

MEDICAL CERTIFICATION OF CAUSE OF DEATH

Instructions for Physicians
on Use of International Form
of Medical Certificate of Cause of Death

WORLD HEALTH ORGANIZATION

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Introduction

This booklet is intended to assist physicians and surgeons in writing certificates of cause of death of the pattern recommended by the World Health Organization. It explains the aims and concepts involved and the nature of the information required. It is the latest, and considerably revised, edition of a booklet originally prepared by the WHO Centre for Classification of Diseases, in London, in response to a recommendation of the WHO Expert Committee on Health Statistics.¹

In most countries, certificates of cause of death have a dual purpose. Firstly, they contribute to the legal record of the death; cause of death may be significant in insurance or inheritance matters. Secondly, they are the source of mortality statistics which have an important part to play in medical research and are likely to become more valuable as methods of diagnosis and analysis improve.

Routine mortality statistics in many countries are prepared according to regulations and recommendations adopted by the World Health Assembly. Causes of death are classified and grouped according to the current revision of the International Classification of Diseases (ICD) in which regulations and recommendations relevant to the certification of causes of death and the preparation of statistics are also reproduced.

When deaths result from a single condition, such as an acute infectious disease, certification and statistical analysis present no difficulty. Increasingly nowadays deaths occur among people who have one or more chronic conditions. In some countries it is now possible to analyse the multiple conditions contributing to death but this is a very complex process. Most routine statistics are based on one cause only per death and there is then the problem of which of multiple causes to select. This has been so since the earliest mortality statistics but the methods of selection of the single cause have changed over the years. Before 1948, the practice in most countries was to give one condition automatic precedence over another regardless of the sequence in which they were recorded.

If untimely deaths are to be prevented, the chain of events has to be cut, or cure instituted, at some point. The most effective public health objective is to prevent the precipitating cause from operating. With this in mind, the Sixth Decennial Revision Conference for the International Classification of Diseases, in 1948, agreed that the

¹ WHO Technical Report Series, No. 5, 1950, p.5.

single cause of death to be used as the basis for routine mortality statistics should be the *underlying cause* and designed a form of certification of all causes of death (the International Form of Medical Certificate of Cause of Death; Fig.1) on which the attending physician could record the chain of events leading back to the underlying cause and also any conditions contributing to death but not directly part of the fatal sequence. The underlying cause was 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".

This procedure remains the basis of the current recommendations on mortality statistics in general, following the Ninth Revision Conference in 1975. That Conference, however, recommended an alternative basis for the certification of perinatal deaths (see page 23).

The use of the International Form of Medical Certificate of Cause of Death places upon the certifying medical practitioner the responsibility for indicating the course of events since he is the best person to decide which of several conditions was directly responsible for death occurring and what antecedent conditions, if any, gave rise to the direct cause.

In the statistical office, the underlying cause identified by the certifier will be selected and used as the basis of statistics unless the entry of a highly improbable sequence of events makes it plain that the certifier has not understood the arrangement of the certificate form. In this case a highly arbitrary set of rules for selection of the underlying cause comes into play. The medical certifier, by giving care and attention to the completion of the certificate, thus has both the responsibility and the opportunity to make mortality statistics reflect the best medical opinion concerning the underlying cause of death.

This is true also of the degree of detail recorded. The latest, ninth, revision of the International Classification of Diseases (ICD) makes it possible to identify very precisely many varieties or sites of diseases and injuries and causal organisms. Although routine mortality statistics often list only broad classes of diseases it is customary for the individual statistical record to store detailed information about the disease or injury, and these records are valuable for research into particular conditions and for special statistical studies. Mortality statistics are much more meaningful if all details available in the deceased person's records regarding the precise diagnoses are incorporated in the death certificate.

The notes and examples which follow illustrate the method of completion of the international form of certification of causes of death and the degree of detail which can be stored using the current ICD.

Statement of Cause of Death

The medical certificate of cause of death recommended by WHO is reproduced in Fig. 1.

