International Journal of Community Medicine and Public Health
Jabba K et al. Int J Community Med Public Health. 2026 Mar;13(3):1109-1116
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20260659

Original Research Article

A statistical analysis of clinical presentations and outcomes of COVID-19 patients in Sierra Leone: case study of admissions at 34 Military Hospital for COVID-19 patients

Kai Jabba[1], Abdulai Turay[2]*, William Kamara[3], Abdul Aziz Suma[4], Fatmata Jabba[5], Amara Sampha Kargbo[6], Amos Aiah Kamanda[7], Emmanuel Sandy[8]

[1]Department of Internal Medicine, University of Sierra Leone Teaching Hospitals Complex-Connaught Hospital, Sierra Leone
[2]Department of Pharmaceutical Sciences, College of Medicine and Allied Health Sciences, University of Sierra Leone, Sierra Leone
[3]Kabala Government Hospital, Sierra Leone
[4]Department of Internal Medicine Registrar, Makeni Regional Hospital, Sierra Leone
[5]College of Medicine and Allied Health Sciences, University of Sierra Leone, Sierra Leone
[6]Department of Obstetrics and Gynecology Registrar, University of Sierra Leone Teaching Hospitals Complex-Princess Christian Maternity Hospital, Sierra Leone
[7]Department of Public Health, College of Medicine and Allied Health Sciences, University of Sierra Leone, Sierra Leone
[8]NPHA, MoH and USLTHC-Connaught Hospital, Sierra Leone

Received: 11 December 2025
Revised: 12 February 2026
Accepted: 20 February 2026

***Correspondence:**
Dr. Abdulai Turay,
E-mail: abdulai.turay@usl.edu.sl

ABSTRACT

Background: COVID-19 outcomes vary widely across settings and are shaped by patient factors and health-system capacity. Evidence from Sierra Leone is limited, particularly on how age, comorbidities and presenting features relate to in-hospital admission outcomes. To describe the demographic, comorbidity and symptoms presentation of COVID-19 patients admitted at 34 Military Hospital, Freetown, assess bivariate associations between patient characteristics and discharge disposition; and estimate independent predictors of death using multinomial logistic regression.
Methods: Retrospective analysis of routinely collected data for 524 laboratory-confirmed COVID-19 patients admitted at the said facility. Primary outcome was discharge disposition (Discharged/Recovered, Deceased, Transferred). Descriptives summarized cohort characteristics. Pearson's χ^2 (Fisher's exact as needed) tested bivariate associations (α=0.05). Multinomial logistic regression (reference: Discharged) included age bands, sex, diabetes and difficulty breathing; results reported as odds ratios (OR) with 95% CIs and p-values.
Results: Patients were 63.2% male; the largest age bands were 22–32 years (21.8%) and 33–43 years (21.9%). Outcomes: 96.6% discharged, 2.7% died, 0.8% transferred. Comorbidities: hypertension 15.3%, diabetes 5.0%; other chronic conditions were rare. Symptoms were sparsely recorded; difficulty breathing 5.2%, malaise 2.9%, ARDS 1.5%. In bivariate analyses, age was associated with outcome (χ^2 p=0.002); sex (p=0.794) and diabetes (p=0.242) were not. In multivariable models, odds of death increased steeply with age versus 33–43 years (e.g., 66–76 years OR≈7.3×10^7, p<0.001). Diabetes (OR 1.41, 95% CI 0.26–7.66, p=0.688) and difficulty breathing (OR 2.73, 95% CI 0.65–11.43, p=0.170) were not independent predictors; transfers showed no significant predictors. Wide CIs reflected sparse events.
Conclusions: Mortality was low overall but rose sharply with age, identifying older adults as the principal risk group in this setting. Comorbidity and symptom variables, at their observed prevalences and documentation quality, did not independently predict death cause. Embedding age-based early escalation and strengthening routine documentation are pragmatic priorities to improve outcomes and future analytics.

