A: Datasheet

Algorithm: vts_003

Developer: Viettel Group

Submission Date: 2022_07_14

Template size: 2048 bytes

Template time (2.5 percentile): 696 msec

Template time (median): 703 msec

Template time (97.5 percentile): 710 msec

Investigation:

Frontal mugshot ranking 19 (out of 357) –– FNIR(1600000, 0, 1) = 0.0011 vs. lowest 0.0008 from sensetime_007

Mugshot webcam ranking 14 (out of 319) –– FNIR(1600000, 0, 1) = 0.0071 vs. lowest 0.0056 from sensetime_007

Mugshot profile ranking 25 (out of 288) –– FNIR(1600000, 0, 1) = 0.0744 vs. lowest 0.0521 from sensetime_007

Immigration visa–border ranking 24 (out of 246) –– FNIR(1600000, 0, 1) = 0.0016 vs. lowest 0.0008 from sensetime_007

Immigration visa–kiosk ranking 6 (out of 191) –– FNIR(1600000, 0, 1) = 0.0497 vs. lowest 0.0438 from kakao_001

Identification:

Frontal mugshot ranking 42 (out of 357) –– FNIR(1600000, T, L+1) = 0.0073, FPIR=0.001000 vs. lowest 0.0014 from sensetime_007

Mugshot webcam ranking 44 (out of 317) –– FNIR(1600000, T, L+1) = 0.0328, FPIR=0.001000 vs. lowest 0.0093 from sensetime_007

Mugshot profile ranking 240 (out of 287) –– FNIR(1600000, T, L+1) = 0.9999, FPIR=0.001000 vs. lowest 0.1093 from cloudwalk_mt_000

Immigration visa–border ranking 45 (out of 245) –– FNIR(1600000, T, L+1) = 0.0135, FPIR=0.001000 vs. lowest 0.0024 from cloudwalk_mt_000

