MILLION DEATH STUDY (MDS) 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 CAUSE OF DEATH (COD) BASED ON RHIME HOUSEHOLD REPORTS

Version 2.9, March 2014

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

Sample Registration System (SRS) Collaborators, India

Centre for Global Health Research (CGHR), St. Michael's Hospital, University of Toronto
Email to: cghr@smh.ca

TABLE OF CONTENTS

Authors:

D.N. Sinha, M. Shah, R. Dikshit, R. Kumar, V. Gajalakshmi, J. Shet, R. Jotkar, R. Bhardwaj, S. Rathi, P. Amoli, P. Jha

Correspondence:
Centre for Global Health Research, LKSKI/KRC, St. Michael's Hospital
30 Bond Street, Toronto, Ontario, M5B 1W8, Canada
Tel: +1.416.864.6042; Fax: +1.416.864.5256; Email: cghr@smh.ca

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 (CODs) is poor, particularly in the rural areas, where majority of deaths occur without medical attention 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 COD 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 begun a long-term partnership with the Centre for Global Health Research (CGHR), University of Toronto, and leading academic partners in the major states of India, to improve the measurement of CODs and the leading risk factors for death in India. The partnership has led to the "Million Death Study (MDS)" (see protocol at www.cghr.org/project.htm), which uses the RHIME method (**R**outine, **R**epresentative, **R**e-sampled **H**ousehold **I**nvestigation of **M**ortality with **M**edical **E**valuation) to investigate CODs). The RHIME method began in the SRS half-yearly surveys in 2001.

The RHIME method involves a household interview of relatives or associates of a disease, to record the train of events and circumstances at the onset and during the course of illness

leading to death. The RHIME report includes an open narrative section 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 physicians who assign a COD on the basis of the provided information.

The RHIME method involves the following key features:

- Lay, non-medical staff conducting household investigation of the events leading to death
- Questionnaire consisting of structured questions plus narrative
- About 5 % random audit of the fieldwork by an independent team
- Transcription of fieldwork into electronic records, each randomly assigned to a physician
- 100% double coding by these trained physicians, and reconciliation or adjudication by a 3rd physician in the case of any disagreements
- Online software to code records, including helpful features such as highlighting of keywords in the narrative, clinical guidelines for various diseases, and differential diagnoses

The RHIME method has been successful in the SRS for a number of reasons:

- It is a simple, feasible, practical, and cost-effective method. Our results from the first phase of MDS coding (2001-2004) has shown that about 70% of the time, two physicians can agree on the underlying COD if the RHIME reports are of good quality. With further 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 provides data that are nationally-representative, and age-, sex-, time-specific disease patterns that are epidemiologically plausible (see RGI COD report: http://www.cghr.org/wordpress/wp-content/uploads/Causes_of_death_2001-03.pdf).
- Methods of assigning cause of death by the 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 physicians provides cause of death information that is reliable and correct in most cases, especially in the young and middle aged (before age 70).

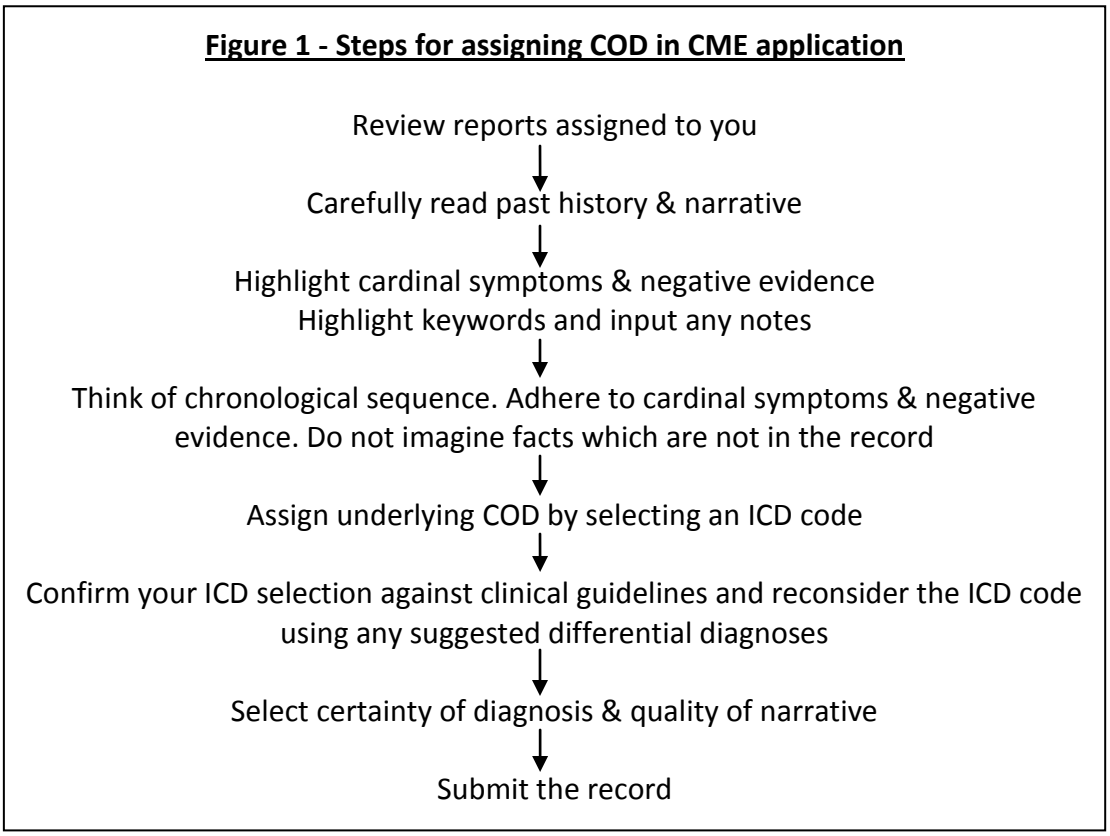
Use of RHIME in clinical settings

Under some circumstances, physicians in routine practice are 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 can also be used in these types of clinical settings.

Your tasks for COD assignment:

- Access the Central Medical Evaluation (CME) online application, using your assigned user name and password.
- Review the narrative and the gist of information on the reports in order to arrive at an underlying cause of death. See the structured steps given in **Figure 1**:
- Highlight cardinal symptoms & negative evidence, and type in any keywords (such as symptoms and signs) and comments or notes to support your diagnosis. For example, if a person died from a heart attack (myocardial infarction) and had a history of angina and diabetes, highlight the relevant section of the narrative and type in keywords "diabetes, chest pain, sweating", etc.
- Consider the chronological sequence of events when deciding on COD. Adhere to cardinal symptoms & negative evidence. Do not imagine facts which are not in the record.
- Finally, assign a COD by selecting an ICD-10 code (in the above example, ICD code: I21, myocardial infarction). Clinical guidelines and differential diagnosis will appear for your selected ICD code.
- Assign an ICD code for the COD; confirm your ICD selection against the clinical guidelines and against any other suggested differential diagnosis.
- Record the certainty of your diagnosis of the COD as high or low. Record the quality of the written narrative as good or bad.

Figure 1 - Steps for assigning COD in CME application



Further information in this manual

This manual provides information on the SRS RHIME methods (Chapter 2), structure of the International Classification of Diseases (ICD – 10) (Chapter 3), definitions and practical guidelines for assigning COD from RHIME reports (Chapter 4), and cause of death workbook (Chapter 5). In addition to this manual, other resources are available to help you in your tasks including self-learning tools available on your online CME application. The MDS documents are also available at www.cghr.org/mds.

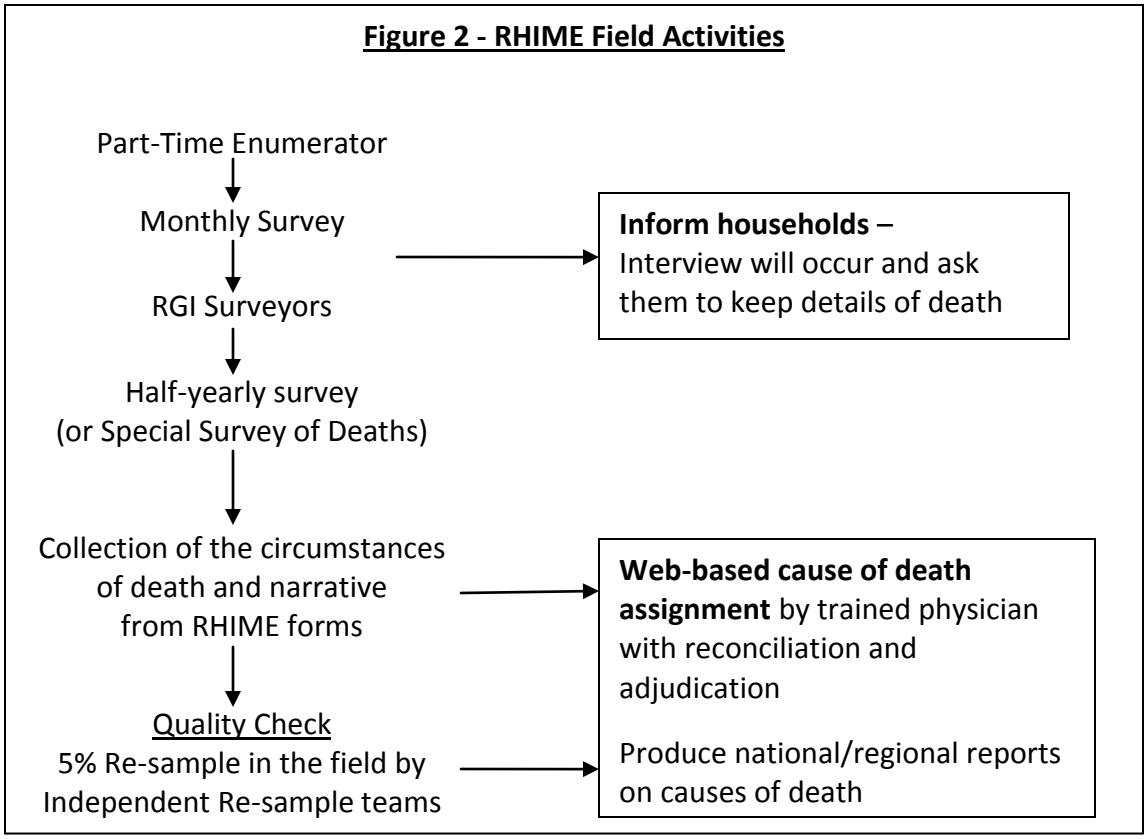
Chapter 2: SRS RHIME methods in the Million Death Study

1. RHIME activities

The surveyors of the RGI 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 surveyors are each assigned SRS units to monitor, and during the half-yearly household survey, the RGI surveyors visit all households in their SRS units independently, and record all the births and deaths that occurred during the previous 6 months. Additionally, RGI surveyors fill out a RHIME report for all recorded deaths.

Resample teams (RSTs) independently and randomly resurvey 5% of households in the SRS units. RSTs use the same forms as the RGI surveyors. **Figure 2** below illustrates the SRS activities involving RHIME reporting, resampling, and assigning COD.

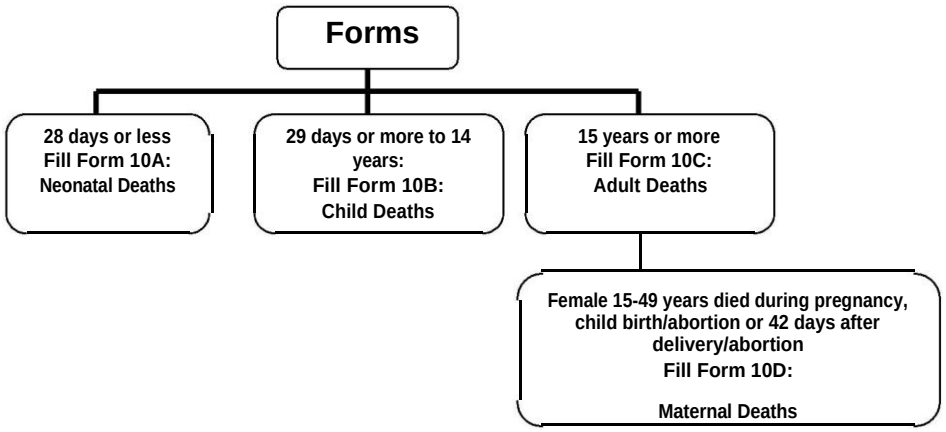
Figure 2 - RHIME Field Activities



2. RHIME field forms

Four separate RHIME field forms (10A, 10B, 10C, and 10D), ANNEXURE – I, have been introduced to collect detailed information on neonatal, child, adult, and maternal deaths, respectively (**Figure 3).** This division has been found to be of practical necessity to keep the interviews focused on symptoms and CODs specific to each age group.

Figure 3 – RHIME Field Forms



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

Section 1 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.

Section 3 is the written narrative, which includes a detailed description / story of the symptoms and circumstances associated with the illness preceding death, based on information gathered from the relative or close associates of the deceased. This may include information from hospital reports, clinical tests, death certificate, etc., if available.

NOTE: Please see the ANNEXURE – I for section 1, 2, and 3 in each RHIME Field Form.

3. Use of web-based physician coding

The collected RHIME field forms are centrally scanned to capture an image of the full form including narrative, and all numeric and logical (yes/no/unknown) fields are digitized.

Web-based reports: The key information from the scanning is extracted and then sent electronically to over 400 physicians who have been trained like you in physician coding. All records are accessed and coded online through the CME application. Each form is sent randomly to any two physicians, based on the language of the narrative. After reviewing the information in each report, physicians assign a COD by selecting an appropriate ICD-10 code **(Figure 4).** The coding application also provides helpful features such as highlight of keywords in the narrative, recording of any notes or comments, clinical guidelines for most diseases, and suggested differential diagnoses.

