

Event of undetermined intent-related deaths in an enlarged European Union



Objective

The objective of this monograph is to provide producers and users of death statistics with a practical tool to help study deaths related to events of undetermined intent.

Methods

Mortality data produced by health authorities of 33 European countries¹ and compiled yearly by Eurostat² were used. Depending on their availability, data were used to describe time trends, geographical distributions and demographical risks.

By reviewing the literature, the international forum for mortality specialists³, the revision and update process of the International Classification of Diseases (ICD) and the answers of a questionnaire filled in by death statistics producers of 36 European countries⁴ in the framework of the **ANAMORT** project⁵, it has been possible to:

- describe the limits of the observed differences
- elaborate recommendations for a better use of available data
- elaborate recommendations for a better production of future data

Definition of deaths related to undetermined intent cases

Death from undetermined intent was considered as any death reported to Eurostat with an underlying cause of death coded Y10 to Y34 (table 1) in the 10th revision of ICD (ICD-10).

Definition of indicators used

The number of deaths for each group of underlying causes of death (UCoD) was the one transmitted by the countries' national

authorities to Eurostat for a given year. Aggregation of the number of deaths for the European Union (EU) was made by Eurostat, using last available data for a given year. Crude death rate (CDR) was obtained by dividing the number of deaths by the last estimate of the population available in Eurostat (for a given age group if age specific crude death rate was computed). Age-standardised death rate (SDR) was computed by direct standardisation, using the 1976 European population. The potential years of life lost before 75 years-old (PYLL75) due to a given cause were calculated for each age group by multiplying the number of deaths related to this cause by the difference between age 75 and the mean age at death in each age group. Potential years of life lost were the sum of the products obtained for each age group. Proportions of PYLL75 were calculated by dividing the PYLL75 due to a given cause by the total amount of PYLL75 due to all causes of death. Indicators were produced at country level, for all countries of EU15⁶ or EU25⁷. For other groups of countries, estimation of a given indicator was calculated as an average of this indicator at country level weighed by the proportion of its population among the group.

Situation regarding deaths from undetermined intent in Europe

The number of deaths from undetermined intent in EU25 was 12,014 in 2005, which represents 5.2% of deaths due to external causes. SDR for undetermined intent was 2.3 for 100,000 inhabitants in 2005, among the 25 countries of the European Union. Variations between 0.0 and 11.6 /100,000/year according to the countries were observed in Europe (Figure 1).

¹ Included the 25 Member States of the European Union before 2007, Albania, Bulgaria, Croatia, Iceland, Macedonia, Norway, Romania and Switzerland

² <http://epp.eurostat.ec.europa.eu>

³ http://www.nordclass.uu.se/index_e.htm

⁴ 33 above mentioned countries, Bosnia Herzegovina, Serbia and Turkey

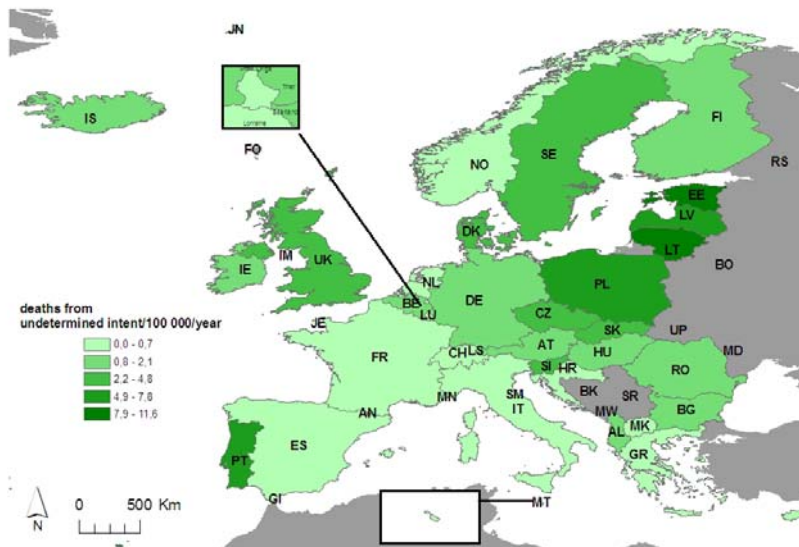
⁵ <http://www.invs.sante.fr/surveillance/anamort>

⁶ EU15 comprised the following 15 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

⁷ EU25 comprised EU15 and the following 10 countries: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic, and Slovenia.

