A: Datasheet

Algorithm: veridas_001

Developer: Veridas Digital Authentication Solutions S.L.

Submission Date: 2021_03_05

Template size: 2048 bytes

Template time (2.5 percentile): 859 msec

Template time (median): 873 msec

Template time (97.5 percentile): 898 msec

Investigation:

Frontal mugshot ranking 58 (out of 279) –– FNIR(1600000, 0, 1) = 0.0028 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 44 (out of 241) –– FNIR(1600000, 0, 1) = 0.0140 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 67 (out of 210) –– FNIR(1600000, 0, 1) = 0.5499 vs. lowest 0.0587 from xforwardai_002

Immigration visa–border ranking 52 (out of 168) –– FNIR(1600000, 0, 1) = 0.0062 vs. lowest 0.0013 from visionlabs_010

Immigration visa–kiosk ranking 58 (out of 165) –– FNIR(1600000, 0, 1) = 0.1309 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

Frontal mugshot ranking 70 (out of 279) –– FNIR(1600000, T, L+1) = 0.0372, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004
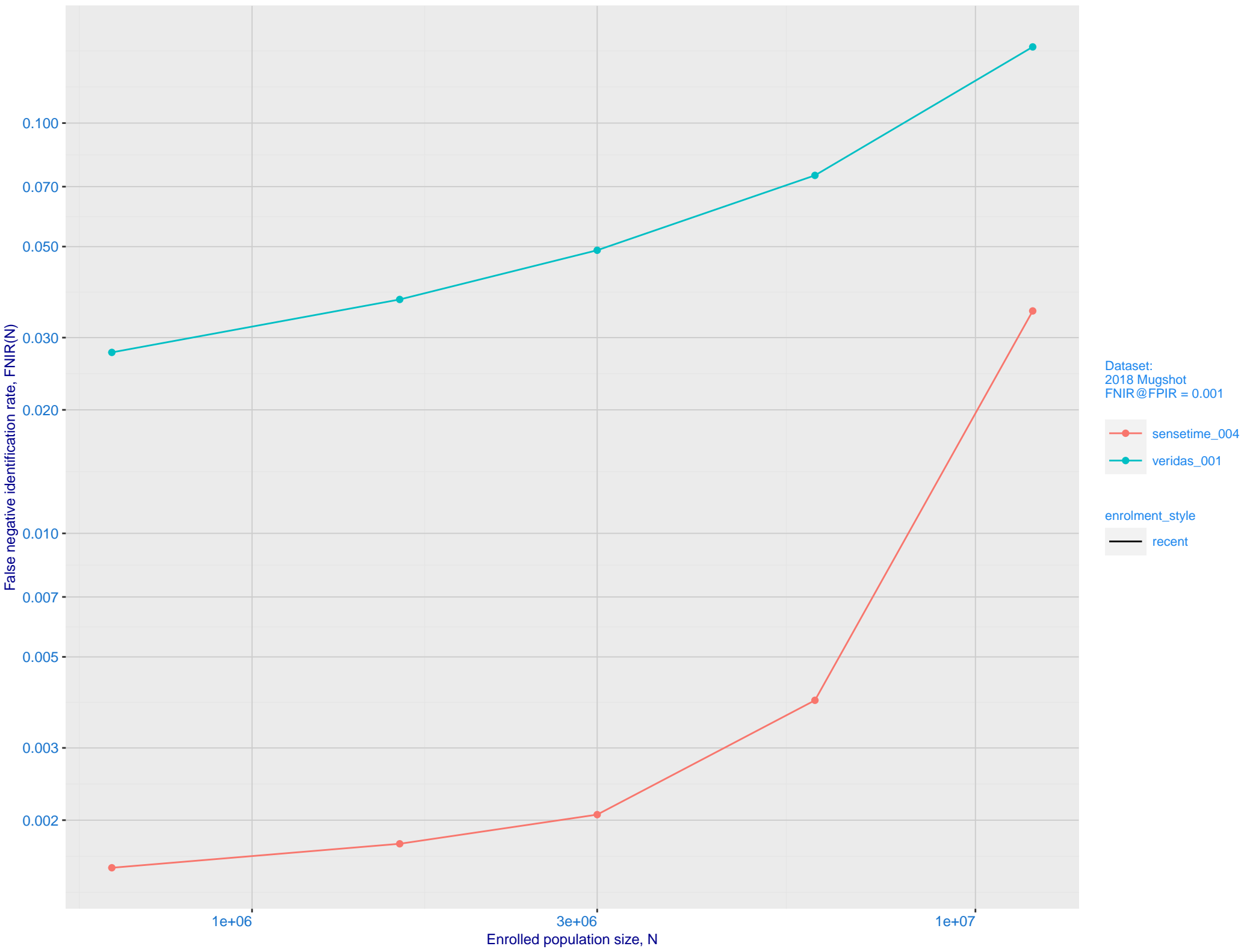
Mugshot webcam ranking 55 (out of 236) –– FNIR(1600000, T, L+1) = 0.0823, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 78 (out of 209) –– FNIR(1600000, T, L+1) = 0.9874, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa–border ranking 46 (out of 167) –– FNIR(1600000, T, L+1) = 0.0441, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa–kiosk ranking 37 (out of 162) –– FNIR(1600000, T, L+1) = 0.2657, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000
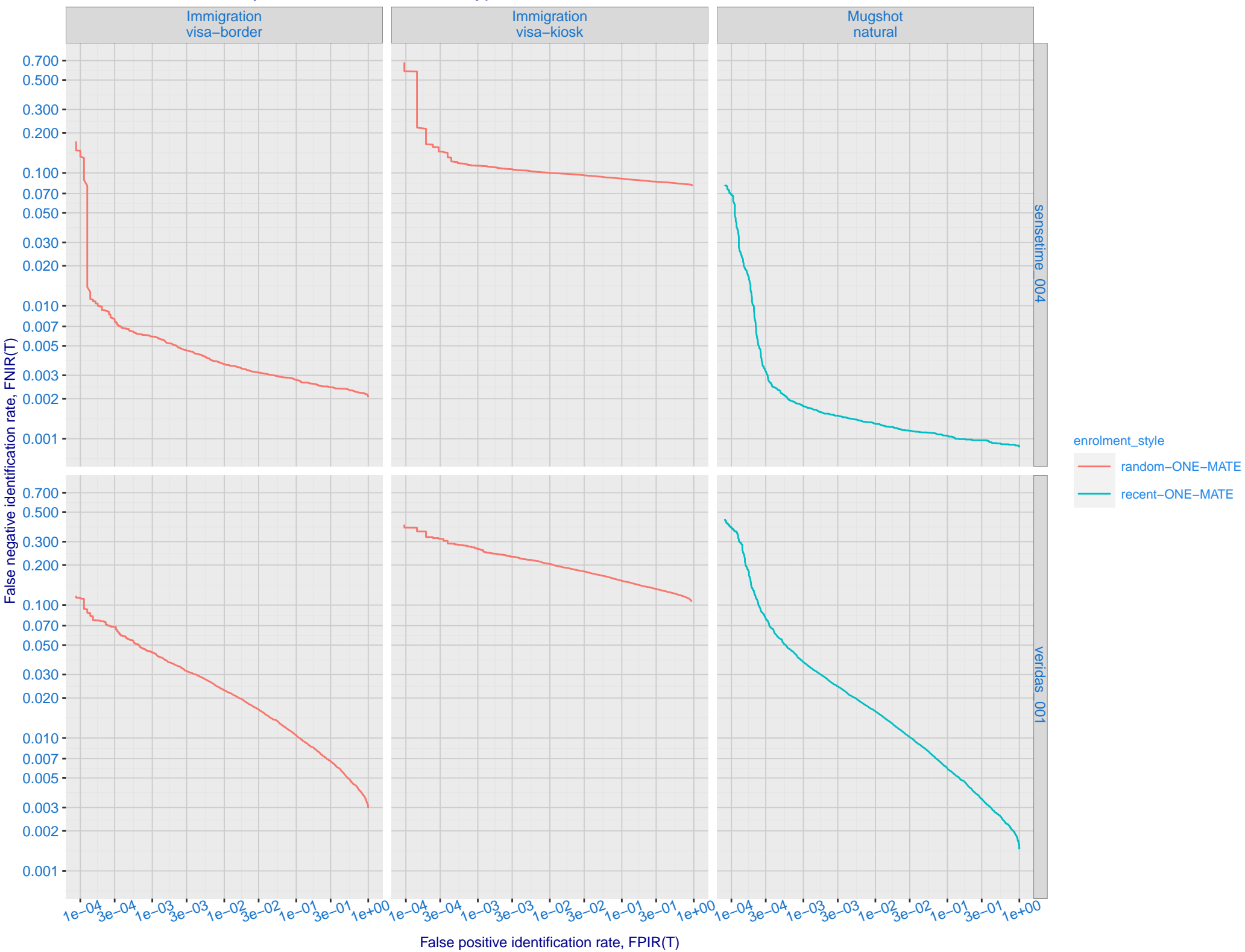
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_004)
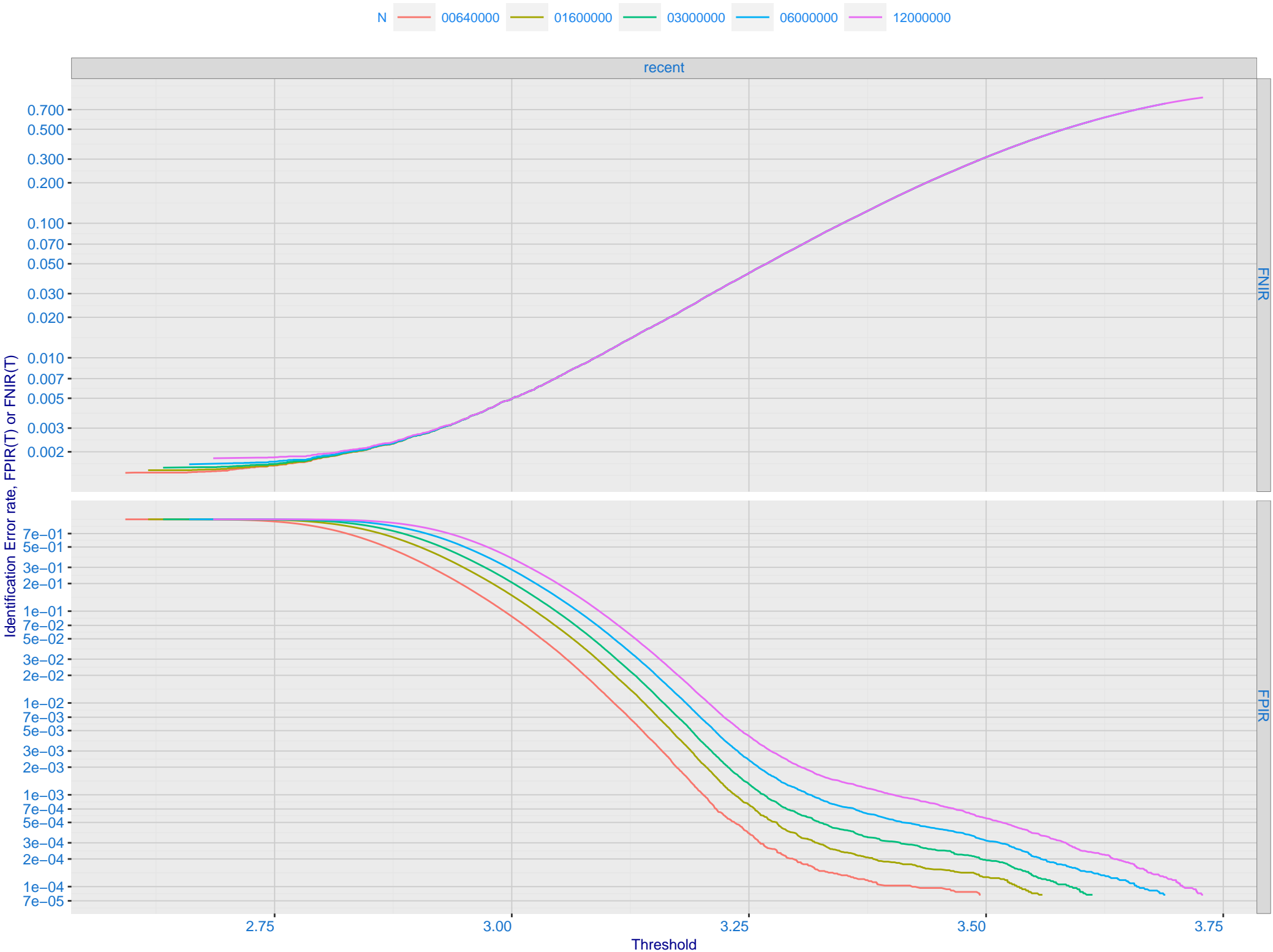
C: Evolution of accuracy for VERIDAS algorithms on three datasets 2018 – present
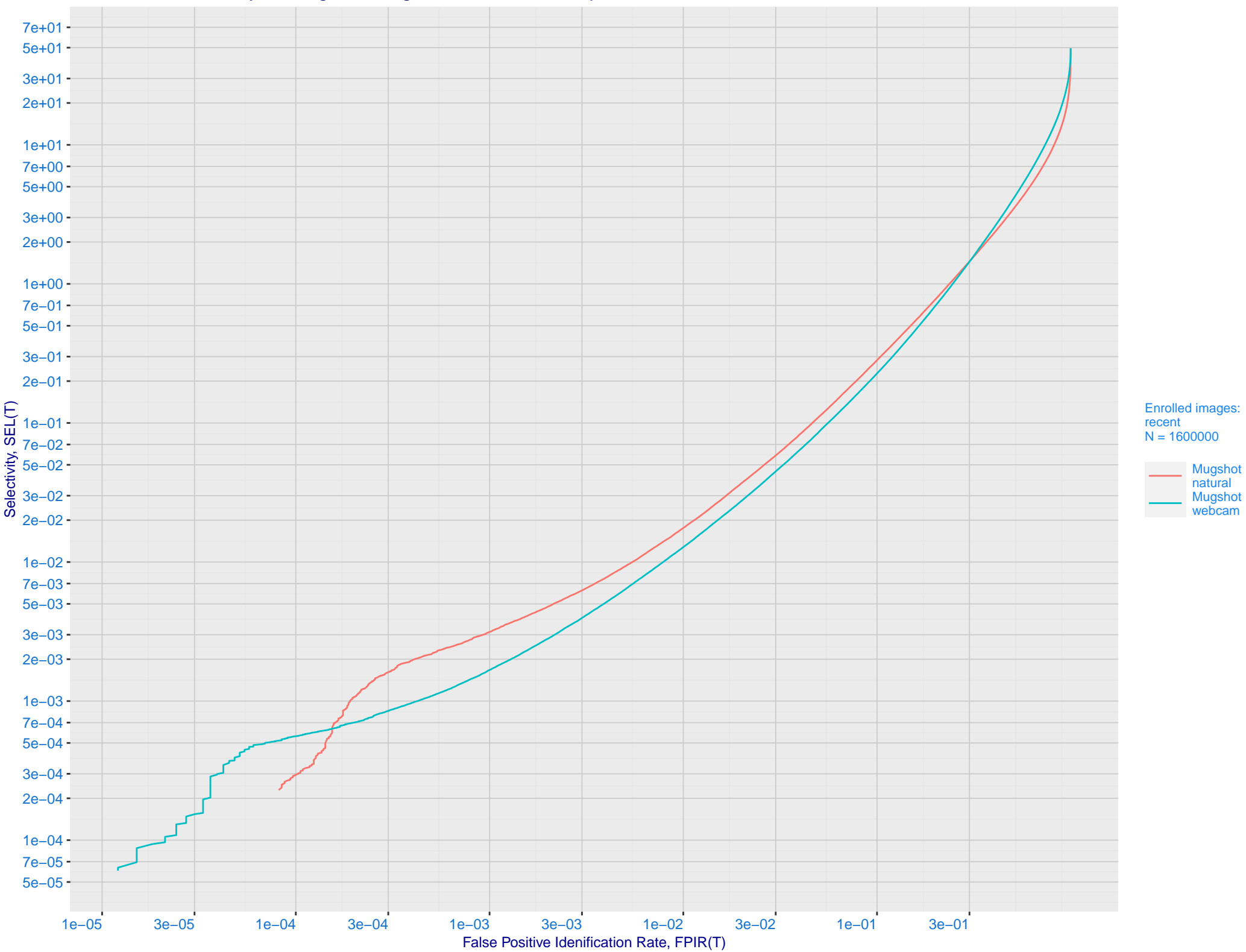
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
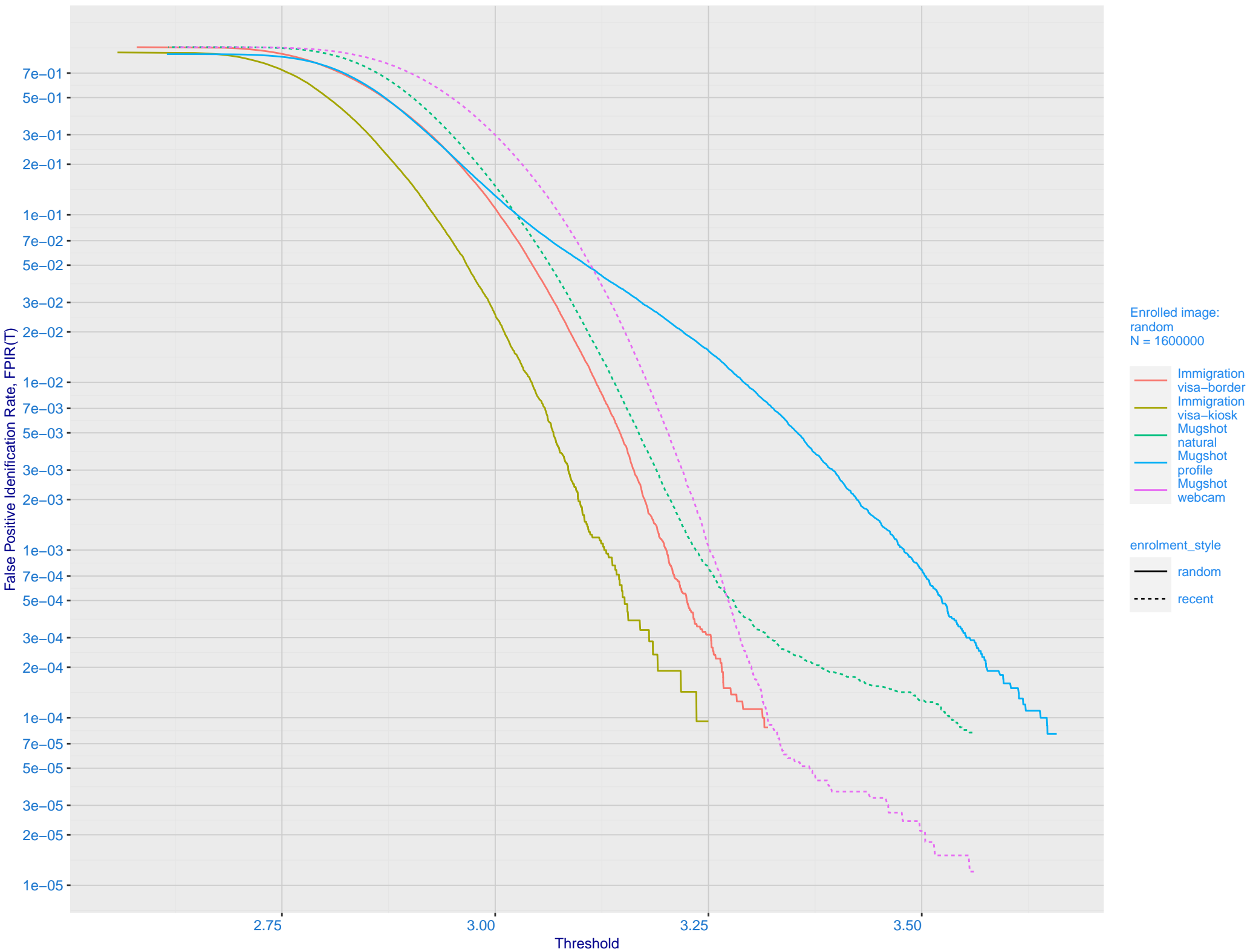
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images

