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1 Introduction

1.1 This manual: framework of its development, contents and intended use

This manual has been developed for Europe by the “Mortalità per Causa” Unit at ISTAT (Italian National Statistics Institute) following a contract signed with EUROSTAT with the purpose to improve the mortality data quality and provide a common, standard training reference for the information to be collected in the death certificates by EU member States, EEA/EFTA, acceding and candidate countries. It is part of a training package on certification of causes of death, including also an interactive training web-based software and a leaflet for quick reference.

This manual follows the WHO guidelines and the EUROSTAT recommendations on death certificate format and information to be collected; it is a generalized tool written in order to allow National adaptation to specific needs and legal requirements.

A basic knowledge of the WHO International Statistical Classification of Diseases and Related Health Problems (ICD) classification in use in one's own country is strongly suggested to each certifier: this familiarity could improve the quality of certification for statistical purpose and the amount of detail that can be handled during the following steps of coding and data production and release.

The intended use of this manual is to assist certifiers in providing quality information in areas where common problems occur by giving instruction and a practical reference on the correct completion of the medical part of death certificates.

The use of this manual will not only expedite the processing of death certificates, and aggregation of cause of death data, but also minimize time spent by certifying doctors responding to query letters in those countries where this system has been implemented (*see also paragraph 2.6.6 on query practices*).

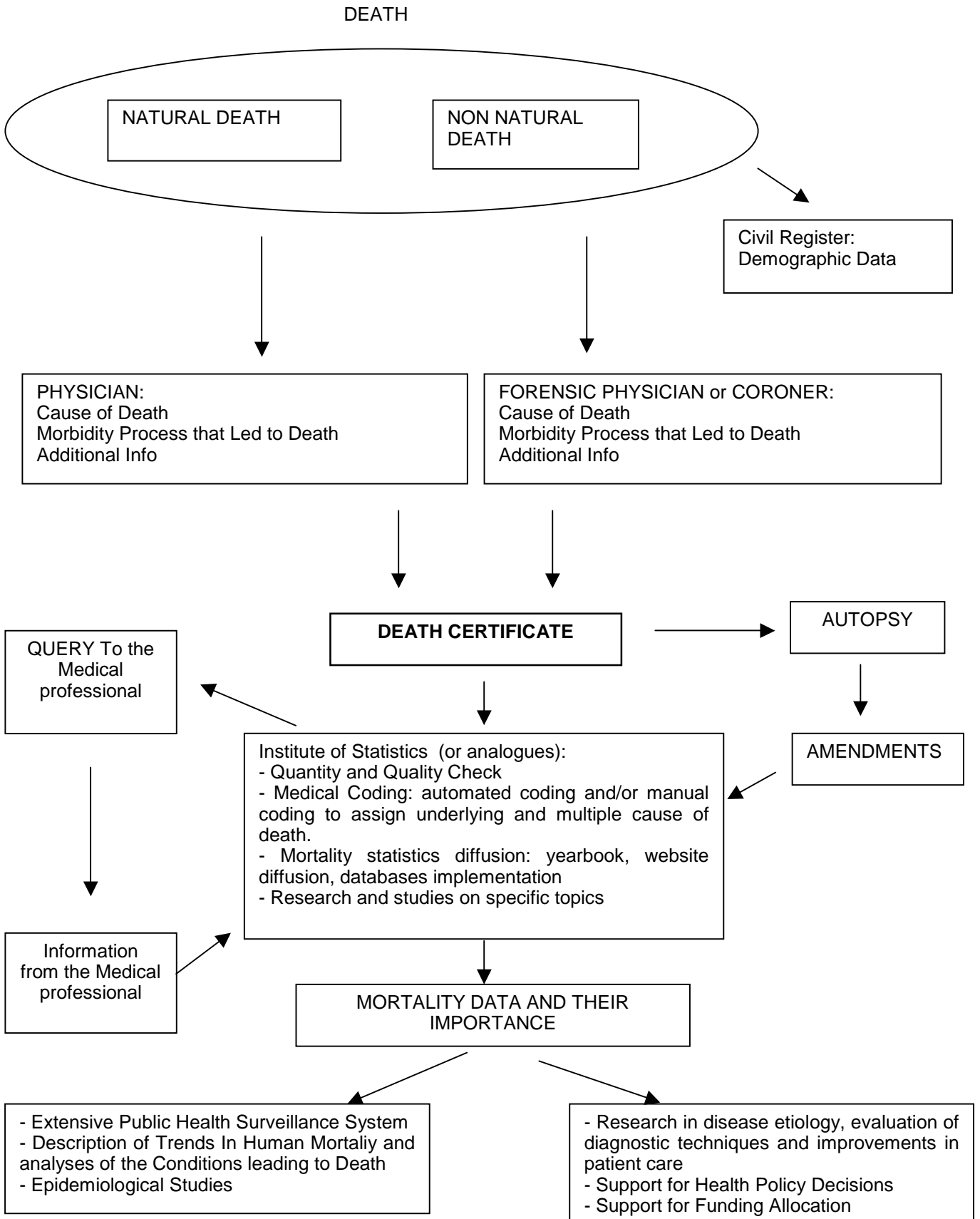
1.2 Purpose of mortality data

The Medical Certificate of Cause of Death, is the source of mortality statistics that set up the basis of the oldest and most extensive public health surveillance systems (*see figure 1 for a generalized scheme on mortality data production*).

Death certificates provide information on the characteristics of the people who die and the important information on the causes of death. Causes of death are the most important statistical research item on the death certificate because they provide the basis for describing trends in human health and mortality and for analysing the conditions leading to death. Mortality statistics provide a basis for the epidemiological studies that focus on the leading causes of death by age, sex or other demographic variables. They also provide a basis for research in disease etiology and the evaluation of diagnostic techniques, which in turn lead to improvements in patient care. Since statistical data derived from death certificates cannot be more accurate than the information reported on the certificate, it is very important that all the people concerned in the registration of the deaths provide an accurate, complete, reliable and prompt information. Mortality statistics focus on the underlying cause of death (i.e. the condition or disease starting the chain of events leading to death; *see paragraph 2.1*) for historical reasons as well as because public health interventions try to break the sequence of causally related medical conditions as early as possible.

These statistical data are used by national and regional governments to set public health policies and goals, researchers and clinicians, educational institutions, and many others for many purposes (*see annex 1 on National mortality data flow, processing, dissemination and use*). Mortality data are the most important indicator to measure and compare health status at local, National and International levels because they are regularly and extensively collected in every developed country and in the most of the developing ones.

Figure 1 - A generalized scheme from death to statistical data



Box 1 - Purposes of mortality data

- To assess the population mortality pattern and determine its changes over time;
- To identify regional differences in death rates and investigate reasons for these differences;
- To monitor trends in public health issues such as infant and maternal mortality, infectious diseases, and accidents and suicides;
- To identify health risks associated with environmental and occupational factors and lifestyle;
- To determine health research and health care priorities and resources allocation;
- To plan health facilities, services and human resources;
- To plan prevention and screening programs and assess the results of these programs;
- To develop health promotion programs and evaluate their results.

1.3 Mortality statistics: the central role of the physician in a complex scenario with several actors

Reliability and consistency in time of mortality statistics heavily depend on the quality of data provided by certifiers. Good statistics are possible only if precise and complete diagnoses, exact circumstances of external causes as well as plausible chain of events are reported by the professionals involved in the process of causes of death certification. It is recognized that doctors (or other professionals permitted by national laws) cannot know by instinct what detail is required for classification purposes, however the certifier is requested to provide his/her **BEST MEDICAL OPINION** as to the sequence of events leading to death. From the prevention standpoint, the objective is to break, as early as possible, the sequence of morbid events that will eventually lead to death (*see case history N. 7*). In general, the completing and signing of the Medical Certificate of Death, in accordance with the provisions of the National Vital Statistics legislation, are a legal responsibility of the physician who attended the deceased during her/his last illness, or the medical examiner in other cases.

Box 2 - The certifying professional must

- Be familiar with national laws for certifying deaths and respect the confidentiality of vital records (*see annex 2*);
- Be familiar with the correct method to complete the Medical Certificate of Death, according to the WHO guidelines and following the instructions of this manual;
- Ensure that the completed and signed death forms are promptly available, according to national laws;
- Use all the information available at the time of the certificate issuing;
- Clearly specify whether specific investigations are still going-on;
- Submit an amended certificate to the competent office in those cases where the autopsy or further investigation results revealed the cause of death to be different from the one originally reported (*see annex 2*).

For statistical and research purposes, it is important that the causes of death and, in particular, the underlying cause of death be reported as specifically and as precisely as possible. In fact, careful reporting of the best medical opinion, results in improved mortality statistics quality for both **underlying and multiple causes of death** (all conditions mentioned on a death certificate; *see box 3 - see also glossary*).

Death certificates are coded and checked by trained nosologists. When there is a problem (ambiguity, impossible causal sequence, incomplete death certificate) clarification of the certificate should be sought from the certifier; for this reason if an important detail is unknown, the fact should be stated, since many statistical offices make a practice of querying for apparently incomplete or vague diagnoses in case the detail required might be available. If further clarification cannot be obtained, WHO provides in the ICD a set of international rules. These rules are applied by the nosologists so that the underlying cause is selected. This selection respects and takes into account all the information given by the certifier.

2 Definitions and Best Practices

2.1 WHO definitions and international death certificate

An important concept in classifying causes of death is the **underlying cause of death**. The underlying cause is defined as "(A) the disease or injury which initiated the train of morbid events leading directly to death, or (B) the circumstances of the accident or violence which produced the fatal injury".

However, information on the other diseases or conditions that led to death and the other significant conditions that contributed to death are also important. The cause of death section in death certificates is thus designed to record information on all significant diseases or conditions of the deceased, whether or not they are the underlying cause.

Box 3 - Some important definitions

- The immediate cause of death is the disease or condition directly leading to death;
- The antecedent cause(s) is any condition giving origin to the one mentioned above it;
- The underlying cause is: (A) the disease or injury which initiated the train of morbid events leading directly to death, or (B) the circumstances of the accident or violence which produced the fatal injury;
- The contributing causes are those diseases or conditions that are not part of the train of events leading to death, but that, in the certifier's opinion, contributed to death;
- The multiple causes of death are all the diseases or conditions reported in a death certificate (*see paragraph 2.6.5*).

The Medical Certificate of Cause of Death is recommended by the World Health Organization for international use (figure 2); this general format is widely used in Europe although some local variations occur (for example an extra line (e) in Part I may appear on some forms or only three lines are printed in part I).

Figure 2 - International medical certificate of cause of death

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Due to (as consequence of)	.....
Antecedent causes	b) Due to (as consequence of)	.....
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Due to (as consequence of)	.....
	d) .....	.....
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	..........	..........
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

Research based on mortality statistics is much more meaningful if all details in the deceased person's medical records regarding the precise diagnoses of the conditions that caused or contributed to death are included in the Medical Certificate. The analysis of every condition reported on the medical certificate is especially important in studying the **multiple causes of death**, as in cases where diseases or conditions rarely are the underlying causes of death, but often contribute to death (*see also paragraph 2.6.5*).

For other important definitions of current use, please refer to the glossary at the end of this manual.

For an extensive review on certification practices in Europe see also the “Technical Report” prepared by ISTAT during this project.

2.2 EUROSTAT recommendations

As a result from the project EU-DG SANCO - EUROSTAT “Comparability and quality improvement of European causes of death statistics”, developed and followed by the EU and EFTA countries, a set of 39 recommendations has been realized concerning the different stages of death certification. These recommendations consist of scientific guidelines whose aim is to improve the overall quality and comparability of mortality statistics in Europe. Among the eight different items, four of them are of particular relevance here: confidentiality, infant causes of death certification, general causes of death certification, training practices (see *annex 2*).

2.3 National Death certificate

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Each Country should report here the relevant information on the National Death Certificate structure.

2.4 Notes on confidentiality

Appropriate access to mortality data and respect of the privacy rights are important issues; sensible data in death certificates are collected for social-demographic information and for medical ones as well. For this reason the personal information dealing with both aspects is protected on vital records against unwarranted or indiscriminate disclosure under National laws. Certifying professionals as well as Statisticians are requested to comply with National laws adopted in their countries at this regard (see *annex 3*).

2.5 How to fill in the medical part of the death certificate

The medical part on the death certificate represents a medical opinion that might vary among individual physicians. A properly completed cause-of-death section (see *box 4*) provides an etiologic explanation of the order, type, and association of events resulting in death. In certifying the cause of death, any disease, abnormality, injury, or poisoning should be reported, if believed to have contributed to death. If the use of alcohol and/or other substance, a smoking history, a recent pregnancy, or surgery (see *box 8*), environmental factors, such as exposure to toxic fumes, history of working in the mining industry, etc. was/were believed to have contributed to death, then this/these condition(s) should be reported (see also *paragraph 2.7 "Additional information"*).

Description of the process leading to death is sometimes complex; in those cases the causes that are suspected having been involved should be selected and eventually defined by words such as "**probable**" or "**presumed**" to indicate that the description provided is not completely certain.

Detailed instructions on how to complete the medical part of the death certificate are given in the following paragraphs. A number of examples of properly completed certificates with case histories are provided in chapter 4 to illustrate how the cause of death should be reported and how some common problems can be solved.

Box 4 - A properly completed cause-of-death section

- Is clearly legible (typewritten or filled in using capital letters and permanent black ink);
- Does not contain abbreviations of medical terms;
- Always shows an entry in line (a) of part I, not intended as the mode of dying;
- Enumerates the conditions in ascending order of casual sequence in part I;
- Shows always the main sequence that led to death in part I;
- In no occasion shows the underlying cause in part II;
- Has always entries for duration where appropriate.

2.5.1 Legibility and abbreviations

It is essential that every information can be clearly read. This may best be achieved by typing, but if this is not possible the information should be written legibly, with permanent black ink. Do not make alterations or erasures. Please **do not use abbreviations of medical terms**, since different people can interpret these in different ways.

2.5.2 Part I

2.5.2.1 Part I, Line (a), Disease or condition directly leading to death

Enter on line I(a) the immediate cause of death i.e. the disease or complication which directly preceded death.

There always must be an entry on line I(a): this condition may be the only condition reported in Part I of the certificate *only if* it was *not due* to, or did not arise as a consequence of any disease or injury that occurred before the immediate cause of death (for example if "viral myocarditis" was present at death).

It is recommended **NOT** to enter the mode of dying such as: cardiac arrest, collapse, respiratory failure, acute renal failure etc... (see also paragraph 2.6.2).

In the case of violent or non natural deaths the injury resulting from external causes is the immediate cause of death and thus it should be entered in line I(a). (Note: Address to National laws to certify external causes of death) (see also chapter 3 about external causes of Death certification).

2.5.2.2 Part I, Lines (b), (c) and (d), antecedent causes

If the immediate cause of death on line I(a) was due to, or arose as a consequence of another disease, this disease should be entered on line I(b). If the condition entered on line I(b) was itself due to another condition or disease, this other condition should be reported on line I(c). Similarly, a condition antecedent to that reported on line I(c) should be reported on line I(d). The lowest used line is the one where the underlying cause **MUST** be reported.

Additional line(s) may be added if necessary; however, remember that the antecedent condition which was the starting point in the chain of related events leading to the immediate cause of death, should be entered on the lowest used line in part I. **Never** enter the starting point of the sequence in Part II because of lack of space in Part I, as the condition or circumstance entered on the lowest line of Part I will be used as the basis for official mortality statistics.

A condition should be regarded as being antecedent not only in an aetiological or pathological sense, but also where it is believed that this condition prepared the way for the immediate cause by damage of tissues or impairment of function, even after a long interval.

Only one condition should be entered on each line; however, two independent diseases may be occasionally thought to have contributed equally to the fatal issue, and in such unusual circumstances they may be entered on the same line.

If the immediate cause of death entered on line I(a) was due to an accident, poisoning, or violence, enter a brief description of the external cause as an antecedent cause of death and the manner of death in the lowest used line or report them in the "additional information" box shown in paragraphs 2.7 and 3.3. (Note: Address to National laws to certify external causes of death) (see chapter 3 on external causes of Death certification) (see case histories N. 1- 3).

2.5.3 Part II, Other significant conditions

Enter in Part II, in order of significance, any other significant disease or condition which contributed to the fatal outcome even if it was not part of the sequence in Part I. (See case histories N. 4 - 6).

Box 5 - What should be reported and where?

Report in part I: (remember that either fewer lines may be used or more lines may be added, if necessary)

Line a: immediate cause of death
due to

Line b: antecedent cause
due to

Line c: antecedent cause
due to

Line d: underlying cause of death

Report in part II:

any other significant disease or condition that contributed to death.

2.5.4 Duration

Enter the duration between the onset of each condition (not the diagnosis of the condition) entered on the certificate and the date of death, in the column provided. Where the time or date of onset is not known, the best estimate should be made. The unit of time should be entered in each case (years, months, days, hours, even minutes).

It is preferable to approximate the duration or to enter “unknown” than to leave this column blank. In a correctly completed certificate, the duration entered for I(a) will never exceed the duration entered for the condition on line I(b) or I(c) or I(d); nor will the duration of the *intermediate cause of death* entered on line I(b) or I(c) exceed that one for the underlying cause of death on line I(c) or I(d) since these conditions are entered in ascending order of the causal sequence.

