# Inaccuracy Analysis of Diagnosis Code of Disease in Medical Records with SIMPUS at Purwoharjo Public Health Center

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**Abstract.** *The inaccuracy of the disease diagnosis code is one of the problem affecting the quality of health services. Based on the preliminary result, 89 outpatient diagnosis codes in a medical record found 30 inaccuracies data from SIMPUS result of general poly at Purwoharjo Health Center. The impact of this inaccuracy has been influenced by the accuracy of disease data that resulted from making report data. The purpose of this study was to analyze the inaccuracy of disease diagnosis codes for outpatient medical records with SIMPUS at Purwoharjo Public Health Center. It was a descriptive study with observation, interviews, and documentation data collection. The object of this study was 95 outpatient medical records with simple random sampling. The result of this research was found 42% inaccuracy code of outpatient medical records with SIMPUS. The cause of these problems was the coder less careful in enforcing the disease diagnosis code because of the high workload of the coder and there's no job description in SOP, so the advice that can be given to Purwoharo Health Center is to hold a division of tasks evenly and can be written in the SOP job description.*

*Keywords: Code inaccuracy, Diagnosis, Medical Record*

## 1. INTRODUCTION

The public health center is one of the health facilities that organizes first-level individual health efforts by prioritizing promotive and preventive at the work process [1]. Puskesmas is carrying out their work and always prioritizes the quality of health services, one of them which is the coding diagnosis [2]. Diagnostic coding is one activity of translating a disease diagnosis into a coded form consisting of letters and numbers [3]. The accuracy in giving the diagnosis code can be influenced by the accuracy of the diagnosis made by the doctor. The coding diagnosis is performed by a medical recorder following the standard regulation in Indonesia [4].

The coding results of a patient's diagnosis are not only written in the medical record that keeps up the development of the health information system, but the diagnosis code is also inputted into the Health Center Management Information System (SIMPUS) at the primary level of health service. The Public health center Management Information System (SIMPUS) is an arrangement that provides information to help implement the management of the public health center to achieve the target of activities [5].

Purwoharjo Public Health Center is one of the primary-level service facilities that has implemented SIMPUS for storing data ranging from social data to clinical data patient. In addition, SIMPUS also plays a role in the disease diagnosis coding process at the Purwoharjo

Health Center because the SIMPUS application provided by the local Health Office is integrating with P-care. The P-care application contains diagnostic codes that have followed the existing classification standards in Indonesia, namely the ICD-10 [6]. The diagnosis code data integrated between SIMPUS and P-care can produce data reports of disease more accurately and on time also make officers' work more accessible.

Based on a preliminary study at the Purwoharjo Health Center, 89 medical records data were checked by the researcher in September 2021. It was found that 42 of the 89 disease diagnosis codes in the outpatient medical record still looked inaccurate with the disease code on SIMPUS. Of the 42 diagnostic code data, there were 30 inaccurate disease diagnosis codes between medical records and SIMPUS from general polyclinics. The impact of the inaccuracy of the code was the inaccuracy of disease morbidity data which will affect the reporting data of disease.

From the results study, the inaccuracy of the diagnosis code states that the problem of the inaccuracy of the code will affect the basis for making disease reports. It has impacted inaccurate morbidity data and reporting data. The impact can affect the quality of health services and cause a health service does not have to a valid medical record database [7]. The inaccuracy of the diagnosis code of disease in outpatients' medical records with SIMPUS at the Purwoharjo Health Center has never been analyzed. The purpose of this study was to analyze an inaccuracy of the diagnosis code of disease in medical records outpatients with SIMPUS at Purwoharjo Public Health Center.

## 2. METHODS

This study used descriptive research. The object research used 95 outpatient medical records in general poly with population of 2565 medical records in January-April 2022 using simple random sampling. Data collection techniques used in interviews observation, and documentation. The study was conducted from September 2021 to May 2022 at the Purwoharjo Public Health Center. The research variable was an inaccuracy in the diagnosis code of outpatients disease in medical records with SIMPUS at Purwoharjo Public Health Center.

