A: Datasheet

Algorithm: veridas_004

Developer: Veridas Digital Authentication Solutions S.L.

Submission Date: 2023_02_03

Template size: 2048 bytes

Template time (2.5 percentile): 570 msec

Template time (median): 579 msec

Template time (97.5 percentile): 609 msec

Investigation:

Frontal mugshot ranking 58 (out of 416) –– FNIR(1600000, 0, 1) = 0.0014 vs. lowest 0.0008 from intema_001

Mugshot webcam ranking 40 (out of 376) –– FNIR(1600000, 0, 1) = 0.0079 vs. lowest 0.0054 from sensetime_009

Mugshot profile ranking 104 (out of 345) –– FNIR(1600000, 0, 1) = 0.1864 vs. lowest 0.0517 from sensetime_009

Immigration visa–border ranking 90 (out of 305) –– FNIR(1600000, 0, 1) = 0.0026 vs. lowest 0.0006 from cloudwalk_mt_002

Immigration visa–kiosk ranking 113 (out of 249) –– FNIR(1600000, 0, 1) = 0.0870 vs. lowest 0.0387 from cloudwalk_mt_002

Identification:

Frontal mugshot ranking 64 (out of 416) –– FNIR(1600000, T, L+1) = 0.0058, FPIR=0.001000 vs. lowest 0.0011 from idemia_010
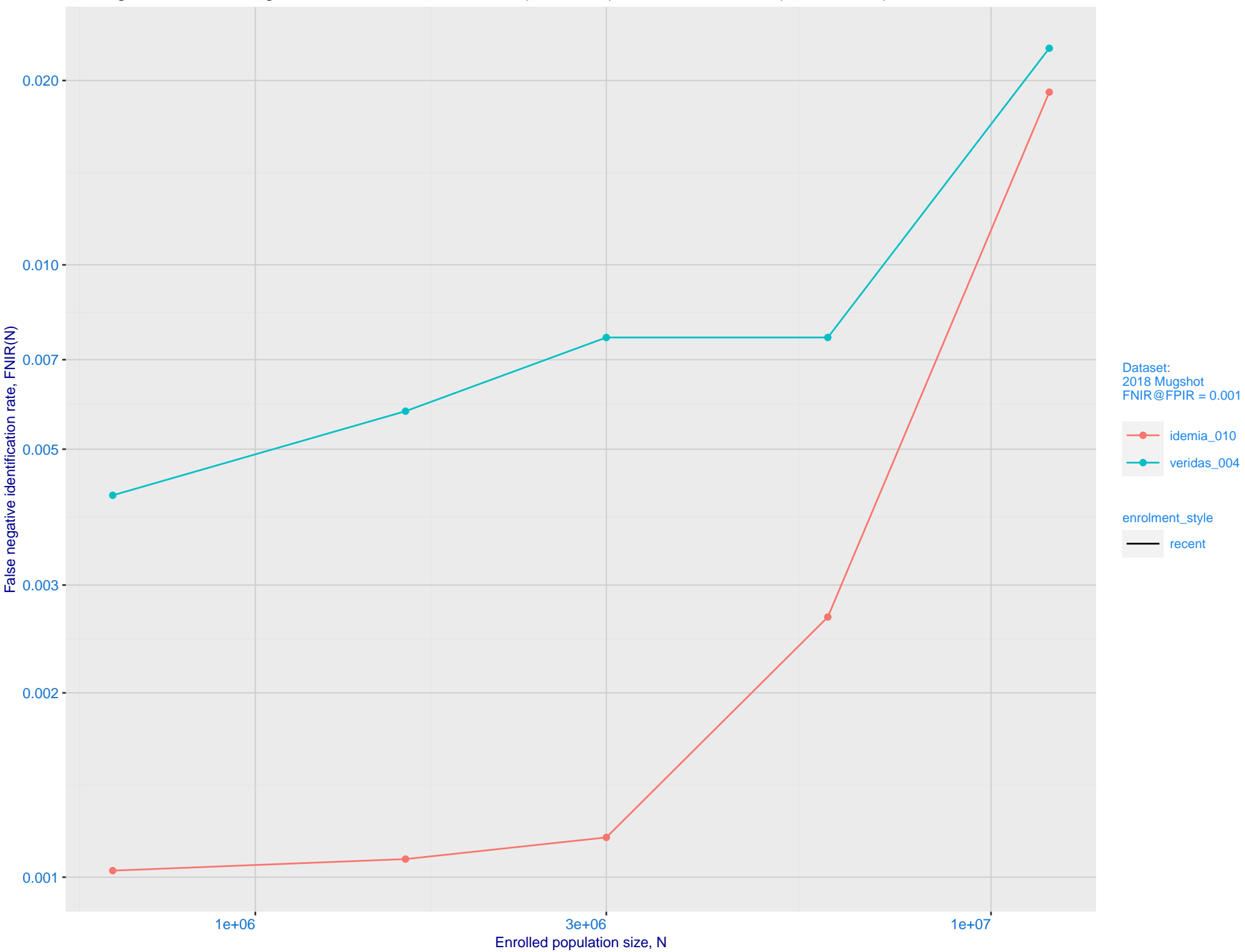
Mugshot webcam ranking 51 (out of 374) –– FNIR(1600000, T, L+1) = 0.0254, FPIR=0.001000 vs. lowest 0.0072 from sensetime_009

Mugshot profile ranking 139 (out of 344) –– FNIR(1600000, T, L+1) = 0.9787, FPIR=0.001000 vs. lowest 0.0634 from cloudwalk_mt_002
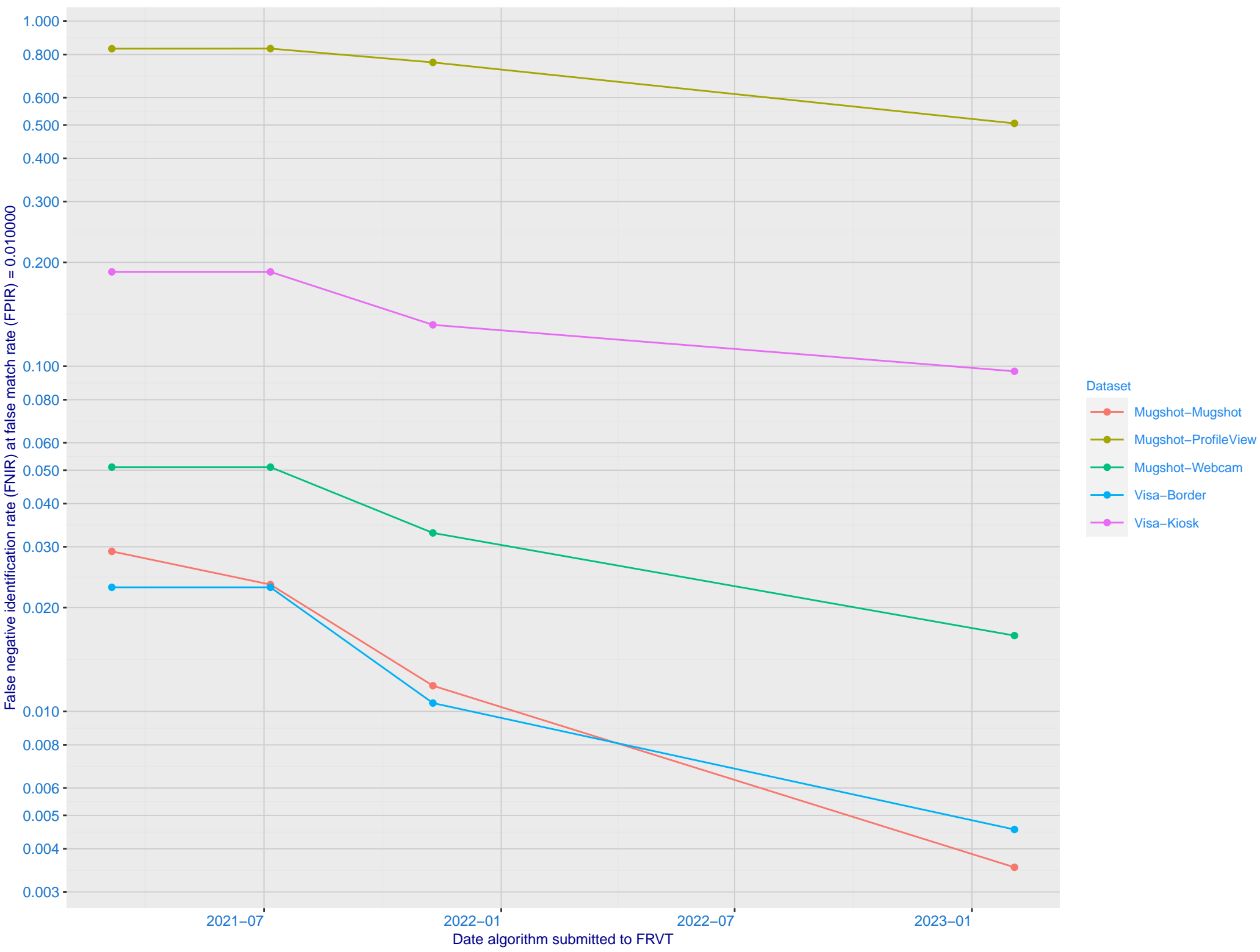
Immigration visa–border ranking 50 (out of 303) –– FNIR(1600000, T, L+1) = 0.0079, FPIR=0.001000 vs. lowest 0.0010 from cloudwalk_mt_002