F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate
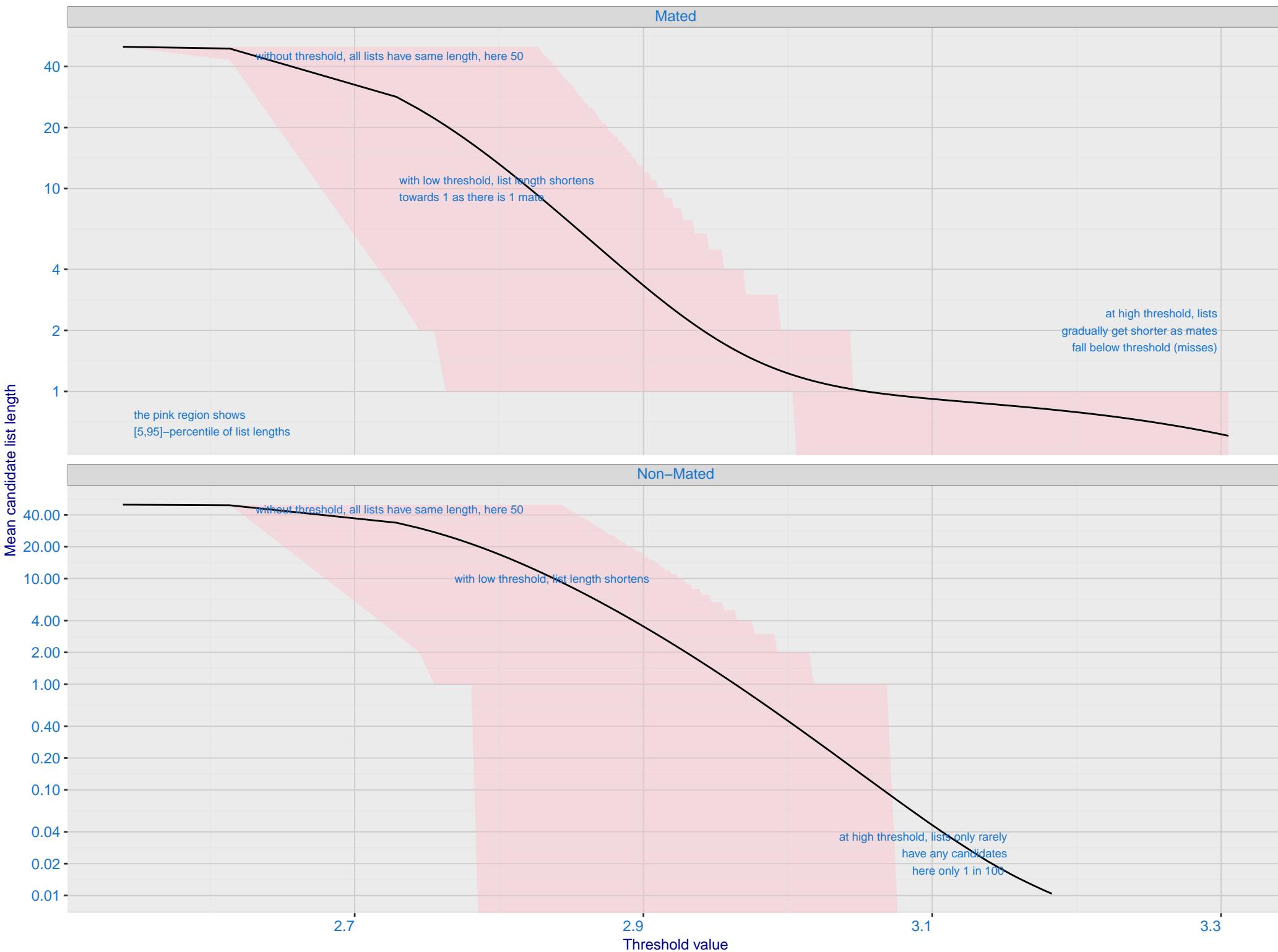
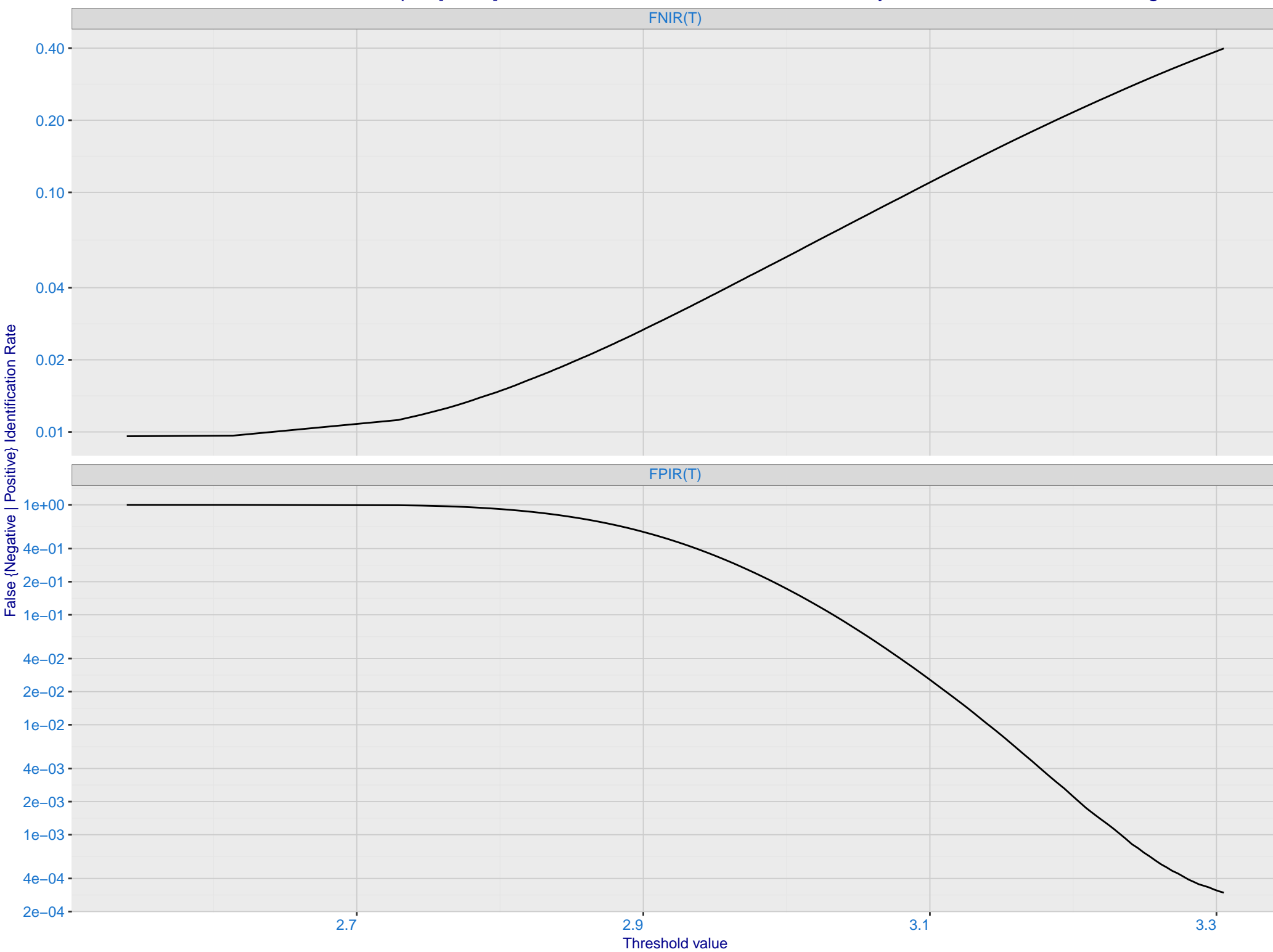G: FPIR dependence on T by probe type for N = 1600000 subjects