## 3. RESULTS

The use of diagnosis codes of disease there at appropriate and accurate in health services such as health center are needed to achieve the goals of the disease diagnosis classification system, one of them is to record mortality and morbidity data [8]. Based on the results of observations made by researchers on medical records of outpatients with SIMPUS input results in January-April 2022, there were still inaccuracies in the diagnosis code of outpatients in medical records with SIMPUS.

Based on the results from observations of disease diagnosis codes in medical records with SIMPUS, it has been found accurate diagnosis codes of disease were 55 medical records and 40 inaccurate data from the total sample of 95 medical records data.

**Table 1.** The Result of Inaccuracy Observation in Diagnosis Code of Disease in Outpatient Medical Record with SIMPUS

| No | The disease diagnosis | SIMPUS Code | Medical record code | Information |
|----|----|----|----|----|
| 1 | Hypertension + T2DM without complications | E11.9 & I10 | E11 & I10 | Inaccurate (The accurate code is E11.9 & I10) |
| 2 | Epilepsy | G40.9 | G40.9 | Accurate |
| 3 | Congenital malformation of heart, unspecified | Q24.9 | Q24.9 | Accurate |
| 4 | Glomerular disorders in systemic connective tissue disorders, Hydronephrosis with renal and ureteral calculous obstruction | N05.8 & N13.2 | N05.8 & N13.2 | Accurate |
| 5 | Control Hypertension | I15.9 | I15 | Inaccurate (The accurate code is I15.9) |
| 6 | Hypertensive heart disease without (congestive) heart failure | I11.9 | I11.9 | Accurate |
| 7 | Gonarthrosis | M17.9 | M17.9 | Accurate |
| 8 | T2DM | E11.9 | E11.9 | Accurate |
| 9 | Stroke | I64 | I64 | Accurate |
| 10 | Acute respiratory infections (ARIs) | J06.9 | J06.9 | Accurate |
| 11 | HIV (with TB) , | B20.0 & F54 | B20 & F54 | Inaccurate (The |

| No | The disease diagnosis | SIMPUS Code | Medical record code | Information |
|---|---|---|---|---|
|  | Psychological and behavioral factors associated with disorders or diseases classified elsewhere |  |  | accurate code is B20.0 & F54) |
| 12 | Myalgia | R53 | R53 | Accurate |
| 13 | T2DM+ Myalgia | E11.9 & R53 | E11 & R53 | Inaccurate (The accurate code is E11.9 & R53) |
| 14 | Acute respiratory infections (ARIs) | J06.9 | J06.9 | Accurate |
| 15 | T2DM + Myalgia | E11.9 & R53 | E11 & R53 | Inaccurate (The accurate code is E11.9 & R53) |
| 16 | T2DM + Myalgia | E11.9 & R53 | E11.9 & R53 | Accurate |
| 17 | Fever | R50.9 | R50 | Inaccurate (The accurate code is R50.9) |
| 18 | T2DM | E11.9 | E11.0 | Inaccurate (The accurate code is E11.9) |
| 19 | Moderate Low Vision | H54.2 | H50 | Inaccurate (The accurate code is H54.2) |
| 20 | Fatty liver | K76.0 | K76 | Inaccurate (The accurate code is K76.0) |
| 21 | Acute respiratory infections (ARIs) | J06.9 | J03 | Inaccurate (The accurate code is J06.9) |
| 22 | Laceration | S90.9 | S90.9 | Accurate |
| 23 | Acute respiratory infections (ARIs) | J06.9 | J06 | Inaccurate (The accurate code is J06.9) |
| 24 | Cataract | H26.9 | H26 | Inaccurate (The accurate code is H26.9) |
| 25 | Follow-up examination for goiter | E04.9 & Z09.0 | E04.9 & Z09.0 | Accurate |
| 26 | Asthma | J45.9 | J45.9 | Accurate |
| 27 | Epilepsy | G40.9 | G40.9 | Accurate |
| 28 | Acute respiratory infections (ARIs) | J06.9 | J06.9 | Accurate |
| 29 | Typhoid fever | A01.0 | A01 | Inaccurate (The accurate code is |