If a death is due to late effects of a previous injury, please state the circumstances of this injury, e.g. *bronchopneumonia due to paraplegia due to motor vehicle accident - 3 years ago*.

This information is useful in coding certain diseases and also provides a useful check on the accuracy of the reported sequence of conditions.

2.5.5 When the cause cannot be determined

Sometimes, despite extensive autopsy and laboratory (toxicology, immunology, virology, bacteriology) examinations, the cause of death may remain unknown. If this is the case, the certifier will have no other choice than to indicate in some way that the cause of death “could not be determined.” One possible phrase is “CAUSE of death not determined at autopsy and toxicological examination” This is better than the term “Unknown” as it at least indicates the extent of the investigation undertaken. If appropriate, mark the appropriate modality in the item “manner of death” shown in the “additional information” box in paragraph 2.7. (See case histories N. 23-24).

2.6 Other important hints

2.6.1 Accidents in surgery and procedures

Please report any accident in surgery or medical procedures that takes part in the chain of events leading to death or contributed to it, in accordance with national laws. Refer to box 8 for further details.

2.6.2 Avoid mechanisms: how and when

The immediate cause does not mean the mechanism of death or terminal event (for example: cardiac arrest or respiratory arrest). The mechanism of death should not be reported as the immediate cause of death since it is a statement not specifically related to the disease process, and it merely attests to the fact of death. Therefore, the mechanism of death provides no additional information on the cause of death. If an organ system failure (such as congestive heart failure, hepatic failure, renal failure, or respiratory failure) is listed as a cause of death, always report its etiology on the line(s) beneath it (e.g. *renal failure; due to Type I diabetes mellitus; or multi-organ failure due to hepatic coma due to ethylene glycol poisoning*).

2.6.3 How to improve specificity

Each condition should be reported precisely as concerned its site(s), aetiology, duration and manifestation(s) in order to allow a correct and well-differentiated coding for statistical purposes by the competent Office.

The most clear and important example at this regards is the certification of **malignancies** (see box 6), where information about site, morphology, behaviour, whether primary or secondary, site of origin, etc are necessary to obtain a specific code and reliable mortality statistics as a consequence. Another important example refers to **drugs**: when a drug is involved in the death, please remember to give the name of the drug (preferably the pharmacological principle, not the commercial name).

Chapter 5 shows in detail several examples of what should be always reported for each disease or condition; please refer to that list in order to: improve certification quality, reduce the amount of necessary queries and speed up data processing and release. (Refer also to the list in chapter 5)

Box 6 - Neoplasm reporting check-list

Please remember to specify:

- Whether benign, malignant or uncertain behaviour;
- The primary site if known;
- If the primary site is unknown;
- The morphological type if known;
- Site(s) of metastases and primary site if known;
- The expression "metastatic from site" defines the primary site(s);
- The expression "metastatic to site" defines the secondary site(s);
- Possibly avoid non-specific terminology such as "carcinomatosis", "carcinosis", "growth", "malignancy", etc...;
- Identify leukemia as "acute", "sub-acute" or "chronic", and define the involved cell type.

(See case histories N. 11-15)

Additional information about the etiology should be included when conditions such as those in table 1 are reported; if the certifier is unable to determine the **etiology** of a process, the process must be qualified as being of an unknown, undetermined, probable or presumed etiology.

Table 1 - Conditions requiring additional information on etiology (this is not a complete list)

A				N	S
	Brain stem herniation	Decubiti	Heart failure		
Abscess	C	Dehydration	Hepatic failure	Necrotizing soft-tissue infection	Seizures
Abdominal hemorrhage		Carcinogenesis	Hepatitis	O	Sepsis
Adhesions	Carcinomatosis	Diarrhea	Hepatorenal syndrome		Old age	Septic shock
Adult respiratory distress syndrome	Cardiac arrest	Disseminated intravascular coagulopathy	Hyperglycemia	P	Shock
Altered mental status	Cardiac dysrhythmia	Dysrhythmia	Hyperkalemia		Pancytopenia	Starvation
Anemia	Cardiomyopathy	E	Hyponatremia	Paralysis	Subdural hematoma
Anoxia	Cardiopulmonary arrest		Embolism	Hypotension	Peritonitis	Subarachnoid hemorrhage
Anoxic encephalopathy	Cellulitis	End-stage liver disease	Hypovolemic shock	Perforated gallbladder	Sudden death
Arrhythmia	Cerebral edema	End-stage renal disease	I	Pleural effusions	T
Ascites	Cerebrovascular accident	Epidural hematoma		Immunosuppression		Pneumonia	Thrombocytopenia
Aspiration	Cerebellar tonsillar herniation	Exsanguination	Increased intra cranial pressure	Prematurity	U
Atrial fibrillation	Chronic bedridden state	F	Intra cranial hemorrhage	Pulmonary arrest		Uncal herniation
B	Cirrhosis		Failure to thrive	M	Pulmonary edema	Urinary tract infection
	Bacteremia	Coagulopathy	Fracture		Pulmonary embolism	V
Bedridden	Compression fracture	G	Metabolic encephalopathy	Pulmonary insufficiency	Ventricular fibrillation
Biliary obstruction	Congestive heart failure		Gangrene	Multiorgan failure	R	Ventricular tachycardia
Bowel obstruction	Convulsions	Gastrointestinal hemorrhage	Multisystem organ failure	Renal failure		Volume depletion
Brain injury	D	H	Myocardial infarction	Respiratory arrest	

2.6.4 How to improve specificity: infant deaths

The infant deceased should have a clear and distinct etiological sequence for cause of death, if possible. "Prematurity" should not be entered without explaining the etiology of prematurity. Maternal conditions may have initiated or affected the sequence that resulted in infant death, and such maternal causes should be reported in addition to the infant causes on the infant's death certificate (*e.g., Hyaline membrane disease; due to prematurity 28 weeks; due to placental abruption; due to blunt trauma to mother's abdomen*). When Sudden Infant Death Syndrome (SIDS) is suspected, a complete investigation should be conducted, according to National laws requirements. In case Sudden Infant Death Syndrome is confirmed, please report the whole diagnosis or its univocal and internationally used acronym (SIDS): it is not sufficient to state "Sudden Death" (*see case history N. 39*). (*Refer also to list in chapter 5*).

2.6.5 Importance of multiple causes of death reporting

All the causes reported on death certificates are important and can be analysed, especially with the approaches allowed by the current **automated coding systems** in use in several countries.

Multiple causes of death analyses do consider all conditions mentioned in the death certificate. Such analyses are important in studying certain diseases and conditions and in investigating relationships among conditions reported on the same death certificate (for example: types of fatal injuries and automobile crashes or types of conditions reported in front of degenerative chronic diseases in the elderly). Thus the certifier has both the responsibility and the opportunity, to make mortality statistics reflect the best medical opinion concerning both the underlying cause of death and the multiple causes of death.

2.6.6 Reasons and aims for querying

In some cases, the physician could be contacted to verify information reported on a death certificate or to provide additional information to clarify what was meant. The reported cause-of-death statement may not be wrong from a clinical point of view, but may not include sufficient information for statistical purposes. Following guidelines in this handbook should minimize the frequency with which a physician will need to spend additional time answering follow-up questions about a patient's cause of death. The competent Institute keeps additional information requests to a minimum; however, the co-operation of doctors in responding promptly to these inquiries is appreciated.

2.7 Additional information

This additional box (figure 3) is NOT part of the medical part of the international certificate of death recommended by WHO. However, its intended use is to provide a frame to collect important information as recommended by WHO and EUROSTAT (see annex 2, recommendations # 15 - 19). It is shown here only for clarity purposes; based upon National needs and current death certificate forms, each country, during the national implementation of this manual, should use this additional box, modify it or decide not to use it.

Figure 3 – Additional information box

DATE OF DEATH	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input type="checkbox"/> No Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				May further information be available later? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

2.7.1 Date of death

Enter the exact month, day, and year that death occurred. Pay particular attention to the entry of month, day, or year when the death occurs around midnight or December 31. Consider a death at midnight to have occurred at the end of one day rather than the beginning of the next. If the exact date of death is unknown, which may be the case in some investigations by the medical examiner, the date will be determined as a result of the investigation. If in the future the correct date is found to be different than that recorded, an amendment to the record may be made.

Sometimes is not possible to assign a precise date of death, as in the case of human remains discovered after death. In these cases, the midpoint of the presumed interval of the data of death should be reported (If specific national laws or regulations exist, please refer to them).

2.7.2 Manner of death

Complete this item for all deaths by checking the appropriate box. Deaths not due to external causes should be identified as “natural”. Physicians can certify deaths other than natural depending on National laws. (*Note: Address to National laws to ascertain who is in charge to certify external causes of death*). The other modalities for this item are described in paragraph 3.3.1 on external causes of death.

2.7.3 Autopsies

Please complete the field(s) on autopsies on the medical certificate because the omission of this information affects the quality of mortality statistics.

The cause of death should include information provided by the pathologist if an autopsy or other type of postmortem examination is carried out. For those deaths which have microscopic examinations pending at the time the certificate is filed, the additional information should be reported as soon as it is available, but the issuing of a death certificate should not be delayed if these information are lacking.

Was an autopsy performed? (Yes or No)

Enter “Yes” if a partial or complete autopsy was performed. Otherwise enter “No.”

Does the cause of death stated above take account of the autopsy findings? (Yes or No).

Enter “Yes” if the autopsy findings were available and used to determine the cause of death. Otherwise enter “No.” If no autopsy was performed, leave this item blank.

May further information be available later? (Yes or No)

If an autopsy or legal investigation is being held and further information relating to the cause or manner of death is expected to become available, enter “Yes.” Otherwise enter “No.” (*See also next paragraph 2.7.4*) (*see case histories N. 18, 23, 24*).

2.7.4 Amendments

Usually the death certificate should be completed and sent within a specified time period. Physicians are expected to use medical training, knowledge of medicine, available medical history, symptoms, diagnostic tests, and autopsy results, if available, to determine the cause of death.

If additional investigation, such as autopsy results are expected, the certifying physician should update the original information after the additional information becomes available.

If additional medical information or autopsy findings are received after the physician has certified the cause(s) of death and he or she determines the cause to be different from what was originally entered on the death certificate, the original certificate should be promptly amended by filing a supplemental report of cause of death with the competent institution; the clear statement “amended certificate” should be reported (*see case histories N. 40, 54*).

2.7.5 Place of death

The nature of the place, (*e.g. deceased’s home, hospital, nursing home, industrial site, farm, sea, jail, highway, etc.*) should be identified and reported.

2.7.6 If the deceased is a woman

Tick the appropriate item if the death occurred:

- during pregnancy;
- within 42 days thereafter;
- between 43 days and a year thereafter.

Otherwise, leave blank (*see case histories N. 29-31*).

2.8 Identities and other demographic information

2.8.1 Certifier identity and address

The full name of the professional certifying the death should be printed clearly in block letters in the space provided on the medical certificate. If requested in the death certificate form, please include medical council registration number. The address given should be the residential address for family physicians, while it can be the Hospital’s or other Institutes’ for professionals working there. It is acceptable to use a name and an

address stamp. However, each copy of the medical certificate must be stamped. Signature must be in original, or electronically authenticate where the electronic death certificate is available.

If extra information needs to be requested about a medical certificate, in the interests of confidentiality it is important that the query is sent to the right doctor at a current address.

2.8.2 Deceased's identity and demographic information

The full name of the deceased should be printed clearly in block letters in the space provided on the medical certificate. Additional information such as age, sex, time of death are usually requested; other kind of information (current job, education, birth-related info, etc...) are to be completed either from the certifying professional or the civil status officer depending on current National laws. Please address to National laws to ascertain who is responsible to fill these items.

2.9 National infant death certificate

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Each country should insert here the relevant information on the National death certificate for infant mortality.

Due to the large variability among countries on this topic both for the certificate format and periods of reference, National instruction should be followed to certify such deaths.

3 External causes of death

Details on very specific problems involved in the certification of external causes are beyond the aims of this manual and are not provided here. Please refer to the following instruction as general guidelines (see case histories N. 41-54).

3.1 Who is in charge of certifying external causes

WARNING!!

Chapters dealing with deaths due to violence or non natural causes are to be DISREGARDED by physicians not authorised to certify those deaths in countries where specifically appointed professional are in charge of issuing such certificates.

Since national laws, regulations, and customs vary significantly referring to which cases must be investigated by a medical-legal officer, each medical examiner, coroner, or any other appointed professional must become familiar with current national laws and regulations and ensure that all cases falling within his or her jurisdiction are properly investigated.

The completion of the cause-of-death section for a medical-legal case requires careful consideration due to special problems that may be involved. In fact, the cause of death may not be clear, even after autopsy and toxicological examination. However, despite these difficult aspects, it is important that the medical certification be as accurate and complete as circumstances allow.

3.2 How to report injuries

In the case of violent or non natural deaths the injury(ies) resulting from external causes is the immediate cause of death and thus it should be entered in line I(a).

For each fatal injury (e.g. *stab wound of chest*), always report the **trauma** with site (e.g. *transection of subclavian vein*), **and impairment of function** (e.g. *air embolism or cardiac tamponade*) that caused the death in part I of the medical death certificate. Non-fatal injuries, or diseases, can be reported in part II if they contributed to death.

If death is due to late effects of a previous injury, please state the circumstances of this injury (e.g. *bronchopneumonia - 1 week ago; due to paraplegia - 3 years ago; due to motor vehicle accident - 3 years ago*).

3.3 Additional information

This additional box (figure 3 bis) is NOT part of the medical part of the international certificate of death recommended by WHO. However, its intended use is to provide a frame to collect important information as recommended by WHO and EUROSTAT (see also annex 2, recommendations # 15- 19).

It is shown here only for clarity purposes; based upon national needs and current death certificate forms, each country, during the national implementation of this manual, should use this additional box, modify it or decide not to use it.

To provide an example of the necessary flexibility, the description of “the circumstances of death”, is also reported in part I of the death certificate in the collected case histories on external causes, as it is currently reported there in several countries. Each country, during the national implementation of this manual, should decide which one of the two possibility best fits with own national death certificate form.

Figure 3 bis – Additional information box

DATE OF DEATH	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input type="checkbox"/> No Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No May further information be available later? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Please refer also to paragraphs 2.7 and 2.8 to complete additional and demographic information.

3.3.1 Manner of death

Complete this item for every death. The item chosen must reflect the underlying cause of death. Mark the appropriate box if death was an *accident*, *suicide*, *homicide* or *could not be determined*. The ICD assigns specific codes for the cause of death to be classified as ‘undetermined’ where the certifier is unable to establish if a death was accidental or intentional. This ‘open verdict’ should be clearly stated by marking the appropriate box.

Deaths not due to external causes should be identified as *Natural*. Depending on National laws, these could be the only types of deaths a physician will certify.

3.3.2 Date of injury

Enter the exact day, month, and year on which the injury occurred. The date of injury may not necessarily be the same as the date of death. Date can be estimate: in this case the statement “approximate” may be provided and placed before the date.

3.3.3 Injury at work

Do not complete in case of natural death. The item must be completed for decedents aged 14 years or over and may be completed for those less than 14 years of age, if warranted. *Please refer to National laws to fill this instruction with the appropriate age.*

Enter “Yes” if the injury occurred at work, otherwise enter “No”. An injury may occur at work regardless of whether the injury occurred in the course of the deceased’s “usual” occupation (see *case history N. 42*).

3.3.4 Place of occurrence of the accident/injury

Enter the general category of the place where the injury occurred. Do not enter firm or organization names, just the general category for the place of injury; e.g. *at home, farm, prison, rest home, highway, lake, school, parking lot, corn field, public offices building, shop, recreational park, etc.*

3.3.5 Circumstances of occurrence of the accident/injury - How injury occurred

If the underlying cause of death is due to external causes, information regarding the circumstances should be provided. Enter a brief description of the external cause as an antecedent cause of death in line I(b) or I(c) of part I, depending on the sequence of consequent injuries, or report it in the additional box. (*For example: line I(a): skull fracture; line I(b): fall from cliff*).

Use a short description of how the injury occurred, explaining the circumstances or cause of the accident or injury, such as “fell off the ladder while painting house,” “ran off roadway while riding a bicycle,” or “car driver in car-truck collision.” For **transport accidents**, indicate necessary details, as introduced by the tenth

revision of the ICD (ICD-10) (see box 7 for details). In case of **accidents in surgery or medical procedures**, please refer to box 8 for details on how to report those cases.

In case of an accidental **fall**, the circumstances of the fall should be stated too; *e.g. accidental fall on stairs at home, or fall from bed in nursing home*. Specify if the fall occurred on the same level as ground, like: "slipped on ice in own house garden while walking" or occurred from a higher level from ground, like: "fell from scaffolding at work".

If known, the **activity** at the time of injury should be stated (*e.g. while washing car, while climbing on glacier etc.*) (see case histories N. 49, 50).

Any **tool, weapon, chemical agent, drug** involved in the injury/poisoning should be mentioned and specified in the following way: "accidentally swallowed paraquat herbicide stored in a soft drink bottle", "stabbed by unknown person with kitchen knife during an assault", "intentional carbon monoxide poisoning by inhalation of motor vehicle exhaust", "shot in the back with hunting rifle during hunt".

