

THE LANCET

Digital Health

Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed.
We post it as supplied by the authors.

Supplement to: Rudnicka AR, Shakespeare R, Chambers R, et al. Automated retinal image analysis systems to triage for grading of diabetic retinopathy: a large-scale, open-label, national screening programme in England. *Lancet Digit Health* 2025. <https://doi.org/10.1016/j.landig.2025.100914>

Supplementary Material

Table of Contents

1. Outcome Classifications from Automated Retinal Images Analysis Systems (ARIAS)	5
Table S1: Outcome classifications sought from ARIAS	5
Figure S1. Enrolment process of ARIAS vendors from identification of potential candidates to the final participants. NHS = National health Service; DESP = Diabetic Eye Screening Programme	8
Table S2: Populations characteristics for encounters between 1 st Jan 2021 to 31 st Dec 2022 from NEL DESP	9
Figure S2. Flow chart of available data on encounters with images and grading data	10
Table S3: Number of screening encounters by population subgroups for each diabetic retinopathy grade for NELDESP data extracted between 1st January 2021 to 31st Dec 2022.	11
Figure S3: Performance metrics for ARIAS A-H against reference standard of final human grade in worst eye of referable diabetic retinopathy (DR) vs no referable DR	12
Figure S4: Performance for Primary Grader (PG) and ARIAS (vendors A-H) for encounters with reference standard final human grade in worst eye R1M1	13
R1M1 = mild non-proliferative (background) diabetic retinopathy (R1) with any diabetic maculopathy (M1)	13
Figure S5: Performance for Primary Grader (PG) and ARIAS (vendor algorithms A-H) by ethnic and age groups for the primary outcome reference standard: final human grade of referable diabetic retinopathy (DR)	14
Figure S6: ARIAS test positive rates (vendors A-H) for encounters with reference standard final human grade of no-referable DR	15
Table S4: ARIAS* test positive (%) by population subgroups of ethnicity, age sex and IMD quintile for the primary outcome reference standard=No-referable diabetic retinopathy	16
Table S5: Screen positive rates based on ARIAS* test positive or visual acuity $\leq 6/12$, for vendors A-H by ethnicity and age group	17
Table S6: Screen positive and false positive rates, positive and negative predictive values for ARIAS for those with final human grade in the worst eye of referable diabetic retinopathy (vs no referable diabetic retinopathy), with and without the visual acuity criterion	18
Figure S7: Performance for Primary Grader (PG) and for ARIAS (vendors algorithms A-H) with visual acuity criterion, by ethnic and age groups for R2, R3 and R3A	19
2. ARIAS operating threshold 1: ARIAS test positive rates by final human grade in worst eye and by population subgroups	20
Table S7: Vendor A ARIAS test positive rates by subgroups of ethnicity and age	20
Table S8: Vendor A ARIAS test positive rates by sex and quintiles of IMD	20
Table S9: Vendor B ARIAS test positive rates by subgroups of ethnicity and age	21
Table S10: Vendor B ARIAS test positive rates by sex and quintiles of IMD	21
Table S11: Vendor C ARIAS test positive rates by subgroups of ethnicity and age	22
Table S12: Vendor C ARIAS test positive rates by sex and quintiles of IMD	22

Table S13: Vendor D ARIAS test positive rates by ethnicity and age.....	23
Table S14: Vendor D ARIAS test positive rates by sex and quintiles of IMD.	23
Table S15: Vendor E ARIAS test positive rates by ethnicity and age.	24
Table S16: Vendor E ARIAS test positive rates by sex and quintiles of IMD.....	24
Table S17: Vendor F ARIAS test positive rates by ethnicity and age.....	25
Table S18: Vendor F ARIAS test positive rates by sex and quintiles of IMD.	25
Table S19: Vendor G ARIAS test positive rates by ethnicity and age.	26
Table S20: Vendor G ARIAS test positive rates by sex and quintiles of IMD.	26
Table S21: Vendor H ARIAS test positive rates by ethnicity and age.	27
Table S22: Vendor H ARIAS test positive rates by sex and quintiles of IMD.	27
3. ARIAS operating threshold 1 + visual acuity criterion: ARIAS test positive or visual acuity 6/12 or worse by final human grade in worst eye and by population subgroups	28
Table S23: Vendor A test positive rates by ethnicity and age.	28
Table S24: Vendor A test positive rates by sex and quintiles of IMD.....	28
Table S25: Vendor B test positive rates by ethnicity and age.....	28
Table S26: Vendor B test positive rates by sex and quintiles of IMD.	29
Table S27: Vendor C test positive rates by ethnicity and age.....	30
Table S28: Vendor C test positive rates by sex and quintiles of IMD.	30
Table S29: Vendor D test positive rates by ethnicity and age.....	31
Table S30: Vendor D Test positive rates by sex and quintiles of IMD.	31
Table S31: Vendor E test positive rates by ethnicity and age.	32
Table S32: Vendor E test positive rates by sex and quintiles of IMD	32
Table S33: Vendor F test positive rates by ethnicity and age.	33
Table S34: Vendor F test positive rates by sex and quintiles of IMD.....	33
Table S35: Vendor G test positive rates by ethnicity and age.....	34
Table S36: Vendor G test positive rates by sex and quintiles of IMD	34
Table S37: Vendor H test positive rates by ethnicity and age.....	35
Table S38 Vendor H test positive rates by sex and quintiles of IMD.	35
4. ARIAS operating threshold 2: ARIAS test positive rates by final human grade in worst eye and population subgroups	36

Table S39: Vendor A ARIAS test positive rates by ethnicity and age.	36
Table S40: Vendor A ARIAS test positive rates by sex and quintiles of IMD.....	36
Table S41: Vendor B ARIAS test positive rates by ethnicity and age.	37
Table S42: Vendor B ARIAS test positive rates by sex and quintiles of IMD.....	37
Table S43: Vendor C ARIAS test positive rates by ethnicity and age.	38
Table S44: Vendor C ARIAS test positive rates by sex and quintiles of IMD.....	38
Table S45: Vendor E ARIAS test positive rates by ethnicity and age.	39
Table S46: Vendor E ARIAS test positive rates by sex and quintiles of IMD.....	39
Table S47: Vendor F ARIAS test positive rates by ethnicity and age.....	40
Table S48: Vendor F ARIAS test positive rates by sex and quintiles of IMD.	40
Table S49: Vendor H ARIAS test positive rates by ethnicity and age.	41
Table S50: Vendor H ARIAS test positive rates by sex and quintiles of IMD.	41
5. ARIAS operating threshold 2 + visual acuity criterion:ARIAS test positive or visual acuity 6/12 or worse by final human grade in worst eye by population subgroups	42
Table S51: Vendor A test positive rates by ethnicity and age.	42
Table S52: Vendor A test positive rates by sex and quintiles of IMD	42
Table S53: Vendor B test positive rates by ethnicity and age.....	43
Table S54: Vendor B test positive rates by sex and quintiles of IMD.	43
Table S55: Vendor C test positive rates by ethnicity and age.....	44
Table S56: Vendor C test positive rates by sex and quintiles of IMD.	44
Table S57: Vendor E test positive rates by ethnicity and age.	45
Table S58: Vendor E test positive rates by sex and quintiles of IMD.....	45
Table S59: Vendor F test positive rates by ethnicity and age.	46
Table S60: Vendor F test positive rates by sex and quintiles of IMD.....	46
Table S61: Vendor H test positive rates by ethnicity and age.....	47
Table S62: Vendor H test positive rates by sex and quintiles of IMD.....	47
6. ARIAS operating threshold 1: ARIAS test positive rates by final human grade in worst eye by Type 1 and Type 2 diabetes	48
Table S63: ARIAS test positive rates by diabetes type	48
7. ARIAS operating threshold 1 + visual acuity criterion: ARIAS test positive or visual acuity 6/12 or worse) by final human grade in worst eye by Type1 and Type 2 diabetes	49

Table S64: ARIAS test positive rates by diabetes type	49
8. ARIAS operating threshold 2: ARIAS test positive rates by final human grade in worst eye by Type 1 and Type 2 diabetes	50
Table S65: ARIAS test positive rates by Diabetes type.....	50
9. ARIAS operating threshold 2 + visual acuity criterion: ARIAS test positive or visual acuity 6/12 or worse by final human grade in worst eye by Type 1 and Type 2 diabetes	51
Table S66: ARIAS test positive rates by diabetes type.	51
Encounters with final human grade of referable DR in the worst eye that were ARIAS test negative and had visual acuity better than 6/12	52
Table S67: Number (%) of encounters that were referred to ophthalmology*	52

1. Outcome Classifications from Automated Retinal Images Analysis Systems (ARIAS)

Table S1 below provides a description of outcome classifications that were sought at the image, eye and patient / encounter level. There is a need to distinguish assessable from non-assessable outcomes and, specifically, reasons why an image was non-assessable to provide the appropriate outcomes outlined below. Essential outcome classifications in black, and desirable outcomes are in shaded rows. The ‘Description’ column in the table below outlines examples of how each output could be produced. It does not dictate how the vendors subsequently implemented it.

Table S1: Outcome classifications sought from ARIAS

Item label	Description
<u>Assessable images</u>	Retinal images centred on the disc or macula and of sufficient quality to be graded by ARIAS*
<u>Non-assessable images</u>	
1. Technical Failure	ARIAS could not process the image, for example, due to corrupted or unreadable image files, wrong image resolution, lack of computational resources (out of memory, low disk space, etc.), faulty hardware, and/or software bugs in the AI implementation
2. Invalid	Image is of the wrong format, e.g., close up of the optic disc that cannot be used for DR grading, or the image is not a retinal image, including clear images of anterior segment / lens. These images should be excluded from outcome classification for DR
3. Ungradable	ARIAS unable to grade retinal image, i.e., correct image format but poor-quality retinal image due to, for example, dense cataract, vitreous opacity
ESSENTIAL: Outcome classification per PATIENT ENCOUNTER	
Disease indicated	Some indicative level/form of DR in at least one of disc or macula centred images from either eye
Disease not indicated	No indicative level/form of DR identified in neither the disc nor macula centred images from either eye
Ungradable / technical failure	a) At least one image in the set (right and left eye disc or macula centred) is ungradable/technical failure in the absence of a good quality image of the same field in the same eye that was successfully graded b) Insufficient number of images to provide outcome classification for this encounter
Referable Disease indicated	Referable DR identified in at least one eye
Non-referable Disease indicated	No Referable DR identified in either eye
Grade of DR and maculopathy	Worst eye English NSC grade

DESIRABLE Outcome classification per EYE	
Disease indicated	Some indicative level/form of DR identified as per ARIAS operating threshold in at least one assessable disc or macula centred images
Disease not indicated	No indicative level/form of DR identified as per ARIAS operating threshold in any of the assessable disc or macula centred images
Ungradable/technical failure	a) At least one image (disc or macula centred) is ungradable or technical failure in the absence of an assessable image of the same field in the same eye b) Insufficient number of images to provide outcome for this eye
Referable Disease indicated	Some indicative level/form of Referable DR indicated in at least one retinal image for this eye
Non-referable Disease indicated	No indicative level/form of Referable DR identified in retinal images from this eye
Grade of DR and maculopathy	English NSC grade
OPTIONAL Outcome classification per IMAGE	
<u>Assessable</u>	Retinal image centred on the disc or macula and of sufficient quality to be graded by ARIAS
Disease indicated	Some indicative level/form of DR identified as per ARIAS operating threshold
Disease not indicated	No indicative level/form of DR identified as per ARIAS operating threshold
Referable Disease indicated	Some indicative level/form of Referable DR indicated
Non-referable Disease indicated	No indicative level/form of Referable DR indicated
Grade of DR and maculopathy	English NSC grade

*One-eyed individuals were flagged in the image files name lists. DR= diabetic retinopathy. Shaded rows represent additional desirable outcomes rather than compulsory.

Links to the English NSC grading criteria are given below

[Diabetic eye screening: retinal image grading criteria - GOV.UK \(www.gov.uk\)](http://www.gov.uk)

[NHS Diabetic Eye Screening Programme: grading definitions for referable disease - GOV.UK \(www.gov.uk\)](http://www.gov.uk)

[Diabetic eye screening pathways: patient, grading, referral, surveillance - GOV.UK \(www.gov.uk\)](http://www.gov.uk)

The English NHS Diabetic Eye Screening diabetic retinopathy (DR) grades with ETDRS equivalent scores are¹

- R0= No observable DR ETDRS scores 10, 14-15 inclusive
- R1= mild non-proliferative (background) DR ETDRS scores 20-35 inclusive
- R2=moderate-to-severe non-proliferative (pre-proliferative) DR ETDRS scores 43-53 inclusive
- R3= proliferative DR. ETDRS scores 61+
R3 is composed of R3S and R3A where R3S is stable treated proliferative DR, and R3A active proliferative DR.
- M0 = no observable diabetic maculopathy (permissible with any 'R' grade)
- M1= any diabetic maculopathy (permissible with grades R1, R2 or R3 only)
- U = ungradable images

In the English NHS DESP retinopathy grades R0M0, R1M0 are not-referable DR, grades M1, R2, R3 are referable DR

Throughout ARIAS test positive is indicative of some level/form of DR or not assessable/technical failure by the algorithm (e.g. poor image quality) ARIAS test negative is indicative of disease absence

1. Group ETDRSR. Fundus photographic risk factors for progression of diabetic retinopathy. ETDRS report number 12. Early Treatment Diabetic Retinopathy Study Research Group. *Ophthalmology* 1991; **98**(5 Suppl): 823-33.

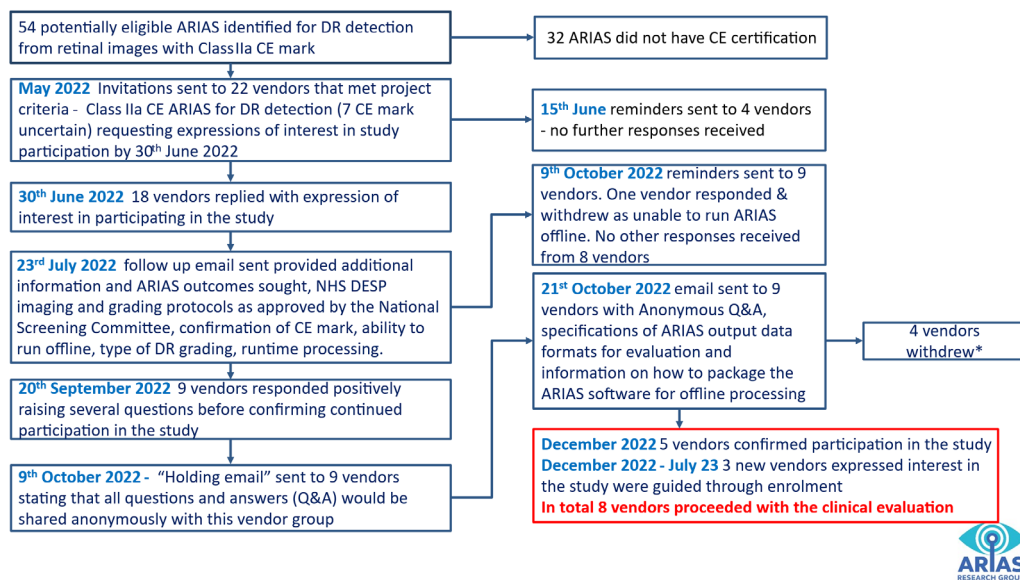


Figure S1. Enrolment process of ARIAS vendors from identification of potential candidates to the final participants. NHS = National health Service; DESP = Diabetic Eye Screening Programme

*Reasons given for withdrawal: not confident their ARIAS would perform well on our data, not able to deliver ARIAS within 6-month time window, Algorithm does not produce diabetic retinopathy specific outcomes

Vendors in yellow highlight fully participated in the study, these all have/pending Class IIa (or IIb) CE. If class II is pending then Class I is currently in place

Vendor n =25	Name of algorithm
Airdoc Inc	Retinal Image Intelligent Analysis Software
Artelus Ltd.	DRISTi 2.0
Digital Diagnostics	IDX-DR
Evolucare technologies SAS	OphtAI 2.3
EyeCheckup	Eyecheckup AI
Eye2you AI	Eye2you
Eyetelligence Pty Ltd	Eyetelligence assure
EyeNuk Inc.	EyeArt v3.0.0
EyRis	SELENA+
Google Health	Automated Retinal disease Assessment (ARDA)
iHealthScreen Inc.	iPredict
Intelligent retinal imaging systems LLC.	Intelligent Retinal Imaging System (IRIS)
MONA.health	MONA
NEC Software Solutions	NEC
Optomed	Avenue AI
Remidio Innovative solutions Pvt. Ltd.	Remidio
RetinAI	RetinAI
Retina-AI Health Inc	Retina-AI Galaxy
RetinaLyze System A/S	RetinaLyze
Retmarker S.A.	Retmarker
Scottish Health Innovations Ltd	iGradingM
SigTuple Technologies	Drishti
TeleMedC	DRLite
Thirona	RetCAD
VUNO	VUNO Med-Fundus AI

Table S2: Populations characteristics for encounters between 1st Jan 2021 to 31st Dec 2022 from NEL DESP.

Characteristics	Ethnic Group (column %)				
	White N = 64023	Black N = 34058	South Asian N = 78415	Other/Unknown N = 24942	Total N = 201438
Age at screening visit (years)	64.2(14.9)	61.3(13.7)	57.6(13.5)	59.4(13.7)	60.5(14.3)
Age Group n (%)					
<30 years	1751(2.7)	633(1.9)	1245(1.6)	590(2.4)	4219(2.1)
30 to < 45 years	4378(6.8)	2532(7.4)	12255(15.6)	2706(10.8)	21871(10.9)
45 to <60 years	15600(24.4)	12594(37.0)	29871(38.1)	8876(35.6)	66941(33.2)
60 to <75 years	25945(40.5)	12151(35.7)	26533(33.8)	9602(38.5)	74231(36.9)
75+ years	16349(25.5)	6148(18.1)	8511(10.9)	3168(12.7)	34176 (17.0)
Female n (%)	28031(43.8)	18204(53.4)	37058(47.3)	11777(47.2)	95070(47.2)
Type of Diabetes n (%)					
Type 1	4827(7.5)	1023(3.0)	1287(1.6)	785(3.1)	7922(3.9)
Type 2	57275(89.5)	31999(94.0)	75513(96.3)	23385(93.8)	188172(93.4)
Other/MODY	183(0.3)	89(0.3)	210(0.3)	83(0.3)	565(0.3)
Not specified/Missing	1738(2.7)	947(2.8)	1405(1.8)	689(2.8)	4779(2.4)
Duration of Diabetes n (%)					
< 10 years	37021(57.8)	19697(57.8)	44681(57.0)	15132(60.7)	116531(57.8)
10 to < 20 years	19938(31.1)	10402(30.5)	24130(30.8)	7178(28.8)	61648(30.6)
20+ years	7056(11.0)	3954(11.6)	9604(12.2)	2620(10.5)	23234(11.5)
Missing	8(0.01)	5(0.01)	0(0.0)	12(0.05)	25(0.01)
Visual acuity in worst eye n (%)					
At least 6/6	28468(44.5)	15521(45.6)	38506(49.1)	12258(49.1)	94753(47.0)
<6/6 to 6/9	22426(35.0)	12365(36.3)	27173(34.7)	8734(35.0)	70698(35.1)
<6/9 to 6/18	8372(13.1)	3814(11.2)	8575(10.9)	2567(10.3)	23328(11.6)
Worse than 6/18	2795(4.4)	1299(3.8)	2489(3.2)	783(3.1)	7366(3.7)
Counting Fingers	394(0.6)	176(0.5)	274(0.3)	124(0.5)	968(0.5)
Hand Movements	885(1.4)	445(1.3)	702(0.9)	246(1.0)	2278(1.1)
Perception of Light	388(0.6)	232(0.7)	353(0.5)	123(0.5)	1096(0.5)
No Perception of Light	26(0.04)	27(0.1)	25(0.03)	11(0.04)	89(0.04)
Missing eye	61(0.1)	48(0.1)	55(0.1)	18(0.1)	182(0.1)
Not measured/missing	208(0.3)	131(0.4)	263(0.3)	78(0.3)	680(0.3)
IMD Quintile n (%)					
1 (most deprived)	19467(30.4)	16231(47.7)	29954(38.2)	8010(32.1)	73662(36.6)
2	10449(16.3)	7188(21.1)	13635(17.4)	4586(18.4)	35858(17.8)
3	9133(14.3)	4715(13.8)	11537(14.7)	3523(14.1)	28908(14.4)
4	6743(10.5)	2652(7.8)	9671(12.3)	3266(13.1)	22332(11.1)
5 (least deprived)	17982(28.1)	3083(9.1)	13081(16.7)	5380(21.6)	39526(19.6)
missing	249(0.4)	189(0.6)	537(0.7)	177(0.7)	1152(0.6)
Total number of images* processed	365545	209445	445958	145360	1166308
Median no. of images per encounter (IQR)	6(4,6)	6(4,7)	6(4,6)	6(4,7)	6(4,6)

NEL = North East London, DESP = Diabetic Eye Screening Programme

N = number of encounters. Values are mean (standard deviation) or count (n) with column %. Number of people = 126,365

* Includes both retinal and non-retinal images.

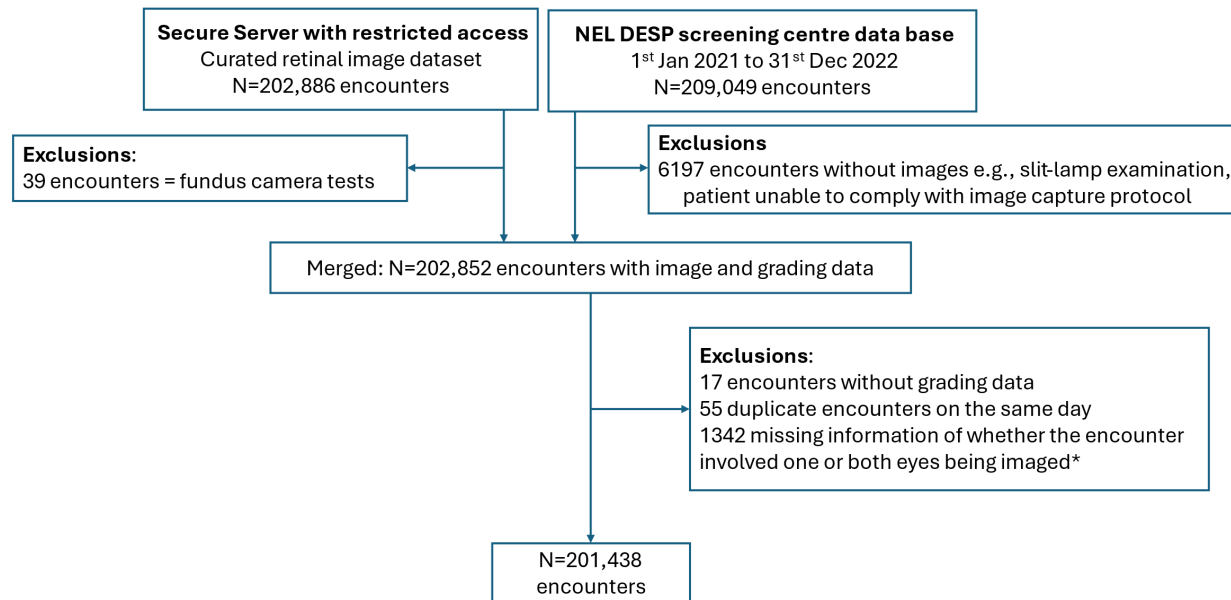


Figure S2. Flow chart of available data on encounters with images and grading data

*1342 (0.7%) were incomplete grading encounters and from the coding it was unclear if these were ‘one-eye encounters’ or two eye encounters with missing data and were thus excluded from the analyses to comply with our protocol for outcome coding in table S1

NEL = North East London

DESP = Diabetic Eye Screening Programme

Table S3: Number of screening encounters by population subgroups for each diabetic retinopathy grade for NELDESP data extracted between 1st January 2021 to 31st Dec 2022.

	Final diabetic retinopathy (DR) grade in the worst eye								
	Non referable DR		Referable DR						Total
	R0M0	R1M0	R1M1	R2M0	R2M1	R3M0	R3M1	U	
	N=131,669	N=39,668	N=18,620	N=999	N=2882	N=826	N=1152	N=5622	N=201,438
Ethnicity	N (column %)								
<i>White</i>	43909 (21.8)	12118 (6.0)	4197 (2.1)	299 (0.1)	791 (0.4)	343 (0.2)	334 (0.2)	2032 (1.0)	64023 (31.8)
<i>Black</i>	21432 (10.6)	6560 (3.3)	3859 (1.9)	161 (0.1)	515 (0.3)	132 (0.1)	242 (0.1)	1157 (0.6)	34058 (16.9)
<i>South Asian</i>	49867 (24.8)	16160 (8.0)	8318 (4.1)	400 (0.2)	1189 (0.6)	255 (0.1)	417 (0.2)	1809 (0.9)	78415 (38.9)
<i>Other</i>	16461 (8.2)	4830 (2.4)	2246 (1.1)	139 (0.1)	387 (0.2)	96 (*)	159 (0.1)	624 (0.3)	24942 (12.4)
Age Category									
<i><30 years</i>	2790 (1.4)	907 (0.5)	335 (0.2)	31 (*)	63 (*)	15 (*)	36 (*)	42 (*)	4219 (2.1)
<i>30 to < 45 years</i>	14815 (7.4)	4201 (2.1)	1928 (1.0)	135 (0.1)	396 (0.2)	86 (0.0)	176 (0.1)	134 (0.1)	21871 (10.9)
<i>45 to <60 years</i>	43729 (21.7)	13317 (6.6)	6808 (3.4)	393 (0.2)	1245 (0.6)	219 (0.1)	434 (0.2)	796 (0.4)	66941 (33.2)
<i>60 to <75 years</i>	48656 (24.2)	14261 (7.1)	6946 (3.4)	345 (0.2)	956 (0.5)	334 (0.2)	406 (0.2)	2327 (1.2)	74231 (36.9)
<i>75+ years</i>	21679 (10.8)	6982 (3.5)	2603 (1.3)	95 (*)	222 (0.1)	172 (0.1)	100 (*)	2323 (1.2)	34176 (17.0)
Sex									
<i>Male</i>	67458 (33.5)	22139 (11.0)	10328 (5.1)	648 (0.3)	1859 (0.9)	482 (0.2)	754 (0.4)	2700 (1.3)	106368 (52.8)
<i>Female</i>	64211 (31.9)	17529 (8.7)	8292 (4.1)	351 (0.2)	1023 (0.5)	344 (0.2)	398 (0.2)	2922 (1.5)	95070 (47.2)
IMD quintile									
<i>1</i>	47832 (23.7)	14720 (7.3)	7057 (3.5)	350 (0.2)	1004 (0.5)	278 (0.1)	427 (0.2)	1994 (1.0)	73662 (36.6)
<i>2</i>	23226 (11.5)	7138 (3.5)	3412 (1.7)	203 (0.1)	599 (0.3)	149 (0.1)	218 (0.1)	913 (0.5)	35858 (17.8)
<i>3</i>	18897 (9.4)	5677 (2.8)	2645 (1.3)	146 (0.1)	452 (0.2)	119 (0.1)	164 (0.1)	808 (0.4)	28908 (14.4)
<i>4</i>	14516 (7.2)	4457 (2.2)	2080 (1.0)	115 (0.1)	315 (0.2)	102 (0.1)	145 (0.1)	602 (0.3)	22332 (11.1)
<i>5</i>	26453 (13.1)	7443 (3.7)	3323 (1.6)	181 (0.1)	495 (0.2)	173 (0.1)	189 (0.1)	1269 (0.6)	39526 (19.6)
<i>missing</i>	745 (0.4)	233 (0.1)	103 (0.1)	4 (*)	17 (*)	5 (*)	9 (*)	36 (*)	1152 (0.6)

Data presented as count (%). *Less than 0.1%. DR = diabetic retinopathy

No observable DR (R0), mild non-proliferative (background) DR (R1), no observable diabetic maculopathy (M0), ungradable images (U), moderate to severe non-proliferative (pre-proliferative) DR (R2), any diabetic maculopathy (M1) and proliferative DR (R3).

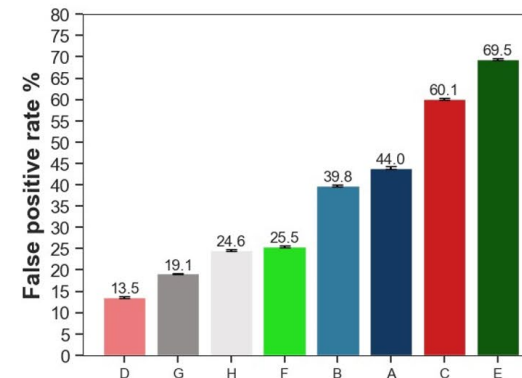
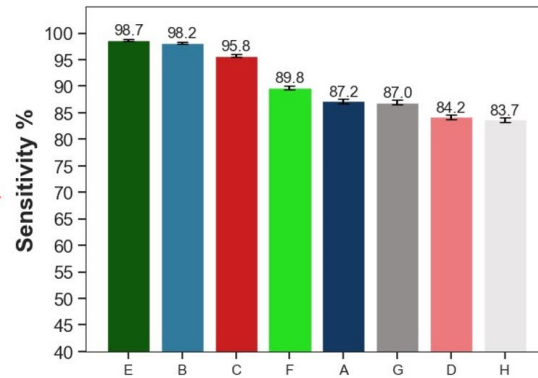
Overall, 3881 cases of R2M0/1 and 1978 cases of R3M0/1. Total number of referable DR (M1, R2 of R3) = 24,479.

Final Human grade in worst eye

Referable DR_(R2,M1,R3)

No Referable DR _(R0,R1)

ARIAS test +



ARIAS test -

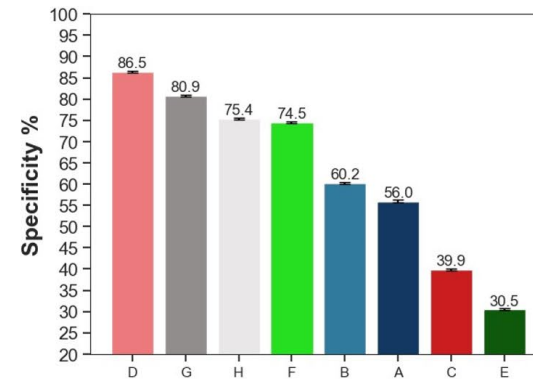
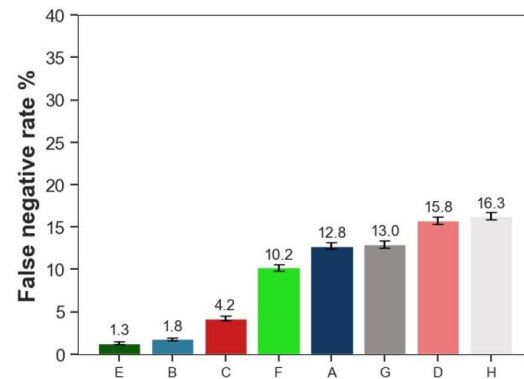


Figure S3: Performance metrics for ARIAS A-H against reference standard of final human grade in worst eye of referable diabetic retinopathy (DR) vs no referable DR
Referable DR = moderate-severe non-proliferative retinopathy (R2), referable maculopathy (M1) or, proliferative retinopathy (R3)
No referable DR = No observable retinopathy (R0), mild-to-moderate non-proliferative retinopathy (R1), no observable maculopathy or no-referable maculopathy (M0).
ARIAS test + = ARIAS test positive (indicative of some level/form of DR or not assessable/technical failure)
ARIAS test - = ARIAS test negative (indicative of disease absence)

Sensitivity for R1M1 by ethnic group



Sensitivity for R1M1 by age group



Figure S4: Performance for Primary Grader (PG) and ARIAS (vendors A-H) for encounters with reference standard final human grade in worst eye R1M1
R1M1 = mild non-proliferative (background) diabetic retinopathy (R1) with any diabetic maculopathy (M1)

Primary grader values are based on % encounters classified as referable DR (PG_r) or DR present (PG_v) by primary grader.
Vendor algorithms A to H values are % encounters that were ARIAS test positive by (a) ethnic group and (c) age group.
ARIAS test positive or visual acuity 6/12 or worse by (b) ethnic group and (d) age group.

Error bars are 95% confidence intervals.

Blue dashed line is the lower 95% confidence limit for PG_r for all subgroups combined.

Ethnic groups: Blue = all ethnicities combined; white ethnicity = orange; black ethnicity = green; South Asian = red, and other ethnic groups = purple.

Age groups: Blue = <30 years, orange = 30 to <45 years, green = 45 to <60 years, red = 60 to <75 years, and purple = 75+ years.

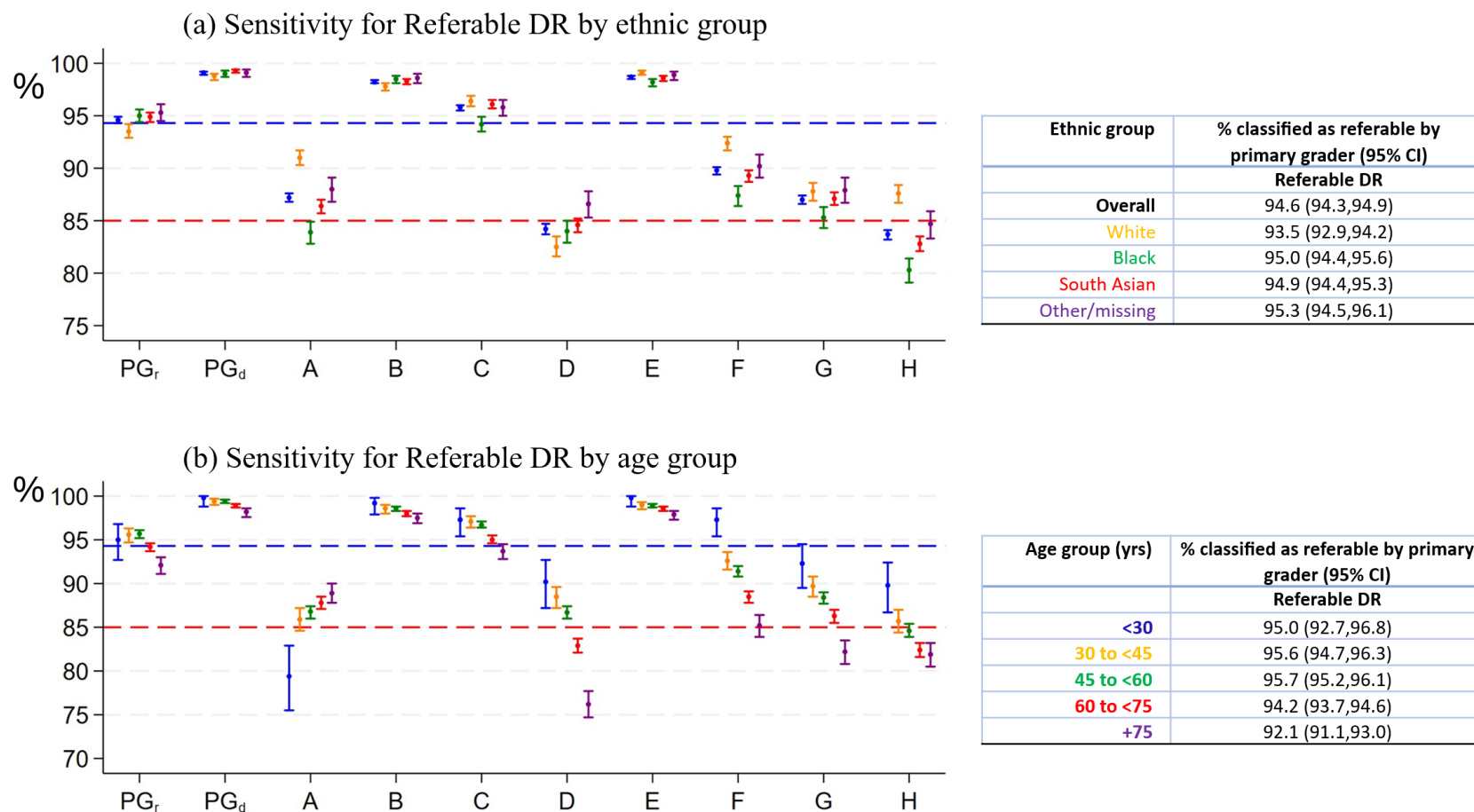


Figure S5: Performance for Primary Grader (PG) and ARIAS (vendor algorithms A-H) by ethnic and age groups for the primary outcome reference standard: final human grade of referable diabetic retinopathy (DR)

Reference standard referable DR is moderate-to-severe non-proliferative DR (R2), any diabetic maculopathy (M1) or proliferative DR (R3).

Primary grader (PG) values are based on % of encounters classified as referable DR (PG_r) or DR present (PG_d) by primary grader. Vendor algorithms A to H values are % encounters that were ARIAS test positive. Error bars are 95% confidence intervals. Blue dashed line is the lower 95% confidence limit for PG_r for all subgroups combined. Red dashed line is at 85%.

Ethnic groups: Blue = all ethnicities combined; white ethnicity = orange; black ethnicity = green; South Asian = red, and other ethnic groups = purple.

Age groups: Blue = <30 years, orange = 30 to <45 years, green = 45 to <60 years, red = 60 to <75 years, and purple = 75+ years.

ARIAS test positive for encounters with human reference standard of no-referable diabetic retinopathy

By ethnic group

By age group

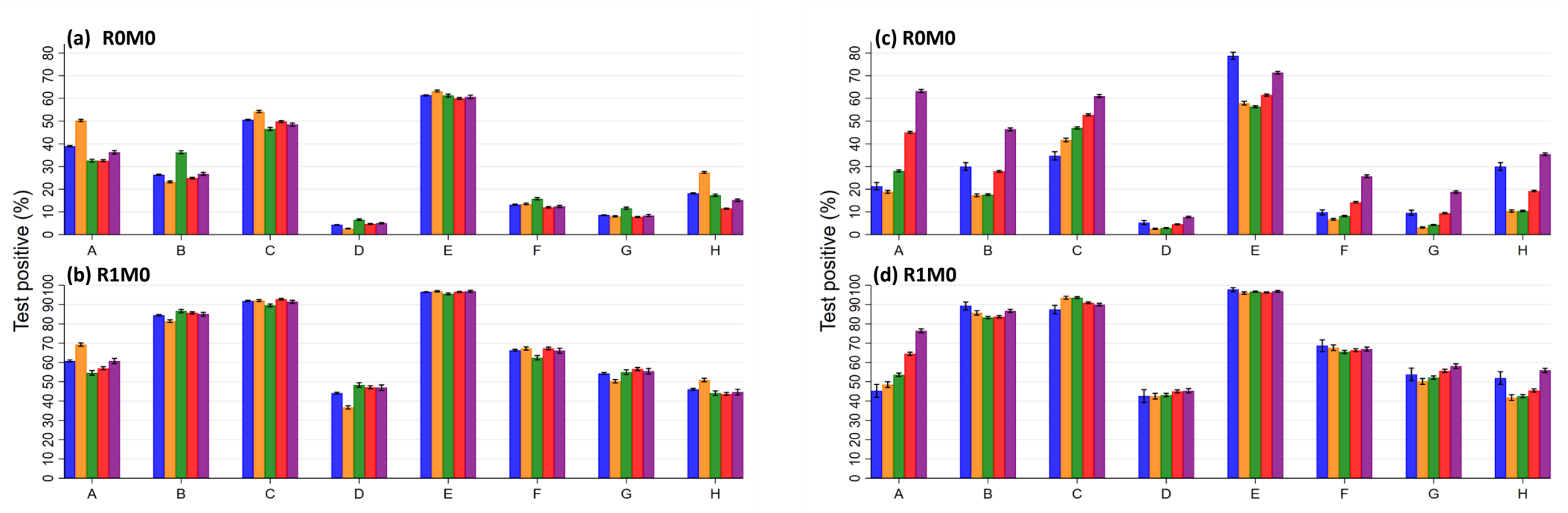


Figure S6: ARIAS test positive rates (vendors A-H) for encounters with reference standard final human grade of no-referable DR

(a) R0M0 by ethnic group, (b) R1M0 by ethnic group, (c) R0M0 by age group and (d) R1M0 by age group

The vertical axes represent among encounters **without** referable DR according to the reference standard, the percentage that were ARIAS test positive results

Error bars are the 95% confidence intervals. DR = diabetic retinopathy

R0 is no observable DR, R1 is mild non-proliferative (background) DR, and M0 is no observable diabetic maculopathy.

Bar chart on the lefthand side by ethnic groups: Blue = all ethnicities combined; white ethnicity = orange; black ethnicity = green; South Asian = red, and other ethnic groups = purple.

Bar chart on righthand side by age groups: Blue = <30 years, orange = 30 to <45 years, green = 45 to <60 years, red = 60 to <75 years, and purple = 75+ years.

Table S4: ARIAS* test positive (%) by population subgroups of ethnicity, age sex and IMD quintile for the primary outcome reference standard=No-referable diabetic retinopathy

ARIAS test positive (%) for no-referable DR (95% confidence interval)										
Vendor	White	Black	South Asian	Other/unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
A	54.4 (54.0,54.8)	37.8 (37.2,38.3)	38.5 (38.2,38.9)	41.8 (41.2,42.5)	27.2 (25.8,28.7)	25.4 (24.8,26.0)	34.0 (33.6,34.4)	49.4 (49.0,49.8)	66.4 (65.9,67.0)	44.0 (43.8,44.2)
B	35.8 (35.4,36.2)	48.1 (47.5,48.6)	39.7 (39.4,40.1)	40.0 (39.3,40.6)	44.6 (43.0,46.2)	32.4 (31.7,33.1)	32.9 (32.6,33.3)	40.6 (40.2,41.0)	56.2 (55.6,56.8)	39.8 (39.6,40.1)
C	62.4 (62.0,62.8)	56.7 (56.1,57.2)	60.3 (59.9,60.7)	58.2 (57.6,58.9)	47.6 (46.0,49.3)	53.2 (52.5,53.9)	57.9 (57.5,58.3)	61.4 (61.0,61.8)	68.1 (67.6,68.6)	60.1 (59.9,60.4)
D	10.0 (9.7,10.2)	16.3 (15.9,16.7)	15.1 (14.8,15.4)	14.5 (14.0,15.0)	14.4 (13.3,15.6)	11.4 (11.0,11.9)	12.3 (12.1,12.6)	13.7 (13.5,14.0)	16.9 (16.5,17.3)	13.5 (13.4,13.7)
E	70.5 (70.1,70.9)	69.3 (68.8,69.9)	68.9 (68.6,69.3)	68.9 (68.3,69.5)	83.5 (82.3,84.7)	66.3 (65.7,67.0)	65.8 (65.4,66.2)	69.4 (69.0,69.7)	77.5 (77.0,78.0)	69.5 (69.3,69.7)
F	25.2 (24.8,25.5)	26.7 (26.2,27.2)	25.5 (25.2,25.9)	24.6 (24.0,25.2)	24.2 (22.9,25.7)	20.1 (19.6,20.7)	21.5 (21.2,21.9)	26.1 (25.7,26.4)	35.8 (35.2,36.3)	25.5 (25.3,25.7)
G	17.2 (16.8,17.5)	21.8 (21.3,22.3)	19.7 (19.4,20.0)	19.1 (18.6,19.6)	20.4 (19.2,21.8)	13.5 (13.0,14.0)	15.5 (15.2,15.8)	19.9 (19.6,20.2)	28.3 (27.8,28.9)	19.1 (19.0,19.3)
H	32.5 (32.1,32.9)	23.6 (23.1,24.1)	19.4 (19.1,19.7)	21.9 (21.3,22.4)	35.4 (33.8,36.9)	17.3 (16.8,17.9)	17.9 (17.6,18.2)	25.2 (24.8,25.5)	40.4 (39.8,41.0)	24.6 (24.4,24.9)
ARIAS test positive (%) for no-referable DR (95% confidence interval)										
Vendor	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall	
A	43.0 (42.6,43.3)	45.1 (44.8,45.5)	40.5 (40.1,40.9)	41.1 (40.5,41.6)	44.8 (44.2,45.4)	46.2 (45.5,46.9)	51.6 (51.1,52.2)	31.9 (29.0,34.9)	44.0 (43.8,44.2)	
B	39.6 (39.3,40.0)	40.0 (39.7,40.4)	41.2 (40.8,41.6)	40.1 (39.5,40.6)	39.8 (39.2,40.4)	39.1 (38.4,39.8)	37.5 (37.0,38.0)	37.8 (34.8,41.0)	39.8 (39.6,40.1)	
C	61.2 (60.8,61.5)	59.0 (58.7,59.4)	58.7 (58.3,59.1)	57.8 (57.2,58.4)	60.3 (59.7,60.9)	61.7 (61.0,62.4)	63.9 (63.4,64.4)	57.0 (53.8,60.1)	60.1 (59.9,60.4)	
D	13.8 (13.6,14.1)	13.2 (13.0,13.5)	14.3 (14.0,14.6)	13.8 (13.4,14.2)	13.9 (13.4,14.3)	13.6 (13.1,14.1)	11.7 (11.4,12.0)	12.9 (10.8,15.1)	13.5 (13.4,13.7)	
E	70.3 (70.0,70.6)	68.7 (68.4,69.0)	68.7 (68.3,69.1)	68.7 (68.2,69.2)	69.6 (69.0,70.1)	70.9 (70.2,71.5)	70.9 (70.5,71.4)	69.2 (66.2,72.1)	69.5 (69.3,69.7)	
F	26.2 (25.9,26.5)	24.7 (24.4,24.9)	26.1 (25.7,26.4)	25.3 (24.8,25.8)	25.6 (25.1,26.2)	25.7 (25.1,26.4)	24.3 (23.9,24.8)	24.3 (21.7,27.2)	25.5 (25.3,25.7)	
G	19.7 (19.4,19.9)	18.6 (18.3,18.9)	19.9 (19.6,20.3)	19.5 (19.0,19.9)	19.4 (18.9,19.9)	18.7 (18.2,19.3)	17.5 (17.1,17.9)	18.5 (16.1,21.1)	19.1 (19.0,19.3)	
H	25.1 (24.8,25.4)	24.1 (23.8,24.4)	21.8 (21.5,22.1)	22.6 (22.1,23.1)	25.3 (24.8,25.9)	26.3 (25.6,26.9)	30.4 (29.9,30.9)	20.2 (17.8,22.9)	24.6 (24.4,24.9)	

*ARIAS = Automated Retinal Image Analysis System; DR = diabetic retinopathy.

No-referable diabetic retinopathy is no observable DR (R0) or mild non-proliferative (background) DR (R1), and no observable diabetic maculopathy (M0).

