MILLION DEATHS STUDY IN INDIA

Registrar General of India (RGI) and Centre for Global Health Research (CGHR), University of Toronto

Routine, **R**epresentative, **R**e-sampled, **H**ousehold **I**nterview of **M**ortality with **M**edical **E**valuation **(RHIME)**

HEALTH CARE PROFESSIONAL'S MANUAL FOR ASSIGNING CAUSES OF DEATH BASED ON RHIME HOUSEHOLD REPORTS

Version 13, March 2011

Office of the Registrar General of India (RGI), India

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Chapter 1: Introduction

India's ***Sample Registration System (SRS)*** is a continuous and longitudinal half-yearly enumeration of vital events occurring in a national random sample of villages and urban areas in India. It is conducted by the Registrar General of India (RGI). The SRS has established itself as the main source of reliable information on urban and rural ***birth and death rates*** at the state and national level. Currently, information on the ***causes of death*** is poor, particularly in the rural areas, due to continuing paucity of medical personnel and facilities in rural areas. Seventy percent of the population of the country lives in rural areas, and it is not yet feasible to build up statistics on causes of mortality based only on ***"Medical Certification of Cause of Death".***

Public Health Importance of Cause of Death Information:

- To identify the public health importance of different diseases at national and regional levels.
- To make a decision on allocation of resources for controlling various diseases and for research programs.
- To evaluate trends in causes of mortality over time in order to assess the impact of national health programmes.
- To analyse the socio-economic, demographic and life style factors that are associated with deaths due to various diseases.

In order to overcome the information gap in mortality data collection in India, the RGI has entered into a long-term partnership with the Centre for Global Health Research, St. Michael's Hospital, University of Toronto (CGHR) and leading academic partners in the major states of India to improve the measurement of causes of death and the leading risk factors for death in India. The partnership leads to the "Million Deaths Study" (see protocol at www.cghr.org/project.htm). All states will be implementing a new method called "RHIME", or **R**outine, **R**epresentative, **R**e-sampled **H**ousehold **I**nvestigation of **M**ortality with **M**edical **E**valuation (see "Prospective Study of One Million Deaths in India" in PLoS Medicine, February 2006 for more information).

The RHIME Method has several components. The first is routine or "lay" assessment of the causes of death by non-medical staff that use "RHIME" methods (see below). The second involves re-sampling of the work. The third involves central medical evaluation of the field reports to arrive at a final cause of death. The RHIME method began in the SRS half-yearly

surveys (HYS) starting in 2001.

"RHIME" involves a household assessment of the cause of death which is an investigation of train of events and circumstances at the onset and during the course of illness leading to death, through an interview of relatives or associates of the deceased. The RHIME report includes a narrative story in addition to structured questions used to prompt or probe family members to help them recollect events before death. The completed RHIME report is then reviewed independently by two health professionals who then assign independently a cause of death on the basis of the provided information.

The RHIME methods involve the following key features:

- Lay, non-medical staff conducting household investigation of the events leading up to death
- Use of structured questions plus narrative questions in the investigation
- Central medical evaluation and adjudication
- About 5 % random audit by independent team reporting to the academic partners
- Trained physicians assign underlying cause of death (ICD-10) plus keywords
- 100% second coding by these trained physicians, and reconciliation

The RHIME method has been introduced in the SRS because:

- It is feasible and practical. Previous studies, our validation results as well as the experience from first phase of the Central Medical Evaluation (2001-2003) has shown that about 70% of the time, two physicians can agree on the underlying cause of death if the RHIME reports are of good quality. With reconciliation, agreement rises to about 90%. There will always be a *small* percentage of cases for which no cause can be found, but these tend to be concentrated in older ages and in the neonatal period (the extremes of age).
- It gives good cause of death information. Please see the RGI report on causes of deaths on website (www.cghr.org/publications).
- Methods of assigning causes to deaths by RHIME have long been used for childhood deaths, and our group has recently developed and validated these methods in India for deaths in early adult life and middle age. Experience have shown that information in the RHIME report collected by trained non-medical surveyors and reviewed by a

health professional provides causes of death information that is reliable and correct in most cases, especially in the young and middle aged (before age 70).

Under some circumstances, physicians in routine practice may be asked to complete death certificates for patients that have died at home or have not been in the care of that physician. Normally, such causes of death are based on opinion, some referent case materials, police reports or, rarely, an actual autopsy. The RHIME instruments will provide a simple method that they can also be used in these types of clinical settings.

Overview of your Tasks for Cause of Death Assignment:

Your key tasks as a Cause of Death assigner and coder are:

- Access the website using your user name and password, which is assigned to you. Download the reports assigned to you and save them on your computer. Make sure you have a new or fully-working mouse.
- Review the narrative and the gist of information on the reports in order to arrive at an underlying cause of death. The diagnostic guidelines will pop up for each of the ICD codes. See the structured steps given below:

Figure 1 - Structured Steps

Download & review reports assigned to you

↓

Carefully read past history & narrative

↓

Highlight cardinal symptoms & negative evidence. Note keywords and any notes

↓

Think of chronological sequence. Adhere to cardinal symptoms & negative evidence. Do not imagine facts which are not in the record

↓

Choose underlying cause of death (by typing text or entering ICD code). Select specific ICD code & confirm against guidelines

↓

Reconsider ICD code using differential diagnosis

↓

Select certainty of diagnosis & quality of narrative

↓

Upload the record

- Highlight cardinal symptoms & negative evidence. Note keywords. Then type in any comments/notes along with the keywords (symptoms/signs) to support your diagnosis. For example, if a person died from a heart attack (myocardial infarction) and had a history of angina and diabetes, enter ICD code I21 (Myocardial Infarction) as the cause of death and highlight the relevant section of the narrative and type-in comments the keywords – "diabetes, chest pain, sweating" etc.
- Think of chronological sequence. Adhere to cardinal symptoms & negative evidence. Do not imagine facts which are not in the record.
- Assign a 3 digit ICD code for the cause of death & confirm against the pop up guidelines and after considering and ruling out other differential diagnosis which will pop up on your screen.
- Record the certainty of your diagnosis of the Cause of Death as 1-High or 2- Low. Record the quality of the written narrative as 1- Good or 2- Bad.
- Conclude your coding work by pressing the "Upload" button.

This manual provides information on the SRS RHIME methods (Chapter 2), definitions and practice guidelines for reporting Causes of Death (Chapter 3), the International Classification of Diseases (ICD-10) Structure and Contents (Chapter 4), and Diagnostic Guidelines for some common Causes of Death (Chapter 5).

In addition to this manual, other resources will become available to help you in your tasks including self learning tools available on web site, a CD and on-line training sessions. MDS documents are now available on the project website (www.cghr.org/mds).

Chapter 2: RHIME Methods in the Million Death Study

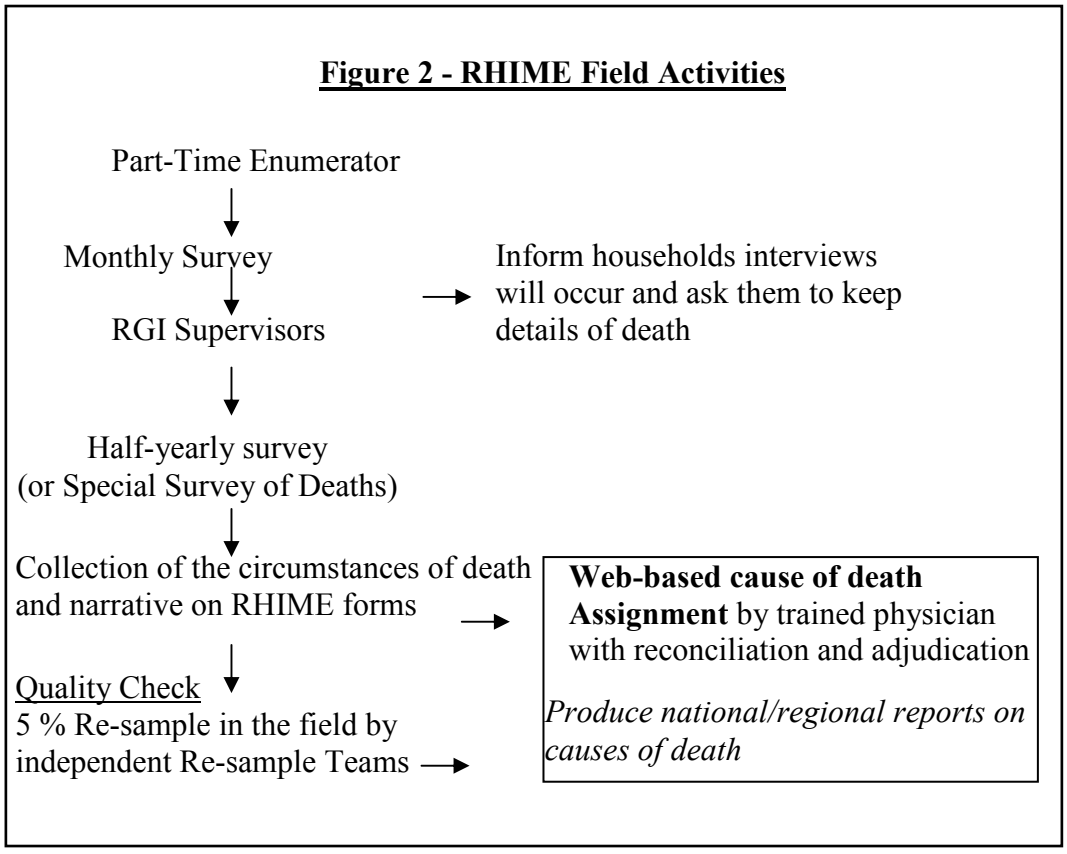
1. RHIME Activities

The Surveyors of Registrar General of India conduct a baseline survey in the selected SRS units every 10 years. A local Part Time Enumerator (PTE) usually a teacher is paid an honorarium to register pregnancies, births and deaths monthly within the sample population of the SRS unit assigned to him/her. Full time RGI Supervisors visit the SRS units assigned to them (average 12 units per RGI Supervisor) every 6 months. During the half-yearly household survey (HYS), RGI supervisors visit all households independently and record all the births and deaths that occurred in the SRS unit during the previous 6 months. Additionally, RGI surveyors fill out a RHIME report for all the recorded deaths.

Re-Sample Teams (RSTs) will resurvey a random 5 percent sample of the SRS units covered by RGI surveyors. RSTs use the exactly the same forms as the ones used by RGI surveyors. Physician coders will receive RHIME forms from both RGI Surveyors and RSTs, but you will not know which is which.

Figure 2 below illustrates the SRS activities involving RHIME reporting, re-sampling work, and assigning Causes of Death.

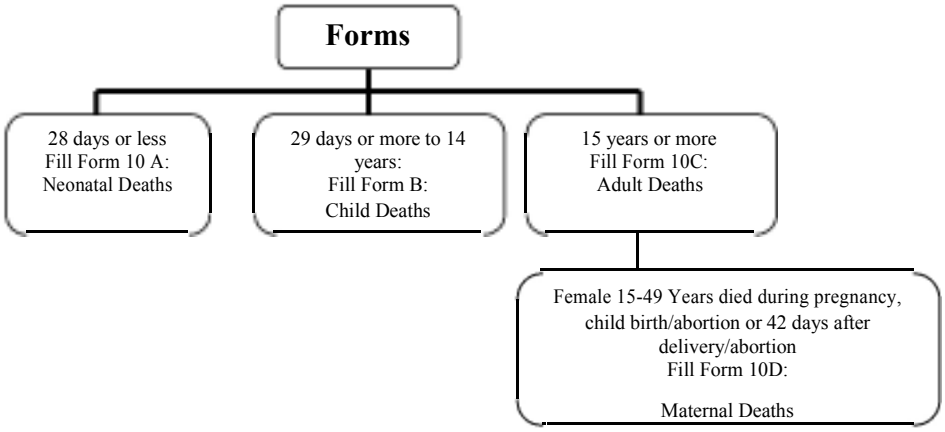
Figure 2 - RHIME Field Activities



2. RHIME Field Forms

Four separate RHIME field forms (10A, 10B, 10C and 10D) have been introduced to collect detailed information on neonatal, child, adult and maternal deaths, respectively. This division has been found to be of practical necessity to keep the interviews focused on causes of death specific to each defined group. Therefore, the selection of which form to fill out depends on the age and sex of the deceased individual (see figure 3 below).

Figure 3 – RHIME Forms



The RHIME field forms have been designed to collect the following information:

- Identifying characteristics of the respondent
- Identifying characteristics of the deceased individual
- Details of the illness preceding the death and circumstances of death:
  - An initial brief description (as told by the respondent);
  - A series of structured questions on specific symptoms;
  - Details of past medical illness; and
  - Evidence from laboratory test reports, prescriptions and other medical documents, as available.

Each of the RHIME forms consists of 3 sections:

Section1 is a structured questionnaire which gathers general information on the respondent and the deceased.

Section 2 is a structured questionnaire to probe about the onset of illness and the nature of symptoms that led to death.

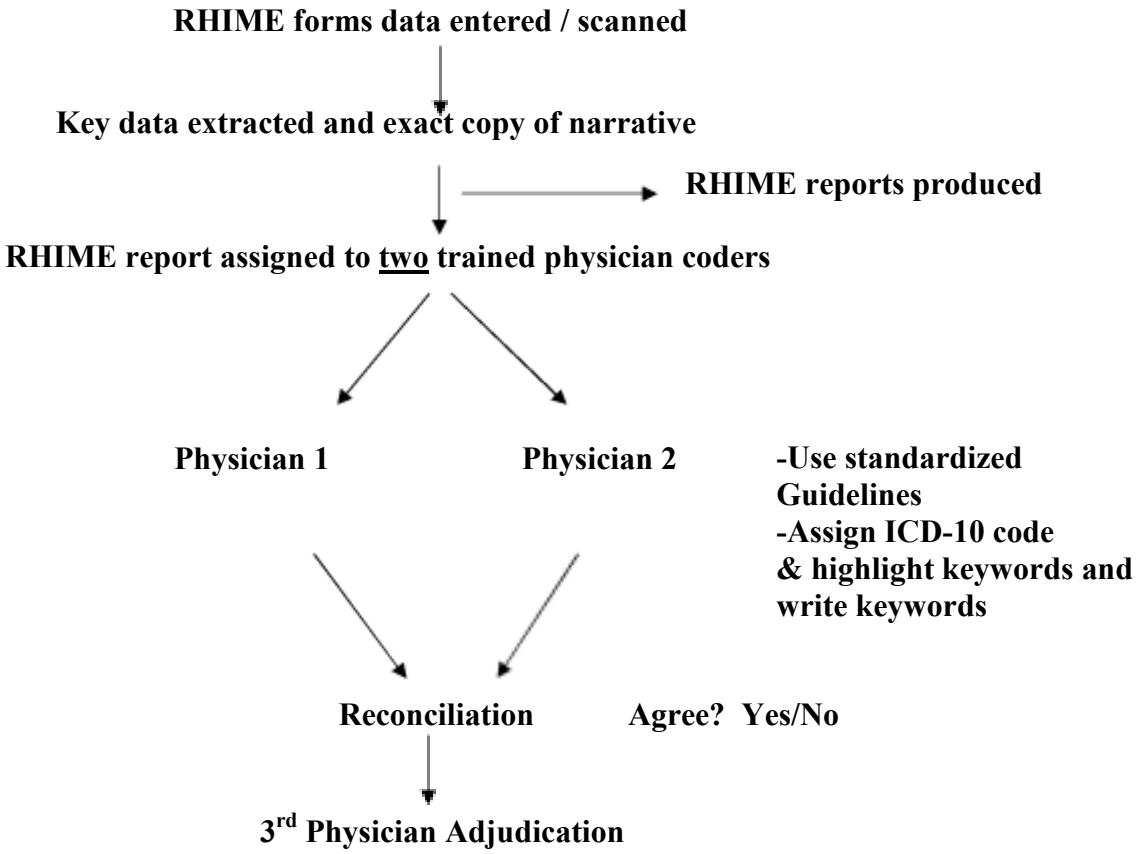
Section3 is the written narrative, which includes a detailed story of the symptoms associated

with the illness preceding death and circumstances of death based on detailed information gathered from the spouse/close associates of the deceased/ neighbours including information from hospital reports, past history of illness, death certificate, etc, if available.

