were effectively *de facto* legalized at least 10 years beforehand (Lewy 2010, 26ff).

The trends in EAS for the four countries considered here are similar: the growth over time is continuous, but after being linear in the years following legalization, they progressively accelerate in subsequent years (with the partial exception of Belgium). This pattern—even if limited to the countries and states for which it was possible to perform these calculations—indicates that, though on very different levels from place to place, diffusion of EAS tends to accelerate, after an initial period of adjustment. This dynamic seems consistent with the model of diffusion of innovations suggested by Rogers, after Tarde, and variously tested. According to this model

**FIGURE 2 EAS per 1,000 deaths not due to external causes, 1991–2021; Fixed-base index numbers: 1,000 = 10th year since legalization (Belgium, Switzerland, Luxembourg, and Oregon) or since decriminalization (the Netherlands)**



we should expect slow progress at the outset of the introduction of an innovation, fast progress of regular acceleration in the middle, before final gradual deceleration down to the end (Tarde 1890; Rogers 2003). Only further research, based on more detailed data, will be able to move in the direction of testing hypotheses such as that regarding the diffusion of EAS considered as cultural innovations.

The levels and trends of EAS can perhaps be better understood by considering different end-of-life contexts, particularly the availability of palliative care. From a theoretical point of view, highly developed palliative care could both prevent or encourage assisted dying. An extensive review on the topic suggests that “the relationship between assisted dying and palliative care practices took varied and sometimes combined forms: supportive, neutral, coexisting, not mutually exclusive, integrated, synergistic, cooperative, collaborative, opposed, ambivalent, and conflicted” (Gerson et al. 2020). In what follows, we take a closer look at Switzerland, the Netherlands, and Belgium, despite the awareness that this complex and controversial topic—here—can only be mentioned.

In Switzerland, from a strictly legal point of view, forms of assisted suicide have been permitted since 1942. The practice has changed over time, seeing an extension of the legal possibilities for medical intervention and the offering of assisted suicide by specific organizations since the 1980s (EXIT was founded in 1982 in Zurich) (Emanuel et al. 2016; Steck et al.

2015; Spoerri et al. 2010). The European End-of-Life Decisions (EURELD) survey shows that, in 2001, Switzerland had, among the countries considered, the highest proportion of doctors accustomed to suspending or not starting life-saving treatments (Van der Heide et al. 2003). This position is even more evident in the first years of the new century. In 2013, in a study very similar to that of the EURELD, doctors in German-speaking areas of Switzerland declared that 83 percent of foreseeable deaths were preceded by an end-of-life decision, compared to 75 percent in 2001. Again with reference to foreseeable deaths, in the same period of 2001–2013, potentially life-shortening palliative care remained constant at around 30 percent, while the practices of interruption or nonactivation of potentially (but not necessarily) life-shortening treatments increased (from 41 percent in 2001 to 49 percent in 2013), especially deep sedation (from 7 percent to 25 percent), often accompanied by other end-of-life practices, such as the progressive reduction of life support (Schmid et al. 2016; Bosshard et al. 2016). The same study reports that the Swiss Palliative Care Association published guidelines on palliative sedation in 2005, which may have increased both awareness of the latter and the practice itself. In fact, despite relatively permissive legislation, the diffusion of EAS in Switzerland may have been slowed by the increase both in deep sedation and the tendency of doctors to suspend or not start treatments that would likely only prolong suffering.

The Netherlands and Belgium amended their legislation in 2001 and 2002, respectively, introducing different forms of EAS. Thanks to several studies, it is possible to compare medical practices before or after the enactment of these laws, revealing very different situations in the two countries. A series of cross-sectional investigations of the Netherlands shows a continuous increase in palliative care, with a boost precisely in the years immediately following the approval of the new law on EAS. In these years EAS interrupted their own rise, with percentages going from 3.7 percent of foreseeable deaths in 2001 to 2.4 percent in 2005, and then to 4.0 percent in 2010. The foreseeable deaths preceded by intensification of pain therapy rose from 27 percent in 1990 to 28 percent in 2001 to 51 percent in 2010; those preceded by deep sedation from 11 percent in 2005 to 17 percent in 2010. These data suggest that the regulation of EAS—if it also provides for a strong interaction between doctor, patient, and family members and the effective possibility of easily accessing pain therapies—may stimulate the increase of other end-of-life practices (Onwuteaka-Philipsen et al. 2012). A systematic bibliographic review shows that advance care planning often decreases the forms of aggressive treatment and raises the use of hospice and palliative care, thus preventing unnecessary hospital admissions. In fact, complex advance care planning interventions appear to increase the convergence between medical interventions and patients' end-of-life wishes (Brinkman-Stoppelenburg, Rietjens, and van der Heide 2014).