Table S5: Screen positive rates based on ARIAS* test positive or visual acuity $\leq 6/12$, for vendors A-H by ethnicity and age group

ARIAS*		% ARIAS test positive+ visual acuity $\leq 6/12$ (95% confidence intervals)								
Final human grade in the worst eye	White N = (64023)	Black N = (34058)	South Asian N = (78415)	O/Unkn† N = (24942)	Age < 30 N = (4219)	30 ≤ Age < 45y N = (21871)	45 ≤ Age < 60y N = (66941)	60 ≤ Age < 75y N = (74231)	Age ≥ 75y N = (34176)	Overall N = (201438)
A										
No referable DR	60.7 (60.3,61.1)	44.5 (43.9,45.1)	44.3 (43.9,44.6)	47.2 (46.5,47.9)	31.3 (29.8,32.8)	28.6 (27.9,29.2)	38.0 (37.6,38.4)	55.9 (55.5,56.3)	77.9 (77.4,78.4)	50.1 (49.8,50.3)
Referable DR (including U)	93.1 (92.5,93.6)	85.8 (84.9,86.7)	89.1 (88.5,89.6)	89.5 (88.4,90.5)	82.0 (78.4,85.2)	86.8 (85.5,88.0)	87.6 (86.9,88.2)	90.0 (89.4,90.5)	94.1 (93.5,94.7)	89.5 (89.2,89.9)
Referable DR (excluding U)	93.3 (92.6,93.9)	86.1 (85.1,87.1)	88.8 (88.2,89.4)	89.6 (88.4,90.6)	81.0 (77.2,84.5)	87.0 (85.7,88.2)	87.9 (87.2,88.6)	90.5 (89.9,91.1)	94.3 (93.5,95.1)	89.5 (89.1,89.9)
B										
No referable DR	44.3 (43.9,44.7)	52.4 (51.8,53.0)	45.2 (44.8,45.6)	45.2 (44.6,45.9)	47.7 (46.1,49.3)	35.3 (34.7,36.0)	37.0 (36.6,37.4)	47.5 (47.1,47.9)	68.1 (67.5,68.6)	46.1 (45.9,46.3)
Referable DR (including U)	98.0 (97.7,98.3)	98.7 (98.4,99.0)	98.7 (98.5,98.9)	98.8 (98.4,99.1)	99.2 (98.0,99.8)	98.5 (98.0,98.9)	98.7 (98.4,98.9)	98.4 (98.1,98.6)	98.4 (98.0,98.7)	98.5 (98.4,98.7)
Referable DR (excluding U)	98.5 (98.2,98.8)	98.8 (98.4,99.1)	98.7 (98.5,98.9)	99.0 (98.5,99.3)	99.4 (98.2,99.9)	98.6 (98.1,99.0)	98.8 (98.5,99.0)	98.6 (98.4,98.9)	98.8 (98.4,99.2)	98.7 (98.6,98.9)
C										
No referable DR	68.2 (67.8,68.6)	62.0 (61.4,62.6)	64.9 (64.5,65.2)	62.8 (62.1,63.4)	51.0 (49.3,52.6)	55.7 (55.0,56.4)	60.9 (60.5,61.3)	66.8 (66.5,67.2)	78.3 (77.8,78.8)	65.2 (65.0,65.4)
Referable DR (including U)	96.3 (95.9,96.7)	94.5 (93.9,95.1)	96.5 (96.1,96.8)	96.1 (95.4,96.7)	97.1 (95.3,98.4)	96.7 (95.9,97.3)	96.6 (96.3,97.0)	95.3 (94.9,95.7)	95.8 (95.3,96.3)	96.0 (95.8,96.2)
Referable DR (excluding U)	97.5 (97.1,97.9)	95.5 (94.9,96.0)	97.0 (96.7,97.3)	97.0 (96.4,97.6)	97.7 (95.9,98.9)	97.2 (96.5,97.8)	97.2 (96.8,97.5)	96.4 (95.9,96.7)	96.7 (96.0,97.3)	96.8 (96.6,97.0)
D										
No referable DR	25.6 (25.2,26.0)	28.0 (27.5,28.6)	25.8 (25.5,26.1)	25.2 (24.6,25.7)	20.0 (18.7,21.3)	16.0 (15.5,16.5)	18.7 (18.4,19.0)	26.7 (26.3,27.0)	46.6 (46.0,47.2)	26.0 (25.8,26.2)
Referable DR (including U)	85.3 (84.5,86.1)	85.2 (84.3,86.1)	87.5 (86.9,88.1)	87.5 (86.4,88.6)	90.4 (87.6,92.8)	88.9 (87.7,90.0)	87.3 (86.6,87.9)	85.0 (84.4,85.7)	86.3 (85.4,87.2)	86.5 (86.1,86.9)
Referable DR (excluding U)	87.8 (87.0,88.6)	87.1 (86.1,88.0)	88.3 (87.6,88.9)	89.4 (88.2,90.5)	91.0 (88.1,93.4)	89.3 (88.1,90.5)	88.3 (87.6,88.9)	87.0 (86.3,87.7)	88.9 (87.8,90.0)	88.1 (87.6,88.5)
E										
No referable DR	74.5 (74.2,74.9)	72.8 (72.3,73.3)	72.5 (72.1,72.8)	71.9 (71.2,72.5)	84.2 (83.0,85.4)	68.0 (67.3,68.6)	68.0 (67.6,68.4)	73.4 (73.1,73.8)	84.7 (84.3,85.1)	73.1 (72.9,73.3)
Referable DR (including U)	98.0 (97.6,98.3)	97.1 (96.7,97.5)	98.4 (98.1,98.6)	98.1 (97.6,98.5)	99.4 (98.3,99.9)	98.8 (98.3,99.2)	98.5 (98.3,98.8)	97.5 (97.2,97.8)	97.4 (96.9,97.8)	98.0 (97.8,98.1)
Referable DR (excluding U)	99.4 (99.2,99.6)	98.5 (98.1,98.8)	98.9 (98.7,99.1)	99.2 (98.9,99.5)	99.8 (98.8,100.0)	99.1 (98.6,99.4)	99.0 (98.8,99.2)	99.0 (98.8,99.2)	98.7 (98.3,99.1)	99.0 (98.9,99.1)
F										
No referable DR	37.0 (36.6,37.4)	36.0 (35.4,36.5)	34.3 (34.0,34.7)	33.3 (32.7,33.9)	29.4 (27.9,30.9)	24.2 (23.6,24.8)	27.1 (26.7,27.5)	36.5 (36.2,36.9)	57.2 (56.6,57.8)	35.3 (35.1,35.6)
Referable DR (including U)	92.6 (92.0,93.2)	89.1 (88.3,89.9)	91.3 (90.8,91.8)	91.3 (90.4,92.2)	97.5 (95.8,98.7)	92.5 (91.5,93.5)	91.8 (91.2,92.3)	89.9 (89.3,90.4)	91.7 (91.0,92.4)	91.2 (90.9,91.5)
Referable DR (excluding U)	95.0 (94.4,95.5)	90.0 (89.2,90.9)	92.0 (91.5,92.5)	92.6 (91.6,93.5)	97.9 (96.2,99.0)	93.1 (92.0,94.0)	92.5 (91.9,93.0)	91.5 (90.9,92.1)	93.5 (92.5,94.3)	92.4 (92.1,92.7)
G										
No referable DR	30.5 (30.2,30.9)	31.6 (31.1,32.2)	29.2 (28.8,29.5)	28.5 (27.9,29.1)	25.4 (24.0,26.8)	18.0 (17.4,18.5)	21.3 (21.0,21.7)	31.2 (30.8,31.6)	52.8 (52.2,53.3)	29.9 (29.7,30.1)
Referable DR (including U)	89.6 (88.9,90.2)	86.3 (85.4,87.1)	89.4 (88.9,90.0)	88.9 (87.9,89.9)	92.5 (89.9,94.6)	89.8 (88.6,90.9)	88.9 (88.3,89.5)	87.8 (87.2,88.4)	89.5 (88.7,90.3)	88.8 (88.4,89.1)
Referable DR (excluding U)	91.5 (90.8,92.2)	87.6 (86.7,88.5)	90.2 (89.6,90.7)	90.2 (89.1,91.3)	92.9 (90.2,95.0)	90.2 (89.0,91.3)	89.7 (89.0,90.3)	89.6 (88.9,90.2)	91.4 (90.4,92.4)	90.0 (89.6,90.4)
H										
No referable DR	41.7 (41.3,42.1)	33.0 (32.5,33.6)	28.7 (28.3,29.0)	30.3 (29.6,30.9)	39.1 (37.5,40.7)	21.2 (20.6,21.8)	23.2 (22.8,23.5)	35.3 (34.9,35.6)	59.8 (59.2,60.4)	33.9 (33.6,34.1)
Referable DR (including U)	90.5 (89.8,91.1)	83.0 (82.1,84.0)	86.4 (85.8,87.0)	87.0 (85.8,88.0)	90.8 (88.0,93.1)	86.5 (85.2,87.8)	85.8 (85.1,86.5)	85.8 (85.1,86.4)	90.9 (90.1,91.6)	86.9 (86.5,87.3)
Referable DR (excluding U)	90.5 (89.8,91.3)	83.3 (82.3,84.4)	86.5 (85.8,87.1)	87.1 (85.8,88.3)	90.6 (87.7,93.1)	86.7 (85.4,88.0)	86.1 (85.4,86.8)	86.1 (85.4,86.9)	91.0 (89.9,91.9)	86.9 (86.5,87.3)

*ARIAS = Automated Retinal Image Analysis System; DR = diabetic retinopathy

†Other or unknown ethnic group.

No referable DR = No observable DR (R0), mild non-proliferative (background) DR (R1), no observable diabetic maculopathy (M0)

Referrable DR = moderate-to-severe non-proliferative DR (R2), any diabetic maculopathy (M1) or proliferative DR (R3).

U = final human grade was ungradable.

Table S6: Screen positive and false positive rates, positive and negative predictive values for ARIAS for those with final human grade in the worst eye of referable diabetic retinopathy (vs no referable diabetic retinopathy), with and without the visual acuity criterion

Vendor	Screen positive* (%)		False positive rate** (%)		Positive predictive value		Negative predictive value	
	With out VA	With VA†	With out VA	With VA†	With out VA	With VA†	With out VA	With VA†
A	49.8	56.0	44.0	50.1	22.1	20.3	96.8	97.1
B	48.5	53.9	39.8	46.1	26.1	23.4	99.6	99.7
C	64.9	69.8	60.1	65.2	18.5	17.5	98.5	98.7
D	22.8	35.1	13.5	26.0	47.0	32.6	97.5	97.7
E	73.5	76.8	69.5	73.1	16.9	16.2	99.4	99.5
F	34.1	43.7	25.5	35.3	33.5	27.2	98.1	98.4
G	28.3	38.7	19.1	29.9	39.4	30.1	97.8	98.0
H	32.7	41.8	24.6	33.9	32.7	26.8	97.0	97.3

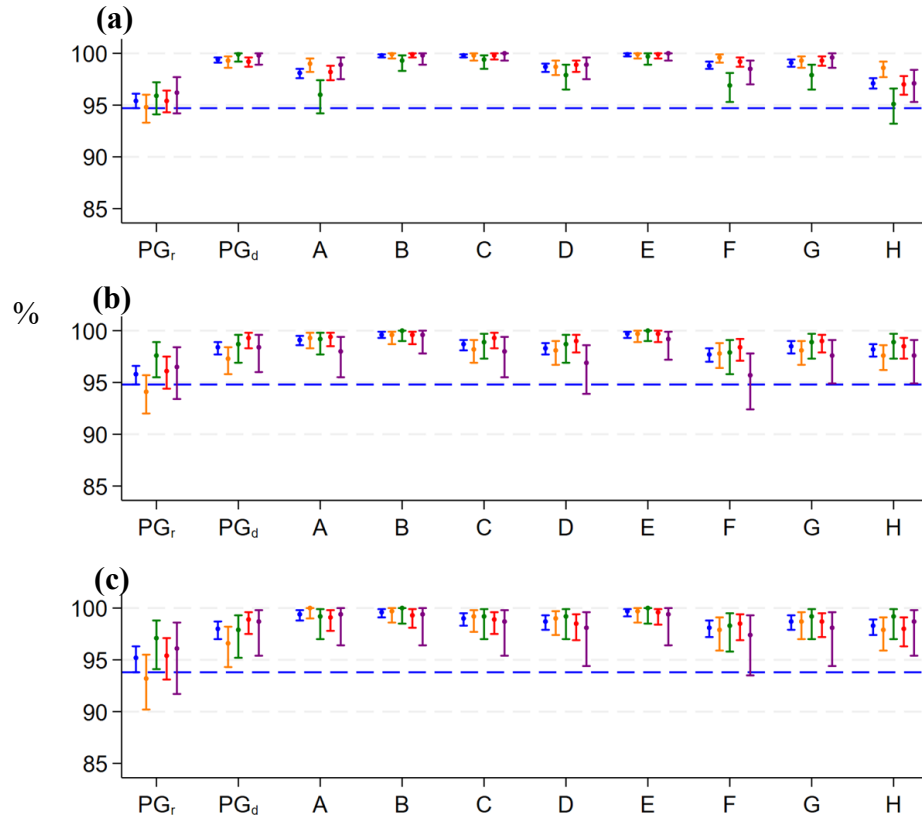
*ARIAS test positive.

†ARIAS test positive or visual acuity $\leq 6/12$.

**False positives are those with final human grade of “no referable diabetic retinopathy” but were ARIAS test positive

ARIAS sensitivity for R2, R3 and R3A combined with visual acuity 6/12 or worse contributing to screen positive outcomes

By ethnic group



By age group

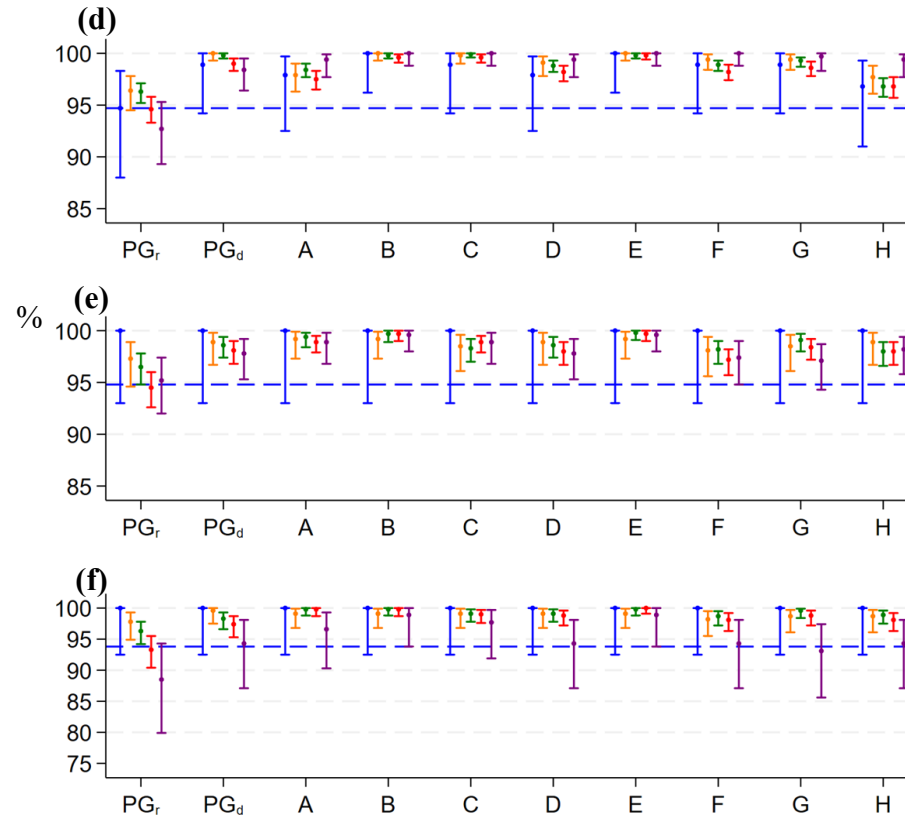


Figure S7: Performance for Primary Grader (PG) and for ARIAS (vendors algorithms A-H) with visual acuity criterion, by ethnic and age groups for R2, R3 and R3A

Results are for reference standard final human grade (a,d) R2 moderate to severe non-proliferative (pre-proliferative) diabetic retinopathy (DR0, (b,e) R3 proliferative DR and (c,f) R3A active proliferative DR

Primary grader (PG) values are based on % of encounters classified as referable DR (PG_r) or DR present (PG_d) by primary grader.

Screen positive includes encounters ARIAS test positive or visual acuity 6/12 or worse,

Error bars are 95% confidence intervals. Blue dashed line is the lower 95% confidence limit for PG_r for all subgroups combined.

Ethnic groups: Blue = all ethnicities combined; white ethnicity = orange; black ethnicity = green; South Asian = red, and other ethnic groups = purple.

Age groups: Blue = <30 years, orange = 30 to <45 years, green = 45 to <60 years, red = 60 to <75 years, and purple = 75+ years.

2. ARIAS operating threshold 1: ARIAS test positive rates by final human grade in worst eye and by population subgroups

Table S7: Vendor A ARIAS test positive rates by subgroups of ethnicity and age

Final human grade in worst eye	ARIAS test positive % for Vendor A (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	50.3 (49.8,50.8)	32.6 (32.0,33.2)	32.5 (32.1,33.0)	36.3 (35.5,37.0)	21.3 (19.8,22.9)	18.9 (18.2,19.5)	28.0 (27.6,28.5)	45.0 (44.6,45.5)	63.2 (62.6,63.9)	38.9 (38.7,39.2)
R1M0	69.3 (68.4,70.1)	54.6 (53.4,55.8)	57.0 (56.2,57.8)	60.8 (59.4,62.1)	45.3 (42.0,48.6)	48.5 (47.0,50.0)	53.6 (52.8,54.5)	64.5 (63.7,65.3)	76.4 (75.4,77.4)	60.8 (60.3,61.3)
R1M1	87.7 (86.7,88.7)	80.4 (79.1,81.7)	83.1 (82.3,83.9)	84.3 (82.8,85.8)	71.0 (65.9,75.8)	80.9 (79.0,82.6)	82.8 (81.9,83.7)	84.9 (84.1,85.8)	86.8 (85.4,88.1)	83.7 (83.2,84.3)
R2	98.8 (98.0,99.4)	95.9 (94.1,97.2)	98.0 (97.2,98.7)	98.7 (97.3,99.5)	97.9 (92.5,99.7)	97.9 (96.3,99.0)	98.3 (97.5,98.9)	97.3 (96.3,98.1)	99.1 (97.3,99.8)	98.0 (97.5,98.4)
R2M0	96.7 (93.9,98.4)	86.3 (80.0,91.2)	93.5 (90.6,95.7)	97.1 (92.8,99.2)	96.8 (83.3,99.9)	92.6 (86.8,96.4)	94.4 (91.6,96.5)	92.2 (88.8,94.8)	97.9 (92.6,99.7)	93.8 (92.1,95.2)
R2M1	99.6 (98.9,99.9)	98.8 (97.5,99.6)	99.6 (99.0,99.9)	99.2 (97.8,99.8)	98.4 (91.5,100.0)	99.7 (98.6,100.0)	99.5 (99.0,99.8)	99.2 (98.4,99.6)	99.5 (97.5,100.0)	99.4 (99.1,99.7)
R3	99.0 (97.9,99.6)	98.1 (96.2,99.2)	99.0 (97.9,99.6)	98.0 (95.5,99.4)	100.0 (93.0,100.0)	98.9 (96.7,99.8)	99.2 (98.2,99.8)	98.4 (97.2,99.2)	97.8 (95.3,99.2)	98.7 (98.1,99.1)
R3M0	98.3 (96.2,99.4)	95.5 (90.4,98.3)	97.6 (94.9,99.1)	94.8 (88.3,98.3)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	97.7 (94.8,99.3)	97.0 (94.6,98.6)	96.5 (92.6,98.7)	97.2 (95.9,98.2)
R3M1	99.7 (98.3,100.0)	99.6 (97.7,100.0)	99.8 (98.7,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	99.4 (96.9,100.0)	100.0 (99.2,100.0)	99.5 (98.2,99.9)	100.0 (96.4,100.0)	99.7 (99.2,99.9)
U	69.2 (67.2,71.2)	58.4 (55.5,61.3)	64.4 (62.1,66.6)	64.6 (60.7,68.3)	57.1 (41.0,72.3)	52.2 (43.4,60.9)	55.7 (52.1,59.1)	62.9 (60.9,64.9)	71.0 (69.1,72.9)	64.9 (63.7,66.2)
Combination grades*										
Any DR	75.7 (75.1,76.3)	66.3 (65.5,67.2)	68.3 (67.8,68.9)	70.8 (69.8,71.7)	57.1 (54.5,59.7)	63.0 (61.9,64.1)	66.7 (66.1,67.3)	72.6 (72.0,73.1)	78.6 (77.9,79.3)	70.4 (70.1,70.7)
Any DR (excluding U)	76.4 (75.8,77.1)	67.1 (66.3,68.0)	68.6 (68.1,69.2)	71.2 (70.2,72.2)	57.1 (54.4,59.7)	63.2 (62.1,64.3)	67.1 (66.4,67.7)	73.5 (73.0,74.1)	80.4 (79.6,81.1)	70.9 (70.5,71.2)
Referable DR	85.5 (84.7,86.3)	79.0 (78.0,80.0)	83.2 (82.5,83.8)	84.0 (82.7,85.2)	77.6 (73.8,81.1)	84.3 (83.0,85.7)	84.3 (83.5,85.0)	82.7 (82.0,83.4)	81.4 (80.3,82.4)	83.0 (82.6,83.5)
Referable DR (excluding U)	91.0 (90.3,91.7)	83.9 (82.8,84.9)	86.4 (85.7,87.0)	88.0 (86.8,89.1)	79.4 (75.5,82.9)	85.9 (84.6,87.2)	86.8 (86.0,87.4)	87.8 (87.1,88.5)	88.9 (87.8,90.0)	87.2 (86.8,87.6)
No referable DR	54.4 (54.0,54.8)	37.8 (37.2,38.3)	38.5 (38.2,38.9)	41.8 (41.2,42.5)	27.2 (25.8,28.7)	25.4 (24.8,26.0)	34.0 (33.6,34.4)	49.4 (49.0,49.8)	66.4 (65.9,67.0)	44.0 (43.8,44.2)

Table S8: Vendor A ARIAS test positive rates by sex and quintiles of IMD

Final human grade in worst eye	ARIAS test positive % for Vendor A (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	37.7 (37.3,38.0)	40.3 (39.9,40.6)	34.9 (34.5,35.3)	35.5 (34.9,36.1)	39.6 (38.9,40.3)	41.3 (40.5,42.1)	47.9 (47.3,48.5)	25.2 (22.2,28.5)	38.9 (38.7,39.2)
R1M0	59.1 (58.4,59.7)	63.0 (62.3,63.7)	58.7 (57.9,59.5)	59.1 (58.0,60.2)	62.2 (60.9,63.4)	62.1 (60.7,63.5)	65.0 (63.9,66.1)	53.2 (46.6,59.8)	60.8 (60.3,61.3)
R1M1	84.6 (83.8,85.2)	82.7 (81.9,83.5)	82.8 (81.9,83.7)	84.6 (83.3,85.8)	84.2 (82.8,85.6)	83.2 (81.5,84.8)	84.8 (83.5,86.0)	80.6 (71.6,87.7)	83.7 (83.2,84.3)
R2	98.2 (97.7,98.7)	97.5 (96.5,98.2)	97.3 (96.3,98.1)	98.5 (97.4,99.2)	97.8 (96.3,98.8)	98.6 (97.0,99.5)	98.4 (97.1,99.2)	100.0 (83.9,100.0)	98.0 (97.5,98.4)
R2M0	94.1 (92.0,95.8)	93.2 (90.0,95.6)	91.4 (88.0,94.1)	94.6 (90.5,97.3)	92.5 (86.9,96.2)	95.7 (90.1,98.6)	97.2 (93.7,99.1)	100.0 (39.8,100.0)	93.8 (92.1,95.2)
R2M1	99.7 (99.3,99.9)	98.9 (98.1,99.5)	99.3 (98.6,99.7)	99.8 (99.1,100.0)	99.6 (98.4,99.9)	99.7 (98.2,100.0)	98.8 (97.4,99.6)	100.0 (80.5,100.0)	99.4 (99.1,99.7)
R3	98.9 (98.1,99.4)	98.4 (97.2,99.2)	98.6 (97.4,99.3)	98.1 (96.1,99.2)	98.6 (96.4,99.6)	100.0 (98.5,100.0)	98.6 (96.8,99.6)	100.0 (76.8,100.0)	98.7 (98.1,99.1)
R3M0	97.3 (95.4,98.6)	97.1 (94.7,98.6)	96.8 (93.9,98.5)	95.3 (90.6,98.1)	97.5 (92.8,99.5)	100.0 (96.4,100.0)	97.7 (94.2,99.4)	100.0 (47.8,100.0)	97.2 (95.9,98.2)
R3M1	99.9 (99.3,100.0)	99.5 (98.2,99.9)	99.8 (98.7,100.0)	100.0 (98.3,100.0)	99.4 (96.6,100.0)	100.0 (97.5,100.0)	99.5 (97.1,100.0)	100.0 (66.4,100.0)	99.7 (99.2,99.9)
U	62.6 (60.7,64.4)	67.1 (65.4,68.8)	61.3 (59.2,63.5)	62.4 (59.2,65.6)	67.2 (63.8,70.4)	65.0 (61.0,68.8)	70.8 (68.3,73.3)	69.4 (51.9,83.7)	64.9 (63.7,66.2)
Combination grades*									
Any DR	69.9 (69.4,70.3)	71.1 (70.6,71.6)	68.6 (68.0,69.2)	69.9 (69.1,70.7)	71.6 (70.7,72.4)	71.1 (70.1,72.2)	73.3 (72.5,74.0)	65.6 (60.8,70.2)	70.4 (70.1,70.7)
Any DR (excluding U)	70.4 (70.0,70.9)	71.5 (70.9,72.0)	69.2 (68.6,69.8)	70.4 (69.6,71.3)	71.9 (71.0,72.9)	71.7 (70.6,72.7)	73.5 (72.7,74.3)	65.2 (60.1,70.1)	70.9 (70.5,71.2)
Referable DR	84.1 (83.6,84.7)	81.7 (81.0,82.3)	81.7 (81.0,82.5)	83.8 (82.8,84.8)	83.9 (82.7,85.0)	83.1 (81.8,84.4)	84.2 (83.2,85.1)	82.2 (75.7,87.6)	83.0 (82.6,83.5)
Referable DR (excluding U)	88.3 (87.7,88.8)	85.8 (85.1,86.4)	86.2 (85.5,86.9)	88.1 (87.1,89.0)	87.7 (86.6,88.8)	87.1 (85.8,88.4)	88.1 (87.1,89.0)	85.5 (78.5,90.9)	87.2 (86.8,87.6)
No referable DR	43.0 (42.6,43.3)	45.1 (44.8,45.5)	40.5 (40.1,40.9)	41.1 (40.5,41.6)	44.8 (44.2,45.4)	46.2 (45.5,46.9)	51.6 (51.1,52.2)	31.9 (29.0,34.9)	44.0 (43.8,44.2)

Table S9: Vendor B ARIAS test positive rates by subgroups of ethnicity and age

Final human grade in worst eye	ARIAS test positive % for Vendor B (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	23.2 (22.8,23.6)	36.2 (35.6,36.9)	24.9 (24.5,25.2)	26.7 (26.1,27.4)	30.0 (28.3,31.7)	17.3 (16.7,17.9)	17.6 (17.3,18.0)	27.9 (27.5,28.3)	46.4 (45.7,47.0)	26.4 (26.1,26.6)
R1M0	81.4 (80.7,82.1)	86.7 (85.8,87.5)	85.7 (85.1,86.2)	85.1 (84.0,86.0)	89.4 (87.2,91.3)	85.7 (84.6,86.8)	83.3 (82.7,83.9)	83.7 (83.1,84.3)	86.7 (85.9,87.5)	84.5 (84.1,84.8)
R1M1	97.0 (96.5,97.5)	98.2 (97.7,98.6)	97.9 (97.5,98.2)	98.2 (97.6,98.7)	98.8 (97.0,99.7)	98.1 (97.4,98.6)	98.1 (97.8,98.5)	97.6 (97.2,97.9)	97.0 (96.2,97.6)	97.8 (97.6,98.0)
R2	99.9 (99.5,100.0)	99.3 (98.3,99.8)	99.9 (99.6,100.0)	99.8 (98.9,100.0)	100.0 (96.2,100.0)	100.0 (99.3,100.0)	99.8 (99.5,100.0)	99.6 (99.1,99.9)	100.0 (98.8,100.0)	99.8 (99.6,99.9)
<i>R2M0</i>	99.7 (98.2,100.0)	97.5 (93.8,99.3)	99.8 (98.6,100.0)	99.3 (96.1,100.0)	100.0 (88.8,100.0)	100.0 (97.3,100.0)	99.2 (97.8,99.8)	98.8 (97.1,99.7)	100.0 (96.2,100.0)	99.3 (98.6,99.7)
<i>R2M1</i>	100.0 (99.5,100.0)	99.8 (98.9,100.0)	100.0 (99.7,100.0)	100.0 (99.1,100.0)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	100.0 (99.7,100.0)	99.9 (99.4,100.0)	100.0 (98.4,100.0)	100.0 (99.8,100.0)
R3	98.8 (97.7,99.5)	100.0 (99.0,100.0)	99.6 (98.7,99.9)	99.6 (97.8,100.0)	100.0 (93.0,100.0)	99.2 (97.3,99.9)	99.7 (98.9,100.0)	99.1 (98.1,99.6)	99.6 (98.0,100.0)	99.4 (98.9,99.7)
<i>R3M0</i>	97.7 (95.5,99.0)	100.0 (97.2,100.0)	98.8 (96.6,99.8)	99.0 (94.3,100.0)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	99.1 (96.7,99.9)	97.9 (95.7,99.2)	99.4 (96.8,100.0)	98.5 (97.5,99.2)
<i>R3M1</i>	100.0 (98.9,100.0)	100.0 (98.5,100.0)	100.0 (99.1,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	100.0 (99.2,100.0)	100.0 (99.1,100.0)	100.0 (96.4,100.0)	100.0 (99.7,100.0)
U	93.4 (92.2,94.4)	98.1 (97.1,98.8)	97.2 (96.3,97.9)	96.2 (94.3,97.5)	95.2 (83.8,99.4)	94.8 (89.5,97.9)	96.2 (94.7,97.4)	96.0 (95.1,96.8)	95.7 (94.8,96.5)	95.9 (95.3,96.4)
Combination grades*										
Any DR	87.5 (87.0,87.9)	92.3 (91.8,92.8)	91.1 (90.7,91.4)	90.7 (90.1,91.3)	92.9 (91.4,94.1)	90.8 (90.1,91.5)	89.7 (89.3,90.1)	89.9 (89.5,90.2)	91.1 (90.6,91.6)	90.2 (90.0,90.4)
Any DR (excluding U)	86.8 (86.3,87.3)	91.7 (91.2,92.2)	90.7 (90.3,91.0)	90.3 (89.6,90.9)	92.8 (91.3,94.1)	90.8 (90.1,91.4)	89.5 (89.1,89.9)	89.3 (88.9,89.7)	90.1 (89.5,90.7)	89.7 (89.5,89.9)
Referable DR	96.7 (96.2,97.0)	98.4 (98.0,98.7)	98.1 (97.9,98.4)	98.2 (97.7,98.6)	98.9 (97.5,99.6)	98.4 (97.9,98.8)	98.4 (98.1,98.6)	97.6 (97.3,97.9)	96.8 (96.3,97.2)	97.8 (97.6,98.0)
Referable DR (excluding U)	97.8 (97.4,98.1)	98.5 (98.1,98.8)	98.3 (98.0,98.5)	98.6 (98.1,99.0)	99.2 (97.9,99.8)	98.6 (98.0,99.0)	98.6 (98.3,98.8)	98.0 (97.7,98.3)	97.5 (96.9,98.0)	98.2 (98.1,98.4)
No referable	35.8 (35.4,36.2)	48.1 (47.5,48.6)	39.7 (39.4,40.1)	40.0 (39.3,40.6)	44.6 (43.0,46.2)	32.4 (31.7,33.1)	32.9 (32.6,33.3)	40.6 (40.2,41.0)	56.2 (55.6,56.8)	39.8 (39.6,40.1)

Table S10: Vendor B ARIAS test positive rates by sex and quintiles of IMD

Final human grade in worst eye	ARIAS test positive % for Vendor B (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	24.8 (24.5,25.2)	28.0 (27.6,28.3)	27.7 (27.3,28.1)	26.2 (25.7,26.8)	26.2 (25.6,26.8)	25.4 (24.7,26.2)	24.9 (24.4,25.4)	22.1 (19.2,25.3)	26.4 (26.1,26.6)
R1M0	84.7 (84.2,85.2)	84.1 (83.6,84.7)	85.2 (84.6,85.8)	85.1 (84.2,85.9)	85.1 (84.2,86.0)	83.6 (82.4,84.6)	82.3 (81.4,83.1)	88.0 (83.1,91.9)	84.5 (84.1,84.8)
R1M1	97.9 (97.6,98.2)	97.6 (97.3,98.0)	97.8 (97.5,98.2)	98.0 (97.5,98.5)	97.5 (96.9,98.1)	97.7 (97.0,98.3)	97.6 (97.0,98.1)	98.1 (93.2,99.8)	97.8 (97.6,98.0)
R2	99.8 (99.5,99.9)	99.9 (99.5,100.0)	99.8 (99.4,100.0)	99.8 (99.1,100.0)	99.7 (98.8,100.0)	99.8 (98.7,100.0)	100.0 (99.5,100.0)	100.0 (83.9,100.0)	99.8 (99.6,99.9)
<i>R2M0</i>	99.1 (98.0,99.7)	99.7 (98.4,100.0)	99.4 (98.0,99.9)	99.0 (96.5,99.9)	98.6 (95.1,99.8)	99.1 (95.3,100.0)	100.0 (98.0,100.0)	100.0 (39.8,100.0)	99.3 (98.6,99.7)
<i>R2M1</i>	100.0 (99.8,100.0)	99.9 (99.5,100.0)	99.9 (99.4,100.0)	100.0 (99.4,100.0)	100.0 (99.2,100.0)	100.0 (98.8,100.0)	100.0 (99.3,100.0)	100.0 (80.5,100.0)	100.0 (99.8,100.0)
R3	99.4 (98.7,99.7)	99.5 (98.6,99.9)	99.4 (98.6,99.8)	99.5 (98.0,99.9)	99.6 (98.0,100.0)	99.6 (97.8,100.0)	98.9 (97.2,99.7)	100.0 (76.8,100.0)	99.4 (98.9,99.7)
<i>R3M0</i>	98.3 (96.8,99.3)	98.8 (97.0,99.7)	98.6 (96.4,99.6)	98.7 (95.2,99.8)	99.2 (95.4,100.0)	99.0 (94.7,100.0)	97.7 (94.2,99.4)	100.0 (47.8,100.0)	98.5 (97.5,99.2)
<i>R3M1</i>	100.0 (99.5,100.0)	100.0 (99.1,100.0)	100.0 (99.1,100.0)	100.0 (98.3,100.0)	100.0 (97.8,100.0)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	100.0 (99.7,100.0)
U	95.6 (94.7,96.3)	96.2 (95.4,96.9)	97.1 (96.3,97.8)	97.4 (96.1,98.3)	96.3 (94.7,97.5)	95.3 (93.3,96.9)	92.8 (91.3,94.2)	100.0 (90.3,100.0)	95.9 (95.3,96.4)
Combination grades*									
Any DR	90.4 (90.1,90.7)	90.0 (89.6,90.3)	90.7 (90.4,91.1)	90.8 (90.3,91.3)	90.6 (90.0,91.1)	89.6 (88.9,90.3)	88.6 (88.0,89.1)	92.6 (89.6,95.0)	90.2 (90.0,90.4)
Any DR (excluding U)	90.0 (89.7,90.3)	89.3 (89.0,89.7)	90.2 (89.8,90.6)	90.3 (89.8,90.8)	90.1 (89.5,90.7)	89.1 (88.4,89.9)	88.1 (87.5,88.7)	91.9 (88.7,94.5)	89.7 (89.5,89.9)
Referable DR	97.9 (97.7,98.1)	97.7 (97.4,97.9)	98.0 (97.8,98.3)	98.3 (97.9,98.6)	97.7 (97.3,98.2)	97.7 (97.1,98.2)	96.9 (96.4,97.3)	98.9 (95.9,99.9)	97.8 (97.6,98.0)
Referable DR (excluding U)	98.4 (98.1,98.6)	98.1 (97.8,98.3)	98.3 (98.0,98.5)	98.5 (98.0,98.8)	98.1 (97.6,98.5)	98.2 (97.6,98.7)	98.1 (97.6,98.5)	98.6 (94.9,99.8)	98.2 (98.1,98.4)
No referable DR	39.6 (39.3,40.0)	40.0 (39.7,40.4)	41.2 (40.8,41.6)	40.1 (39.5,40.6)	39.8 (39.2,40.4)	39.1 (38.4,39.8)	37.5 (37.0,38.0)	37.8 (34.8,41.0)	39.8 (39.6,40.1)

Table S11: Vendor C ARIAS test positive rates by subgroups of ethnicity and age

Final human grade in worst eye	ARIAS test positive % for Vendor C (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	54.2 (53.7,54.7)	46.6 (45.9,47.2)	49.8 (49.4,50.2)	48.5 (47.7,49.2)	34.7 (32.9,36.5)	41.7 (40.9,42.5)	47.0 (46.5,47.5)	52.7 (52.3,53.2)	61.0 (60.4,61.7)	50.6 (50.3,50.8)
R1M0	92.1 (91.6,92.6)	89.6 (88.9,90.3)	92.8 (92.4,93.2)	91.5 (90.6,92.2)	87.5 (85.2,89.6)	93.6 (92.8,94.3)	93.6 (93.2,94.1)	90.9 (90.5,91.4)	90.0 (89.3,90.7)	91.9 (91.6,92.2)
R1M1	95.6 (94.9,96.2)	93.0 (92.2,93.8)	95.2 (94.7,95.7)	94.7 (93.7,95.6)	96.4 (93.8,98.1)	96.1 (95.1,96.9)	95.9 (95.4,96.3)	94.0 (93.4,94.6)	92.7 (91.7,93.7)	94.8 (94.5,95.1)
R2	99.6 (99.1,99.9)	99.0 (97.9,99.6)	99.8 (99.4,100.0)	100.0 (99.3,100.0)	98.9 (94.2,100.0)	99.8 (99.0,100.0)	99.9 (99.6,100.0)	99.5 (99.0,99.8)	98.7 (96.8,99.7)	99.6 (99.4,99.8)
<i>R2M0</i>	99.3 (97.6,99.9)	97.5 (93.8,99.3)	99.3 (97.8,99.8)	100.0 (97.4,100.0)	100.0 (88.8,100.0)	99.3 (95.9,100.0)	99.5 (98.2,99.9)	98.6 (96.7,99.5)	98.9 (94.3,100.0)	99.1 (98.3,99.6)
<i>R2M1</i>	99.7 (99.1,100.0)	99.4 (98.3,99.9)	100.0 (99.7,100.0)	100.0 (99.1,100.0)	98.4 (91.5,100.0)	100.0 (99.1,100.0)	100.0 (99.7,100.0)	99.9 (99.4,100.0)	98.6 (96.1,99.7)	99.8 (99.6,99.9)
R3	96.6 (94.9,97.8)	97.9 (95.8,99.1)	98.4 (97.1,99.2)	96.9 (93.9,98.6)	100.0 (93.0,100.0)	98.5 (96.1,99.6)	97.9 (96.4,98.8)	96.8 (95.2,97.9)	97.1 (94.3,98.7)	97.5 (96.7,98.1)
<i>R3M0</i>	94.5 (91.5,96.6)	95.5 (90.4,98.3)	96.1 (92.9,98.1)	92.7 (85.6,97.0)	100.0 (78.2,100.0)	95.3 (88.5,98.7)	95.0 (91.2,97.5)	94.0 (90.9,96.3)	95.9 (91.8,98.3)	94.9 (93.2,96.3)
<i>R3M1</i>	98.8 (97.0,99.7)	99.2 (97.0,99.9)	99.8 (98.7,100.0)	99.4 (96.5,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	99.3 (98.0,99.9)	99.0 (97.5,99.7)	99.0 (94.6,100.0)	99.3 (98.6,99.7)
U	78.0 (76.1,79.7)	78.0 (75.5,80.3)	76.9 (74.9,78.9)	72.3 (68.6,75.8)	83.3 (68.6,93.0)	70.1 (61.6,77.7)	71.6 (68.3,74.7)	75.4 (73.6,77.1)	80.8 (79.1,82.3)	77.0 (75.9,78.1)
Combination grades*										
Any DR	92.0 (91.6,92.3)	90.3 (89.8,90.8)	93.0 (92.7,93.3)	91.6 (91.0,92.2)	90.7 (89.1,92.1)	94.5 (93.9,95.0)	94.1 (93.8,94.4)	91.0 (90.6,91.3)	89.2 (88.7,89.8)	92.1 (91.8,92.3)
Any DR (excluding U)	93.5 (93.2,93.9)	91.6 (91.1,92.1)	94.1 (93.8,94.4)	93.1 (92.6,93.7)	90.9 (89.3,92.4)	95.0 (94.4,95.5)	94.9 (94.6,95.2)	92.5 (92.2,92.9)	91.2 (90.6,91.7)	93.4 (93.2,93.6)
Referable DR	91.7 (91.1,92.3)	91.1 (90.4,91.8)	93.3 (92.9,93.7)	91.8 (90.8,92.7)	96.2 (94.1,97.6)	95.8 (95.0,96.5)	94.7 (94.3,95.1)	91.0 (90.5,91.5)	88.3 (87.4,89.1)	92.3 (92.0,92.6)
Referable DR (excluding U)	96.4 (95.9,96.9)	94.2 (93.5,94.9)	96.1 (95.7,96.5)	95.8 (95.0,96.5)	97.3 (95.4,98.6)	97.1 (96.4,97.7)	96.7 (96.4,97.1)	95.0 (94.6,95.5)	93.7 (92.8,94.5)	95.8 (95.5,96.0)
No Referable DR	62.4 (62.0,62.8)	56.7 (56.1,57.2)	60.3 (59.9,60.7)	58.2 (57.6,58.9)	47.6 (46.0,49.3)	53.2 (52.5,53.9)	57.9 (57.5,58.3)	61.4 (61.0,61.8)	68.1 (67.6,68.6)	60.1 (59.9,60.4)

Table S12: Vendor C ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor C (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	50.9 (50.5,51.3)	50.2 (49.8,50.6)	48.5 (48.0,48.9)	47.4 (46.8,48.1)	50.9 (50.2,51.6)	52.2 (51.3,53.0)	56.2 (55.6,56.8)	45.8 (42.2,49.4)	50.6 (50.3,50.8)
R1M0	92.4 (92.0,92.7)	91.3 (90.8,91.7)	92.1 (91.6,92.5)	91.5 (90.8,92.1)	91.8 (91.0,92.5)	92.9 (92.1,93.6)	91.4 (90.7,92.0)	92.7 (88.6,95.7)	91.9 (91.6,92.2)
R1M1	95.3 (94.9,95.7)	94.1 (93.5,94.6)	95.3 (94.8,95.8)	94.8 (94.0,95.5)	93.9 (92.9,94.8)	93.9 (92.8,94.9)	94.9 (94.1,95.6)	97.1 (91.7,99.4)	94.8 (94.5,95.1)
R2	99.7 (99.4,99.9)	99.5 (99.0,99.8)	99.5 (98.9,99.8)	99.6 (98.9,99.9)	99.7 (98.8,100.0)	99.8 (98.7,100.0)	99.9 (99.2,100.0)	100.0 (83.9,100.0)	99.6 (99.4,99.8)
<i>R2M0</i>	99.1 (98.0,99.7)	99.1 (97.5,99.8)	98.6 (96.7,99.5)	99.0 (96.5,99.9)	98.6 (95.1,99.8)	100.0 (96.8,100.0)	100.0 (98.0,100.0)	100.0 (39.8,100.0)	99.1 (98.3,99.6)
<i>R2M1</i>	99.9 (99.7,100.0)	99.6 (99.0,99.9)	99.8 (99.3,100.0)	99.8 (99.1,100.0)	100.0 (99.2,100.0)	99.7 (98.2,100.0)	99.8 (98.9,100.0)	100.0 (80.5,100.0)	99.8 (99.6,99.9)
R3	97.9 (96.9,98.6)	96.8 (95.2,97.9)	97.4 (96.0,98.5)	97.3 (95.0,98.7)	98.6 (96.4,99.6)	97.2 (94.2,98.9)	97.0 (94.6,98.5)	100.0 (76.8,100.0)	97.5 (96.7,98.1)
<i>R3M0</i>	95.4 (93.2,97.1)	94.2 (91.2,96.4)	94.6 (91.3,96.9)	93.3 (88.0,96.7)	97.5 (92.8,99.5)	95.1 (88.9,98.4)	94.8 (90.4,97.6)	100.0 (47.8,100.0)	94.9 (93.2,96.3)
<i>R3M1</i>	99.5 (98.6,99.9)	99.0 (97.4,99.7)	99.3 (98.0,99.9)	100.0 (98.3,100.0)	99.4 (96.6,100.0)	98.6 (95.1,99.8)	98.9 (96.2,99.9)	100.0 (66.4,100.0)	99.3 (98.6,99.7)
U	74.6 (72.9,76.2)	79.2 (77.7,80.7)	76.3 (74.3,78.1)	77.1 (74.2,79.8)	78.7 (75.7,81.5)	76.9 (73.3,80.2)	76.8 (74.4,79.1)	83.3 (67.2,93.6)	77.0 (75.9,78.1)
Combination grades*									
Any DR	92.6 (92.3,92.8)	91.4 (91.1,91.7)	92.3 (91.9,92.6)	92.0 (91.5,92.5)	91.9 (91.4,92.5)	92.4 (91.8,93.0)	91.4 (90.9,91.9)	93.6 (90.8,95.8)	92.1 (91.8,92.3)
Any DR (excluding U)	93.9 (93.7,94.2)	92.6 (92.3,92.9)	93.6 (93.3,93.9)	93.2 (92.7,93.6)	93.1 (92.6,93.6)	93.7 (93.2,94.3)	93.0 (92.5,93.5)	94.6 (91.8,96.7)	93.4 (93.2,93.6)
Referable DR	92.8 (92.4,93.2)	91.5 (91.0,92.0)	92.5 (92.0,93.0)	92.7 (92.0,93.4)	92.2 (91.3,92.9)	91.9 (90.9,92.8)	91.5 (90.8,92.3)	94.8 (90.4,97.6)	92.3 (92.0,92.6)
Referable DR (excluding U)	96.3 (96.0,96.7)	95.0 (94.5,95.4)	96.1 (95.7,96.5)	95.8 (95.2,96.4)	95.2 (94.5,95.9)	95.1 (94.3,95.9)	95.8 (95.2,96.4)	97.8 (93.8,99.5)	95.8 (95.5,96.0)
No referable DR	61.2 (60.8,61.5)	59.0 (58.7,59.4)	58.7 (58.3,59.1)	57.8 (57.2,58.4)	60.3 (59.7,60.9)	61.7 (61.0,62.4)	63.9 (63.4,64.4)	57.0 (53.8,60.1)	60.1 (59.9,60.4)

