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# ACCURACY OF THE TENTATIVE UNDERLYING CAUSE OF DEATH CODE BASED ON RULE 1 AND RULE 2

**Linda Widyaningrum*, Naufal Arifin Yuliadi, Sella Yulia Sari**
Medical Records and Health Information, Unversitas Duta Bangsa, Jl. Bhayangkara No.55, Tipes, Serengan, Surakarta, Central Java 57154, Indonesia
*linda_widya.udb.ac.id

## ABSTRACT

Tentative Underlying Cause of Death (TUCoD) is the code selected as the result of each step in the process, when applying the instructions for each step. This research is a descriptive study with a cross sectional data approach, data sources obtained from primary data, namely the results of patient medical record documents and the results of interviews with the head of medical records and coding officers using research instruments, observation guidelines, interview guidelines, check-lists, MMDS tables. The samples taken was 82 samples from a total population of 444 general death certificates. The data sources taken are primary sources, namely the results of interviews and observations and secondary sources are taken from the SPO for coding the death index. The results of the accuracy of writing the sequence of events were 85% and the inaccuracy was 15%, this was due to the recording being carried out by the doctor in charge of the patient, determination of the tentative underlying cause of death code which is based on rule 1 at 24% with each rule 1 namely Rule 1.1 at 45% and rule 1.2 at 55%, rule 2 is 7% and General Principle rule is 69. Conclution this researsch procedure uses ICD-10 but does not involve MMDS, 85% of the event sequence writing is accurate, while 15% is inaccurate, the determination of rule 1 is 26% respectively for rule 1, namely rule 1.1 at 43% and rule 1.2 at 57% rule 2 at 6% and rule GP at 68% suggest immediate revision of the SOP for causes of death by involving MMDS in the death coding procedure. It would be better for coding officers to be more careful in coding the diagnosis of the basic cause of death so that there is no diagnosis without a code. diagnosis and improve coordination between medical record officers, doctors and other health workers to increase the completeness of medical records.

Keywords: death certificates; rule mortality; tentative underlying cause of death

## INTRODUCTION

Coding is carried out by a medical recorder using the classification standard, namely ICD-10. ICD 10 is a statistical classification, consisting of a number of alphanumeric codes that differ from each other according to categories, which describe the concept of the whole disease. The classification in ICD-10 includes guidelines that contain specific rules or regulations for its use. Implementation of diagnostic coding must be complete and accurate in accordance with ICD-10 directives (WHO, 2016).ICD-10 can be used to classify diseases and other disorders summarized in various types of health and vital records. In fact, it was once used to classify causes of death as recorded in death certificate registration, which then expanded its scope to include diagnoses in morbidity (WHO, 2016). Reports on causes of death are very useful for hospitals so that hospitals can make classifications of the main causes of death which can be used to evaluate the quality of services, the need for medical personnel and medical equipment. The 6th International Decennial Revision Conference agreed that the cause of death for the first tabulation should be designated Underlying Cause of Death (UCoD). From a death prevention perspective, it is important to break the chain of events or circumstances that influence healing at any given time. The most effective general public health objective is to prevent precipitating causes. Therefore, the underlying cause of death (Underlying Cause of Death) is an illness or injury which causes a series of events that lead directly to death or an accident or violence that causes fatal injury (WHO, 2016). Tentative Underlying

Cause of Death (TUCoD) is the code selected as the result of each step in the process, if the instructions for each step are applied (Pacific Community, 2021).

Coding cause of death can use ICD-10 to code the disease diagnosis in the death certificate and then refer to it in the MMDS (Medical Mortality Data System) table. MMDS MMDS is data used to automate the recording, classification and retrieval of information reported on death certificates (NCHS, 2015). When more than one cause of death is recorded, the first step in selecting the underlying cause is to determine the initial cause by applying selection rules including the general principle, Rule 1, rule 2, rule 3. Rule 1 the sequence reported ends in the condition first entered. in the certificate, if the general principle is not applied and there is a reported sequence ending in the first condition entered in the certificate, then select the original cause sequence. If there is more than one sequence that ends in the condition mentioned at the beginning, then choose the original cause from the sequence of causes mentioned at the beginning. Rule 2 unreported sequence ends at the first condition entered on the certificate, if there is no reported sequence ending at the first condition entered on the certificate, then choose the condition mentioned first (NCHS, 2018)

Coding on death certificates at PKU hospitals Muhammadiyah Surakarta uses ICD-10 to determine diagnosis codes on death certificates and MMDS to determine rules and assign basic cause of death codes. Where the doctor writes the diagnosis of Underlying Cause of Death in the patient's medical record document and is coded by the code officer.The unique thing about the title of this research is that the researcher wants to know whether the doctor has written the sequence of events on the death certificate according to the rules of ICD-10 volume 2 and whether the medical record officer applies the mortality rules using MMDS. Based on a survey conducted by researchers from the results of interviews, it was found that errors in writing the sequence of events, both in writing and placement, were often made by the doctor responsible for the patient. For the results of a preliminary study carried out by the author at the PKU Muhammadiyah Surakarta Hospital. The results of the preliminary study began by opening 10 patient medical record documents in the death certificate section to be used as samples in the preliminary stud

## METHOD

This research is a descriptive study with a cross sectional data approach, data sources obtained from primary data, namely the results of patient medical record documents and the results of interviews with the head of medical records and coding officers using research instruments, observation guidelines, interview guidelines, check-lists, MMDS tables. . The number of samples taken was 82 samples from a total population of 444 general death certificates using the Slovin formula. The data sources taken are primary sources, namely the results of interviews and observations and secondary sources are taken from the SPO for coding the death index. Data processing is carried out by collecting data, examining data, classifying and compiling data that is analyzed using descriptive analysis methods.

