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Research Article

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Posted Date: November 12th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11305604/v1

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Additional Declarations: No competing interests reported.

Hospital-Based Patterns of Better-Eye Uncorrected Distance Visual Acuity Impairment and Recorded Diagnosis-Group Associations in Mogadishu, Somalia: A Retrospective Electronic Health Record Study

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Running title: Uncorrected visual acuity impairment in Somalia

Article type: Research Article

Abstract

Background: Evidence on visual-acuity impairment in routine eye-care settings in Somalia remains limited, constraining eye-service planning and quality improvement. We described better-eye uncorrected distance visual acuity (UCVA) impairment and secondarily examined cross-sectional associations with age, sex, and concurrently recorded ophthalmic diagnosis groups.

Methods: We conducted a retrospective EHR-based observational study at a specialist hospital in Mogadishu, Somalia. One deterministic earliest visual-acuity examination per patient was selected from 1 January 2025 to 25 September 2026. Better-eye UCVA was categorized using WHO distance-acuity thresholds operationally applied to uncorrected acuity. Secondary diagnosis-group analyses used patients with one uniquely linkable same-day eye-service encounter.

Results: Of 55,651 index patients, 51,645 had classifiable bilateral UCVA. Any UCVA impairment (>6/12) affected 15,390 patients (29.80%; 95% CI 29.41–30.20), moderate-or-worse impairment 10,200 (19.75%; 95% CI 19.41–20.10), and severe-or-worse impairment 4,117 (7.97%; 95% CI 7.74–8.21). Any impairment increased from 12.57% at age 18–39 years to 62.80% at age ≥60 years. In the exact-linked eye-service subset (n=39,074), selected diagnosis groups were concurrently associated with UCVA impairment after adjustment.

Conclusions: Better-eye UCVA impairment was common among patients with classifiable bilateral UCVA records and showed a pronounced age gradient. These hospital-based findings are not population presenting- or best-corrected-acuity prevalence estimates, but they identify priorities for standardized visual-acuity documentation, refraction pathway evaluation, and eye-

service planning in a resource-constrained setting; diagnosis-group associations do not establish etiology.

Keywords: uncorrected visual acuity; visual impairment; ophthalmic epidemiology; electronic health records; Somalia; eye care

1. Background

Vision impairment is a major global health problem with substantial effects on education, employment, independence, and quality of life. The World Health Organization (WHO) classifies distance vision impairment using better-eye distance-acuity thresholds, and global burden analyses show that vision loss remains common worldwide.[1–3] The present study applies WHO distance-acuity thresholds to uncorrected visual acuity (UCVA), a measurement state that differs from presenting and best-corrected visual acuity.

The burden of vision loss remains high in sub-Saharan Africa. Regional analyses identify cataract and undercorrected refractive error among the leading contributors to blindness and moderate-to-severe vision impairment.[4,5] Hospital-, outreach-, and population-based studies from Rwanda, Zimbabwe, Zambia, Kenya, Ethiopia, and Nigeria also show strong age gradients and prominent roles for refractive error, cataract, glaucoma, and other ocular disease, while estimates vary materially by sampling frame and acuity state.[6–12]

Published evidence from Somalia remains limited. A 2020 hospital-based study of 2,605 adults in Mogadishu reported blindness in one or both eyes in 9.8% of patients and identified trauma, cataract, diabetic retinopathy, and glaucoma among the major causes.[13] A larger 2026 hospital-based study of 9,740 adults in Mogadishu reported blindness in 12.7% and described distinct age-related patterns, with trauma-related visual loss predominating among younger adults and

cataract and glaucoma becoming more prominent with increasing age.[14] These studies provide important information on blindness; however, they do not characterize the full spectrum of mild-to-severe uncorrected distance visual-acuity impairment across all ages in a large routine electronic health record (EHR) cohort.

