A: Datasheet

Algorithm: s1_000

Developer: Samsung S1 Corp

Submission Date: 2021_06_03

Template size: 4096 bytes

Template time (2.5 percentile): 864 msec

Template time (median): 865 msec

Template time (97.5 percentile): 871 msec

Investigation:

Frontal mugshot ranking 56 (out of 288) –– FNIR(1600000, 0, 1) = 0.0024 vs. lowest 0.0009 from sensetime_006

Mugshot webcam ranking 73 (out of 250) –– FNIR(1600000, 0, 1) = 0.0166 vs. lowest 0.0057 from sensetime_006

Mugshot profile ranking 34 (out of 219) –– FNIR(1600000, 0, 1) = 0.2581 vs. lowest 0.0550 from sensetime_006

Immigration visa–border ranking 51 (out of 177) –– FNIR(1600000, 0, 1) = 0.0054 vs. lowest 0.0009 from sensetime_006

Immigration visa–kiosk ranking 26 (out of 174) –– FNIR(1600000, 0, 1) = 0.0896 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

Frontal mugshot ranking 65 (out of 288) –– FNIR(1600000, T, L+1) = 0.0279, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

Mugshot webcam ranking 65 (out of 248) –– FNIR(1600000, T, L+1) = 0.0842, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 210 (out of 218) –– FNIR(1600000, T, L+1) = 1.0000, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa–border ranking 59 (out of 176) –– FNIR(1600000, T, L+1) = 0.0471, FPIR=0.001000 vs. lowest 0.0039 from sensetime_006

