# Accuracy of International Classification of Diseases (ICD) 10 Coding for Dengue Haemorraghic Fever (DHF) Infections based on Laboratory Result at RSUP Dr. M Djamil, Padang

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## ABSTRACT

**Introduction:** Dengue has become a global public health concern. Epidemiologic measures of the burden of dengue such as its incidence and prevalence are important for policymaking and monitoring the progress of disease control. WHO reported the global incidence of dengue has increased 30-fold in the past 50 years and estimated some 50 to 100 million new infections occurred annually (WHO, 2016) causing about 20,000 deaths. Few studies have make use of administrative data which are available from hospital discharge and health insurance claims databases (Uhart, 2016) in part because the validity of discharge diagnoses codes is uncertain. The aim of this study is to evaluate the accuracy of diagnoses coded according to the International Classification of Diseases, Tenth Revision (ICD-10) codes for dengue. Validation of these codes is necessary to promote the wider use of hospital discharge and insurance claims data for health services research on dengue.

**Material and methods**: The study used descriptive method with a quantitative approach retrospective review of medical records. Data was collected in RSUP. Dr. M. Djamil, Padang, West Sumatera, Indonesia. Study population was all inpatient of dengue haemorrhagic fever (A91) medical records and laboratory results from January to December in 2019, for these 45 medical records. Accuracy diagnoses code are coded according to the International Classification of Diseases, Tenth Revision, (ICD-10).

**Result:** Accuracy coding of Dengue Haemorrahge fever in Hospital Dr. M.Jamil Padang is 99.85% and accuracy diagnosis according to labolatory result is 99.92%.

**Conclusion:** Medical record unit of hospital is good for coding quality.

**Keyword:** Dengue, Medical Record, ICD 10, Code, Accuracy

## INTRODUCTION

Hospital is a complete individual health service institution that provides inpatient, outpatient and emergency services.[1] RSUP Dr. M. Djamil Hospital is a Class A Education hospital with the status of a Public Service Agency (BLU), is a referral hospital for the Central Sumatra region, serving people in the provinces of West Sumatra, Riau, Jambi, Bengkulu, and the southern part of North Sumatra with a capacity 800 TT. Medical Record as one of the units in hospital that is tasked with collecting, managing and analyzing all medical record files. Medical Record is a file containing notes and documentation about patient identity, examination, treatment, actions and other services that have been provided to patients.[2] Coding is the provision of code assignments using letters or numbers or a combination of letters in numbers that represent data components. Activities and actions and diagnoses contained in medical records must be coded and then indexed in order to facilitate services in presenting information to support planning, management and research functions in the health sector.[3]

Viruses are highly contagious intracellular pathogens present ubiquitously in nature. Since the ancient time infectious disease are leading cause of large scale human casualties and among all the infectious diseases virus based infections are much higher nearly 50% of all global infections.[4] Dengue has become a global public health concern. Epidemiologic me asures of the burden of dengue such as its incidence and prevalence are important for policymaking and monitoring the progress of disease control. WHO reported the global incidence of dengue has increased 3 0-fold in the past 50 years and estimated some 50 to 100 million new infections occurred annually causing about 20,000 deaths.[5] These estimates are largely based on dengue notification data reported to national surveillance systems, which are widely used as a proxy measure of dengue incidence.[6] However, for dengue where the majority of infected individuals are asymptomatic and may suffer no or little adverse health consequences, estimates of incidence and prevalence are measures of disease frequency rather than measures of the disease burden. Few studies have make use of administrative data which are available from hospital discharge and health insurance claims databases[7] in part because the validity of discharge diagnoses codes is uncertain. The aim of this study is to evaluate the accuracy of diagnoses coded according to the International Classification of Diseases (ICD) 10 codes for dengue. Validation of these codes is necessary to promote the wider use of hospital discharge and insurance claims data for health services research on dengue.