Routine EHR data can complement population surveys by describing visual-function patterns encountered in clinical services and linking them with recorded demographic and diagnostic information; however, inference from routinely collected data is affected by missingness, documentation practices, healthcare utilization, referral pathways, and dataset-construction choices.[15–19] The present study extends previous Somali blindness-focused reports by providing an all-age patient-level analysis of the full better-eye UCVA severity spectrum with transparent handling of routine low-vision notation. This study primarily aimed to describe the distribution of better-eye UCVA impairment among patients attending a specialist hospital in Mogadishu. Secondary analyses examined cross-sectional associations with age, sex, and concurrently recorded ophthalmic diagnosis groups; these associations were not intended to identify causes of impairment.

2. Methods

2.1 Study design and setting

This retrospective, single-center, EHR-based observational study was conducted at Al Ihsan Specialist Hospital in Mogadishu, Somalia. Clinical records were managed in ERPNext/Frappe Healthcare (ERPNext 14.27.12; Frappe 14.40.0; Healthcare 14.0.1). Reporting was structured according to STROBE and the RECORD extension for studies using routinely collected health data.[15,20]

2.2 Study period and source data

The study period was 1 January 2025 through 25 September 2026; 2026 therefore represents a partial calendar year, and 25 September 2026 was the prespecified study data cutoff. All eligible VA Examination records within the period were considered. One deterministic earliest VA examination was selected per patient according to examination date, creation timestamp, and record name. This represented the first recorded VA entry within the study period, not necessarily the patient's first-ever hospital visit; record name was used only as a deterministic tie-breaker. Source patient identifiers were used only for deduplication and linkage before de-identification. Unusable demographic values were retained as missing rather than imputed, and source clinical records were never altered.

2.3 Visual-acuity semantics

The legacy right- and left-eye VA fields were confirmed to represent uncorrected distance visual acuity (UCVA). Separate legacy “with glass” fields represented acuity measured while the patient wore habitual spectacles. Habitual-spectacle VA was available in at least one eye for only 4,620 of 51,645 patients (8.9%) in the primary cohort and was therefore treated as a sparse secondary data element rather than an outcome-defining measure. Historical pinhole fields were also sparsely and inconsistently populated and were not included in the de-identified research export or primary analysis.

2.4 Eligibility and analysis cohorts

The primary descriptive cohort included patients with classifiable UCVA in both eyes. All ages were eligible. Adults aged ≥18 years and children aged 0–17 years were prespecified subgroups. Secondary diagnosis-group analyses used the subset with exactly one same-day patient encounter

and an eye-service department. Eye-service departments were prespecified as Ophthalmology, Vitrioretinal Specialist (legacy label "Vitrioretibal specialist"), and Optometry Department.

2.5 Visual-acuity normalization and classification

The primary outcome was severity of better-eye UCVA. Raw VA values were retained, and conservative analytical normalization standardized routine Snellen and low-vision notation while preserving uncertainty when distance information was unavailable. Explicit Snellen values, counting-fingers (CF) entries with a documented metric distance, hand movements (HM), light perception (LP), and no light perception (NLP) were accepted. Ambiguous malformed numeric strings were not automatically corrected. WHO distance-acuity thresholds were operationally adapted to UCVA and routine low-vision notation: no impairment at 6/12 or better; mild impairment worse than 6/12 to 6/18; moderate impairment worse than 6/18 to 6/60; severe impairment worse than 6/60 to 3/60; and blindness worse than 3/60.[1] CF at 3–6 m was mapped to severe impairment, CF at 1–2 m to blindness-level acuity, and HM, LP, and NLP to blindness-level low-vision notation. Because CF/HM values are semiquantitative and can vary across testing conditions, these mappings were treated as operational research rules rather than exact Snellen equivalences.[21,22] CF without a defensible distance was retained as severe/blindness indeterminate. Each eye was assigned an ordered acuity rank; the better eye was the eye with the better rank, with deterministic right-eye tie resolution when ranks were equal. The prespecified severe-or-worse composite endpoint combined severe impairment, blindness, and severe/blindness-indeterminate records. Normalization was algorithmic; targeted manual inspection was used to validate parsing rules, not to overwrite source values.