Fig. 1

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

CAUSE OF DEATH		Approximate interval between onset and death
I		
<i>Disease or condition directly leading to death *</i>	(a) due to (or as a consequence of)
<i>Antecedent causes</i> Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b) due to (or as a consequence of)
	(c)
II		
<i>Other significant conditions contributing to the death, but not related to the disease or condition causing it</i>

<small>* This does not mean the mode of dying, e.g., heart failure, asphyxia, etc. It means the disease, injury, or complication which caused death.</small>		

It will be seen that the statement is in two parts:

- Part I for the sequence of events leading to death, proceeding backwards from the direct cause of death at I (a); and
- Part II for other significant contributory conditions.

Part I

Enter at I (a) the disease or condition leading directly to death. This should not be the mode of dying but the disease, injury, or complication which caused death.

There must always be an entry at I (a).

If the condition at I (a) was the consequence of another condition, record that next, at I (b). If this in turn resulted from a further condition, record that condition at I (c).

The fatal sequence will not, of course, always contain three conditions: if the condition at I (a) or I (b) is the underlying cause, enter no more in Part I. If the sequence of events comprised more than three stages, extra lines may be added in Part I.

However many conditions are involved, write the full sequence, one condition per line, with the most recent condition at the top, and the earliest (the condition that started the sequence of events between normal health and death) last.

The words "due to (or as a consequence of)", which are printed between the lines of Part I, apply not only in sequences with an etiological or pathological basis but also to sequences where an antecedent condition is believed to have prepared the way for the more direct cause by damage to tissues or impairment of function, even after a long interval.

In the case of accident, poisoning or violence, enter a brief description of the external cause on the line immediately below the description of the type of injury or poisoning.

If the direct cause of death arose as a complication of, or from an error or accident in, surgery or other procedure or treatment, enter this as an antecedent cause with a note of the circumstances and a statement of the condition for which the procedure or other treatment was being carried out. (The attending doctor must, of course, comply with any local regulations for the referral of deaths due to violence, etc., to the coroner or other legal authority.)

Normally the condition or circumstance on the lowest line used in Part I will be taken as the basis for underlying cause statistics, though classification of it may be modified to take account of complications or other conditions entered by special provisions of the ICD.

Part II

Enter, in order of significance, all other diseases or conditions believed to have unfavourably influenced the course of the morbid process and thus contributed to the fatal outcome but which were not related to the disease or condition directly causing death.

There will be cases where it will be difficult to decide whether a condition relevant to death should be recorded as part of the fatal sequence in Part I or as a contributory condition in Part II. Condi-

tions in Part I should represent a distinct sequence so that each condition may be regarded as being the consequence of the condition entered immediately below it. Where a condition does not seem to fit into such a sequence, consider whether it belongs in Part II.

Interval between onset and death

Space is provided, against each condition recorded on the certificate, for the interval between the presumed onset and the date of death. This should be entered where known, even approximately, or "unknown" should be written. This provides a useful check on the sequence of causes as well as useful information about the duration of illness in certain diseases.

Detail Required

Study of the ICD is the best way of appreciating the degree of detail about conditions which can be stored for statistical analysis. The following notes give the pertinent details for the major causes of death. As a general rule, record diagnoses as precisely as the information permits, incorporating relevant details from histological or autopsy reports. Where an important detail is unknown, the fact should be stated, since many statistical offices make a practice of questioning apparently incomplete or vague diagnoses in case the detail required might be available.

Infections

Acute, subacute or chronic; name of the disease and/or infecting organism, where known; the site, if localized; mode of transmission, where relevant; for syphilis, whether primary or secondary, congenital or acquired, early or late, clinical form:

e.g., tuberculous meningitis
 staphylococcal enterocolitis
 bacillary dysentery due to *Shigella boydii*
 mosquito-borne haemorrhagic fever
 congenital syphilitic encephalitis
 acute amoebic dysentery

