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Special Communication

Attitudes and Practices of Euthanasia and Physician-Assisted Suicide in the United States, Canada, and Europe

Ezekiel J. Emanuel, MD, PhD; Bregje D. Onwuteaka-Philipsen, PhD; John W. Urwin, BS; Joachim Cohen, PhD

IMPORTANCE The increasing legalization of euthanasia and physician-assisted suicide worldwide makes it important to understand related attitudes and practices.

OBJECTIVE To review the legal status of euthanasia and physician-assisted suicide and the available data on attitudes and practices.

EVIDENCE REVIEW Polling data and published surveys of the public and physicians, official state and country databases, interview studies with physicians, and death certificate studies (the Netherlands and Belgium) were reviewed for the period 1947 to 2016.

FINDINGS Currently, euthanasia or physician-assisted suicide can be legally practiced in the Netherlands, Belgium, Luxembourg, Colombia, and Canada (Quebec since 2014, nationally as of June 2016). Physician-assisted suicide, excluding euthanasia, is legal in 5 US states (Oregon, Washington, Montana, Vermont, and California) and Switzerland. Public support for euthanasia and physician-assisted suicide in the United States has plateaued since the 1990s (range, 47%-69%). In Western Europe, an increasing and strong public support for euthanasia and physician-assisted suicide has been reported; in Central and Eastern Europe, support is decreasing. In the United States, less than 20% of physicians report having received requests for euthanasia or physician-assisted suicide, and 5% or less have complied. In Oregon and Washington state, less than 1% of licensed physicians write prescriptions for physician-assisted suicide per year. In the Netherlands and Belgium, about half or more of physicians reported ever having received a request; 60% of Dutch physicians have ever granted such requests. Between 0.3% to 4.6% of all deaths are reported as euthanasia or physician-assisted suicide in jurisdictions where they are legal. The frequency of these deaths increased after legalization. More than 70% of cases involved patients with cancer. Typical patients are older, white, and well-educated. Pain is mostly not reported as the primary motivation. A large portion of patients receiving physician-assisted suicide in Oregon and Washington reported being enrolled in hospice or palliative care, as did patients in Belgium. In no jurisdiction was there evidence that vulnerable patients have been receiving euthanasia or physician-assisted suicide at rates higher than those in the general population.

CONCLUSIONS AND RELEVANCE Euthanasia and physician-assisted suicide are increasingly being legalized, remain relatively rare, and primarily involve patients with cancer. Existing data do not indicate widespread abuse of these practices.

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Author Affiliations: Department of Medical Ethics and Health Policy, Perelman School of Medicine, University of Pennsylvania, Philadelphia (Emanuel, Urwin); Department of Public and Occupational Health, EMGO Institute for Health and Care Research and Cancer Center Amsterdam, VU University Medical Center, Amsterdam, the Netherlands (Onwuteaka-Philipsen); End-of-Life Care Research Group, Vrije Universiteit Brussels (VUB) and Ghent University, Brussels, Belgium (Cohen).

Corresponding Author: Ezekiel J. Emanuel, MD, PhD, Department of Medical Ethics and Health Policy, Perelman School of Medicine at the University of Pennsylvania, 423 Guardian Dr, Blockley Hall, 11th and 14th Floors, Philadelphia, PA 19104-4884 (MEHPchair@upenn.edu).

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The ethics and legality of euthanasia and physician-assisted suicide (PAS) continue to be controversial.¹ In the early 20th century, multiple attempts at legalization were defeated.¹ Recently, several countries have legalized the practices, and a number of countries are considering legalization. At least since the late 1940s, polling agencies and others have assessed the public's support for euthanasia and PAS. Since the 1990s, researchers have studied these practices and their consequences. This Special Communication provides an overview of the legal status of euthanasia and PAS, reports an assessment of the attitudes and practices regarding euthanasia and PAS, and delineates questions needing further investigation.

Methods

The published literature was searched beginning with surveys in 1947 until 2016, with a focus on original data from 3 main data sources: (1) surveys providing data on attitudes and practices; (2) data from jurisdictions that have legalized euthanasia, PAS, or both with reporting requirements, specifically Oregon,² Washington state,³ the Netherlands,⁴ and Belgium,⁵ that have provided data on prevalence and practices; and (3) death certificate studies, conducted since 1990 in the Netherlands and Belgium, that have provided population-based assessments of practices. Death certificate studies from these countries confidentially surveyed the attending physicians of a random sample of deaths about the circumstances of patients' deaths in which the physicians have been involved.⁶

Definitions

Definitions of euthanasia and PAS vary between countries and are controversial (Table 1). For active euthanasia—or simply euthanasia—a person, usually a physician, actively and intentionally ends a patient's life by some medical means such as injection of a neuromuscular relaxant.^{8,9} Consistent with laws in the Netherlands and Belgium, "euthanasia" is usually limited to voluntary cases—those in which the patient is mentally competent and explicitly requests euthanasia.^{7,10} Involuntary euthanasia occurs when the patient is mentally competent but did not request euthanasia. Nonvoluntary euthanasia refers to cases when the patient is not mentally competent and could not request euthanasia. In the Netherlands, Belgium, and most European countries, involuntary and nonvoluntary cases are not deemed euthanasia but "termination of life without the patient's explicit request." The term "passive euthanasia" should be avoided because it refers to terminating potentially life-sustaining treatments, not administration of a medical intervention to end a patient's life. In the United States and many countries, terminating potentially life-sustaining treatments is deemed ethical and legal when performed with the patient or proxy's agreement.