2.6 Encounter and diagnosis linkage

Same-day patient encounters were linked by patient identifier and matching calendar date, irrespective of within-day timestamp; the VA record was not required to precede the encounter in time. Across all 55,651 index patients, 42,359 had exactly one same-day encounter, 9,168 had multiple same-day encounters, and 4,124 had no same-day match. Multiple same-day encounters reflected routine multi-service or multi-practitioner pathways and could not be assigned deterministically to a single VA record without introducing an additional assumption; they were therefore excluded from secondary diagnosis-group modeling. Department and practitioner were obtained from Patient Encounter. Diagnoses and ICD-10 codes were obtained from Patient Encounter Diagnosis and analytically deduplicated using diagnosis, ICD-10 code, eye, diagnosis type, and status; source records were not modified.

2.7 Diagnosis grouping

For the secondary recorded diagnosis-group analysis, structured ICD-10 codes from the uniquely linked encounter were grouped a priori into cataract (H25/H26/H28), refractive disorders (H52), glaucoma (H40–H42), corneal disorders (H16–H18), retinal/choroidal disorders (H30–H36), optic nerve disorders (H46–H48), conjunctival disorders (H10/H11), lacrimal/dry-eye disorders (H04), pseudophakia (Z96.1), and ocular trauma (S05). H04 was treated as one operational lacrimal/dry-eye group because the source system records dry-eye diagnoses within the lacrimal-disorder code family. Structured diagnosis rows were entered during routine clinical care by treating eye-care staff; free-text diagnoses were not used for grouping. Diagnosis laterality was incompletely populated (available for approximately 10% of the exact-linked eye-service cohort), so diagnosis groups were not attributed specifically to the better or worse eye. Groups

were non-mutually exclusive and represented concurrent recorded diagnoses rather than adjudicated causes.

2.8 Statistical analysis

Categorical variables were summarized as counts and percentages, with Wilson 95% confidence intervals for principal UCVA proportions. Three binary outcomes were analyzed: any impairment, moderate-or-worse impairment, and severe-or-worse impairment. Absolute age- and sex-specific proportions were emphasized. Modified-Poisson generalized linear models with a log link and robust (sandwich) variance were used to estimate adjusted prevalence ratios (aPRs), the principal adjusted effect measure for common outcomes; logistic adjusted odds ratios (aORs) were retained as secondary estimates for comparability. Age was prespecified categorically (0–17, 18–39, 40–59, and ≥60 years), with 18–39 years as reference; female sex was the sex reference group. Secondary diagnosis-group models were restricted to exact-linked eye-service encounters and adjusted simultaneously for age, sex, and prespecified diagnosis groups. Models used available-case covariate data without imputation and converged successfully. Final statistical verification was reproduced in Python 3.13.5 using pandas 2.2.3, NumPy 2.3.5, SciPy 1.17.0, and statsmodels 0.14.6. Diagnosis-group estimates are interpreted as concurrent cross-sectional associations rather than causal effects.

2.9 Use of generative AI

During preparation of this manuscript, the authors used OpenAI ChatGPT (GPT-5.6 Sol, OpenAI) for language refinement, manuscript organization, coding support, and data-analysis assistance. The authors reviewed, revised, and verified all AI-assisted outputs and take full responsibility for the accuracy, originality, and integrity of the manuscript.

2.10 Ethics

The study was reviewed and approved by the Al Ihsan Specialist Hospital Ethics Committee, Mogadishu, Somalia, on 20 August 2026 (Reference: ASH2026UCVI01). The approval explicitly covered retrospective use of routinely collected clinical records generated from 1 January 2025 through the 25 September 2026 data cutoff. The Ethics Committee waived the requirement for individual informed consent because the study involved no participant contact or intervention and analysis/reporting used de-identified or aggregated data. Research data handling was subject to institutional data-governance and confidentiality requirements.