## RESULTS AND DISCUSSION

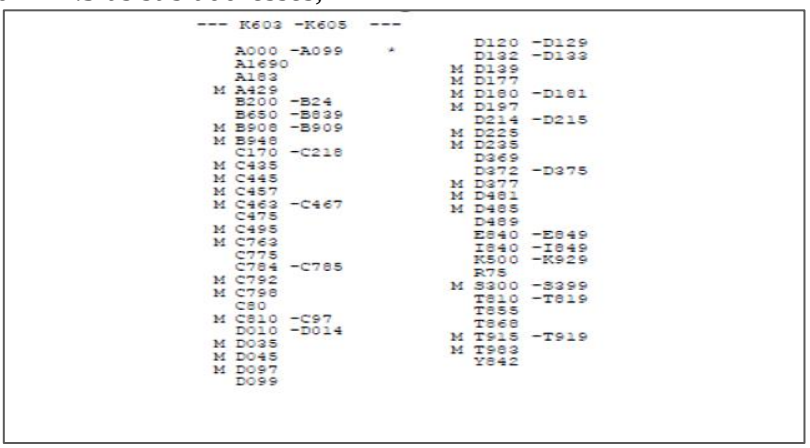
### Accuracy of Writing a Sequence of Events

The results showed that as many as 85% (70 documents) of the writing of the sequence of events were declared correct, but as many as 15% (12 documents) of writing of the sequence of events were declared incorrect. For example, in one of the medical record documents, the cause of death page is incorrectly written in the following: section I(a) Cardiac arrest (I46.9); I(b) - I(c) CKD, HT

(I12.0), the hospital writes down the sequence of events which in section I(b) is skipped to section I(c) according to the ICD-10 volume 2 guidelines where each section should not be skipped if there are only 2 diagnoses in different sections. They must be written sequentially without skipping as in the ICD-10 volume 2 guide as follows: I(a) Cardiac arrest; I(b) Chronic Kidney Disease (CKD), Hypertension (HT). Based on the results of the interview, the reason the writing of the sequence was not coherent was due to the recording of the diagnosis on the death certificate by the doctor responsible for the patient. The order of writing diagnoses that is in accordance with ICD-10 rules will make it easier for coding parties to code and determine accurate basic cause and effect codes for death. It is necessary to create procedures so that doctors write diagnoses of the basic cause of death in accordance with ICD-10 so that the diagnosis can be easily read and understood to improve communication facilities between health professions (Sri Lestari, 2018: 99).

**Underlying Cause of Death Code based on selection rule 1.1**

Based on the analysis of death certificates in medical record documents, it was found that the number of documents that stipulate rule 1.1 was 9 documents with a percentage of 45%. Example: part I(a) Perianal fistula, Abscess scrotum (K61.0); I(b) DM (E11.9); I(c) Mod et causa sepsis (A41.9), the hospital in determining the diagnosis code in section I(a) only has one code and the determination of the code for diagnosis section I(b) is not in accordance with ICD-10 volume 3, there should be 2 codes in part I(a), namely Perianal Fistula with code K60.3, Scrotum Abscess with code N49.2 and DM with code E14.9. To determine the TUCoD rule, by looking at table D in the MMDS, it is found that code K60.3 at addresses – – – K603 –K605 – – – cannot be found for codes E14.9 and A41.9 as sub addresses,



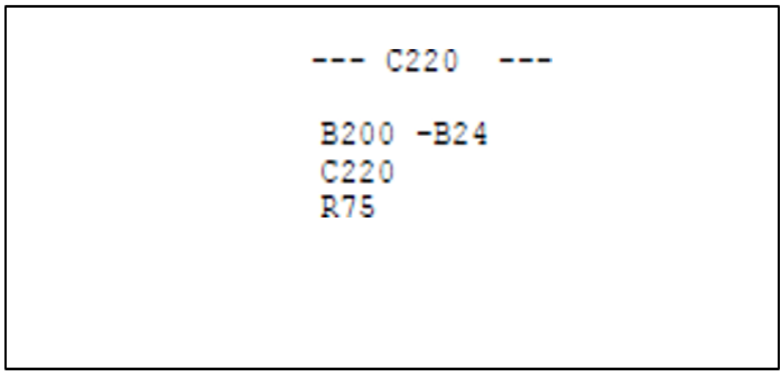

code A41.9 was not found sub address under address – – – E14.9 – – –. So the rule used is rule 1.1 and the TUCoD code obtained is E14.9 Rule 1.1 applies if the general principle cannot be used and there is more than one condition reported ending in the first condition entered on the death certificate, then select the cause entered separately as the basic cause if that condition is the initial cause of the sequence ending with the condition entered first on death certificates (NCHS, 2018). This means that Sepsis mode cannot cause diabetes mellitus, but diabetes mellitus can cause scrotal abscess but cannot cause perianal fistula (Sri Lestari, 2018: 101).