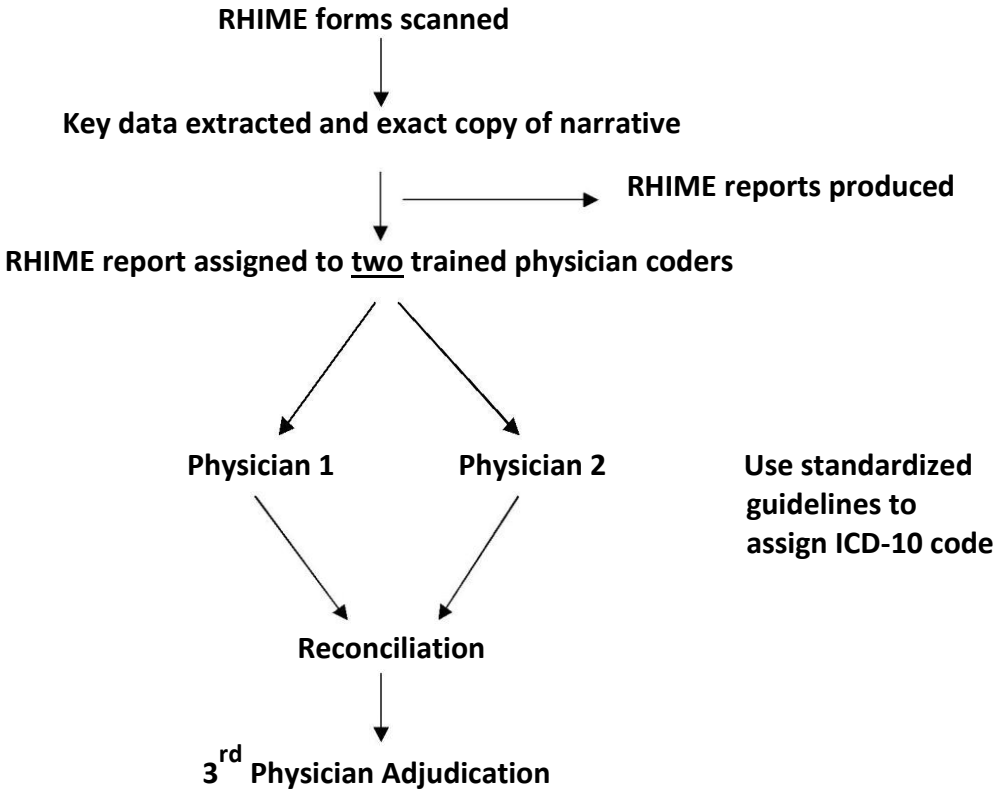
100% double coding: Reconciliation is required if there are major disagreements (not minor ones like J44 for COPD and J45 for asthma) between two physicians in initial coding. During reconciliation, the two physicians receive each others' assigned ICD-10 code, highlighted keywords, and any notes or comments used during diagnosis. The physicians can review these records and decide to keep their original COD assignment, use the other physician's COD, or assign a new COD. Any remaining disagreements are resolved through adjudication; this is where a 3rd, senior physician receives all the previous COD assignments, keywords, and comments, and makes a final decision on the ICD-10 code.

Work expectations: The experience from first phase of 200,000 records from 2001-2004 shows that each physician can easily complete 150-200 RHIME reports per month. Based on 400 trained physicians and 50,000 deaths annually in the SRS (requiring 100,000 assignments from double coding), each annual SRS survey could be fully coded within 2 months.

The online coding system automatically assigns more records to faster coders. Conversely, physicians who do not complete their work are not assigned new records.

An automated report card with your speed and quality will be emailed to you regularly. Your performance versus that of other physicians will also be provided. We encourage you to code as many records as you are comfortable with, but to be as thorough as possible with each one.

Figure 4 – Web-Based Physician Coding of Deaths in the MDS



Chapter 3: Structure of the International Classification of Diseases (ICD-10)

The International Statistical Classification of Diseases and Health Related Problems (ICD) first originated in 1893. The current tenth revision (ICD-10) was adopted in 1993 by the World Health Organization (WHO). 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 and comparison of mortality and morbidity data collected around the world. The ICD has become the international standard diagnostic classification for most general, epidemiological, and health management purposes.

The ICD also covers a conceptual framework of definitions, standards, and methods, including practical instructions and rules for reporting CODs, coding of mortality and morbidity data, and guidelines for presentation and interpretation of data.

The basic ICD unit is a three-character code; the first character is a letter specifying the major ICD chapter; the second and third characters are numerical, which identify the specific disease or condition, 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.

Among these top-level categories, the ICD-10 is divided into a total of 22 chapters organized by disease, disorder, or event. Three of these chapters [XIX - Injury, poisoning and certain other

consequences of external causes (S00 – T98), XXI - Factors influencing health status and contact with health services (Z00-Z99), & XXII – Codes for special purposes (U00-U99)] are not used routinely for coding the underlying COD – 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.

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: As mentioned above, we do not use codes S00-T98 (injury, poisoning), Z00-Z99 (factors influencing health status or contact with health service), or U00-U99 (special purposes).

These chapters are further divided into 'blocks' of three-character ICD codes, and the detailed chapter-wise list of these blocks, along with the individual ICD codes is provided here: http://apps.who.int/classifications/icd10/browse/2010/en.

Chapter 4: Definitions and Practical Guidelines for assigning COD from RHIME reports

I. Key tasks

Your task as a physician coder includes ensuring overall uniformity of COD assignment. This section provides you with a set of standard disease descriptions and criteria for some of the common CODs in India, based on previous epidemiological observations and experience. It is important to rely on the presence of cardinal symptoms of the disease (e.g. sudden onset of chest pain for diagnosing myocardial infarction, recurrent bouts of cough with breathlessness for COPD), as well as associated symptoms (e.g. radiation of pain for myocardial infarction, clinical features of cor pulmonale for COPD), as is usually done while making a clinical diagnosis. You are expected to provide an opinion on the COD 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 codes, rather than ill-defined conditions such as senility, abdominal pain, fever, etc. In uncertain cases, try to assign the ICD-10 chapter diagnosis rather than 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, assign code R99 (P96 for neonates), highlight keywords and include any relevant comments or notes. Clinical guidelines are provided at the end of this section to guide your assignment of a specific COD. When the narrative provides information from medical documents, or from respondent's experience with health services, these details should be corroborated with the other symptoms as described by the respondents.

Below are the cardinal symptoms lists (for adults and children) used by SRS Surveyors to collect information on the symptoms leading to death:

A. Cardinal Symptoms List for Adult Deaths (12):

1. FEVER

- High or low grade
- Longer than 30 days
- Continuous, intermittent (on and off), or occasional
- Did the fever rise every day
- Repeated attacks with chills, shaking, sweating, or muscle pain
- **Associated with**: headache; burning sensation while passing urine; neck stiffness; irritated and does not like light or sound; confusion; drowsiness; coma; rash/blisters

2. COUGH

- Dry, wet (with sputum), bloody (rusty), or foul smelling
- Longer than 30 days
- Worse during day or night
- With wheezing or in-drawing of chest (use local language)
- Any pain during cough or deep breath
- Any pain at the sides of the chest wall
- **Associated with:** night sweats; evening rise of temperature; vomiting; hoarseness of voice

3. BREATHLESSNESS

- What brings it on (for example, allergy or chest infection)
- Progression: did the person feel breathlessness only during exertion? Did it progressively worsen so that breathlessness occurred also at rest?
- Worse after lying flat, and relieved by sitting up
- Continuous or in episodes/attacks
- **Associated with**: night sweats; evening rise of temperature; vomiting; hoarseness of voice

4. DIARRHOEA/DYSENTERY IN STOOLS

- Were the stools liquid or semisolid
- Did stools contain mucus, or look like rice water
- Longer than 30 days
- Painless or painful
- Large quantity or not
- Blood in the stool, red or black in colour
- How many times a day at worst
- **Associated with:** vomiting; very thirsty; dehydration; sunken eyes

5. WEIGHT LOSS

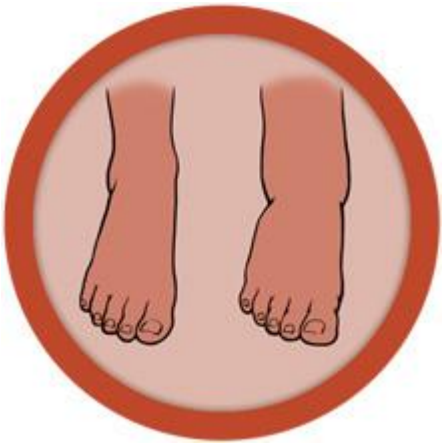
- Rapid weight loss in last 2-3 months
- Associated with prolonged fever for more than 1 month (either constant or continuous)
- Diarrhoea for more than 1 month
- Persistent cough for more than 1 month
- Swelling in arm pits, neck, groin
- Itching and skin rash
- White sores or white patches in mouth
- 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, or back
- Did pain spread? To left arm, deep central chest, hand, shoulder, or back?
- Pain worse with walking, exertion, cough or deep breath, touching the area, or eating
- **Associated with:** sweating; vomiting

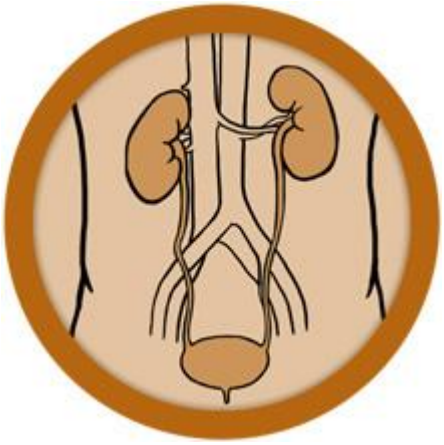
7. PARALYSIS/STROKE

- Onset: over minutes, hours, or noticed after waking up
- Accompanied by sudden loss of consciousness
- Which part of body was paralyzed (i.e., half of body, 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; neck stiffness



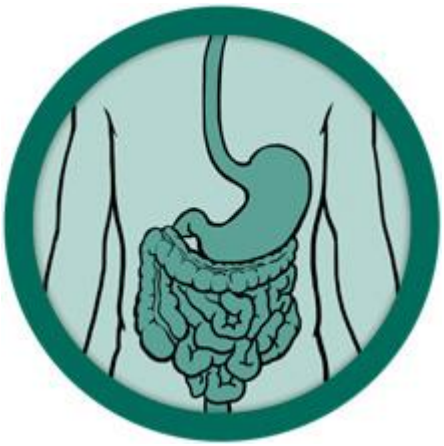
8. OEDEMA (SWELLING)

- Location: hands, feet, abdomen, or elsewhere
- Onset: sudden or gradual
- Worse at night or morning
- **Associated with**: worse with walking; fatigue; feeling the heart beat faster; nausea; loss of appetite



9. URINARY PROBLEMS

- Reduced urine amount or more frequent passage of urine
- Burning sensation while urinating
- Pus or blood in urine
- Intense desire to pass urine even after the bladder has been emptied
- **Associated with:** pain in 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



10. GASTRO-INTESTINAL TRACT (ABDOMINAL) PROBLEMS

- Was there pain? Describe the location; type (i.e., burning); and onset (sudden or gradual)
- If pain, describe periodicity: did it occur in episodes or continuous? How long was each episode?
- Relationship to food: more pain on empty stomach? Was it relieved after taking food?
- Difficulty in swallowing solid or liquid food
- Did pain wake person from sleep?
- Onset of abdominal distension: sudden or gradual
- **Associated with:** loss of appetite, nausea; constipation; black stools; vomiting with blood; 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; was urine dark yellow/brown?
- Onset: yellowness came first followed by other illness OR illness came first followed by yellowness
- **Associated with**: vomiting blood; alcohol abuse; history of cancer

12. SEIZURES/ FITS

- Previous episodes of sudden jerky movements of arms or legs
- Loss of consciousness
- Awake between fits or not
- **Associated with**: rolling of eye balls; frothing of mouth; loss of memory; bit tongue; bed wetting; confused; history of head injury

B. Cardinal Symptoms List for Child & Neonatal Deaths (9):

1. FEVER

- High or low grade
- Longer than 30 days
- Continuous, intermittent (on and off), or occasional
- Did the fever rise every day
- Low body temperature
- **Associated with**: headache; burning sensation while passing urine; neck stiffness; irritated and does not like light or sound; confusion; drowsiness; coma; rash/blisters

2. BREATHING PROBLEMS

- What brings it on (for example, allergy or chest infection)
- Progression: did the person feel breathlessness only during exertion? Did it progressively worsen so that breathlessness occurred also at rest?
- Is breathlessness worse after lying flat, and relieved by sitting up?
- Was breathlessness continuous or in episodes/attacks
- **Associated with**: night sweats; evening rise of temperature; vomiting; hoarseness of voice

3. COUGH

- Dry, wet (with sputum), bloody (rusty), or foul smelling
- Longer than 30 days
- Worse during day or night
- With wheezing or chest in-drawing
- Any pain during cough or deep breath
- Any pain at the sides of the chest wall
- **Associated with**: night sweats; evening rise of temperature; vomiting; hoarse voice

4. DIARRHOEA/DYSENTERY IN STOOLS

- Stools liquid or semisolid
- Did stools contain mucus, or look like rice water?
- Longer than 30 days
- Painless or painful
- Large quantity or not
- Blood in the stool, red or black in colour
- How many times a day at worst?
- **Associated with:** vomiting; very thirsty; dehydration sunken eyes; reduced urine amount. Note: mothers of breastfed infants tend to report children with soft/loose stools, so it is important to ask if soft and loose stools were more frequent than usual

5. JAUNDICE

- What become yellow: eyes or skin; was urine dark yellow/brown?
- Onset: yellowness came first followed by other illness OR illness came first followed by yellowness
- **Associated with**: fast breathing; excessive crying; chest in-drawing; vomiting blood

6. SEIZURES/ FITS

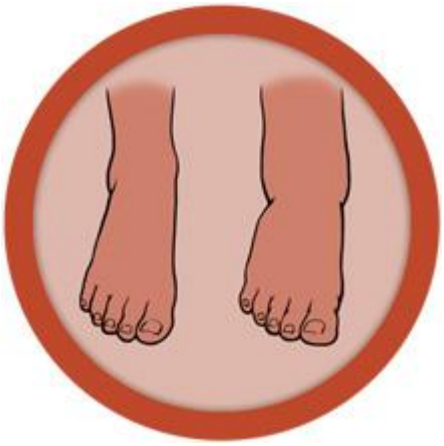
- Previous episodes of sudden jerky movements of arms or legs
- Loss of consciousness
- Awake between fits or not
- **Associated with**: rolling of eye balls; frothing of mouth; loss of memory; bit tongue; bed wetting; confused; history of head injury

7. DISCOLORATION OF LIPS, HAND, AND LEGS

- Bleeding into eyes and skin
- Location: lips, hands, or legs
- Was discoloration blue or red?
- **Associated with**: bulging fontanel or drowsiness, scalp injuries, spasm of body

8. WEIGHT LOSS

- Rapid weight loss in last 2-3 months
- Associated with prolonged fever for more than 1 month (either 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 or HIV/AIDS



9. OEDEMA/SWELLING

- Location: hands, feet, abdomen, or elsewhere
- Onset: sudden or gradual
- Worse at night or morning
- **Associated with**: worse with walking; fatigue; feeling heart beat faster; nausea; appetite loss

II. Differences in assigning COD between hospital-based clinical records and reports based on the RHIME field visits:

1) Think of common diagnoses (such as myocardial infarction, ICD I21-24) rather than rare or exotic ones (such as Gaucher's disease, ICD E75), unless the symptoms strongly point to a rare condition. This means that you can best do your RHIME coding by adhering to the guidelines for the major categories of diseases.