Immigration visa–kiosk ranking 164 (out of 171) –– FNIR(1600000, T, L+1) = 1.0000, FPIR=0.001000 vs. lowest 0.0925 from sensetime_006
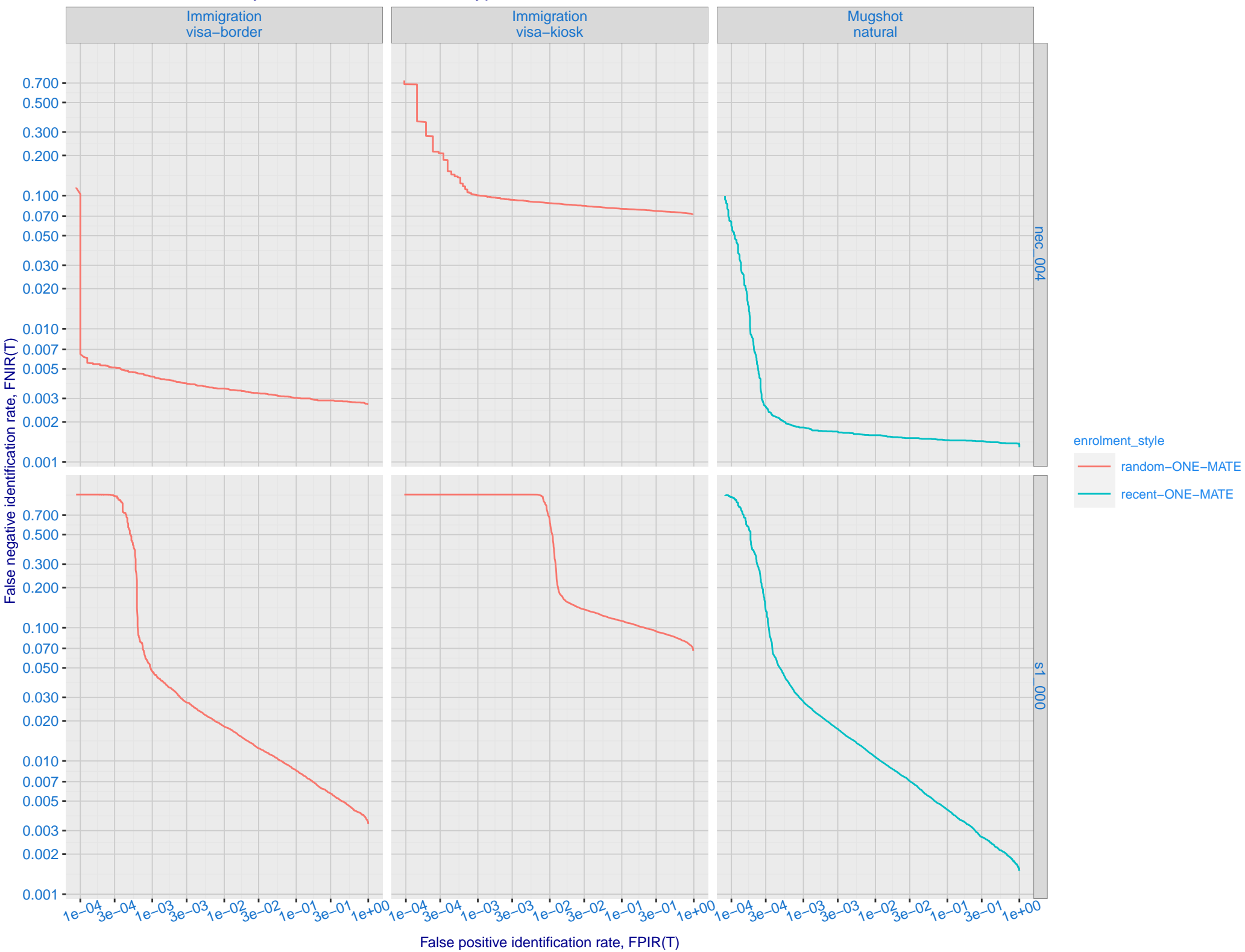
