Evaluation of The Completeness of Electronic Medical Records In Supporting Reporting of The Top 10 Diseases of Inpatients At Majalengka Regional Hospital

Nova Oktaviani Rahayu[1]*, Intan Pujilestari[2]

[1,2]Program Studi Rekam Medik dan Informasi Kesehatan Politeknik TEDC Bandung, Indonesia
Corresponding author:
E-mail: *oktavianinova80@gmail.com*

Abstract.
The completeness of Electronic Medical Records (EMR) is one of the important factors that determine the quality of health information and the accuracy of reporting the top 10 diseases in hospitals. This study aims to evaluate the completeness of the EMR in inpatients in supporting the reporting of the top 10 diseases at Majalengka Regional Hospital, identify the top 10 diseases, analyze EMR support for reporting, and identify factors that influence EMR incompleteness. The study used a mixed method with a quantitative approach as the dominant method and a qualitative approach as a complement. The quantitative population amounted to 1,813 EMR documents of inpatients in the fourth quarter of 2025 with a sample of 328 documents determined using simple random sampling. The qualitative population consisted of medical record officers. The research instruments included a checklist, interview guide, and documentation study. Quantitative data were analyzed descriptively using percentages, while qualitative data were analyzed through narrative writing. The results showed that most EMR components were complete, but incompleteness was still found in the informed consent, history taking, diagnosis, and operation report. The EMR supports the compilation of top 10 disease reports through the Zicare application, but reporting quality is still affected by completeness of documentation, diagnostic accuracy, workload, healthcare provider coordination, and system limitations. This study concludes that the EMR has supported the reporting of top 10 diseases at Majalengka Regional Hospital, but improvements in documentation quality and strengthening of the EMR management system are still needed to produce more accurate and high-quality reports.

Keywords: *Electronic Medical Records, Health Information Management, Hospital Reporting, Inpatient Care and Medical Record Completeness.*

I. INTRODUCTION

Health is a fundamental aspect of human and national development because it directly impacts productivity, community well-being, and sustainable development. Efforts to improve the quality of health services depend not only on the availability of health workers and service facilities but also require a health information system capable of providing complete, accurate, and easily accessible data. Quality health data is a crucial basis for clinical decision-making, health program development, service evaluation, and disease control in the community (January 2024). Within the health information system, medical records play a strategic role as a source of documentation containing patient identity, medical history, examination results, diagnoses, medical procedures, and the patient's condition development during the course of health care (January 2024).

The development of information technology has driven the transformation of conventional medical records into Electronic Medical Records (EMR), which offer various advantages, such as easy real-time data access, information integration between service units, reduced risk of document loss, and increased efficiency of health reporting (Handiwidjojo, 2020). In inpatient care, the existence of EMR is becoming increasingly important due to the more complex nature of the service, involving various healthcare professionals, and the need for more comprehensive documentation compared to outpatient care. Therefore, complete data in EMR is a crucial factor in producing accurate clinical and managerial information that can be utilized in evaluating service quality and health reporting.

Although the implementation of EMR has expanded across various healthcare facilities, issues regarding the completeness of data entry are still frequently encountered. Several critical components, such as vital signs, additional diagnoses, supporting examinations, and nursing notes, are not fully documented, potentially reducing the quality of clinical information. Research by Silalahi et al. (2025) showed that incomplete EMRs in inpatients at Sele Be Solu Regional Hospital, Southwest Papua, impacted service efficiency and the quality of clinical documentation. These findings align with research by Lestari et al. (2021) which reported that 33.3% of inpatient electronic medical records at X Hospital, Bandung, were incomplete, thus failing to meet optimal healthcare standards. Furthermore, Medis & Inap (2024) explained that incomplete medical records can hinder the fulfillment of patients' rights to medical information, complicate the process of disease classification and coding, and hinder the preparation of hospital reports.

The completeness of medical records is also closely related to the reporting of surveillance for the top 10 diseases because fully documented diagnostic data serves as the basis for describing morbidity patterns, determining health program priorities, and supporting decision-making by hospitals and health departments (January, 2024). Incomplete medical records are influenced by various factors, including the discipline and accuracy of human resources, time constraints due to workload, suboptimal implementation of standard operating procedures, and the lack of routine monitoring and evaluation (Medis & Inap, 2024). Based on initial observations at the Medical Records Unit of Majalengka Regional Hospital of 681 inpatient RME documents, 671 documents (98.53%) were complete, while 10 documents (1.47%) were incomplete. Although this level of completeness is relatively high, this condition still has the potential to affect the quality of the data used in reporting surveillance for the top 10 diseases and requires further evaluation.