Immigration visa–kiosk ranking 46 (out of 248) –– FNIR(1600000, T, L+1) = 0.1082, FPIR=0.001000 vs. lowest 0.0517 from cloudwalk_mt_002
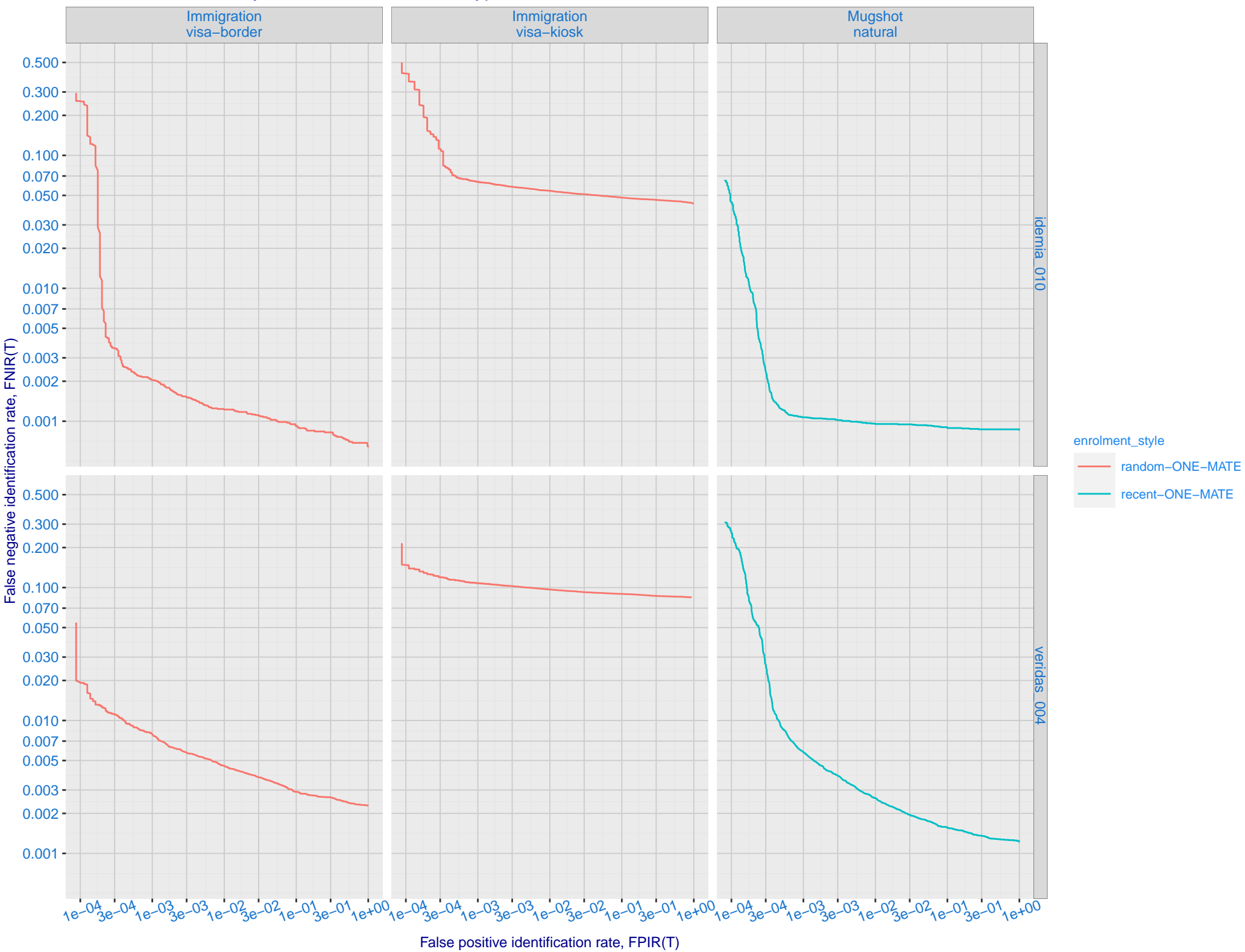
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (idemia_010)

C: Evolution of accuracy for VERIDAS 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–Mugshot
- Mugshot–ProfileView
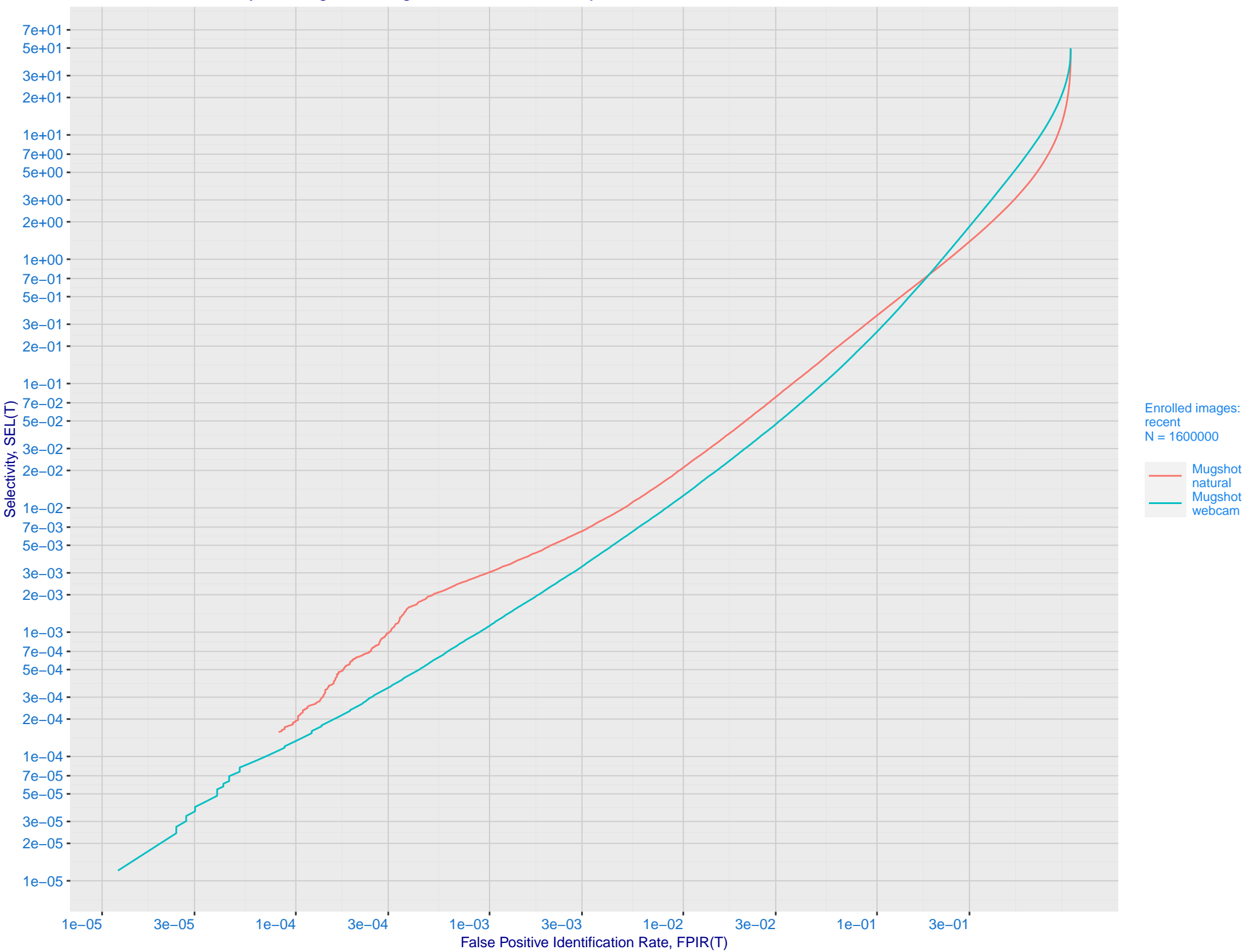- Mugshot–Webcam
- Visa–Border
- Visa–Kiosk

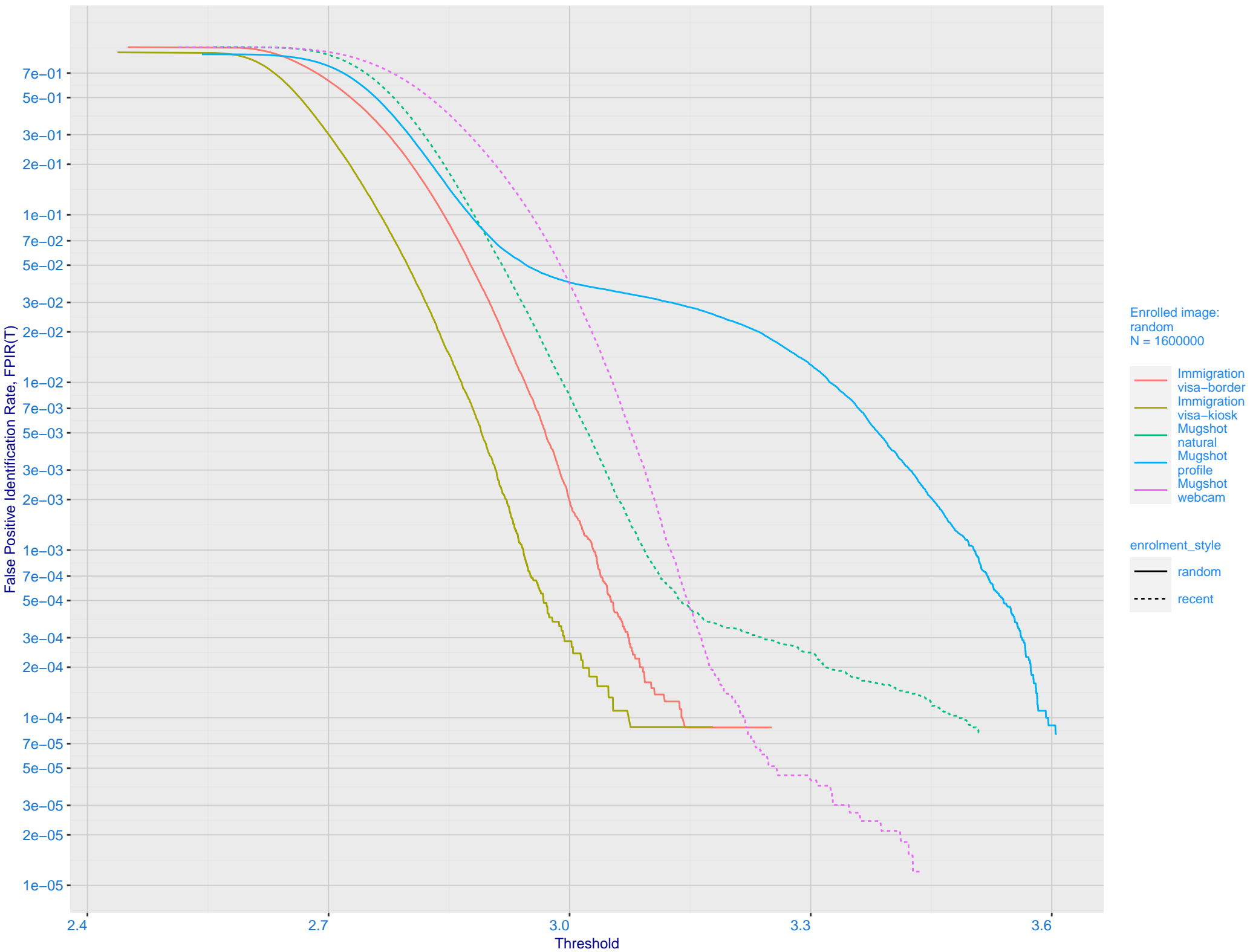D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals

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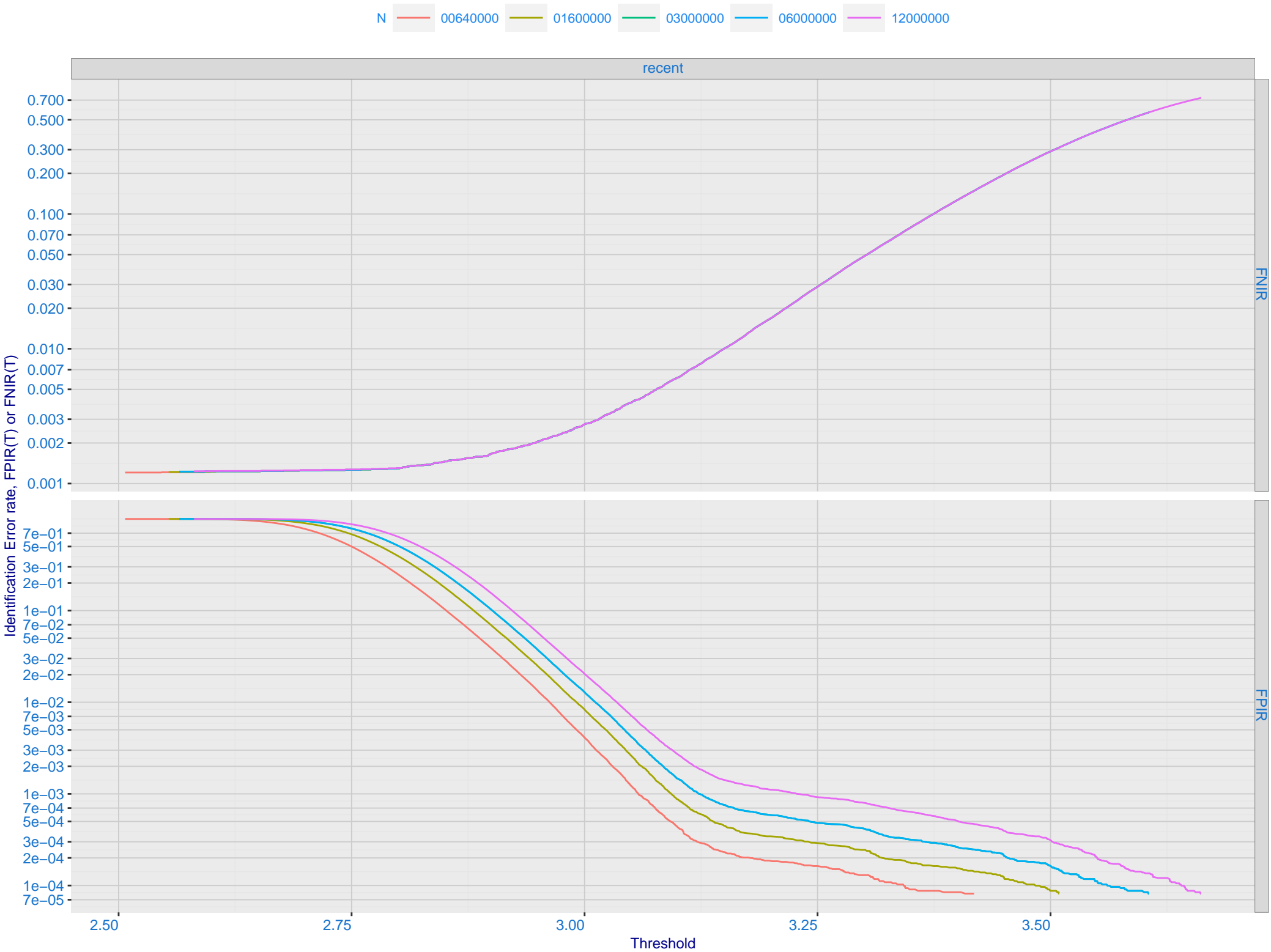
F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate
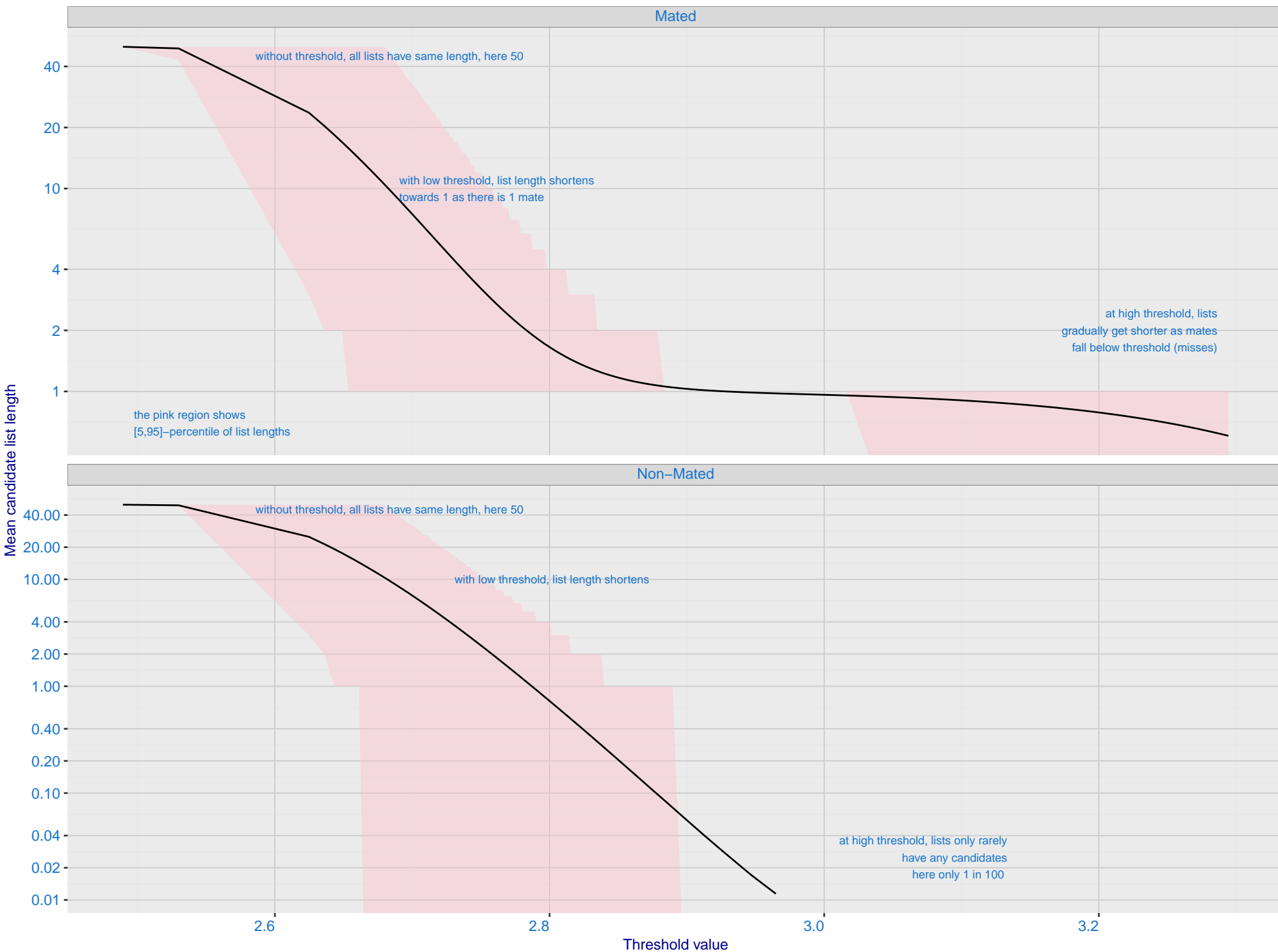
G: FPIR dependence on T by probe type for N = 1600000 subjects