3. Use of web-based physician coding

The RHIME field forms are collected by the RGI supervisors and RST teams and sent to a central location for scanning. The scanning computerizes all the numeric and logical (yes/no/unknown) fields and captures and exact image of the reason that respondent gave for cause of death as well as the full narrative.

Figure 4 - Web-based Physician coding of deaths in the MDS Study



Web-based reports: The key information from these forms is extracted and then sent electronically to over 400 physicians who have been trained like you in physician coding. The physicians are selected randomly by the computer from all states and locations, based only on the language of the narrative. These physicians are sent electronically the reports to assign ICD code via a website. They can access the web and download the coding records.

They then can code the report according to the ICD-10 (see below), highlight the keywords and put comments if any. They will upload the report with ICD-10 code, keywords and add comments to a website.

100% double coding by another physician: If there are major disagreements (not minor ones like J44 for COPD and J45 for asthma), then each physician receives electronically a new report called the Reconciliation. The Reconciliation report has the ICD-10 code and keywords for the diagnosis and that of the other physician. The physician can download and review these records and decide to code their original cause of death, use the other physician's cause of death or assign a new code. They will upload the Reconciliation report with ICD-10 code, keywords and comments if any to a website. If disagreements continue, then a senior physician gets all the previous physician codes assigned and makes a final decision on the ICD 10 code. This is called the Adjudication.

Work expectations: The experience from first phase of 130,000 records from 2001-2003 doubly assigned shows that **each physician can easily complete 150-200 RHIME reports each month**. The total number of physicians trained will be now about 400. The total number of deaths in the SRS typically a year is 50,000. Thus, each physician can expect an average of 250 reports (50,000*double=100,000) divided by 400 physicians. Thus it would take about 2 months to accomplish the coding of one year with 400 active physicians.

The system automatically gives more records to faster coders. Physicians who complete their reports quickly are assigned more records automatically. Conversely, if your work is uncompleted, no new records will be given to you.

A report card depicting your speed and quality will be emailed to you regularly. Your performance versus that of other physicians will also be provided. The idea is to encourage healthy competition to do better on speed as well as quality. We encourage you to be as fast, but as thorough as possible.

Chapter 3: Reporting Causes of Death - Definitions and Practice Guidelines

This section is in two parts. The first, discusses the concept of underlying cause of death and the second discusses the risk factors for death.

I. Underlying Cause of Death: Definition & Concept

WHO has defined Cause of death as "all those diseases, morbid conditions or injuries that either resulted in or contributed to death and the circumstances of the accident or violence that produced any such injuries". Frequently, there are multiple conditions that could have caused the death, which could be:

- o Sequential stages in the natural history of one disease;
- o Complications arising from one of the intermediate conditions; or
- o Different diseases existing simultaneously at the time of death.

While mortality data by age and sex strictly adhere to the principle of one death-one count, the situation becomes a bit complex when extended to recording the causes of death. To overcome this problem, the WHO developed and defined the principle of the underlying cause of death, which resolves the above situations to a one death-one cause situation. Furthermore, the WHO recommends that all primary tabulations on causes of death should be based on the underlying cause of death.

The underlying cause of death is defined as:

The disease which initiated the train of events leading directly to death

OR

The circumstances of the accident or violence which produced the fatal injury

The terminal event that occurred, just before the death, is called mode of death (e.g. aspiration pneumonia, cerebral oedema, shock). While constructing the chain of events, **it is essential to note that modes of death such as respiratory failure, cardio-respiratory arrest, or brain death etc… should NOT be considered as the underlying causes of death**.

Apart from the above situations where a clear sequence of events exists, there are frequent instances, notably among adults, where other significant medical conditions exist, which although do not fit into the sequence, may contribute in an indirect manner to the final event of death. In such situations, those diseases or conditions that are independent of the causal chain of events are often called contributory causes of death (co-morbidity)**.** For example, if a person dies of a stroke but had diabetes in the past, then diabetes may have contributed also to this

condition. Similarly, if a neonate dies of diarrhoea and also has low birth weight, then low birth weight may be a contributory cause of death. It is often a judgment call on what is underlying and what is the contributory cause of death. Use your best clinical judgment to decide. However, always write a possible contributory cause as keyword.

II. Risk Factors vs. Underlying Causes of Death

You may encounter cases which have several risk factors for death, such as a diabetic dying from renal failure or a smoker dying from lung cancer. As much as possible, you should code the *underlying (direct) cause of death* and NOT the underlying risk factor, even if the risk factor is very important. Common examples include:

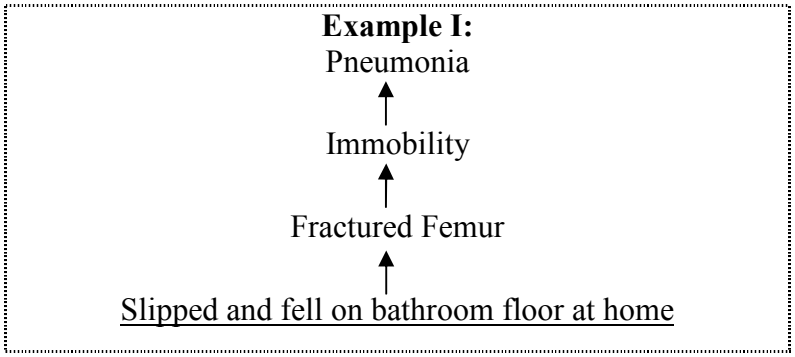
- **Smoking and cancers (C codes)**. You will not be given smoking, alcohol or diet history. But still the narrative might reveal the behavioural risk pattern like smoking/alcoholism. Code the relevant disease, and rely only somewhat on the fact that the person smoked (i.e. not everyone who smokes gets cancer, and not all those who have cancers smoke). Your keywords should include *smoking*.
- **Diabetes and renal failure**. **(N17-19)** Generally code renal failure (N17-N19), even if it was diabetes that led to the series of events that resulted in renal death. Your keywords should include *diabetes*.
- **Diabetes and cardiovascular disease (I21-24, I63-64).** Generally code cardiovascular disease. Your keywords should include *diabetes.* (You may code diabetes (E10-E14) as a cause of death in cases who died of hypoglycaemia/ hyperglycemias, or diabetic keto-acidosis).
- **Malnutrition/low birth weight (LBW) (E46) and diarrhoeal (A09) or measles (B05) death.** Generally code the infectious cause of death, and note *malnutrition/LBW* as keywords.
- **Anaemia (D60-64).** Generally code the patho-physiological cause of death (e.g. malaria), and note *anaemia* as a keyword.
- **Hypertensive heart disease (I11)** should not be coded as a cause of death. Instead code the conditions that hypertensive heart disease leads to, such as congestive heart failure (I50) or myocardial infarction (I21) or stroke (I64).

You will have to type the keywords. Thus it will be possible to analyze various deaths to see which risk factors are more common or not. However, this will be done after your coding is

completed.

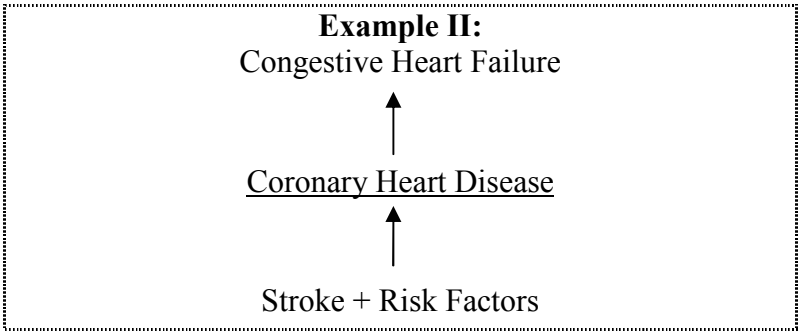
Illustrations:

Example 1: An 80 years female slipped and fell on bathroom floor at home and got fractured her femur. She wad bed-laden, developed pneumonia and died.



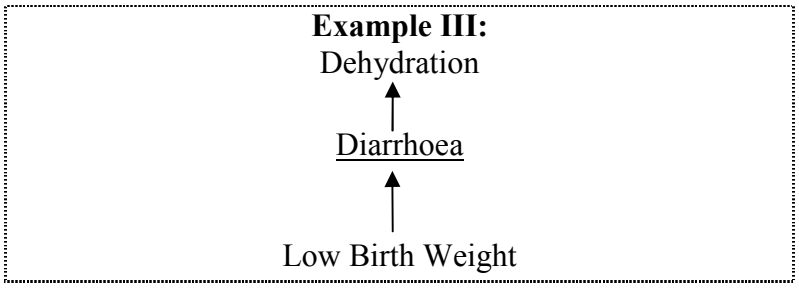
Underlying cause of death: W01 - fall on same level from slipping, tripping and stumbling.

Example 2: A 55 years male patient had past history of stroke/BP and had several episodes of myocardial infarctions in past and presented with sudden onset heart failure not responding to diuretics and died in his sleep.



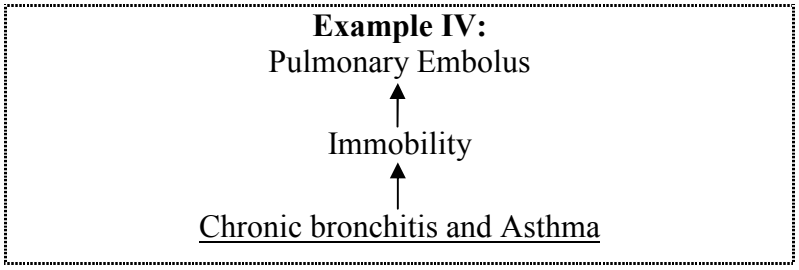
Underlying cause of death: I25 - chronic ischemic heart disease.

Example 3: A 13 days' old LBW girl not having feeds, developed loose motions and fever , did not respond to treatment, eyes sunken died in 2 days.



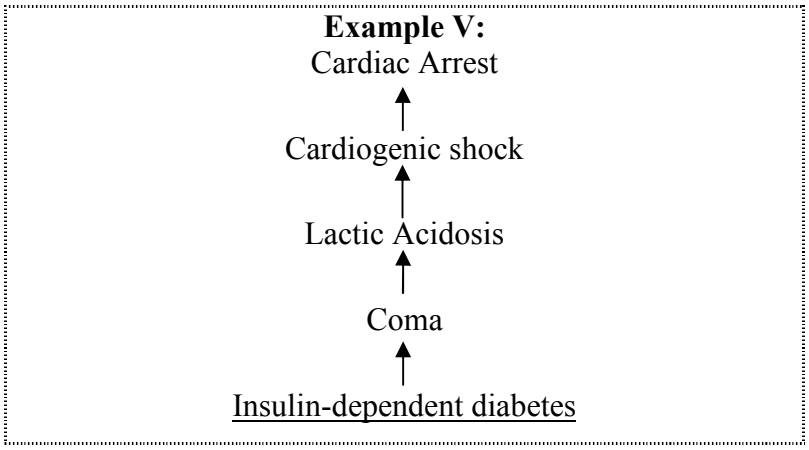
Underlying cause of death: A09 - diarrhoea and gastroenteritis of presumed infectious origin.

Example 4: A 63 year female had chronic cough, sputum, could not move. Became suddenly worst and died.



Underlying cause of death: J44 - other chronic obstructive pulmonary disease.

Example 5: A 53 years male was lifelong diabetic (since childhood) and used to take insulin though irregularly. He drank alcohol one day and overdosed insulin to become unconscious. Swollen legs and BP lowered and heart stopped.



Underlying cause of death: E10 - insulin-dependent diabetes mellitus.

A Note of Caution about Underlying CoD

Your CoD assignment here is different than hospital-based certification:

- Detailed clinical data are almost never available - rely on symptoms & judgment
- Think of common diagnoses rather than rare or exotic ones
- A major category diagnosis is as important as a more specific diagnosis from a public health viewpoint
  - In children, it's as important note LRI as it is to say bronchiolitis or a viral or bacterial pneumonia

Chapter 4: Structure and Content of the International Classification of Diseases (ICD-10)

The current definition of the ICD is the International Statistical Classification of Diseases and Health Related Problems. The ICD first originated in 1893. The current tenth revision (ICD-10) was adopted in 1993 by the World Health Organization. Its original use was to classify causes of mortality as recorded at the registration of death. Later, its scope has been expanded to classify diseases and other health related problems recorded on many types of health and vital records. The ICD is primarily designed for the classification of diseases and injuries with a formal diagnosis (and hence the retention of the original acronym ICD, despite the expanded definition). The current version includes a wide variety of signs, symptoms, abnormal findings, complaints, and social circumstances that may appear in place of a diagnosis on health related records, and may be important for analysis.

The purpose of the ICD is to permit the systematic recording, analysis, interpretation and comparison of mortality and morbidity data collected in different countries or areas at different times. In practice, the ICD has become the international standard diagnostic classification for all general, epidemiological and for many health management purposes. These include the analysis of the general health situation of population groups, and the monitoring and analysis of mortality and morbidity (incidence / prevalence) due to diseases in relation to other variables such as the characteristics and circumstances of the individuals affected.