Neoplasms

The morphological type, if known; malignant, benign, etc., if not specific to the morphology; site of origin of primary growths,

stated as precisely as possible, and sites of secondary growths, clearly distinguished as such; if primary growth unknown or exact site within an organ not known, state accordingly; acute, subacute or chronic for leukaemias:

e.g., astrocytoma, temporal lobe, brain
carcinoma, isthmus uteri
carcinoma, endocervical canal
malignant papilloma, bladder trigone
Hodgkin's paraganuloma
chronic myeloid leukaemia

Endocrine disorders

Nature of disease process or disturbance of function; for thyroid disorders, whether toxic; for diabetes, state nature of complication or manifestation in a particular site:

e.g., panhypopituitarism
corticoadrenal insufficiency
diabetic nephropathy

Nutritional disorders

Type of deficiency, etc.; severity, where appropriate:

e.g., phenylketonuria
pure hyperglyceridaemia

Blood disorders

Nature of disease process; type and nature of any deficiency for anaemias; whether hereditary, where relevant; nature of haemoglobinopathy; factor involved for coagulation defects:

e.g., pernicious anaemia
scorbutic anaemia
sickle-cell thalassaemia
hereditary spherocytosis
congenital Factor IX disorder

Nervous system disorders

Disease process; infecting organism, where relevant; whether hereditary, where relevant:

e.g., *Haemophilus influenzae* meningoencephalitis
encephalitis due to mumps
postvaccinal encephalomyelitis
idiopathic Parkinson's disease
hereditary peripheral neuropathy

Circulatory diseases

Nature of disease process; site, if localized; acute or chronic, where relevant; for rheumatic fever, whether active; specify rheumatic or other etiology for valvular heart conditions; any complications:

e.g., acute rheumatic pericarditis
rheumatic mitral regurgitation
hypertensive heart and renal disease
acute myocardial infarction
Coxsackie endocarditis
thrombosis of basilar artery
generalized atherosclerosis
ruptured abdominal aortic aneurysm
cerebral haemorrhage
thromboangiitis obliterans

Respiratory diseases

Nature of disease process; acute or chronic; infecting organism; any external cause:

e.g., acute bronchitis
chronic obstructive bronchitis
Pseudomonas pneumonia
aspergillosis
intrinsic asthma

coalworkers' pneumoconiosis
acute pulmonary oedema due to cadmium fumes
pneumococcal serofibrinous pleurisy
idiopathic fibrosing alveolitis

Digestive diseases

Nature of disease process; site of ulcers, hernias, diverticula, etc.; acute or chronic, where relevant; nature of any complication for ulcers, appendicitis, hernias:

e.g., chronic duodenal ulcer with haemorrhage and perforation
acute appendicitis with generalized peritonitis
gangrenous femoral hernia
Crohn's disease of colon
diverticulosis of jejunum
pneumococcal peritonitis
alcoholic cirrhosis of liver
calculus of gallbladder with chronic cholecystitis
acute pancreatitis

Genitourinary disorders

Acute or chronic; clinical syndrome and pathological lesion for glomerulonephritis, etc.; site of calculi; infecting organism and site of infections; nature of complications:

e.g., nephrotic syndrome with lesion of membranoproliferative glomerulonephritis
chronic glomerulonephritis with lesion of systemic lupus erythematosus
chronic pyelonephritis
acute renal failure with lesion of renal medullary necrosis
hyperplasia of prostate
gonococcal endometritis

Deaths associated with pregnancy, childbirth, and the puerperium

Nature of complication; whether obstruction occurred during labour; timing of death in relation to delivery; for abortions, whether spontaneous or induced; nature of complication; legal or illegal, if induced:

e.g., ruptured tubal pregnancy
 pelvic sepsis following illegally induced abortion
 amniotic fluid embolism following legally induced abortion
 severe pre-eclampsia; delivered by caesarean section
 obstructed labour due to transverse lie; delivery by
 breech extraction
 rupture of uterus during labour; delivery by forceps

Musculoskeletal disorders

Nature of disease process; name of infecting organism; underlying systemic disease, where relevant; site; complication; for deformities, whether congenital or acquired:

e.g., systemic sclerosis
 generalized osteoarthritis
 tuberculous spondylitis
 chronic osteomyelitis
 acquired kyphoscoliosis