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
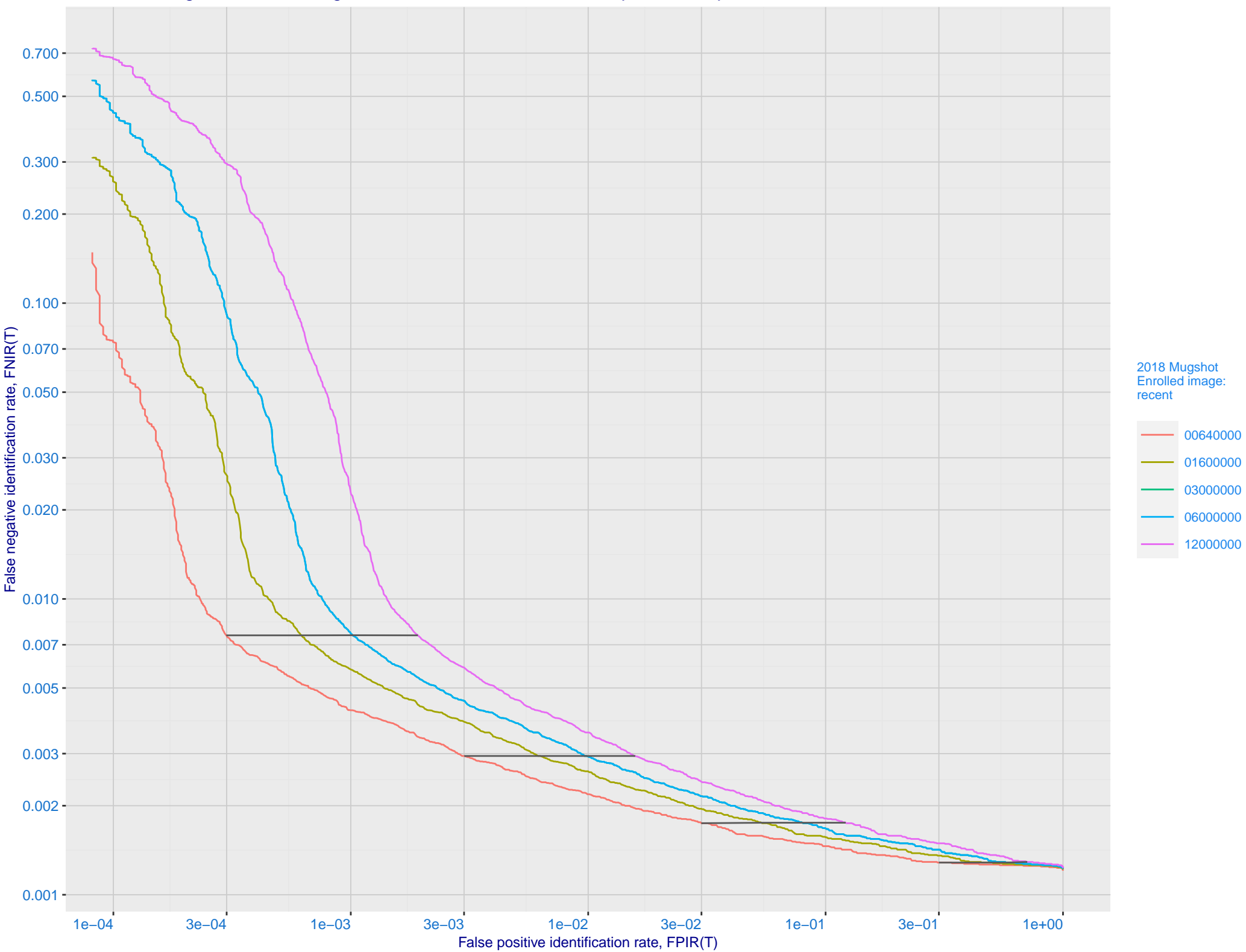
Mean candidate list length