**TABLE 3 EAS by 1,000 deaths not due to external causes, by sex in three European countries, Canada, Oregon, average values for the entire period**

	Men	Women
The Netherlands 2016–2021	44.2	39.9
Belgium 2008–2021	16.9	16.2
Switzerland 1998–2019	6.3	8.0
Canada 2019–2021	25.2	25.2
Oregon 1999–2020	2.9	2.6

After the adoption of the new law on EAS, trends in Flemish Belgium differ from those in the Netherlands (Chambaere et al. 2015). Foreseeable deaths preceded by intensification of pain relief procedures rose from 26 percent in 1998 to 31 percent in 2001, to 38 percent in 2007 and then declined slightly to 34 percent in 2013; those preceded by deep sedation went from 12 percent in 2005 to 21 percent in 2007, then 17 percent in 2013. The decline or halt in the growth of these end-of-life practices between 2007 and 2013—as we will see—may be linked to the parallel increase in EAS.

Observing end-of-life practices in these three different countries suggests that early interaction between doctor and patient, the renunciation of therapeutic obstinacy and—especially—the use of pain therapy and, if necessary, deep sedation, may slow the diffusion of EAS. However, as the case of Switzerland and the Netherlands shows, if EAS are permitted by law, even in the presence of extensive palliative care, the spread of EAS does not stop. This probably also happens because—as research on the English case shows (Zamora, Cookson, and Garau 2019)—in the current state of knowledge, even the best available palliative care is not able to prevent a significant minority of patients from dying without unbearable pain.<sup>8</sup>

## A differential analysis

### Sex

The registry data used here allow us to make comparisons for four places: the Netherlands, Belgium, Switzerland and the state of Oregon (Table 3). The proportion of EAS among total nonviolent deaths is similar for men and women, and this result persists over time, with the exception of Switzerland, where EAS are somewhat more prevalent among women and the gap grows over time. These data are consistent with the results of Onwuteaka-Philipsen et al. (2012), based on self-completed questionnaires from a statistical sample of doctors who signed the death certificates of patients who chose EAS between 1995 and 2010 in the Netherlands. They observe values that are moderately higher among men, but with overlapping confidence intervals.

The differences between men and women are therefore zero or not statistically significant. This differs markedly from nonassisted suicides (Stack 2000). With some exceptions (mainland China and Kuwait; see, respectively, (He and Lester 1997; Ji, Kleinman, and Becker 2001) and (Stack 2000)), in all countries for which data exist and for all historical periods, men commit nonassisted suicide up to three to four times more frequently than women (Wray, Colen, and Pescosolido 2011).

The existence of systematic differences in attitudes toward unassisted and assisted suicides among men and women has been observed in the literature. Steck et al. observed that, among the terminally ill, women more frequently choose assisted suicide, men unassisted suicide (Steck et al. 2016). Canetto et al. hypothesized that the medicalization and legalization of assisted suicide has increased women's willingness toward suicide (Canetto and McIntosh 2021). Doherty showed the impact the introduction of assisted suicide has had on the elderly female population (Doherty, Axe, and Jones 2022).

To interpret the substantial homogeneity between men and women in the use of EAS, it is useful to consider briefly the explanations for male super-mortality by nonassisted suicide. Indeed, this helps to understand the psychological and relational dimensions of EAS.