Apart from the main classification of diseases and health related problems, the ICD also covers a conceptual framework of definitions, standards and methods that have been closely linked and developed along with the classifications themselves. These include practical instructions and rules for reporting causes of death, coding of mortality and morbidity data, and guidelines for presentation and interpretation of data. Adherence to these guidelines enables standardized collection, analysis and presentation of data, which allows for the effective comparison of observations between populations, and across time. Some of the guidelines for cause of death certification and coding of underlying cause of death have been covered in the previous section, and will be elucidated further in this section on examples of RHIME data with solutions. The basic ICD is a coded list of three-character alphanumeric categories, with a letter in the first position, followed by a number in the second and third positions, as follows:

A16 – Respiratory Tuberculosis

This three-digit code constitutes the core classification of the ICD-10, and is the mandatory level of coding for international reporting to the WHO mortality database and for general international comparisons.

The ICD has developed as a practical, rather than a purely theoretical classification. It has been based on the principle that for practical, epidemiological purposes statistical data on diseases should be grouped in the following way:

- Epidemic diseases,
- Constitutional or general diseases,
- Local diseases arranged by system,
- Developmental diseases,
- Injuries.

As per the above-defined grouping pattern, the ICD-10 classification groups codes into a total of 22 chapters organized by disease, disorder or event. Three of these chapters (XIX, XXI & XXII) are not used routinely for coding the underlying cause of death – a list of the other 19 chapters with corresponding ICD codes is provided below. As can be seen, this type of grouping of infectious diseases, neoplasm, injuries etc. brings together conditions that are epidemiologically related and would be inconvenient for analysis if they were scattered in a classification arranged primarily by body site. The distinction between these 'special group' chapters and the 'body system' chapters has practical implications for understanding the structure of the classification, for coding, and interpreting statistics that are based on it.

A00-B99	Certain infectious and parasitic diseases	Chapter I
C00-D48	Neoplasm	Chapter II
D50-D89	Diseases of the blood and blood forming organs	Chapter III
E00-E90	Endocrine, nutritional and metabolic diseases	Chapter IV
F00-F99	Mental and behavioural disorders	Chapter V
G00-G99	Diseases of the nervous system	Chapter VI
H00-H59	Diseases of the eye and adnexa	Chapter VII
H60-H95	Diseases of the ear and mastoid process	Chapter VIII
I00-I99	Diseases of the circulatory system	Chapter IX
J00-J99	Diseases of the respiratory system	Chapter X
K00-K93	Diseases of the digestive system	Chapter XI
L00-L99	Diseases of the skin and subcutaneous tissue	Chapter XII
M00-M99	Diseases of the musculoskeletal system	Chapter XIII

N00-N99	Diseases of the genito urinary system	Chapter XIV
O00-O99	Pregnancy, childbirth and the puerperium	Chapter XV
P00-P96	Certain conditions originating in the perinatal period	Chapter XVI
Q00-Q99	Congenital malformations and chromosomal abnormalities	Chapter XVII
R00-R99	Symptoms, signs and abnormalities not elsewhere classified	Chapter XVIII
V01-Y98	External causes of morbidity and mortality	Chapter XX

Note: We do not use S00-T98 codes to Injury, poisoning, Z00-Z99 codes for factors influencing health status or contact with health service or U00-U99 codes that are used for special purposes.

The chapters are divided into homogenous 'blocks' of three-character categories, and the detailed chapter-wise list of these blocks, along with the individual three character categories is provided in web link http://cghr.org/project.htm for ready reference to the user.

Assigning ICD-10 Code

A complete description of the coding rules (General principle, Selection rules 1 to 3, and modification rules A to F) is available in Volume 2 of the ICD-10 WHO web link http://www.who.int/classifications/icd/en/, and may be studied to get a clear understanding of the process of coding the underlying cause of death. Alternatively, *Google* ICD–10 code (e.g. "ICD Y31").

Following the selection of an underlying cause of death on screen, you will get pop up search among these blocks for the suitable three character code with possible differential codes in some cases, and assign the same for the death.

Care should be taken while transcribing all codes, to ensure that certain sex-specific codes (e.g. for prostate cancers, obstetric causes etc…), and age-specific codes (perinatal causes, diseases of old age etc…) are entered correctly, so that aberrations are not observed while examining summary tabulations.

Special Notes on Coding Injury

1. For all deaths due to injuries, the code for the external cause of the injury using guidelines for injuries. That is, only codes with the first letter V to Y are acceptable as underlying cause codes for deaths due to injuries. Codes with first letters S-T signifying the body site of injury etc. are NOT to be used as the underlying cause code. The nature of injury (e.g., fracture, dislocation, etc…) will NOT be used here. Only one external cause is to be coded in every death.

2. The most common causes of unintentional injury are vehicular accidents. For these we have developed a special table (Page 55).
3. For the causes like water transport accidents (V90-V94) and accidental drowning (W65-W74) and the deceased was epileptic; write "epileptic" in your keywords.
4. The following codes will be used: hypothermia of newborns will use a P80 code. Hypothermia from exposure to cold for adults will use the X31- exposure to excessive natural cold. Heat stroke will use the X30 - Exposure to excessive natural heat. An abbreviated list of X codes has been provided for particular conditions such as burns. Most coding for injuries because of transport accidents though should be chosen from the V codes.
5. For burns, the more common codes will be:
   - Accidental (X00-X09) - Exposure to smoke, fire and flames
   - Intentional self-harm (Suicide X76) - Intentional self harm by smoke, fire and flames
   - Assault (Domestic violence, etc. X97) - Assault by smoke, fire and flames
6. For intentional self-harm (Suicide X60-X84) causes and the deceased was mentally or emotionally depressed; mention "depression" in your keywords.
7. Even though external causes are coded as per chapter XX of ICD-10, some difficulties may be experienced by coder, e.g., injury due to snake bite is included under X20 (contact with venomous snakes and lizards) and W59 (bitten or crushed by reptile including non-venomous snakes). The difference here is between venomous and non-venomous snake. Since it may be difficult to identify the type of snake by RHIME, best clinical judgement should be used to select the most appropriate codes.
8. Sometimes, difficulties may be experienced in separating suicide, homicide and accidental deaths (e.g., in the absence of sufficient information, burn injuries can fit into any category). However, careful narrative in RHIME can help in differentiating these injuries.

Chapter 5: Guidelines for Assigning and Coding Causes of Death by RHIME

This chapter is in six parts. The first describes your key tasks. The second discusses differences in assigning causes of death between hospital based records and field visits. The third covers the procedure for causes of death assignment .The fourth provides practical guidelines for assigning causes of death. The fifth discusses how to reduce reconciliation rates. The last mentions common DOs and DON'Ts.

I. Key Tasks

Your task, as a health professional assigning the underlying cause of death, includes ensuring overall uniformity of cause of death assignment. This section provides you with a set of standard disease descriptions and criteria for some of the common causes of deaths in India, based on previous epidemiological observations and experience. It is important to rely on presence of keywords or cardinal symptoms of the disease (e.g. sudden onset chest pain for diagnosing myocardial infarction, recurrent bouts of cough with breathlessness for COPD), as well as associated symptoms (e.g. radiation of pain, associated sweating etc for MI, clinical features of cor pulmonale for COPD), as is usually done while making a clinical diagnosis. This is mentioned because from past experience, relatives may not be able to recall minute details, especially when they are mostly subjective in nature.

Below is the cardinal symptom list used by SRS field staff:

SYMPTOM LIST FOR DEATHS

HOW TO USE THIS LIST:

1. Identify MAJOR SYMPTOMS from history.

a. For each symptom, ask **probing** questions listed below, including associated symptoms.

b. For each symptom, ask about **duration (how many days, weeks, or months?)**, **treatment received, hospital/clinics used**, and details on death certificate/clinical records if available.

2. If respondent **does not give clear history** then ask about each MAJOR SYMPTOM one by one.

a. And then probe **all positive responses**.

1. FEVER

□ High or low grade

□ If more than 30 days see weight loss

□ Continuous with no normal temperature, intermittent (on and off), or occasional

□ Fever rose every day

□ Repeated attacks with chills, shaking, sweating, muscle pain

□ **Associated with** diarrhoea, cough, headache, chest pain, jaundice, burning sensation while passing urine, neck stiffness, irritated and does not like light or sound, fits, confusion, drowsiness, coma, fever followed by rash/blisters

2. COUGH

□ Dry, wet (with sputum), bloody (rusty), foul smelling

□ If more than 30 days see weight loss

□ Worse during day or night, only at night

□ Cough with wheezing or in-drawing (use local language)

□ Had to sit in bed for relief

□ Pain at the sides of the chest wall

□ Pain worse with cough and/or deep breath

□ **Associated with** fever, weight loss, night sweats, evening rise of temperature, vomiting, hoarseness of voice

3. BREATHLESSNESS

□ Onset and **progression** (did the person feel short of breath initially on exertion, but progressively worsens to breathlessness at rest)

□ Occurs soon after lying flat and relieved by sitting up

□ What brings it on? Allergy or chest infection

□ Episodes or attacks of wheezes and breathlessness

□ **Associated with** fever, weight loss, night sweats, evening rise of temperature, vomiting and hoarseness of voice, swelling of hands and legs, swelling of the body or abdomen

4. DIARRHOEA/DYSENTERY IN STOOLS

□ Loose/semisolid stools, blood/mucus in stools, watery/rice water like stools

□ If more than 30 days see weight loss

□ Painless and large quantity

□ Blood in the stool, colour red or black

□ How many times a day at worst

□ **Associated with** vomiting, fever, very thirsty, dehydration (less water in the body, sunken eyes, reduced urine amount)

5. WEIGHT LOSS

□ Loss of weight became very rapid in last 2-3 months

□ Prolonged unexplained fever for more than 1 month (constant or continuous)

□ Diarrhoea for more than 1 month

□ Persistent cough for more than 1 month

□ Swelling in arm pits, neck, groin

□ Itching and skin rash

□ White sores or white patches in mouth

□ History of tuberculosis

6. CHEST PAIN

□ Onset: **sudden or gradual**

□ Did pain last more **than 24 hours or less than 24 hours?**

□ **Location**: chest, upper stomach, back

□ **Spread** of pain: to left arm, deep central chest, hand, shoulder, back, etc

□ Pain **worse** with walking/exertion/cough or deep breath, touching the area or eating

□ **Associated with** breathlessness, sweating, vomiting, passed out, fever

7. PARALYSIS/STROKE

□ Onset: over minutes, hours or noticed on waking up

□ **Accompanied by sudden loss of consciousness**

□ **Paralysis in any part of the body**

□ **Which part of body (half side, one arm, right/left face)?**

□ Time of onset: during activity or in sleep

□ **Associated with** vomiting, headache, loss of memory, loss of vision or speech, loss of urinary control, loss of sensation of any part of body, seizures/fits, neck stiffness

8. OEDEMA (SWELLING)

□ Location: hands and feet or elsewhere, only abdomen

□ Sudden or gradual

□ Worse at night or morning

□ **Associated with** breathlessness at rest, fever, urinary problems, jaundice, worse with walking, fatigue, feeling the heart beat faster, nausea, loss of appetite

9. URINARY PROBLEMS

□ Reduced **urine amount**

 Change in passing urine: burning with urine, urine with pus or blood, frequent passage of urine, intense desire to pass more urine even after the bladder has been emptied

 Associated with pain in middle of lower abdomen, tenderness in the side of abdomen, sudden onset of pain in one or both loins, spreading to lower abdomen, paleness, nausea, vomiting, became dull, drowsy or unconsciousness, swelling of face or eyelids (especially in the morning), hands, legs or abdomen

10. GI TRACT PROBLEMS

 Type of abdominal pain: one place or all over, **type** (burning), **sudden or gradual**

 Relationship to food: Was pain more on empty stomach? Was it relieved after taking food? Difficulty in swallowing solid or liquid food?

 Location: middle of upper abdomen or extending to chest

 Did pain wake person from sleep?

 Periodicity: pain occurs in episodes, lasting 1-3 weeks every time, 3-4 times per year

 Type of abdominal distension: sudden or gradual

 Associated with loss of appetite, nausea, jaundice, constipation, black stools, vomiting with blood, breathlessness, sweating, history of surgery or trauma or cancer, history of lump/mass in abdomen, alcohol abuse

11. JAUNDICE (YELLOWNESS IN THE WHITE PART OF EYES OR SKIN)

 What **become yellow**: eyes or skin or urine (dark yellow/brown)?

 When did **yellowness start**: early and got worse/later after person was quite ill for some time?

 Associated with: fever, weight loss, swelling of abdomen, feet and then face and hands, breathlessness, vomiting blood, alcohol abuse, history of cancer

12. SEIZURES/ FITS

 History of sudden jerky movements of arms or legs

 With or without loss of consciousness

 Awake between fits or not

 Associated with fever, paralysis/stroke, rolling of eye balls, frothing of mouth, loss of memory, bit tongue, bed wetting, confused, history of head injury

It is very important that you use these descriptions and criteria as general guidelines and for

reference, and to apply clinical diagnostic knowledge and skills to judge whether the information from individual verbal autopsies is sufficient to assign a specific condition as the underlying cause. It should also be noted here that you are expected to provide an opinion on the cause of death to the best of your knowledge and belief, based on the information available to you, and with the assurance that these data are collected purely for the purpose of generating health statistics for policy formulation and program evaluation, and not for any legal purposes.

You are encouraged to attempt assigning, wherever possible, specific disease or condition causes and codes, rather than ill-defined conditions such as senility, pain abdomen, fevers etc. Try to write the ICD-10 chapter diagnosis in uncertain cases versus a general R54 or R99 code.

For example,

for a diagnosis of pneumonia:

Ideal choice	2nd best choice	3rd best choice
J18	J99	R99

In case it is not possible to arrive at a diagnosis, write code R99 (P96 for neonates) and highlight and record relevant keywords. To enable such assignment, these disease descriptions and criteria are provided below to assist and guide the selection of specific disease entities. Also, wherever available, information on the illness before death from medical documents available at the home of the deceased, or as told to the relatives by health personnel should be considered and corroborated with, as described by the respondents.

II. Differences in assigning causes of death between hospital-based clinical records and reports based on RHIME field visits

First, for public health purposes, the broad categories of deaths are sufficient to decide on how to monitor and evaluate public health. Similarly, the more common causes of death (such as myocardial infarction- ICD I21-24) are more important than the rarer causes (such as Gaucher's disease ICD E75). This means that you can best do your RHIME coding work by adhering to the guidelines for the major categories of diseases.

Second, for public health purposes, major categories of a particular disease (e.g. cerebro vascular disease ICD I63 or I64) are almost as useful as the specific details for those same diseases (e.g. cerebro vascular diseases with subarachnoid haemorrhage- ICD I60). Thus you should try for the most specific cause possible, but code to the most general group you think is

defensible.

Third, RHIME field reports from the fields have many more *symptoms* than signs, and will very seldom have diagnostic information such as lab tests. Thus, you should focus your diagnostic skills on the most relevant symptoms that predict a disease. For example, acute chest pain within 24 hours of death is quite sensitive for myocardial infarction deaths (in independent validation studies), even if signs such as rapid heart rate, or diagnosis by ECG are unavailable. A second example is neonatal pneumonia, which can be diagnosed by the women (especially elder women) in the household noticing fast breathing with abdominal or chest in-drawing.