| No | The disease diagnosis | SIMPUS Code | Medical record code | Information |
|---|---|---|---|---|
| | | | | A01.0) |
| 30 | Acute respiratory infections (ARIs) | J06.9 | J06.9 | Accurate |
| 31 | Ca. Mamae | C50.9 | C50.9 | Accurate |
| 32 | T2DM | E11.9 | E11.9 | Accurate |
| 33 | T2DM (unspecified complication) | E11.8 | E11.8 | Accurate |
| 34 | Acute respiratory infections (ARIs) | J06.9 | J06.9 | Accurate |
| 35 | Paranoid schizophrenia | F20.0 | F20.0 | Accurate |
| 36 | T2DM + Myalgia | E11.9 & R53 | E11.9 & R53 | Accurate |
| 37 | T2DM | E11.9 | E11.9 | Accurate |
| 38 | Acute respiratory infections (ARIs) | J06.9 | J06.9 | Accurate |
| 39 | Defek septum ventrikel | Q21.0 | Q21.0 | Accurate |
| 40 | T2DM + Myalgia | E11.9 & R53 | E11.9 & R53 | Accurate |
| 41 | Cataract (anamnesis: old age) | H25.9 | H26 | Inaccurate (The accurate code is H25.9) |
| 42 | Idiopathic gout | M10.0 | M10.0 | Accurate |
| 43 | Myalgia | R53 | R53 | Accurate |
| 44 | Typhoid fever | A01.0 | A01 | Inaccurate (The accurate code is A01.0) |
| 45 | Peptic ulcer + asthma | J45.9 & K29.7 | K29.7& J45 | Inaccurate (The accurate code is J45.9 & K29.7) |
| 46 | Sleep disturbance due to anxiety | F41.9 & G47.9 | F41.9 & G47.9 | Accurate |
| 47 | Pneumonia due to other specified infectious organisms | J16.8 | J16 | Inaccurate (The accurate code is J16.8) |
| 48 | Hypertension + T2DM | E11.9 & I10 | E11 & I10 | Inaccurate (The accurate code is E11.9 & I10) |
| 49 | Cataract (anamnesis: old age) | H25.9 | H26 | Inaccurate (The accurate code is H25.9) |
| 50 | Cholecystitis | K81.9 | K81 | Inaccurate (The accurate code is K81.9) |
| 51 | Laceration | S90.9 | S81.8 | Inaccurate (The |

| No | The disease diagnosis | SIMPUS Code | Medical record code | Information |
|---|---|---|---|---|
| | | | | accurate code is S90.9) |
| 52 | T2DM (History of renal complications) | E11.0 | E11.9 | Inaccurate (The accurate code is E11.0) |
| 53 | LBP | M54.5 | M54.5 | Accurate |
| 54 | Pneumonia + COPD | J18.9 & J44.9 | J44.9 & J18.9 | Accurate |
| 55 | Schizophrenia | F20.9 | F20 | Inaccurate (The accurate code is F20.9) |
| 56 | Sindrom nephrotic | N04.9 | N04.9 | Accurate |
| 57 | Degenerative disc disease | M51.9 | M50 | Inaccurate (The accurate code is M51.9) |
| 58 | Schizophrenia | F20.9 | F20 | Inaccurate (The accurate code is F20.9) |
| 59 | HIV (TB history) | B20.0 | B20 | Inaccurate (The accurate code is B20.0) |
| 60 | Pneumonia due to other specified infectious organisms | J16.8 | J16 | Inaccurate (The accurate code is J16.8) |
| 61 | HIV (TB history) | B20.0 | B20.0 | Accurate |
| 62 | HIV due to infection | B20.9 | B20 & F54 | Inaccurate (The accurate code is B20.9) |
| 63 | Moderate low Vision | H54.2 | H50 | Inaccurate (The accurate code is H54.2) |
| 64 | T2DM + Mialgia | E11.9 & R53 | E11.9 & R53 | Accurate |
| 65 | Myasthenia gravis | G70.0 | G70 | Inaccurate (The accurate code is G70.0) |
| 66 | CKD | N18.9 | N18.9 | Accurate |
| 67 | Chest pain | R07.4 | R07.4 | Accurate |
| 68 | Irritation due to contact with certain drugs Iritasi karena tersentuh obat tertentu | L24.4 | L24.0 | Inaccurate (The accurate code is L24.4) |
| 69 | Conjunctivitis | H10.9 | H10 | Inaccurate (The accurate code is H10.9) |
| 70 | HIV (TB history) | B20.0 | B20 | Inaccurate (The |

