A: Datasheet

Algorithm: innovatrics_007

Developer: Innovatrics

Submission Date: 2021_08_16

Template size: 538 bytes

Template time (2.5 percentile): 768 msec

Template time (median): 777 msec

Template time (97.5 percentile): 813 msec

Investigation:

Frontal mugshot ranking 33 (out of 298) –– FNIR(1600000, 0, 1) = 0.0017 vs. lowest 0.0009 from sensetime_006

Mugshot webcam ranking 35 (out of 260) –– FNIR(1600000, 0, 1) = 0.0112 vs. lowest 0.0057 from sensetime_006

Mugshot profile ranking 37 (out of 229) –– FNIR(1600000, 0, 1) = 0.2481 vs. lowest 0.0550 from sensetime_006

Immigration visa–border ranking 19 (out of 187) –– FNIR(1600000, 0, 1) = 0.0024 vs. lowest 0.0009 from sensetime_006

Immigration visa–kiosk ranking 16 (out of 184) –– FNIR(1600000, 0, 1) = 0.0771 vs. lowest 0.0487 from cubox_000

Identification:

Frontal mugshot ranking 34 (out of 298) –– FNIR(1600000, T, L+1) = 0.0125, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004
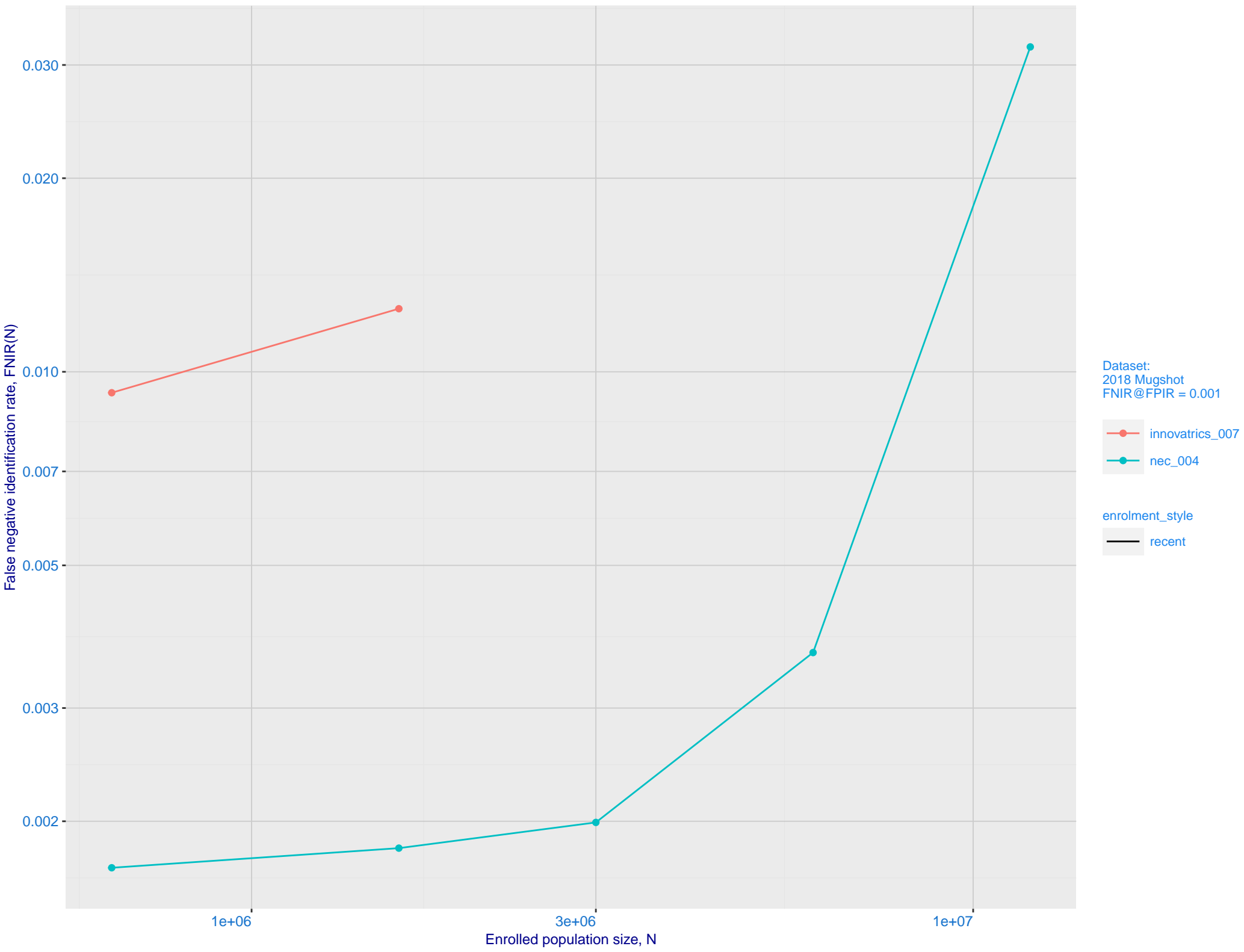
Mugshot webcam ranking 39 (out of 258) –– FNIR(1600000, T, L+1) = 0.0513, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 26 (out of 228) –– FNIR(1600000, T, L+1) = 0.7445, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000
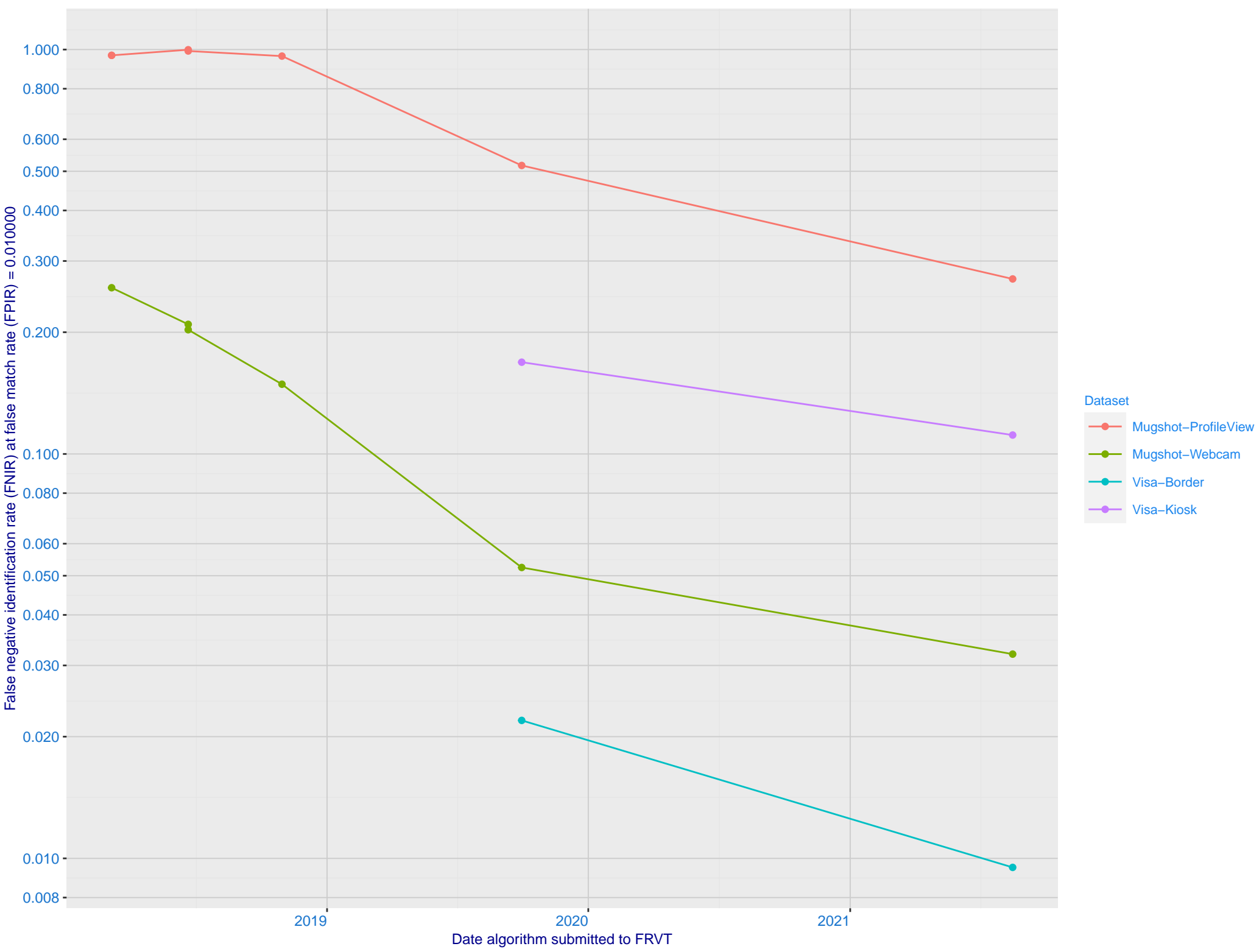
Immigration visa–border ranking 26 (out of 185) –– FNIR(1600000, T, L+1) = 0.0171, FPIR=0.001000 vs. lowest 0.0039 from sensetime_006

