A: Datasheet

Algorithm: hzailu_001

Developer: Hangzhuo Allu Network Information Technology

Submission Date: 2022_08_18

Template size: 2048 bytes

Template time (2.5 percentile): 772 msec

Template time (median): 777 msec

Template time (97.5 percentile): 782 msec

Investigation:

Mugshot webcam ranking 72 (out of 331) –– FNIR(1600000, 0, 1) = 0.0110 vs. lowest 0.0055 from sensetime_008

Mugshot profile ranking 47 (out of 300) –– FNIR(1600000, 0, 1) = 0.1058 vs. lowest 0.0521 from sensetime_007

Immigration visa–border ranking 46 (out of 258) –– FNIR(1600000, 0, 1) = 0.0023 vs. lowest 0.0006 from cloudwalk_mt_001

Immigration visa–kiosk ranking 73 (out of 203) –– FNIR(1600000, 0, 1) = 0.0854 vs. lowest 0.0395 from cloudwalk_mt_001

Identification:

Frontal mugshot ranking 54 (out of 369) –– FNIR(1600000, T, L+1) = 0.0086, FPIR=0.001000 vs. lowest 0.0013 from sensetime_008
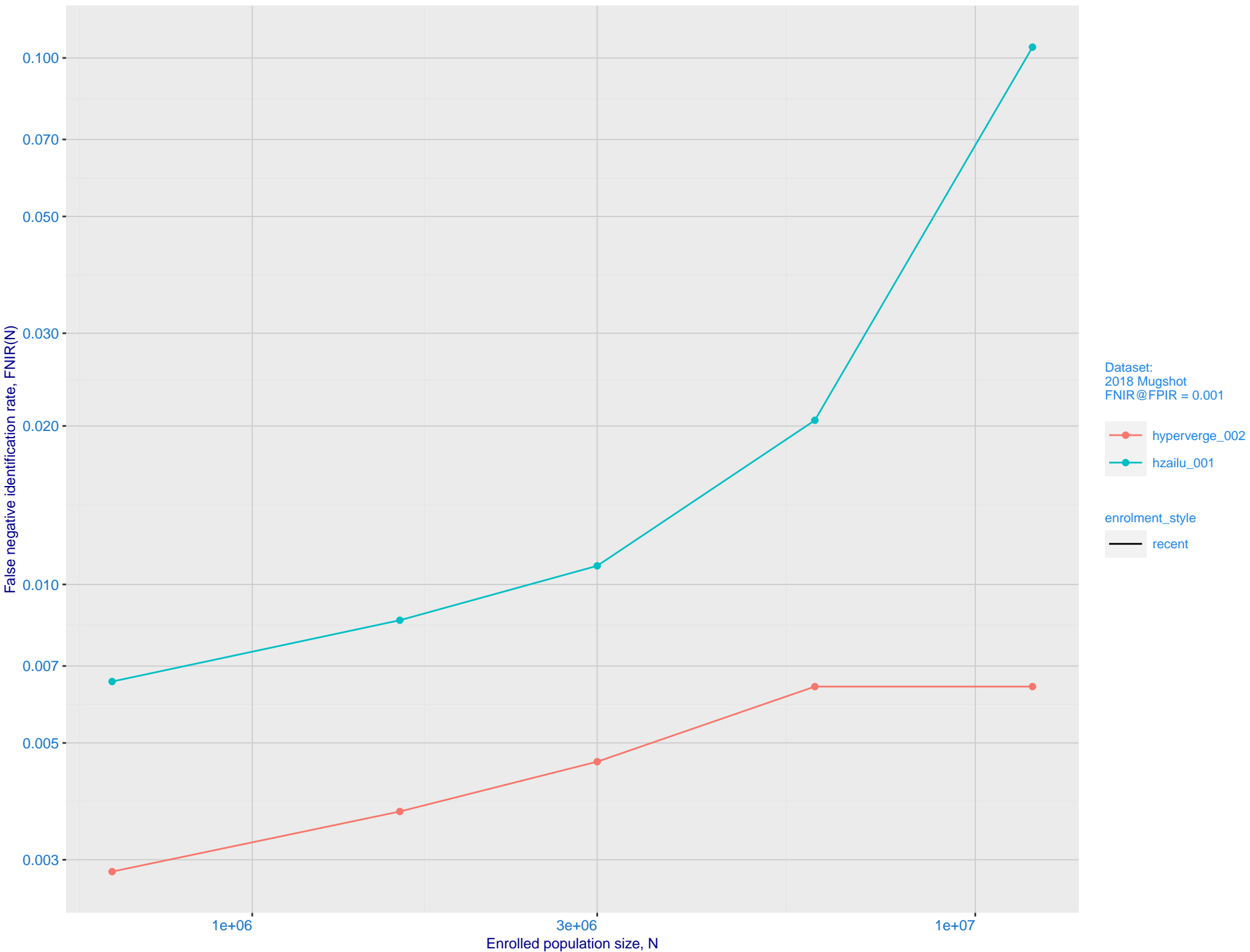
Mugshot webcam ranking 217 (out of 329) –– FNIR(1600000, T, L+1) = 0.1809, FPIR=0.001000 vs. lowest 0.0090 from sensetime_008