Box 7 - Reporting transport accidents

Please remember to specify:

- Type of vehicle(s) (bicycle, car, heavy transport vehicle, bulldozer, train, ultralight aircraft, commercial fixed-wing aircraft, horse, passenger ship, sailboat,...) when relevant to circumstances. Indicate and specify if more than one vehicle was involved;
- Specify type of vehicle deceased was in;
- Whether the deceased was a driver, passenger, occupant, pedestrian, or person outside the vehicle;
- If a collision occurred;
- If a collision occurred, specify the object(s) or type(s) of vehicle involved;
- The location at the time of the accident (on highway, off highway, railroad track, ski slopes, railroad track, off road, corn field, sea harbour, ...).

(See case histories N. 43- 45)

Box 8 - Reporting surgery and procedures

If a cause of death arose as a complication of or from an accident in surgery or other medical procedure or treatment, it is important to report:

- What the result of the complication or accident was;
- What the complication or accident was;
- What medical procedure was performed;
- What condition was being treated.

(See also case histories N. 36-38)

4 Case histories

4.1 Introduction to case histories

In the following chapter 54 examples of death certificate completion are presented. Each example includes a short case history followed by a completed death certificate. The form used to report cause of death is consistent with WHO recommendation and presents 4 lines in part I and a part II. It is useful to remind that the way of completion of the death certificate is not the only one possible but just an example of good certification according to the medical opinion of the Author.

Beside the international death certificate form, an additional box containing information about date of death, manner of death, date of injury, autopsy, place of death and place of injury, and about injury circumstances, has been provided.

For women in their fertile age, a box for specifying whether the death occurred during pregnancy or post-gestational period has been added.

4.2 General aspects

4.2.1 Focus on part I

Case history N. 1 - Just one antecedent cause

A boy aged 18 months died from a bacterial pneumonia caused by *Haemophilus influenzae* that he had been suffering for two days. The pneumonia intervened after measles which he contracted 7 days before death.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Bacterial pneumonia (<i>Haemophilus influenzae</i>) Due to (as consequence of)	2 days
Antecedent causes	b) Measles Due to (as consequence of)	1 week
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		_____
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 30/06/2003	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The immediate cause of death was pneumonia. It was considered to be the complication of measles as it is also indicated by durations.

Line I(a) of death certificate must always be entered. If it is not possible to identify a cause of death please state it (see case histories N. 23, 24). The mechanism of death such as cardiac arrest should not be reported

Time interval between the disease onset and death must always be reported even if approximate.

Case history N. 2 - More than one antecedent cause

A 68-year-old male was admitted to the hospital with progressive right lower quadrant pain of several weeks' duration. The patient had lost approximately 18 Kg, with progressive weakness and malaise. On physical examination, the patient had an enlarged liver span which was four fingerbreadths below the right costal margin. Rectal examination was normal and stool was negative for occult blood. Routine laboratory studies were within normal limits. Chests x ray and barium enema were negative. His EKG showed a right bundle branch block. CT scan showed numerous masses within both lobes of the liver. A needle biopsy of the liver was diagnostic of moderately differentiated hepatocellular carcinoma, and the patient was started on chemotherapy. Three months after the diagnosis, the patient developed sharp diminution of liver function as well as a deep venous thrombosis of his left thigh, and he was admitted to the hospital. On his third day, the patient developed a pulmonary embolism and died 30 minutes later.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Pulmonary embolism Due to (as consequence of)	30 minutes
Antecedent causes	b) Deep venous thrombosis in left thigh Due to (as consequence of)	3 days
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Acute hepatic failure Due to (as consequence of)	3 days
	d) Moderately differentiated hepatocellular carcinoma	over 3 months
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 20/05/2003	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The histology of the neoplasm has been reported.

Case history N. 3 - Additional line in part I

A woman of 59 died of asphyxia following inhalation of vomitus some hours after suffering a cerebellar haemorrhage. Three years before she had been diagnosed to having an adrenal adenoma with aldosteronism, which manifested itself as hypertension. Congestive heart failure was also present.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Asphyxia by vomitus Due to (as consequence of)	minutes
Antecedent causes	b) Cerebellar hemorrhage Due to (as consequence of)	hours
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Hypertension Due to (as consequence of)	about 3 years
	d) Aldosteronism	3 years plus
	e) Adrenal adenoma	3 years plus
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Congestive heart failure	3 years plus
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 14/03/2003	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

In order to provide more space for the description of the chain of events leading to death, experts of WHO, with the tenth revision of ICD, modified the international certificate of death introducing a fourth line in part I. Nevertheless sometimes more than four lines may be necessary to completely describe the process. In this case add additional lines, but space in part II must not be used to report a condition that caused the disease indicated last in part I. This example shows how an additional line was necessary.

4.2.2 Focus on part II

Case history N. 4 - An important pathology may be a contributory cause

A 63-year-old man died 2 days after the onset of a peritonitis caused by a duodenal perforation intervened 4 days before death. The duodenal perforation was the consequence of a chronic duodenal ulcer, which the man had been suffering for 1 year before death. He suffered also a bronchial carcinoma that was diagnosed three months before death.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Peritonitis Due to (as consequence of)	2 days
Antecedent causes	b) Duodenum perforation Due to (as consequence of)	4 days
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Chronic duodenal ulcer Due to (as consequence of)	1 year
	d) .....	.....
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Bronchial small cell carcinoma	6 months
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 12/04/2002	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

After filling in part I the certifier must consider whether there were other significant conditions that contributed to the fatal event but did not directly cause it. If this is the case, those conditions must be listed in part II. The condition starting the chain of events leading to death was the duodenal ulcer. The bronchial cancer did not directly participate to the death, but the certifier believes that it contributed to the death and then he has reported it in part II. Site and histology of neoplasm are also reported.

Case history N. 5 - Conditions not related to death and mechanisms of death are not reported in death certificate

A man aged 66 died the 20th of December 1998. He had a history of non-insulin dependent diabetes mellitus for 15 years. He had a cholecystectomy in 1992 due to biliary lithiasis. Six months before his death he developed diabetic glomerulosclerosis and 5 days before he suffered acute renal failure followed by hyperglycemic coma for 3 days causing respiratory arrest.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) <u>Hyperglycaemic coma</u> Due to (as consequence of)	<u>3 days</u>
Antecedent causes	b) <u>Acute renal failure</u> Due to (as consequence of)	<u>5 days</u>
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) <u>Diabetic glomerulosclerosis</u> Due to (as consequence of)	<u>6 months</u>
	d) <u>Non insulin dependent diabetes</u>	<u>15 years</u>
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 20/12/1998	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Non-insulin dependent diabetes mellitus gave rise to diabetic glomerulosclerosis. This last condition produced the acute renal failure, which ended in a respiratory arrest. The anterior cholecystectomy does not have to be reported because it was completely cured and healed and was not related to the death. It is not necessary to report respiratory arrest because it is a mechanism of death, not useful to describe the fatal chain of events.

Case history N. 6 - Reporting smoking habits in part II

A 68-year-old male was operated for a pulmonary cancer 6 years ago. He was hypertensive and had a strong infarction 5 years ago. His present health status was stable and he was regularly treated. He had been treated with anti-hypertensives for 15 years and his hypertension seemed to be under control. He was a heavy smoker and he regularly smoked 35 cigarettes per day. He suddenly had a strong retrosternal pain with syncope followed by shock. An ECG exam revealed problems in the rhythm and ventricular fibrillation. The first aid station staff intervened. His blood pressure was low (80/50). He died on arrival at hospital.

Cause of death		Approximate interval between onset and death
Part I Disease or condition directly leading to death* a) <u>Ventricular fibrillation</u> Due to (as consequence of)		minutes
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last b) <u>Hypotension</u> Due to (as consequence of)		minutes
c) <u>Acute myocardial Infarction</u> Due to (as consequence of)		minutes
d) _____ Due to (as consequence of)		minutes
Part II Other significant conditions contributing to death, but not related to the disease or condition causing it		
Arterial hypertension; infarction (5 years) tobacco use, Pulmonary cancer operated 6 years previously		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 04/05/2003	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Even though the arterial hypertension, the old myocardial infarction and the pulmonary cancer were under control, they were believed to have played a role in the death. Beyond the diseases listed, the certifier reported tobacco use in part II. This is an example of lifestyle habits or environmental conditions that are believed to contribute to death.

See also case histories N. 10; 16; 21; 2

4.2.3 Importance of providing the best medical opinion: alternatives to certificate completion in complex cases

Case history N. 7 - Medical opinion has an impact on mortality statistics

A man aged 57 had a history of insulin dependent diabetes mellitus which he had been suffering since he was 27 and ischemic heart disease which developed 8 years prior to death. 10 days before death he contracted influenza and, 3 days after, pneumonia.

1st way of completion

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Pneumonia Due to (as consequence of)	1 week
Antecedent causes	b) Insulin dependent diabetes mellitus Due to (as consequence of)	30 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Due to (as consequence of)	.....
	d) .....	.....
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Chronic ischaemic heart disease Influenza virus	8 years 10 days
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

According to the certifier the immediate cause pneumonia was caused by the long persistence of diabetes mellitus. Chronic ischaemic heart disease did not directly caused the death but contributed to it.

2nd way of completion

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Pneumonia Due to (as consequence of)	1 week
Antecedent causes	b) Chronic ischaemic heart disease Due to (as consequence of)	8 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Due to (as consequence of)	.....
	d) .....	.....
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Insulin dependent diabetes mellitus Influenza virus	30 years 10 days
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

In this case the certifier believes that chronic heart disease caused pneumonia. Diabetes mellitus contributed to death but did not cause any of the other conditions.

3rd way of completion

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) <u>Pneumonia</u> Due to (as consequence of)	<u>1 week</u>
Antecedent causes	b) <u>Influenza virus</u> Due to (as consequence of)	<u>10 days</u>
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	<u>Chronic ischaemic heart disease</u>	<u>8 years</u>
	<u>Insulin dependent diabetes mellitus</u>	<u>30 years</u>
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

In this case pneumonia is considered to be a consequence of influenza and does not have any casual relationship with the chronic diseases that the man suffered.

The additional information box will be completed for every case in the following way:

DATE OF DEATH 03/11/2002	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

This example illustrates how the cause of death statement can be correctly completed in different ways according to the opinion of the certifying physician. The different ways of completion are all correct but they result in a different cause of death code attribution. Then it is very important to decide which sequence the certifier thinks had the greatest impact and report it in part I. This example highlights the important role played by the certifier in determining the final outcome in mortality statistics.

4.3 Case histories on natural deaths

4.3.1 Infectious diseases

Case history N. 8 - Implied causative agent

A three-year-old boy died for toxæmia 4 days after an attack of laryngeal diphtheria.

Cause of death		Approximate interval between onset and death
Part I Disease or condition directly leading to death* a) <u>Toxaemia</u> Due to (as consequence of)		hours
Antecedent causes b) <u>Laryngeal diphtheria</u> Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last c) Due to (as consequence of)		4 days
d) Due to (as consequence of)		
Part II Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH	MANNER OF DEATH	DATE OF INJURY	INJURY AT WORK	Was an autopsy performed?
02/02/1995	<input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The term diphtheria implies the causative agent: there is no need to specify it.

Case history N. 9 - How to report AIDS

A 34-year-old male was admitted to the hospital with severe shortness of breath. He had a 9-month history of unintentional weight loss, night sweats, and diarrhoea. The patient had no history of any medical condition that would cause immunodeficiency. An Elisa test and confirmatory Western Blot test for human immunodeficiency virus (HIV) were positive. T-lymphocyte tests indicated a low T helper-suppressor ratio. A lung biopsy was positive for *Pneumocystis carinii* pneumonia (PCP), indicating a diagnosis of acquired immunodeficiency syndrome (AIDS). The patient's pneumonia responded to pentamidine therapy, and the patient was discharged. The patient had two additional admissions for PCP. Seventeen months after the patient was first discovered to be HIV positive, he developed PCP again, but did not respond to therapy. He died 2 weeks later.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) <i>Pneumocystis carinii</i> pneumonia Due to (as consequence of)	2 weeks
Antecedent causes	b) Acquired immunodeficiency syndrome Due to (as consequence of)	17 months
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) HIV infection (mode of transmission unknown) Due to (as consequence of)	over 17 months
	d) .....	.....
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		.....
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 07/09/1999	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

By definition, AIDS is due to HIV infection; even though it may seem redundant to specify HIV infection in the causal sequence death, it is desirable to do so. HIV infection and AIDS are not synonymous, and there is a variable clinical course between the time of HIV infection and onset of AIDS. It is not enough to report AIDS condition on the certificate, because consequences of this disease can be different. If known, report also the mode of transmission of the infection because this information can be useful for specific epidemiological studies (see case history N. 38).

Case history N. 10 - How to report sepsis

A 78-year-old man was admitted to hospital with fever and severe headache. The diagnosis was meningitis. Laboratory exams confirmed the diagnosis and revealed that the infection was sustained by *Staphylococcus aureus*. Despite antibiotics therapy the patient condition worsened and eventually degenerated into sepsis two days after admission. The man was actually affected for more than 15 years by non-insulin dependent diabetes mellitus and he had a renal transplant for renal complications 6 years before hospital admission. His septic state did not improve and the man died for a septic shock 5 days later.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Septic shock Due to (as consequence of)	1 day
Antecedent causes	b) <i>Staphylococcus aureus</i> sepsis Due to (as consequence of)	5 days
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) <i>Staphylococcus aureus</i> meningitis Due to (as consequence of)	1 week
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Renal transplant	6 years
	Type II diabetes	15 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 15/01/1998	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

When the immediate cause of death is sepsis, give the name of the causative agent and the site of the primary infection. If the certifier is not able to do so please specify: organism and site unknown.

See also case histories N. 1; 26; 27; 38; 42

4.3.2 Neoplasm

Case history N° 11 - Qualifying a neoplasm

A female aged 59 years with a history of hypertension for 10 years was admitted to hospital for investigation following complaint of persistent headache for some weeks. Exploratory craniotomy on 24th March revealed she had an inoperable tumour of the left temporal lobe. Biopsy showed the tumour to be an astrocytoma. The patient died 18th May.

Cause of death		Approximate interval between onset and death
Part I Disease or condition directly leading to death* a) Astrocytoma of left temporal lobe Due to (as consequence of)		months
Antecedent causes b) _____ Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last c) _____ Due to (as consequence of)		
Due to (as consequence of) d) _____		
Part II Other significant conditions contributing to death, but not related to the disease or condition causing it		10 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 18/05/2003	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Neoplasm are classified according to their benign or malignant features and by site. Hence the terms "neoplasm", "growth" and tumour should not be used without the qualification of malignant or benign. The primary site should be always indicated, even though the primary may have been removed long before death. If a secondary growth is included in the sequence of events leading to death, state the site of the secondary growth due to the site of the primary growth. If the primary site is unknown, this must be stated on the death certificate. In this certificate, hypertension was thought to have unfavourably influenced the course of the illness, but it was in no way related to the astrocytoma; therefore, it is reported in Part II.

Case history N. 12 - How to report metastases

A man aged 79 years develops a tumour in his inner inferior lip. He has an operation and the tumour is removed. The histological examination reveals a spinocellular carcinoma. Three years after the operation he develops some metastases on the neck and on the lower and upper jaw. The man dies from a cachexia.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Cachexia Due to (as consequence of)	15 days
Antecedent causes	b) Metastases to the neck, lower and upper jaw Due to (as consequence of)	2 months
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Spinocellular carcinoma of the inner lower lip (operated) Due to (as consequence of)	3 years
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 14/06/1998	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Accident <input type="checkbox"/> Suicide	<input type="checkbox"/> Homicide <input type="checkbox"/> Could not be determined	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):					Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area					May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area					
<input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)					
HOW INJURY OCCURRED (please specify)					
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy					
<input type="checkbox"/> Death occurred within 42 days after pregnancy					
<input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy					

When an expression such as "metastatic carcinoma, lung" is used without further clarification, it is not clear whether the primary site is the lung or if the lung is being referred as the metastatic site. Words should be selected in order to make these circumstances clear. The site of the secondary tumour has been clearly specified in this example as "metastases to the neck" which makes clear that the neck is the metastatic site.

Case history N. 13 - Primary cancer successfully removed

A 47-year-old woman with a history of diabetes was operated for malignant neoplasm in her left breast. The postoperative histology showed that the malignant neoplasm also affected the axillary lymph nodes. Further examinations revealed liver metastases. 2 months later, the patient died in hepatic failure.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Chronic hepatic failure Due to (as consequence of)	1 week
Antecedent causes	b) Secondary malignant neoplasm of liver Due to (as consequence of)	2 months
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Secondary malignant neoplasm of axillary lymph nodes Due to (as consequence of)	7 months
	d) Malignant neoplasm of the central portion of the breast	8 months
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Insulin-dependent diabetes mellitus	11 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The operation is not in the casual chains of events leading to death and it is not reported in the death certificate. Even though the primary malignant cancer was successfully removed it will be indicated as underlying cause of death because it is the cause of the secondary malignant neoplasm.

Case history N. 14 - Unknown neoplasm primary site

A female aged 48 years, with diffuse metastases along the vertebral column, died from bronchopneumonia. Despite accurate examinations, the primary neoplasm could not be identified.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) <u>Bronchopneumonia</u> Due to (as consequence of)	1 week
Antecedent causes	b) <u>Carcinomatous metastases along the vertebral column</u> Due to (as consequence of)	1 months
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) <u>Primary tumour unknown</u> Due to (as consequence of)	
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 05/04/2000	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

It is necessary to specify that the primary tumour is unknown because the carcinomatosis is a generic expression that should be avoided as underlying cause of death.