Immigration visa–kiosk ranking 137 (out of 191) –– FNIR(1600000, T, L+1) = 0.6705, FPIR=0.001000 vs. lowest 0.0676 from cloudwalk_mt_000
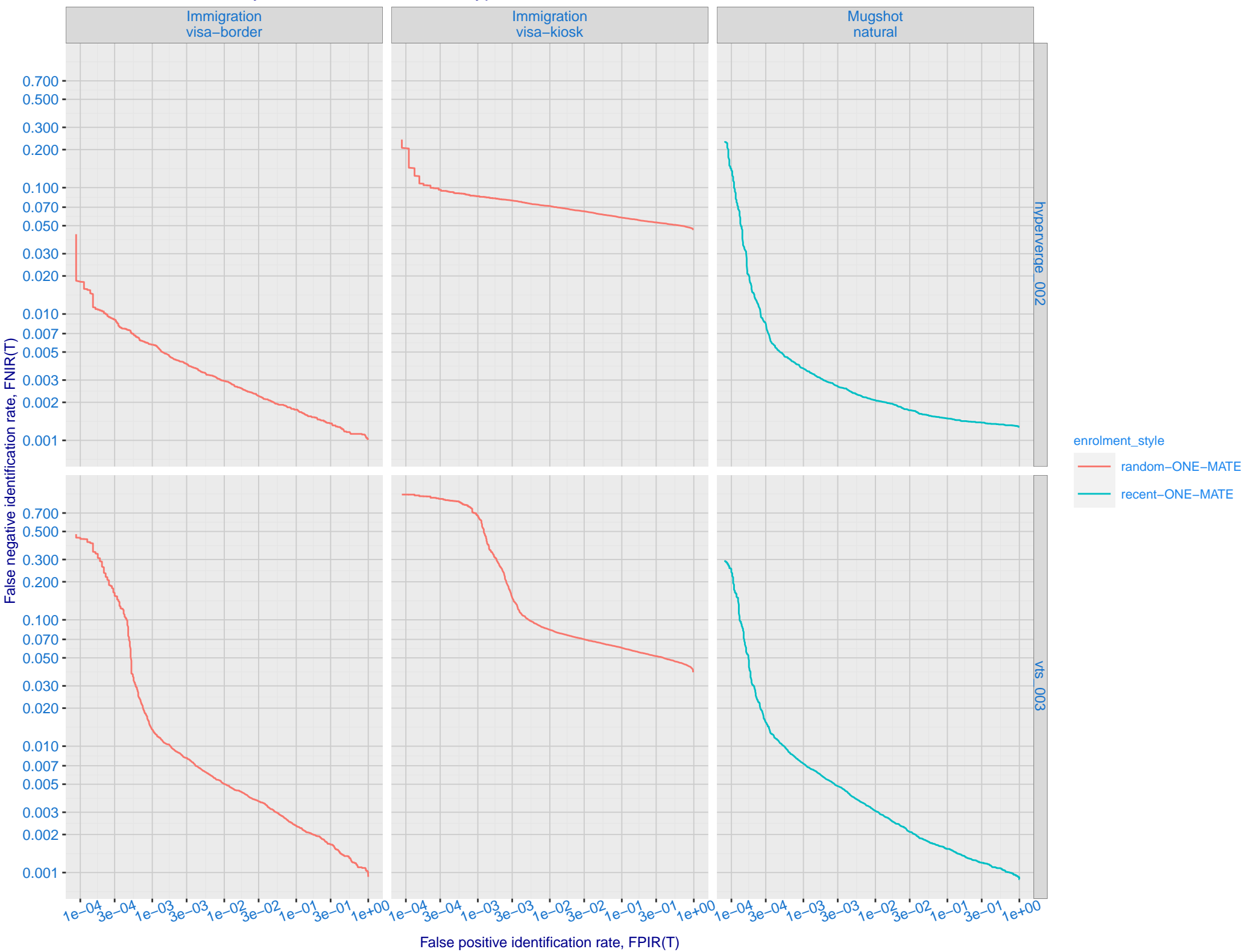
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (hyperverge_002)
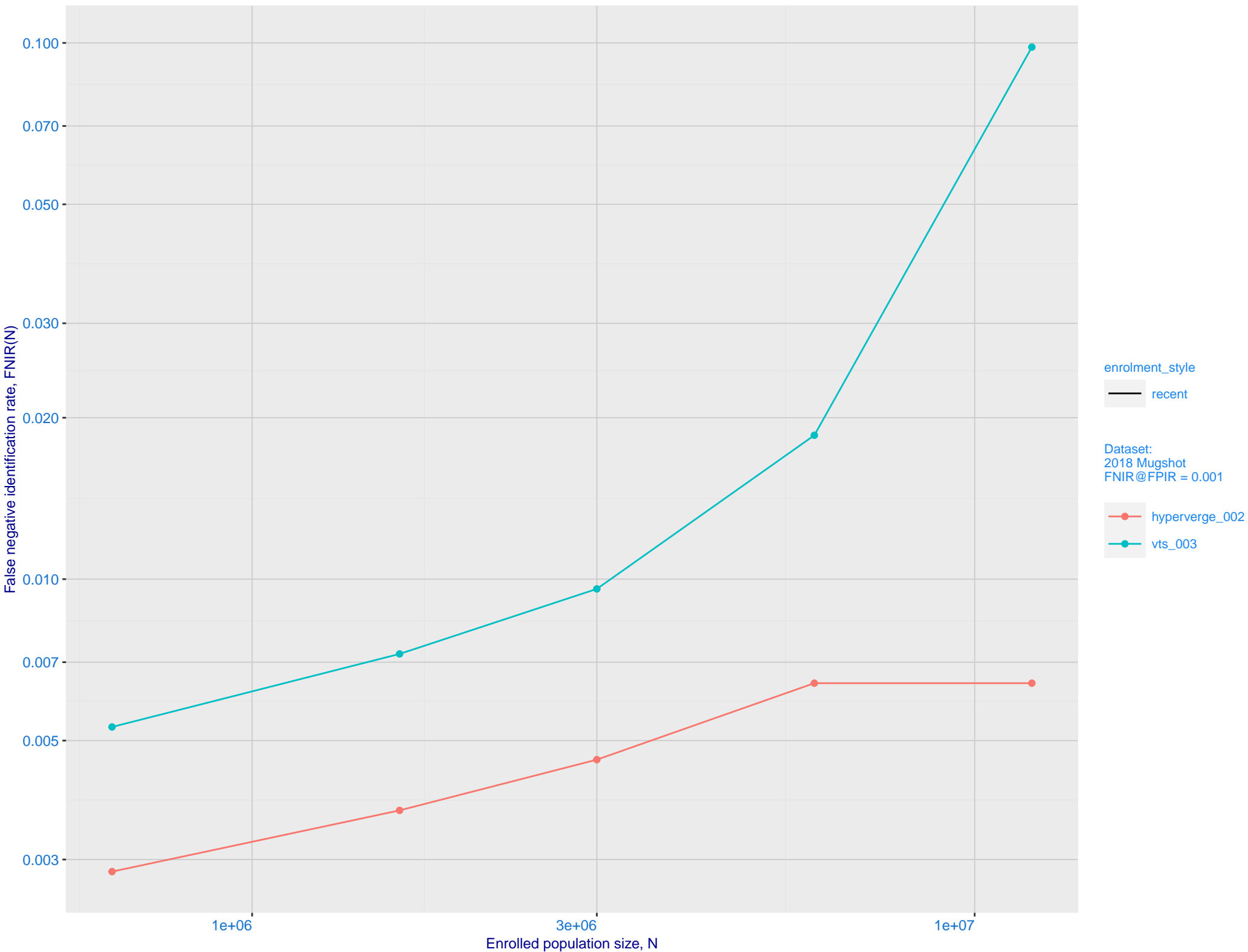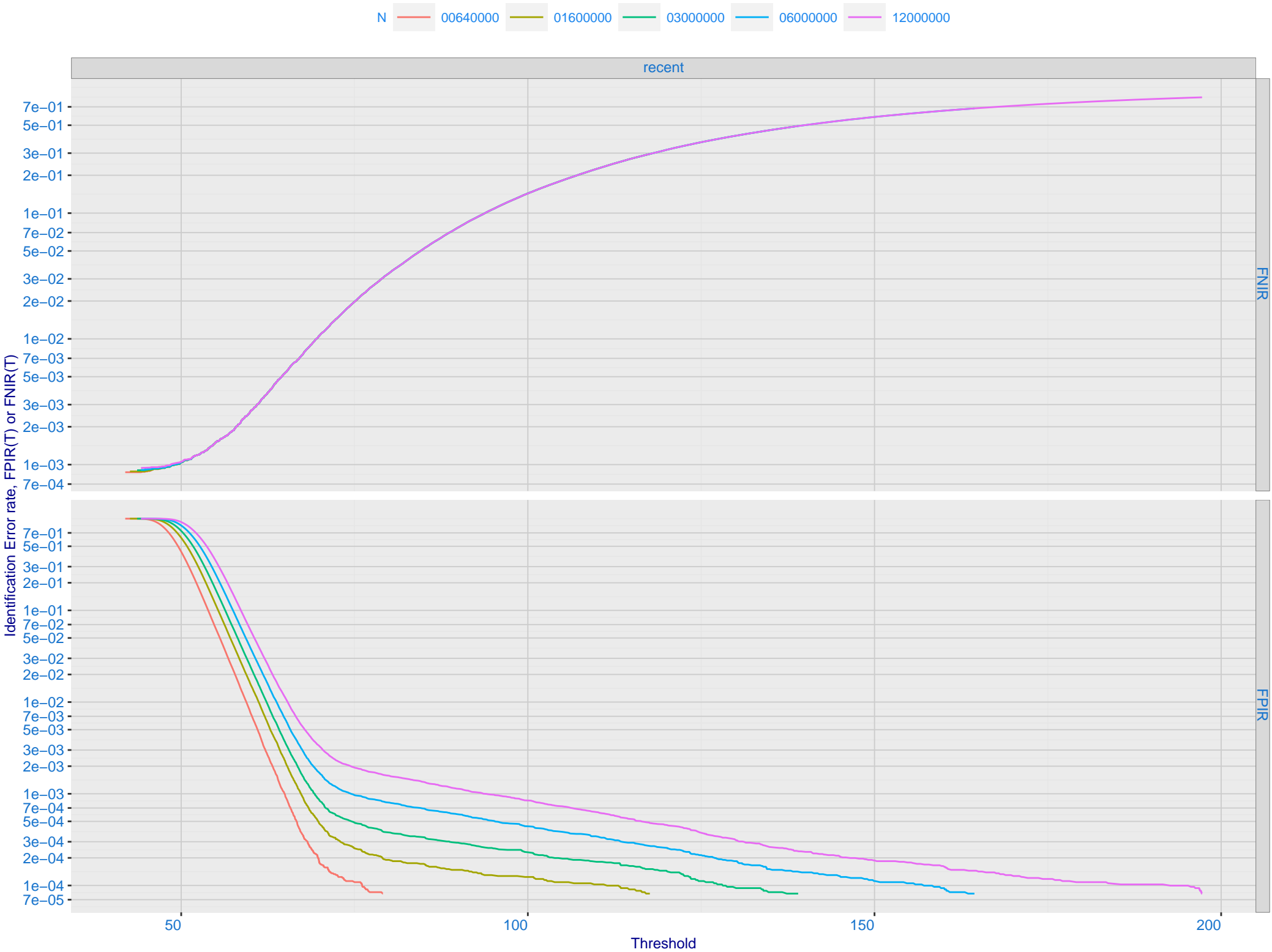