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (nec_004)
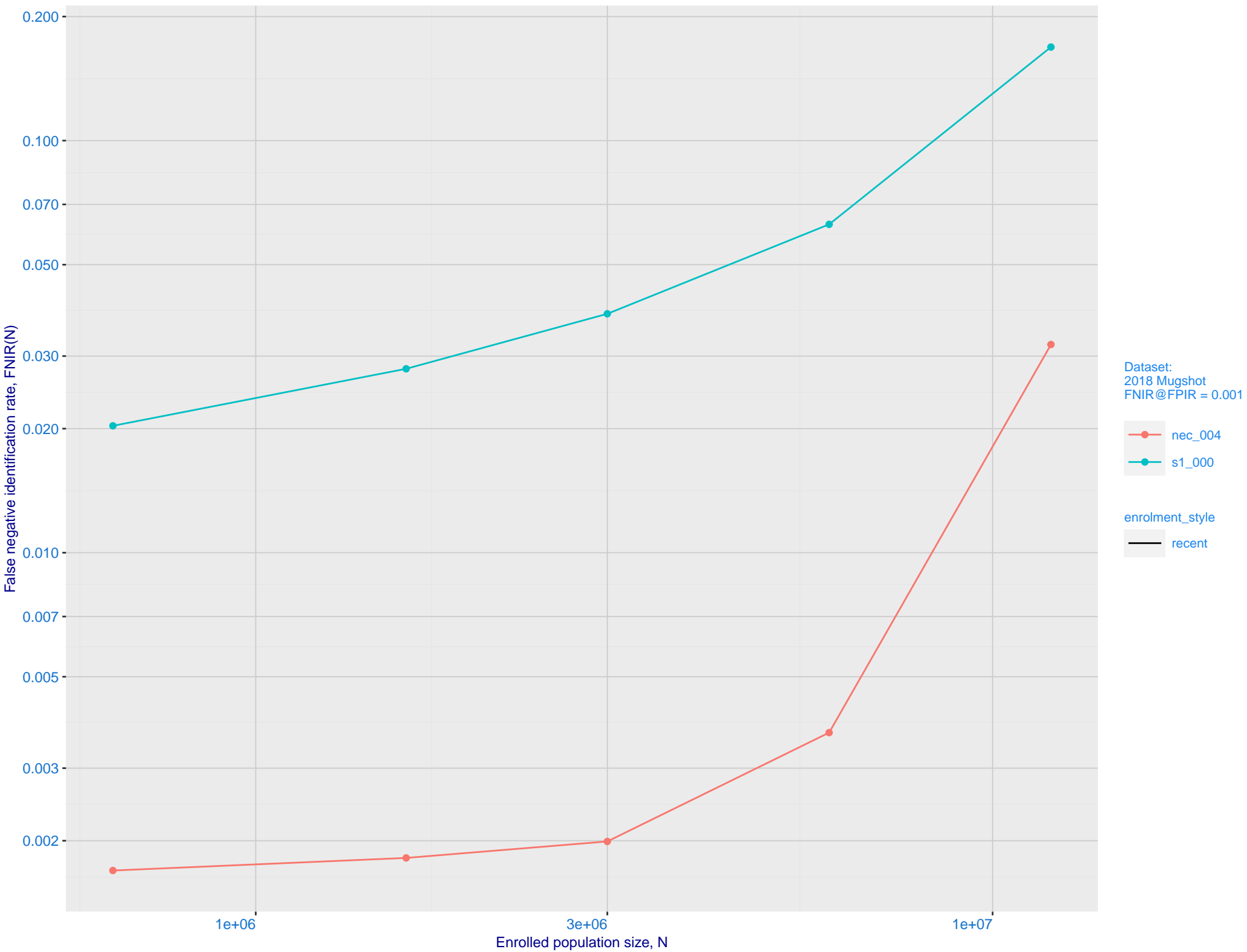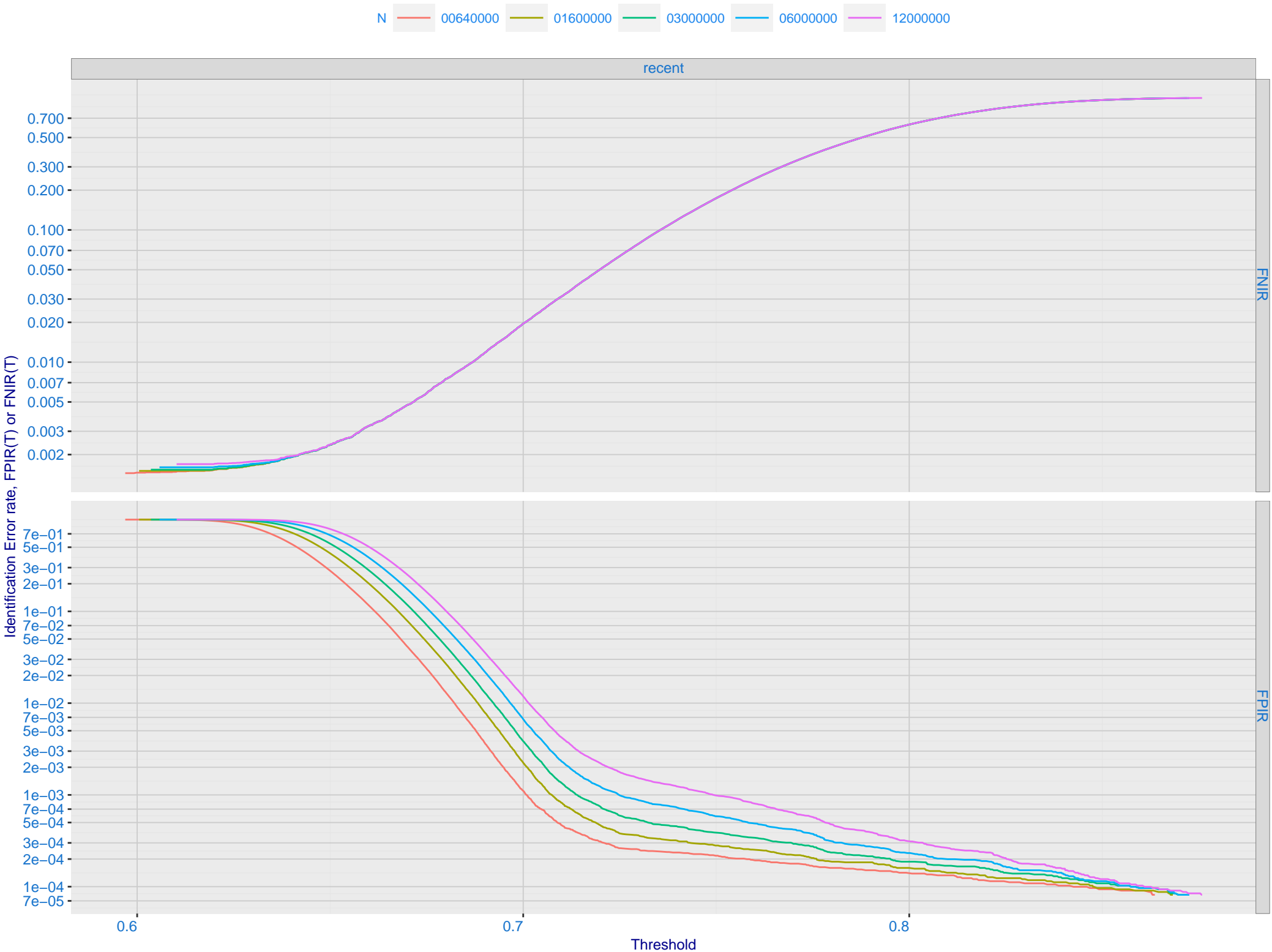
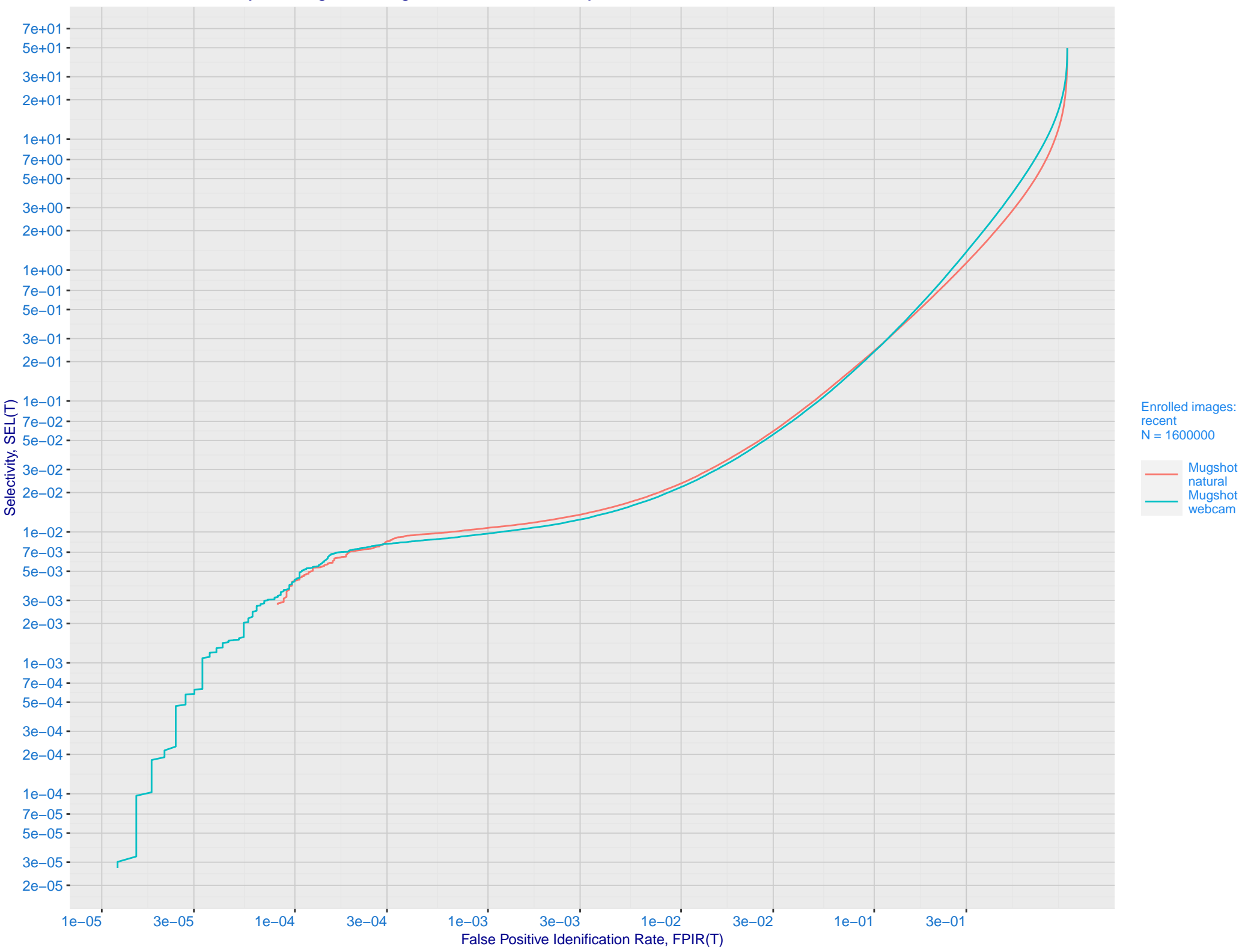C: Evolution of accuracy