Figure 1 Age-standardised mortality rate by undetermined intent in Europe in 2005*

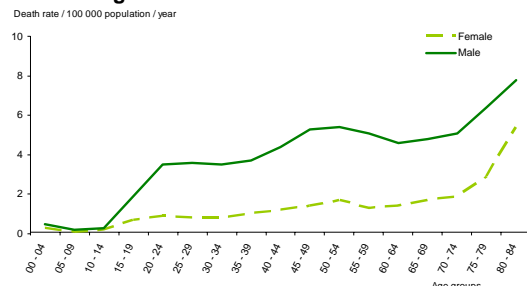
* Owing to missing data for 2005, the map included data for 2004 for Albania, 1997 for Belgium, 2001 for Denmark, 1994 for Greece, 2003 for Italy and 2003 for Malta.



There is no clear geographical gradient observed with the SDR by undetermined intent in Europe. The highest rates were observed in Estonia, Latvia, Lithuania, Portugal, and Poland.

The risk of death by undetermined intent was 2.5 times higher among men (average for EU25 in 2005). This difference was not observed before the age of 15 (Figure 2). In 2005 among EU25 countries, victims were observed among the elderly persons (65 years and more) in 31% of the cases. CDR by undetermined intent increased with age regardless of the gender (Figure 2): compared to 15-24 years-old, the risk of death of the elderly (65 years-old and more) was 4.0 times higher.

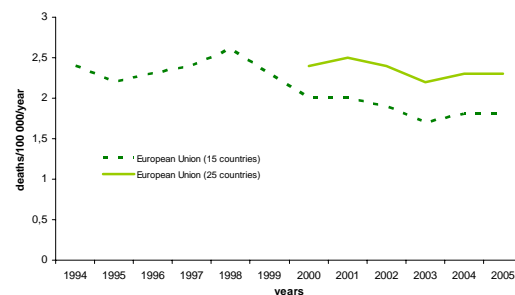
Figure 2 Crude rates of mortality by undetermined intent by gender and age group in the European Union (25 countries) in 2005 – logarithmic scale.



There was no clear trend regarding the SDR between 2000 and 2005 in the European Union of 25 countries and between 1994 and 2005 in the EU15 (Figure 3) as there were little variation rates. In many countries, erratic variations in SDR by undetermined intent could be observed (the most

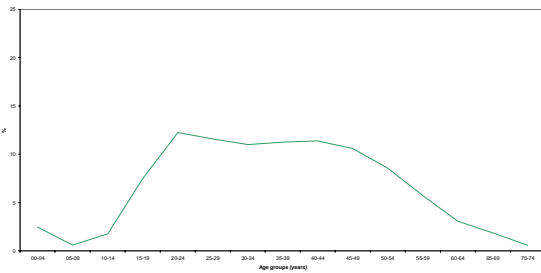
important were Latvia 1998 and 1999, France 2000, Portugal 2001 and 2002). These variations could be associated with the implementation of the 10th revision of ICD as in Portugal and France (i.e. drowning and poisonings which used to be coded as undetermined intent became more often coded as accidental). The 10 new Member States, mostly in Eastern Europe, explained the increase in death rates by undetermined intent in the European Union (EU25 versus EU15) was due to higher incidence rates in these countries (Figure 3).

Figure 3 Trends in age standardised deaths by undetermined intent in the European Union (25 countries).



In EU25, deaths from undetermined intent were responsible of 6% of the PYLL by external causes of death. The highest impact was among people between 20 and 49 years-old (Figure 4).

Figure 4 Distribution of potential years of life lost by undetermined intent in the European Union (25 countries) by age group



Interpretation and limits of observed differences in deaths by undetermined intent in Europe

The group of undetermined intent deaths is important to take into account as it contains deaths where information is insufficient to enable a medical or legal authority to make a distinction between accident, self-harm and assault. Uses of this category may vary according to countries and groups of CoD. Accidents, homicides, suicides and/or assault will be all the more underestimated as figures of undetermined intent increase. The use of this category may be important in case of death related to euthanasia and overdoses with opiates.