| No | The disease diagnosis | SIMPUS Code | Medical record code | Information |
|---|---|---|---|---|
| | | | | accurate code is B20.0) |
| 71 | T2DM without complications with hypertension | E11.8 & I10 | E11.9 & I10.9 | Inaccurate (The accurate code is E11.8 & I10) |
| 72 | Senile cataract insipiens | H25.0 | H25.0 | Accurate |
| 73 | Conjunctivitis | H10.9 | H00 | Inaccurate (The accurate code is H10.9) |
| 74 | Inflammation of the stomach with heat | K29.9 & R50.9 | K29.7 & R50 | Inaccurate (The accurate code is K29.7 & R50.9) |
| 75 | T2DM with unknown complications | E11.8 | E11.8 | Accurate |
| 76 | T2DM + Mialgia | E11.9 & R53 | E11.9 & R53 | Accurate |
| 77 | Myalgia | R53 | R53 | Accurate |
| 78 | CVA | I69.8 | I69.8 | Accurate |
| 79 | T2DM without complications | E11.8 | E11.8 | Accurate |
| 80 | Inflammation of the tonsils (anamnesis: ± 1 year) | J35.0 | J35.9 | Inaccurate (The accurate code is J35.0) |
| 81 | T2DM + Mialgia | E11.9 & R53 | E11.9 & R53 | Accurate |
| 82 | T2DM + Mialgia | E11.9 & R53 | E11.9 & R53 | Accurate |
| 83 | Cardiomegaly | I57.1 | I57.1 | Accurate |
| 84 | Laceration | S90.9 | S90 | Inaccurate (The accurate code is S90.9) |
| 85 | Other hypertension | I15.8 | I15.8 | Accurate |
| 86 | T2DM + Pattern headache | E10.8 & G44.0 | E10.8 & G44.0 | Accurate |
| 87 | T2DM + Mialgia | E11.9 & R53 | E11.9 & R53 | Accurate |
| 88 | Cardiomegaly | I57.1 | I57.1 | Accurate |
| 89 | LBP | M54.5 | M54.5 | Accurate |
| 90 | HIV (TB history) | B20.0 | B20 | Inaccurate (The accurate code is B20.0) |
| 91 | HIV (TB history) , Psychological and behavioral factors associated with disorders or diseases classified elsewhere | B20.0 & F54 | B20 | Inaccurate (The accurate code is B20.0 & F54) |

| No | The disease diagnosis | SIMPUS Code | Medical record code | Information |
|----|----------------------|-------------|---------------------|-------------|
| 92 | Control due to brain bleeding | I61.9 & Z09.0 | I61.9 & Z09.0 | Accurate |
| 93 | Clogged ears | H61.2 | H61.2 | Accurate |
| 94 | T2DM + Myalgia | E11.9 & R53 | E11.9 & R53 | Accurate |
| 95 | Bleeding peptic ulcer | K27.4 | K27.4 | Accurate |

Based on table 1. the results of the observations from 95 medical records of outpatients with SIMPUS, then calculated the percentage of inaccuracies in disease diagnosis codes and the following results were obtained:
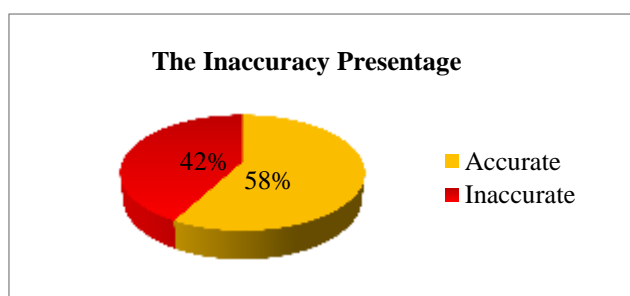


**Figure 1.** Inaccuracy Percentage of Diagnosis Codes of Disease for outpatients Medical Records with SIMPUS at Purwoharjo Public Health Center

Based on figure 1. the percentage of inaccuracies in the diagnosis code for outpatients' medical records with SIMPUS at the Purwoharjo Public Health Center reached 42% while the accuracy of the diagnosis code of disease reached 58%.