Case history N. 15 - Unknown neoplasm localization

An 87-year-old man died of a generalized carcinomatosis. A stomach carcinoma (not surgically removed) was diagnosed to have. As the neoplasm was clinically diagnosed, the exact anatomical localization was not determined.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Generalized carcinomatosis Due to (as consequence of)	1 month
Antecedent causes	b) Stomach carcinoma (exact localization unknown) Due to (as consequence of)	months
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		_____
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 15/02/2001	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input type="checkbox"/> Hospital <input checked="" type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

In this case it is necessary to report that the exact localization was not determined.

See also case histories N. 2; 4; 31; 40

4.3.3 Circulatory system diseases

Case history N. 16 - Myocardial infarction

A 70-year-old man with a 10-year history of non-insulin dependent diabetes mellitus and hypertension and a 2-year history of angina arrived to the hospital with an acute myocardial infarction. Two weeks after discharge, he returns with recurrent pain and signs of congestive heart failure. His electrocardiogram shows ischemia. He is admitted to the coronary care unit, where he has a cardiac arrest and dies.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Anterior myocardial infarction Due to (as consequence of)	2 weeks
Antecedent causes	b) Arteriosclerotic coronary artery disease Due to (as consequence of)	2 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Hypertension	10 years
	Non insulin dependent diabetes mellitus	10 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 14/03/2003	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The man died of atherosclerotic coronary artery disease. This led to his myocardial infarction and recurrent ischemic pain, which resulted in congestive heart failure and cardiac arrest. Cardiac arrest is a mechanism of death and congestive heart failure is a non-specific process; neither of them is etiologically specific, therefore they should not be used as the underlying cause of death.

Case history N. 17 - More on myocardial infarction

This 53-year-old male was admitted to the hospital following 2 days of intermittent midepigastic and left-sided chest pain. The pain radiated to his left arm and was accompanied by nausea and vomiting. He gave a history that included 2 years of occasional chest discomfort, a near syncopal episode 6 months prior, hypertension, a 30-year history of one-pack-per-day cigarette smoking, congenital blindness, and insulin-dependent diabetes mellitus. He was noted to be markedly obese and to have severe hypercholesterolemia. At the time of admission, his enzyme studies were normal, but the EKG suggested myocardial ischemia. Two days later, he experienced an episode of severe chest pain that did not respond to nitro-glycerine and was accompanied by ST-segment elevation. A cardiac catheterisation demonstrated severe multivessel coronary artery stenosis. He underwent quadruple coronary artery bypass surgery. Shortly, after being taken off the cardiopulmonary bypass machine, he went into cardiac arrest. As resuscitation was being attempted by open cardiac massage, a rupture developed in his left ventricular wall, which resulted in rapid exsanguination and death.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Rupture of left ventricle Due to (as consequence of)	minutes
Antecedent causes	b) Acute myocardial infarction Due to (as consequence of)	2 days
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Coronary atherosclerosis Due to (as consequence of)	2 years
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Insulin dependent diabetes mellitus, cigarette smoking (30 years) Hypercholesterolemia, coronary bypass surgery (hours)	
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 06/10/2000	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

In this case, insulin-dependent diabetes mellitus, cigarette smoking, hypertension, and hypercholesterolemia would all be considered factors that contributed to the death. However, they would not be in the direct causal sequence of Part I, so they would be placed in Part II. The surgery probably played a role in death but did not cause the coronary artery disease, so, it is also listed in Part II. The smoking habit can be assigned to the main chain of events leading to death; this different approach depends from different medical opinion or local habits.

Case history N. 18 - How to report arteriosclerosis

A male aged 60 years who had been having a history of hypertension for 20 years and symptoms of ischaemic heart disease for 5 years, dropped dead at home. The coronary thrombosis, which was confirmed at autopsy, was diagnosed to be the cause of death.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Coronary thrombosis Due to (as consequence of)	immediate
Antecedent causes	b) Coronary arteriosclerosis Due to (as consequence of)	5 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Atherosclerosis Due to (as consequence of)	many years
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Hypertension (benign)	20 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 04/04/1999	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

It is recognised that atherosclerosis will probably be generalised by the time of death. However, the site of arteriosclerosis or atherosclerosis which led to the immediate cause of death, e.g. coronary atherosclerosis, cerebral atherosclerosis is needed.

Case history N. 19 - Hypertension as underlying cause

A 63-year-old man suffers from hypertension. He is cured for many years but develops a hypertensive cardiac disease and a chronic renal failure. While the cardiac disease worsens, he suffers from an acute appendicitis with rupture of the appendix and he is operated. The operation was successful, but the cardiac disease worsens and the man dies two weeks later.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Cardiac failure Due to (as consequence of)	1 day
Antecedent causes	b) Hypertensive cardiac disease Due to (as consequence of)	2 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Hypertension Due to (as consequence of)	5 years
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Appendectomy due to acute appendicitis with appendix rupture	2 weeks
	Chronic renal failure	2 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 15/04/2000	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Appendicitis and the operation contributed to the exacerbation of the cardiac disease but they are not part of the chain of events leading to death. For this reason they are reported in part II as well as renal failure. If hypertension is thought to be the underlying cause, all complications must be reported (eg. heart or renal involvement). It is desirable to qualify hypertension as malignant or benign.

Case history N. 20 - Old rheumatic fever

A man aged 45 years dies for mitral failure due to a rheumatic fever from which he suffered 20 years before.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Mitral failure Due to (as consequence of)	3 months
Antecedent causes	b) Endocarditis of mitral valve Due to (as consequence of)	20 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Rheumatic fever (inactive) Due to (as consequence of)	20 years
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 08/06/2001	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Although the rheumatic fever has been contracted many years before death, it is responsible of the complications that lead the man to death. It is important to report if this condition was active or inactive at the time of death.

See also case histories N. 6; 21; 27; 28; 45

4.3.4 Respiratory Diseases

Case history N. 21 - How to report pneumonia

A male aged 64 years was admitted to the hospital with an arteriosclerotic cerebral infarction. He was transferred to rehabilitation where he developed hypostatic pneumonia. In ICU sputum cultured *Klebsiella pneumoniae* and the patient died shortly after. He has been suffering from ischaemic hart disease for 19 years and he has been an alchoolist for some 20 years.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Hypostatic <i>Klebsiella pneumoniae</i> Due to (as consequence of)	1 week
Antecedent causes	b) Cerebral infarction Due to (as consequence of)	2 months
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Arteriosclerosis Due to (as consequence of)	many years
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Alcoholism	20 years
	Ischaemic heart disease	19 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH	MANNER OF DEATH	DATE OF INJURY	INJURY AT WORK	Was an autopsy performed?
02/08/2000	<input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				
May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Pneumonia is often a disease that occurs as the terminal event in someone who dies of a more specific underlying cause of death, such as congestive heart failure resulting from ischemic heart disease. In such cases, the specific underlying cause of death should be included in the cause of death statement

When pneumonia or bronchopneumonia are reported on death certificate, please identify if the condition is primary, hypostatic or due to aspiration (of vomitus, food) and, if possible, the causative organism. If the pneumonia has been caused by debility or inactivity please state the condition leading to the inactivity or debility.

Case history N. 22 - Risk factors for respiratory diseases

A 75-year-old male had a 10-year history of chronic bronchitis associated with smoking two packs of cigarettes a day for more than 40 years. When seen by his physician approximately 2 years prior to his terminal episode, he had moderately reduced FEV₁ and FVC with no response to bronchodilators. During his last year, he required corticosteroids to prevent wheezing and coughing at night; however, he was unable to reduce his smoking to less than one pack of cigarettes per day. When seen 3 months prior to his terminal episode, he had significantly reduced FEV₁ and FVC with no response to bronchodilators. He awoke one evening complaining to his wife about coughing and worsening shortness of breath. He was taken to the emergency room where he was found to have an acute exacerbation of obstructive airway disease. He was admitted to the hospital. At the patient's request, no mechanical ventilation was employed, and he died 12 hours later in respiratory arrest.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Acute exacerbation of obstructive airways disease Due to (as consequence of)	12 hours
Antecedent causes	b) Chronic bronchitis Due to (as consequence of)	10 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Cigarette smoking	40 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify): _____				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify) _____				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Relevant risk factors should also be cited in the cause of death statement, as might occur in a smoker who develops chronic bronchitis. Respiratory arrest is considered a mechanism of death, and it would not be listed as the immediate cause of death.

See also case history N. 1

4.3.5 Ill-defined conditions and undetermined causes of death

Case history N. 23 - Sudden and unknown natural death

A 92-year-old male was found dead in bed. He had no significant medical history. Autopsy disclosed minimal coronary disease and generalized atrophic changes commonly associated with aging. No specific cause of death was identified. Toxicology was negative.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) <u>Undetermined natural causes</u> Due to (as consequence of)	<u>unknown</u>
Antecedent causes	b) _____ Due to (as consequence of)	_____
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		_____
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 07/07/2000	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify): _____				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify) _____			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify) _____				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

In some cases, no overwhelming cause presents itself. It is acceptable to indicate that a thorough investigation was performed; however, no cause was identified. As the certifier did not find any external cause for the decease, the manner of death will be natural.

Case history N. 24 - Cause and manner of death stay undetermined upon autopsy or toxicological examination

On August 18th, 2003, a 32-year-old female was found dead at home. Initial investigation did not reveal the cause of death; neither did autopsy or toxicological examination.

Cause of death		Approximate interval between onset and death
Part I Disease or condition directly leading to death*		unknown
a)	Cause of death not determined upon autopsy and toxicological examination Due to (as consequence of)	
b)	Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last Due to (as consequence of)	
c)	Due to (as consequence of)	
d)	Due to (as consequence of)	
Part II Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

This example is one way in which the medical-legal officer, after reasonable investigation, can indicate that the cause has not been determined.

DATE OF DEATH Presumably 17/08/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Accident <input type="checkbox"/> Suicide <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Could not be determined	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

In this case even if the autopsy results were available, the certifier was not able to determine the cause or the manner of death. The information on the autopsy performed must be reported in the appropriate item.

4.3.6 Elderly deaths

The certification of death in the elderly poses some problems because they often seem to die “with their diseases” rather than “of their diseases”. An aged person may suffer from several diseases or conditions, none of which clearly led to death. However, if possible, the elderly decedent should have a clear and distinct etiological sequence for the cause of death. Terms such as “senescence, infirmity, old age”, and “advanced age” are not relevant from the public health standpoint. Age is recorded elsewhere on the certificate, in addition there are no standards about what age is “old”. When a number of conditions resulted in death, the physician should choose the single sequence that, in his or her opinion, best describes the process leading to death, and place any other pertinent conditions in Part II.

Case history N. 25 - Report specific condition

A 75-year-old woman has a 20-year history of Alzheimer's disease. She is unable to perform any activities of daily living, and she requires 24-hour nursing care in a chronic care facility. She refuses to eat, and after discussion with the family, a decision is made to forgo enthal or intravenous feeding. She dies 20 days later.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Dehydration Due to (as consequence of)	days
Antecedent causes	b) Alzheimer's disease Due to (as consequence of)	20 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		_____
_____		_____
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 23/03/2002	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input type="checkbox"/> Hospital <input checked="" type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify): _____				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify) _____			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify) _____				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Dehydration is a non-specific process and must not be used as underlying cause of death.

Case history N. 26 - Competing causes in elderly

Clostridium difficile colitis develops in an 88-year-old nursing-home resident. The woman has not received antibiotics recently. She is admitted to hospital for rehydration and antimicrobial therapy. She has a 25-year history of type II diabetes mellitus and a 10-year history of angina. On the day of her scheduled discharge from hospital, she has a thrombotic stroke in the territory of the left middle cerebral artery that is confirmed on a CT scan of the head. Her level of consciousness deteriorates, and she dies.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) <u>Left middle cerebral artery infarction</u> Due to (as consequence of)	<u>1 day</u>
Antecedent causes	b) _____ Due to (as consequence of)	_____
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	<u>Diabetes mellitus (25 years) Coronary artery disease (10 years)</u>	
	<u>Clostridium difficile colitis (1 week)</u>	
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 22/06/1998	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Although the temporal sequence makes sense based on the woman's history, the certifying physician has not listed 2 competing causes (colitis and stroke) in part I, because it is unlikely that stroke occurred as a consequence of colitis. The woman had well-documented risk factors for cerebrovascular disease. *C. difficile colitis* is more appropriately listed in part II, with left middle cerebral artery infarction listed as the cause of death. An underlying cause of death can stand alone in a Cause of Death statement, as illustrated in this case. An alternative completion would be to list "cerebral artery atherosclerosis" on line I(b) as a more specific underlying cause of death. This would indicate that the cause of the stroke was not cardioembolic in origin. Without an autopsy, however, the certifying physician does not always know this information.

Case history N. 27 - Complications of cerebrovascular accidents in elderly

An 82 year-old female, found by her daughter 10 days before the time of death, unable to stand up, walk and speak. On physical examination the patient showed hemiparalysis of the right side. She reacted to instructions, but she could not speak. Her blood pressure was 110/80 and she became incontinent with an indwelling catheter. A more serious urinary infection entailed hospitalisation. She was unconscious and her blood pressure was always low. She died from septicaemia during the night. Her medical history revealed she had been treated for varicose veins 22 years ago (sclerosis followed by stripping four years later) and she had been operated on bile stones 17 years before. She had been obese and diabetic for 20 years (treated with oral hypoglycemiants). This woman was also hypertensive and had been treated for 5 years with diuretics and potassium helped.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Septicaemia Due to (as consequence of)	1 day
Antecedent causes	b) Urinary infection (organism unknown) Due to (as consequence of)	10 days
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Hemiparalysis, incontinence Due to (as consequence of)	10 days
	d) Cerebral vascular accident	10 days
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	arterial hypertension (5 years), obesity (20 years), Non insulin dependent diabetes mellitus (20 years)	
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The woman had many risk factors for cerebrovascular accidents, which have been documented in part II. All the complications that led the woman to death are listed in part I.

Case history N. 28 - Chronic heart diseases in elderly

A 102-year old female was brought to the hospital because her word combinations were not comprehensible, but at admission, her sentences were lucid. She was placed on blood anticoagulants. She had a history of arthritis, hypertension, blocked arteries, coronary heart disease (25 years before), stroke (10 years before), periodic TIA's (8 year period), and congestive heart failure (hospitalised 6 years before). On the fourth day in the hospital, a colonoscopy indicated internal bleeding, so the anticoagulant was discontinued. She was released from the hospital after 7 days. After discharge, language and motor skills were impaired although functioning was better earlier in the day; moreover, her leg coloration started changing. After a week at home, the woman was re-admitted to the hospital following a spell of vomiting. Vascular imaging indicated that circulation was blocked at the groin, there was no improvement in language, ability to eat and keep food down deteriorated, and heart rate periodically was arrhythmic with periods of 3rd degree heart block. After a week of hospitalisation she was sent home under hospice care and died two days later. Her attending physician completed the death certificate.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Congestive heart failure Due to (as consequence of)	6 years
Antecedent causes	b) Coronary heart disease Due to (as consequence of)	25 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Hypertension (20 years) periodic TIA's (8 years)	_____
	Atrial fibrillation	5 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 02/02/2002	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify): _____				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify) _____				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Despite the very complicated clinical history of the decedent, the certifier was able to determine the etiological sequence for the cause of death. The relevant condition that can have contributed to death has been placed in part two. Expressions like "senile degeneration" have not been used.

4.3.7 Maternal deaths

Case history N. 29 - Eclampsia

A 33-year-old woman, 36 weeks gestation, had arterial hypertension (160/115), oedema and proteinuria for a week before her death. The last day she had violent convulsions (eclampsia), cerebral haemorrhage and 12 hour later she died.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Cerebral hemorrhage Due to (as consequence of)	12 hours
Antecedent causes	b) Eclampsia Due to (as consequence of)	1 day
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Severe preclampsia Due to (as consequence of)	1 week
	d) .....	.....
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		.....
.....	
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 15/12/2002	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input checked="" type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

When a death occurs during pregnancy, labour or puerperium, it must always be indicated in the appropriate item or reported in part II even though the maternal condition is not related to the death.

Case history N. 30 - Complications of miscarriage

A 28-year-old female died on November 19th, 2000. She suffered from arterial hypertension and chronic rheumatic cardiac disease, which was diagnosed at the age of 23. That condition was probably caused by an acute rheumatic fever during her childhood. In 1998 she had an abnormal childbirth.

The 19th November, 2000 she was admitted to hospital for uterine haemorrhage due to uterine erosion for a miscarriage two days before. She died for a hypovolemic shock

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Hypovolemic shock Due to (as consequence of)	hours
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	b) Uterine hemorrhage Due to (as consequence of)	hours
	c) Incomplete spontaneous abortion Due to (as consequence of)	2 days
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Chronic rheumatic cardiac disease	5 years
	Arterial hypertension	5 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 19/11/2000	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input checked="" type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

In part II of the certificate all those condition that put the woman at risk for pregnancy-related problems have been reported.