Mugshot profile ranking 128 (out of 299) –– FNIR(1600000, T, L+1) = 0.9865, FPIR=0.001000 vs. lowest 0.0698 from cloudwalk_mt_001
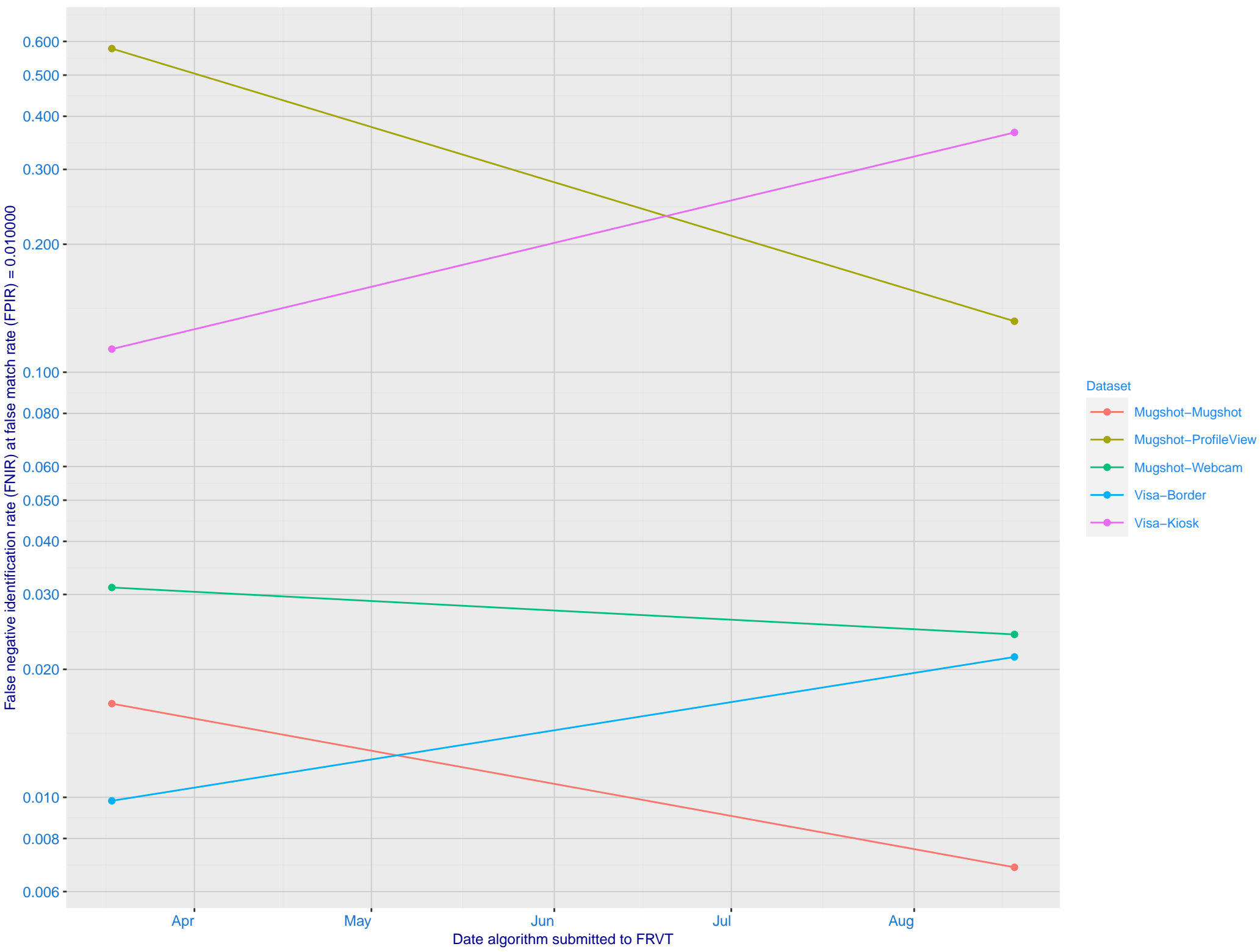
Immigration visa–border ranking 184 (out of 257) –– FNIR(1600000, T, L+1) = 0.1961, FPIR=0.001000 vs. lowest 0.0013 from cloudwalk_mt_001

Immigration visa–kiosk ranking 146 (out of 203) –– FNIR(1600000, T, L+1) = 0.6649, FPIR=0.001000 vs. lowest 0.0532 from cloudwalk_mt_001
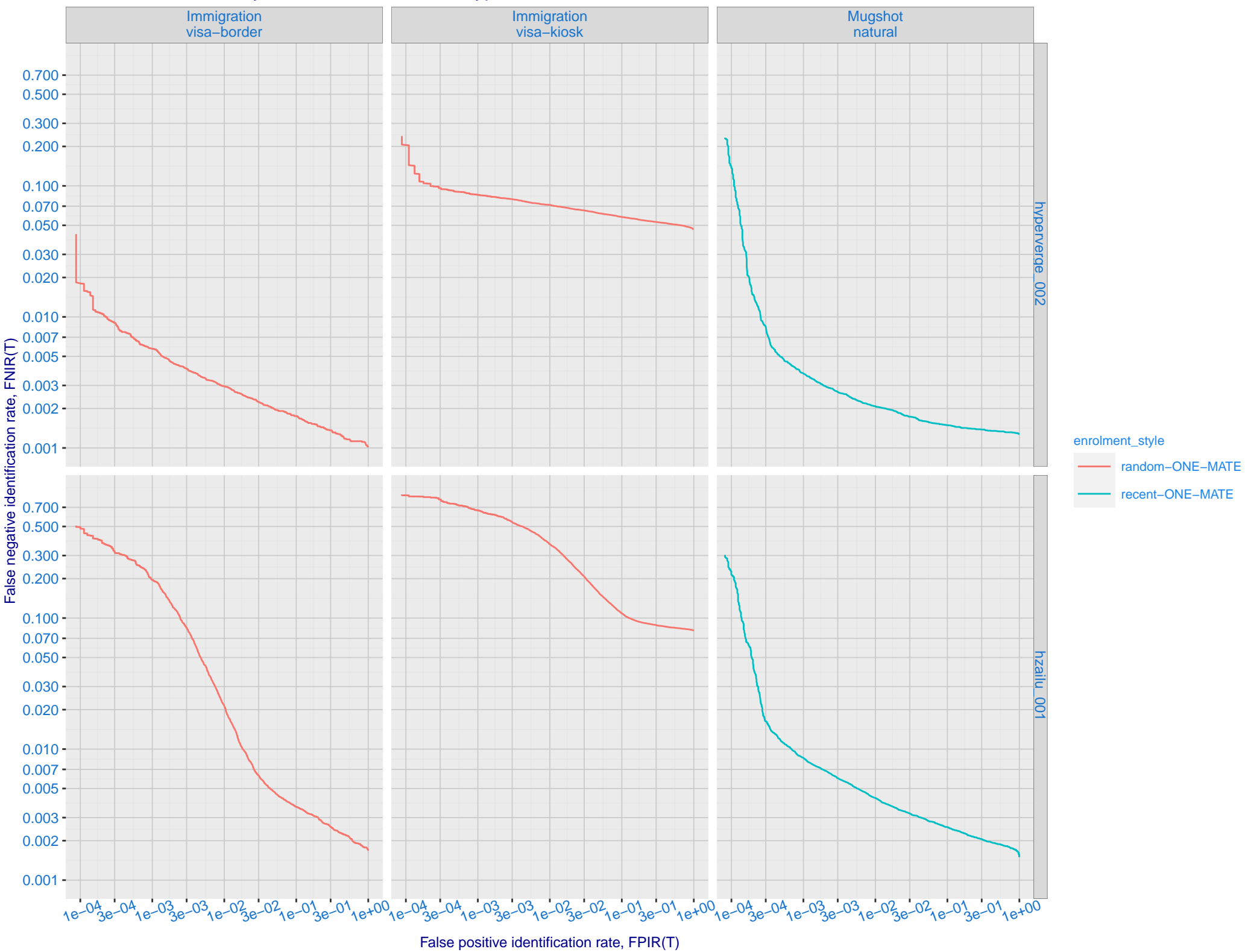
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (hyperverge_002)