2) Major categories of disease (e.g. cerebrovascular disease, ICD I63-I64) are almost as useful as the specific details for those same diseases (e.g. cerebrovascular diseases with subarachnoid haemorrhage, ICD I60), from a public health perspective. Thus you should try for the most specific cause possible, but code to the most general group you think is defensible.

3) The RHIME field reports have many more *symptoms* than *signs*, and will 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, 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.

III. The importance of underlying COD

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". One single cause of death must be assigned to each record in the MDS.

However, there could be multiple conditions that may seem to have led to death, such as:

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

To overcome this problem, WHO developed the principle of the underlying COD, which allows the assignment of only one COD, even in difficult or complex situations. WHO uses the underlying COD in its primary tabulations of COD statistics globally.

The underlying COD is defined as:

The disease which initiated the train of morbid 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, brain death, etc., should NOT be considered as the underlying causes of death**.

Contributory CODs (also called co-morbidities) are diseases or conditions that are independent of the causal chain of events, but which may contribute indirectly to the final event of death**.** For example, if a person dies of a stroke but had diabetes in the past, then diabetes may have contributed to this condition. Similarly, if a neonate dies of diarrhoea and also has low birth weight, then low birth weight may be a contributory COD. Use your best clinical judgement to assign only the underlying condition as the COD, and where possible, write in the contributory COD and modes of death as keywords.

A further description of coding rules (general principles, selection rules 1 to 3, and modification rules A to F) is available in Volume 2 of the ICD-10 (http://www.who.int/classifications/icd/en/), and should be referred to for a broader understanding of coding the underlying COD.

IV. Risk factors vs. Underlying COD

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) COD 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 cancer victims are smokers). 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 COD, and note *malnutrition/LBW* as keywords.
- **Anaemia (D60-64).** Generally code the patho-physiological COD (e.g. malaria), and note *anaemia* as a keyword.
- **Essential hypertension (I10) or hypertensive heart disease (I11)** should not be coded as a COD. Instead code the conditions that hypertensive heart disease leads to, such as congestive heart failure (I50), myocardial infarction (I21-I25), or stroke (I60-I69).

V. Special notes on coding injuries

1. For all deaths due to injuries, code the external cause of the injury (only using codes V01-Y98). Codes S01-T99, signifying the body site of injury, are NOT to be used as the underlying cause code for injuries. 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 60).
3. For deaths involving water transport accidents (V90-V94) and accidental drowning (W65-W74), and where the deceased was epileptic, write “epileptic” in your keywords.
4. Specific cases: hypothermia of newborns will be coded as P80. Hypothermia from exposure to cold for adults will use the X31 (exposure to excessive natural cold). Heat stroke will use 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.

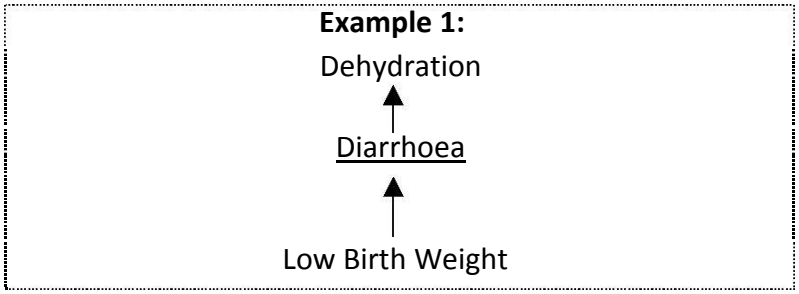
5. For burns, the most common codes are:
    - Accidental (X00-X09) - Exposure to smoke, fire, and flames
    - Intentional self-harm (Suicide X76) - Intentional self harm by smoke, fire, and flames
    - Assault (Domestic violence, etc. X97) - Assault by smoke, fire, and flames
6. For intentional self-harm (Suicide X60-X84) causes where 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 coders, 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.

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 reading of the narrative can help in differentiating these injuries.

Your coding process requires that you type keywords for each record. This will allow the other physicians to understand your logic in any reconciliation or adjudication process, and for future analysis of risk factors and their associated CODs.

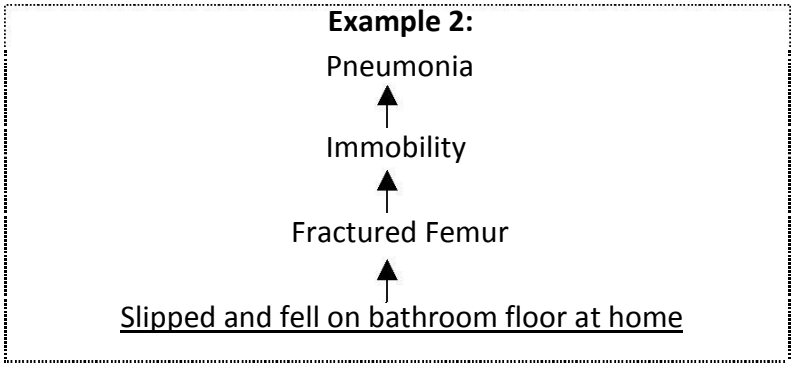
Case studies for assigning COD

Example 1: A 13 days’ old law birth weight girl not having feeds, developed loose motions and fever, did not respond to treatment, eyes sunken, died in 2 days.



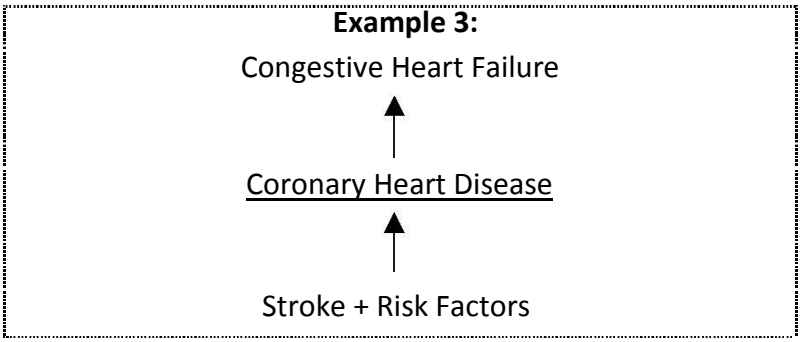
Underlying cause of death: A09 - diarrhoea and gastroenteritis of presumed infectious origin

Example 2: An 80 years old female slipped and fell on bathroom floor at home and got fractured her femur. She was bed-laden, developed pneumonia, and died.



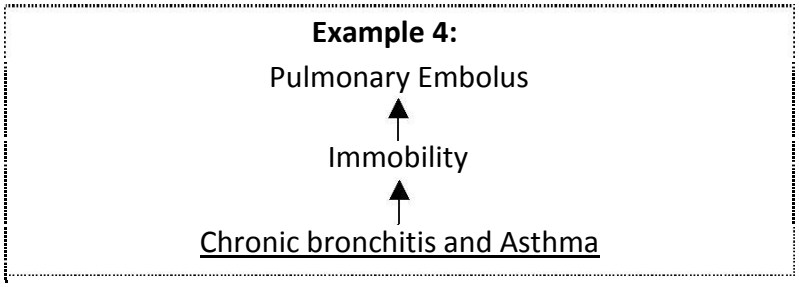
Underlying cause of death: W01 - fall on same level from slipping, tripping, and stumbling

Example 3: A 55 years old male patient had past history of stroke/elevated blood pressure 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.



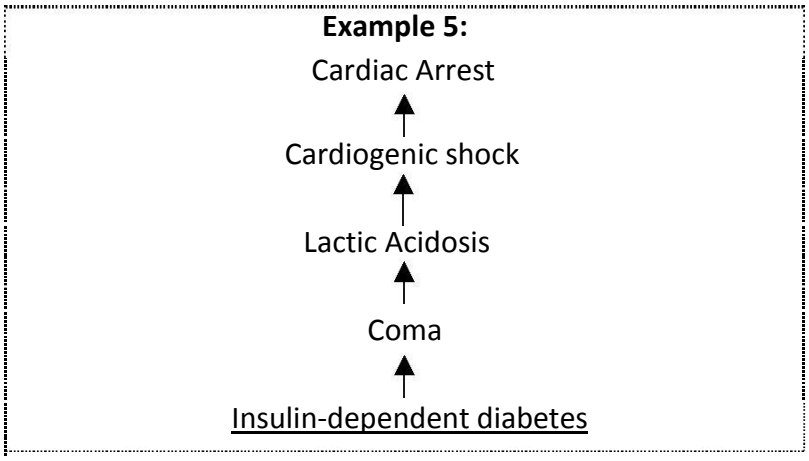
Underlying cause of death: I25 - chronic ischemic heart disease

Example 4: A 63 years old female had chronic cough, sputum, could not move. Condition became suddenly worst and she died.



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

Example 5: A 53 years old 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

VI. Six steps for assigning COD

The details contained in the RHIME reports may vary, and some deaths may have many complex or vague conditions occurring simultaneously. However, using your best clinical judgment and a consistent approach to diagnoses will ensure that your coding work is of high quality. Below we outlined six steps that you must follow to assign the most probable underlying COD.

Six Steps:

1. Carefully read the full narrative and past medical history.
2. Highlight any symptoms, signs, or negative evidence, and enter any comments or notes (keywords).
3. Think of the chronological sequence that the symptoms occurred in. Adhere to cardinal symptoms & negative evidence. **Do not imagine facts which are not in the record.**
4. Choose an underlying COD, by selecting a specific ICD code.
5. Confirm your ICD selection against the presented clinical guidelines and use the suggested differential diagnosis to reconsider your ICD code.
6. Rate the certainty of your diagnosis and the quality of the narrative.

VII. Practical examples for assigning COD using six steps

Example 1 - Adult female, aged 63

Narrative: Respondent thought person died of "beehosh". This 63 year old female had two years ago an attack of paralysis 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 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 and narrative; highlight any symptoms, signs, or negative evidence, and enter any comments or notes (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 and 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: If any complications of stroke more than 1 month duration, consider sequelae of stroke (I69).

Step 5: Reconsider ICD code using differential diagnoses:

- Ischemic heart disease (I20- I25)
- Falls (W00-W19)
- Meningitis/Encephalitis (G00-G09, A81-A89)
- Epilepsy (G40-G41)
- Malaria (B50-B54)

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 1- High. Narrative quality here is 1-Good.

Example 2 - Female child, aged 9 months

Narrative: Respondent thought child 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 milk only from the other 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 received 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 and narrative; highlight any symptoms, signs or negative evidence, and enter any comments or notes (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 bowel motions (3 or more per day)

AND Any one of the following:

- Low/nil urine output
- Restricted fluid intake **OR** very thirsty, drinks eagerly
- Eyes sunken
- Vomiting
- Blood or mucus in stool
- Dark yellow urine
- Sunken / depressed fontanelle **(in children and neonates)**

- **Possibly With** Fever

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 1- 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 and narrative; highlight any symptoms, signs or negative evidence, and enter any comments or notes (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

AND Smaller than average sized baby (if weighed, birth weight below 2.5 kilograms)

AND No other obvious causes of death

AND Death at 3-7 days

Possibly With Poor suckling after birth

NOTE: P05 used only for full term pregnancy. If other obvious cause of death, consider LBW as a keyword for that cause.

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 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.

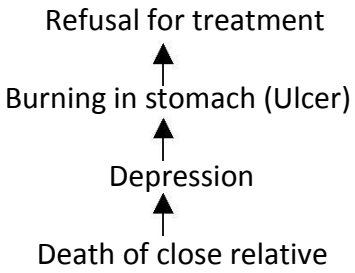
Steps 1 and 2: Carefully read past medical history and narrative; highlight any symptoms, signs or negative evidence, and enter any comments or notes (keywords). Consider diagnostic information provided.

Cardinal symptoms/Keywords include:

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

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

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 **OR** Sadness, depression, or loss of interest for the majority of the day on most days

AND Any of the following:

- Social isolation from others
- Eating little **OR** Eating a lot
- Sleeping little/insomnia **OR** Sleeping a lot

NOTE: First try to exclude other causes of death.

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 symptoms in the narrative were difficult to match to the clinical guidelines. Narrative quality here is 2-Bad.

VIII. Reducing reconciliation rates

You will sometimes disagree with the ICD code assigned by the other independent physician. Below are some tips and examples to help you resolve this difference, and to reduce the number of records which must go for reconciliations.

