



Analysis Of Inpatient Mortality Distribution Based On Patient Characteristics At Hermina Arcamanik General Hospital In The Second Quarter Of 2026

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Abstract

Inpatient mortality is an important indicator of hospital service quality because it reflects clinical outcomes and patient safety. Mortality data managed by the Medical Records Unit should be transformed into detailed statistical information, not only through Gross Death Rate (GDR) and Net Death Rate (NDR), but also according to patient characteristics and recorded diagnostic patterns. This study aimed to analyze the distribution of inpatient mortality by age, sex, length of stay, treatment unit, and recorded diagnoses, and to calculate GDR and NDR at Hermina Arcamanik General Hospital during the second quarter of 2026. A quantitative descriptive design with total sampling was applied to 153 inpatient mortality cases. Secondary data were obtained through documentary review of mortality recapitulation records from the Medical Records Unit. The findings showed that mortality was most frequently observed among patients aged ≥ 60 years (51.6%), male patients (57.5%), patients hospitalized for ≥ 48 hours (75.2%), and patients treated in the Intensive Care Unit (86.9%). Cardiac arrest was the most frequently recorded diagnosis (19.1% of 602 diagnosis entries). The GDR was 21.44‰ and the NDR was 16.11‰, both below the ideal reference thresholds used in the study. These findings indicate that the hospital mortality indicators met the referenced standards during the study period; nevertheless, periodic monitoring and medical audit remain necessary, particularly for high-risk patient groups and critically ill patients.

Keywords: Inpatient Mortality; Patient Characteristics; Medical Records; Gross Death Rate; Net Death Rate

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1. Introduction

Medical records are a fundamental source of health information containing patient-service data that can be processed through coding, reporting, and analysis to generate information supporting improvements in healthcare quality (Ministry of Health of the Republic of Indonesia, 2022). One important indicator used to assess hospital service quality is mortality, which reflects clinical outcomes and patient safety. Inpatient mortality represents one outcome of the care provided during hospitalization and may be influenced by disease severity, the quality of nursing care, and the appropriateness of therapy (Utami et al., 2023). Hospital mortality reporting includes internal and external reporting. Internal reports are used by hospital management as archives and sources of information, whereas external reports are submitted to health authorities such as the Ministry of Health and local health offices (Alsadiana et al., 2025). Accurate mortality data are essential for statistical reporting and service-quality evaluation. Electronic medical records can support more efficient patient-data management and facilitate access to information for healthcare professionals and patients (Marbella et al., 2024). At Hermina Arcamanik General Hospital, the electronic medical record system functions both as a patient-data management platform and as a tool for statistical reporting (Setiatin and Kusuma, 2025).

The Medical Records Unit plays an important role in managing and reporting inpatient mortality. Mortality reports require accurate, complete, and timely data to generate statistical information that meets hospital service needs (Nindia and Monica, 2025). Previous studies have examined inpatient mortality from different perspectives. Yofi et al. (2021) emphasized age, length of stay, and diagnosis, whereas Rostika and Agustina (2024) focused on Gross Death Rate (GDR) and Net Death Rate (NDR). Although GDR and NDR provide an overall picture of inpatient deaths, they do not describe the characteristics of deceased patients or the diagnostic patterns recorded among them. This gap highlights the need to transform mortality recapitulation data managed by the Medical Records Unit into more detailed statistical information. Analysis by sex, age, length of stay, treatment unit, and recorded diagnosis can describe the pattern of inpatient mortality during a specific period. Calculation of GDR and NDR complements this analysis by providing hospital-level mortality indicators that can be compared with the reference standards used by the hospital.

To date, no study cited in the source manuscript has specifically described inpatient mortality at Hermina Arcamanik General Hospital during the second quarter of 2026 by sex, age, length of stay, treatment unit, and recorded diagnosis while simultaneously calculating GDR and NDR. The novelty of this study therefore lies in combining characteristic-based mortality distribution, recorded diagnostic frequency, and hospital mortality indicators using second-quarter 2026 data. Accordingly, this study aimed to analyze inpatient mortality distribution based on sex, age, length of stay, treatment unit, and recorded diagnoses, and to calculate GDR and NDR at Hermina Arcamanik General Hospital during the second quarter of 2026.





2. Research Methods

This study employed a quantitative descriptive design to describe inpatient mortality according to sex, age, length of stay, treatment unit, and diagnoses recorded among deceased inpatients at Hermina Arcamanik General Hospital during the second quarter of 2026. The study also calculated Gross Death Rate (GDR) and Net Death Rate (NDR) as hospital mortality indicators. The population consisted of all 153 inpatient mortality cases recorded during the second quarter of 2026. Total sampling was used; therefore, all 153 cases were included. The study variables were sex, age, length of stay, treatment unit, and recorded diagnosis. Secondary data were obtained from inpatient mortality recapitulation records maintained by the Medical Records Unit. Data used to calculate GDR and NDR included the number of inpatient discharges, both alive and deceased, and the number of deaths according to length of stay below 48 hours and at least 48 hours. Data collection was conducted through documentary review.