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

False negative identification rate (FNIR) at false match rate (FPIR) = 0.010000

Date algorithm submitted to FRVT

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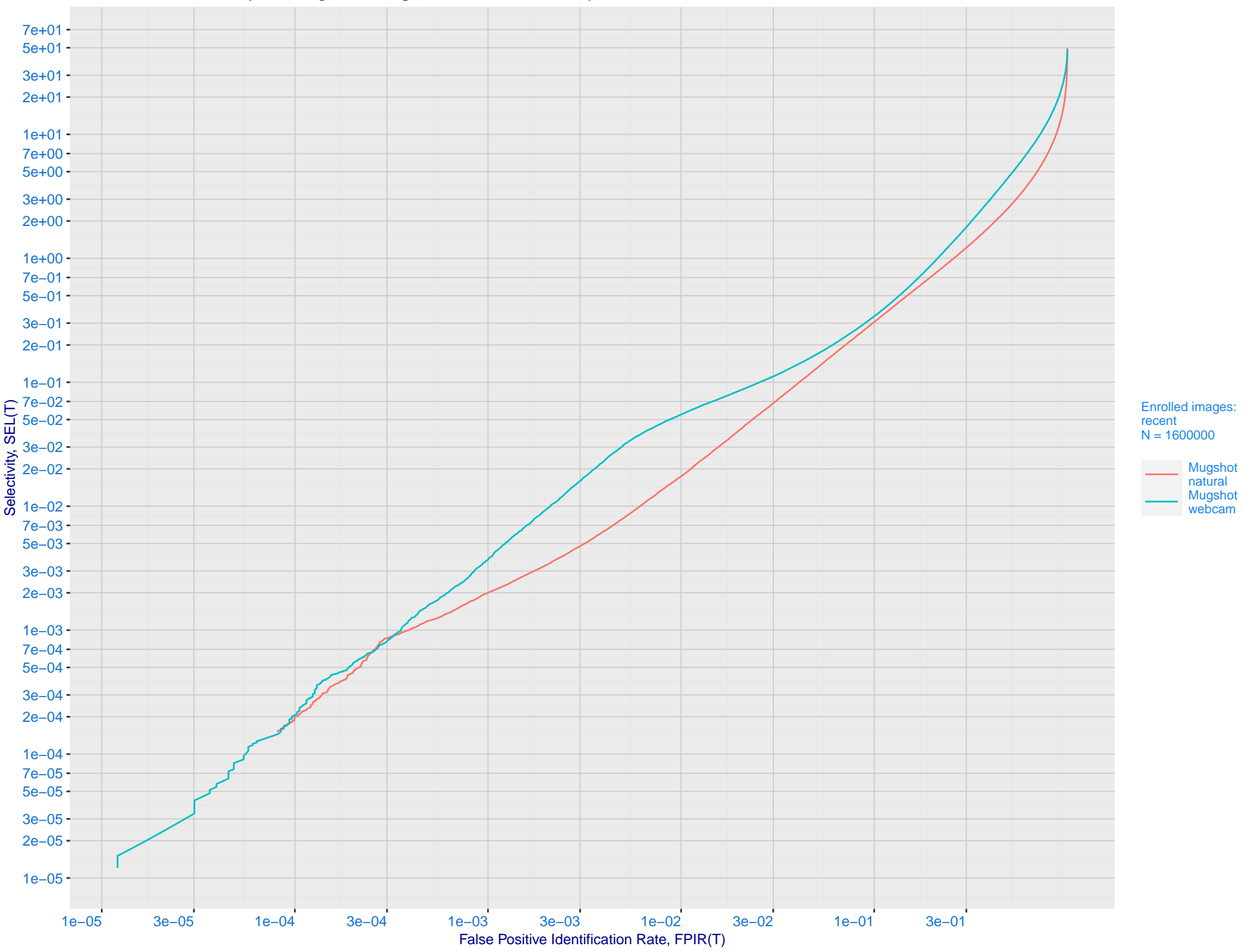- Visa–Border
- Visa–Kiosk

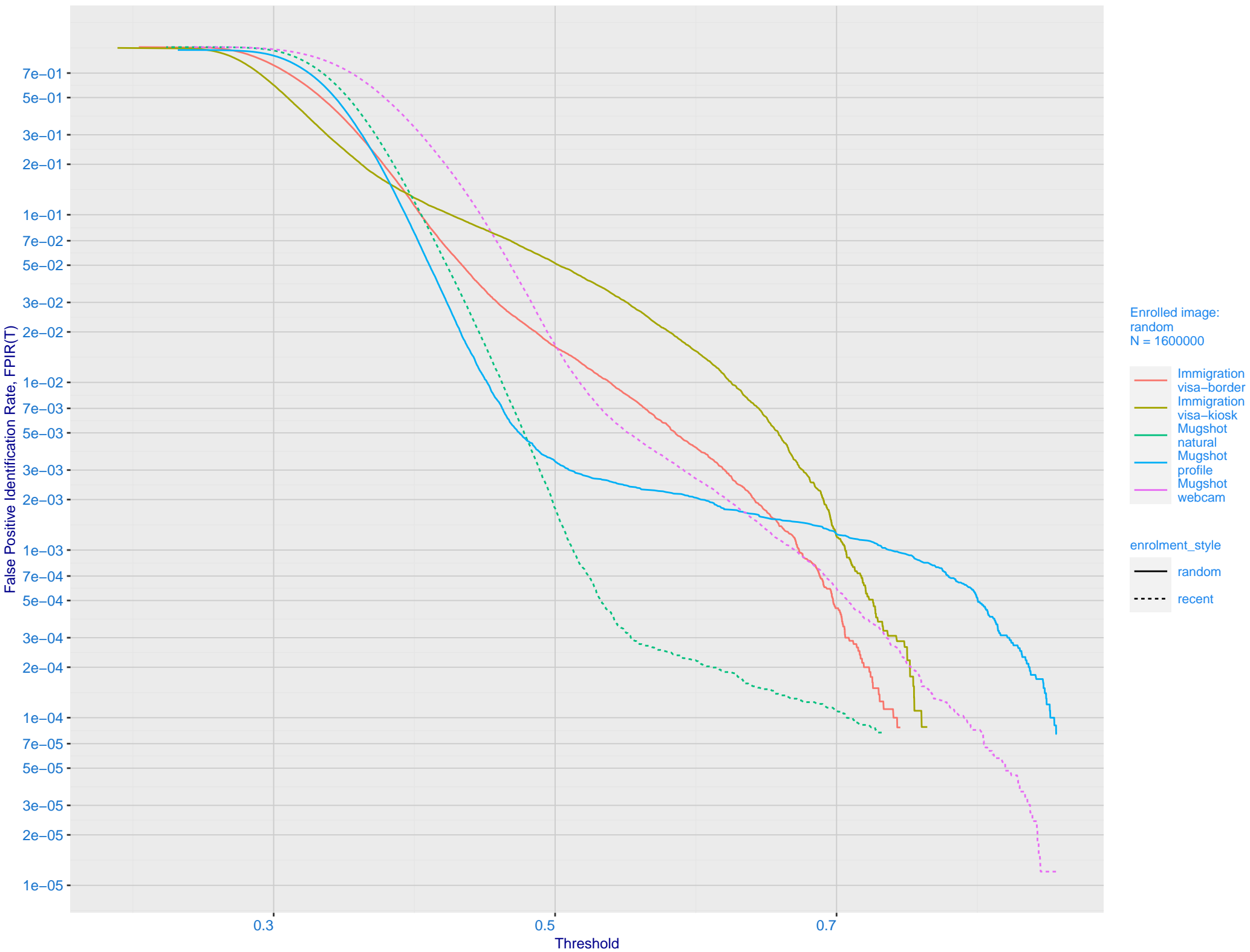D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals

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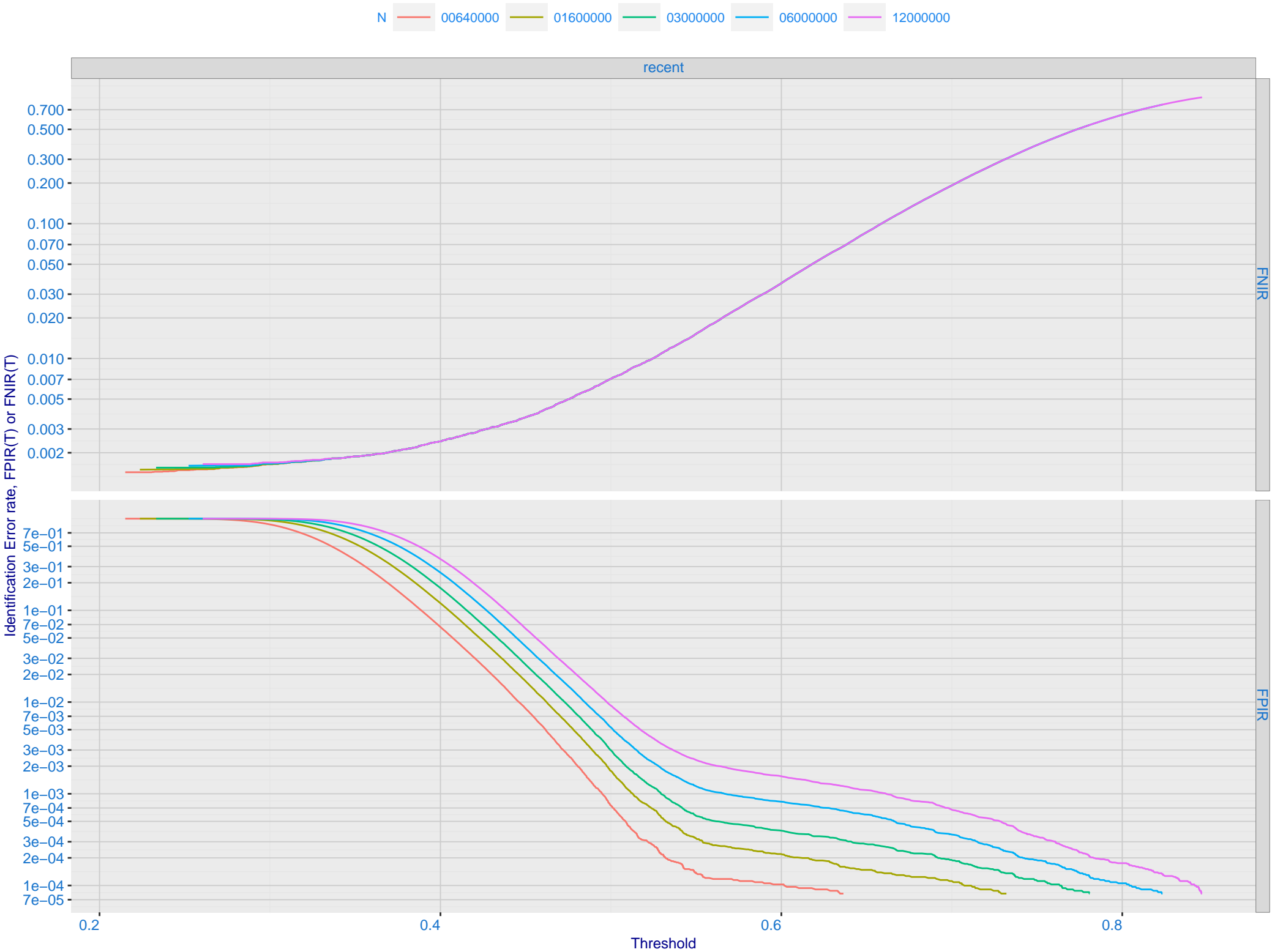
F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate
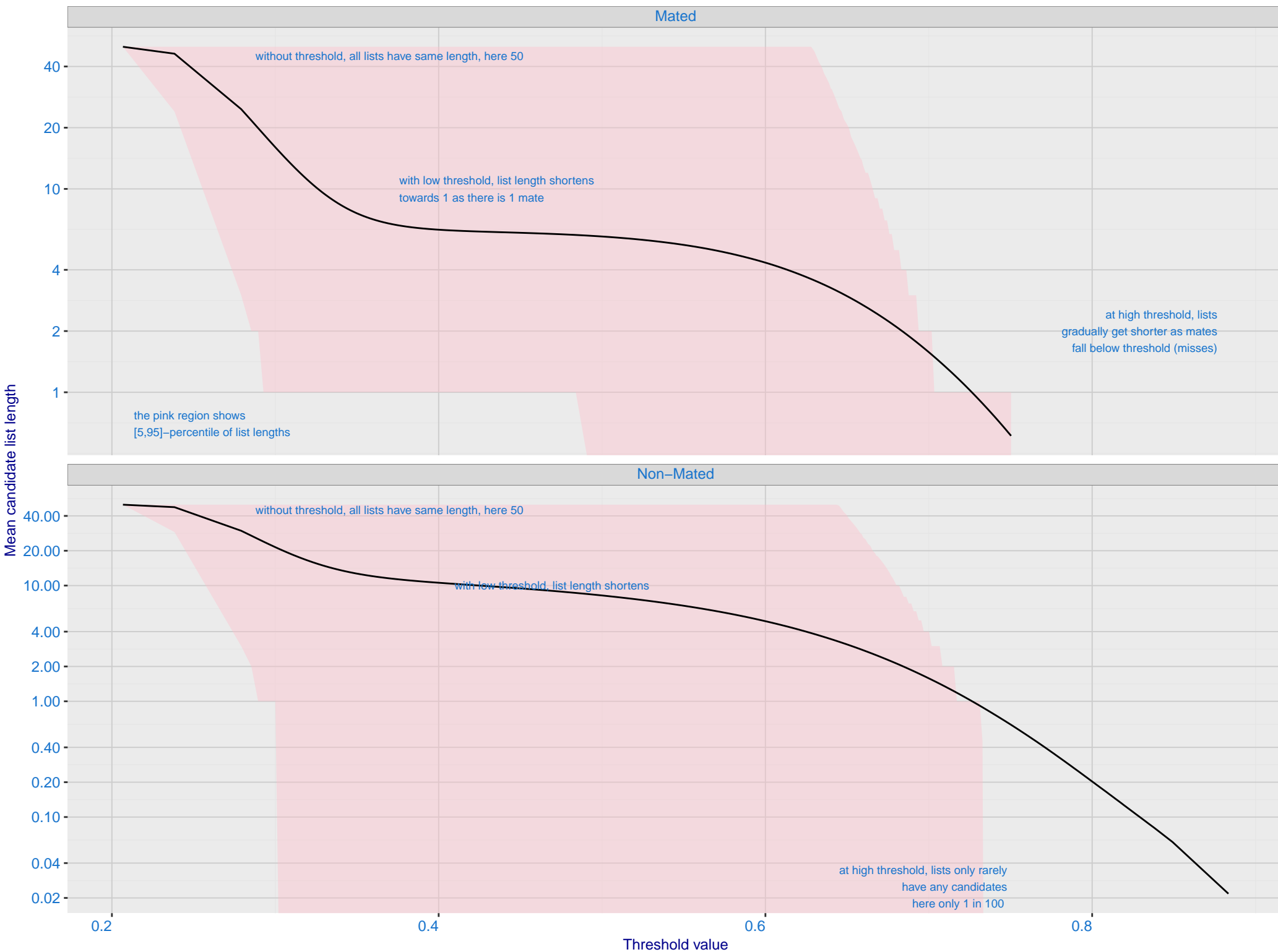
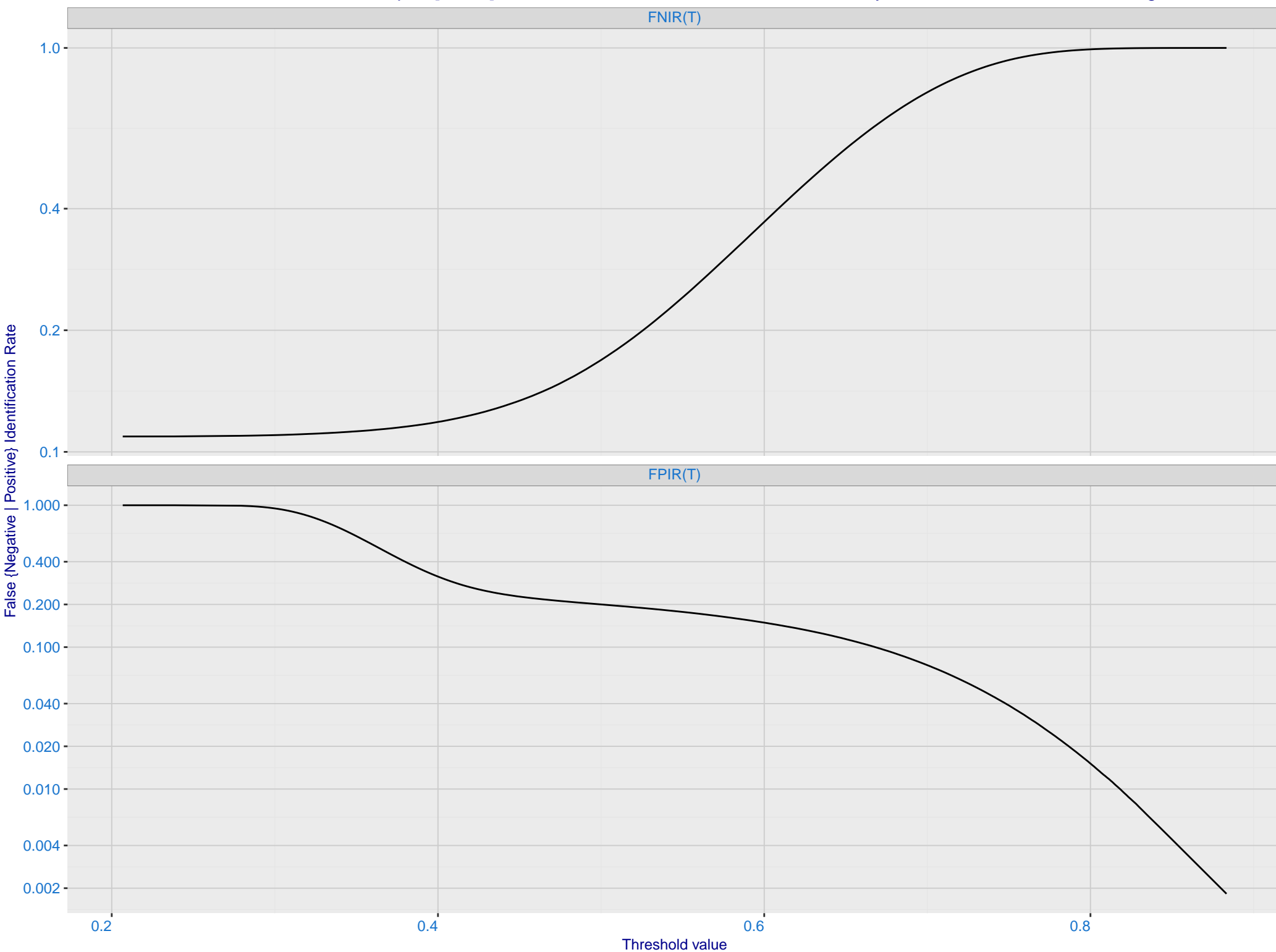G: FPIR dependence on T by probe type for N = 1600000 subjects

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

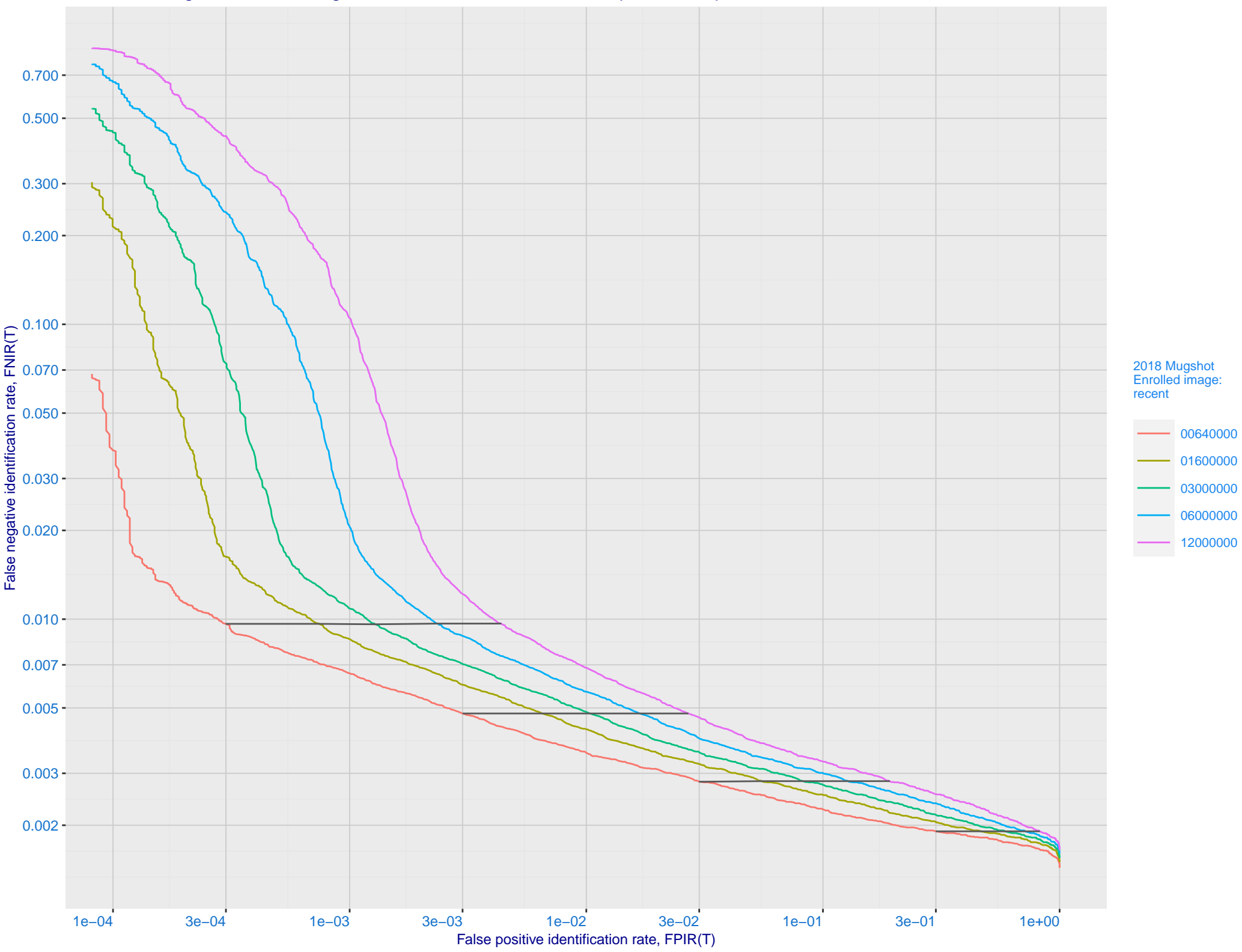Mean candidate list length

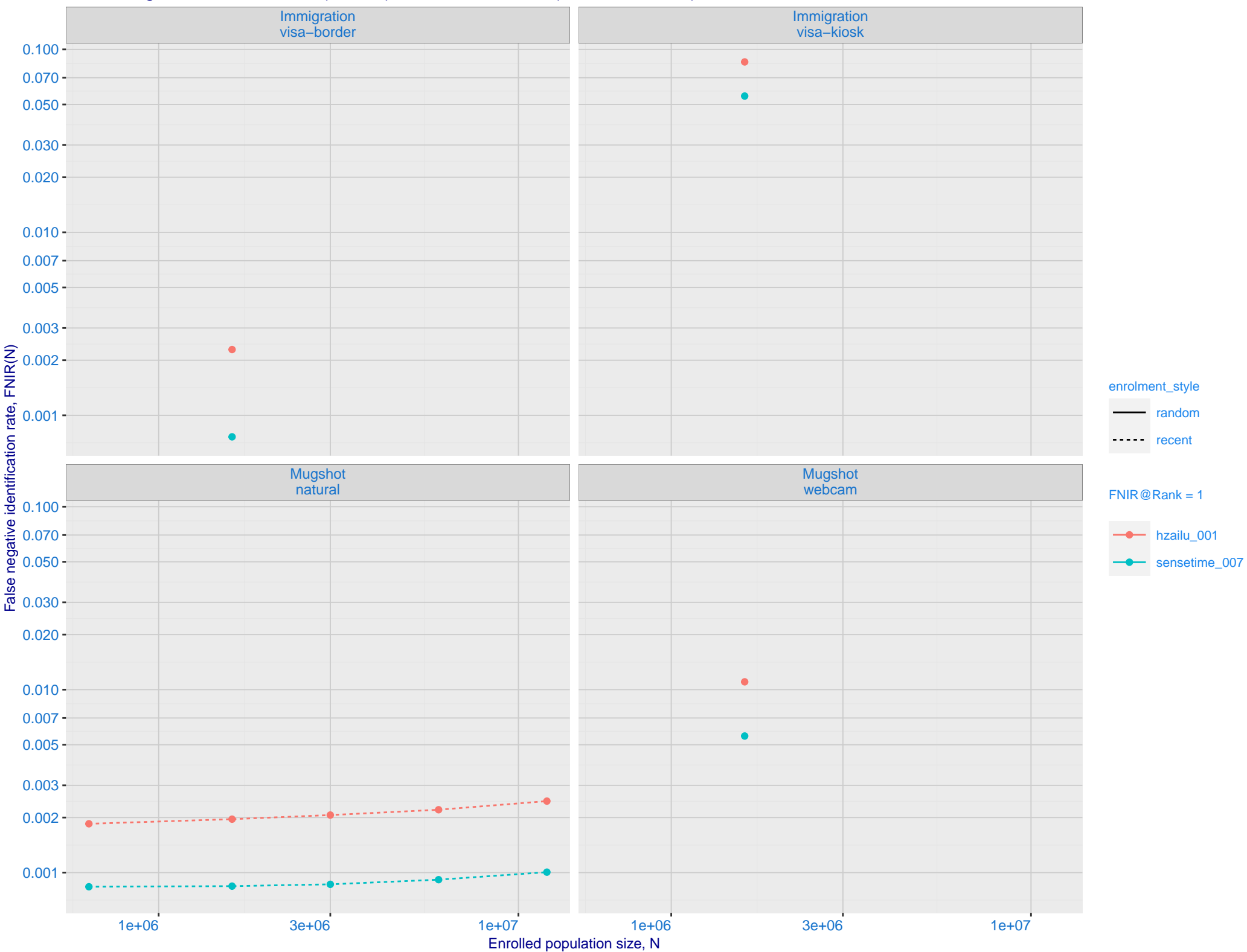Threshold value

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.

2018 Mugshot Enrolled image: recent

- 00640000
- 01600000
- 03000000
- 06000000
- 12000000

False negative identification rate, FNIR(T)

False positive identification rate, FPIR(T)

K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_007)