Table S13: Vendor D ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor D (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	2.6 (2.5,2.8)	6.5 (6.2,6.9)	4.7 (4.5,4.9)	5.0 (4.7,5.3)	5.3 (4.5,6.2)	2.6 (2.3,2.8)	2.9 (2.8,3.1)	4.6 (4.4,4.7)	7.7 (7.4,8.1)	4.3 (4.2,4.4)
R1M0	36.7 (35.9,37.6)	48.3 (47.1,49.5)	47.1 (46.4,47.9)	47.0 (45.5,48.4)	42.6 (39.3,45.9)	42.5 (41.0,44.0)	43.1 (42.3,44.0)	45.0 (44.2,45.8)	45.3 (44.2,46.5)	44.1 (43.6,44.6)
R1M1	76.3 (75.0,77.6)	80.3 (79.0,81.5)	80.8 (79.9,81.7)	82.6 (81.0,84.2)	86.6 (82.4,90.0)	84.1 (82.4,85.7)	82.7 (81.8,83.6)	78.7 (77.7,79.7)	71.8 (70.0,73.5)	79.9 (79.3,80.5)
R2	98.3 (97.4,99.0)	97.6 (96.2,98.6)	98.8 (98.1,99.3)	98.5 (97.0,99.3)	97.9 (92.5,99.7)	99.1 (97.8,99.7)	98.7 (98.0,99.2)	98.0 (97.1,98.7)	97.8 (95.5,99.1)	98.4 (98.0,98.8)
<i>R2M0</i>	95.0 (91.9,97.2)	92.5 (87.3,96.1)	95.8 (93.3,97.5)	96.4 (91.8,98.8)	93.5 (78.6,99.2)	96.3 (91.6,98.8)	95.2 (92.6,97.1)	94.5 (91.5,96.7)	95.8 (89.6,98.8)	95.1 (93.6,96.3)
<i>R2M1</i>	99.6 (98.9,99.9)	99.2 (98.0,99.8)	99.8 (99.4,100.0)	99.2 (97.8,99.8)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	99.8 (99.4,100.0)	99.3 (98.5,99.7)	98.6 (96.1,99.7)	99.6 (99.3,99.8)
R3	95.9 (94.1,97.2)	97.9 (95.8,99.1)	97.3 (95.8,98.4)	96.5 (93.4,98.4)	100.0 (93.0,100.0)	98.9 (96.7,99.8)	97.9 (96.4,98.8)	96.2 (94.6,97.5)	93.4 (89.7,96.0)	96.8 (95.9,97.5)
<i>R3M0</i>	93.3 (90.1,95.7)	93.9 (88.4,97.3)	93.3 (89.5,96.1)	90.6 (82.9,95.6)	100.0 (78.2,100.0)	96.5 (90.1,99.3)	94.1 (90.1,96.8)	92.5 (89.1,95.1)	90.7 (85.3,94.6)	93.1 (91.2,94.7)
<i>R3M1</i>	98.5 (96.5,99.5)	100.0 (98.5,100.0)	99.8 (98.7,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	99.8 (98.7,100.0)	99.3 (97.9,99.8)	98.0 (93.0,99.8)	99.5 (98.9,99.8)
U	30.5 (28.5,32.6)	43.0 (40.2,46.0)	38.6 (36.4,40.9)	35.3 (31.5,39.1)	54.8 (38.7,70.2)	44.8 (36.2,53.6)	37.4 (34.1,40.9)	35.6 (33.7,37.6)	35.6 (33.7,37.6)	36.2 (35.0,37.5)
Combination grades*										
Any DR	49.7 (49.0,50.4)	61.7 (60.8,62.5)	60.5 (59.9,61.0)	60.2 (59.2,61.3)	58.9 (56.3,61.5)	60.3 (59.1,61.4)	60.0 (59.4,60.6)	57.5 (56.9,58.1)	51.4 (50.5,52.3)	57.6 (57.2,57.9)
Any DR (excluding U)	51.8 (51.1,52.6)	63.6 (62.7,64.5)	61.9 (61.4,62.5)	62.2 (61.1,63.3)	59.0 (56.4,61.7)	60.6 (59.4,61.7)	60.8 (60.2,61.5)	59.7 (59.0,60.3)	55.0 (54.0,56.0)	59.4 (59.0,59.8)
Referable DR	69.3 (68.3,70.3)	76.2 (75.1,77.2)	77.9 (77.1,78.6)	77.8 (76.4,79.1)	87.4 (84.2,90.1)	86.4 (85.1,87.6)	82.7 (82.0,83.5)	73.2 (72.4,74.0)	59.1 (57.8,60.4)	75.2 (74.8,75.7)
Referable DR (excluding U)	82.5 (81.6,83.5)	84.0 (82.9,85.0)	84.6 (83.9,85.2)	86.6 (85.3,87.8)	90.2 (87.2,92.7)	88.5 (87.2,89.6)	86.7 (86.0,87.4)	82.9 (82.1,83.7)	76.2 (74.7,77.7)	84.2 (83.7,84.7)
No referable DR	10.0 (9.7,10.2)	16.3 (15.9,16.7)	15.1 (14.8,15.4)	14.5 (14.0,15.0)	14.4 (13.3,15.6)	11.4 (11.0,11.9)	12.3 (12.1,12.6)	13.7 (13.5,14.0)	16.9 (16.5,17.3)	13.5 (13.4,13.7)

Table S14: Vendor D ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor D (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	4.1 (3.9,4.2)	4.6 (4.5,4.8)	4.7 (4.5,4.9)	4.1 (3.9,4.4)	4.4 (4.2,4.7)	4.3 (4.0,4.7)	3.8 (3.6,4.0)	3.6 (2.4,5.2)	4.3 (4.2,4.4)
R1M0	43.7 (43.0,44.3)	44.7 (44.0,45.5)	45.5 (44.7,46.3)	45.3 (44.1,46.4)	45.3 (44.0,46.6)	43.7 (42.2,45.1)	39.8 (38.7,40.9)	42.5 (36.1,49.1)	44.1 (43.6,44.6)
R1M1	80.4 (79.6,81.1)	79.3 (78.4,80.2)	81.3 (80.4,82.2)	81.7 (80.3,82.9)	78.6 (77.0,80.2)	78.8 (76.9,80.5)	76.7 (75.3,78.2)	82.5 (73.8,89.3)	79.9 (79.3,80.5)
R2	98.6 (98.1,99.1)	98.0 (97.2,98.7)	97.9 (96.9,98.6)	99.0 (98.0,99.6)	98.7 (97.4,99.4)	98.8 (97.3,99.6)	98.4 (97.1,99.2)	100.0 (83.9,100.0)	98.4 (98.0,98.8)
<i>R2M0</i>	95.7 (93.8,97.1)	94.0 (91.0,96.3)	92.9 (89.6,95.3)	96.6 (93.0,98.6)	95.2 (90.4,98.1)	97.4 (92.6,99.5)	96.1 (92.2,98.4)	100.0 (39.8,100.0)	95.1 (93.6,96.3)
<i>R2M1</i>	99.7 (99.3,99.9)	99.4 (98.7,99.8)	99.6 (99.0,99.9)	99.8 (99.1,100.0)	99.8 (98.8,100.0)	99.4 (97.7,99.9)	99.2 (97.9,99.8)	100.0 (80.5,100.0)	99.6 (99.3,99.8)
R3	96.8 (95.6,97.7)	96.9 (95.4,98.0)	97.2 (95.7,98.3)	95.4 (92.7,97.3)	98.2 (95.9,99.4)	98.8 (96.5,99.7)	95.0 (92.3,97.0)	100.0 (76.8,100.0)	96.8 (95.9,97.5)
<i>R3M0</i>	92.3 (89.6,94.5)	94.2 (91.2,96.4)	93.2 (89.5,95.8)	89.3 (83.1,93.7)	96.6 (91.6,99.1)	97.1 (91.6,99.4)	91.3 (86.1,95.1)	100.0 (47.8,100.0)	93.1 (91.2,94.7)
<i>R3M1</i>	99.6 (98.8,99.9)	99.2 (97.8,99.8)	99.8 (98.7,100.0)	99.5 (97.5,100.0)	99.4 (96.6,100.0)	100.0 (97.5,100.0)	98.4 (95.4,99.7)	100.0 (66.4,100.0)	99.5 (98.9,99.8)
U	34.6 (32.8,36.5)	37.7 (36.0,39.5)	39.8 (37.7,42.0)	35.8 (32.7,39.0)	35.5 (32.2,38.9)	39.4 (35.4,43.4)	29.4 (26.9,32.0)	52.8 (35.5,69.6)	36.2 (35.0,37.5)
Combination grades*									
Any DR	58.0 (57.5,58.5)	57.0 (56.4,57.5)	59.0 (58.4,59.6)	59.3 (58.4,60.1)	58.0 (57.0,59.0)	57.4 (56.3,58.5)	52.7 (51.9,53.6)	58.5 (53.5,63.3)	57.6 (57.2,57.9)
Any DR (excluding U)	59.7 (59.2,60.3)	59.0 (58.4,59.6)	60.6 (60.0,61.2)	61.1 (60.2,62.0)	60.0 (58.9,61.0)	59.0 (57.8,60.1)	55.2 (54.3,56.1)	59.0 (53.8,64.1)	59.4 (59.0,59.8)
Referable DR	76.9 (76.3,77.6)	73.1 (72.3,73.8)	76.9 (76.1,77.7)	77.5 (76.4,78.6)	74.6 (73.3,75.9)	75.7 (74.3,77.2)	69.8 (68.6,71.0)	79.9 (73.2,85.6)	75.2 (74.8,75.7)
Referable DR (excluding U)	85.1 (84.5,85.7)	83.0 (82.3,83.7)	85.0 (84.2,85.7)	85.8 (84.7,86.8)	83.6 (82.3,84.8)	83.7 (82.2,85.0)	81.6 (80.4,82.7)	87.0 (80.2,92.1)	84.2 (83.7,84.7)
No referable DR	13.8 (13.6,14.1)	13.2 (13.0,13.5)	14.3 (14.0,14.6)	13.8 (13.4,14.2)	13.9 (13.4,14.3)	13.6 (13.1,14.1)	11.7 (11.4,12.0)	12.9 (10.8,15.1)	13.5 (13.4,13.7)

Table S15: Vendor E ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor E (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	63.2 (62.8,63.7)	61.3 (60.6,61.9)	60.0 (59.6,60.4)	60.7 (59.9,61.4)	78.8 (77.3,80.3)	57.9 (57.1,58.7)	56.4 (55.9,56.8)	61.5 (61.0,61.9)	71.3 (70.7,71.9)	61.4 (61.1,61.6)
R1M0	96.9 (96.6,97.2)	95.6 (95.1,96.1)	96.6 (96.3,96.8)	96.9 (96.4,97.4)	97.9 (96.7,98.7)	96.0 (95.3,96.6)	96.7 (96.4,97.0)	96.3 (96.0,96.6)	96.9 (96.4,97.3)	96.6 (96.4,96.7)
R1M1	98.9 (98.5,99.2)	97.7 (97.2,98.2)	98.3 (98.0,98.5)	98.6 (98.0,99.0)	99.7 (98.3,100.0)	98.7 (98.0,99.1)	98.6 (98.3,98.9)	98.2 (97.9,98.5)	97.5 (96.8,98.0)	98.3 (98.1,98.5)
R2	99.8 (99.3,100.0)	99.7 (98.9,100.0)	99.9 (99.5,100.0)	100.0 (99.3,100.0)	100.0 (96.2,100.0)	100.0 (99.3,100.0)	99.8 (99.5,100.0)	99.8 (99.3,100.0)	100.0 (98.8,100.0)	99.8 (99.7,99.9)
<i>R2M0</i>	99.7 (98.2,100.0)	98.8 (95.6,99.8)	99.5 (98.2,99.9)	100.0 (97.4,100.0)	100.0 (88.8,100.0)	100.0 (97.3,100.0)	99.2 (97.8,99.8)	99.4 (97.9,99.9)	100.0 (96.2,100.0)	99.5 (98.8,99.8)
<i>R2M1</i>	99.9 (99.3,100.0)	100.0 (99.3,100.0)	100.0 (99.7,100.0)	100.0 (99.1,100.0)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	100.0 (99.7,100.0)	99.9 (99.4,100.0)	100.0 (98.4,100.0)	100.0 (99.8,100.0)
R3	99.4 (98.5,99.8)	100.0 (99.0,100.0)	99.6 (98.7,99.9)	99.2 (97.2,99.9)	100.0 (93.0,100.0)	99.2 (97.3,99.9)	99.8 (99.1,100.0)	99.5 (98.6,99.9)	99.3 (97.4,99.9)	99.5 (99.1,99.8)
<i>R3M0</i>	98.8 (97.0,99.7)	100.0 (97.2,100.0)	98.8 (96.6,99.8)	97.9 (92.7,99.7)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	99.5 (97.5,100.0)	98.8 (97.0,99.7)	98.8 (95.9,99.9)	98.9 (97.9,99.5)
<i>R3M1</i>	100.0 (98.9,100.0)	100.0 (98.5,100.0)	100.0 (99.1,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	100.0 (99.2,100.0)	100.0 (99.1,100.0)	100.0 (96.4,100.0)	100.0 (99.7,100.0)
U	84.3 (82.6,85.9)	81.4 (79.1,83.6)	84.9 (83.2,86.5)	82.9 (79.7,85.7)	85.7 (71.5,94.6)	88.1 (81.3,93.0)	84.4 (81.7,86.9)	81.1 (79.5,82.7)	85.8 (84.4,87.2)	83.7 (82.8,84.7)
Combination grades*										
Any DR	96.3 (96.0,96.6)	95.3 (94.9,95.7)	96.6 (96.4,96.8)	96.6 (96.2,97.0)	98.2 (97.3,98.8)	97.0 (96.6,97.4)	97.2 (96.9,97.4)	95.7 (95.5,96.0)	95.1 (94.7,95.4)	96.3 (96.1,96.4)
Any DR (excluding U)	97.7 (97.4,97.9)	96.7 (96.4,97.0)	97.4 (97.2,97.5)	97.7 (97.3,98.0)	98.6 (97.8,99.1)	97.2 (96.7,97.5)	97.6 (97.4,97.8)	97.2 (97.0,97.4)	97.2 (96.8,97.5)	97.4 (97.2,97.5)
Referable DR	95.4 (94.9,95.8)	95.0 (94.4,95.5)	96.6 (96.3,96.9)	96.1 (95.5,96.7)	98.7 (97.3,99.5)	98.5 (97.9,98.9)	97.7 (97.4,98.0)	95.0 (94.6,95.4)	92.8 (92.1,93.5)	95.9 (95.7,96.1)
Referable DR (excluding U)	99.1 (98.9,99.3)	98.2 (97.8,98.5)	98.6 (98.3,98.8)	98.9 (98.4,99.2)	99.8 (98.8,100.0)	99.0 (98.5,99.3)	98.9 (98.7,99.1)	98.6 (98.3,98.8)	97.9 (97.3,98.3)	98.7 (98.5,98.8)
No referable DR	70.5 (70.1,70.9)	69.3 (68.8,69.9)	68.9 (68.6,69.3)	68.9 (68.3,69.5)	83.5 (82.3,84.7)	66.3 (65.7,67.0)	65.8 (65.4,66.2)	69.4 (69.0,69.7)	77.5 (77.0,78.0)	69.5 (69.3,69.7)

Table S16: Vendor E ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor E (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	61.6 (61.2,61.9)	61.1 (60.8,61.5)	60.1 (59.7,60.5)	60.2 (59.5,60.8)	61.5 (60.8,62.2)	63.0 (62.2,63.8)	63.7 (63.2,64.3)	60.3 (56.7,63.8)	61.4 (61.1,61.6)
R1M0	96.8 (96.6,97.0)	96.3 (96.0,96.5)	96.6 (96.3,96.9)	96.6 (96.1,97.0)	96.5 (96.0,97.0)	96.5 (95.9,97.0)	96.5 (96.1,97.0)	97.9 (95.1,99.3)	96.6 (96.4,96.7)
R1M1	98.5 (98.2,98.7)	98.1 (97.8,98.4)	98.4 (98.1,98.7)	98.3 (97.8,98.7)	97.8 (97.2,98.4)	98.5 (97.8,98.9)	98.4 (98.0,98.8)	99.0 (94.7,100.0)	98.3 (98.1,98.5)
R2	99.9 (99.7,100.0)	99.7 (99.3,99.9)	99.9 (99.5,100.0)	99.8 (99.1,100.0)	100.0 (99.4,100.0)	99.8 (98.7,100.0)	99.9 (99.2,100.0)	100.0 (83.9,100.0)	99.8 (99.7,99.9)
<i>R2M0</i>	99.7 (98.9,100.0)	99.1 (97.5,99.8)	99.4 (98.0,99.9)	99.0 (96.5,99.9)	100.0 (97.5,100.0)	99.1 (95.3,100.0)	100.0 (98.0,100.0)	100.0 (39.8,100.0)	99.5 (98.8,99.8)
<i>R2M1</i>	100.0 (99.8,100.0)	99.9 (99.5,100.0)	100.0 (99.6,100.0)	100.0 (99.4,100.0)	100.0 (99.2,100.0)	100.0 (98.8,100.0)	99.8 (98.9,100.0)	100.0 (80.5,100.0)	100.0 (99.8,100.0)
R3	99.6 (99.1,99.9)	99.5 (98.6,99.9)	99.6 (98.8,99.9)	99.2 (97.6,99.8)	99.6 (98.0,100.0)	100.0 (98.5,100.0)	99.4 (98.0,99.9)	100.0 (76.8,100.0)	99.5 (99.1,99.8)
<i>R3M0</i>	99.0 (97.6,99.7)	98.8 (97.0,99.7)	98.9 (96.9,99.8)	98.0 (94.2,99.6)	99.2 (95.4,100.0)	100.0 (96.4,100.0)	98.8 (95.9,99.9)	100.0 (47.8,100.0)	98.9 (97.9,99.5)
<i>R3M1</i>	100.0 (99.5,100.0)	100.0 (99.1,100.0)	100.0 (99.1,100.0)	100.0 (98.3,100.0)	100.0 (97.8,100.0)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	100.0 (99.7,100.0)
U	83.4 (82.0,84.8)	84.0 (82.6,85.3)	84.0 (82.3,85.5)	85.4 (83.0,87.7)	84.4 (81.7,86.8)	83.6 (80.3,86.4)	81.7 (79.5,83.8)	88.9 (73.9,96.9)	83.7 (82.8,84.7)
Combination grades*									
Any DR	96.6 (96.4,96.8)	95.8 (95.6,96.1)	96.4 (96.1,96.6)	96.5 (96.2,96.8)	96.2 (95.8,96.6)	96.3 (95.8,96.7)	95.8 (95.5,96.2)	97.5 (95.5,98.8)	96.3 (96.1,96.4)
Any DR (excluding U)	97.6 (97.4,97.7)	97.1 (96.9,97.3)	97.4 (97.2,97.6)	97.4 (97.1,97.6)	97.2 (96.9,97.6)	97.4 (97.0,97.7)	97.4 (97.1,97.6)	98.4 (96.5,99.4)	97.4 (97.2,97.5)
Referable DR	96.4 (96.1,96.6)	95.3 (94.9,95.6)	96.1 (95.7,96.4)	96.4 (95.9,96.9)	95.8 (95.1,96.3)	96.1 (95.4,96.7)	94.9 (94.3,95.5)	97.1 (93.4,99.1)	95.9 (95.7,96.1)
Referable DR (excluding U)	98.8 (98.7,99.0)	98.4 (98.2,98.7)	98.7 (98.5,99.0)	98.6 (98.2,98.9)	98.4 (97.9,98.7)	98.8 (98.3,99.2)	98.7 (98.4,99.0)	99.3 (96.0,100.0)	98.7 (98.5,98.8)
No referable DR	70.3 (70.0,70.6)	68.7 (68.4,69.0)	68.7 (68.3,69.1)	68.7 (68.2,69.2)	69.6 (69.0,70.1)	70.9 (70.2,71.5)	70.9 (70.5,71.4)	69.2 (66.2,72.1)	69.5 (69.3,69.7)

Table S17: Vendor F ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor F (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	13.5 (13.2,13.9)	15.8 (15.3,16.3)	12.0 (11.7,12.3)	12.4 (11.9,12.9)	9.8 (8.7,10.9)	6.7 (6.3,7.1)	8.2 (7.9,8.4)	14.2 (13.9,14.6)	25.7 (25.1,26.3)	13.2 (13.0,13.4)
R1M0	67.3 (66.4,68.1)	62.4 (61.3,63.6)	67.3 (66.6,68.0)	66.1 (64.8,67.4)	68.7 (65.6,71.7)	67.7 (66.2,69.1)	65.5 (64.6,66.3)	66.3 (65.6,67.1)	66.9 (65.8,68.0)	66.3 (65.9,66.8)
R1M1	90.0 (89.0,90.9)	85.0 (83.9,86.1)	86.8 (86.1,87.5)	87.9 (86.5,89.2)	96.4 (93.8,98.1)	90.0 (88.6,91.3)	89.0 (88.3,89.8)	86.1 (85.2,86.9)	82.8 (81.2,84.2)	87.3 (86.8,87.8)
R2	99.3 (98.6,99.7)	96.4 (94.8,97.7)	98.9 (98.2,99.3)	98.5 (97.0,99.3)	98.9 (94.2,100.0)	99.4 (98.4,99.9)	98.7 (98.0,99.2)	97.9 (97.0,98.6)	98.1 (95.9,99.3)	98.5 (98.1,98.9)
<i>R2M0</i>	98.0 (95.7,99.3)	91.9 (86.6,95.6)	96.5 (94.2,98.1)	95.7 (90.8,98.4)	96.8 (83.3,99.9)	97.8 (93.6,99.5)	96.4 (94.1,98.0)	94.5 (91.5,96.7)	97.9 (92.6,99.7)	96.1 (94.7,97.2)
<i>R2M1</i>	99.7 (99.1,100.0)	97.9 (96.2,98.9)	99.7 (99.1,99.9)	99.5 (98.1,99.9)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	99.4 (98.8,99.8)	99.2 (98.4,99.6)	98.2 (95.5,99.5)	99.3 (99.0,99.6)
R3	95.9 (94.1,97.2)	95.5 (92.8,97.3)	96.7 (95.1,97.9)	93.7 (90.0,96.4)	100.0 (93.0,100.0)	98.1 (95.6,99.4)	97.5 (96.1,98.6)	94.2 (92.3,95.8)	93.0 (89.3,95.7)	95.8 (94.8,96.6)
<i>R3M0</i>	93.3 (90.1,95.7)	91.7 (85.6,95.8)	93.7 (90.0,96.4)	87.5 (79.2,93.4)	100.0 (78.2,100.0)	96.5 (90.1,99.3)	93.6 (89.5,96.5)	90.7 (87.1,93.6)	91.9 (86.7,95.5)	92.5 (90.5,94.2)
<i>R3M1</i>	98.5 (96.5,99.5)	97.5 (94.7,99.1)	98.6 (96.9,99.5)	97.5 (93.7,99.3)	100.0 (90.3,100.0)	98.9 (96.0,99.9)	99.5 (98.3,99.9)	97.0 (94.9,98.5)	95.0 (88.7,98.4)	98.2 (97.2,98.9)
U	54.1 (51.9,56.3)	60.8 (58.0,63.7)	56.2 (53.8,58.5)	53.0 (49.0,57.0)	69.0 (52.9,82.4)	56.7 (47.9,65.2)	53.6 (50.1,57.2)	53.4 (51.3,55.4)	59.3 (57.2,61.3)	56.0 (54.7,57.4)
Combination grades*										
Any DR	73.4 (72.8,74.0)	72.0 (71.2,72.8)	74.7 (74.2,75.2)	73.8 (72.8,74.7)	78.3 (76.1,80.4)	77.1 (76.1,78.1)	75.2 (74.7,75.8)	72.9 (72.4,73.5)	70.1 (69.3,70.9)	73.7 (73.4,74.1)
Any DR (excluding U)	75.5 (74.9,76.2)	73.1 (72.3,73.9)	76.0 (75.5,76.5)	75.4 (74.4,76.3)	78.6 (76.3,80.7)	77.5 (76.5,78.5)	76.0 (75.4,76.5)	74.9 (74.3,75.5)	72.6 (71.7,73.5)	75.3 (74.9,75.6)
Referable DR	82.6 (81.8,83.5)	82.3 (81.3,83.3)	84.4 (83.8,85.1)	83.9 (82.6,85.0)	95.0 (92.8,96.7)	91.0 (89.9,92.0)	88.4 (87.7,89.0)	81.2 (80.5,82.0)	74.3 (73.1,75.4)	83.5 (83.0,83.9)
Referable DR (excluding U)	92.4 (91.7,93.0)	87.4 (86.4,88.3)	89.3 (88.7,89.8)	90.2 (89.1,91.3)	97.3 (95.4,98.6)	92.6 (91.6,93.6)	91.4 (90.8,92.0)	88.5 (87.8,89.1)	85.2 (83.9,86.4)	89.8 (89.4,90.1)
No referable DR	25.2 (24.8,25.5)	26.7 (26.2,27.2)	25.5 (25.2,25.9)	24.6 (24.0,25.2)	24.2 (22.9,25.7)	20.1 (19.6,20.7)	21.5 (21.2,21.9)	26.1 (25.7,26.4)	35.8 (35.2,36.3)	25.5 (25.3,25.7)

Table S18: Vendor F ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor F (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	12.9 (12.6,13.2)	13.5 (13.2,13.7)	13.4 (13.1,13.7)	12.7 (12.3,13.2)	13.3 (12.8,13.8)	12.9 (12.4,13.5)	13.2 (12.8,13.7)	10.3 (8.2,12.7)	13.2 (13.0,13.4)
R1M0	66.9 (66.3,67.5)	65.7 (64.9,66.4)	67.2 (66.4,67.9)	66.2 (65.1,67.3)	66.7 (65.4,67.9)	67.5 (66.1,68.9)	63.8 (62.7,64.9)	69.1 (62.7,75.0)	66.3 (65.9,66.8)
R1M1	88.4 (87.7,89.0)	86.0 (85.2,86.7)	87.9 (87.1,88.7)	87.3 (86.1,88.4)	86.4 (85.1,87.7)	87.1 (85.5,88.5)	87.0 (85.8,88.1)	82.5 (73.8,89.3)	87.3 (86.8,87.8)
R2	98.7 (98.2,99.1)	98.1 (97.2,98.8)	98.5 (97.7,99.1)	98.6 (97.6,99.3)	98.0 (96.5,99.0)	99.1 (97.6,99.7)	98.4 (97.1,99.2)	100.0 (83.9,100.0)	98.5 (98.1,98.9)
<i>R2M0</i>	96.3 (94.5,97.6)	95.7 (93.0,97.6)	95.7 (93.0,97.6)	96.1 (92.4,98.3)	93.2 (87.8,96.7)	97.4 (92.6,99.5)	98.3 (95.2,99.7)	100.0 (39.8,100.0)	96.1 (94.7,97.2)
<i>R2M1</i>	99.6 (99.2,99.8)	98.9 (98.1,99.5)	99.5 (98.8,99.8)	99.5 (98.5,99.9)	99.6 (98.4,99.9)	99.7 (98.2,100.0)	98.4 (96.8,99.3)	100.0 (80.5,100.0)	99.3 (99.0,99.6)
R3	96.4 (95.3,97.4)	94.7 (92.9,96.2)	96.9 (95.3,98.0)	93.2 (90.1,95.5)	96.8 (94.0,98.5)	96.8 (93.7,98.6)	94.8 (91.9,96.8)	100.0 (76.8,100.0)	95.8 (94.8,96.6)
<i>R3M0</i>	92.5 (89.8,94.7)	92.4 (89.1,95.0)	93.9 (90.4,96.4)	87.2 (80.8,92.1)	94.1 (88.3,97.6)	95.1 (88.9,98.4)	91.9 (86.8,95.5)	100.0 (47.8,100.0)	92.5 (90.5,94.2)
<i>R3M1</i>	98.9 (97.9,99.5)	96.7 (94.5,98.2)	98.8 (97.3,99.6)	97.2 (94.1,99.0)	98.8 (95.7,99.9)	97.9 (94.1,99.6)	97.4 (93.9,99.1)	100.0 (66.4,100.0)	98.2 (97.2,98.9)
U	54.0 (52.1,55.9)	57.9 (56.1,59.7)	58.0 (55.8,60.2)	58.1 (54.8,61.3)	54.5 (50.9,57.9)	53.2 (49.1,57.2)	53.5 (50.7,56.3)	72.2 (54.8,85.8)	56.0 (54.7,57.4)
Combination grades*									
Any DR	74.7 (74.2,75.1)	72.5 (72.0,73.0)	74.6 (74.0,75.1)	74.2 (73.4,74.9)	73.6 (72.7,74.5)	74.3 (73.3,75.2)	71.3 (70.5,72.1)	75.4 (70.9,79.5)	73.7 (73.4,74.1)
Any DR (excluding U)	76.2 (75.8,76.7)	74.1 (73.5,74.6)	76.0 (75.4,76.5)	75.4 (74.6,76.2)	75.3 (74.4,76.2)	76.0 (75.0,77.0)	73.2 (72.4,74.0)	75.7 (71.0,80.0)	75.3 (74.9,75.6)
Referable DR	85.0 (84.4,85.5)	81.6 (80.9,82.2)	84.4 (83.7,85.1)	84.5 (83.5,85.4)	82.7 (81.6,83.9)	83.2 (81.9,84.5)	81.3 (80.3,82.3)	83.9 (77.6,89.0)	83.5 (83.0,83.9)
Referable DR (excluding U)	90.9 (90.4,91.4)	88.2 (87.6,88.8)	90.2 (89.5,90.8)	89.8 (88.8,90.6)	89.2 (88.2,90.2)	89.8 (88.6,90.9)	89.4 (88.4,90.3)	87.0 (80.2,92.1)	89.8 (89.4,90.1)
No referable DR	26.2 (25.9,26.5)	24.7 (24.4,24.9)	26.1 (25.7,26.4)	25.3 (24.8,25.8)	25.6 (25.1,26.2)	25.7 (25.1,26.4)	24.3 (23.9,24.8)	24.3 (21.7,27.2)	25.5 (25.3,25.7)

Table S19: Vendor G ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor G (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	8.0 (7.8,8.3)	11.6 (11.2,12.1)	7.8 (7.5,8.0)	8.4 (8.0,8.9)	9.6 (8.5,10.8)	3.1 (2.9,3.4)	4.3 (4.1,4.5)	9.4 (9.1,9.7)	18.8 (18.2,19.3)	8.6 (8.4,8.7)
R1M0	50.3 (49.4,51.2)	55.0 (53.8,56.2)	56.6 (55.8,57.4)	55.5 (54.1,56.9)	53.8 (50.5,57.1)	50.2 (48.6,51.7)	52.2 (51.3,53.0)	55.7 (54.8,56.5)	58.1 (56.9,59.3)	54.3 (53.8,54.8)
R1M1	83.5 (82.4,84.6)	81.9 (80.6,83.1)	84.0 (83.2,84.7)	84.2 (82.6,85.7)	89.3 (85.4,92.4)	85.8 (84.1,87.3)	84.8 (83.9,85.6)	82.9 (82.0,83.8)	79.0 (77.4,80.5)	83.5 (82.9,84.0)
R2	99.1 (98.3,99.6)	97.8 (96.4,98.8)	99.1 (98.5,99.5)	99.4 (98.3,99.9)	98.9 (94.2,100.0)	99.4 (98.4,99.9)	99.2 (98.6,99.6)	98.4 (97.5,99.0)	98.7 (96.8,99.7)	98.9 (98.5,99.2)
<i>R2M0</i>	97.0 (94.4,98.6)	93.8 (88.9,97.0)	97.5 (95.5,98.8)	98.6 (94.9,99.8)	96.8 (83.3,99.9)	97.8 (93.6,99.5)	96.9 (94.7,98.4)	96.2 (93.6,98.0)	97.9 (92.6,99.7)	96.9 (95.6,97.9)
<i>R2M1</i>	99.9 (99.3,100.0)	99.0 (97.7,99.7)	99.7 (99.1,99.9)	99.7 (98.6,100.0)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	99.9 (99.6,100.0)	99.2 (98.4,99.6)	99.1 (96.8,99.9)	99.6 (99.3,99.8)
R3	95.7 (93.9,97.1)	98.4 (96.5,99.4)	97.6 (96.2,98.6)	97.3 (94.4,98.9)	100.0 (93.0,100.0)	98.5 (96.1,99.6)	98.5 (97.2,99.3)	96.5 (94.9,97.7)	93.4 (89.7,96.0)	97.1 (96.2,97.8)
<i>R3M0</i>	92.4 (89.1,95.0)	96.2 (91.4,98.8)	94.5 (91.0,97.0)	93.8 (86.9,97.7)	100.0 (78.2,100.0)	95.3 (88.5,98.7)	95.9 (92.3,98.1)	92.8 (89.5,95.3)	91.9 (86.7,95.5)	93.8 (92.0,95.4)
<i>R3M1</i>	99.1 (97.4,99.8)	99.6 (97.7,100.0)	99.5 (98.3,99.9)	99.4 (96.5,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	99.8 (98.7,100.0)	99.5 (98.2,99.9)	96.0 (90.1,98.9)	99.4 (98.8,99.8)
U	48.5 (46.3,50.7)	55.2 (52.3,58.1)	51.5 (49.2,53.8)	48.9 (44.9,52.9)	78.6 (63.2,89.7)	53.7 (44.9,62.4)	47.9 (44.3,51.4)	48.9 (46.9,51.0)	53.3 (51.2,55.3)	50.9 (49.6,52.2)
Combination grades*										
Any DR	61.2 (60.6,61.9)	66.8 (66.0,67.6)	67.6 (67.0,68.1)	66.6 (65.6,67.6)	67.5 (65.0,69.9)	65.5 (64.3,66.6)	66.2 (65.6,66.8)	65.8 (65.2,66.4)	63.4 (62.5,64.2)	65.5 (65.1,65.8)
Any DR (excluding U)	62.7 (62.0,63.4)	68.0 (67.1,68.8)	68.7 (68.1,69.2)	68.0 (67.0,69.0)	67.1 (64.6,69.6)	65.7 (64.6,66.8)	66.9 (66.2,67.5)	67.5 (66.9,68.1)	65.7 (64.7,66.6)	66.8 (66.4,67.1)
Referable DR	77.8 (76.8,78.7)	79.6 (78.5,80.6)	81.9 (81.2,82.6)	81.3 (80.0,82.5)	91.2 (88.4,93.5)	88.0 (86.7,89.2)	85.1 (84.4,85.8)	78.6 (77.8,79.3)	70.0 (68.8,71.2)	80.3 (79.8,80.7)
Referable DR (excluding U)	87.8 (86.9,88.6)	85.3 (84.3,86.3)	87.1 (86.5,87.7)	87.9 (86.7,89.1)	92.3 (89.5,94.5)	89.7 (88.5,90.8)	88.4 (87.7,89.0)	86.3 (85.5,87.0)	82.2 (80.8,83.5)	87.0 (86.6,87.4)
No referable DR	17.2 (16.8,17.5)	21.8 (21.3,22.3)	19.7 (19.4,20.0)	19.1 (18.6,19.6)	20.4 (19.2,21.8)	13.5 (13.0,14.0)	15.5 (15.2,15.8)	19.9 (19.6,20.2)	28.3 (27.8,28.9)	19.1 (19.0,19.3)

Table S20: Vendor G ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor G (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	8.2 (8.0,8.4)	8.9 (8.7,9.1)	9.1 (8.8,9.3)	8.4 (8.1,8.8)	8.6 (8.2,9.1)	7.9 (7.5,8.4)	8.1 (7.8,8.4)	7.1 (5.4,9.2)	8.6 (8.4,8.7)
R1M0	54.5 (53.9,55.2)	54.0 (53.3,54.7)	55.3 (54.5,56.1)	55.3 (54.2,56.5)	55.1 (53.8,56.4)	54.0 (52.6,55.5)	50.8 (49.7,51.9)	54.9 (48.3,61.4)	54.3 (53.8,54.8)
R1M1	84.5 (83.8,85.2)	82.2 (81.3,83.0)	84.7 (83.8,85.5)	84.2 (83.0,85.4)	82.2 (80.6,83.6)	81.6 (79.9,83.2)	82.3 (80.9,83.6)	85.4 (77.1,91.6)	83.5 (82.9,84.0)
R2	99.0 (98.5,99.3)	98.8 (98.1,99.3)	98.5 (97.7,99.1)	99.1 (98.2,99.6)	99.2 (98.1,99.7)	98.8 (97.3,99.6)	99.3 (98.3,99.8)	100.0 (83.9,100.0)	98.9 (98.5,99.2)
<i>R2M0</i>	96.8 (95.1,98.0)	97.2 (94.8,98.6)	95.1 (92.3,97.1)	97.0 (93.7,98.9)	97.3 (93.1,99.2)	97.4 (92.6,99.5)	99.4 (97.0,100.0)	100.0 (39.8,100.0)	96.9 (95.6,97.9)
<i>R2M1</i>	99.7 (99.4,99.9)	99.4 (98.7,99.8)	99.7 (99.1,99.9)	99.8 (99.1,100.0)	99.8 (98.8,100.0)	99.4 (97.7,99.9)	99.2 (97.9,99.8)	100.0 (80.5,100.0)	99.6 (99.3,99.8)
R3	97.2 (96.2,98.1)	96.8 (95.2,97.9)	97.2 (95.7,98.3)	96.2 (93.7,97.9)	98.2 (95.9,99.4)	98.8 (96.5,99.7)	95.6 (92.9,97.5)	100.0 (76.8,100.0)	97.1 (96.2,97.8)
<i>R3M0</i>	93.6 (91.0,95.6)	94.2 (91.2,96.4)	93.9 (90.4,96.4)	90.6 (84.7,94.8)	96.6 (91.6,99.1)	97.1 (91.6,99.4)	92.5 (87.5,95.9)	100.0 (47.8,100.0)	93.8 (92.0,95.4)
<i>R3M1</i>	99.6 (98.8,99.9)	99.0 (97.4,99.7)	99.3 (98.0,99.9)	100.0 (98.3,100.0)	99.4 (96.6,100.0)	100.0 (97.5,100.0)	98.4 (95.4,99.7)	100.0 (66.4,100.0)	99.4 (98.8,99.8)
U	49.3 (47.4,51.2)	52.4 (50.5,54.2)	55.3 (53.1,57.5)	52.1 (48.8,55.4)	51.6 (48.1,55.1)	48.8 (44.8,52.9)	43.3 (40.5,46.0)	63.9 (46.2,79.2)	50.9 (49.6,52.2)
Combination grades*									
Any DR	66.3 (65.9,66.8)	64.4 (63.9,65.0)	66.7 (66.1,67.3)	66.9 (66.0,67.7)	65.8 (64.9,66.7)	64.9 (63.8,65.9)	61.8 (61.0,62.6)	67.3 (62.5,71.9)	65.5 (65.1,65.8)
Any DR (excluding U)	67.6 (67.1,68.1)	65.7 (65.1,66.3)	67.7 (67.1,68.3)	68.0 (67.2,68.9)	67.1 (66.1,68.0)	66.2 (65.1,67.3)	63.8 (62.9,64.7)	67.7 (62.6,72.4)	66.8 (66.4,67.1)
Referable DR	81.9 (81.3,82.5)	78.2 (77.5,78.9)	81.9 (81.1,82.6)	81.9 (80.8,82.9)	79.9 (78.6,81.0)	79.2 (77.8,80.6)	76.4 (75.2,77.5)	83.9 (77.6,89.0)	80.3 (79.8,80.7)
Referable DR (excluding U)	88.2 (87.7,88.7)	85.4 (84.7,86.1)	87.7 (87.0,88.3)	87.8 (86.8,88.7)	86.3 (85.2,87.4)	85.8 (84.5,87.1)	86.0 (84.9,87.0)	89.1 (82.7,93.8)	87.0 (86.6,87.4)
No referable DR	19.7 (19.4,19.9)	18.6 (18.3,18.9)	19.9 (19.6,20.3)	19.5 (19.0,19.9)	19.4 (18.9,19.9)	18.7 (18.2,19.3)	17.5 (17.1,17.9)	18.5 (16.1,21.1)	19.1 (19.0,19.3)

Table S21: Vendor H ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor H (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	27.4 (27.0,27.8)	17.3 (16.8,17.8)	11.5 (11.2,11.7)	15.2 (14.6,15.7)	30.0 (28.3,31.7)	10.4 (9.9,10.9)	10.4 (10.1,10.7)	19.2 (18.9,19.6)	35.4 (34.8,36.0)	18.2 (18.0,18.4)
R1M0	50.9 (50.0,51.8)	44.1 (42.9,45.3)	43.7 (43.0,44.5)	44.7 (43.2,46.1)	51.9 (48.6,55.2)	41.8 (40.3,43.3)	42.5 (41.7,43.4)	45.5 (44.7,46.3)	55.9 (54.7,57.0)	46.1 (45.6,46.6)
R1M1	83.2 (82.1,84.3)	76.1 (74.7,77.4)	78.9 (78.0,79.8)	80.4 (78.7,82.0)	86.3 (82.1,89.8)	80.8 (78.9,82.5)	80.5 (79.5,81.4)	78.2 (77.2,79.2)	78.4 (76.7,79.9)	79.5 (78.9,80.1)
R2	98.3 (97.4,99.0)	94.4 (92.4,96.0)	96.5 (95.5,97.4)	96.8 (94.9,98.1)	96.8 (91.0,99.3)	97.4 (95.6,98.6)	96.5 (95.5,97.4)	96.2 (95.0,97.1)	98.7 (96.8,99.7)	96.7 (96.1,97.2)
<i>R2M0</i>	95.3 (92.3,97.4)	79.5 (72.4,85.5)	90.0 (86.6,92.8)	89.9 (83.7,94.4)	90.3 (74.2,98.0)	91.1 (85.0,95.3)	88.3 (84.7,91.3)	89.3 (85.5,92.3)	96.8 (91.0,99.3)	89.9 (87.9,91.7)
<i>R2M1</i>	99.5 (98.7,99.9)	99.0 (97.7,99.7)	98.7 (97.9,99.3)	99.2 (97.8,99.8)	100.0 (94.3,100.0)	99.5 (98.2,99.9)	99.1 (98.4,99.6)	98.6 (97.7,99.3)	99.5 (97.5,100.0)	99.1 (98.6,99.4)
R3	97.0 (95.5,98.2)	98.1 (96.2,99.2)	98.1 (96.7,99.0)	97.6 (94.9,99.1)	100.0 (93.0,100.0)	98.9 (96.7,99.8)	98.0 (96.6,98.9)	97.4 (96.0,98.4)	96.0 (92.9,98.0)	97.7 (96.9,98.3)
<i>R3M0</i>	94.8 (91.8,96.9)	96.2 (91.4,98.8)	95.3 (91.9,97.5)	93.8 (86.9,97.7)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	95.0 (91.2,97.5)	94.9 (92.0,97.0)	93.6 (88.8,96.8)	95.0 (93.3,96.4)
<i>R3M1</i>	99.4 (97.9,99.9)	99.2 (97.0,99.9)	99.8 (98.7,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	99.4 (96.9,100.0)	99.5 (98.3,99.9)	99.5 (98.2,99.9)	100.0 (96.4,100.0)	99.6 (99.0,99.9)
U	63.2 (61.1,65.3)	48.7 (45.7,51.6)	52.8 (50.5,55.2)	55.8 (51.8,59.7)	50.0 (34.2,65.8)	53.7 (44.9,62.4)	54.5 (51.0,58.0)	53.9 (51.8,55.9)	59.0 (57.0,61.0)	56.1 (54.8,57.4)
Combination grades*										
Any DR	63.0 (62.3,63.7)	58.6 (57.7,59.4)	58.8 (58.2,59.4)	59.8 (58.7,60.8)	64.6 (62.0,67.1)	59.0 (57.8,60.1)	59.5 (58.8,60.1)	59.2 (58.6,59.8)	63.1 (62.2,63.9)	60.1 (59.7,60.4)
Any DR (excluding U)	63.0 (62.3,63.7)	59.6 (58.7,60.5)	59.2 (58.6,59.8)	60.1 (59.0,61.2)	65.0 (62.5,67.5)	59.1 (57.9,60.2)	59.6 (59.0,60.3)	59.8 (59.1,60.4)	64.0 (63.1,65.0)	60.4 (60.1,60.8)
Referable DR	81.4 (80.5,82.2)	74.2 (73.1,75.3)	78.4 (77.7,79.1)	79.7 (78.4,81.0)	86.6 (83.4,89.4)	84.2 (82.8,85.6)	82.2 (81.4,83.0)	76.5 (75.7,77.3)	72.3 (71.1,73.4)	78.5 (78.1,79.0)
Referable DR (excluding U)	87.6 (86.7,88.4)	80.3 (79.1,81.4)	82.8 (82.1,83.5)	84.7 (83.3,85.9)	89.8 (86.7,92.4)	85.7 (84.4,87.0)	84.6 (83.9,85.4)	82.4 (81.6,83.2)	81.9 (80.5,83.2)	83.7 (83.2,84.1)
No referable DR	32.5 (32.1,32.9)	23.6 (23.1,24.1)	19.4 (19.1,19.7)	21.9 (21.3,22.4)	35.4 (33.8,36.9)	17.3 (16.8,17.9)	17.9 (17.6,18.2)	25.2 (24.8,25.5)	40.4 (39.8,41.0)	24.6 (24.4,24.9)

Table S22: Vendor H ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor H (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	17.9 (17.7,18.2)	18.4 (18.1,18.7)	14.9 (14.6,15.2)	15.8 (15.4,16.3)	18.9 (18.4,19.5)	19.6 (19.0,20.3)	25.1 (24.5,25.6)	11.9 (9.7,14.5)	18.2 (18.0,18.4)
R1M0	47.0 (46.3,47.7)	44.9 (44.2,45.7)	44.3 (43.5,45.1)	44.6 (43.4,45.8)	46.7 (45.4,48.0)	47.9 (46.4,49.4)	49.5 (48.3,50.6)	46.8 (40.2,53.4)	46.1 (45.6,46.6)
R1M1	81.1 (80.4,81.9)	77.4 (76.5,78.3)	79.2 (78.2,80.2)	80.6 (79.3,81.9)	78.8 (77.1,80.3)	78.8 (76.9,80.5)	79.9 (78.5,81.3)	77.7 (68.4,85.3)	79.5 (78.9,80.1)
R2	96.9 (96.1,97.5)	96.4 (95.2,97.3)	95.7 (94.5,96.7)	96.6 (95.1,97.8)	97.3 (95.7,98.5)	97.2 (95.2,98.5)	97.8 (96.4,98.8)	100.0 (83.9,100.0)	96.7 (96.1,97.2)
<i>R2M0</i>	90.6 (88.1,92.7)	88.6 (84.8,91.7)	86.0 (81.9,89.5)	88.7 (83.5,92.7)	91.8 (86.1,95.7)	92.2 (85.7,96.4)	95.6 (91.5,98.1)	100.0 (39.8,100.0)	89.9 (87.9,91.7)
<i>R2M1</i>	99.1 (98.5,99.5)	99.0 (98.2,99.5)	99.1 (98.3,99.6)	99.3 (98.3,99.8)	99.1 (97.7,99.8)	99.0 (97.2,99.8)	98.6 (97.1,99.4)	100.0 (80.5,100.0)	99.1 (98.6,99.4)
R3	98.1 (97.1,98.8)	97.0 (95.5,98.1)	97.9 (96.5,98.8)	97.3 (95.0,98.7)	95.8 (92.7,97.8)	100.0 (98.5,100.0)	97.5 (95.3,98.9)	100.0 (76.8,100.0)	97.7 (96.9,98.3)
<i>R3M0</i>	95.6 (93.4,97.3)	94.2 (91.2,96.4)	95.3 (92.1,97.5)	93.3 (88.0,96.7)	92.4 (86.1,96.5)	100.0 (96.4,100.0)	94.8 (90.4,97.6)	100.0 (47.8,100.0)	95.0 (93.3,96.4)
<i>R3M1</i>	99.6 (98.8,99.9)	99.5 (98.2,99.9)	99.5 (98.3,99.9)	100.0 (98.3,100.0)	98.2 (94.7,99.6)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	99.6 (99.0,99.9)
U	56.4 (54.5,58.3)	55.7 (53.9,57.5)	48.0 (45.8,50.3)	54.2 (50.9,57.5)	55.7 (52.2,59.2)	60.0 (55.9,63.9)	68.3 (65.7,70.9)	58.3 (40.8,74.5)	56.1 (54.8,57.4)
Combination grades*									
Any DR	61.6 (61.1,62.0)	58.2 (57.7,58.8)	58.3 (57.7,58.9)	59.9 (59.0,60.7)	60.3 (59.3,61.3)	61.4 (60.3,62.5)	62.9 (62.0,63.7)	60.2 (55.3,65.0)	60.1 (59.7,60.4)
Any DR (excluding U)	61.9 (61.4,62.4)	58.5 (57.9,59.1)	59.2 (58.5,59.8)	60.3 (59.4,61.2)	60.7 (59.7,61.7)	61.5 (60.4,62.6)	62.3 (61.4,63.2)	60.4 (55.2,65.4)	60.4 (60.1,60.8)
Referable DR	80.8 (80.1,81.3)	75.7 (75.0,76.4)	76.8 (76.0,77.6)	79.7 (78.6,80.7)	78.1 (76.9,79.3)	79.3 (77.9,80.7)	80.6 (79.5,81.6)	78.2 (71.3,84.1)	78.5 (78.1,79.0)
Referable DR (excluding U)	85.4 (84.8,86.0)	81.3 (80.6,82.1)	83.1 (82.3,83.9)	84.8 (83.7,85.8)	83.3 (82.0,84.5)	83.5 (82.1,84.9)	84.2 (83.0,85.2)	83.3 (76.0,89.1)	83.7 (83.2,84.1)
No referable DR	25.1 (24.8,25.4)	24.1 (23.8,24.4)	21.8 (21.5,22.1)	22.6 (22.1,23.1)	25.3 (24.8,25.9)	26.3 (25.6,26.9)	30.4 (29.9,30.9)	20.2 (17.8,22.9)	24.6 (24.4,24.9)