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

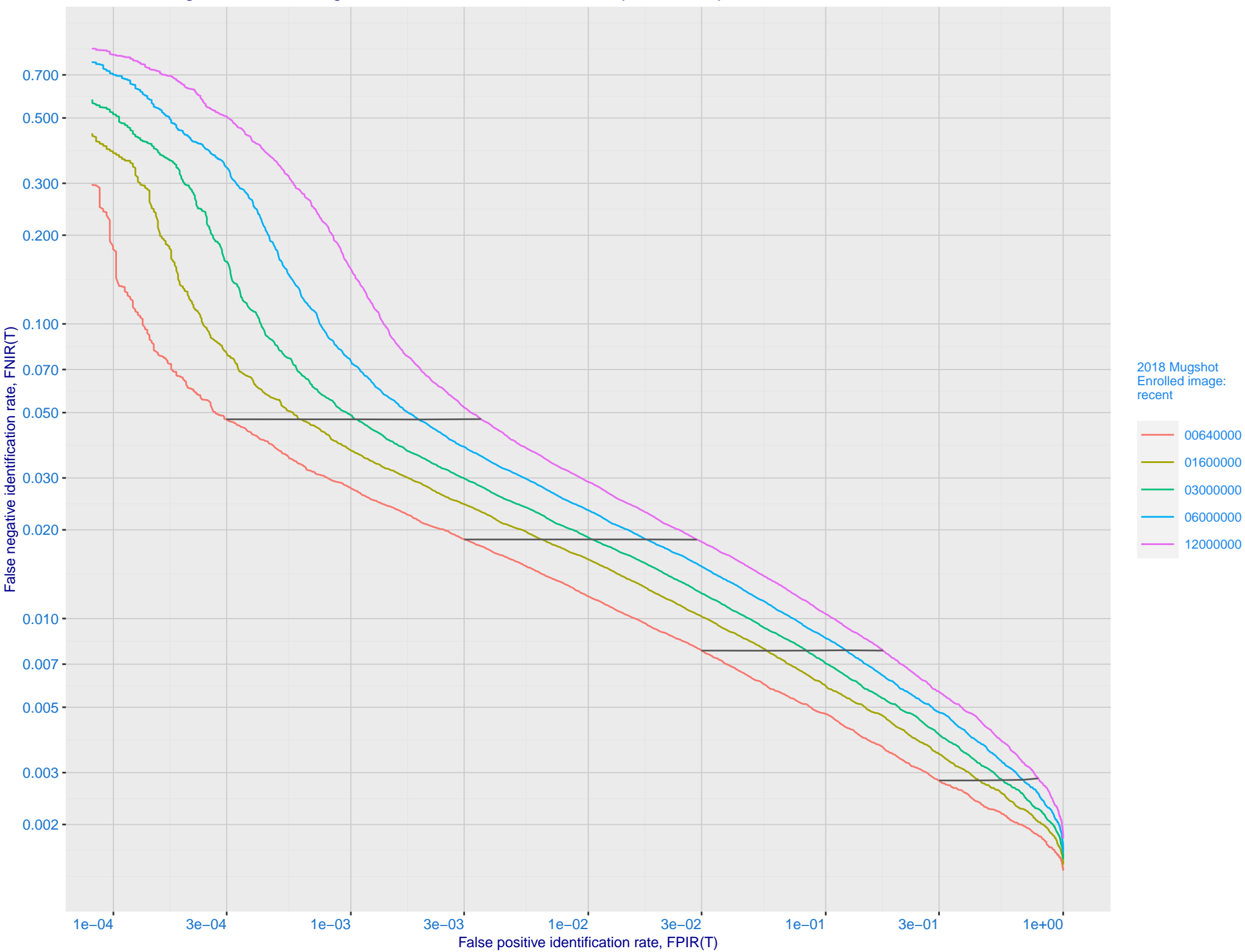Mean candidate list length

Threshold value
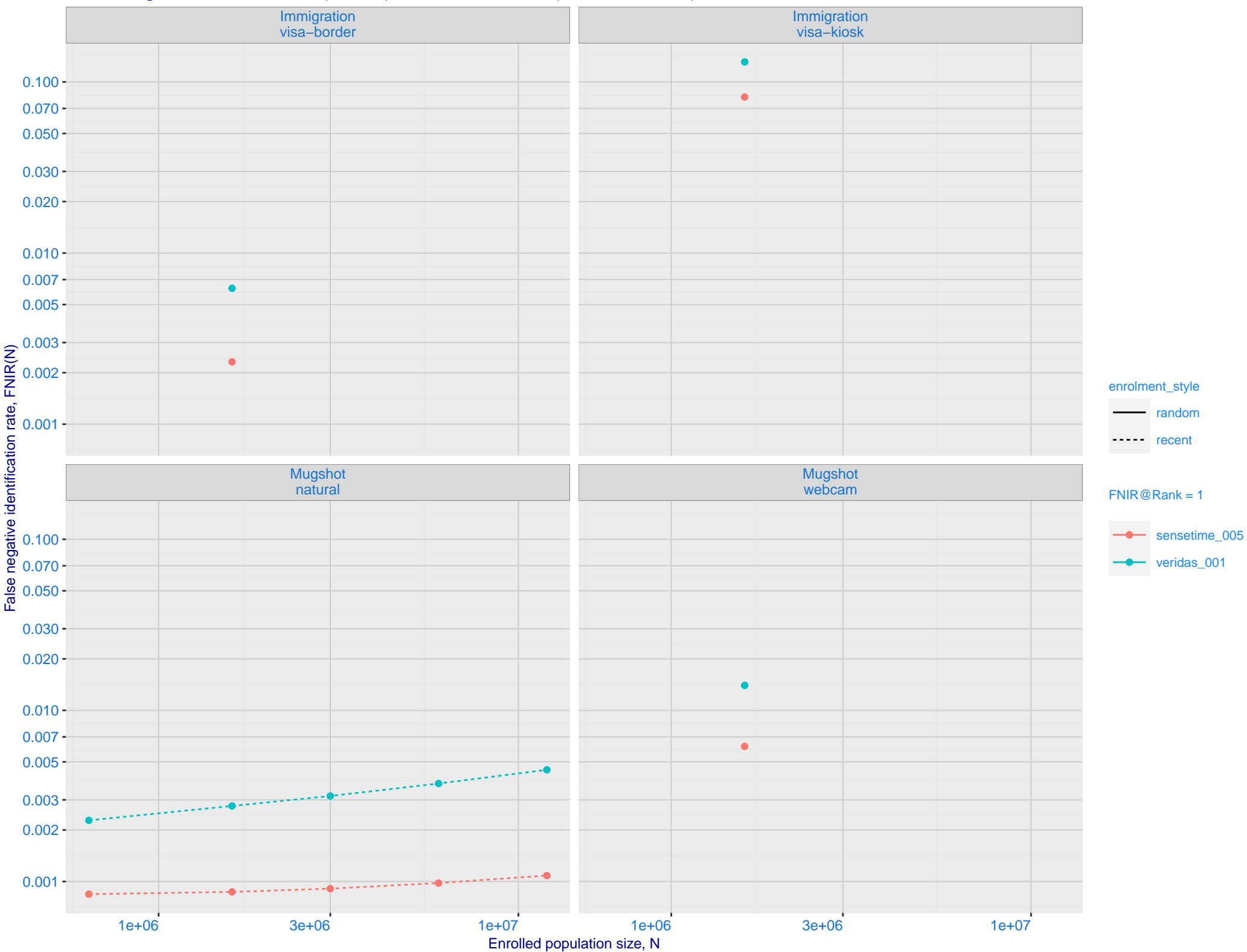
I: FNIR and FPIR dependence on threshold