PAS occurs when lethal drugs are prescribed or supplied by the physician at the patient's request and self-administered by the patient with the aim of ending his or her life. In the United States there is debate as to whether the appropriate term for this practice is PAS, physician-assisted death, or physician aid-in-dying. We use PAS because this term is more commonly used, especially in Europe, where physician-assisted death is a more inclusive term that includes

euthanasia, termination of life without the patient's explicit request, and PAS; we also focus on the substantive issues related to these practices rather than linguistic controversies.¹¹

Legalization of Euthanasia and PAS

In 1942, Switzerland became the first country to decriminalize assistance in suicide as long as there was no selfish motive by the person assisting such as obtaining inheritance (Table 2).^{17,18} From the 1980s onward this law was interpreted as legal permission to establish organizations to facilitate assisted suicide, including for Swiss nonresidents.¹⁷

Since the 1980s, in the Netherlands euthanasia and PAS were tolerated as long as certain safeguards, such as the patient having unbearable suffering and explicitly requesting the life-ending intervention after due consideration, were adhered to. Then in 2002 both the Netherlands^{22,28} and Belgium²⁰ legalized euthanasia and PAS (Table 2). Luxembourg followed in 2009.²⁴ Euthanasia remains illegal in all US states (Table 2). However, since 1997, 5 US states—Oregon, Washington, Montana, Vermont, and California—have legalized PAS.^{12-16,29} In Canada, the Supreme Court ordered provinces to draft laws legalizing euthanasia by February 2016²⁵ (later extended to June 2016), after Quebec's decision to legalize euthanasia in 2014.²⁶ In June 2016, Canada's parliament passed legislation legalizing both euthanasia and PAS.²⁷ In 2015, Colombia permitted its first legal euthanasia.¹⁹ In July 1996, the Northern Territory of Australia legalized euthanasia, but this legislation was overturned 9 months later.³⁰

The status of euthanasia and PAS is unclear in several countries. For instance, German law does not criminalize suicide or persons helping in a suicide, but in November 2015, Germany forbid assistance in facilitating suicide in a commercial or business-like form, as available in Switzerland. Moreover, the German Medical Association's code of conduct explicitly forbids physicians from performing either euthanasia or PAS.

Guidelines and Safeguards

There is variability in the age at which euthanasia and PAS are permissible (Table 2). Throughout the United States, in Canada, and in Luxembourg, patients must be at least 18 years old. The Netherlands allows patients as young as 12 to request euthanasia or PAS. In 2007 the Dutch government made it possible for a physician to end the life of severely malformed newborns without being prosecuted if due care criteria are met.^{31,32} Since 2014 Belgium permitted euthanasia and PAS regardless of age, as long as the person has capacity for discernment.^{20,21,33}

Both substantive and procedural safeguards differ among countries (Table 2). All US states require patients receiving PAS to have a prognosis for survival of 6 months or less. In the US, patients do not have to have unbearable pain or any symptom(s) despite treatment. For adults, the Netherlands, Belgium, and Luxembourg require that patients have "unbearable physical or mental suffering" without prospect of improvement but do not require them to be terminally ill. Belgium does require that children receiving euthanasia be terminally ill.

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Table 1. Definitions of Euthanasia and Physician-Assisted Suicide

Predominant Term in Ethics	Predominant Term in Research ⁷	Definition
Voluntary active euthanasia	Euthanasia	When a person (generally a physician) administers a medication, such as a sedative and neuromuscular relaxant, to intentionally end a patient's life with the mentally competent patient's explicit request
Involuntary active euthanasia	Ending a life without explicit patient request	When a physician or someone else administers a medication, such as sedative and neuromuscular relaxant, or other intervention, to intentionally end a patient's life but without the mentally competent patient's request
Nonvoluntary active euthanasia	Ending a life without explicit patient request	When a physician or someone else administers a medication, such as sedative and neuromuscular relaxant, or other intervention, to intentionally end a patient's life with a noncompetent patient who could not give informed consent because the patient is a child or has Alzheimer disease or other condition that compromises decision-making capacity
Physician-assisted suicide or physician-assisted death	Physician-assisted suicide	When the physician provides medication or a prescription to a patient at his or her explicit request with the understanding that the patient intends to use the medications to end his or her life

There is substantial variability in the procedural requirements (Table 2). All US states permitting PAS require a 15-day period between 2 oral requests and a 48-hour waiting period between a final written request and dispensing of the prescription. In Canada there is a 10-day waiting period between a written request and provision of PAS. The Netherlands and Luxembourg do not have mandatory waiting periods. For nonterminally ill patients, Belgium requires a 1-month waiting period. No jurisdiction standardly requires a psychiatric evaluation.

Colombia is the only jurisdiction that requires prior approval of euthanasia cases by an independent committee. Oregon, Washington state, the Netherlands, and Belgium require reporting of cases to an official body after the intervention. In 2015, the first Belgian case was referred to the public prosecutor.^{34,35} In the Netherlands, between 2002 and 2015, 75 cases have been forwarded to the public prosecutor for noncompliance with legal safeguards, but none has been prosecuted.⁴ In Oregon, only 1 case of PAS is known to have been legally prosecuted.³⁶

Public Attitudes Toward Euthanasia and PAS

Assessing attitudes toward euthanasia and PAS is challenging because of framing effects. Support varies substantially depending on the wording of survey questions; the provision of details about the patients, their prognosis, their medical diagnosis, and symptoms; how the interventions are characterized; and whether the questions are focused on ethical acceptability, legalization, or some other endorsement (Table 3).³⁷⁻⁴¹