Case history N. 31 - Breast cancer during pregnancy

A 36-year-old married dentist assistant was allergic to penicillin. She was pregnant for the second time and the first pregnancy finished with miscarriage at the 6th week of amenorrhoea. A specialist followed the second pregnancy. At the 28th week of amenorrhoea, following a congestive mammary swelling, a mammography to the right breast was performed revealing a breast cancer. A biopsy diagnosed an adenocarcinoma. The patient was transferred to a cancer centre. Further examinations revealed a local invasion and pulmonary metastases. After being informed about the diagnosis, the patient decided to continue the pregnancy and although the clinical situation was serious, no treatment was performed. After a scheduled caesarean birth at the 37th week, the baby was born alive. Chemotherapy was immediately performed, but 8 days later, the metastases reached the brain and a coma followed. This young female died 3 days later.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Coma Due to (as consequence of)	3 days
Antecedent causes	b) Metastases to brain Due to (as consequence of)	3 days
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Breast adenocarcinoma Due to (as consequence of)	10 weeks
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Cancer diagnosed at the 28th week of amenorrhoea and no anti-cancer treatment was performed, caesarean birth at the 37th week of amenorrhoea, 11 days before death	
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 10/03/2003	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input checked="" type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The fact that the cancer was not cured during pregnancy has been reported in part II. Caesarean birth has also been listed.

4.4 Miscellanea

4.4.1 Work related diseases

Case history N. 32 - Silicosis

A 73-year-old male had been smoking 15 cigarettes per day for 40 years. He was a metallic pieces sandblasting skilled worker for a metallurgic industry. Some 20 years ago, after sanitary controls including hard rays thoracic radiography carried out in the firm, a nodular pulmonary silicosis was diagnosed. 5 years later, the spirometric test showed a restrictive ventilatory insufficiency that progressively worsened and was accompanied by effort dyspnoea. Moreover, 10 years ago, the ECG exam showed a previous myocardial ischemia of the anterior septum. 2 years ago, after a worsening of the dyspnoea that was also present at rest, the patient was subjected to further cardiologic and radiological tests (thoracic x-rays and echocardiogram), showing a chronic pulmonary heart disease. Today he had a serious difficulty in breathing with a clinical picture showing an acute pulmonary oedema that lead to death.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Acute pulmonary oedema Due to (as consequence of)	1 day
Antecedent causes	b) Chronic pulmonary heart disease Due to (as consequence of)	2 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Nodular pulmonary silicosis Due to (as consequence of)	20 years
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Ischemic cardiopathy	10 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 14/06/2000	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The acute pulmonary oedema is frequently the terminal condition of a chronic pulmonary heart disease, which is a pathology following to serious respiratory insufficiency like that one caused by pulmonary silicosis in this case. The ischemic cardiopathy also, together with the respiratory pathology, contributed to the cardiac insufficiency worsening.

Case history N. 33 - Mesothelioma

A 58-year-old male had been smoking 20 cigarettes per day for 30 years; he worked for a specialized firm and he was a worker dealing with insulation and false ceiling works and therefore he had been exposed to asbestos fibres. A chronic bronchitis showing persistent cough and catarrh for 3-4 months every year was diagnosed 10 years ago. He had been complaining dyspnoea for 1 year. The radiological examination showed a mass in the lung. A biopsy followed and the histopathologic diagnosis was malignant pleural mesothelioma. The patient's conditions worsened one month before death and a CT scan showed the presence of several diffuse metastases. Patient's conditions worsened because of a serious wasting leading to death one week later.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) <u>Neoplastic cachexia</u> Due to (as consequence of)	<u>1 week</u>
Antecedent causes	b) <u>Spread metastases</u> Due to (as consequence of)	<u>1 month</u>
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) <u>Malignant pleural mesothelioma</u> Due to (as consequence of)	<u>1 year</u>
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	<u>Chronic bronchitis</u>	<u>10 years</u>
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 06/05/2003	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The pleural mesothelioma has been chosen as underlying cause of the morbid process that through the spreading of metastases ended with cachexia (malignant tumoral pathologies frequent outcome). Chronic bronchitis certainly contributed to the patient's condition worsening.

4.4.2 Drug addiction, Alcoholism

Case history N. 34 - Common complications of chronic alcohol consumption

A 65-year-old man died in January 2001. He had been an alcohol consumer since he was 20. Four years prior to death he had a diagnosis of alcoholic liver cirrhosis. Two years later he was involved in a traffic accident in which he sustained femur and ribs fracture. Three days before his death he presented oesophageal varices bleeding with hematemesis and melena.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Oesophageal varices bleeding Due to (as consequence of)	3 days
Antecedent causes	b) Alcoholic liver cirrhosis Due to (as consequence of)	4 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Chronic alcoholism Due to (as consequence of)	45 years
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 06/01/2001	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)		May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The traffic accident that occurred two years prior the death had not casual relation with the death, therefore, it is not reported in the death certificate. The chronic alcohol consumption was the real cause of the complications that led the man to death.

Case history N. 35 - Overdose

An unemployed 38-year-old female was found dead at home from an overdose of methadone benzodiazepine and heroin. She was a well-known drug addicted (she had been a heroin addict for 10 years). She tried several detoxification treatments unsuccessfully. She had been seropositive for 4 years and had pneumocystis 1 year ago. 2 months before death, she was imprisoned for a short time. During that period, her health status worsened (toxoplasmosis with neurological complications were diagnosed). Since Acquired Immunodeficiency Syndrome (AIDS) was diagnosed, she had been treated with zidovudine (AZT), but she followed this treatment at irregular intervals.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Overdose of methadone, benzodiazepine and heroin Due to (as consequence of)	minutes
Antecedent causes	b) Heroin addict Due to (as consequence of)	10 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	HIV infection (4 years) AIDS (1 years), toxoplasmosis (2 months), pneumocystis (1 year) Bad living conditions, irregular treatment	_____
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 14/07/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY 14/07/2003	INJURY AT WORK <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input checked="" type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify) Overdose of methadone, benzodiazepine and heroin				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

4.4.3 Surgery

Case history N. 36 - Reporting condition necessitating surgery

A male aged 54 years, with a 10-year history of ischemic heart disease, was admitted to hospital for colon removal surgery because of a carcinoma of the sigmoid colon. The patient developed a postoperative pulmonary embolism three days later and died shortly after.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) <u>Pulmonary embolism</u> Due to (as consequence of)	<u>1 hour</u>
Antecedent causes	b) <u>Colectomy due to cancer of the colon</u> Due to (as consequence of)	<u>3 days</u>
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) <u>Primary carcinoma of sigmoid colon</u> Due to (as consequence of)	<u>18 months</u>
	d) .....	.....
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	<u>Ischemic heart disease</u>	<u>10 years</u>
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 14/03/2001	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

As the carcinoma of the sigmoid colon was the condition necessitating the surgery, this will be selected as the underlying cause of death. Entering a postoperative complication, or a complication of a medical procedure always include the condition for which the operation was performed and when the operation was performed.

It is rare for pulmonary embolism to occur spontaneously in anyone below the age of 75 year, and there are a large variety of underlying causes of this condition. Where Pulmonary Embolism is the immediate cause or mode of death it should be entered as such in Part Ia of the death certificate, with its underlying cause(s) sequenced in the due to relationship on the lines below it.

See also case histories N. 6; 17; 19; 51

4.4.4 Medical and surgical postprocedural complications

Case history N. 37 - Unexpected reaction to anesthetic

A 32-year-old woman with reflux nephropathy and shrunken right kidney with abdominal pain she had been suffering from 1 day, was admitted to private hospital for elective right nephrectomy. During anesthesia induction she had an anaphylactic shock to the muscle relaxant vecuronium and it has been impossible to revive her.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Anaphylactic shock (vecuronium) Due to (as consequence of)	minutes
Antecedent causes	b) Induction of anaesthesia for nephrectomy Due to (as consequence of)	minutes
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Reflux nephropathy with shrunken right kidney Due to (as consequence of)	days
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 14/02/2003	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)			May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

When an anaphylactic shock is reported, substance or drug responsible for it must be reported.

Case history N. 38 - Transfusion and AIDS

A 34-year-old male, who was a commercial engineer, died in hospital from respiratory failure. The patient had been admitted to hospital for 20 days for intensive treatment. He was seropositive to AIDS as diagnosed 2 years before (initial diagnosis: pneumocystis). Admission to hospital was due to Kaposi's sarcoma and pulmonary attacks. He also contracted oesophageal candidiasis and was an atypical mycobacteria carrier. He contracted HIV infection 5 years ago, after a blood transfusion needed as consequence of a car crash caused at a dangerous crossing. This patient was also treated for a serious depression he developed after learning about HIV infection.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Pulmonary Kaposi's sarcoma, oesophageal candidiasis, mycobacteria <i>Due to (as consequence of)</i>	months
Antecedent causes	b) Acquired immunodeficiency syndrome <i>Due to (as consequence of)</i>	over 2 years
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Blood transfusion contaminated with HIV <i>Due to (as consequence of)</i>	5 years
	d) car crash <i>Due to (as consequence of)</i>	5 years
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	serious depression	5 years
	pneumocystis at the beginning of AIDS	2 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 25/02/2000	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

In case of AIDS and other infectious diseases, the mode of transmission of the infective agent is relevant for statistical purposes. The reason for transfusion has been put in part I because it is required for statistical purposes (see box 8).

4.4.5 Sudden infant death syndrome

Case history N. 39 - Sudden infant death syndrome

On March 18th 2003, a 2-month-old male was found dead in his crib. There was no previous illness, and, although autopsy revealed a congestion of the lungs, the medical examiner determined that this did not cause the death. Because no other conditions leading the infant to death could be found, the cause of death was determined to be sudden infant death syndrome.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Sudden infant death syndrome Due to (as consequence of)	unknown
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	b) _____ Due to (as consequence of)	_____
	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II Other significant conditions contributing to death, but not related to the disease or condition causing it		_____
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 17 or 18/03/2003	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

4.4.6 Amendments after further exams results - natural deaths

Case history N. 40 - Amending the cause of death

A 60-year-old man was diagnosed having recurrent idiopathic pancreatitis for 3 years. Other medical history included type 1 diabetes mellitus, nephrolithiasis that required lithotripsy, and cholecystitis that required cholecystectomy. He had abdominal symptoms that led to diagnoses of pancreatic abscesses and peritonitis. Medical management and surgical drainage led to the culture of multiple organisms from the inflammatory process; then systemic sepsis and coagulopathy developed and resulted in death. The family initially declined to have an autopsy performed, and the cause-of-death statement on the death certificate was prepared by the attending physician as follows:

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) <u>Intra-abdominal abscess</u> Due to (as consequence of)	<u>2 days</u>
Antecedent causes	b) <u>Peripancreatic abscess</u> Due to (as consequence of)	<u>1 week</u>
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) <u>Chronic pancreatitis</u> Due to (as consequence of)	<u>3 years</u>
d)		
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 18/04/1999	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)			May further information be available later? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Amendments due to autopsy results

Autopsy revealed widespread intra-abdominal abscesses. The head of the pancreas contained a 3-cm mucinous cystic neoplasm, which was microscopically proved to be an infiltrating mucinous cystadenocarcinoma. Metastatic adenocarcinoma was found in the lungs, subcarinal and pulmonary hilar lymph nodes, perirenal soft tissue, and peripancreatic and periportal lymph nodes. The pancreas also showed hemorrhagic cystic spaces consistent with abscesses and pseudocysts with haemorrhage. The location and morphologic characteristics of the tumour indicated that it had obstructed the pancreatic duct, which probably accounted for the pancreatitis and pseudocyst formation.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Sepsis Due to (as consequence of)	unknown
Antecedent causes	b) Peritonitis Due to (as consequence of)	unknown
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Pancreatic abscess Due to (as consequence of)	unknown
	d) Infiltrating cystadomacarcinoma of the pancreas	unknown
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 18/04/1999	MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area		<input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area		May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		<input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)		
HOW INJURY OCCURRED (please specify)				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

4.5 Case histories on external causes of death

4.5.1 Accidents and transport accident

Case history N. 41 - Accidental injury and depression

A 64-year-old female was found dead by her husband during the night. She was lying down next to the fridge and a broken glass with milk was found not too far from her. She fell down and hit a step. After resuscitating, she complained about a thoracic pain and then headaches. She was then rushed to the first aid station. After 30 minutes, she got into coma and she died one hour later. Autopsy revealed a petrous bone breaking, cerebral haematoma, and broken ribs. This female was depressed and she had been suffering from insomnia for 1 year. She was using several sleeping drugs.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Coma Due to (as consequence of)	1 hour
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	b) Cerebral haematoma Due to (as consequence of)	2 hours
	c) Petrous bone fracture Due to (as consequence of)	2 hours
	d) Fell and hit a step by accident	2 hours
Part II Other significant conditions contributing to death, but not related to the disease or condition causing it		
Depression, abuse of sleeping drugs, broken ribs.		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 07/05/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Suicide <input type="checkbox"/> Homicide <input type="checkbox"/> Could not be determined	DATE OF INJURY 08/05/2003	INJURY AT WORK <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input checked="" type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify) Fell and hit a step at night				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The underlying cause was the injury sustained in decedent's home. For statistical and epidemiological purposes, in order to prevent deaths, it is important to know the external cause responsible of the fracture. That was the knock against the step. Therefore the nature of the lesion and the external agent which caused it will be reported in part I. Depression has been reported as contributory cause.

Case history N. 42 - Injury at work

On May 15th 2003, a 49-year-old gardener male was brought to the emergency room with an infected wound of the right foot. Because of repeated convulsions, he was admitted to the hospital. The examining physician made a diagnosis of tetanus. His wife reported that while employed as a gardener on April 1st, 2003, he stepped on a garden rake. He treated the laceration by himself. Patient died of asphyxia during convulsions on May 16th 2003. Autopsy supported diagnosis.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Convulsions Due to (as consequence of)	2 days
Antecedent causes	b) Clostridium tetanus infection Due to (as consequence of)	6 weeks
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Infected puncture laceration of foot Due to (as consequence of)	6 weeks
	d) Accidentally stepped on rake while gardening	6 weeks
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 16/05/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY 01/04/2003	INJURY AT WORK <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input checked="" type="checkbox"/> Other (specify) Garden..				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify) Stepped on rake while gardening				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

In this case the decedent contracted tetanus during his work activity. This must be reported in the appropriate item or in part I.

Case history N. 43 - Driver in vehicle accident

A 49-year-old man died of fracture of the vault of the skull shortly after being involved in a collision between the car he was driving and a heavy truck on a narrow road.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Fracture of vault of skull Due to (as consequence of)	15 minutes
Antecedent causes	Accidental collision between car he was driving and heavy truck on road	15 minutes
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	b) Due to (as consequence of) c) Due to (as consequence of) d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 07/06/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY 07/06/2003	INJURY AT WORK <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Was an autopsy performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input checked="" type="checkbox"/> Other (specify): Public road				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input checked="" type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify) Driver of car in collision car-heavy truck				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Specify how and where a transport accident occurred. The underlying cause of death is the collision between a motor vehicle and another motor vehicle on the road. The deceased person is specified as "driver".

Case history N. 44 - Alcohol and transport accident

On January 2nd 2003, a 21-year-old female was critically injured in an automobile accident and died from a fractured skull causing cerebral contusion soon after being brought to the hospital. She was the driver in a two-car collision that occurred at 2:15 a.m. at the corner between two roads. The decedent crossed the centerline and struck an oncoming car head on. Autopsy showed injuries and blood ethanol of 0.240 grams percent.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Cerebral contusion Due to (as consequence of)	30 minutes
Antecedent causes	b) Fractured skull Due to (as consequence of)	30 minutes
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Blunt impact to head Due to (as consequence of)	30 minutes
	d) Driver in accidental collision of two cars	30 minutes
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Acute alcohol intoxication (0.240 grams percent)	
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 02/01/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY 02/01/2003	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input checked="" type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify) Driver in frontal collision of two cars				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				
May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				

Although alcohol intoxication did not directly cause the death, it could have contributed to the accident and it must be reported in part II.

Case history N. 45 - Pedestrian invested by a car

A 59-year-old man died on February 10th 2000. He had a history of non-insulin dependent diabetes for 20 years; in the last year he suffered diabetic precoma. One year before death, he had an acute transmural myocardial infarction of the laterobasal wall for which he was hospitalised. Height days prior to death he was invested by a car while crossing a road. He reported multiple fractures of ribs and sternum and was admitted to hospital. The 10th of February he had a new myocardial infarction at the same site and died.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Acute myocardial infarction of the laterobasal wall Due to (as consequence of)	1 day
Antecedent causes	b) Multiple fractures of ribs and sternum Due to (as consequence of)	8 days
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Pedestrian accidentally run over by a car while crossing a road Due to (as consequence of)	8 days
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Acute myocardial infarction of the laterobasal wall	1 year
	Non insulin dependent diabetes	20 years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 10/02/2000	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY 02/02/2000	INJURY AT WORK <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Sports and athletics area <input checked="" type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify) Pedestrian invested by a car while crossing a road				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The certifier believes that the new myocardial infarction was caused by the multiple fractures caused by the accident.

