

ANALYSIS OF THE COMPLETENESS AND ACCURACY OF LABOR DIAGNOSIS CODING AT BATARAGURU PUBLIC HEALTH CENTER

Roslina ¹, Niska Salsiani Sinta ^{2*}, Ahmad Amiruddin J ³

^{1, 2, 3} Politeknik Baubau, Baubau, Indonesia

ARTICLE INFORMATION

Received: 4 May 2025
Revised : 9 July 2025
Accepted: 27 August 2025
DOI:

KEYWORDS

Keywords : Coding Completeness, Coding Accuracy, Delivery Diagnosis, ICD-10, Medical Records

CORRESPONDING AUTHOR

Name: Niska Salsiani Sinta
Address: Baubau
Email : niskasalsianisinta@gmail.com

A B S T R A C T

Medical records are essential documents in healthcare services as they serve as a basis for clinical decision-making, quality evaluation, and reimbursement claims. One important component of medical records is diagnosis coding, which must be complete and accurate according to ICD-10 standards. However, in practice, challenges related to the completeness and accuracy of delivery of diagnostic coding are still frequently encountered. This study aims to determine the level of completeness and accuracy of delivery diagnosis coding at Bataraguru Health Center. This was a descriptive quantitative study. The sample consisted of 28 delivery medical record files selected using purposive sampling. The research instrument was an observation checklist assessing completeness and accuracy of diagnosis coding based on ICD-10 guidelines. The study showed that the completeness of diagnosis coding reached 82.14%, while incompleteness accounted for 17.86%. The accuracy of diagnosis coding reached 60.71%, while inaccuracy accounted for 39.28%. Most inaccuracies were caused by the use of unofficial reference sources (Google) and insufficient training of coding staff in ICD-10 applications. Conclusion The completeness of diagnosis coding at Bataraguru Health Center is relatively good; however, the accuracy still needs improvement. Regular ICD-10 training, mandatory use of official references, and continuous monitoring and evaluation are required to improve the quality of diagnostic coding.

INTRODUCTION

Healthcare is a fundamental public need that must be provided equitably, effectively, and with high quality. Healthcare facilities such as community health centers (Puskesmas) play a crucial role in providing promotive, preventive, curative, and rehabilitative services in accordance with national policies. (Law Number 17 of 2023) Medical records are a vital instrument in supporting the quality of health services, as they contain clinical information, legal evidence, and the basis for administrative financing. (Minister of Health Regulation No. 24 of 2022). In addition, medical records are also used for research, evaluation of service quality, and health policy planning. (Darmawan, 2019). The implementation of electronic medical records (EMR) is increasingly emphasized to support service efficiency, but major challenges are still faced, especially in terms of human resources and accuracy of recording. (Irmawati & Nazillahtunnisa, 2019).

A common problem in medical record management is the coding of diagnoses, which does not always conform to standards. Coding diagnoses is necessary to convert clinical data into codes consistent with the international ICD-10 classification, ensuring uniformity and global usability. (Setiyawan et al., 2023) However, in reality, incomplete and inaccurate diagnosis coding is still common, including in community health centers (Puskesmas) as primary healthcare services. A preliminary study at the Bataraguru Community Health Center showed that medical records officers often used unofficial references such as Google rather than the official ICD-10 guidelines. This can lead to administrative errors, reduce the accuracy of financing claims, and decrease the validity of public health data. (Yeni Tri et al., 2024) Therefore, the issue of completeness and accuracy of the coding of labor diagnoses needs further investigation.

The urgency of this research lies in the importance of accurate medical record data as a guarantee of quality healthcare services. Complete and accurate medical records are not only useful for medical personnel in planning patient care but also serve as legal evidence in accordance with applicable law. Minister of Health Regulation No. 269 of 2008. Incomplete or inaccurate codification can have serious implications for INA-CBG-based financing claims at BPJS Kesehatan. (Maulida & Djunawan, 2022). In addition, completeness of the birth diagnosis record also includes the condition of the baby, gestational age, and post-natal actions that must be documented. (K. Salwa, N. Herlinda,

2023)Therefore, this research is highly relevant to be conducted at Community Health Centers (Puskesmas), as primary health care facilities are at the forefront of providing basic public health services.

