A: Datasheet

Algorithm: neurotechnology_009

Developer: Neurotechnology

Submission Date: 2021_09_01

Template size: 513 bytes

Template time (2.5 percentile): 682 msec

Template time (median): 683 msec

Template time (97.5 percentile): 707 msec

Investigation:

Frontal mugshot ranking 29 (out of 329) –– FNIR(1600000, 0, 1) = 0.0014 vs. lowest 0.0009 from sensetime_006

Mugshot webcam ranking 46 (out of 291) –– FNIR(1600000, 0, 1) = 0.0107 vs. lowest 0.0057 from sensetime_006

Mugshot profile ranking 42 (out of 260) –– FNIR(1600000, 0, 1) = 0.1789 vs. lowest 0.0550 from sensetime_006

Immigration visa–border ranking 23 (out of 218) –– FNIR(1600000, 0, 1) = 0.0022 vs. lowest 0.0009 from sensetime_006

Immigration visa–kiosk ranking 32 (out of 215) –– FNIR(1600000, 0, 1) = 0.0787 vs. lowest 0.0487 from cubox_000

Identification:

Frontal mugshot ranking 60 (out of 329) –– FNIR(1600000, T, L+1) = 0.0152, FPIR=0.001000 vs. lowest 0.0017 from nec_005
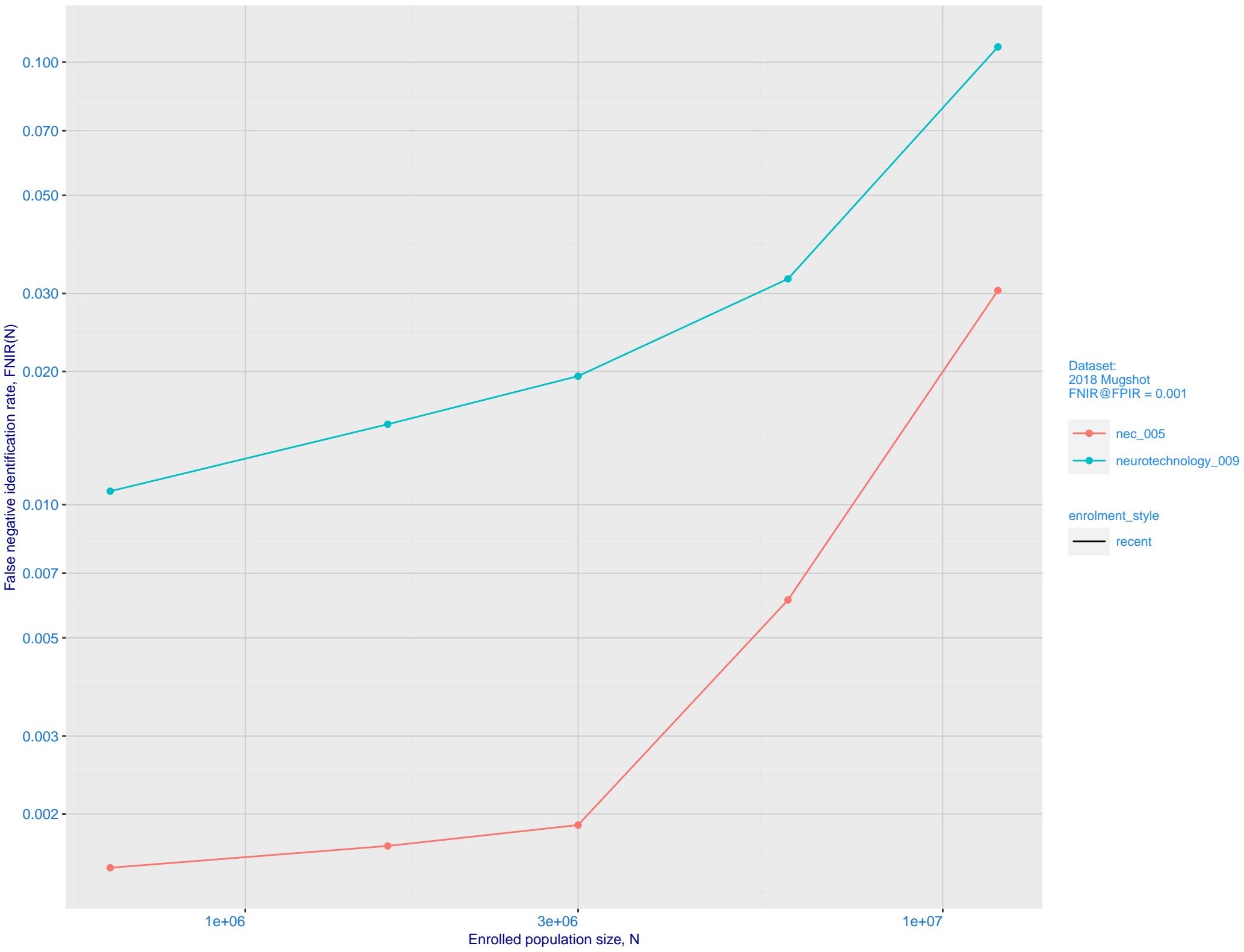
Mugshot webcam ranking 56 (out of 289) –– FNIR(1600000, T, L+1) = 0.0518, FPIR=0.001000 vs. lowest 0.0120 from nec_005