Since at least 1947, Gallup, in a representative survey that more recently included approximately 1000 to 1500 individuals, has asked the US public, "When a person has a disease that cannot be cured, do you think doctors should be allowed to end the patient's life by some painless means if the patient and his family request it?"³⁷ The question leaves ambiguous the patient's age, disease, prognosis, and any symptoms; presupposes that the life-ending act is necessarily painless; and adds family consent, which is neither an ethical nor legal requirement in any jurisdiction. Support for this practice increased from 37% in 1947 to 53% in the early 1970s (Figure 1). Support plateaued in approximately 1990, with two-thirds of the United States population supporting ending a patient's life. Subsequently, several, but not all, public opinion surveys in the United States appear to have detected a decline in support from a peak of 75% in

2005 to 64% in 2012 (Figure 1). When the question was changed so the patient is in "severe pain" and the term "legalization" is added, but the action is a patient "suicide" rather than a physician ending the patient's life, public support is consistently lower, by 10% to 15%.

Two aspects of these survey data are surprising. There is a lag between increases in support for euthanasia and PAS and the legalization of PAS in the United States. Also, there is higher public support for euthanasia than PAS, yet euthanasia remains illegal.

In the United States, several characteristics are consistently associated with favoring or opposing euthanasia and PAS. In general, white persons, men, younger persons, and the religiously unaffiliated tend to be more supportive.⁴²⁻⁴⁷

In Europe, there has been no plateau of public support for euthanasia and PAS (Figure 2).^{48,49} Between 1999 and 2008 in most Western European countries support for euthanasia increased. Simultaneously, there has been no increase and even a decrease in acceptance of euthanasia and PAS in most Central and Eastern European countries. These changes seem correlated with a strong decline in religiosity in Western Europe and an increase in religiosity in postcommunist Eastern Europe. Since legalization in 2002, support for euthanasia has increased significantly in Belgium but declined slightly in the Netherlands.

Physician Attitudes Toward Euthanasia and PAS

Surveys of physicians are limited by the same framing effects and inconsistent wording as public surveys. In addition, these surveys tend to have much smaller numbers of respondents, often use non-random sampling techniques, and have low response rates. However, surveys in the United States, Europe, and Australia consistently demonstrate lower support for euthanasia and PAS among physicians than the public.⁵⁰⁻⁶⁰ For instance, in 2014, Medscape conducted a survey of physicians in 7 countries (n = 21 531) asking "should physician-assisted suicide be allowed."⁶¹ US physicians were most supportive, with 54% agreeing, while a minority of physicians in Germany (47%), United Kingdom (47%), Italy (42%), France (30%), and Spain (36%) concurred that PAS should be permitted (eFigure in the Supplement).

In the United States, older but more methodologically rigorous surveys generally have shown that fewer than half of physicians support legalizing euthanasia and PAS.^{44,62-66} Contrary to the public, physicians are more likely to support PAS than euthanasia. Surveys

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Table 2. States and Countries With Legalized Euthanasia and Physician-Assisted Suicide

State	Physician-Assisted Suicide		Year of Landmark ^a	Age Requirement, y	Required Diagnosis	Waiting Period ^b	Psychiatric Consultation Requested?	Patient Symptom State
	Euthanasia Current Status	Method of Legalization						
Oregon ¹²	Legal	Referendum	1997	18	Terminal <6 mo	15 d oral request, 48 h written request	No	"Capable" ¹²
Washington ¹³	Legal	Referendum	2009	18	Terminal <6 mo	15 d oral request, 48 h written request	No	"Competent" ¹³
Montana ¹⁴	Legal	Court ruling	2009	None specified	None specified	None specified	Not specified	None specified
Vermont ¹⁵	Legal	Legislation	2013	18	Terminal <6 mo	15 d oral request, 48 h written request	No	"Capable" ¹⁵
California ¹⁶	Legal	Legislation	2015	18	Terminal <6 mo	15 d oral request, 48 h written request	No	Has "capacity to make medical decisions" ¹⁶
Switzerland ^{17,18}	Legal ^c	Penal code ^c	1942	None specified	None	None	No	None specified
Colombia ¹⁹	Legal	Court ruling	1997	18	Terminal phase	Within 15 d after committee approval	No, but psychiatrist on committee	In terminal phase ¹⁹
Belgium ^{10,20,21}	Legal	Legislation	2002	None	None, adults	None, terminal	Yes, children (<18 y) and adults (≥18 y) with psychiatric condition	Medically futile condition of constant and unbearable physical or mental suffering ²⁰
Netherlands ^{1,0,22,23}	Legal	First legal review procedure ^f	1994	12	Terminal, children	1 mo, nonterminal	No, all others	Patient's suffering is unbearable and there is no prospect of improvement ²²
Luxembourg ⁴	Legal	Legislation	2009	18	None	None	No	Incurable medical situation with constant and unbearable physical or mental suffering without prospect of improvement ²⁴
Canada ²⁵⁻²⁷	Legal, national	Legislation, national	2016	18	None	10-d written request	No	"Grievous and irremediable medical condition that causes enduring and intolerable suffering" ²⁷

^a "Landmark" indicates legislation, court rulings, and major events.
^b In US states, patients must make 2 oral requests separated by at least 15 days, followed by 1 written request. After the written request, patients must wait at least 48 hours before receiving a prescription.
^c Article 115 of the Swiss penal code only considers assisting suicide a crime if the motive is selfish. Does not require assistance to come from a physician. Switzerland allows noncitizens to utilize physician-assisted death ("suicide tourism").
^d Colombia's highest court ruled in 1997 that physicians cannot be prosecuted for euthanasia if the patient has a terminal condition and has consented but no official case of euthanasia took place until the Health Ministry published guidelines in 2015.
^e While the law does not address physician-assisted suicide directly, it is treated as a form of euthanasia by the Federal Control and Evaluation Committee for Euthanasia.
^f In the Netherlands the first legal notification procedure started (by the public prosecutor) in 1994; it was enacted as a law in 2002. The requirements mentioned in this table are similar in the 2 procedures, except for the age requirement that was explicitly mentioned first in the 2002 law.
^g The Quebec law does not mention euthanasia or assisted suicide but medical aid in dying (aide médicale à mourir), defined as the administration of medications or substances to a person at the end of life, at the person's request, to relieve their suffering by causing death. The law also stipulates that the physician must administer "such aid" personally and take care of and stay with the patient until death ensues. It is unclear whether physician-assisted suicide can be considered as a possibility under this description.