Immigration visa–kiosk ranking 18 (out of 180) –– FNIR(1600000, T, L+1) = 0.1543, FPIR=0.001000 vs. lowest 0.0925 from sensetime_006
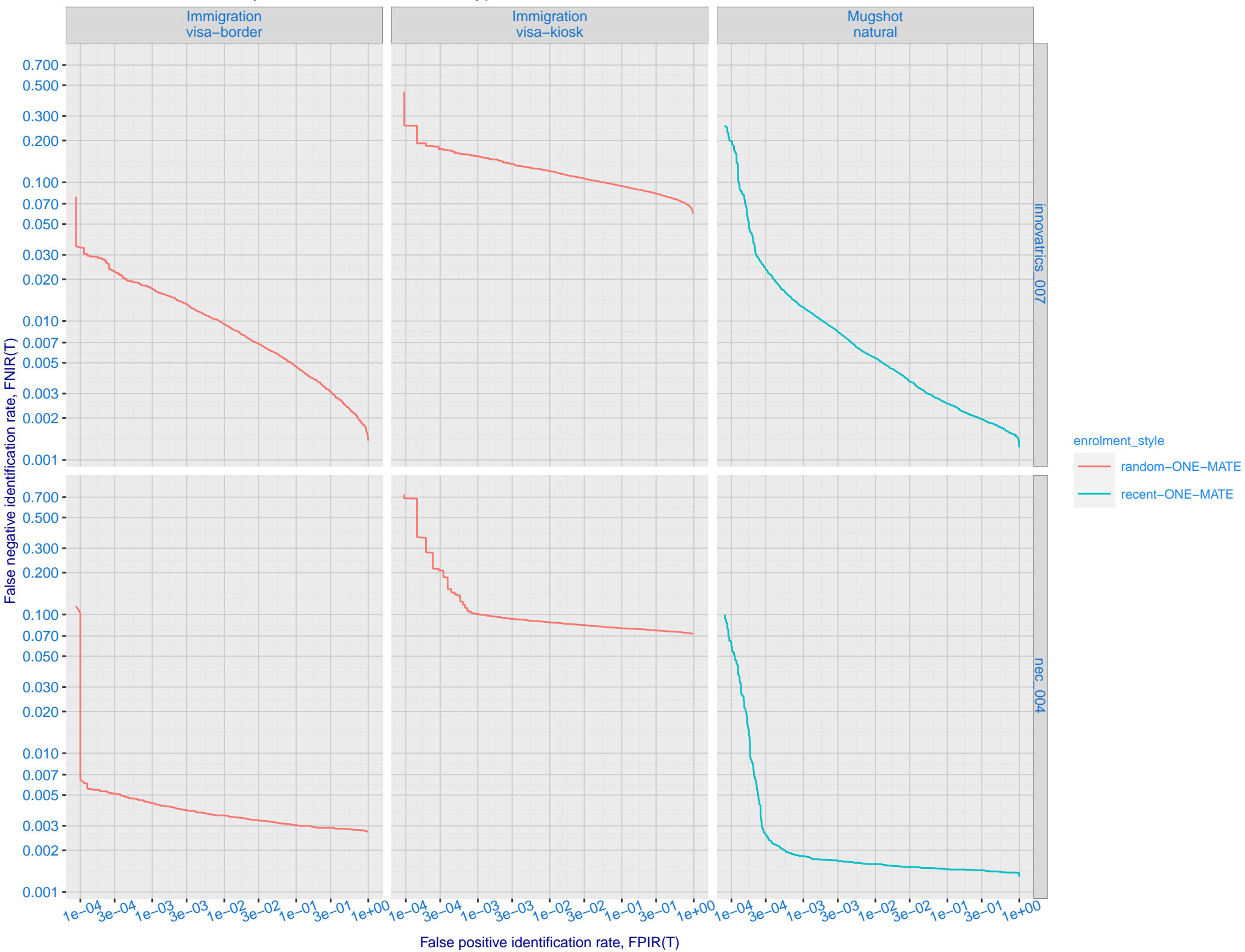
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (nec_004)

C: Evolution of accuracy for INNOVATRICS algorithms on three datasets 2018 – present

Y-axis: False negative identification rate (FNIR) at false match rate (FPIR) = 0.010000