C: Evolution of accuracy for VTS algorithms on three datasets 2018 – present
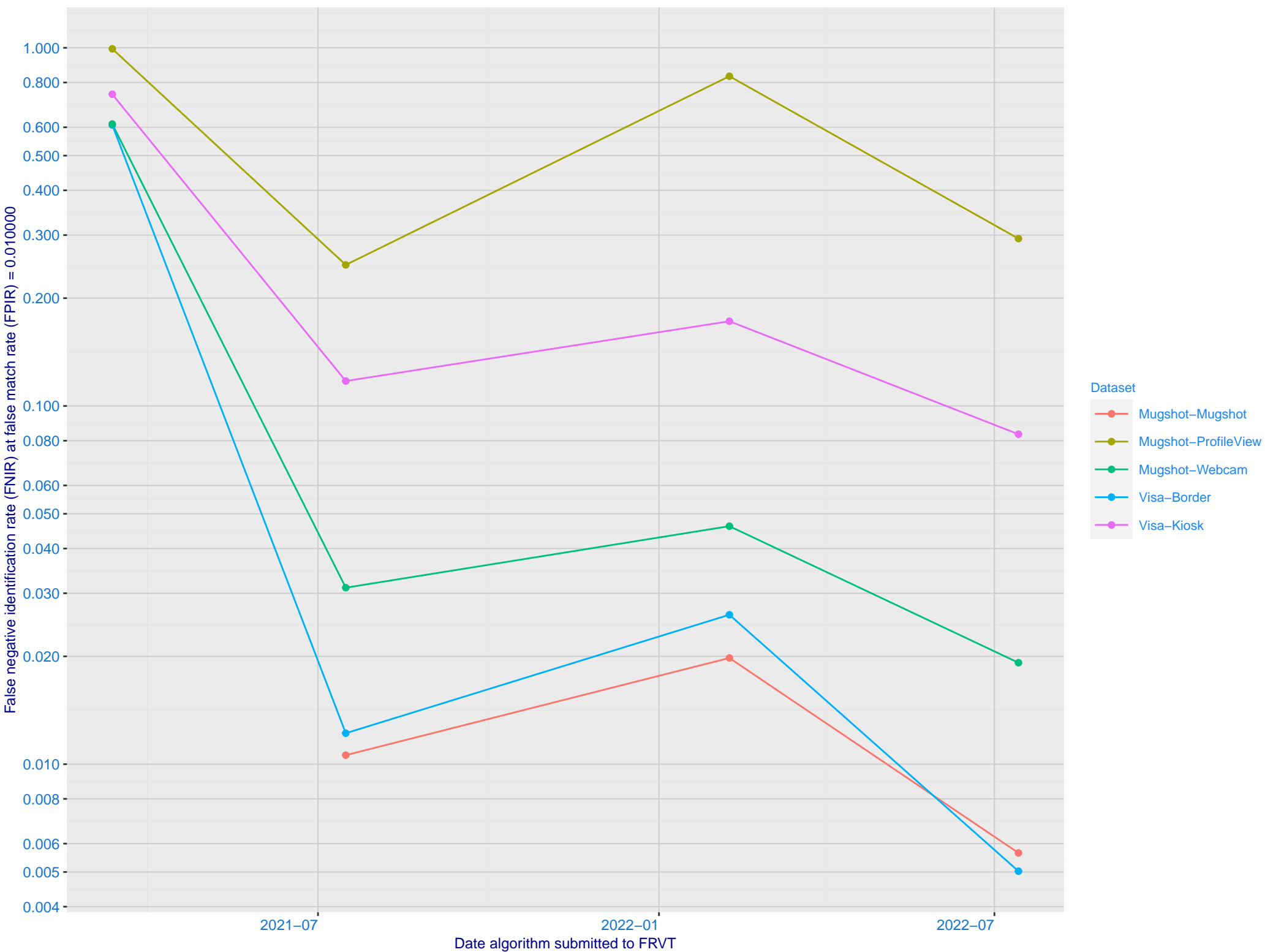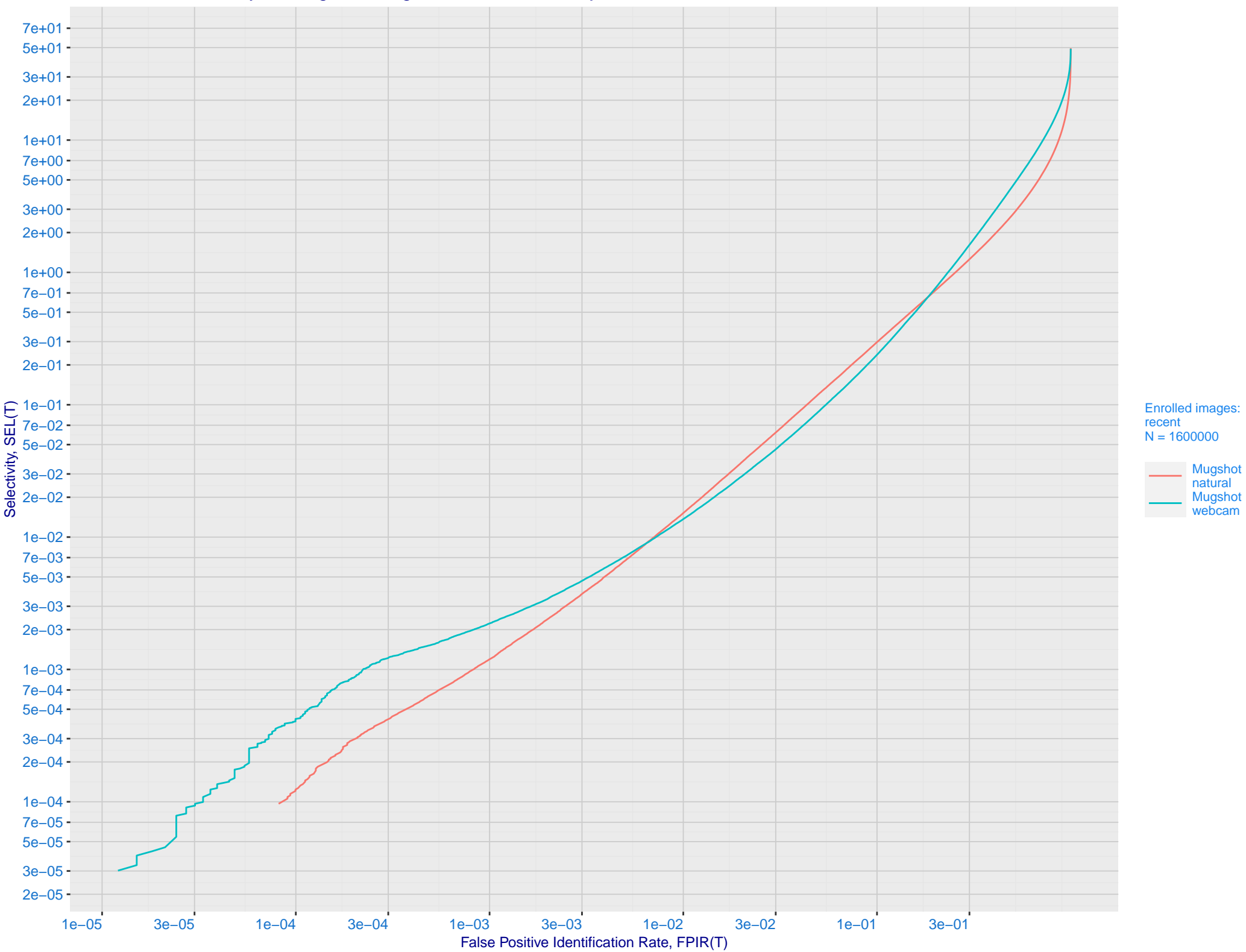
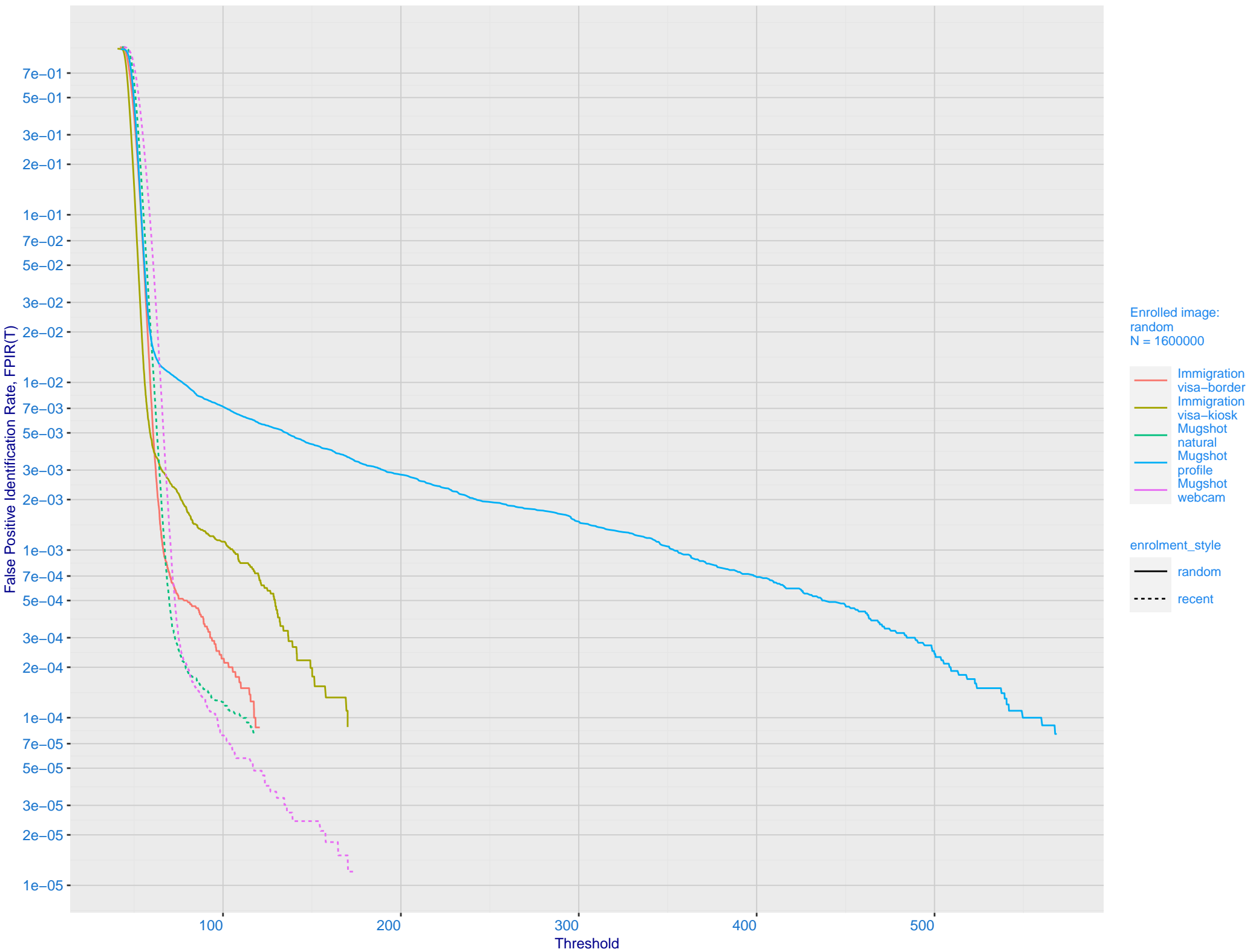D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals

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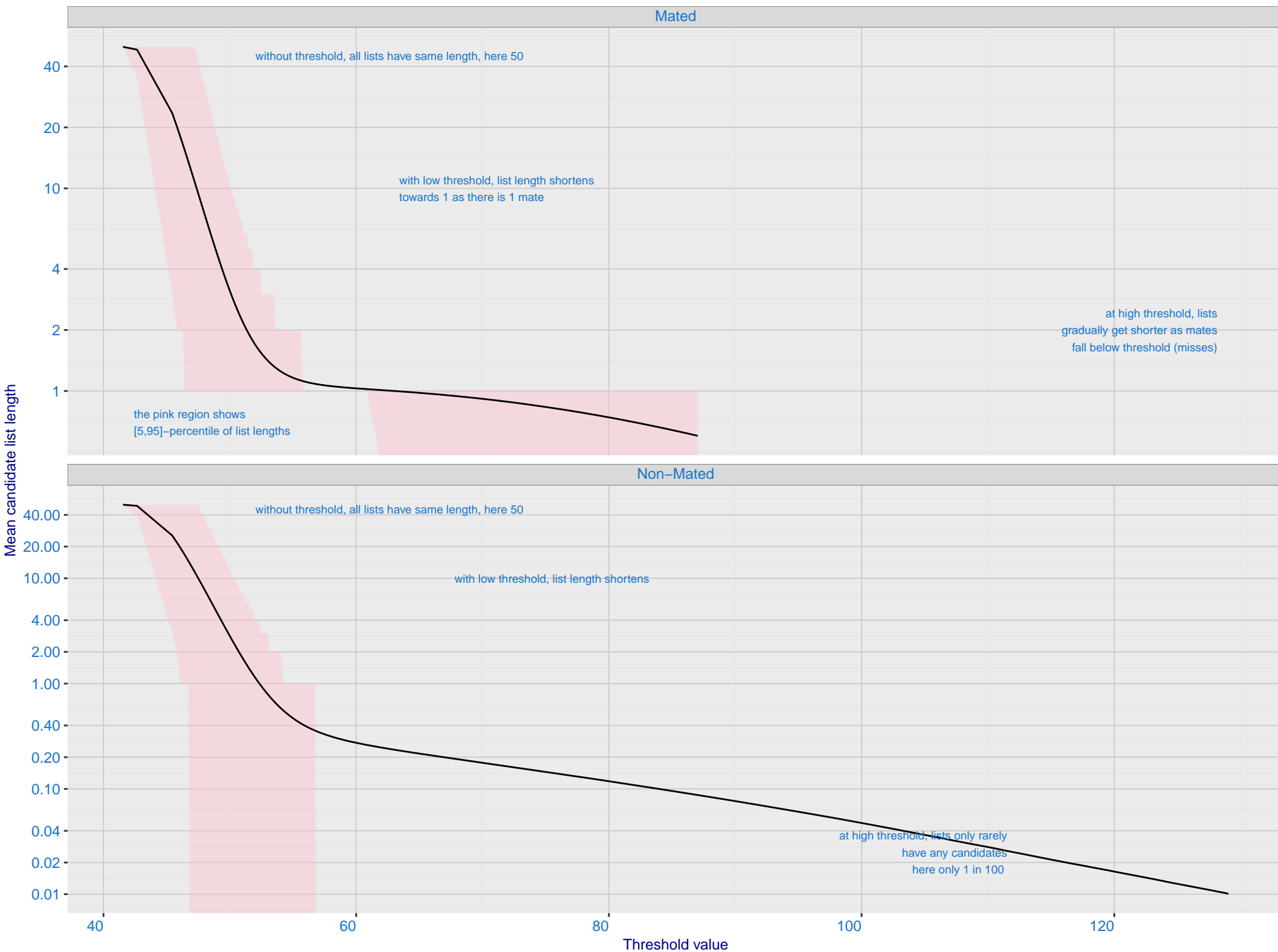
G: FPIR dependence on T by probe type for N = 1600000 subjects