3. ARIAS operating threshold 1 + visual acuity criterion: ARIAS test positive or visual acuity 6/12 or worse by final human grade in worst eye and by population subgroups

Table S23: Vendor A test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor A (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	57.2 (56.8,57.7)	39.9 (39.3,40.6)	38.8 (38.4,39.2)	42.1 (41.3,42.9)	26.1 (24.5,27.8)	22.3 (21.6,23.0)	32.5 (32.1,32.9)	52.0 (51.5,52.4)	75.8 (75.2,76.4)	45.5 (45.3,45.8)
R1M0	73.4 (72.6,74.2)	59.6 (58.4,60.8)	61.2 (60.4,61.9)	64.6 (63.2,65.9)	47.4 (44.1,50.7)	50.7 (49.1,52.2)	56.1 (55.3,57.0)	69.3 (68.5,70.0)	84.4 (83.5,85.2)	65.0 (64.6,65.5)
R1M1	90.9 (90.0,91.7)	83.1 (81.9,84.3)	86.2 (85.5,86.9)	86.4 (84.9,87.8)	73.4 (68.4,78.1)	82.3 (80.5,84.0)	84.3 (83.4,85.2)	88.3 (87.5,89.1)	93.2 (92.2,94.2)	86.6 (86.2,87.1)
R2	99.0 (98.2,99.5)	96.0 (94.2,97.4)	98.2 (97.4,98.8)	98.9 (97.5,99.6)	97.9 (92.5,99.7)	97.9 (96.3,99.0)	98.4 (97.7,99.0)	97.5 (96.5,98.3)	99.4 (97.7,99.9)	98.1 (97.6,98.5)
R2M0	97.0 (94.4,98.6)	87.0 (80.8,91.7)	94.0 (91.2,96.1)	97.1 (92.8,99.2)	96.8 (83.3,99.9)	92.6 (86.8,96.4)	94.9 (92.2,96.9)	92.5 (89.2,95.0)	98.9 (94.3,100.0)	94.2 (92.6,95.6)
R2M1	99.7 (99.1,100.0)	98.8 (97.5,99.6)	99.6 (99.0,99.9)	99.5 (98.1,99.9)	98.4 (91.5,100.0)	99.7 (98.6,100.0)	99.5 (99.0,99.8)	99.4 (98.6,99.8)	99.5 (97.5,100.0)	99.5 (99.1,99.7)
R3	99.3 (98.3,99.8)	99.2 (97.7,99.8)	99.4 (98.5,99.8)	98.0 (95.5,99.4)	100.0 (93.0,100.0)	99.2 (97.3,99.9)	99.4 (98.4,99.8)	98.9 (97.9,99.5)	98.9 (96.8,99.8)	99.1 (98.6,99.5)
R3M0	98.5 (96.6,99.5)	98.5 (94.6,99.8)	98.8 (96.6,99.8)	94.8 (88.3,98.3)	100.0 (78.2,100.0)	98.8 (93.7,100.0)	98.2 (95.4,99.5)	97.9 (95.7,99.2)	98.3 (95.0,99.6)	98.2 (97.0,99.0)
R3M1	100.0 (98.9,100.0)	99.6 (97.7,100.0)	99.8 (98.7,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	99.4 (96.9,100.0)	100.0 (99.2,100.0)	99.8 (98.6,100.0)	100.0 (96.4,100.0)	99.8 (99.4,100.0)
U	92.3 (91.1,93.4)	84.4 (82.2,86.5)	90.4 (88.9,91.7)	89.1 (86.4,91.4)	92.9 (80.5,98.5)	83.6 (76.2,89.4)	83.9 (81.2,86.4)	87.9 (86.5,89.2)	93.8 (92.8,94.8)	89.7 (88.9,90.5)
Combination grades*										
Any DR	81.2 (80.7,81.7)	72.2 (71.4,73.0)	73.3 (72.8,73.8)	75.3 (74.4,76.2)	60.0 (57.4,62.6)	65.3 (64.2,66.4)	69.6 (69.0,70.1)	78.4 (77.9,78.9)	88.7 (88.1,89.2)	75.6 (75.3,75.9)
Any DR (excluding U)	79.9 (79.4,80.5)	71.0 (70.1,71.8)	72.1 (71.6,72.6)	74.2 (73.2,75.2)	59.0 (56.4,61.7)	64.9 (63.8,66.1)	69.0 (68.4,69.6)	77.5 (76.9,78.0)	87.5 (86.8,88.1)	74.4 (74.0,74.7)
Referable DR	93.1 (92.5,93.6)	85.8 (84.9,86.7)	89.1 (88.5,89.6)	89.5 (88.4,90.5)	82.0 (78.4,85.2)	86.8 (85.5,88.0)	87.6 (86.9,88.2)	90.0 (89.4,90.5)	94.1 (93.5,94.7)	89.5 (89.2,89.9)
Referable DR (excluding U)	93.3 (92.6,93.9)	86.1 (85.1,87.1)	88.8 (88.2,89.4)	89.6 (88.4,90.6)	81.0 (77.2,84.5)	87.0 (85.7,88.2)	87.9 (87.2,88.6)	90.5 (89.9,91.1)	94.3 (93.5,95.1)	89.5 (89.1,89.9)
No referable DR	60.7 (60.3,61.1)	44.5 (43.9,45.1)	44.3 (43.9,44.6)	47.2 (46.5,47.9)	31.3 (29.8,32.8)	28.6 (27.9,29.2)	38.0 (37.6,38.4)	55.9 (55.5,56.3)	77.9 (77.4,78.4)	50.1 (49.8,50.3)

Table S24: Vendor A test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	Test positive % for Vendor A (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	43.3 (42.9,43.7)	47.9 (47.5,48.3)	42.3 (41.9,42.8)	42.4 (41.8,43.0)	46.2 (45.5,47.0)	47.3 (46.5,48.1)	53.0 (52.4,53.6)	32.5 (29.1,36.0)	45.5 (45.3,45.8)
R1M0	62.6 (61.9,63.2)	68.2 (67.5,68.9)	63.4 (62.6,64.2)	63.4 (62.3,64.5)	66.5 (65.3,67.7)	66.3 (64.8,67.6)	68.3 (67.2,69.3)	57.5 (50.9,63.9)	65.0 (64.6,65.5)
R1M1	86.9 (86.3,87.6)	86.3 (85.5,87.0)	85.8 (85.0,86.6)	87.4 (86.2,88.5)	87.4 (86.0,88.6)	86.1 (84.5,87.6)	87.5 (86.3,88.6)	84.5 (76.0,90.9)	86.6 (86.2,87.1)
R2	98.3 (97.7,98.8)	97.8 (96.9,98.5)	97.5 (96.5,98.3)	98.5 (97.4,99.2)	98.2 (96.7,99.1)	98.6 (97.0,99.5)	98.5 (97.3,99.3)	100.0 (83.9,100.0)	98.1 (97.6,98.5)
R2M0	94.3 (92.2,95.9)	94.0 (91.0,96.3)	92.3 (89.0,94.9)	94.6 (90.5,97.3)	93.2 (87.8,96.7)	95.7 (90.1,98.6)	97.2 (93.7,99.1)	100.0 (39.8,100.0)	94.2 (92.6,95.6)
R2M1	99.7 (99.3,99.9)	99.1 (98.3,99.6)	99.3 (98.6,99.7)	99.8 (99.1,100.0)	99.8 (98.8,100.0)	99.7 (98.2,100.0)	99.0 (97.7,99.7)	100.0 (80.5,100.0)	99.5 (99.1,99.7)
R3	99.4 (98.7,99.7)	98.8 (97.7,99.4)	98.9 (97.8,99.5)	98.6 (96.8,99.6)	98.9 (96.9,99.8)	100.0 (98.5,100.0)	99.7 (98.5,100.0)	100.0 (76.8,100.0)	99.1 (98.6,99.5)
R3M0	98.3 (96.8,99.3)	98.0 (95.9,99.2)	97.5 (94.9,99.0)	96.6 (92.3,98.9)	98.3 (94.1,99.8)	100.0 (96.4,100.0)	99.4 (96.8,100.0)	100.0 (47.8,100.0)	98.2 (97.0,99.0)
R3M1	100.0 (99.5,100.0)	99.5 (98.2,99.9)	99.8 (98.7,100.0)	100.0 (98.3,100.0)	99.4 (96.6,100.0)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	99.8 (99.4,100.0)
U	88.8 (87.5,89.9)	90.6 (89.5,91.6)	89.1 (87.6,90.4)	89.3 (87.1,91.2)	92.0 (89.9,93.7)	89.5 (86.8,91.9)	89.5 (87.7,91.2)	97.2 (85.5,99.9)	89.7 (88.9,90.5)
Combination grades*									
Any DR	74.3 (73.9,74.8)	77.2 (76.7,77.7)	74.3 (73.7,74.8)	75.0 (74.2,75.8)	76.9 (76.0,77.7)	76.2 (75.2,77.1)	77.6 (76.9,78.4)	71.5 (66.8,75.8)	75.6 (75.3,75.9)
Any DR (excluding U)	73.2 (72.8,73.7)	75.8 (75.3,76.3)	73.0 (72.5,73.6)	73.9 (73.1,74.7)	75.6 (74.7,76.4)	75.1 (74.0,76.1)	76.4 (75.6,77.1)	69.0 (64.0,73.7)	74.4 (74.0,74.7)
Referable DR	89.8 (89.4,90.3)	89.1 (88.6,89.6)	88.7 (88.1,89.3)	90.1 (89.2,90.8)	90.5 (89.6,91.3)	89.3 (88.2,90.4)	90.0 (89.2,90.8)	90.2 (84.8,94.2)	89.5 (89.2,89.9)
Referable DR (excluding U)	90.0 (89.5,90.5)	88.7 (88.1,89.3)	88.6 (87.9,89.2)	90.2 (89.3,91.1)	90.1 (89.1,91.1)	89.3 (88.1,90.4)	90.2 (89.3,91.1)	88.4 (81.9,93.2)	89.5 (89.1,89.9)
No referable DR	48.1 (47.7,48.4)	52.2 (51.9,52.6)	47.3 (46.9,47.7)	47.3 (46.8,47.9)	50.9 (50.3,51.6)	51.8 (51.0,52.5)	56.4 (55.8,56.9)	38.4 (35.4,41.6)	50.1 (49.8,50.3)

Table S25: Vendor B test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor B (95% confidence intervals)									
--------------------------------	---	--	--	--	--	--	--	--	--	--

	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	33.4 (32.9,33.8)	41.5 (40.8,42.2)	31.6 (31.2,32.0)	33.2 (32.5,33.9)	34.0 (32.3,35.8)	20.9 (20.2,21.6)	22.6 (22.2,23.0)	36.3 (35.9,36.7)	60.9 (60.2,61.5)	34.0 (33.8,34.3)
R1M0	84.0 (83.3,84.6)	87.9 (87.1,88.7)	87.2 (86.7,87.7)	86.3 (85.3,87.3)	89.7 (87.6,91.6)	86.3 (85.2,87.3)	84.4 (83.7,85.0)	85.6 (85.0,86.2)	90.5 (89.8,91.2)	86.2 (85.9,86.6)
R1M1	98.0 (97.5,98.4)	98.6 (98.1,98.9)	98.4 (98.2,98.7)	98.7 (98.2,99.1)	99.1 (97.4,99.8)	98.2 (97.5,98.7)	98.5 (98.1,98.7)	98.3 (98.0,98.6)	98.6 (98.0,99.0)	98.4 (98.2,98.6)
R2	99.9 (99.5,100.0)	99.3 (98.3,99.8)	99.9 (99.6,100.0)	99.8 (98.9,100.0)	100.0 (96.2,100.0)	100.0 (99.3,100.0)	99.8 (99.5,100.0)	99.6 (99.1,99.9)	100.0 (98.8,100.0)	99.8 (99.6,99.9)
<i>R2M0</i>	99.7 (98.2,100.0)	97.5 (93.8,99.3)	99.8 (98.6,100.0)	99.3 (96.1,100.0)	100.0 (88.8,100.0)	100.0 (97.3,100.0)	99.2 (97.8,99.8)	98.8 (97.1,99.7)	100.0 (96.2,100.0)	99.3 (98.6,99.7)
<i>R2M1</i>	100.0 (99.5,100.0)	99.8 (98.9,100.0)	100.0 (99.7,100.0)	100.0 (99.1,100.0)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	100.0 (99.7,100.0)	99.9 (99.4,100.0)	100.0 (98.4,100.0)	100.0 (99.8,100.0)
R3	99.6 (98.7,99.9)	100.0 (99.0,100.0)	99.6 (98.7,99.9)	99.6 (97.8,100.0)	100.0 (93.0,100.0)	99.2 (97.3,99.9)	99.7 (98.9,100.0)	99.7 (99.0,100.0)	99.6 (98.0,100.0)	99.6 (99.3,99.9)
<i>R3M0</i>	99.1 (97.5,99.8)	100.0 (97.2,100.0)	98.8 (96.6,99.8)	99.0 (94.3,100.0)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	99.1 (96.7,99.9)	99.4 (97.9,99.9)	99.4 (96.8,100.0)	99.2 (98.3,99.7)
<i>R3M1</i>	100.0 (98.9,100.0)	100.0 (98.5,100.0)	100.0 (99.1,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	100.0 (99.2,100.0)	100.0 (99.1,100.0)	100.0 (96.4,100.0)	100.0 (99.7,100.0)
U	96.4 (95.5,97.2)	98.4 (97.6,99.1)	98.3 (97.6,98.9)	97.9 (96.5,98.9)	97.6 (87.4,99.9)	96.3 (91.5,98.8)	97.5 (96.1,98.5)	97.5 (96.8,98.1)	97.8 (97.2,98.4)	97.6 (97.2,98.0)
Combination grades*										
Any DR	89.5 (89.1,90.0)	93.1 (92.7,93.5)	92.2 (91.9,92.5)	91.7 (91.1,92.3)	93.2 (91.8,94.5)	91.3 (90.6,91.9)	90.5 (90.1,90.8)	91.3 (90.9,91.6)	94.0 (93.6,94.4)	91.5 (91.3,91.7)
Any DR (excluding U)	88.8 (88.3,89.2)	92.6 (92.1,93.0)	91.8 (91.4,92.1)	91.2 (90.6,91.8)	93.1 (91.6,94.4)	91.2 (90.5,91.8)	90.2 (89.8,90.6)	90.6 (90.3,91.0)	93.1 (92.6,93.6)	91.0 (90.8,91.2)
Referable DR	98.0 (97.7,98.3)	98.7 (98.4,99.0)	98.7 (98.5,98.9)	98.8 (98.4,99.1)	99.2 (98.0,99.8)	98.5 (98.0,98.9)	98.7 (98.4,98.9)	98.4 (98.1,98.6)	98.4 (98.0,98.7)	98.5 (98.4,98.7)
Referable DR (excluding U)	98.5 (98.2,98.8)	98.8 (98.4,99.1)	98.7 (98.5,98.9)	99.0 (98.5,99.3)	99.4 (98.2,99.9)	98.6 (98.1,99.0)	98.8 (98.5,99.0)	98.6 (98.4,98.9)	98.8 (98.4,99.2)	98.7 (98.6,98.9)
No referable DR	44.3 (43.9,44.7)	52.4 (51.8,53.0)	45.2 (44.8,45.6)	45.2 (44.6,45.9)	47.7 (46.1,49.3)	35.3 (34.7,36.0)	37.0 (36.6,37.4)	47.5 (47.1,47.9)	68.1 (67.5,68.6)	46.1 (45.9,46.3)

Table S26: Vendor B test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	Test positive % for Vendor B (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	31.2 (30.9,31.6)	36.9 (36.6,37.3)	35.5 (35.1,36.0)	33.7 (33.1,34.4)	33.9 (33.2,34.6)	32.8 (32.0,33.5)	32.4 (31.8,33.0)	27.7 (24.5,31.0)	34.0 (33.8,34.3)
R1M0	86.0 (85.6,86.5)	86.5 (86.0,87.0)	87.1 (86.6,87.7)	86.6 (85.8,87.4)	86.6 (85.6,87.4)	85.4 (84.3,86.4)	84.3 (83.4,85.1)	89.7 (85.1,93.3)	86.2 (85.9,86.6)
R1M1	98.4 (98.2,98.6)	98.4 (98.1,98.7)	98.4 (98.1,98.7)	98.4 (98.0,98.8)	98.1 (97.6,98.6)	98.5 (97.8,98.9)	98.5 (98.0,98.9)	99.0 (94.7,100.0)	98.4 (98.2,98.6)
R2	99.8 (99.5,99.9)	99.9 (99.5,100.0)	99.8 (99.4,100.0)	99.8 (99.1,100.0)	99.7 (98.8,100.0)	99.8 (98.7,100.0)	100.0 (99.5,100.0)	100.0 (83.9,100.0)	99.8 (99.6,99.9)
<i>R2M0</i>	99.1 (98.0,99.7)	99.7 (98.4,100.0)	99.4 (98.0,99.9)	99.0 (96.5,99.9)	98.6 (95.1,99.8)	99.1 (95.3,100.0)	100.0 (98.0,100.0)	100.0 (39.8,100.0)	99.3 (98.6,99.7)
<i>R2M1</i>	100.0 (99.8,100.0)	99.9 (99.5,100.0)	99.9 (99.4,100.0)	100.0 (99.4,100.0)	100.0 (99.2,100.0)	100.0 (98.8,100.0)	100.0 (99.3,100.0)	100.0 (80.5,100.0)	100.0 (99.8,100.0)
R3	99.6 (99.1,99.9)	99.7 (99.0,100.0)	99.4 (98.6,99.8)	99.7 (98.5,100.0)	100.0 (98.7,100.0)	100.0 (98.5,100.0)	99.4 (98.0,99.9)	100.0 (76.8,100.0)	99.6 (99.3,99.9)
<i>R3M0</i>	99.0 (97.6,99.7)	99.4 (97.9,99.9)	98.6 (96.4,99.6)	99.3 (96.3,100.0)	100.0 (96.9,100.0)	100.0 (96.4,100.0)	98.8 (95.9,99.9)	100.0 (47.8,100.0)	99.2 (98.3,99.7)
<i>R3M1</i>	100.0 (99.5,100.0)	100.0 (99.1,100.0)	100.0 (99.1,100.0)	100.0 (98.3,100.0)	100.0 (97.8,100.0)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	100.0 (99.7,100.0)
U	97.5 (96.9,98.1)	97.7 (97.1,98.2)	98.5 (97.9,99.0)	98.5 (97.4,99.2)	97.8 (96.5,98.7)	97.3 (95.7,98.5)	95.5 (94.2,96.6)	100.0 (90.3,100.0)	97.6 (97.2,98.0)
Combination grades*									
Any DR	91.4 (91.2,91.7)	91.7 (91.3,92.0)	92.1 (91.8,92.4)	91.9 (91.4,92.4)	91.7 (91.1,92.2)	91.0 (90.4,91.7)	90.2 (89.7,90.7)	93.9 (91.1,96.0)	91.5 (91.3,91.7)
Any DR (excluding U)	91.0 (90.7,91.3)	91.0 (90.7,91.4)	91.5 (91.2,91.9)	91.4 (90.9,91.9)	91.2 (90.6,91.7)	90.5 (89.8,91.2)	89.6 (89.1,90.2)	93.3 (90.2,95.6)	91.0 (90.8,91.2)
Referable DR	98.6 (98.4,98.7)	98.5 (98.2,98.7)	98.7 (98.4,98.9)	98.7 (98.4,99.0)	98.4 (98.0,98.8)	98.5 (98.1,98.9)	98.1 (97.7,98.4)	99.4 (96.8,100.0)	98.5 (98.4,98.7)
Referable DR (excluding U)	98.8 (98.6,98.9)	98.7 (98.4,98.9)	98.7 (98.4,98.9)	98.8 (98.4,99.1)	98.6 (98.1,98.9)	98.8 (98.3,99.2)	98.8 (98.4,99.1)	99.3 (96.0,100.0)	98.7 (98.6,98.9)
No referable DR	44.8 (44.4,45.1)	47.6 (47.2,47.9)	47.7 (47.3,48.1)	46.2 (45.6,46.7)	46.1 (45.4,46.7)	45.1 (44.4,45.8)	43.8 (43.3,44.3)	42.4 (39.3,45.6)	46.1 (45.9,46.3)

Table S27: Vendor C test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor C (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	61.2 (60.7,61.6)	53.0 (52.3,53.6)	55.3 (54.9,55.8)	54.0 (53.2,54.8)	38.8 (37.0,40.7)	44.8 (44.0,45.6)	50.8 (50.3,51.3)	59.3 (58.9,59.7)	73.3 (72.7,73.9)	56.7 (56.5,57.0)
R1M0	93.7 (93.2,94.1)	91.5 (90.8,92.2)	94.2 (93.8,94.6)	92.7 (91.9,93.4)	88.3 (86.0,90.3)	94.2 (93.4,94.9)	94.2 (93.8,94.6)	92.5 (92.1,92.9)	93.9 (93.3,94.5)	93.4 (93.2,93.7)
R1M1	96.8 (96.2,97.3)	94.5 (93.7,95.2)	96.3 (95.9,96.7)	96.2 (95.3,97.0)	97.0 (94.6,98.6)	96.3 (95.3,97.1)	96.5 (96.0,96.9)	95.5 (94.9,95.9)	96.0 (95.2,96.8)	96.0 (95.7,96.3)
R2	99.8 (99.3,100.0)	99.4 (98.5,99.8)	99.8 (99.4,100.0)	100.0 (99.3,100.0)	98.9 (94.2,100.0)	99.8 (99.0,100.0)	99.9 (99.6,100.0)	99.6 (99.1,99.9)	100.0 (98.8,100.0)	99.8 (99.6,99.9)
<i>R2M0</i>	99.3 (97.6,99.9)	98.1 (94.7,99.6)	99.3 (97.8,99.8)	100.0 (97.4,100.0)	100.0 (88.8,100.0)	99.3 (95.9,100.0)	99.5 (98.2,99.9)	98.6 (96.7,99.5)	100.0 (96.2,100.0)	99.2 (98.4,99.7)
<i>R2M1</i>	100.0 (99.5,100.0)	99.8 (98.9,100.0)	100.0 (99.7,100.0)	100.0 (99.1,100.0)	98.4 (91.5,100.0)	100.0 (99.1,100.0)	100.0 (99.7,100.0)	100.0 (99.6,100.0)	100.0 (98.4,100.0)	100.0 (99.8,100.0)
R3	98.2 (96.9,99.1)	98.9 (97.3,99.7)	99.3 (98.3,99.8)	98.0 (95.5,99.4)	100.0 (93.0,100.0)	98.5 (96.1,99.6)	98.3 (97.0,99.2)	98.9 (97.9,99.5)	98.9 (96.8,99.8)	98.7 (98.1,99.1)
<i>R3M0</i>	96.8 (94.3,98.4)	97.7 (93.5,99.5)	98.4 (96.0,99.6)	94.8 (88.3,98.3)	100.0 (78.2,100.0)	95.3 (88.5,98.7)	95.9 (92.3,98.1)	97.9 (95.7,99.2)	98.3 (95.0,99.6)	97.2 (95.9,98.2)
<i>R3M1</i>	99.7 (98.3,100.0)	99.6 (97.7,100.0)	99.8 (98.7,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	99.5 (98.3,99.9)	99.8 (98.6,100.0)	100.0 (96.4,100.0)	99.7 (99.2,99.9)
U	92.9 (91.7,94.0)	90.6 (88.7,92.2)	93.3 (92.0,94.4)	91.3 (88.9,93.4)	90.5 (77.4,97.3)	86.6 (79.6,91.8)	90.1 (87.8,92.1)	91.2 (90.0,92.4)	94.7 (93.7,95.5)	92.4 (91.6,93.1)
Combination grades*										
Any DR	94.7 (94.4,95.0)	93.0 (92.5,93.4)	95.2 (94.9,95.4)	94.1 (93.6,94.6)	91.5 (90.0,92.9)	95.2 (94.7,95.7)	95.2 (95.0,95.5)	93.7 (93.4,94.0)	94.8 (94.4,95.2)	94.5 (94.4,94.7)
Any DR (excluding U)	94.9 (94.6,95.3)	93.2 (92.7,93.7)	95.3 (95.1,95.6)	94.4 (93.8,94.9)	91.6 (90.0,93.0)	95.4 (94.8,95.8)	95.4 (95.1,95.7)	94.0 (93.7,94.3)	94.8 (94.3,95.2)	94.7 (94.5,94.9)
Referable DR	96.3 (95.9,96.7)	94.5 (93.9,95.1)	96.5 (96.1,96.8)	96.1 (95.4,96.7)	97.1 (95.3,98.4)	96.7 (95.9,97.3)	96.6 (96.3,97.0)	95.3 (94.9,95.7)	95.8 (95.3,96.3)	96.0 (95.8,96.2)
Referable DR (excluding U)	97.5 (97.1,97.9)	95.5 (94.9,96.0)	97.0 (96.7,97.3)	97.0 (96.4,97.6)	97.7 (95.9,98.9)	97.2 (96.5,97.8)	97.2 (96.8,97.5)	96.4 (95.9,96.7)	96.7 (96.0,97.3)	96.8 (96.6,97.0)
No referable DR	68.2 (67.8,68.6)	62.0 (61.4,62.6)	64.9 (64.5,65.2)	62.8 (62.1,63.4)	51.0 (49.3,52.6)	55.7 (55.0,56.4)	60.9 (60.5,61.3)	66.8 (66.5,67.2)	78.3 (77.8,78.8)	65.2 (65.0,65.4)

Table S28: Vendor C test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	Test positive % for Vendor C (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	56.1 (55.7,56.5)	57.4 (57.0,57.8)	55.2 (54.8,55.7)	54.1 (53.4,54.7)	57.1 (56.4,57.8)	57.6 (56.8,58.4)	61.2 (60.7,61.8)	50.9 (47.2,54.5)	56.7 (56.5,57.0)
R1M0	93.5 (93.2,93.9)	93.3 (92.9,93.6)	93.7 (93.3,94.1)	93.0 (92.4,93.6)	93.2 (92.6,93.9)	94.3 (93.6,95.0)	92.8 (92.2,93.4)	94.8 (91.2,97.3)	93.4 (93.2,93.7)
R1M1	96.4 (96.0,96.7)	95.5 (95.1,96.0)	96.4 (95.9,96.8)	96.0 (95.2,96.6)	95.7 (94.8,96.4)	95.5 (94.6,96.4)	95.9 (95.2,96.6)	98.1 (93.2,99.8)	96.0 (95.7,96.3)
R2	99.7 (99.4,99.9)	99.9 (99.5,100.0)	99.6 (99.1,99.9)	99.8 (99.1,100.0)	99.7 (98.8,100.0)	100.0 (99.1,100.0)	100.0 (99.5,100.0)	100.0 (83.9,100.0)	99.8 (99.6,99.9)
<i>R2M0</i>	99.1 (98.0,99.7)	99.4 (98.0,99.9)	98.9 (97.1,99.7)	99.0 (96.5,99.9)	98.6 (95.1,99.8)	100.0 (96.8,100.0)	100.0 (98.0,100.0)	100.0 (39.8,100.0)	99.2 (98.4,99.7)
<i>R2M1</i>	99.9 (99.7,100.0)	100.0 (99.6,100.0)	99.9 (99.4,100.0)	100.0 (99.4,100.0)	100.0 (99.2,100.0)	100.0 (98.8,100.0)	100.0 (99.3,100.0)	100.0 (80.5,100.0)	100.0 (99.8,100.0)
R3	98.9 (98.1,99.4)	98.4 (97.2,99.2)	98.6 (97.4,99.3)	98.9 (97.2,99.7)	98.6 (96.4,99.6)	99.2 (97.1,99.9)	98.3 (96.4,99.4)	100.0 (76.8,100.0)	98.7 (98.1,99.1)
<i>R3M0</i>	97.3 (95.4,98.6)	97.1 (94.7,98.6)	96.8 (93.9,98.5)	97.3 (93.3,99.3)	97.5 (92.8,99.5)	99.0 (94.7,100.0)	96.5 (92.6,98.7)	100.0 (47.8,100.0)	97.2 (95.9,98.2)
<i>R3M1</i>	99.9 (99.3,100.0)	99.5 (98.2,99.9)	99.8 (98.7,100.0)	100.0 (98.3,100.0)	99.4 (96.6,100.0)	99.3 (96.2,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	99.7 (99.2,99.9)
U	91.3 (90.1,92.3)	93.4 (92.4,94.3)	93.1 (91.9,94.2)	92.6 (90.7,94.2)	93.4 (91.5,95.0)	90.5 (87.9,92.7)	91.1 (89.4,92.6)	97.2 (85.5,99.9)	92.4 (91.6,93.1)
Combination grades*									
Any DR	94.7 (94.5,94.9)	94.3 (94.0,94.6)	94.8 (94.6,95.1)	94.4 (94.0,94.8)	94.4 (94.0,94.9)	94.8 (94.3,95.3)	93.9 (93.5,94.4)	96.3 (94.0,97.9)	94.5 (94.4,94.7)
Any DR (excluding U)	95.0 (94.7,95.2)	94.4 (94.1,94.7)	95.0 (94.7,95.2)	94.5 (94.1,94.9)	94.5 (94.0,95.0)	95.2 (94.6,95.6)	94.3 (93.8,94.7)	96.2 (93.7,97.9)	94.7 (94.5,94.9)
Referable DR	96.2 (96.0,96.5)	95.7 (95.3,96.0)	96.3 (96.0,96.7)	96.1 (95.6,96.6)	96.0 (95.4,96.6)	95.5 (94.7,96.2)	95.5 (94.9,96.0)	98.3 (95.0,99.6)	96.0 (95.8,96.2)
Referable DR (excluding U)	97.2 (96.9,97.5)	96.3 (95.9,96.7)	97.0 (96.6,97.4)	96.9 (96.3,97.3)	96.6 (95.9,97.1)	96.6 (95.8,97.2)	96.7 (96.2,97.3)	98.6 (94.9,99.8)	96.8 (96.6,97.0)
No referable DR	65.4 (65.0,65.7)	65.1 (64.7,65.4)	64.3 (63.9,64.6)	63.2 (62.7,63.8)	65.5 (64.9,66.1)	66.2 (65.5,66.9)	68.2 (67.7,68.7)	61.3 (58.2,64.4)	65.2 (65.0,65.4)

Table S29: Vendor D test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor D (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	19.8 (19.4,20.1)	19.8 (19.3,20.3)	16.8 (16.5,17.2)	17.0 (16.4,17.6)	11.9 (10.8,13.2)	7.7 (7.3,8.1)	10.2 (9.9,10.4)	19.1 (18.7,19.4)	41.1 (40.4,41.8)	18.3 (18.1,18.5)
R1M0	46.8 (45.9,47.7)	54.9 (53.7,56.1)	53.5 (52.8,54.3)	52.9 (51.5,54.4)	44.8 (41.5,48.1)	45.3 (43.8,46.8)	46.7 (45.8,47.5)	52.7 (51.8,53.5)	63.7 (62.6,64.8)	51.6 (51.1,52.1)
R1M1	83.3 (82.2,84.5)	84.1 (82.9,85.2)	85.4 (84.6,86.1)	86.3 (84.8,87.7)	87.8 (83.8,91.1)	85.4 (83.7,86.9)	84.7 (83.9,85.6)	83.7 (82.8,84.6)	86.7 (85.4,88.0)	84.8 (84.2,85.3)
R2	98.7 (97.9,99.3)	97.9 (96.5,98.9)	98.9 (98.2,99.3)	98.9 (97.5,99.6)	97.9 (92.5,99.7)	99.1 (97.8,99.7)	98.8 (98.2,99.3)	98.2 (97.3,98.8)	99.4 (97.7,99.9)	98.7 (98.2,99.0)
<i>R2M0</i>	96.0 (93.1,97.9)	93.2 (88.1,96.5)	96.0 (93.6,97.7)	96.4 (91.8,98.8)	93.5 (78.6,99.2)	96.3 (91.6,98.8)	95.7 (93.2,97.5)	94.5 (91.5,96.7)	98.9 (94.3,100.0)	95.6 (94.1,96.8)
<i>R2M1</i>	99.7 (99.1,100.0)	99.4 (98.3,99.9)	99.8 (99.4,100.0)	99.7 (98.6,100.0)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	99.8 (99.4,100.0)	99.5 (98.8,99.8)	99.5 (97.5,100.0)	99.7 (99.5,99.9)
R3	98.1 (96.7,99.0)	98.7 (96.9,99.6)	99.0 (97.9,99.6)	96.9 (93.9,98.6)	100.0 (93.0,100.0)	98.9 (96.7,99.8)	98.6 (97.4,99.4)	98.0 (96.7,98.9)	97.8 (95.3,99.2)	98.3 (97.7,98.8)
<i>R3M0</i>	96.2 (93.6,98.0)	96.2 (91.4,98.8)	97.3 (94.4,98.9)	91.7 (84.2,96.3)	100.0 (78.2,100.0)	96.5 (90.1,99.3)	95.9 (92.3,98.1)	95.5 (92.7,97.5)	96.5 (92.6,98.7)	96.0 (94.4,97.2)
<i>R3M1</i>	100.0 (98.9,100.0)	100.0 (98.5,100.0)	100.0 (99.1,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	100.0 (99.2,100.0)	100.0 (99.1,100.0)	100.0 (96.4,100.0)	100.0 (99.7,100.0)
U	78.1 (76.2,79.8)	77.4 (74.8,79.7)	83.1 (81.3,84.8)	78.4 (74.9,81.5)	83.3 (68.6,93.0)	79.9 (72.1,86.3)	76.1 (73.0,79.1)	77.6 (75.8,79.2)	82.7 (81.1,84.2)	79.6 (78.5,80.6)
Combination grades*										
Any DR	62.1 (61.4,62.8)	69.5 (68.7,70.3)	68.3 (67.7,68.8)	67.8 (66.8,68.8)	61.4 (58.9,64.0)	62.9 (61.8,64.1)	64.0 (63.4,64.6)	67.0 (66.4,67.6)	73.7 (72.9,74.4)	66.7 (66.3,67.0)
Any DR (excluding U)	60.3 (59.6,61.0)	68.7 (67.8,69.6)	67.3 (66.7,67.8)	67.0 (65.9,68.0)	60.8 (58.2,63.4)	62.6 (61.4,63.7)	63.6 (62.9,64.2)	65.9 (65.3,66.5)	71.6 (70.7,72.5)	65.5 (65.2,65.9)
Referable DR	85.3 (84.5,86.1)	85.2 (84.3,86.1)	87.5 (86.9,88.1)	87.5 (86.4,88.6)	90.4 (87.6,92.8)	88.9 (87.7,90.0)	87.3 (86.6,87.9)	85.0 (84.4,85.7)	86.3 (85.4,87.2)	86.5 (86.1,86.9)
Referable DR (excluding U)	87.8 (87.0,88.6)	87.1 (86.1,88.0)	88.3 (87.6,88.9)	89.4 (88.2,90.5)	91.0 (88.1,93.4)	89.3 (88.1,90.5)	88.3 (87.6,88.9)	87.0 (86.3,87.7)	88.9 (87.8,90.0)	88.1 (87.6,88.5)
No referable DR	25.6 (25.2,26.0)	28.0 (27.5,28.6)	25.8 (25.5,26.1)	25.2 (24.6,25.7)	20.0 (18.7,21.3)	16.0 (15.5,16.5)	18.7 (18.4,19.0)	26.7 (26.3,27.0)	46.6 (46.0,47.2)	26.0 (25.8,26.2)

Table S30: Vendor D Test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	Test positive % for Vendor D (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	15.9 (15.7,16.2)	20.8 (20.5,21.1)	19.2 (18.8,19.5)	18.0 (17.5,18.5)	18.7 (18.1,19.3)	17.5 (16.9,18.1)	17.3 (16.8,17.7)	14.1 (11.7,16.8)	18.3 (18.1,18.5)
R1M0	49.6 (48.9,50.2)	54.2 (53.5,55.0)	53.3 (52.5,54.1)	52.6 (51.4,53.7)	52.9 (51.6,54.2)	50.7 (49.2,52.2)	47.1 (46.0,48.3)	47.2 (40.7,53.8)	51.6 (51.1,52.1)
R1M1	84.4 (83.7,85.1)	85.2 (84.4,86.0)	85.9 (85.1,86.7)	86.0 (84.8,87.1)	84.5 (83.1,85.9)	83.6 (81.9,85.1)	82.0 (80.6,83.3)	85.4 (77.1,91.6)	84.8 (84.2,85.3)
R2	98.7 (98.2,99.1)	98.5 (97.8,99.1)	98.1 (97.2,98.7)	99.0 (98.0,99.6)	98.8 (97.6,99.5)	99.3 (98.0,99.9)	98.8 (97.7,99.5)	100.0 (83.9,100.0)	98.7 (98.2,99.0)
<i>R2M0</i>	95.8 (94.0,97.2)	95.2 (92.4,97.2)	93.4 (90.3,95.8)	96.6 (93.0,98.6)	95.9 (91.3,98.5)	97.4 (92.6,99.5)	97.2 (93.7,99.1)	100.0 (39.8,100.0)	95.6 (94.1,96.8)
<i>R2M1</i>	99.7 (99.4,99.9)	99.7 (99.1,99.9)	99.7 (99.1,99.9)	99.8 (99.1,100.0)	99.8 (98.8,100.0)	100.0 (98.8,100.0)	99.4 (98.2,99.9)	100.0 (80.5,100.0)	99.7 (99.5,99.9)
R3	98.3 (97.4,98.9)	98.4 (97.2,99.2)	98.7 (97.6,99.4)	97.3 (95.0,98.7)	98.9 (96.9,99.8)	99.2 (97.1,99.9)	97.5 (95.3,98.9)	100.0 (76.8,100.0)	98.3 (97.7,98.8)
<i>R3M0</i>	95.6 (93.4,97.3)	96.5 (94.0,98.2)	96.8 (93.9,98.5)	93.3 (88.0,96.7)	97.5 (92.8,99.5)	98.0 (93.1,99.8)	94.8 (90.4,97.6)	100.0 (47.8,100.0)	96.0 (94.4,97.2)
<i>R3M1</i>	100.0 (99.5,100.0)	100.0 (99.1,100.0)	100.0 (99.1,100.0)	100.0 (98.3,100.0)	100.0 (97.8,100.0)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	100.0 (99.7,100.0)
U	78.0 (76.4,79.6)	81.0 (79.5,82.4)	82.3 (80.6,84.0)	81.4 (78.7,83.9)	81.3 (78.4,83.9)	77.1 (73.5,80.4)	73.6 (71.1,76.0)	94.4 (81.3,99.3)	79.6 (78.5,80.6)
Combination grades*									
Any DR	65.5 (65.0,66.0)	68.1 (67.6,68.7)	68.0 (67.5,68.6)	67.9 (67.1,68.7)	67.6 (66.7,68.5)	65.7 (64.6,66.7)	62.6 (61.8,63.5)	65.6 (60.8,70.2)	66.7 (66.3,67.0)
Any DR (excluding U)	64.6 (64.1,65.0)	66.8 (66.2,67.3)	66.8 (66.2,67.4)	66.9 (66.0,67.7)	66.4 (65.4,67.4)	64.7 (63.6,65.8)	61.4 (60.6,62.3)	62.8 (57.7,67.7)	65.5 (65.2,65.9)
Referable DR	86.5 (86.0,87.0)	86.4 (85.8,87.0)	87.6 (87.0,88.2)	87.9 (87.0,88.7)	86.8 (85.8,87.8)	85.6 (84.3,86.7)	83.1 (82.1,84.1)	90.2 (84.8,94.2)	86.5 (86.1,86.9)
Referable DR (excluding U)	88.2 (87.6,88.7)	87.9 (87.3,88.5)	88.7 (88.1,89.4)	89.2 (88.2,90.0)	88.1 (87.0,89.1)	87.4 (86.1,88.6)	85.9 (84.8,86.9)	89.1 (82.7,93.8)	88.1 (87.6,88.5)
No referable DR	24.2 (24.0,24.5)	28.0 (27.7,28.3)	27.2 (26.9,27.6)	26.1 (25.6,26.6)	26.6 (26.1,27.2)	25.3 (24.7,25.9)	23.8 (23.4,24.3)	22.0 (19.4,24.7)	26.0 (25.8,26.2)

Table S31: Vendor E test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor E (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	68.2 (67.8,68.7)	65.6 (65.0,66.2)	64.4 (64.0,64.9)	64.4 (63.6,65.1)	79.7 (78.2,81.2)	59.9 (59.2,60.7)	59.2 (58.7,59.6)	66.5 (66.1,66.9)	80.3 (79.8,80.9)	65.9 (65.6,66.1)
R1M0	97.4 (97.1,97.6)	96.3 (95.8,96.7)	97.2 (96.9,97.4)	97.3 (96.8,97.8)	98.0 (96.9,98.8)	96.3 (95.7,96.9)	96.9 (96.6,97.2)	97.0 (96.7,97.2)	98.1 (97.8,98.4)	97.1 (96.9,97.3)
R1M1	99.2 (98.9,99.5)	98.1 (97.7,98.5)	98.7 (98.4,98.9)	99.1 (98.6,99.4)	99.7 (98.3,100.0)	98.8 (98.2,99.2)	98.8 (98.5,99.0)	98.7 (98.5,99.0)	98.5 (98.0,98.9)	98.7 (98.6,98.9)
R2	99.9 (99.5,100.0)	99.7 (98.9,100.0)	99.9 (99.5,100.0)	100.0 (99.3,100.0)	100.0 (96.2,100.0)	100.0 (99.3,100.0)	99.8 (99.5,100.0)	99.8 (99.4,100.0)	100.0 (98.8,100.0)	99.9 (99.7,100.0)
<i>R2M0</i>	99.7 (98.2,100.0)	98.8 (95.6,99.8)	99.5 (98.2,99.9)	100.0 (97.4,100.0)	100.0 (88.8,100.0)	100.0 (97.3,100.0)	99.2 (97.8,99.8)	99.4 (97.9,99.9)	100.0 (96.2,100.0)	99.5 (98.8,99.8)
<i>R2M1</i>	100.0 (99.5,100.0)	100.0 (99.3,100.0)	100.0 (99.7,100.0)	100.0 (99.1,100.0)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	100.0 (99.7,100.0)	100.0 (99.6,100.0)	100.0 (98.4,100.0)	100.0 (99.9,100.0)
R3	99.7 (98.9,100.0)	100.0 (99.0,100.0)	99.7 (98.9,100.0)	99.2 (97.2,99.9)	100.0 (93.0,100.0)	99.2 (97.3,99.9)	99.8 (99.1,100.0)	99.7 (99.0,100.0)	99.6 (98.0,100.0)	99.7 (99.3,99.9)
<i>R3M0</i>	99.4 (97.9,99.9)	100.0 (97.2,100.0)	99.2 (97.2,99.9)	97.9 (92.7,99.7)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	99.5 (97.5,100.0)	99.4 (97.9,99.9)	99.4 (96.8,100.0)	99.3 (98.4,99.7)
<i>R3M1</i>	100.0 (98.9,100.0)	100.0 (98.5,100.0)	100.0 (99.1,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	100.0 (99.2,100.0)	100.0 (99.1,100.0)	100.0 (96.4,100.0)	100.0 (99.7,100.0)
U	93.8 (92.7,94.8)	91.4 (89.6,92.9)	95.1 (94.0,96.0)	92.6 (90.3,94.6)	95.2 (83.8,99.4)	93.3 (87.6,96.9)	93.0 (91.0,94.6)	91.9 (90.7,93.0)	95.4 (94.5,96.2)	93.6 (92.9,94.2)
Combination grades*										
Any DR	97.6 (97.4,97.8)	96.7 (96.4,97.0)	97.7 (97.5,97.9)	97.7 (97.3,98.0)	98.5 (97.8,99.1)	97.3 (96.9,97.7)	97.6 (97.4,97.8)	97.2 (97.0,97.4)	97.8 (97.5,98.0)	97.5 (97.4,97.6)
Any DR (excluding U)	98.0 (97.8,98.2)	97.2 (96.9,97.5)	97.9 (97.7,98.0)	98.1 (97.7,98.4)	98.6 (97.9,99.2)	97.4 (97.0,97.8)	97.8 (97.6,98.0)	97.8 (97.6,97.9)	98.3 (98.1,98.6)	97.8 (97.7,97.9)
Referable DR	98.0 (97.6,98.3)	97.1 (96.7,97.5)	98.4 (98.1,98.6)	98.1 (97.6,98.5)	99.4 (98.3,99.9)	98.8 (98.3,99.2)	98.5 (98.3,98.8)	97.5 (97.2,97.8)	97.4 (96.9,97.8)	98.0 (97.8,98.1)
Referable DR (excluding U)	99.4 (99.2,99.6)	98.5 (98.1,98.8)	98.9 (98.7,99.1)	99.2 (98.9,99.5)	99.8 (98.8,100.0)	99.1 (98.6,99.4)	99.0 (98.8,99.2)	99.0 (98.8,99.2)	98.7 (98.3,99.1)	99.0 (98.9,99.1)
No referable DR	74.5 (74.2,74.9)	72.8 (72.3,73.3)	72.5 (72.1,72.8)	71.9 (71.2,72.5)	84.2 (83.0,85.4)	68.0 (67.3,68.6)	68.0 (67.6,68.4)	73.4 (73.1,73.8)	84.7 (84.3,85.1)	73.1 (72.9,73.3)

Table S32: Vendor E test positive rates by sex and quintiles of IMD

Final human grade in worst eye	Test positive % for Vendor E (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	65.2 (64.8,65.6)	66.6 (66.3,67.0)	65.1 (64.7,65.5)	64.8 (64.2,65.4)	66.0 (65.3,66.7)	67.2 (66.5,68.0)	67.5 (66.9,68.1)	64.0 (60.5,67.5)	65.9 (65.6,66.1)
R1M0	97.2 (97.0,97.4)	97.0 (96.7,97.3)	97.2 (96.9,97.5)	97.1 (96.7,97.5)	97.1 (96.6,97.5)	97.0 (96.4,97.5)	97.0 (96.6,97.4)	97.9 (95.1,99.3)	97.1 (96.9,97.3)
R1M1	98.9 (98.6,99.1)	98.6 (98.3,98.8)	98.8 (98.5,99.1)	98.7 (98.2,99.0)	98.5 (97.9,98.9)	98.9 (98.4,99.3)	98.7 (98.3,99.1)	99.0 (94.7,100.0)	98.7 (98.6,98.9)
R2	99.9 (99.7,100.0)	99.8 (99.4,100.0)	99.9 (99.5,100.0)	99.8 (99.1,100.0)	100.0 (99.4,100.0)	99.8 (98.7,100.0)	100.0 (99.5,100.0)	100.0 (83.9,100.0)	99.9 (99.7,100.0)
<i>R2M0</i>	99.7 (98.9,100.0)	99.1 (97.5,99.8)	99.4 (98.0,99.9)	99.0 (96.5,99.9)	100.0 (97.5,100.0)	99.1 (95.3,100.0)	100.0 (98.0,100.0)	100.0 (39.8,100.0)	99.5 (98.8,99.8)
<i>R2M1</i>	100.0 (99.8,100.0)	100.0 (99.6,100.0)	100.0 (99.6,100.0)	100.0 (99.4,100.0)	100.0 (99.2,100.0)	100.0 (98.8,100.0)	100.0 (99.3,100.0)	100.0 (80.5,100.0)	100.0 (99.9,100.0)
R3	99.8 (99.3,99.9)	99.6 (98.8,99.9)	99.7 (99.0,100.0)	99.5 (98.0,99.9)	100.0 (98.7,100.0)	100.0 (98.5,100.0)	99.4 (98.0,99.9)	100.0 (76.8,100.0)	99.7 (99.3,99.9)
<i>R3M0</i>	99.4 (98.2,99.9)	99.1 (97.5,99.8)	99.3 (97.4,99.9)	98.7 (95.2,99.8)	100.0 (96.9,100.0)	100.0 (96.4,100.0)	98.8 (95.9,99.9)	100.0 (47.8,100.0)	99.3 (98.4,99.7)
<i>R3M1</i>	100.0 (99.5,100.0)	100.0 (99.1,100.0)	100.0 (99.1,100.0)	100.0 (98.3,100.0)	100.0 (97.8,100.0)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	100.0 (99.7,100.0)
U	93.0 (92.0,94.0)	94.1 (93.2,94.9)	94.2 (93.1,95.2)	94.1 (92.4,95.5)	94.4 (92.6,95.9)	92.4 (89.9,94.4)	92.2 (90.6,93.6)	97.2 (85.5,99.9)	93.6 (92.9,94.2)
Combination grades*									
Any DR	97.6 (97.5,97.8)	97.3 (97.2,97.5)	97.6 (97.4,97.8)	97.5 (97.2,97.8)	97.5 (97.2,97.8)	97.4 (97.0,97.7)	97.2 (96.9,97.5)	98.3 (96.5,99.3)	97.5 (97.4,97.6)
Any DR (excluding U)	97.9 (97.8,98.1)	97.7 (97.5,97.9)	97.9 (97.7,98.1)	97.8 (97.5,98.1)	97.8 (97.4,98.1)	97.8 (97.5,98.1)	97.8 (97.5,98.0)	98.4 (96.5,99.4)	97.8 (97.7,97.9)
Referable DR	98.2 (97.9,98.4)	97.8 (97.5,98.0)	98.2 (97.9,98.4)	98.1 (97.7,98.5)	98.0 (97.6,98.4)	97.9 (97.4,98.4)	97.5 (97.0,97.9)	98.9 (95.9,99.9)	98.0 (97.8,98.1)
Referable DR (excluding U)	99.1 (99.0,99.3)	98.8 (98.6,99.0)	99.0 (98.8,99.2)	98.9 (98.6,99.2)	98.9 (98.5,99.2)	99.2 (98.8,99.5)	99.0 (98.6,99.3)	99.3 (96.0,100.0)	99.0 (98.9,99.1)
No referable DR	73.1 (72.8,73.4)	73.1 (72.8,73.4)	72.6 (72.3,73.0)	72.4 (71.9,72.9)	73.2 (72.6,73.8)	74.2 (73.6,74.9)	74.0 (73.5,74.5)	72.1 (69.2,74.9)	73.1 (72.9,73.3)

Table S33: Vendor F test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor F (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	27.1 (26.7,27.5)	26.2 (25.6,26.8)	22.2 (21.8,22.5)	22.4 (21.8,23.1)	16.0 (14.7,17.4)	11.4 (10.9,11.9)	14.7 (14.3,15.0)	26.3 (25.9,26.7)	50.3 (49.7,51.0)	24.5 (24.3,24.7)
R1M0	72.8 (72.0,73.6)	67.9 (66.7,69.0)	71.8 (71.1,72.5)	70.4 (69.1,71.7)	70.5 (67.4,73.4)	69.4 (68.0,70.8)	67.9 (67.1,68.7)	71.5 (70.7,72.2)	78.6 (77.6,79.5)	71.3 (70.8,71.7)
R1M1	93.3 (92.5,94.0)	88.1 (87.0,89.1)	90.1 (89.5,90.8)	90.9 (89.6,92.0)	97.3 (95.0,98.8)	90.6 (89.2,91.9)	90.4 (89.7,91.1)	89.6 (88.9,90.4)	92.2 (91.1,93.2)	90.5 (90.1,90.9)
R2	99.6 (99.1,99.9)	96.9 (95.3,98.1)	99.2 (98.7,99.6)	98.5 (97.0,99.3)	98.9 (94.2,100.0)	99.4 (98.4,99.9)	98.9 (98.3,99.3)	98.2 (97.4,98.9)	100.0 (98.8,100.0)	98.8 (98.5,99.2)
<i>R2M0</i>	98.7 (96.6,99.6)	91.9 (86.6,95.6)	97.3 (95.1,98.6)	95.7 (90.8,98.4)	96.8 (83.3,99.9)	97.8 (93.6,99.5)	96.9 (94.7,98.4)	94.8 (91.9,96.9)	100.0 (96.2,100.0)	96.6 (95.3,97.6)
<i>R2M1</i>	100.0 (99.5,100.0)	98.4 (97.0,99.3)	99.9 (99.5,100.0)	99.5 (98.1,99.9)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	99.5 (99.0,99.8)	99.5 (98.8,99.8)	100.0 (98.4,100.0)	99.6 (99.3,99.8)
R3	97.8 (96.4,98.8)	97.9 (95.8,99.1)	98.4 (97.1,99.2)	95.7 (92.4,97.8)	100.0 (93.0,100.0)	98.1 (95.6,99.4)	98.2 (96.8,99.0)	97.2 (95.7,98.2)	97.4 (94.8,99.0)	97.7 (97.0,98.3)
<i>R3M0</i>	95.9 (93.2,97.8)	95.5 (90.4,98.3)	96.9 (93.9,98.6)	91.7 (84.2,96.3)	100.0 (78.2,100.0)	96.5 (90.1,99.3)	95.0 (91.2,97.5)	95.2 (92.3,97.2)	96.5 (92.6,98.7)	95.6 (94.0,96.9)
<i>R3M1</i>	99.7 (98.3,100.0)	99.2 (97.0,99.9)	99.3 (97.9,99.9)	98.1 (94.6,99.6)	100.0 (90.3,100.0)	98.9 (96.0,99.9)	99.8 (98.7,100.0)	98.8 (97.1,99.6)	99.0 (94.6,100.0)	99.2 (98.5,99.6)
U	85.6 (84.0,87.1)	85.0 (82.9,87.1)	87.3 (85.7,88.8)	85.3 (82.2,87.9)	92.9 (80.5,98.5)	82.1 (74.5,88.2)	83.9 (81.2,86.4)	83.5 (82.0,85.0)	89.3 (88.0,90.6)	86.0 (85.1,86.9)
Combination grades*										
Any DR	80.7 (80.1,81.2)	78.1 (77.3,78.8)	80.3 (79.8,80.7)	79.4 (78.6,80.3)	80.3 (78.2,82.4)	78.8 (77.8,79.7)	78.1 (77.6,78.6)	79.6 (79.1,80.1)	84.4 (83.7,85.0)	79.9 (79.6,80.2)
Any DR (excluding U)	80.1 (79.5,80.7)	77.3 (76.6,78.1)	79.8 (79.3,80.3)	79.0 (78.1,79.9)	80.0 (77.8,82.0)	78.7 (77.7,79.7)	77.9 (77.3,78.4)	79.2 (78.7,79.7)	83.2 (82.5,84.0)	79.4 (79.0,79.7)
Referable DR	92.6 (92.0,93.2)	89.1 (88.3,89.9)	91.3 (90.8,91.8)	91.3 (90.4,92.2)	97.5 (95.8,98.7)	92.5 (91.5,93.5)	91.8 (91.2,92.3)	89.9 (89.3,90.4)	91.7 (91.0,92.4)	91.2 (90.9,91.5)
Referable DR (excluding U)	95.0 (94.4,95.5)	90.0 (89.2,90.9)	92.0 (91.5,92.5)	92.6 (91.6,93.5)	97.9 (96.2,99.0)	93.1 (92.0,94.0)	92.5 (91.9,93.0)	91.5 (90.9,92.1)	93.5 (92.5,94.3)	92.4 (92.1,92.7)
Non-referable	37.0 (36.6,37.4)	36.0 (35.4,36.5)	34.3 (34.0,34.7)	33.3 (32.7,33.9)	29.4 (27.9,30.9)	24.2 (23.6,24.8)	27.1 (26.7,27.5)	36.5 (36.2,36.9)	57.2 (56.6,57.8)	35.3 (35.1,35.6)

Table S34: Vendor F test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	Test positive % for Vendor F (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	22.5 (22.2,22.8)	26.6 (26.3,27.0)	25.2 (24.8,25.6)	24.0 (23.4,24.5)	24.7 (24.1,25.4)	23.7 (23.0,24.4)	24.0 (23.5,24.6)	19.1 (16.3,22.1)	24.5 (24.3,24.7)
R1M0	70.6 (70.0,71.2)	72.1 (71.4,72.8)	72.4 (71.7,73.1)	71.1 (70.1,72.2)	71.4 (70.3,72.6)	72.3 (70.9,73.6)	68.4 (67.4,69.5)	73.8 (67.7,79.3)	71.3 (70.8,71.7)
R1M1	90.9 (90.3,91.5)	90.0 (89.4,90.7)	91.1 (90.4,91.8)	90.4 (89.3,91.4)	90.1 (88.9,91.2)	90.4 (89.1,91.7)	89.9 (88.9,91.0)	86.4 (78.2,92.4)	90.5 (90.1,90.9)
R2	98.9 (98.4,99.3)	98.8 (98.0,99.3)	98.7 (98.0,99.3)	98.9 (97.9,99.5)	98.5 (97.2,99.3)	99.3 (98.0,99.9)	99.0 (97.9,99.6)	100.0 (83.9,100.0)	98.8 (98.5,99.2)
<i>R2M0</i>	96.5 (94.7,97.7)	96.9 (94.5,98.4)	96.0 (93.4,97.8)	96.1 (92.4,98.3)	95.2 (90.4,98.1)	97.4 (92.6,99.5)	98.9 (96.1,99.9)	100.0 (39.8,100.0)	96.6 (95.3,97.6)
<i>R2M1</i>	99.7 (99.4,99.9)	99.4 (98.7,99.8)	99.7 (99.1,99.9)	99.8 (99.1,100.0)	99.6 (98.4,99.9)	100.0 (98.8,100.0)	99.0 (97.7,99.7)	100.0 (80.5,100.0)	99.6 (99.3,99.8)
R3	98.1 (97.2,98.8)	97.0 (95.5,98.1)	98.6 (97.4,99.3)	94.8 (92.0,96.9)	97.9 (95.4,99.2)	99.2 (97.1,99.9)	97.8 (95.7,99.0)	100.0 (76.8,100.0)	97.7 (97.0,98.3)
<i>R3M0</i>	96.1 (93.9,97.6)	95.1 (92.2,97.1)	96.4 (93.5,98.3)	90.6 (84.7,94.8)	96.6 (91.6,99.1)	99.0 (94.7,100.0)	96.0 (91.8,98.4)	100.0 (47.8,100.0)	95.6 (94.0,96.9)
<i>R3M1</i>	99.5 (98.6,99.9)	98.7 (97.1,99.6)	100.0 (99.1,100.0)	97.7 (94.7,99.3)	98.8 (95.7,99.9)	99.3 (96.2,100.0)	99.5 (97.1,100.0)	100.0 (66.4,100.0)	99.2 (98.5,99.6)
U	84.8 (83.4,86.1)	87.1 (85.9,88.3)	87.8 (86.3,89.2)	87.8 (85.5,89.9)	86.8 (84.2,89.0)	83.1 (79.8,86.0)	82.5 (80.3,84.6)	97.2 (85.5,99.9)	86.0 (85.1,86.9)
Combination grades*									
Any DR	79.7 (79.3,80.1)	80.1 (79.7,80.6)	80.8 (80.3,81.3)	80.0 (79.3,80.7)	80.0 (79.2,80.7)	80.3 (79.4,81.1)	77.7 (76.9,78.4)	81.3 (77.2,85.0)	79.9 (79.6,80.2)
Any DR (excluding U)	79.3 (78.9,79.7)	79.4 (78.9,79.9)	80.2 (79.7,80.7)	79.4 (78.6,80.1)	79.4 (78.5,80.2)	80.0 (79.1,81.0)	77.1 (76.4,77.9)	79.8 (75.3,83.8)	79.4 (79.0,79.7)
Referable DR	91.7 (91.2,92.1)	90.7 (90.2,91.2)	91.9 (91.4,92.4)	91.5 (90.7,92.2)	91.1 (90.2,91.9)	90.9 (89.9,91.8)	89.9 (89.0,90.6)	91.4 (86.2,95.1)	91.2 (90.9,91.5)
Referable DR (excluding U)	93.0 (92.5,93.4)	91.7 (91.1,92.2)	92.8 (92.3,93.3)	92.2 (91.4,93.0)	92.1 (91.2,93.0)	92.6 (91.6,93.6)	92.0 (91.2,92.8)	89.9 (83.6,94.3)	92.4 (92.1,92.7)
Non-referable	34.4 (34.1,34.7)	36.4 (36.0,36.7)	36.3 (36.0,36.7)	35.1 (34.5,35.6)	35.5 (34.9,36.1)	35.1 (34.4,35.8)	33.8 (33.3,34.3)	32.1 (29.2,35.1)	35.3 (35.1,35.6)

Table S35: Vendor G test positive rates by ethnicity and age

Final human grade in worst eye	Test positive % for Vendor G (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	23.0 (22.6,23.4)	22.7 (22.2,23.3)	18.6 (18.2,18.9)	19.1 (18.5,19.7)	15.7 (14.4,17.1)	8.1 (7.7,8.6)	11.1 (10.8,11.4)	22.3 (21.9,22.6)	46.5 (45.8,47.1)	20.8 (20.6,21.0)
R1M0	57.8 (57.0,58.7)	60.6 (59.4,61.8)	61.9 (61.1,62.6)	60.3 (58.9,61.7)	55.2 (51.9,58.5)	52.7 (51.2,54.2)	55.1 (54.2,55.9)	61.7 (60.9,62.5)	72.3 (71.2,73.3)	60.2 (59.8,60.7)
R1M1	88.5 (87.5,89.4)	84.7 (83.5,85.8)	87.7 (87.0,88.4)	87.2 (85.7,88.5)	90.1 (86.4,93.1)	86.5 (84.9,88.0)	86.5 (85.6,87.3)	87.0 (86.2,87.8)	89.8 (88.6,91.0)	87.2 (86.7,87.7)
R2	99.3 (98.6,99.7)	97.9 (96.5,98.9)	99.3 (98.8,99.7)	99.6 (98.6,100.0)	98.9 (94.2,100.0)	99.4 (98.4,99.9)	99.3 (98.7,99.6)	98.6 (97.8,99.2)	99.7 (98.3,100.0)	99.1 (98.7,99.4)
<i>R2M0</i>	97.3 (94.8,98.8)	93.8 (88.9,97.0)	98.0 (96.1,99.1)	98.6 (94.9,99.8)	96.8 (83.3,99.9)	97.8 (93.6,99.5)	97.2 (95.0,98.6)	96.2 (93.6,98.0)	100.0 (96.2,100.0)	97.2 (96.0,98.1)
<i>R2M1</i>	100.0 (99.5,100.0)	99.2 (98.0,99.8)	99.7 (99.3,99.9)	100.0 (99.1,100.0)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	99.9 (99.6,100.0)	99.5 (98.8,99.8)	99.5 (97.5,100.0)	99.8 (99.5,99.9)
R3	98.1 (96.7,99.0)	98.9 (97.3,99.7)	99.0 (97.9,99.6)	97.6 (94.9,99.1)	100.0 (93.0,100.0)	98.5 (96.1,99.6)	99.1 (98.0,99.7)	98.4 (97.2,99.2)	97.1 (94.3,98.7)	98.5 (97.8,99.0)
<i>R3M0</i>	96.2 (93.6,98.0)	97.7 (93.5,99.5)	97.3 (94.4,98.9)	93.8 (86.9,97.7)	100.0 (78.2,100.0)	95.3 (88.5,98.7)	97.3 (94.1,99.0)	96.4 (93.8,98.1)	95.9 (91.8,98.3)	96.5 (95.0,97.6)
<i>R3M1</i>	100.0 (98.9,100.0)	99.6 (97.7,100.0)	100.0 (99.1,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	100.0 (99.2,100.0)	100.0 (99.1,100.0)	99.0 (94.6,100.0)	99.9 (99.5,100.0)
U	83.8 (82.1,85.3)	80.5 (78.1,82.7)	85.2 (83.5,86.8)	82.7 (79.5,85.6)	88.1 (74.4,96.0)	81.3 (73.7,87.5)	80.5 (77.6,83.2)	81.0 (79.4,82.6)	86.9 (85.4,88.2)	83.4 (82.4,84.4)
Combination grades*										
Any DR	70.5 (69.8,71.1)	72.9 (72.1,73.7)	73.8 (73.3,74.3)	72.6 (71.7,73.6)	68.9 (66.4,71.3)	67.7 (66.6,68.8)	69.5 (68.9,70.1)	73.2 (72.7,73.8)	79.9 (79.2,80.6)	72.5 (72.2,72.9)
Any DR (excluding U)	69.0 (68.3,69.6)	72.2 (71.3,73.0)	73.1 (72.5,73.6)	71.8 (70.8,72.8)	68.3 (65.8,70.7)	67.4 (66.3,68.5)	69.1 (68.5,69.7)	72.5 (71.9,73.0)	78.3 (77.5,79.1)	71.6 (71.2,71.9)
Referable DR	89.6 (88.9,90.2)	86.3 (85.4,87.1)	89.4 (88.9,90.0)	88.9 (87.9,89.9)	92.5 (89.9,94.6)	89.8 (88.6,90.9)	88.9 (88.3,89.5)	87.8 (87.2,88.4)	89.5 (88.7,90.3)	88.8 (88.4,89.1)
Referable DR (excluding U)	91.5 (90.8,92.2)	87.6 (86.7,88.5)	90.2 (89.6,90.7)	90.2 (89.1,91.3)	92.9 (90.2,95.0)	90.2 (89.0,91.3)	89.7 (89.0,90.3)	89.6 (88.9,90.2)	91.4 (90.4,92.4)	90.0 (89.6,90.4)
No referable DR	30.5 (30.2,30.9)	31.6 (31.1,32.2)	29.2 (28.8,29.5)	28.5 (27.9,29.1)	25.4 (24.0,26.8)	18.0 (17.4,18.5)	21.3 (21.0,21.7)	31.2 (30.8,31.6)	52.8 (52.2,53.3)	29.9 (29.7,30.1)

Table S36: Vendor G test positive rates by sex and quintiles of IMD

Final human grade in worst eye	Test positive % for Vendor G (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	18.6 (18.3,18.9)	23.1 (22.8,23.5)	21.7 (21.3,22.1)	20.5 (19.9,21.0)	21.1 (20.5,21.7)	19.6 (19.0,20.3)	20.0 (19.5,20.5)	16.0 (13.4,18.8)	20.8 (20.6,21.0)
R1M0	59.2 (58.5,59.8)	61.6 (60.9,62.3)	61.6 (60.8,62.3)	60.9 (59.8,62.1)	61.2 (59.9,62.5)	59.7 (58.3,61.2)	56.5 (55.4,57.6)	60.9 (54.4,67.2)	60.2 (59.8,60.7)
R1M1	87.5 (86.9,88.1)	86.8 (86.0,87.5)	88.0 (87.2,88.7)	87.7 (86.6,88.8)	86.8 (85.4,88.0)	85.7 (84.1,87.2)	86.2 (85.0,87.4)	86.4 (78.2,92.4)	87.2 (86.7,87.7)
R2	99.2 (98.7,99.5)	99.0 (98.3,99.4)	98.7 (98.0,99.3)	99.1 (98.2,99.6)	99.2 (98.1,99.7)	99.3 (98.0,99.9)	99.6 (98.7,99.9)	100.0 (83.9,100.0)	99.1 (98.7,99.4)
<i>R2M0</i>	97.1 (95.5,98.2)	97.4 (95.2,98.8)	95.7 (93.0,97.6)	97.0 (93.7,98.9)	97.3 (93.1,99.2)	97.4 (92.6,99.5)	100.0 (98.0,100.0)	100.0 (39.8,100.0)	97.2 (96.0,98.1)
<i>R2M1</i>	99.9 (99.6,100.0)	99.5 (98.9,99.8)	99.8 (99.3,100.0)	99.8 (99.1,100.0)	99.8 (98.8,100.0)	100.0 (98.8,100.0)	99.4 (98.2,99.9)	100.0 (80.5,100.0)	99.8 (99.5,99.9)
R3	98.3 (97.4,98.9)	98.8 (97.7,99.4)	98.7 (97.6,99.4)	97.5 (95.4,98.9)	98.9 (96.9,99.8)	99.6 (97.8,100.0)	97.8 (95.7,99.0)	100.0 (76.8,100.0)	98.5 (97.8,99.0)
<i>R3M0</i>	95.9 (93.7,97.4)	97.4 (95.1,98.8)	96.8 (93.9,98.5)	94.0 (88.8,97.2)	98.3 (94.1,99.8)	99.0 (94.7,100.0)	95.4 (91.1,98.0)	100.0 (47.8,100.0)	96.5 (95.0,97.6)
<i>R3M1</i>	99.9 (99.3,100.0)	100.0 (99.1,100.0)	100.0 (99.1,100.0)	100.0 (98.3,100.0)	99.4 (96.6,100.0)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	99.9 (99.5,100.0)
U	82.4 (80.9,83.8)	84.4 (83.1,85.7)	85.8 (84.2,87.3)	84.9 (82.4,87.1)	85.3 (82.6,87.6)	80.7 (77.3,83.8)	78.5 (76.1,80.7)	94.4 (81.3,99.3)	83.4 (82.4,84.4)
Combination grades*									
Any DR	72.1 (71.7,72.6)	73.1 (72.6,73.6)	73.6 (73.1,74.2)	73.4 (72.6,74.2)	73.2 (72.4,74.1)	71.7 (70.7,72.7)	69.6 (68.8,70.3)	73.7 (69.1,77.9)	72.5 (72.2,72.9)
Any DR (excluding U)	71.4 (70.9,71.8)	71.9 (71.4,72.4)	72.6 (72.0,73.2)	72.5 (71.7,73.3)	72.2 (71.2,73.1)	70.9 (69.9,72.0)	68.6 (67.7,69.4)	71.7 (66.8,76.2)	71.6 (71.2,71.9)
Referable DR	89.2 (88.7,89.7)	88.2 (87.6,88.7)	89.6 (89.0,90.2)	89.6 (88.7,90.4)	89.0 (88.0,89.9)	87.6 (86.4,88.7)	86.8 (85.9,87.7)	90.8 (85.5,94.7)	88.8 (88.4,89.1)
Referable DR (excluding U)	90.5 (90.0,91.0)	89.3 (88.6,89.8)	90.4 (89.8,91.0)	90.5 (89.6,91.3)	89.8 (88.8,90.8)	89.1 (87.9,90.2)	89.2 (88.3,90.2)	89.9 (83.6,94.3)	90.0 (89.6,90.4)
No referable DR	28.6 (28.3,28.9)	31.4 (31.1,31.7)	31.1 (30.7,31.5)	30.0 (29.5,30.5)	30.4 (29.8,31.0)	29.0 (28.4,29.7)	28.0 (27.5,28.5)	26.7 (23.9,29.6)	29.9 (29.7,30.1)

Table S37: Vendor H test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor H (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	37.5 (37.0,37.9)	27.5 (26.9,28.1)	21.6 (21.3,22.0)	24.3 (23.7,25.0)	34.4 (32.7,36.2)	14.6 (14.0,15.1)	16.2 (15.9,16.6)	30.1 (29.7,30.5)	56.7 (56.0,57.3)	28.2 (28.0,28.4)
R1M0	57.2 (56.3,58.1)	51.1 (49.8,52.3)	50.5 (49.7,51.3)	50.5 (49.1,51.9)	53.5 (50.2,56.8)	44.6 (43.1,46.1)	46.0 (45.1,46.8)	52.9 (52.1,53.7)	69.7 (68.6,70.7)	52.6 (52.2,53.1)
R1M1	87.3 (86.2,88.3)	79.8 (78.5,81.0)	83.5 (82.7,84.3)	83.5 (81.9,85.0)	87.5 (83.4,90.8)	82.1 (80.3,83.7)	82.4 (81.5,83.3)	82.9 (82.0,83.8)	89.2 (87.9,90.4)	83.6 (83.0,84.1)
R2	98.6 (97.7,99.2)	95.1 (93.2,96.6)	97.0 (96.0,97.8)	97.1 (95.3,98.4)	96.8 (91.0,99.3)	97.7 (96.1,98.8)	96.8 (95.8,97.6)	96.8 (95.7,97.7)	99.4 (97.7,99.9)	97.1 (96.6,97.6)
<i>R2M0</i>	95.7 (92.7,97.7)	80.7 (73.8,86.5)	91.3 (88.0,93.8)	90.6 (84.5,94.9)	90.3 (74.2,98.0)	91.9 (85.9,95.9)	89.1 (85.5,92.0)	90.1 (86.5,93.1)	98.9 (94.3,100.0)	90.8 (88.8,92.5)
<i>R2M1</i>	99.7 (99.1,100.0)	99.6 (98.6,100.0)	98.9 (98.1,99.4)	99.5 (98.1,99.9)	100.0 (94.3,100.0)	99.7 (98.6,100.0)	99.2 (98.5,99.6)	99.3 (98.5,99.7)	99.5 (97.5,100.0)	99.3 (99.0,99.6)
R3	97.6 (96.2,98.6)	98.9 (97.3,99.7)	98.5 (97.3,99.3)	97.6 (94.9,99.1)	100.0 (93.0,100.0)	98.9 (96.7,99.8)	98.0 (96.6,98.9)	98.0 (96.7,98.9)	98.2 (95.8,99.4)	98.2 (97.5,98.7)
<i>R3M0</i>	95.9 (93.2,97.8)	98.5 (94.6,99.8)	96.5 (93.4,98.4)	93.8 (86.9,97.7)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	95.0 (91.2,97.5)	96.1 (93.4,97.9)	97.1 (93.3,99.0)	96.2 (94.7,97.4)
<i>R3M1</i>	99.4 (97.9,99.9)	99.2 (97.0,99.9)	99.8 (98.7,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	99.4 (96.9,100.0)	99.5 (98.3,99.9)	99.5 (98.2,99.9)	100.0 (96.4,100.0)	99.6 (99.0,99.9)
U	90.4 (89.0,91.6)	81.8 (79.4,83.9)	86.1 (84.4,87.7)	86.4 (83.4,89.0)	92.9 (80.5,98.5)	82.8 (75.4,88.8)	82.9 (80.1,85.5)	84.3 (82.7,85.7)	90.8 (89.5,91.9)	86.8 (85.9,87.7)
Combination grades*										
Any DR	70.4 (69.8,71.1)	66.4 (65.6,67.3)	66.1 (65.6,66.7)	66.2 (65.2,67.2)	67.1 (64.6,69.5)	61.6 (60.4,62.7)	63.0 (62.3,63.6)	67.4 (66.9,68.0)	79.0 (78.3,79.7)	67.4 (67.1,67.8)
Any DR (excluding U)	68.2 (67.5,68.9)	64.9 (64.0,65.8)	64.7 (64.2,65.3)	64.6 (63.5,65.7)	66.3 (63.8,68.8)	61.1 (60.0,62.3)	62.3 (61.6,62.9)	65.8 (65.1,66.4)	76.3 (75.5,77.2)	65.7 (65.4,66.1)
Referable DR	90.5 (89.8,91.1)	83.0 (82.1,84.0)	86.4 (85.8,87.0)	87.0 (85.8,88.0)	90.8 (88.0,93.1)	86.5 (85.2,87.8)	85.8 (85.1,86.5)	85.8 (85.1,86.4)	90.9 (90.1,91.6)	86.9 (86.5,87.3)
Referable DR (excluding U)	90.5 (89.8,91.3)	83.3 (82.3,84.4)	86.5 (85.8,87.1)	87.1 (85.8,88.3)	90.6 (87.7,93.1)	86.7 (85.4,88.0)	86.1 (85.4,86.8)	86.1 (85.4,86.9)	91.0 (89.9,91.9)	86.9 (86.5,87.3)
No referable DR	41.7 (41.3,42.1)	33.0 (32.5,33.6)	28.7 (28.3,29.0)	30.3 (29.6,30.9)	39.1 (37.5,40.7)	21.2 (20.6,21.8)	23.2 (22.8,23.5)	35.3 (34.9,35.6)	59.8 (59.2,60.4)	33.9 (33.6,34.1)

Table S38 Vendor H test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	Test positive % for Vendor H (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	26.0 (25.7,26.4)	30.5 (30.1,30.8)	26.3 (25.9,26.7)	26.0 (25.5,26.6)	29.3 (28.6,29.9)	28.7 (28.0,29.5)	32.6 (32.1,33.2)	20.7 (17.8,23.8)	28.2 (28.0,28.4)
R1M0	51.9 (51.2,52.5)	53.6 (52.9,54.4)	51.9 (51.1,52.7)	51.3 (50.2,52.5)	53.2 (51.9,54.6)	53.1 (51.6,54.6)	54.6 (53.4,55.7)	54.1 (47.4,60.6)	52.6 (52.2,53.1)
R1M1	84.3 (83.6,85.0)	82.7 (81.8,83.5)	83.6 (82.7,84.4)	84.6 (83.4,85.8)	83.5 (82.0,84.9)	82.7 (81.0,84.3)	83.2 (81.9,84.4)	81.6 (72.7,88.5)	83.6 (83.0,84.1)
R2	97.2 (96.4,97.8)	97.1 (96.1,97.9)	96.4 (95.2,97.3)	96.8 (95.3,97.9)	97.8 (96.3,98.8)	97.7 (95.8,98.9)	98.1 (96.7,99.0)	100.0 (83.9,100.0)	97.1 (96.6,97.6)
<i>R2M0</i>	91.2 (88.8,93.3)	90.0 (86.4,93.0)	87.7 (83.8,91.0)	89.2 (84.1,93.1)	92.5 (86.9,96.2)	93.0 (86.8,96.9)	95.6 (91.5,98.1)	100.0 (39.8,100.0)	90.8 (88.8,92.5)
<i>R2M1</i>	99.2 (98.7,99.6)	99.5 (98.9,99.8)	99.4 (98.7,99.8)	99.3 (98.3,99.8)	99.6 (98.4,99.9)	99.4 (97.7,99.9)	99.0 (97.7,99.7)	100.0 (80.5,100.0)	99.3 (99.0,99.6)
R3	98.5 (97.6,99.1)	97.7 (96.4,98.7)	98.3 (97.0,99.1)	97.8 (95.8,99.1)	96.8 (94.0,98.5)	100.0 (98.5,100.0)	98.1 (96.1,99.2)	100.0 (76.8,100.0)	98.2 (97.5,98.7)
<i>R3M0</i>	96.7 (94.7,98.1)	95.6 (92.9,97.5)	96.4 (93.5,98.3)	94.6 (89.7,97.7)	95.0 (89.3,98.1)	100.0 (96.4,100.0)	96.0 (91.8,98.4)	100.0 (47.8,100.0)	96.2 (94.7,97.4)
<i>R3M1</i>	99.6 (98.8,99.9)	99.5 (98.2,99.9)	99.5 (98.3,99.9)	100.0 (98.3,100.0)	98.2 (94.7,99.6)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	99.6 (99.0,99.9)
U	86.2 (84.8,87.5)	87.4 (86.1,88.6)	86.2 (84.6,87.6)	87.7 (85.4,89.8)	86.3 (83.7,88.6)	85.9 (82.8,88.6)	87.7 (85.8,89.5)	94.4 (81.3,99.3)	86.8 (85.9,87.7)
Combination grades*									
Any DR	67.3 (66.8,67.7)	67.6 (67.1,68.1)	66.8 (66.2,67.4)	67.2 (66.4,68.0)	67.8 (66.9,68.7)	67.4 (66.4,68.5)	68.5 (67.7,69.3)	68.6 (63.8,73.0)	67.4 (67.1,67.8)
Any DR (excluding U)	65.9 (65.4,66.3)	65.6 (65.0,66.1)	65.2 (64.6,65.8)	65.6 (64.7,66.5)	66.2 (65.2,67.1)	65.9 (64.8,67.0)	66.5 (65.6,67.3)	66.0 (61.0,70.8)	65.7 (65.4,66.1)
Referable DR	87.6 (87.1,88.1)	86.0 (85.4,86.6)	86.5 (85.9,87.2)	87.8 (86.9,88.7)	86.8 (85.8,87.8)	86.5 (85.3,87.6)	86.9 (86.0,87.8)	87.9 (82.1,92.4)	86.9 (86.5,87.3)
Referable DR (excluding U)	87.8 (87.3,88.4)	85.6 (85.0,86.3)	86.6 (85.9,87.3)	87.8 (86.8,88.8)	87.0 (85.8,88.1)	86.6 (85.3,87.8)	86.7 (85.7,87.7)	86.2 (79.3,91.5)	86.9 (86.5,87.3)
No referable DR	32.4 (32.1,32.7)	35.4 (35.1,35.8)	32.3 (32.0,32.7)	32.0 (31.5,32.5)	34.8 (34.2,35.4)	34.4 (33.8,35.1)	37.5 (36.9,38.0)	28.6 (25.8,31.6)	33.9 (33.6,34.1)

4. ARIAS operating threshold 2: ARIAS test positive rates by final human grade in worst eye and population subgroups

Table S39: Vendor A ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor A (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	20.6 (20.2,21.0)	15.0 (14.6,15.5)	15.2 (14.9,15.5)	16.0 (15.5,16.6)	9.9 (8.8,11.1)	6.4 (6.0,6.8)	10.0 (9.7,10.2)	19.6 (19.2,19.9)	34.1 (33.5,34.7)	17.1 (16.9,17.3)
R1M0	21.7 (21.0,22.5)	17.2 (16.3,18.1)	17.5 (16.9,18.1)	18.1 (17.0,19.2)	10.4 (8.5,12.5)	7.2 (6.4,8.0)	11.0 (10.5,11.5)	21.4 (20.7,22.1)	36.6 (35.4,37.7)	18.8 (18.4,19.2)
R1M1	31.5 (30.1,32.9)	24.6 (23.3,26.0)	25.0 (24.1,26.0)	25.4 (23.6,27.3)	11.0 (7.9,14.9)	14.4 (12.8,16.0)	18.6 (17.7,19.6)	31.0 (30.0,32.1)	45.5 (43.6,47.5)	26.4 (25.8,27.1)
R2	61.5 (58.5,64.4)	52.8 (49.0,56.6)	54.7 (52.2,57.2)	59.3 (55.0,63.5)	34.0 (24.6,44.5)	42.4 (38.1,46.7)	54.8 (52.4,57.3)	63.0 (60.3,65.6)	73.8 (68.6,78.6)	56.9 (55.3,58.5)
R2M0	44.1 (38.4,50.0)	32.9 (25.7,40.8)	36.5 (31.8,41.4)	39.6 (31.4,48.2)	22.6 (9.6,41.1)	20.7 (14.2,28.6)	33.3 (28.7,38.2)	46.7 (41.3,52.1)	62.1 (51.6,71.9)	38.6 (35.6,41.7)
R2M1	68.0 (64.6,71.3)	59.0 (54.6,63.3)	60.8 (58.0,63.6)	66.4 (61.5,71.1)	39.7 (27.6,52.8)	49.7 (44.7,54.8)	61.6 (58.8,64.3)	68.8 (65.8,71.8)	78.8 (72.9,84.0)	63.2 (61.4,65.0)
R3	90.0 (87.4,92.1)	82.6 (78.4,86.3)	85.4 (82.5,88.0)	87.8 (83.2,91.6)	86.3 (73.7,94.3)	77.9 (72.3,82.7)	88.1 (85.3,90.4)	87.0 (84.4,89.4)	91.5 (87.6,94.6)	86.8 (85.2,88.2)
R3M0	89.2 (85.4,92.3)	77.3 (69.2,84.1)	82.0 (76.7,86.5)	82.3 (73.2,89.3)	93.3 (68.1,99.8)	70.9 (60.1,80.2)	84.0 (78.5,88.6)	84.1 (79.8,87.9)	90.7 (85.3,94.6)	84.3 (81.6,86.7)
R3M1	90.7 (87.1,93.6)	85.5 (80.5,89.7)	87.5 (84.0,90.5)	91.2 (85.7,95.1)	83.3 (67.2,93.6)	81.3 (74.7,86.7)	90.1 (86.9,92.7)	89.4 (86.0,92.2)	93.0 (86.1,97.1)	88.5 (86.6,90.3)
U	44.0 (41.8,46.2)	41.5 (38.6,44.4)	46.0 (43.7,48.3)	44.6 (40.6,48.5)	38.1 (23.6,54.4)	36.6 (28.4,45.3)	34.5 (31.2,38.0)	42.2 (40.2,44.2)	50.0 (48.0,52.1)	44.2 (42.9,45.5)
Combination grades*										
Any DR	30.5 (29.8,31.1)	25.5 (24.8,26.3)	25.2 (24.7,25.7)	26.6 (25.7,27.6)	15.6 (13.8,17.6)	15.0 (14.2,15.8)	19.3 (18.8,19.8)	29.9 (29.4,30.5)	43.1 (42.2,43.9)	26.9 (26.6,27.3)
Any DR (excluding U)	29.0 (28.3,29.6)	23.9 (23.1,24.7)	23.7 (23.2,24.3)	25.2 (24.3,26.2)	14.9 (13.1,16.9)	14.6 (13.8,15.4)	18.8 (18.3,19.3)	28.7 (28.1,29.3)	41.5 (40.5,42.4)	25.4 (25.1,25.8)
Referable DR	43.7 (42.6,44.8)	34.6 (33.4,35.8)	35.2 (34.3,36.0)	37.9 (36.4,39.5)	24.7 (21.1,28.6)	26.4 (24.8,28.1)	30.5 (29.6,31.4)	40.7 (39.8,41.6)	51.3 (50.0,52.6)	37.6 (37.1,38.2)
Referable DR (excluding U)	43.6 (42.3,44.9)	32.9 (31.6,34.3)	33.3 (32.4,34.2)	36.6 (34.9,38.3)	23.5 (19.8,27.6)	25.9 (24.3,27.6)	30.1 (29.2,31.1)	40.3 (39.3,41.3)	52.3 (50.5,54.0)	36.1 (35.5,36.7)
No referable DR	20.8 (20.5,21.2)	15.5 (15.1,16.0)	15.8 (15.5,16.0)	16.5 (16.0,17.0)	10.0 (9.1,11.0)	6.6 (6.2,7.0)	10.2 (9.9,10.4)	20.0 (19.7,20.3)	34.7 (34.1,35.2)	17.5 (17.3,17.7)

Table S40: Vendor A ARIAS test positive rates by sex and quintiles of IMD

Final human grade in worst eye	ARIAS test positive % for Vendor A (95% confidence intervals)							
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing
R0M0	15.2 (15.0,15.5)	19.0 (18.7,19.3)	14.9 (14.6,15.2)	15.1 (14.6,15.6)	17.7 (17.1,18.2)	18.4 (17.8,19.0)	21.8 (21.3,22.3)	9.3 (7.3,11.6)
R1M0	16.0 (15.5,16.5)	22.4 (21.8,23.0)	17.4 (16.8,18.1)	17.4 (16.5,18.3)	19.9 (18.9,21.0)	19.7 (18.5,20.9)	21.8 (20.9,22.8)	10.7 (7.1,15.4)
R1M1	24.6 (23.8,25.5)	28.7 (27.7,29.7)	25.3 (24.3,26.4)	26.4 (25.0,28.0)	27.3 (25.6,29.1)	27.3 (25.4,29.2)	27.7 (26.2,29.3)	21.4 (13.9,30.5)
R2	55.4 (53.4,57.4)	59.6 (57.0,62.2)	55.9 (53.2,58.6)	56.2 (52.7,59.7)	59.7 (55.6,63.7)	53.7 (48.9,58.5)	59.5 (55.7,63.2)	47.6 (25.7,70.2)
R2M0	38.4 (34.7,42.3)	39.0 (33.9,44.4)	36.3 (31.2,41.6)	32.5 (26.1,39.4)	39.7 (31.7,48.1)	38.3 (29.4,47.8)	49.2 (41.7,56.7)	50.0 (6.8,93.2)
R2M1	61.3 (59.1,63.5)	66.7 (63.7,69.6)	62.7 (59.7,65.7)	64.3 (60.3,68.1)	66.2 (61.6,70.5)	59.4 (53.7,64.8)	63.2 (58.8,67.5)	47.1 (23.0,72.2)
R3	86.3 (84.3,88.2)	87.5 (84.9,89.8)	87.0 (84.2,89.3)	84.2 (80.1,87.8)	84.8 (80.1,88.8)	87.0 (82.2,91.0)	90.6 (87.1,93.4)	78.6 (49.2,95.3)
R3M0	82.8 (79.1,86.0)	86.3 (82.2,89.8)	82.7 (77.8,87.0)	81.9 (74.7,87.7)	84.0 (76.2,90.1)	86.3 (78.0,92.3)	87.9 (82.0,92.3)	80.0 (28.4,99.5)
R3M1	88.6 (86.1,90.8)	88.4 (84.9,91.4)	89.7 (86.4,92.4)	85.8 (80.4,90.1)	85.4 (79.0,90.4)	87.6 (81.1,92.5)	93.1 (88.5,96.3)	77.8 (40.0,97.2)
U	41.6 (39.7,43.4)	46.6 (44.8,48.4)	41.9 (39.7,44.1)	42.3 (39.0,45.6)	45.3 (41.8,48.8)	40.4 (36.4,44.4)	49.9 (47.1,52.7)	58.3 (40.8,74.5)
Combination grades*								
Any DR	24.8 (24.4,25.2)	29.6 (29.1,30.1)	25.4 (24.9,25.9)	26.0 (25.3,26.8)	28.1 (27.3,29.0)	27.3 (26.3,28.3)	29.9 (29.1,30.7)	21.9 (17.9,26.2)
Any DR (excluding U)	23.6 (23.1,24.0)	27.8 (27.3,28.4)	24.0 (23.5,24.6)	24.8 (24.0,25.5)	26.6 (25.7,27.5)	26.2 (25.2,27.2)	27.7 (26.9,28.6)	18.3 (14.5,22.6)
Referable DR	36.5 (35.8,37.2)	39.1 (38.2,39.9)	35.9 (35.0,36.8)	37.3 (36.0,38.6)	38.9 (37.4,40.4)	37.4 (35.8,39.1)	40.6 (39.3,41.9)	36.8 (29.6,44.4)
Referable DR (excluding U)	35.5 (34.7,36.3)	37.0 (36.0,37.9)	34.6 (33.7,35.6)	36.3 (34.9,37.7)	37.4 (35.8,39.1)	36.7 (34.9,38.6)	37.9 (36.4,39.3)	31.2 (23.6,39.6)
No referable DR	15.4 (15.2,15.7)	19.7 (19.5,20.0)	15.5 (15.2,15.8)	15.6 (15.2,16.0)	18.2 (17.7,18.7)	18.7 (18.2,19.3)	21.8 (21.4,22.3)	9.6 (7.8,11.6)

Table S41: Vendor B ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor B (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	15.7 (15.4,16.1)	26.1 (25.5,26.7)	15.0 (14.7,15.3)	17.3 (16.7,17.9)	7.5 (6.6,8.6)	6.0 (5.6,6.4)	9.2 (8.9,9.5)	19.4 (19.1,19.8)	38.0 (37.3,38.6)	17.3 (17.1,17.5)
R1M0	43.3 (42.4,44.2)	54.5 (53.3,55.7)	47.6 (46.8,48.4)	48.7 (47.3,50.1)	44.0 (40.7,47.3)	39.4 (37.9,40.9)	42.2 (41.4,43.1)	49.3 (48.5,50.1)	59.6 (58.4,60.8)	47.6 (47.1,48.1)
R1M1	92.3 (91.5,93.1)	95.1 (94.3,95.7)	94.1 (93.5,94.6)	95.1 (94.1,95.9)	94.9 (92.0,97.0)	94.9 (93.8,95.8)	94.8 (94.2,95.3)	93.5 (92.9,94.0)	92.5 (91.4,93.5)	94.0 (93.6,94.3)
R2	99.4 (98.7,99.7)	97.6 (96.2,98.6)	98.7 (98.1,99.2)	98.1 (96.5,99.1)	98.9 (94.2,100.0)	99.8 (99.0,100.0)	98.5 (97.8,99.0)	98.4 (97.5,99.0)	98.4 (96.4,99.5)	98.6 (98.2,99.0)
<i>R2M0</i>	97.7 (95.2,99.1)	90.7 (85.1,94.7)	95.3 (92.7,97.1)	92.8 (87.2,96.5)	96.8 (83.3,99.9)	99.3 (95.9,100.0)	93.6 (90.8,95.8)	94.2 (91.2,96.4)	95.8 (89.6,98.8)	94.9 (93.3,96.2)
<i>R2M1</i>	100.0 (99.5,100.0)	99.8 (98.9,100.0)	99.9 (99.5,100.0)	100.0 (99.1,100.0)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	100.0 (99.7,100.0)	99.9 (99.4,100.0)	99.5 (97.5,100.0)	99.9 (99.7,100.0)
R3	97.8 (96.4,98.8)	99.7 (98.5,100.0)	99.1 (98.1,99.7)	99.2 (97.2,99.9)	100.0 (93.0,100.0)	99.2 (97.3,99.9)	99.2 (98.2,99.8)	98.2 (97.0,99.1)	98.5 (96.3,99.6)	98.8 (98.2,99.2)
<i>R3M0</i>	95.6 (92.9,97.5)	99.2 (95.9,100.0)	97.6 (94.9,99.1)	97.9 (92.7,99.7)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	97.7 (94.8,99.3)	96.1 (93.4,97.9)	97.7 (94.2,99.4)	97.1 (95.7,98.1)
<i>R3M1</i>	100.0 (98.9,100.0)	100.0 (98.5,100.0)	100.0 (99.1,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	100.0 (99.2,100.0)	100.0 (99.1,100.0)	100.0 (96.4,100.0)	100.0 (99.7,100.0)
U	91.5 (90.2,92.7)	97.4 (96.3,98.2)	96.3 (95.3,97.1)	95.4 (93.4,96.9)	95.2 (83.8,99.4)	92.5 (86.7,96.4)	95.4 (93.6,96.7)	95.1 (94.1,95.9)	94.2 (93.2,95.1)	94.7 (94.1,95.3)
Combination grades*										
Any DR	63.3 (62.6,63.9)	74.5 (73.7,75.2)	68.3 (67.7,68.8)	69.0 (68.0,70.0)	63.1 (60.5,65.6)	62.3 (61.2,63.4)	65.0 (64.4,65.6)	69.4 (68.8,69.9)	74.7 (74.0,75.5)	68.0 (67.7,68.4)
Any DR (excluding U)	60.1 (59.4,60.8)	72.2 (71.3,73.0)	66.4 (65.8,67.0)	66.9 (65.9,67.9)	62.1 (59.5,64.6)	61.7 (60.6,62.9)	64.0 (63.3,64.6)	66.8 (66.2,67.4)	70.3 (69.4,71.2)	65.7 (65.3,66.1)
Referable DR	93.5 (93.0,94.1)	96.1 (95.6,96.6)	95.3 (94.9,95.6)	95.8 (95.1,96.5)	96.2 (94.1,97.6)	96.1 (95.3,96.8)	95.7 (95.3,96.1)	94.7 (94.2,95.1)	93.9 (93.2,94.5)	95.0 (94.8,95.3)
Referable DR (excluding U)	94.2 (93.6,94.8)	95.8 (95.2,96.3)	95.1 (94.7,95.5)	95.9 (95.2,96.6)	96.3 (94.1,97.8)	96.3 (95.5,96.9)	95.8 (95.3,96.2)	94.6 (94.1,95.0)	93.6 (92.7,94.4)	95.1 (94.8,95.4)
No referable DR	21.7 (21.3,22.0)	32.7 (32.2,33.3)	23.0 (22.6,23.3)	24.4 (23.8,25.0)	16.5 (15.3,17.7)	13.4 (12.9,13.9)	16.9 (16.6,17.2)	26.2 (25.8,26.5)	43.2 (42.7,43.8)	24.3 (24.1,24.5)