X-axis: Date algorithm submitted to FRVT

Dataset:
- Mugshot–ProfileView
- Mugshot–Webcam
- Visa–Border
- Visa–Kiosk

D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals

E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images
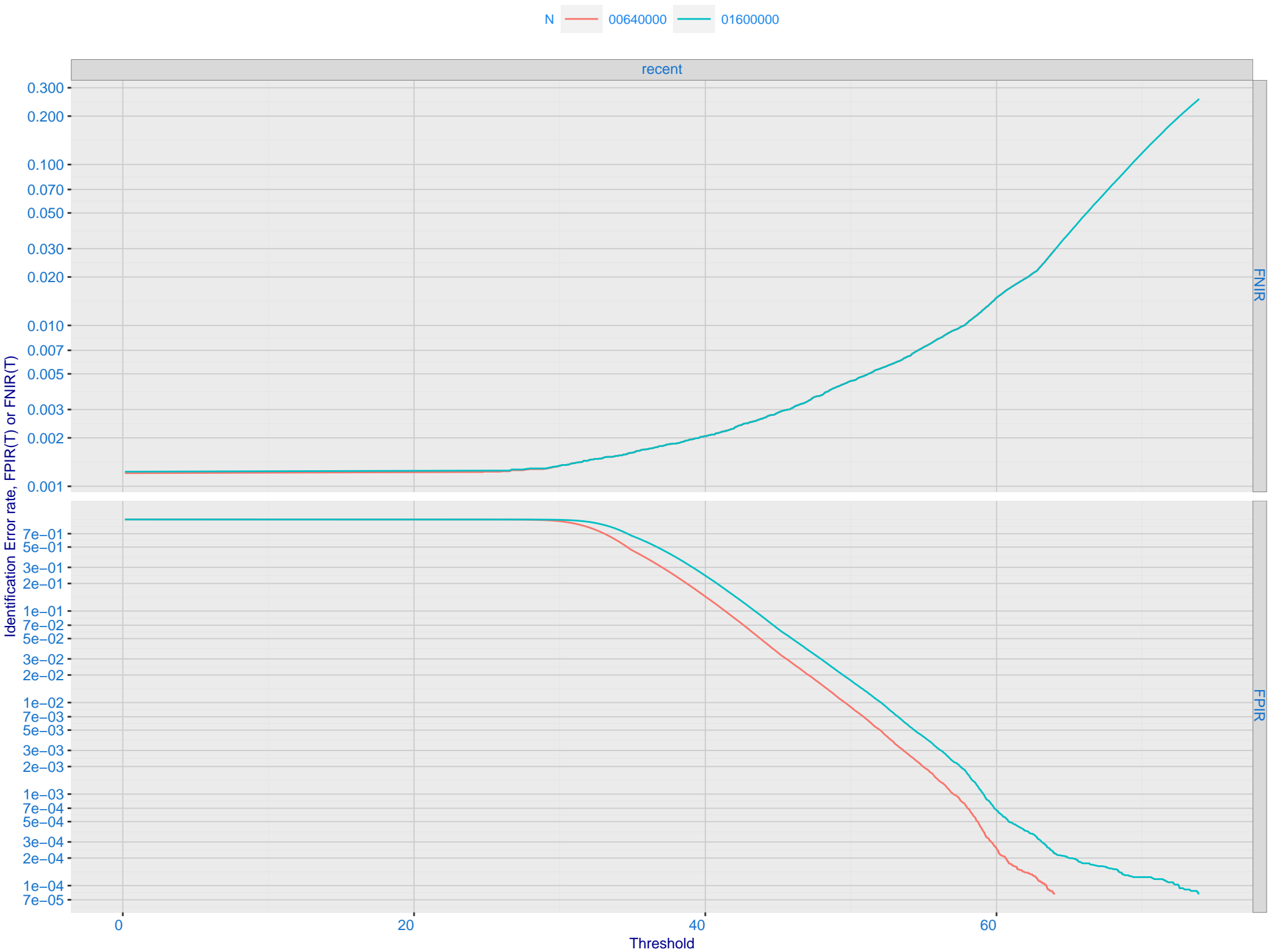
F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate

G: FPIR dependence on T by probe type for N = 1600000 subjects
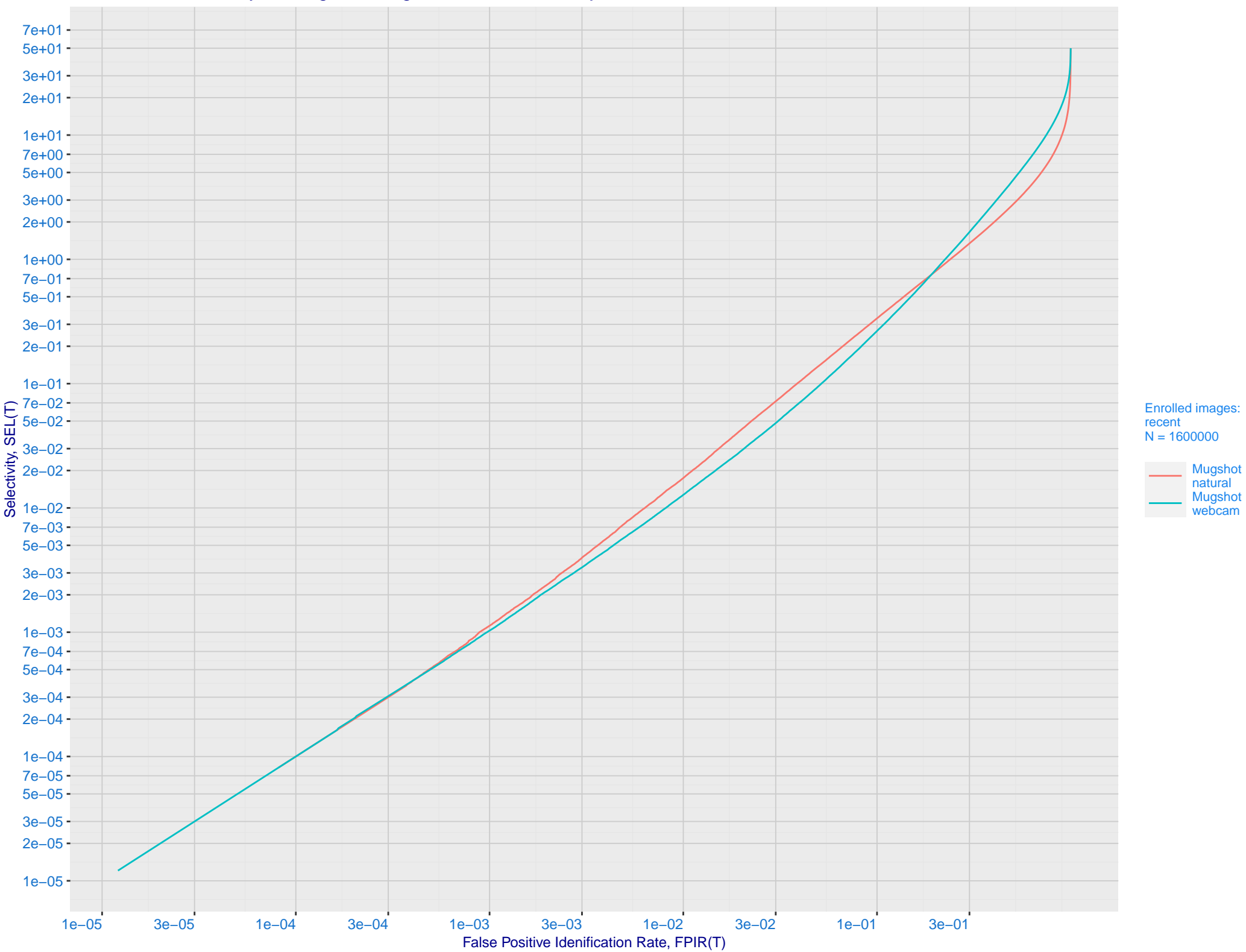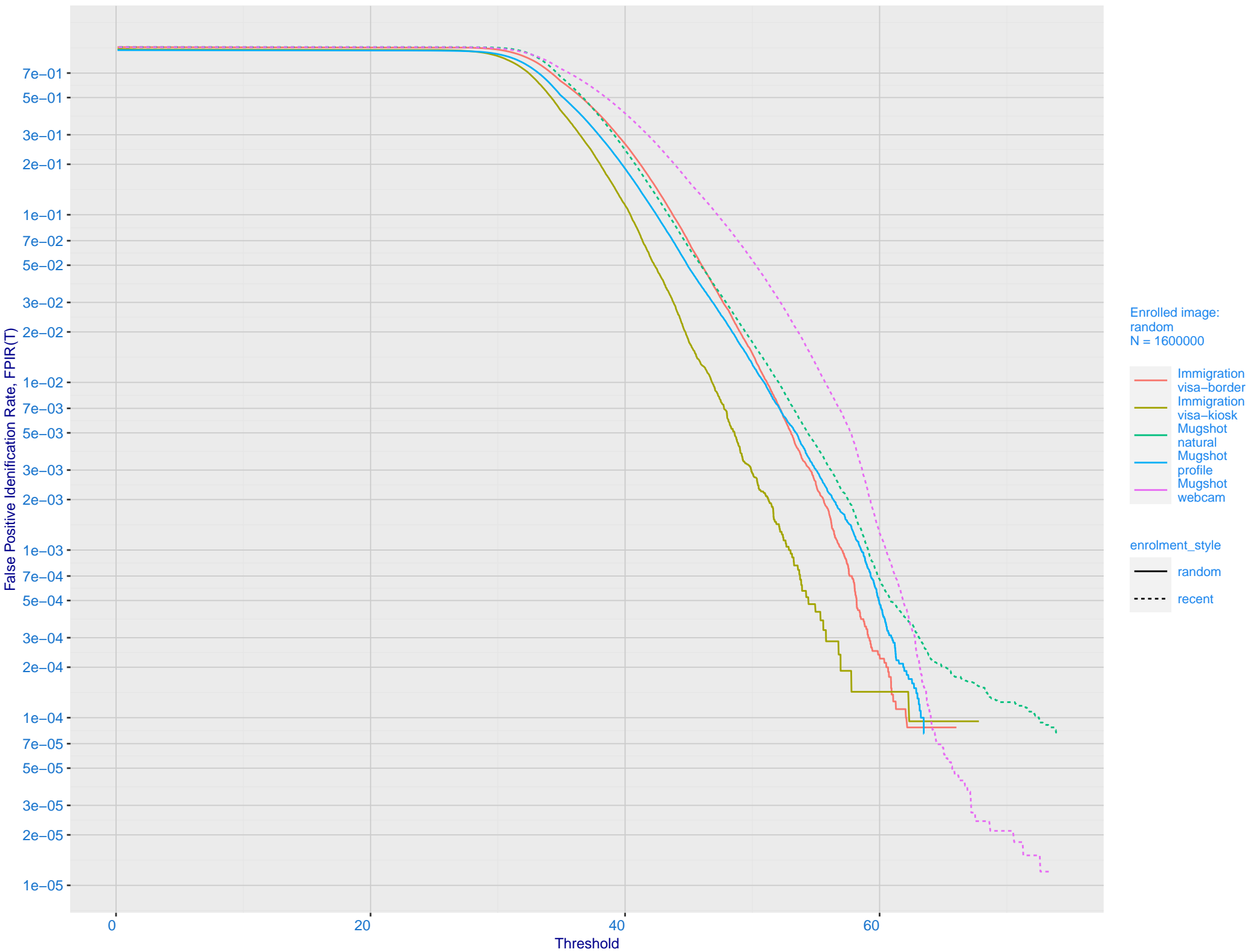
H: Reduced length candidate lists for human review
Dataset is border−border with time−lapse [10,15] YRS with N = 1600000. Probes are 10−15 years later than enrollment image

Mated

without threshold, all lists have same length, here 50

with low threshold, list length shortens
towards 1 as there is 1 mate

at high threshold, lists
gradually get shorter as mates
fall below threshold (misses)

the pink region shows
[5,95]−percentile of list lengths

Non−Mated

without threshold, all lists have same length, here 50

with low threshold, list length shortens

at high threshold, lists only rarely
have any candidates
here only 1 in 100

Mean candidate list length

Threshold value

I: FNIR and FPIR dependence on threshold
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image