First, if you have coded an R code (i.e., R54) and the other physician has coded a more specific code (i.e., I64), then you should give higher priority to the more specific code. In past reviews, the more specific code tended to be the final one chosen. The most common examples are in the following table, ranked from most to least common:

ICD-10 by 1st Physician	Less Specific Diagnosis	ICD-10 by 2nd Physician	More Specific Diagnosis
R54	Senility	A09	Diarrhoea
R99	Other unspecified	I21	AMI
R54	Senility	I21	AMI
R54	Senility	R50	Fever
R96	Sudden death	R50	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	A09	Diarrhoea

Example 1:

A 74 years old female in rural area. Past medical history: nothing or unknown. Son was the 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."

Coding analysis: Coder 1 chose R54 (senility). Coder 2 chose A09 (gastroenteritis). At reconciliation, both stuck with their original diagnoses. Final adjudication by 3rd physician was A09 (gastroenteritis).

Why? First, R54 (senility) is not valid as symptoms were available in the narrative. Second, the symptoms description is not ideal, and could justify the use of R99. However, the above rule of "try to code a more specific cause" follows, given that diarrhoea was mentioned several times in the narrative.

Example 2:

A 79 years 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."

Coding analysis: Coder 1 assigned this as ill-defined (R99). Coder 2 assigned this as gastroenteritis (A09). During reconciliation both physicians agreed on R99.

Why? 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 symptoms are brief, and as per the guidelines, they are insufficient to point to the chain of events that led to death.

IX. Common "DOs" and "DON'Ts" in assigning COD

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 any medical information (i.e., results from clinical tests or diagnoses from past

health service use) in the narrative with the signs and symptoms provided by the respondents. The earlier medical information may not always be correct.

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. Where possible, assign the most specific ICD-10 code applicable:
    a. Each ICD groupings have more and less specific codes. Read the list carefully and choose the most specific one (i.e. C34 vs. C39, or B50 vs. B54)
    b. Avoid R99 for adults & P96 for neonates
6. Refer to the suggested differential diagnoses. If differential diagnoses are missing for your assigned ICD code, 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 more likely than rare or exotic conditions.
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 (e.g., a specific type of myocardial infarction), as this is difficult to determine from the information provided in a RHIME report. Moreover, while such pathological diagnoses are appropriate for clinical and hospital care, assigning a correct broad category of COD 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 and history of illness are the basis for assigning the COD.
4. 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 CODs are assigned.
5. 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 physicians. This is meant as a tool of ongoing learning and standardization.

X. Guidelines for the Most Common Diagnoses

Clinical guidelines for assigning COD: This section provides clinical guidelines that should be used to determine a COD, and is organized by age and sex-specific CODs. A separate table is included for coding accidental and injury deaths.

All ages:

ICD-10 CODE	CAUSE OF DEATH	CLINICAL DIAGNOSIS CRITERIA
Certain infectious and parasitic diseases		
A00	**Cholera**	Severe watery diarrhoea often described as 'rice water' in nature and may have odour **AND** Any of the following: • Vomiting • Symptoms related to dehydration such as weakness, loss of skin elasticity, increase thirst, dry mouth, sunken eyes, lethargic look • Muscle cramps • Altered consciousness, seizures, or even coma due to electrolyte imbalance (**IN CHILDREN**) • Recent exposure to infected food and water
A01	**Typhoid & Paratyphoid**	High fever of long duration (at least 7 days), progressively increasing, continuous **AND** Any of the following: • Severe headache • Abdominal pain, distension • Constipation/diarrhoea • Death occurred in 2nd to 4th weeks • Delirium • Blood in stool • Tongue highly coated
A03 & A06	**Bacillary & amoebic dysentery**	Diarrhoea and abdominal cramps **AND** any of the following: • Blood, pus, or mucus in stool • Fever • Vomiting • Weakness and generalized body ache **NOTE**: Due to similar clinical presentations, it would be difficult to

		differentiate bacillary dysentery (A03) and amoebic dysentery (A06) from narratives regarding circumstances of deaths.
A09	**Diarrhoea and gastroenteritis of presumed infectious origin**	Frequent/liquid/watery loose bowel motions (3 or more per day) **AND** Any one of the following: • Low/nil urine output • Restricted fluid intake **OR** very thirsty, drinks eagerly • Eyes sunken • Vomiting • Blood or mucus in stool • Dark yellow urine • Sunken / depressed fontanelle **(in children and neonates)** • **Possibly With** Fever
A15-A19, J65, B90	**Tuberculosis**	Chronic cough of long duration, with or without sputum **AND** Fever of long duration **AND** Any one of the following: • Blood in sputum • Chest pain • Breathlessness • Loss of appetite • Chronic weight loss • Lymphadenopathy (especially cervical lymph nodes) of long duration • History of treatment for tuberculosis **NOTE**: Family history of diagnosed TB to be considered. Try to distinguish between pulmonary TB (A15-A16), other TB (A17-A19), pneumoconiosis associated with TB (J65), sequelae of TB (B90), or HIV resulting in TB (B20). Exclude diagnosis of pneumonia (J12-J18) or COPD (J40-J44).
A35	**Tetanus**	Neck stiffness **OR** Arching of neck or body **AND** Lock jaw **OR** Convulsion **AND** Inability to open mouth in Children OR Feeding Difficulty in Infants **Possibly With:** • History of cuts/wounds in limbs • History of ear discharge • History of umbilical stump infection or unclean delivery **(IN CHILDREN)** **NOTE**: Obstetrical tetanus (A34) only possible for females in age group 15-49 years.
A36	**Diphtheria**	Enlarged neck lymph nodes and thick grey membrane covering throat and tonsils **AND** any of the following: • Sore throat and hoarseness of voice • Fever

		• Painful swallowing • Difficulty in breathing • Nasal discharge • Malaise
A40-A41	**Septicaemia (also called sepsis)**	High fever **OR** hypothermia of variable duration with chills **AND** Short term organ system failure (delirium or confusion or loss of consciousness or coma or low/nil urine output or distressed abdomen) **AND Possibly With** Cuts, boils or other source of infection **NOTE**: Exclude obvious other cause of infection (pneumonia, diarrhoea, malaria, TB, or other infection)
A80	**Acute poliomyelitis**	Sudden onset of flaccid paralysis of limbs (particularly lower limbs) including loss of reflexes, and severe muscle aches, spasm, or atrophy **AND** Any of the following: • Fever 5 - 7 days before other symptoms • History of not receiving pulse polio immunization • Drooling • Stiff neck and back • Rarely, acute poliomyelitis may be related to vaccine related complications • Generalized fatigue and muscle weakness • Rarely, breathing related problems
A82	**Rabies**	History of dog (animal) bite **OR** animal scratch **OR** injury by animal **AND** Any one of the following: • Fear to drink water • Convulsions **OR** seizures • Unconsciousness **OR** loss of consciousness, coma • Dysphasia **Possibly With**: • Fever • Changes in behaviour • Paralysis • Fear of light or sun
A90-A91	**Dengue fever**	Sudden onset of high fever **AND** Any one of the following: • Prominent aches and pains in muscles, bones, forehead, and behind eyeballs • Concurrent bleeding or nose bleed or blood in urine or bruises on skin or skin rash **OR** Blood test positive for dengue
A92	**Other mosquito-borne viral fevers (A92.0 –**	Sudden onset of high fever accompanied by sever joint pain affecting multiple joints (joint pain may last for couple of weeks) **AND** Any of the following:

	Chikungunya virus disease)	• Muscle pain • Headache • Nausea • Fatigue • Rash
B15-B19	**Viral hepatitis**	Abdominal pain or discomfort **AND** Progressive yellowness of eyes and skin **AND** Any of the following: • Fever • Nausea • Vomiting • Loss of appetite • Urine is dark in colour • Altered consciousness • **Possibly with** outbreak of jaundice **NOTE:** Exclude alcoholic liver disease (K70)
B20-B24	**HIV/AIDS**	History of severe and rapid weight loss in less than 3 months **AND** history of prolonged (1 month or more) or recurrent unexplained fever **OR** chronic diarrhoea (1 month or more) **OR** Persistent or worsening or recurrent cough for **more than 1 month** (intermittent or continuous) **OR** HIV positive serology **Possibly With:** • Mouth sores / white patches in mouth • Skin rash • Persistent generalized swelling of lymph nodes in armpits, neck, groin (1 month or more) • History of ulcers in genital area • History of tuberculosis • History of spouse/partner with similar illness or death of spouse/partner from illness • History of intravenous drug use
B50-B54	**Malaria**	Acute onset of high grade fever and rigor with or without chills (fever may be intermittent) **AND** Any one of the following: • Jaundice • Convulsion or unconsciousness or coma • Vomiting • Breathlessness • Decreased or nil urine output • Headache **OR** Blood test positive for malaria

		NOTE: Exclude- • Acute respiratory infection • Meningitis • Burning during urination • Rash on body • Heat stroke
Cancers		
C01-C06	**Oral cancer (mouth)**	Lump or mass or swelling on tongue/ cheek/ mouth cavity/ gum/ palate, usually progressive and present for 3 weeks or longer **AND** Any one of the following: • Non-healing red or white sore or ulcer • Bleeding on touch • Restriction/difficulty in opening mouth • Weight loss **OR** Diagnosed as mouth cancer
C10-C14	**Pharynx (i.e. throat cancer)**	Growth in throat / neck or hoarseness of voice **AND** Any one of the following: • Pain/difficulty in swallowing • Weight loss **OR** Diagnosed as throat cancer
C15	**Oesophageal cancer**	Progressive difficulty in consuming solids followed by liquids **OR** painful or difficulty swallowing **AND** weight loss over at least 1 month
C16	**Stomach cancer**	Vomiting/vomiting of blood **OR** Difficulty in swallowing **AND** Any of the following: • Black stools • Pain or discomfort in abdomen (1 month or longer) • Nausea • Weight loss **OR** Diagnosed as stomach cancer **Possibly With** History of repeated course of anti-ulcer drugs
C17-C21	**Intestine, colon or rectal cancer**	Bleeding or passage of mucus from anal opening **OR** black stools **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 within weeks **AND** Weight loss **AND** No regular fever

		Possibly With History of hepatitis **OR** Diagnosed as liver cancer **NOTE:** Consider if other primary site or metastatic liver cancer
C23	**Malignant neoplasm of gall bladder**	Lump in abdomen, epigastric pain, and jaundice (yellowish discolouration of skin and sclera) **AND** any of the following: • Fever • Nausea/Vomiting • Bloating **OR** Diagnosed as cancer of gall bladder
C32-C34, C39	**Trachea, larynx, bronchus and lung cancer (airways and not upper throat)**	Chronic cough and blood in 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 **OR** Diagnosed as lung cancer **AND** No history of tuberculosis (A15-A19, J65, B90)
C40-C41	**Malignant neoplasm of bone and articular cartilage**	Persistent pain and swelling around any joint or any part of bone of limb, skull, face, mandible, vertebral column, or unspecified sites **AND** Diagnosed as malignant neoplasm of bone or articular cartilage
C50	**Breast cancer**	Painless lump in one or both breasts **AND** Any of the following: • Discharge from nipple or nipple inversion or dimpling • Skin ulceration or break in skin of breast • Enlarged lymph nodes in the neck/arm pit
C53	**Cervical cancer**	Non-menstrual bleeding **OR** Bleeding between menstrual cycles **OR** Post-coital bleeding **OR** Blood stained discharge **OR** Foul smelling vaginal discharge with blood/mucus/pus **AND** Weight loss **NOTE:** Try to rule out uterine cancer (C54-55)
C54-C55	**Malignant neoplasm of uterus**	Post menopausal bleeding (**most common**) **OR** bleeding between menstrual cycles **OR** Post-coital bleeding **OR** Foul smelling vaginal discharge with blood/mucus/pus **AND Any of the following:** • Weight loss • Pelvic pain • Painful or difficult urination
C61	**Malignant**	Difficulty in micturition (urination) and reduction in the force of urine flow

	neoplasm of prostate	(Difficulty in initiation and maintaining a steady stream of urine) **AND** any of the following: • Pain in hip, thigh, or back (Bone pain) in advance stage • Discomfort in the pelvic area • Blood in urine (Hematuria) • Blood in semen and / or painful ejaculation • Erectile dysfunction
C71	**Brain tumour-**	Persistent Headache **OR** Vomiting **AND** Any of the following: • Change in type of headache compared to usual • Convulsions/seizures • Involuntary eye movements (side to side or up/down) • Unilateral protruding eyes • Unsteady gait • Fainting spells/loss of consciousness • Dementia or inappropriate behaviour or personality change or irritability or hallucinations **OR** Diagnosed as brain cancer **NOTE:** Consider other primary source of metastasis.
C81-C85	**Lymphoma - Hodgkin's & Non-Hodgkin's**	Painless enlargement of multiple lymph nodes, especially in neck or arm pits, not responding to antibiotics or antitubercular treatment **AND** Any of the following: • Low grade fever • Hoarse cough • Night sweats • Abdominal distension or discomfort/pain • Weight loss or loss of appetite **OR** Diagnosed as lymphoma
C91-C95	**Leukaemias**	Fever (with or without chills) **OR** bleeding or bruising or anaemia **AND** Any of the following: • Night sweats • Weakness or easily tired • Bruising • Weight loss • Persistent sore throat not responding to antibiotics • Abdominal pain • Enlarged Lymph Nodes • Purple or red patches on the skin • Bone or Joint Pain • OR Diagnosed as Leukaemia
Endocrine, nutritional, and metabolic diseases		
D50-	**Anaemia**	Marked paleness of skin