4.5.2 Suicides

Case history N. 46 - Autopsy confirmed intentional self-inflicted gunshot wound

On May 10th 2003, a 25-year-old male was admitted to the hospital with a gunshot wound to the head. He had been at home in his study when the shot was fired at approximately 9 p.m. A letter clearly stating the intention to kill himself was on the desk. He died at 11:05 p.m. on the same day. Autopsy showed contact gunshot wound of right temple confirming that the act was intentional.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Penetration brain injury Due to (as consequence of)	2 hours
Antecedent causes	b) Gunshot wound to head (suicide) Due to (as consequence of)	2 hours
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		_____
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 10/05/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input checked="" type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input checked="" type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area		<input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area	<input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)	May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify) Decedent had contact gunshot wound to the right temple				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Autopsy findings and other evidences in this case indicate an intentionally inflicted gunshot wound rather than accidental discharge of a firearm.

Case history N. 47 - Suicide in depression

A 35-year-old female treated from maniac-depressive psychosis, was treated with lithium. This treatment was irregularly followed. She was found already dead, hanging on a beam of her barn. She lived alone, very isolated (no family, no relationships).

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Asphyxia by hanging (suicide) Due to (as consequence of)	unknown
Antecedent causes	b) Irregular treated maniac depressive psychosis Due to (as consequence of)	unknown
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		_____
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 15/02/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input checked="" type="checkbox"/> Suicide	DATE OF INJURY 15/02/2003	INJURY AT WORK <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input checked="" type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify) Hanging				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Depression is often the cause of suicide. According to the beliefs of the certifying physician it can be reported in part I as an antecedent cause of suicide or in part II as contributory cause.

See also case history N. 53

4.5.3 Homicide

Case history N. 48 - Assault

A 32-year-old male was admitted to the hospital on August 23, 2003, with several stab wounds. He had been found by the police in an alley at 4 a.m. No weapon was discovered. He died at 6:30 p.m. on the same day. Autopsy revealed that the intrathoracic hemorrhage due to the stab wound of the lung could be considered fatal.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Pulmonary hemorrhage Due to (as consequence of)	15 hours
Antecedent causes	b) Stab wound of lung Due to (as consequence of)	15 hours
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Stabbed by sharp instruments during assault Due to (as consequence of)	15 hours
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Several stabs wounds of abdomen and extremities	15 hours

*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.

DATE OF DEATH 23/08/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input checked="" type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY 23/08/2003	INJURY AT WORK <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Sports and athletics area <input checked="" type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify) Stabbed by sharp instruments				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The only injury that caused death is reported in part I. Other stab wounds are reported in part II because they contributed to the death but did not directly cause it.

4.5.4 Falls in the elderly

Case history N. 49 - Falls and senile dementia

An elderly female with senile dementia had been unstable on her feet. While walking, she fell and struck her head on the floor. She seemed to be okay, but was then found dead a few hours later on the sofa. Autopsy showed an occipital scalp hematoma and significant subdural hematoma.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Subdural hematoma Due to (as consequence of)	3 hours
Antecedent causes	b) Blunt force head trauma Due to (as consequence of)	3 hours
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Accidentally fell while walking Due to (as consequence of)	3 hours
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Senile dementia	years
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 15/08/2002	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY 15/08/2002	INJURY AT WORK <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input checked="" type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify)				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify) Fell to floor while walking				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The fall is reported on the lowermost completed line in Part I which allows for the manner of death to be classified as an accident. In this case the disease is reported in Part II as other significant conditions.

Case history N. 50 - Falls due to senility

In June the 1st 2003, a female aged 80 years stumbled and fell over while vacuuming at home and sustained a fracture of the neck of the left femur. She had an operation for insertion of a pin the following day. Four weeks later her condition deteriorated, she developed hypostatic pneumonia and died two days later.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Terminal hypostatic pneumonia Due to (as consequence of)	2 days
Antecedent causes	b) Fractured left neck of femur (pinned) Due to (as consequence of)	4 weeks
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Accidentally stumbled while vacuuming at home Due to (as consequence of)	4 weeks
	d) General frailty	years
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 03/07/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY 01/06/2003	INJURY AT WORK <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input checked="" type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				
HOW INJURY OCCURRED (please specify) Stumbled while vacuuming at home				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The certifier believes that the fall was caused by the general frailty due to the old age of the lady and he reported this condition in part I.

4.5.5 Poisoning

Case history N. 51 - Acute alcohol intoxication

On July 4th 2003, a 56-year-old male was found dead in a hotel. Autopsy revealed no anatomic cause of death. Blood alcohol level was 0.450 grams percent.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Acute alcohol poisoning Due to (as consequence of)	unknown
Antecedent causes	b) Over ingested ethanol beverages (alcohol level in blood 0.450 g percent) - Accident Due to (as consequence of)	unknown
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____ Due to (as consequence of)	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Alcoholic cirrhosis	unknown
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 03/06/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY 03/06/2003	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input checked="" type="checkbox"/> Other (specify): Hotel room.....				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input checked="" type="checkbox"/> Other (specify) Hotel Room.....		May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
HOW INJURY OCCURRED (please specify) Over ingested ethanol beverages. Decedent's blood alcohol level was 0.450 grams percent				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Although the autopsy revealed the presence of alcoholic cirrhosis, related to chronic alcohol consumption, the event that caused the death was the excess of alcohol consumed that led to an acute intoxication.

Case history N. 52 - Accidental poisoning with drugs

On January 12th 2003, a 2-year-old female was admitted to the hospital with salicylate poisoning. She had been under treatment for tonsillitis and upper respiratory infection. She had been given multiple excessive doses of aspirin (adult rather than baby tablets). She died on January 13th 2003.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Acute salicylate poisoning Due to (as consequence of)	23 hours
Antecedent causes	b) Accidental aspirin overdose Due to (as consequence of)	23 hours
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Treatment for acute tonsillitis Due to (as consequence of)	2 days
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it	Upper respiratory infection	
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 13/01/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY 12/01/2003	INJURY AT WORK <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input checked="" type="checkbox"/> Home <input type="checkbox"/> Residential institution <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Street and highway <input type="checkbox"/> Trade and service area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Farm <input type="checkbox"/> Other (specify)				May further information be available later? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
HOW INJURY OCCURRED (please specify) Overdose of aspirin given				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

Manner of death is accident because there is no evidence of intentionality. When a death is due to poisoning, please specify the substance that led to the intoxication. In part I is reported the reason for use of substance that led to death.

Case history N. 53 - Suicide by poisoning

On May 5th 2003, a 54-year-old male was found dead from carbon monoxide poisoning in an automobile in a closed garage. A hose, running into the passenger compartment of the car, was attached to the exhaust pipe. The deceased had been despondent for some time as a result of a malignancy, and letters found in the car indicated intent to take his own life.

Cause of death		Approximate interval between onset and death
Part I Disease or condition directly leading to death* a) <u>Carbon monoxide poisoning</u> Due to (as consequence of)		<u>unknown</u>
Antecedent causes b) <u>Inhaled auto fumes from auto exhaust through hose in an enclosed in garage for suicidal intent</u> Due to (as consequence of)		<u>unknown</u>
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last c) _____ Due to (as consequence of)		_____
d) _____		_____
Part II Other significant conditions contributing to death, but not related to the disease or condition causing it		
<u>Cancer of stomach</u>		

*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.

DATE OF DEATH <i>Unknown</i>	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input checked="" type="checkbox"/> Suicide	DATE OF INJURY <i>Unknown</i>	INJURY AT WORK <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input checked="" type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify): _____				
PLACE OF INJURY				
<input checked="" type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> Farm <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Other (specify) _____				
HOW INJURY OCCURRED (please specify) Inhaled carbon monoxide from auto exhaust through hose in an enclosed in garage				
IF FEMALE INDICATE:				
<input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

It is preferable to specify the nature of the substance that caused the decease instead of using a generic expression as exhaust auto fumes.

4.5.6 Amendments after further exams results - external causes

Case history N. 54 - Amending the manner of death and the external cause

On September 4th 2003, a 50-year-old alcoholic male was found unconscious in an abandoned house at 4 a.m. by the police. He was admitted to the hospital where he died at 10 a.m. on the same day. Examination on admission revealed a large subdural hematoma causing intracerebral haemorrhage. There was a large subgaleal haemorrhage over the area of the subdural hematoma.

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Subdural hematoma Due to (as consequence of)	unknown
Antecedent causes	b) Blunt force impact to head for undetermined intent Due to (as consequence of)	unknown
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) _____ Due to (as consequence of)	_____
	d) _____	_____
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		_____
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH 04/09/2003	MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input checked="" type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	DATE OF INJURY	INJURY AT WORK <input type="checkbox"/> Yes <input type="checkbox"/> No	Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input checked="" type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input type="checkbox"/> Other (specify):				Does the cause of death stated above take account of autopsy findings? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input checked="" type="checkbox"/> Other (specify) Abandoned house....		May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
HOW INJURY OCCURRED (please specify) Unknown				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

The above certificate was issued before police investigation was completed. After a thorough investigation, the legal-medical officer made the judgment that the decedent probably fell down the stairs next to which the body was found. The certificate should be amended in the appropriate item to "Accident."

Amendment due to results of investigation

Cause of death		Approximate interval between onset and death
Part I		
Disease or condition directly leading to death*	a) Subdural hematoma Due to (as consequence of)	unknown
Antecedent causes	b) Blunt force impact to head Due to (as consequence of)	unknown
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	c) Probable accidental fall down the stairs Due to (as consequence of)	unknown
	d)	
Part II		
Other significant conditions contributing to death, but not related to the disease or condition causing it		
*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury or complication that caused death.		

DATE OF DEATH	MANNER OF DEATH	DATE OF INJURY	INJURY AT WORK	Was an autopsy performed?
04/09/2003	<input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Could not be determined <input type="checkbox"/> Suicide	04/09/2003	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF DEATH <input type="checkbox"/> Home <input type="checkbox"/> Hospital <input type="checkbox"/> Long-term care Institute <input checked="" type="checkbox"/> Other (specify): Abandoned house..				Does the cause of death stated above take account of autopsy findings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PLACE OF INJURY <input type="checkbox"/> Home <input type="checkbox"/> Sports and athletics area <input type="checkbox"/> Industrial and construction area <input type="checkbox"/> Residential institution <input type="checkbox"/> Street and highway <input type="checkbox"/> School, other institution and administrative area <input type="checkbox"/> Trade and service area <input type="checkbox"/> Farm <input checked="" type="checkbox"/> Other (specify) Abandoned house.....				May further information be available later? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
HOW INJURY OCCURRED (please specify) Probable fall down the stairs				
IF FEMALE INDICATE: <input type="checkbox"/> Death occurred during pregnancy <input type="checkbox"/> Death occurred within 42 days after pregnancy <input type="checkbox"/> Death occurred between 42 days and 1 year after pregnancy				

5 List of imprecise causes and hints on how to add specificity

5.1 Introduction

Some diseases or conditions have been reported in more than one chapter because of their multifactorial aetiology and because of the fact that different certifiers could look to some diseases as originated from different systems. This approach could help the certifier in the correct completion of the death certificate.

I INFECTIONS

General information to be reported by the certifier in order to add specificity to the infection diseases:

- Acute, subacute, or chronic; *e.g. acute amoebic dysentery*;
- Name of the disease and/or infecting organism, where known; *e.g. staphylococcal enterocolitis*;
- The site, if localized;
- Mode of transmission, where relevant;
- Primary or secondary, congenital or acquired, early or late, clinical form; *e.g. congenital syphilitic encephalitis*.

See also case histories N. 8-10; 1; 3; 21; 42

Cytomegalic inclusion disease

If due to AIDS or other HIV illness

Encephalitis	Type	Acute viral: specify name causal organism if known Late effect of viral: specify state if death was due to late effects of the disease Postvaccinal Idiopathic Meningococcal Suppurative Tuberculous
Endocarditis	Acute or chronic Site Cause	Mitral valve, aortic valve Rheumatic, bacterial
Dysentery	Type	Amoebic (and, if so, whether acute or chronic) Bacterial Other protozoal
Hepatitis	Type	Acute or chronic Of newborn Of pregnancy, childbirth or puerperium Viral (and if so, whether Type A, B, C, D, E)
Human Immunodeficiency Virus (HIV) disease		Complication(s) and the presence of acute syndrome If due to medical post-procedural complications
Influenza		With pneumonia Other manifestation (specify)

Meningitis	Cause	Meningococcal Tuberculous <i>Haemophilus influenzae</i> Other organism (specify)
Septicaemia (bacteraemia, pyaemia, etc)		
	Antecedent illness (antecedent condition leading to septicaemia)	
	Type of organism	
Syphilis	Site affected	
	Type	Congenital Early or late, primary, secondary, tertiary
Tetanus (See case history N. 42)		
	If following	Minor injury (specify) Major injury (specify)
	Puerperal, obstetric	
Toxaemia	Antecedent cause	
	Pregnancy (specify)	Albuminuria Eclampsia Hyperemesis Hepatitis Hypertension Pre-eclampsia
Toxoplasmosis	If due to AIDS or other HIV illness	
Tuberculosis	Primary site	
	Associated pneumoconiosis if present	
	Mode of transmission	
Urinary tract infection		
	Primary	Specify the organism and the precise location; <i>e.g. ureter or kidney</i>
	Secondary	Specify the antecedent disease; <i>e.g. diabetes</i>

II NEOPLASMS

General information to be reported by the certifier in order to add specificity to the neoplasm:

- The morphological type, if known; *e.g. astrocytoma temporal lobe brain*;
- Malignant, benign, etc., if not specific to the morphology; *e.g. prostatic benign tumor; e.g. melanoma*;
- Site of origin of primary growths, stated as precisely as possible, and sites of secondary growths, clearly distinguished as such;
- If the primary growth or the exact site within an organ is unknown, state accordingly;
- To avoid ambiguity in interpretation, if the term "metastatic cancer" is used, it should be qualified by identifying both the primary and secondary sites, and whether metastatic to (secondary) or metastatic from (primary); *e.g. metastases from breast primary to lung*.

See also paragraph 2.6.3 and box 6

See also case histories N. 11-15; 31

Cancer	The site of primary cancer, if known
	The site of secondary cancer
	Morphological type, if known

Kaposi's sarcoma

If	Due to AIDS or other HIV illness
	Not due to HIV infection; <i>e.g. endemic Kaposi's sarcoma of skin</i>

Leukaemia	Acute, subacute or chronic Type Lymphatic Myeloid Monocytic
Lymphoma	Type; <i>e.g. Hodgkin's disease; non-Hodgkin's lymphoma, mixed-cell type</i>
Metastatic	Identify whether metastatic TO (Secondary) or metastatic FROM (Primary); <i>e.g. metastases from breast primary to lung</i>
Neoplasm	Identify the morphology, malignancy, site and behaviour Type Benign Malignant with site of primary growth
Paget's disease	Specify site; <i>e.g. breast, skin</i> Specify if malignant
Secondary	Identify primary site or document primary as Unknown
Tumor / Growth	Identify the morphology, malignancy, site and behaviour Type Benign Malignant Unknown behaviour

Site of Primary Neoplasm (*e.g. primary carcinoma of inner aspect lower lip*)

Lip	Mouth	Pharynx	Oral	Skin
lower	cheek (mucosa)	nasopharynx	tongue	vulva
upper	vestibule	hypopharynx	salivary gland	vagina
commissure	retro molar	oropharynx	palate	penis
skin of lip	overlapping	tonsil	gum	scrotum
overlapping	unknown	pyriform sinus	overlapping	melanoma (by site)
unknown	overlapping	unknown	unknown	other specified type (by site) unknown

Liver	Intestine	Uterus	Endocrine Gland	Adrenal Gland
Sarcoma	large (colon)	cervix uteri	parathyroid	medulla
angiosarcoma	small	corpus uteri	pituitary	cortex
hepatoblastoma	colon with rectum	ligament	craniopharyngeal	unknown
hepatocellular	unknown	overlapping	pineal	
intrahepatic duct		unknown	pluriglandular	
unknown			aortic body	
			unknown	

Respiratory	CNS	Female Genitalia	Urinary Organs
Nasal cavity	meninges	ovary	kidney
middle ear	brain	adnexa	ureter
accessory sinuses	"specific" lobe	placenta	bladder
mediastinum	"specific" ventricle	uterine ligament	urethra
trachea	brain stem	broad ligament	paraurethral gland
thymus	cranial nerve	round ligament	overlapping
bronchus	spinal cord	parametrium	unknown
larynx	cauda equina	fallopian tube	
overlapping	overlapping	overlapping	
unknown	unknown	unknown	

III BLOOD DISORDERS

General information to be reported by the certifier in order to add specificity to the blood disorders:

- Nature of the disease process; *e.g. pernicious anaemia;*

- Whether hereditary, where relevant; *e.g. hereditary spherocytosis*;
- If drug-induced state the name of the drug involved, and the condition for which it was prescribed; *e.g. platelet deficiency due to pain-relief pills due to severe back pain*.

Agranulocytosis	Cause If due to drug therapy, specify condition for which drug given
Anaemia	Primary Specify type and nature of any deficiency Secondary Specify antecedent cause
Coagulation	Factor involved for coagulation defects; <i>e.g. congenital Factor IX deficiency</i>
Haemoglobinopathy	Specify the nature; <i>e.g. thalassaemia</i>

IV ENDOCRINE, NUTRITIONAL AND METABOLIC DISORDERS

General information to be reported by the certifier in order to add specificity to the endocrine, nutritional and metabolic disorders:

- Nature of the disease process or disturbance of function; *e.g. corticoadrenal insufficiency*; *e.g. congenital syndrome of iodine deficiency*;
- Type of deficiency, etc.; *e.g. pure hyperglyceridaemia*;
- Severity, where appropriate.