Based on these conditions, this study aims to evaluate the completeness of Electronic Medical Records (EMR) for inpatients at Majalengka Regional Hospital in supporting the reporting of the top 10 diseases, identify diseases included in the top 10, analyze EMR support for such reporting, and identify factors that influence incomplete EMR filling. This study is important because accurate disease reporting is highly de-

pendent on the quality of available medical record data. To date, there has been no study that specifically evaluates the completeness of Electronic Medical Records in relation to support for reporting the top 10 diseases of inpatients at Majalengka Regional Hospital. Therefore, this study is expected to provide a basis for evaluation to improve the quality of electronic medical record management while supporting the preparation of more accurate, timely, and accountable health reports.

II. METHODOLOGY

This study employed a mixed method with a quantitative approach as the dominant method and a qualitative approach as a complement. According to Sugiyono (2017), a research method is a scientific way to obtain data used to achieve research objectives through a rational, empirical, and systematic process. The quantitative approach was used because the study focused on evaluating the completeness of Electronic Medical Records (EMR) as a healthcare service document, thus an assessment was conducted on each component of the EMR based on applicable standards. Through a descriptive design, this study aimed to describe the level of EMR completeness, identify the top 10 diseases of inpatients, and assess the support of EMR in supporting the reporting of the top 10 diseases at Majalengka Regional Hospital.

A qualitative approach was used to complement the quantitative analysis by exploring factors influencing incomplete Electronic Medical Records (EMR) and the EMR system's support for reporting. Combining these two approaches yields more comprehensive information, as numerical data on document completeness can be enriched with contextual explanations of the hospital's EMR management process.

The research instrument consisted of a checklist and interview guide. The checklist was used to audit the completeness of the Electronic Medical Record (EMR) elements of inpatients, including patient identity, diagnosis, actions or procedures, medications, laboratory results, and admission and discharge dates. Each component was scored with a score of 1 if complete and a score of 0 if incomplete, allowing for the calculation of the percentage of completeness of each document and each EMR element. Furthermore, data on the top 10 diseases were obtained from hospital statistical reports and the Hospital Management Information System (SIMRS) as secondary data, which were then verified based on diagnosis codes to assess the suitability of the EMR data to disease reporting.

The qualitative instrument used an interview guide aimed at medical records officers to obtain information regarding Electronic Medical Records support in reporting the top 10 diseases and various factors influencing incomplete documents. Data collection was also supported by a documentation study of standard operating procedures, medical record filling guidelines, and hospital policies related to reporting the top 10 diseases. According to Siti et al. (2025), data collection is a systematic process to obtain information relevant to the research objectives. Quantitative data were ana-

lyzed descriptively using the percentage of completeness, while qualitative data were analyzed through a narrative process to explain the quantitative findings in more depth.

The research population consists of quantitative and qualitative populations. According to Sugiyono (2017), a population is a generalization area consisting of objects or subjects that have certain characteristics to be studied and conclusions drawn. The quantitative population is all Electronic Medical Record documents for inpatients at Majalengka Regional Hospital during the fourth quarter of 2025, namely October to December, with a total of 1,813 documents. All components contained in the EMR documents are the objects of assessment to evaluate the level of completeness of the filling. The qualitative population consists of medical record officers responsible for managing and filling out Electronic Medical Records because they have an understanding of the documentation process and factors that influence document completeness.

The quantitative sample was determined using a simple random sampling technique so that each Electronic Medical Record document had an equal chance of being selected as a research sample. The sample size was determined using the Slovin formula with a 5 percent error rate, resulting in a sample of 328 Electronic Medical Record documents for inpatients from a population of 1,813 documents. The qualitative sample was selected directly from medical record officers assigned to the medical record unit and willing to serve as research informants to provide information on the EMR management process, support for reporting the top 10 diseases, and various obstacles that cause incomplete document filling.