D64		**AND** Any of the following: • Weight loss • Fatigue or weakness or breathlessness on exertion • History of heavy bleeding (e.g. trauma, delivery of pregnancy, heavy menstruation) • Black stool • Dark urine **Possibly With** • Pallor of fingers • Ankle swelling or swelling of the whole body • Health professional's remarks about need for blood transfusions **AND** None of the following: • Jaundice • Enlarged lymph nodes • Features of chronic cough • Chest pain • Fever **NOTE:** If died of heart failure (I50), code as such and list anaemia as a keyword. Also write in keywords if history of hook worm (B76) present.
E10-E14	**Diabetes mellitus**	**NOTE:** For childhood onset (type 1) with death in early life, generally code diabetes. For adult onset diabetes, use your judgement about underlying cause of death, but always write diabetes as a keyword. Frequent urination or increased thirst and/or increased hunger (for children especially) **AND (for adult)** Any of the following: • Foot ulcers, sores or wounds (usually painless) not healing properly or gangrene • Neuropathy: lack of touch or temperature sensation in toes or feet • Progressive organ failure • Renal complications • Vascular complications: history of hypertension (high blood pressure) or ischemic heart disease (angina or myocardial infarction) or stroke
E40-E46	**Malnutrition**	Losing weight OR Not Growing properly **(IN CHILDREN)** **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 • Progressively weakened crying **(IN NEONATES)** **NOTE:** To use this code, malnutrition MUST be a major contributing factor to death (i.e., famine or starvation)**.** 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).
Mental and behavioural disorders		
F20-F29	**Schizophrenia**	Suspicion of others leading to deep dysfunction **OR** Planning to harm themselves or harm others **AND** Any of the following: • Stop taking interest in his/her dress or appearance or insufficient attention to personal hygiene • Hallucinations (visual or auditory) • Sleep disturbance • Talking to himself/herself **AND** None of the following: • Lack of attention to surroundings or to person speaking to them • Lack of orientation to current date/place
F30-F39	**Depression**	Major change in mood **OR** Sadness, depression or loss of interest for the majority of the day on most days **AND** Any of the following: • Social isolation from others • Eating little **OR** Eating a lot • Sleeping little/insomnia **OR** Sleeping a lot **NOTE:** First try to exclude other causes of death.
Diseases of the nervous system		
A83-A89	**Encephalitis**	Convulsion/seizure of body or body parts **OR** asymmetrical weakness or paralysis OR Confusion **AND** High fever until death **AND** Any of the following: • Vomiting or nausea • Fluctuating level of consciousness/coma or change in behaviour (tends to be more common in encephalitis than in meningitis) • Headache • Stiff neck **Possibly with** other encephalitis cases in the area
G00-G05	**Meningitis**	Continuous fever until death **AND** Neck stiffness (more common in meningitis than in encephalitis) **AND** No symptoms of acute respiratory infection **Possibly With**:

		• Loss of consciousness/coma OR Convulsions **(IN CHILDREN)** • Nausea and/or vomiting • Pitticheal rash • Diarrhoea **(IN CHILDREN)** • Photophobia **(IN CHILDREN)**
G20-G26	**Parkinsonism and extrapyramidal and movement disorders**	Tremors or shaking of hands/limbs **AND** Difficulty in starting & stopping walking **OR** Small steps during walk/shuffling gait **OR** Expression-less face
G40-G41	**Epilepsy**	History of convulsions/seizures of body or limbs over several months or years, with fit on the day of death **AND** Loss of consciousness during and/or following fits **AND** None of the following: • History of injury to head • Fever associated with death • Neck stiffness
G81	**Hemiplegia**	Do not code hemiplegia as G81 but code as stroke codes I60-I69.
Diseases of the circulatory system		
I01-I09	**Rheumatic heart disease**	Temporary joint pains (large joints), or history of 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 **Possibly With** History of penicillin injections
I10-I11	**Essential (primary) hypertension / Hypertensive heart disease**	Do not code essential hypertension/hypertensive heart disease unless you can exclude heart failure (I50), acute myocardial infarction (I21-I25), or stroke (I60-I69). If you cannot determine other specific condition mentioned above but determine hypertension and non-specific heart condition then code hypertensive heart disease (I11). If you can only determine hypertension then code essential (primary) hypertension (I10).
I21-I25	**Myocardial infarction**	Episode(s) of severe chest pain lasting for more than 1/2 hour, but less than 24 hours, in the month preceding death **AND** Any of the following: • Shortness of breath • Vomiting • Anxiousness • Pain radiating to left arm • Sweating

		OR Diagnosed heart attack
I46	**Cardiac arrest**	**NOTE:** Do not code Cardio-respiratory arrest or Cardiac arrest (I46) as this is a mode of death. Rather, try to code the underlying reason for the arrest.
I50	**Heart failure**	Progressive shortness of breath on lying down or at night, improving on sitting up **AND** Any of the following: • Swelling of feet • Distension of abdomen • Progressive cough • History of previous myocardial infarction or heart disease or anaemia
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:** If any complications of stroke more than 1 month duration, consider sequelae of stroke (I69).
I84	**Haemorrhoids**	Painless bleeding during bowel movements **AND** any of the following: • Swelling or lump around anal region • Irritation or itching around anal region • Mucous discharge after passing the stool • History of chronic constipation • History of use of laxatives
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 followed by severe cough and respiratory problems **AND** High temperature or fever
J12-J18, J20-J22	**Pneumonia OR Acute Lower Respiratory Infection OR Acute Bronchitis**	Acute cough (dry or productive) **AND** High fever **(Cough OR Fever – IN NEONATES)** **AND** Any of the following: • Shortness of breath • Fast breathing OR Chest In-drawing **(IN CHILDREN AND**

		NEONATES) • Chest pain • Blood in sputum **AND** None of the following: • Wheezing • Swelling of legs • Distension of abdomen **NOTE**: If had measles in last 3 months, consider measles (B05)
J40-J44, J46-J47	**Chronic respiratory disease**	Recurrent episodes of productive cough over several years **AND** Breathlessness, initially episodic (more in winter), later progressive **OR** Ankle swelling late in disease **AND** Exclude TB (A15-A19, J65, B90)
J45	**Asthma**	Cough (with early wheezing) off and on for long period of time **AND** Any of the following: • 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), ascites gradually **AND** Swelling of lower limbs **AND** Any of the following: • Early progressive jaundice • Painless liver • Vomiting of blood • Passing of blood in stool • Drowsiness or coma **AND** No fever
K73	**Chronic hepatitis**	Progressive yellow discoloration of eyes, body, and/or urine until death **AND** Moderate fever **AND** Any of the following : • White chalky stools • Loss of appetite **Possibly with** outbreak of jaundice **NOTE:** Distinguish from acute hepatitis (**B15-B19)**
K72	**Liver failure (Hepatic failure, not elsewhere classified)**	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 • Later on, unconsciousness or delirium
K80-K87	**Disorders of gallbladder, biliary tract, and pancreas**	Severe Epigastric pain (might be acute in onset) **AND** any of the following: • Yellow discoloration of eyes, body, urine (chronic cases only) • Nausea and/or vomiting • Fever • Loss of appetite • Poor digestion • History of alcohol **Rule out** cirrhosis of liver (K70-K71, K74-75), chronic hepatitis (K73), liver failure (K72)
K45-K46	**Hernia**	Initial history of reducible swelling in scrotum inguinal area or other region, which used to come on coughing or straining **AND** Any of the following: • Obstruction or swelling • Pain and high fever • Abdominal distension **NOTE:** Death usually occurs due to obstruction, sepsis, or dehydration.
K25-K27	**Peptic ulcer**	Abdominal pain (in gastric ulcer, pain is often burning in nature (heartburn) and strongly correlated to meal times while in duodenal ulcer, pain aggravates 2-3 hours after taking a meal) **AND** any of the following: • Nausea and vomiting (sometimes vomiting of blood) • Bloating and abdominal fullness • Changes in appetite and weight loss • Dark blood in stool • Medication history such as NSAIDs (such as ibuprofen) and corticosteroids (such as prednisolone)
K35	**Acute appendicitis**	Severe abdominal pain begins as periumbilical or epigastric pain, which migrates to right lower quadrant of abdomen and also radiating to the back **AND** any of the following: • Nausea or vomiting • Fever • Anorexia • Respiratory distress
Diseases of the musculoskeletal system and connective tissue		
M05-M06	**Rheumatoid Arthritis**	Painful and swollen joints particularly involving small joints of hands and feet **AND** Any of the following: • Firm nodule under the skin of arm • Fever • Fatigue

		• Weight loss • Blood (serum) examination: positive report for rheumatoid factor Medication history for pain-killers or treatment for rheumatoid arthritis
M10	**Gout**	Painful and swollen joints particularly involving small joints of hands and feet **AND** Any of the following: • Firm nodule under the skin of arm • Fever • Fatigue • Weight loss • Blood (serum) examination: positive report for rheumatoid factor Medication history for pain-killers or treatment for rheumatoid arthritis
Diseases of the genitourinary system		
N17-N19	**Renal failure**	Progressive or acute onset of decreasing urinary output **AND** Any of the following: • Progressive loss of appetite • Hiccups • Drowsiness • Confusion • Unconsciousness • Swelling of eyelids or face or body in the morning **OR** History of dialysis
N20-N23	**Urolithiasis**	Severe pain in the side and back of lower abdomen, which sometimes radiates to groin **AND** Any of the following: • Pain on urination • Persistent urge to urinate • Foul-smelling and/or coloured urine (such as pink, red, or brown) • More than usual time required for urination • Fever (in case of infection) **NOTE**: Patient may eventually die of renal failure (N17-N19) but try to code urolithiasis (N20-N23), if you are certain about diagnosis.
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: • Patient becomes dull and drowsy • Hiccups • Vomiting • Face is swollen • Delirium or coma **AND** Rule out prostate cancer (C61)
Symptoms, signs, and abnormalities not elsewhere classified		
R10	**Acute abdomen**	Severe acute abdominal pain

	(not elsewhere classified)	**AND** Any of the following: • Abdominal distension • Fever • Constipation • Collapse or unconsciousness • History of peptic ulcer • Vomiting • Vomit blood or blood in stools **AND** Exclude intestinal obstructions (K56)
R17	**Jaundice (not elsewhere classified)**	Yellowing of the eyes and skin **AND** Any of the following signs or symptoms: • Headache • Nausea • Vomiting • Loss of appetite • Urine is yellow in colour **AND** No other specified cause found **NOTE:** 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.
R50	**Fever of unknown origin**	Fever (at least 2 weeks duration) **AND** No other specified cause found **NOTE:** 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, J65, B90), 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.
R54	**Senility**	Age >70 years **AND** No other specified cause found **NOTE:** Consider and rule out Heart failure (I50) and Ischemic heart disease (I20-I25). Consider R54 only if the deceased person was > 70 years of age.
R96	**Sudden death**	**NOTE:** Consider and rule out Ischemic heart disease (I21-I25). Otherwise code R99 if history was unclear.
R99	**Ill-defined/ Unspecified**	**NOTE:** Code Senility (R54) if the deceased person was above 70 years. 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.

Maternal deaths (during pregnancy or within 42 days of abortion or delivery, 15-49 years):

ICD10 CODE	CAUSE OF DEATH	CRITERIA
O00	**Ectopic pregnancy**	Gestational age ≤6 months **AND** Severe abdominal pain and sudden collapse **AND** Report 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 mode of death, but likely due to the abortion **NOTE:** If termination >7 months, see codes O72, O75 or O85.
O10-O16	**Hypertension disorders of pregnancy**	Gestational age ≥5 months and <72h postpartum **AND** No fever, diarrhoea and no history of convulsions outside pregnancy **AND** Any of the following • Coma >1h duration • History of convulsions in pregnancy, labour and/or postpartum • Signs and symptoms: abdominal pain (upper right quadrant), severe frontal headache, blurred vision, generalized oedema (not just ankle swelling) • Jaundice without fever in third trimester • Report of diagnosis of hypertension, either prior to or during the pregnancy **Possibly With:** • Gravida 1 • Twins • Intrauterine death diagnosed or stillbirth delivered • History of postpartum haemorrhage **NOTE:** if ≥72h postpartum, consider O87
O26	**Maternal care for other conditions predominantly related to pregnancy**	Gestational age 1-10 months **AND** Unknown cause of death during pregnancy, of probable direct maternal cause **Possibly With** previously healthy woman with no sign of other infection
O41	**Intra-amniotic infection**	Gestational age ≥7months **AND** History of 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:** • 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** History of 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**: • History of 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 **Possibly With** Pain
O64-O66	**Obstructed labour**	**NOTE:** Do not code O64-O66, instead try to determine the underlying cause of death that may have been exacerbated by the obstructed labour. Consider the following: Intrapartum haemorrhage (O67), Postpartum haemorrhage (072), Intra-amniotic infection (O41), Puerperal sepsis (085), or Complications of labour and delivery (O75).
O67	**Intrapartum haemorrhage**	Gestational age ≥7 months **AND** Woman dies during delivery **AND** Profuse per vaginal bleeding
O71	**Other obstetric trauma: uterine rupture in labour OR postpartum uterine inversion**	<u>Uterine rupture in labour</u> Gestational age was ≥7 months **AND** Woman dies undelivered **OR** Sudden collapse following delivery **AND** Any of the following: • History of prolonged (obstructed) labour • Use of oxytocin induction/augmentation ('injections to increase the pain') • Report of fundal pressure used during delivery • Report of fetal malposition, i.e. transverse lie • History of previous caesarean

		<u>Postpartum Uterine Inversion</u> Gestational age was ≥7 months **AND** Uterus inverts with attempted delivery of placenta **Possibly With** Uterus is not replaced by Skilled Birth Attendant
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: • Per vaginal bleeding • 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
O75	**Complications of labour and delivery**	Gestational age was ≥7 months **AND** Woman dies in labour or within 24h of delivery, of probable direct maternal cause of death **Possibly With:** • Previously healthy outside of pregnancy • May have developed complications during the pregnancy/delivery/postpartum
O85-O86	**Puerperal sepsis**	Gestational age was ≥7 months **AND** Death occurs ≥24h and ≤42d postpartum (usually day 3-14) **AND** Fever or chills **OR** Abdominal pain **OR** Foul-smelling discharge per vagina **Possibly With:** • Jaundice appearing ≥4 days postpartum • No history of fever in pregnancy • History of prolonged labour or ruptured membranes (>24h prior to delivery) • History of preterm labour • History of stillbirth/neonatal death • Sweating/rigours/dizziness/headaches • For O86 (Other puerperal infections, i.e., cesarean wound, perineal repair): history of wound
O90	**Complications of the puerperal period-Unspecified**	Gestational age was ≥7 months **AND** Death occurs ≥24h and ≤42 days 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 month or more 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 deep vein thrombosis, pulmonary embolism, amniotic fluid embolism), 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-miss event in pregnancy/delivery/postpartum period (any pregnant or recently delivered woman, in whom immediate survival was threatened and who survived by chance or due to the hospital care she received) **NOTE:** Consider a more specific cause of death
O97	**Death from sequelae of direct obstetric causes: More than 1 year post partum**	Death of woman >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-miss event in pregnancy/delivery/postpartum period (any pregnant or recently delivered woman, in whom immediate survival was threatened and who survived by chance or due to the hospital care she received) **NOTE:** 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:** • History of fever prior to pregnancy, or prior to puerperium • History of intermittent fever • Jaundice with or without fever (not postpartum/post abortion, no signs and symptoms of hypertension disorders of pregnancy) • Diarrhoea **NOTE:** Consider a more specific cause of death.
O99	**Other maternal**	Death of a woman who is pregnant/intrapartum/postpartum (≤42 days),

	diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium	of probably non-infectious cause of death, possibly exacerbated by the pregnancy **Possibly With:** • History of pre-existing medical condition • Reported diagnosis of new medical condition **NOTE:** Consider a more specific cause of death.
A34	**Obstetric tetanus**	Maternal death; post abortion or postpartum **AND** Unable to swallow or neck stiffness **AND** Rigid spasms **Possibly With:** • Incubation 4-42 days, average 12 days, though may be earlier if history of prolonged labour reported • No antenatal care 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.