Congenital anomalies

Site and type of anomaly; specify congenital if not obvious; complications:

e.g., spina bifida with hydrocephalus
 persistent ostium secundum
 congenital mitral stenosis
 congenital bronchiectasis
 atresia of colon

Perinatal deaths

Conditions in fetus or infant; conditions in mother or of placenta, cord or membranes, if believed to have affected the fetus or infant; for deaths from hypoxia or anoxia, state time of death in relation to onset of labour and to delivery; for deaths from birth asphyxia, state severity (or 1-minute Apgar score); for deaths associated with immaturity, state length of gestation and/or birthweight; whether light- or heavy-for-dates; type of birth trauma; infecting organism; whether transitory or permanent for endocrine or metabolic disturbances; cause of jaundice; type of blood grouping involved in iso-immunization (Rh, ABO, etc.); any complications:

e.g., maternal tuberculosis
incompetent cervix
placenta praevia
light-for-dates with signs of fetal malnutrition
tentorial tear
fetal death from anoxia before onset of labour
severe birth asphyxia (1-minute Apgar score 2)
meconium pneumonitis
congenital toxoplasmosis
intrauterine *Escherichia coli* infection
kernicterus due to Rh isoimmunization
jaundice due to congenital obstruction of bile duct
neonatal thyrotoxicosis
idiopathic hydrops fetalis
extreme immaturity, birthweight 750 g

Injuries

Type of injury; site, stated as precisely as possible; complications:

e.g., fracture of vault of skull
fracture of cervical vertebra with spinal cord lesion
fracture of ileum
open transcervical fracture of femur
traumatic middle meningeal haemorrhage
penetrating wound of chest wall with haemorrhage
rupture of kidney
traumatic rupture of abdominal aorta

Poisoning

Substance involved; whether accidental, suicidal or homicidal.

Adverse effects of drugs in therapeutic use

State this fact; name of drug; nature of adverse effect; any complications; condition being treated:

e.g., aplastic anaemia due to therapeutic dosage of chloramphenicol for urinary infection
Cushing's syndrome due to treatment with ACTH for severe rheumatoid arthritis
acute renal failure with renal papillary necrosis due to aspirin treatment for arthritis

External cause of accidents

For transport accidents state vehicle involved; whether deceased was driver, passenger, etc.; description of accident; place of occurrence; for other accidents specify circumstances and place of occurrence:

e.g., driver of train in collision with fallen tree on railway
passenger in motor vehicle in collision with motorcycle
on highway
accidental poisoning from carbon monoxide from car
with engine running in private garage
water skier struck by propeller of boat
pilot of commercial aircraft which exploded on landing
fall from playground equipment on school premises
explosion due to fire in factory
burnt by flames from overturned stove in private house
dog bite on farm
accidental drowning while playing in water
suffocated by falling earth
struck by ball during game
pinned under overturned farm tractor on land
electrocuted by faulty electrical equipment in factory
suicide by drowning
killed in fist fight
aircraft shot down in war operations

Examples of Certification

Example 1

A man of 47 without previous history of coronary disease suffered a myocardial infarction and died 24 hours later.

It is sufficient to certify as follows:

I (a) Myocardial infarction 1 day
due to
(b) —
due to
(c) —
II —

Example 2

A child of 18 months died of pneumonia following measles. The direct cause of death is pneumonia and this can be considered to be “due to” the measles even if the pneumonia was a bacterial one.

- I (a) Pneumonia 6 days
due to
- (b) Measles 3 weeks
due to
- (c) —
- II —

The underlying cause is measles. Classification according to the ICD is to a subcategory of measles: “Postmeasles pneumonia”.

Example 3

A man of 63 with chronic duodenal ulceration died of peritonitis a few days after an operation for duodenal perforation, carcinoma of the bronchus also being present.