**Underlying Cause of Death Code based on selection rule 1.2**

Based on the results of analysis of medical record documents on the cause of death page, it was found that the number of documents was 11 documents with a percentage of 55%, for example: part I(a) Respiratory failure (J96.9); I(b) ARDS (J80); I(c) Multiple organ failure (R68.8); I(d) DM, CVA (E14.9, I64) hospital in determining the diagnosis code in part I(d), namely the diagnosis of Diabetes mellitus using code E11.9 but based on ICD-10 volume 3 the code for this diagnosis uses code E14.9. To determine this rule, by looking at table D in the MMDS, we get the code J80 located at address – – – J960–J969 – – – with sub address A000-R825. Selection rule 1.2 is the use of the mortality rule if there is more than one sequence that ends in the first condition mentioned, then select the initial cause from the sequence mentioned first. This means that Diabetes mellitus (DM) can cause multiple organ failure, multiple organ failure can also cause acute respiratory distress syndrome (ARDS) and acute respiratory distress syndrome can cause respiratory failure. Likewise, the diagnosis of cerebrovascular accident (CVA) can cause multiple organ failure, multiple organ failure can also cause acute respiratory distress syndrome and acute respiratory distress syndrome can cause respiratory failure, but to determine which one will become TUCoD is the first one mentioned on the death certificate. So the diagnosis of diabetes mellitus (E14.9) is TUCoD (NCHS, 2018).

**Tentative underlying cause of death based on rule 2**

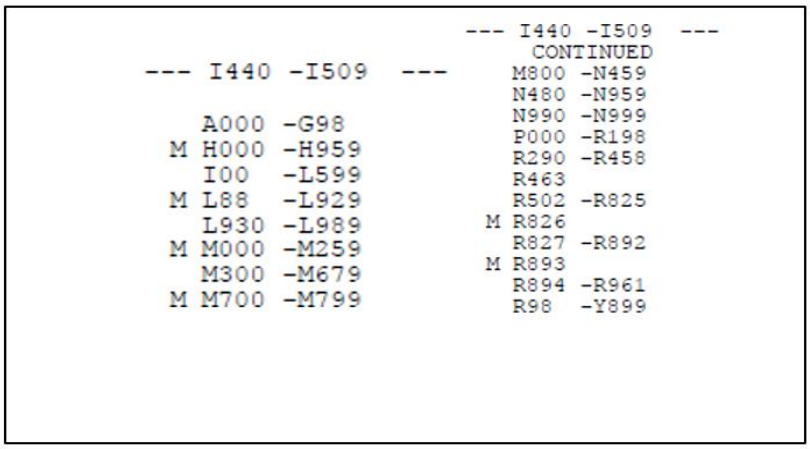
The tentative underlying cause of death code based on rule 2 at the PKU Muhammadiyah Surakarta Hospital yielded a result of 7% (6 documents). For example the following: Part I(a) HCC stage IV (C22.0); I(b) Hepatitis B chronic (B18.1), in order to find out which TUCoD code, after knowing the diagnosis codes, the codes are referred to MMDS table D to look for diagnosis codes B18.1 at address – – – C220 – – –, but code B18.1 does not have a sub address. So the TUCoD rule used is rule 2.




If none of the reported sequences ends in the condition first entered on the certificate, select the first condition listed. This means that a diagnosis of chronic hepatitis B cannot result in stage IV hepatocellular carcinoma (HCC). So the diagnosis code used is HCC stage IV (C22.0) (NCHS, 2018).

***Tentative underlying cause of death* berdasarkan *rule* General Principle**

The tentative underlying cause of death code resulted in 68% (56 documents). For example, as follows: Part I(a) Cardiac arrest (I46.9); I(b) CHF (I50.0), to find out the TUCoD code, after determining the diagnosis codes the code is referred to the MMDS table table D, to look for the I50.0 code at the address – – – I440-I509 – – –, the code has been found at subaddress I00-I599 so the rule used is general principle (GP).




## CONCLUSION

The accuracy of writing the sequence of events from 82 samples of medical record documents, there are 70 medical record documents where the writing of the sequence of events was declared accurate with a percentage of 85% and 12 medical record documents where the writing of the sequence of events was declared inaccurate by 15% due to the recording by the doctor in charge. patientDetermination of the tentative underlying cause of death (TUCoD) code based on rule 1 and rule 2. the 82 samples of medical record documents, 68% (56 documents) of rule 1 obtained a code determination based on GP rule, 21 documents with a percentage of 26%. Rule 1.1 the number of documents obtained was 9 documents withpercentage of 43%, rule 1.2 the number of documents obtained was 12 documents with a percentage of 57%. For code determination based on rule 2, 5 documents were found with a percentage of 6%.

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