for S1 algorithms on three datasets 2018 – present
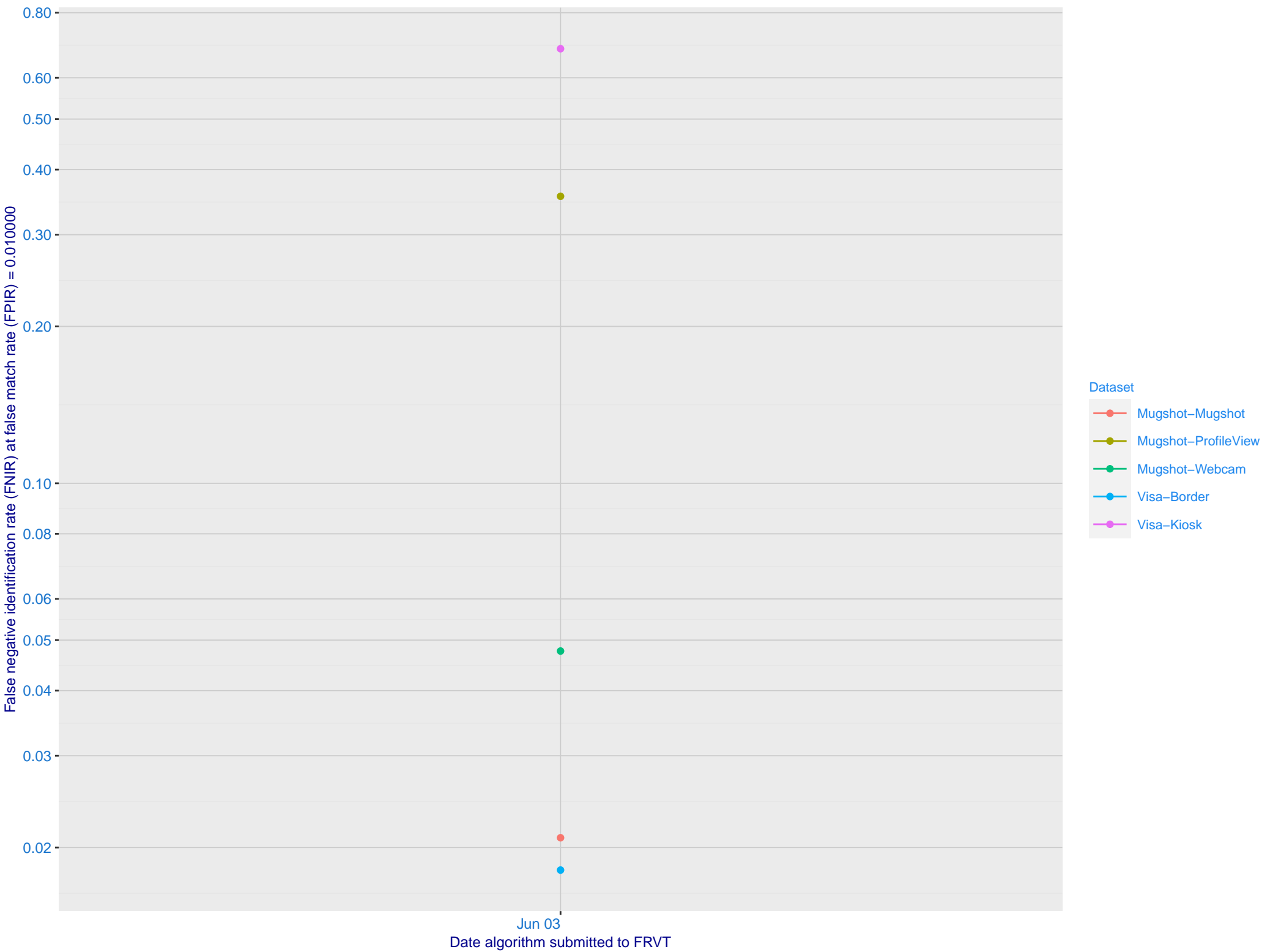
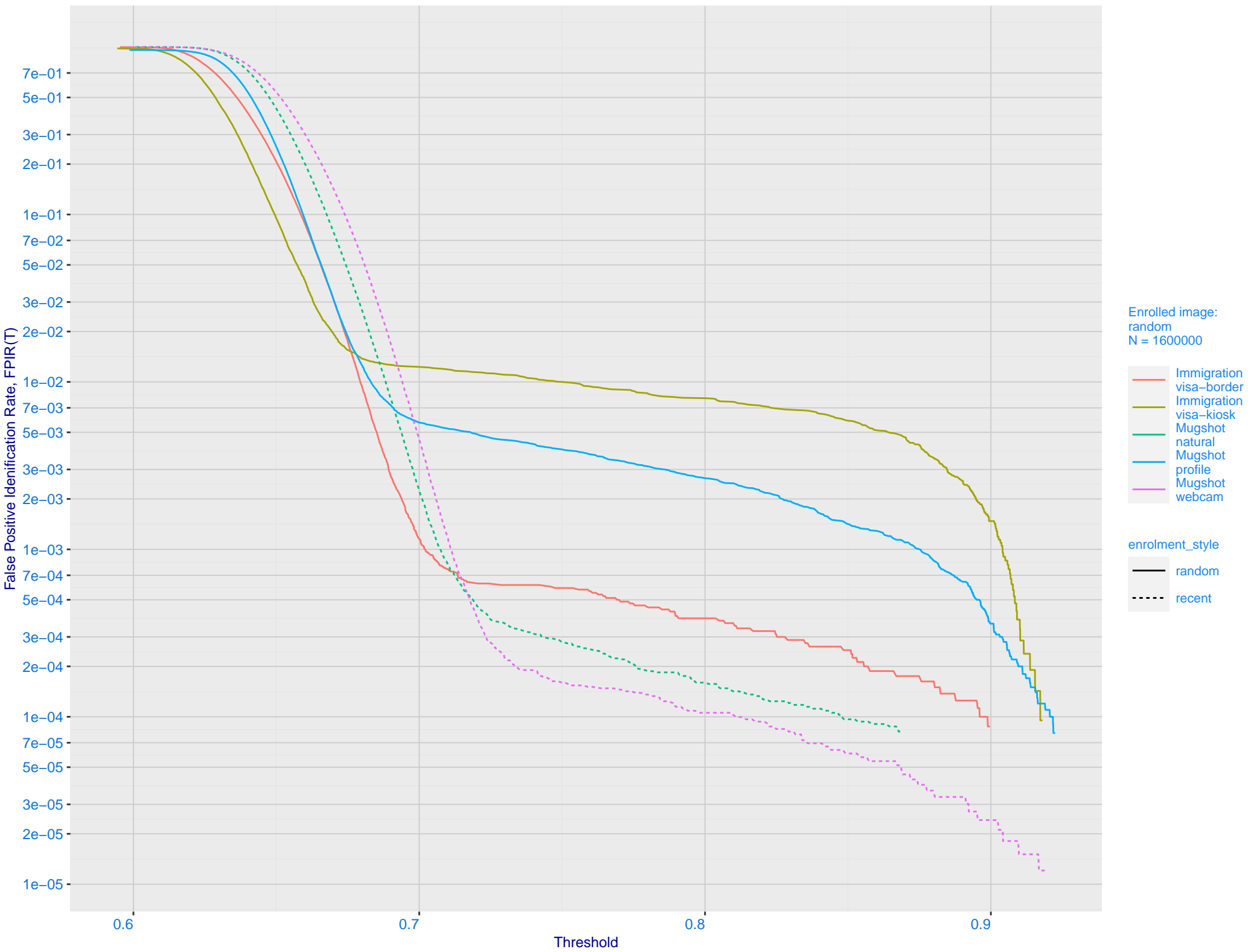D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals

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
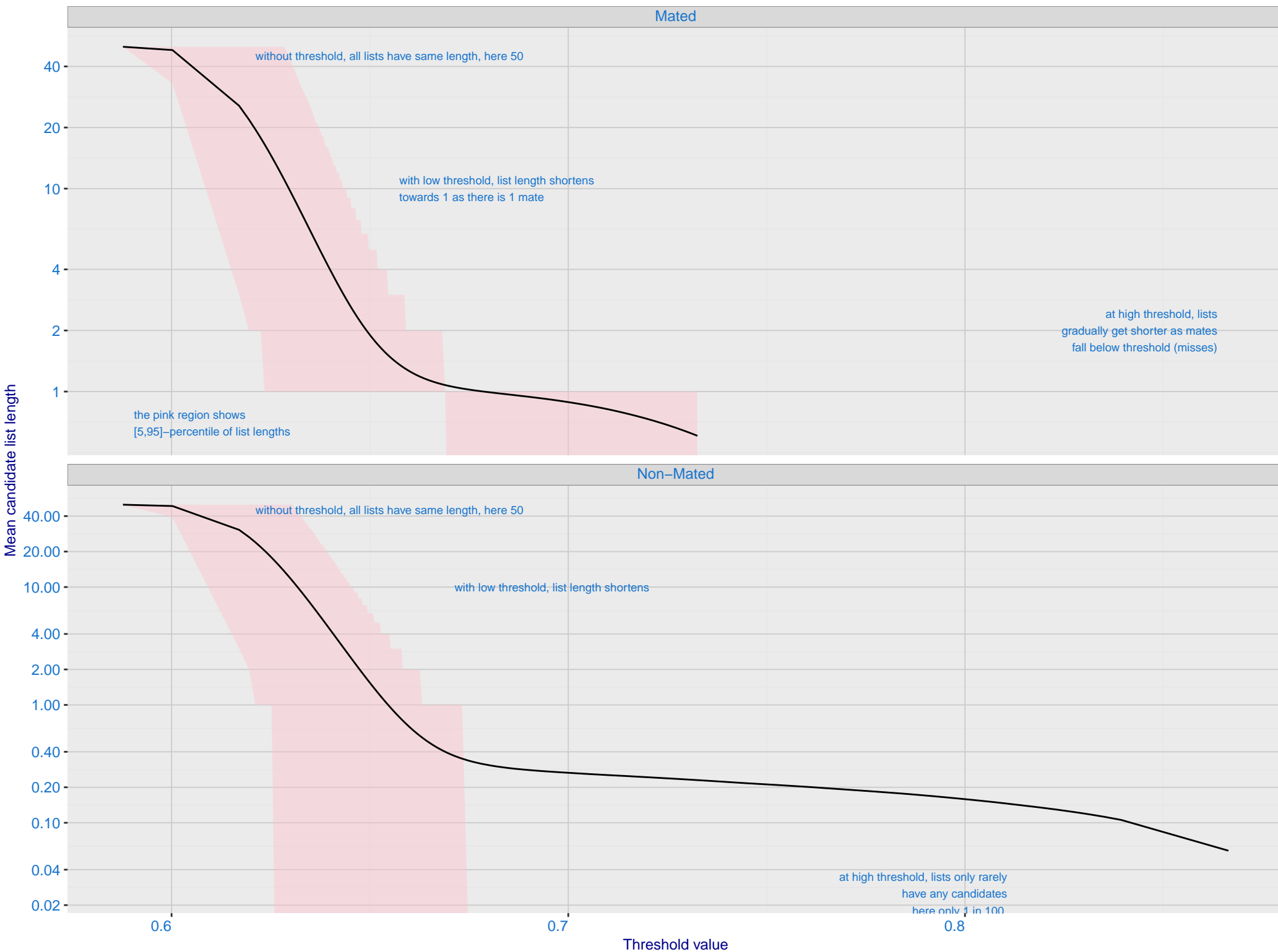
G: FPIR dependence on T by probe type for N = 1600000 subjects