- I (a) Peritonitis 3 days
due to
- (b) Perforation of duodenal ulcer
 (operation performed on...[date])... 1 week
due to
- (c) Chronic ulcer of duodenum. 4 years
- II Oat-cell carcinoma, left lower lobe, lung

The underlying cause is chronic duodenal ulcer. The ICD allows classification to chronic duodenal ulcer with perforation. Specify histological variety of neoplasm, if known.

Example 4

A man aged 45 died of mitral incompetence which originated in an attack of rheumatic fever 20 years earlier.

- I (a) Mitral incompetence 3 months
due to
- (b) Mitral endocarditis 20 years
due to
- (c) Rheumatic fever at age of 25 (no
 sign of recent activity). 20 years
- II —

The underlying cause is rheumatic fever. The ICD allows classification to chronic rheumatic mitral insufficiency.

Example 5

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

- I (a) Asphyxia by vomitus minutes
due to
- (b) Cerebellar haemorrhage. hours
due to
- (c) Hypertension. about 3 years
due to
- (d) Aldosteronism. 3 years plus
due to
- (e) Adrenal adenoma 3 years plus
- II Congestive heart failure.

Extra lines have been added in Part I to complete the sequence. The underlying cause is benign neoplasm of the adrenal.

Example 6

A man of 49 died of a 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.

- I (a) Fracture of vault of skull. 15 minutes
due to
- (b) Collision between car he was driving
and heavy truck, on road.

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

Example 7

A woman was admitted to hospital in advanced labour. Examination showed complete dilatation of the cervix, slight contraction of the maternal pelvis, and engagement of the fetal head. Expulsion of

the fetus was delayed. After birth, the child showed difficulty in movement of the limbs and died 12 hours later. Autopsy revealed cerebral haemorrhage.

- I (a) Cerebral haemorrhage 12 hours
due to
- (b) Birth injury 12 hours
due to
- (c) Contracted pelvis.

The underlying cause is "newborn affected by disproportion during labour and delivery".

Example 8

A woman of 74 suffering from residual hemiparesis following a cerebral thrombosis several years ago fell at home and fractured the neck of her femur. During immobilization following the injury she developed hypostatic pneumonia, from which she died.

- I (a) Hypostatic pneumonia 1 day
due to
- (b) Immobilization 2 months
due to
- (c) Pertrochanteric fracture of femur . . . 2 months
due to
- (d) Tripped and fell at home. 2 months
- II Hemiparesis from old cerebral
thrombosis 5 years

The hemiparesis may have contributed to the fall but is not considered to be part of the direct sequence of causes leading to death. Specify how the fall occurred and the site of fracture. The underlying cause is "fall on same level from slipping, tripping or stumbling".

Example 9

A woman of 48 died of shock following removal of gallbladder for acute cholecystitis arising from gallstones, chronic glomerulonephritis also being present.

- I (a) Postoperative shock
due to
- (b) Cholecystectomy for acute cholecystitis
due to

- (c) Cholelithiasis
- II Chronic membranoproliferative glomerulonephritis

Specify acute or chronic cholecystitis and indicate site of calculi. The underlying cause is cholelithiasis. The ICD allows classification to “calculus of gallbladder with acute cholecystitis”. Specify acute or chronic and pathological lesion in glomerulonephritis.

Example 10

A woman of 65 died of acute renal failure. Damage to kidneys considered to be due to long-term ingestion of aspirin for recurrent headaches. Autopsy revealed lesion of renal papillary necrosis.

- I (a) Acute renal failure. 1 week
due to
- (b) Renal papillary necrosis. 1 week
due to
- (c) Aspirin taken for recurrent
headaches many years

Specify pathological lesion in kidneys. The underlying cause is “acute renal failure with lesion of renal papillary necrosis”.

Example 11

A man of 63 had been treated for some years for malignant hypertension and developed hypertensive heart disease and chronic renal failure. While seriously ill with the heart condition he developed acute appendicitis and the appendix ruptured. Appendectomy was carried out successfully, but the heart condition deteriorated further and he died 2 weeks later.