Keywords: 34 Military Hospital, Age-related risk, COVID-19, Comorbidities, In-hospital mortality, Multinomial logistic regression, Sub-Saharan Africa, Sierra Leone

INTRODUCTION

COVID-19 remains a major global public health emergency that has continued to strain health systems worldwide.[1] Since the first cases were reported in late 2019, the pandemic has resulted in millions of infections and deaths globally.[1,2] In Sierra Leone, the burden of COVID-19 has been documented through national surveillance and response reports, although reporting varies by setting.[3,4] In the context of Sierra Leone, clinical data capture has been challenged by limited diagnostic capacity, late presentation and incomplete documentation in routine hospital records.[4,5] These data limitations may influence the recorded frequency of symptoms, complications and outcomes, particularly in resource-limited hospitals.[5]

Clinically, COVID-19 presents on a spectrum from asymptomatic infection to severe viral pneumonia, acute respiratory distress syndrome (ARDS), multiorgan involvement and death.[6] Early cohort studies underscored that severity of the disease steeply linked to age, generally higher in males and is amplified by comorbidities such as hypertension, diabetes and cardiovascular disease.[7] Large hospital data reported on 5,700 admitted patients in New York demonstrated that mortality rate and intensive interventions correlated with advanced age and the presence of underlying conditions, reinforcing age as a primary risk factor.[8] While "classic" symptoms include fever, cough, fatigue and dyspnea, atypical features (gastrointestinal symptoms, anosmia/ageusia or delirium in older adults) confusing triage system based on certain symptoms, may delay care seeking or inappropriate isolation.[9]

The biological plausibility of comorbidity-related risk is a corner peg for prognosis. Chronic conditions associated with vascular dysfunction, immune dysregulation and metabolic stress appear to potentiate the inflammatory cascade that characterizes severe COVID-19. Meta-analysis evidence early in the pandemic estimated pooled prevalences of hypertension (≈17%), diabetes (≈8%) and cardiovascular disease (≈5%) among hospitalized patients, linking these profiles to worse outcomes.[10] However, the prevalence and impact of these comorbidities vary by setting. In some SSA cohorts, lower recorded rates may reflect younger age structures and under-diagnosis, simultaneously, outcome risks may be shaped by constraints in oxygen delivery, late presentation or co-infections rather than by comorbid burden alone.

This interplay underscores why setting-specific analyses are necessary: the same clinical variables can have different predictive weights where health-system factors differ. Within sub-Saharan Africa, the observed "lower" mortality has been attributed to multiple, non-exclusive explanations including demography (median age), survivorship biases in testing and under-ascertainment alongside genuine differences in exposure and epidemic timing.[4,5] Irrespective of the exact contribution of each factor, a central implication for countries like Sierra Leone is that age remains a consistent, powerful determinant of risk, but the translation from risk to outcome is modulated by system readiness. When oxygen supply is scarce, documentation is inconsistent, referral systems are slow and treatment centers are overwhelmed, even modest physiologic stressors can tip patients into poor outcomes. Conversely, timely triage, basic supportive care and reliable monitoring can convert high-risk presentations into survivable episodes.[11]

In this context, the 34 Military Hospital plays an outsized role in this epidemic outbreak, as the first established major urban treatment facility for Covid-19, with experienced from prior outbreaks, it functions not only as a care hub but also as a bellwether of national capacity where patterns in admissions, case mix and outcomes can illuminate strengths and gaps applicable to other facilities. Yet despite this strategic position, there has been limited prevailing statistical data describing who was admitted, what comorbidities patient may have and symptoms they had and how these characteristics related to discharge, transfer or death. Without such analysis, resource allocation (e.g., oxygen concentrators, pulse oximeters), staff deployment and clinical protocols will affect patient's outcome and survival.

The present study responds to that need by applying a structured, statistical approach to secondary data from 524 confirmed COVID-19 patients treated at 34 Military Hospital. The design reflects three linked aims. First, to describe the demographic and clinical profile of admitted patients in a way that moves beyond anecdotes age and sex distributions, comorbidity prevalences and symptom patterns at presentation.[6,9] Second, to examine bivariate associations between these characteristics and patient outcomes, testing with chi-square methods whether variables like age, sex and diabetes track with discharge, death or transfer in this setting.[7,8,10] Third, to model outcome probabilities using multinomial logistic regression, estimating the independent effect of age and selected clinical features on mortality after accounting for other variables thereby generating risk estimates that clinicians and public health can act upon in real time.[4]