L: Investigational mode: FNIR(1600000, R, 0) by probe type
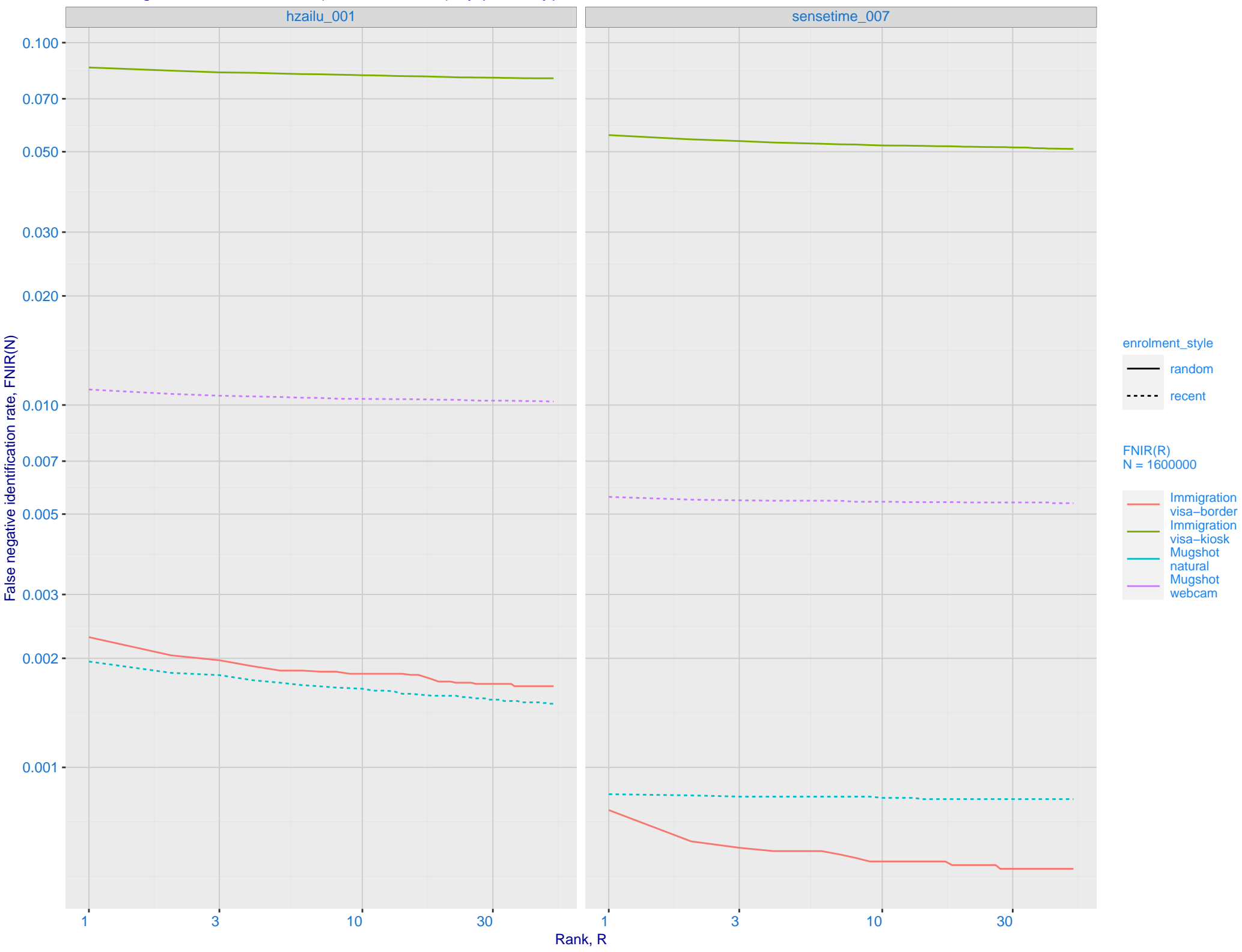
M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations
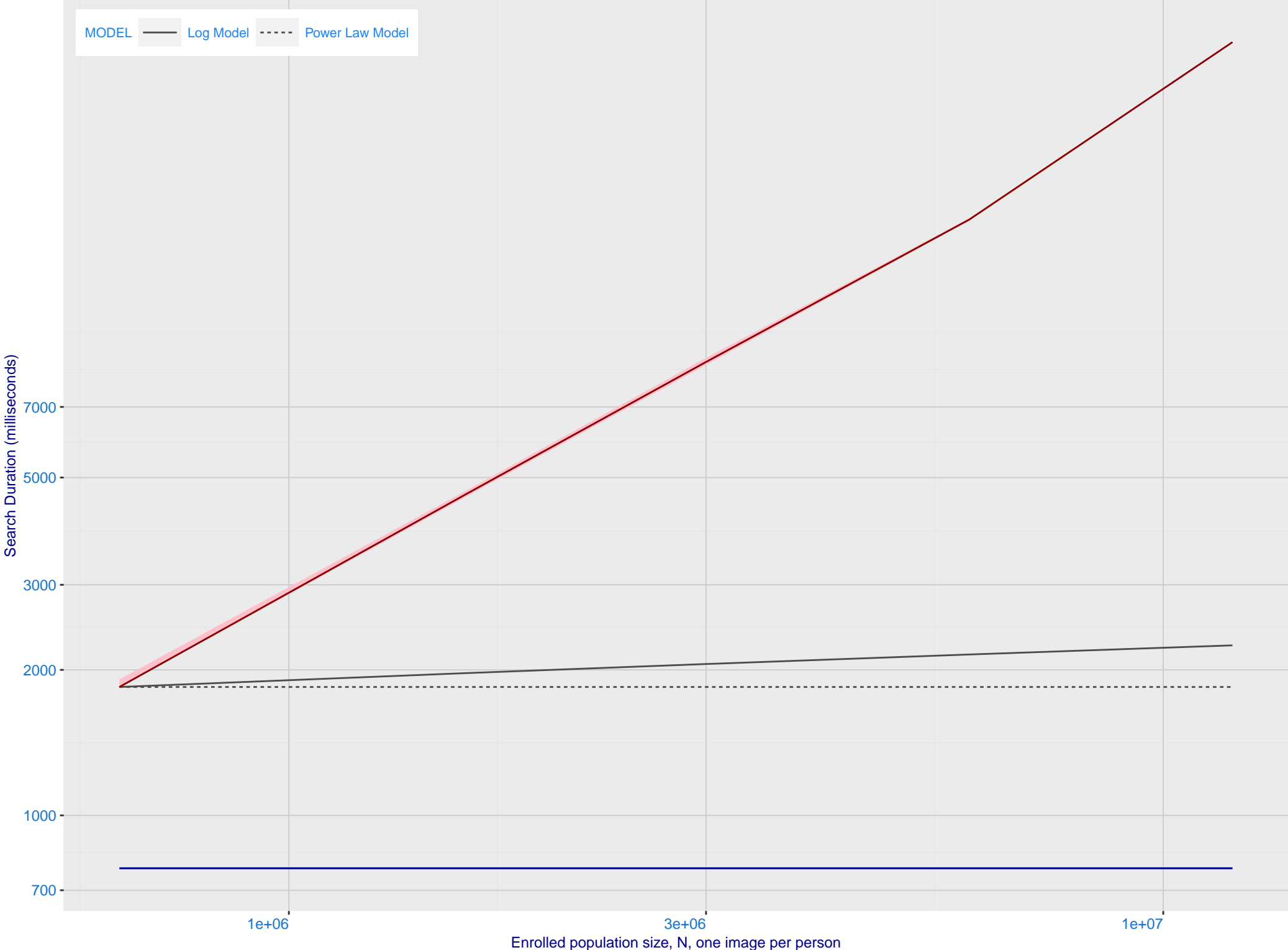
O: FNIR(T, N = 1.6 million) by sex, age and time-lapse. The top row gives investigational rank-1 miss rates. The bottom panels give high threshold for more lights-out identification with low FPIR.