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
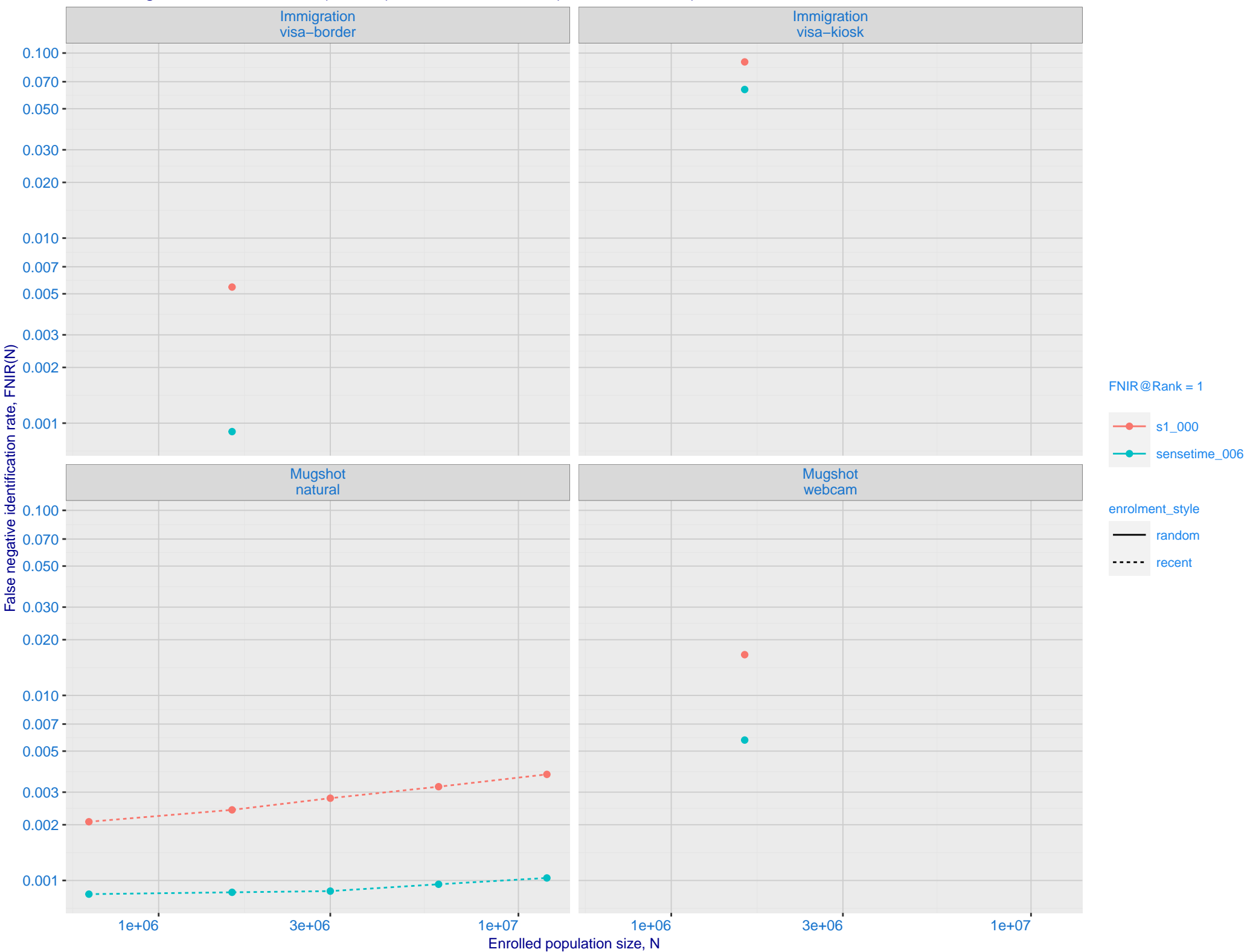
I: FNIR and FPIR dependence on threshold
Dataset is border−border with time−lapse [10,15] YRS with N = 1600000. Probes are 10−15 years later than enrollment image