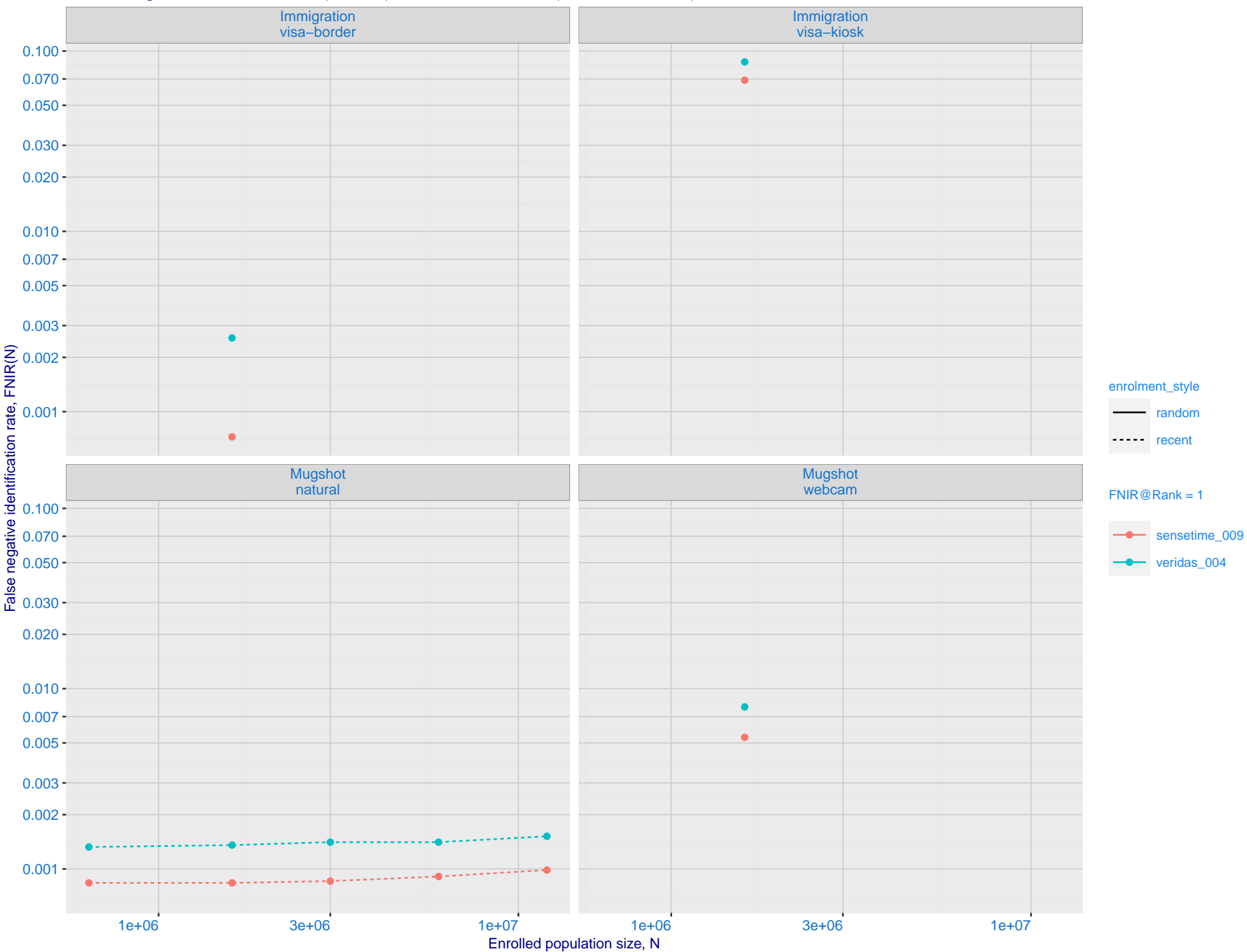Threshold value

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
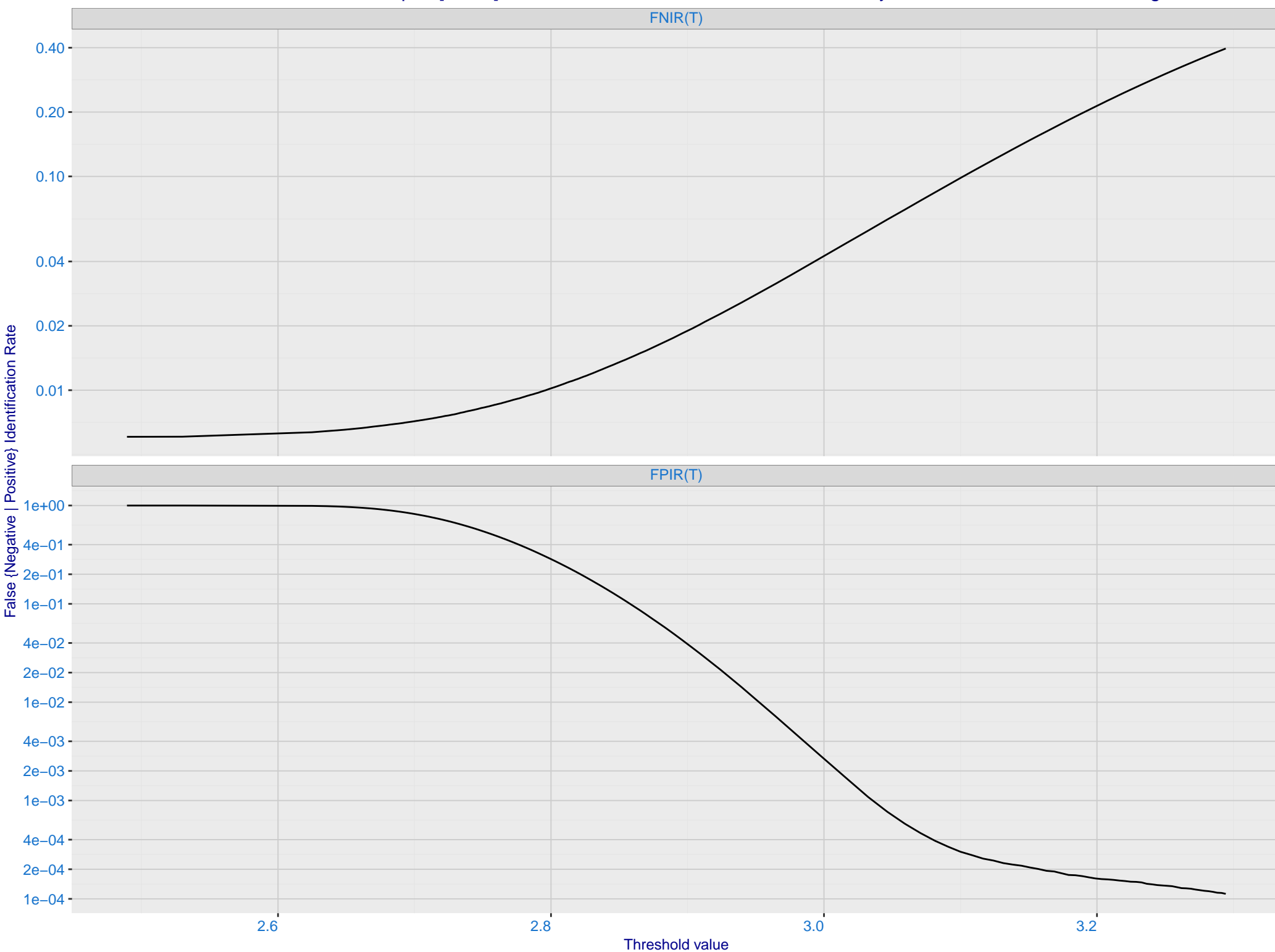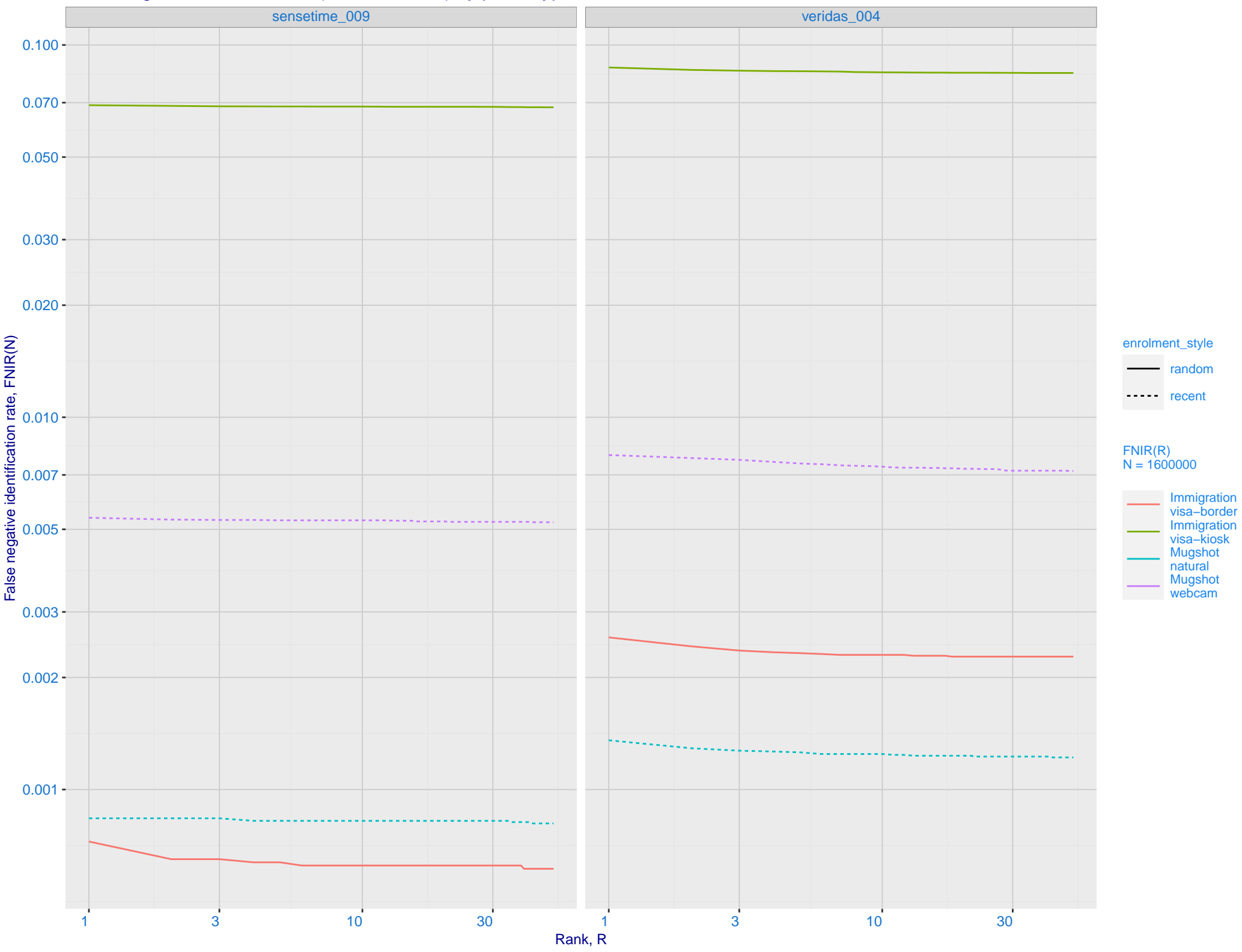
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.

K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_009)