The research was conducted at Majalengka Regional Hospital from March 30 to May 30, 2026. The research phase began with a preliminary study and the development of a research proposal, followed by quantitative data collection through an audit of Electronic Medical Record documents using a checklist and secondary data collection regarding the top 10 diseases from hospital statistical reports and the Hospital Management Information System (SIMS). Qualitative data collection was then conducted through interviews with medical record officers and a documentation study of medical record filling guidelines, standard operating procedures, and other supporting documents. All data obtained were then analyzed according to their respective approaches to produce an evaluation of the completeness of the Electronic Medical Record in supporting the reporting of the top 10 diseases of inpatients at Majalengka Regional Hospital.

III. RESULTS AND DISCUSSIONS

Completeness of Electronic Medical Records (ER) for Inpatients at Majalengka Regional Hospital

This research was conducted through an analysis of the completeness of filling out inpatient medical record documents based on the medical record completeness checklist for the fourth quarter of 2025.

Table 1. Completeness of RME for the Fourth Quarter of 2025

No	Components assessed	Complete (n)	Complete (%)	Incomplete(n)	Incomplete(%)
1	SPRI (Inpatient request letter)	328	100%	0	0%
2	Integrated patient progress notes (CPPT)	328	100%	0	0%
3	General consent	328	100%	0	0%
4	Results of physical examination and medical support	328	100%	0	0%
5	Diagnosis	320	97.56%	8	2.44%
6	Operation report	321	97.87%	7	2.13%
7	Anamnesis results	318	96.95%	10	3.05%
8	Informed consent	302	92.07%	26	7.93%
9	Doctor's name	328	100%	0	0%
10	Doctor's signature	328	100%	0	0%

Table 1 shows that most components of the electronic medical record have been completed. The SPRI, CPPT, General Consent, Physical Examination and Medical Support Results, Physician's Name, and Physician's Signature components have a completeness rate of 100%. However, several components were still incomplete, namely diagnosis (8 documents) (2.44%), surgical report (7 documents) (2.13%), anamnesis (10 documents) (3.05%), and informed consent (26 documents) (7.93%). The informed consent component was the component with the highest level of incompleteness.

Overview of the Top 10 Diseases of Inpatients at Majalengka Regional Hospital

Data on the top 10 diseases were obtained from hospital statistical reports and recapitulation of inpatient diagnoses during the fourth quarter of 2025.

Table 2. Top 10 Diseases in the Fourth Quarter of 2025

No	Diagnosis	Amount
1.	Impacted Teeth	22
2.	Hypertensive Renal Disease With Renal Failure	13
3.	Neoplasms Of Uncertain Behavior Of Breast	11
4.	Hypertrophy Of Nasal Turbinates	10
5.	Inguinal Hernia	9
6.	Viral Infection	8
7.	Non Insulin Dependent Diabetes Mellitus With Peripheral Complications	6
8.	Bacterial Infection, Unspecified	5
9.	Severe Pre-Eclampsia	5
10.	Benign Neoplasm of the Ear Skin	5

Based on Table 2, it is known that Impacted Teeth was the most common diagnosis among inpatients at Majalengka Regional Hospital in the fourth quarter of 2025 with 22 cases. The next most common diagnoses were Hypertensive Renal Disease with Renal Failure with 13 cases, Neoplasms of Uncertain Behavior of Breast with 11 cases, Hypertrophy of Nasal Turbinates with 10 cases, and Inguinal Hernia with 9 cases. In addition, Viral Infection was recorded with 8 cases, Non-Insulin Dependent Dia-

betes Mellitus with Peripheral Complication with 6 cases, while Bacterial Infection, Unspecified, Severe Pre-Eclampsia, and Benign Neoplasm Skin of Ear each had 5 cases. The diagnosis of Impacted Teeth was the disease with the highest number of cases, while Bacterial Infection, Unspecified, Severe Pre-Eclampsia, and Benign Neoplasm Skin of Ear were the diagnoses with the lowest number of cases in the top 10 disease groups..

Electronic Medical Records Support in Reporting the Top 10 Diseases at Majalengka Regional Hospital

Based on interviews with medical records staff, "Electronic Medical Records (EMR) at Majalengka Regional Hospital play a crucial role in supporting the reporting of the top 10 diseases. The EMR system used, the Zicare application, allows staff to access and process patient diagnostic data more quickly than with conventional medical records systems."