See also case histories N. 5; 7

Diabetes	Nature of complication or manifestation in a particular site
Diabetes mellitus	Type I or II diabetes With Complication(s); <i>e.g. nephropathy, peripheral vascular disease</i>
Goitre	Type Simple Toxic Diffuse Uninodular Multinodular
Malnutrition	Type Congenital If due to deprivation or disease (specify) Protein deficient, (specify type and degree of severity)
Thyroid	Disorders, specify whether toxic
Uraemia	Cause Associated childbirth or pregnancy

V MENTAL AND BEHAVIOURAL DISORDERS

General information to be reported by the certifier in order to add specificity to the mental and behavioural disorders:

- Nature of disease process; *e.g. paranoid schizophrenia*;
- Drug dependence: specify substance involved; *e.g. alcoholism*.

See also case histories N. 25; 47

Dementia	Cause; <i>e.g. senile, alcoholic, atherosclerotic, alzheimer's or multi-infarct</i> Date of onset
-----------------	--

Mental retardation Antecedent physical condition

Mental disorders or alienation

Behavioural disorder
 Immediate cause of death
 Disease involved; e.g. *congenital, cerebral disease, arteriosclerosis, syphilis*

VI NERVOUS SYSTEM DISORDERS

General information to be reported by the certifier in order to add specificity to the nervous system disorders:

- Nature of disease process; e.g. *spongiform encephalopathy (Creutzfeldt-Jakob disease)*;
- Infecting organism, where relevant; e.g. *Haemophilus influenzae meningoencephalitis*;
- Whether hereditary, where relevant; e.g. *hereditary peripheral neuropathy*.

See also case history N. 27

Chorea Type Rheumatic
 With heart involvement
 Without heart involvement
 Huntington's
 Gravidarum

Encephalitis Type Acute viral
 Late effect of viral
 Postvaccinal
 Idiopathic
 Meningococcal
 Suppurative
 Tuberculous

Hemiplegia Cause and duration; e.g. *spinal cord injury from motor vehicle accident - 20 years previously*

Hydrocephalus Congenital or acquired, and if so, the antecedent cause

Nevrite Site
 Cause; e.g. *alcohol, lead, rheumatism*

Paralysis; paresis Cause; e.g. *due to birth injury, syphilis*
 Precise form; e.g. *infantile, agitans*

Parkinson Specify if agitans paralysis or sequelae of acute encephalic infection

IX CIRCULATORY DISEASES

General information to be reported by the certifier in order to add specificity to the circulatory diseases:

- Nature of disease process; e.g. *Rheumatic mitral regurgitation; e.g. coxsackie endocarditis*;
- Site, if localized; e.g. *hypertensive heart and renal diseases*;
- Acute or chronic, where relevant; e.g. *acute rheumatic pericarditis*;
- Any complications.

See also case histories N. 16- 21; 2; 6; 26-28; 44

Aneurysm Site; e.g. *cerebral, aortic*
 Cause; e.g. *arteriosclerotic*
 Ruptured or dissecting

Arteriosclerosis, Atheroma or Atherosclerosis

If associated with hypertension, specify type; *e.g. benign, malignant*;
Arteries involved; *e.g. coronary, cerebral*

Arteritis

Arteries involved; *e.g. coronary, cerebral*;
Cause; *e.g. arteriosclerotic, syphilitic*

Arthritis

Type *e.g. rheumatoid, juvenile*
Cause; *e.g. traumatic*
Site

Cardiac

Failure

Dilation

Hypertrophy

Decompensation

Antecedent disease causing this condition

Cardiovascular disease

Specific disease condition; *e.g. hypertensive*

Carditis

Site Myocardium
Endocardium
Pericardium
Type Acute
Rheumatic
Meningococcal or viral

Cerebral degeneration

Antecedent cause

Cerebral effusion

Antecedent cause

Cerebral sclerosis

Atherosclerosis or disseminated sclerosis

Cerebrovascular accident (CVA)

Cause Infarction
Haemorrhage
Thrombotic/embolic

Cerebrovascular disease

Nature of disease; *e.g. atherosclerosis causing infarction, haemorrhage occlusion - thrombotic/embolic*

Deep venous thrombosis

If Following an operation: condition for which operation performed
Due to inactivity: the condition causing the inactivity

Embolism

Site
If Following an operation: condition for which surgery performed
Due to inactivity: antecedent condition causing the inactivity

Endocarditis

Acute or chronic
Site mitral valve, aortic valve, pulmonary valve, tricuspid
Cause rheumatic, bacterial

Haemorrhage

Site
Cause (if due to injuries, state circumstances of injuries)

Hypertension	With	Heart involvement Cerebrovascular involvement Renal involvement Pregnancy If secondary, specify antecedent cause
Infarction - cerebral		If due to occlusion, stenosis, embolism/thrombosis
Infarction - myocardial		Site Acute, healed or old
Myocarditis		Acute or chronic Cause; e.g. <i>rheumatic fever, atherosclerosis</i> ;
Peripheral vascular disease		Cause; e.g. <i>atherosclerosis</i> ; Site
Rheumatic fever	Active or inactive With	Nature of heart disease Hypertrophy, carditis, endocarditis
Sclerosis	Arterial:	Coronary, Cerebral (specify whether disseminated or atherosclerosis) Disseminated, spinal (lateral, posterior), renal
Thrombosis	Arterial (specify artery) Intracranial sinus:	Pyogenic Non-pyogenic Late effect Post-abortive Puerperal Venous (specify site) Portal If post-operative or due to confinement in bed, specify condition which necessitated operation or immobilisation
Valvular disease	Valve(s) affected Acute or chronic If	Rheumatic: active or inactive Non-rheumatic: specify cause
Vascular disease		Nature; e.g. <i>hypertensive, peripheral</i> Cause

X RESPIRATORY DISEASES

General information to be reported by the certifier in order to add specificity to the respiratory diseases:

- Nature of disease process; e.g. *Pseudomonas pneumonia*;
- Acute or chronic; infecting organism; e.g. *acute bronchitis*;
- Any external cause; e.g. *radiation pneumonia due to inhalation of contaminated dust from nuclear plant explosion*.

See also case histories N. 21-22; 1

Asthma	Allergic or late onset
Atelectasis	Antecedent cause

Bronchitis	Type	acute or chronic With asthma, emphysema etc.
Bronchopneumonia¹		Primary, hypostatic or aspiration Causative agent and antecedent cause if any contributing disease or condition
Cor pulmonale		Antecedent cause, if not primary Acute or chronic
Lung disease (chronic)		Nature of disease; <i>e.g. obstructive</i>
Obstructive airways disease	Type	Chronic Acute lower respiratory infection Acute exacerbation of asthma, bronchiectasis, emphysema etc.
Oedema of lungs	Type	Acute Hypostatic Secondary to heart disease (specify disease) With hypertension If hypostatic or terminal, specify the conditions necessitating inactivity If chronic and due to external agents (specify cause and agents)
Pleural effusion		Cause, particularly whether tuberculosis
Pneumoconiosis	Whether	Silicosis Anthracosilicosis Asbestosis Associated with tuberculosis Other (specify)
Pneumocystosis pneumonia		If due to AIDS or other HIV illness
Pneumonia¹	Type of organism	If hypostatic or terminal, specify antecedent illness
Pneumothorax	Cause	Traumatic Spontaneous If secondary, always state the antecedent cause or etiology
Pulmonary embolism²		If following an operation, state the condition for which surgery was performed If due to inactivity, the condition causing the inactivity; If it is associated with childbirth, abortion or oral contraceptives
Respiratory failure		Specify the antecedent cause

¹ **Pneumonia and Bronchopneumonia**

When a death is due to pneumonia or bronchopneumonia please identify if the condition is primary hypostatic or due to aspiration (of blood, food, meconium, etc.). State the cause of any antecedent condition that led to the pneumonia and identify the causative organism. If the pneumonia has been caused by debility or inactivity please state the condition leading to the inactivity or debility.

² **Pulmonary Embolism**

It is rare for pulmonary embolism to occur spontaneously in anyone below the age of 75 years of age, and there are a large variety of antecedent causes of this condition. Where Pulmonary Embolism is the immediate cause or mode of death it should be entered as such in Part I a of the death certificate, with its antecedent cause(s) reported on the lines below it.

Silicosis (*see also case history N. 32*)
If associated with tuberculosis

Tuberculosis Primary site
Associated pneumoconiosis if present

XI DIGESTIVE DISEASES

General information to be reported by the certifier in order to add specificity to the digestive diseases:

- Nature of disease process; *e.g. diverticulosis of jejunum*;
- Site; *e.g. Crohn's disease of colon*;
- Acute or chronic; where relevant; *e.g. acute pancreatitis*;
- Nature of any complication; *e.g. acute appendicitis with generalized peritonitis*.

See also case history N. 4

Appendicitis Whether acute or chronic
With peritonitis or abscess

Cirrhosis of liver Cause; *e.g. alcoholic*

Diarrhoea Antecedent cause (if unknown, whether believed infectious or not)

Gastro-enteritis Cause infectious or non-infectious

Haematemesis Cause gastric ulcer, adverse effects of medication etc.

Hepatitis Type Acute or chronic
Alcoholic
Of newborn
Of pregnancy, childbirth or puerperium
Viral (and if so, whether type a, b, c, d, e)

Liver failure; hepatic failure
Cause; *e.g. acute infective, post-immunisation, post-transfusion, toxæmia of pregnancy or of puerperium*)

Obstruction of intestine
Cause
If Cancer, state site and type
Hernia, state type
Paralytic following operation, state condition for which surgery performed

Paralytic ileus Antecedent cause

Peptic ulcer Site Stomach, gastric duodenum
With Haemorrhage, perforation

Ulcer Site
Perforated or with haemorrhage

XIII MUSCULOSKELETAL DISORDERS

General information to be reported by the certifier in order to add specificity to the musculoskeletal disorders:

- Nature of disease process;
- Name of infecting organism; *e.g. chronic osteomyelitis due to staphylococcus aureus*;
- Antecedent systemic disease, where relevant;
- Site;

- Complication; for deformities, whether congenital or acquired; *e.g. acquired kyphoscoliosis.*

Fractures (see injuries specifications)

Site
Pathological or traumatic (if due to injury, state circumstances of injury)

Rheumatism Specify acute articular; subacute articular
This term must not be used to state other diseases; chronic articular rheumatism should be reported as rheumatoid arthritis, osteoarthritis, spondylitis

Scoliosis Acquired; *e.g. tuberculous, osteoporosis*
Congenita

Spondylitis Whether Ankylosing
Deformans
Gonococcal
Sacro-iliac
Tuberculous

XIV GENITOURINARY DISORDERS

General information to be reported by the certifier in order to add specificity to the genitourinary disorders:

- Acute or chronic; *e.g. chronic pyelonephritis;*
- Clinical syndrome and pathological lesion; *e.g. nephrotic syndrome with lesion of membranoproliferative glomerulonephritis;*
- Site of calculi; infecting organism and site of infections; nature of complications; *e.g. acute renal failure with lesion of renal medullary necrosis.*

Endometritis-perimetritis

If puerperal o post-abortive infection

Failure, Renal Acute or chronic
Cause analgesic, diabetes etc.

Nephritis/ Glomerulonephritis

Type Acute, sub-acute chronic
With oedema
Infective or toxic (cause)
If associated with Hypertension
Arteriosclerosis
Heart disease
Pregnancy

Renal disease or failure

Acute, chronic or end-stage
Antecedent cause; *e.g. diabetic nephropathy*
With hypertension, heart disease, necrosis

Salpingite

Acute or chronic
Gonococcal, tubercular, postabortive, puerperal

XV DEATHS ASSOCIATED WITH PREGNANCY, CHILDBIRTH AND THE PUERPERIUM

General information to be reported by the certifier in order to add specificity to the deaths associated with pregnancy, childbirth, and the puerperium:

- Nature of disease process; *e.g. chronic osteomyelitis;*
- Nature of complication; *e.g. ruptured tubal pregnancy;*
- Whether obstruction occurred during labour; *e.g. obstructed labour due to transverse lie; delivery by breech extraction;*

- Timing of death in relation to delivery;
- For abortions, whether spontaneous or induced; nature of complication; legal or illegal, if induced. *e.g. pelvic sepsis following illegally induced abortion.*

See also case histories N. 29-31

Abortion Spontaneous (miscarriage) or induced
Report the reason if known; duration of pregnancy; indicate possible infection or toxemia

Antepartum haemorrhage
Cause; *e.g. coagulation defects, placenta praevia*

Endometritis-perimetritis
Specify if puerperal or post-abortive infection

Pelvic abscess; Parametritis; Peritonitis; Phlebitis
Cause, particularly whether due to puerperal or post-abortive infection

Pelvic abscess Cause
Specify if puerperal or post-abortive infection

Pregnancy Specify intervening causes that led to death
Severe eclampsia

Puerperal fever Type of infection; presence of embolism; phlebitis; thrombosis; septicaemia
This term must not be used to designate post-abortive infection

Toxaemia Antecedent cause
Pregnancy (specify): Albuminuria
Eclampsia
Hyperemesis
Hepatitis
Hypertension
Pre-eclampsia

XVII CONGENITAL ANOMALIES

General information to be reported by the certifier in order to add specificity to the congenital anomalies:

- Site and type of anomaly; *e.g. atresia of colon;*
- Specify congenital if not obvious; *e.g. congenital mitral stenosis;*
- Complications; *e.g. spina bifida with hydrocephalus.*

XVIII SYMPTOMS, SIGNS AND ILL-DEFINED CONDITIONS

General information to be reported by the certifier in order to add specificity to the symptoms, signs and ill-defined conditions:

- Reporting of symptoms should not replace complete description of diseases;
- If the autopsy results will be included, please state appropriately.

See also case histories N. 12; 23-25

Abscess Site
Cause / Organism

Adhesions If following an operation, the antecedent condition for which surgery was performed and time interval since surgery

Ascite Specify antecedent cause

Calculus	Site and if with obstruction
Cachexia	Type Congenital If due to deprivation or disease (specify) Protein deficient, (specify type and degree of severity)
Crisis	Specify: of apoplexia; of appendicitis, epileptic; eclamptic; hysteric
Cyst	Site Congenital, multiple, hydatid, dermoid
Debility	Antecedent cause
Gangrene	Site Type Atherosclerotic, diabetic, due to gas bacillus etc.
Haematemesis	Cause Gastric ulcer, adverse effects of medication etc.
Haemorrhage	Site Cause, if due to injuries, state circumstances of injuries
Hemoptysis	Specify if due to tuberculosis
Jaundice	Catarrhal, epidemic, haemolytic Specify antecedent cause: state due to birth, pregnancy, vaccination; transfusion
Melaena	Antecedent cause; e.g. <i>Primary carcinoma of transverse colon</i>
Old age	Report the etiological sequence
Senility	With Dementia, Alzheimer's disease etc.
SIDS (sudden infant death syndrome) (<i>see also paragraph 2.6.4</i>)	Specify as such, it is not sufficient to report "sudden death"
Stenosis, stricture	Site If congenital or acquired (specify cause)
Tetany	Specify if Parathyroprival Associated to rickets Convulsions
Ulcer	Site Perforated or with haemorrhage

XIX INJURY, POISONING, ADVERSE EFFECT IN MEDICAL CARE OR OTHER CONSEQUENCES RESULTED FROM EXTERNAL CAUSES

(Chapters dealing with deaths due to violence or non natural causes are to be DISREGARDED by physicians not authorized to certify those deaths in countries where specifically appointed professional are in charge of issuing such certificates).

General information to be reported by the certifier in order to add specificity to the injury, poisoning, and adverse effect in medical care resulted from external causes.

(Refer to chapter 3 for instruction)

See also case histories N. 35-37; 41-54

Adverse effects of drugs in therapeutic use

- State this fact;
- Name of drug; *e.g. Aplastic anaemia due to therapeutic dosage of chloramphenicol for urinary infection*
- Nature of adverse effect; *e.g. Meningitis follow vaccination*
- Any complications; *e.g. acute renal failure with renal papillary necrosis due to aspirin treatment for arthritis*
- Condition being treated
- Specify circumstances (*see the following paragraph in this list*)

Injuries

- Type of injury; *e.g. fracture of cervical vertebra with spinal cord lesion, e.g. self-lesion*
- Site, stated as precisely as possible; *e.g. open transcervical fracture of femur*
- Complications
- Specify circumstances (*see the following paragraph in this list*)

Poisoning

- Substance involved
- Whether accidental, suicidal, homicidal, or could not be determined; *e.g. accidental poisoning from sleeping pills; e.g. accidental overdose of heroin; e.g. homicide through poisoning with arsenic*
- Specify circumstances (*see the following paragraph in this list*)

XX EXTERNAL CAUSE OF DEATH

General information to be reported by the certifier in order to add specificity to the external cause of death:

- Report the injuries (*see previous chapter in this list*);
- Specify circumstances (*see also boxes 7 and 8*).

(Refer to chapter 3 for instruction).