The theoretical basis of this research refers to the principles of diagnosis coding in ICD-10 which emphasizes accuracy, completeness, and consistency in medical recording.Asadi et al., (2022)explains that good coding must meet the aspects of reliability, validity, completeness, and timeliness. Unfortunately, many officers still code generally without paying attention to the details of the fourth or fifth character in ICD-10. On the other hand, the implementation of a digital-based health information system also requires strengthening through training and technological innovation to ensure a more accurate coding process.(Banoet et al., 2023)The novelty of this study is its focus on the completeness and accuracy of the coding of labor diagnoses in community health centers (Puskesmas), a practice rarely studied compared to hospitals. Therefore, this study has the potential to make a significant contribution to the medical records literature and primary care practice.

A number of previous studies have shown that inaccuracy of obstetric diagnosis codes is still a serious problem.Oashttamadea SM, (2019)found that only 58% of obstetric medical record documents had the correct diagnosis code, while researchNugraha et al., (2021)recorded an inaccuracy rate of 61.4%. Research at Patria IKKT Hospital byAngela Marsiana Siki et al., (2023)even reported the accuracy of labor diagnosis codes was only 22.33%. Other studies also emphasize the importance of staff accuracy and the use of standard medical terminology in supporting coding accuracy.(Eni Nur Rahmawati, 2024)Against this backdrop, a clear gap exists between the ICD-10 coding standards and field practice. Therefore, this study aims to analyze the completeness and accuracy of the coding of labor diagnoses at the Bataraguru Community Health Center and provide recommendations for improvements that can enhance the quality of medical records management at primary healthcare facilities.

METHOD

This study used a quantitative descriptive approach to describe the level of completeness and accuracy of labor diagnosis coding. The data used were primary and secondary. Primary data were obtained directly from observations of labor medical records, while secondary data were obtained through literature review, official ICD-10 coding guidelines, and supporting documents available at community health centers. Using this method, researchers were able to objectively assess diagnosis coding practices carried out by medical records staff.

The study population consisted of all medical records of childbirth patients registered at the Bataraguru Community Health Center. The sample was determined using total sampling, meaning the entire population meeting the inclusion criteria was included as the study sample. Inclusion criteria included medical records of childbirth patients with a clear diagnosis, complete medical records, and availability during the study period. The total sample used in this study was 28 medical records of childbirth, representing the eligible population.

This research was conducted at the Bataraguru Community Health Center in Baubau City from April to June 2025. The location was selected because this community health center is a primary healthcare facility serving the community with a relatively high monthly birth rate. Furthermore, preliminary studies identified issues with the completeness and accuracy of diagnosis coding, making this location a representative location for further analysis.

Data collection was conducted using document observation using a checklist compiled based on ICD-10 guidelines. Observations were conducted to assess the completeness of diagnosis entries and the accuracy of codes selected by medical records staff. The research instrument was an assessment form containing variables such as completeness of diagnosis, accuracy of coding, and code compliance with ICD-10 standards. To strengthen the data, researchers also reviewed official guidelines and regulations related to medical records as additional sources.

The collected data were analyzed using quantitative descriptive analysis techniques, using frequency distribution and percentages. This analysis was used to describe the level of completeness of diagnoses and the accuracy of coding recorded in the delivery medical records. The results were then presented in a distribution table and explained narratively to provide a comprehensive overview of the actual condition of delivery diagnosis coding at the Bataraguru Community Health Center. This method is expected to yield valid and useful conclusions as recommendations for improving the quality of medical records.

RESULTS & DISCUSSION

This study aimed to analyze the completeness and accuracy of labor diagnosis coding at the Bataraguru Community Health Center. The results showed that, in general, most labor medical records were completed correctly, although some were incomplete. The data in Table 1 shows that of the 28 documents analyzed, 23 (82.14%) were complete and 5 (17.86%) were incomplete.