J: DET for Mugshot natural images and various N. Links connect points of equal threshold.
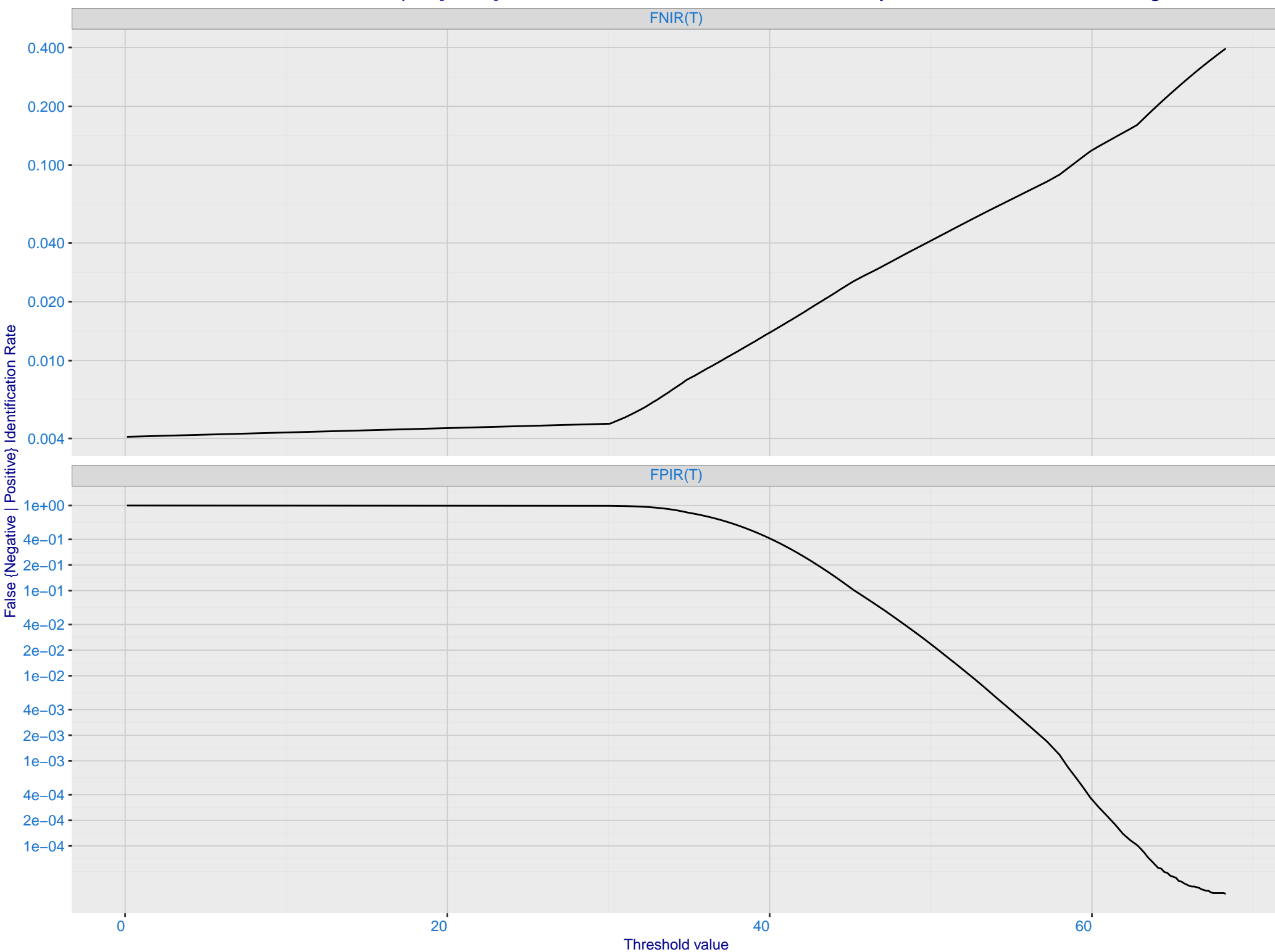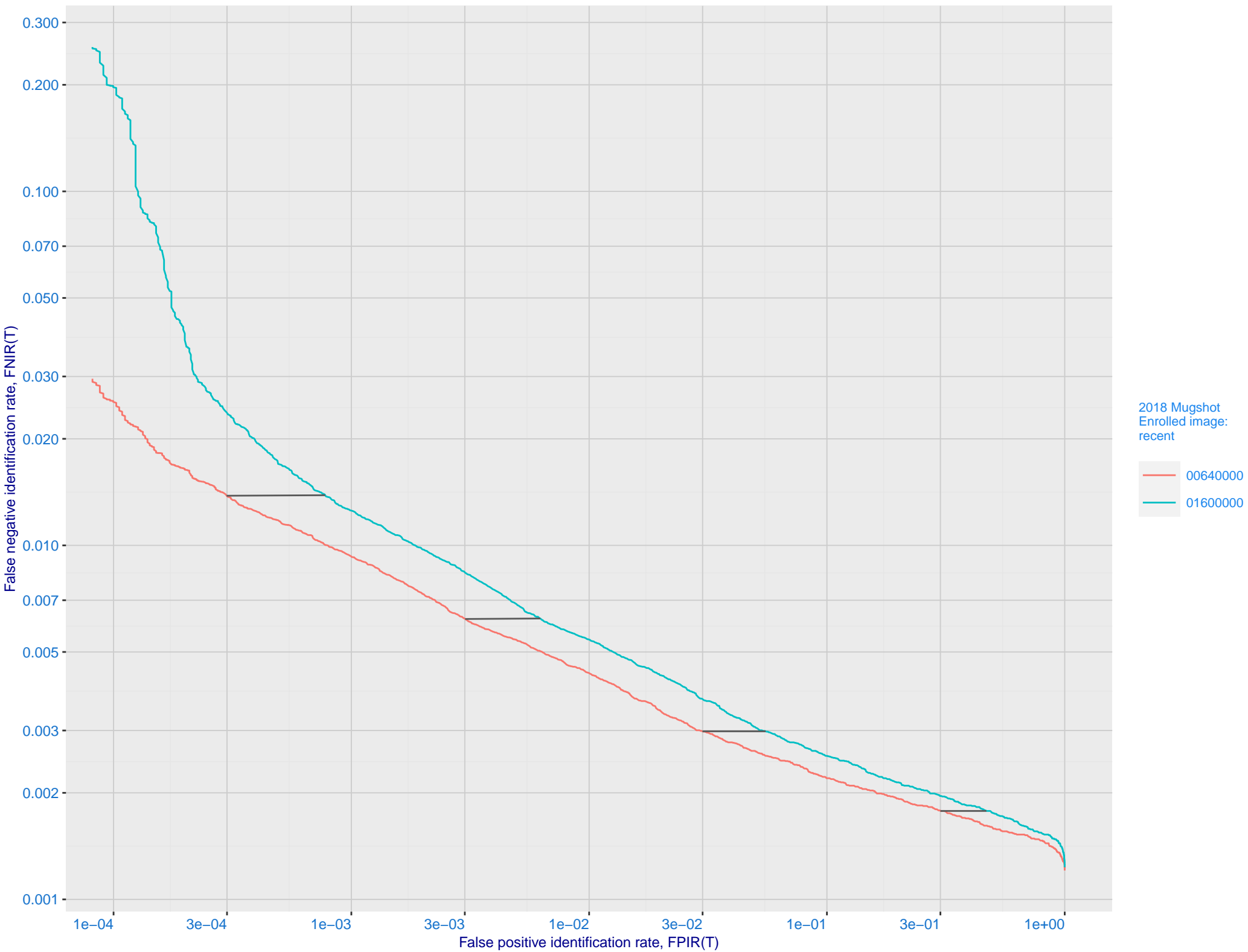
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_006)