3. Results

3.1 Cohort derivation and data completeness

The source export contained 55,651 index patients. Right-eye UCVA was classifiable in 51,884 (93.2%) and left-eye UCVA in 51,838 (93.1%). A total of 51,645 patients (92.8%) had classifiable bilateral UCVA and formed the primary descriptive cohort; 432 had only one classifiable eye and 3,574 had neither eye classifiable. Age was usable in 55,628/55,651 (99.96%) index patients and sex was unknown in 10 (0.02%). Habitual-spectacle VA was available in at least one eye for 4,620/51,645 (8.9%) primary-cohort patients, confirming that it was too sparse to define a parallel presenting-acuity outcome. Among the primary cohort, 39,339 had exactly one same-day clinical encounter and 39,074 were linked to a prespecified eye-service department for secondary diagnosis-group analyses. Patients excluded for nonclassifiable bilateral UCVA were younger overall (43.8% aged 0–17 years vs 18.4% in the primary cohort), emphasizing that the reported proportions apply specifically to patients with classifiable bilateral UCVA. Figure 1 and Supplementary Table S1 summarize cohort derivation and missingness.

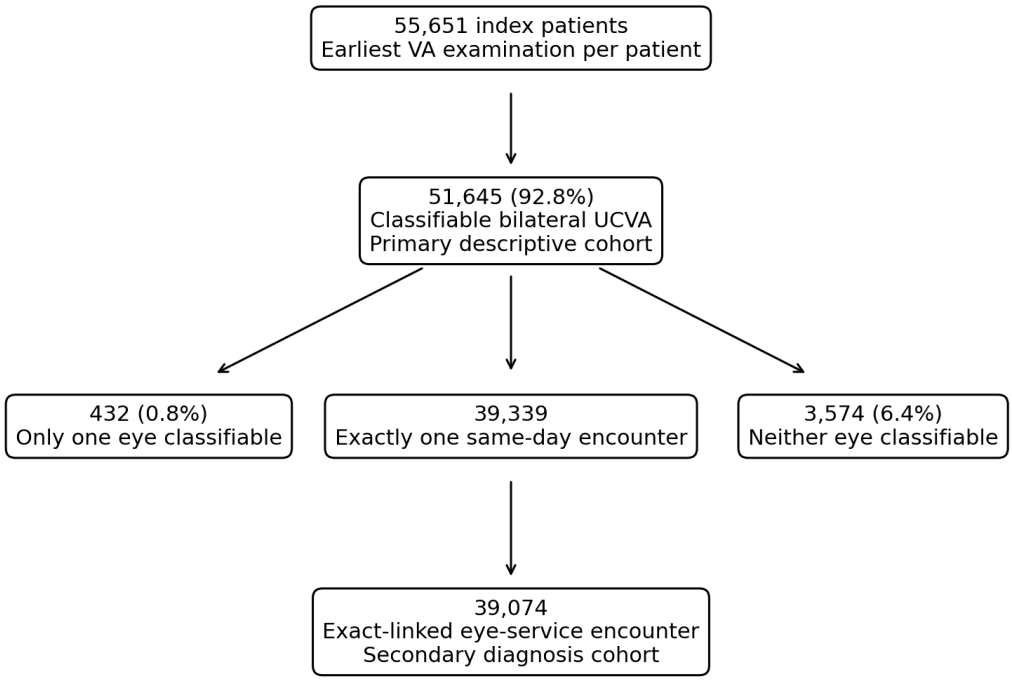


Figure 1. Cohort derivation and linkage for the primary descriptive and secondary diagnosis-group analyses.

3.2 Distribution of better-eye UCVA impairment

In the primary cohort, 36,255 patients (70.20%) had no UCVA impairment, 5,190 (10.05%) had mild impairment, 6,083 (11.78%) had moderate impairment, 2,530 (4.90%) had severe impairment, and 1,256 (2.43%) met the blindness-level category; 331 patients (0.64%) remained severe-versus-blindness indeterminate. The severity distribution is shown in Table 2. Overall,

any UCVA impairment was present in 15,390 patients (29.80%; 95% CI 29.41–30.20), moderate-or-worse impairment in 10,200 (19.75%; 95% CI 19.41–20.10), and severe-or-worse impairment in 4,117 (7.97%; 95% CI 7.74–8.21) (Table 1).

