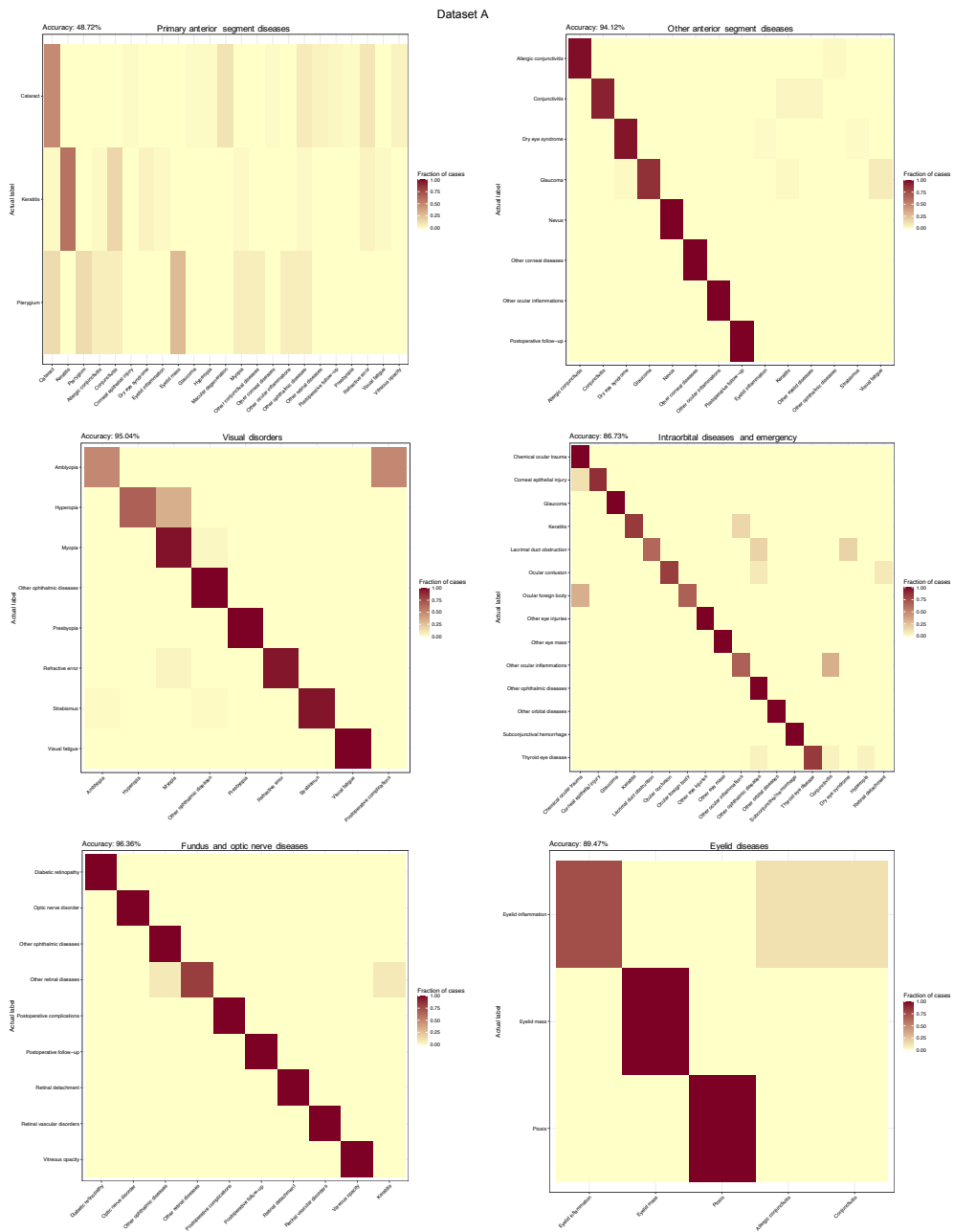


| #1 In silico development (4391 subjects, 6551 entries) | | | | | | | | #2 Silent evaluation (202 subjects, 912 entries) | |
|---|--|--|--|---|---|---|---|---|--|
| Dialogues | Dataset A | Dataset B | Smartphone photos | Dataset C | Dataset D | Dataset E | Dataset F | Dataset G | Medical history |
| Included: <ul style="list-style-type: none"> 492 subjects 492 entries Excluded: <ul style="list-style-type: none"> 42 subjects 42 entries Final dataset: <ul style="list-style-type: none"> 450 subjects 450 entries Usage: <ul style="list-style-type: none"> Training text model | Included: <ul style="list-style-type: none"> 612 subjects 612 entries Excluded: <ul style="list-style-type: none"> 32 subjects 32 entries Final dataset: <ul style="list-style-type: none"> 580 subjects 580 entries Usage: <ul style="list-style-type: none"> Testing text model | Included: <ul style="list-style-type: none"> 1035 subjects 1335 entries Excluded: <ul style="list-style-type: none"> 56 subjects 80 entries Final dataset: <ul style="list-style-type: none"> 950 subjects 1255 entries Usage: <ul style="list-style-type: none"> Training and validating slit-lamp model | Included: <ul style="list-style-type: none"> 208 subjects 208 entries Excluded: <ul style="list-style-type: none"> 8 subjects 8 entries Final dataset: <ul style="list-style-type: none"> 200 subjects 200 entries Usage: <ul style="list-style-type: none"> Training and validating eye-target detection model | Included: <ul style="list-style-type: none"> 1530 subjects 2691 entries Excluded: <ul style="list-style-type: none"> 59 subjects 80 entries Final dataset: <ul style="list-style-type: none"> 1471 subjects 2586 entries Usage: <ul style="list-style-type: none"> Training and validating slit-lamp model | Included: <ul style="list-style-type: none"> 290 subjects 290 entries Excluded: <ul style="list-style-type: none"> 6 subjects 6 entries Final dataset: <ul style="list-style-type: none"> 284 subjects 284 entries + 2 models Usage: <ul style="list-style-type: none"> Testing slit-lamp model Training text + slit-lamp model | Included: <ul style="list-style-type: none"> 291 subjects 291 entries Excluded: <ul style="list-style-type: none"> 17 subjects 17 entries Final dataset: <ul style="list-style-type: none"> 274 subjects 274 entries + 2 models Usage: <ul style="list-style-type: none"> Testing smartphone model Training text + smartphone model | Included: <ul style="list-style-type: none"> 190 subjects 190 entries Excluded: <ul style="list-style-type: none"> 5 subjects 5 entries Final dataset: <ul style="list-style-type: none"> 182 subjects 182 entries + 2 models Usage: <ul style="list-style-type: none"> Testing text + slit-lamp + smartphone model1 Testing text + slit-lamp + smartphone model2 | Included: <ul style="list-style-type: none"> 207 subjects 207 entries Excluded: <ul style="list-style-type: none"> 5 subjects 5 entries Final dataset: <ul style="list-style-type: none"> 202 subjects 202 entries + 4 models Usage: <ul style="list-style-type: none"> Testing text model Testing text + slit-lamp model Testing text + smartphone model Testing text + slit-lamp + smartphone model | Included: <ul style="list-style-type: none"> 105 subjects 105 entries Excluded: <ul style="list-style-type: none"> 1 subjects 1 entries Final dataset: <ul style="list-style-type: none"> 104 subjects 104 subjects (randomly selected from Dataset G) Usage: <ul style="list-style-type: none"> Testing text model |
| Inclusion criteria: <ul style="list-style-type: none"> Dialogues representing 50 predefined disease types. Exclusion criteria: <ul style="list-style-type: none"> Dialogues with too much redundant information. | Inclusion criteria: <ul style="list-style-type: none"> Outpatient cases representing 50 predefined disease types. Exclusion criteria: <ul style="list-style-type: none"> Cases without a confirmed diagnosis. | Inclusion criteria: <ul style="list-style-type: none"> Slit-lamp images for diseases with top 1-5 prevalence rates in each subspecialty. Exclusion criteria: <ul style="list-style-type: none"> Images without a confirmed label. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Smartphone images displaying both eyes. Exclusion criteria: <ul style="list-style-type: none"> Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Smartphone images for diseases with top 1-5 prevalence rates in each subspecialty. Exclusion criteria: <ul style="list-style-type: none"> Images without a confirmed label. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Cases of cataract, keratitis, pterygium and others with slit-lamp images. Exclusion criteria: <ul style="list-style-type: none"> Cases without a confirmed diagnosis. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Cases of cataract, keratitis, pterygium and others with smartphone images. Exclusion criteria: <ul style="list-style-type: none"> Cases without a confirmed diagnosis. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Cases of cataract, keratitis, pterygium and others with both slit-lamp and smartphone images. Exclusion criteria: <ul style="list-style-type: none"> Cases without a confirmed diagnosis. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Cases of cataract, keratitis, pterygium and others with both slit-lamp and smartphone images. Exclusion criteria: <ul style="list-style-type: none"> Cases without a confirmed diagnosis. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Random selection from Dataset G. Exclusion criteria: <ul style="list-style-type: none"> Cases without electronic medical history. |