Data were obtained after permission had been granted by the Medical Records Unit. Patient confidentiality was protected by excluding patient identifiers from data processing and presentation, and the data were used solely for research purposes. Age was grouped into ≤ 1 year, 2–18 years, 19–59 years, and ≥ 60 years. Length of stay was categorized as < 48 hours and ≥ 48 hours. Treatment units were grouped according to the mortality recapitulation data, including the ICU, PICU, NICU, and HCU. Diagnosis data were analyzed using all diagnoses recorded among deceased inpatients. Because one patient could have more than one recorded diagnosis, diagnostic analysis was based on the total frequency of diagnosis entries rather than only one principal diagnosis per patient. Collected data were analyzed descriptively and presented as frequency and percentage distributions. GDR and NDR were calculated to describe inpatient mortality and were compared with the reference standards applied in the source study.

3. Research Results and Discussion

a. Results

A total of 153 inpatient mortality cases were identified from the mortality recapitulation data of the Medical Records Unit for the second quarter of 2026. The distributions by age, sex, length of stay, treatment unit, recorded diagnosis, and the GDR/NDR indicators are presented below.

Table 1. Distribution of Inpatient Mortality by Age at Hermina Arcamanik General Hospital, Second Quarter of 2026

Age (years)	Frequency	Percentage (%)
≤ 1	15	9.8
2–18	4	2.6
19–59	55	35.9
≥ 60	79	51.6
Total	153	100

Among the 153 deceased inpatients, the ≥ 60 -year age group accounted for the largest proportion, with 79 patients (51.6%), whereas the 2–18-year group accounted for the smallest proportion, with 4 patients (2.6%). Thus, mortality during the study period was concentrated in older patients.





Table 2. Distribution of Inpatient Mortality by Sex at Hermina Arcamanik General Hospital, Second Quarter of 2026

Sex	Frequency	Percentage (%)
Male	88	57.5
Female	65	42.5
Total	153	100

Male patients represented 88 deaths (57.5%), compared with 65 deaths (42.5%) among female patients. The proportion of mortality cases was therefore higher among male patients during the study period.

Table 3. Distribution of Inpatient Mortality by Length of Stay at Hermina Arcamanik General Hospital, Second Quarter of 2026

Length of stay	Frequency	Percentage (%)
<48 hours	38	24.8
≥48 hours	115	75.2
Total	153	100

Most deceased patients had been hospitalized for ≥48 hours, accounting for 115 cases (75.2%), whereas 38 cases (24.8%) had a length of stay of <48 hours.

Table 4. Distribution of Inpatient Mortality by Treatment Unit at Hermina Arcamanik General Hospital, Second Quarter of 2026

Treatment unit	Frequency	Percentage (%)
ICU	133	86.9
PICU	7	4.6
NICU	11	7.2
HCU	2	1.3
Total	153	100

The ICU accounted for the highest number of mortality cases, with 133 patients (86.9%). The HCU had the lowest number, with 2 patients (1.3%), indicating that mortality cases in this dataset were predominantly associated with intensive care.

Table 5. Distribution of Recorded Diagnoses among Deceased Inpatients at Hermina Arcamanik General Hospital, Second Quarter of 2026

Diagnosis	Frequency	Percentage (%)
Cardiac Arrest	115	19.1
Respiratory Failure	65	10.8
Pneumonia	50	8.3
Septic Shock	30	5.0
Stroke	21	3.5
Type 2 Diabetes Mellitus	16	2.7
Hypertension	15	2.5
Hyponatremia	13	2.2
Anemia	12	2.0
Chronic Kidney Disease	10	1.7
Pulmonary Tuberculosis	10	1.7
Pleural Effusion	9	1.5
Coronary Artery Disease	9	1.5
Metabolic Acidosis	9	1.5





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Hypoglycemia	9	1.5
Hypokalemia	7	1.2
Chronic Obstructive Pulmonary Disease	6	1.0
Hypertensive Heart Disease	6	1.0
Hypocalcemia	6	1.0
Hyperkalemia	6	1.0
Hypovolemic Shock	6	1.0
Sepsis	6	1.0
Other Diagnoses (<1% each)	166	27.6
Total	602	100

A total of 602 diagnosis entries were recorded among the 153 deceased inpatients. The number of diagnosis entries exceeded the number of patients because one patient could have more than one diagnosis during hospitalization. Cardiac arrest was the most frequently recorded individual diagnosis, with 115 entries (19.1%), followed by respiratory failure (10.8%), pneumonia (8.3%), and septic shock (5.0%). Diagnoses with individual proportions below 1% were grouped as Other Diagnoses, comprising 166 entries (27.6%).