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

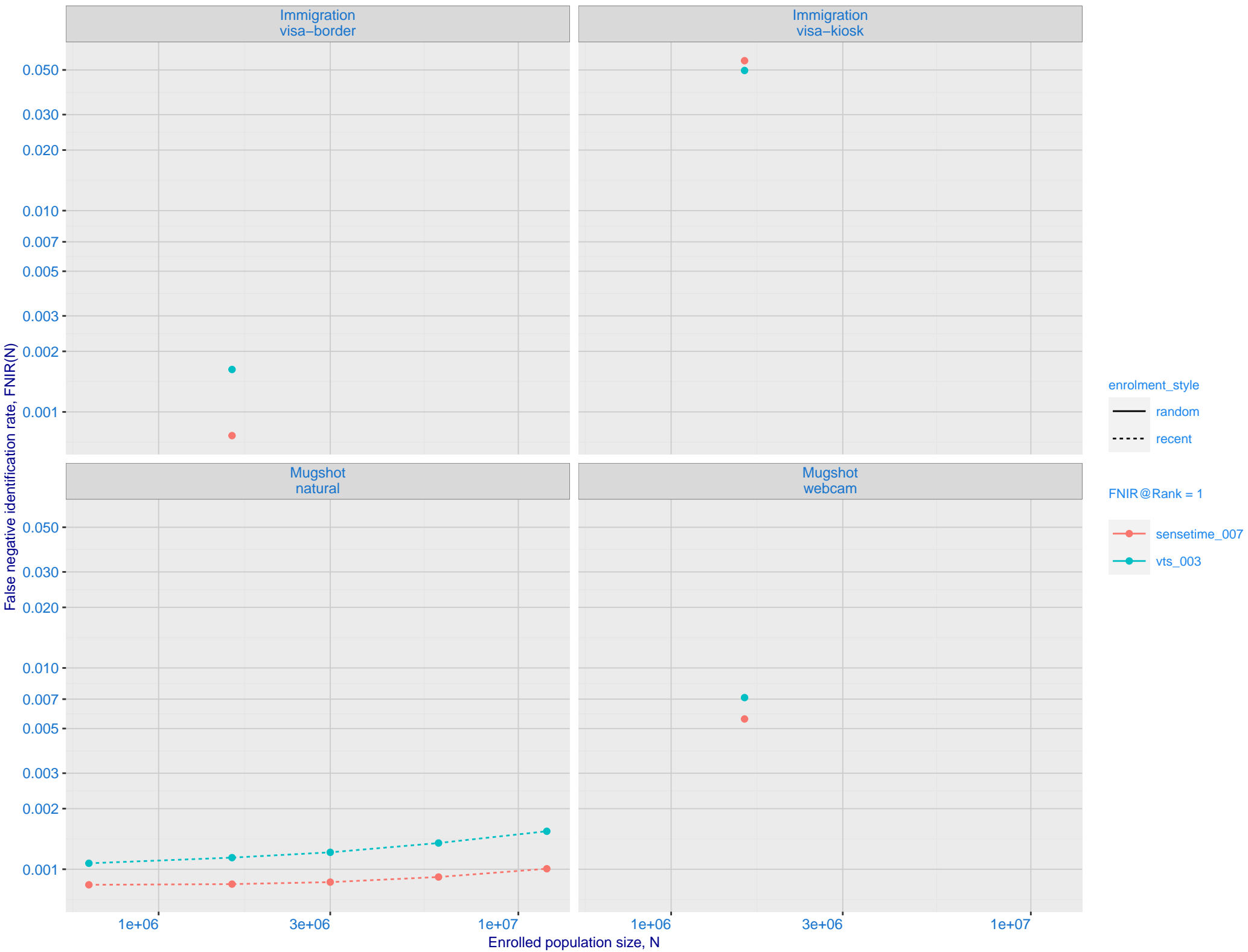Threshold value

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
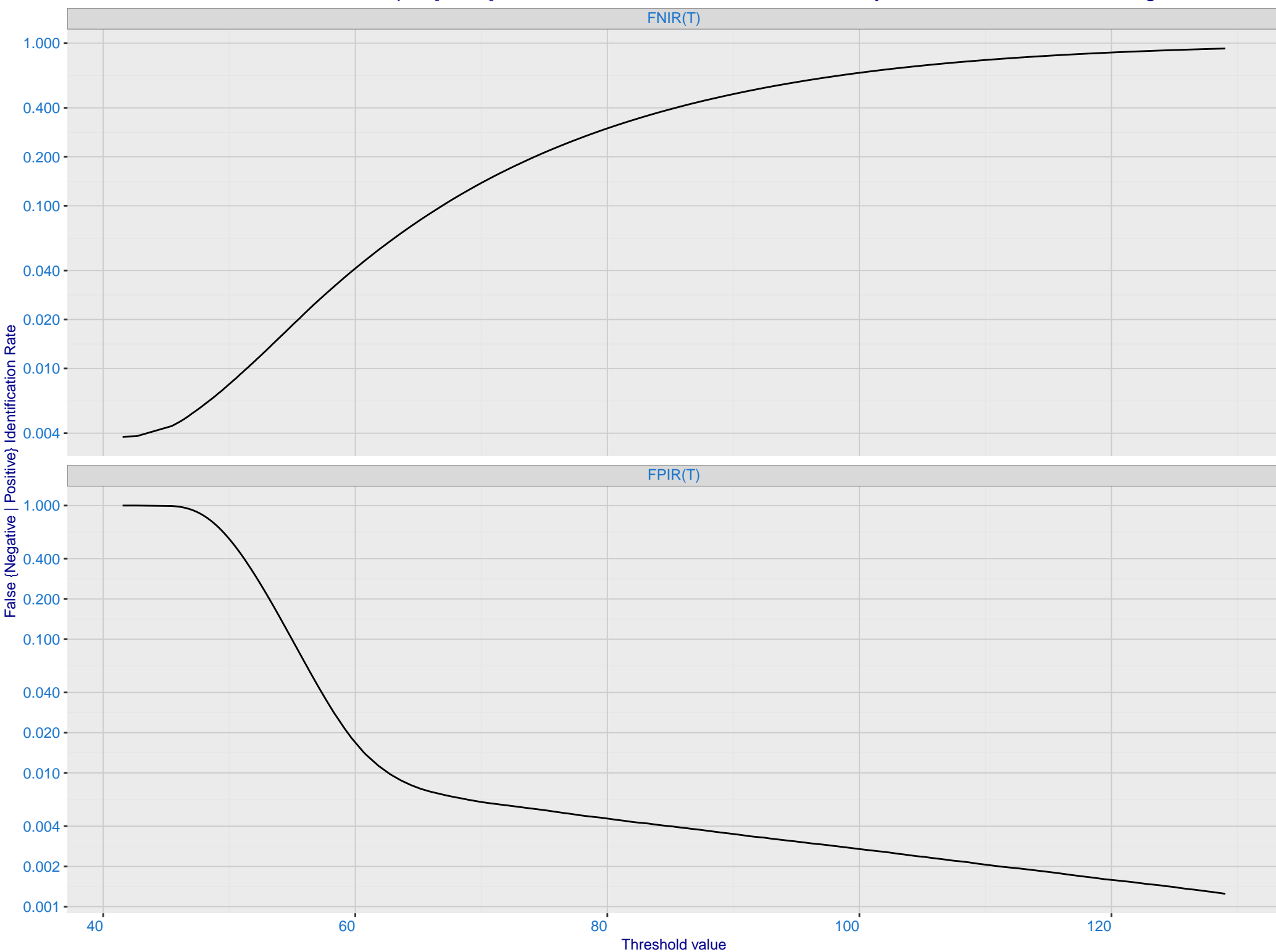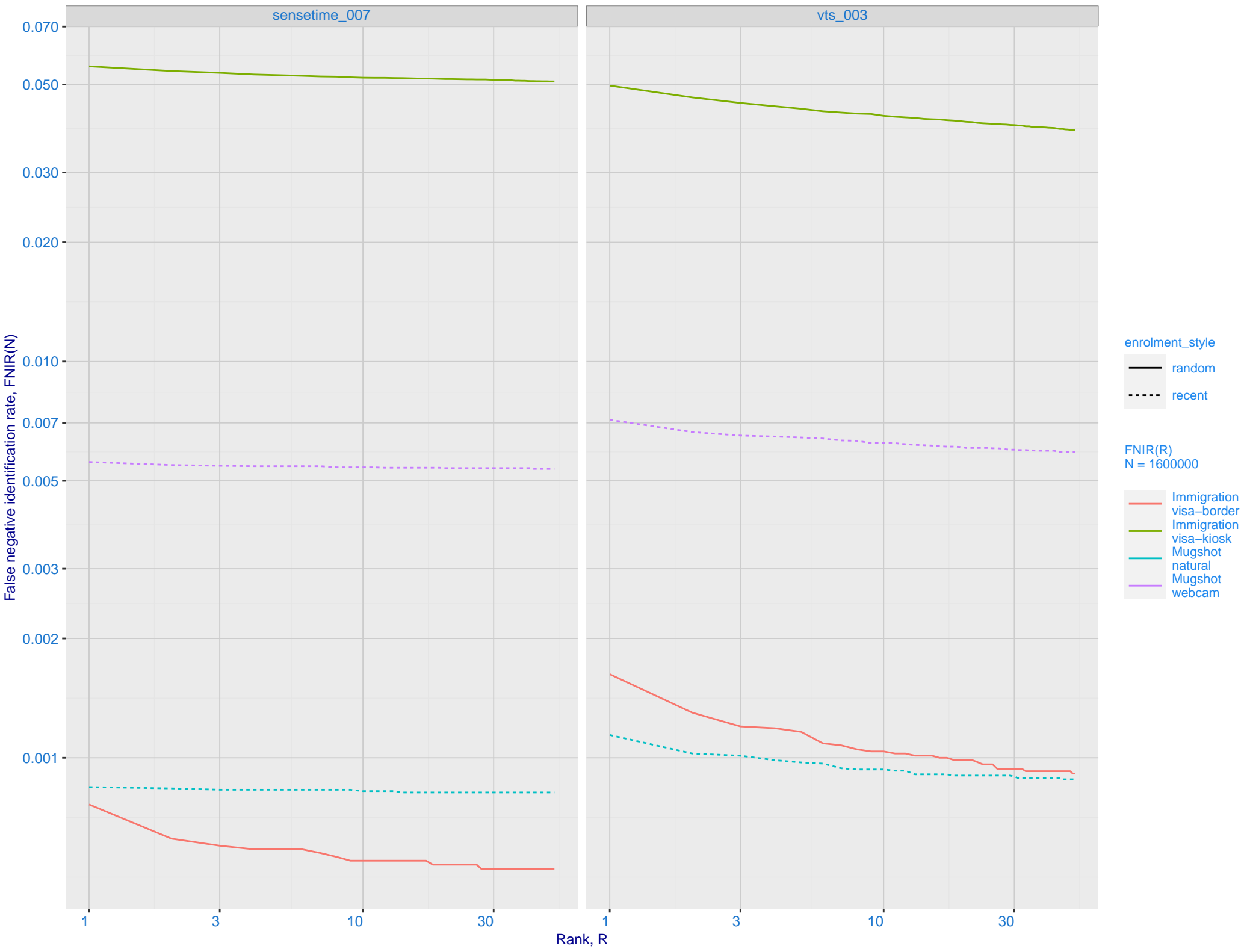
