Accidental suffocation-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 accidental suffocation.

Methods

Mortality data produced by health authorities of 33 European countries and compiled yearly by Eurostat 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 specialists, 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 countries in the framework of the AnAmort project, 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 accidental suffocation

Death from accidental suffocation was considered as any unintentional death reported to Eurostat with an underlying cause of death coded W75 to W84 (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 (UCd) was the one transmitted by countries' national authorities to Eurostat for a given year. Aggregation of 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. Due to partial availability of detailed data, indicators were produced for variable 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 accidental suffocation in Europe

The number of deaths from accidental suffocation was available in 26 European countries. In these countries, 8,747 deaths from accidental suffocation occurred in 2005, which represented 4.9% of deaths due to external causes. SDR for accidental suffocation was 2.0 for 100,000 inhabitants in 2005, among these 26 countries. Variations between 0.4 and 8.3/100,000/year according to the countries were observed (Figure 1).

There was no clear trend for SDR on accidental suffocation-related deaths although the highest rates were observed in the Baltic countries (Lithuania, Latvia and Estonia).

1. Included the 25 Member States of the European Union (EU) before 2007, Albania, Bulgaria, Croatia, Iceland, Macedonia (the former Yugoslav Republic of), Norway, Romania and Switzerland. EU15 comprised the following 15 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom. EU25 comprised EU15 and the following 10 countries: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic, and Slovenia.
3. www.nordclass.uu.se/index_e.htm.
4. 33 above mentioned countries, Bosnia Herzegovina, Serbia and Turkey.
6. Albania*; Austria; Croatia; Cyprus; Czech Republic; Estonia; Finland*; France; Greece; Hungary; Iceland; Ireland; Latvia; Lithuania; Macedonia (the former Yugoslav Republic of); Malta; Norway*; Poland; Portugal*; Romania; Slovak Republic; Slovenia; Spain; Sweden; Switzerland; United Kingdom* (* data for 2004).
Regardless of age, the CDRs by suffocation for men were higher than for women except in the youngest age groups (Figure 2). The risk of death by accidental suffocation was 1.5 times higher among men (average for the same 26 European countries in 2005). In 2005, victims were observed among the elderly (65 years-old and more) in 59% of the cases. The highest CDRs were observed among the elderly (over 80 years-old).

The SDR trend remained more or less still between 1994 and 2005 (from 2.1 to 1.9/100,000/year) in the group of 26 European countries (Figure 3). Due to small figures erratic variations were observed in most countries.
Deaths from accidental suffocation were responsible for 4% of the PYLL75 by external causes of death. The highest impact was among children aged less than 5 years: they represented nearly 20% of the PYLL75 by accidental suffocation (Figure 4).

Due to probable misclassifications within this group of causes of death, it should be useful to analyse deaths due to suffocation considering all possible categories: accidental, suicides, homicides, and undetermined intent.

In addition, specific analyses should be conducted regarding the undetermined intent suffocation category, in order to assess whether these cases should be coded as suicide or in other categories.

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

WHO guidelines on "highly improbable" sequences should be reinforced by including more examples (e.g. how to deal with suffocation due to dementia, stroke, head or spinal trauma or tumour, or neuromuscular diseases?).

Timeliness of transmission of information from forensic institute and police to certifier or statistical office may improve accuracy of ICD codes.

In case of a death due to suffocation, a foreign body should be suspected for young persons (under 10 years-old). On the opposite, for older ages (65 years-old and more), an underlying disease affecting swallowing should be suspected (i.e. mental disorder diseases, Alzheimer, stroke, head or spinal trauma or tumour, neuromuscular diseases, etc.).

Additional and more detailed recommendations may be found on [www.invs.sante.fr/surveillance/anamort](http://www.invs.sante.fr/surveillance/anamort).

**Bibliographic references**


### Table 1

**CORRESPONDENCE TABLE DEFINING THE GROUP OF ACCIDENTAL SUFOCATION ACCORDING TO REVISION NUMBER OF INTERNATIONAL CLASSIFICATION OF DISEASES (ICD)**

<table>
<thead>
<tr>
<th>ICD-10</th>
<th>Label</th>
<th>ICD-9 ICD-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>W75</td>
<td>Accidental suffocation and strangulation in bed</td>
<td>E913.0</td>
</tr>
<tr>
<td>W76</td>
<td>Other accidental hanging and strangulation</td>
<td>E913.9</td>
</tr>
<tr>
<td>W77</td>
<td>Threat to breathing due to cave-in, falling earth and other substances</td>
<td>E913.9</td>
</tr>
<tr>
<td>W78</td>
<td>Inhalation of gastric contents</td>
<td>E913.9</td>
</tr>
<tr>
<td>W79</td>
<td>Inhalation and ingestion of food causing obstruction of respiratory tract</td>
<td>E911</td>
</tr>
<tr>
<td>W80</td>
<td>Inhalation and ingestion of other objects causing obstruction of respiratory tract</td>
<td>E912</td>
</tr>
<tr>
<td>W81</td>
<td>Confined to or trapped in a low-oxygen environment</td>
<td>E913.9</td>
</tr>
<tr>
<td>W83</td>
<td>Other specified threats to breathing</td>
<td>E953</td>
</tr>
<tr>
<td>W84</td>
<td>Unspecified threat to breathing</td>
<td>E963</td>
</tr>
<tr>
<td>X70</td>
<td>Intentional self-harm by hanging, strangulation and suffocation</td>
<td>E983</td>
</tr>
<tr>
<td>X91</td>
<td>Assault by hanging, strangulation and suffocation</td>
<td>E983</td>
</tr>
</tbody>
</table>

### Acknowledgements

**The Anamort project team:**
Belanger F, Ung A-B, Falzon A, Institut de veille sanitaire, Unité Traumatismes - DMCT, France

**Members of the Anamort Project Steering Committee:**

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

Citation: