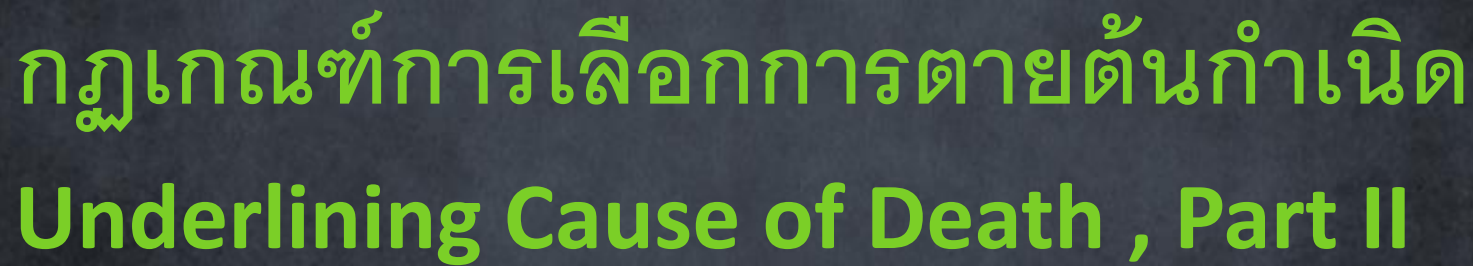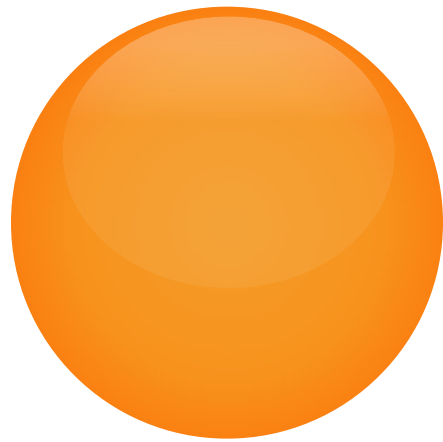ผศ.นพ.พรณรงค์ โชติวรรณ

กฏเกณฑ์การเลือกการตายต้นกำเนิด
Underlining Cause of Death , Part II

CODING INSTRUCTIONS FOR MORTALITY

Selecting the underlining cause of death

Coding instructions for mortality

Death Certificate a, b, c, d → **Assign ICD codes to all conditions** → **Select an underlining cause of death**

หลักการให้รหัสสาเหตุตายต้นกำเนิด

1

Finding the starting point (Step SP1 to SP8)

หาจุดเริ่มต้นที่นำไปสู่การตายให้เจอก่อน ขั้นตอน **SP1** ถึง **SP8**

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		Approximate interval between onset and death
I		
Disease or condition directly leading to death*	(a)	. . . .
	due to (or as a consequence of)	
Antecedent causes Morbid conditions, if any,	(b)	. . . .
giving rise to the above cause, stating the underlying	due to (or as a consequence of)	
condition last	(c)	. . . .
	due to (or as a consequence of)	
	(d)	. . . .
II		
Other significant conditions contributing to the 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.

หนังสือรับรองการตาย ท.ร.4/1

1.4 อายุ ปี	1.5 สัญชาติ	1.6 อาชีพ	1.7 สถานภาพการสมรส
1.8 ที่อยู่			1.9 ศาสนา
2.1 ตาย วันที่ เวลา น.		2.2 ผู้รักษาก่อนตาย	

2.3 โรคที่เป็นสาเหตุการตาย (เขียนเป็นภาษาอังกฤษตัวพิมพ์ใหญ่(CAPITAL LETTER)	ระยะเวลาตั้งแต่เริ่มเป็นโรคจนกระทั่ง เสียชีวิต
a) .... (due to)	....
b) Part 1 .... (due to)	....
c) .... (due to)	....
d) .... (due to)	....

2.4 โรคหรือภาวะอื่นที่เป็นเหตุหนุน .... Part 2 ....

2.5 โรคหรือภาวะที่เจ้าหน้าที่ทะเบียนราษฎร์ควรคัดลอกลงในช่อง"สาเหตุการตาย" ในมรณบัตร

(ให้เขียนเพียงโรคหรือภาวะเดียวเท่านั้นโดยเขียนเป็นภาษาไทย) ....

2.6 หากผู้เสียชีวิตเป็นสตรี ☐ ไม่ตั้งครรภ์ ☐ กำลังตั้งครรภ์............สัปดาห์ ขณะเสียชีวิต ☐ เพิ่งสิ้นสุดการตั้งครรภ์ไม่เกิน 6 สัปดาห์ ☐ ไม่ทราบ

Step SP1 –Single cause on certificate

- ถ้าแพทย์บันทึกเพียงโรคเดียวในรายงานไม่ว่าจะใน **Part 1** หรือ **2** โรคนั้นจะเป็น **starting point หรือจุดเริ่มต้น และยังเป็น underlying cause ด้วย.** ให้ข้ามไปพิจารณาใน Step M1.

- ถ้าแพทย์บันทึกมากกว่า 1 โรคในรายงานให้ข้ามไป Step SP2.

- ถ้า**Part 1** มีบันทัดเดียวแต่มีมากกว่า 1 โรคให้ใช้โรคแรกเป็น**tentative starting point** หรือจุดเริ่มต้นในขั้นนี้ แล้วข้ามไป **SP6.**

- ถ้า **Part 1** มีโรคเดียวแต่มีโรคอื่นใน **Part 2** ให้ใช้โรคเดียวใน **Part 1** เป็น **tentative starting point.** หรือจุดเริ่มต้นในขั้นนี้ แล้วข้ามไป **SP6.**

- ถ้ามีการบันทึกมากกว่า 1 บันทัดใน **Part 1** ให้ไป **SP3.**

Example 1:

1(a) Myocardial infarction and diabetes mellitus

   (b)

   (c)

   (d)

Myocardial infarction บันทึกไว้ก่อน DM จึงใช้เป็น tentative starting point แล้วข้ามไป Step SP6 เพื่อตรวจสอบว่าจะเข้าข่ายต้องใช้กฎในการเลือกหรือแก้ไขหรือไม่.

Example 2: **1(a) Myocardial infarction**

(b)

(c)

(d)

2 Diabetes mellitus

Myocardial infarction บันทึกไว้โรคเดียวใน Part 1 จึงใช้เป็น tentative starting point แล้วข้ามไป Step SP6 เพื่อตรวจสอบว่าจะเข้าข่ายต้องใช้กฎในการเลือกหรือแก้ไขหรือไม่.

ให้ดูว่าบันทัดล่างสุดในส่วนที่ 1 สามารถทำให้เกิดบันทัดสูงขึ้นไปทุกรายการหรือไม่โดยไม่ต้องคิดsequence แต่บันทัดล่างสุดต้องเกิดก่อนทุกบันทัด ถ้าเป็นเช่นนี้ บันทัดล่างสุดจะป็นจุดตั้งต้นชั่วคราวเพื่อพิจารณาหา underlining cause of death โดยไปต่อที่ step SP6

ถ้าบันทัดล่างสุดไม่สามารถทำให้เกิดทุกเหตุการณ์ในบันทัดบนๆได้ ให้ไป SP4

Example 3: 1(a) Bronchopneumonia

(b) Hemiplegia

(c) Cerebral infarction

(d)

2

ทั้ง **bronchopneumonia and hemiplegia** อาจเกิดมาจาก**cerebral infarction.** หมายถึง **cerebral infarction** เป็น**tentative starting point** ไปต่อที่ **Step SP6.**

Step SP3 —*More than one line used in Part 1, first cause on lowest line explains all entries above*

Example 4: 1(a) Kaposi sarcoma 1 year

(b) HIV 3 years

(c) Blood transfusion 5 years

(d) Haemophilia since birth

2

Kaposi sarcoma, HIV and blood transfusion can all be caused by haemophilia, which is the first (and also only) condition mentioned on the lowest used line in Part 1. This means that haemophilia is the tentative starting point.

Example 5: 1(a) Pneumocystosis 6 months

(b) HIV 5 years

(c) Ruptured spleen 7 years

(d) Assault – fist fight 7 years

Assault by fist fight is the only condition mentioned on the lowest used line in Part 1. It can cause everything on the lines above, assuming a blood transfusion as treatment for the ruptured spleen. See also Section 4.1.3, Basic concepts, where assumption of intervening cause is described in the section on causal relationship

Example 6: 1(a) Liver metastases 2 months

(b) Bronchopneumonia 4 days

(c) Stomach cancer 6 months

(d)

Both liver metastases and bronchopneumonia can be caused by stomach cancer. This means that stomach cancer is the tentative starting point, even though bronchopneumonia cannot cause liver metastases and the bronchopneumoniahas a shorter duration than the liver metastases

Example 7: 1(a) Liver metastases and pulmonary oedema

(b) Bronchopneumonia

(c) Stomach cancer

(d)

Liver metastases, pulmonary oedema and

bronchopneumonia can all be caused by stomach cancer. This means that stomach cancer is the tentative starting point, even though bronchopneumonia cannot cause liver metastases.

Example 8:

1(a) Liver metastases

   (b) Bronchopneumonia and stomach cancer

   (c)

   (d)

Liver metastases cannot be due to bronchopneumonia. This means that no tentative starting point can be identified at Step SP3. Therefore, go to Step SP4.

- ถ้าบันทัดล่างสุดไม่สามารถอธิบายบันทัดบนๆได้ทุกบันทัด แต่มี Sequence ไปถึงบันทัดบนสุดได้ ให้ใช้จุดเริ่มต้นของ Sequence นั้นเป็น tentative starting point ใหม่แล้วไปต่อที่ SP6

- ถ้าไม่มี Sequence ไปสิ้นสุดที่บันทัดบนสุดเลยให้ไปดำเนินการ ต่อที่ SP5

- ต้องดู step 4.2.3 เสมอเพื่อดูว่า sequence นั้นใช้ได้หรือไม่

1(a) Liver metastases 2 months

 (b) Cerebral infarction and stomach cancer 6 months

 (c)

 (d)

Cerebral infarction cannot cause liver metastases, but liver metastases can be due to stomach cancer. Stomach cancer is the tentative starting point.

1(a) Bronchopneumonia 2 months

 (b) Cerebral infarction and liver metastases 6 months

 (c) Atherosclerosis and stomach cancer

 (d)

Atherosclerosis cannot cause liver metastases. However, there are three acceptable sequences on the certificate: 1) bronchopneumonia caused by cerebral infarction, in its turn caused by atherosclerosis; 2) bronchopneumonia caused by cerebral infarction, in its turn caused by stomach cancer; and 3) bronchopneumonia caused by liver

metastases, in its turn caused by stomach cancer. But the first-mentioned sequence is bronchopneumonia caused by cerebral infarction, in its turn caused by atherosclerosis. Consequently, atherosclerosis is the tentative starting point.

- ถ้าไม่มี sequence นำไปถึงบันทัดบนสุด ของใบรับรอง ให้ใช้บันทัดบนสุดนั้นเป็น tentative starting point. แล้วไปทำ Step SP6 ต่อ.

Example 12: 1(a) Liver metastases

(b) Cerebral infarction

(c) Atherosclerosis

(d)

2 Stomach cancer

Atherosclerosis cannot cause liver metastases. Also, there is no sequence in Part 1 that ends with the terminal condition, because cerebral infarction cannot cause liver metastases. Because there is no sequence ending with the terminal condition, the terminal condition itself – liver metastases – is the tentative starting point.

ตรวจสอบว่า Tentative starting point ที่เลือกจาก step SP1-SP5 นั้นสามาถเกิดจากเหตุอื่นที่มีบันทึกไว้ในตำแหน่งอื่นของใบรับรองอย่างชัดเจนหรือไม่ ถ้ามีก็เปลี่ยน Tentative starting point ไปที่จุดใหม่ แล้วไปดำเนินการในขั้นที่ SP7 ต่อไป

ถ้าไม่เจอก็ดำเนินการในขั้นที่ SP7 ต่อไป

Example 13: 1(a) Liver metastases

(b) Cerebral infarction

(c)

(d)

2 Stomach cancer

Cerebral infarction cannot cause liver metastases, and liver metastases is the tentative starting point. But stomach cancer is an obvious cause of liver metastases, and stomach cancer is the new tentative starting point.

Example 14: 1(a) Sepsis

          (b) Peritonitis

          (c)

          (d)

          2 Necrosis of intestine, mesenteric infarction

Sepsis can be caused by peritonitis, and peritonitis is the tentative starting point. But necrosis of intestine is an obvious cause of peritonitis, so necrosis of intestine is the new tentative starting point. Next, mesenteric infarction is an obvious cause of necrosis of intestine, and mesenteric infarction is the final starting point.

Example 15: 1(a) Sepsis

          (b) Peritonitis

          (c)

          (d)

          2 Mesenteric embolism, ruptured appendicitis

Sepsis can be caused by peritonitis, and peritonitis is the tentative starting point. Next, both mesenteric embolism and ruptured appendicitis are obvious causes of peritonitis. Because mesenteric embolism is mentioned first, it is the new tentative starting point.

Step SP7 – Ill-defined conditions

Now check whether the tentative starting point is listed in the table of illdefined conditions (see Annex 7.3, List of ill-defined conditions). If it is, the tentative starting point is considered ill-defined. Then do as follows:

If there are other conditions reported on the certificate, check whether they are all ill-defined. If all other conditions are ill-defined, go to Step M1.

If there is at least one condition that is not ill-defined, then disregard the illdefined condition. Go to Step SP1 and select another starting point, as if the ill-defined condition had not been mentioned on the certificate. If the tentative starting point is not ill-defined, go to Step SP8.

7.3 List of ill-defined conditions

Use this table in Step SP7. Conditions in this table are considered ill-defined.

Code	Category or subcategory title
I46.1	Sudden cardiac death, so described
I46.9	Cardiac arrest, unspecified
(I50.-)	Acute heart failure in I50.-
I95.9	Hypotension, unspecified
I99	Other and unspecified disorders of circulatory system
J96.0	Acute respiratory failure
J96.9	Respiratory failure, unspecified
P28.5	Respiratory failure of newborn
R00–R57.1, R57.8–R59.9, R65.2–R65.3, R68.0–R94, R96–R99	Symptoms, signs and abnormal laboratory findings, not elsewhere classified

Example 16: 1(a) Respiratory failure

         (b)

         (c)

         (d)

       2 Mesenteric embolism

Respiratory failure is the only condition mentioned in Part 1 and it is the tentative starting point according to Steps SP2 and SP6. But respiratory failure is in the table of ill-defined conditions, so disregard respiratory failure and restart the selection procedure from Step SP1. Mesenteric embolism is the new starting point according to Step SP1.

Example 17: 1(a) Anaemia

      (b) Splenomegaly

      (c)

      (d)

       2

Splenomegaly(R16.1), the tentative starting point according to Step SP3, is in the table of ill-defined conditions. Disregard splenomegaly and restart the selection procedure from Step SP1. Now, anaemia is the new starting point according to Step SP2. However, splenomegaly modifies the coding of anaemia (see the Alphabetical index). Code to 'splenomegalic anaemia'(D64.8).

ตรวจดูว่า tentative starting point ที่เลือกไว้อยู่ในรายชื่อ รหัสที่ไม่น่าเป็นสาเหตุการตายหรือไม่ (ดูคู่มือฯ 2017 หน้า 27-34 หรือ ICD-10 WHO 2016 Vol 2 Annex 7.4) ถ้าอยู่ ให้ดำเนินการดังนี้

If there are other conditions reported on the certificate, check whether they are all ill-defined or unlikely to cause death. If they are all ill-defined or unlikely to cause death, go to Step M1

Example 18: 1(a) Hearing loss
       (b)
       (c)
       (d)
       2 Ischaemic heart disease

Hearing loss is the tentative starting point according to Step SP2, but hearing loss is in the table of conditions considered unlikely to cause death. There is another condition on the certificate, ischaemic heart disease, which is not in the table of conditions considered unlikely to cause death. Disregard hearing loss and restart the selection procedure from Step SP1. Ischaemic heart disease is the new starting point according to Step SP1.

Example 19: 1(a) Liver failure

(b) Excessive use of paracetamol

(c) Migraine type headache

(d)

2

Migraine type headache is the tentative starting point according to Step SP3. It is in the table of conditions considered unlikely to cause death. The condition was treated with paracetamol and there was a reaction to the treatment, liver failure. Disregard the condition unlikely to cause death and select the reaction to the treatment, liver failure, as the starting point.

Example 20: 1(a) Sepsis

(b) Submandibular abscess

(c) Caries

(d)

2

Caries is the tentative starting point according to Step SP3.It is in the table of conditions considered unlikely to cause death, but in this case it caused complications that are not considered unlikely to cause death. Because of that, select caries as the starting point.

Example 21: 1(a) Headache

(b) Caries

(c)

(d)

2 Ischaemic heart disease

Caries is the tentative starting point according to Step SP3. It is in the table of conditions considered unlikely to cause death. A complication is reported, headache, but it is in the table of ill-defined conditions. Disregard both caries and headache and restart the selection procedure from Step SP1. Ischaemic heart disease is the new starting point according to Step SP1.

2 CHECK FOR MODIFICATIONS OF THE STARTING POINT (STEPS M1 TO M4)

Special instructions on linkages and other provisions (Step M1)

ขั้นตอนนี้ใช้หลังจากเลือก tentative starting pint จาก step SP1-SP8 มาแล้วต้องมาพิจารณาว่ารหัสที่ได้เชื่อมโยงกับข้อมูลอื่นในหนังสือรับรองฯ จนทำให้เกิดรหัสใหม่ตาม ICD-10 vol2 -2016 หน้า 69-97 หรือไม่ ส่วนนี้ใช้ความรู้ในด้านการให้รหัสค่อนข้างเยอะ

Special instructions on linkages and other provisions (Step M1)

ขั้นตอนนี้ใช้หลังจากเลือก **tentative starting pint** จาก **step SP1-SP8** มาแล้วต้องมาพิจารณาว่ารหัสที่ได้เชื่อมโยงกับข้อมูลอื่นในหนังสือรับรอง ฯ จนทำให้เกิดรหัสใหม่ตาม **ICD-10 vol2 -2016** หน้า **69-97** หรือไม่ ส่วนนี้ใช้ความรู้ในด้านการให้รหัสค่อนข้างเยอะ

If no special coding instruction applies, then the starting point you found using Steps SP1 to SP8 is the tentative underlying cause. Next, go to Step M2.

Example 1: 1(a) Myocardial infarction

(b) Ischaemic heart disease

(c)

(d)

Ischaemic heart disease is the tentative starting point according to Step SP3. There is a special instruction on ischaemic heart disease reported with myocardial infarction, and, according to this instruction, myocardial infarction is the new tentative underlying cause.

Example 2: 1(a) Ischaemic heart disease

      (b) Atherosclerosis

      (c)

      (d)

     2 Myocardial infarction

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported with ischaemic heart disease, and another one on atherosclerosis reported with myocardial infarction. Ischaemic heart disease is reported first on the certificate, so apply the instruction on atherosclerosis reported with ischaemic heart disease and select ischaemic heart disease as the new starting point. Next, there is a special instruction on ischaemic heart disease reported with myocardial infarction. Apply this instruction and select myocardial infarction as the new tentative underlying cause.

Example 3: 1(a) Ischaemic heart disease
        (b) Atherosclerosis
        (c)
        (d)
       2 Cerebral infarction

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported with ischaemic heart disease, and another one on atherosclerosis reported with cerebral infarction. Ischaemic heart disease is reported first on the certificate, so apply the instruction on atherosclerosis reported with ischaemic heart disease and select ischaemic heart disease as the new tentative underlying cause

Example 4: 1(a) Cerebrovascular infarction

(b) Atherosclerosis

(c) Hypertension

(d)

2 Myocardial infarction

Hypertension is the tentative starting point according to Step SP3. There are special instructions on hypertension reported with cerebrovascular infarction and with myocardial infarction. Cerebrovascular infarction is reported first on the certificate, so apply the instruction on hypertension reported with cerebrovascular infarction and select cerebrovascular infarction as the new tentative underlying cause.

Example 5: 1(a) Dementia

(b) Atherosclerosis

(c)

(d)

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported as the cause of dementia. Apply this instruction and select atherosclerotic dementia as the new tentative underlying cause.

Example 6: 1(a) Atherosclerosis

      (b)

      (c)

      (d)

  2 Dementia

Atherosclerosis is the tentative starting point according to Step SP2. Although there is a special instruction on dementia reported as caused by atherosclerosis, this instruction does not apply here because dementia is reported in Part 2 and not as caused by atherosclerosis. In this case, atherosclerosis remains the tentative starting point

Example 7: 1(a) Epilepsy

(b) Alcoholism

(c)

(d)

2

Alcoholism is the tentative starting point according to Step SP3. In Volume 1, a list of inclusion terms at G40.5, Special epileptic syndromes, mentions 'epileptic seizures related to alcohol'. However, the code title for G40.5, Special epileptic syndromes, does not mention alcohol. Therefore, keep alcoholism as the tentative starting point.

If the tentative underlying cause describes a condition in general terms and a term that provides more precise information about the site or nature of this condition is reported on the certificate, this more informative term is the new tentative underlying cause.

Next, check whether this new tentative underlying cause can be specified even further by other terms on the death certificate. That is, reapply Step M2. Repeat until you have found a tentative underlying cause that cannot be specified further.

Example 8: 1(a) Cerebrovascular accident
(b) Atherosclerosis
(c)
(d)
2 Arterial embolism to brain stem

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported with cerebrovascular accident; apply this instruction and select cerebrovascular accident as the new starting point according to Step M1. The type of cerebrovascular accident is described more precisely in Part2 as an arterial embolism to brain stem. This is the new tentative underlying cause.

Example 9: 1(a) Cerebrovascular accident
        (b) Atherosclerosis
        (c)
        (d)
        2 Oat cell cancer originating in upper right lobe

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported with cerebrovascular accident; apply this instruction and select cerebrovascular accident as the new tentative underlying cause. There is no more specific description of the type of cerebrovascular accident on the certificate, and cerebrovascular accident remains the tentative underlying cause.

Example 10: 1(a) Meningitis

(b) Tuberculosis

(c)

(d)

Tuberculosis is the tentative starting point according to Step SP3. The manifestation is described as meningitis, and the two terms combine into tuberculous meningitis, which is the tentative underlying cause.

If, at this point, the tentative underlying cause is not the same as the starting point you selected using Steps SP1 to SP8, then go back to Step SP6. Repeat the procedures described in Steps SP6, M1 and M2.

• Do not go back to Step SP6 if the cause selected in Step M1 or M2 is correctly reported as due to another condition, except when this condition is ill-defined.

• Also, do not go back to Step SP6 if the tentative underlying cause is a reaction to treatment of a condition unlikely to cause death, as selected in Step SP8.

Example 11: 1(a) Sepsis

      (b) Arterial disease, arterial embolism of left leg

      (c)

      (d)

    2 Colon cancer

Arterial disease is the tentative starting point according to Step SP3. Arterial embolism of left leg, reported as the second condition on line 1(b), is a specific type of arterial disease. Therefore, select arterial embolism of left leg as the tentative underlying cause in Step M2. Reapply Step SP6, because the tentative starting point is not the same as the one selected in Steps SP1 to SP8. But colon cancer is an obvious cause of arterial embolism, and colon cancer is the new starting point. No further modifications apply. Code colon cancer (C18.9, Malignant neoplasm of colon, unspecified) as the underlying cause of death

Example 12: 1(a) Sepsis

(b) Arterial disease, arterial embolism of left leg

(c) Atherosclerosis

(d)

2 Colon cancer

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported as the cause of arterial disease, and, according to this instruction, arterial disease is the new starting point according to Step M1. Arterial embolism of left leg, reported as the second condition on line 1(b), is a more specific description of the type of arterial disease and is selected as the tentative starting point in Step M2. Do not reapply Step SP6, because arterial embolism of left leg is reported as due to atherosclerosis, and this is a correct causal relationship. No further modifications apply. Code arterial embolism of left leg (I74.3, Embolism and thrombosis of arteries of lower extremities) as the underlying cause of death.

Step M4 – Instructions on medical procedures, poisoning, main injury and maternal deaths