Importantly, the study also situates its findings within the practical realities of documentation and care delivery to COVID-19 patients in Sierra Leone.[4,11] Where symptom recording is sparse or comorbidities are under-diagnosed, interpretation must be cautious: a "non-significant" predictor may reflect data limitations rather than clinical irrelevance. Recognizing those constraints does not diminish the value of the analysis, instead, it clarifies priorities for system improvement better triage forms, standardized symptom checklists, routine vital-sign capture and integration of simple risk scores at admission. In turn, these improvements can enhance both patient care and the quality of future analyses, creating a virtuous cycle where data and practice reinforce each other. In summary, this introduction sets out the rationale and expectations for a focused, hospital-based analysis of COVID-19 patients admitted in Sierra Leone. Global evidence indicates that age, sex and comorbidity shape risk.[6-10] Regional assessments highlight heterogeneity within sub-Saharan Africa and the importance of health-system context.[4,5] By analyzing admissions at 34 Military Hospital with transparent statistical methods, the study aims to quantify which factors mattered most locally and to translate those insights into actionable recommendations prioritizing elderly patients for early escalation, reinforcing documentation and aligning resources where they can reduce mortality most effectively.[11]

METHODS

Study design and setting

Authors conducted a retrospective, quantitative study from 25 November 2020 to 30 January 2021 using routinely collected secondary data from patients with laboratory-confirmed COVID-19 admitted to the 34 Military Hospital in Freetown, Sierra Leone. The hospital served as a national COVID-19 treatment center during the pandemic, receiving referrals from across the Western Area and beyond. This design was chosen to describe clinical and demographic patterns and to identify factors associated with patient outcomes in a real-world, resource-limited setting.

Data source

The processed data comprises anonymized clinical and administrative records extracted from hospital case notes and admission registers. Variables available for analysis included demographics (age, sex), comorbidities (e.g., diabetes, hypertension, HIV, other), presenting symptoms (e.g., malaise, difficulty breathing), vital signs (e.g., pulse, blood pressure) where recorded, length of hospital stay and discharge disposition (discharged/recovered, deceased or transferred).

Study population and sampling

The study population included all consecutive patients with confirmed COVID-19 who were admitted to 34 Military Hospital during the study period and had complete core variables necessary for analysis. Authors used a census approach rather than sampling: every eligible record with complete outcome and key predictor information was included. Records with missing outcome status or with insufficient documentation on core predictors were excluded from analysis.

Inclusion criteria

Confirmed COVID-19 diagnosis, inpatient admission at 34 Military Hospital and complete medical record for core variables.

Exclusion criteria

Non-confirmed cases, outpatient encounters only or incomplete records for the main analysis fields.

The primary outcome variable was discharging disposition, classified into three mutually exclusive categories: discharged (recovered), deceased (died) or transferred. explanatory variables encompassed demographics, comorbidities, presenting symptoms, admission physiology and a hospitalization metric. Demographic characteristics included age analyzed in categorical bands aligned with hospital reporting (0–10, 11–21, 22–32, 33–43, 44–54, 55–65, 66–76, 77–87 and 88–98 years) and sex (male or female). Comorbid conditions were coded as binary indicators for diabetes, hypertension, HIV and “other” documented diagnoses.

Symptoms at admission captured the presence or absence of difficulty breathing, malaise and any additional symptom descriptors recorded in the medical notes. Physiological measures at admission comprised pulse and blood pressure, which were summarized descriptively where recorded. Finally, length of stay, measured in days from admission to discharge outcome, was used to characterize hospitalization and was likewise summarized descriptively.

Data analysis

Analyses were performed in SPSS Version 16 (IBM Corp.). We first generated descriptive statistics (frequencies and percentages for categorical variables; summary measures for continuous variables where applicable) to characterize the cohort. Bivariate associations between patient characteristics and the three-level outcome were assessed using Pearson’s chi-square tests; Fisher’s exact tests were used where expected cell counts were <5. Statistical significance was set at $\alpha = 0.05$ (two-sided).

To estimate independent associations with outcome, we fitted a multinomial logistic regression model with discharged (recovered) as the reference category. Age categories were entered as indicator variables to allow for non-linear risk across age bands, sex, diabetes and difficulty breathing were included as clinically relevant covariates available in the dataset. Model results are reported as odds ratios (Exp (B)) with 95% confidence intervals and corresponding p-values. Goodness-of-fit and classification outputs were reviewed to ensure model stability; variables with collinearity or near-zero variance were not retained.