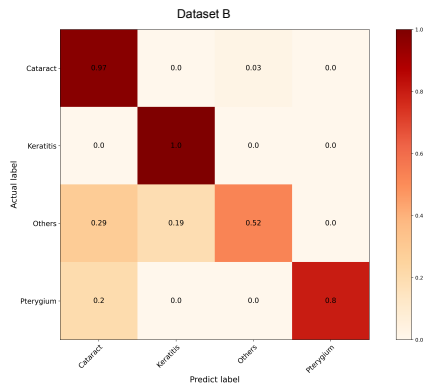
| #3 Early clinical evaluation (5232 subjects, 8177 entries) | | | | | | | | | |
|--|---|--|--|---|---|---|--|--|--|
| Internal evaluation (Shanghai) | | | | | Internal evaluation (Nanjing, Suqian) | | | | |
| Data provider: researchers | | | Data provider: patients | | Data provider: researchers | | | Data provider: patients | |
| Dataset 1 | Dataset 2 | Dataset 3 | Dataset 4 | Dataset 5 | Dataset 6 | Dataset 7 | Dataset 8 | Dataset 9 | Dataset 10 |
| Included: <ul style="list-style-type: none"> 1129 subjects 1129 entries Excluded: <ul style="list-style-type: none"> 64 subjects 64 entries Final dataset: <ul style="list-style-type: none"> 1065 subjects 1065 entries Usage: <ul style="list-style-type: none"> Testing text model | Included: <ul style="list-style-type: none"> 202 subjects 202 entries Excluded: <ul style="list-style-type: none"> 13 subjects 13 entries Final dataset: <ul style="list-style-type: none"> 189 subjects 189 entries + 2 models Usage: <ul style="list-style-type: none"> Testing text model Testing text + slit-lamp model | Included: <ul style="list-style-type: none"> 62 subjects 62 entries Excluded: <ul style="list-style-type: none"> 5 subjects 5 entries Final dataset: <ul style="list-style-type: none"> 57 subjects 57 entries + 2 models Usage: <ul style="list-style-type: none"> Testing text model Testing text + smartphone model | Included: <ul style="list-style-type: none"> 855 subjects 855 entries Excluded: <ul style="list-style-type: none"> 42 subjects 42 entries Final dataset: <ul style="list-style-type: none"> 813 subjects 813 entries + 2 models Usage: <ul style="list-style-type: none"> Testing text model Testing text + smartphone model | Included: <ul style="list-style-type: none"> 177 subjects 62 entries Excluded: <ul style="list-style-type: none"> 9 subjects 9 entries Final dataset: <ul style="list-style-type: none"> 168 subjects 168 entries + 2 models Usage: <ul style="list-style-type: none"> Testing text model Testing text + slit-lamp + smartphone model | Included: <ul style="list-style-type: none"> 1288 subjects 1288 entries Excluded: <ul style="list-style-type: none"> 66 subjects 66 entries Final dataset: <ul style="list-style-type: none"> 1222 subjects 1222 entries Usage: <ul style="list-style-type: none"> Testing text model | Included: <ul style="list-style-type: none"> 234 subjects 234 entries Excluded: <ul style="list-style-type: none"> 13 subjects 13 entries Final dataset: <ul style="list-style-type: none"> 221 subjects 221 entries + 2 models Usage: <ul style="list-style-type: none"> Testing text model Testing text + slit-lamp model | Included: <ul style="list-style-type: none"> 719 subjects 719 entries Excluded: <ul style="list-style-type: none"> 31 subjects 31 entries Final dataset: <ul style="list-style-type: none"> 688 subjects 688 entries + 2 models Usage: <ul style="list-style-type: none"> Testing text model Testing text + smartphone model | Included: <ul style="list-style-type: none"> 553 subjects 553 entries Excluded: <ul style="list-style-type: none"> 29 subjects 29 entries Final dataset: <ul style="list-style-type: none"> 524 subjects 524 entries + 2 models Usage: <ul style="list-style-type: none"> Testing text model Testing text + smartphone model | Included: <ul style="list-style-type: none"> 297 subjects 297 entries Excluded: <ul style="list-style-type: none"> 12 subjects 12 entries Final dataset: <ul style="list-style-type: none"> 285 subjects 285 entries + 2 models Usage: <ul style="list-style-type: none"> Testing text model Testing text + slit-lamp + smartphone model |
| Inclusion criteria: <ul style="list-style-type: none"> Informed consent provided. Chief complaints related to eyes. Exclusion criteria: <ul style="list-style-type: none"> Patients medical unstable to be recruited. Cases without a confirmed diagnosis. Diseases with prevalence below 5-percentile threshold. | Inclusion criteria: <ul style="list-style-type: none"> Informed consent provided. Chief complaints related to eyes. Cases with slit-lamp images. Exclusion criteria: <ul style="list-style-type: none"> Patients medical unstable to be recruited. Cases without a confirmed diagnosis. Diseases with prevalence below 5-percentile threshold. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Informed consent provided. Chief complaints related to eyes. Cases with smartphone images. Exclusion criteria: <ul style="list-style-type: none"> Patients medical unstable to be recruited. Cases without a confirmed diagnosis. Diseases with prevalence below 5-percentile threshold. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Informed consent provided. Chief complaints related to eyes. Cases with smartphone images. Exclusion criteria: <ul style="list-style-type: none"> Patients unable to use IOMDS. Cases without a confirmed diagnosis. Diseases with prevalence below 5-percentile threshold. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Informed consent provided. Chief complaints related to eyes. Cases with both slit-lamp and smartphone images. Exclusion criteria: <ul style="list-style-type: none"> Patients unable to use IOMDS. Cases without a confirmed diagnosis. Diseases with prevalence below 5-percentile threshold. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Informed consent provided. Chief complaints related to eyes. Exclusion criteria: <ul style="list-style-type: none"> Patients medical unstable to be recruited. Cases without a confirmed diagnosis. Diseases with prevalence below 5-percentile threshold. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Informed consent provided. Chief complaints related to eyes. Cases with slit-lamp images. Exclusion criteria: <ul style="list-style-type: none"> Patients medical unstable to be recruited. Cases without a confirmed diagnosis. Diseases with prevalence below 5-percentile threshold. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Informed consent provided. Chief complaints related to eyes. Cases with smartphone images. Exclusion criteria: <ul style="list-style-type: none"> Patients medical unstable to be recruited. Cases without a confirmed diagnosis. Diseases with prevalence below 5-percentile threshold. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Informed consent provided. Chief complaints related to eyes. Cases with smartphone images. Exclusion criteria: <ul style="list-style-type: none"> Patients unable to use IOMDS. Cases without a confirmed diagnosis. Diseases with prevalence below 5-percentile threshold. Unclear images. | Inclusion criteria: <ul style="list-style-type: none"> Informed consent provided. Chief complaints related to eyes. Cases with both slit-lamp and smartphone images. Exclusion criteria: <ul style="list-style-type: none"> Patients unable to use IOMDS. Cases without a confirmed diagnosis. Diseases with prevalence below 5-percentile threshold. Unclear images. |

Supplementary Figure 1 Flowchart of model development and clinical evaluation. Our study consists of a development stage and two evaluation stages of cross-sectional study. During the in silico development stage, we developed a multimodal AI system using ChatGPT and anterior segment images captured by slit-lamp and/or smartphone to facilitate the diagnosis and triage of ophthalmic diseases. During the first evaluation stage (silent evaluation), we aim to evaluate the AI system's performance based on medical histories obtained through observation without patient interaction alongside slit-lamp and/or smartphone images. During the second evaluation stage (early clinical evaluation), we aim to evaluate the AI system's performance in outpatient clinics based on medical histories obtained through patient interview or self-reported information, combined with slit-lamp and/or smartphone-captured anterior segment images.