Table 6. Gross Death Rate (GDR) and Net Death Rate (NDR) at Hermina Arcamanik General Hospital, Second Quarter of 2026

Indicator	Result	Ideal standard	Interpretation
GDR	21.44‰	≤45‰	Within standard
NDR	16.11‰	≤25‰	Within standard

The GDR was 21.44‰, below the reference threshold of ≤45‰ used in the source study. The NDR was 16.11‰, also below the reference threshold of ≤25‰. Both indicators were therefore interpreted as meeting the referenced ideal standards for the study period.

b. Discussion

Mortality Distribution by Age

Patients aged ≥60 years represented the largest proportion of mortality cases (51.6%). This pattern is consistent with the interpretation in the source manuscript that aging is associated with declining physiological function, a greater burden of chronic disease and comorbidity, and increased vulnerability to complications during hospitalization (Yofi et al., 2021; Astuti and Aridamayanti, 2021). Frailty and age-related reductions in cellular, tissue, and organ function may further increase mortality risk among older adults (Lutpatul and Pradana, 2022). The finding therefore suggests that older inpatients constitute an important group for continued clinical monitoring and mortality review.

Mortality Distribution by Sex

Mortality cases were more frequent among male patients (57.5%) than among female patients (42.5%). A similar distribution was reported by Wonda et al. (2024). The source manuscript discusses several possible contributing factors, including differences in comorbidity, lifestyle, occupational burden, stress, and delays in seeking medical care. Cohen et al. (2026) is also cited in relation to comorbidity burden and in-hospital





mortality. These explanations should be interpreted as contextual considerations rather than evidence of causality in the present descriptive dataset.

Mortality Distribution by Length of Stay

Most mortality cases occurred among patients hospitalized for ≥ 48 hours (75.2%). The source manuscript relates this pattern to the complexity of critical illness and the need for intensive monitoring, noting that length of stay is influenced by patient characteristics, disease type, and the course of treatment (Cohen et al., 2026; Margaretha and Zulfahmi, 2026). Death after ≥ 48 hours should therefore be interpreted together with diagnosis, clinical severity, treatment efforts, and the patient's condition throughout hospitalization rather than as an isolated measure of service quality (Pratama, 2023).

Mortality Distribution by Treatment Unit

The ICU accounted for 86.9% of the mortality cases. This concentration is clinically plausible because intensive care units manage patients with severe and life-threatening conditions. Oktorina et al. (2025) reported that age, comorbidity, acute diagnosis, and hemodynamic disturbances are among factors associated with mortality in intensive care. Raharni et al. (2023) likewise described the association between intensive-care treatment and mortality risk in critically ill patients, including those with severe disease or multiorgan dysfunction. The high proportion observed in the present study therefore primarily reflects the concentration of critically ill patients in the ICU.

Distribution of Recorded Diagnoses

The 602 recorded diagnoses among 153 deceased patients demonstrate that multiple diagnoses were frequently documented for individual patients, reflecting clinical complexity, comorbidities, complications, and acute conditions. Cardiac arrest was the most frequently recorded individual diagnosis (19.1%), followed by respiratory failure, pneumonia, and septic shock. Syahputra and Ariwibowo (2026) describe cardiac arrest as a critical condition involving sudden cessation of effective cardiac pumping and a high risk of mortality. In the context of the present dataset, the frequency of cardiac arrest should be interpreted as a recorded clinical condition among deceased patients and not necessarily as the underlying cause of death in every case.

Gross Death Rate and Net Death Rate

The GDR of 21.44‰ and NDR of 16.11‰ were below the reference standards of $\leq 45\%$ and $\leq 25\%$, respectively, used in the source study. GDR describes overall inpatient deaths relative to discharges, whereas NDR focuses on deaths occurring after the initial 48-hour period of hospitalization (Khansanah et al., 2022). Although both indicators were within the referenced thresholds, mortality should continue to be reviewed periodically because it can be influenced by disease severity, timeliness and appropriateness of treatment, and responsiveness of care. Regular mortality monitoring and medical audit can help identify contributing factors and support continuous quality improvement.





4. Conclusion

During the second quarter of 2026, 153 inpatient mortality cases at Hermina Arcamanik General Hospital showed a heterogeneous distribution. Mortality was most frequently recorded among patients aged ≥ 60 years (51.6%), male patients (57.5%), patients with a length of stay ≥ 48 hours (75.2%), and patients treated in the ICU (86.9%). Among 602 recorded diagnosis entries, cardiac arrest was the most frequent individual diagnosis (19.1%), followed by respiratory failure (10.8%), pneumonia (8.3%), and septic shock (5.0%). The larger number of diagnosis entries relative to patients indicates that multiple diagnoses were recorded for individual patients. The GDR was 21.44‰ and the NDR was 16.11‰, both below the reference thresholds used in the study. Despite these indicator values, periodic mortality monitoring and medical audit remain important, especially for older patients, critically ill patients treated in the ICU, and frequently recorded high-risk clinical conditions. The Medical Records Unit should continue to maintain complete, accurate, and structured mortality data to support statistical reporting and continuous hospital quality evaluation.

5. Compliance with Ethical Standards

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Disclosure of conflict of interest

The source manuscript does not report any conflict of interest. The authors should confirm this statement before journal submission.

Statement of informed consent

This study used secondary mortality recapitulation data and did not present patient identifiers. The source manuscript states that permission was obtained from the Medical Records Unit and that patient confidentiality was maintained. Any journal-specific ethics or consent statement should be confirmed by the authors before submission.

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