Ethical considerations

This analysis used de-identified secondary data extracted from routine hospital records. Only aggregate results are reported and no personal identifiers were accessed or retained. Institutional permission for data use was obtained from the hospital data custodians. The study adhered to principles of confidentiality and privacy consistent with ethical conduct for retrospective record reviews.

RESULTS

This chapter presents the results of the statistical analysis of 524 laboratory-confirmed COVID-19 patients managed at 34 Military Hospital, Sierra Leone. Descriptive summaries are followed by inferential findings that examine how demographic and clinical characteristics relate to discharge disposition discharged (recovered), deceased (died) or transferred with all tests interpreted at $\alpha=0.05$.

As shown in Table 1, the cohort was predominantly male (63.2%) and concentrated in the young-to-middle-adult age bands: 22–32 years (21.8%) and 33–43 years (21.9%), together accounting for 43.7% of admissions. Outcomes were overwhelmingly favourable, with 96.6% discharged alive; 2.7% died and 0.8% were transferred. This age structure and high recovery proportion suggest a largely low-to-moderate clinical severity case-mix at presentation. Details the comorbidity profile, Hypertension was the most frequent condition (15.3%), followed by diabetes (5.0%) (Table 2). No cases of asthma/COPD, chronic kidney disease, hepatitis B/C or HIV were documented and "other" comorbidities were rare (1.1%). The paucity of chronic respiratory and renal disease conditions often implicated in severe COVID-19 may partly explain the high overall recovery rate; it also indicates that risk stratification within this dataset is driven primarily by age rather than multimorbidity. Presenting symptoms at admission (Table 3) were infrequently recorded. Difficulty breathing was seen in 5.2% and malaise in 2.9%, while ARDS was documented in 1.5%. A wide range of other symptom descriptors appeared at very low frequencies and in most records no additional symptoms were noted (81.9%). This pattern is consistent with a cohort skewed toward mild disease or with incomplete symptom capture in routine documentation; either way, symptom prevalence was low relative to the total caseload. Bivariate associations between patient characteristics and outcomes are summarized in Table 4. Age was significantly associated with discharge disposition (χ^2 p=0.002), with deaths clustering in older strata especially 66–76 years (six deaths) and 55–65 years (four deaths) while the largest younger groups (22–32 and 33–43 years) experienced virtually no mortality. In contrast, neither sex (p=0.794) nor diabetes (p=0.242) showed a statistically significant relationship with outcome. These findings indicate that, within this setting, age is the dominant unadjusted correlate of mortality, whereas the limited burden of recorded diabetes does not materially shift risk at the crude level.

Multivariable results from the multinomial logistic regression (Table 5), using discharged (recovered) as the reference category, reinforce the central role of age. Relative to the 33–43 years band, the odds of death rose sharply with advancing age, with particularly large point estimates for 55–65 years (Exp (B)$\approx 2.76\times10^7$) and 66–76 years (Exp (B)$\approx 7.32\times10^7$), all statistically significant at $p<0.001$. By contrast, diabetes (p=0.688; Exp (B)=1.41, 95% CI 0.26–7.66) and documented difficulty breathing at admission (p=0.170; Exp (B)=2.73, 95% CI 0.65–11.43) were not significant independent predictors of death. Predictors of transfer did not reach significance and several age-band coefficients displayed extremely wide confidence intervals, reflecting sparse events. Overall, the model confirms that age is the most consistent and clinically meaningful predictor of mortality in this series, while comorbidity and symptom variables at their observed prevalences do not independently explain outcome variation.

In summary, most patients in this hospital cohort recovered, mirroring the youthful age distribution and low prevalence of severe presenting physiology. Mortality, though uncommon, increased steeply with age on both crude and adjusted analyses, identifying older adults as the key risk group for adverse outcomes. Comorbidities were infrequent and, alongside low documented symptom burden, did not show statistically significant associations with death in multivariable modelling. These patterns underscore the value of age-focused risk stratification and early escalation pathways for older patients, while also highlighting opportunities to strengthen routine clinical documentation to improve future predictive analytics.

Table 1: Socio-demographic characteristics of COVID-19 patients.

Variables		Frequency (n=524)	(100%)
Age of COVID-19 patients (in years)	0-10	31	5.9
	11-21	32	6.1
	22-32	114	21.8
	33-43	115	21.9
	44-54	97	18.5
	55-65	68	13.0
	66-76	44	8.4
	77-87	21	4.0
	88-98	2	0.4

Continued.

Variables		Frequency (n=524)	(100%)
Sex of COVID-19 patients	Male	331	63.2
	Female	193	36.8
Outcome (recovered/died/transferred)	Discharged (recovered)	506	96.6
	Deceased (died)	14	2.7
	Transferred	4	0.8

Table 2: Prevalence of comorbidities.

Variables	Frequency (n=524)	(100%)
Diabetes	Yes 26	5.0
	No 498	95.0
Hypertension	Yes 80	15.3
	No 444	84.7
Asthma/COPD	Yes 0.0	0
	No 100.0	524
Kidney disease	Yes 0.0	0
	No 100.0	524
Hepatitis B	Yes 0.0	0
	No 100.0	524
Hepatitis C	Yes 0.0	0
	No 100.0	524
HIV	No 0.8	4
	Yes 99.2	520
Other comorbidities	No 98.9	518
	Yes 1.1	6

Table 3: Symptoms at admission.

Variables		Frequency (n=524)	(100%)
Difficulties breathing	No	497	94.8
	Yes	27	5.2
Malaise	No	509	97.1
	Yes	15	2.9
Acute respiratory distress syndrome	No	501	95.6
	Yes	8	1.5
	Mild	4	0.8
	Moderate respiratory distress	2	0.4
	Severe.	1	0.2
	Nil	7	1.3

Continued.

Variables		Frequency (n=524)	(100%)
	Chest with transmitted sounds, bilateral	1	0. 2
Other symptoms	Febrile and urinary problem and confuse afebrile to touch	2	0.4
	No	429	81.9
	Recurring boils and weakness	31	5.9
	Dyspnea and hyperglycemia	13	2.5
	Chest pain	5	1.0
	Anorexia and asymptomatic	6	1.1
	Vomiting and restlessness	6	1.1
	Sneezing and loss of taste and lethargy	12	2.3
	Nasal congestion and body pain and headache	13	2.5
	Shortness of breath and fatigue	4	0.8
	Diarrhoea and throat dryness	3	0.6

Table 4: Bivariate analysis-patient characteristics vs. outcome.

Variables		Discharged (recovered) (n=506)	Deceased (died) (n=14)	Transferred (n=4)	Total (n=524)	(100%)	P value *(<0.05)
Age of COVID-19 patients (in years)	0-10	31	0	0	31	5.9	*0.002
	11-21	30	1	1	32	6.1	<0.05
	22-32	113	1	0	114	21.8	
	33-43	115	0	0	115	21.9	
	44-54	94	1	2	97	18.5	
	55-65	63	4	1	68	13	
	66-76	38	6	0	44	8.4	
	77-87	20	1	0	21	4	
	88-98	2	0	0	2	0.4	
Sex of COVID-19 patients	Male	320	8	3	331	63.2	0.794
	Female	188	6	1	193	36.8	>0.05
Diabetes	No	482	12	4	498	95	0.242
	Yes	24	2	0	26	5	>0.05

*Clinically significant

Table 5: Multinomial logistics regression predicting mortality.

Outcome		Sig.	Exp (B)	95% Confidence interval for exp (B)	
				Lower bound	Upper bound
Deceased	Intercept	0.000			
	0-10	1.000	1.000	0.000	.[b]
	11-21	0.000	1.679E7	930232.475	3.030E8
	22-32	0.000	4.637E6	261287.086	8.230E7
	33-43	1.000	0.970	0.000	.[b]
	44-54	0.000	5.751E6	323684.897	1.022E8
	55-65	0.000	2.759E7	2859281.928	2.662E8
	66-76	0.000	7.319E7	7848668.753	6.825E8
	77-87	.	2.048E7	2.048E7	2.048E7
	88-98	.	.	.	.
	(Diabetes=Yes	0.688	1.413	0.261	7.658
	(Diabetes=No	.	.	.	.
	(difficulty breathing=Yes)	0.170	2.728	0.651	11.425
	(difficulty breathing=No)	.	.	.	.
Transferred	Intercept	0.999			
	0-10	1.000	1.000	0.000	.[b]
	11-21	1.000	6.928E7	0.000	.[b]

Continued.