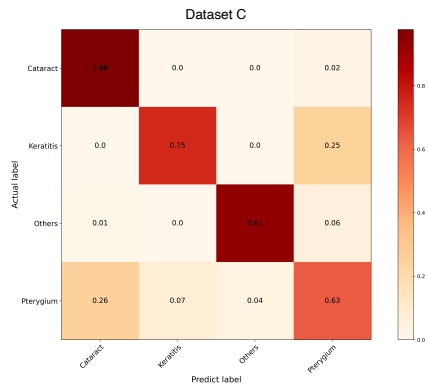
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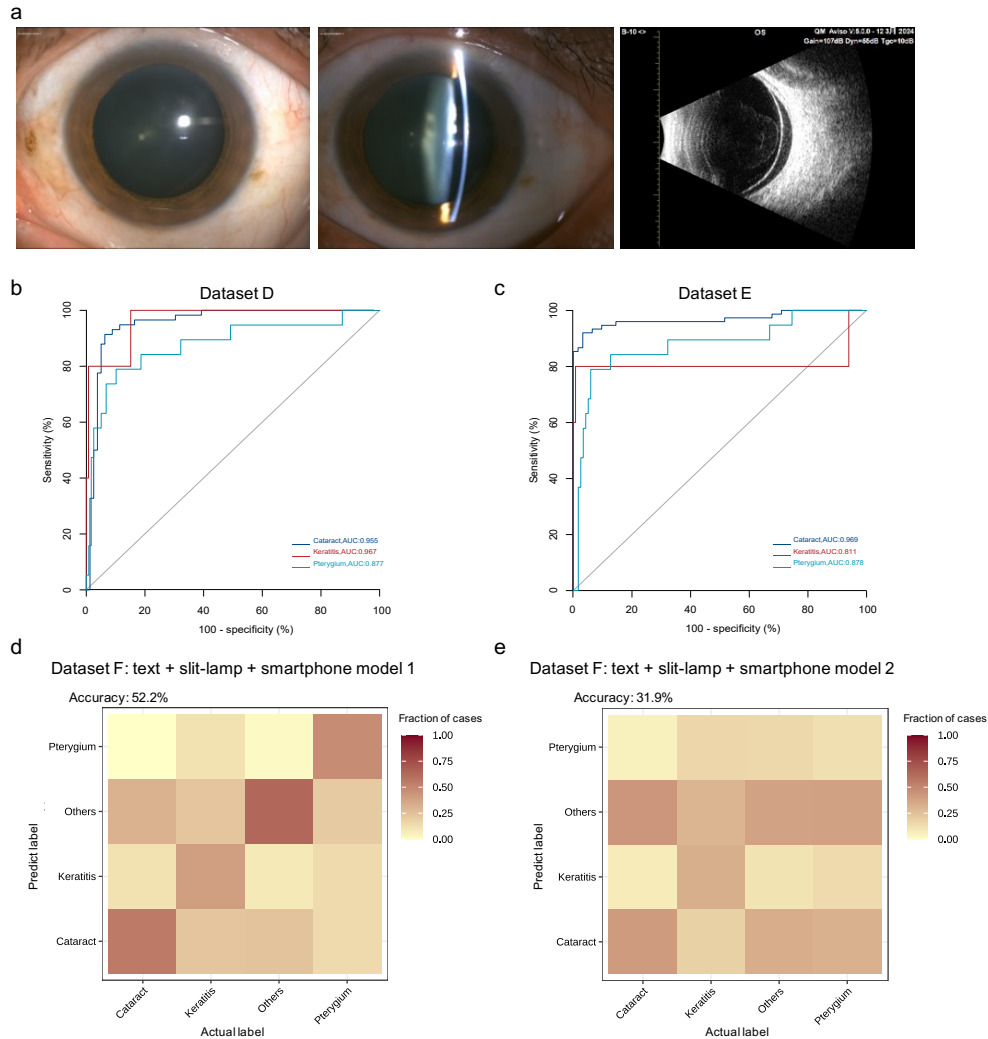
b



c



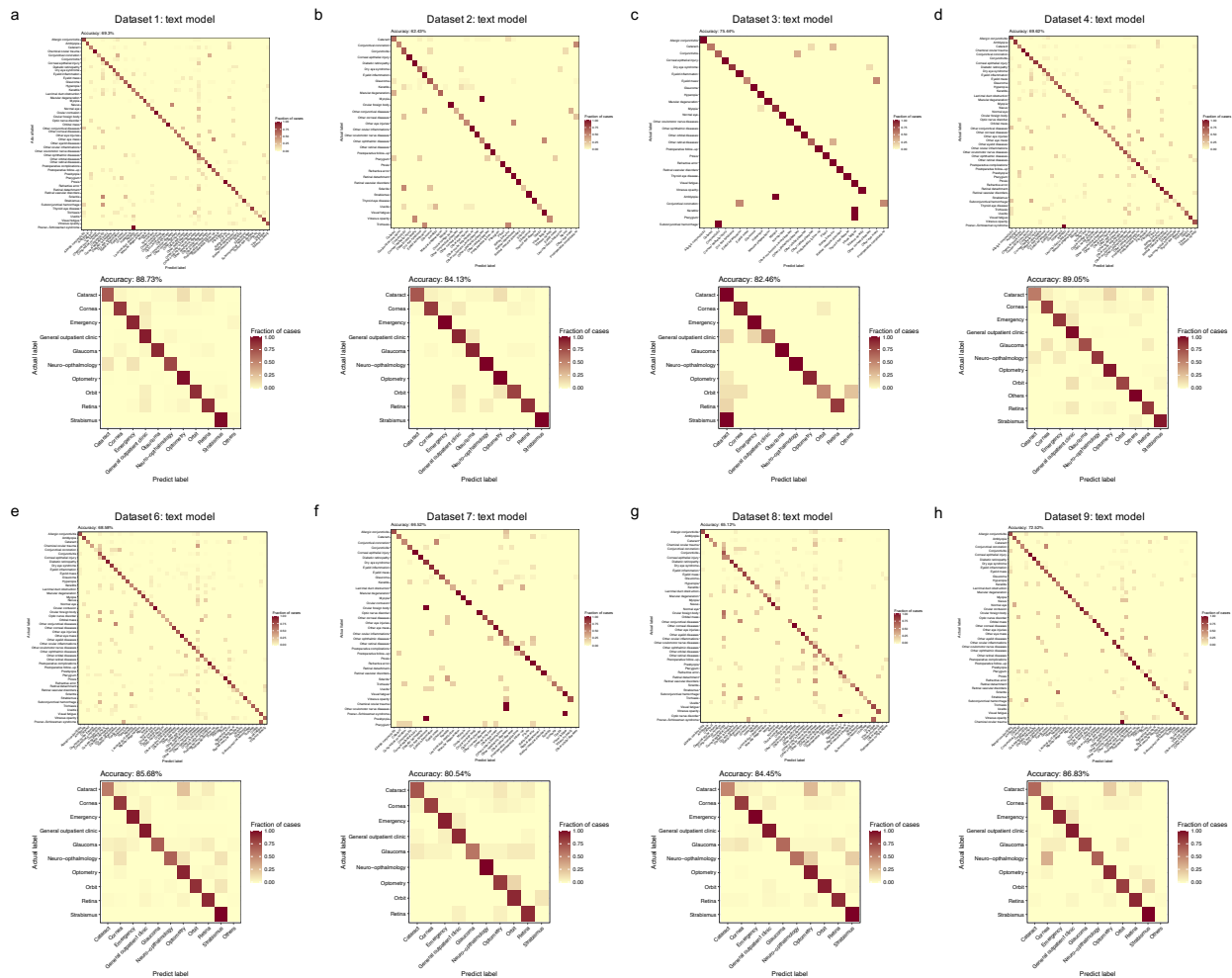
Supplementary Figure 2 Confusion matrix obtained during the development stage. a, Confusion matrix illustrating diagnostic performance of the text model across six major classifications after in silico evaluation (Dataset A). **b,** Confusion matrix illustrating diagnostic performance of the slit-lamp model in the validation set (Dataset B). **c,** Confusion matrix illustrating diagnostic performance of the smartphone model in the validation set (Dataset C).