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
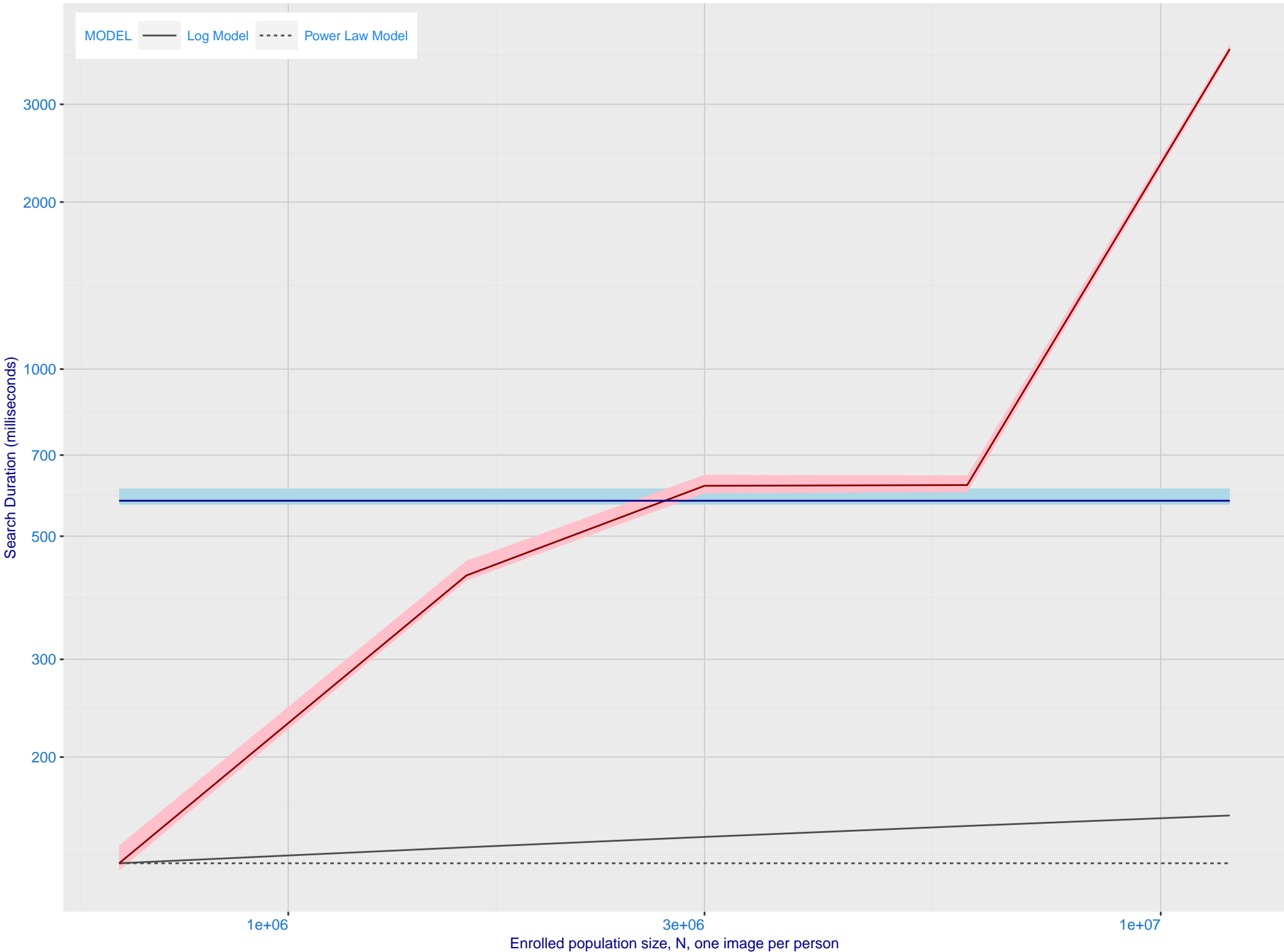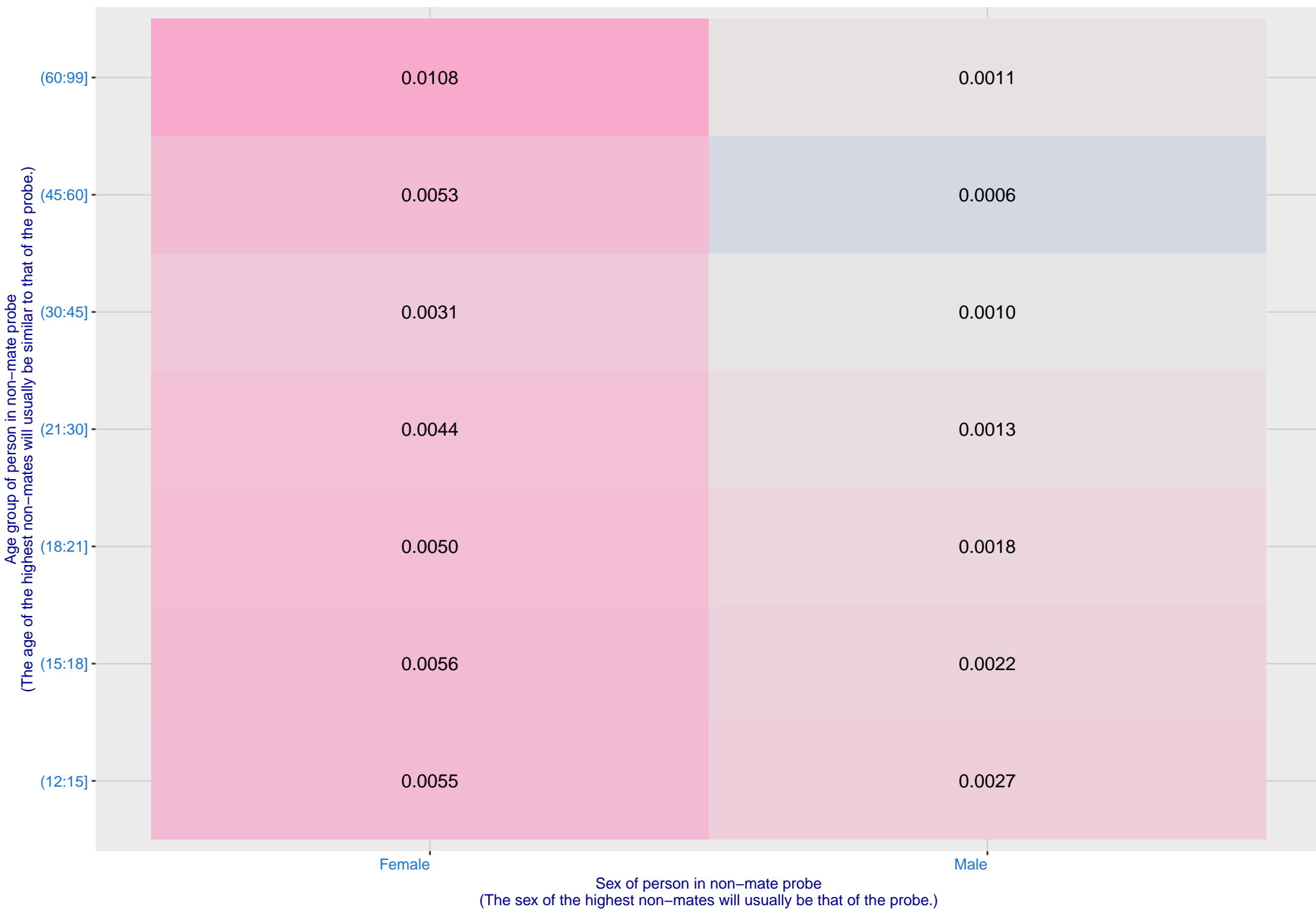
O: FNIR(T, N = 1.6 million) by sex, age and time–lapse. The top row gives investigational rank–1 miss rates.
The bottom panels give high threshold for more lights–out identification with low FPIR.
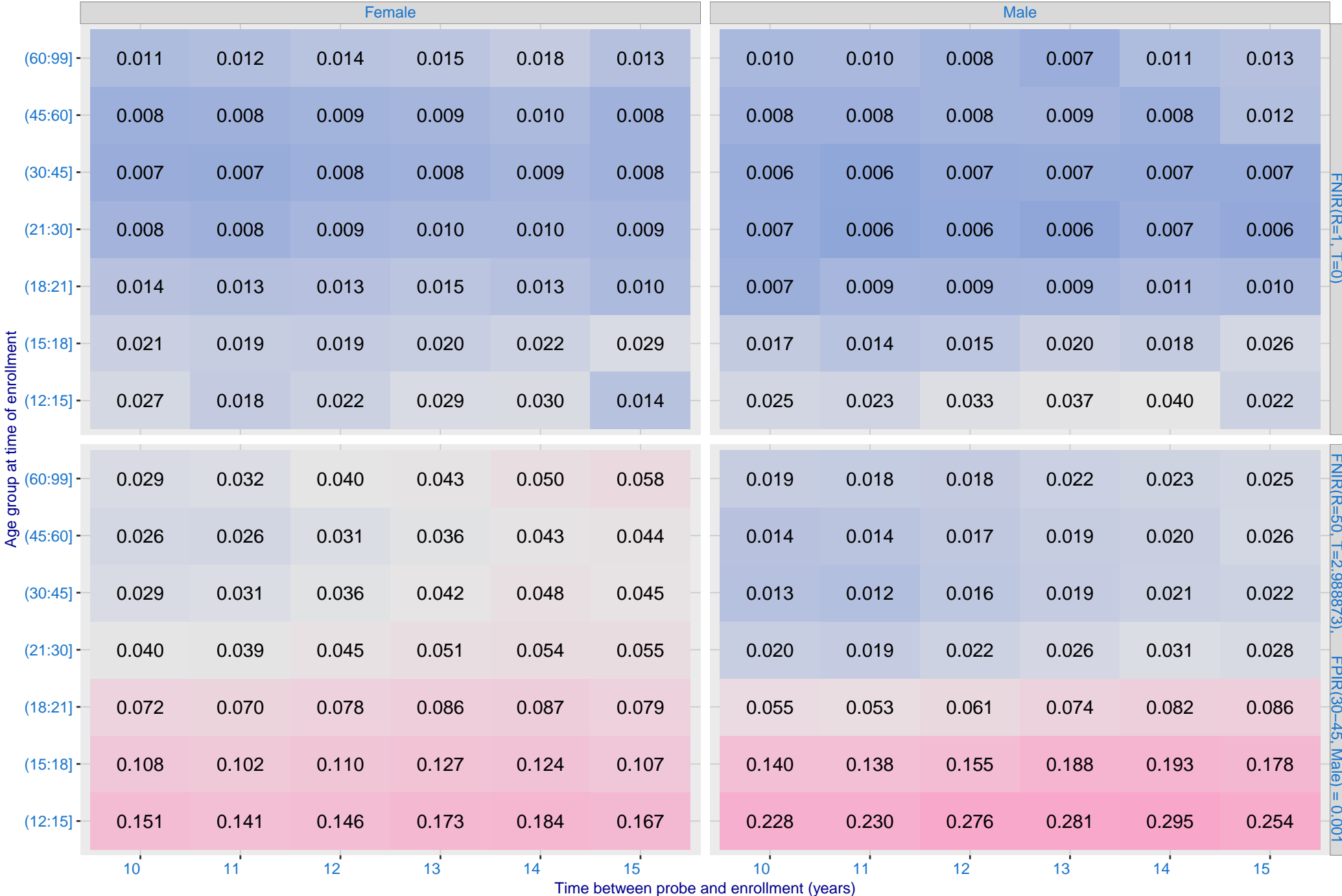
P: FPIR(N = 1.6 million) by sex and age. It is typical for false positive identification rates to be higher in women except in their teens.
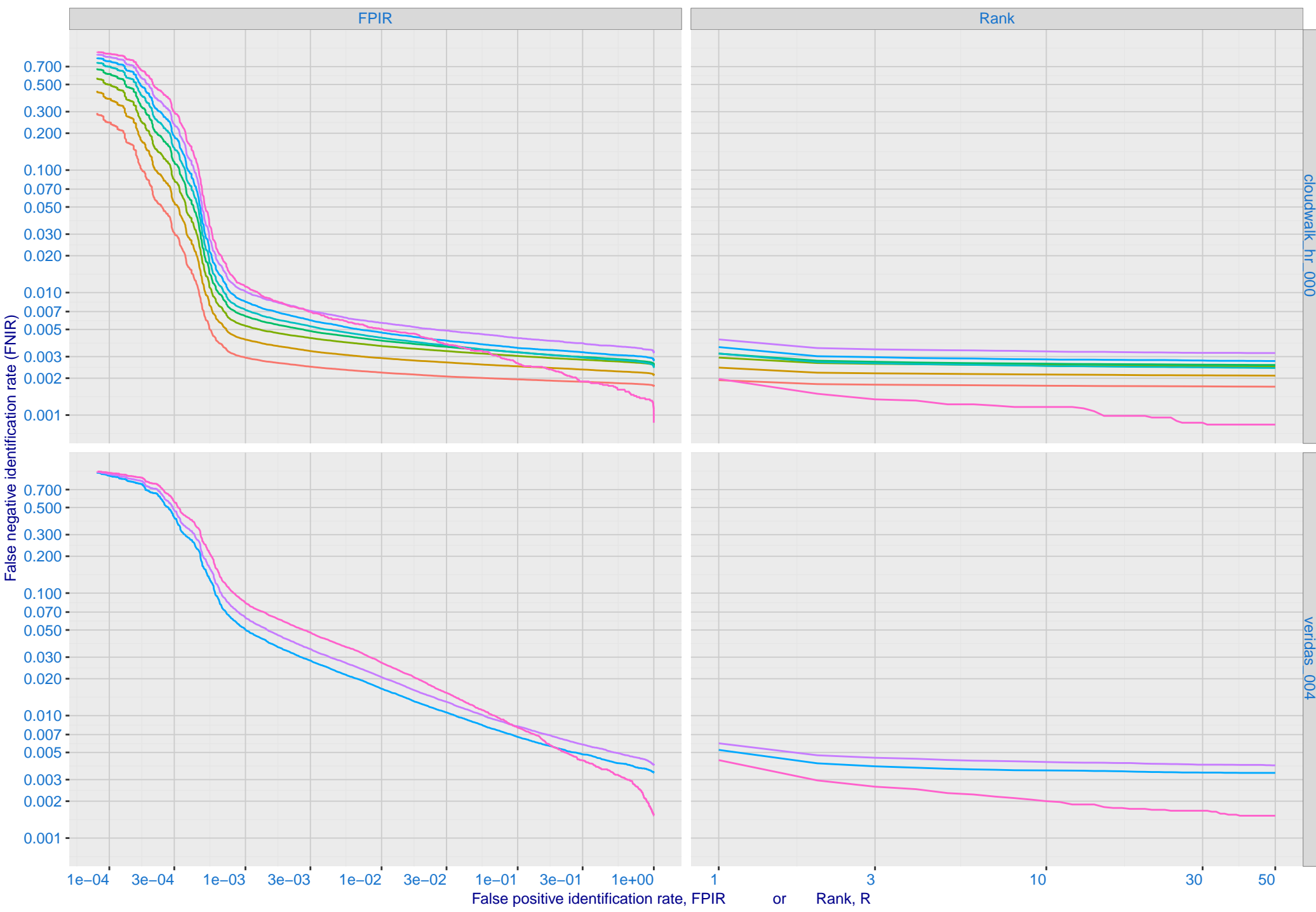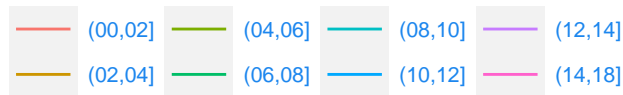
Algorithm: veridas_004, Dataset: Border−Crossing Ageing
Threshold: 2.988873 set to achve FPIR(30−45, Male) = 0.001

Color encodes log(FPIR)

−4   −3   −2   −1

Age group of person in non−mate probe
(The age of the highest non−mates will usually be similar to that of the probe.)

Age group	Female	Male
(60:99]	0.0108	0.0011
(45:60]	0.0053	0.0006
(30:45]	0.0031	0.0010
(21:30]	0.0044	0.0013
(18:21]	0.0050	0.0018
(15:18]	0.0056	0.0022
(12:15]	0.0055	0.0027

Female   Male

Sex of person in non−mate probe
(The sex of the highest non−mates will usually be that of the probe.)

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

R: Decline of genuine scores with ageing, with some eventually dropping below typical thresholds shown by the horizontal lines