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Table 3. Phrasing of Survey Questions Related to Euthanasia and Physician-Assisted Suicide

Source	Report Year	Survey Question ^a	Proportion of Public Supporting Euthanasia or PAS, % ^b	Sample Size
Gallup et al ³⁷	2014	Do you believe that, in general, the following is morally acceptable? Doctor-assisted suicide	52	1028
		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?	58	
		When a person has a disease that cannot be cured, do you think 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?	69	
General Social Survey ³⁸	2014	When a person has a disease that cannot be cured, do you think doctors should be allowed by law to end the patient's life by some painless means if the patient and his family request it?	67	1664
Rasmussen Reports ³⁹	2014	Three US states now allow voluntary euthanasia or assisted suicide for those who are terminally ill. Do you favor or oppose the practice of voluntary euthanasia? ^c	50	1000
Pew Research Center ⁴⁰	2013	Is there a moral right to suicide when a person is an extremely heavy burden on his or her family?	32	1994
		Is there a moral right to suicide when a person is ready to die because living has become a burden?	38	
		Do you approve or disapprove of laws to allow doctor-assisted suicide for terminally ill patients?	47	
		Is there a moral right to suicide when a person has an incurable disease?	56	
		Is there a moral right to suicide when a person is suffering great pain with no hope of improvement?	62	
BBC World News/Harris Interactive ⁴¹	2011	Do you think that the law should allow doctors to comply with the wishes of a dying patient in severe distress who asks to have his life ended, or not?	58	2340
		Do you think doctors should be allowed to advise terminally ill patients who request the information on alternatives to medical treatment and/or ways to end their own lives?	67	
		How much do you agree with the following statement? Individuals who are terminally ill, in great pain and who have no chance for recovery have the right to choose to end their own life	70	

Abbreviation: PAS, physician-assisted suicide.

^a All surveys are of adults (18 years or older) in the United States.^b All survey results are national projections.^c At the time the survey was conducted (October 10-11, 2014), 4 US states under some circumstances permitted PAS; contrary to the question's premise, none legalized voluntary euthanasia.

among physicians in European countries and in Australia, where neither euthanasia nor PAS have been legalized, report similar results.⁵⁷ For instance, a review of 15 surveys (n = 13 857) of UK physicians conducted between 1990 and 2010 found that the majority of physicians opposed legalizing euthanasia and PAS.⁶⁷ The main factor associated with opposition to euthanasia and PAS was strength of religious views.

The Netherlands and Belgium find much stronger physician support for euthanasia and PAS.^{59,60,68-70} In the Netherlands (2012) and in Belgium (2009), 86% (n = 1456) and 81% (n = 914) of physicians, respectively, said they could imagine a circumstance in which they might perform euthanasia or PAS.^{59,71}

Practices of Euthanasia and PAS

The most recent rigorous surveys (1996) have suggested that among US physicians (n = 1902), 18% have ever received a request for PAS and 11% for euthanasia; 3% had ever complied with a request for PAS, and 5% had complied with a request for euthanasia.⁷² The rate is much higher for US oncologists (n = 3299): 56% have received requests for PAS, while 38% have received requests for euthanasia; 11% had ever performed PAS and 4% euthanasia (1998).⁶² Even in Oregon and Washington state, only a few physicians participate in PAS. For instance, in Oregon in

2015, the 218 prescriptions were written by 106 physicians, just 1.0% of actively licensed physicians.²

A 2010-2011 Dutch survey of 1456 physicians indicated that 77% ever received requests for euthanasia and PAS, 60% had ever performed these interventions, and 14% indicated they would never do so.⁷¹

A 2012 survey of Dutch pediatricians found that 6% had ever received an explicit request for euthanasia and PAS from a child younger than 18 years, and 1% had received a request in the last 2 years.⁷³ Overall, 5% indicated they had ever performed euthanasia, 0.6% within the last 2 years. Furthermore, 14% of Dutch pediatricians reported that they had ever ended life at the request from the parents but without an explicit request from the child.

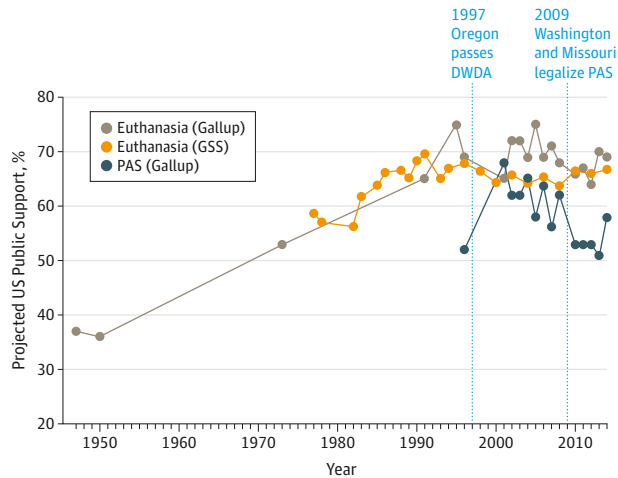
In the United States the most detailed databases are the 18 years (1998-2015) of reporting from Oregon² and the 7 years (2009-2015) of reporting from Washington state (Table 4).³ First, these data show that death by PAS typically accounts for less than 0.4% of all deaths. Second, for almost all years there has been a consistent increase in the number of requests for PAS. Third, in Oregon, the rate of actual deaths by request has ranged between 47.7% and 81.8%.