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## MATERIAL AND METHOD

The study used descriptive method with a quantitative approach and retrospective review of medical records. Data was collected from July-September 2020 in RSUP. Dr. M. Djamil, Padang, West Sumatera, Indonesia. Inclusion criteria was dengue haemorrhage fever code A91. Study

| No | Diagnosis | Labolatory result | Labolatory examination | Code in medical record | ICD-10 Code |
|---|---|---|---|---|---|
| 1 | DHF grade II | IgG (-) dan IgM (+) | Serological | A91 | A91 |
| 2 | DH grade I | IgG (+) dan IgM (-) | Serological | A91 | A91 |
| 3 | DHF grade II | IgG (+) dan IgM (-) | Serological | A91 | A91 |
| 4 | DHF grade II | IgG (+) dan IgM (-) | Serological | A91 | A91 |
| 5 | DHF grade III with recurrent shock | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 6 | DHF | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 7 | DHF | IgG (+) dan IgM (+) | Serological | - | A91 |
| 8 | DHF grade II | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 9 | Dengue shock syndrom | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 10 | DHF grade II | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 11 | DHF grade IV | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 12 | DHF grade II | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 13 | DHF grade II | IgG (+) dan IgM (+) | Pemeriksaan Serologi (lembar hasil pemeriksaan tidak ditemukan dalam rekam medis) | A91 | A91 |
| 14 | DHF grade II | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 15 | DHF grade III with recurrent shock | IgG (+) dan IgM (+) | Pemeriksaan Serologi (lembar hasil pemeriksaan tidak ditemukan dalam rekam medis) | A91 | A91 |
| 16 | DHF | IgG (+) dan IgM (+) | Serological | A90 | A91 |
| 17 | DHF grade II | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 18 | DHF grade I | IgG (+) dan IgM (+) | Serological | - | A91 |
| 19 | DHF grade II | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 20 | DHF grade III | IgG (+) dan IgM (+) | Serological | A91 | A91 |
| 21 | Dengue shock syndrom | - | Tidak ada lembar pemeriksaan imunologi dan serum serta tidak dicantumkan hasil pemeriksaan di ringkasan pulang | A91 | A91 |
| 22 | DHF grade II | Trombositopenia | Haematological | A91 | A91 |
| 23 | DHF grade III | Trombositopenia | Haematological | A91 | A91 |
| 24 | DHF grade II | Trombositopenia | Haematological | A91 | A91 |
| 25 | Dengue shock syndrom | trombositopenia | Haematological | A91 | A91 |
| 26 | DHF grade II | trombositopenia | Haematological | A91 | A91 |
| 27 | DHF grade III | trombositopenia | Haematological | A91 | A91 |
| 28 | DHF grade II | trombositopenia | Haematological | - | A91 |
| 29 | DHF grade I | trombositopenia | Haematological | - | A91 |
| 30 | DHF grade II | trombositopenia | Haematological | - | A91 |
| 31 | DHF grade II | trombositopenia | Haematological | A91 | A91 |
| 32 | DH grade I | trombositopenia | Haematological | A91 | A91 |
| 33 | DHF grade II | trombositopenia | Haematological | - | A91 |
| 34 | DHF grade II | trombositopenia | Haematological | A91 | A91 |
| 35 | DHF grade II | trombositopenia | Haematological | A91 | A91 |
| 36 | DHF grade II | trombositopenia | Haematological | A91 | A91 |
| 37 | DHF grade II | trombositopenia | Haematological | A91 | A91 |
| 38 | DHF grade | trombositopenia | Haematological | A91 | A91 |
| 39 | DHF grade III | trombositopenia | Haematological | A91 | A91 |
| 40 | DHF grade III | trombositopenia | Haematological | A91 | A91 |

DHF = Dengue Haemorrhagic Fever

**Table-1:** Accuracy code based on International Classification of Diseases, Tenth Revision, (ICD-10) and Labolatory Examination Result.

population was all inpatient of dengue haemorrhagic fever (A91) medical records and laboratory results from January to December in 2019, for these 45 medical records inpatient (Slovin pattern). We compared discharge diagnoses ICD codes for dengue against the standard diagnostic tests based on dengue IgG and IgM. Both IgG and IgM might not identify all dengue cases presenting to the hospitals but they are sufficiently accurate to be recommended for routine diagnostic use. For this study we defined a record of having a true diagnosis of dengue if showed a positive result for labolatory result. Information of haematology result is also used for confirmation accuracy code. Accuracy diagnoses according to the International Classification of Diseases, Tenth Revision, (ICD-10). Research variable is accuracy diagnosis code based on ICD- 10 and accuracy diagnosis according labolatory result.