Table S42: Vendor B ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor B (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	16.1 (15.8,16.3)	18.6 (18.3,18.9)	18.0 (17.7,18.4)	16.9 (16.5,17.4)	17.3 (16.8,17.9)	16.6 (16.0,17.3)	17.0 (16.5,17.4)	10.9 (8.7,13.3)	17.3 (17.1,17.5)
R1M0	46.4 (45.7,47.0)	49.1 (48.3,49.8)	48.4 (47.6,49.2)	48.8 (47.6,50.0)	47.7 (46.4,49.0)	47.2 (45.7,48.6)	45.0 (43.9,46.2)	42.5 (36.1,49.1)	47.6 (47.1,48.1)
R1M1	94.2 (93.8,94.7)	93.7 (93.1,94.2)	93.8 (93.2,94.4)	94.5 (93.7,95.3)	93.5 (92.5,94.4)	94.0 (92.9,95.0)	94.3 (93.4,95.0)	93.2 (86.5,97.2)	94.0 (93.6,94.3)
R2	98.7 (98.2,99.1)	98.5 (97.7,99.1)	98.2 (97.4,98.9)	98.8 (97.7,99.4)	98.5 (97.2,99.3)	98.6 (97.0,99.5)	99.4 (98.5,99.8)	100.0 (83.9,100.0)	98.6 (98.2,99.0)
<i>R2M0</i>	95.2 (93.3,96.7)	94.3 (91.3,96.5)	93.4 (90.3,95.8)	95.6 (91.8,98.0)	93.8 (88.6,97.1)	94.8 (89.0,98.1)	97.8 (94.4,99.4)	100.0 (39.8,100.0)	94.9 (93.3,96.2)
<i>R2M1</i>	99.9 (99.7,100.0)	99.9 (99.5,100.0)	99.9 (99.4,100.0)	99.8 (99.1,100.0)	100.0 (99.2,100.0)	100.0 (98.8,100.0)	100.0 (99.3,100.0)	100.0 (80.5,100.0)	99.9 (99.7,100.0)
R3	98.6 (97.8,99.2)	99.1 (98.1,99.6)	99.0 (98.0,99.6)	99.2 (97.6,99.8)	98.9 (96.9,99.8)	99.2 (97.1,99.9)	97.5 (95.3,98.9)	100.0 (76.8,100.0)	98.8 (98.2,99.2)
<i>R3M0</i>	96.5 (94.4,97.9)	98.0 (95.9,99.2)	97.5 (94.9,99.0)	98.0 (94.2,99.6)	97.5 (92.8,99.5)	98.0 (93.1,99.8)	94.8 (90.4,97.6)	100.0 (47.8,100.0)	97.1 (95.7,98.1)
<i>R3M1</i>	100.0 (99.5,100.0)	100.0 (99.1,100.0)	100.0 (99.1,100.0)	100.0 (98.3,100.0)	100.0 (97.8,100.0)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	100.0 (99.7,100.0)
U	94.2 (93.3,95.1)	95.1 (94.3,95.9)	96.4 (95.5,97.2)	96.5 (95.1,97.6)	95.7 (94.0,97.0)	94.0 (91.8,95.8)	90.4 (88.6,92.0)	97.2 (85.5,99.9)	94.7 (94.1,95.3)
Combination grades*									
Any DR	67.4 (67.0,67.9)	68.8 (68.3,69.3)	68.5 (67.9,69.1)	69.2 (68.4,70.0)	68.2 (67.3,69.1)	67.7 (66.7,68.7)	66.2 (65.4,67.0)	65.1 (60.3,69.7)	68.0 (67.7,68.4)
Any DR (excluding U)	65.4 (64.9,65.9)	66.1 (65.5,66.6)	66.2 (65.6,66.8)	67.1 (66.3,68.0)	65.8 (64.8,66.7)	65.5 (64.4,66.6)	63.6 (62.7,64.5)	62.0 (56.8,67.0)	65.7 (65.3,66.1)
Referable DR	95.2 (94.9,95.5)	94.8 (94.4,95.2)	95.1 (94.7,95.5)	95.8 (95.2,96.3)	95.0 (94.3,95.6)	95.0 (94.2,95.7)	94.2 (93.6,94.8)	95.4 (91.1,98.0)	95.0 (94.8,95.3)
Referable DR (excluding U)	95.4 (95.1,95.8)	94.7 (94.3,95.1)	94.9 (94.4,95.3)	95.6 (95.0,96.2)	94.8 (94.0,95.5)	95.2 (94.3,95.9)	95.3 (94.7,95.9)	94.9 (89.8,97.9)	95.1 (94.8,95.4)
No referable DR	23.5 (23.3,23.8)	25.2 (24.9,25.5)	25.2 (24.8,25.5)	24.4 (23.9,24.9)	24.3 (23.8,24.9)	23.8 (23.2,24.4)	23.1 (22.7,23.6)	18.4 (16.0,21.0)	24.3 (24.1,24.5)

Table S43: Vendor C ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor C (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	8.6 (8.4,8.9)	11.6 (11.1,12.0)	6.5 (6.3,6.7)	7.7 (7.3,8.1)	4.3 (3.6,5.2)	2.4 (2.2,2.7)	3.9 (3.7,4.1)	8.5 (8.3,8.8)	20.4 (19.9,20.9)	8.2 (8.0,8.3)
R1M0	9.1 (8.6,9.6)	9.9 (9.2,10.7)	7.2 (6.8,7.6)	8.9 (8.1,9.7)	3.6 (2.5,5.1)	3.3 (2.7,3.8)	5.1 (4.7,5.5)	9.3 (8.8,9.7)	16.8 (15.9,17.7)	8.4 (8.1,8.7)
R1M1	16.4 (15.3,17.5)	14.8 (13.7,16.0)	13.3 (12.6,14.0)	14.2 (12.8,15.7)	5.1 (3.0,8.0)	9.1 (7.9,10.5)	12.3 (11.5,13.1)	16.0 (15.1,16.8)	20.9 (19.4,22.6)	14.4 (13.9,14.9)
R2	53.3 (50.3,56.3)	39.9 (36.2,43.7)	48.5 (46.0,51.0)	49.4 (45.1,53.8)	35.1 (25.5,45.6)	46.3 (42.0,50.7)	51.5 (49.1,54.0)	47.6 (44.8,50.3)	44.2 (38.6,49.8)	48.5 (46.9,50.1)
<i>R2M0</i>	36.5 (31.0,42.2)	25.5 (18.9,32.9)	36.3 (31.5,41.2)	35.3 (27.3,43.8)	22.6 (9.6,41.1)	39.3 (31.0,48.0)	32.8 (28.2,37.7)	34.5 (29.5,39.8)	37.9 (28.1,48.4)	34.4 (31.5,37.5)
<i>R2M1</i>	59.7 (56.2,63.1)	44.5 (40.1,48.9)	52.6 (49.8,55.5)	54.5 (49.4,59.6)	41.3 (29.0,54.4)	48.7 (43.7,53.8)	57.4 (54.6,60.2)	52.3 (49.1,55.5)	46.8 (40.1,53.6)	53.4 (51.5,55.2)
R3	63.5 (59.8,67.1)	63.4 (58.3,68.3)	67.4 (63.7,70.9)	63.5 (57.3,69.4)	78.4 (64.7,88.7)	65.6 (59.6,71.4)	70.0 (66.3,73.5)	61.6 (58.0,65.1)	57.7 (51.6,63.7)	64.8 (62.7,66.9)
<i>R3M0</i>	54.2 (48.8,59.6)	62.1 (53.3,70.4)	63.5 (57.3,69.4)	59.4 (48.9,69.3)	73.3 (44.9,92.2)	53.5 (42.4,64.3)	62.1 (55.3,68.6)	57.8 (52.3,63.1)	58.7 (51.0,66.2)	59.0 (55.5,62.3)
<i>R3M1</i>	73.1 (68.0,77.7)	64.0 (57.7,70.1)	69.8 (65.1,74.2)	66.0 (58.1,73.4)	80.6 (64.0,91.8)	71.6 (64.3,78.1)	74.0 (69.6,78.0)	64.8 (59.9,69.4)	56.0 (45.7,65.9)	69.0 (66.3,71.7)
U	47.6 (45.4,49.8)	55.8 (52.9,58.7)	47.8 (45.5,50.1)	45.7 (41.7,49.7)	69.0 (52.9,82.4)	47.0 (38.3,55.8)	44.1 (40.6,47.6)	45.6 (43.6,47.6)	54.2 (52.2,56.3)	49.2 (47.8,50.5)
Combination grades*										
Any DR	18.7 (18.2,19.3)	18.8 (18.1,19.5)	15.2 (14.8,15.7)	17.2 (16.4,18.0)	10.6 (9.1,12.4)	11.3 (10.5,12.0)	13.6 (13.2,14.1)	17.8 (17.4,18.3)	26.2 (25.4,27.0)	17.1 (16.9,17.4)
Any DR (excluding U)	15.5 (15.0,16.0)	15.1 (14.4,15.7)	13.0 (12.6,13.4)	14.9 (14.1,15.7)	8.9 (7.4,10.5)	10.6 (9.8,11.3)	12.6 (12.1,13.0)	15.1 (14.6,15.5)	19.8 (19.0,20.6)	14.3 (14.1,14.6)
Referable DR	33.3 (32.3,34.4)	28.4 (27.3,29.6)	25.8 (25.0,26.6)	28.1 (26.6,29.6)	22.8 (19.3,26.6)	23.0 (21.5,24.6)	25.2 (24.3,26.0)	28.7 (27.8,29.5)	38.1 (36.8,39.4)	28.6 (28.1,29.1)
Referable DR (excluding U)	28.5 (27.3,29.6)	22.0 (20.8,23.1)	22.0 (21.2,22.8)	24.5 (23.0,26.1)	18.8 (15.4,22.5)	21.8 (20.3,23.4)	23.5 (22.6,24.4)	24.3 (23.4,25.2)	26.4 (24.9,27.9)	23.9 (23.4,24.4)
No referable DR	8.7 (8.5,9.0)	11.2 (10.8,11.5)	6.6 (6.4,6.8)	7.9 (7.6,8.3)	4.2 (3.5,4.9)	2.6 (2.4,2.8)	4.2 (4.0,4.3)	8.7 (8.5,8.9)	19.5 (19.1,20.0)	8.2 (8.1,8.4)

Table S44: Vendor C ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor C (95% confidence intervals)							
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing
R0M0	7.9 (7.7,8.2)	8.4 (8.2,8.6)	8.6 (8.4,8.9)	8.1 (7.7,8.4)	7.9 (7.5,8.3)	7.5 (7.0,7.9)	8.0 (7.7,8.4)	6.2 (4.6,8.2)
R1M0	7.9 (7.5,8.2)	9.1 (8.7,9.6)	8.8 (8.4,9.3)	8.2 (7.6,8.9)	8.2 (7.5,8.9)	8.2 (7.4,9.1)	8.2 (7.6,8.8)	5.2 (2.7,8.8)
R1M1	14.0 (13.3,14.7)	14.9 (14.2,15.7)	14.7 (13.9,15.5)	14.5 (13.3,15.7)	13.6 (12.3,15.0)	14.7 (13.2,16.3)	14.3 (13.1,15.5)	11.7 (6.2,19.5)
R2	49.9 (47.9,51.8)	46.0 (43.3,48.7)	47.1 (44.4,49.8)	49.5 (46.0,53.0)	52.2 (48.1,56.2)	46.7 (41.9,51.6)	48.2 (44.4,52.1)	38.1 (18.1,61.6)
<i>R2M0</i>	35.8 (32.1,39.6)	31.9 (27.1,37.1)	30.3 (25.5,35.4)	38.9 (32.2,46.0)	39.7 (31.7,48.1)	35.7 (26.9,45.1)	32.0 (25.3,39.4)	50.0 (6.8,93.2)
<i>R2M1</i>	54.8 (52.5,57.0)	50.8 (47.7,53.9)	53.0 (49.8,56.1)	53.1 (49.0,57.1)	56.2 (51.5,60.8)	50.8 (45.1,56.4)	54.1 (49.6,58.6)	35.3 (14.2,61.7)
R3	66.6 (63.9,69.2)	61.9 (58.3,65.4)	64.7 (61.0,68.2)	62.4 (57.2,67.4)	68.9 (63.2,74.3)	64.4 (58.1,70.3)	64.6 (59.5,69.6)	64.3 (35.1,87.2)
<i>R3M0</i>	60.6 (56.1,65.0)	56.7 (51.3,62.0)	59.4 (53.3,65.2)	49.0 (40.7,57.3)	65.5 (56.3,74.0)	58.8 (48.6,68.5)	62.4 (54.8,69.7)	60.0 (14.7,94.7)
<i>R3M1</i>	70.4 (67.0,73.7)	66.3 (61.5,71.0)	68.1 (63.5,72.5)	71.6 (65.1,77.4)	71.3 (63.8,78.1)	68.3 (60.0,75.7)	66.7 (59.5,73.3)	66.7 (29.9,92.5)
U	46.8 (44.9,48.7)	51.4 (49.5,53.2)	53.2 (51.0,55.4)	50.6 (47.3,53.9)	49.4 (45.9,52.9)	45.8 (41.8,49.9)	42.7 (40.0,45.5)	66.7 (49.0,81.4)
Combination grades*								
Any DR	16.8 (16.4,17.1)	17.6 (17.2,18.0)	17.4 (16.9,17.9)	17.2 (16.5,17.8)	17.3 (16.6,18.0)	16.7 (15.9,17.6)	16.7 (16.1,17.4)	16.0 (12.5,19.9)
Any DR (excluding U)	14.5 (14.2,14.9)	14.1 (13.7,14.5)	14.4 (14.0,14.9)	14.6 (13.9,15.2)	14.5 (13.8,15.2)	14.3 (13.5,15.1)	13.9 (13.3,14.6)	11.1 (8.0,14.7)
Referable DR	28.5 (27.8,29.2)	28.7 (28.0,29.5)	28.7 (27.9,29.6)	28.8 (27.6,30.0)	29.2 (27.9,30.6)	28.0 (26.5,29.6)	28.0 (26.8,29.2)	30.5 (23.7,37.9)
Referable DR (excluding U)	25.0 (24.3,25.7)	22.4 (21.6,23.2)	23.4 (22.5,24.2)	24.4 (23.2,25.7)	24.6 (23.2,26.0)	24.2 (22.6,25.8)	23.7 (22.5,25.0)	21.0 (14.5,28.8)
No referable DR	7.9 (7.7,8.1)	8.5 (8.4,8.7)	8.7 (8.5,8.9)	8.1 (7.8,8.4)	8.0 (7.6,8.3)	7.6 (7.3,8.0)	8.1 (7.8,8.4)	5.9 (4.5,7.6)

Table S45: Vendor E ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor E (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	36.8 (36.4,37.3)	36.9 (36.2,37.5)	36.8 (36.4,37.2)	37.5 (36.8,38.3)	67.6 (65.8,69.3)	37.8 (37.0,38.6)	30.7 (30.2,31.1)	35.8 (35.4,36.2)	47.4 (46.8,48.1)	36.9 (36.6,37.2)
R1M0	68.2 (67.3,69.0)	69.2 (68.0,70.3)	73.0 (72.3,73.7)	71.9 (70.6,73.1)	82.2 (79.6,84.7)	72.9 (71.5,74.2)	70.9 (70.2,71.7)	68.8 (68.0,69.5)	71.6 (70.6,72.7)	70.7 (70.3,71.2)
R1M1	94.7 (93.9,95.3)	91.7 (90.8,92.6)	94.3 (93.8,94.8)	94.3 (93.3,95.3)	97.9 (95.7,99.2)	96.1 (95.1,96.9)	95.4 (94.9,95.9)	92.7 (92.1,93.3)	90.6 (89.4,91.7)	93.9 (93.5,94.2)
R2	98.1 (97.1,98.8)	95.7 (93.9,97.1)	97.7 (96.9,98.4)	96.8 (94.9,98.1)	97.9 (92.5,99.7)	98.7 (97.3,99.5)	97.7 (96.8,98.4)	96.4 (95.2,97.3)	97.2 (94.7,98.7)	97.3 (96.8,97.8)
<i>R2M0</i>	95.3 (92.3,97.4)	83.9 (77.2,89.2)	92.3 (89.2,94.7)	89.9 (83.7,94.4)	93.5 (78.6,99.2)	97.0 (92.6,99.2)	92.4 (89.3,94.8)	88.1 (84.2,91.3)	91.6 (84.1,96.3)	91.5 (89.6,93.1)
<i>R2M1</i>	99.1 (98.2,99.6)	99.4 (98.3,99.9)	99.6 (99.0,99.9)	99.2 (97.8,99.8)	100.0 (94.3,100.0)	99.2 (97.8,99.8)	99.4 (98.7,99.7)	99.4 (98.6,99.8)	99.5 (97.5,100.0)	99.4 (99.0,99.6)
R3	97.6 (96.2,98.6)	98.9 (97.3,99.7)	99.0 (97.9,99.6)	98.0 (95.5,99.4)	98.0 (89.6,100.0)	99.2 (97.3,99.9)	98.9 (97.8,99.6)	97.6 (96.2,98.6)	98.5 (96.3,99.6)	98.4 (97.7,98.9)
<i>R3M0</i>	95.9 (93.2,97.8)	98.5 (94.6,99.8)	97.3 (94.4,98.9)	94.8 (88.3,98.3)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	97.3 (94.1,99.0)	95.2 (92.3,97.2)	97.7 (94.2,99.4)	96.6 (95.1,97.7)
<i>R3M1</i>	99.4 (97.9,99.9)	99.2 (97.0,99.9)	100.0 (99.1,100.0)	100.0 (97.7,100.0)	97.2 (85.5,99.9)	100.0 (97.9,100.0)	99.8 (98.7,100.0)	99.5 (98.2,99.9)	100.0 (96.4,100.0)	99.7 (99.1,99.9)
U	68.7 (66.6,70.7)	68.1 (65.3,70.8)	70.8 (68.7,72.9)	67.0 (63.1,70.7)	83.3 (68.6,93.0)	76.9 (68.8,83.7)	68.3 (65.0,71.6)	66.7 (64.7,68.6)	70.9 (69.0,72.8)	69.1 (67.8,70.3)
Combination grades*										
Any DR	76.4 (75.8,76.9)	78.3 (77.5,79.0)	81.1 (80.6,81.5)	79.8 (78.9,80.6)	87.5 (85.7,89.2)	82.2 (81.3,83.1)	80.7 (80.2,81.2)	77.3 (76.8,77.8)	76.7 (75.9,77.4)	79.0 (78.7,79.3)
Any DR (excluding U)	77.2 (76.6,77.8)	79.3 (78.5,80.0)	81.7 (81.3,82.2)	80.8 (79.9,81.7)	87.7 (85.8,89.4)	82.3 (81.4,83.2)	81.2 (80.6,81.7)	78.4 (77.9,78.9)	78.0 (77.2,78.8)	79.9 (79.6,80.2)
Referable DR	88.8 (88.1,89.5)	88.1 (87.3,88.9)	91.6 (91.1,92.0)	90.3 (89.3,91.2)	96.7 (94.8,98.1)	95.9 (95.1,96.6)	93.9 (93.4,94.3)	88.1 (87.5,88.7)	83.1 (82.1,84.1)	90.0 (89.6,90.3)
Referable DR (excluding U)	95.6 (95.1,96.1)	92.8 (92.1,93.5)	95.1 (94.7,95.5)	95.1 (94.2,95.8)	97.9 (96.2,99.0)	96.9 (96.2,97.5)	96.1 (95.7,96.5)	93.6 (93.1,94.1)	91.9 (91.0,92.9)	94.8 (94.5,95.1)
Non-referable	43.6 (43.2,44.0)	44.4 (43.9,45.0)	45.6 (45.3,46.0)	45.3 (44.6,46.0)	71.2 (69.7,72.6)	45.6 (44.8,46.3)	40.1 (39.7,40.5)	43.3 (42.9,43.6)	53.3 (52.8,53.9)	44.7 (44.5,45.0)

Table S46: Vendor E ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor E (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	37.1 (36.8,37.5)	36.7 (36.3,37.0)	36.4 (36.0,36.8)	36.5 (35.9,37.2)	37.0 (36.3,37.7)	37.8 (37.0,38.6)	37.6 (37.0,38.2)	36.0 (32.5,39.5)	36.9 (36.6,37.2)
R1M0	72.1 (71.6,72.7)	69.0 (68.3,69.7)	69.9 (69.1,70.6)	72.0 (71.0,73.1)	70.8 (69.6,71.9)	71.4 (70.1,72.7)	70.8 (69.7,71.8)	73.8 (67.7,79.3)	70.7 (70.3,71.2)
R1M1	94.5 (94.0,94.9)	93.1 (92.5,93.6)	94.3 (93.7,94.8)	93.6 (92.7,94.4)	93.8 (92.9,94.7)	93.3 (92.2,94.4)	93.6 (92.7,94.4)	96.1 (90.4,98.9)	93.9 (93.5,94.2)
R2	97.8 (97.2,98.4)	96.4 (95.3,97.4)	97.0 (95.9,97.8)	97.5 (96.2,98.5)	97.8 (96.3,98.8)	97.2 (95.2,98.5)	97.5 (96.0,98.5)	100.0 (83.9,100.0)	97.3 (96.8,97.8)
<i>R2M0</i>	92.7 (90.5,94.6)	89.2 (85.4,92.2)	89.1 (85.4,92.2)	91.1 (86.3,94.7)	93.2 (87.8,96.7)	91.3 (84.6,95.8)	95.0 (90.8,97.7)	100.0 (39.8,100.0)	91.5 (89.6,93.1)
<i>R2M1</i>	99.6 (99.2,99.8)	98.9 (98.1,99.5)	99.7 (99.1,99.9)	99.7 (98.8,100.0)	99.3 (98.1,99.9)	99.4 (97.7,99.9)	98.4 (96.8,99.3)	100.0 (80.5,100.0)	99.4 (99.0,99.6)
R3	98.5 (97.6,99.1)	98.2 (97.0,99.1)	98.7 (97.6,99.4)	98.4 (96.5,99.4)	98.6 (96.4,99.6)	98.8 (96.5,99.7)	97.2 (95.0,98.7)	100.0 (76.8,100.0)	98.4 (97.7,98.9)
<i>R3M0</i>	96.3 (94.2,97.8)	97.1 (94.7,98.6)	97.1 (94.4,98.7)	96.6 (92.3,98.9)	97.5 (92.8,99.5)	97.1 (91.6,99.4)	94.8 (90.4,97.6)	100.0 (47.8,100.0)	96.6 (95.1,97.7)
<i>R3M1</i>	99.9 (99.3,100.0)	99.2 (97.8,99.8)	99.8 (98.7,100.0)	99.5 (97.5,100.0)	99.4 (96.6,100.0)	100.0 (97.5,100.0)	99.5 (97.1,100.0)	100.0 (66.4,100.0)	99.7 (99.1,99.9)
U	69.8 (68.0,71.5)	68.4 (66.7,70.1)	72.0 (70.0,74.0)	70.8 (67.7,73.7)	69.2 (65.9,72.4)	67.1 (63.2,70.9)	63.8 (61.0,66.4)	77.8 (60.8,89.9)	69.1 (67.8,70.3)
Combination grades*									
Any DR	80.4 (80.0,80.8)	77.3 (76.9,77.8)	78.9 (78.4,79.4)	80.1 (79.4,80.8)	79.1 (78.3,79.9)	79.2 (78.3,80.1)	78.0 (77.3,78.7)	82.1 (78.0,85.7)	79.0 (78.7,79.3)
Any DR (excluding U)	81.2 (80.8,81.6)	78.3 (77.8,78.7)	79.5 (79.0,80.0)	80.9 (80.1,81.6)	80.0 (79.2,80.8)	80.2 (79.3,81.1)	79.5 (78.8,80.3)	82.5 (78.2,86.2)	79.9 (79.6,80.2)
Referable DR	91.3 (90.9,91.7)	88.3 (87.7,88.8)	90.9 (90.3,91.4)	90.7 (89.9,91.4)	90.1 (89.2,91.0)	89.5 (88.4,90.5)	87.6 (86.7,88.4)	93.1 (88.3,96.4)	90.0 (89.6,90.3)
Referable DR (excluding U)	95.4 (95.1,95.8)	93.9 (93.4,94.3)	95.0 (94.5,95.4)	94.6 (93.9,95.3)	94.9 (94.1,95.6)	94.4 (93.5,95.2)	94.5 (93.8,95.2)	97.1 (92.7,99.2)	94.8 (94.5,95.1)
No referable DR	45.8 (45.5,46.1)	43.6 (43.3,43.9)	44.3 (43.9,44.7)	44.9 (44.3,45.4)	44.8 (44.1,45.4)	45.7 (45.0,46.4)	44.9 (44.3,45.4)	45.0 (41.8,48.2)	44.7 (44.5,45.0)

Table S47: Vendor F ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor F (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	11.0 (10.7,11.3)	14.3 (13.8,14.8)	10.0 (9.7,10.2)	10.5 (10.0,11.0)	7.3 (6.4,8.4)	4.7 (4.4,5.1)	6.1 (5.9,6.3)	12.1 (11.8,12.4)	23.7 (23.1,24.3)	11.1 (10.9,11.2)
R1M0	43.0 (42.1,43.9)	38.9 (37.7,40.0)	41.0 (40.2,41.8)	41.8 (40.4,43.2)	36.5 (33.4,39.7)	33.4 (32.0,34.8)	36.4 (35.6,37.2)	43.9 (43.1,44.7)	50.9 (49.8,52.1)	41.3 (40.9,41.8)
R1M1	79.3 (78.0,80.5)	73.6 (72.2,75.0)	75.3 (74.3,76.2)	77.4 (75.6,79.1)	80.0 (75.3,84.2)	76.9 (74.9,78.7)	77.2 (76.2,78.2)	75.9 (74.9,76.9)	72.6 (70.9,74.4)	76.1 (75.5,76.7)
R2	98.0 (97.0,98.7)	94.7 (92.7,96.2)	97.4 (96.4,98.1)	97.5 (95.8,98.7)	96.8 (91.0,99.3)	98.1 (96.6,99.1)	97.4 (96.5,98.1)	96.4 (95.2,97.3)	96.5 (93.9,98.3)	97.1 (96.5,97.6)
R2M0	94.0 (90.7,96.4)	88.2 (82.2,92.7)	92.3 (89.2,94.7)	93.5 (88.1,97.0)	93.5 (78.6,99.2)	94.1 (88.7,97.4)	91.9 (88.7,94.4)	91.0 (87.5,93.8)	95.8 (89.6,98.8)	92.3 (90.5,93.9)
R2M1	99.5 (98.7,99.9)	96.7 (94.8,98.1)	99.1 (98.4,99.5)	99.0 (97.4,99.7)	98.4 (91.5,100.0)	99.5 (98.2,99.9)	99.2 (98.5,99.6)	98.3 (97.3,99.0)	96.8 (93.6,98.7)	98.8 (98.3,99.1)
R3	94.4 (92.4,96.0)	93.9 (90.9,96.1)	95.4 (93.5,96.8)	92.9 (89.1,95.8)	100.0 (93.0,100.0)	96.9 (94.1,98.7)	96.2 (94.4,97.5)	92.6 (90.4,94.4)	91.9 (88.0,94.9)	94.4 (93.3,95.4)
R3M0	91.0 (87.4,93.8)	87.9 (81.1,92.9)	90.6 (86.3,93.9)	85.4 (76.7,91.8)	100.0 (78.2,100.0)	95.3 (88.5,98.7)	90.0 (85.2,93.6)	87.1 (83.1,90.5)	90.7 (85.3,94.6)	89.7 (87.4,91.7)
R3M1	97.9 (95.7,99.2)	97.1 (94.1,98.8)	98.3 (96.6,99.3)	97.5 (93.7,99.3)	100.0 (90.3,100.0)	97.7 (94.3,99.4)	99.3 (98.0,99.9)	97.0 (94.9,98.5)	94.0 (87.4,97.8)	97.8 (96.8,98.6)
U	51.0 (48.8,53.2)	58.4 (55.5,61.3)	52.2 (49.9,54.6)	50.0 (46.0,54.0)	69.0 (52.9,82.4)	52.2 (43.4,60.9)	50.5 (47.0,54.0)	50.0 (48.0,52.1)	56.2 (54.1,58.2)	52.8 (51.5,54.1)
Combination grades*										
Any DR	56.1 (55.4,56.8)	55.9 (55.0,56.8)	56.1 (55.5,56.7)	56.8 (55.7,57.9)	53.9 (51.3,56.5)	52.9 (51.7,54.0)	54.8 (54.2,55.5)	57.2 (56.6,57.8)	58.5 (57.6,59.3)	56.1 (55.8,56.5)
Any DR (excluding U)	56.7 (55.9,57.4)	55.6 (54.7,56.5)	56.4 (55.8,57.0)	57.4 (56.2,58.4)	53.4 (50.8,56.1)	52.9 (51.7,54.1)	55.0 (54.3,55.7)	57.9 (57.3,58.6)	59.0 (58.0,60.0)	56.4 (56.1,56.8)
Referable DR	75.9 (75.0,76.9)	74.3 (73.2,75.4)	75.8 (75.1,76.6)	76.7 (75.3,78.1)	84.1 (80.7,87.1)	81.5 (80.0,82.9)	79.6 (78.8,80.4)	74.0 (73.2,74.8)	68.0 (66.8,69.3)	75.7 (75.2,76.1)
Referable DR (excluding U)	84.4 (83.5,85.3)	78.0 (76.9,79.2)	79.9 (79.1,80.6)	82.2 (80.8,83.6)	85.4 (81.9,88.5)	82.9 (81.5,84.3)	82.2 (81.4,83.0)	80.2 (79.4,81.0)	76.7 (75.2,78.1)	80.9 (80.4,81.4)
No referable DR	17.9 (17.6,18.2)	20.1 (19.6,20.5)	17.6 (17.3,17.9)	17.6 (17.1,18.1)	14.5 (13.4,15.7)	11.0 (10.6,11.5)	13.2 (12.9,13.5)	19.3 (19.0,19.6)	30.3 (29.8,30.9)	18.1 (17.9,18.3)

Table S48: Vendor F ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor F (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	10.8 (10.5,11.0)	11.4 (11.2,11.7)	11.6 (11.4,11.9)	11.0 (10.6,11.4)	11.0 (10.6,11.5)	10.3 (9.8,10.8)	10.7 (10.4,11.1)	7.7 (5.8,9.8)	11.1 (10.9,11.2)
R1M0	40.8 (40.2,41.5)	42.0 (41.3,42.7)	41.8 (41.0,42.6)	41.4 (40.3,42.6)	42.0 (40.7,43.3)	41.3 (39.9,42.8)	40.1 (39.0,41.2)	35.6 (29.5,42.1)	41.3 (40.9,41.8)
R1M1	76.8 (76.0,77.7)	75.1 (74.2,76.1)	76.2 (75.2,77.2)	77.8 (76.3,79.1)	74.5 (72.8,76.1)	75.3 (73.4,77.2)	75.9 (74.4,77.3)	74.8 (65.2,82.8)	76.1 (75.5,76.7)
R2	97.5 (96.8,98.1)	96.4 (95.2,97.3)	97.0 (96.0,97.9)	97.3 (95.9,98.3)	97.0 (95.3,98.2)	96.3 (94.0,97.9)	97.5 (96.0,98.5)	100.0 (83.9,100.0)	97.1 (96.5,97.6)
R2M0	93.2 (91.0,95.0)	90.6 (87.1,93.4)	91.4 (88.0,94.1)	92.1 (87.5,95.4)	91.1 (85.3,95.2)	90.4 (83.5,95.1)	96.1 (92.2,98.4)	100.0 (39.8,100.0)	92.3 (90.5,93.9)
R2M1	99.0 (98.4,99.4)	98.3 (97.4,99.0)	99.0 (98.2,99.5)	99.0 (97.8,99.6)	98.9 (97.4,99.6)	98.4 (96.3,99.5)	98.0 (96.3,99.0)	100.0 (80.5,100.0)	98.8 (98.3,99.1)
R3	95.1 (93.7,96.2)	93.4 (91.4,95.1)	95.3 (93.5,96.8)	91.3 (87.9,94.0)	95.1 (91.8,97.3)	96.0 (92.7,98.0)	94.2 (91.3,96.4)	100.0 (76.8,100.0)	94.4 (93.3,95.4)
R3M0	89.6 (86.6,92.2)	89.8 (86.1,92.8)	90.6 (86.6,93.8)	83.2 (76.2,88.8)	90.8 (84.1,95.3)	93.1 (86.4,97.2)	90.8 (85.4,94.6)	100.0 (47.8,100.0)	89.7 (87.4,91.7)
R3M1	98.5 (97.4,99.3)	96.5 (94.2,98.1)	98.4 (96.7,99.3)	96.8 (93.5,98.7)	98.2 (94.7,99.6)	97.9 (94.1,99.6)	97.4 (93.9,99.1)	100.0 (66.4,100.0)	97.8 (96.8,98.6)
U	50.4 (48.5,52.3)	55.1 (53.2,56.9)	55.1 (52.9,57.3)	55.9 (52.6,59.1)	50.6 (47.1,54.1)	49.8 (45.8,53.9)	49.4 (46.6,52.2)	69.4 (51.9,83.7)	52.8 (51.5,54.1)
Combination grades*									
Any DR	56.4 (55.9,56.9)	55.8 (55.2,56.3)	56.6 (56.0,57.2)	57.3 (56.4,58.1)	56.0 (55.1,57.0)	55.8 (54.7,56.9)	54.6 (53.7,55.4)	54.1 (49.1,59.0)	56.1 (55.8,56.5)
Any DR (excluding U)	56.9 (56.4,57.4)	55.9 (55.3,56.4)	56.7 (56.1,57.3)	57.4 (56.5,58.3)	56.5 (55.5,57.5)	56.3 (55.1,57.4)	55.1 (54.2,56.0)	52.6 (47.3,57.7)	56.4 (56.1,56.8)
Referable DR	77.0 (76.4,77.7)	73.9 (73.2,74.7)	76.2 (75.4,77.0)	77.9 (76.7,79.0)	74.5 (73.2,75.8)	75.0 (73.5,76.4)	73.7 (72.5,74.8)	78.7 (71.9,84.6)	75.7 (75.2,76.1)
Referable DR (excluding U)	82.1 (81.5,82.8)	79.2 (78.4,80.0)	80.8 (80.0,81.6)	82.3 (81.1,83.3)	79.9 (78.6,81.3)	80.4 (78.9,81.9)	80.8 (79.6,81.9)	81.2 (73.6,87.3)	80.9 (80.4,81.4)
No referable DR	18.2 (17.9,18.4)	18.0 (17.7,18.2)	18.7 (18.4,19.0)	18.1 (17.7,18.6)	18.2 (17.7,18.7)	17.6 (17.0,18.1)	17.2 (16.8,17.6)	14.3 (12.2,16.7)	18.1 (17.9,18.3)

Table S49: Vendor H ARIAS test positive rates by ethnicity and age.

Final human grade in worst eye	ARIAS test positive % for Vendor H (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	27.2 (26.8,27.7)	17.2 (16.7,17.7)	11.3 (11.0,11.6)	15.0 (14.5,15.6)	29.9 (28.2,31.6)	10.3 (9.8,10.8)	10.2 (10.0,10.5)	19.1 (18.7,19.4)	35.1 (34.5,35.7)	18.0 (17.8,18.2)
R1M0	43.2 (42.3,44.1)	33.4 (32.3,34.6)	30.9 (30.2,31.7)	33.6 (32.3,35.0)	47.1 (43.8,50.4)	28.5 (27.2,29.9)	28.2 (27.4,28.9)	35.9 (35.2,36.7)	50.9 (49.7,52.0)	35.4 (35.0,35.9)
R1M1	79.1 (77.9,80.3)	71.5 (70.0,72.9)	72.0 (71.1,73.0)	74.8 (72.9,76.5)	83.9 (79.5,87.7)	73.7 (71.7,75.7)	73.3 (72.2,74.3)	73.3 (72.2,74.3)	75.8 (74.1,77.4)	73.9 (73.2,74.5)
R2	97.4 (96.3,98.3)	92.6 (90.4,94.5)	95.5 (94.4,96.5)	96.0 (94.0,97.5)	96.8 (91.0,99.3)	96.8 (94.9,98.1)	95.1 (93.9,96.1)	95.2 (93.9,96.3)	97.8 (95.5,99.1)	95.6 (94.9,96.2)
R2M0	92.3 (88.7,95.1)	73.9 (66.4,80.5)	87.3 (83.6,90.4)	87.8 (81.1,92.7)	90.3 (74.2,98.0)	88.9 (82.3,93.6)	84.2 (80.2,87.7)	86.4 (82.3,89.8)	93.7 (86.8,97.6)	86.7 (84.4,88.7)
R2M1	99.4 (98.5,99.8)	98.4 (97.0,99.3)	98.3 (97.4,99.0)	99.0 (97.4,99.7)	100.0 (94.3,100.0)	99.5 (98.2,99.9)	98.5 (97.6,99.1)	98.4 (97.4,99.1)	99.5 (97.5,100.0)	98.7 (98.2,99.1)
R3	96.8 (95.1,98.0)	97.6 (95.5,98.9)	97.9 (96.5,98.9)	97.6 (94.9,99.1)	100.0 (93.0,100.0)	98.9 (96.7,99.8)	97.7 (96.2,98.7)	97.0 (95.5,98.1)	96.0 (92.9,98.0)	97.4 (96.6,98.1)
R3M0	94.2 (91.1,96.4)	94.7 (89.4,97.8)	94.9 (91.4,97.3)	93.8 (86.9,97.7)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	94.1 (90.1,96.8)	94.0 (90.9,96.3)	93.6 (88.8,96.8)	94.4 (92.6,95.9)
R3M1	99.4 (97.9,99.9)	99.2 (97.0,99.9)	99.8 (98.7,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	99.4 (96.9,100.0)	99.5 (98.3,99.9)	99.5 (98.2,99.9)	100.0 (96.4,100.0)	99.6 (99.0,99.9)
U	62.9 (60.8,65.0)	48.2 (45.3,51.2)	50.6 (48.2,52.9)	54.8 (50.8,58.8)	50.0 (34.2,65.8)	53.0 (44.2,61.7)	52.8 (49.2,56.3)	52.7 (50.7,54.8)	58.3 (56.3,60.3)	55.0 (53.7,56.3)
Combination grades*										
Any DR	57.4 (56.8,58.1)	51.5 (50.6,52.3)	49.3 (48.7,49.9)	51.9 (50.8,52.9)	61.0 (58.4,63.5)	49.1 (47.9,50.3)	48.9 (48.3,49.6)	52.4 (51.8,53.0)	59.6 (58.7,60.5)	52.4 (52.0,52.7)
Any DR (excluding U)	56.8 (56.1,57.5)	51.8 (50.9,52.7)	49.2 (48.6,49.8)	51.6 (50.5,52.8)	61.3 (58.7,63.9)	49.0 (47.8,50.2)	48.8 (48.1,49.4)	52.4 (51.7,53.0)	59.9 (58.9,60.9)	52.1 (51.7,52.5)
Referable DR	79.0 (78.1,79.9)	71.0 (69.8,72.1)	73.3 (72.5,74.1)	76.0 (74.6,77.4)	85.1 (81.7,88.0)	79.3 (77.8,80.8)	76.8 (76.0,77.7)	73.1 (72.3,73.9)	70.7 (69.5,71.9)	74.7 (74.2,75.2)
Referable DR (excluding U)	84.5 (83.5,85.4)	76.4 (75.2,77.6)	77.2 (76.4,78.0)	80.4 (78.9,81.8)	88.1 (84.9,90.9)	80.6 (79.1,82.1)	79.0 (78.1,79.8)	78.4 (77.5,79.2)	79.7 (78.2,81.1)	79.2 (78.7,79.7)
No referable DR	30.7 (30.3,31.1)	21.0 (20.5,21.4)	16.1 (15.8,16.4)	19.2 (18.7,19.8)	34.1 (32.6,35.7)	14.3 (13.8,14.8)	14.4 (14.1,14.7)	22.9 (22.6,23.2)	38.9 (38.4,39.5)	22.1 (21.9,22.3)

Table S50: Vendor H ARIAS test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	ARIAS test positive % for Vendor H (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	17.8 (17.5,18.1)	18.3 (18.0,18.6)	14.7 (14.4,15.0)	15.7 (15.2,16.1)	18.7 (18.2,19.3)	19.5 (18.9,20.2)	25.0 (24.4,25.5)	11.7 (9.5,14.2)	18.0 (17.8,18.2)
R1M0	35.0 (34.4,35.7)	35.9 (35.2,36.6)	32.7 (32.0,33.5)	33.5 (32.4,34.6)	36.0 (34.8,37.3)	37.6 (36.1,39.0)	40.9 (39.8,42.1)	31.3 (25.4,37.7)	35.4 (35.0,35.9)
R1M1	74.7 (73.8,75.5)	72.8 (71.9,73.8)	73.2 (72.2,74.3)	75.4 (73.9,76.8)	71.8 (70.0,73.5)	74.3 (72.3,76.1)	75.1 (73.5,76.5)	71.8 (62.1,80.3)	73.9 (73.2,74.5)
R2	95.9 (95.0,96.6)	95.1 (93.8,96.2)	94.6 (93.3,95.8)	95.3 (93.6,96.6)	96.8 (95.1,98.1)	96.3 (94.0,97.9)	96.4 (94.8,97.7)	100.0 (83.9,100.0)	95.6 (94.9,96.2)
R2M0	88.1 (85.4,90.5)	84.0 (79.8,87.7)	82.9 (78.5,86.7)	84.2 (78.5,89.0)	89.7 (83.6,94.1)	89.6 (82.5,94.5)	92.3 (87.4,95.7)	100.0 (39.8,100.0)	86.7 (84.4,88.7)
R2M1	98.6 (98.0,99.1)	98.9 (98.1,99.5)	98.7 (97.8,99.3)	99.0 (97.8,99.6)	99.1 (97.7,99.8)	98.7 (96.8,99.7)	98.0 (96.3,99.0)	100.0 (80.5,100.0)	98.7 (98.2,99.1)
R3	97.9 (96.9,98.6)	96.6 (95.1,97.8)	97.6 (96.2,98.6)	97.3 (95.0,98.7)	95.8 (92.7,97.8)	100.0 (98.5,100.0)	96.7 (94.3,98.3)	100.0 (76.8,100.0)	97.4 (96.6,98.1)
R3M0	95.2 (92.9,97.0)	93.3 (90.1,95.7)	94.6 (91.3,96.9)	93.3 (88.0,96.7)	92.4 (86.1,96.5)	100.0 (96.4,100.0)	93.1 (88.2,96.4)	100.0 (47.8,100.0)	94.4 (92.6,95.9)
R3M1	99.6 (98.8,99.9)	99.5 (98.2,99.9)	99.5 (98.3,99.9)	100.0 (98.3,100.0)	98.2 (94.7,99.6)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	99.6 (99.0,99.9)
U	55.5 (53.6,57.4)	54.6 (52.8,56.4)	46.9 (44.7,49.1)	53.1 (49.8,56.4)	54.6 (51.1,58.1)	59.1 (55.1,63.1)	67.5 (64.9,70.1)	55.6 (38.1,72.1)	55.0 (53.7,56.3)
Combination grades*									
Any DR	52.9 (52.4,53.4)	51.7 (51.1,52.3)	49.9 (49.3,50.5)	52.0 (51.2,52.9)	52.3 (51.3,53.3)	54.2 (53.1,55.3)	56.6 (55.8,57.5)	49.6 (44.7,54.6)	52.4 (52.0,52.7)
Any DR (excluding U)	52.7 (52.2,53.2)	51.4 (50.8,52.0)	50.2 (49.5,50.8)	51.9 (51.0,52.8)	52.1 (51.0,53.1)	53.8 (52.6,54.9)	55.4 (54.5,56.3)	49.1 (43.9,54.3)	52.1 (51.7,52.5)
Referable DR	76.5 (75.8,77.1)	72.5 (71.7,73.2)	72.7 (71.8,73.5)	76.0 (74.9,77.2)	73.6 (72.2,74.9)	76.3 (74.8,77.7)	77.3 (76.2,78.4)	74.1 (67.0,80.5)	74.7 (74.2,75.2)
Referable DR (excluding U)	80.5 (79.8,81.1)	77.5 (76.7,78.3)	78.3 (77.4,79.1)	80.6 (79.4,81.8)	77.9 (76.5,79.3)	80.0 (78.5,81.5)	80.2 (79.0,81.3)	79.0 (71.2,85.5)	79.2 (78.7,79.7)
No referable DR	22.0 (21.8,22.3)	22.1 (21.8,22.4)	19.0 (18.6,19.3)	19.9 (19.4,20.3)	22.7 (22.2,23.3)	23.7 (23.1,24.4)	28.5 (28.0,29.0)	16.4 (14.1,18.8)	22.1 (21.9,22.3)

5. ARIAS operating threshold 2 + visual acuity criterion:ARIAS test positive or visual acuity 6/12 or worse by final human grade in worst eye by population subgroups

Table S51: Vendor A test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor A (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	33.0 (32.5,33.4)	25.4 (24.8,26.0)	24.1 (23.7,24.5)	25.1 (24.4,25.7)	15.7 (14.3,17.1)	10.8 (10.3,11.3)	16.0 (15.6,16.3)	30.5 (30.1,30.9)	56.4 (55.8,57.1)	27.4 (27.2,27.6)
R1M0	32.8 (32.0,33.7)	26.6 (25.5,27.6)	26.3 (25.6,26.9)	26.4 (25.1,27.6)	15.2 (12.9,17.7)	11.0 (10.1,12.0)	15.8 (15.2,16.4)	31.8 (31.0,32.6)	57.2 (56.1,58.4)	28.3 (27.9,28.8)
R1M1	44.5 (43.0,46.1)	35.0 (33.5,36.5)	36.9 (35.8,37.9)	36.3 (34.3,38.4)	16.4 (12.6,20.8)	18.9 (17.2,20.7)	25.9 (24.9,27.0)	44.9 (43.8,46.1)	69.1 (67.3,70.8)	38.1 (37.4,38.8)
R2	66.0 (63.1,68.8)	58.1 (54.3,61.9)	60.6 (58.2,63.0)	63.3 (59.0,67.4)	36.2 (26.5,46.7)	46.0 (41.7,50.3)	58.9 (56.5,61.3)	69.3 (66.7,71.8)	83.0 (78.4,86.9)	62.0 (60.5,63.6)
R2M0	47.8 (42.0,53.7)	37.3 (29.8,45.2)	42.0 (37.1,47.0)	44.6 (36.2,53.3)	22.6 (9.6,41.1)	27.4 (20.1,35.7)	36.4 (31.6,41.4)	51.0 (45.6,56.4)	73.7 (63.6,82.2)	43.3 (40.2,46.5)
R2M1	72.8 (69.6,75.9)	64.7 (60.4,68.8)	66.9 (64.1,69.5)	70.0 (65.2,74.6)	42.9 (30.5,56.0)	52.3 (47.2,57.3)	66.0 (63.3,68.7)	75.9 (73.1,78.6)	86.9 (81.8,91.1)	68.5 (66.8,70.2)
R3	91.9 (89.6,93.8)	86.1 (82.2,89.4)	90.2 (87.7,92.3)	89.0 (84.5,92.6)	90.2 (78.6,96.7)	80.5 (75.2,85.1)	89.7 (87.2,92.0)	91.1 (88.8,93.0)	95.6 (92.4,97.7)	89.8 (88.4,91.1)
R3M0	91.3 (87.7,94.0)	83.3 (75.9,89.3)	89.4 (85.0,92.9)	83.3 (74.4,90.2)	100.0 (78.2,100.0)	73.3 (62.6,82.2)	86.3 (81.0,90.6)	89.5 (85.7,92.6)	95.9 (91.8,98.3)	88.5 (86.1,90.6)
R3M1	92.5 (89.1,95.1)	87.6 (82.8,91.5)	90.6 (87.4,93.3)	92.5 (87.2,96.0)	86.1 (70.5,95.3)	84.1 (77.8,89.2)	91.5 (88.4,93.9)	92.4 (89.3,94.8)	95.0 (88.7,98.4)	90.8 (89.0,92.4)
U	84.0 (82.3,85.5)	77.9 (75.4,80.2)	84.9 (83.2,86.5)	82.7 (79.5,85.6)	83.3 (68.6,93.0)	80.6 (72.9,86.9)	76.4 (73.3,79.3)	80.6 (78.9,82.2)	87.5 (86.1,88.8)	82.9 (81.9,83.8)
Combination grades*										
Any DR	44.2 (43.5,44.9)	37.3 (36.4,38.1)	36.5 (35.9,37.0)	37.3 (36.3,38.4)	21.6 (19.4,23.8)	19.7 (18.8,20.6)	26.0 (25.4,26.5)	43.4 (42.8,44.0)	66.8 (66.0,67.6)	39.0 (38.6,39.3)
Any DR (excluding U)	39.8 (39.0,40.5)	33.2 (32.3,34.1)	33.2 (32.6,33.8)	33.7 (32.7,34.8)	19.7 (17.6,21.9)	18.5 (17.6,19.5)	24.2 (23.6,24.7)	39.7 (39.1,40.3)	62.1 (61.1,63.0)	35.1 (34.7,35.5)
Referable DR	61.5 (60.4,62.5)	48.9 (47.6,50.1)	49.8 (48.9,50.7)	51.8 (50.2,53.5)	32.6 (28.6,36.8)	32.5 (30.8,34.2)	39.6 (38.7,40.6)	58.1 (57.2,59.0)	78.9 (77.8,80.0)	53.0 (52.4,53.5)
Referable DR (excluding U)	53.8 (52.5,55.1)	42.0 (40.7,43.4)	43.8 (42.9,44.8)	45.5 (43.7,47.3)	28.1 (24.1,32.4)	30.1 (28.4,31.9)	36.4 (35.4,37.4)	52.3 (51.2,53.3)	72.7 (71.1,74.3)	46.1 (45.5,46.7)
No referable DR	32.9 (32.6,33.3)	25.7 (25.2,26.2)	24.6 (24.3,25.0)	25.4 (24.8,26.0)	15.6 (14.4,16.8)	10.8 (10.4,11.3)	15.9 (15.6,16.2)	30.8 (30.4,31.1)	56.6 (56.1,57.2)	27.6 (27.4,27.8)