- I (a) Congestive heart failure
due to
- (b) Cardiac hypertrophy
due to
- (c) Malignant hypertension
- II Appendectomy for acute appendicitis with
rupture of appendix. Hypertensive renal failure.

The appendicitis and operation are thought to have accelerated the original condition but they were not part of the fatal sequence. In generalized conditions such as hypertension or arteriosclerosis, state organ mainly involved in the events leading to death. Indicate

clearly the link between the hypertension and the renal condition in Part II. Specify complications of appendicitis. The underlying cause is malignant hypertension. The ICD classifies to malignant hypertensive heart disease.

Example 12

A man of 39 developed a tumour of the inner aspect of the lower lip, which was excised and found on histological examination to be a squamous-cell carcinoma. Some time later he developed secondaries and died from the effects of these.

- I (a) Secondary deposits in neck,
mandible and maxilla 3 months
due to
- (b) Squamous-cell carcinoma of
inner aspect of lower lip (excised) . . . 3 years
due to
- (c) —
- II —

State site of neoplasms very precisely; statistics for research purposes often require a very detailed site classification. Indicate clearly whether a tumour is malignant or benign, unless this cannot be established, and include any available detail about histology.

The underlying cause is malignant neoplasm of inner aspect of lower lip, even though the original tumour was no longer present at death.

Example 13

A woman of 48 with secondary carcinoma of the vertebral column died of bronchopneumonia. Extensive investigations had failed to reveal the site of the primary growth.

- I (a) Bronchopneumonia 1 week
due to
- (b) Secondary carcinoma of vertebral
column (primary site unknown) 3 years
due to
- (c) —

The long illness was considered to have paved the way for the development of bronchopneumonia. The underlying cause is malignant neoplasm of unknown site.

Example 14

A man of 87 with clinically diagnosed carcinoma of stomach, never operated on, died of generalized carcinomatosis.

I (a) Carcinomatosis 1 month
due to

(b) Carcinoma of stomach (part unknown) 1 year

Give the fullest details known about the site of the neoplasms or state if the exact location is unknown. It is likely that the statistical office will inquire for further details if the site is not specified so as to allow classification as precisely as the ICD permits.

Example 15

A woman of 38 died of cardiac arrest shortly after a caesarean operation had been carried out because of obstruction during labour caused by locked twins. Attempts at resuscitation were unsuccessful.

I (a) Cardiac arrest Instantaneous
due to

(b) Caesarean section 1/2 hour
due to

(c) Locked twins causing obstruction
in labour 4 hours

The underlying cause is "obstructed labour due to locked twins".

Example 16

(If this form of certificate is in use for fetal deaths.)

The mother, a 32-year-old primigravida, developed hypertension with albuminuria and oedema during pregnancy. At 35 weeks' gestation there was premature separation of the placenta with concealed haemorrhage. The fetus, weighing 2050 g, died from intrauterine anoxia.

I (a) Intrauterine anoxia
due to

(b) Abruptio placenta
due to

(c) Pre-eclampsia, severe

The underlying cause is "fetus affected by maternal hypertensive disorder".

Example 17

The following illustrates the importance of accurately stating the sequence of morbid conditions in order to allow selection of the cause considered "underlying" by the attending physician.

A diabetic man who had been under insulin control for many years developed ischaemic heart disease and died suddenly from a myocardial infarction. Most people consider there to be a relationship between diabetes and ischaemic heart disease but its nature is not yet fully understood. Depending on the role the doctor considers to have been played in the fatal outcome by one or the other conditions, the following certifications are possible:

1. If the doctor considered that the heart condition resulted from the long-standing diabetes, the sequence would be:

- I (a) Myocardial infarction 1 hour
due to
- (b) Chronic ischaemic heart disease. 5 years
due to
- (c) Diabetes mellitus. 12 years

and the statistical office would select diabetes as the underlying cause of death.

2. If the doctor considered that the heart condition developed independently of the diabetes, the certification would be:

- I (a) Myocardial infarction 1 hour
due to
- (b) Chronic ischaemic heart disease. 5 years
- II Diabetes mellitus. 12 years

and the heart condition would be recorded as the underlying cause.