3.3 Age and sex patterns

UCVA impairment showed a marked age gradient. Any impairment affected 16.98% of patients aged 0–17 years, 12.57% of those aged 18–39 years, 27.79% of those aged 40–59 years, and 62.80% of those aged ≥60 years. Severe-or-worse impairment increased from 2.43% at age 18–39 years to 19.72% at age ≥60 years. Relative to age 18–39 years, age ≥60 years was associated with an adjusted prevalence ratio (aPR) of 5.00 (95% CI 4.81–5.21) for any impairment, 5.39 (95% CI 5.11–5.68) for moderate-or-worse impairment, and 8.05 (95% CI 7.30–8.88) for severe-or-worse impairment. Male sex showed little difference for any impairment (aPR 0.98, 95% CI 0.96–1.00) and a modestly higher prevalence of severe-or-worse impairment (aPR 1.10, 95% CI 1.04–1.17). Adjusted age- and sex-specific associations are summarized in Table 3.

3.4 Diagnosis-group associations

Diagnosis-group analyses were conducted in the exact-linked eye-service subset (n=39,074; 75.7% of the primary cohort), not in all patients with classifiable bilateral UCVA. Compared with the full primary cohort, this subset was modestly younger and had slightly lower impairment proportions: any UCVA impairment 27.23% versus 29.80%, moderate-or-worse 17.72% versus 19.75%, and severe-or-worse 6.75% versus 7.97% (Supplementary Table S1b). In these selected same-day exact-linked encounters, refractive disorders, cataract, glaucoma, retinal/choroidal disorders, and optic nerve disorders were concurrently recorded more often among patients with impaired UCVA after multivariable adjustment. The adjusted prevalence ratios for any UCVA impairment were 2.56 for refractive disorders, 1.55 for cataract, 1.40 for

glaucoma, 1.65 for retinal/choroidal disorders, and 1.76 for optic nerve disorders. Descriptive diagnosis-group impairment proportions are shown in Table 4, and adjusted associations are shown in Table 5.

3.5 Sensitivity analyses

Sensitivity to indeterminate CF records. Excluding the 331 severe/blindness-indeterminate records reduced the severe-or-worse proportion from 7.97% to 7.38%, while the age association was essentially unchanged. Assigning all indeterminate records to severe impairment or to blindness changed the separate severe and blindness categories but did not change the severe-or-worse composite proportion.

Restricted explicit-Snellen analysis. In 38,509 patients with explicit bilateral Snellen-format UCVA, any impairment was 28.08% and moderate-or-worse impairment was 17.10%. Severe-or-worse impairment was only 0.10% because CF/HM/LP/NLP low-vision records were excluded by design; this value is a notation-restriction sensitivity result and should not be interpreted as an alternative clinical prevalence estimate.

Tables

Table 1. Primary cohort characteristics and UCVA impairment by subgroup

Subgroup	N	Any UCVA impairment n (%)	Moderate-or-worse UCVA impairment n (%)	Severe-or-worse UCVA impairment n (%)
0–17 years	9,493	1,612 (16.98)	1,022 (10.77)	266 (2.80)
18–39 years	18,181	2,285 (12.57)	1,450 (7.98)	442 (2.43)
40–59 years	10,140	2,818 (27.79)	1,776 (17.51)	685 (6.76)
60+ years	13,808	8,671 (62.80)	5,949 (43.08)	2,723 (19.72)
Female	29,621	8,704 (29.38)	5,623 (18.98)	2,196 (7.41)
Male	22,014	6,685 (30.37)	4,576 (20.79)	1,920 (8.72)
Total	**51,645**	**15,390 (29.80)**	**10,200 (19.75)**	**4,117 (7.97)**

Percentages use the subgroup denominator shown in column 2. Age-group totals exclude 23 patients with unusable age values; sex totals exclude 10 patients with unknown sex. “Moderate-

or-worse" and "Severe-or-worse" refer to better-eye UCVA categories; the severe-or-worse composite includes severe impairment, blindness, and severe/blindness-indeterminate CF records.