The Three-Step Theory proposed by Klonsky et al. (2016) summarizes the "conditions" necessary for a person to commit suicide in Western countries. The first is intolerable pain, from a physical and/or psychological point of view. The second is social isolation, associated with a lack of hope in being able to overcome the condition itself. Finally, those thinking about suicide must have the means to carry it out, in material (e.g., a weapon, or access to lethal drugs) but also cognitive and emotional terms (familiarity and comfort with resorting to violence and/or willingness to perform impulsive acts). The lack of gender differences for EAS could be related to elements of these second and third conditions. Social isolation affects men more frequently than women. Social isolation is not absent in assisted suicide cases either, as suggested by the 17 percent share of cases in Canada where "loneliness" or "isolation" is mentioned (Health Canada 2021, 26), and as shown by the weight of the divorcee component in assisted suicide cases in Switzerland (Steck et al. 2016). However, EAS mostly occur—without differences between men and women—in the context of dense and meaningful social relationships (Green 2022). Furthermore, EAS do not require familiarity with impulsive, violent acts, nor do they require access to lethal means, again more masculine than feminine characteristics. On the contrary, EAS are often the result of long-considered decisions. Only the first condition (intolerable physical or psychological pain) characterizes both EAS and nonassisted suicides. These considerations furthermore suggest that EAS and nonassisted suicides are substantially different events, a topic we return to below.

## Age

Using registry data for Belgium and the Netherlands, we calculated indicators comparable with those employed in the previous paragraphs, that is, the proportions of EAS by age, excluding from the denominator the external causes of deaths (first two rows of Table 4). We find that in these two countries, the proportion of EAS is lowest among the youngest, remains almost constant between the ages of 30 and 60, and progressively decreases thereafter. Applying the same indicator to Switzerland, the proportion of EAS is higher among the under 60s, especially for women (Table 5).<sup>9</sup>

In addition to the proportion of EAS out of nonviolent deaths for each age group, the age-specific EAS mortality rate can also be calculated for the Netherlands and Belgium (last two rows of Table 4). As expected, this indicator grows rapidly with increasing age, as also happens for general non-specific mortality by cause.

## Cause of death

Out of total EAS, cancer is the pathology for which the highest proportion of applications and completed procedures is recorded (Table 6). These data are detectable for all years and for all countries that have registry information on cause leading to request EAS. Other studies similarly find that cancers exceed 50 percent of EAS cases (Dierickx et al. 2016; Dierickx et al. 2020; Onwuteaka-Philipsen et al. 2012). The information we collected reveals that in the past 5 years, in the Netherlands, Belgium and the state of Oregon, this pathology alone accounts for just under two-thirds of total EAS. Multiple pathologies make up a variable share between 13 percent in the Netherlands and 18 percent in Belgium, while Amyotrophic Lateral Sclerosis (ALS), for which data are available only for Oregon, accounts for a little over 7 percent of total cases.

We now consider EAS compared to the deaths that occurred from the same pathology (Table 7). The proportion of EAS on the total cancer deaths far exceeds that observed for the total deaths. For instance, in the Netherlands, 8.6 percent of cancer deaths ended in EAS, compared to 4.1 percent of the overall deaths. Dementia and other pathologies related to mental and behavioral disorders instead show lower values than for the total number of deaths. The case of ALS is different. In the only country for which the data necessary to calculate this proportion are available, we observe values far higher not only than the average (19 times higher), but also compared to cancers (6 times higher): in Oregon, 11 percent of ALS deaths ended in EAS, against 1.8 percent of cancer deaths and 0.6 percent of total deaths.

Since it is predominantly cancer patients who turn to EAS, the growth in the proportion of cancer deaths ended in EAS is obviously in line with the overall growth in EAS. The proportion of cancer deaths in which EAS was



**TABLE 4** EAS by 1,000 deaths not due to external causes by age class, in Netherland (2016–2021) and Belgium (2012–2019), mean values for the period, and mortality rate by EAS per 100,000 people in the same country in the same period

	<18	18–29	30–39	40–49	50–59	60–69	70–79	80–89	90–99	100+
	EAS by 1,000 nonviolent deaths									
The Netherlands 2016–2021	16	62	56	65	66	59	31	25		
Belgium 2012–2019	2	35	40	36	35	35	27	15	10	7
	Mortality rate by EAS: annual mean by 100,000 people									
The Netherlands 2016–2021	0.4	2.2	7.2	24.5	66.9	145.7	248.4	457.8		
Belgium 2012–2019	0.0	0.5	1.5	4.3	13.2	34.2	66.0	112.0	200.4	309.6