List of symptoms queried by the field staff:

SYMPTOM LIST
1. FEVER
2. COUGH
3. BREATHLESSNESS
4. DIARRHOEA/DYSENTERY IN STOOLS
5. WEIGHT LOSS
6. CHEST PAIN
7. PARALYSIS/STROKE
8. OEDEMA (SWELLING)
9. URINARY PROBLEMS
10. GI TRACT PROBLEMS
11. JAUNDICE (YELLOWNESS IN THE WHITE PART OF EYES OR SKIN)
12 SEIZURES/ FITS

III. Six Logical steps to assign Causes of Death

When a number of conditions have been identified to have occurred in the deceased, it is your responsibility to construct a chain of events that place the various conditions in sequence, i.e., one leading to the second to the third etc. (see examples below).

To do so, you need to follow six logical steps:

1. Carefully read past medical history & narrative.
2. Highlight the cardinal symptoms & negative evidence. Note keywords.
3. Think of chronological sequence. Adhere to cardinal symptoms & negative evidence. Do not imagine facts which are not in the record.
4. Choose underlying cause of death. Select specific ICD code & confirm against

guidelines.

5. Reconsider ICD code using differential diagnoses.
6. Select certainty of diagnosis & quality of narrative.

IV. Practical Examples for Assigning Cause of Death

Example 1 - Adult female, aged 63

Narrative: Respondent thought person died of "beehosh". This 63 year old female had two years ago an attack on one side of the body in which she could not move and her tongue was twisted also. She was seen by a doctor at the hospital who gave her some blood thinner drugs and then said all that could be done would be is to put her into a nursing home. Reluctantly her son agreed. One month ago, she went beehosh and then one day had a cough with high fever. She was drooling from her mouth. Doctors gave her more intravenous medications, but she got worse and died. She had no other past medical problems except for some blood pressure in the past (she had not taken medications for a while).

Steps 1 and 2: *Carefully read past medical history & narrative AND highlight cardinal symptoms & negative evidence. Note keywords.* Consider diagnostic information provided:

Cardinal symptoms:

"Got pneumonia while passed out" – Aspiration Bronchopneumonia

"Beehosh" – prolonged coma

"Paralysis on one side of the body" – preceding a stroke

Keywords include:

"attack on one side", "tongue twisted", "blood pressure", "beehosh"

Step 3: *Think of chronological sequence. Adhere to cardinal symptoms & negative evidence. Do not imagine facts which are not in the record.*

Sequence of events:

"Got pneumonia while passed out"

↑

"Beehosh"

↑

"Paralysis on one side of the body"

Step 4: *Choose underlying cause of death. Select specific ICD code & confirm against guidelines.* Here Stroke/CVA (I64) is chosen. The guidelines state:

Sudden onset of paralysis of one or more limbs in the month preceding death **AND** Any of the following:

- Unconsciousness
- Loss of vision
- Urinary incontinence
- Loss of sensations on any part of body
- Altered speech
- Sudden onset of headache with altered sensorium
- Late onset of convulsions

AND No previous episodes of convulsions

- **NOTE: Do not use Hemiplegia (G81) to code for stroke.**

Step 5*: Reconsider ICD code using differential diagnoses*:

- Ischemic heart disease (I20- I25)
- Falls (W00-W19)

No history of chest discomfort possibly rules out Ischemic heart disease and no history of falls rules out the fall

Step 6: In this case, the diagnosis is clear, and *certainly* should be rated as a 1- High. *Narrative quality* here is 1-Good.

Example 2- Female child, age 9 months

Narrative: Respondent thought person died of "fever". "Dai" delivered child in house. The weight of child was below normal. Because of lump in one breast of mother child used to suck the milk only from one breast. Five months after birth she developed complaints of loose motions, which was continued till her death. Every time she was taken to hospital (approximately 3 times in a month). Before death she had a high fever and excessive loose motion. She was taken to Government hospital, where loose motion continued. Child lips were dried. Bottle of glucose was given. She was also advised to take bottle of blood. However, before that she died. Positive items in RHIME questionnaire include:

- Smaller than usual at birth.
- Mother given 2 tetanus injections.
- Diarrhoea for 3 days in last episode, no vomiting. No other major symptoms.

Steps 1 and 2: *Carefully read past medical history & narrative AND highlight cardinal symptoms & negative evidence. Note keywords.* Consider diagnostic information provided:
Cardinal Symptoms:

"Dry lips" – Dehydration

"Fever and excessive loose motions" – Gastroenteric infection from bacteria or virus

Keywords include:

"fever", "low birth weight", "loose motion", "dried lips"

Step 3: *Think of chronological sequence. Adhere to cardinal symptoms & negative evidence. Do not imagine facts which are not in the record.*

Here there is no sequence of events that lead to death. It was one singular event:

Gastroenteritis or diarrhoea (A09)

Step 4: *Choose underlying cause of death. Select specific ICD code & confirm against guidelines*. Here diarrhoea (A09) is chosen. The guidelines state:

> Frequent/liquid/watery loose motions **AND** may have Fever **AND** Any one of the following:
> - Low/nil urine content
> - Restricted fluid intake
> - Eyes sunken
> - Vomiting
> - Blood or mucus in stool
> - Deep dark yellow urine

Step 5: *Reconsider ICD code using differential diagnosis*:
- Cholera (A00)
- Other diarrhoeas attributable to specific causative agent (A02-A08)

No history of detection of specific causative agent rules out the A00, A02-A08.

Step 6: In this case, the diagnosis is clear, and certainty should be rated as a 1- or High. Note here that low birth weight is a contributory condition. Narrative quality here is 1- Good.

Example 3: Female child, 20 days

Narrative: Respondent thought person died of "baby was sleeping, baby cold" According to the mother, the baby was born in government hospital. After delivery, baby breastfed but vomited, had vomiting for every feed until death. The cry was normal. She looked weak and had a pale appearance, sometimes there was noise while breathing, but the child had no diarrhoea, child was not growing properly, becoming thin. Shown to private hospital, but no use. From 20th day baby was fed and slept. After few hours mother noticed that baby's body was cold, lips turned into blue colour (according to neighbour, the child was neglected, not properly brought up because it was third female baby). Items in questionnaire:

- Doses of TT received
- Small at birth
- Able to suckle normally after birth
- Term pregnancy
- No fever,
- No cough
- Vomiting
- Birth weight recorded

Steps 1 and 2: *Carefully read past medical history & narrative AND highlight cardinal symptoms & negative evidence. Note keywords.* Consider diagnostic information provided:
Cardinal Symptoms:

"Vomiting for every feed" – Regurgitation, poor feeding

"Term pregnancy", "not growing properly", "pale", "weak", "thin" – Low Birth Weight

Keywords include:

"Vomiting", "not growing properly", "third baby", "thin", "small at birth", "term pregnancy"

Step 3: *Think of chronological sequence. Adhere to cardinal symptoms & negative evidence. Do not imagine facts which are not in the record.*

Here there is no sequence of events that lead to death. It was one singular event:

Low Birth Weight (P05)

A careful read of the history shows that it is more likely regurgitation than some form of projectile vomiting that is occurring. Child was third female child, and all accounts suggest the child was low birth weight (P05). Note that a full term pregnancy is an important negative-

ruling out prematurity as a cause.

Step 4: *Choose underlying cause of death. Select specific ICD code & confirm against guidelines*.
Here Low Birth Weight (P05) is chosen. The guidelines suggest:

- **Full term pregnancy** ONLY - Smaller than average size baby. If weighed, birth weight below 2.5 kilograms **AND** No other obvious causes of death
- **Possibly With** Poor suckling after birth **OR** Death at 3-7 days

Step 5: *Reconsider ICD code using differential diagnosis:*

- Prematurity (P07)
- Birth Asphyxia (P21)

The keyword term pregnancy rules out P07 while able to cry/breath at birth rules out P21

Step 6: In this case, the certainty of diagnosis should probably be a 2-Low. Narrative quality here is 1-Good.

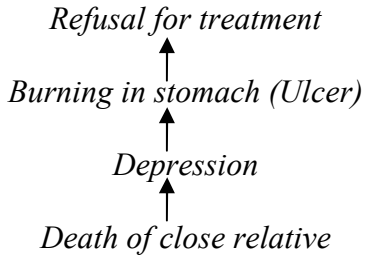
Example 4: Female, 75 years

Narrative: Respondent thought person died of "depression." Seven years back her husband and son died. She almost stopped eating and started drinking alcohol (term used as "Wine"). She experienced burning sensation in stomach. She was taken to private nursing home. Doctor advised for surgery, it was also explained that if surgery is not performed she may even die. She refused to undergo surgery and died.

Steps 1 and 2: *Carefully read past medical history & narrative AND highlight cardinal symptoms & negative evidence. Note keywords.* Consider diagnostic information provided:
Cardinal symptoms/Keywords include:

"Death of husband/son", "depression", "stopped eating", "alcohol drinking" and "refused surgery"

Step 3: Underlying cause of death: Is it ulcer in stomach or depression or alcoholism?



Step 4: Choose underlying cause of death. Select specific ICD code & confirm against guidelines.

Here "Depression (ICD F32)" is chosen. The guidelines for depression (ICD F32) state:

Major change in mood, along with any of the following:

- Keeping aloof from others
- Changed behavioural patterns
- Refusal of feeds
- Nervous breakdown
- Sleep disturbances

Exclude other causes of depression

The depression as a result of death of close relatives resulted in alcohol drinking. This resulted in burning in stomach (ulcer) and refusal for treatment. The underlying cause of death may therefore be depression. Note that ulcer in stomach as a cause of death would need other corroborating events that this is what started the path to death. It appears that depression led to other symptoms of which the ulcer is only one.

Step 5: *Reconsider ICD code using differential diagnosis:*

- Mental and behavioural disorder due to use of alcohol (F10)

The keywords "death of close relative" rules out F10.

Step 6: In this case, the *certainty of diagnosis* should probably be 2-Low as none of the symptoms mentioned in the guidelines are mentioned in the history. *Narrative quality* here is 2-Bad.

V. Reducing Reconciliation Rates

Probable diagnoses where you are likely to disagree with other physician coders: some examples to help you at the reconciliation stage (and to reduce the reconciliation rate):

1. If you have coded an "R" code (say R54) and the other physician has coded a more specific code (say I64), then you should give higher priority to the more specific code. In past reviews, the more specific code tended to be that chosen finally. The most common examples are in the following table, ranked from most to least common:

ICD-10 by 1st coder	Less specific Diagnosis	ICD-10 by 2nd coder	More specific Diagnosis
R54	Senility	A09	Diarrhoea
R99	Other unspecified	I21	AMI
R54	Senility	I21	AMI
R54	Senility	R50	Fever
R54	Senility	R50	Fever

R96	sudden Death	R54	Fever
R99	Other unspecified	I64	Stroke
R96	sudden Death	I21	AMI
R50	Fever	B54	Malaria
R99	Other unspecified	R50	Fever
R54	Senility	J45	Asthma
R54	Senility	I64	Stroke
R99	Other unspecified	J45	Asthma
R99	Other unspecified	A09	Diarrhoea

2. Consider this example:

"74 year old female in rural area. Past medical history: nothing or unknown. Son respondent. Respondent's cause of death was left blank. Narrative states: "She was in old age. She was unable to walk. She used to take less food. She had cough, and often she used to have fever and diarrhoea. She had diarrhoea and vomiting in the night when she died."

Coder 1 chose R54-senility. Coder 2 chose A09-gastroenteritis. At reconciliation, they stuck with their original diagnosis. Final adjudication by 3rd physician was A09-gastroenteritis.

Why? First, R54 (senility) is not valid as there were symptoms (guideline no 6 above). Second, the symptom description is not ideal, and could justify the use of R99. However, the best judgement of the panel of 3 physicians was gastroenteritis. Moreover, the above rule "try to code to a more specific cause" follows given that the diarrhoea was mentioned in several places.

3. Consider another example:

"79 year old female in rural area. Past medical history: nothing or unknown. Friend was the respondent (did not live with her). Respondent's cause of death was left blank. Narrative states: "She was poor. She had often mild fever and cough. She had diarrhoea off and on, and for that she was taking indigenous medicine. She used to take less food. She died in the afternoon."

Coder 1 assigned this as gastroenteritis (A09). Coder 2 assigned this as ill-defined (R99). The panel of adjudicators assigned this as R99. Note however, that because some

symptoms are provided, senility (R54) is not a valid cause, and similarly fever of unknown origin (R50) is not a valid cause. The reason was as per the guidelines, the symptoms are brief, and insufficient to point to the chain of events that led to death. Please also note that such histories are chiefly provided when the respondent did not live with the deceased.

VI. Common "DOs" and "DON'Ts" in Assigning Cause of Death

DOs

1. Read the narrative, history and any other information very carefully. You can avoid going down blind alleys and false diagnosis by a careful read.
2. Corroborate what a doctor may have said on the form with some other symptom or signs or clinical record.
3. Look for important negatives in the history. These can narrow down several possible causes to one or two.
4. Code the underlying cause of death rather than the risk factor.
5. Assign the most specific ICD-10 code applicable. Wherever possible, attempt to assign most specific disease or condition
    - Each ICD groupings have more & less specific codes. Read the list carefully & choose the most specific one (i.e. C34 vs. C39 or B50 vs. B54)
    - Avoid R99 for adults & P96 for neonates
6. Refer to the pop up of possible differential ICD-10 short list. If code is missing or you need a more specific code then refer to the full ICD-10 codebook.
7. Use common sense and best clinical judgement. There is no substitute for this.
8. Do think from a public health perspective- common causes are common.
9. Do not be afraid to state that no cause can be assigned. This is reality.

DON'Ts

1. Do not make a random diagnosis if none is found.
2. Do not try to make a pathological diagnosis. It is very difficult from the RHIME report to make a pathological diagnosis (e.g., various types of myocardial infarction). Moreover, while such pathological diagnosis is appropriate for clinical and hospital care, getting right the overall categories of causes of death is far more important for public health.
3. Do not rely on the respondent's education level, or other characteristics. Misconceptions

abound across education or income levels of respondents. The narrative plus history is the basis for assigning the cause of death.

4. Do not go to sub-codes for ICD-10 if this is not easily done. The three digit code is sufficient for public health purposes.
5. Do not rely on the **risk factors** alone for making a diagnosis. For example, cirrhosis occurs not only among alcohol drinkers but also among non-drinkers. Similarly, lung cancer can happen among smokers and non-smokers. The SRS will have methods to analyze the importance of such risk factors that occur after the causes of death are assigned.
6. Do not be afraid to seek advice from senior physicians and others for ongoing learning. At least the first 50 causes of death assigned by you will be reviewed by expert physician. This is meant as a tool of ongoing learning and standardization.