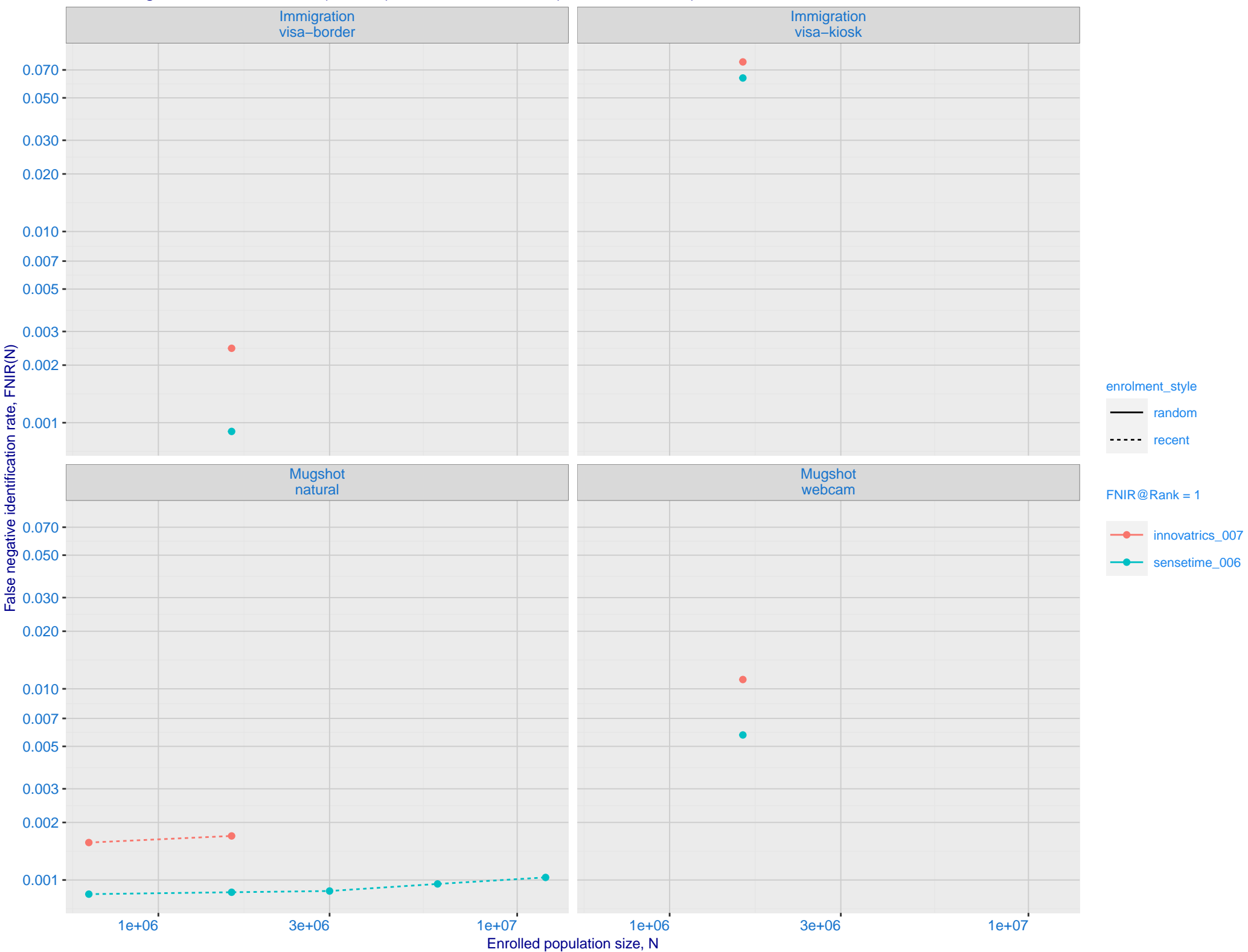
L: Investigational mode: FNIR(1600000, R, 0) by probe type
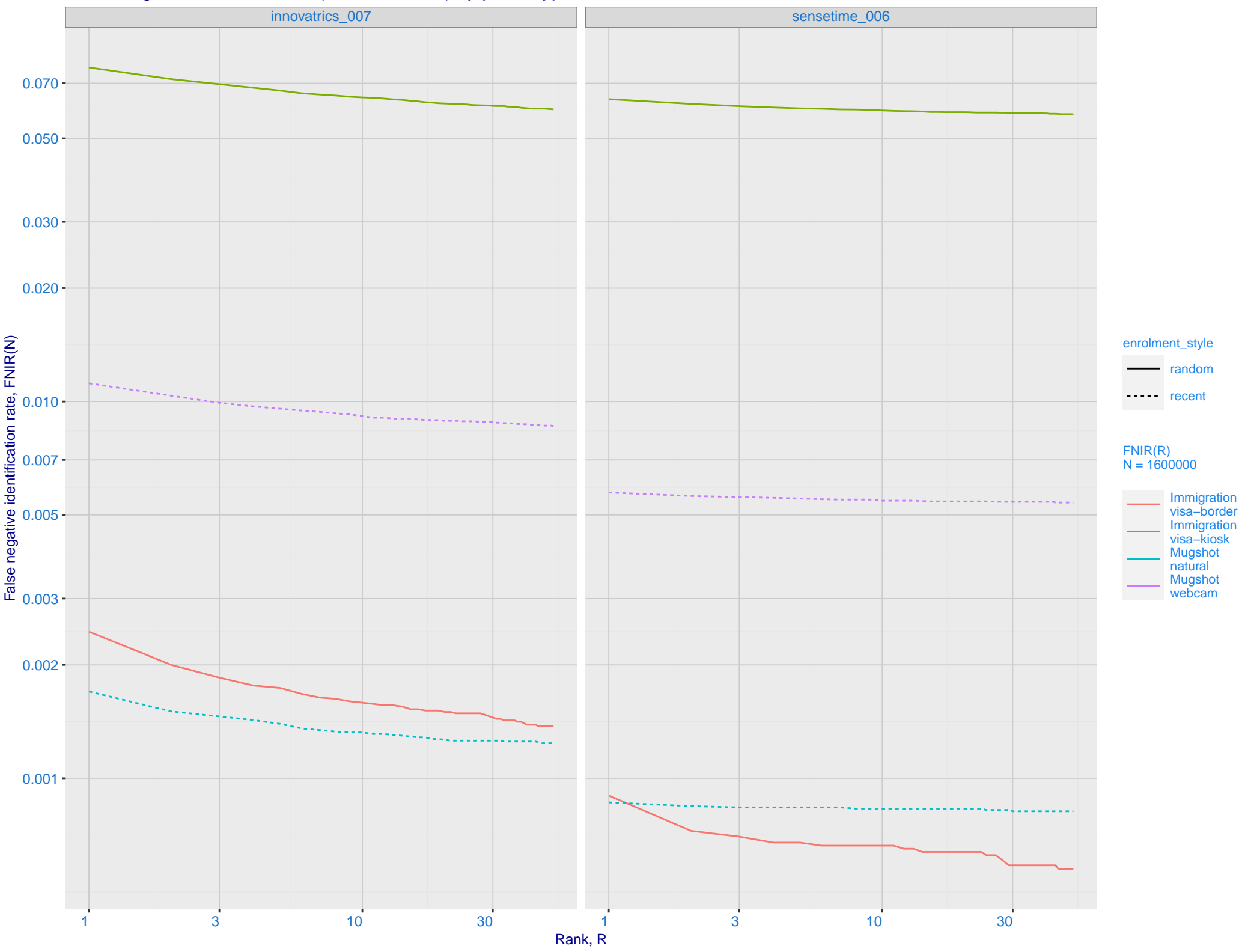
M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power−law models are fit to the first two (N,T) observations