The process of compiling the top 10 disease report is carried out by extracting raw data from the Zicare application. This data is then exported into Microsoft Excel format for further processing, such as grouping diagnoses and calculating case frequencies. The results of this processing reveal the most common diseases, allowing for the compilation of the top 10 disease report.

Furthermore, RME significantly simplifies data access for medical records staff and other parties requiring health reports, including the Health Department. Patient and diagnosis data can be retrieved more quickly because it's stored electronically, eliminating the need for manual data retrieval through physical files.

However, the accuracy of the data in the EMR significantly impacts the quality of the reporting of the top 10 diseases. The accuracy of the diagnosis coding is a crucial factor. For example, if the doctor's diagnosis is not specific enough, such as simply listing "bitten" without explaining the cause or condition in more detail, the disease coding process will be inaccurate. This can affect the disease grouping results and impact the validity of the top 10 disease report. Therefore, medical records officers need to seek further clarification from the Physician in Charge of Services (DPJP) to ensure the accuracy of the diagnosis and disease codes used.

To support reporting of the top 10 diseases, the Zicare application also provides a report menu containing overall patient data. Although there is no specific feature that automatically generates a top 10 disease report, the data available in the system can be used as a primary source for processing and analysis based on patient diagnoses. Thus, the RME serves as a data provider that supports the effectiveness and efficiency of compiling the top 10 disease report at Majalengka Regional Hospital.

Factors Influencing Incomplete Electronic Medical Records (EMRE)

Based on the results of interviews with informants, "it was found that the incompleteness of Electronic Medical Records (ER) at Majalengka Regional Hospital was influenced by various interrelated factors, both originating from human resources, service processes, information technology systems, and coordination between health

workers. This incompleteness of EMR is a significant concern because medical records are the primary source of patient health information used for services, reporting, evaluation of service quality, and hospital management decision-making.

One of the most common factors contributing to incomplete EMR is incomplete patient consent (general consent) and patient signatures. Interviews revealed this situation is often found in patients admitted through the Emergency Department (ER). In emergency situations, healthcare workers are required to provide prompt medical treatment to save the patient's life. As a result, administrative processes that should be completed thoroughly sometimes take a backseat, resulting in incomplete patient consent and signatures. These incomplete documents can diminish the administrative validity and legality of medical records, as patient consent is a crucial component of healthcare documentation.

In addition to administrative documents, incomplete clinical documents, which are a crucial part of electronic medical records, were also found. Informants reported that Integrated Patient Progress Notes (IPCP), anesthesia reports, and surgical reports were often incomplete. These incomplete clinical documents can occur because the responsible healthcare provider has not completed all the necessary information or there is a delay in inputting the data into the system. Yet, these documents play a crucial role in describing the patient's care journey during treatment. If clinical data is incompletely recorded, information regarding the patient's condition, the procedures performed, and the outcomes of care will be suboptimal and can impact the continuity of healthcare services.

Another factor contributing to incomplete EMRs is the high number of patient visits. Informants explained that the large number of patients seeking services requires staff to work quickly to ensure all patients are served on time. This often leads staff to rush data entry, resulting in incomplete data entry for several important items. Incomplete data can occur in patient registration data, general consent, informed consent, and other service documents. This high workload indicates that human resource factors and service load significantly influence the quality of electronic medical record completion. The higher the number of patients that must be treated within a limited time, the greater the risk of omissions in the documentation process.

From an information technology perspective, interviews revealed that the Zicare application system, used as the RME platform at Majalengka Regional Hospital, remains challenging. Informants explained that some forms required for certain services are not yet optimally available within the system. For example, for patients requiring blood transfusions, the informed consent form, which should have been completed during the emergency room visit, is sometimes not available in the appropriate menu within the application. This prevents documents from being inputted or properly documented within the system. These limitations in the application's features can potentially lead to incomplete data and hinder the overall healthcare documentation process. This

demonstrates that the success of RME implementation depends not only on the users but also on the readiness and completeness of the system's features.