## RESULT

Table 1. Shows the result of accuracy Dengue Haemorraghic Fever (DHF) code A91 and laboratory examination results. Hospital province of Dr. M. Djamil, Padang is known from 40 observed medical records, 7 medical records inacurate, which are 1 medical record inacurate and 6 medical records are not included in diagnosis code on discharge summary form. Base the result, percentage of accuracy diagnosis code for Dengue Haemorrhagic Fever (DHF) (A91) according to the ICD-10 is 99.85%.

Result of labolatory examination (Table 1), explain from 40 medical records with DHF diagnosis (A91), medical records were not found laboratory results, but laboratory results were written in discharge summary of patient and there was 1 medical record that was not found in laboratory results and did not written result of labolatory on discharge summary. According data, there were 3 medical records whose laboratory results were not found. It means 99.92% (37 medical records) whose laboratory results were complete and accurate with the written diagnoses. There are two types of labolatory examination, Laboratory haematology (thrombocytopenia) examination with 19 medical records and serology examination consisted of 18 medical records. For serology examination, distribution number of samples based on serological examination of anti-dengue IgM-IgG showed that, tests with IgM (+) IgG (+) results (16 samples) is highest than others. It shows number of secondary infections (IgM (+) IgG (+)) is higher than primary infections (IgM (+) IgG (-)).

## DISCUSSION

Administrative data such as hospital discharge and health insurance claims databases have infrequently been used for health services research on dengue despite their considerable strengths which included nationally repre-sentative sample to allow generalizability, larger samplesize and low cost. The main disadvantage of administra-tive data is uncertain validity of the ICD codes used to identify patients with dengue. The same study was conducted by Woon, et al.[8] In several hospitals in Malaysia and found 83% specificity and

94% sensitivity of the diagnostic code accuracy for dengue fever based on ICD-10 CM and serological examination results, so that this value can reduce the risk of inflation at homesick. In this study showed 99.85% accurate code based on ICD-10. Kuntoro in his book explains that the coding quality of a hospital is said to be good if the value range is in the 78-100 interval, then this indicates that the quality of the coding of M. Jamil Hospital is in the good category. Sari and Nurul[9] also analyzed the coding of hepatitis diagnoses and got an accurate number of Hepatitis diagnosis codes as many as 61 files with a percentage of 67.8%.

According to Hatta[10] Standards and coding ethics developed by AHIMA include several standards that must be met by professional coders, including:

1. Coders must follow the current classification system by selecting the appropriate diagnostic coding and action.
2. Accurate, complete and consistent to produce quality data.
3. The coder should be marked with a clear and consistent coded report on the doctor's documentation in the patient's medical record.
4. A professional coder should consult a doctor for classification and completeness of filling in diagnostic and action data.
5. Professional coders do not change the code on the payment bill.
6. Professional coders must develop coding policies at their institutions.
7. Professional coders must regularly improve their coding skills.
8. Professional coders are always trying to provide the most suitable code for payments.

Haematology examination (trombosite) is also used for confirmation to coding. Platelet examination results A decreased or reduced platelet count is an indicator of plasma infiltration. Plasma permeation is caused by an immunological reaction between the dengue virus and the body's defense system which causes changes in the nature of blood vessel walls to become easily penetrated by fluids. These results are in line with previous studies which provide evidence that thrombocytopenia is a haematological parameter disorder that is always found in patients with dengue infection.[11,12]

## CONCLUSION

Accuracy coding of Dengue Haemorrahge fever in Hospital Dr. M.Jamil Padang is 99.85% and accuracy diagnosis according to labolatory result is 99.92%. Medical record unit of hospital is good for coding quality.

## ACKNOWLEDGEMENTS

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