O: FNIR(T, N = 1.6 million) by sex, age and time−lapse. The top row gives investigational rank−1 miss rates.
The bottom panels give high threshold for more lights−out identification with low FPIR.

Algorithm: innovatrics_007, Dataset: Border−Crossing Ageing N = 1600000
Text encodes FNIR, Color encodes log(FNIR)

−3 −2 −1

Female

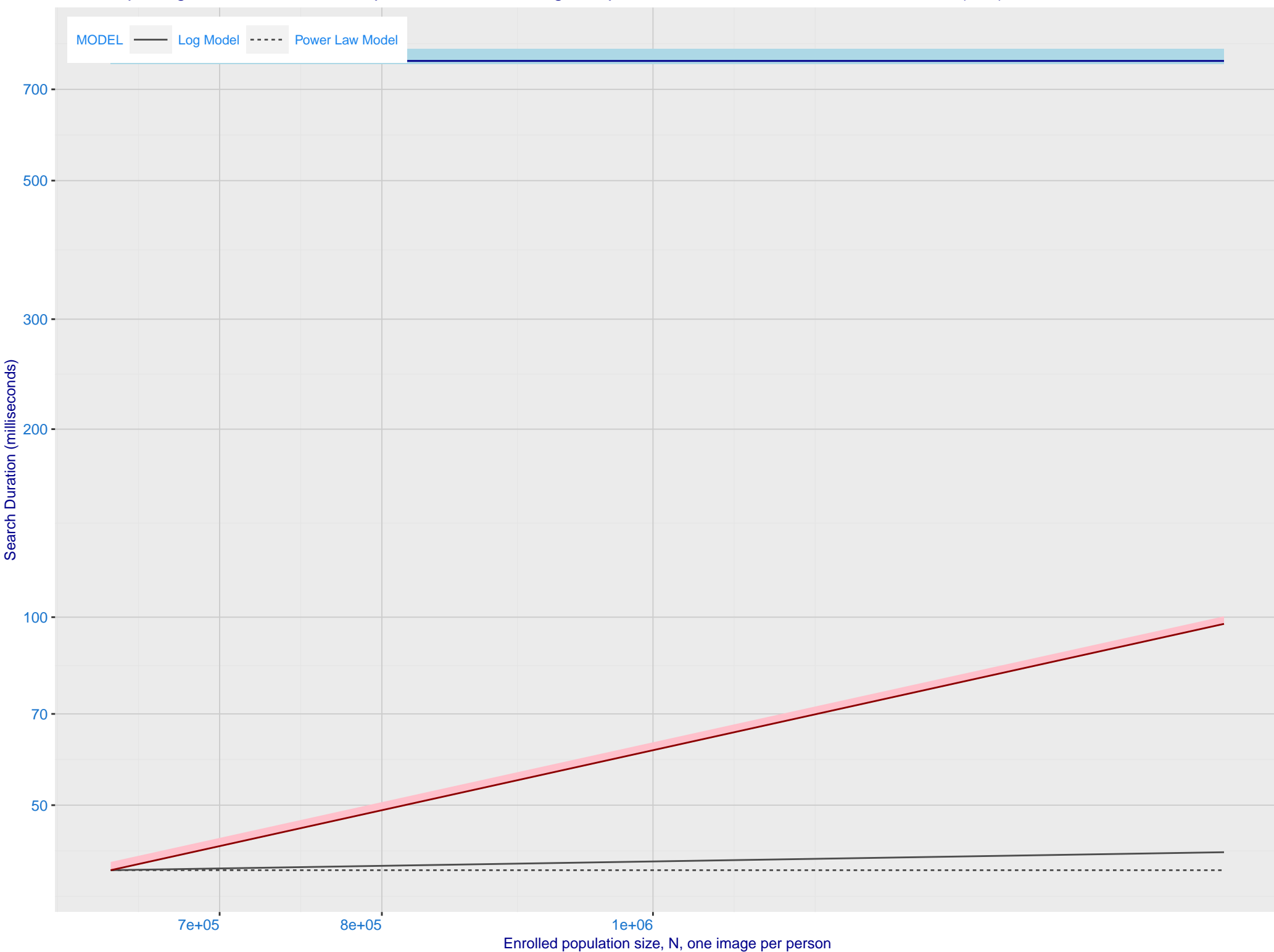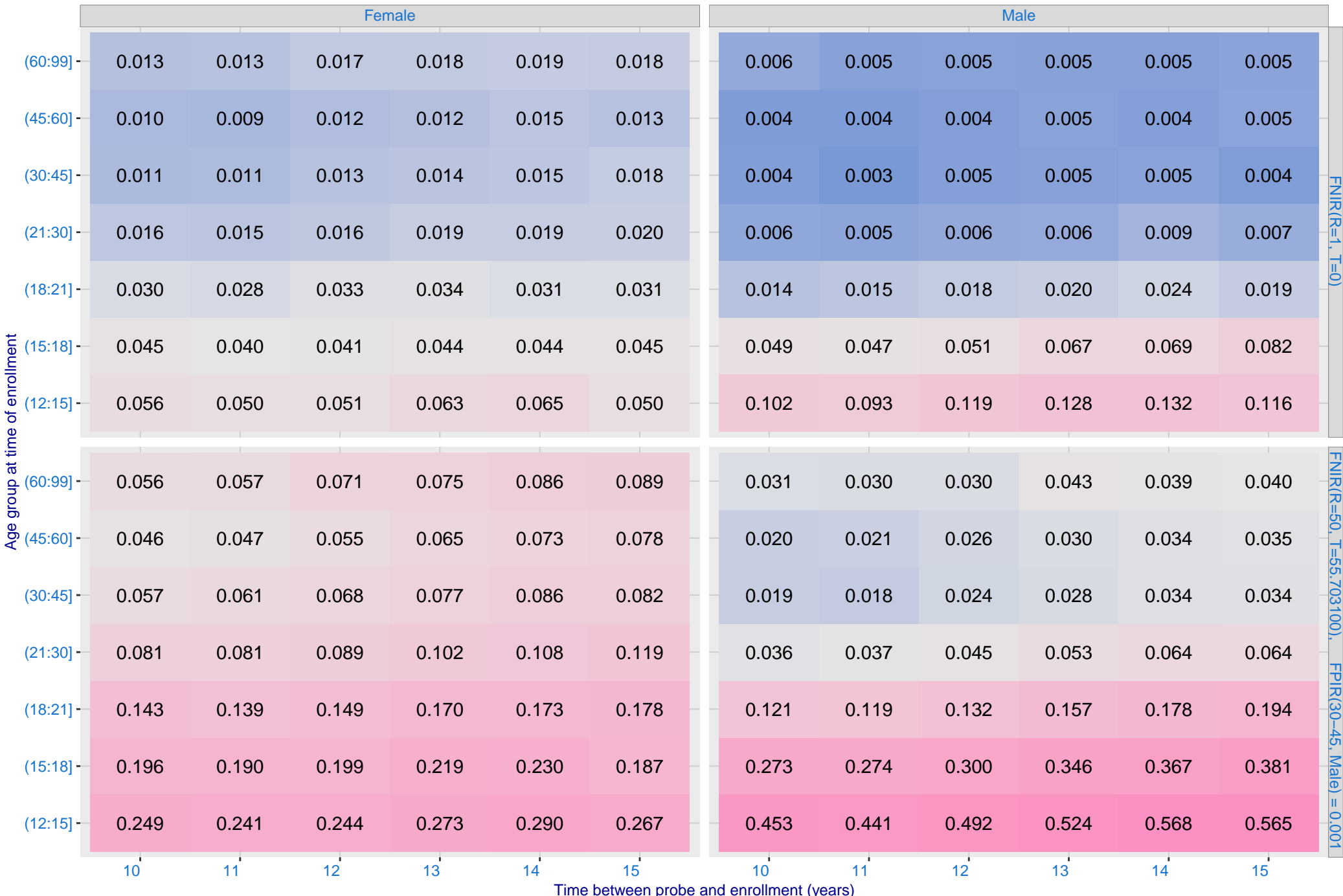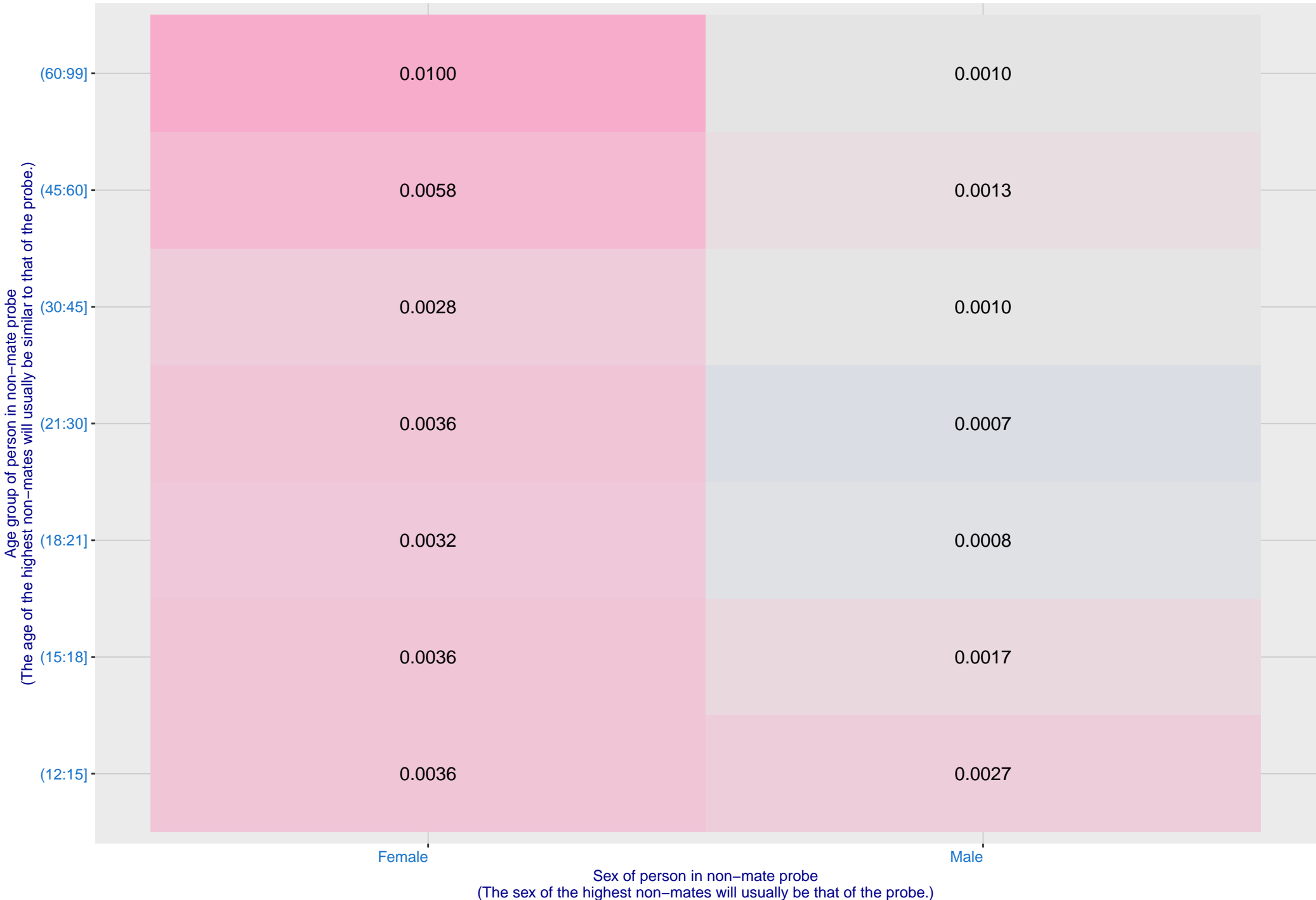| Age group	10	11	12	13	14	15
(60:99]	0.013	0.013	0.017	0.018	0.019	0.018
(45:60]	0.010	0.009	0.012	0.012	0.015	0.013
(30:45]	0.011	0.011	0.013	0.014	0.015	0.018
(21:30]	0.016	0.015	0.016	0.019	0.019	0.020
(18:21]	0.030	0.028	0.033	0.034	0.031	0.031
(15:18]	0.045	0.040	0.041	0.044	0.044	0.045
(12:15]	0.056	0.050	0.051	0.063	0.065	0.050