Fourth, about 75% of patients using PAS are dying of cancer.^{2,3} A small minority, usually less than 15%, have neurodegenerative diseases, primarily amyotrophic lateral sclerosis. Fifth, the typical patient using PAS is older, white, and well-educated. Sixth, pain is

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not the main motivation for PAS. Typically, less than 33% of patients experience inadequate pain control. The dominant motives are loss of autonomy and dignity and being less able to enjoy life's activities.

Figure 1. National Projections for Public Support of Euthanasia and Physician-Assisted Suicide in the United States, 1947-2014



All surveys were conducted among adults in the United States. Sample sizes varied by year but were most recently 1028 for Gallup (2014) and 1664 for the General Social Survey (2014). Projected public support for euthanasia (Gallup)³⁷ was assessed using the question "When a person has a disease that cannot be cured, do you think doctors should be allowed by law to end the patient's life by some painless means if the patient and his family request it?" ("Yes" answers indicate support.) Projected public support for euthanasia (General Social Survey)³⁸ was assessed using the question "When a person has a disease that cannot be cured, do you think doctors should be allowed to end the patient's life by some painless means if the patient and his or her family request it?" ("Yes" answers indicate support.) Projected public support for physician-assisted suicide (PAS) (Gallup)³⁷ was assessed using the question "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?" ("Yes" answers indicate support.) DWDA indicates Death With Dignity Act.

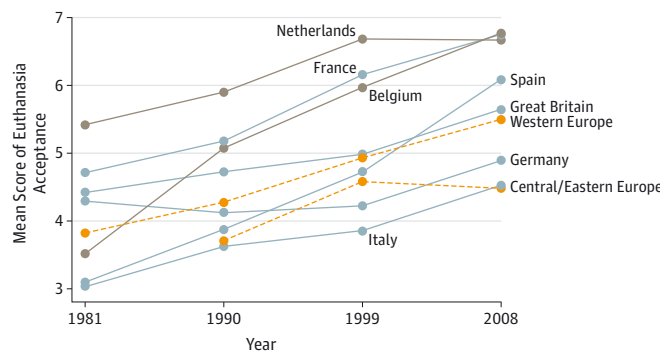
In the Netherlands and Belgium, the frequency of deaths by euthanasia and PAS is significantly higher than in the United States (Table 4). The most recent death certificate studies in those countries, which incorporate unreported cases, found a prevalence of 2.9% of all deaths in the Netherlands⁷⁴ (2010) and 4.6% in Belgium⁷⁵ (2013) from euthanasia and PAS. Second, there has been a steady increase in officially reported cases of euthanasia and PAS in both Netherlands and Belgium. Third, the proportion of deaths with requests for euthanasia or PAS has increased over time, from 4.6% in 2005 to 6.7% in 2010 in the Netherlands⁷⁴ and from 3.5% in 2007 to 6.0% in 2013 in Belgium.⁷⁶

Fourth, cancer accounts for more than 70% of all cases of euthanasia and PAS in the Netherlands and Belgium.⁷⁴⁻⁷⁶ Just 6% of Dutch and Belgian patients receiving euthanasia and PAS have neurodegenerative diseases.

Fifth, in Belgium more educated decedents are more likely to use euthanasia or PAS.^{76,81} In the Netherlands, only 5 euthanasia cases involving minors have been reported since the legalization in 2002.²¹ In 2001, a study in the Netherlands (n = 233) reported that 0.7% of children's deaths occurred by euthanasia and in an additional 2.0% drugs were used with the explicit intention of hastening death at the family's request.⁸² In Belgium no cases of minors receiving euthanasia have been reported, both officially and in the death certificate surveys.⁸³

Sixth, as in the United States, pain is not the main motivation for requesting euthanasia and PAS. In officially reported Belgian cases, pain was the reason for euthanasia in about half of cases.⁸⁴ Loss of dignity is mentioned as a reason for 61% of cases in the Netherlands and 52% in Belgium. Furthermore, 1 Dutch study showed that patients with a depressed mood are more than 4 times more likely to request euthanasia than those without depressive symptoms.⁸⁵ Surveys asking physicians about their last case of a euthanasia request from one of their patients have indicated that depression is a reason in 7% of requests in the Netherlands and 12% in Belgium.^{86,87} The chance of having a request granted because of depression was substantially lower.^{87,88}

Figure 2. Public Support of Euthanasia in Europe, 1981-2008⁴⁸



Public support assessed using the question "Please tell me whether you think euthanasia (terminating the life of the incurably sick) can always be justified, never be justified, or something in between. Rated on a scale from 1 (never justified) to 10 (always justified)." All surveys were conducted among adults in specified countries. Sample size was 102 701 across all 23 countries and 4 surveys (1981, 1990, 1999, 2008). Brown curves indicate countries with

legalized euthanasia (the Netherlands, Belgium); blue indicates countries without legalized euthanasia (France, Spain, Great Britain, Germany); dashed orange lines indicate regional averages (Western Europe, Central/Eastern Europe). Only countries with populations greater than 10 000 000 were included in the graph. Data for Germany concern West Germany and the same geographic area in the survey years after the reunification of Germany.