**TABLE 5 EAS by 1,000 deaths not due to external causes by sex, age class, year span, 2003–2019, mean values for the period, Switzerland**

	Men		Women	
	<65	65+	<65	65+
2003–2009	5	4	9	4
2010–2019	11	11	21	13

used grew from 4.1 percent (2004) to 9.5 percent (2020) in the Netherlands, from 0.7 percent (2003) to 5.9 percent (2019) in Belgium, from 0.2 percent (1999) to 2.1 percent (2020) in Oregon.

As we have seen, in Belgium and the Netherlands—the two countries where it was possible to construct our indicators—the use of EAS among people with dementia is very limited. According to good qualitative research, this low frequency is due to two concomitant aspects (Lemos Dekker 2021; Van der Geest and Satalkar 2021). First, patients in the early stages of dementia who initially express a desire for EAS tend to procrastinate based on the argument: “I want it, because I don’t want to burden others. But not now”. The problem is that when “now” arrives, patients are no longer able to give consent. Second, doctors are more reluctant to implement EAS in cases of dementia because the pain is not unbearable and death is not imminent. That said, in analyzing the cases reported to the Federal Committee for Monitoring and Evaluation of Euthanasia in Belgium from 2002 until the end of 2013, Dierickx et al. (2017) observe signs of growth. This is also confirmed by the registry data for the Netherlands: the proportion of deceased with dementia as the main cause of death who resorted to EAS increased from 0.9 percent in 2012–2015 to 1.4 percent in 2016–2019.

Though these are (still) contained values, it is important to note their potential demographic significance. Indeed, growth in the age of the elderly is also accompanied by rapid growth in the number of people with cognitive impairment.<sup>10</sup> If the tendency of these patients to request EAS, before the onset of other diseases, continues to grow, then EAS could significantly affect the length of average survival. Today this does not occur, as cancer patients who resort to EAS are almost all in the terminal phase, while patients with ALS or similar pathologies—who can also resort to EAS despite still having months or years to live—are relatively few in number (in Oregon, ALS causes 0.3 percent of total deaths).

### Ethnic and linguistic group

The choice to use forms of EAS is not only influenced by age or the pathology from which one suffers. As expected, following the great differences of opinion regarding EAS expressed by different social groups, many social factors are indubitably at play in making this decision, only a fraction of which

**TABLE 6** Pathology for which access to EAS has been requested in the Netherlands, Belgium, and Oregon by year of death, row pct.

	Cancer	Dementia	Mental and behavioral disorders	Other, of which polyopathologies	Other, of which ALS	Others	Tot	N
The Netherlands 2017–2021	63.8	2.6	1.3	12.7	na	19.6	100.0	(33.676)
Belgium 2018–21	62.8	0.9	1.0	17.7	na	17.6	100.0	(10.158)
Oregon 2017–21	61.7	na	na	na	7.1	31.2	100.0	(1.072)

**TABLE 7 EAS per 100 deaths from the same cause of death in the Netherlands, Belgium, Oregon, 2017 (or 2018)–2021**

	Cancer	Dementia	Mental and behavioral disorders	Of which ALS	Total
The Netherlands 2017–2021	8.6	1.3	1.7	nd	4.1
Belgium 2018–2021	5.6	0.5	0.9	nd	2.3
Oregon 2017–2021	1.8	nd	nd	11.3	0.6

can be analyzed on the basis of the data available today. In Oregon, the proportion of EAS is highest among Asians and non-Hispanic Whites, almost nonexistent among African Americans, and intermediate among Hispanics. In Belgium, the same indicator in 2020–2021 doubles when moving from the French-speaking areas to the Flemish areas. This last result lends support to Steck et al.'s (2018) findings for Switzerland, who observe a higher proportion of deaths by EAS among German- and French-speaking Swiss compared to Italian-speaking Swiss.

It thus seems clear that cultural factors play a nonnegligible role in end-of-life decisions. Detailed individual data are, however, needed in order to conduct a thorough analysis of the modalities of this influence, including factors such as education, social class, family context, urban versus rural residence, religion, and so on; all characteristics that—as we have seen—also shape opinions on the end-of-life.