Specific causes common only to child deaths (29 days or more to 14 years):

ICD-10 CODE	CAUSE OF DEATH	CRITERIA
Certain infectious and parasitic diseases		
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 history of injury to head or difficulty in opening mouth or diagnosis of pyogenic meningitis
A37	**Whooping cough**	Long bouts of cough > 15 days, 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) • History of outbreak of whooping cough (in local language) in the area • Inability to take food • Vomiting after cough

B01	**Chickenpox**	Rash (red and itchy in nature) that usually first appear on the abdomen, back, or face and then spread to all over body followed by thin walled blisters filled with fluid, which eventually break leaving open sores and finally crust over to leave dry scabs. **AND** any of the following: Fever, headache, sore throat, or stomach pain
B05	**Measles**	Rash all over body after an attack of fever > 3 days **AND** Red or watery eyes or cough and running nose (coryza) **Possibly followed by** ARI or diarrhoea within 3 months
Cancers		
C40-C41	**Bone cancer (Osteosarcoma)**	Painful and progressively increasing swelling of limb **Possibly** on bone near knee joint, hip, humerus or jaw, or with history of injury **OR** Diagnosed as osteosarcoma
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 reports eye had a bright reflection like a cat (i.e. “amaurotic cat's eye”) or eye pain **OR** crossed eyes **OR** Diagnosed as Retinoblastoma **NOTE:** Often starts painlessly at 2-4 years, may remain quiescent and manifest at 5 or 6 years.
Others		
Q00-Q89	**Congenital malformations**	Report at birth of abnormality of head (small, flat, swelling), spine, body, arms and legs, or circulatory, respiratory or other system.

Specific causes common only to neonatal deaths (28 days or less):

ICD10 CODE	CAUSE OF DEATH	CRITERIA
A33	**Neonatal tetanus**	Baby able to suck after birth **AND** Stopped sucking after 3 days **AND** Baby's body became rigid with or without convulsions **Possibly With** history of umbilical stump infection **OR** unclean delivery **OR** Umbilical cord inflammation **OR** Fever **NOTE:** Do not code Tetanus for deaths on days 0, 1, 2 or 3. Local language is often used for tetanus.
P05	**Low Birth Weight (Term baby)**	Full term pregnancy **AND** Smaller than average sized baby (if weighed, birth weight below 2.5 kilograms) **AND** No other obvious causes of death

		AND Death at 3-7 days **Possibly With** Poor suckling after birth **NOTE:** P05 used only for full term pregnancy. If other obvious cause of death, consider LBW as a keyword for that cause.
P07	**Prematurity (Pre-term)**	Born between 24 and 36 weeks of gestation **AND** No other obvious causes of death. **Possibly With** Smaller than average sized baby. **NOTE:** Consider prematurity as a keyword with other obvious causes of death. Do not use P07 if full term pregnancy – instead, consider low birth weight (P05).
P10-P15	**Birth trauma**	Any of the following: • Bruises at birth • Elongation or swelling of skull • Blood clots over skull • Any limb broken at birth **Possibly With:** • Convulsions in first 72 hours of birth • Complicated delivery
P21-22, P24	**Birth asphyxia**	Delayed or poor breathing or no breathing at birth **OR** Delayed or no crying at birth **OR** Bluish or pale skin colour **AND** Any sign of life present at birth (i.e. exclude stillbirths) **Possibly With:** • Convulsions in first 72 hours of birth • Prolonged or difficult labour **OR** passing of meconium in the amniotic fluid
P36	**Bacterial sepsis of newborn**	Fever **AND** No other obvious causes of death (i.e., pneumonia, diarrhoea) **AND** No other obvious infection source **Possibly With:** • Limp and lethargic poor sucking • Purulent discharge from cord • Coma • Abdominal distension **NOTE**: Choose this code after excluding other ICD codes.
P59	**Neonatal jaundice from other and unspecified causes**	Yellow discolouration of skin and sclera in newborn, which presents on the second or third day of life **AND** any of the following: • Preterm delivery • Treatment history of phototherapy (Respondent may say that the baby was kept in a glass box for couple of days)
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
P92	**Feeding problems of newborn**	Death of a newborn related to feeding problems such as vomiting, regurgitation, slow feeding, underfeeding, difficulty in feeding at breast, other specified/unspecified feeding problem
P95	**Stillbirth**	**NOTE:** Use P95 only for foetal (intrauterine) deaths. Do not use P95 for newborns that showed ANY sign of life, regardless of number of weeks of gestation. If born alive and cause unknown, use P96 (Other perinatal conditions).
P96	**Other perinatal conditions**	**NOTE:** Use P96 only if no other specific cause of neonatal death can be found. If child is born dead use P95.
Q00-Q89	**Congenital malformations**	Report at birth of abnormality of head (small, flat, swelling), spine, body, arms and legs, or circulatory, respiratory or other system.
R95	**Sudden Infant Death Syndrome (SIDS)**	**Possibly With:** Associated with infant sleeping on stomach **NOTE:** Do not use this code for generic deaths with uncertain cause - instead use P96 (Other perinatal conditions).
R99	**Ill-defined/ unspecified**	**NOTE:** For unspecified neonatal cause of death, use P96 (Other perinatal conditions) instead of R99.

All ages - External causes of morbidity and mortality (V01-Y98):

ICD-10 CODE	CAUSE OF DEATH	CRITERIA
W00-W19	**Falls**	Death following history of fall on the same level or at different levels from any of the following: • Fall from any objects such as wheel chairs, bed, stairs and steps, ladder, scaffolds, tree, cliff, building, structure, etc. • Fall involving ice and snow including ice-skates, skis, roller-skates or skateboards • Fall while being carried or supported by other persons or due to collision with or pushing by another person • Fall due to slipping, tripping, stumbling, or unspecified mechanism
W20-W49	**Inanimate mechanical forces**	Death due to injury by any objects (any equipment, machinery) due to any specified or unspecified mechanism. Please exclude assault (X85-Y09) contact, collision with animals or persons (W50-W64), or intentional self-harm (X60-X84)
W54	**Dog bite**	Death due to injury following history of bite by any dog. Exclude rabies-related death.
W55	**Bitten or struck by other mammals**	Death due to injury following history of bite by any mammals other than a dog or a rat.

W65-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, which may be a risk factor.
W85-W87	**Electrical injuries**	Death due to injury following history of exposure to specified or unspecified electric current resulting in burns, electric shocks, or electrocution.
X00-X04 & X08-X09	**Exposure related to smoke, fire/flames**	Death due to injury following history of sudden exposure to controlled/uncontrolled and prolonged/short periods of excessive heat due to specified/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 natural heat / sunlight in the environment.
X31	**Excessive natural cold**	Death due to injury following history of exposure to unbearable excessive natural cold weather in the environment.
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).
X40-X49	**Accidental poisoning from chemicals**	Death due to injury following history of accidental consumption of any drugs, narcotics, hallucinogens, alcohol, solvents, gases, pesticides, and any unspecified chemicals
X68	**Intentional self-poisoning by and exposure to pesticides**	Death due to intentional ingestion of fumigants, fungicides, herbicides, insecticides, rodenticides, or wood preservatives. Exclusion: death due to intentional ingestion of plant foods and fertilizers (X69
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 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 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 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 history of depression and type of fire.
X93-X94 & X96-	**Assault / violence by**	Death due to injury following history of assault/violence by handguns, acids, fire, explosive materials, sharp objects, blunt objects, or by motor

Y03 & Y08	**specified means**	vehicles.
Y04-Y05	**Assault by bodily force**	Death due to injury following history of assault/violence by bodily force (including fight or unarmed brawl) or sexual assault by bodily force (including attempted rape or sodomy).
Y09	**Assault / violence by unspecified means**	Death due to injury following history of assault/violence by any unspecified objects or means.
Y83	**Death during or following a surgical procedure**	Surgical operation and other surgical procedures (such as transplant of whole organ, implant of artificial limb device, anastomosis, bypass or graft, amputation of limb, or any unspecified surgical procedures) as the cause of abnormal reaction of the patient, or of later complication, without mention of misadventure at the time of the procedure.
Y84	**Death during or following a medical procedure**	Other medical procedures (such as cardiac catheterization, kidney dialysis, aspiration of fluid, or any unspecified medical procedures) as the cause of abnormal reaction of the patient, or of later complication, without mention of misadventure at the time of the procedure.
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 to drowning and submersion, following or jumping from a boat, ship or any local water transport vehicles. Keywords may capture history of epilepsy.
V01-V79, W22, W51	**Surface transport accidents**	See table for common road traffic injuries below. If no specific code applies, then use V99 (unspecified transport accident).
V81	**Occupant of railway train or railway vehicle injured in transport accident**	Death of an occupant of railway train or railway vehicle injured in collision with motor vehicle or other object, hit by rolling stock, fall from railway train or railway vehicle, or other specified/unspecified railway accident.

All ages - Common road traffic injury codes:

Compare Victim in Collision with:

Victim and Mode of Transport	Pedestrian / animal	Pedal cyclist	2-3 wheeler	Car, truck or van	Heavy vehicle Bus	Railway	Other non-motor	Fixed / stationary objects	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
Motor cycle 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
Occupant of car	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49
Occupant of 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
Occupant of bus	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79

Note: **Use V99 if no specific code exists**

Chapter 5: Cause of Death Workbook

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

A Reminder of the six steps for assigning the underlying COD:

1. Carefully read the full narrative and past medical history.
2. Highlight any symptoms, signs or negative evidence, and enter any comments or notes (keywords).
3. Think of the chronological sequence that the symptoms occurred in. Adhere to cardinal symptoms & negative evidence. **Do not imagine facts which are not in the record.**
4. Choose an underlying COD, by selecting a specific ICD code.
5. Confirm your ICD selection against the presented clinical guidelines, and use the suggested differential diagnosis to reconsider your ICD code.
6. Rate the certainty of your diagnosis and the quality of the 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 on regular medication. She had 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 micturition. She was discharged from hospital in coma and passed away in home.

Items in RHIME questionnaire include:

- ✓ Hypertension
- ✓ Heart disease
- ✓ Stroke
- ✓ Diabetes

Step 1:_____

_____

Step 2:_____

_____

_____

Step 3: _____

_____

_____

Step 4: _____

_____

_____

Step 5: _____

_____

Step 6: _____

_____

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 on regular medication. He had 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: _____

_____

Step 2: _____

_____

_____

Step 3: _____

_____

_____

Step 4: _____

_____

_____

Step 5: _____

_____

_____

_____

Step 6: _____

_____

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 1̄ and half years and was regular medication. She had loss of weight and loss of appetite. She was hypertensive too. She passed away.

Items in RHIME questionnaire include:

- ✓ Cancer

Step 1:_____

_____

Step 2:_____

_____

_____

Step 3: _____

_____

_____

Step 4: _____

_____

_____

Step 5: _____

_____

_____

_____

Step 6: _____

_____

Exercise 4: Male, 65 years old

Respondent thought person died of "brain haemorrhage". According to the respondent, the deceased man was hypertensive, asthmatic, and was on regular unani medication. He had 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: _____

_____

Step 2: _____

_____

_____

Step 3: _____

_____

_____

Step 4: _____

_____

_____

Step 5: _____

_____

_____

_____

Step 6: _____

_____

_____

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:_____

_____

Step 2:_____

_____

_____

Step 3: _____

_____

_____

Step 4: _____

_____

_____

Step 5: _____

_____

_____

_____

Step 6: _____

_____

_____

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:_____

_____

Step 2:_____

_____

_____

Step 3: _____

_____

_____

Step 4: _____

_____

_____

Step 5: _____

_____

_____

_____

Step 6: _____

_____

_____

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:_____

_____

Step 2:_____

_____

_____

Step 3: _____

_____

_____

Step 4: _____

_____

_____

Step 5: _____

_____

_____

_____

Step 6: _____

_____

_____

Exercise 8: Male, 53 years old

Respondent thought patient died of "stomach pain". The deceased 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:_____

_____

_____

Step 3: _____

_____

_____

Step 4: _____

_____

_____

Step 5: _____

_____

_____

_____

Step 6: _____

_____

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 has sugar (diabetes) problem. He prescribed medications and the patient took these medicines for about two months. But there was no change then the patient was taken 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: _____

_____

Step 2: _____

_____

_____

Step 3: _____

_____

_____

Step 4: _____

_____

Step 5: _____

_____

Step 6: _____

_____

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 had 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:_____

_____

Step 3: _____

_____

Step 4: _____

_____

_____

Step 5: _____

_____

Step 6: _____

_____

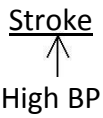
Answer 1: Female, 60 years old

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 on regular medication. She had 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 micturition. 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 on regular medication", "BP high", "stroke and paralysis of left side of body in last month", "lost consciousness and control over speech and micturition"

Step 3: Chronology:



Step 4: CoD is stroke / cerebro-vascular accident (CVA) (I64)

Sudden onset of paralysis of one or more limbs in the month preceding death AND any of the following (keywords that match the guidelines are bolded):

- **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: If any complications of stroke more than 1 month duration, consider sequelae of stroke (I69).