Table 2. Distribution of better-eye UCVA severity in the primary cohort

Category	n	%	95% CI
No UCVA impairment	36,255	70.20	69.80–70.59
Mild UCVA impairment	5,190	10.05	9.79–10.31
Moderate UCVA impairment	6,083	11.78	11.50–12.06
Severe UCVA impairment	2,530	4.90	4.72–5.09
Blindness	1,256	2.43	2.30–2.57
Severe/blindness indeterminate	331	0.64	0.58–0.71

Severity categories were based on better-eye UCVA. The severe/blindness-indeterminate group contained counting-fingers records without a defensible distance-based split across the 3/60 boundary.

Table 3. Age- and sex-adjusted associations with UCVA impairment

Outcome	Predictor	Adjusted prevalence ratio	95% CI	p-value
Any UCVA impairment	Age 0–17 vs 18–39	1.35	1.28–1.44	<0.001
Any UCVA impairment	Age 40–59 vs 18–39	2.21	2.10–2.32	<0.001
Any UCVA impairment	Age 60+ vs 18–39	5.00	4.81–5.21	<0.001
Any UCVA impairment	Male vs Female	0.98	0.96–1.00	0.086
Moderate-or-worse	Age 0–17 vs 18–39	1.34	1.25–1.45	<0.001
Moderate-or-worse	Age 40–59 vs 18–39	2.20	2.06–2.35	<0.001
Moderate-or-worse	Age 60+ vs 18–39	5.39	5.11–5.68	<0.001
Moderate-or-worse	Male vs Female	1.03	1.00–1.07	0.048
Severe-or-worse	Age 0–17 vs 18–39	1.14	0.98–1.32	0.093
Severe-or-worse	Age 40–59 vs 18–39	2.79	2.48–3.13	<0.001
Severe-or-worse	Age 60+ vs 18–39	8.05	7.30–8.88	<0.001
Severe-or-worse	Male vs Female	1.10	1.04–1.17	<0.001

aPR, adjusted prevalence ratio; CI, confidence interval. Modified-Poisson models with robust variance. Reference groups: age 18–39 years and female.

Table 4. UCVA impairment by recorded ICD diagnosis group in the exact-linked eye-service cohort

Recorded ICD group	N	Any impairment %	Moderate-or-worse %	Severe-or-worse %
Cataract	5,068	63.42	44.75	20.17
Refractive disorder	3,241	42.55	28.60	7.00
Glaucoma	1,217	50.94	38.70	20.87
Corneal disorder	2,673	14.55	9.47	3.63
Retinal/choroidal disorder	225	46.22	36.44	17.78
Optic nerve disorder	190	43.16	37.37	23.68
Conjunctival disorder	6,370	11.90	6.33	1.59
Lacrimal/dry eye	9,940	19.55	10.88	3.24
Pseudophakia	2,164	54.85	34.61	12.89
Ocular trauma	1,243	5.63	3.78	1.21

Diagnosis groups were non-mutually exclusive recorded encounter diagnoses in the exact-linked eye-service cohort (n=39,074). Percentages are calculated within each diagnosis group, not across mutually exclusive categories. Raw percentages are descriptive; adjusted association estimates with 95% CIs are presented in Table 5.