3. If the man had instead died from some other complication of the diabetes, such as nephropathy, the heart condition playing only a subsidiary part in the death and the doctor being uncertain that it arose from the diabetes at all, the certificate should be in the form:

- I (a) Acute renal failure. 1 week
due to
- (b) Nephropathy. 4 years
due to
- (c) Diabetes mellitus. 12 years
- II Chronic ischaemic heart disease. 5 years

The underlying cause is "diabetic nephropathy".

Each of the above certifications would be accepted by the statistical office as it stands. Sometimes, however, certificates are received in this form:

- I (a) Diabetes mellitus
due to
- (b) Myocardial infarction

This is an impossible sequence since I (a) could not be “due to” I (b); it indicates that the certifier did not understand the way the certificate is intended to be used. In such a case the safest course is for the statistical office to enquire from the certifier what he really meant to say. This is not always feasible and in such a case the appropriate coding rule dealing with “highly improbable” sequences has to be applied, which may not always give the answer intended by the certifier.

Perinatal Deaths

The Ninth Revision Conference for the ICD, while endorsing the principle of a single underlying cause for tabulation of mortality in general, considered that it was less useful in perinatal mortality, where two separate individuals (mother and baby) were involved and where causes or circumstances not necessarily attributable to mother or child could contribute to the event of perinatal death. An alternative form of certificate of causes of perinatal death was recommended, to be brought into use when practicable — that is, when any necessary legislation and other arrangements have been completed in a particular country. Until this is done, the existing form of certificate remains in use.

Statement of Cause of Death on the Special Certificate for Perinatal Deaths, When This is in Use

The new recommended form of certificate of cause of perinatal death (Fig. 2) provides five sections for the entry of causes of death, as follows:

- (a) Main disease or condition in fetus or infant
- (b) Other diseases or conditions in fetus or infant
- (c) Main maternal disease or condition affecting fetus or infant

Fig. 2

CERTIFICATE OF CAUSE OF PERINATAL DEATH			
To be completed for stillbirths and live born infants dying within 168 hours (1 week) from birth			
<p align="center"><i>(Identifying Particulars)</i></p>		<p><input type="checkbox"/> This child was live born on _____ at _____ hours and died on _____ at _____ hours</p> <p><input type="checkbox"/> This child was stillborn on _____ at _____ hours and died Before labour <input type="checkbox"/> During labour <input type="checkbox"/> Not known <input type="checkbox"/></p>	
Mother		Child	
<p>Date of birth <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> or, if unknown, age (years) <input type="text"/> <input type="text"/> <input type="text"/></p> <p>Number of previous pregnancies:</p> <p>Live births <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>Stillbirths <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>Abortions <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>Outcome of last previous pregnancy:</p> <p>Live birth <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>Stillbirth <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>Abortion <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>Date <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p>		<p>1st day of last menstrual period <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>or, if unknown, estimated duration of pregnancy (completed weeks) <input type="text"/> <input type="text"/> <input type="text"/></p> <p>Antenatal care, two or more visits</p> <p>Yes <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>No <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>Not known <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>Delivery:</p> <p>Normal spontaneous vertex <input type="checkbox"/></p> <p>Other (specify) _____</p>	
<p>Birthweight: _____ grams</p> <p>Sex: Boy <input type="checkbox"/> Girl <input type="checkbox"/> Indeterminate <input type="checkbox"/></p> <p>Single birth <input type="checkbox"/> First twin <input type="checkbox"/></p> <p>Second twin <input type="checkbox"/> Other multiple <input type="checkbox"/></p>		<p>Attendant at birth</p> <p>Physician <input type="checkbox"/> Trained midwife <input type="checkbox"/></p> <p>Other trained person (specify) _____</p> <p>Other (specify) _____</p>	
CAUSES OF DEATH			
a. Main disease or condition in fetus or infant			
b. Other diseases or conditions in fetus or infant			
c. Main maternal disease or condition affecting fetus or infant			
d. Other maternal diseases or conditions affecting fetus or infant			
e. Other relevant circumstances			
<p>The certified cause of death has been confirmed by autopsy <input type="checkbox"/></p> <p>Autopsy information may be available later <input type="checkbox"/></p> <p>Autopsy not being held <input type="checkbox"/></p>		<p>I certify _____</p> <p>_____</p> <p>Signature and qualification</p>	

- (d) Other maternal diseases or conditions affecting fetus or infant
- (e) Other relevant circumstances.