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 on regular medication. He had 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 on 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)

Cough with early wheezing (off and on for long period) AND any of the following: (keywords that match the guidelines are bolded):

- **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, J65, B90), 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, J65, B90), 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 had loss of weight and loss of 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 on regular medication", "loss of weight and appetite", "hypertensive" and items from RHIME questionnaire.

Step 3: Chronology:

Stomach cancer (associated with loss of weight and appetite)

Step 4: CoD is stomach cancer (C16)

Vomiting/ vomiting of blood OR Difficulty in swallowing AND any of the following (keywords that match the guidelines are bolded):

- Black stools
- **Pain or discomfort in abdomen (1 month or longer)**
- Nausea
- **Weight loss**

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

Step 5: Consider differential diagnoses: peptic ulcers (K25-K27).
However, no long duration history of stomach pain and /or weigh loss ranks peptic ulcers (K25-K27) 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).

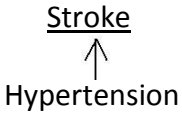
Answer 4: Male, 65 years old

Respondent thought person died of "brain haemorrhage". According to the respondent, the deceased man was hypertensive, asthmatic, and was on regular unani medication. He had 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:



Step 4: CoD is stroke / cerebro-vascular accident (CVA) (I64)

Sudden onset of paralysis of one or more limbs in the month preceding death AND any of the following (keywords that match the guidelines are bolded):

- **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: If any complications of stroke more than 1 month duration, consider sequelae of stroke (I69).

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 meningitis (G00)

Keywords that match the guidelines are bolded:
Continuous fever until death
AND Neck stiffness (more common in meningitis than in encephalitis)
AND No symptoms of acute respiratory infection
Possibly With:

- Loss of consciousness/coma OR Convulsions (IN CHILDREN)
- Nausea and/or vomiting
- Piticheal rash
- Diarrhoea (IN CHILDREN)
- Photophobia (IN CHILDREN)

Step 5: Consider differential diagnoses: viral meningitis (A81-A89), acute bacterial sepsis (A39-A41), typhoid (A01) or respiratory infections (J00-J22). Microbiologic diagnosis is 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)

Chronic cough of long duration, with or without sputum AND **fever of long duration** AND any one of the following: (keywords that match the guidelines are bolded):

- **Blood in sputum**
- **Chest pain**
- **Breathlessness**
- Loss of appetite
- **Chronic weight loss**
- Lymphadenopathy (especially cervical lymph nodes) of long duration
- History of treatment for tuberculosis

NOTE: Family history of diagnosed TB to be considered. Try to distinguish between pulmonary TB (A15-A16), other TB (A17-A19), pneumoconiosis associated with TB (J65), sequelae of TB (B90), or HIV resulting in TB (B20). Exclude diagnosis of pneumonia (J12-J18) or COPD (J40-J44).

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:

- **High fever of long duration (at least 7 days), progressively increasing, continuous** AND
- Severe headache
- Abdominal pain / distension
- Constipation / diarrhoea
- **Death occurred in 2nd to 4th week**
- Delirium
- Blood in stool
- Tongue highly coated

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 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)

Vomiting/ vomiting of blood OR Difficulty in swallowing AND any of the following (keywords that match the guidelines are bolded):

- Black stools
- **Pain or discomfort in abdomen (1 month or longer)**
- Nausea
- Weight loss

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

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 (K25-27)
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 has sugar (diabetes) problem. He prescribed medications and the patient took these medicines for about two months. But there was no change then the patient was taken 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 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 had 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 micturition" and items from RHIME questionnaire

Step 3: Chronology:

Congestive Heart Failure

COPD/Ischaemic Heart Disease/High BP

Step 4: COD is congestive heart failure (I50)

Progressive shortness of breath on lying down or at night, improving on sitting up AND any of the following: (keywords that match the guidelines are bolded):

- Swelling of feet
- Distension of abdomen
- **Progressive cough**
- **History of previous Myocardial Infarction / heart disease/anaemia**

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).

ANNEXURE – I

RGI/CGHR PROSPECTIVE STUDY
SRS - VERBAL AUTOPSY FORM
Form 10A: Neonatal death (28 days or less of age)

CONFIDENTIAL

SRS unit number | Unique form number 1

Year : 20 | 1st HYS | 2nd HYS

Name of the head of the household | Identification code of the head

Full name of deceased | Identification code of the deceased

Name of mother of the deceased | Identification code of mother of the deceased

Section 1: Details for respondent and deceased

Details of respondent

1. Name of respondent | Identification code of respondent

2. Relationship of respondent with deceased
- 1.
- 2. Brother/Sister
- 3.
- 4. Mother/Father
- 5.
- 6.
- 7.
- 8.
- 9. Grandfather/Grandmother
- 10. Other relative
- 11. Neighbour/No relation
- 99. Unknown

3. Did the respondent live with the deceased during the events that led to death?
1. Yes 2. No 99. Unknown

4. Respondent's age in completed years

5. Respondent's sex 1. Male 2. Female

6. What is the highest standard of education the respondent has completed?
- 0. Illiterate and literate with no formal education
- 1. Literate, Primary or below
- 2. Literate, Middle
- 3. Literate, Matric Class-X
- 4. Literate, Class XII
- 5. Graduate and above
- 99. Unknown

7. Religion of the head of the household
1. Hindu
2. Muslim
3. Christian
4. Sikh
5. Buddhist
6. Jain
7. No religion
8. Other
99. Unknown

Details of deceased

8. Deceased's Sex 1. Male 2. Female

9. Age in completed days less than 1 day AND 01-28 days

10. Relationship of the deceased with the head of the household
- 1.
- 2. Brother/Sister
- 3. Son/Daughter
- 4.
- 5. Grandchild
- 6.
- 7.
- 8.
- 9.
- 10. Other relative
- 11.
- 99. Unknown

11. Date of birth D D / M M / Y Y

12. Date of death D D / M M / Y Y

13A. House address of the deceased

13B. PIN

14. Place of death?
- 1. Home
- 2. On way to health facility
- 3. PHC/CHC/Rural Hospital
- 4. District Hospital
- 5. Private Hospital
- 6. Other place
- 99. Unknown

15. What did the respondent think the newborn died of? (Allow the respondent to tell the illness in his or her own words)

Section 2: Neonatal Death

16A. Did s/he die from an injury or accident? 1. Yes 2. No 99. Unknown

16B. If yes, what kind of injury or accident?
- 1. Road traffic accident
- 2. Falls
- 3. Fall of objects
- 4. Burns
- 5. Drowning
- 6. Poisoning
- 7. Bite/sting
- 8. Natural disaster
- 9. Homicide/assault
- 99. Unknown

Details of pregnancy and delivery

17. How many months long was the pregnancy?

18. Did the mother receive 2 doses of tetanus toxoid during pregnancy?
1. Yes 2. No 99. Unknown

19A. Were there any complication during the pregnancy, or during labour?
1. Yes 2. No 99. Unknown

19B. If yes, what complication(s) occurred? (Check all that apply)
- 1. Mother had fits
- 2. Excessive bleeding before/during delivery
- 3. Water broke one or more days before contractions started
- 4. Prolonged/difficult labour (12 hours or more)
- 5. Operative delivery
- 6. Mother had fever
- 7. Baby had cord around neck
- 99. Unknown

20. Was the child a single or multiple birth?
1. Single 2. Multiple 99. Unknown

21. Where was s/he born?
- 1. Home
- 2. On way to health facility
- 3. PHC/CHC/Rural Hospital
- 4. District Hospital
- 5. Private Hospital
- 6. Other place
- 99. Unknown

22. Who attended the delivery?
- 1. Untrained traditional birth attendant
- 2. Trained traditional birth attendant
- 3. ANM/Nurse
- 4. Allopathic Doctor
- 5. None
- 6. Other
- 99. Unknown

23. Was a clean blade (disinfected or new) used to cut the umbilical cord?
1. Yes 2. No 99. Unknown

Details of baby after birth

24. Did the baby ever cry, move or breath?
1. Yes 2. No 99. Unknown

25. Were there any bruises or signs of injury on child's body after the birth?
1. Yes 2. No 99. Unknown

26. Did s/he have any visible malformations at birth?
1. Yes 2. No 99. Unknown

27A. Compared to other children in your area, what was the child's size at birth?
- 1. Very small
- 2. Smaller than average
- 3. Average
- 4. Larger than average
- 99. Unknown

27B. What was the birth weight?
grams OR Unknown

28A. Did s/he stop being able to cry?
1. Yes 2. No 99. Unknown

28B. If yes, how many completed days after birth did s/he stop crying?
less than 1 day AND 01-28 days

29A. When was s/he first breastfed?
- 1. Immediately/within one hour of birth
- 2. Same day child was born
- 3. Second day or later
- 4. Never breastfed
- 99. Unknown

29B. Was the baby ever given anything to drink other than breast milk?
1. Yes 2. No 99. Unknown

30A. Was s/he able to suckle normally during the first day of life?
1. Yes 2. No 99. Unknown

30B. If yes, did s/he stop being able to suck in a normal way?
1. Yes 2. No 99. Unknown

30C. If yes, how many completed days after birth did s/he stop sucking?
less than 1 day AND 01-28 days

Note: Check "less than 1 day" if the event occurred during the first day of life and write "00" in the "01-28 days" boxes. Otherwise, complete the "01-28 days" box with the number of completed days.

Details of sickness at time of death

31A. Did s/he have fever?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

31B. If yes, how many completed days did the fever last?
☐ less than 1 day AND ☐☐ 01-28 days

32A. Did s/he have any difficulty with breathing?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

32B. If yes, for how many completed days did the difficulty with breathing last?
☐ less than 1 day AND ☐☐ 01-28 days

33A. Did s/he have fast breathing?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

33B. If yes, for how many completed days did the fast breathing last?
☐ less than 1 day AND ☐☐ 01-28 days

34. Did s/he have in-drawing of the chest?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

35A. Did s/he have a cough?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

35B. Did s/he have grunting (demonstrate)?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

35C. Did his/her nostrils flare with breathing?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

36A. Did s/he have diarrhoea (frequent liquid stools)?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

36B. If yes, for how many completed days were the stools frequent or liquid?
☐ less than 1 day AND ☐☐ 01-28 days

37A. Did s/he vomit?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

37B. If yes, for how many completed days did s/he vomit?
☐ less than 1 day AND ☐☐ 01-28 days

38. Did s/he have redness around, or discharge from, the umbilical cord stump?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

39. Did s/he have yellow eyes or skin?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

40. Did s/he have spasms or fits (convulsions)?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

41. Did s/he become unresponsive or unconscious?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

42. Did s/he have a bulging fontanelle (describe)?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

43. Did the child's body feel cold when touched?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

44. Were the child's hands, legs or lips discoloured (blue, other colour)?
☐ 1. Yes ☐ 2. No ☐ 99. Unknown

Section 3: Written narrative in local language

45. Narrative language code ☐☐

Please describe the symptoms in order of appearance, doctor consulted or hospitalization, history of similar episodes, enter the results from reports of the investigations if available. (Use attached symptoms list)

Respondent's cooperation: ☐ 1. Good ☐ 2. Poor

Interviewer name: _____ Code: ☐☐☐

Date: D D / M M / Y Y

Signature/Impresion

Respondent: Respondent

Interviewer: Interviewer

Note: Check "less than 1 day" if the event occurred during the first day of life and write "00" in the "01-28 days" boxes. Otherwise, complete the "01-28 days" box with the number of completed days.

RGI/CGHR PROSPECTIVE STUDY
SRS - VERBAL AUTOPSY FORM
Form 10B: Child death (29 days to 14 years)

CONFIDENTIAL

SRS unit number | Unique form number 2

Year : 20 | 1st HYS | 2nd HYS

Name of the head of the household | Identification code of the head

Full name of deceased | Identification code of the deceased

Name of mother of the deceased | Identification code of mother of the deceased

Section 1: Details for respondent and deceased

Details of respondent

1. Name of respondent | Identification code of respondent

2. Relationship of respondent with deceased

- 1.
- 2. Brother/Sister
- 3.
- 4. Mother/Father
- 5.
- 6.
- 7.
- 8.
- 9. Grandfather/Grandmother
- 10. Other relative
- 11. Neighbour/No relation
- 99. Unknown

3. Did the respondent live with the deceased during the events that led to death?

1. Yes 2. No 99. Unknown

4. Respondent's age in completed years

5. Respondent's sex 1. Male 2. Female

6. What is the highest standard of education the respondent has completed?

- 0. Illiterate and literate with no formal education
- 1. Literate, Primary or below
- 2. Literate, Middle
- 3. Literate, Matric Class-X
- 4. Literate, Class XII
- 5. Graduate and above
- 99. Unknown

7. Religion of the head of the household

1. Hindu
2. Muslim
3. Christian
4. Sikh
5. Buddhist
6. Jain
7. No religion
8. Other
99. Unknown

Details of deceased

8. Deceased's Sex 1. Male 2. Female

9. Age of Deceased Years: AND Months:

10. Relationship of the deceased with the head of the household

- 1.
- 2. Brother/Sister
- 3. Son/Daughter
- 4.
- 5. Grandchild
- 6.
- 7. Brother-in-law/Sister-in-law
- 8.
- 9.
- 10. Other relative
- 11. Neighbour/ No relation
- 99. Unknown

11. Date of birth D D / M M / Y Y

12. Date of death D D / M M / Y Y

13A. House address of the deceased

13B. PIN

14. Place of death?

- 1. Home
- 2. On way to health facility
- 3. PHC/CHC/Rural Hospital
- 4. District Hospital
- 5. Private Hospital
- 6. Other place
- 99. Unknown

15. What did the respondent think the newborn died of? (Allow the respondent to tell the illness in his or her own words)

Section 2: Child death

16A. Did s/he die from an injury or accident? 1. Yes 2. No 99. Unknown

16B. If yes, what kind of injury or accident?