In addition to technical system factors, incomplete EMRs are also influenced by communication and coordination between healthcare professionals. Informants reported that miscommunication persists between nurses and service units, resulting in inaccurate information regarding document completeness. Consequently, some documents that should have been completed by specific staff are not promptly addressed due to a lack of coordination. This demonstrates that successful electronic medical record management requires strong collaboration between all healthcare professionals involved in patient care, including doctors, nurses, medical records officers, and other healthcare professionals.

Interview results also showed that the accuracy and completeness of medical record data are closely related. When incomplete data is present, medical records staff often experience difficulties in coding diagnoses and verifying patient information. This impacts not only patient care but also hospital reporting activities, including reporting the top 10 diseases that require complete and accurate diagnostic data. Therefore, incomplete medical records can impact the quality of health information produced by hospitals.

To overcome these various problems, Majalengka Regional Hospital has made various control and improvement efforts."Based on the interview results, "The head of the medical records installation routinely evaluates the completeness of medical records and conveys the results to the heads of each room. Through this coordination, each service unit is expected to promptly complete any missing documents. Furthermore, medical records officers also conduct checks before data is stored in the system. If there are sections that fall under the authority of a doctor, such as a diagnosis or specific medical record, the officer does not immediately complete the input process but first asks the doctor concerned to complete the data.

Another effort undertaken by the hospital is through regular file reviews. This activity aims to identify incomplete sections of medical records and evaluate the causes of these incompleteness. The results of the reviews are then used as material for improvement and coaching for healthcare workers to further enhance the quality of medical record documentation. Through routine evaluations, inter-unit coordination, and ongoing file reviews, the hospital strives to improve the completeness of the EMR to support the quality of healthcare services, patient safety, and the quality of health reporting produced.

IV. DISCUSSION

Based on the results of a study of 328 Electronic Medical Records (EMR) documents for inpatients at Majalengka Regional Hospital, it was found that the level of completeness of medical records was generally considered good. This is evident from several components that have reached a completeness level of 100%, namely the Inpa-

tient Request Letter (SPRI), Integrated Patient Progress Notes (CPPT), General Consent, results of physical examinations and medical support, doctor's name, and doctor's signature. The high level of completeness in these components indicates that the implementation of Electronic Medical Records at Majalengka Regional Hospital has been able to support the process of optimal health care documentation. The completeness of medical records is one indicator of health care quality because the information recorded in them forms the basis for patient care, service quality evaluation, hospital reporting, and management decision-making.

However, this study still found several components that were incomplete. The informed consent component had the highest incompleteness rate at 7.93%, followed by the history taking result at 3.05%, the diagnosis at 2.44%, and the surgical report at 2.13%. These results indicate that there are still shortcomings in the electronic medical record documentation process that could potentially affect the quality of the resulting health information. Incomplete informed consent is a significant concern because this document has administrative and legal value related to the patient's consent to the medical treatment provided. Meanwhile, incomplete history taking, diagnosis, and surgical report can affect the quality of clinical data stored in the medical record and impact the accuracy of the information used in various hospital activities.

The completeness of medical records is closely related to the preparation of the top 10 disease report. Based on research results, the report of the top 10 diseases of inpatients at Majalengka Regional Hospital in the fourth quarter of 2025 shows that Impacted Teeth ranked first with 22 cases, followed by Hypertensive Renal Disease with Renal Failure with 13 cases, and Neoplasms of Uncertain Behavior of Breast with 11 cases. In addition, several other diseases were also found such as Hypertrophy of Nasal Turbinates, Inguinal Hernia, Viral Infection, Bacterial Infection, Severe Pre-Eclampsia, Non-Insulin Dependent Diabetes Mellitus with Peripheral Complication, and Benign Neoplasm Skin of Ear. This data provides an overview of the disease patterns most commonly found in hospitalized patients and can be used as a basis for planning health services, providing resources, procuring drugs, and evaluating hospital service programs.

The compilation of the top 10 disease report is inseparable from the role of Electronic Medical Records (ERCs) as the primary data source. Based on interviews, the reporting process is carried out by extracting patient diagnosis data from the Zicare application, which is then processed using Microsoft Excel to calculate the frequency of occurrence of each disease. The EMR system makes it easier for medical records staff to obtain data because all patient information is stored electronically and integrated into a single system. Compared to manual systems that require searching for individual files, the use of EMRs can speed up the data collection process and improve staff work efficiency. Furthermore, easy data access also supports the provision of health information for both internal hospital parties and external agencies such as the Health Department.