## Conclusions

Even in countries where different forms of EAS have been legalized for years, the proportion of EAS on overall deaths continues to vary widely. These strong differences seem mainly due to the circumstances under which EAS were adopted into law and the different practices approved (see Tables 1 and 2). Moreover, for the few countries for which data are available for a sufficient number of years, increased recourse to EAS is linear in the first years following their introduction into law, but their diffusion accelerates thereafter, likely a result of growing public acceptance. Though the proportion of people in favor of EAS in many developed countries has since ceased to increase, a large majority of public opinion in the twenty-first century is favorable toward these practices, especially for the purposes of ending unsustainable suffering. That said, particularly in countries debating whether and how to legalize EAS, the strong differences in public opinion should not be undervalued. Those least in favor of EAS are the poorest and least educated.

In a context where medicine is increasingly capable of prolonging life even in circumstances that are difficult to bear, a growing and generalized use of EAS is not the only option. Research shows that diffusion of EAS

slows if appropriate palliative care is organized, capable of greatly reducing or even eliminating chronic pain, extending even to deep sedation. This approach could find favor among a public that views EAS not so much as an exercise of an “absolute individual right” but as a way to avoid a death marred by irrepressible pain. However, palliative care of this nature necessitates an intense interaction between the patient, his/her relatives and health care personnel. From this point of view, EAS risks becoming a shortcut, compared to a more sophisticated and complex accompaniment toward a pain-free death.

However, the cases of Switzerland and the Netherlands show that even the general availability of the best palliative care is not able to interrupt the growth of EAS. Furthermore, a generalized use of palliative care requires overcoming cultural barriers even among doctors, which—in some countries—make them reluctant to use the appropriate opioid drugs. The justifiable alarm over opioid-induced abuse, addiction, and deaths observed in the United States (Weisberg et al. 2014) contrasts with their very low use in Mediterranean Europe, and more intermediate levels in Northern and Central Europe (Leone and Magro 2015).

The use of EAS in the absence of unsustainable chronic physical pain, such as when an individual suffers from ALS or dementia, is more complex. The proportion of ALS patients who request EAS is high. For these sick people—beyond a respect for their decision—forms of accompaniment over the course of the disease are fundamental for helping the patient bear a condition of severe disability. It would be a mistake, however, to identify the ALS patient as the typical user of EAS since the prevalence of this pathology is much smaller than others, such as neoplasms. This means that the proportion of ALS patients among all those individuals who resort to EAS is minimal everywhere.

Use of EAS among people with dementia is low, but growing. Since this illness makes it difficult to discern the patient’s will, ethical concerns loom large. If the view that this kind of existence is “not worth living” becomes widespread, then aging populations and high incidences of dementia could further accelerate EAS use. Should this happen, survival at the population level could also be affected. So far, however, EAS have not significantly influenced life expectancy, as they are almost always implemented when the patient has only a few weeks or days left to live.

Despite our literature searches and attempts to make the best use of the available data, the differential analyses summarized and developed here remain very elementary. That said, the data by sex, age, and disease do allow to illustrate several interesting results. For example, we observe that EAS are structurally different from unassisted suicides. The latter tend to occur in contexts of despair, loneliness, and lack of strong social support, while EAS are the result of a long-considered decisions, often made within a framework of strong social interactions, even if—in some contexts—loneliness

is one of the causes that push people to request EAS. Unfortunately, however, a lack of other sociodemographic data prevent us from developing further analyses. Moreover, the data available on EAS are very uneven across countries, and there are no internationally accepted conventions for their collection and presentation.

To advance research on this topic, Death Forms should indicate whether euthanasia or assisted suicide were a co-cause of death. This would give cross-country comparisons and national analyses much greater validity and depth. A possibility would be to include two new questions in the Death Form: “was death induced by assisted suicide?” and “was death induced by euthanasia?”. This choice would have the advantage of simplicity, separating the collection of this kind of information from the complex and consolidated mechanism of detecting the causes of death.