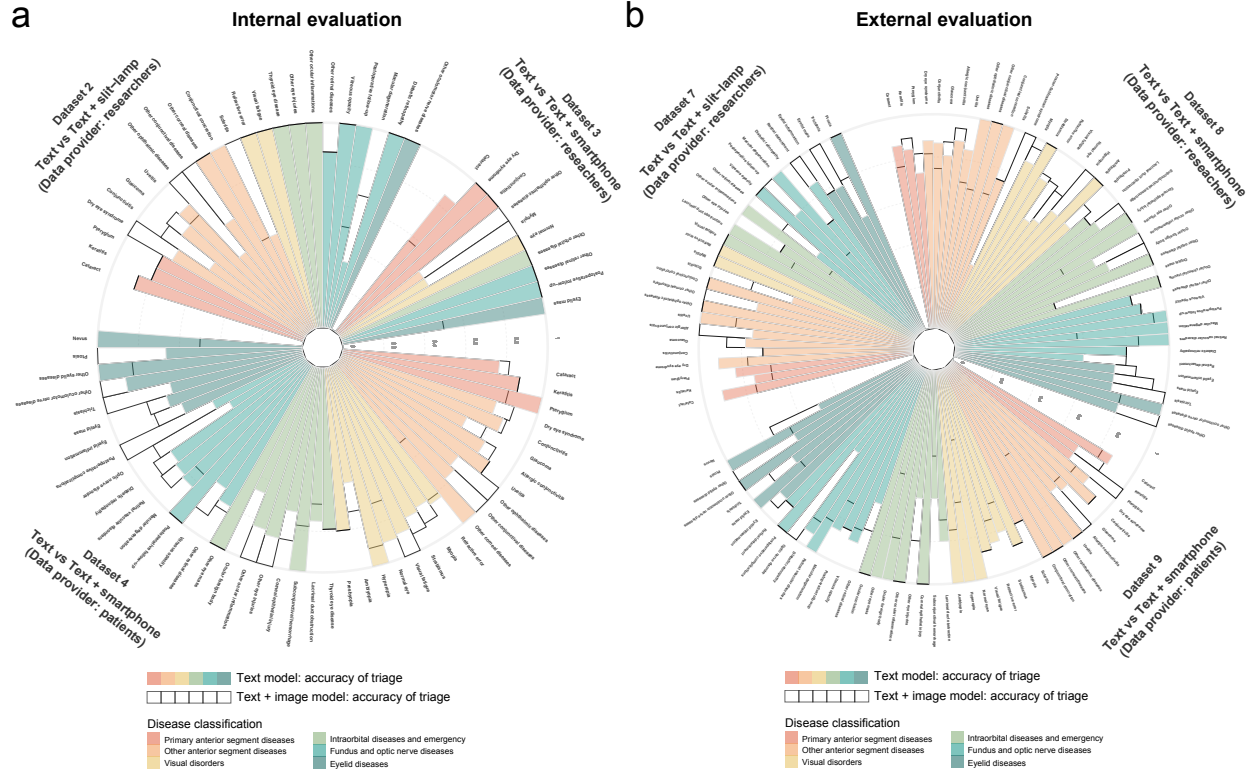
Supplementary Figure 3 Clinical rationale behind the threshold method for image model.

a, The slit-lamp images (left and center) show a 52-year-old male with a right eye cataract. However, considering his medical history of sudden visual obstruction for three days and the B-scan ultrasound (right), the primary diagnosis is right eye retinal detachment, with a secondary diagnosis of right eye cataract. This indicates that image information may not necessarily represent the primary diagnosis but can suggest possible diagnoses and help rule out unlikely

ones in clinical evaluation. **b-c**, Receiver operating characteristic (ROC) curves and corresponding AUCs for cataract, keratitis, and pterygium in Dataset D (b) and Dataset E (c). The curves are used to determine the thresholds for achieving high specificity in all three diseases. **d-e**, Confusion matrix illustrating diagnostic performance of the text + slit-lamp + smartphone model 1 (d) and the text + slit-lamp + smartphone model 2 (e) in the testing datasets. AUC = area under the curve.