GUIDELINES FOR THE MOST COMMON DIAGNOSES: "THE SHORT LIST"

This section is organized by RHIME form/age-specific causes of death and contains a separate table for coding accidental deaths.

Form C: Adult Deaths (15 years or older)

ICD10 CODE	CAUSE OF DEATH	CRITERIA
Certain infectious and parasitic diseases		
A01	**Typhoid & Paratyphoid**	Long duration high fever progressively increasing, continuous **AND** Any of the following: • Severe headache • Abdominal pain, distension • Constipation/diarrhoea • Death occurred in 2nd or 3rd week • Delirium • Blood in stool • Tongue highly coated
A09	**Diarrhoea**	Frequent/liquid/watery loose motions **AND** may have Fever **AND** Any one of the following: • Low/nil urine content • Restricted fluid intake • Eyes sunken • Vomiting • Blood or mucus in stool • Deep dark yellow urine
A15-A19	**Tuberculosis** (Pulmonary TB is A15-A16)	Chronic cough of long duration with fever **AND** Any one of the following signs or symptoms: • Blood in sputum

		• Evening rise in fever • Chest pain • Breathlessness • Loss of appetite • Chronic weight loss • Lymphadenopathy **NOTE**: Family history of diagnosed TB to be considered. Try to distinguish between pulmonary TB (A15-A16), other TB (A17-A19 and sequelae of TB (B90)
A35	**Tetanus**	Neck stiffness or arching of neck behind **AND** History of open wound **AND** Convulsions **AND** Inability to open mouth. **Possibly with** H/O cuts/wounds in limbs or history or ear discharge
A 40-41	**Septicaemia**	High fever of short or medium duration with chills, delirium and confusion Possibly with - cuts, boils or other source of infection **AND** Exclude pneumonia, diarrhoea, malaria, TB or other infection
A82	**Rabies**	History of animal bite OR Bat exposure **AND** Fear to drink water **AND** Any one of the following signs or symptoms: • Convulsions • Unconsciousness • No h/o injection after animal bite
A90-A91	**Dengue fever**	Sudden onset of high fever **AND** Any one of the following: • Vomiting • Prominent aches and pains in muscles, bones, forehead, and behind eyeballs • Any history of bleeding **OR** Blood test positive for dengue
B15-B19	**Acute viral hepatitis**	Marked acute jaundice with abdominal pain; progressive yellowness of eyes and skin AND any of the following signs or symptoms: • Fever • Headache • Nausea • Vomiting • Loss of appetite • Urine is dark yellow in colour • Altered consciousness AND No obvious other cause Possibly with outbreak of jaundice
B20-B24	**HIV/AIDS**	H/o severe and rapid weight loss in less than 3 months **AND** History of prolonged unexplained fever or

		diarrhoea or persistent cough for **more than 1 month** (intermittent or continuous) **OR** HIV +vet serology **Possibly With** Mouth sores / white patches in mouth, Skin rash, Generalized swelling of nodes in armpits, neck, groin, History of ulcers in genital area, History of spouse/partner with similar illness/ death of spouse partner from illness, OR Iv drug use

B50-B54	**Malaria**	Acute onset of high grade fever, with chills and rigor. Fever may be intermittent **AND** Any one of the following: • Jaundice • Convulsion / Unconscious • Vomiting • Breathlessness • Decreased urine output • Headache **AND** None of the following (Exclude): • ARI • Meningitis • Burning during urination • Rash on body • Heatstroke **OR** Blood test positive for malaria
Cancers		
C01-C06	**Oral cancer (mouth)**	Lump or mass or swelling on tongue/ cheek/ mouth cavity/ gum/ palate, usually progressive **AND** Any one of the following: • Non healing sore or ulcer • Bleeding on touch • Restriction/difficulty in opening mouth • Weight loss **OR** Diagnosed as mouth cancer
C10-C14	**Pharynx or larynx (i.e. throat cancer**	Growth in throat / neck or hoarseness of voice **AND** Any one of the following: • Pain/difficulty in swallowing • Loss of weight **OR** Diagnosed as throat cancer
C15	**Oesophageal cancer**	Progressive difficulty in taking foods. **AND** Weight loss over several months **OR** Diagnosed as oesophageal cancer
C16	**Stomach cancer**	Vomiting/ Vomiting of blood. Difficulty in swallowing AND Mass in upper abdomen **AND** Any of the following: • Pain in abdomen

		• Weight loss • Enlarged liver • Black stools **OR** Diagnosed as stomach cancer **Possibly with** History of repeated course of anti-ulcer drugs

C17-C21	**Intestine, colon or rectal cancer**	Bleeding from anal opening **AND** Any of the following: • Constipation alternating with loose stools or constipation alone • Weight loss • Painful abdominal distension • Lump in lower part of abdomen **OR** Diagnosed as colorectal cancer
C22	**Liver cancer**	Enlargement of liver **AND** Abdominal distension (Ascites) within weeks **AND** Weight loss **AND** H/o hepatitis or jaundice. **AND** No regular fever **OR** Diagnosed as liver cancer
C33-C34, C39	**Trachea, bronchus and lung cancer (airways)**	Chronic cough and blood streaked sputum eventually leading to haemoptysis, and not responding to antibiotics and antitubercular drugs **AND** Any of the following: • Breathlessness • Chest pain • Hoarseness of voice • Recurrent history of Pneumonia • Rapid loss of weight towards end **AND** No h/o Tuberculosis (no fever) **OR** Diagnosed as lung cancer
C43	**Melanoma**	Rapidly expanding mole **AND** Any of the following signs or symptoms: • Patch/lesion with irregular margins may or may not bleed • Varied discoloration of the lesion (brownish or red) • Progressively expanding lesion **OR** Diagnosed as melanoma **Possibly with** Massive liver enlargement
C50	**Breast cancer**	Painless lump in one or both breasts **AND** Any of the following: • Discharge from nipple • Skin ulceration over breast • Enlarged glands in the neck/maxilla **OR** Diagnosed as breast cancer
C53	**Cervical cancer**	Non-menstrual bleeding often after menopause **OR**

		Intermenstrual bleeding **OR** Post coital bleeding **OR** Blood stained discharge **OR** Foul smelling vaginal discharge with blood **AND** Weight loss **OR** Diagnosed as Carcinoma cervix Note: Try to rule out uterine cancer (C54-55)

C71	**Brain cancer**	Persistent Headache **OR** Vomiting **AND** Any of the following: • Headache • Convulsions • Involuntary eye movements (side to side or up/down) • Unsteady gait • Fainting spells • Dementia/inappropriate behaviour **OR** Diagnosed as brain cancer
C81-C85	**Lymphoma** Hodgkins (C81) & Non-Hodgkins (C83)	Painless enlargement of multiple lymph nodes, in neck not responding to antibiotics or antitubercular treatment **AND** Any of the following: • Low grade fever • Hoarse cough • Night sweats • Abdominal distension • Weight loss • Abdominal pain **OR** Diagnosed as lymphoma
C91-C95	**Leukaemias**	Acute onset fever or bleeding or bruising or anaemia **AND** Any of the following: • Night sweats • Weakness • Bruising • Weight loss • Persistent sore throat not responding to antibiotics • Abdominal pain **OR** Diagnosed as leukaemia

Endocrine, nutritional and metabolic diseases		
D50-D64	**Anaemia**	Marked paleness of body **AND** Any of the following: • Weight loss • Fatigue or weakness or breathlessness on exertion • Giddiness • History of bleeding anywhere **AND** None of the following: • Jaundice

		• Enlarged lymph glands • Features of chronic cough • Chest pain • Fever **OR** Diagnosed as Anaemia **Possibly With** Pallor of fingers **OR** Ankle swelling **OR** Swelling of the whole body **OR** Health professional's remarks about need for blood transfusions Write in keywords history of hook worm (B76) if present
E10-E14	**Diabetes mellitus**	Frequent urination or Increased thirst or AND increased hunger **AND** Any of the following: • Ulcers/foot sores or wounds not healing properly/gangrene • Neuropathy • Progressive organ failure • Renal complications • Vascular complications- Ischemic heart disease or stroke
Mental and behavioural disorders		
F20-F29	**Schizophrenia**	Suspicion of others leading to deep dysfunction OR Planning to kill themselves or harm others **AND** Any of the following: • Stop taking interest in his/her dress or appearance • Hallucinations (visual or auditory) • Sleep disturbance • Talking to himself/herself
F30-F39	**Depression**	Major change in mood, along with Any of the following: • Keeping aloof from others • Changed behavioural patterns • Refusal of feeds • Nervous breakdown • Sleep disturbances Exclude other causes of depression

Diseases of the nervous system		
A83-A89	**Encephalitis**	Convulsion of body /body parts **AND** Fever until death **AND** Any of the following: • Vomiting • Fluctuating level of consciousness • Stiff neck/Meningitis
G00-G05	**Meningitis**	Continuous fever until death **AND** Neck stiffness **Possibly With** Loss of consciousness **AND** No symptoms of ARI, diarrhoea
G20-G26	**Parkinsonism**	Tremors or shaking of hands/ body parts **AND** Difficulty in starting & stopping walk **AND** Small steps during walk **OR** Expression- less face
G40-G41	**Epilepsy**	History of convulsions of body or parts of body over

		several months or years, with fit on the day of death **AND** Loss of consciousness following fits **AND** no history of injury to head or fever or neck stiffness.
Diseases of the circulatory system		
I01-I09	**Rheumatic heart disease**	Joint pains (large joints), fleeting in nature, Penicillin injections, H/o heart disease/murmur **AND** Any of the following: • Involuntary dancing movements of hands & fingers • Fever • Cough • Breathlessness • Liver enlargement • Chest pain **AND** No residual damage to joints
I20-I25	**Myocardial infarction/Angina**	Severe chest pain lasting for more than 1/2 hour but less than 24 hours, within the last month before death **AND** Any of the following: • Shortness of breath • Vomiting • Anxiousness • Pain radiating to left arm • Sweating **OR** Diagnosed heart attack **NOTE: Do not code cardio-respiratory arrest or cardiac arrest (I46) as this is a <u>mode</u> of death. Code the underlying reason for the arrest. R96 may not be used for Sudden Deaths.**
I50	**Heart failure**	Progressive shortness of breath on lying down or at night, improving on sitting up **AND** Any of the following signs or symptoms: • Swelling of feet • Distension of abdomen • Progressive cough H/o previous MI/ heart disease
I60-I69	**Stroke**	Sudden onset of paralysis of one or more limbs in the month preceding death **AND** Any of the following: • Unconsciousness • Loss of vision • Urinary incontinence • Loss of sensations on any part of body • Altered speech • Sudden onset of headache with altered sensorium • Late onset of convulsions **AND** No previous episodes of convulsions **NOTE: Do not use Hemiplegia (G81) to code for**

		stroke.
Diseases of the respiratory system		
J10-J11	**Influenza**	High fever of short duration **AND** Muscular pain in body and back **AND** Cold and running nose with severe cough **AND** Severe headache, insomnia, convulsions, delirium **AND** Temperature may rise very high resulting in death
J12-J18, J20-J22	**Pneumonia (ARI)**	Acute cough (dry or productive) **AND** High fever **AND** Any of the following: • Shortness of breath/ fast breathing • Chest pain • Blood in sputum **AND** Any of the following: • No wheezing • No swelling of legs • No distension of abdomen
J40-J47	**Chronic respiratory disease**	Recurrent episodes of productive cough > 1-2 yrs **AND** Breathlessness, initially episodic (more in winter) later progressive or ankle swelling late in disease **AND** Exclude TB
J45	**Asthma**	Cough (with early wheezing) off and on for long period (> 6 months duration) **AND** Any of the following signs or symptoms: • Shortness of breath, especially at night or during • change of season • Wheezing relieved by bronchodilators • Family history of similar illness **AND** None of the following: • Weight loss • Mild fever with evening rise
Diseases of the digestive system		
K70-K71, K74-K75	**Cirrhosis of liver**	Abdominal distension (fluid in abdomen) ascitis gradually **AND** Swelling of lower limbs **AND** Any of the following signs or symptoms: • Early progressive jaundice • Painless liver • Vomiting of blood • Passing of blood in stool • Drowsiness or coma • H/o chronic alcoholism **AND** No fever
K73-K75	**Chronic hepatitis**	Progressive yellow discoloration of eyes, body, urine till death **AND** Moderate fever **AND** Any of the following : • White chalky stools • Enlarged liver • Loss of appetite Perhaps with history of outbreak of jaundice

K72	**Liver failure**	Progressive yellow discoloration of eyes, body, urine till death **AND** progressive abdominal swelling, and swelling of whole body. Possibly with: limbs becoming lean and thin, paleness, poor digestion, and later on unconsciousness or delirium.
K45-K46	**Hernia**	Strangulated initial history of reducible swelling in scrotum which used to come on coughing or straining; Obstruction of swelling form going back into abdomen; Painful tender and bring high fever. Abdominal distension. Death occurs due to dehydration or sepsis.

Diseases of the genitourinary system		
N17-N19	**Renal failure**	Progressive or acute onset of decreasing urinary output for more than 1 day **AND** Any of the following signs or symptoms: • Progressive loss of appetite • Hiccups • Drowsiness • Confusion • Unconsciousness • Swelling of eyelids/ face / body in the morning **OR** History of dialysis
N40-N42	**Hyperplasia of prostate**	Difficult in passing urine with frequent urging in elderly man > 60 years **AND** Lower abdominal pain **AND** Any of the following signs or symptoms: • Patient becomes dull and drowsy • Hiccups • Vomiting • Face is swollen • Delirium or coma **AND** Rule out Prostrate Cancer
Symptoms, signs and abnormalities not elsewhere classified		
RI0	**Acute abdomen (not elsewhere classified)**	Severe acute abdominal pain; Vomiting, Vomiting of blood; Abdominal distension **AND** Any of the following signs or symptoms: • Fever • Constipation • Collapse/ Unconsciousness • History of peptic ulcer • Vomit blood or blood in stools
R17	**Jaundice (not elsewhere classified)**	Try to pick a more specific code. If fever is associated with jaundice, then consider acute hepatitis (B15-B19). If fever is absent with jaundice, then consider liver diseases (K70-K77). Consider R17 only if the narrative is inconclusive and mentions jaundice **AND a**ny of the following signs or

		symptoms: • Headache • Nausea • Vomiting • Loss of appetite • Urine is yellow in colour. **AND** No other obvious cause
R50	**Fever of unknown origin**	If fever is found in the narrative, then consider and rule out Malaria (B50-B54), Typhoid (A01), Dengue (A90-A91), Meningitis/Encephalitis (G00-G09 or A81-A89, Tuberculosis (A15-A19), HIV/AIDS (B20-B24), Lymphoma/Leukaemia (C81-C96). Consider R50 only if the narrative is inconclusive and mentions Fever of at least two weeks duration **AND** No possible reason found
R54	**Senility**	Consider and rule out Heart failure (I50) and Ischemic heart disease (I20-I25). Consider R54 only if the deceased person was above 70 years of age **AND** has no other specified cause is found
R96	**Sudden death**	Consider and rule out Heart failure (I50) and Ischemic heart disease (I20-I25). Code only if no cause was observed. Otherwise code R99 if history was unclear.
R99	**Ill-defined/ unspecified**	Code Senility (R54) if the deceased person was above 70 years. Code P96 in Neonates. Code R99 only if no more specific cause can be found or if the narrative or symptoms are inadequate to arrive at any other diagnosis.