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Table 4. Characteristics of Euthanasia and Physician-Assisted Suicide Cases³

	Oregon: Reported Cases ²	Washington: Reported Cases ³	Netherlands		Belgium	
			Reported Cases ⁴	All Estimated Cases ⁷⁴	Reported Cases ⁵	All Estimated Cases ^{75,76}
No. of reported annual cases	2015	2015	2015	2010	2013	2013
Total deaths	35 598 ⁷⁷	52 028 (2014) ⁷⁸	147 134 ⁷⁹	136 058	109 295 ⁸⁰	61 621 ^b
Physician-assisted suicide (% of all deaths)	132 (0.39)	166 (0.32)	208 (0.1)	(0.1) ^c	1807 (1.7)	(0.05)
Euthanasia (% of all deaths)	0	0	5308 (3.6)	(2.8) ^c		(4.6)
Age, y, %	1998-2015	2009-2015	2015 ^d	2010 ^d	2012-2013	2013 ^e
<18	0	0	NA	35 (<65)	0	0
18-44	3	2	NA		4	2 (18-49)
45-54	6	6	NA		8	9 (50-59)
55-64	21	20	NA		16	8 (60-64)
65-74	29	32	NA	41 (65-79)	24	20
75-84	26	23	NA		27	37
≥85	15	17	NA	24 (≥80)	21	24
Disease profile, %	1998-2015	2009-2015	2015	2010	2012-2013	2013
Cancer	77	75	73	79	73	70
Neurodegenerative	8	11	8	6	6	6
Respiratory	4	5	4	5	3	3
Cardiovascular	3	5	4	4	5	10
Mental	NA	NA	1	6	4	12
Other (including multifactorial)	8	3	11		10	
End of life concerns, %	1998-2015	2009-2015	2015 ^f	2010	2012-2013 ^f	2013
Losing autonomy	91	90	NA	NA	NA	NA
Less able to engage in activities making life enjoyable	89	89	NA	NA	NA	NA
Loss of dignity	68	76	NA	61	NA	52
Losing control of bodily functions	48	51	NA	NA	NA	NA
Burden on family, friends/caregivers	41	53	NA	NA	NA	14
Inadequate pain control or concern about it/pain ^g	25	36	NA	49	NA	NA
Financial implications of treatment	3	9	NA	NA	NA	NA
Wish of patient	NA	NA	NA	85	NA	88
Physical and/or mental suffering	NA	NA	NA	NA	NA	87
No prospect of improvement	NA	NA	NA	82	NA	78
No more options for treatment	NA	NA	NA	73	NA	NA
Symptoms other than pain	NA	NA	NA	NA	63	NA
Expected suffering	NA	NA	NA	50	NA	48
Estimated shortening of life, %	1998-2015	2009-2015	2015	2010	2012-2013	2013
<1 wk	NA	NA	NA	41	NA	55
≥1 wk	NA	NA	NA	59	NA	45

Abbreviation: NA, not available.

^a Percentages are for all PAS and euthanasia cases unless stated differently. Percentages might add up to more than 100% because of rounding.

^b The prevalences published in Dierickx et al⁷⁶ have been recalculated as column percentages.

^c In 2010, the percentage of all deaths for reported cases of physician-assisted suicide was 0.1% (n = 182) and of euthanasia was 2.2% (n = 2954).

^d The age distribution is not reported in the public reports about all officially reported cases of euthanasia and physician-assisted suicide in the Netherlands. The death certificate studies do provide age distribution but due to data protection measures only 3 aggregated categories can be calculated (<65, 65-79, ≥80 years).

^e Age distribution for the 2013 euthanasia and physician-assisted suicide

estimated cases (death certificate study) calculated based on the original data. Because age is provided in aggregated categories (data protection measures) the categories deviate for the 18-44 (18-49), 45-54 (50-59), and 55-64 (60-64) categories.

^f The Dutch and Belgian official declaration forms for euthanasia and physician-assisted suicide cases do not systematically record concerns and/or most important reasons for granting the request (although the physicians need to write in free text why they felt the case complied with the legal criteria [eg, of unbearable suffering]). In principle, unbearable suffering without prospect of improvement is therefore present in 100% of reported cases (although it may not necessarily have been the most important reason to grant euthanasia).

^g The Netherlands question includes "pain"; others include "pain control."

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Data from other countries are limited. In Switzerland, a 2013 study of 3173 death certificates found 1.4% of all deaths to be by euthanasia and PAS,⁸⁹ an increase compared with the 0.5% found in the 2001 study.⁹⁰ Compared with other countries, Switzerland had a lower incidence of cancer (46%),⁹¹⁻⁹⁴ and more patients cited pain as a reason for their PAS request (56%).⁹⁵ In Australia, 7 patients were euthanized when it was temporarily legal in the Northern Territory. All had cancer, 4 had depressive symptoms, and none had uncontrolled pain.³⁰

In a 2009 French study, physicians (n = 14 999) administered a drug deliberately intending to end a patient's life in 0.8% of all deaths.⁹⁶ Only one-fourth (0.2%) of those deaths were at the patient's explicit request. In the other countries, the prevalence of euthanasia and PAS is generally low, between 0.1% and 1.8% of all deaths.^{90,97-99}

Evaluation of Euthanasia and PAS Practices

The practices of euthanasia and PAS can be evaluated on 3 main dimensions (Table 2). First, both Oregon and Washington state require a 15-day waiting period between the initial request and dispensing of the prescription. In Oregon, all patients are reported to have had at least 15 days between first request and receiving the medication.² In Washington state, it appears that all cases had at least 2 weeks between the patient request and the prescription being provided.³ In Belgium, official reports indicate that in all cases the waiting period was respected.⁵ However, in the first case referred to the public prosecutor, violation of the waiting time caused concern.