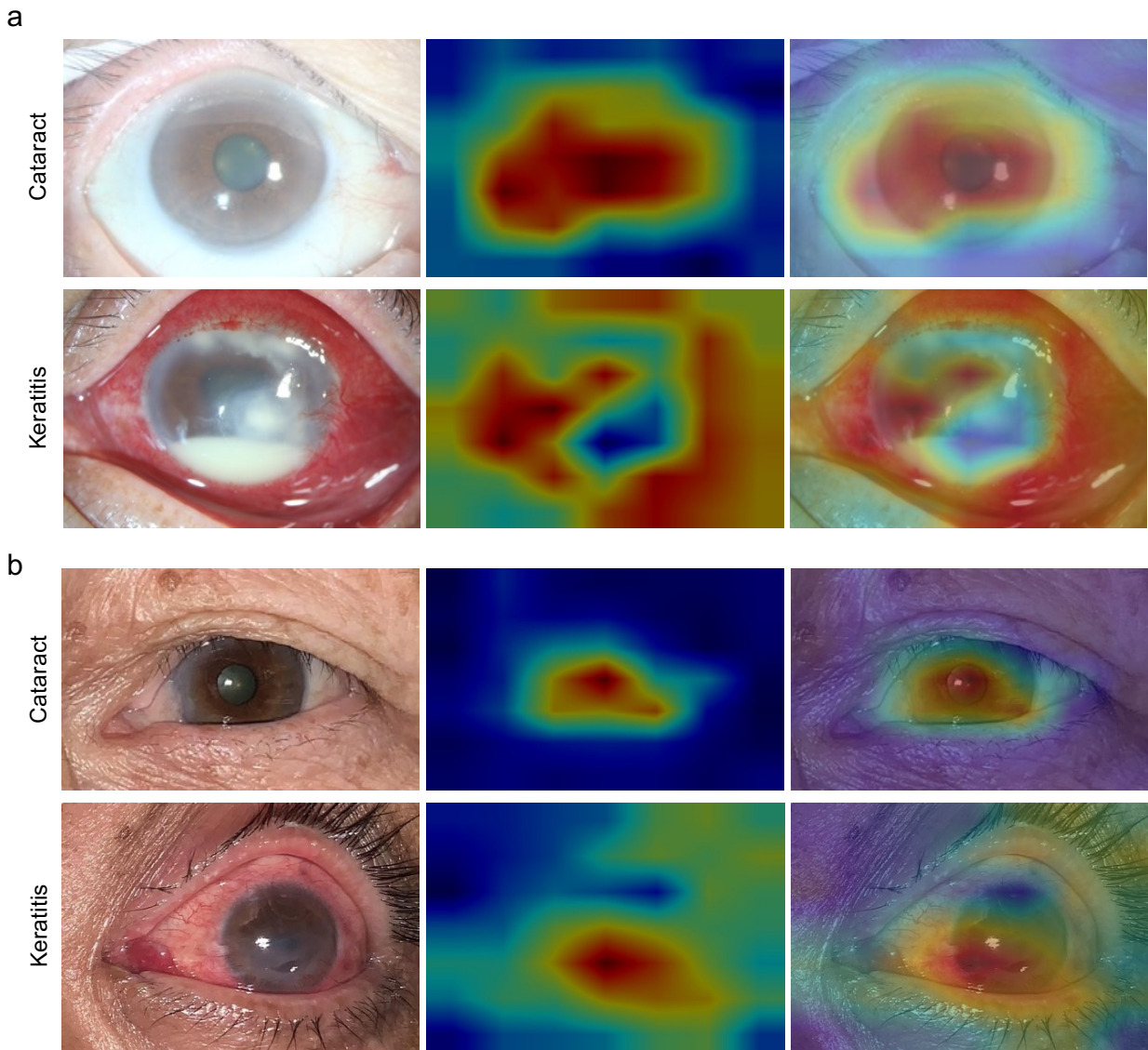


Supplementary Figure 4 Confusion matrix obtained during the early clinical evaluation stage. Confusion matrix illustrating the diagnosis (upper) and triage (lower) performance of the text model during internal evaluations in Dataset 1 (a), Dataset 2 (b), Dataset 3 (c), and Dataset 4 (d), as well as external evaluations in Dataset 6 (e), Dataset 7 (f), Dataset 8 (g), and Dataset 9 (h). Overall accuracy for each dataset is noted in the top-left corner.


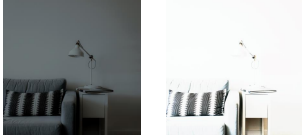





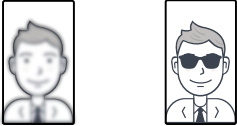


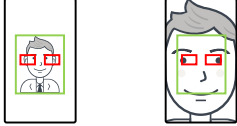



Supplementary Figure 5 Internal and external evaluation of IOMIDS performance on triage. Circular stacked bar charts of disease-specific triage accuracy across different models from internal (a, Dataset 2-4) and external (b, Dataset 7-9) evaluations. Solid bars represent the text model, while hollow bars represent multimodal models. No asterisk is provided because there are no significant differences in triage accuracy between the two models according to Fisher's exact test.

(internal, external), models (text, text + slit-lamp, text + smartphone), and data providers (researchers, patients). * $P < 0.05$, ** $P < 0.01$.



Supplementary Figure 7 Class activation maps of multimodal models. Typical slit-lamp captured images (a) and smartphone-captured images (b) for cataract and keratitis cases, along with their corresponding class activation maps (middle and right) generated from respective multimodal models.

| Correct | Wrong |
|---|--|
| <p data-bbox="521 289 789 302">1. Choose a simple environment with appropriate lighting</p>  | <p data-bbox="878 275 927 287">Too dark</p> <p data-bbox="1040 275 1089 287">Too bright</p>  <p data-bbox="951 438 1000 451">Too messy</p>  |
| <p data-bbox="500 638 810 651">2. Use rear camera of the smartphone and change to portrait mode</p>  | <p data-bbox="854 625 951 638">Front-facing camera</p> <p data-bbox="1013 625 1094 638">Landscape mode</p>  <p data-bbox="927 787 1019 800">Multiple appearance</p>  |
| <p data-bbox="505 984 794 997">3. Remain stationary and keep eyes open to reveal the lesion</p>  | <p data-bbox="883 974 924 987">Blurred</p> <p data-bbox="1040 974 1081 987">Sheltered</p>  <p data-bbox="967 1136 1005 1148">Closed</p>  |
| <p data-bbox="518 1335 781 1348">4. Use the red guiding box to adjust the position of eyes</p>  | <p data-bbox="878 1325 927 1337">Too small</p> <p data-bbox="1040 1325 1089 1337">Too large</p>  <p data-bbox="967 1486 1005 1499">Tilted</p>  |

Supplementary Figure 8 Detailed instructions for obtaining high-quality smartphone-captured eye photos. Before entering the photographing process, the system guides patients to use the rear-facing camera. During the photographing process, the system requires the patient's eye and facial position to be within the corresponding red and green boxes.

