



Department of Health

# **Implementation of the Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems**

## **"Guidelines for Completion of Medical Certificate of the Cause of Death"**

### **The Introduction**

The Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) had been adopted for disease coding in Hong Kong since the first day of January 2001 and the main purpose of implementation of ICD-10 is to provide better quality of mortality and morbidity statistics for formulating health policy. The usefulness of the mortality data depends on the accuracy of cause of death information in the Medical Certificate of the Cause of Death (commonly known as the death certificate).

Hong Kong will incorporate ICD updates as recommended by the World Health Organization (WHO) starting from the first day of Jan 2010. In order to facilitate all medical practitioners to complete the death certificate properly, this guidelines has been revised by the Working Group on Documentation of Causes of Death formed by the Department of Health with representatives from Department of Health, Hospital Authority, Hong Kong Academy of Medicine, Faculty of Medicine of the University of Hong Kong, Faculty of Medicine of the Chinese University of Hong Kong, Hong Kong Private Hospitals Association and Hong Kong Medical Association.

### **Definition of Causes of Death**

Causes of death are defined by WHO as "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". The purpose of the definition is to ensure that all the relevant information is recorded and that the certifier does not select some conditions for entry and reject others.

### **Completing the CAUSE OF DEATH Section of the Death Certificate**

- In accordance with section 20 of the Births and Deaths Registration Ordinance, Chapter 174, Laws of Hong Kong, the attending medical practitioners are required to give information on the death certificate, stating to the best of his/her knowledge and belief the causes of death of the deceased.
- For the purpose of securing uniformity in the death returns, all registered medical practitioners are required to ensure that the nomenclature of causes of death given by them on the death certificate be consistent with those in the ICD-10.
- Medical practitioners should report on the death certificate each disease, abnormality, injury, or poisoning that he/she believes has adversely affected the decedent, and provide information with sufficient details in accordance with the four-character subcategories of ICD-10 with effect from the first day of January 2001. The current version of ICD-10 could be assessed online via WHO's

website (<https://icd.who.int/browse10>).

- In reporting causes of death, writing should be legible and abbreviations should be avoided.
- The section on cause of death in the death certificate consists of two parts and should be completed as described below:

***Part I (Diseases related to chain of events directly leading to death)***

- Part I is for reporting disease related to the chain of events which directly leads to death, proceeding from immediate cause of death (the final disease, injury, or complication directly causing death) to *the underlying cause of death (the disease or injury that initiated the chain of morbid events which lead directly to death)*. The underlying cause of death will be recorded as the main cause of death in mortality statistics. Report the full sequence of events as follows-

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的大約相隔時間 Approximate interval between onset and death
<b>I 直接引致死亡的疾病或情況。§</b> <b>Disease or condition directly leading to death. §</b> <b>先前原因</b> 導致上述原因的病理學情況(如有的話)·述明最後的潛在情況。 <b>Antecedent causes</b> Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) <b><i>Immediate cause of death</i></b> 由於(或起因為) due to (or as a consequence of) ..... (b) <b><i>Intervening cause of death</i></b> 由於(或起因為) due to (or as a consequence of) ..... (c) <b><i>Underlying cause of death</i></b> .....	..... ..... .....
<b>II 造成死亡的其他主要情況，但與引致死亡的疾病或情況無關者。</b> <b>Other significant conditions contributing to the death, but not related to the disease or condition causing it.</b>	<b><i>Contributory conditions</i></b> ..... .....	..... .....

§ 這並非指死亡的方式，例如心臟衰竭、虛弱等，而是指引致死亡的疾病，損傷或併發症。  
 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.

- Only one cause should be entered on each line. Line (a) is for the immediate cause of death. Do not leave line (a) blank.
- If there is only one step in the chain of events, an entry at line (a) is sufficient.
- If there is more than one step, the condition that gave rise to the immediate cause of death should be entered in line (b). If this in turn was resulted from a further condition, report that condition on line (c).
- The underlying cause of death should be entered on the lowest used line in Part I, i.e. line I(c) in this example.
- The mode of dying (e.g. cardiac arrest and respiratory arrest) should NOT be used.
- If an organ system failure such as congestive heart failure, hepatic failure, is listed as a cause of death, always report the underlying etiology (e.g. I(a). Congestive heart failure and I(b).Ischaemic cardiomyopathy).
- For each cause or condition, the best estimate of the interval between the presumed onset and date and time of death should be entered. It helps the certifying doctor to establish the chain of events that

lead to death, and is also useful subsequently in choosing the appropriate code for the underlying cause of death.