Second, palliative care or hospice use may be a reasonable if not ideal measure of proper symptom management. Oregon reports that between 1998 and 2015, 87.2% of cases (n = 991) were enrolled in hospice.² In Washington state, 81.3% of patients in 2015 (n = 166) "were enrolled in hospice when they ingested the medication."³ In Oregon, the median number of weeks of a patient-physician relationship was 12, but some relationships were very short, less than a week (the data do not specify how many were less than 15 days), making it unclear how adequate palliative care—and the waiting period—could have been ensured. A 2013 study in Belgium (n = 6188) found that 74% of euthanasia cases had received care from a palliative care service sometime before the end of life.⁷⁵ In the Netherlands (2010), there was a positive association between euthanasia and having consulted a palliative care team or pain specialist.¹⁰⁰

Given that requests for euthanasia and PAS are frequently motivated by mental health considerations, such as depression and inability to engage in enjoyable activities,¹⁰¹ psychiatric evaluation might be important. In Oregon, less than 5% of patients received a psychiatric evaluation and in Washington state only 4% were referred for psychiatric evaluations.^{2,3} In Belgium, of all nonterminal cases between 2002 and 2013 (n = 867), a psychiatrist acted as the third physician in 42% to 78% of cases.^{5,84} In the Netherlands (2011-2014), in 89% of all reported cases of psychiatric patients requesting PAS (n = 66), an independent psychiatrist was involved as formal consultant or for a second opinion.⁸⁸

Third, in Oregon in 2015, 218 patients had prescriptions for medications that could be used for PAS; written information was available on 175 (80.3%).² In 2015 Washington state had "after death re-

porting forms" for 197 of the 213 (92.5%).³ In neither state, however, are there data on how many physicians might have engaged in PAS without reporting it—that is the true denominator of the total number of euthanasia and PAS cases.

Implications of Legalization of Euthanasia and PAS

Four implications can be empirically assessed after legalization of euthanasia, PAS, or both.

Problems and Complications

There are no flawless medical procedures; all procedures and interventions can have complications. Determining the rate of problems and complications related to euthanasia and PAS has been challenging because of definitions and the lack of witnesses. For several years, Oregon reported no complications.² Between 1998 and 2015 (average number of deaths per year, 55), Oregon reported absence of data on complications for 43.9% of cases, no complications for 53.4% of cases, and regurgitation of medication in 2.4% of cases as the sole complication. The state reported that between 2005 and 2012, 6 patients (0.7%) regained consciousness after ingesting the lethal medications but paradoxically does not classify this as a complication. The median time between ingestion of barbiturate and death was 25 minutes, but the range extends to 104 hours—more than 4 days.² The number of prolonged deaths—those taking longer than a day—is not reported in Oregon. In Washington state, for 2014 and 2015 combined, the data are less complete.³ For the 292 reported cases, 1.4% of patients regurgitated the medications, and 1 patient experienced a seizure. It is unclear if any patients in Washington state regained consciousness. Only 66.8% of patients died in less than 90 minutes, while the range extends to 30 hours.

A comprehensive 2000 study of problems and complications in 649 Dutch cases (prior to the actual legalization) revealed a higher frequency of problems with PAS than with euthanasia.¹⁰² Technical problems with PAS, such as difficulty swallowing, occurred in 9.6% of cases, and complications such as vomiting or seizures occurred in 8.8% of cases. In 1.8% of PAS cases, patients awoke from coma and in 12.3% of cases time to death was longer than anticipated or the patient never became comatose. For euthanasia, 4.5% of cases had technical problems, such as inability to find a vein for injection, and in 3.7% of cases patients had complications such as vomiting, or myoclonus. In 0.9% cases patients awoke from coma, and in 4.3% of cases time to death was longer than expected or the patient did not become comatose. These data are 16 years old, and 13 years of legalization may have reduced the complication rate.^{74,103}

There are no data from other countries, including Belgium, on problems or complications with euthanasia or PAS.

Routinization

One worry about legalizing euthanasia and PAS is that they might not be limited to extreme cases but become routine practices. One measure of routinization is how frequently euthanasia and PAS are discussed with dying patients. In Oregon and Washington state, the data collection method makes it impossible to determine whether the rate of discussion has increased. The Netherlands and Belgium report an increase in explicit requests (granted or not) for

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euthanasia.⁷⁴⁻⁷⁶ All jurisdictions demonstrated an increase in number of actual cases the longer the practices have been legalized.

Another aspect of routinization is the introduction of standardization and specialized clinics and physicians to perform euthanasia and PAS. In both the Netherlands and Belgium, guidelines have been developed for both physicians¹⁰⁴ and pharmacists^{104,105} to avoid common complications, such as use of the incorrect medications and patients never becoming comatose or waking up from coma. The Royal Dutch Pharmacy Association issued the first guidelines before legalization¹⁰⁶; the Belgian Order of Physicians did this in 2005.¹⁰⁴ In both countries the drugs recommended for euthanasia in those guidelines (usually a combination of a benzodiazepine, a barbiturate, and a muscle relaxant [but not opioids]) have increasingly been used.^{74,75} Similarly, starting in 1998 in Amsterdam then in 2003 extending throughout the Netherlands, Support and Consultation on Euthanasia in Netherlands (SCEN) has provided independent and trained physicians who can perform the required-by-law consultation of a second physician.¹⁰⁷ In 2010, consultation was performed by a SCEN physician in 80% of euthanasia cases.¹⁰⁸ In Belgium, the Life End Information Forum (LEIF) was founded in 2003 to provide consultants to physicians with euthanasia requests.¹⁰⁷ A 2009 survey found that 30% of consultations surrounding euthanasia were with LEIF physicians¹⁰⁹ and in 52% of consulted cases they helped administer medications.¹¹⁰ In the United States, Compassion and Choices promotes access to assisted suicide by providing free end-of-life consultations to dying patients.¹¹¹