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.
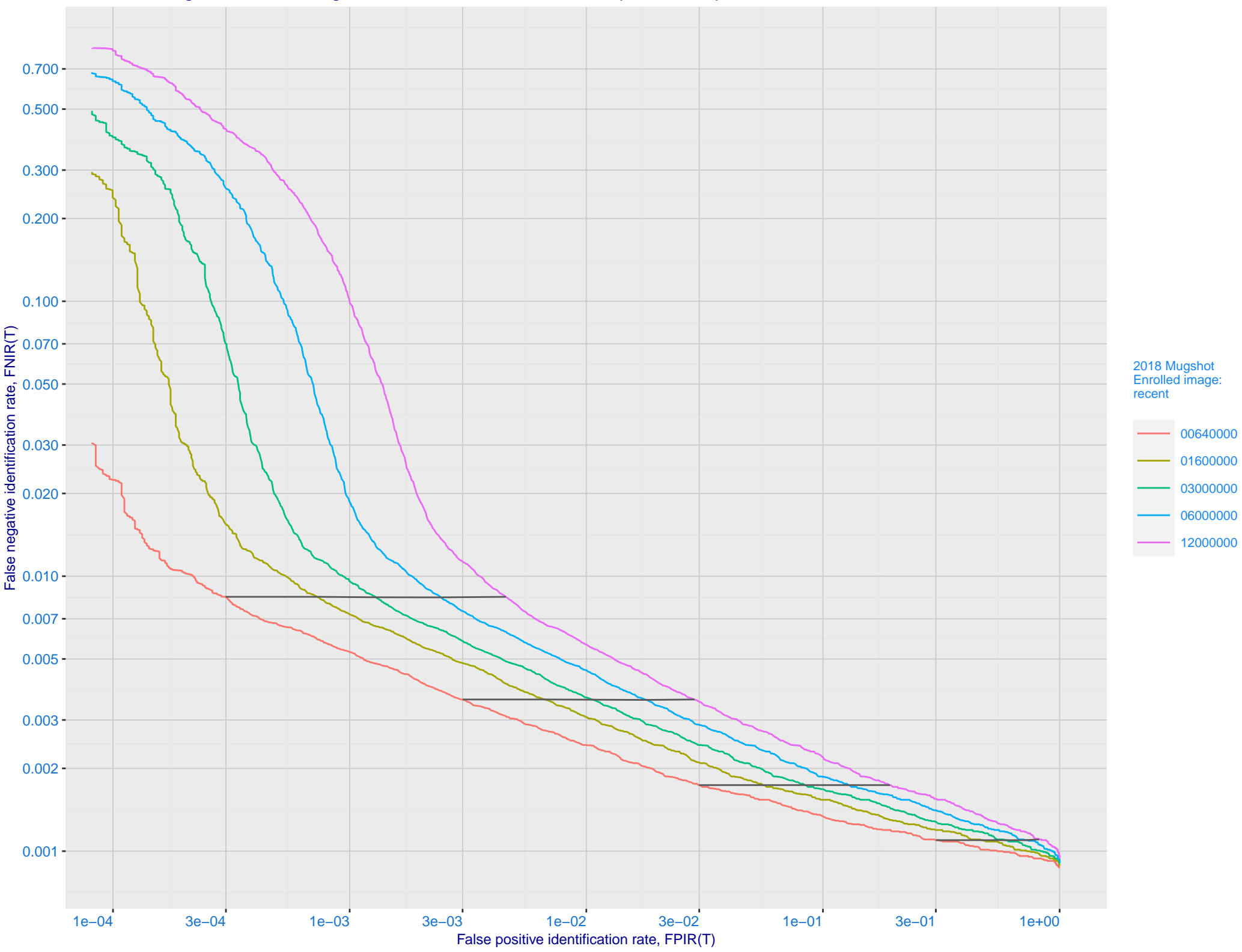
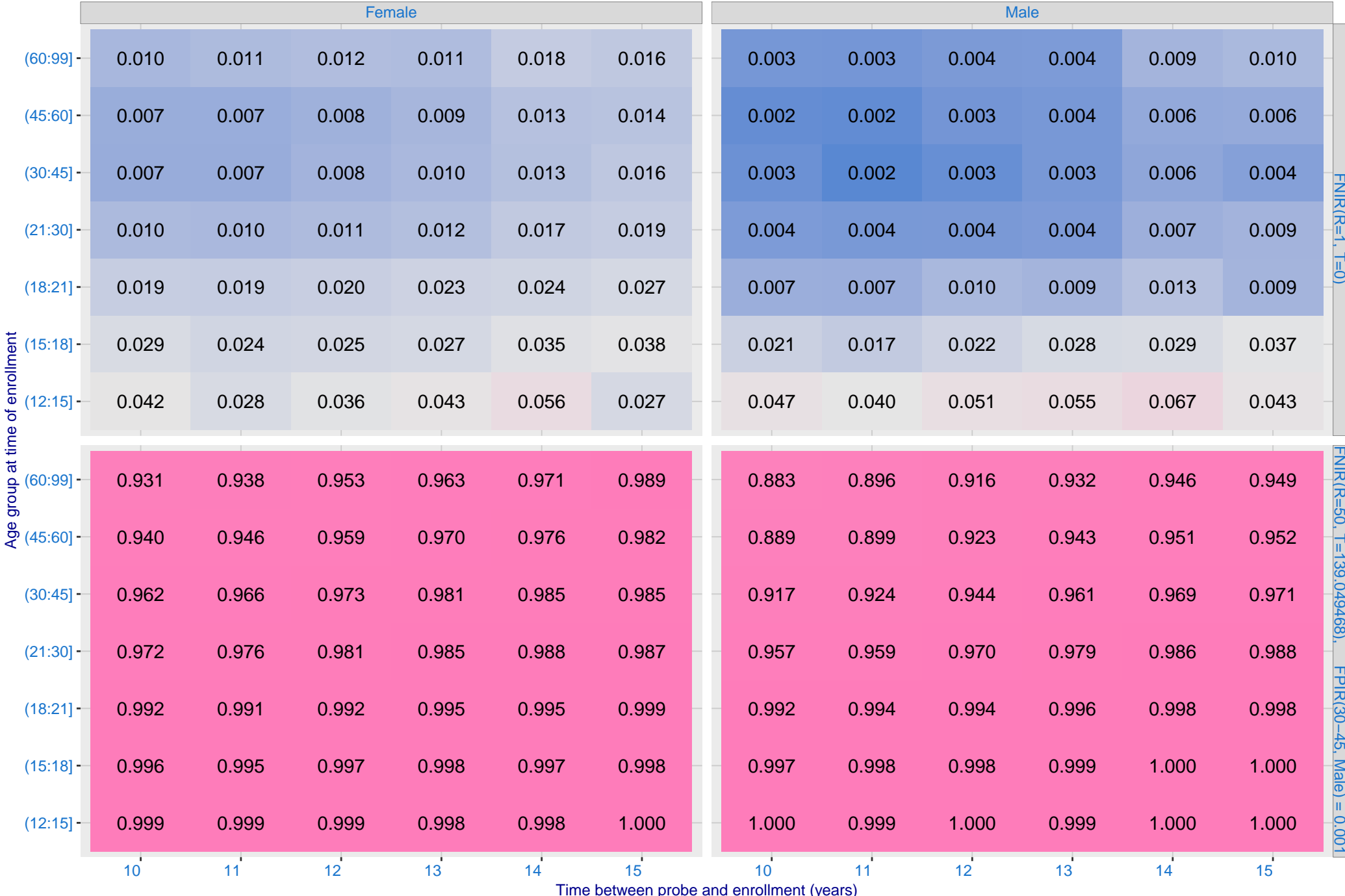K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_007)