Mugshot profile ranking 27 (out of 259) –– FNIR(1600000, T, L+1) = 0.5878, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000
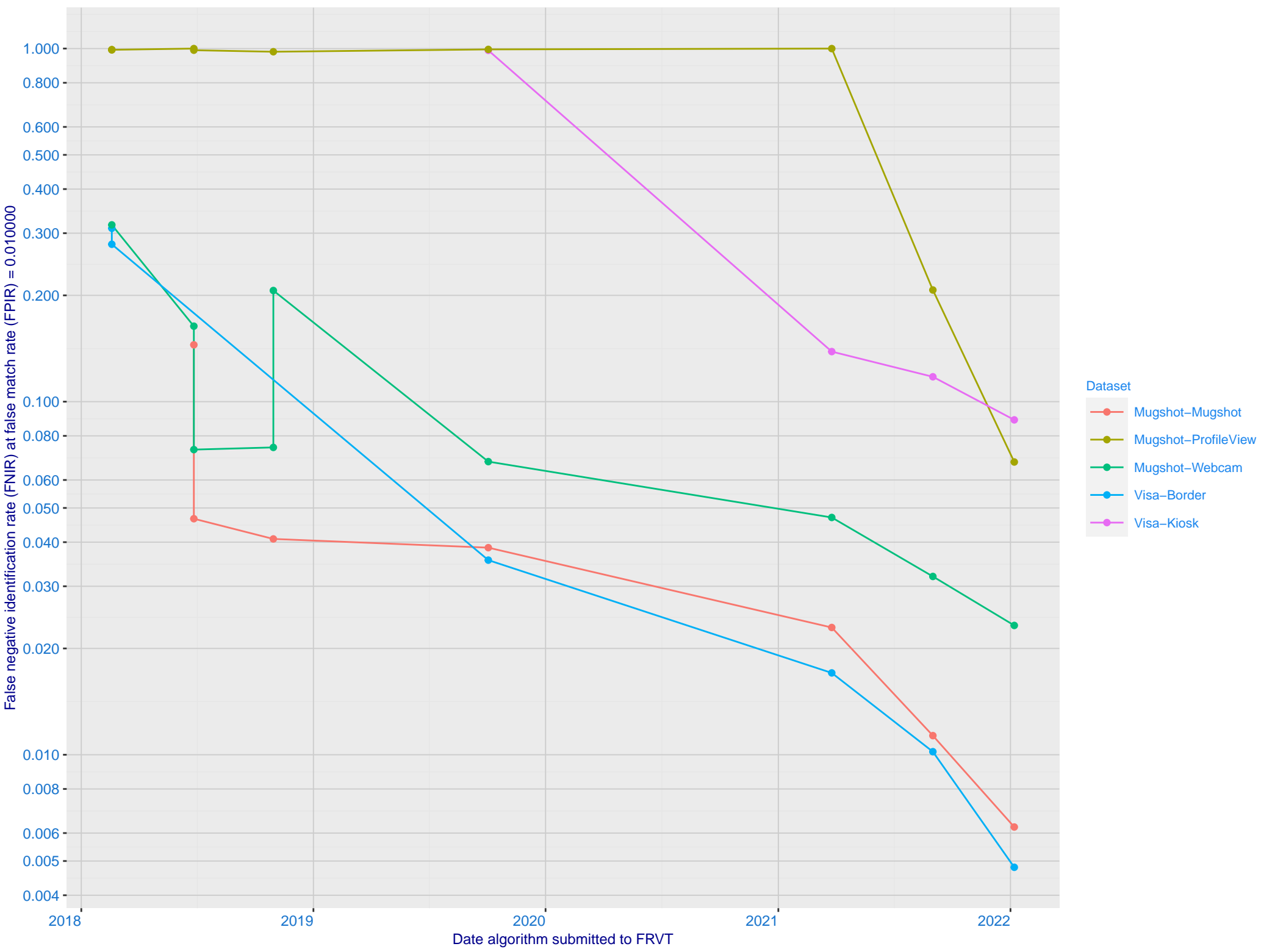
Immigration visa–border ranking 47 (out of 217) –– FNIR(1600000, T, L+1) = 0.0204, FPIR=0.001000 vs. lowest 0.0032 from paravision_009

Immigration visa–kiosk ranking 35 (out of 212) –– FNIR(1600000, T, L+1) = 0.1653, FPIR=0.001000 vs. lowest 0.0728 from paravision_009
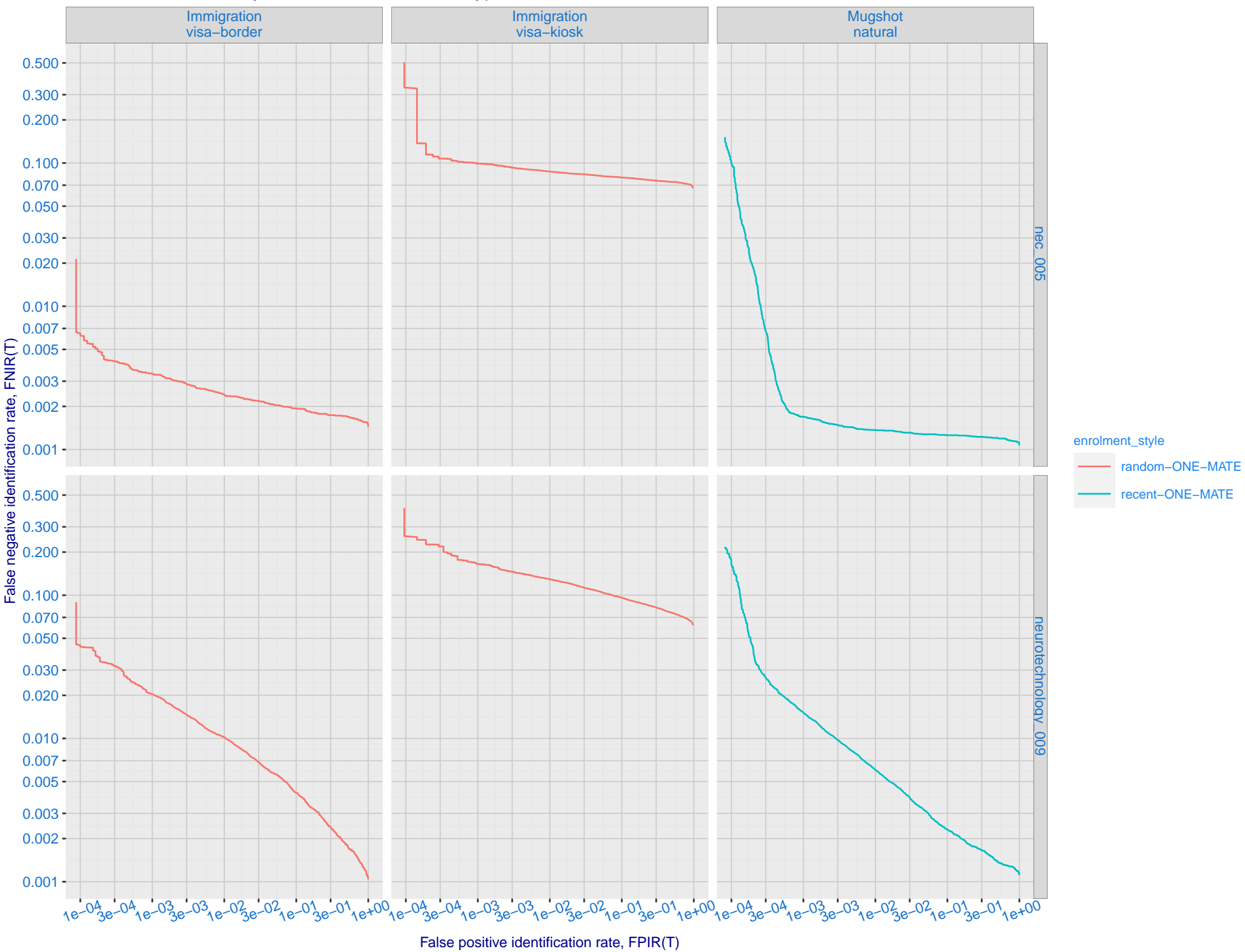
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (nec_005)

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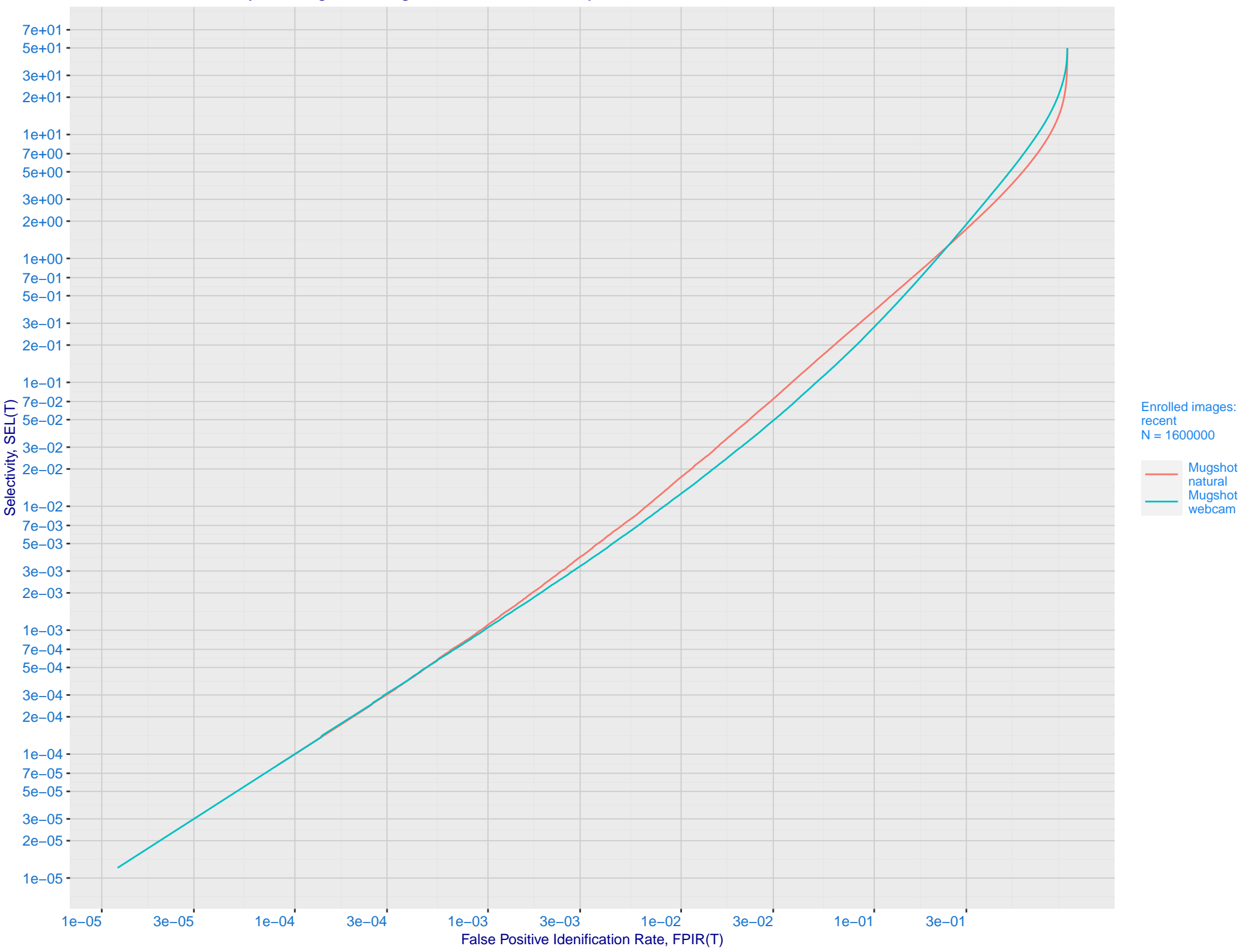- Mugshot–Webcam
- Visa–Border
- Visa–Kiosk