Supplementary Table 1 Summary of the clinical datasets based on study center

| Center | Shanghai (n=2292) | Nanjing (n=1748) | Suqian (n=1192) | P value |
|---|-------------------|------------------|-----------------|-------------------------------|
| Subspecialty, n(%) | | | | <0.0001^a |
| Outpatient clinic | 574 (25.0%) | 309 (17.7%) | 231 (19.4%) | |
| Cornea | 479 (20.9%) | 362 (20.7%) | 234 (19.6%) | |
| Cataract | 308 (13.4%) | 231 (13.2%) | 98 (8.2%) | |
| Optometry | 224 (9.8%) | 305 (17.4%) | 193 (16.2%) | |
| Glaucoma | 202 (8.8%) | 120 (6.9%) | 71 (6.0%) | |
| Retina | 188 (8.2%) | 171 (9.8%) | 115 (9.6%) | |
| Orbit | 160 (7.0%) | 123 (7.0%) | 117 (9.8%) | |
| Strabismus | 49 (2.1%) | 62 (3.5%) | 71 (6.0%) | |
| Emergency | 82 (3.6%) | 44 (2.5%) | 50 (4.2%) | |
| Neuro-ophthalmology | 26 (1.1%) | 21 (1.2%) | 12 (1.0%) | |
| Disease classification, n (%) | | | | <0.0001^a |
| Primary anterior segment diseases (cataract, keratitis, pterygium) ^c | 372 (16.2%) | 328 (18.8%) | 163 (13.7%) | |
| Other anterior segment diseases | 655 (28.6%) | 544 (31.1%) | 353 (29.6%) | |
| Vision disorders | 617 (26.9%) | 335 (19.2%) | 354 (29.7%) | |
| Intraorbital diseases and emergency | 257 (11.2%) | 149 (8.5%) | 87 (7.3%) | |
| Fundus and optic nerve disorders | 261 (11.4%) | 231 (13.2%) | 164 (13.8%) | |
| Eyelid diseases | 130 (5.7%) | 161 (9.2%) | 71 (6.0%) | |
| Sex, n (%) | | | | <0.0001^a |
| Male | 1101 (48.0%) | 794 (45.4%) | 635 (53.3%) | |
| Female | 1191 (52.0%) | 954 (54.6%) | 557 (46.7%) | |
| Age (mean ± SD) | 39.2 ± 24.6 | 45.5 ± 22.8 | 36.1 ± 23.9 | 0.005^b |

| | | | | |
|--------------------------|--------------|--------------|-------------|---------------------------|
| Laterality, n (%) | | | | 0.0138^a |
| Unilateral | 936 (40.8%) | 652 (37.3%) | 435 (36.5%) | |
| Bilateral | 1356 (59.2%) | 1096 (62.7%) | 757 (63.5%) | |
| Visit type, n (%) | | | | 0.6120 ^a |
| First visit | 1849 (80.7%) | 1402 (80.2%) | 974 (81.7%) | |
| Follow-up | 443 (19.3%) | 346 (19.8%) | 218 (18.3%) | |

^a *P* values were calculated using two-sided Fisher's exact test. Bold indicates statistical significance.

^b *P* value was calculated using two-sided t-test. Bold indicates statistical significance.

^c Due to the critical role of cataract, keratitis, and pterygium in image model development, they are classified and analyzed separately.

Supplementary Table 2 Examples of prompts used for prompt engineering during development of text model.

| Theme ^a | Chief complaint | Physician's questions | Patient's answers | Physician's medical advice |
|--------------------|--|---|--|--|
| Dry eye | My eyes feel extremely dry. I can hardly open my eyes in the afternoon and evening. I need to blink all the time. I usually wear contact lenses. | 1. Do your eyes itch? 2. Do you sneeze frequently? | 1. They do itch. 2. A little frequently. | Based on the information you provided, your diagnosis may be dry eye syndrome or allergic conjunctivitis. It is recommended to see a corneal specialist and use anti-inflammatory and dry eye drops. Hormone drugs should not be used for more than 2 weeks. Wear contact lenses less often. Reduce eye use and rest enough. Don't stay up late. |
| Itchy eye | I've always had a rhinitis which would lead to conjunctivitis when getting serious. I came to see a doctor in March and was prescribed cyclosporine. | 1. Are your eyes feeling itchy now? Do you have a lot of eye secretion? | 1. My eyes are not as itchy as before. Every morning when I wake up, my eyes are dry. There are some dry secretion instead of brushed secretion in the past. | Based on the information you provided, your diagnosis may be allergic conjunctivitis. It is recommended that you see a corneal specialist. Continue to use eye drops. |
| Eye swelling | My intraocular pressure has always been very high at about 30. I have a swelling and sore sensation with my eyes. | 1. Have you checked the corneal endothelium? 2. Has your intraocular pressure been high before? | 1. I did, and they said that the cornea is a little thick. 2. Yes, it has been high since I was a child. | According to the information you provided, your diagnosis may be glaucoma. It is recommended to see a glaucoma specialist. According to your description, it is necessary to complete the glaucoma examination, but other causes cannot be ruled out. |
| Eye pain | My left eye is swollen and painful. It was a little painful the day before yesterday and got swollen yesterday. | 1. Does it hurt when you press it? 2. Did you stay up late recently? 3. Are there any other symptoms? | 1. Yes, it does. 2. A lot. 3. There are no other problems. | Based on the information you provided, your diagnosis may be blepharitis. It is recommended to see a corneal specialist. You need to use antibiotic eye drops for treatment, eat a light diet, and drink less tea or coffee. Apply hot compresses to your eyes before going to bed at night. Don't stay up late. |
| Eye discharge | My child began to have a lot of eye discharge since | 1. Which eye? 2. Is he allergic to anything? | 1. Both eyes. 2. He is allergic to some food. | Based on the information you provided, your diagnosis may be conjunctivitis. It is recommended that you see a corneal |