Table S52: Vendor A test positive rates by sex and quintiles of IMD

Final human grade in worst eye	Test positive % for Vendor A (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	24.1 (23.8,24.5)	30.8 (30.5,31.2)	26.1 (25.7,26.5)	25.6 (25.1,26.2)	28.1 (27.5,28.8)	27.9 (27.2,28.6)	30.8 (30.3,31.4)	18.9 (16.2,21.9)	27.4 (27.2,27.6)
R1M0	23.7 (23.1,24.2)	34.2 (33.5,34.9)	27.5 (26.8,28.3)	27.2 (26.1,28.2)	29.4 (28.3,30.6)	28.8 (27.4,30.1)	30.1 (29.1,31.2)	21.0 (16.0,26.8)	28.3 (27.9,28.8)
R1M1	34.1 (33.2,35.0)	43.2 (42.1,44.2)	37.5 (36.4,38.7)	37.9 (36.2,39.5)	40.1 (38.2,42.0)	38.8 (36.6,40.9)	37.9 (36.2,39.6)	35.0 (25.8,45.0)	38.1 (37.4,38.8)
R2	59.4 (57.5,61.4)	66.8 (64.3,69.3)	60.9 (58.2,63.5)	61.8 (58.4,65.2)	66.6 (62.6,70.3)	58.8 (54.0,63.5)	63.2 (59.4,66.8)	47.6 (25.7,70.2)	62.0 (60.5,63.6)
R2M0	42.0 (38.1,45.9)	45.9 (40.6,51.2)	39.7 (34.6,45.1)	37.9 (31.2,45.0)	47.9 (39.6,56.4)	39.1 (30.2,48.7)	55.2 (47.7,62.6)	50.0 (6.8,93.2)	43.3 (40.2,46.5)
R2M1	65.5 (63.3,67.7)	74.0 (71.2,76.7)	68.2 (65.2,71.1)	69.9 (66.1,73.6)	72.6 (68.2,76.6)	66.0 (60.5,71.2)	66.1 (61.7,70.2)	47.1 (23.0,72.2)	68.5 (66.8,70.2)
R3	89.4 (87.6,91.1)	90.6 (88.2,92.6)	91.2 (88.9,93.2)	87.2 (83.3,90.4)	87.3 (82.8,90.9)	88.3 (83.6,92.0)	93.1 (90.0,95.5)	85.7 (57.2,98.2)	89.8 (88.4,91.1)
R3M0	88.4 (85.2,91.1)	88.7 (84.8,91.8)	88.1 (83.7,91.7)	85.9 (79.3,91.1)	89.9 (83.0,94.7)	87.3 (79.2,93.0)	91.3 (86.1,95.1)	80.0 (28.4,99.5)	88.5 (86.1,90.6)
R3M1	90.1 (87.7,92.1)	92.2 (89.1,94.6)	93.2 (90.4,95.4)	88.1 (83.0,92.1)	85.4 (79.0,90.4)	89.0 (82.7,93.6)	94.7 (90.5,97.4)	88.9 (51.8,99.7)	90.8 (89.0,92.4)
U	81.2 (79.7,82.7)	84.4 (83.0,85.7)	83.7 (82.0,85.3)	83.6 (81.0,85.9)	84.3 (81.6,86.7)	78.9 (75.4,82.1)	81.7 (79.5,83.8)	94.4 (81.3,99.3)	82.9 (81.9,83.8)
Combination grades*									
Any DR	34.8 (34.3,35.3)	44.2 (43.6,44.7)	38.1 (37.5,38.7)	38.1 (37.2,38.9)	40.5 (39.6,41.5)	38.8 (37.7,39.9)	40.5 (39.7,41.4)	34.6 (30.0,39.5)	39.0 (38.6,39.3)
Any DR (excluding U)	31.4 (30.9,31.8)	40.0 (39.4,40.6)	34.3 (33.7,34.9)	34.5 (33.7,35.4)	36.7 (35.7,37.7)	35.5 (34.4,36.6)	36.1 (35.2,37.0)	28.8 (24.3,33.7)	35.1 (34.7,35.5)
Referable DR	49.6 (48.8,50.3)	57.3 (56.4,58.1)	52.1 (51.1,53.0)	52.3 (50.9,53.6)	55.1 (53.6,56.5)	52.2 (50.5,53.9)	54.4 (53.0,55.7)	52.9 (45.2,60.5)	53.0 (52.4,53.5)
Referable DR (excluding U)	43.5 (42.7,44.3)	49.7 (48.7,50.6)	45.2 (44.1,46.2)	46.0 (44.6,47.5)	48.4 (46.7,50.0)	46.3 (44.4,48.2)	46.4 (44.9,47.9)	42.0 (33.7,50.7)	46.1 (45.5,46.7)
No referable DR	24.0 (23.7,24.3)	31.6 (31.2,31.9)	26.4 (26.1,26.8)	26.0 (25.5,26.5)	28.4 (27.9,29.0)	28.1 (27.5,28.7)	30.7 (30.2,31.2)	19.4 (17.0,22.0)	27.6 (27.4,27.8)

Table S53: Vendor B test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor B (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	27.1 (26.7,27.5)	32.5 (31.8,33.1)	22.9 (22.5,23.3)	24.9 (24.3,25.6)	13.0 (11.8,14.3)	10.2 (9.7,10.7)	14.7 (14.4,15.1)	29.1 (28.6,29.5)	54.9 (54.3,55.6)	26.1 (25.9,26.3)
R1M0	50.6 (49.7,51.5)	57.9 (56.7,59.1)	52.4 (51.6,53.1)	52.4 (51.0,53.9)	45.8 (42.5,49.1)	41.5 (40.0,43.0)	45.1 (44.2,45.9)	54.8 (53.9,55.6)	70.9 (69.8,72.0)	52.7 (52.2,53.2)
R1M1	95.1 (94.4,95.8)	96.1 (95.5,96.7)	95.8 (95.3,96.2)	96.2 (95.3,97.0)	95.8 (93.1,97.7)	95.5 (94.5,96.4)	95.7 (95.2,96.2)	95.4 (94.9,95.9)	96.8 (96.1,97.5)	95.8 (95.5,96.0)
R2	99.4 (98.8,99.8)	97.6 (96.2,98.6)	98.9 (98.3,99.4)	98.1 (96.5,99.1)	98.9 (94.2,100.0)	99.8 (99.0,100.0)	98.6 (97.9,99.1)	98.4 (97.5,99.0)	99.1 (97.3,99.8)	98.7 (98.3,99.1)
<i>R2M0</i>	98.0 (95.7,99.3)	90.7 (85.1,94.7)	96.0 (93.6,97.7)	92.8 (87.2,96.5)	96.8 (83.3,99.9)	99.3 (95.9,100.0)	94.1 (91.3,96.3)	94.2 (91.2,96.4)	97.9 (92.6,99.7)	95.3 (93.8,96.5)
<i>R2M1</i>	100.0 (99.5,100.0)	99.8 (98.9,100.0)	99.9 (99.5,100.0)	100.0 (99.1,100.0)	100.0 (94.3,100.0)	100.0 (99.1,100.0)	100.0 (99.7,100.0)	99.9 (99.4,100.0)	99.5 (97.5,100.0)	99.9 (99.7,100.0)
R3	98.8 (97.7,99.5)	99.7 (98.5,100.0)	99.1 (98.1,99.7)	99.2 (97.2,99.9)	100.0 (93.0,100.0)	99.2 (97.3,99.9)	99.2 (98.2,99.8)	99.2 (98.2,99.7)	98.5 (96.3,99.6)	99.1 (98.6,99.5)
<i>R3M0</i>	97.7 (95.5,99.0)	99.2 (95.9,100.0)	97.6 (94.9,99.1)	97.9 (92.7,99.7)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	97.7 (94.8,99.3)	98.2 (96.1,99.3)	97.7 (94.2,99.4)	97.9 (96.7,98.8)
<i>R3M1</i>	100.0 (98.9,100.0)	100.0 (98.5,100.0)	100.0 (99.1,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	100.0 (99.2,100.0)	100.0 (99.1,100.0)	100.0 (96.4,100.0)	100.0 (99.7,100.0)
U	95.2 (94.2,96.1)	98.3 (97.3,98.9)	97.8 (97.0,98.4)	97.4 (95.9,98.5)	97.6 (87.4,99.9)	94.8 (89.5,97.9)	96.6 (95.1,97.8)	97.0 (96.2,97.6)	97.1 (96.3,97.7)	96.9 (96.4,97.4)
Combination grades*										
Any DR	68.7 (68.0,69.3)	76.6 (75.9,77.4)	71.6 (71.0,72.1)	71.6 (70.6,72.5)	64.5 (61.9,66.9)	63.8 (62.7,64.9)	67.0 (66.4,67.6)	73.1 (72.6,73.7)	82.5 (81.8,83.1)	71.6 (71.3,72.0)
Any DR (excluding U)	65.7 (65.0,66.4)	74.4 (73.6,75.2)	69.8 (69.2,70.4)	69.5 (68.5,70.5)	63.4 (60.8,66.0)	63.2 (62.1,64.3)	65.9 (65.3,66.6)	70.8 (70.2,71.3)	79.2 (78.4,79.9)	69.4 (69.1,69.8)
Referable DR	96.1 (95.6,96.5)	96.9 (96.5,97.3)	96.6 (96.3,97.0)	96.9 (96.3,97.4)	96.9 (95.1,98.2)	96.6 (95.9,97.3)	96.5 (96.1,96.9)	96.3 (96.0,96.7)	97.1 (96.7,97.6)	96.6 (96.4,96.8)
Referable DR (excluding U)	96.3 (95.8,96.8)	96.6 (96.1,97.1)	96.5 (96.1,96.8)	96.8 (96.1,97.4)	96.9 (94.9,98.2)	96.7 (96.0,97.4)	96.5 (96.1,96.9)	96.2 (95.8,96.6)	97.2 (96.5,97.7)	96.5 (96.3,96.7)
No referable DR	32.2 (31.8,32.6)	38.4 (37.8,39.0)	30.1 (29.8,30.5)	31.2 (30.6,31.8)	21.0 (19.7,22.4)	17.1 (16.6,17.7)	21.8 (21.5,22.2)	34.9 (34.5,35.3)	58.8 (58.3,59.4)	32.3 (32.0,32.5)

Table S54: Vendor B test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	Test positive % for Vendor B (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	23.4 (23.1,23.7)	28.9 (28.6,29.3)	27.1 (26.7,27.5)	25.6 (25.1,26.2)	26.2 (25.6,26.8)	25.0 (24.3,25.7)	25.4 (24.9,26.0)	18.0 (15.3,20.9)	26.1 (25.9,26.3)
R1M0	50.3 (49.7,51.0)	55.8 (55.0,56.5)	53.9 (53.1,54.7)	53.5 (52.4,54.7)	52.8 (51.5,54.1)	52.0 (50.5,53.4)	50.2 (49.1,51.4)	48.1 (41.5,54.7)	52.7 (52.2,53.2)
R1M1	95.7 (95.3,96.1)	95.8 (95.3,96.2)	95.6 (95.1,96.1)	95.8 (95.0,96.4)	95.6 (94.7,96.3)	96.0 (95.0,96.8)	96.1 (95.4,96.7)	94.2 (87.8,97.8)	95.8 (95.5,96.0)
R2	98.8 (98.2,99.2)	98.7 (97.9,99.2)	98.4 (97.6,99.0)	98.8 (97.7,99.4)	98.5 (97.2,99.3)	98.8 (97.3,99.6)	99.6 (98.7,99.9)	100.0 (83.9,100.0)	98.7 (98.3,99.1)
<i>R2M0</i>	95.4 (93.5,96.9)	95.2 (92.4,97.2)	94.0 (91.0,96.2)	95.6 (91.8,98.0)	93.8 (88.6,97.1)	95.7 (90.1,98.6)	98.3 (95.2,99.7)	100.0 (39.8,100.0)	95.3 (93.8,96.5)
<i>R2M1</i>	99.9 (99.7,100.0)	99.9 (99.5,100.0)	99.9 (99.4,100.0)	99.8 (99.1,100.0)	100.0 (99.2,100.0)	100.0 (98.8,100.0)	100.0 (99.3,100.0)	100.0 (80.5,100.0)	99.9 (99.7,100.0)
R3	99.0 (98.3,99.5)	99.3 (98.4,99.8)	99.1 (98.2,99.7)	99.5 (98.0,99.9)	99.3 (97.5,99.9)	100.0 (98.5,100.0)	98.1 (96.1,99.2)	100.0 (76.8,100.0)	99.1 (98.6,99.5)
<i>R3M0</i>	97.5 (95.7,98.7)	98.5 (96.6,99.5)	97.8 (95.4,99.2)	98.7 (95.2,99.8)	98.3 (94.1,99.8)	100.0 (96.4,100.0)	96.0 (91.8,98.4)	100.0 (47.8,100.0)	97.9 (96.7,98.8)
<i>R3M1</i>	100.0 (99.5,100.0)	100.0 (99.1,100.0)	100.0 (99.1,100.0)	100.0 (98.3,100.0)	100.0 (97.8,100.0)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	100.0 (99.7,100.0)
U	96.7 (96.0,97.4)	97.1 (96.4,97.7)	98.1 (97.5,98.7)	97.8 (96.6,98.7)	97.6 (96.4,98.6)	96.3 (94.5,97.7)	94.1 (92.6,95.3)	100.0 (90.3,100.0)	96.9 (96.4,97.4)
Combination grades*									
Any DR	70.3 (69.8,70.7)	73.4 (72.9,73.9)	72.3 (71.7,72.8)	72.3 (71.6,73.1)	71.8 (70.9,72.6)	71.2 (70.2,72.2)	70.0 (69.2,70.8)	68.8 (64.0,73.3)	71.6 (71.3,72.0)
Any DR (excluding U)	68.3 (67.8,68.8)	70.9 (70.4,71.5)	70.1 (69.5,70.7)	70.4 (69.5,71.2)	69.5 (68.5,70.4)	69.1 (68.0,70.2)	67.4 (66.6,68.3)	65.8 (60.7,70.6)	69.4 (69.1,69.8)
Referable DR	96.6 (96.3,96.9)	96.6 (96.2,96.9)	96.6 (96.3,97.0)	96.8 (96.3,97.2)	96.6 (96.0,97.1)	96.7 (96.0,97.3)	96.2 (95.6,96.7)	96.6 (92.6,98.7)	96.6 (96.4,96.8)
Referable DR (excluding U)	96.6 (96.2,96.8)	96.4 (96.1,96.8)	96.3 (95.9,96.7)	96.6 (96.0,97.1)	96.4 (95.7,97.0)	96.8 (96.0,97.4)	96.8 (96.2,97.3)	95.7 (90.8,98.4)	96.5 (96.3,96.7)
No referable DR	30.1 (29.8,30.4)	34.7 (34.4,35.0)	33.4 (33.0,33.8)	32.2 (31.7,32.7)	32.3 (31.8,32.9)	31.3 (30.7,32.0)	30.9 (30.4,31.4)	25.2 (22.5,28.0)	32.3 (32.0,32.5)

Table S55: Vendor C test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor C (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	23.2 (22.8,23.6)	22.3 (21.8,22.9)	17.1 (16.8,17.5)	18.2 (17.6,18.8)	10.6 (9.5,11.8)	7.3 (6.9,7.8)	10.7 (10.4,11.0)	21.3 (20.9,21.7)	46.4 (45.7,47.0)	20.1 (19.9,20.3)
R1M0	22.8 (22.0,23.6)	21.0 (20.0,22.0)	18.3 (17.7,18.9)	18.6 (17.5,19.7)	8.9 (7.2,11.0)	7.7 (6.9,8.6)	10.7 (10.2,11.2)	21.7 (21.1,22.4)	43.9 (42.7,45.0)	20.1 (19.8,20.5)
R1M1	33.8 (32.3,35.2)	28.4 (27.0,29.8)	29.1 (28.1,30.1)	27.5 (25.6,29.4)	11.3 (8.2,15.2)	14.1 (12.6,15.7)	21.0 (20.0,22.0)	34.0 (32.9,35.1)	55.6 (53.7,57.5)	29.8 (29.1,30.5)
R2	61.8 (58.9,64.7)	51.8 (47.9,55.6)	57.3 (54.8,59.7)	60.1 (55.7,64.3)	36.2 (26.5,46.7)	50.3 (45.9,54.6)	58.0 (55.6,60.4)	59.6 (56.8,62.3)	70.7 (65.3,75.6)	58.0 (56.4,59.5)
R2M0	41.8 (36.2,47.6)	35.4 (28.0,43.3)	42.3 (37.4,47.3)	43.9 (35.5,52.5)	22.6 (9.6,41.1)	43.7 (35.2,52.5)	37.4 (32.6,42.4)	40.9 (35.6,46.3)	61.1 (50.5,70.9)	41.2 (38.2,44.4)
R2M1	69.4 (66.1,72.6)	56.9 (52.5,61.2)	62.3 (59.5,65.1)	65.9 (60.9,70.6)	42.9 (30.5,56.0)	52.5 (47.5,57.5)	64.5 (61.8,67.2)	66.3 (63.2,69.3)	74.8 (68.5,80.3)	63.8 (62.0,65.5)
R3	77.3 (73.9,80.4)	76.2 (71.6,80.4)	83.5 (80.5,86.2)	75.7 (69.9,80.8)	84.3 (71.4,93.0)	73.7 (67.9,78.9)	78.1 (74.7,81.2)	80.4 (77.4,83.2)	81.3 (76.1,85.7)	79.0 (77.1,80.7)
R3M0	67.9 (62.7,72.8)	71.2 (62.7,78.8)	79.6 (74.1,84.4)	70.8 (60.7,79.7)	80.0 (51.9,95.7)	58.1 (47.0,68.7)	69.9 (63.3,75.9)	74.6 (69.5,79.1)	77.9 (71.0,83.9)	72.4 (69.2,75.4)
R3M1	86.8 (82.7,90.3)	78.9 (73.2,83.9)	85.9 (82.1,89.1)	78.6 (71.4,84.7)	86.1 (70.5,95.3)	81.3 (74.7,86.7)	82.3 (78.3,85.7)	85.2 (81.4,88.5)	87.0 (78.8,92.9)	83.7 (81.4,85.8)
U	82.9 (81.2,84.5)	81.2 (78.8,83.4)	84.1 (82.3,85.7)	81.6 (78.3,84.5)	85.7 (71.5,94.6)	81.3 (73.7,87.5)	79.3 (76.3,82.0)	79.8 (78.1,81.4)	87.0 (85.6,88.4)	82.8 (81.8,83.8)
Combination grades*										
Any DR	35.1 (34.4,35.8)	32.1 (31.2,32.9)	29.3 (28.8,29.8)	29.9 (28.9,30.9)	16.2 (14.4,18.3)	16.5 (15.7,17.4)	21.3 (20.8,21.8)	34.0 (33.4,34.6)	55.8 (54.9,56.7)	31.5 (31.2,31.9)
Any DR (excluding U)	29.7 (29.1,30.4)	27.1 (26.3,27.9)	25.6 (25.1,26.1)	25.8 (24.8,26.8)	14.1 (12.3,16.1)	15.3 (14.4,16.1)	19.2 (18.7,19.8)	29.4 (28.8,30.0)	48.7 (47.7,49.7)	27.1 (26.7,27.4)
Referable DR	53.8 (52.7,54.9)	44.0 (42.7,45.3)	43.7 (42.8,44.6)	44.8 (43.2,46.4)	28.9 (25.1,33.0)	29.5 (27.8,31.2)	35.6 (34.6,36.5)	49.4 (48.5,50.3)	71.0 (69.8,72.2)	46.6 (46.0,47.1)
Referable DR (excluding U)	43.8 (42.6,45.1)	35.2 (33.9,36.6)	36.8 (35.9,37.7)	37.2 (35.5,38.9)	24.0 (20.2,28.0)	26.9 (25.2,28.6)	31.7 (30.8,32.7)	41.5 (40.5,42.6)	59.3 (57.5,61.0)	38.2 (37.6,38.8)
No referable DR	23.1 (22.7,23.4)	22.0 (21.5,22.5)	17.4 (17.1,17.7)	18.3 (17.7,18.8)	10.2 (9.3,11.2)	7.4 (7.1,7.8)	10.7 (10.5,11.0)	21.4 (21.1,21.7)	45.8 (45.2,46.3)	20.1 (19.9,20.3)

Table S56: Vendor C test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	Test positive % for Vendor C (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	18.0 (17.7,18.3)	22.3 (22.0,22.7)	20.9 (20.6,21.3)	19.9 (19.4,20.4)	20.1 (19.6,20.7)	18.9 (18.3,19.6)	19.6 (19.1,20.1)	15.2 (12.7,17.9)	20.1 (19.9,20.3)
R1M0	17.0 (16.5,17.5)	24.2 (23.5,24.8)	21.1 (20.4,21.7)	20.0 (19.0,20.9)	20.2 (19.2,21.3)	19.1 (17.9,20.3)	19.2 (18.3,20.1)	17.6 (12.9,23.1)	20.1 (19.8,20.5)
R1M1	26.5 (25.6,27.3)	33.9 (32.9,35.0)	30.8 (29.8,31.9)	29.2 (27.7,30.7)	31.3 (29.5,33.1)	29.4 (27.5,31.4)	27.3 (25.8,28.8)	29.1 (20.6,38.9)	29.8 (29.1,30.5)
R2	56.8 (54.9,58.8)	60.0 (57.4,62.6)	56.6 (54.0,59.3)	58.1 (54.6,61.5)	64.9 (60.9,68.7)	55.8 (51.0,60.6)	56.2 (52.4,60.0)	42.9 (21.8,66.0)	58.0 (56.4,59.5)
R2M0	40.3 (36.5,44.2)	43.0 (37.8,48.4)	38.3 (33.2,43.6)	43.8 (36.9,51.0)	48.6 (40.3,57.0)	36.5 (27.7,46.0)	40.9 (33.6,48.4)	50.0 (6.8,93.2)	41.2 (38.2,44.4)
R2M1	62.6 (60.4,64.8)	65.9 (62.9,68.8)	63.0 (60.0,66.0)	62.9 (58.9,66.8)	70.1 (65.7,74.3)	62.9 (57.3,68.2)	61.8 (57.4,66.1)	41.2 (18.4,67.1)	63.8 (62.0,65.5)
R3	79.7 (77.3,81.9)	77.8 (74.6,80.7)	79.7 (76.6,82.6)	76.3 (71.6,80.6)	79.9 (74.7,84.4)	79.4 (73.8,84.2)	79.3 (74.7,83.3)	78.6 (49.2,95.3)	79.0 (77.1,80.7)
R3M0	74.9 (70.8,78.7)	68.9 (63.7,73.8)	73.0 (67.4,78.1)	65.8 (57.6,73.3)	75.6 (66.9,83.0)	76.5 (67.0,84.3)	72.8 (65.6,79.3)	60.0 (14.7,94.7)	72.4 (69.2,75.4)
R3M1	82.8 (79.9,85.4)	85.4 (81.6,88.7)	84.1 (80.3,87.4)	83.5 (77.9,88.2)	82.9 (76.3,88.3)	81.4 (74.1,87.4)	85.2 (79.3,89.9)	88.9 (51.8,99.7)	83.7 (81.4,85.8)
U	81.1 (79.6,82.6)	84.3 (82.9,85.6)	85.7 (84.0,87.2)	84.1 (81.6,86.4)	84.3 (81.6,86.7)	79.2 (75.8,82.4)	77.7 (75.3,80.0)	94.4 (81.3,99.3)	82.8 (81.8,83.8)
Combination grades*									
Any DR	28.5 (28.1,29.0)	35.4 (34.8,35.9)	32.2 (31.6,32.8)	31.2 (30.3,32.0)	32.7 (31.7,33.6)	30.4 (29.4,31.4)	30.5 (29.7,31.3)	30.7 (26.3,35.4)	31.5 (31.2,31.9)
Any DR (excluding U)	24.6 (24.1,25.0)	30.3 (29.7,30.8)	27.7 (27.2,28.3)	27.0 (26.2,27.8)	28.1 (27.2,29.1)	26.3 (25.3,27.4)	25.4 (24.6,26.2)	24.5 (20.2,29.2)	27.1 (26.7,27.4)
Referable DR	43.7 (43.0,44.5)	50.1 (49.2,50.9)	46.9 (46.0,47.9)	45.7 (44.4,47.0)	49.0 (47.5,50.5)	45.4 (43.7,47.1)	45.5 (44.1,46.8)	48.3 (40.6,56.0)	46.6 (46.0,47.1)
Referable DR (excluding U)	36.6 (35.8,37.4)	40.5 (39.6,41.4)	38.5 (37.5,39.5)	38.0 (36.6,39.5)	40.9 (39.2,42.5)	38.0 (36.2,39.9)	36.1 (34.6,37.5)	36.2 (28.2,44.8)	38.2 (37.6,38.8)
No referable DR	17.7 (17.5,18.0)	22.7 (22.4,23.0)	21.0 (20.7,21.3)	19.9 (19.5,20.4)	20.1 (19.6,20.7)	19.0 (18.4,19.5)	19.5 (19.1,19.9)	15.7 (13.5,18.2)	20.1 (19.9,20.3)

Table S57: Vendor E test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor E (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	46.1 (45.6,46.6)	44.2 (43.6,44.9)	43.9 (43.5,44.4)	43.9 (43.2,44.7)	69.2 (67.5,71.0)	40.8 (40.0,41.6)	35.1 (34.7,35.6)	44.3 (43.9,44.8)	64.3 (63.6,64.9)	44.7 (44.4,45.0)
R1M0	72.9 (72.1,73.7)	73.6 (72.5,74.6)	76.9 (76.3,77.6)	75.4 (74.2,76.6)	82.8 (80.2,85.2)	74.1 (72.8,75.4)	72.9 (72.1,73.6)	73.5 (72.8,74.3)	81.3 (80.4,82.2)	74.9 (74.5,75.4)
R1M1	96.3 (95.6,96.8)	93.8 (93.0,94.5)	95.8 (95.4,96.3)	95.8 (94.9,96.6)	97.9 (95.7,99.2)	96.4 (95.5,97.2)	96.0 (95.5,96.5)	94.8 (94.3,95.3)	95.0 (94.1,95.8)	95.5 (95.2,95.8)
R2	98.5 (97.6,99.2)	96.0 (94.2,97.4)	98.0 (97.2,98.6)	97.1 (95.3,98.4)	97.9 (92.5,99.7)	98.9 (97.6,99.6)	98.0 (97.2,98.6)	96.7 (95.6,97.6)	98.1 (95.9,99.3)	97.7 (97.2,98.1)
<i>R2M0</i>	95.7 (92.7,97.7)	83.9 (77.2,89.2)	93.3 (90.3,95.5)	91.4 (85.4,95.5)	93.5 (78.6,99.2)	97.8 (93.6,99.5)	93.1 (90.2,95.4)	88.4 (84.5,91.6)	93.7 (86.8,97.6)	92.2 (90.4,93.8)
<i>R2M1</i>	99.6 (98.9,99.9)	99.8 (98.9,100.0)	99.6 (99.0,99.9)	99.2 (97.8,99.8)	100.0 (94.3,100.0)	99.2 (97.8,99.8)	99.5 (99.0,99.8)	99.7 (99.1,99.9)	100.0 (98.4,100.0)	99.6 (99.3,99.8)
R3	98.7 (97.5,99.4)	99.5 (98.1,99.9)	99.3 (98.3,99.8)	98.0 (95.5,99.4)	100.0 (93.0,100.0)	99.2 (97.3,99.9)	99.1 (98.0,99.7)	98.6 (97.5,99.4)	98.9 (96.8,99.8)	98.9 (98.4,99.3)
<i>R3M0</i>	97.4 (95.1,98.8)	99.2 (95.9,100.0)	98.0 (95.5,99.4)	94.8 (88.3,98.3)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	97.7 (94.8,99.3)	97.0 (94.6,98.6)	98.3 (95.0,99.6)	97.6 (96.3,98.5)
<i>R3M1</i>	100.0 (98.9,100.0)	99.6 (97.7,100.0)	100.0 (99.1,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	100.0 (97.9,100.0)	99.8 (98.7,100.0)	100.0 (99.1,100.0)	100.0 (96.4,100.0)	99.9 (99.5,100.0)
U	88.0 (86.6,89.4)	85.1 (83.0,87.1)	89.9 (88.4,91.2)	87.2 (84.3,89.7)	95.2 (83.8,99.4)	89.6 (83.1,94.2)	84.5 (81.8,87.0)	86.4 (84.9,87.7)	90.4 (89.2,91.6)	87.9 (87.1,88.8)
Combination grades*										
Any DR	81.6 (81.0,82.1)	82.8 (82.1,83.4)	84.9 (84.5,85.4)	83.7 (82.9,84.5)	88.3 (86.5,89.9)	83.3 (82.4,84.2)	82.6 (82.1,83.1)	82.4 (81.9,82.9)	86.7 (86.0,87.2)	83.4 (83.1,83.7)
Any DR (excluding U)	80.8 (80.2,81.4)	82.5 (81.8,83.2)	84.6 (84.2,85.0)	83.4 (82.6,84.2)	88.1 (86.3,89.8)	83.2 (82.3,84.1)	82.5 (82.0,83.0)	82.0 (81.5,82.5)	85.8 (85.1,86.5)	83.0 (82.7,83.3)
Referable DR	94.7 (94.2,95.2)	92.7 (92.0,93.4)	95.4 (95.0,95.8)	94.7 (93.9,95.4)	97.9 (96.3,98.9)	96.8 (96.1,97.4)	95.6 (95.2,96.0)	93.6 (93.1,94.0)	93.4 (92.8,94.1)	94.6 (94.3,94.9)
Referable DR (excluding U)	96.9 (96.5,97.4)	94.5 (93.8,95.1)	96.4 (96.0,96.7)	96.2 (95.5,96.9)	98.1 (96.5,99.1)	97.2 (96.5,97.8)	96.6 (96.2,97.0)	95.4 (95.0,95.8)	95.6 (94.8,96.3)	96.1 (95.9,96.4)
No referable DR	51.9 (51.5,52.3)	51.1 (50.5,51.7)	52.0 (51.6,52.4)	51.1 (50.4,51.7)	72.6 (71.1,74.0)	48.2 (47.5,48.9)	43.9 (43.5,44.4)	51.0 (50.6,51.3)	68.4 (67.9,69.0)	51.7 (51.5,51.9)

Table S58: Vendor E test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	Test positive % for Vendor E (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	43.4 (43.0,43.8)	46.1 (45.7,46.4)	44.6 (44.1,45.0)	44.3 (43.6,44.9)	44.9 (44.2,45.6)	45.3 (44.4,46.1)	44.9 (44.3,45.5)	42.1 (38.6,45.8)	44.7 (44.4,45.0)
R1M0	75.2 (74.7,75.8)	74.6 (73.9,75.2)	74.7 (74.0,75.4)	75.8 (74.8,76.8)	75.0 (73.8,76.1)	75.4 (74.1,76.6)	74.2 (73.2,75.2)	78.1 (72.2,83.2)	74.9 (74.5,75.4)
R1M1	95.9 (95.5,96.3)	95.0 (94.5,95.5)	95.9 (95.4,96.3)	95.1 (94.4,95.8)	95.5 (94.6,96.3)	95.6 (94.6,96.4)	95.1 (94.3,95.8)	96.1 (90.4,98.9)	95.5 (95.2,95.8)
R2	98.0 (97.3,98.5)	97.2 (96.1,98.0)	97.1 (96.1,97.9)	98.0 (96.8,98.9)	98.0 (96.5,99.0)	97.9 (96.1,99.0)	97.9 (96.5,98.9)	100.0 (83.9,100.0)	97.7 (97.2,98.1)
<i>R2M0</i>	93.1 (90.8,94.9)	90.6 (87.1,93.4)	89.4 (85.7,92.4)	93.1 (88.7,96.2)	93.8 (88.6,97.1)	92.2 (85.7,96.4)	95.0 (90.8,97.7)	100.0 (39.8,100.0)	92.2 (90.4,93.8)
<i>R2M1</i>	99.7 (99.3,99.9)	99.4 (98.7,99.8)	99.8 (99.3,100.0)	99.7 (98.8,100.0)	99.3 (98.1,99.9)	100.0 (98.8,100.0)	99.0 (97.7,99.7)	100.0 (80.5,100.0)	99.6 (99.3,99.8)
R3	98.9 (98.1,99.4)	99.1 (98.1,99.6)	99.0 (98.0,99.6)	98.9 (97.2,99.7)	99.6 (98.0,100.0)	98.8 (96.5,99.7)	98.3 (96.4,99.4)	100.0 (76.8,100.0)	98.9 (98.4,99.3)
<i>R3M0</i>	97.3 (95.4,98.6)	98.0 (95.9,99.2)	97.8 (95.4,99.2)	97.3 (93.3,99.3)	99.2 (95.4,100.0)	97.1 (91.6,99.4)	96.5 (92.6,98.7)	100.0 (47.8,100.0)	97.6 (96.3,98.5)
<i>R3M1</i>	99.9 (99.3,100.0)	100.0 (99.1,100.0)	99.8 (98.7,100.0)	100.0 (98.3,100.0)	100.0 (97.8,100.0)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	99.9 (99.5,100.0)
U	87.4 (86.1,88.7)	88.4 (87.2,89.5)	90.0 (88.6,91.3)	88.5 (86.3,90.5)	89.0 (86.6,91.1)	86.7 (83.7,89.3)	84.1 (82.0,86.1)	94.4 (81.3,99.3)	87.9 (87.1,88.8)
Combination grades*									
Any DR	83.8 (83.4,84.2)	83.0 (82.5,83.4)	83.5 (83.0,84.0)	84.0 (83.4,84.7)	83.6 (82.8,84.3)	83.6 (82.8,84.4)	82.4 (81.7,83.0)	86.0 (82.2,89.2)	83.4 (83.1,83.7)
Any DR (excluding U)	83.5 (83.1,83.9)	82.4 (82.0,82.8)	83.0 (82.5,83.4)	83.7 (83.0,84.3)	83.1 (82.3,83.9)	83.3 (82.5,84.2)	82.2 (81.5,82.9)	85.2 (81.1,88.6)	83.0 (82.7,83.3)
Referable DR	95.1 (94.7,95.4)	94.0 (93.6,94.4)	95.2 (94.7,95.5)	94.7 (94.1,95.3)	94.9 (94.2,95.5)	94.5 (93.7,95.3)	93.1 (92.5,93.8)	96.6 (92.6,98.7)	94.6 (94.3,94.9)
Referable DR (excluding U)	96.5 (96.2,96.8)	95.6 (95.2,96.0)	96.3 (95.9,96.7)	95.9 (95.3,96.5)	96.3 (95.6,96.9)	96.2 (95.4,96.9)	95.8 (95.1,96.4)	97.1 (92.7,99.2)	96.1 (95.9,96.4)
No referable DR	51.3 (51.0,51.6)	52.2 (51.8,52.5)	51.7 (51.3,52.1)	51.7 (51.1,52.3)	51.8 (51.2,52.5)	52.3 (51.6,53.0)	51.4 (50.8,51.9)	50.7 (47.5,53.9)	51.7 (51.5,51.9)

Table S59: Vendor F test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor F (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	25.0 (24.6,25.4)	24.9 (24.3,25.5)	20.4 (20.0,20.7)	20.8 (20.1,21.4)	13.8 (12.5,15.1)	9.4 (9.0,9.9)	12.8 (12.5,13.1)	24.4 (24.1,24.8)	49.0 (48.4,49.7)	22.7 (22.5,22.9)
R1M0	51.1 (50.2,52.0)	46.4 (45.1,47.6)	47.6 (46.9,48.4)	47.8 (46.4,49.2)	39.9 (36.7,43.2)	36.5 (35.1,38.0)	40.2 (39.3,41.0)	51.4 (50.6,52.3)	66.7 (65.6,67.8)	48.5 (48.0,49.0)
R1M1	85.3 (84.1,86.3)	78.3 (77.0,79.6)	80.8 (80.0,81.7)	81.6 (79.9,83.2)	82.1 (77.6,86.0)	78.3 (76.4,80.1)	79.7 (78.7,80.7)	81.8 (80.9,82.7)	86.9 (85.5,88.1)	81.4 (80.8,81.9)
R2	98.4 (97.5,99.1)	95.3 (93.4,96.7)	98.0 (97.2,98.6)	97.7 (96.0,98.8)	96.8 (91.0,99.3)	98.3 (96.8,99.2)	97.7 (96.8,98.4)	96.8 (95.7,97.7)	99.7 (98.3,100.0)	97.6 (97.1,98.1)
R2M0	94.6 (91.5,96.9)	88.2 (82.2,92.7)	93.8 (90.9,95.9)	93.5 (88.1,97.0)	93.5 (78.6,99.2)	94.8 (89.6,97.9)	92.4 (89.3,94.8)	91.3 (87.8,94.1)	100.0 (96.2,100.0)	93.1 (91.3,94.6)
R2M1	99.9 (99.3,100.0)	97.5 (95.7,98.6)	99.4 (98.8,99.8)	99.2 (97.8,99.8)	98.4 (91.5,100.0)	99.5 (98.2,99.9)	99.4 (98.7,99.7)	98.7 (97.8,99.3)	99.5 (97.5,100.0)	99.2 (98.8,99.5)
R3	96.9 (95.3,98.1)	96.3 (93.8,97.9)	97.5 (96.0,98.5)	95.3 (91.9,97.5)	100.0 (93.0,100.0)	97.3 (94.6,98.9)	97.1 (95.5,98.2)	95.9 (94.3,97.2)	97.1 (94.3,98.7)	96.8 (95.9,97.5)
R3M0	94.2 (91.1,96.4)	91.7 (85.6,95.8)	94.9 (91.4,97.3)	90.6 (82.9,95.6)	100.0 (78.2,100.0)	95.3 (88.5,98.7)	92.2 (87.9,95.4)	92.5 (89.1,95.1)	95.9 (91.8,98.3)	93.6 (91.7,95.2)
R3M1	99.7 (98.3,100.0)	98.8 (96.4,99.7)	99.0 (97.6,99.7)	98.1 (94.6,99.6)	100.0 (90.3,100.0)	98.3 (95.1,99.6)	99.5 (98.3,99.9)	98.8 (97.1,99.6)	99.0 (94.6,100.0)	99.0 (98.3,99.5)
U	84.4 (82.7,86.0)	83.9 (81.7,86.0)	86.2 (84.6,87.8)	83.7 (80.5,86.5)	92.9 (80.5,98.5)	81.3 (73.7,87.5)	82.5 (79.7,85.1)	82.0 (80.4,83.6)	88.4 (87.0,89.7)	84.8 (83.8,85.7)
Combination grades*										
Any DR	65.7 (65.0,66.3)	63.7 (62.8,64.5)	63.7 (63.2,64.3)	63.9 (62.9,64.9)	57.2 (54.6,59.8)	55.7 (54.5,56.9)	58.9 (58.2,59.5)	66.1 (65.5,66.6)	76.5 (75.7,77.2)	64.3 (63.9,64.7)
Any DR (excluding U)	63.6 (62.9,64.3)	61.6 (60.7,62.5)	62.2 (61.6,62.8)	62.4 (61.3,63.4)	56.2 (53.5,58.8)	55.2 (54.0,56.4)	58.0 (57.4,58.7)	64.5 (63.9,65.1)	73.7 (72.9,74.6)	62.5 (62.1,62.9)
Referable DR	87.8 (87.1,88.5)	82.4 (81.4,83.3)	84.7 (84.1,85.3)	85.2 (84.0,86.3)	87.4 (84.2,90.1)	83.9 (82.5,85.2)	84.1 (83.3,84.8)	84.5 (83.8,85.2)	88.8 (87.9,89.6)	85.1 (84.7,85.5)
Referable DR (excluding U)	89.0 (88.2,89.8)	82.0 (80.9,83.1)	84.5 (83.8,85.1)	85.5 (84.2,86.8)	86.9 (83.5,89.8)	84.0 (82.6,85.4)	84.2 (83.4,84.9)	85.2 (84.4,85.9)	89.0 (87.9,90.1)	85.2 (84.8,85.6)
No referable DR	30.6 (30.3,31.0)	29.9 (29.4,30.5)	27.0 (26.7,27.4)	26.9 (26.3,27.5)	20.2 (18.9,21.5)	15.4 (14.9,15.9)	19.2 (18.8,19.5)	30.6 (30.2,30.9)	53.3 (52.8,53.9)	28.7 (28.5,28.9)

Table S60: Vendor F test positive rates by sex and quintiles of IMD.

Final human grade in worst eye	Test positive % for Vendor F (95% confidence intervals)							
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing
R0M0	20.6 (20.3,20.9)	24.9 (24.6,25.3)	23.7 (23.3,24.1)	22.4 (21.9,23.0)	22.8 (22.2,23.4)	21.4 (20.8,22.1)	21.9 (21.4,22.4)	16.5 (13.9,19.4)
R1M0	46.4 (45.7,47.0)	51.2 (50.5,52.0)	49.3 (48.5,50.1)	48.6 (47.4,49.7)	49.1 (47.8,50.4)	48.3 (46.9,49.8)	46.6 (45.5,47.8)	44.2 (37.7,50.8)
R1M1	81.1 (80.3,81.8)	81.8 (81.0,82.6)	81.6 (80.7,82.5)	82.6 (81.3,83.9)	80.5 (78.9,82.0)	81.1 (79.3,82.7)	80.7 (79.3,82.0)	78.6 (69.5,86.1)
R2	97.9 (97.2,98.4)	97.1 (96.1,97.9)	97.3 (96.3,98.1)	97.6 (96.3,98.6)	97.8 (96.3,98.8)	97.2 (95.2,98.5)	98.1 (96.7,99.0)	100.0 (83.9,100.0)
R2M0	93.7 (91.5,95.4)	92.0 (88.7,94.6)	92.0 (88.6,94.6)	92.6 (88.1,95.8)	93.8 (88.6,97.1)	90.4 (83.5,95.1)	96.7 (92.9,98.8)	100.0 (39.8,100.0)
R2M1	99.4 (98.9,99.7)	98.8 (98.0,99.4)	99.2 (98.4,99.7)	99.3 (98.3,99.8)	99.1 (97.7,99.8)	99.7 (98.2,100.0)	98.6 (97.1,99.4)	100.0 (80.5,100.0)
R3	97.1 (96.0,98.0)	96.2 (94.6,97.5)	97.3 (95.8,98.4)	93.7 (90.7,96.0)	96.5 (93.6,98.3)	98.8 (96.5,99.7)	97.5 (95.3,98.9)	100.0 (76.8,100.0)
R3M0	93.6 (91.0,95.6)	93.6 (90.5,95.9)	93.9 (90.4,96.4)	87.9 (81.6,92.7)	93.3 (87.2,97.1)	98.0 (93.1,99.8)	95.4 (91.1,98.0)	100.0 (47.8,100.0)
R3M1	99.3 (98.5,99.8)	98.5 (96.7,99.4)	99.5 (98.3,99.9)	97.7 (94.7,99.3)	98.8 (95.7,99.9)	99.3 (96.2,100.0)	99.5 (97.1,100.0)	100.0 (66.4,100.0)
U	83.4 (81.9,84.8)	86.1 (84.8,87.4)	86.8 (85.2,88.3)	87.0 (84.6,89.1)	85.3 (82.6,87.6)	81.9 (78.6,84.9)	80.9 (78.6,83.0)	97.2 (85.5,99.9)
Combination grades*								
Any DR	63.1 (62.6,63.5)	65.9 (65.3,66.4)	64.9 (64.3,65.4)	65.0 (64.1,65.8)	64.6 (63.6,65.5)	63.9 (62.8,65.0)	62.7 (61.8,63.5)	62.4 (57.5,67.1)
Any DR (excluding U)	61.6 (61.0,62.1)	63.8 (63.2,64.3)	63.0 (62.4,63.6)	63.3 (62.4,64.1)	62.8 (61.8,63.7)	62.4 (61.3,63.5)	60.7 (59.8,61.6)	59.0 (53.8,64.1)
Referable DR	85.1 (84.6,85.7)	85.1 (84.5,85.7)	85.5 (84.8,86.1)	86.3 (85.4,87.2)	84.8 (83.7,85.9)	84.6 (83.3,85.8)	83.9 (82.9,84.8)	86.8 (80.8,91.4)
Referable DR (excluding U)	85.5 (84.9,86.0)	84.8 (84.1,85.5)	85.2 (84.4,85.9)	86.2 (85.1,87.1)	84.7 (83.5,85.9)	85.2 (83.8,86.5)	84.8 (83.6,85.8)	84.1 (76.9,89.7)
No referable DR	26.9 (26.7,27.2)	30.6 (30.3,30.9)	29.7 (29.4,30.1)	28.6 (28.1,29.1)	28.9 (28.3,29.5)	27.7 (27.1,28.4)	27.3 (26.8,27.8)	23.1 (20.5,25.9)

Table S61: Vendor H test positive rates by ethnicity and age.