Table 1. Number of completeness and incompleteness of labor diagnosis coding

No	Category	Frequency (F)	Presentation
1	Complete	23	82.14%
2	Incomplete	5	7.14%
Total		28	100%

Source: Primary Data, 2025

The high level of completeness indicates that most medical records officers understand the importance of recording diagnoses as the basis for medical, legal, and administrative information. However, the 17.86% incomplete documentation indicates weaknesses, particularly in recording additional diagnoses or subdiagnoses, which are often overlooked. This aligns with the opinion of Yeni Tri et al., (2024) that factors of accuracy, workload, and time availability influence the completeness of medical records. According to Salwa & Herlinda (2023), incomplete documents also impact the quality of health services because data that is not detailed enough can lead to clinical and administrative misinterpretations.

To find out the form of incompleteness in more detail, Table 2 shows the distribution of cases of incomplete delivery diagnosis found at the Bataraguru Community Health Center.

Table 2. Incomplete delivery diagnosis codes at Bataraguru Health Center

Diagnosis		Incomplete Code	Complete Code
Normal Delivery Without Complications		O80 - Single delivery, spontaneous, without specified complications	O80 - Single delivery, spontaneous, without specified complications
			Z37.0 - Single birth, live birth
			Z3A.39 - 39 weeks gestation
Childbirth with Episiotomy		O70.0 - First degree perineal tear during delivery	O70.0 - First degree perineal tear during delivery
			Z37.0 - Single birth, live birth
			Z3A.40 - 40 weeks gestation
			Z39.0 - Immediate postpartum care
Labor with Prolonged Second Stage		O63.0 - Second stage prolonged C	O63.0 - Prolonged second stage
			O80 - Single delivery, spontaneous, without specified complications
			O70.1 - Second-degree perineal tear during delivery
			Z37.0 - Single birth, live birth
			Z3A.38 - 38 weeks gestation
			Z39.0 - Immediate postpartum care
Childbirth with Gestational Hypertension		O14.9 - Unspecified gestational hypertension O80 - Single delivery, spontaneous, without specified complications	O14.9 - Unspecified gestational hypertension
			O80 - Single delivery, spontaneous, without specified complications
			Z37.0 - Single birth, live birth
			Z3A.37 - 37 weeks gestation
			Z39.0 - Immediate postpartum care
			O16 - Unspecified hypertension in pregnancy
Delivery with Vacuum Extractor Procedure		O81 - Delivery by vacuum extraction	O81 - Delivery by vacuum extraction

Diagnosis	Incomplete Code	Complete Code
		Z37.0 - Single birth, live birth
		Z3A.41 - 41 weeks gestation
		Z39.0 - Immediate postpartum care
		O71.8 - Other specified obstetric trauma

Source: Primary Data, 2025

These incompletenesses include diagnoses without additional codes, the use of overly general diagnoses, and blank fields that should be filled in. Banoet et al., (2023), incomplete medical records will reduce the accuracy of epidemiological data and potentially hinder BPJS financing claims. Darmawan, (2019) also emphasized that the completeness of medical records is the main indicator of the quality of health services, so improvements to this aspect must be carried out continuously.

In addition to completeness, this study also assessed the accuracy of the coding of labor diagnoses. The analysis in Table 3 shows that of the 28 documents studied, 17 (60.71%) were coded correctly, while 11 (39.29%) were inaccurate.

Table 3. Number of accuracy and inaccuracy of diagnosis coding

No	Category	Frequency (F)	Presentation
1	Appropriate	17	60.71%
2	Not exactly	11	7.14%
	Total	28	39.28%

Source: Primary Data, 2025

This figure shows that although most diagnosis codes conform to ICD-10 guidelines, 39.29% of documents are still incorrect. Coding errors generally occur due to the use of overly general codes or the failure to include appropriate subcategories. Oashttamadea SM, (2019) found that only 58% of obstetric diagnosis coding at Kardinah Regional Hospital was correct, while Nugraha et al., (2021) reported an inaccuracy rate of 61.4% in similar cases. This indicates that coding accuracy is a classic problem that persists in various healthcare facilities.

To clarify the form of inaccuracy, Table 4 presents examples of coding errors found in this study.