Sections (a) and (b)

Enter diseases of the fetus or infant, with the most important one of these in section (a) and the remainder, if any, in section (b). By “the most important” is meant that pathological condition which in the opinion of the certifier made the greatest contribution to the death of the infant or fetus.

The mode of death — e.g., heart failure, asphyxia, anoxia — should not be entered in section (a) unless it was the only fetal or infant condition known. This also holds true for prematurity.

Sections (c) and (d)

Enter all diseases or conditions affecting the mother which in your opinion had some adverse effect on the infant or fetus. Again, the most important one of these should be entered in section (c) and the others, if any, in section (d).

Section (e)

This is provided for the reporting of any other circumstances which the certifier considers to have a bearing on the death but which cannot be described as a disease or condition of the infant or the mother. An example might be delivery in the absence of an attendant.

**Examples of Certification of Cause of Perinatal Death,
Using the Special Certificate**

N.B.: Examples 18-21 below illustrate the completion of the causes of death statement for perinatal deaths, when the new recommended certificate is in use. Until this is adopted in individual countries, the established International Form of Medical Certificate of Cause of Death described in the earlier pages of this booklet should be used, if completed as specified above. It should be remembered that maternal causes, as well as causes in the fetus or infant, can be relevant as part of the fatal sequence in Part I or as contributory conditions in Part II of that form.

Example 18

A woman, whose previous pregnancies had ended in spontaneous abortions at 12 and 18 weeks, was admitted when 24 weeks pregnant, in premature labour. There was spontaneous delivery of a 700-g infant, which died during the first day of life. The main finding of the autopsy was "pulmonary immaturity".

Causes of perinatal death:

- (a) Pulmonary immaturity
- (b) —
- (c) Premature labour, cause unknown
- (d) Recurrent aborter
- (e) —

Example 19

A primigravida, aged 26 years, with a history of regular menstrual cycles received routine antenatal care starting at the 10th week of pregnancy. At 30-32 weeks fetal growth retardation was noted clinically, and confirmed at 34 weeks. There was no evident cause apart from a symptomless bacteriuria. A caesarean section was performed and a liveborn boy weighing 1600 g was delivered. The placenta weighed 300 g and was described as infarcted. Respiratory distress syndrome developed which was responding to treatment when the baby died suddenly on the third day. Autopsy revealed extensive pulmonary hyaline membrane and massive intraventricular haemorrhage.

Causes of perinatal death:

- (a) Intraventricular haemorrhage
- (b) Respiratory distress syndrome; retarded fetal growth
- (c) Placental insufficiency
- (d) Bacteriuria in pregnancy
Caesarean section
- (e) —

Example 20

A known diabetic was controlled during her first pregnancy with difficulty. She developed megaloblastic anaemia at 32 weeks. Labour was induced at 38 weeks. There was a spontaneous delivery

of an infant weighing 3200 g. The baby developed hypoglycaemia and died on the second day. Autopsy showed truncus arteriosus.

Causes of perinatal death:

- (a) Truncus arteriosus
- (b) Hypoglycaemia
- (c) Diabetes
- (d) Megaloblastic anaemia
- (e) —

Example 21

The patient was a 30-year-old woman who, four years previously, had given birth to a healthy child. There was a normal pregnancy apart from hydramnios. X-ray at 36 weeks suggested anencephaly. Labour was induced. A stillborn anencephalic fetus weighing 1500 g was delivered.

Causes of perinatal death:

- (a) Anencephaly
 - (b) —
 - (c) Hydramnios
 - (d) —
 - (e) —
-