Form B: Child Deaths (29 days – less than 15 years)

ICD-10 CODE	CAUSE OF DEATH	CRITERIA
Certain infectious and parasitic diseases		
A01	**Typhoid & Paratyphoid**	Long duration high fever progressively increasing, continuous **AND** Any of the following: • Severe headache • Abdominal pain, distension • Constipation/diarrhoea • Death occurred in 2nd or 3rd week • Delirium • Blood in stool • Tongue highly coated
A09	**Diarrhoea**	Frequent / liquid / watery loose or soft stools **AND** may have **fever AND** Any of the following: • Low/nil urine output • Restricted fluid intake • Vomiting • Eyes sunken or depressed fontanelle or loss of skin turgor • lethargic • Blood or mucus in stool
A17	**Tubercular meningitis (inc. nervous system)**	History of tuberculosis in the family or the child, history of fever of long duration with weight loss **AND** headache or convulsions of body parts **AND** neck stiffness or vomiting or unconsciousness **AND** no h/o injury to head or locked jaw or diagnosis of pyogenic meningitis
A35	**Tetanus**	Neck stiffness or stretching of neck behind **AND** Convulsions **AND** Inability to open mouth or refused to feed **AND** No h/o tuberculosis in family or self **Possibly with** H/o cuts/wounds in limbs or history of ear discharge DO NOT use A34- that is for obstetric cases only.
A37	**Whooping cough**	Long bouts of cough > 15 days, with thick tenacious mucus. Cough becoming more severe and frequent over time **AND** Any of the following : • Bouts of cough with inspiratory whoop (may be absent, especially in infants) • H/o Outbreak of whooping cough "in local language" in the area • Inability to take food • Vomiting after cough

A40-A41	**Septicaemia**	High fever of medium duration, with chills, delirium, confusion or unconscious. Not responding to usual antibiotics. Some history of ear infection, ear discharge or boils on body or other source of infection. **Exclude** other causes such as ARI, Malaria, diarrhoea, TB.
A82	**Rabies**	History of animal bite OR Bat exposure **AND** Fear to drink water **AND** Any of the following signs or symptoms: • Convulsions • Unconsciousness • No h/o injection after animal bite
B05	**Measles**	Rash all over body after an attack of fever > 3 days **AND** Red or watery eyes or cough, running nose – Coryza **Possibly followed by** Rapid breathing or diarrhoea
J10-J18 **J20-J22**	**Pneumonia (acute lower respiratory tract infection)**	Cough **OR** High fever **AND** Fast breathing or chest in-drawing
Cancers		
C40-C41	**Bone cancer (Osteosarcoma)**	Painful and progressively increasing swelling on bone **OR** Diagnosed as osteosarcoma **Possibly** on bone near knee joint, hip, humerus or jaw OR with History of Injury
C64-C68	**Wilm's Tumour**	Abdominal pain **AND** Massive lump in abdomen (flanks) with or without fever **OR** Diagnosed as Wilm's tumour Possible with passing blood in urine OR Hypertension
C69	**Retinoblastoma**	Enlargement of globe with protrusion of eye balls **AND** Parent report eye had a bright reflection like a cat (i.e. "amaurotic cat's eye) or eye pain **OR** crossed eyes Often starts painlessly at 2-4 years may remain quiescent and manifest at 5 or 6 years **OR** Diagnosed as Retinoblastoma
C71	**Brain cancer**	Vomiting **AND** Any of the following: • Headache • Convulsions • Unilateral protruding eyes • Involuntary eye movements (side to side or up/down) • Unsteady gait **OR** Diagnosis as brain cancer

C81-C85	**Lymphoma** Hodgkins (C81) & Non-Hodgkins (C85)	Painless enlargement of multiple lymph nodes, (often in neck) not responding to antibiotics or antitubercular treatment **AND** Any of the following: • Low-grade fever • Hoarse cough • Night sweats • Abdominal distension • Weight loss **OR** Diagnosed as lymphoma
C91-C96	**Leukaemia**	White discoloration of body or paleness **AND** Any of the following: • Fever • Bleeding from natural orifices (nose, mouth etc) • Bone or Joint pain • Enlarged lymph glands • Purplish or red patches on the skin **OR** Diagnosed as leukaemia
Endocrine, nutritional and metabolic diseases		
E40-E46	**Malnutrition**	Not growing properly or loosing weight and becoming very thin over months **AND** Any of the following: • Recurrent febrile illness • Reddish brown discoloration of hair • Flaking of skin • Pallor • Abnormally distended abdomen • Swelling of feet • Night-blindness **NOTE:** If malnutrition is a consequence of disease, then code the disease and not E40-E46. Common diseases to consider: prolonged diarrhoeal disease or amoebiasis (AO6) or other non infective diarrhoea (K52)
Diseases of the nervous system		
A83-A89	**Encephalitis**	Convulsion of body /body parts or asymmetrical weakness or paralysis **OR** fluctuating Loss of Consciousness **AND** Fever until death **AND** Any of the following: • Vomiting • Unconsciousness • Stiff neck **Possibly with** Confusions,
G00-G05	**Meningitis**	Continuous fever until death **AND** Neck stiffness Vomiting **Possibly With** Loss of consciousness, convulsions or rash **OR** No symptoms of ARI, diarrhoea **OR**

		Photophobia
Diseases of liver		
K73-K75	**Chronic hepatitis**	Progressive yellow discoloration of eyes, body, urine till death **AND** Moderate fever **AND** Any of the following : • White chalky stools • Enlarged liver • Loss of appetite • Outbreak of jaundice • Abdominal distension • Bleeding patches on skin, bleeding from mouth, nose **NOTE:** Exclude acute viral hepatitis (B15-17)-

Form A: Neonatal Deaths (28 days or less)

ICD10 CODE	CAUSE OF DEATH	CRITERIA
A09	**Diarrhoea**	Frequent/liquid/watery loose or soft stools **Possibly With** Fontanelle depressed **OR** Eyes sunken **OR** Urine volume low
A33	**Neonatal tetanus (often local language used)**	Baby able to suck after birth **AND** Stopped sucking after 3 days **AND** Baby's body became rigid with or without convulsions **Possibly With** Umbilical cord inflammation **OR** Fever **DO NOT code Tetanus for deaths on days 0, 1, 2 or 3.**
J10-J18 J20 -J22	**Pneumonia (ARI)**	Cough **OR** Fever **AND** Rapid breathing **OR** Difficult breathing with in-drawing of chest (often local term)
P05	**Low-Birth-Weight (Term baby)**	**Full term pregnancy** ONLY - Smaller than average size baby. If weighed, birth weight below 2.5 kilograms **AND** No other obvious causes of death **Possibly With** Poor suckling after birth **OR** Death at 3-7 days
P07	**Prematurity (Pre-term)**	Born between 24 and 36 weeks of gestation **AND** No other obvious causes of death. May or may not be smaller than average size baby.
P10-P15	**Birth trauma**	Bruises at birth, or elongation/swelling/blood clots over skull **OR** Any limb broken at birth **Possibly With** Convulsions in first 72 hours of birth **Possibly With** Instrumental delivery **OR** Complicated delivery
P21-22, P24	**Birth asphyxia**	Delayed or poor breathing or no breathing at birth **OR** Delayed or no cry at birth **OR** bluish or pale skin colour **AND** Any sign of life present at birth (i.e. exclude stillbirths) **Possibly With** Prolonged or difficult labour **OR** passing of meconium in the amniotic fluid
P36	**Bacterial sepsis of newborn**	Fever **AND/OR** No other obvious causes of death (like pneumonia, diarrhoea) **Possibly With** Purulent discharge from cord **OR** Poor sucking **OR** Limp and lethargic OR coma **OR** abdominal distension **OR** jaundice
P80	**Hypothermia**	Central part of body felt cold **AND baby is** lethargic **AND** Stopped feeding AND is full term (Exclude temperature regulation problems due to prematurity – P07) **Possibly with** Exposure to cold
P95	**Stillbirth**	Do not use P95 for newborns that showed ANY sign of life regardless of number of weeks of gestation. DO NOT use P95 for cause-unknown if born alive. Use P95 ONLY for foetal (INTRA UTERINE) deaths.
P96	**Other perinatal conditions**	Use P96 only if no other specific cause of neonatal death can be found. Do not use R95 (SIDS)
Q00-Q89	**Congenital malformations**	Abnormality of head (small, flat, swelling), spine, body, arms and legs or circulatory or respiratory or other systems reported at birth. **If born alive, avoid P96**

Form D: Maternal Deaths (During pregnancy or within 42 days of abortion or delivery)

Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

A direct maternal death (e.g. O00-O97) that is the result of a complication of the pregnancy, delivery, or their management, and an indirect maternal death (e.g. O98 or O99) that is a pregnancy-related death in a patient with a preexisting or newly developed health problem. Accidental death or incidental causes are coded according to the specific areas of the ICD-10 coding (e.g. V, W, X, Y).

ICD10 CODE	CAUSE OF DEATH	CRITERIA
O00	**Ectopic pregnancy**	Gestational age ≤6 months (usually ≤4 months), severe abdominal pain and sudden collapse **AND** Report from informant of physician diagnosis of extra-uterine pregnancy
O03-O06	**Abortion**	Gestational age ≤6 months **AND** Recent history of spontaneous vaginal bleeding (O03) **OR** intentional termination of the pregnancy **(O04-O05)** **OR** unspecified whether spontaneous or intentional termination of pregnancy (O06) **AND** Any of the following: • Infection: fever with chills & rigor or pelvic pain, foul-smelling per vaginal discharge, • Haemorrhage: profuse bleeding • Unspecified **NOTE:** if abortion ≥7 months, see codes O72, O75 or O85
O10-O16	**Hypertension disorders of pregnancy (HDP)**	Gestational age ≥5 months and <72h postpartum **AND** no fever, diarrhoea and no h/o convulsions outside pregnancy **AND** Report of diagnosis of hypertension, either prior to or during the pregnancy AND/OR any of the following • coma >1h duration • h/o convulsions in pregnancy, labour and/or postpartum • signs and symptoms of HDP: abdominal pain, headache, blurred vision, generalized oedema (not just ankle swelling) • jaundice without fever in third trimester **Possibly with**

		• Gravida 1 • multiple gestation • intrauterine death diagnosed or stillbirth delivered • h/o of PPH **NOTE** if ≥72h postpartum, consider O87
O24	**Diabetes mellitus in pregnancy**	Gestational age 1-10 months **AND** diagnosis of pre-existing or new report of diabetes
O41	**Intra-amniotic infection**	Gestational age ≥7months **AND** h/o ruptured amniotic membranes ≥24h **OR** New onset of fever around the time of labour **AND** Woman dies in labour or within 24h of delivery **Possibly with any of the following** • foul-smelling discharge • intrauterine death/stillbirth/neonatal death • increasing uterine pain not consistent with labour • preterm labour • obstructed labour
O44	**Placenta praevia**	Gestational age ≥7 months **AND** Maternal death due to haemorrhage *prior* to delivery **AND** No significant pain reported other than labour **Possibly with** H/o painless episodes of bleeding often starting at 7 months
O45	**Placental abruption**	Gestational age ≥7 months AND Abdominal pain described as extreme, constant, abdomen is board-like Possibly with H/o hypertension, trauma (accident, violence), per vaginal bleeding (can have concealed abruption), if delivery occurs - baby is stillbirth
O46	**Ante partum haemorrhage not elsewhere classified**	Gestational age ≥7 months AND Woman dies prior to delivery AND profuse per vaginal bleeding.
O64-O66	**Obstructed labour**	Gestational age ≥7 months AND Long-labour ≥24h for primie and 12 hours for multi

O67	**Intrapartum haemorrhage**	Gestational age ≥7 months **AND** Woman dies *prior* to delivery **AND** profuse bleeding per vaginal **Possibly with** intrauterine death diagnosed prior to maternal death
O71	**Other obstetric trauma: uterine rupture in labour or postpartum uterine inversion**	Gestational age was ≥7 months AND Woman dies undelivered **AND** Any of the following: • sudden collapse during prolonged (obstructed) labour • report of fetal malposition, i.e. transverse lie • h/o previous caesarean
O72	**Postpartum haemorrhage**	Gestational age was ≥7 months **AND** Woman dies *following* delivery of baby (can occur with placenta *in situ* or postpartum up to 14 days) **AND** Any of the following:

		• bleeding per vagina • if placenta undelivered, can have concealed bleeding and abdomen rises up as uterus fills with blood **Possibly with** obstructed labour, signs and symptoms of infection in labour or postpartum, caesarean delivery, multiple gestation
O85-O86	**Puerperal sepsis**	Gestational age was ≥7 months **AND** Death occurs ≥24h - ≤42d postpartum (usually day 3-14) **AND** fever or chills **OR** abdominal pain **OR** foul-smelling discharge per vagina **Possibly with** • jaundice appearing ≥4d postpartum • no h/o fever in pregnancy • h/o prolonged labour or ruptured membranes (>24h prior to delivery) • h/o preterm labour • h/o stillbirth/neonatal death • sweating/rigours/dizziness/headaches
O90	**Complications of the puerperal Unspecified**	Gestational age was ≥7 months AND Death occurs ≥24h - ≤42days postpartum AND Woman dies in the postpartum period of probable direct maternal cause of death Possibly with • previously healthy outside of pregnancy • may have developed complications during the pregnancy/delivery/postpartum
O95	**Obstetric death ≤ 42 days post-partum**	Death of a woman from gestational age 1-10 months to 42 days postpartum/post abortion AND Most probably a direct maternal cause of death **NOTE**: Use O75 or O90 if clearly in the intrapartum period or postpartum period respectively. O95 can be used for sudden death not related to O98 or O99 (perhaps suspected DVT, PE, AFE), or other diseases specific to the maternal death timeframe.
O96	**Late maternal death 43 days – 1 year post-partum**	Death of woman *between 43-365 days postpartum* of most probably a direct maternal cause of death Possibly with • previously healthy outside of pregnancy • may have developed complications during the pregnancy/delivery/postpartum • report of near-death event in pregnancy/delivery/postpartum period Consider a more specific cause of death
O97	**Death from sequalae of direct obstetric causes: More than 1 year post partum**	Death of woman *>366 days postpartum* of most probably a direct maternal cause of death Possibly with • previously healthy outside of pregnancy

		• may have developed complications during the pregnancy/delivery/postpartum • report of near-miss event[1] in pregnancy,/delivery/postpartum period Consider a more specific cause of death
O98	**Maternal infectious and parasitic diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium**	Death of a woman who is pregnant/intrapartum/postpartum (≤42 days) of probable infectious cause of death – possibly exacerbated by pregnancy **Possibly with:** • h/o of fever prior to pregnancy, or prior to puerperium • h/o intermittent fever • jaundice +/- fever (not postpartum/post abortion, no signs and symptoms of HDP) • diarrhoea **NOTE:** Consider a more specific ICD code if possible
O99	**Other maternal diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium**	Death of a woman who is pregnant/intrapartum/postpartum (≤42 days) of probably non-infectious cause of death, possibly exacerbated by the pregnancy **Possibly with** • h/o pre-existing medical condition • reported diagnosis of new medical condition **NOTE:** Consider a more specific ICD code if possible
A34	**Obstetric tetanus**	Maternal death; post abortion or postpartum **AND** Reports unable to swallow or neck stiffness **AND** Rigid spasms **Possibly with** • incubation 4-42 days, average 12 days, though may be earlier if h/o prolonged labour reported • no ANC attendance, no report of TT injection in pregnancy • febrile convulsions • episodes of cyanosis ("she became black")
F53	**Mental and behavioural disorders associated with the peurperium**	Postpartum suicide with signs and symptoms of postpartum depression or psychosis

NOTE: For Indirect Obstetrical causes of death use the previous guidelines for all adults.