| | | | | |
|--------------------------------|--|---|---|--|
| | yesterday. His eyes are sticky and red. | | | specialist. You need to use eye drops for treatment and pay attention to eye hygiene. If there is no improvement in a week, you need to go to the ophthalmology clinic for a follow-up examination in time. |
| Eye masses | I have a small fleshy growth on my eye. | 1. When did it grow? Has it grown bigger? | 1. It grew when my eye was itchy before. It has been there ever since, and has not grown bigger. | Based on the information you provided, your diagnosis may be a conjunctival tumor. It is recommended that you see a specialist of orbital and ocular tumors. |
| Blurry vision | I can't see. | 1. How long have you been unable to see? Can't you see anything? 2. Do you have a high blood pressure or diabetes? Do you have any other health problems? | 1. It started in the second half of last year. I can't see clearly. 2. I have a high blood pressure, but no other problems. | Based on the information you provided, your diagnosis may be age-related cataracts. It is recommended that you see a cataract specialist. However, other eye diseases, such as retinopathy, need to be ruled out. |
| Eye injuries or foreign bodies | I hit my eye while playing basketball, and now I occasionally feel a black object floating in my eye. | 1. When did you hurt your eye? 2. Do you feel a foreign body sensation? | 1. One month ago. 2. There is no foreign body sensation. But I feel like hair or blood floating in my eye. | Based on the information you provided, your diagnosis may be vitreous opacity. It is recommended that you see a retinal specialist. It may be secondary to eye trauma. It is recommended to take a B-ultrasound and intraocular pressure test to rule out retinal lesions. If there are no special problems found, you can ignore the vitreous opacity and it will get better in the future. |
| Proptosis | I felt a little dizzy and tearful a while ago, so I went for a checkup. A cavernous hemangioma was found in my left orbit last week. I feel that my left eye is bulging. | 1. How long have you been feeling bulging with your eye? 2. Do you have any other problems in your body, such as high blood pressure, diabetes, hyperthyroidism, etc.? 3. Do you see one thing as two? 4. Do you feel that your eyes change a lot when you lower your head? | 1. One month. 2. No. 3. No. 4. I don't feel an obvious change. | Based on the information you provided, your diagnosis may be orbital cavernous hemangioma. It is recommended to see a specialist in orbital diseases and eye tumors. A CT scan is needed. The tumor is not growing fast. You can consider observation or surgical treatment. Surgery carries the risk of blindness. |

^a The themes are categorized based on chief complaints.

Supplementary Table 3 Univariate logistic regression for diagnostic and triage accuracy

| Subgroup | Diagnosis | | Triage | |
|--|--------------------|-------------------|--------------------|----------------|
| | OR (95% CI) | <i>P</i> value | OR (95% CI) | <i>P</i> value |
| Center (reference: Shanghai) | | | | |
| Nanjing | 0.95 (0.85 - 1.06) | 0.367 | 0.97 (0.84 - 1.11) | 0.652 |
| Suqian | 1.02 (0.89 - 1.17) | 0.724 | 1.28 (1.07 - 1.52) | 0.007 |
| Model (reference: text model) | | | | |
| Text + slit-lamp | 0.94 (0.76 - 1.17) | 0.600 | 0.89 (0.68 - 1.16) | 0.390 |
| Text + smartphone | 1.71 (1.51 - 1.93) | <0.0001 | 0.94 (0.82 - 1.09) | 0.423 |
| Text + slit-lamp + smartphone | 0.82 (0.53 - 1.25) | 0.738 | 0.92 (0.73 - 1.16) | 0.485 |
| Data provider (reference: researchers) | | | | |
| Patients | 1.37 (1.23 - 1.53) | <0.0001 | 0.84 (0.74 - 0.96) | 0.008 |
| Gender (reference: male) | | | | |
| Female | 0.97 (0.87 - 1.07) | 0.508 | 0.97 (0.85 - 1.10) | 0.617 |
| Age (reference: ≤45) | | | | |
| >45 | 0.53 (0.48 - 0.59) | <0.0001 | 0.90 (0.79 - 1.02) | 0.100 |
| Laterality (reference: unilateral) | | | | |
| Bilateral | 1.49 (1.34 - 1.65) | <0.0001 | 0.92 (0.81 - 1.05) | 0.223 |
| Visit type (reference: first visit) | | | | |
| Follow-up | 1.42 (1.24 - 1.63) | <0.0001 | 0.90 (0.77 - 1.06) | 0.209 |
| Disease classification (reference: primary anterior segment diseases) | | | | |
| Other anterior segment diseases | 1.66 (1.43 - 1.92) | <0.0001 | 1.09 (0.90 - 1.32) | 0.380 |
| Visual disorders | 3.26 (2.75 - 3.87) | <0.0001 | 1.14 (0.93 - 1.39) | 0.213 |
| Intraorbital diseases and emergency | 1.34 (1.10 - 1.63) | 0.003 | 1.01 (0.78 - 1.30) | 0.958 |
| Fundus and optic nerve diseases | 1.39 (1.16 - 1.66) | <0.0001 | 1.00 (0.79 - 1.26) | 0.990 |
| Eyelid diseases | 1.35 (1.09 - 1.68) | 0.006 | 0.95 (0.72 - 1.25) | 0.715 |
| Words input by subjects (reference: ≤50 Chinese characters) | | | | |
| >50 Chinese characters | 1.37 (1.08 - 1.74) | 0.009 | 1.28 (0.97 - 1.70) | 0.080 |
| AI diagnosis (reference: false) | | | | |
| True | NA | NA | 0.95 (0.82 - 1.09) | 0.446 |

Bold indicates statistical significance. CI = confidence interval, NA = not applicable, OR = odds ratio