## Part II (Other significant conditions)

- Enter all diseases or conditions that contributed to fatal outcome, but not related to the disease or condition directly causing death.
- If two or more possible chains that lead to death, or if two conditions seems to have added together, report in Part I the one that, in your opinion, most directly caused death, and report in Part II the other diseases or conditions.

## Examples of Proper Completion of the Death Certificate

The following examples will assist in further understanding of how to complete the "Cause of Death" section of the death certificate:

### Example 1

A 50-year-old man was admitted with severe chest pain. ECG showed extensive myocardial infarct of inferior wall. He developed ventricular fibrillation one day after onset of chest pain and died. He had a history of ischaemic heart disease for 3 years and mild non-insulin-dependent diabetes mellitus for 2 years.

The logical sequence of completing Part I of cause of death is as shown. Non-insulin-dependent diabetes mellitus should be entered in Part II if the attending doctor thought that it contributed to death but was not a direct cause.

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的大約相距時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況。§ Disease or condition directly leading to death. § 先前原因 導致上述原因的病理學情況(如有的話), 述明最後的潛在情況。 Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) <b>Ventricular fibrillation</b> 由於(或起因為) due to (or as a consequence of)  (b) <b>Acute myocardial infarction of inferior wall</b> 由於(或起因為) due to (or as a consequence of)  (c) <b>Chronic ischaemic heart disease</b>	<b>Immediate</b>   <b>1 day</b>   <b>3 years</b>
II 造成死亡的其他主要情況, 但與引致死亡的疾病或情況無關者。 Other significant conditions contributing to the death, but not related to the disease or condition causing it.	<b>Non-insulin-dependent diabetes mellitus</b>	<b>2 years</b>
§ 這並非指死亡的方式, 例如心臟衰竭、虛弱等, 而是指引致死亡的疾病、損傷或併發症。 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.		

## Example 2

A 80-year-old lady was admitted for sudden onset of right hemiplegia. CT scan showed subcortical intracerebral haemorrhage. She developed hypostatic pneumonia 4 weeks after admission, and then died 2 days later. She had hypertension which was well controlled by medication for 5 years.

The logical sequence of completing the death certificate is as shown. Hypertension should be entered in Part II if the attending doctor thought that it contributed to death. However, if the attending doctor thought that Hypertension was the cause of the intracerebral haemorrhage, Hypertension should then be reported in the lowest used line in Part 1.

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的 大約相隔時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況。§ Disease or condition directly leading to death. § 先前原因 導致上述原因的病理學情況(如有的話), 述明最後的潛在情況。 Antecedent causes Morbidity conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) <u>Hypostatic pneumonia</u> 由於(或起因為) due to (or as a consequence of)	<u>2 days</u>
	(b) <u>Subcortical intracerebral haemorrhage</u> 由於(或起因為) due to (or as a consequence of)	<u>4 weeks</u>
	(c) _____	_____
II 造成死亡的其他主要情況, 但與引致死亡的疾病或情況無關者。 Other significant conditions contributing to the death, but not related to the disease or condition causing it.	<u>Hypertension</u> _____	<u>5 years</u> _____
§ 這並非指死亡的方式, 例如心臟衰竭、虛弱等, 而是指引致死亡的疾病、損傷或併發症。 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.		

### Example 3

A 50-year-old lady had carcinoma in the central portion of right breast for 2 years. She was admitted for fracture of shaft of femur with bone secondary. She developed pulmonary embolism 2 weeks after admission, and then died 1 day later.

The underlying cause of death, "Malignant neoplasm of central portion of breast", should be reported in the lowest used line in Part 1.

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的 大約相距時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況。§ Disease or condition directly leading to death. § 先前原因 導致上述原因的病理學情況(如有的話), 述明最後的潛在情況。 Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) <u>Pulmonary embolism</u> 由於(或起因為) due to (or as a consequence of)	<u>1 day</u>
	(b) <u>Secondary carcinoma of shaft of femur with fracture</u> 由於(或起因為) due to (or as a consequence of)	<u>2 weeks</u>
	(c) <u>Malignant neoplasm of central portion of breast</u>	<u>2 years</u>
II 造成死亡的其他主要情況, 但與引致死亡的疾病或情況無關者。 Other significant conditions contributing to the death, but not related to the disease or condition causing it.	..... .....	..... .....
§ 這並非指死亡的方式, 例如心臟衰竭、虛弱等, 而是指引致死亡的疾病、損傷或併發症。 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.		

#### Example 4

A 90-year-old man was diagnosed to have Alzheimer's disease with mild degree of dementia 10 years ago. He was admitted with productive cough and pleuritic chest pain. Chest X-ray showed infiltrates at right upper lobe and ECG was normal. His condition deteriorated despite treatment and he finally died 3 days after admission.

If the attending doctor thought that pneumonia was directly caused by dementia which resulted in swallowing difficulty and diverted saliva and pathogens down to the lungs, dementia should be entered in the second line of Part I. Dementia is a syndrome characterized by disturbance of multiple higher cortical functions. It is advised to provide its underlying cause in the lowest line of Part I. In this case, Alzheimer's disease should then be written in I(c).

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的 大約相隔時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況。§ Disease or condition directly leading to death. § 先前原因 導致上述原因的病理學情況(如有的話)·述明最後的潛在情況。 Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) <b><i>Pneumonia</i></b> 由於(或起因為) due to (or as a consequence of)	<b><i>3 days</i></b>
	(b) <b><i>Dementia</i></b> 由於(或起因為) due to (or as a consequence of)	<b><i>10 years</i></b>
	(c) <b><i>Alzheimer's disease</i></b>	<b><i>10 years</i></b>
II 造成死亡的其他主要情況，但與引致死亡的疾病或情況無關者。 Other significant conditions contributing to the death, but not related to the disease or condition causing it.		
§ 這並非指死亡的方式，例如心臟衰竭、虛弱等，而是指引致死亡的疾病、損傷或併發症。 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.		

**Quiz:** Complete the death certificates for the following patients. Suggested solutions are provided on page 10.

**Patient 1:**

A 70-year-old man was diagnosed to have inoperable adenocarcinoma of the head of the pancreas 4 months ago. He was admitted for shortness of breath for 2 days. Investigation showed metastasis to multiple sites including the lung, liver and lymph nodes. He died two days after admission.

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的大約相距時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況。§ Disease or condition directly leading to death. § 先前原因 導致上述原因的病理學情況(如有的話), 說明最後的潛在情況。 Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) ..... 由於(或起因為) due to (or as a consequence of) (b) ..... 由於(或起因為) due to (or as a consequence of) (c) .....	..... ..... .....
II 造成死亡的其他主要情況, 但與引致死亡的疾病或情況無關者。 Other significant conditions contributing to the death, but not related to the disease or condition causing it.	..... .....	..... .....
§ 這並非指死亡的方式, 例如心臟衰竭、虛弱等, 而是指引致死亡的疾病、損傷或併發症。 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.		

**Patient 2:**

A 55-year-old man, known to have chronic viral hepatitis B for more than 10 years and suffering from liver cirrhosis for 5 years, was admitted for coma. Clinical and laboratory findings showed that he had liver failure. The patient died 6 days after admission.

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的大約相距時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況。§ Disease or condition directly leading to death. § 先前原因 導致上述原因的病理學情況(如有的話), 說明最後的潛在情況。 Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) ..... 由於(或起因為) due to (or as a consequence of) (b) ..... 由於(或起因為) due to (or as a consequence of) (c) .....	..... ..... .....
II 造成死亡的其他主要情況, 但與引致死亡的疾病或情況無關者。 Other significant conditions contributing to the death, but not related to the disease or condition causing it.	..... .....	..... .....
§ 這並非指死亡的方式, 例如心臟衰竭、虛弱等, 而是指引致死亡的疾病、損傷或併發症。 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.		

### Patient 3:

A 75-year-old female was admitted to hospital from a nursing home for fever with decreased general condition for four days. She had history of cerebro-vascular accident two years ago and became increasingly bed-bound and required an indwelling Foley catheter. Laboratory investigation after admission showed that she had leucocytosis and urine and blood culture were both positive for *Pseudomonas aeruginosa*. Despite treatment, she developed hypotension and died on the fifth day after admission.

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的大約相距時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況。§ Disease or condition directly leading to death. § 先前原因 導致上述原因的病理學情況(如有的話), 說明最後的潛在情況。 Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) ..... 由於(或起因為) due to (or as a consequence of) (b) ..... 由於(或起因為) due to (or as a consequence of) (c) .....	..... ..... .....
II 造成死亡的其他主要情況, 但與引致死亡的疾病或情況無關者。 Other significant conditions contributing to the death, but not related to the disease or condition causing it.	..... .....	..... .....
§ 這並非指死亡的方式, 例如心臟衰竭、虛弱等, 而是指引致死亡的疾病、損傷或併發症。 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.		

### Patient 4:

A 50-year-old woman was found to have calculus of gallbladder five years ago. She was admitted for fever and right upper quadrant pain for 1 day. The diagnosis was acute cholecystitis and cholecystectomy was performed. She developed pulmonary embolism 3 days after operation and died one day afterwards.