All Ages: Injury, Poisoning and External Causes

Injury, poisoning and external causes		
W19	**Falls, place and details of unspecified nature**	Death following history of fall on the same level or at different levels from any objects (wheel chairs, bed, stairs and steps, ladder, scaffolds, tree, building, structure, etc.) due to unspecified mechanism
W49	**Inanimate mechanical forces**	Death due to injury by any objects (any equipment, machinery) due to any specified or unspecified mechanism.
W54	**Dog bite**	Death due to injury following history of bite by any dog. Exclude rabies-related death.
W74	**Accidental drowning**	Death due to injury following history of drowning and submersion in bath-tub, swimming pool, natural water areas, tanks, lakes and ponds. Keywords may capture if any history of epilepsy (Risk Factor)
W87	**Electrical injuries**	Death due to injury following history of exposure to specified electric current resulting in burns, electric shocks or electrocution.
X09	**Exposure related to smoke, fire / flames**	Death due to injury following history of sudden exposure to prolonged / short periods of excessive heat due to unspecified smoke, fire / flames.
X20	**Snake bite**	Death due to injury following history of bite or crush by any reptiles, including snakes.
X30, X32	**Excessive natural heat / extreme sunlight**	Death due to injury following history of exposure to unbearable excessive heat / sunlight in the environment due to nature.
X31	**Excessive natural cold**	Death due to injury following history of exposure to unbearable excessive cold weather in the environment due to nature.
X34	**Earthquakes, landslides, floods and others**	Death due to injury following history of victim being involved in any natural disasters like earthquakes, landslides, floods and others (separate codes are available for each of the above mentioned disasters).
X49	**Accidental poisoning from chemicals**	Death due to injury following history of accidental consumption of any drugs, alcohol, solvents, gases, pesticides and any unspecified chemicals.
X69	**Suicides by poisoning**	Death due to injury following history of **intentional self harm** by consumption of any types of drugs, gases and vapours, pesticides or any unspecified chemicals. Keywords may capture if any history of depression and type of poison used
X70	**Suicides by hanging**	Death due to injury following history of **intentional self harm** by hanging with any objects like rope, saree, lungi, dupatta, etc. Keywords may capture if any history of depression

X71	**Suicides by drowning**	Death due to injury following history of **intentional self harm** by drowning in a water body like wells, ponds, rivers, lakes, etc. Keywords may capture if any history of depression.
X76	**Suicides by burns/self-immolation**	Death due to injury following history of **intentional self harm** by self-immolation through kerosene or setting fire by themselves by any other unspecified means. Keywords may capture if any history of depression and type of fire
Y08	**Assault / violence by specified means**	Death due to injury following history of assault / violence by handguns, acids, fire, explosive materials, sharp objects, blunt objects, bodily force or by motor vehicles.
Y09	**Assault / violence by unspecified means**	Death due to injury following history of assault / violence by any unspecified objects or means.
Y99	**Unspecified injury**	Death due to injury following history of exposure to sudden energy transfer by unspecified means.
V94	**Water transport accidents**	Death following history of injuries due drowning and submersion, following or jumping from a boat, ship or any local water transport vehicles. Keywords may capture if any history of epilepsy.
V01-V99 (and W22, W51)	**Surface transport accidents**	See table below. If no specific code can be got from this table, then use V99

Use this table for common road traffic Vehicular Injury codes (from V00 to V99 or W22 or W51) for all ages

Victim and Mode of Transport	In collision with or involved in:									
	Pedes-trian/ animal	Pedal cyclist	2-3 wheeler	Car-Pick-up Truc k Van	Heavy vehicle /bus	Rail-way	Other non-motor	Fixed/ stationary object	Non-collision transport	Other non specific
Pedestrian	(W51)	V01	V02	V03	V04	V05	V06	(W22)	V09	V09
Pedal cyclist	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19
Motorcycle rider	V20	V21	V22	V23	V24	V25	V26	V27	V28	V29
Occupant of 3 wheeler	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39
Car occupant	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49
Occupant of Pickup truck or van	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59
Occupant of Heavy transport vehicle	V60	V61	V62	V63	V64	V65	V66	V67	V68	V69
Bus Occupant	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79

Index by Disease

CAUSE OF DEATH	ICD-10 CODE
Abortion	O06
Acute Abdomen (not elsewhere classified)	R10
Acute Lower Respiratory Tract Infection (ARI)	J22
AIDS (or HIV/AIDS)	B20 to B24
Anaemia	D60 to D64
Ante-Partum Haemorrhage	O46
Asphyxia at Birth	P21
Assault (or Violence)	Y08/Y09
Asthma	J45/J46
Bacterial Sepsis (neonate)	P36
Birth Trauma	P10 to P15
Bronchitis	J20
Chronic Hepatitis	K73
Chronic Obstructive Pulmonary Disease	J40 to J44
Cirrhosis of Liver	K70 to K72; K74 to K77
Congenital Malformation (neonate)	Q89
Congestive Heart Failure	I50
Convulsions/Epilepsy/Seizures	G40/G41
Coronary Insufficiency/ Heart Attack/Myocardial Infarction	I21 to I25
Dengue Fever	A90/A91
Depression (Primary)	F33
Diabetes Mellitus	E11 to E14
Diabetes Mellitus (Juvenile, insulin dependent)	E10
Diarrhoea/Gastroenteritis/Dysentery	A09
Diphtheria	A36
Drowning (accidental)	W74
Dysentery/Diarrhoea/Gastroenteritis	A09
Eclampsia	O15
Encephalitis	G05; A85
Epilepsy/Convulsions/Seizures	G40/G41
Falls	W19
Gastroenteritis/Dysentery/Diarrhoea	A09
Haemorrhage, Ante-Partum	O46
Haemorrhage, Post-Partum	O72
Heart Attack/Coronary Insufficiency/Myocardial Infarction	I21 to I25
Heart Disease, Rheumatic	I05 to I09
Heart Failure, Congestive	I50
Heat Stroke	X30
Hepatitis, Viral	B15 to B19
Hepatitis, Chronic	K73
HIV/AIDS (or AIDS)	B20 to B24
Hyperplasia of Prostate	N40 to N42

Hypothermia	X31
Hypothermia (neonate)	P80
Ill-defined/Unspecified	R99
Ill-defined/Unspecified (neonate)	P96
Influenza	J11
Jaundice (not elsewhere classified)	R17
Labour, Obstructed	O64/O66
Liver Cirrhosis	K70 to K72; K74 to K77
Low Birth Weight (full term pregnancy)	P05
Malaria	B50 to B54
Malnutrition	E46
Measles	B05
Myocardial Infarction/Heart Attack/Coronary Insufficiency	I21 to I25
Meningitis	G00, G03, A39, A87
Meningitis, Tubercular	A17
Motor Vehicle Accidents (MVA)	See table in manual
Neoplasm/Cancers:	
Bone Tumour (Osteosarcoma)	C41
Brain Tumour	C71
Breast	C50
Bronchus and Lung	C34
Carcinoma Cervix	C53
Colon/Rectal	C18 to C21
Larynx (throat)	C32
Leukaemia	C95
Liver	C22
Lymphoma, Hodgkin's	C85
Lymphoma, Non-Hodgkin's	C81
Malignant Melanoma	C43/C44
Oesophageal	C15
Oral (mouth)	C06
Pharynx	C10/C11
Stomach	C16
Trachea	C33
Obstructed labour	O64/O66
Paratyphoid (& Typhoid)	A01
Pertussis (or Whooping Cough)	A37
Pneumonia	J18
Post-Partum Haemorrhage	O72
Prematurity	P07
Prostate Hyperplasia	N40 to N42
Puerperal Sepsis	O85
Pulmonary Tuberculosis	A16
Pyrexia of unknown origin	R50

Rabies	A82
Renal Failure (sometimes Uraemia)	N17/N19
Rheumatic Heart Disease	I05 to I09
Schizophrenia	F20
Seizures/Convulsions/Epilepsy	G40/G41
Senility	R54
Sepsis, Puerperal	O85
Septicaemia	A40/A41
Snake bite	X20
Stroke (sometimes paralysis or cerebral apoplexy)	I64
Suicides	X69 to X76
Tetanus	A35
Tetanus, Neonatal	A33/A34
Tubercular Meningitis	A17
Tuberculosis, Pulmonary	A16
Typhoid (& Paratyphoid)	A01
Violence (or Assault)	Y08/Y09
Viral Hepatitis	B15 to B19

Chapter 6: Cause of Death Workbook

To practice the six steps required for consistent coding, we have included ten worksheets to help negotiate the process. The answer key to the ten narratives is at then end. Try not to look at the answers until you have completely finished.

A Reminder of the Six Steps:

1. Carefully read past medical history & narrative
2. Highlight cardinal symptoms & negative evidence. Note keywords
3. Think of chronological sequence. Adhere to cardinal symptoms & negative evidences. Do not imagine facts which are not in the record
4. Choose underlying cause of death. Select specific ICD code & confirm against guidelines
5. Reconsider ICD code using differential diagnoses
6. Select certainty of diagnosis & quality of narrative

Notes:

Exercise 1: Female, 60 years old

Respondent thought person died of "diabetes / sugar disease". According to the respondent, the deceased woman was suffering from diabetes for last 8 years and was regular medication. She was having increased thirst, urination, appetite and weight gain. She developed stroke and paralysis of left side of body in last month. Her BP was raised and she lost consciousness and control over speech and micturation. She was discharged from hospital in coma and passed away in home.

Items in RHIME questionnaire include:

√ Hypertension
√ Heart disease
√ Stroke
√ Diabetes

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 2: Male (inferred from narrative), 83 years old

Respondent thought person died of "asthma". According to the respondent, the deceased man was suffering from asthma for last 6 years and was regular medication. He was having breathlessness, chest pain and hoarseness of voice and decreased intake of meals and weakness for last 4-5 days. He was taken to physician who advised antibiotics and pumping medicine (inhalers). The medicines did not work and he passed away.

Items in RHIME questionnaire include:

√ Asthma

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 3: Female, 63 years old

Respondent thought person died of "stomach cancer". According to the respondent, the deceased woman was suffering from Stomach pain on and off for last 1 and half years and was regular medication. She was having loss of weight and appetite. She was hypertensive too. She passed away.

Items in RHIME questionnaire include:

√ Cancer

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 4: Male, 65 years old

Respondent thought person died of "brain haemorrhage". According to the respondent, the deceased man was hypertensive and asthmatic and was regular unani medication. He developed severe headache, vomiting, fainting and bleeding. He passed away on road. He was weak and had loss of appetite.

Items in RHIME questionnaire include:

√ Hypertension

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 5: Male, 19 years old

Respondent thought person died of "fits". The patient died due to sudden fits. This was caused by nervous weakness, mental disturbance, physical weakness and constant high fever.

Items in RHIME questionnaire include:

√ Other chronic illness

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 6: Male, 25 years old

Respondent thought patient died of "lung cancer". Patient had an attack of cough with sputum. Sputum was mixed with blood. Patient had also history of chest pain. Pain was worse with cough and associated with fever and weight loss. Patient felt difficulty in breathing. Patient consulted doctors, was admitted in hospital and then died.

Items in RHIME questionnaire include:

√ Asthma

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 7: Male, 22 years old

Respondent thought patient died of "diarrhoea" and "vomiting". According to the respondent's statement the deceased suffered with continuous fever associated with diarrhoea and vomiting for around one week. Fever rose every day. He was admitted to hospital and died after three days.

Items in RHIME questionnaire include:

√ Other chronic disease

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 8: Male, 53 years old

Respondent thought patient died of "stomach pain". The deceased had had pain in the stomach accompanied by a burning sensation since six months. He just took rice and dal only. He had a regular check up in the hospital for nearly 15 days. Since a month, he had started to vomit after every meal. The deceased had become very weak at the time of death. He died in his home.

Items in RHIME questionnaire include:

√ Nil significant

Step 1: _____

_____

Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 9: Male, 58 years old

Respondent thought patient died of "sugar ki beemari". He felt weakness. He was frequently passing urine. His mouth and tongue was automatically becoming dry. He was feeling pain in his knees. He was day by day becoming thin. Took him to [the doctor]. He, upon examining the patient, declared that the patient is sugar (diabetes) problem. He prescribed medications and the patient took these medicines for about two months. But there was no change then was took the patient to the hospital. They performed some tests and told us that the patient is diabetic. They prescribed medicines. He took these medicines but of no use. Brought him to hospital for 10 days, where doctors performed some tests. They too confirmed diabetes and prescribed some medicines and restrictions on food, etc. Taken for treatment but there was no change. His condition worsened and ultimately he passed away.

Items in RHIME questionnaire include:

√ Diabetes

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 10: Female, 83 years old

Respondent thought patient died of "heart attack" and "old age". As reported by the respondent, the deceased was in old age and suffering from hypertension disease. She was under the treatment of several doctors. She has given high drugs but she could not tolerate these drugs. She was also involved by cough of long duration of more than six years. She spent sleepless night due to cough. Blood pressure remains higher than normal in various periods. Fever rose many days. Pain remains in aches more than 24 hours. Spread pain up to left arm and deep central chest. Due to cough she was associated with breathlessness, reduced urine amount also, burning with urine. Sometimes she fell unconscious. She fell seriously ill and could not talk. Due to high BP she passed away.