Outcome		Sig.	Exp (B)	95% Confidence interval for exp (B)	
				Lower bound	Upper bound
	22-32	1.000	1.082	0.000	.[b]
	33-43	1.000	1.078	0.000	.[b]
	44-54	1.000	4.331E7	0.000	.[b]
	55-65	1.000	4.177E7	0.000	.[b]
	66-76	1.000	1.284	0.000	.[b]
	77-87	1.000	1.853	0.000	.[b]
	88-98	.	.	.	.
	(Diabetes=Yes)	0.998	6.702E-8	0.000	.[b]
	(Diabetes=No)	.	.	.	.
	(difficulty breathing =Yes)	0.998	1.040E-7	0.000	.[b]
	(difficulty breathing =No)	.	.	.	.

b: Odd ratio; The reference category is: discharged (recovered).

DISCUSSION

This facility-based analysis from 34 Military Hospital adds setting-specific evidence to a literature that consistently identifies age as the dominant driver of adverse COVID-19 outcomes while showing wide heterogeneity by health-system capacity and data completeness.[4,6-8] In this cohort of 524 laboratory-confirmed admissions, recovery was common (96.6%), deaths were uncommon (2.7%) and transfers were rare (0.8%). On crude comparisons and in the multinomial model, the probability of death rose steeply with advancing age, with the highest risk concentrated among patients ≥55 precisely the gradient observed in early hospital series from China, Europe and the United States.[6-9] That pattern is biologically and clinically plausible. Ageing is associated with immune senescence, decline in organs functions, endothelial dysfunction and a higher background prevalence of cardiometabolic disease, all of which can amplify the inflammatory and thrombotic cascades characteristic of severe SARS-CoV-2 infection.[7,9]

At the same time, several context-specific features may help explain the low crude mortality. First, the age distribution was skewed toward younger and middle-aged adults: patients aged 22–43 accounted for 43.7% of admissions, reflecting the demography of Sierra Leone and much of sub-Saharan Africa.[4,5] Second, the charted burden of major comorbidities was modest (hypertension 15.3%, diabetes 5.0%, virtually no chronic respiratory or renal disease). Although under-diagnosis and incomplete documentation are possible in routine hospital records, a genuinely lower prevalence of multimorbidity among admitted patients would shift absolute risk downward even if age-specific risks were similar to other regions.[4] Third, presenting symptom capture was sparse: 81.9% of records had no "other symptoms" listed, dyspnoea was present in only 5.2% and ARDS in 1.5%. These frequencies could reflect a case-mix skewed toward mild disease or, equally, limited documentation during surge periods; either way, the recorded physiologic burden at admission appears low, which aligns with the high discharge rate.[11]

The finding that sex and individual comorbidities (e.g., diabetes) were not statistically significant predictors of outcome at bivariate or multivariable levels should be interpreted cautiously. In larger datasets, male sex and cardiometabolic comorbidity usually add measurable risk, but power to detect those effects depends on prevalence, event counts and measurement quality.[7,8,10] Here, the number of deaths was small, the recorded prevalence of diabetes was low and symptom/vital-sign documentation was incomplete each of which can attenuate effect estimates and widen confidence intervals. The extremely large point estimates and wide intervals for some age bands in the regression are further signs of sparse events in those strata, they correctly indicate monotonic risk growth with age but are not numerically stable enough for bedside risk communication.[9] A practical implication is that quality improvement in routine data capture (standardized triage forms, mandatory vital-sign fields and structured comorbidity checklists) would improve clinical care and sharpen future analytics.[11]

Considering regional experiences in this outbreak, the results reinforce two operational messages. First, age-focused risk stratification should be embedded in admission and ward-round protocols: older adults should trigger early senior review, low thresholds for oxygen and monitoring and preferential access to escalation pathways.[7,11] Second, correct documentation is a prognostic factor for cure and inferences in any epidemics. In settings where outcome risks are modulated by oxygen availability, timeliness of presentation and referral reliability, apparently "non-significant" symptom or comorbidity effects may be artifacts of missingness rather than true nulls.[4,5] Closing those gaps through simple checklists, brief staff refreshers and routine audit-feedback can raise both care quality and the evidentiary value of hospital data.[11]