- 1. Road traffic accident
- 2. Falls
- 3. Fall of objects
- 4. Burns
- 5. Drowning
- 6. Poisoning
- 7. Bite/sting
- 8. Natural disaster
- 9. Homicide/assault
- 10. Suicide
- 11. Workplace
- 99. Other/Unknown

Details of baby after birth

17A. Was s/he born premature?

1. Yes 2. No 99. Unknown

17B. How many months long was the pregnancy?

18A. Compared to other children in your area, what was the child's size at birth?

- 1. Very small
- 2. Smaller than average
- 3. Average
- 4. Larger than average
- 99. Unknown

18B. What was the birth weight?

grams OR 99. Unknown

19A. When was s/he first breastfed?

- 1. Immediately/within one hour of birth
- 2. Same day child was born
- 3. Second day or later
- 4. Never breastfed
- 99. Unknown

19B. Did the child receive anything other than breast milk to drink during the first 6 months of life?

1. Yes 2. No 99. Unknown

19C. During the illness that led to death, was the child breastfeeding?

1. Yes 2. No 99. Unknown

19D. During the illness that led to death, did the child stop breastfeeding?

1. Yes 2. No 99. Unknown

Details of sickness at time of death

20A. Did s/he have fever?

1. Yes 2. No 99. Unknown

20B. If yes, how many completed days did the fever last?

less than 1 day AND days

20C. Was the fever accompanied by chills/rigors?

1. Yes 2. No 99. Unknown

21. Did s/he have convulsions or fits?

1. Yes 2. No 99. Unknown

22. Was s/he unconscious during the illness that led to death?

1. Yes 2. No 99. Unknown

23. Did s/he develop stiffness of the whole body?

1. Yes 2. No 99. Unknown

24. Did s/he have a stiff neck (demonstrate)?

1. Yes 2. No 99. Unknown

25A. Did s/he have diarrhoea (more frequent or more liquid stools)?

1. Yes 2. No 99. Unknown

25B. If yes, for how many completed days?

less than 1 day AND days

25C. Was there blood in the stools?

1. Yes 2. No 99. Unknown

25D. If s/he had diarrhoea, was s/he given (use local term for oral rehydration treatment)?

1. Yes 2. No 99. Unknown

26A. Did s/he have a cough?

1. Yes 2. No 99. Unknown

26B. If yes, for how many completed days?

less than 1 day AND days

26C. If yes, was there blood?

1. Yes 2. No 99. Unknown

27A. Did s/he have breathing difficulties?

1. Yes 2. No 99. Unknown

27B. If yes, for how many completed days?

less than 1 day AND days

27C. Did s/he have fast breathing?

1. Yes 2. No 99. Unknown

Note: Check "less than 1 day" if the event lasted for less than one day, and write "00" in the "days" box. Otherwise, complete the "days" box with the number of completed days.

27D. Did s/he have in-drawing of the chest?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

27E. Did s/he have wheezing (demonstrate sound)?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

28A. During the illness, did s/he have abdominal pain?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

28B. Did s/he have abdominal distention?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

29A. Did s/he vomit?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

29B. If yes, for how many completed days?

☐ less than 1 day AND ☐☐ days

30. Did the eye/skin colour change to yellow?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

31A. Did s/he have any skin disease or rash?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

31B. Was the rash all over the body?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

31C. Did s/he have red eyes?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

31D. Was this measles (use local term)?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

32. During the weeks preceding death, did s/he become very thin?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

33. During the weeks preceding death, did s/he have any swelling of hands, feet or abdomen?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

34. During the weeks preceding death, did s/he suffer from lack of blood or appear pale?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

35. In the last six months, compared to other children of the same age, was s/he growing normally?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

36. During the illness that lead to death, did s/he receive any antibiotics?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

37A. Did s/he have multiple illnesses?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

37B. If yes, what were the symptoms associated with these illnesses? (check all that apply)

☐ 1. Cough ☐ 4. Fever ☐ 99. Unknown

☐ 2. Diarrhoea ☐ 5. Rashes

☐ 3. Ear discharge ☐ 6. Other

38A. Did s/he receive BCG injection?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

38B. Did s/he receive 3 injections of DPT (DPT-3)?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

38C. Did s/he receive polio drops in the mouth?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

38D. Did s/he receive an injection for measles (use local term)?

☐ 1. Yes - only one ☐ 3. No - did not receive any

☐ 2. Yes - more than one ☐ 99. Unknown

Section 3: Written narrative in local language

39. Narrative language code ☐☐

Please describe the symptoms in order of appearance, doctor consulted or hospitalization, history of similar episodes, enter the results from reports of the investigations if available. (Use attached symptoms list)

Respondent's cooperation: ☐ 1. Good ☐ 2. Poor

Interviewer name: Code: ☐☐☐

Date: D D / M M / Y Y

Signature/Impresion

Respondent: Respondent

Interviewer: Interviewer

Note: Check "less than 1 day" if the event lasted for less than one day, and write "00" in the "days" box.
Otherwise, complete the "days" box with the number of completed days.

RGI/CGHR PROSPECTIVE STUDY
SRS - VERBAL AUTOPSY FORM
Form 10C: Adult death (15 years or older)

CONFIDENTIAL

SRS unit number

Unique form number 3

Year : 20

1st HYS ☐ 2nd HYS ☐

Name of the head of the household

Identification code of the head

Full name of deceased

Identification code of the deceased

Section 1: Details for respondent and deceased

Details of respondent

1. Name of respondent

Identification code of respondent

2. Relationship of respondent with deceased

- 1. Wife/Husband
- 2. Brother/Sister
- 3. Son/Daughter
- 4. Mother/Father
- 5. Grandchild
- 6. Son-in-law/ Daughter-in-law
- 7. Brother-in-law/ Sister-in-law
- 8. Parent-in-law
- 9. Grandfather/Grandmother
- 10. Other relative
- 11. Neighbour/No relation
- 99. Unknown

3. Did the respondent live with the deceased during the events that led to death?

1. Yes 2. No 99. Unknown

4. Respondent's age in completed years

5. Respondent's sex 1. Male 2. Female

6. What is the highest standard of education the respondent has completed?

- 0. Illiterate and literate with no formal education
- 1. Literate, Primary or below
- 2. Literate, Middle
- 3. Literate, Matric Class-X
- 4. Literate, Class XII
- 5. Graduate and above
- 99. Unknown

7. Religion of the head of the household

- 1. Hindu
- 2. Muslim
- 3. Christian
- 4. Sikh
- 5. Buddhist
- 6. Jain
- 7. No religion
- 8. Other
- 99. Unknown

Details of deceased

8. Deceased's Sex 1. Male 2. Female

9. Age of Deceased Years:

10. Relationship of the deceased with the head of the household

- 1. Wife/Husband
- 2. Brother/Sister
- 3. Son/Daughter
- 4. Mother/Father
- 5. Grandchild
- 6. Son-in-law/ Daughter-in-law
- 7. Brother-in-law/ Sister-in-law
- 8. Parent-in-law
- 9. Grandfather/Grandmother
- 10. Other relative
- 11. Neighbour/No relation
- 12. Self
- 99. Unknown

11. What is the highest standard of education the deceased had completed?

- 0. Illiterate and literate with no formal education
- 1. Literate, Primary or below
- 2. Literate, Middle
- 3. Literate, Matric Class-X
- 4. Literate, Class XII
- 5. Graduate and above
- 99. Unknown

12. What was the occupation of the deceased?

- 1. Nonworker
- 2. Salaried
- 3. Wage earner
- 4. Profession/Business
- 5. Cultivator/farmer
- 6. Agricultural wage labour
- 7. Non agricultural wage labour
- 8.. Student
- 9. Other
- 99. Unknown

13. Date of death D D / M M / Y Y

14. How many years did the deceased live at this address?

15. Place of death?

- 1. Home
- 2. On way to health facility
- 3. PHC/CHC/Rural Hospital
- 4. District Hospital
- 5. Private Hospital
- 6. Other place
- 99. Unknown

16A. House address of the deceased

16B. PIN

17. What did the respondent think that this person died of?
(Allow the respondent to tell the illness in his or her own words)

Section 2: Past History

Had a doctor EVER stated that the deceased had the following diseases?

	Yes	No	Unknown
18. Hypertension	☐	☐	☐
19. Heart disease	☐	☐	☐
20. Stroke	☐	☐	☐
21. Cholesterol problem	☐	☐	☐
22. Diabetes	☐	☐	☐
23. Tuberculosis	☐	☐	☐
24. HIV/AIDS	☐	☐	☐
25. Cancer (write site in narrative)	☐	☐	☐
26. Asthma	☐	☐	☐
27. Other chronic illness (specify in narrative)	☐	☐	☐

28. Was the deceased taking any medications regularly duing the last five years? (Record up to three in Hindi or English only).

1.

2.

3.

First, ask the following questions for the deceased (First column), and then ask them for the main respondent (Second column)

Tobacco, alcohol and diet	Deceased (Ask first)	Respondent (Ask second)
29A. Did s/he smoke tobacco within the last 5 years?	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown
29B. If yes, how many bidi per day?	☐☐	☐☐
29C. If yes, how many cigarettes per day?	☐☐	☐☐
29D. Any other tobacco smoked?	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown
30A. Did s/he chew tobacco within the last 5 years?	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown
30B. Did s/he apply tobacco within the last 5 years?	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown
31A. Did s/he normally drink alcohol (use local term) at least once a week during most weeks in the last 5 years?	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown
31B. If yes, what was the average no. of days per week s/he drank?	☐ days OR ☐ Unknown	☐ days OR ☐ Unknown
31C. If yes, what type of alcohol was most commonly consumed?	☐ 1. Country liquor ☐ 3. Indian made foreign liquor ☐ 2. Toddy ☐ 4. Beer ☐ 5. Other	☐ 1. Country liquor ☐ 3. Indian made foreign liquor ☐ 2. Toddy ☐ 4. Beer ☐ 5. Other
32. Was s/he a pure vegetarian (consumed no egg, meat or fish) for the last 5 years?	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown	☐ 1. Definite Yes ☐ 2. Definite No ☐ 99. Unknown

For female deaths aged 15-49 ask: 33. Was she either known or suspected to be pregnant or within 42 days of delivery or abortion?

☐ 1. Yes ☐ 2. Definite No → If YES to question Q33 then DO NOT complete narrative below. Instead complete Form 10D and copy the Form 10D number here ⟶ ☐☐☐☐☐☐☐

34. Key symptoms (check all that apply, and then use symptom list for narrative)

☐ 1. Fever ☐ 2. Cough ☐ 3. Breathlessness ☐ 4. Diarrhoea/dysentry ☐ 5. Weight loss ☐ 6. Chest pain ☐ 7. Paralysis/stroke ☐ 8. Oedema (swelling) ☐ 9. Urinary problems ☐ 10. GI tract problems ☐ 11. Jaundice ☐ 12. Seizures/fits

Section 3: Written narrative in local language

35. Narrative language code ☐☐

Please describe the symptoms in order of appearance, doctor consulted or hospitalization, history of similar episodes, enter the results from reports of the investigations if available. (Use attached symptoms list)

Respondent's cooperation: ☐ 1. Good ☐ 2. Poor

Interviewer name: _____ Code: ☐☐☐

Date: D D / M M / Y Y

Signature/Impresion

Respondent: Respondent

Interviewer: Interviewer

RGI/CGHR PROSPECTIVE STUDY
SRS - VERBAL AUTOPSY FORM
Form 10D: Maternal death (females aged 15 to 49 years)

CONFIDENTIAL

SRS unit number

Unique form number 5

Year : 20

1st HYS ☐ 2nd HYS ☐

Name of the head of the household

Identification code of the head

Full name of deceased

Identification code of the deceased

1. How many months long was the pregnancy?

2A. How many times previously was she pregnant?

2B. How many times previously did she deliver a live infant?

3A. Did she receive antenatal care during this pregnancy?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

3B. How many times did she receive antenatal care during this pregnancy?

4. How many days after delivery/abortion did she die?

5. Where was the delivery/abortion?

☐ 1. Home
☐ 2. On way to Health facility
☐ 3. PHC/CHC/Rural Hospital
☐ 4. Public Hospital
☐ 5. Private Hospital
☐ 6. Other place
☐ 99. Unknown

6. If the delivery was NOT at home - were other women delivering babies at the facility at the same time the woman delivered?

☐ 1. No - mother was only delivery
☐ 2. Yes - 5 or less other women
☐ 3. Yes - more than 5 other women
☐ 99. Unknown

7. Who attended the delivery?

☐ 1. Untrained traditional birth attendant
☐ 2. Trained traditional birth attendant
☐ 3. ANM/Nurse
☐ 4. Allopathic Doctor
☐ 5. None
☐ 6. Other
☐ 99. Unknown

8. Did she have a caesarean delivery?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

9. Did she have too much bleeding at the beginning of labour pains?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

10. Did she have too much bleeding during labour (before delivering the baby)?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

11. Did she have too much bleeding after delivering the baby?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

12. Did she have prolonged labour: ≥ 24 hours for first baby, ≥ 12 hours otherwise?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

13. Did she have difficulty delivering the placenta?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

14. Did she have fits or loss of consciousness during the pregnancy, during labour or after labour?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

15. Did she have a fever after the birth?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

16. Did she have foul smelling discharge?

☐ 1. Yes ☐ 2. No ☐ 99. Unknown

Section 3: Written narrative in local language

17. Narrative language code

Please describe the symptoms in order of appearance, doctor consulted or hospitalization, history of similar episodes, enter the results from reports of the investigations if available. (Use attached symptoms list)

Respondent's cooperation: ☐ 1. Good ☐ 2. Poor

Interviewer name: Code:

Date: D D / M M / Y Y

Signature/Impresion

Respondent: Respondent

Interviewer: Interviewer