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image
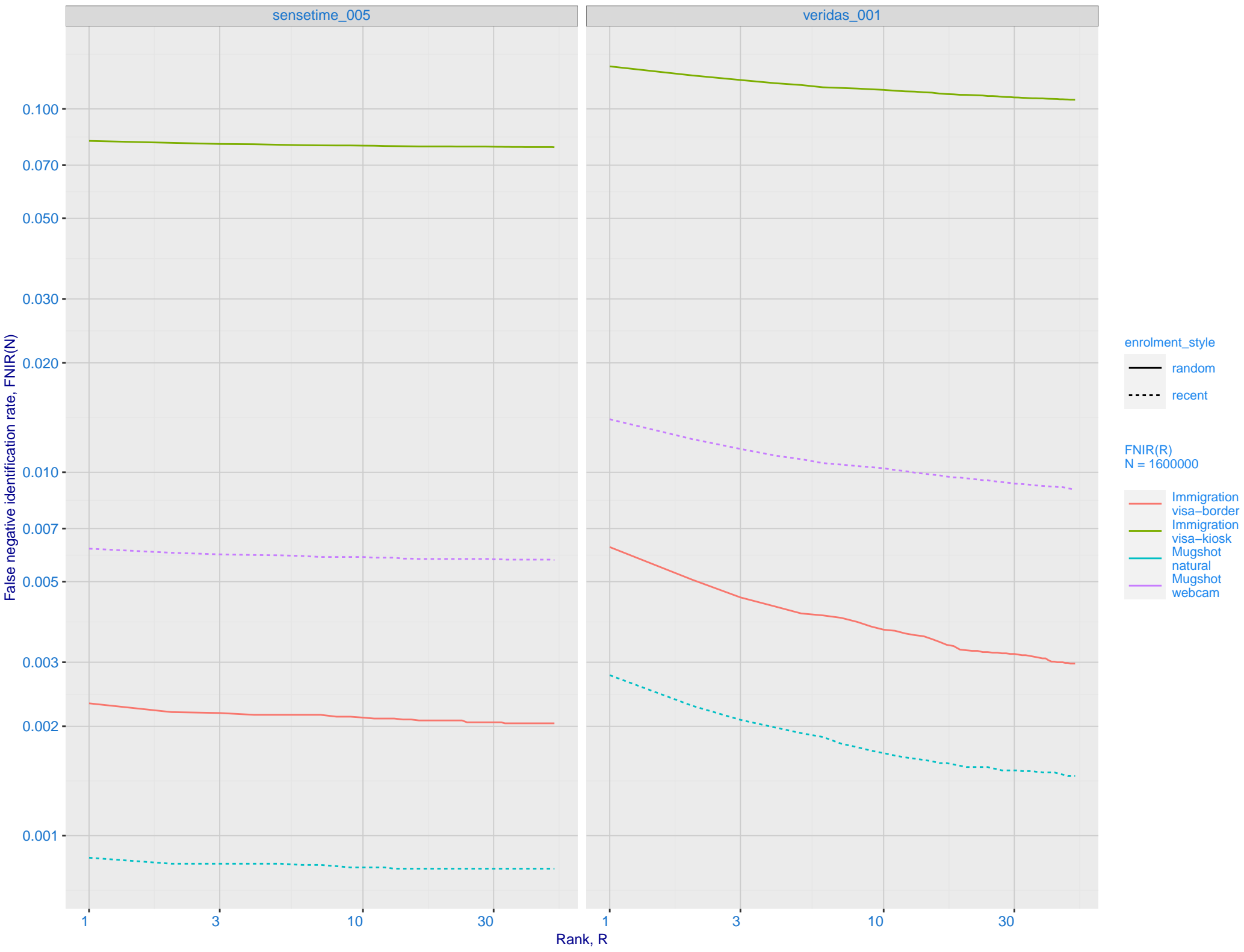
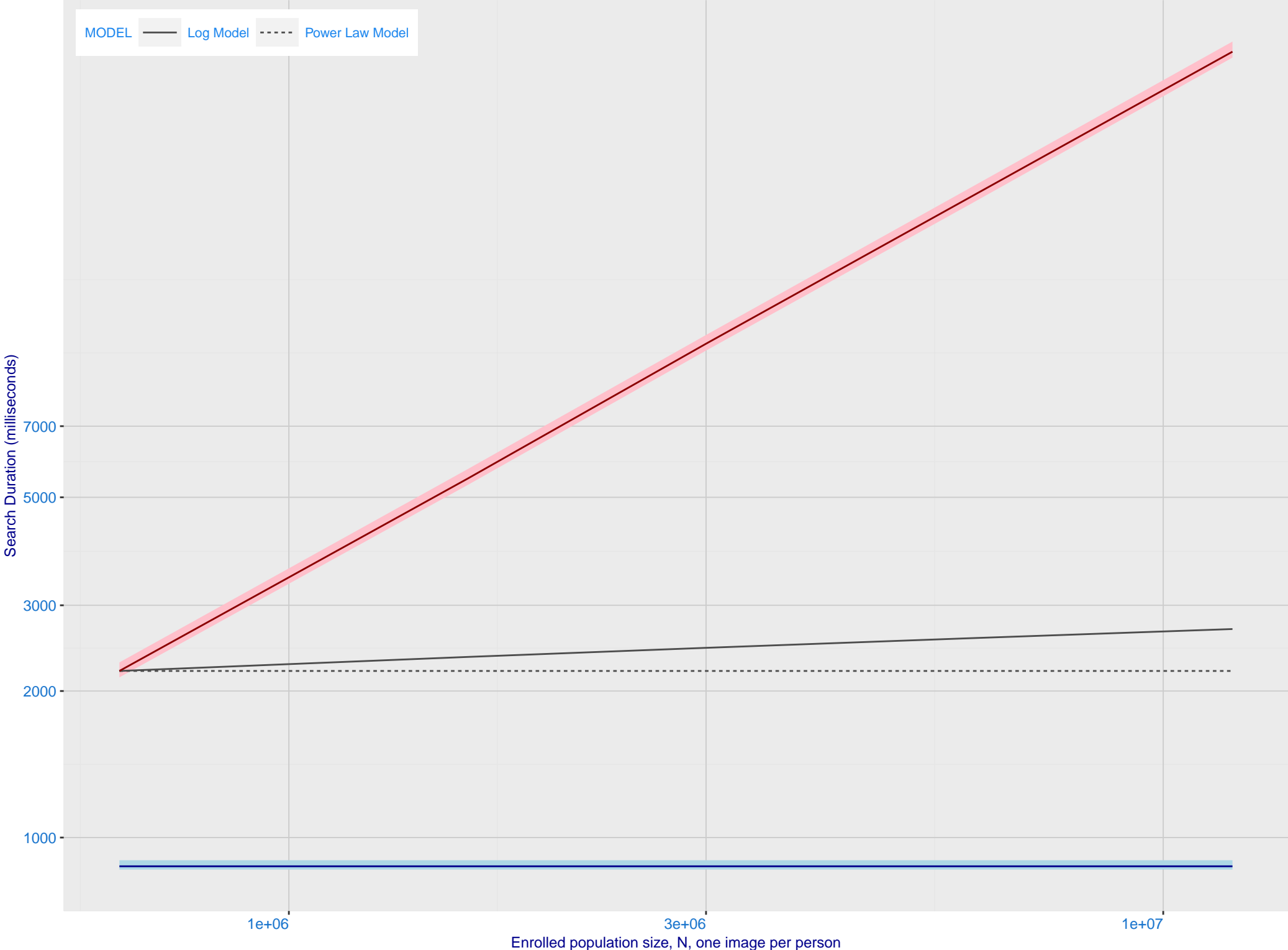J: DET for Mugshot natural images and various N. Links connect points of equal threshold.

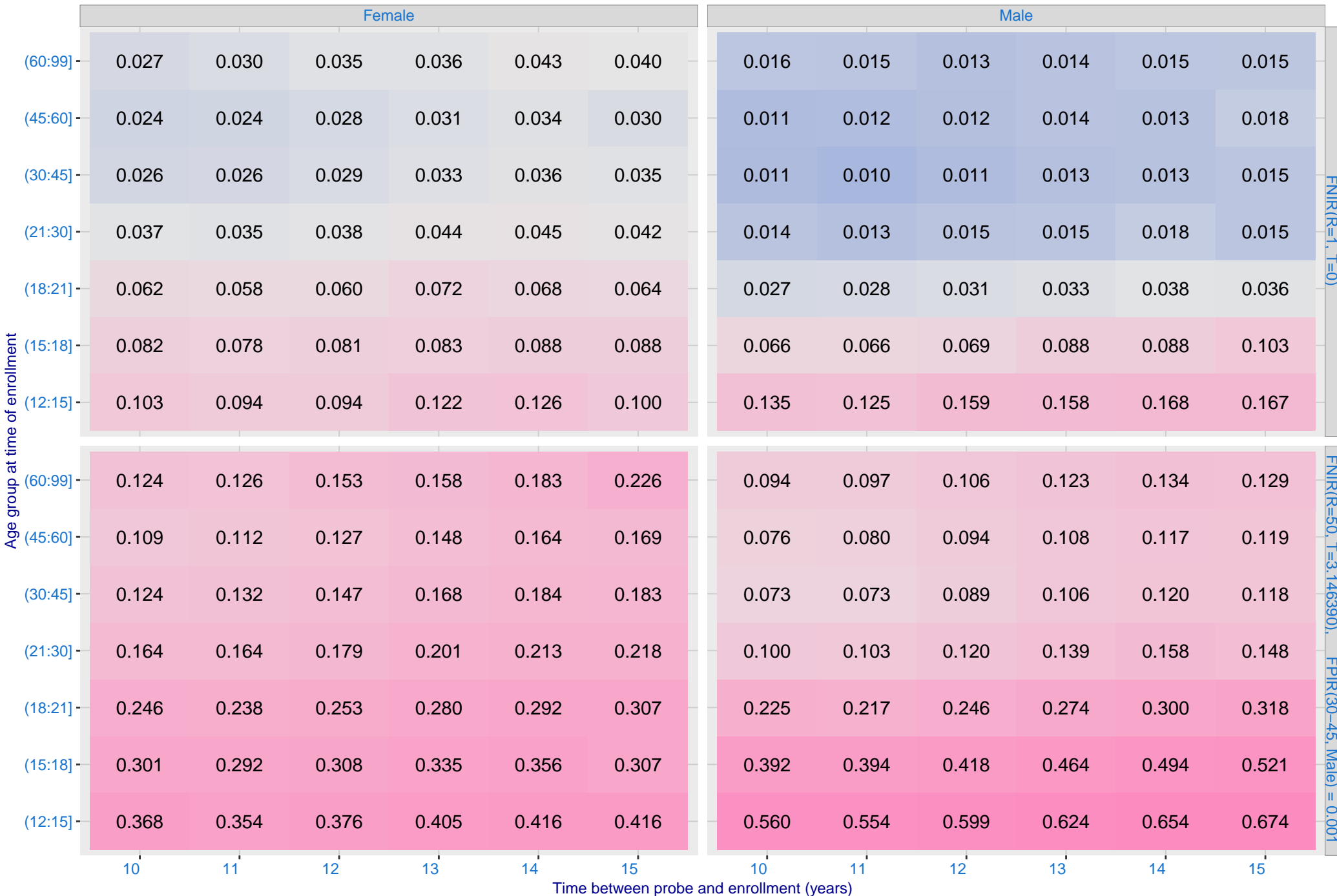K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005)