The study's strengths include its census-style inclusion of consecutive confirmed admissions at a national treatment Centre and a prespecified analytic pathway (descriptive→ bivariate→ multinomial). Programmatically, three low-cost opportunities emerge. Implement an "Age ≥55" admission flag that auto-prompts oxygen readiness checks, early senior review and daily escalation reassessment.[11] Adopt a one-page standardised intake (demographics, four core comorbidities, five key symptoms, vitals including SpO_2) with mandatory fields and weekly audit-feedback.[11] Establish a simple data pipeline that aggregates length-of-stay, mortality and oxygen-use metrics, enabling the hospital to detect deterioration in real time and to benchmark against other centres.[4] These are feasible within current resources and align with WHO and Africa CDC guidance emphasizing rapid triage, oxygen systems and data-driven management in resource-limited settings.[4,11]

Limitations are the flip side of real-world datasets: single-centre scope; few deaths limiting statistical power; potential under-ascertainment of comorbidities and symptoms; and lack of standardized measures of severity (e.g. SpO_2/FiO_2, CRP, D-dimer). These constraints do not diminish the central signal age dominates outcome risk but they do argue for multicentre harmonization across Sierra Leone to validate findings, quantify sex/comorbidity effects with adequate power and incorporate time-to-event analyses. Because the pandemic evolved through multiple waves with different variants and treatment practices, adding calendar-time adjustments in expanded datasets would also help disentangle period effects from patient-level risk.[4]

CONCLUSION

In a young adult-skewed cohort at 34 Military Hospital, most patients recovered and mortality was low; nevertheless, risk of death increased sharply with age on both crude and adjusted analyses, identifying older adults as the key risk group for adverse outcomes. The absence of significant effects for sex and diabetes likely reflects low prevalence and sparse events rather than true null associations. The practical take-home is straightforward: prioritise age-based early escalation (especially ≥55) and strengthen routine documentation so that symptom severity and comorbidity risks are not obscured by missing data. Embedding these steps into admission workflows and audit cycles can improve outcomes now and generate higher-fidelity evidence to guide preparedness for future respiratory epidemics in Sierra Leone.[4,5,11]

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. World Health Organization (WHO) (2020) Coronavirus disease (COVID-19) pandemic. Geneva: WHO. Available at: https://www.who.int/emergencies/diseases/novel-coronavirus. Accessed on 21 August 2025.
2. Wu Z, McGoogan, J.M. Characteristics of and important lessons from the coronavirus disease. (COVID-19) outbreak in China. JAMA. 2020;323(13):1239–42.
3. Osuteye E, Koroma B, Macarthy JM, Kamara SF, Conteh A. Fighting COVID-19 in Freetown, Sierra Leone: the critical role of community organisations in a growing pandemic. Open Health. 2020;1:51-63.
4. Union A. Africa Centres for Disease Control and Prevention (Africa CDC). Partnerships for African Vaccine Manufacturing (PAVM) Framework for Action. 2021.
5. Nkengasong JN, Mankoula W. Looming threat of COVID-19 infection in Africa: act collectively, and fast. Lancet. 2020;395(10227):841-2.
6. Huang C, Wang Y, Li X, Ren L. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395(10223):497-506.
7. Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet. 2020;395(10229):1054-62.
8. Richardson S, Hirsch JS, Narasimhan M, Crawford JM. Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized with COVID-19 in the New York City area. JAMA. 2020;323(20):2052-9.
9. Guan WJ, Ni ZY, Hu Y, Liang WH. Clinical characteristics of coronavirus disease 2019 in China. New England J Med. 2020;382(18):1708-20.
10. Yang J, Zheng YA, Gou X, Pu K, Chen Z, Guo Q, et al. Prevalence of comorbidities and its effects in patients infected with SARS-CoV-2: a systematic review and meta-analysis. Int j Infect Dis. 2020;94:91-5.
11. World Health Organization. Clinical management of COVID-19: living guideline, 18 August 2023. World Health Organization. 2023.
12. Jin JM, Bai P, He W, Wu F, Liu XF, Han DM, et al. Gender differences in patients with COVID-19: focus on severity and mortality. Fronti Publ Heal. 2020;8:545030.
13. World Health Organization (WHO) (2020a) WHO Director-General's opening remarks at the media briefing on COVID-19. 2020.

Cite this article as: Jabba K, Turay A, Kamara W, Suma AA, Jabba F, Kargbo AS, et al. A statistical analysis of clinical presentations and outcomes of COVID-19 patients in Sierra Leone: case study of admissions at 34 Military Hospital for COVID-19 patients. Int J Community Med Public Health 2026;13:1109-16.