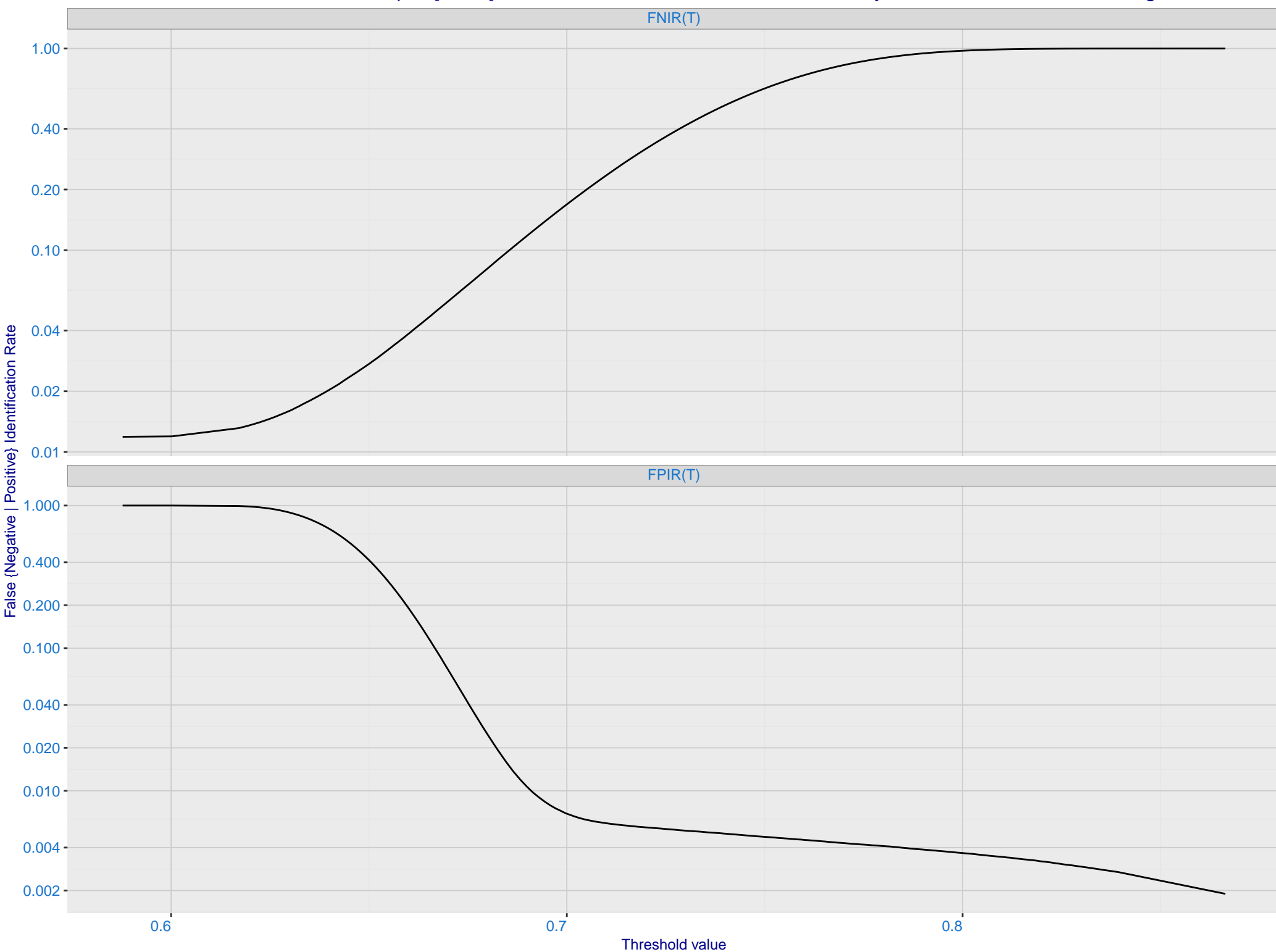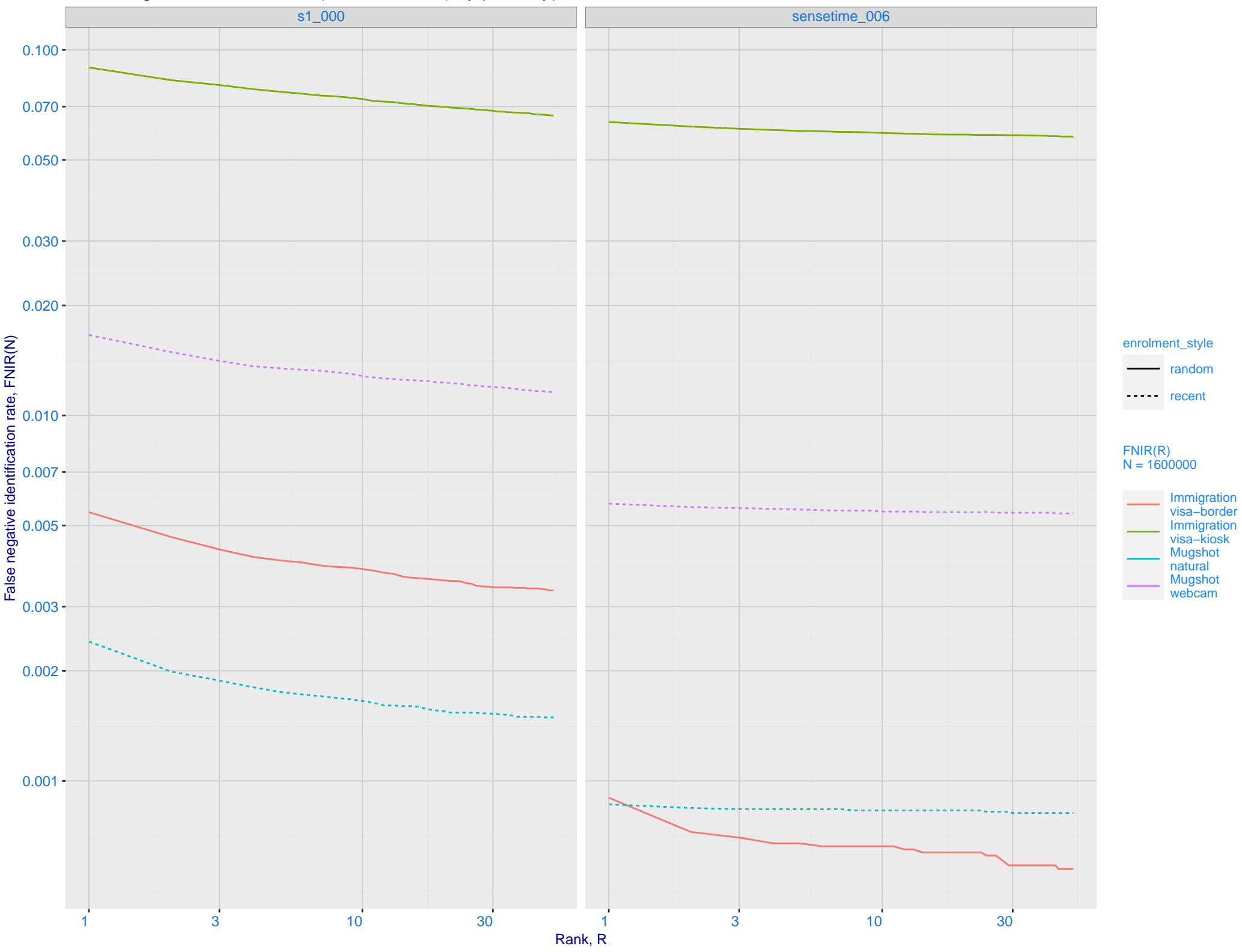
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.
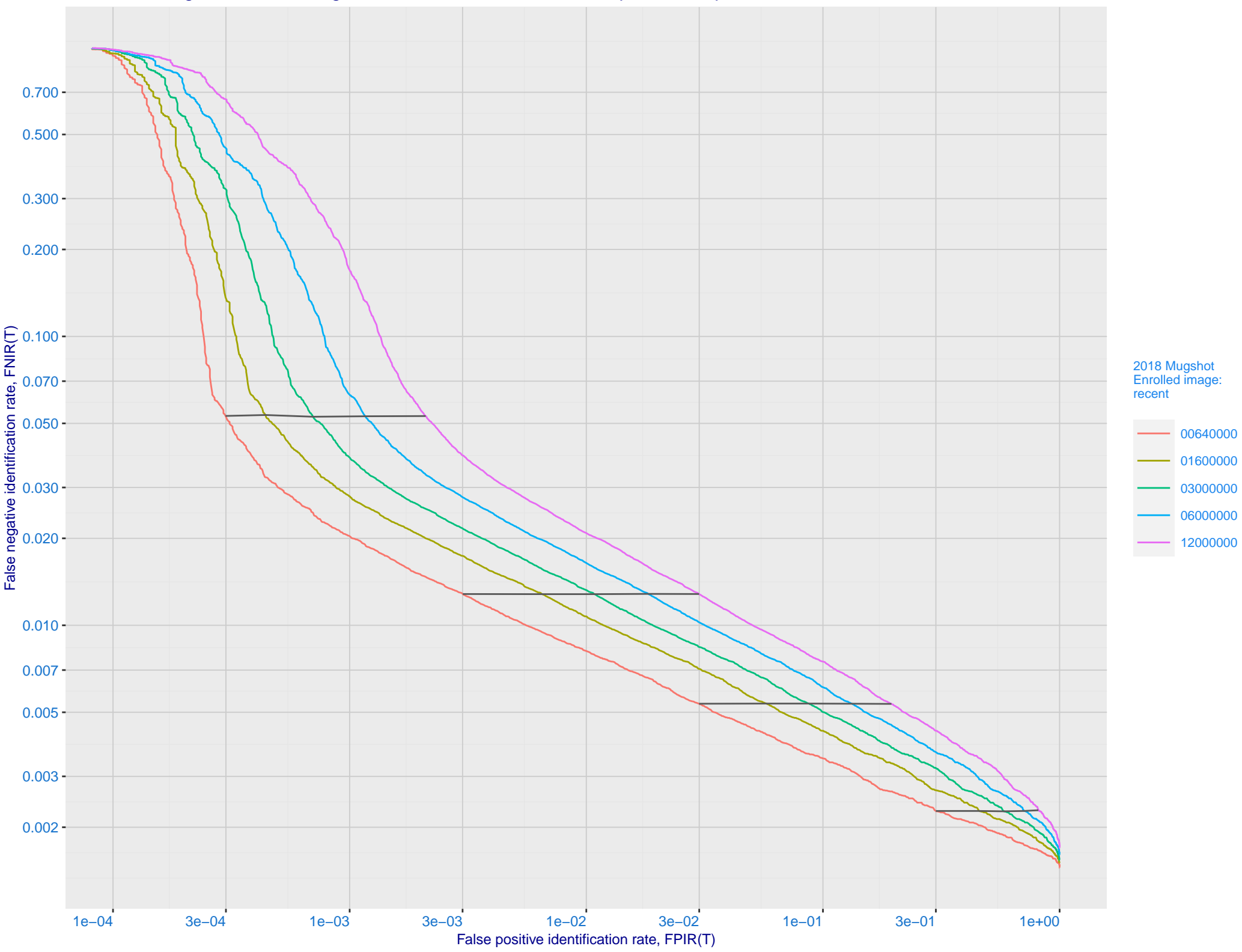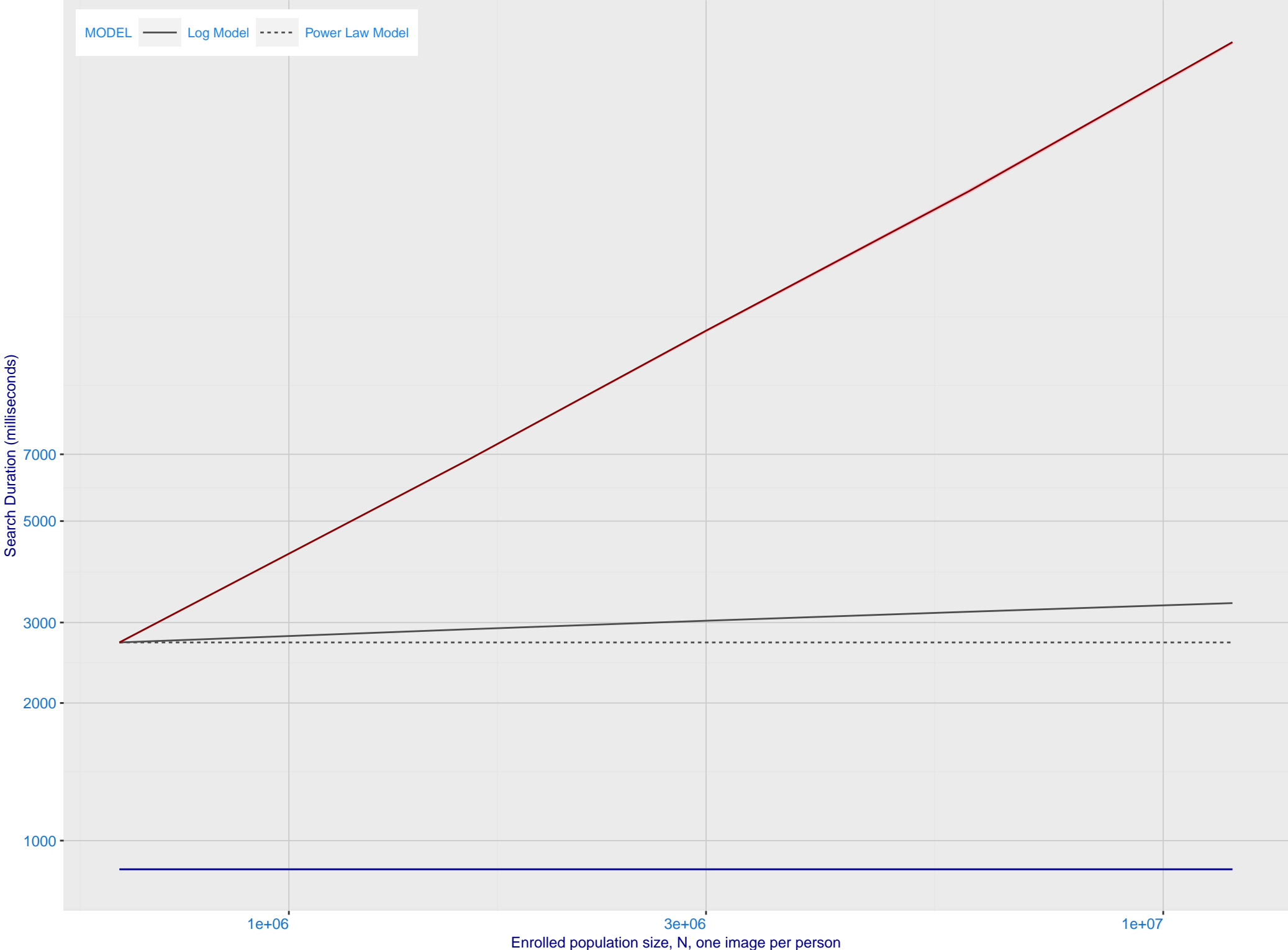
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_006)