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的大約相距時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況。§ Disease or condition directly leading to death. § 先前原因 導致上述原因的病理學情況(如有的話), 說明最後的潛在情況。 Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) ..... 由於(或起因為) due to (or as a consequence of) (b) ..... 由於(或起因為) due to (or as a consequence of) (c) .....	..... ..... .....
II 造成死亡的其他主要情況, 但與引致死亡的疾病或情況無關者。 Other significant conditions contributing to the death, but not related to the disease or condition causing it.	..... .....	..... .....
§ 這並非指死亡的方式, 例如心臟衰竭、虛弱等, 而是指引致死亡的疾病、損傷或併發症。 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.		



### Patient 5:

A 30-year-old man was found to have human immunodeficiency virus infection 7 years ago. He developed acquired immunodeficiency syndrome 5 years later. He was admitted for *Pneumocystis carinii* pneumonia and died 2 weeks later.

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的大約相距時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況。§ Disease or condition directly leading to death. § 先前原因 導致上述原因的病理學情況(如有的話), 述明最後的潛在情況。 Antecedent causes Morbidity conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) ..... 由於(或起因為) due to (or as a consequence of) (b) ..... 由於(或起因為) due to (or as a consequence of) (c) .....	..... ..... .....
II 造成死亡的其他主要情況, 但與引致死亡的疾病或情況無關者。 Other significant conditions contributing to the death, but not related to the disease or condition causing it.	..... .....	..... .....
§ 這並非指死亡的方式, 例如心臟衰竭、虛弱等, 而是指引致死亡的疾病、損傷或併發症。 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.		

### Patient 6

A 54-year-old man with history of chronic obstructive pulmonary disease for more than 10 years, was addicted to intravenous heroin for 20 years. He was admitted for *staphylococcus* endocarditis and died 2 weeks later.

死因 CAUSE OF DEATH (申報人應閱讀第 II 及 III 部。)(The informant should read Parts II and III of this form.)		發作與死亡之間的大約相距時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況。§ Disease or condition directly leading to death. § 先前原因 導致上述原因的病理學情況(如有的話), 述明最後的潛在情況。 Antecedent causes Morbidity conditions, if any, giving rise to the above cause, stating the underlying condition last.	(a) ..... 由於(或起因為) due to (or as a consequence of) (b) ..... 由於(或起因為) due to (or as a consequence of) (c) .....	..... ..... .....
II 造成死亡的其他主要情況, 但與引致死亡的疾病或情況無關者。 Other significant conditions contributing to the death, but not related to the disease or condition causing it.	..... .....	..... .....
§ 這並非指死亡的方式, 例如心臟衰竭、虛弱等, 而是指引致死亡的疾病、損傷或併發症。 This does not mean the mode of dying e.g., heart failure, asthenia, etc. It means the disease, injury or complication which caused death.		

Reference: 1. International Statistical Classification of Diseases and Related Health Problems, Tenth Revision. World Health Organization, 1992.

2. Instruction Manual Part 20. ICD-10 Cause-of-Death Querying, 1999. Centers for Disease Control and Prevention, National Center for Health Statistics.

### **Suggested solutions to quiz**

#### ***Patient 1***

<b>I(a)</b> Multiple metastasis <b>(b)</b> Adenocarcinoma of the head of the pancreas <b>(c)</b>	4 months
<b>II</b>	

#### ***Patient 2***

<b>I(a)</b> Hepatic coma <b>(b)</b> Liver cirrhosis <b>(c)</b> Chronic hepatitis B	6 days 5 years >10 years
<b>II</b>	

#### ***Patient 3***

<b>I(a)</b> Pseudomonas septicemia <b>(b)</b> Urinary tract infection <b>(c)</b> Old cerebro-vascular accident	5 days 8 days 2 years
<b>II</b>	

#### ***Patient 4***

<b>I(a)</b> Pulmonary embolism <b>(b)</b> Cholecystectomy <b>(c)</b> Calculus of gallbladder with acute cholecystitis	1 day 4 days 5 days
<b>II</b>	

#### ***Patient 5***

<b>I(a)</b> Pneumocystis carinii pneumonia <b>(b)</b> Acquired immunodeficiency syndrome <b>(c)</b> Human immunodeficiency virus infection	2 weeks 2 years 7 years
<b>II</b>	

#### ***Patient 6***

<b>I(a)</b> Staphylococcus endocarditis <b>(b)</b> Chronic intravenous heroin addiction <b>(c)</b>	2 weeks 20 years
<b>II</b> Chronic obstructive pulmonary disease	10 years

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