Variable interpretation of ICD rules have been underlined for drowning and poisoning when intention was not determined (not specified or inconclusive investigations).

In addition to undetermined intent causes of death, increased number of unknown causes of death (R99 in ICD10) may contribute to the underestimation of the magnitude of certain groups of CoD.

Analytical recommendation to improve comparability of time trends (for statistics users)

Grouping causes of death without taking into account intent (e.g. drowning due to accident, homicide, self and undetermined intent) may be interesting as regulation measures may prevent a given cause of death, whatever the intent is (a similar recommendation should be used for overdoses). For specific categories of external causes (e.g. suicide by hanging) better estimates could be produced by grouping suicide with undetermined intent after validating homogeneity of this new group in given countries.

The potential impact of the rate of autopsies performed should always be evoked when a variation of undetermined intent deaths is observed. Differences between the concepts of “undetermined intent” and “unknown causes” should be always clearly stated.

Recommendations to improve comparability of future data collected (for data producers)

Physicians should be trained to better specify in the death certificate all information useful for codification (circumstances, intent, place and date of accidents, etc.).

Intent should be more clearly assessed and described in the death certificate. Therefore, it should be useful to add a box in the death certificate to identify systematically the intent in death, taking into account the difference between intent needed for judicial purposes (as part of a trial) and possible intent which is a purpose of the death certificate.

Possible values for intent could be:

- "no" for disease or accident
- "suspected or possible homicide"
- "suspected or possible suicide"
- "undetermined intent"
- "other" for operation of war, legal intervention, etc.

When a medico-legal investigation has been performed, the causes of death (with all elements regarding intent including suspected intention) should be systematically transmitted to the coding/statistical office.

Additional and more detailed recommendations may be found on <http://invs.sante.fr/surveillance/anamort>.

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Table 1 Correspondence table defining the group of undetermined intent according to revision number of International Classification of Diseases (ICD)

ICD-10	Label	ICD-9	ICD-8
Y10	· Poisoning by and exposure to nonopioid analgesics, antipyretics and antirheumatics, undetermined intent		
Y11	· Poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified, undetermined intent		
Y12	· Poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified, undetermined intent	E980	E980
Y13	· Poisoning by and exposure to other drugs acting on the autonomic nervous system, undetermined intent		
Y14	· Poisoning by and exposure to other and unspecified drugs, medicaments and biological substances, undetermined intent		
Y15	· Poisoning by and exposure to alcohol, undetermined intent		
Y16	· Poisoning by and exposure to organic solvents and halogenated hydrocarbons and their vapours, undetermined intent	E981- E982	E981- E982
Y17	· Poisoning by and exposure to other gases and vapours, undetermined intent		
Y18	· Poisoning by and exposure to pesticides, undetermined intent	E980	E980
Y19	· Poisoning by and exposure to other and unspecified chemicals and noxious substances, undetermined intent	E980- E981- E982	E980- E981- E982
Y20	· Hanging, strangulation and suffocation, undetermined intent	E983	E983
Y21	· Drowning and submersion, undetermined intent	E984	E984
Y22	· Handgun discharge, undetermined intent		
Y23	· Rifle, shotgun and larger firearm discharge, undetermined intent	E985	E985
Y24	· Other and unspecified firearm discharge, undetermined intent		
Y25	· Contact with explosive material, undetermined intent		
Y26	· Exposure to smoke, fire and flames, undetermined intent	E988	E988
Y27	· Contact with steam, hot vapours and hot objects, undetermined intent		
Y28	· Contact with sharp object, undetermined intent	E986	E986
Y29	· Contact with blunt object, undetermined intent		
Y30	· Falling, jumping or pushed from a high place, undetermined intent	E987	E987
Y31	· Falling, lying or running before or into moving object, undetermined intent		
Y32	· Crashing of motor vehicle, undetermined intent	E988	E988
Y33	· Other specified events, undetermined intent		
Y34	· Unspecified event, undetermined intent		
////*	· Late effects of injury, undetermined whether accidentally or purposely inflicted	E989	E989

* not included but a code with 4 digit (Y87.2) could have been used

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Support:

European Commission, DG Sanco (partial financial support) and Eurostat (technical support).

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