*"There were problems related to the reports of diseases at the Purwoharjo Public Health Center, which were caused by SIMPUS which was not yet continuous with P-care. However, these obstacles have been overcome so that disease reports can be taken directly from SIMPUS"(Informants 1-4)*

Based on the results of this interview, it was known that the presence of inaccurate diagnosis code data of disease can affect the accuracy of making reports at the Purwoharjo Public Health Center. The constraint in making reports of the top 10 have occurred because there was no continuity between SIMPUS and P-care data. However, the problem improvements have been made, then SIMPUS and P-care data continuity can be realized. The continuous data between SIMPUS and P-care is expected to produce accurate and on time reports.

*"Coder also attempted to a coding for the diagnosis of outpatients immediately after the patient's status was obtained, but there was still a constrained diagnosis coding that could*

*not be coded immediately because of the large number of incoming patients, while the coder duty was not only coding but also other jobs, assembling and distributing medical records."*
*(Informant 1,2)*

Based on the results of interviews with the coder, it was known that the process of coding from the disease diagnosis that coder did cannot be resolved because of the double job. The amount of work done by a coder can make the coder less careful in coding the diagnosis of the disease. According to the coder, the inaccuracy of the diagnosis code of disease can occur due to less accuracy coder in enforcing the diagnostic code.

## 4. DISCUSSION

The accuracy of diagnosis coding of disease based on minimum service standards in the medical record field must reach 100% [9]. The inaccuracy of diagnosis coding of disease in outpatient medical records with SIMPUS at the Purwoharjo Public Health Center was not following the professional standards of medical recorders and health information in determining the diagnosis code of disease correctly according to the existing classification in Indonesia (ICD-10) [10]. A patient's diagnosis code of disease that is not coded appropriately and accurately can cause low data validation which results in reports such as outpatient morbidity reports and the top 10 diseases [11].

This is supported by the results of the previous studies which stated that the coding error of the disease diagnosis occurred due to the lack of accuracy of the coder in coding which resulted in the inaccuracy of the disease diagnosis code being enforced [12]. Previous research also stated the workload coder that accumulates causes diagnosis code of disease is inaccuracies up to 70% compared to a low coder workload there are only 22% inaccuracies in diagnosis codes [13]. The coder is responsible for the accuracy of the diagnostic code enforcement. Previous research stated that the lack of accuracy of the coder for not re-checking the diagnosis that has been coded whether it is following the history, supporting results, or the diagnosis listed in the medical record is the cause of the inaccuracy of coding the disease diagnosis [14].

The coding of the diagnosis that did by a coder there is still constraint related to the workload of officers that affect the accuracy of officers in coding so that it can have an impact on the inaccuracy of the diagnosis code for outpatient diseases between SIMPUS and medical records at the Purwoharjo Public Health Center.

Purwoharjo Health Center should be able to hold a division of tasks equally and can be written in the job description in the SOP for coding disease diagnosis. There is clarity on the authority of any officer who can do the coding of a disease diagnosis in the medical record and the division of its duties following the job description of each officer to minimize the inaccuracy of the diagnosis code for the outpatient medical records with SIMPUS at the Purwoharjo. This is supported by previous research that the problem of inaccuracies in diagnosis codes of disease that are not immediately overcome can have an impact on the resulting inaccurate and invalid data information so that disease reporting data becomes less accurate which has an impact on the quality of health services [15].

## 5. CONCLUSION

Based on the results, regarding the inaccuracy of the diagnosis code of disease for outpatients' medical records with SIMPUS conducted at the Purwoharjo Public Health Center, it can be concluded that from the results of 95 medical records studied there were about 42% or 40 medical records data of disease code were still less accurate with SIMPUS. One of the causes of these inaccuracies was that there was no division of tasks or job descriptions for each officer, which causes the coder to have a large workload and has an impact on the accuracy of the coder in enforcing the diagnosis code, causing inaccuracies in the diagnosis code of outpatient disease in medical records with SIMPUS at the Purwoharjo Public Health Center.

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