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## Notes

1 For septuagenarians living in countries defined as “advanced” by the United Nations Population Division (Europe, Canada, USA, Japan, Australia, and New Zealand),  $e_{70}$  increased from 10.1 years in 1950 to 12.4 in 1985, reaching 15.4 years in 2020. In its 2022 estimates, the UN Population Division forecasts further improvement in the near future, extending to as high as 19.1 years by 2055. That said, not all of these additional years of life are lived in good health. In the 27 countries of the European Union in 2011,  $e_{65}$  was 19.6 years, but 4.1 of these were lived with severe limitations in terms of daily activities, and 4.4 with a poor or very poor subjective perception of own state of health (European Health & Life Expectancy EHLEIS 2014).

2 A long process of secularization has reduced a fear of eternal damnation when it comes to unassisted suicide and as a result,

a progressive increase has been observed in many countries. The protection from suicide that religion provides also depends on the role it plays in providing stronger social support, reducing marital instability, instilling greater capacity to cope with grief and loss, and conveying a decided moral revulsion toward suicide. This growth stopped, however, during the twentieth century. This was not because secularization came to a halt, but rather because new factors emerged that acted in the opposite direction. Advances in medicine and pharmacology have made life more bearable for people who, in their absence, would have committed suicide. In all developed countries, not only has the number of unassisted suicides stop rising, but in some places there has even been a decline (Barbagli 2015, 2018).

3 On this process, see Barbagli (2009). For a review on this topic, see Stack (2000).

4 As was the case with attitudes towards euthanasia, approval towards assisted suicide increased in US from the late 1990s to the beginning of the new century, but then declined from 68 percent in 2001 to 51 percent in 2013, only to go back up again but without reaching the levels of the beginning of the century (Emanuel et al. 2016; Jones 2020).

5 The proportion of EAS would be higher if the denominator was instead foreseeable deaths (as opposed to total deaths excluding those originating from external causes). If we use the former, which as mentioned total around 70 percent of all deaths in developed countries, the proportion of EAS to foreseeable deaths would exceed 5 percent in the Netherlands during the 2010s and 4 percent in Canada in the early 2020s. Although this is “cleaner” from a statistical-epidemiological point of view, we do not use this indicator in subsequent analyses because foreseeable deaths are not detected systematically, and are not known according to the characteristics of the deceased considered here (age, sex, etc.).

6 In addition to normative variations, actual practices also play a key role. The criterion of disease leading to a foreseeable death, adopted, for example, in ethico-medical guidelines in Switzerland between 2004 and 2018, would have been fully met in 44 percent of cases, certainly not met in 5 percent of cases, and probably not met in most of the remaining 51 percent of 8,738 cases analyzed by Güth et al. (2023).

7 Unofficial data for the Netherlands based on physician-assisted deaths reported to the public prosecutor, have been presented

by van der Maas et al. (1996) for the years 1981–1995, and by Gordijn and Janssens (2004) for the years 1995–2002.

8 Specific research is lacking, but it should be noted whether in the terminal phases of the Covid-19 disease, EAS practices or the suspension or non-activation of health treatments were used, in particular for older subjects. On the other hand, it is plausible an indirect effect of the spread of Covid-19 also on EASs attributable to increasing restrictions on access to hospitals, slowing down, if not halting, practices for diseases other than Covid-19, and taking away hospital space due to the growth in hospitalizations due to the pandemic.

9 In their study on the Netherlands, Onwuteaka-Philipsen et al. (2012) divide the population into three large age groups (0–64, 65–79, 80+) and observe that the proportion of EAS on total deaths decreases with increasing age. Dierickx et al. (2016) find the same relationship in Belgium between 2003 and 2013. Both results are, however, somewhat problematic in that neither excludes from the denominator violent deaths, which are much more numerous among young people.

10 In Italy in 2019 among individuals living with family, 5 percent among those aged 75–84 and 15 percent among those aged 85+ were suffering from Alzheimer’s or dementia (Istat 2021, fig. 3). These numbers are predicted to increase rapidly. According to the United Nations Population Division forecasts for all advanced developing countries, by 2039 the total number of people will grow by 29 percent for the 75–84 age group, and by 46 percent for the 85+ age group.

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