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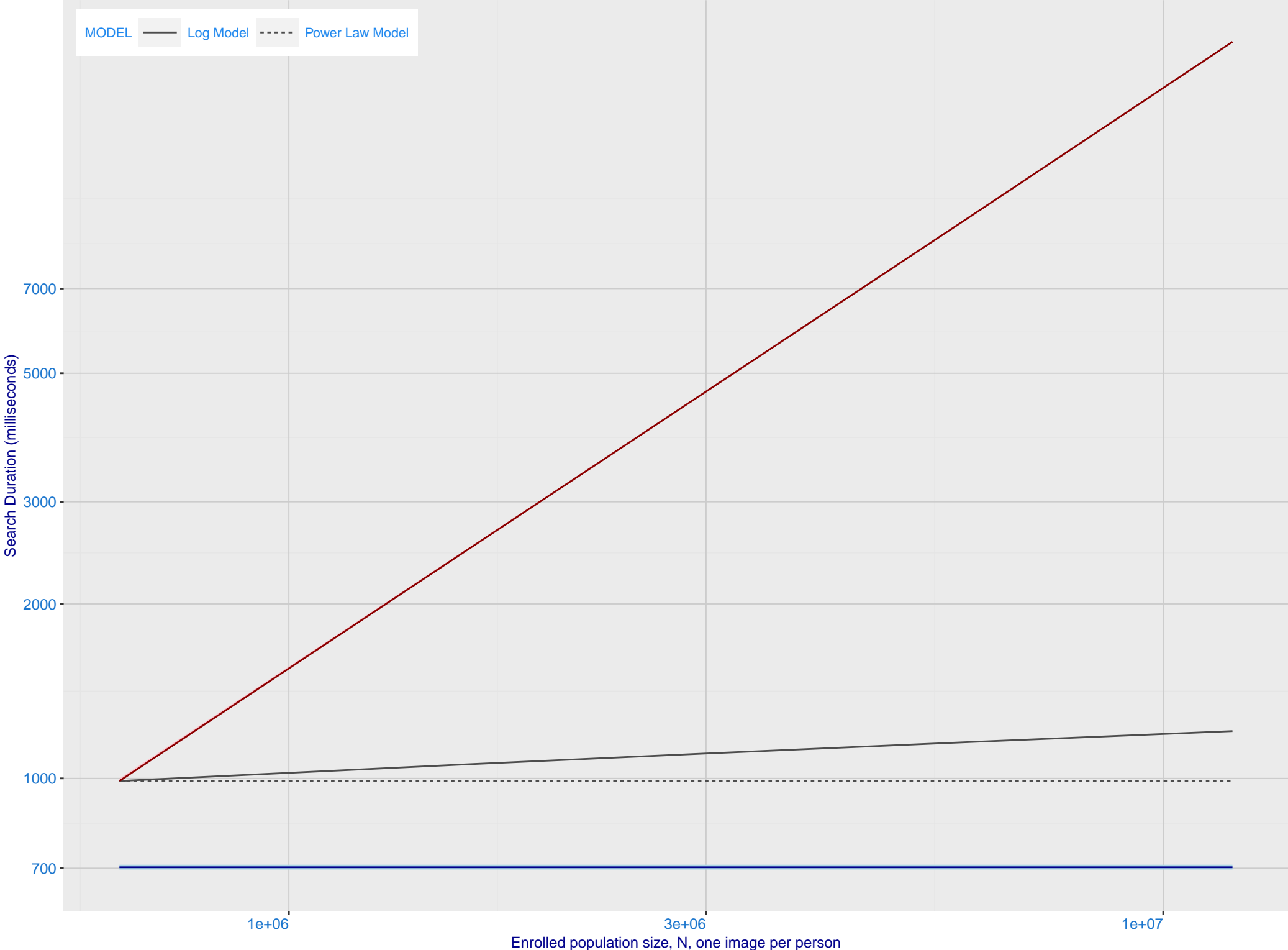
O: FNIR(T, N = 1.6 million) by sex, age and time−lapse. The top row gives investigational rank−1 miss rates. The bottom panels give high threshold for more lights−out identification with low FPIR.