See also case histories N. 41-54

Accident in medical procedure

- Enter any post procedural complication
- Describe the circumstances of the accident and include the medical procedure
- Report the condition for which the procedure was performed
- Always report duration for each disease and condition, including medical cares

Date of injury

- If different from the date of death
- If present in national death certificate

Manner of death

- Accidental; *e.g. (accidental) drowning while playing in water*
- Suicide; *e.g. (suicide by) drowning*
- Homicide; *e.g. (homicide through) stab to the heart*
- Could not be determined; *e.g. explosion due to fire in factory (it was not possible to determinate whether the fire was intentionally or accidentally set)*

Place of injury (this is an incomplete list)

- Home (boarding-house; caravan [trailer] park, residential; farmhouse; garage; swimming-pool or tennis-court in private house or garden; etc.)
- Residential Institution (dormitory; home for the sick; military camp; reform school; etc.)
- School, other institution and administrative area (camp; church; dancehall; day nursery; theatre; etc.)
- Sports and athletics area (baseball field; gymnasium; riding-school; tennis-court public; etc.)
- Street and highway (freeway; pavement; sidewalk; etc.)
- Trade and Service area (casino; garage commercial; market; station (bus) (railway); warehouse; etc.)
- Industrial and construction area (building [any] under construction; factory building; factory premises; pit (coal) (gravel) (sand); tunnel under construction; etc.)
- Farm (farm building; farm land under cultivation; ranch; etc.)
- Other (beach; caravan site NOS (not otherwise specified); forest; park (amusement) (public); pond or pool; railway line; zoo; etc.)

Transport accident (see box 7)

- Type of vehicle (car, heavy transport vehicle, motorcycle, bike, etc.)
- Victim of accident (driver, passenger, pedestrian, person outside the vehicle, etc.); *e.g. driver of train in collision with fallen tree on railway; e.g. pilot of aircraft shot down in war operations*
- Specify the object(s) or type(s) of vehicle involved
- The location at the time of the accident (on highway, off highway, railroad track, ski slopes, railroad track, off road, corn field, sea harbour, ...) (see also above "Place of injury").

Glossary

The term (WHO) indicates that the definition are drawn from World Health Organization (WHO) official publications.

Abortion (induced abortion) - The purposeful interruption of pregnancy performed by a specialist, with the intention to remove the products of conception.

Accident in medical care - A misadventure or poisoning occurring during surgery or other medical care.

Activity - Description of what the decedent was doing while he/she sustained the injury when a death for external causes occurs. This is a vital information for prevention of accidents purposes.

Amended death certificate - A second certificate of death correcting the information provided for the same decease in a previously issued certificate. The amended certificate takes into account new clinical findings thus modifying or completing the reported causes of death.

Antecedent cause - Any cause involved in the train of events leading to death, with the exception of the immediate cause (for example: antecedent cause for the condition reported on line I(a), is the condition reported on line I(b)) or, if the certificate has not been filled out correctly, the condition that the certifier should have reported there.

Automated coding system - Software tools-based systems on which assigns ICD codes to the entities (see item) reported on death certificates and, through the application of ICD rules, determines the underlying cause of death. The utilization of such tools allows avoiding biases in coding and allows reproducibility and comparability between countries.

Birth weight - The first weight of the fetus or newborn obtained after birth. (WHO) (see low, very low and extremely low birth weight).

- **Extremely low birth weight** - Less than 1.000 g (up to and including 999 g) (WHO).
- **Very low birth weight** - Less than 1.500 g (up to and including 1.499 g) (WHO).
- **Low birth weight** - Less than 2.500 g (up to and including 2,499 g) (WHO).

Cause of death - Any condition, which leads to or contributes to death and is classifiable according to the International Classification of Diseases (ICD) system.

Circumstances of injury, poisoning or violence - All the events surrounding and/or causing the injury, poisoning or violence.

Coding rules - Coding rules contained in the applicable revision of the ICD, published by the World Health Organization, allow to systematically select an underlying cause of death from all entity reported in the death certificate. These coding rules improve the usefulness and comparability of mortality statistics among countries by giving preference to certain categories and by consolidating conditions.

Contributory cause - any cause of death that is neither the immediate, intervening, originating antecedent nor underlying is a contributory cause of death. (i.e. conditions that should be reported on part II).

Death Certificates Official records of individual deaths including the cause of death certified by a physician, or other legally appointed professional and any other required identifying information as well.

Direct obstetric death Those deaths resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above (WHO).

Duration of disease - Time elapsed between the onset of the disease and the death.

Entity - A diagnostic term or condition entered on the certificate of death that constitutes a codable entry.

Epidemiology - The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems.

External Causes of Death - Deaths due to accidents and violence including environmental events, circumstances and conditions as the cause of injury, poisoning, and other adverse effects. Broad categories include accidents, suicides, medical misadventures or abnormal reactions, homicide, legal intervention, and injury from war operations.

Family of classifications - This concept, developed by WHO, suggests the idea that health –related problems may be classified with the use of several different classifications depending on the user needs and purposes; ICD10 forms the “core” of this family, but it is now flanked by different adaptations for specific fields (oncology, psychiatry, etc...) based on diagnosis and by different classifications not based on diagnosis (ICF, medical procedures, etc...) that may be used coupled with ICD10 or autonomously.

Fetal death (deadborn fetus) - Death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation, the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles (WHO).

Gestational Age - The duration of gestation is measured from the first day of the last normal menstrual period. Gestational age is expressed in completed days or completed weeks (e.g. events occurring 280 to 286 completed days after the onset of the last normal menstrual period are considered to have occurred at 40 weeks of gestation) (WHO).

- **Gestational Age, Post-term** - More than 42 completed weeks (294 days) of gestation (WHO).
- **Gestational Age, Term** - From 37 completed weeks to less than 42 completed weeks (259 to 293 days) of gestation (WHO).
- **Gestational Age, Pre-term** - Less than 37 completed weeks (less than 259 days) of gestation (WHO).

ICD-10 code - A single ICD alphanumeric string representing a single disease or injury or the association of two of them.

ICD Clinical Modification (ICD-CM) - Modification of the ICD used to classify morbidity (conditions and interventions), providing very detailed descriptions.

Immediate cause of death - Any disease or condition entered on line (a) in Part I of the death certificate directly leading to death and consequent to diseases entered on lower lines of part I. Also known as terminal, direct or final cause of death.

Indirect obstetric death - Deaths resulting from previously existing disease or disease that developed during pregnancy and which was not directly the result of obstetric conditions, but which was aggravated by the physiologic effects of pregnancy (WHO).

International Classification of Diseases (ICD) - International Classification of Diseases. A widely used system of classifying diseases and injuries. Each disease or set of diseases has an ICD code or ICD group assigned to it.

Intervening cause - any cause between the originating antecedent cause and the immediate cause of death, or, if the certificate has not been filled out correctly, any condition that the certifier should have reported there. Also known as complication.

Injury at work - intentional or unintentional injury, which happened to a person engaged in his/her work or a volunteering activity.

Late maternal death - the death of a woman from direct or indirect obstetric causes more than 42 days but less than one year after termination of pregnancy (WHO).

Live birth - The complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which after such separation, breathes or shows other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered liveborn (WHO).

Manner of death - Manner of death help to clarify the modality/intention surrounding a decease. The most common option for the classification of this variable are: Natural, Accident, Suicide, Homicide and Undetermined.

Maternal death - The death of a women while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. (WHO) (*see direct obstetric death and Indirect obstetric death*).

Miscarriage (spontaneous abortion) - intentionally left blank for countries adaptation.

Multiple Causes of Death - All those diseases, morbid conditions or injuries which either resulted in or contributed to death and the circumstances of the accident or violence which produced any such injuries.

Neonatal period - Begins at birth and ends 28 completed days after birth. Neonatal deaths (deaths among live births during the first 28 completed days of life) may be subdivided into early neonatal deaths, occurring during the first seven days of life, and late neonatal deaths, occurring after the seventh day but before 28 completed days of life (WHO).

One-term entity - a diagnostic entity that is classifiable to a single ICD-10 code. It can be one word or more than one word.

Originating antecedent cause - this term indicates the condition entered on the lowest used line in Part I, or, if the certificate has not been filled out correctly, the condition that the certifier should have reported there. The originating antecedent cause is, from a medical point of view, the starting point of the train of events that eventually caused the death; in this manual it is commonly referred to as "underlying cause of death".

Perinatal period - Begins at 22 completed weeks (154 days) of gestation (when birth weight is normally 500 g) and ends seven completed days after birth (WHO).

Period of gestation - see gestational age.

Place of death - The place where the death occurred.

Place of injury - Place where the injury took place.

Pregnancy related deaths - A death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective to the cause of death. (WHO)

Properly positioned - Condition(s) placed in an appropriate order to form a sequence of events.

Quality of death certificate completion - A well completed death certificate should guarantee accuracy and the use of specific diagnostic terms for all items; the cause of death section should contain a single sequence in part I with the indication of duration; other possible contributing conditions should be reported in part II. Such death certificates result in a proper coding and in high quality statistical data.

Query - Request of information to the certifier by the vital statistics system due to difficulties to attribute appropriate codes to the death certificate provided.

Selected underlying cause of death - a condition which is chosen either temporarily or finally by the application of an international selection rule.

Sequence - two or more conditions entered on successive lines of Part I, each condition being an acceptable cause of the one entered on the line above it.

Transport accident- Any accident involving a device designed primarily for, or being used at the time primarily for, conveying people or goods from one place to another.

Trend - temporal evolution of a phenomenon.

Underlying cause of death - The disease or injury which initiated the train of morbid events leading directly to death or the circumstances of the accident or violence that produced the fatal injury (WHO).

Vital statistics - Data collected from continuous or periodic recording or registration of all "vital events", such as births, deaths, marriages and divorces.

Women of reproductive age (or women of childbearing age) - Refers to all women aged 15 to 49 years (WHO).

Annex 1 - National mortality data flow

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Annex 2 - Excerpt from EUROSTAT recommendations on causes of death certification practices.

CONFIDENTIALITY

Principle: Understanding that the basic principle for confidentiality of Causes of Death data is to obtain the highest quality of information whilst protecting / respecting the deceased, his or her family and the certifying authority. This principle should be applied following the existing guidelines on statistical data in general and on Causes of Death data in particular.

Recommendation 4

Identifiable Causes of Death data should not be used for general administrative purposes (i.e. insurance, personal interest matters...) unless this is required by legislation and subsequently specifically requested.

Recommendation 5

Any change in privacy or data protection should avoid the possible adverse consequences on Causes of Death statistics and medical research.

Recommendation 6

It is essential that the implications of confidentiality regulations be properly understood. Thus the above principle should be respected whenever appropriate during the training of physicians or when communicating with lawyers, researchers and public.

Recommendation 7

Any use of identifiable data other than that for statistical purposes, including public health and medical research, is not the responsibility of the statistical bodies and therefore should not be subject to discussion in the framework of statistical issues. However, under certain conditions for research purposes, individual causes of death data could be used, following existing national rules and regulations.

Recommendation 8

Further investigation into the use of national rules and regulations of individual causes of death data for research purposes in European countries is recommended. This could lead to a list of best practices, aiming at the 'step-wise' improvement of common practices in European countries.

INFANT CAUSES OF DEATH CERTIFICATION

Preamble: the perinatal death certificate recommended by the WHO has been adopted by only a few European countries. Among the reasons for this non-application, the difficulty to select a sole underlying cause of death and thus include these deaths in routine cause of death statistics, is the most important.

Recommendation 11

The European Commission should facilitate consultations with the WHO concerning the perinatal death certificate.

Recommendation 12

Consideration should be given on ways to encourage the correlation / linkage of detailed birth information to infant deaths. Should that prove impractical, the standard death certificate should be extended to include a single cause of maternal morbidity (if any), relevant to the infant death.

Recommendation 13

Analysis of infant mortality is enhanced by additional data from events around the time of birth (i.e.; birth weight, apgar score, single/multiple birth, delivery complications). To put these into context, both numerator (deaths) and denominator (births) should be used, and include the same additional variables.

Recommendation 14

Three main additional elements, relevant to the analysis of infant deaths, to be collected should be: birth weight, gestation and plurality.

GENERAL CAUSES OF DEATH CERTIFICATION

Recommendation 15

Each European country must use the 'International Form of Medical Certification of Cause of Death' with 4 lines (WHO Revision Conference 1989). Each European country should also apply the WHO rules, guidelines and regulations for selection of the underlying cause of death.

Recommendation 16

The basic additional information to be collected on the death certificate is:

- place of death; (home, hospital, nursing home etc.)
- place of accident;
- pregnancy state;
- country of usual residence;
- citizenship.

Recommendation 17

For the purpose of violent causes of death statistics, the definition of epidemiological criteria should be harmonised so that it is made clear whether the death is due to suicide, homicide, accident or could not be determined after investigation.

Recommendation 18

Information on autopsies should be recorded on death certificates, including:

- was an autopsy carried out?
- was it a legal or medical autopsy?
- has the result been used in certification?
- is an autopsy still on-going?

Recommendation 19

Information on other investigations should be recorded on death certificates, including:

- were specific investigations carried out to help in the certification of cause of death?
- are specific investigations still on-going?

If the answers to the above are 'yes', the certifier should specify.

Recommendation 20

In case of legal inquest:

- the Causes of Death Statistics Office must be informed if there is an inquest (provisional death certificate);
- the Causes of Death Statistics Office could use a provisional cause of death before the final cause of death;
- the persons (or institutions) who state the final cause of death must transmit the information to the Causes of Death Statistics Office;
- the Causes of Death Statistics Office must ask for the final cause of death;
- the Causes of Death Statistics Office must include the final cause of death in statistics.

Recommendation 21

Causes of Death Statistics Offices should notify the EUROSTAT office of any change in their national death certificate when submitting annual data.

Recommendation 22

The development of electronic certification should be supported.

TRAINING PRACTICES

Recommendation 30

Basic training in death certification for medical students as well as continuous professional development for practising physicians should be developed.

Recommendation 31

Basic certification training should be:

- taught at the end of clinical training;
- integrated into appropriate courses in public health or epidemiology;
- if taught in legal medicine, emphasis on WHO guidelines and definitions is essential;
- the contents of the course and exams should be prepared by Causes of Death Statistics Offices in collaboration with university teachers.

Recommendation 32

Causes of Death Statistics Offices should, through collaborative effort, investigate the opportunities for continuous professional training for physicians, and integrate death certification as a training module (in many countries vocational training/continuous professional training is an obligation for physicians).

Recommendation 33

The creation of a basic training course package should be developed as reference on certification (sequence, underlying causes etc.) for specific national training purposes on Causes of Death certification, and be adapted by each European country.

Recommendation 34

To encourage awareness of the medical profession and improve certification, a common model or leaflet for inclusion in national training packages and campaigns should be developed. The main contents should be common and each country will adapt the final redaction and form to its own context. The document has to be short, freely available and easily copied (e.g. small plastic card, filofax). Certification must be explained with text and examples of case histories of 4/5 lines. These case histories have to be prepared with hospital practitioners. The Causes of Death Statistics Offices should find specific opportunities to disseminate the document.

Recommendation 35

The creation of a common website on Causes of Death certification should be developed within existing networks of EUROSTAT and WHO (to be adapted by each European country).

Recommendation 36

Causes of Death Statistics Offices should take advantage of opportunities for informing doctors on death certification via: queries, medical and public health journals, conferences and congresses for physicians. The follow-up of these recommendations on certification training needs to be organised (capacity and authority) with a possible responsibility of Ministries of Health and delegation to the Causes of death Statistics Offices.

Annex 3 - Excerpt from the national law(s) on vital statistics.

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Hints on what could be included here:

- Medical professionals obligations;
- national law on confidentiality of vital statistics data.

Annex 4 - Short guide to national implementation

This manual is intended as a generalized product for Europe; for this reason it will require some efforts to be adapted to each country's specific needs.

The aim of this short annex is to provide some information and reasons for the present manual structure in order to facilitate the implementation steps. For this reason this annex is not addressed to certifiers, but to the professionals in charge of national adaptation of this manual.

Chapters 1- 3: Two levels of detail (fluent text and boxes) allow to choose between a "quick guide" based on boxes or a more standard reference text, providing in both cases the essential information required to improve certification quality; however, these two modalities are not mutually exclusive and can be both maintained in the final manual to provide the most complete overview of best certification practices.

Chapter 4: Case histories.

In order to follow a didactic pathway, case histories have been divided into several paragraphs, which illustrate the specific aspects of certification. Nevertheless each example can be useful to discuss several different problems in certification. Hence, in order to put in evidence all these aspects, a "see also" list has been added at the end of the paragraph when needed.

In order to facilitate the consultation, each example has been titled with a short phrase, which summarizes the main topic of the case history. Each example is followed by a short comment that explains the main didactic aim of the case history. The first case of each paragraph discusses the most general problem of certification for that specific section. Further cases point out more specific aspects.

The items "how injury occurred" and "manner of death" often contain the same expression reported in the lowest used line of part I: each country, during the national implementation of this manual, should decide which one of the two possibility best fits with own national death certificate form.

Chapter 5: List of imprecise causes and hints on how to add specificity

The list is grouped according to chapters in ICD-10. For each group some general hints are immediately shown, followed by the cross-reference to fluent text and/or pertinent case histories; after this general information, a more specific list of diseases, symptoms or conditions requiring specific instructions and clarification is reported in alphabetical order. The task of national implementation should be facilitated by offering a double possibility based on specific needs: either give general hints on groups of diseases as reported after the statement "General information to be reported by the certifier in order to add specificity to the mentioned diseases" at the beginning of each chapter, or going into a deeper detail with the "each disease or condition alphabetical list".