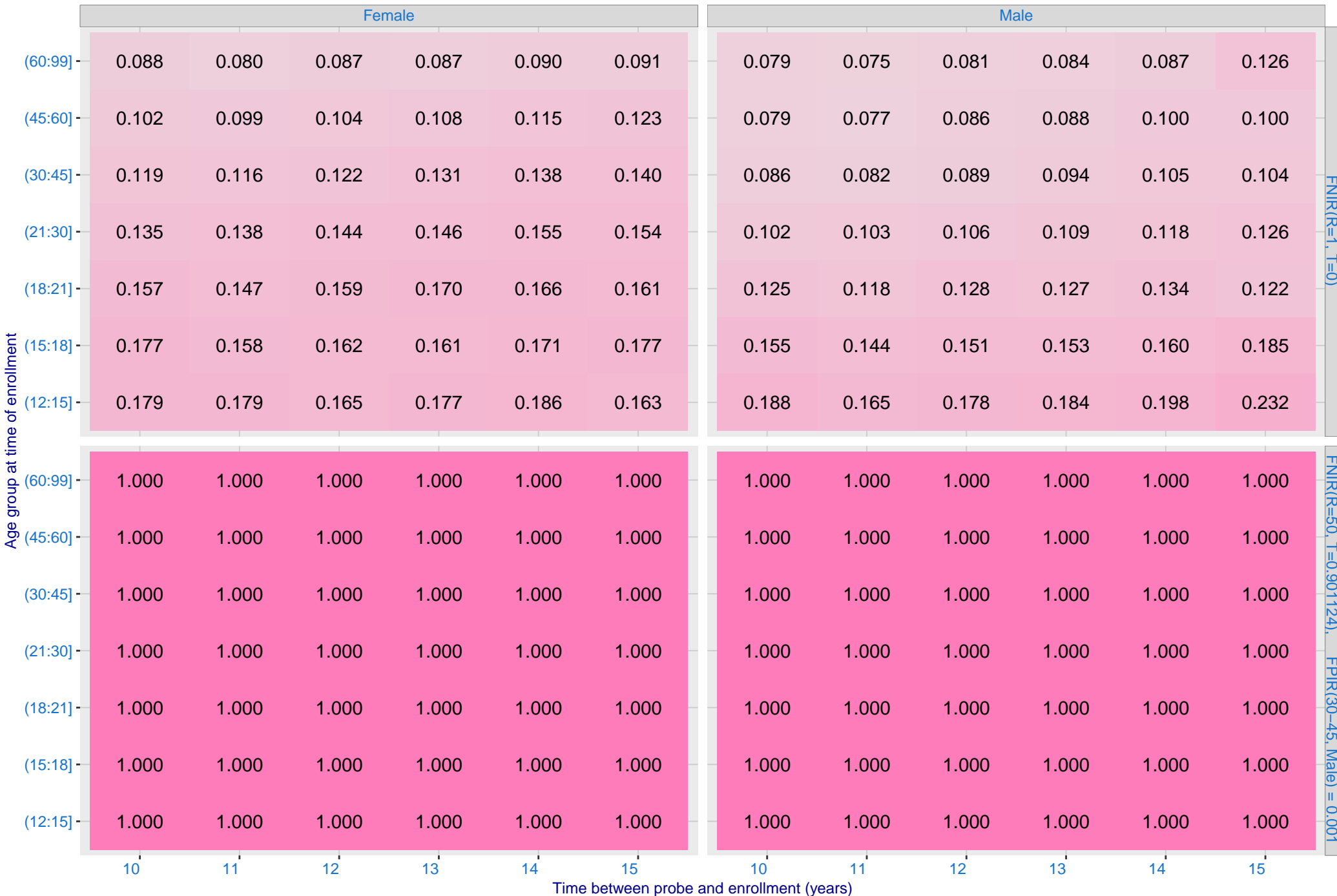
P: FPIR(N = 1.6 million) by sex and age. It is typical for false positive identification rates to be higher in women except in their teens.
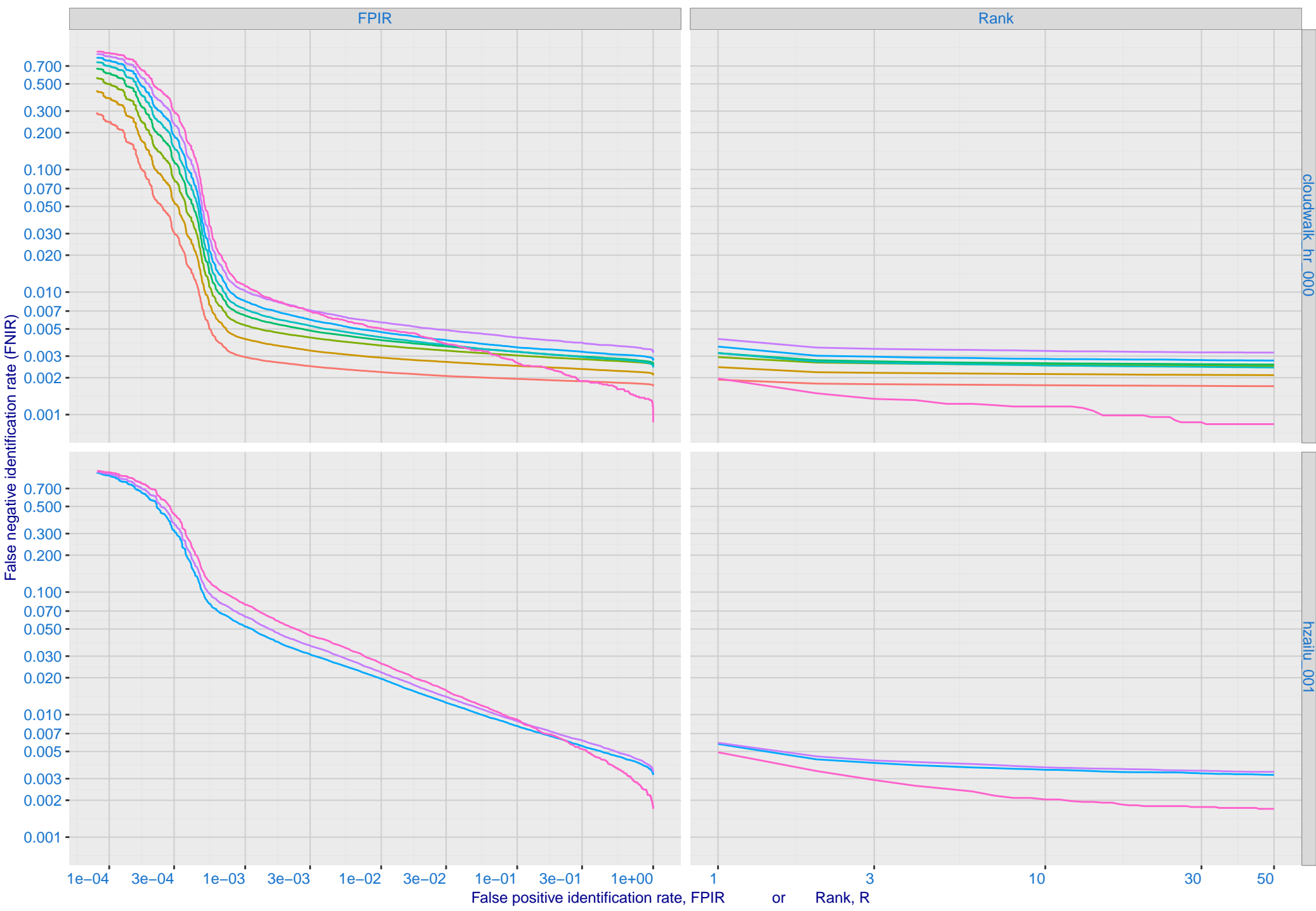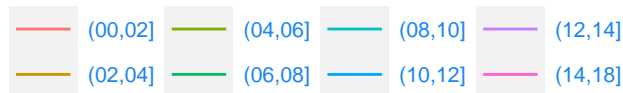
Q: Identification FNIR(N, T, L+1) and Investigational FNIR(N, 0, R) under ageing

Dataset: 2018 Mugshot   N = 3068801

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