Algorithm: vts_003, Dataset: Border−Crossing Ageing N = 1600000
Text encodes FNIR, Color encodes log(FNIR)

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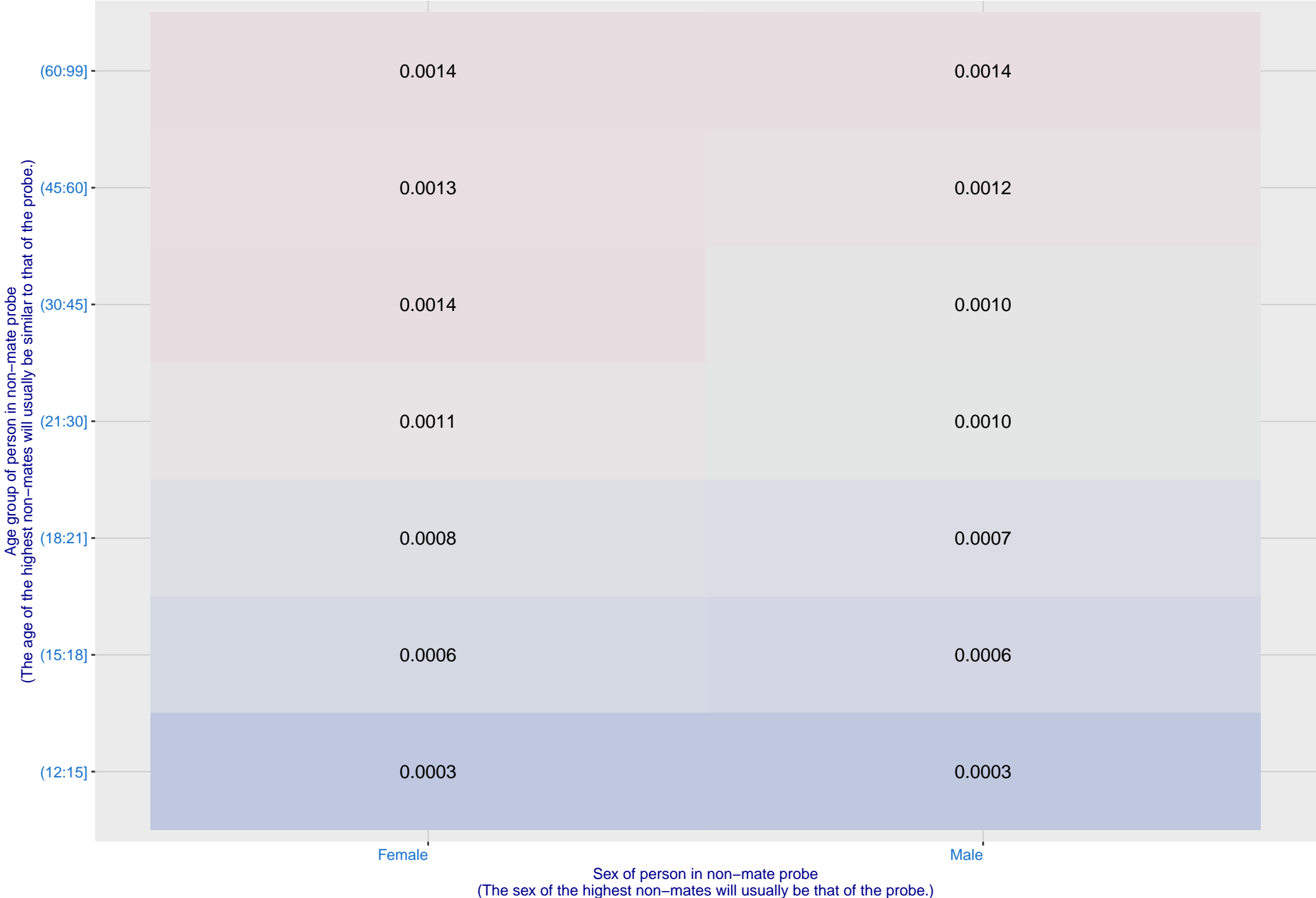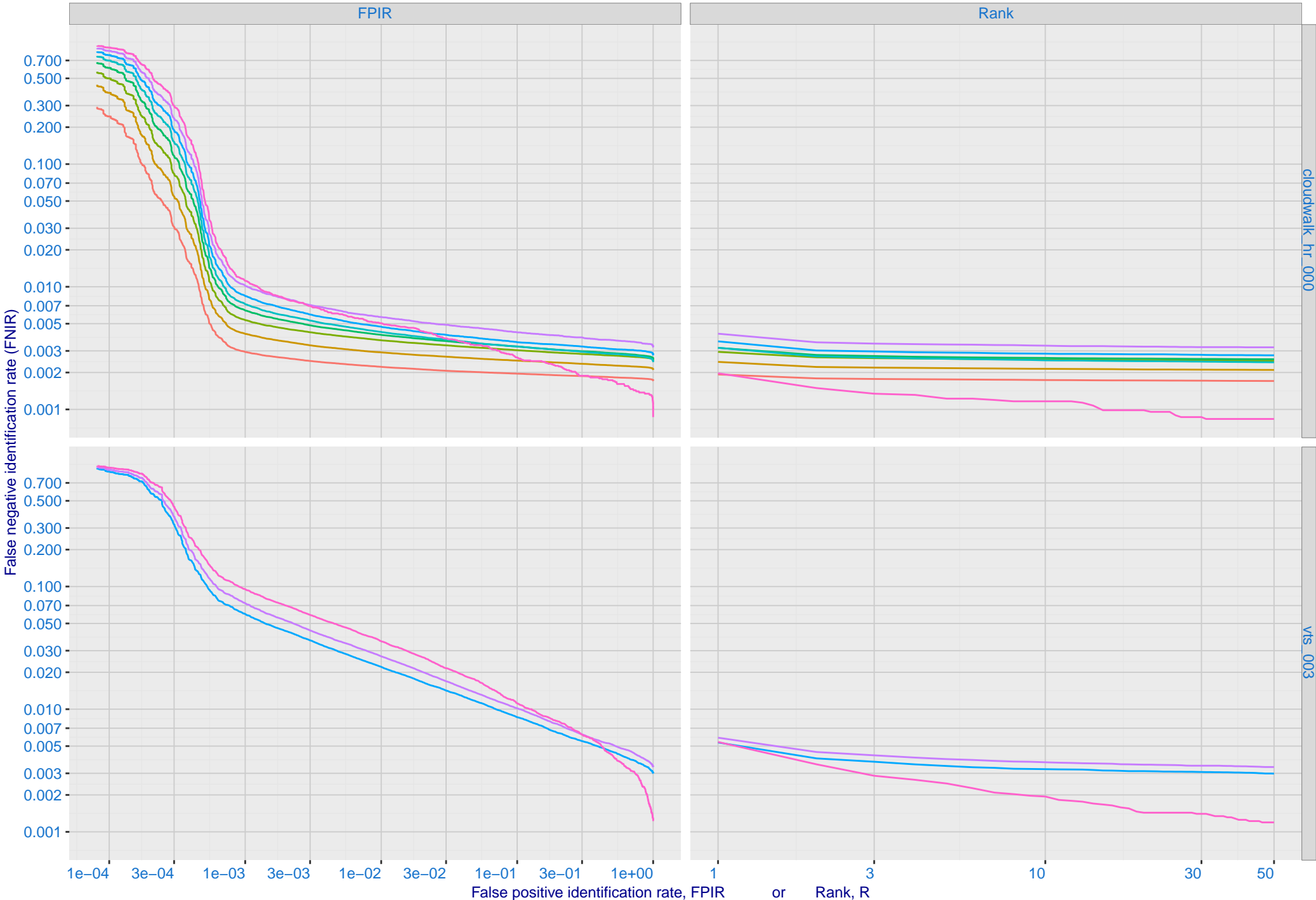
Q: Identification FNIR(N, T, L+1) and Investigational FNIR(N, 0, R) under ageing

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