Male (FNIR(R=1, T=0))

Age group	10	11	12	13	14	15
(60:99]	0.006	0.005	0.005	0.005	0.005	0.005
(45:60]	0.004	0.004	0.004	0.005	0.004	0.005
(30:45]	0.004	0.003	0.005	0.005	0.005	0.004
(21:30]	0.006	0.005	0.006	0.006	0.009	0.007
(18:21]	0.014	0.015	0.018	0.020	0.024	0.019
(15:18]	0.049	0.047	0.051	0.067	0.069	0.082
(12:15]	0.102	0.093	0.119	0.128	0.132	0.116

Female (bottom)

Age group	10	11	12	13	14	15
(60:99]	0.056	0.057	0.071	0.075	0.086	0.089
(45:60]	0.046	0.047	0.055	0.065	0.073	0.078
(30:45]	0.057	0.061	0.068	0.077	0.086	0.082
(21:30]	0.081	0.081	0.089	0.102	0.108	0.119
(18:21]	0.143	0.139	0.149	0.170	0.173	0.178
(15:18]	0.196	0.190	0.199	0.219	0.230	0.187
(12:15]	0.249	0.241	0.244	0.273	0.290	0.267

Male (bottom) (FNIR(R=50, T=55.703100), FPIR(30−45, Male) = 0.001)

Age group	10	11	12	13	14	15
(60:99]	0.031	0.030	0.030	0.043	0.039	0.040
(45:60]	0.020	0.021	0.026	0.030	0.034	0.035
(30:45]	0.019	0.018	0.024	0.028	0.034	0.034
(21:30]	0.036	0.037	0.045	0.053	0.064	0.064
(18:21]	0.121	0.119	0.132	0.157	0.178	0.194
(15:18]	0.273	0.274	0.300	0.346	0.367	0.381
(12:15]	0.453	0.441	0.492	0.524	0.568	0.565

Age group at time of enrollment

Time between probe and enrollment (years)

P: FPIR(N = 1.6 million) by sex and age. It is typical for false positive identification rates to be higher in women except in their teens.

Q: Identification FNIR(N, T, L+1) and Investigational FNIR(N, 0, R) under ageing