Table 4. Accuracy and inaccuracy of labor diagnosis coding

Diagnosis	Incorrect Code	Exact Code
Classification of placenta	O34	O34.9
Active phase I	O63.2	O63.0
APB	O46.8	O46.9
FD	O68.0	O68.9
Delivery by cesarean section due to cephalopelvic disproportion	O82	O82.0
Twin delivery, live birth	O80	O84.0
Premature delivery at 32 weeks of gestation	O80	O60.1
Delivery with postpartum hemorrhage	O72.9	O72.1
Labor with premature rupture of membranes (PROM)	O75.9	O42.0
Delivery with breech presentation	O80	O83.0
Labor with retained placenta	O80	O73.0

Source: Primary Data, 2025

These errors indicate that medical records officers often use only the main code without specifying the subcode details, or choose codes that do not conform to correct medical terminology. This is consistent with research. Angela Marsiana Siki et al., (2023) which found that the accuracy of the delivery diagnosis code was only 22.33% at Patria IKKT Hospital, with the main cause being the lack of understanding of the officers regarding the ICD-10 guidelines. Asadi et al., (2022) also emphasized that the coding of diagnoses must meet the aspects of reliability, validity, and completeness, so that any errors in coding can reduce the quality of the medical record data as a whole.

Overall, this study successfully answered the objectives formulated in the introduction, namely to assess the completeness and accuracy of the coding of labor diagnoses at the Bataraguru Community Health Center. The relatively high level of completeness (82.14%) is a positive achievement, but the inaccuracy rate, which still reached 39.29%, indicates a serious problem that

must be addressed immediately. The impact of this inaccuracy is not only administrative but also legal, health financing, and the accuracy of epidemiological data that forms the basis for policy formulation.(Minister of Health Regulation No. 269 of 2008;Eni Nur Rahmawati, 2024)Therefore, a strategy is needed to improve the competence of medical records officers through intensive training, the implementation of an internal monitoring system, and the consistent use of ICD-10 guidelines to continuously improve the quality of diagnosis coding.

CONCLUSION

This study aims to analyze the level of completeness and accuracy of the coding of labor diagnoses at the Bataraguru Community Health Center. The results showed that most labor medical records were completed completely, namely 23 of 28 documents (82.14%), while 5 documents (17.86%) were still found to be incomplete. In terms of coding accuracy, 17 documents (60.71%) were coded according to ICD-10 standards, while 11 documents (39.29%) were still incorrect. Frequent errors found included the use of general codes without subcategories, errors in code selection, and lack of detailed recording. These findings confirm that although the level of completeness is considered good, serious challenges remain in the accuracy aspect that can impact financing claims, health data validity, and service quality. Thus, this study answers the objectives formulated in the introduction, namely to describe the actual condition of the completeness and accuracy of labor diagnosis coding at the Bataraguru Community Health Center.

This study has several limitations that should be considered. First, the sample size was limited to only 28 delivery medical records within the study period, so the results cannot be broadly generalized. Second, the study only assessed documents from one community health center (Puskesmas), so it may not reflect conditions in other primary health care facilities. Third, this study did not examine causal factors in depth, such as the education, training, or experience of medical records staff, which may influence the accuracy of diagnosis coding. These limitations are expected to inform future research involving more locations, larger sample sizes, and more comprehensive causal factor analyses.

ACKNOWLEDGMENTS

The authors would like to thank the Head of the Bataraguru Community Health Center and the medical records staff for their permission and support throughout the research process. They also thank the academic advisors who provided guidance and all those who assisted in completing this research.