Final human grade in worst eye	Test positive % for Vendor H (95% confidence intervals)									
	White	Black	South Asian	Other/Unknown	Age < 30	30 ≤ Age < 45	45 ≤ Age < 60	60 ≤ Age < 75	Age ≥ 75	Overall
R0M0	37.3 (36.9,37.8)	27.4 (26.8,28.0)	21.5 (21.2,21.9)	24.2 (23.6,24.9)	34.4 (32.6,36.2)	14.5 (13.9,15.1)	16.1 (15.7,16.4)	30.0 (29.6,30.4)	56.5 (55.9,57.2)	28.1 (27.8,28.3)
R1M0	50.2 (49.3,51.1)	40.9 (39.7,42.1)	38.5 (37.7,39.2)	40.1 (38.7,41.5)	48.6 (45.3,51.9)	31.7 (30.3,33.1)	31.9 (31.1,32.7)	44.1 (43.3,45.0)	65.9 (64.7,67.0)	42.6 (42.2,43.1)
R1M1	83.9 (82.7,85.0)	75.6 (74.2,76.9)	77.5 (76.6,78.4)	78.7 (77.0,80.4)	85.4 (81.1,89.0)	75.4 (73.4,77.3)	75.7 (74.7,76.7)	78.9 (77.9,79.9)	87.6 (86.2,88.8)	78.7 (78.1,79.3)
R2	97.7 (96.6,98.5)	93.5 (91.4,95.2)	96.2 (95.1,97.1)	96.4 (94.4,97.8)	96.8 (91.0,99.3)	97.2 (95.4,98.4)	95.4 (94.3,96.4)	95.9 (94.7,96.9)	99.1 (97.3,99.8)	96.2 (95.5,96.7)
R2M0	92.6 (89.1,95.3)	75.8 (68.4,82.2)	89.0 (85.5,91.9)	88.5 (82.0,93.3)	90.3 (74.2,98.0)	89.6 (83.2,94.2)	85.2 (81.3,88.6)	87.2 (83.3,90.6)	97.9 (92.6,99.7)	87.9 (85.7,89.8)
R2M1	99.6 (98.9,99.9)	99.0 (97.7,99.7)	98.6 (97.7,99.2)	99.2 (97.8,99.8)	100.0 (94.3,100.0)	99.7 (98.6,100.0)	98.6 (97.8,99.2)	99.1 (98.2,99.6)	99.5 (97.5,100.0)	99.0 (98.6,99.4)
R3	97.5 (96.0,98.5)	98.4 (96.5,99.4)	98.4 (97.1,99.2)	97.6 (94.9,99.1)	100.0 (93.0,100.0)	98.9 (96.7,99.8)	97.9 (96.4,98.8)	97.6 (96.2,98.6)	98.2 (95.8,99.4)	98.0 (97.3,98.6)
R3M0	95.6 (92.9,97.5)	97.0 (92.4,99.2)	96.1 (92.9,98.1)	93.8 (86.9,97.7)	100.0 (78.2,100.0)	97.7 (91.9,99.7)	94.5 (90.6,97.1)	95.2 (92.3,97.2)	97.1 (93.3,99.0)	95.8 (94.2,97.0)
R3M1	99.4 (97.9,99.9)	99.2 (97.0,99.9)	99.8 (98.7,100.0)	100.0 (97.7,100.0)	100.0 (90.3,100.0)	99.4 (96.9,100.0)	99.5 (98.3,99.9)	99.5 (98.2,99.9)	100.0 (96.4,100.0)	99.6 (99.0,99.9)
U	90.4 (89.0,91.6)	81.5 (79.1,83.7)	85.6 (83.9,87.2)	85.9 (82.9,88.5)	92.9 (80.5,98.5)	82.8 (75.4,88.8)	82.7 (79.9,85.2)	83.8 (82.2,85.2)	90.7 (89.4,91.9)	86.5 (85.6,87.4)
Combination grades*										
Any DR	65.4 (64.8,66.1)	59.7 (58.9,60.6)	57.5 (56.9,58.0)	58.9 (57.9,60.0)	63.5 (61.0,66.0)	52.0 (50.9,53.2)	52.8 (52.2,53.5)	61.4 (60.8,62.0)	76.5 (75.8,77.3)	60.3 (60.0,60.7)
Any DR (excluding U)	62.6 (61.9,63.3)	57.5 (56.6,58.5)	55.5 (55.0,56.1)	56.8 (55.7,57.9)	62.7 (60.0,65.2)	51.4 (50.2,52.6)	51.8 (51.1,52.4)	59.1 (58.5,59.8)	73.3 (72.4,74.2)	58.1 (57.7,58.4)
Referable DR	88.6 (87.9,89.3)	80.1 (79.1,81.1)	82.2 (81.5,82.9)	83.8 (82.6,85.0)	89.5 (86.5,92.0)	81.9 (80.5,83.3)	81.0 (80.2,81.8)	83.1 (82.4,83.8)	90.1 (89.2,90.8)	83.7 (83.3,84.1)
Referable DR (excluding U)	87.9 (87.1,88.8)	79.8 (78.6,80.9)	81.7 (80.9,82.4)	83.4 (82.0,84.7)	89.2 (86.0,91.8)	81.9 (80.4,83.3)	80.8 (80.0,81.6)	82.9 (82.1,83.7)	89.6 (88.5,90.6)	83.0 (82.5,83.5)
No referable DR	40.1 (39.7,40.5)	30.6 (30.0,31.1)	25.7 (25.3,26.0)	27.8 (27.2,28.4)	37.9 (36.3,39.5)	18.3 (17.8,18.9)	19.8 (19.4,20.1)	33.2 (32.8,33.6)	58.8 (58.2,59.4)	31.5 (31.2,31.7)

Table S62: Vendor H test positive rates by sex and quintiles of IMD

Final human grade in worst eye	Test positive % for Vendor H (95% confidence intervals)								
	Male	Female	IMDquintile 1	IMDquintile 2	IMDquintile 3	IMDquintile 4	IMDquintile 5	Missing	Overall
R0M0	25.9 (25.6,26.2)	30.4 (30.0,30.8)	26.2 (25.8,26.6)	26.0 (25.4,26.5)	29.1 (28.5,29.8)	28.6 (27.9,29.4)	32.5 (32.0,33.1)	20.4 (17.6,23.5)	28.1 (27.8,28.3)
R1M0	40.4 (39.8,41.1)	45.5 (44.7,46.2)	41.1 (40.3,41.9)	41.1 (40.0,42.3)	43.2 (41.9,44.5)	43.3 (41.8,44.8)	46.5 (45.3,47.6)	38.6 (32.3,45.2)	42.6 (42.2,43.1)
R1M1	78.4 (77.6,79.2)	79.0 (78.1,79.9)	78.4 (77.4,79.4)	79.9 (78.5,81.2)	77.5 (75.8,79.0)	78.8 (77.0,80.6)	78.9 (77.5,80.3)	78.6 (69.5,86.1)	78.7 (78.1,79.3)
R2	96.3 (95.4,97.0)	96.0 (94.8,97.0)	95.4 (94.2,96.5)	95.5 (93.8,96.8)	97.3 (95.7,98.5)	96.7 (94.6,98.2)	96.9 (95.3,98.1)	100.0 (83.9,100.0)	96.2 (95.5,96.7)
R2M0	89.0 (86.4,91.3)	85.8 (81.7,89.2)	84.9 (80.7,88.4)	85.2 (79.6,89.8)	90.4 (84.4,94.7)	90.4 (83.5,95.1)	92.8 (88.0,96.1)	100.0 (39.8,100.0)	87.9 (85.7,89.8)
R2M1	98.8 (98.1,99.2)	99.5 (98.9,99.8)	99.1 (98.3,99.6)	99.0 (97.8,99.6)	99.6 (98.4,99.9)	99.0 (97.2,99.8)	98.4 (96.8,99.3)	100.0 (80.5,100.0)	99.0 (98.6,99.4)
R3	98.3 (97.4,98.9)	97.4 (96.0,98.5)	98.0 (96.7,98.9)	97.8 (95.8,99.1)	96.8 (94.0,98.5)	100.0 (98.5,100.0)	97.5 (95.3,98.9)	100.0 (76.8,100.0)	98.0 (97.3,98.6)
R3M0	96.3 (94.2,97.8)	95.1 (92.2,97.1)	95.7 (92.6,97.7)	94.6 (89.7,97.7)	95.0 (89.3,98.1)	100.0 (96.4,100.0)	94.8 (90.4,97.6)	100.0 (47.8,100.0)	95.8 (94.2,97.0)
R3M1	99.6 (98.8,99.9)	99.5 (98.2,99.9)	99.5 (98.3,99.9)	100.0 (98.3,100.0)	98.2 (94.7,99.6)	100.0 (97.5,100.0)	100.0 (98.1,100.0)	100.0 (66.4,100.0)	99.6 (99.0,99.9)
U	85.8 (84.4,87.1)	87.2 (85.9,88.4)	85.9 (84.3,87.4)	87.2 (84.8,89.3)	86.3 (83.7,88.6)	85.5 (82.5,88.3)	87.5 (85.5,89.2)	94.4 (81.3,99.3)	86.5 (85.6,87.4)
Combination grades*									
Any DR	59.1 (58.6,59.6)	61.9 (61.4,62.5)	59.2 (58.6,59.8)	60.0 (59.2,60.9)	60.5 (59.5,61.4)	60.7 (59.6,61.8)	62.7 (61.9,63.6)	59.0 (54.0,63.8)	60.3 (60.0,60.7)
Any DR (excluding U)	57.1 (56.6,57.6)	59.3 (58.7,59.9)	56.9 (56.3,57.6)	57.9 (57.0,58.8)	58.2 (57.2,59.2)	58.7 (57.5,59.8)	60.1 (59.2,61.0)	55.5 (50.3,60.7)	58.1 (57.7,58.4)
Referable DR	83.8 (83.2,84.3)	83.6 (82.9,84.2)	83.1 (82.4,83.8)	84.6 (83.6,85.5)	83.1 (82.0,84.2)	83.9 (82.6,85.1)	84.2 (83.2,85.2)	86.2 (80.2,91.0)	83.7 (83.3,84.1)
Referable DR (excluding U)	83.4 (82.7,84.0)	82.6 (81.8,83.3)	82.5 (81.7,83.2)	84.1 (83.0,85.1)	82.4 (81.1,83.6)	83.5 (82.1,84.9)	83.3 (82.1,84.4)	84.1 (76.9,89.7)	83.0 (82.5,83.5)
No referable DR	29.5 (29.2,29.8)	33.6 (33.3,33.9)	29.7 (29.4,30.1)	29.5 (29.0,30.0)	32.4 (31.8,33.0)	32.1 (31.4,32.7)	35.6 (35.1,36.1)	24.7 (22.1,27.6)	31.5 (31.2,31.7)

6. ARIAS operating threshold 1: ARIAS test positive rates by final human grade in worst eye by Type 1 and Type 2 diabetes

Table S63: ARIAS test positive rates by diabetes type

	ARIAS test positive % (95% confidence intervals)							
	Vendor A		Vendor B		Vendor C		Vendor D	
Final human grade in worst eye	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2
R0M0	29.9 (28.4,31.5)	39.2 (38.9,39.4)	27.3 (25.8,28.8)	26.5 (26.3,26.8)	45.4 (43.7,47.0)	50.8 (50.5,51.0)	5.1 (4.4,5.8)	4.3 (4.2,4.5)
R1M0	59.4 (57.4,61.4)	61.0 (60.5,61.5)	90.8 (89.6,92.0)	84.1 (83.7,84.5)	93.9 (92.9,94.9)	91.8 (91.5,92.1)	46.7 (44.6,48.7)	44.2 (43.6,44.7)
R1M1	85.7 (83.7,87.6)	83.6 (83.0,84.1)	99.4 (98.8,99.7)	97.7 (97.4,97.9)	97.9 (96.9,98.6)	94.6 (94.2,94.9)	87.7 (85.8,89.4)	79.3 (78.7,79.9)
R2	98.1 (96.1,99.2)	98.1 (97.6,98.5)	100.0 (99.0,100.0)	99.8 (99.5,99.9)	99.5 (98.1,99.9)	99.7 (99.4,99.8)	98.4 (96.5,99.4)	98.6 (98.1,98.9)
R2M0	94.8 (89.0,98.1)	94.3 (92.5,95.7)	100.0 (96.8,100.0)	99.2 (98.3,99.7)	99.1 (95.3,100.0)	99.1 (98.2,99.6)	95.7 (90.1,98.6)	95.5 (93.9,96.8)
R2M1	99.6 (97.8,100.0)	99.4 (99.0,99.7)	100.0 (98.6,100.0)	100.0 (99.8,100.0)	99.6 (97.8,100.0)	99.8 (99.6,100.0)	99.6 (97.8,100.0)	99.6 (99.2,99.8)
R3	98.6 (96.8,99.6)	98.8 (98.1,99.3)	99.4 (98.0,99.9)	99.4 (98.9,99.7)	97.5 (95.3,98.9)	97.6 (96.7,98.3)	97.8 (95.7,99.0)	96.7 (95.6,97.5)
R3M0	97.3 (93.7,99.1)	97.4 (95.9,98.5)	98.9 (96.1,99.9)	98.6 (97.3,99.3)	95.6 (91.6,98.1)	94.7 (92.7,96.3)	95.6 (91.6,98.1)	92.6 (90.3,94.6)
R3M1	100.0 (98.0,100.0)	99.7 (99.1,99.9)	100.0 (98.0,100.0)	100.0 (99.6,100.0)	99.4 (96.9,100.0)	99.5 (98.8,99.8)	100.0 (98.0,100.0)	99.4 (98.6,99.8)
U	70.0 (62.0,77.2)	64.7 (63.4,66.0)	98.0 (94.3,99.6)	95.9 (95.3,96.4)	79.3 (72.0,85.5)	76.9 (75.8,78.1)	57.3 (49.0,65.4)	35.6 (34.3,36.9)
Combination grades*								
Any DR	73.6 (72.3,74.9)	70.3 (69.9,70.6)	95.0 (94.3,95.6)	89.9 (89.7,90.2)	95.3 (94.7,95.9)	91.9 (91.7,92.1)	67.1 (65.7,68.5)	57.1 (56.7,57.5)
Any DR (excluding U)	73.8 (72.4,75.1)	70.8 (70.4,71.1)	94.9 (94.2,95.5)	89.4 (89.1,89.6)	95.9 (95.2,96.5)	93.2 (93.0,93.4)	67.5 (66.1,68.9)	59.0 (58.6,59.4)
Referable DR	88.9 (87.5,90.2)	82.7 (82.2,83.1)	99.4 (99.0,99.7)	97.7 (97.5,97.9)	96.8 (96.0,97.5)	92.0 (91.7,92.3)	89.1 (87.7,90.4)	74.3 (73.8,74.8)
Referable DR (excluding U)	90.3 (88.9,91.6)	86.9 (86.5,87.4)	99.5 (99.1,99.8)	98.1 (97.9,98.3)	98.1 (97.4,98.7)	95.6 (95.3,95.8)	91.5 (90.2,92.7)	83.5 (83.0,84.0)
No referable DR	41.7 (40.5,43.0)	44.1 (43.9,44.4)	52.8 (51.5,54.1)	39.6 (39.4,39.9)	64.8 (63.6,66.1)	60.1 (59.9,60.3)	21.7 (20.7,22.8)	13.4 (13.2,13.6)
	Vendor E		Vendor F		Vendor G		Vendor H	
Final human grade in worst eye	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2
R0M0	69.3 (67.7,70.8)	61.2 (60.9,61.5)	10.7 (9.7,11.8)	13.3 (13.1,13.5)	8.7 (7.8,9.7)	8.6 (8.4,8.7)	24.5 (23.1,26.0)	17.9 (17.7,18.1)
R1M0	98.2 (97.6,98.7)	96.5 (96.3,96.7)	75.4 (73.6,77.1)	65.9 (65.4,66.4)	57.1 (55.0,59.1)	54.3 (53.8,54.8)	51.9 (49.9,54.0)	45.7 (45.2,46.2)
R1M1	99.3 (98.7,99.7)	98.3 (98.0,98.4)	95.0 (93.6,96.1)	86.7 (86.2,87.2)	91.5 (89.8,92.9)	82.8 (82.3,83.4)	86.0 (83.9,87.8)	78.9 (78.3,79.5)
R2	100.0 (99.0,100.0)	99.9 (99.7,100.0)	99.5 (98.1,99.9)	98.5 (98.1,98.9)	99.2 (97.6,99.8)	99.0 (98.6,99.3)	97.3 (95.1,98.7)	96.7 (96.1,97.3)
R2M0	100.0 (96.8,100.0)	99.5 (98.8,99.9)	98.3 (93.9,99.8)	96.3 (94.8,97.5)	97.4 (92.6,99.5)	97.4 (96.1,98.3)	91.3 (84.6,95.8)	90.0 (87.8,91.9)
R2M1	100.0 (98.6,100.0)	100.0 (99.8,100.0)	100.0 (98.6,100.0)	99.3 (98.9,99.6)	100.0 (98.6,100.0)	99.6 (99.2,99.8)	100.0 (98.6,100.0)	99.0 (98.5,99.3)
R3	100.0 (99.0,100.0)	99.5 (99.0,99.8)	96.1 (93.6,97.9)	95.7 (94.6,96.6)	97.5 (95.3,98.9)	97.0 (96.1,97.8)	97.2 (95.0,98.7)	97.8 (96.9,98.4)
R3M0	100.0 (98.0,100.0)	98.7 (97.5,99.4)	94.0 (89.5,97.0)	92.1 (89.8,94.1)	95.1 (90.9,97.7)	93.8 (91.6,95.5)	95.1 (90.9,97.7)	95.0 (93.0,96.6)
R3M1	100.0 (98.0,100.0)	100.0 (99.6,100.0)	98.3 (95.2,99.7)	98.1 (97.0,98.9)	100.0 (98.0,100.0)	99.2 (98.5,99.7)	99.4 (96.9,100.0)	99.6 (98.9,99.9)
U	88.0 (81.7,92.7)	83.5 (82.5,84.5)	69.3 (61.3,76.6)	55.8 (54.4,57.1)	70.0 (62.0,77.2)	50.4 (49.0,51.7)	66.0 (57.8,73.5)	55.8 (54.4,57.1)
Combination grades*								
Any DR	98.5 (98.0,98.8)	96.1 (96.0,96.3)	84.4 (83.3,85.5)	73.1 (72.8,73.5)	74.1 (72.8,75.4)	65.1 (64.7,65.4)	69.5 (68.2,70.9)	59.5 (59.1,59.8)
Any DR (excluding U)	98.8 (98.4,99.1)	97.3 (97.1,97.4)	85.0 (83.9,86.0)	74.7 (74.3,75.0)	74.2 (72.9,75.5)	66.4 (66.0,66.8)	69.7 (68.3,71.0)	59.8 (59.4,60.2)
Referable DR	98.7 (98.2,99.2)	95.7 (95.4,95.9)	94.2 (93.1,95.1)	82.8 (82.3,83.2)	92.3 (91.1,93.4)	79.4 (79.0,79.9)	88.4 (87.0,89.7)	77.8 (77.3,78.3)
Referable DR (excluding U)	99.6 (99.1,99.8)	98.6 (98.4,98.7)	96.0 (95.1,96.8)	89.2 (88.8,89.6)	94.0 (92.8,95.0)	86.3 (85.9,86.8)	90.1 (88.7,91.3)	83.0 (82.5,83.5)
No referable DR	80.9 (79.8,81.9)	69.2 (69.0,69.5)	36.6 (35.4,37.9)	25.3 (25.1,25.5)	28.1 (27.0,29.3)	19.0 (18.8,19.2)	35.5 (34.3,36.8)	24.2 (24.0,24.5)

7. ARIAS operating threshold 1 + visual acuity criterion: ARIAS test positive or visual acuity 6/12 or worse) by final human grade in worst eye by Type1 and Type 2 diabetes

Table S64: ARIAS test positive rates by diabetes type

	Test positive % (95% confidence intervals)							
	Vendor A		Vendor B		Vendor C		Vendor D	
Final human grade in worst eye	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2
R0M0	33.7 (32.1,35.3)	45.9 (45.6,46.2)	31.0 (29.4,32.5)	34.2 (34.0,34.5)	48.4 (46.7,50.0)	57.0 (56.7,57.3)	11.6 (10.6,12.7)	18.6 (18.3,18.8)
R1M0	61.3 (59.3,63.3)	65.3 (64.8,65.8)	91.4 (90.2,92.5)	86.0 (85.6,86.3)	94.4 (93.4,95.3)	93.4 (93.1,93.6)	49.9 (47.8,51.9)	51.9 (51.4,52.4)
R1M1	87.1 (85.1,88.9)	86.6 (86.1,87.1)	99.4 (98.8,99.7)	98.3 (98.1,98.5)	98.2 (97.3,98.9)	95.9 (95.5,96.2)	88.9 (87.0,90.5)	84.4 (83.9,85.0)
R2	98.4 (96.5,99.4)	98.2 (97.7,98.6)	100.0 (99.0,100.0)	99.8 (99.5,99.9)	99.5 (98.1,99.9)	99.8 (99.6,99.9)	98.9 (97.2,99.7)	98.7 (98.3,99.1)
R2M0	95.7 (90.1,98.6)	94.5 (92.8,95.9)	100.0 (96.8,100.0)	99.2 (98.3,99.7)	99.1 (95.3,100.0)	99.2 (98.3,99.7)	96.5 (91.3,99.0)	95.9 (94.3,97.1)
R2M1	99.6 (97.8,100.0)	99.5 (99.1,99.7)	100.0 (98.6,100.0)	100.0 (99.8,100.0)	99.6 (97.8,100.0)	100.0 (99.9,100.0)	100.0 (98.6,100.0)	99.7 (99.4,99.9)
R3	98.6 (96.8,99.6)	99.3 (98.7,99.6)	99.4 (98.0,99.9)	99.7 (99.3,99.9)	98.1 (96.1,99.2)	98.9 (98.3,99.4)	98.1 (96.1,99.2)	98.5 (97.7,99.0)
R3M0	97.3 (93.7,99.1)	98.6 (97.3,99.3)	98.9 (96.1,99.9)	99.4 (98.4,99.8)	96.7 (93.0,98.8)	97.4 (95.9,98.5)	96.2 (92.3,98.4)	96.2 (94.3,97.5)
R3M1	100.0 (98.0,100.0)	99.8 (99.2,100.0)	100.0 (98.0,100.0)	100.0 (99.6,100.0)	99.4 (96.9,100.0)	99.9 (99.4,100.0)	100.0 (98.0,100.0)	100.0 (99.6,100.0)
U	90.7 (84.8,94.8)	89.6 (88.7,90.4)	98.0 (94.3,99.6)	97.6 (97.2,98.0)	90.7 (84.8,94.8)	92.4 (91.7,93.1)	85.3 (78.6,90.6)	79.4 (78.3,80.5)
Combination grades*								
Any DR	75.7 (74.4,77.0)	75.6 (75.3,76.0)	95.3 (94.6,95.9)	91.3 (91.1,91.5)	96.1 (95.4,96.6)	94.4 (94.3,94.6)	70.1 (68.8,71.5)	66.5 (66.2,66.9)
Any DR (excluding U)	75.2 (73.9,76.5)	74.4 (74.0,74.7)	95.2 (94.5,95.8)	90.8 (90.5,91.0)	96.2 (95.6,96.8)	94.6 (94.4,94.8)	69.6 (68.2,71.0)	65.4 (65.0,65.8)
Referable DR	91.2 (89.9,92.3)	89.4 (89.0,89.7)	99.4 (99.0,99.7)	98.5 (98.3,98.6)	97.9 (97.2,98.4)	95.9 (95.6,96.1)	91.9 (90.6,93.0)	86.1 (85.6,86.5)
Referable DR (excluding U)	91.2 (89.9,92.4)	89.3 (88.9,89.7)	99.5 (99.1,99.8)	98.6 (98.5,98.8)	98.4 (97.8,98.9)	96.7 (96.4,96.9)	92.4 (91.1,93.5)	87.6 (87.2,88.1)
No referable DR	44.7 (43.4,46.0)	50.3 (50.1,50.6)	55.2 (53.9,56.5)	46.0 (45.8,46.3)	66.8 (65.6,68.0)	65.3 (65.1,65.5)	26.9 (25.8,28.1)	26.2 (25.9,26.4)
	Vendor E		Vendor F		Vendor G		Vendor H	
Final human grade in worst eye	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2
R0M0	71.0 (69.5,72.5)	65.8 (65.5,66.1)	16.2 (15.0,17.5)	24.8 (24.6,25.0)	14.1 (13.0,15.3)	21.0 (20.8,21.3)	29.1 (27.5,30.6)	28.1 (27.9,28.4)
R1M0	98.5 (97.9,98.9)	97.0 (96.9,97.2)	77.2 (75.4,78.9)	71.0 (70.5,71.5)	59.5 (57.4,61.5)	60.4 (59.9,60.9)	54.5 (52.4,56.5)	52.5 (52.0,53.0)
R1M1	99.5 (98.9,99.8)	98.7 (98.5,98.8)	95.8 (94.5,96.8)	90.1 (89.6,90.5)	92.3 (90.7,93.7)	86.8 (86.3,87.3)	87.1 (85.2,88.9)	83.3 (82.7,83.8)
R2	100.0 (99.0,100.0)	99.9 (99.7,100.0)	99.7 (98.5,100.0)	98.8 (98.4,99.2)	99.2 (97.6,99.8)	99.2 (98.8,99.5)	97.6 (95.4,98.9)	97.2 (96.6,97.7)
R2M0	100.0 (96.8,100.0)	99.5 (98.8,99.9)	99.1 (95.3,100.0)	96.7 (95.2,97.8)	97.4 (92.6,99.5)	97.6 (96.3,98.5)	92.2 (85.7,96.4)	90.8 (88.7,92.6)
R2M1	100.0 (98.6,100.0)	100.0 (99.9,100.0)	100.0 (98.6,100.0)	99.6 (99.2,99.8)	100.0 (98.6,100.0)	99.7 (99.4,99.9)	100.0 (98.6,100.0)	99.3 (98.9,99.6)
R3	100.0 (99.0,100.0)	99.7 (99.3,99.9)	97.5 (95.3,98.9)	97.8 (96.9,98.4)	98.3 (96.4,99.4)	98.6 (97.9,99.1)	97.2 (95.0,98.7)	98.4 (97.6,99.0)
R3M0	100.0 (98.0,100.0)	99.2 (98.1,99.7)	96.2 (92.3,98.4)	95.5 (93.6,97.0)	96.7 (93.0,98.8)	96.6 (94.9,97.9)	95.1 (90.9,97.7)	96.6 (94.9,97.9)
R3M1	100.0 (98.0,100.0)	100.0 (99.6,100.0)	98.9 (96.0,99.9)	99.2 (98.5,99.7)	100.0 (98.0,100.0)	99.9 (99.4,100.0)	99.4 (96.9,100.0)	99.6 (98.9,99.9)
U	96.0 (91.5,98.5)	93.4 (92.7,94.1)	88.0 (81.7,92.7)	86.0 (85.0,86.9)	88.0 (81.7,92.7)	83.3 (82.2,84.3)	88.0 (81.7,92.7)	86.8 (85.8,87.7)
Combination grades*								
Any DR	98.9 (98.6,99.2)	97.4 (97.3,97.5)	86.4 (85.3,87.4)	79.5 (79.2,79.8)	76.2 (74.9,77.5)	72.4 (72.0,72.7)	71.9 (70.6,73.3)	67.1 (66.7,67.5)
Any DR (excluding U)	99.0 (98.7,99.3)	97.8 (97.6,97.9)	86.3 (85.2,87.3)	78.9 (78.6,79.3)	75.8 (74.5,77.1)	71.4 (71.0,71.8)	71.4 (70.0,72.7)	65.3 (64.9,65.7)
Referable DR	99.4 (99.0,99.7)	97.9 (97.7,98.0)	96.2 (95.3,97.0)	90.8 (90.5,91.2)	94.2 (93.1,95.1)	88.3 (88.0,88.7)	90.7 (89.4,91.9)	86.5 (86.1,86.9)
Referable DR (excluding U)	99.7 (99.3,99.9)	98.9 (98.8,99.1)	96.8 (95.9,97.5)	92.0 (91.6,92.4)	94.7 (93.6,95.6)	89.5 (89.1,89.9)	90.9 (89.5,92.1)	86.5 (86.0,86.9)
No referable DR	82.0 (81.0,83.0)	72.9 (72.7,73.2)	40.7 (39.4,42.0)	35.3 (35.1,35.6)	32.3 (31.1,33.5)	30.0 (29.8,30.2)	39.3 (38.0,40.5)	33.7 (33.5,33.9)

8. ARIAS operating threshold 2: ARIAS test positive rates by final human grade in worst eye by Type 1 and Type 2 diabetes

Table S65: ARIAS test positive rates by Diabetes type

	ARIAS test positive % (95% confidence intervals)					
	Vendor A		Vendor B		Vendor C	
Final human grade in worst eye	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2
R0M0	12.0 (11.0,13.2)	17.2 (17.0,17.4)	10.1 (9.1,11.2)	17.7 (17.4,17.9)	5.4 (4.7,6.2)	8.3 (8.1,8.4)
R1M0	12.2 (10.9,13.6)	19.2 (18.8,19.6)	50.8 (48.7,52.8)	47.5 (47.0,48.0)	4.9 (4.1,5.9)	8.7 (8.4,9.0)
R1M1	20.4 (18.2,22.7)	26.9 (26.2,27.5)	96.9 (95.8,97.8)	93.8 (93.4,94.1)	10.7 (9.1,12.6)	14.7 (14.2,15.2)
R2	41.0 (36.0,46.2)	58.6 (56.9,60.2)	99.5 (98.1,99.9)	98.6 (98.2,99.0)	38.3 (33.3,43.5)	49.3 (47.6,51.0)
R2M0	31.3 (23.0,40.6)	39.9 (36.6,43.2)	98.3 (93.9,99.8)	94.8 (93.1,96.2)	27.8 (19.9,37.0)	35.2 (32.0,38.4)
R2M1	45.5 (39.2,51.8)	64.9 (63.0,66.7)	100.0 (98.6,100.0)	99.9 (99.7,100.0)	43.1 (36.9,49.4)	54.0 (52.1,55.9)
R3	85.1 (81.0,88.6)	87.1 (85.3,88.7)	99.2 (97.6,99.8)	98.7 (98.0,99.2)	62.7 (57.5,67.7)	65.3 (62.9,67.7)
R3M0	85.2 (79.3,90.0)	84.3 (81.2,87.1)	98.4 (95.3,99.7)	96.8 (95.1,98.0)	55.7 (48.2,63.1)	59.8 (55.8,63.6)
R3M1	84.9 (78.8,89.8)	88.9 (86.8,90.9)	100.0 (98.0,100.0)	100.0 (99.6,100.0)	69.8 (62.5,76.5)	69.0 (65.9,72.0)
U	46.0 (37.8,54.3)	44.0 (42.7,45.4)	97.3 (93.3,99.3)	94.7 (94.0,95.2)	54.0 (45.7,62.2)	49.1 (47.7,50.4)
Combination grades*						
Any DR	24.0 (22.7,25.3)	27.1 (26.7,27.4)	73.4 (72.1,74.7)	67.8 (67.4,68.2)	15.7 (14.6,16.8)	17.2 (16.9,17.5)
Any DR (excluding U)	23.2 (22.0,24.5)	25.6 (25.2,25.9)	72.6 (71.3,73.9)	65.4 (65.0,65.8)	14.3 (13.3,15.4)	14.3 (14.0,14.6)
Referable DR	36.6 (34.5,38.6)	37.6 (37.0,38.1)	97.8 (97.1,98.4)	94.8 (94.6,95.1)	27.2 (25.3,29.1)	28.5 (28.0,29.1)
Referable DR (excluding U)	35.9 (33.8,38.0)	36.0 (35.4,36.7)	97.8 (97.1,98.4)	94.9 (94.6,95.2)	25.2 (23.3,27.1)	23.6 (23.1,24.2)
No referable DR	12.1 (11.3,13.0)	17.7 (17.5,17.8)	26.4 (25.3,27.6)	24.5 (24.3,24.7)	5.2 (4.6,5.8)	8.4 (8.2,8.5)
	Vendor E		Vendor F		Vendor H	
Final human grade in worst eye	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2
R0M0	50.5 (48.8,52.2)	36.5 (36.2,36.8)	8.0 (7.1,8.9)	11.2 (11.0,11.4)	24.5 (23.1,26.0)	17.8 (17.5,18.0)
R1M0	76.7 (75.0,78.4)	70.4 (70.0,70.9)	42.7 (40.7,44.7)	41.4 (40.9,41.9)	43.6 (41.6,45.7)	34.9 (34.4,35.4)
R1M1	96.6 (95.5,97.5)	93.6 (93.3,94.0)	83.9 (81.8,85.9)	75.5 (74.8,76.1)	81.7 (79.5,83.8)	73.2 (72.5,73.9)
R2	98.6 (96.9,99.6)	97.3 (96.7,97.8)	97.6 (95.4,98.9)	97.1 (96.5,97.7)	96.5 (94.0,98.1)	95.6 (94.9,96.3)
R2M0	95.7 (90.1,98.6)	91.1 (89.1,93.0)	93.9 (87.9,97.5)	92.5 (90.6,94.2)	90.4 (83.5,95.1)	86.4 (84.0,88.6)
R2M1	100.0 (98.6,100.0)	99.3 (99.0,99.6)	99.2 (97.2,99.9)	98.7 (98.2,99.1)	99.2 (97.2,99.9)	98.7 (98.2,99.1)
R3	97.8 (95.7,99.0)	98.5 (97.8,99.1)	93.9 (90.9,96.2)	94.7 (93.4,95.7)	96.7 (94.3,98.3)	97.6 (96.7,98.3)
R3M0	96.2 (92.3,98.4)	96.8 (95.1,98.0)	90.2 (84.9,94.1)	90.1 (87.4,92.3)	94.0 (89.5,97.0)	94.6 (92.5,96.2)
R3M1	99.4 (96.9,100.0)	99.7 (99.1,99.9)	97.8 (94.4,99.4)	97.7 (96.6,98.6)	99.4 (96.9,100.0)	99.6 (98.9,99.9)
U	78.0 (70.5,84.3)	68.7 (67.5,70.0)	64.7 (56.5,72.3)	52.5 (51.2,53.9)	65.3 (57.1,72.9)	54.7 (53.3,56.1)
Combination grades*						
Any DR	86.0 (84.9,87.0)	78.6 (78.3,79.0)	63.9 (62.4,65.3)	55.8 (55.4,56.1)	63.9 (62.5,65.3)	51.6 (51.2,52.0)
Any DR (excluding U)	86.2 (85.2,87.3)	79.5 (79.2,79.9)	63.8 (62.4,65.3)	56.0 (55.6,56.4)	63.8 (62.4,65.3)	51.3 (50.9,51.7)
Referable DR	95.9 (94.9,96.7)	89.6 (89.2,89.9)	86.6 (85.1,88.0)	74.9 (74.4,75.4)	85.6 (84.1,87.1)	73.8 (73.3,74.4)
Referable DR (excluding U)	97.2 (96.4,97.9)	94.5 (94.2,94.8)	88.2 (86.7,89.6)	80.2 (79.7,80.7)	87.1 (85.6,88.6)	78.4 (77.8,78.9)
No referable DR	61.0 (59.7,62.3)	44.2 (44.0,44.5)	21.9 (20.8,23.0)	18.1 (17.9,18.3)	32.2 (31.0,33.4)	21.7 (21.5,21.9)

9. ARIAS operating threshold 2 + visual acuity criterion: ARIAS test positive or visual acuity 6/12 or worse by final human grade in worst eye by Type 1 and Type 2 diabetes

Table S66: ARIAS test positive rates by diabetes type.

	Test positive % (95% confidence intervals)					
	Vendor A		Vendor B		Vendor C	
Final human grade in worst eye	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2
R0M0	17.5 (16.2,18.8)	27.7 (27.4,27.9)	14.7 (13.5,15.9)	26.6 (26.3,26.8)	11.1 (10.1,12.2)	20.4 (20.2,20.6)
R1M0	16.2 (14.7,17.8)	29.1 (28.6,29.5)	53.0 (51.0,55.1)	52.9 (52.4,53.4)	9.8 (8.6,11.1)	20.8 (20.4,21.2)
R1M1	26.0 (23.6,28.5)	39.0 (38.3,39.8)	97.2 (96.1,98.0)	95.6 (95.3,95.9)	17.1 (15.1,19.3)	30.7 (30.0,31.4)
R2	43.5 (38.3,48.7)	64.0 (62.4,65.6)	99.5 (98.1,99.9)	98.7 (98.3,99.1)	42.7 (37.6,47.9)	59.3 (57.7,61.0)
R2M0	33.0 (24.6,42.4)	44.8 (41.5,48.2)	98.3 (93.9,99.8)	95.2 (93.5,96.5)	31.3 (23.0,40.6)	42.3 (39.0,45.7)
R2M1	48.2 (41.9,54.6)	70.5 (68.7,72.2)	100.0 (98.6,100.0)	99.9 (99.7,100.0)	47.8 (41.5,54.2)	65.1 (63.2,66.9)
R3	87.0 (83.1,90.3)	90.5 (88.9,91.9)	99.2 (97.6,99.8)	99.2 (98.6,99.6)	71.5 (66.6,76.1)	80.6 (78.5,82.5)
R3M0	86.9 (81.1,91.4)	89.3 (86.6,91.6)	98.4 (95.3,99.7)	97.9 (96.5,98.9)	62.8 (55.4,69.9)	75.3 (71.7,78.7)
R3M1	87.2 (81.3,91.7)	91.3 (89.3,93.0)	100.0 (98.0,100.0)	100.0 (99.6,100.0)	80.4 (73.9,86.0)	84.1 (81.6,86.4)
U	82.0 (74.9,87.8)	82.8 (81.8,83.8)	97.3 (93.3,99.3)	96.9 (96.4,97.4)	82.0 (74.9,87.8)	82.8 (81.7,83.8)
Combination grades*						
Any DR	29.2 (27.9,30.6)	39.5 (39.1,39.9)	74.7 (73.4,76.0)	71.6 (71.2,71.9)	22.0 (20.8,23.3)	32.1 (31.7,32.5)
Any DR (excluding U)	27.4 (26.1,28.7)	35.6 (35.3,36.0)	73.9 (72.6,75.2)	69.3 (68.9,69.7)	19.9 (18.7,21.1)	27.6 (27.2,27.9)
Referable DR	43.2 (41.1,45.3)	53.5 (52.9,54.1)	97.9 (97.2,98.5)	96.5 (96.2,96.7)	35.1 (33.1,37.2)	47.1 (46.6,47.7)
Referable DR (excluding U)	40.2 (38.1,42.4)	46.5 (45.9,47.2)	98.0 (97.2,98.5)	96.3 (96.1,96.6)	31.6 (29.6,33.7)	38.7 (38.0,39.3)
No referable DR	17.0 (16.0,18.0)	28.0 (27.8,28.2)	30.1 (28.9,31.3)	32.6 (32.3,32.8)	10.6 (9.8,11.4)	20.5 (20.3,20.7)
	Vendor E		Vendor F		Vendor H	
Final human grade in worst eye	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2
R0M0	53.6 (51.9,55.3)	44.5 (44.2,44.7)	13.6 (12.5,14.8)	23.0 (22.8,23.3)	29.0 (27.5,30.5)	28.0 (27.8,28.3)
R1M0	78.1 (76.4,79.8)	74.8 (74.4,75.3)	45.9 (43.8,47.9)	48.8 (48.3,49.3)	46.5 (44.4,48.6)	42.4 (41.9,42.9)
R1M1	97.3 (96.3,98.1)	95.4 (95.0,95.7)	85.6 (83.6,87.5)	81.0 (80.4,81.6)	83.1 (81.0,85.2)	78.3 (77.7,78.9)
R2	98.6 (96.9,99.6)	97.6 (97.1,98.1)	97.8 (95.8,99.1)	97.7 (97.1,98.1)	96.7 (94.4,98.3)	96.2 (95.5,96.8)
R2M0	95.7 (90.1,98.6)	91.8 (89.8,93.6)	94.8 (89.0,98.1)	93.2 (91.3,94.8)	91.3 (84.6,95.8)	87.6 (85.2,89.7)
R2M1	100.0 (98.6,100.0)	99.6 (99.2,99.8)	99.2 (97.2,99.9)	99.2 (98.7,99.5)	99.2 (97.2,99.9)	99.0 (98.6,99.4)
R3	98.6 (96.8,99.6)	99.0 (98.4,99.5)	95.9 (93.3,97.7)	97.0 (96.1,97.8)	97.0 (94.6,98.5)	98.2 (97.4,98.8)
R3M0	97.3 (93.7,99.1)	97.8 (96.3,98.8)	92.9 (88.2,96.2)	94.1 (91.9,95.8)	94.5 (90.2,97.3)	96.2 (94.3,97.5)
R3M1	100.0 (98.0,100.0)	99.9 (99.4,100.0)	98.9 (96.0,99.9)	99.0 (98.2,99.6)	99.4 (96.9,100.0)	99.6 (98.9,99.9)
U	92.7 (87.3,96.3)	87.8 (86.9,88.7)	87.3 (80.9,92.2)	84.7 (83.7,85.6)	88.0 (81.7,92.7)	86.5 (85.5,87.4)
Combination grades*						
Any DR	87.4 (86.4,88.4)	83.2 (82.9,83.5)	67.0 (65.6,68.3)	64.2 (63.8,64.6)	66.6 (65.2,68.0)	59.9 (59.5,60.3)
Any DR (excluding U)	87.3 (86.2,88.2)	82.8 (82.5,83.1)	66.2 (64.8,67.7)	62.4 (62.0,62.8)	65.8 (64.4,67.2)	57.5 (57.1,57.9)
Referable DR	97.4 (96.7,98.1)	94.4 (94.1,94.7)	89.6 (88.2,90.8)	84.7 (84.3,85.2)	88.1 (86.7,89.5)	83.2 (82.8,83.7)
Referable DR (excluding U)	97.8 (97.1,98.4)	96.0 (95.7,96.2)	89.7 (88.3,91.0)	84.7 (84.3,85.2)	88.1 (86.6,89.5)	82.5 (82.0,83.0)
No referable DR	63.4 (62.2,64.7)	51.4 (51.1,51.6)	26.6 (25.4,27.7)	28.9 (28.7,29.1)	36.0 (34.8,37.3)	31.3 (31.1,31.5)

Encounters with final human grade of referable DR in the worst eye that were ARIAS test negative and had visual acuity better than 6/12

Table S67: Number (%) of encounters that were referred to ophthalmology*

Reference standard DR grade	N (%)							
	ARIAS A-H							
R1M1 n =14,764	A	B	C	D	E	F	G	H
Referred to ophthalmology urgent for DR	1 (0.01)	0 (0.00)	1 (0.01)	2 (0.01)	0 (0.00)	1 (0.01)	1 (0.01)	1 (0.01)
Referred to ophthalmology for DR	43 (0.29)	5 (0.03)	17 (0.12)	49 (0.33)	6 (0.04)	32 (0.22)	42 (0.28)	47 (0.32)
Referred to ophthalmology for non-DR	4 (0.03)	0 (0.00)	3 (0.02)	12 (0.08)	1 (0.01)	7 (0.05)	5 (0.03)	5 (0.03)
Total Referrals Ophthalmology	48 (0.33)	5 (0.03)	21 (0.14)	63 (0.43)	7 (0.05)	40 (0.27)	48 (0.33)	53 (0.36)
R2M0/1 n =3083								
Referred to ophthalmology urgent for DR	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Referred to ophthalmology for DR	7 (0.23)	1 (0.03)	2 (0.06)	3 (0.10)	0 (0.00)	2 (0.06)	1 (0.03)	9 (0.29)
Referred to ophthalmology for non-DR	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.03)
Total Referrals Ophthalmology	7 (0.23)	1 (0.03)	2 (0.06)	3 (0.10)	0 (0.00)	2 (0.06)	1 (0.03)	10 (0.32)
R3M0/1 n = 1040								
Referred to ophthalmology urgent for DR	6 (0.58)	5 (0.48)	12 (1.15)	16 (1.54)	4 (0.38)	23 (2.21)	16 (1.54)	20 (1.92)
Referred to ophthalmology for DR	0 (0.00)	0 (0.00)	1 (0.10)	0 (0.00)	0 (0.00)	1 (0.10)	0 (0.00)	0 (0.00)
Referred to ophthalmology for non-DR	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Total Referrals Ophthalmology	6 (0.58)	5 (0.48)	13 (1.25)	16 (1.54)	4 (0.38)	24 (2.31)	16 (1.54)	20 (1.92)
Referable DR (grades M1, R2, R3 combined) n =18,887								
Referred to ophthalmology urgent for DR	7 (0.04)	5 (0.03)	13 (0.07)	18 (0.10)	4 (0.02)	24 (0.13)	17 (0.09)	21 (0.11)
Referred to ophthalmology for DR	50 (0.26)	6 (0.03)	20 (0.11)	52 (0.28)	6 (0.03)	35 (0.19)	43 (0.23)	56 (0.30)
Referred to ophthalmology for non-DR	4 (0.02)	0 (0.00)	3 (0.02)	12 (0.06)	1 (0.01)	7 (0.04)	5 (0.03)	6 (0.03)
Total Referrals Ophthalmology	61 (0.32)	11 (0.06)	36 (0.19)	82 (0.43)	11 (0.06)	66 (0.35)	65 (0.34)	83 (0.44)

*Figures exclude those that were pregnant

n= number of encounters that were ARIAS test negative and had visual acuity better than 6/12

This table shows the screening pathway outcomes regarding referrals to ophthalmology for encounters with reference standard of referable DR (DR grades R1M1, R2M0/1 and R3M0/1) that had good visual acuity (better than 6/12) and were also ARIAS test negative. Table shows the number (%) of referrals to ophthalmology (hospital eye services) for DR grade subgroups of referable DR.

Section & Topic	No	Item	Page
TITLE OR ABSTRACT			
	1	Identification as a study of diagnostic accuracy using at least one measure of accuracy (such as sensitivity, specificity, predictive values, or AUC)	Title & Abstract
ABSTRACT			
	2	Structured summary of study design, methods, results, and conclusions (for specific guidance, see STARD for Abstracts)	2
INTRODUCTION			
	3	Scientific and clinical background, including the intended use and clinical role of the index test	3-4
	4	Study objectives and hypotheses	4
METHODS			
<i>Study design</i>	5	Whether data collection was planned before the index test and reference standard were performed (prospective study) or after (retrospective study)	5-6
<i>Participants</i>	6	Eligibility criteria	5
	7	On what basis potentially eligible participants were identified (such as symptoms, results from previous tests, inclusion in registry)	5
	8	Where and when potentially eligible participants were identified (setting, location and dates)	5
	9	Whether participants formed a consecutive, random or convenience series	5
<i>Test methods</i>	10a	Index test, in sufficient detail to allow replication	5,s6-7
	10b	Reference standard, in sufficient detail to allow replication	5-6
	11	Rationale for choosing the reference standard (if alternatives exist)	5-6,
	12a	Definition of and rationale for test positivity cut-offs or result categories of the index test, distinguishing pre-specified from exploratory	7
	12b	Definition of and rationale for test positivity cut-offs or result categories of the reference standard, distinguishing pre-specified from exploratory	7
	13a	Whether clinical information and reference standard results were available to the performers/readers of the index test	6
	13b	Whether clinical information and index test results were available to the assessors of the reference standard	6
<i>Analysis</i>	14	Methods for estimating or comparing measures of diagnostic accuracy	7-8
	15	How indeterminate index test or reference standard results were handled	6,7,8
	16	How missing data on the index test and reference standard were handled	Table S1
	17	Any analyses of variability in diagnostic accuracy, distinguishing pre-specified from exploratory	7,8
	18	Intended sample size and how it was determined	7
RESULTS			
<i>Participants</i>	19	Flow of participants, using a diagram	Figure S2
	20	Baseline demographic and clinical characteristics of participants	Table 2, S2,3

	21a	Distribution of severity of disease in those with the target condition	Table 2
	21b	Distribution of alternative diagnoses in those without the target condition	Table 2
	22	Time interval and any clinical interventions between index test and reference standard	NA
<i>Test results</i>	23	Cross tabulation of the index test results (or their distribution) by the results of the reference standard	Table 2, Tables S4 to-S66
	24	Estimates of diagnostic accuracy and their precision (such as 95% confidence intervals)	9-11, Table 2, Tables S4 to-S66
	25	Any adverse events from performing the index test or the reference standard	NONE
DISCUSSION			
	26	Study limitations, including sources of potential bias, statistical uncertainty, and generalisability	13
	27	Implications for practice, including the intended use and clinical role of the index test	13-14
OTHER INFORMATION			
	28	Registration number and name of registry	NA
	29	Where the full study protocol can be accessed	Previously published in methods paper DOI: 10.1056/Aloa2400353
	30	Sources of funding and other support; role of funders	2,8,16