While EMR provides numerous benefits in supporting the reporting of the top 10 diseases, the quality of the resulting reports is highly dependent on the quality of the data stored within the system. Interviews indicate that diagnostic accuracy is a critical factor in the reporting process. Incomplete or insufficiently specific diagnoses can lead to errors in the disease coding process, thus affecting the disease grouping results in the top 10 disease report. For example, a diagnosis simply written as "bite" without further explanation will make it difficult for medical records officers to determine the correct disease code. As a result, the resulting data may not reflect the patient's true health condition. Therefore, medical records officers frequently consult with the Physician in Charge of Services (DPJP) to ensure the accuracy of the diagnosis before coding.

The research also shows that several factors still contribute to incomplete electronic medical records at Majalengka Regional Hospital. The first factor is the high workload of healthcare workers. The large number of patients seeking care requires staff to work quickly, resulting in incomplete documentation. This is particularly common among patients admitted through the Emergency Department (ER), where healthcare workers prioritize patient survival over administrative tasks. This situation is one of the reasons why informed consent and other supporting documentation are still incomplete.

The second factor is human resources. Interviews revealed that clinical documents such as anesthesia reports, surgical reports, and diagnoses were still incomplete by the responsible healthcare professionals. This indicates that compliance and accuracy in completing medical records remain crucial factors influencing the quality of electronic documentation. The more complete the information recorded by healthcare professionals, the better the quality of the data produced for service delivery and reporting purposes.

The third factor stems from the information technology system used. Informants explained that several service forms are still not optimally available in the Zicare application. For example, informed consent for blood transfusions is sometimes not available in the appropriate menu, preventing the document from being fully input into the system. These application feature limitations demonstrate that the success of Electronic Medical Records implementation is influenced not only by the user, but also by the system's readiness to support the entire healthcare documentation process.

Furthermore, communication and coordination between healthcare professionals also impact the completeness of electronic medical records. Interviews revealed persistent miscommunication between nurses and service units, resulting in inaccurate information regarding required documentation. Consequently, some documents, which should have been completed by specific staff, were not promptly addressed. This can lead to incomplete data in medical records and ultimately impact the quality of the resulting information.

Based on these findings, it is clear that the completeness of Electronic Medical Records plays a crucial role in producing accurate reports on the top 10 diseases. The

more complete and accurate the data stored in the system, the better the quality of the information produced for reporting and decision-making purposes. Conversely, incomplete data can lead to errors in coding, disease grouping, and the preparation of hospital statistical reports. Therefore, efforts to improve the completeness of medical records through routine evaluations, file reviews, strengthened coordination among healthcare professionals, and application system development are necessary to optimize the quality of health data and hospital reporting.

V. CONCLUSION

This study shows that the Electronic Medical Records (EMR) completeness level for inpatients at Majalengka Regional Hospital is generally in the good category. Most medical record components have reached 100% completeness, but incompleteness was still found in several elements, particularly informed consent, history taking results, diagnoses, and surgical reports. EMR data also proved to support the preparation of the report of the top 10 diseases through the use of the Zicare application as the main data source, although the report processing was still carried out using Microsoft Excel. Interview results indicated that the incompleteness of EMR was influenced by the workload of healthcare workers, limited system features, suboptimal clinical documentation processes, and ineffective interprofessional coordination. These conditions affect the accuracy of documentation and the quality of data used in disease reporting.

This study still has limitations because it was only conducted in one hospital with an observation period of the fourth quarter of 2025, so the results cannot describe the conditions in other health care facilities or different periods. Furthermore, the study used a descriptive approach, so it did not analyze the relationship between variables that influence the completeness of Electronic Medical Records. Future research is recommended to involve more hospitals, expand the observation period, and use analytical methods to identify the dominant factors influencing the completeness of EMR. Practically, the results of this study can be used as evaluation material for Majalengka Regional Hospital to strengthen monitoring of the completeness of medical records, improve coordination between health workers, optimize the development of the Zicare application, and improve the quality of reporting the top 10 diseases as a basis for decision-making and improving the quality of health services.

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