Table 5. Adjusted diagnosis-group associations with UCVA impairment

Outcome	Recorded ICD group	Adjusted prevalence ratio	95% CI	p-value
Any UCVA impairment	Cataract	1.55	1.49–1.60	<0.001
Any UCVA impairment	Refractive disorder	2.56	2.43–2.71	<0.001
Any UCVA impairment	Glaucoma	1.40	1.32–1.48	<0.001
Any UCVA impairment	Retinal/choroidal disorder	1.65	1.43–1.90	<0.001
Any UCVA impairment	Optic nerve disorder	1.76	1.51–2.05	<0.001
Severe-or-worse	Cataract	1.80	1.64–1.97	<0.001
Severe-or-worse	Refractive disorder	1.99	1.74–2.29	<0.001
Severe-or-worse	Glaucoma	2.05	1.81–2.32	<0.001
Severe-or-worse	Retinal/choroidal disorder	2.54	1.90–3.40	<0.001
Severe-or-worse	Optic nerve disorder	3.92	3.05–5.06	<0.001

Modified-Poisson models with robust variance were adjusted simultaneously for age, sex, and all prespecified diagnosis groups. Adjusted odds ratios and complete null/inverse estimates are reported in Supplementary Table S3.

4. Discussion

4.1 Principal findings

This study primarily describes better-eye UCVA impairment in a large specialist-hospital cohort. The dominant demographic finding was a marked age gradient: any impairment rose from 12.57% among patients aged 18–39 years to 62.80% among those aged ≥60 years, while 19.72% of patients aged ≥60 years met the severe-or-worse composite endpoint. Secondary diagnosis-group analyses provide contextual cross-sectional information from the selected exact-linked eye-service subset rather than etiological or population-level risk estimates. These findings support standardized acuity assessment and clinical follow-up for older attendees without implying age-specific population burden.

4.2 Comparison with African and Somali evidence

The increasing impairment with age and frequent co-recording of refractive, lens, glaucomatous, retinal, and optic nerve diagnoses are broadly compatible with reports from other African eye-care settings, while direct numerical comparison is limited by differences in acuity state, sampling frame, age composition, referral pathways, and access to refractive correction.[4–12] Earlier Somali studies focused principally on blindness and identified cataract, trauma, diabetic retinopathy, glaucoma, and corneal disease as important clinical findings.[13,14] The present study adds an all-age patient-level description of the full better-eye UCVA severity spectrum rather than another estimate of presenting- or best-corrected-acuity prevalence.

4.3 Interpretation of diagnosis-group associations

In same-day, exact-linked eye-service encounters, selected diagnosis groups were concurrently recorded more often among patients with impaired UCVA after adjustment. These diagnoses

were common or strongly associated features among impaired patients in this selected hospital case mix, but the analysis does not establish which condition caused the acuity deficit, temporal sequence, or cause-specific burden. Because diagnosis laterality was sparsely recorded, the models also cannot determine whether a diagnosis applied to the better-seeing eye, worse-seeing eye, or both eyes.

4.4 UCVA versus presenting and best-corrected acuity

Because this study classified impairment using UCVA, the reported proportions include some patients whose vision may improve with habitual or optimal refractive correction. Comparisons with studies based on presenting or best-corrected acuity should therefore be made cautiously. The acuity cut-points are WHO distance thresholds, operationally applied to UCVA and routine low-vision notation; this does not make the estimates equivalent to WHO population prevalence measures based on other acuity states.

4.5 Strengths and limitations

The main limitations affecting external validity and selection are the single-center specialist-hospital setting, care-seeking and referral selection, exclusion of 7.2% of index patients because bilateral UCVA could not be classified, disproportionate exclusion of younger patients, and further restriction of diagnosis-group analyses to patients with a uniquely linkable same-day eye-service encounter. Such conditioning on healthcare utilization and documentation processes can introduce selection effects in EHR-based research.[16–19] Diagnosis-group associations may therefore not represent all patients in the primary UCVA cohort.

Measurement and interpretation limitations include use of UCVA rather than standardized presenting or best-corrected visual acuity, sparse habitual-spectacle VA, absence of sufficiently complete pinhole data, semiquantitative non-Snellen low-vision notation, incomplete diagnosis

laterality, reliance on routine recorded diagnoses rather than adjudicated causes of visual loss, partial-year 2026 data, residual confounding, and documentation changes over time. The operational CF/HM/LP/NLP mapping improves reproducibility but should not be interpreted as exact equivalence to standardized chart acuity.[21,22] Accordingly, the severe-or-worse composite is more interpretable than the separate severe and blindness categories in this routine-record dataset.