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.
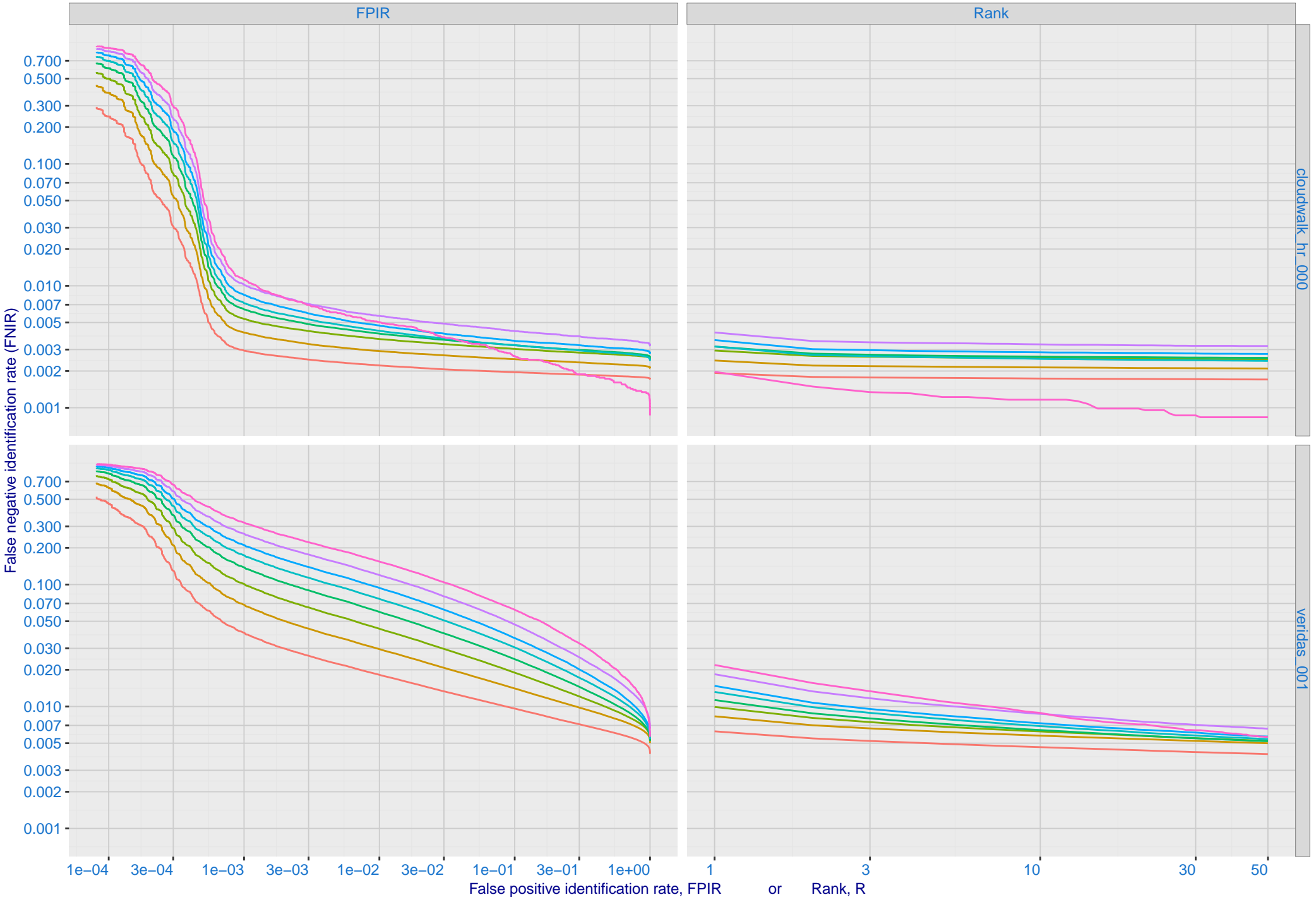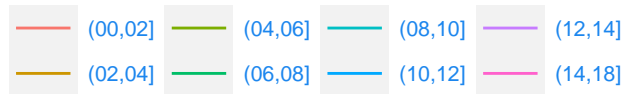
Algorithm: veridas_001, Dataset: Border–Crossing Ageing
Threshold: 3.146390 set to achive FPIR(30–45, Male) = 0.001

Color encodes log(FPIR)

−4   −3   −2   −1

Age group of person in non-mate probe	Female	Male
(60:99]	0.0130	0.0006
(45:60]	0.0082	0.0005
(30:45]	0.0077	0.0010
(21:30]	0.0138	0.0023
(18:21]	0.0191	0.0046
(15:18]	0.0207	0.0052
(12:15]	0.0192	0.0065

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

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