REFERENCES

- Angela Marsiana Siki, Deasy Rosmala Dewi, Daniel Happy Putra, & Puteri Fannya. (2023). Analysis of the Accuracy of Diagnostic Codes in Inpatient Delivery Cases at Patria Ikkt Hospital in 2022. *SEHATMAS: Scientific Journal of Public Health*, 2(2), 468–479. <https://doi.org/10.55123/sehatmas.v2i2.1201>
- Asadi, F., Hosseini, M.A., Gomar, T., & Sabahi, A. (2022). Factors Affecting Clinical Coding Errors. *Shiraz E Medical Journal*, 23(9). <https://doi.org/10.5812/semj-122161>
- Banoet, OEG, Feoh, G., & Wasita, RRR (2023). ANALYSIS OF THE EFFECT OF THE IMPLEMENTATION OF THE DESIGN AND CONSTRUCTION OF A WEB-BASED ELECTRONIC MEDICAL RECORD INFORMATION SYSTEM FOR OUTPATIENTS ON WAITING TIME AT THE SASI COMMUNITY HEALTH CENTER, NORTH CENTRAL TIMOR DISTRICT. *Journal of Health, Science, and Technology (Jakasakti)*, 2(1), 73–78. <https://doi.org/10.36002/js.v2i1.2469>
- Darmawan, D. (2019). Indonesia's health profile 2019. In *Journal of Chemical Information and Modeling*.
- Eni Nur Rahmawati, Nurulshyha Md Yatim, Pangestuti 'Ainun Hasanah, SYS (2024). THE CORRELATION BETWEEN WRITING MEDICAL TERMINOLOGY ACCURACY WITH THE ACCURACY OF TYPHOID FEVER DIAGNOSIS CODES FOR INPATIENTS. 3(3), 107–114.

- Irmawati, I., & Nazillahtunnisa, N. (2019). Accuracy of Disease Diagnosis Codes Based on ICD-10 in Outpatient Medical Records at Community Health Centers. *Journal of Medical Records and Health Information*, 2(2), 100. <https://doi.org/10.31983/jrmik.v2i2.5359>
- K. Salwa, N. Herlinda, WM (2023). Analysis of Factors Causing Incomplete Inpatient Medical Resumes of BPJS Kesehatan Patients at RSI Aisyiyah, Malang City. *Indonesian Health Information Journal*, 4(1), 88–100.
- Maulida, ES, & Djunawan, A. (2022). Analysis of the Causes of Pending Claims in BPJS Kesehatan Files for Inpatient Services at Airlangga University Hospital. *Indonesian Public Health Media*, 21(6), 374–379. <https://doi.org/10.14710/mkmi.21.6.374-379>
- Nugraha, M., Putra, DSH, & Ardianto, ET (2021). Evaluation of Inaccuracy in Outpatient Medical Record Coding at Phc Hospital Surabaya. *J-REMI: Journal of Medical Records and Health Information*, 2(2), 271–278. <https://doi.org/10.25047/j-remi.v2i2.2176>
- Oashttamadea SM, R. (2019). Analysis of the Accuracy of Obstetric Diagnosis Coding at Naili DBS Hospital, Padang. *Indonesian Journal of Health Information Management*, 7(2), 86. <https://doi.org/10.33560/jmiki.v7i2.239>
- Regulation of the Minister of Health No. 24. (2022). Regulation of the Minister of Health of the Republic of Indonesia No. 24 of 2022 concerning Medical Records. Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2022, 151(2), 1–19.
- Regulation of the Minister of Health of the Republic of Indonesia No. 269/Menkes/Per/III/2008. (2008). Regulation of the Minister of Health of the Republic of Indonesia No. 269/Menkes/Per/III/2008. In Regulation of the Minister of Health of the Republic of Indonesia No. 269/Menkes/Per/III/2008 (Vol. 2008, p. 7).
- Setiyawan, H., Rohman, H., & Nugraha, FB (2023). Analysis of the Completeness and Accuracy of Obstetric Medical Terminology Coding at the Jetis Bantul Community Health Center, Yogyakarta. *Proceedings of the National Health Information Seminar (SIKESNas)*, 72–77.
- Law Number 17 of 2023 concerning Health.* (2023). http://www.amifrance.org/IMG/pdf_HM9_Mental_Health.pdf
- Yeni Tri, U., Linda, W., & Santi, S. (2024). Analysis of the Accuracy of Diagnosis and Treatment Codes for Obstetric Cases of Inpatients at Waras Wiris Regional Hospital, Boyolali. *Infokes: Scientific Journal of Medical Records and Health Informatics*, 14(1), 14–21. <https://doi.org/10.47701/infokes.v14i1.3773>