4.6 Clinical and health-system implications

Although this study did not assess treatment effects or service uptake, its findings have direct clinical-service and public-health relevance in a setting where large routine ophthalmic datasets are scarce. Visual-acuity documentation should distinguish UCVA, presenting VA, pinhole VA, and best-corrected VA; counting-fingers measurements should include distance; and structured laterality and diagnostic fields should be completed consistently. The frequent co-recording of refractive disorders with impaired UCVA supports further audit of refraction assessment and spectacle-service pathways, particularly to determine how much measured UCVA impairment improves with correction. The pronounced age gradient can also inform service planning and prioritization of standardized acuity assessment and follow-up among older attendees, while population-based studies remain necessary for estimating community prevalence.

5. Conclusions

Better-eye UCVA impairment was common among patients with classifiable bilateral UCVA records attending this specialist hospital in Mogadishu and increased substantially with age. Recorded refractive, cataract, glaucoma, retinal/choroidal, and optic nerve diagnoses were concurrently associated with impairment in the exact-linked eye-service subset, but these

findings do not establish etiology or population burden. The study demonstrates how routine EHR data can support ophthalmic service evaluation and public-health planning while also identifying documentation limitations that should be addressed. Standardized recording of acuity state, low-vision measurements, laterality, and diagnostic fields would strengthen future clinical audit, service planning, and epidemiological research in Somalia.

List of abbreviations

aOR, adjusted odds ratio; aPR, adjusted prevalence ratio; CF, counting fingers; CI, confidence interval; EHR, electronic health record; HM, hand movements; ICD-10, International Classification of Diseases, Tenth Revision; LP, light perception; NLP, no light perception; RECORD, REporting of studies Conducted using Observational Routinely-collected health Data; STROBE, Strengthening the Reporting of Observational Studies in Epidemiology; UCVA, uncorrected distance visual acuity; VA, visual acuity; WHO, World Health Organization.

6. Declarations

Ethics approval and consent to participate

The study was reviewed and approved by the Al Ihsan Specialist Hospital Ethics Committee, Mogadishu, Somalia, on 20 August 2026 (Reference: ASH2026UCVI01). The approval covered retrospective use of routinely collected clinical records from 1 January 2025 through 25 September 2026. The Ethics Committee waived the requirement for individual informed consent because the study involved no participant contact or intervention and analysis/reporting used de-identified or aggregated data. Research data handling was subject to institutional data-governance and confidentiality requirements.

Consent for publication

Not applicable.

Availability of data and materials

The analytical dataset contains de-identified hospital clinical data. Access to underlying institutional data is subject to Al Ihsan Specialist Hospital data-protection and governance requirements. Analytical code and normalization rules may be considered for sharing on reasonable request, subject to institutional approval and applicable data-governance requirements.

Competing interests

The authors declare that they have no competing interests.

Funding

This research did not receive any specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Authors' contributions

Author contributions (CRediT): Liban Hassan Mohamud — Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. Mohamoud Ahmed Mohamed (Dr Shiine) — Conceptualization, Investigation, Methodology, Resources, Supervision, Validation, Writing – review & editing. Isxaq Dhore Ibrahim — Data curation, Investigation, Validation, Writing – review & editing. Ayuub Mohamed Dhaylow — Data curation, Investigation, Validation, Writing – review & editing. All authors approved the final manuscript and accept responsibility for the work.

Declaration of generative AI use

During preparation of this manuscript, the authors used OpenAI ChatGPT (GPT-5.6 Sol, OpenAI) for language refinement, manuscript organization, coding support, and data-analysis assistance. The authors reviewed, revised, and verified all AI-assisted outputs and take full responsibility for the accuracy, originality, and integrity of the manuscript.

Acknowledgements

Not applicable.

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