Emotional Distress

A 2011 survey (n = 1456) among Dutch physicians found that 86% of physicians dread the emotional burden of performing euthanasia.⁷³ Interviews of physicians who have participated in euthanasia and PAS indicate that the decision to go through with a procedure is neither easy nor straightforward.^{112,113} An Oregon study found that only 11% of hospice nurses (n = 397) rated caregivers of patients receiving PAS as more burdened than caregivers of other hospice patients.¹¹⁴

Slippery Slope

The term "slippery slope" is commonly used when referring to the expansion of intentionally ending the life of patients who did not make an explicit request.

In the first study of practices in the Netherlands (1990; n = 5197), death among 0.8% of patients resulted from "administration of lethal drugs without explicit patient consent." Subsequently, the number has declined to 0.2% in the 2010 assessment (n = 6861).⁷⁴ Over the years there has also been a decrease in the use of drugs by a physician with the explicit intention to end the life of severely affected newborns. While this occurred in 1% of all deaths (n = 177) among children younger than 1 year in 2010, this occurred in 9% of all deaths in 1995 (n = 299) and 2001 (n = 233) but in 8% in 2005.¹¹⁵ In a study in Belgium prior to legalization (n = 3999), 3.2% of deaths were by administration of lethal drugs without explicit patient consent, but that figure declined to 1.7% in the 2013 assessment (n = 6188).⁷⁵

There is much debate concerning performing euthanasia, PAS, or other life-ending procedures on patients with dementia or chronic mental illness, who are minors, who are just "tired of life,"

or who are socioeconomically vulnerable.^{23,116} In Oregon and Washington state these cases would be illegal and there are no data on such cases. A 2011 survey (n = 1456) among Dutch physicians found that only 2% of all requests were from patients with a psychiatric disease, 4% from those with dementia, and 3% from those without a serious physical or psychiatric disease.¹⁰³ Furthermore it is difficult to study such cases because they are rare and may be underreported. For instance, only 5 cases of euthanasia among minors have been reported in the Netherlands since 2002,²¹ and only a few euthanasia cases concern patients with neuropsychiatric disorders.

In the United States, the concern that minorities, the disabled, the poor, or other socioeconomically marginalized groups might be pressured to accept PAS does not seem to be borne out.^{117,118} The demographic profile of patients in the United States who have received these interventions is white, well-educated, and well-insured.

Unresolved Issues Needing Additional Research

Data about the practices of assisted dying are limited. Therefore, collecting reliable data to evaluate end-of-life practices should be prioritized in all countries, and not only in countries legalizing euthanasia or PAS. Only such studies can help determine whether and how symptom management differs between patients requesting euthanasia or PAS and those who do not request these interventions.

In the United States, 3 kinds of current and additional data would be useful: (1) survey studies starting from a random selection of death certificates to determine the true frequency of PAS cases and how unreported cases differ from reported cases; (2) physician surveys to determine rates of requests and performance of euthanasia and PAS; and (3) surveys on complications such as how many patients wake up after ingesting medications prescribed for PAS.

All countries that have legalized euthanasia or PAS, such as Luxembourg, Switzerland, Columbia, and Canada, need to perform the same rigorous studies performed in the Netherlands and Belgium of official reporting data and regularly repeated large-scale death certificate studies. Additionally, the monitoring of the practice of euthanasia might further improve if the official declaration forms would include items such as the most important reasons for the request, possible complications that have arisen, and the familial and social situation of the deceased. Also, there is a need for studies that look at the possible influence on society of legalizing euthanasia or PAS, for example on views on how to care for vulnerable groups or on trust in physicians. International studies that compare trends in these views between countries with and without legalization could shed light on this.

Conclusions

In most developed countries there have been high levels of public support for euthanasia and PAS over the last 30 years but more limited support among physicians. Euthanasia and PAS can be legally practiced in the Netherlands, Belgium, Luxembourg, Colombia, and Canada, and physician-assisted suicide, excluding euthanasia, is legal in 5 US states and Switzerland.

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The dominant motivations for requesting PAS include loss of autonomy and dignity, inability to enjoy life and regular activities, and other forms of mental distress. Problems and complications with the performance of euthanasia or PAS occur, but the available data make it difficult to determine the precise rates, although they appear to be more common in PAS than euthanasia. In jurisdictions that have legalized euthanasia or PAS, use of these procedures has

increased but alleged slippery-slope cases, such as ending the life of patients who are minors or have dementia, appear to be a very small minority of cases.

Euthanasia and physician-assisted suicide are increasingly being legalized, remain relatively rare, and primarily involve patients with cancer. Existing data do not indicate widespread abuse of these practices.

ARTICLE INFORMATION

Author Contributions: Dr Emanuel and Mr Urwin had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Emanuel, Urwin, Cohen. **Acquisition, analysis, or interpretation of data:** All authors.

Drafting of the manuscript: Emanuel, Urwin, Cohen. **Critical revision of the manuscript for important intellectual content:** All authors.

Administrative, technical, or material support: Emanuel.

Study supervision: Emanuel, Onwuteaka-Philipsen, Cohen.

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