Items in RHIME questionnaire include:

√ Hypertension
√ Heart disease
√ Diabetes
√ Asthma

Step 1: _____

_____

Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Answer 1: Female, 60 years old
Respondent thought person died of "diabetes / sugar disease". According to the respondent, the deceased woman was suffering from diabetes for last 8 years and was regular medication. She was having increased thirst, urination, appetite and weight gain. She developed stroke and paralysis of left side of body in last month. Her BP was raised and she lost consciousness and control over speech and micturation. She was discharged from hospital in coma and passed away in home.

Step 1: Relevant past history noted and narrative carefully read

Step 2: Keywords: "increased thirst, increased urination, increased appetite and weight gain", "diabetes for last 8 years and was regular medication", "BP high", "stroke and paralysis of left side of body in last month", "lost consciousness and control over speech and micturation"

Step 3: Chronology:

Stroke
↑
High BP

Step 4: CoD is stroke/ cerebro-vascular accident (CVA) (I64)
Keywords that match the guidelines are bolded:
Sudden onset of paralysis of one or more limbs in the month preceding death *AND any of the following:*

- ***Unconsciousness***
- *Loss of vision*
- ***Urinary incontinence***
- *Loss of sensations on any part of body*
- ***Altered speech***
- *Sudden onset of headache with altered sensorium*
- *Late onset of convulsions*

AND No previous episodes of convulsions

Step 5: Consider differential diagnoses: epilepsy (G40-G41), meningitis/encephalitis (G00-G09, A81-89), malaria (B50-B54), ischemic heart disease (I20-I25) and falls (W00-W19).

No history of convulsions rules out epilepsy (G40-G41). No history of fever and/or convulsions and/or neck stiffness rules out meningitis/encephalitis (G00-G09, A81-89) and malaria (B50-B54). No history of chest pain rules out Ischemic heart disease (I20-I25). No history of falls rules out falls (W00-W19)

Step 6: In this case, the certainty of diagnosis should probably be a 1-High as clearly indicative narrative. Quality of narrative is 1-Good.

Answer 2: Male (inferred from narrative), 83 years old
Respondent thought person died of "asthma". According to the respondent, the deceased man was suffering from Asthma for last 6 years and was regular medication. He was having breathlessness, chest pain and hoarseness of voice and decreased intake of meals and weakness for last 4-5 days. He was taken to physician who advised antibiotics and pumping medicine (inhalers). The medicines did not work and he passed away.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "suffering from asthma for last 6 years and was regular medication", "breathlessness, chest pain and hoarseness of voice and decreased intake of meals and weakness for last 4-5 days", "taken to physician who advised antibiotics and pumping medicine (inhalers)", "medicines did not work" and items from RHIME questionnaire.

Step 3: Chronology:

Exacerbation of asthma (not responding to medicines)
↑
Asthma

Step 4: CoD is asthma (J45).
Keywords that match the guidelines are bolded:
*Cough (with early wheezing- **hoarseness of voice**) off and on for long period (> 6 months duration) AND any of the following signs or symptoms:*

- ***Shortness of breath, especially at night or during change of season***
- *Wheezing relieved by bronchodilators*
- *Family history of similar illness*
- *AND None of the following:*
- ***Weight loss***
- ***Mild fever with evening rise***

Step 5: Consider differential diagnoses: tuberculosis (A15-A16), lower respiratory tract infection (J09-J22), lung cancer (C33-C34), ischemic heart disease (I20-I25), heart failure (I50)

No history of fever and/or haemoptysis and /or weight loss rules out tuberculosis (A15-A16), lower respiratory tract infection (J09-J22) and lung cancer (C33-C34). No history of classical chest pain with radiation to left hand or left side rules out ischemic heart disease (I20-I25). No history of swelling over feet and abdomen rules out heart failure (I50)

Step 6: In this case, the certainty of diagnosis should probably be a 1-High as clearly indicative narrative. Quality of narrative is 1-Good.

Answer 3: Female, 63 years old
Respondent thought person died of "stomach cancer". According to the respondent, the deceased woman was suffering from stomach pain on and off for last 1 and half years and was regular medication. She was having loss of weight and appetite. She was hypertensive too. She passed away.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "suffering from stomach pain on and off for last 1 and half years and was regular medication", "loss of weight and appetite", "hypertensive" and items from RHIME questionnaire.

Step 3: Chronology:

Abdominal cancer (associated with loss of weight and appetite)

Step 4: CoD is abdominal cancer (C16).
Keywords that match the guidelines are bolded:
Vomiting/ vomiting of blood. Difficulty in swallowing AND Mass in upper abdomen AND any of the following:

- ***Pain in abdomen***
- ***Weight loss***
- *Enlarged liver*
- *Black stools*

OR diagnosed as stomach cancer
Possibly with history of repeated course of anti-ulcer drugs

Step 5: Consider differential diagnoses: peptic ulcers (K25-K29).

However, no long duration history of stomach pain and /or weigh loss ranks peptic ulcers (K25-K29) in far second place.

Step 6: In this case, the certainty of diagnosis should probably be a 2-Low as it does not match precisely with guidelines. Quality of narrative is 2-Poor (inadequate, could be improved).

Answer 4: Male, 65 years old
Respondent thought person died of "brain haemorrhage". According to the respondent, the deceased man was hypertensive and asthmatic and was regular unani medication. He developed severe headache, vomiting, fainting and bleeding. He passed away on road. He was weak and had loss of appetite.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "severe headache, vomiting, fainting and bleeding", "loss of appetite and weakness", "Hypertensive and asthmatic on regular unani medication" and items from RHIME questionnaire.

Step 3: Chronology:

Stroke
↑
Hypertension

Step 4: CoD is stroke / cerebro-vascular accident (CVA) (I64).
Keywords that match the guidelines are bolded:
Sudden onset of paralysis of one or more limbs in the month preceding death AND any of the following:

- ***Unconsciousness***
- *Loss of vision*
- *Urinary incontinence*
- *Loss of sensations on any part of body*
- *Altered speech*
- ***Sudden onset of headache with altered sensorium***
- *Late onset of convulsions*

AND ***no previous episodes of convulsions***

Step 5: Consider differential diagnoses: epilepsy (G40-G41), meningitis/encephalitis (G00-G09, A81-89), malaria (B50-B54), ischemic heart disease (I20-I25), falls (W00-W19)

No history of convulsions rules out epilepsy (G40-G41). No history of fever and/or convulsions and/or neck stiffness rules out Meningitis/Encephalitis (G00-G09, A81-89) and malaria (B50-B54). No history of chest pain rules out ischemic heart disease (I20-I25). No history of falls rules out falls (W00-W19)

Step 6: In this case, the certainty of diagnosis should probably be a 2-Low as it does not match precisely with guidelines. Quality of narrative is 2-Poor (could be inadequate).

Answer 5: Male, 19 years old
Respondent thought person died of "fits". The patient died due to sudden fits. This was caused by nervous weakness, mental disturbance, physical weakness and constant high fever.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "fits", "caused by constant high fever", "sudden" and items from RHIME questionnaire

Step 3: Chronology:

Fits

↑

High Fever

Step 4: CoD is acute CNS infection (G00).
Keywords that match the guidelines are bolded:

- *Continuous **fever until death** AND Neck stiffness, Vomiting*
- *Possibly with Loss of consciousness OR **No symptoms of ARI, diarrhoea** OR Photophobia*

Step 5: Consider differential diagnoses: viral meningitis (A81-A89), acute bacterial sepsis (A39-A41), typhoid (A01) or respiratory infections (J00-J22). Microbiologic diagnosis not possible on verbal autopsy without test results, ruling out meningitis. Death was earlier than that usually noted in typhoid (where it is usually in the 2nd or 3rd week). No respiratory symptoms were noted.

Step 6: In this case, the certainty of diagnosis is 1-High and the quality of narrative is 1-Good

Answer 6: Male, 25 years old
Respondent thought patient died of "lung cancer". Patient had an attack of cough with sputum. Sputum was mixed with blood. Patient had also history of chest pain. Pain was worse with cough and associated with evening fever and weight loss. Patient felt difficulty in breathing. Patient consulted doctors, was admitted in hospital and then died.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "cough", "sputum with blood", "chest pain", "fever", "weight loss", "breathlessness" and items from RHIME questionnaire

Step 3: Chronology:

Pulmonary Tuberculosis

Step 4: CoD is pulmonary tuberculosis (A16).
Keywords that match the guidelines are bolded:
Chronic cough of long duration with fever *AND any one of the following signs or symptoms:*

- ***Evening rise in fever***
- ***Blood in sputum***
- ***Chest pain***
- ***Breathlessness***
- *Loss of appetite*
- ***Chronic weight loss***

OR family history of diagnosed TB

Step 5: Consider differential diagnoses: airway cancer (C39)
This is also an option but as he was a young patient it has a low probability. History of fever also makes it unlikely. Probably admitted to a 'CD (communicable disease) hospital' and treated.

Step 6: In this case, the certainty of diagnosis is 1-High (based on clinical judgment even though diagnostic confirmation or treatment history not available). Quality of narrative is 2-Poor.

Answer 7: male, 22 years old
According to the respondent's statement the deceased suffered with continuous fever associated with diarrhoea and vomiting for around one week. Fever rose every day. He was admitted to hospital and died after three days.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "continuous fever", "diarrhoea & vomiting – all for more than 1 week", "fever rose each day", "died in 2nd week" and items from RHIME questionnaire

Step 3: Chronology:

Typhoid Fever

Step 4: CoD is typhoid fever (A01).
Keywords that match the guidelines are bolded:
Continuous, long duration high fever progressively increasing (Step ladder) *AND tongue highly coated AND any of the following:*

- *Severe headache*
- *Abdominal pain / distension or constipation*
- ***Death occurred in 2nd or 3rd week***
- *Delirium*
- *Blood in stool*

Step 5: Consider differential diagnoses: pneumonia (J18-22); malaria (B50-54); meningitis/encephalitis (A81-89, G00-09); gastroenteritis (A09)

No history of cough or fast-breathing rules out pneumonia (J18-22). No history of chills or rigors or other complications rules out malaria (B50-54). No history of specific symptoms rules out meningitis/encephalitis (A81-89, G00-09) and gastroenteritis (A09).

Primary symptom was fever that was rising each day & resulting in death in 2nd week

Step 6: In this case, the certainty of diagnosis is 1-High and the quality of narrative is 1-Good.

Answer 8: Male, 53 years old
Respondent thought patient died of "stomach pain". The deceased had had pain in the stomach accompanied by a burning sensation since six months. He just took rice and dal only. He had a regular check up in the hospital for nearly 15 days. Since a month, he had started to vomit after every meal. The deceased had become very weak at the time of death. He died in his home.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "pain in stomach", "burning sensation since 6 months", "vomiting after meals since last 1 month", "became weak" and items from RHIME questionnaire.

Step 3: Chronology:

Upper GI Obstruction

↑

Stomach Cancer

Step 4: CoD is stomach cancer (C16).
Keywords that match the guidelines are bolded:
Vomiting*/ vomiting of blood.* ***Difficulty in swallowing*** *AND mass in upper abdomen AND any of the following:*

- ***Pain in abdomen***
- *Weight loss*
- *Enlarged liver*
- *Black stools*

OR Diagnosed as stomach cancer

Plus non-specific symptoms such as 'became weak' and the fact that it was a relatively short duration fatal illness

Step 5: Consider differential diagnoses: Peptic ulcer (K25-29)

Burning sensation in stomach is a favourable symptom but there is no history of improvement after being seen and treated in hospital.

Step 6: In this case, certainty of diagnosis is 1-High and the quality of narrative is 1-Good.

Answer 9: Male, 58 years old

Respondent thought patient died of "sugar ki beemari". He felt weakness. He was frequently passing urine. His mouth and tongue was automatically becoming dry. He was feeling pain in his knees. He was day by day becoming thin. Took him to [the doctor]. He, upon examining the patient, declared that the patient is sugar (diabetes) problem. He prescribed medications and the patient took these medicines for about two months. But there was no change then was took the patient to the hospital. They performed some tests and told us that the patient is diabetic. They prescribed medicines. He took these medicines but of no use. Brought him to hospital for 10 days, where doctors performed some tests. They too confirmed diabetes and prescribed some medicines and restrictions on food, etc. Taken for treatment but there was no change. His condition worsened and ultimately he passed away.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "diagnosed diabetes at several clinics", "started on diet control and tablets", "no improvement" and items from RHIME questionnaire

Step 3: Chronology:

Diabetes

Step 4: CoD is diabetes (E11).

We are diagnosing diabetes as underlying cause of death rather than risk factor in this case because symptoms and diagnosis of diabetes are mentioned in narrative with no history of complications causing death

Step 5: Consider differential diagnoses: ischaemic heart disease (I20-25); stroke (I64), renal failure (N17-19)

Patient could have died due to any of these causes but no mention of symptoms or diagnosis mentioned in the narrative likely rules them out.

Step 6: In this case, the certainty of diagnosis is 1-High and the quality of narrative is 2-Poor (diabetes diagnosis to be followed up by history of complications along with history of terminal illness).

Answer 10: Female, 83 years old
Respondent thought patient died of "heart attack" and "old age". As reported by the respondent, the deceased was in old age and suffering from hypertension disease. She was under the treatment of several doctors. She has given high drugs but she could not tolerate these drugs. She was also involved by cough of long duration of more than six years. She spent sleepless night due to cough. Blood pressure remains higher than normal in various periods. Fever rose many days. Pain remains in aches more than 24 hours. Spread pain up to left arm and deep central chest. Due to cough she was associated with breathlessness, reduced urine amount also, burning with urine. Sometimes she fell unconscious. She fell seriously ill and could not talk. Due to high BP she passed away.

Step 1: Relevant past history noted and narrative carefully read.

Step 2: Keywords: "uncontrolled hypertension with fainting spells", "breathlessness for 6 years – nocturnal, associated with breathlessness", "cough > 6 yrs (chronic cough", "chest pain->24 hrs in left arm & chest", "fever", "reduced urine output and burning on micturation" and items from RHIME questionnaire

Step 3: Chronology:

Congestive Heart Failure

↑

COPD/Ischaemic Heart Disease/High BP

Step 4: CoD is congestive hart failure (I50).
Keywords that match the guidelines are bolded:
Progressive shortness of breath on lying down or at night*, improving on sitting up*
AND any of the following signs or symptoms:

- *Swelling of feet*
- *Distension of abdomen*
- ***Progressive cough***
- ***History of previous MI/ heart disease***

Step 5: Consider differential diagnoses: COPD (J40-47); urinary tract infection (N39)

Emphasis was given to the history of breathlessness at rest and breathlessness at night in a patient with long-standing cough to suggest that the underlying COPD probably led to the complication of heart failure which caused the death.

Less emphasis was also given the history of probable urinary tract infection in this case.
As can be seen, at older ages, it is more difficult to arrive at a probable cause of death based on the VA narrative in a person with multiple problems

Step 6: In this case, the certainty of diagnosis is 2-Low and the quality of narrative is 2-Poor (no temporal sequence or description of terminal illness on day of death).