

Supplementary

Table A: Ethnic distribution of training dataset

	Population	With Photocoagulation	No Photocoagulation
Latin American	0.52	0.56	0.47
Not Specified	0.14	0.13	0.14
Indian subcontinent origin	0.12	0.11	0.12
African Descent	0.10	0.07	0.13
Caucasian	0.04	0.03	0.05
Asian	0.03	0.03	0.03
Others	0.05	0.07	0.06

Table B: Distribution of laser treatment prevalence across different diabetic retinopathy grades

DR grade	0	1	2	3	4	ungradable
Total count	558,451	52,928	106,377	16,909	19,470	25,718
With laser	0	0	365	175	9,607	136
No laser	558,451	52,928	105,742	16,734	9,863	25,582

Table C: Cohort statistics for the three modules tested for laser treatment filtering effect.

Task	Patients	Images	Mean Age (S.D)	Gender	Ethnicity (fraction)
DME detection	1,607	3,576	54.80 (10.35)	50% female	white = 0.55 (Hispanic = 0.93, non-Hispanic = 0.07) ethnicity not specified = 0.13 Indian subcontinent origin = 0.12 African Descent = 0.11 Asian = 0.02 Other = 0.07
Age	2612	4754	61.78 (10.88)	57% female	white = 0.50 (Hispanic = 0.88, non-Hispanic = 0.12) ethnicity not specified = 0.17 African Descent = 0.13 Indian subcontinent origin = 0.08 Asian = 0.03 Other = 0.09
Sex	1318	10506	54.94 (11.06)	59% female	white = 0.60 (Hispanic = 0.83, non-Hispanic = 0.17) ethnicity not specified = 0.14 African Descent = 0.09 Indian subcontinent origin = 0.06 Asian = 0.03 Other = 0.08

Table C1: Calibration data cohort statistics for the three modules tested for laser treatment filtering effect.

Task	Patients	Images	Mean Age (S.D)	Gender	Ethnicity (fraction)
DME detection	1,607	3,576	54.80 (10.35)	50% female	white = 0.55 (Hispanic = 0.93, non-Hispanic = 0.07) ethnicity not specified = 0.13 Indian subcontinent origin = 0.12 African Descent = 0.11 Asian = 0.02 Other = 0.07
Age	9,485	76,173	55.18 (11.67)	59% female	white = 0.61 (Hispanic = 0.87, non-Hispanic = 0.13) ethnicity not specified = 0.18 African Descent = 0.10 Indian subcontinent origin = 0.04 Asian = 0.04 Other = 0.07
Sex	1,930	15,786	54.47 (11.37)	60% female	white = 0.66 (Hispanic = 0.85, non-Hispanic = 0.15) ethnicity not specified = 0.14 African Descent = 0.08 Indian subcontinent origin = 0.05 Asian = 0.05 Other = 0.02

Table C2: Test data cohort statistics for the three modules tested for laser treatment filtering effect.

Task	Patients	Images	Mean Age (S.D)	Gender	Ethnicity (fraction)
DME detection	14,078	28,274	55.00 (10.18)	51% female	white = 0.55 (Hispanic = 0.93, non-Hispanic = 0.07) ethnicity not specified = 0.13 Indian subcontinent origin = 0.11 African Descent = 0.11 Asian = 0.03 Other = 0.07
Age	85,374	686,255	55.17 (11.62)	58% female	white = 0.61 (Hispanic = 0.87, non-Hispanic = 0.13) ethnicity not specified = 0.18 African Descent = 0.10 Indian subcontinent origin = 0.05 Asian = 0.04 Other = 0.06
Sex	91,961	742,915	55.23 (11.64)	59% female	white = 0.63 (Hispanic = 0.87, non-Hispanic = 0.13) ethnicity not specified = 0.15 African Descent = 0.1 Indian subcontinent origin = 0.05 Asian = 0.04 Other = 0.03

All models were trained using data compiled and provided by EyePacs which consisted of 45° angle fundus photography images and expert readings of said images. Images were resized to 512X512 pixels for all models.

DME model

The data was composed of 32,049 images from 15,892 patients. Two images were taken for each eye from two different fields, one centered on the macula and another centered between the macula and the disc. The average age was 55.02 (10.21 SD), 51% of the patients were female.

The data was divided into training, validation, and test datasets consisting of 80%, 10%, and 10% of the data respectively.

Sex model

The training & validation data was comprised of 742,915 images from 91,961 patients. Test data was comprised of 15,786 images from 1,930 patients.

Age model

The training & validation data was comprised of 686,225 images from 85,374 patients. Test data was comprised of 76,173 images from 9,485 patients.

Table D: laser artifact detection stratified by ethnicity.

	Accuracy	Sensitivity	Specificity	AUC	Support
Latin American	0.914	0.901	0.931	0.973	10847
Ethnicity not specified	0.909	0.877	0.94	0.963	2855
African Descent	0.864	0.778	0.912	0.936	2196
Indian subcontinent origin	0.832	0.776	0.882	0.905	2473
Caucasian	0.913	0.864	0.943	0.97	905
Asian	0.926	0.928	0.925	0.979	664
Multi-racial	0.888	0.889	0.887	0.962	160
Other	0.928	0.938	0.915	0.983	207

Table E: Results on the EyePACs dataset for patients with and without DME, given in accuracy, sensitivity, specificity, and AUC with a 95% confidence interval. CI noted in parentheses.

DME	No	Yes
Sensitivity (C.I)	0.873 (0.856, 0.889)	0.770 (0.727, 0.811)
Specificity (C.I)	0.906 (0.890, 0.919)	0.897 (0.962, 0.925)
AUC (C.I)	0.955 (0.948, 0.962)	0.908 (0.884, 0.927)

Table F: Results for images which were filtered out and not filtered out by the image quality tool, given in accuracy, sensitivity, specificity, and AUC with a 95% confidence interval.

	Sensitivity (C.I)	Specificity (C.I)	AUC (C.I)
Filtered out	0.787 (0.710, 0.849)	0.793 (0.709, 0.860)	0.857 (0.803, 0.898)
Remained	0.854 (0.838, 0.869)	0.904 (0.890, 0.917)	0.948 (0.941, 0.955)