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
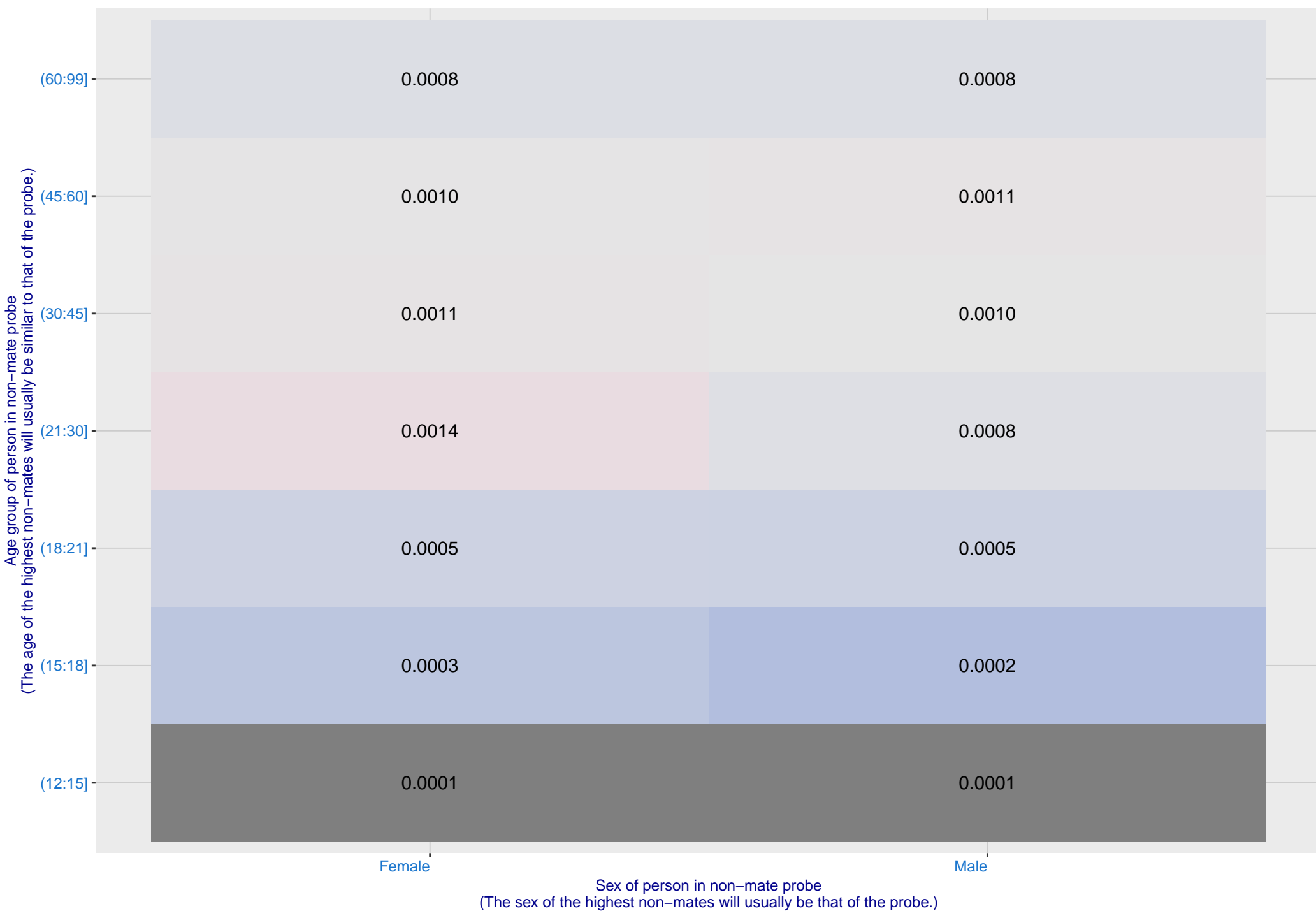
O: FNIR(T, N = 1.6 million) by sex, age and time−lapse. The top row gives investigational rank−1 miss rates. The bottom panels give high threshold for more lights−out identification with low FPIR.
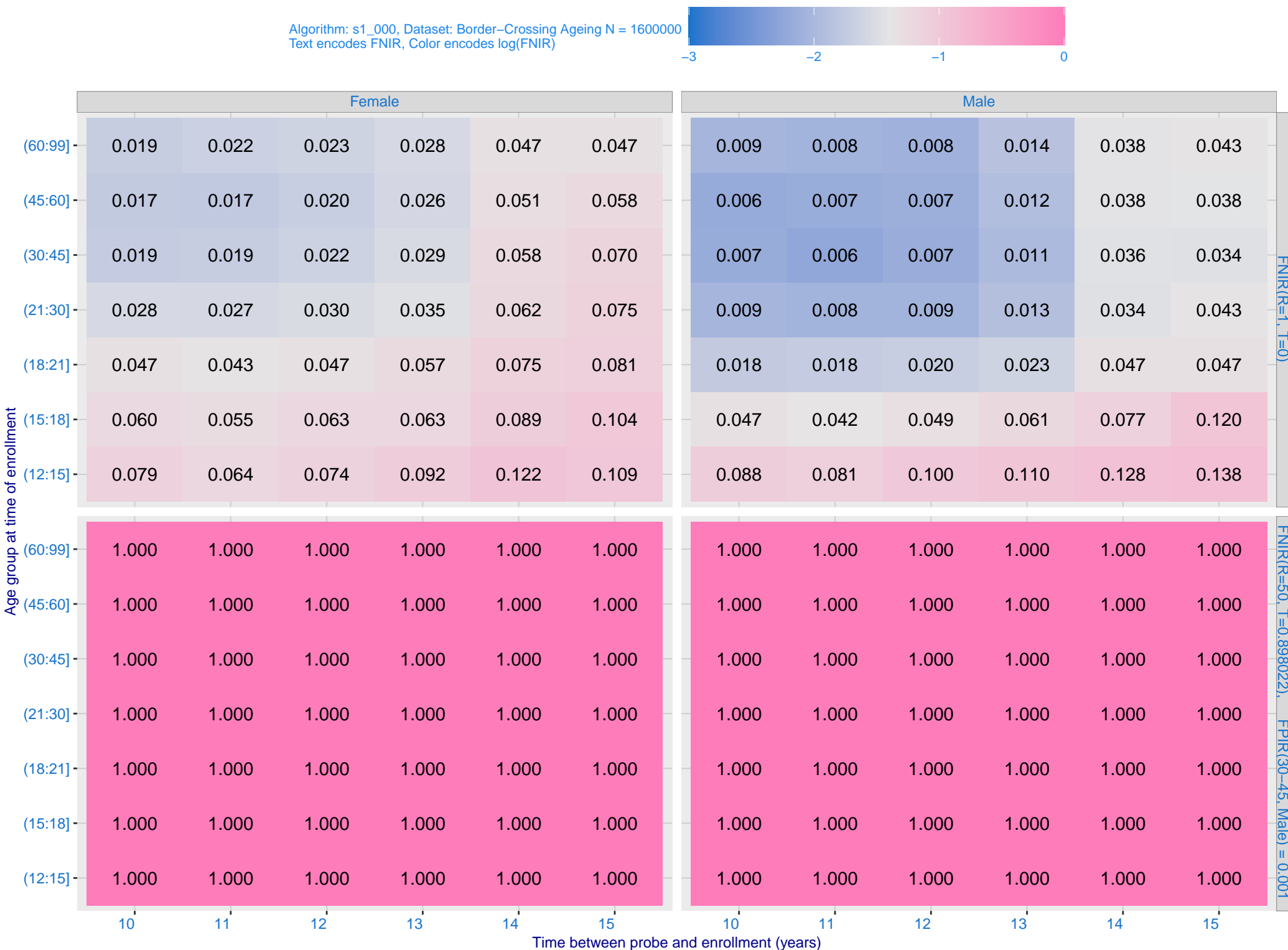
P: FPIR(N = 1.6 million) by sex and age. It is typical for false positive identification rates to be higher in women except in their teens.

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

Dataset: 2018 Mugshot   N = 3068801

- (00,02]
- (02,04]
- (04,06]
- (06,08]
- (08,10]
- (10,12]
- (12,14]
- (14,18]