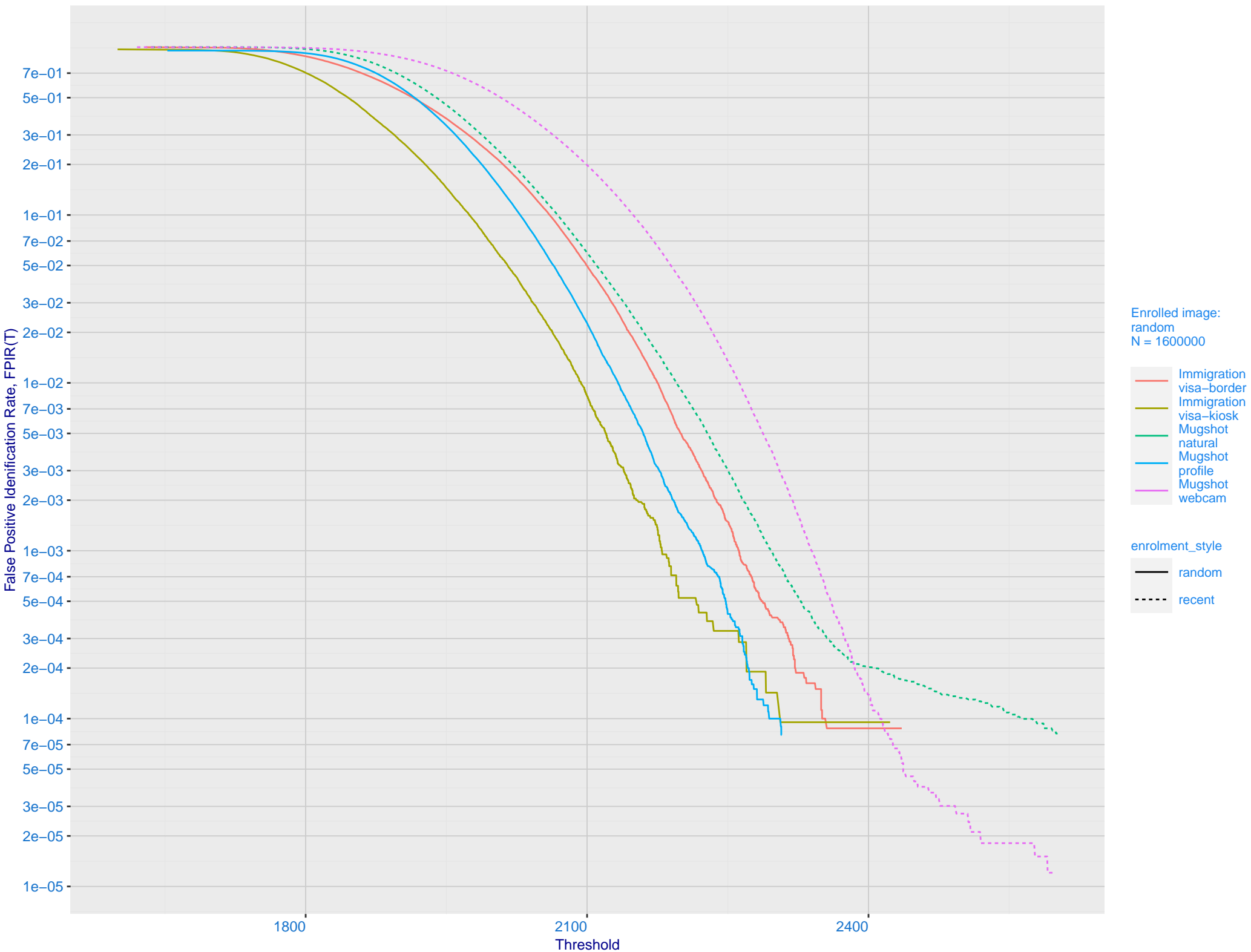D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals

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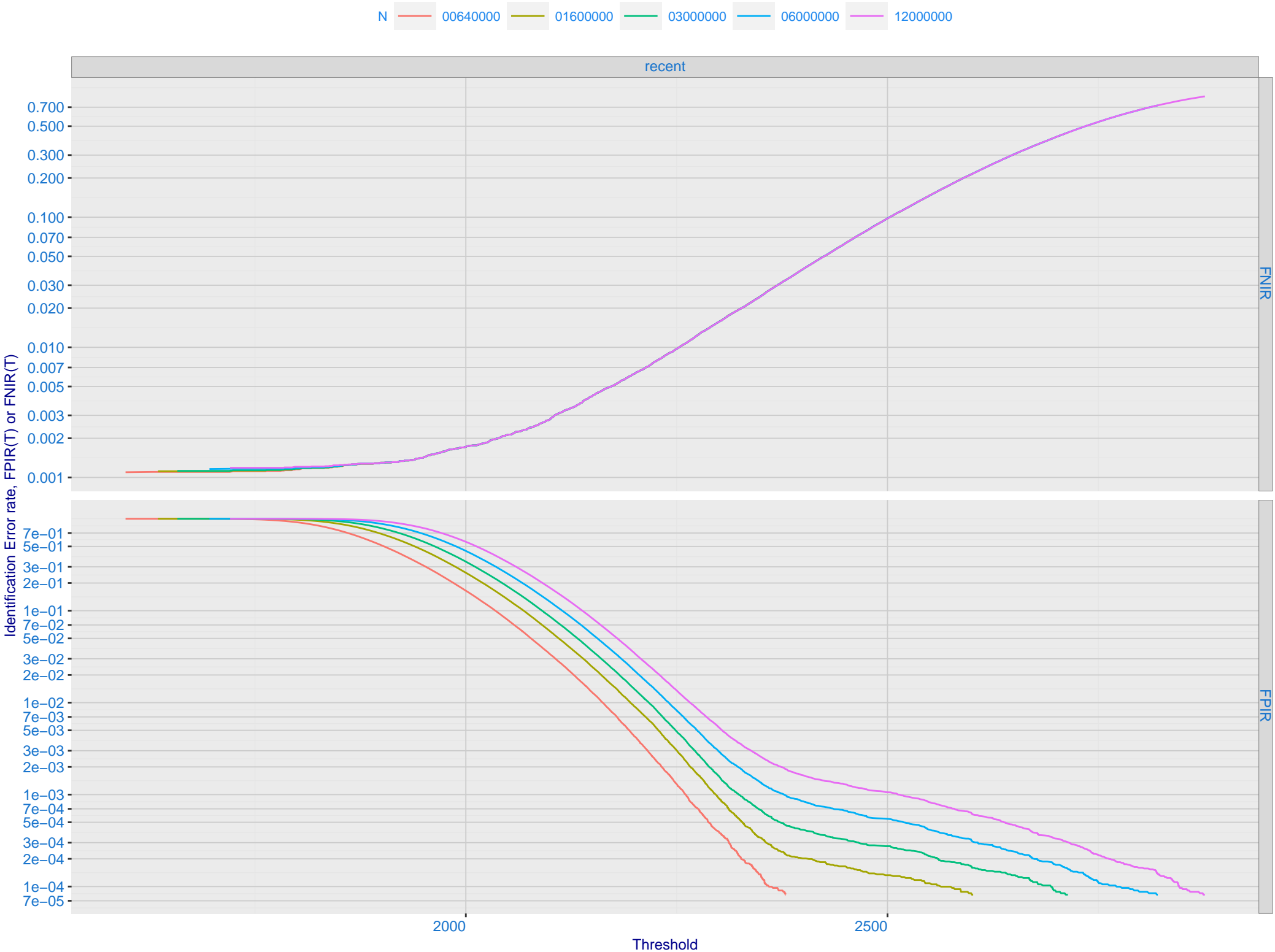
F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate
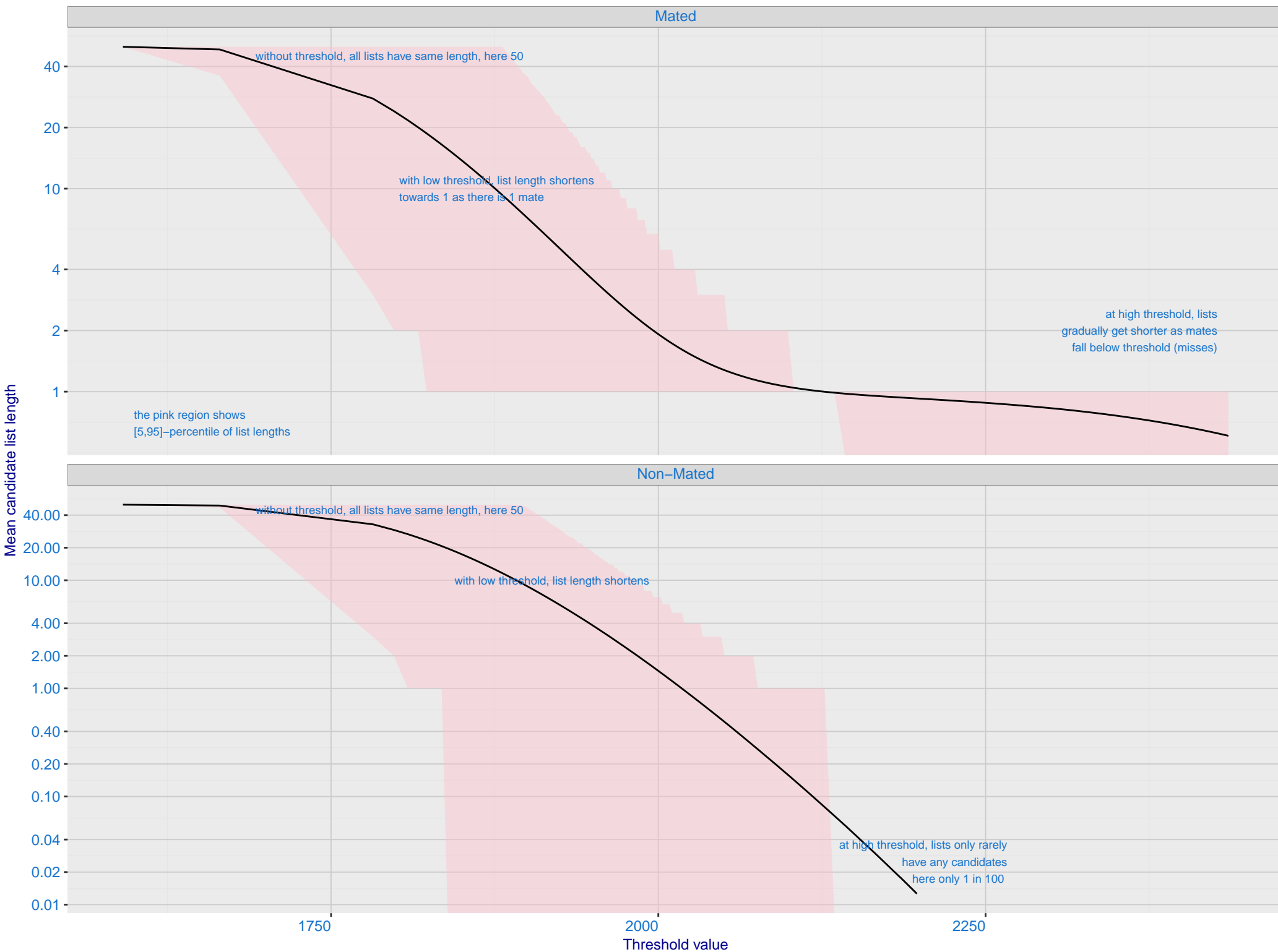
G: FPIR dependence on T by probe type for N = 1600000 subjects

# 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
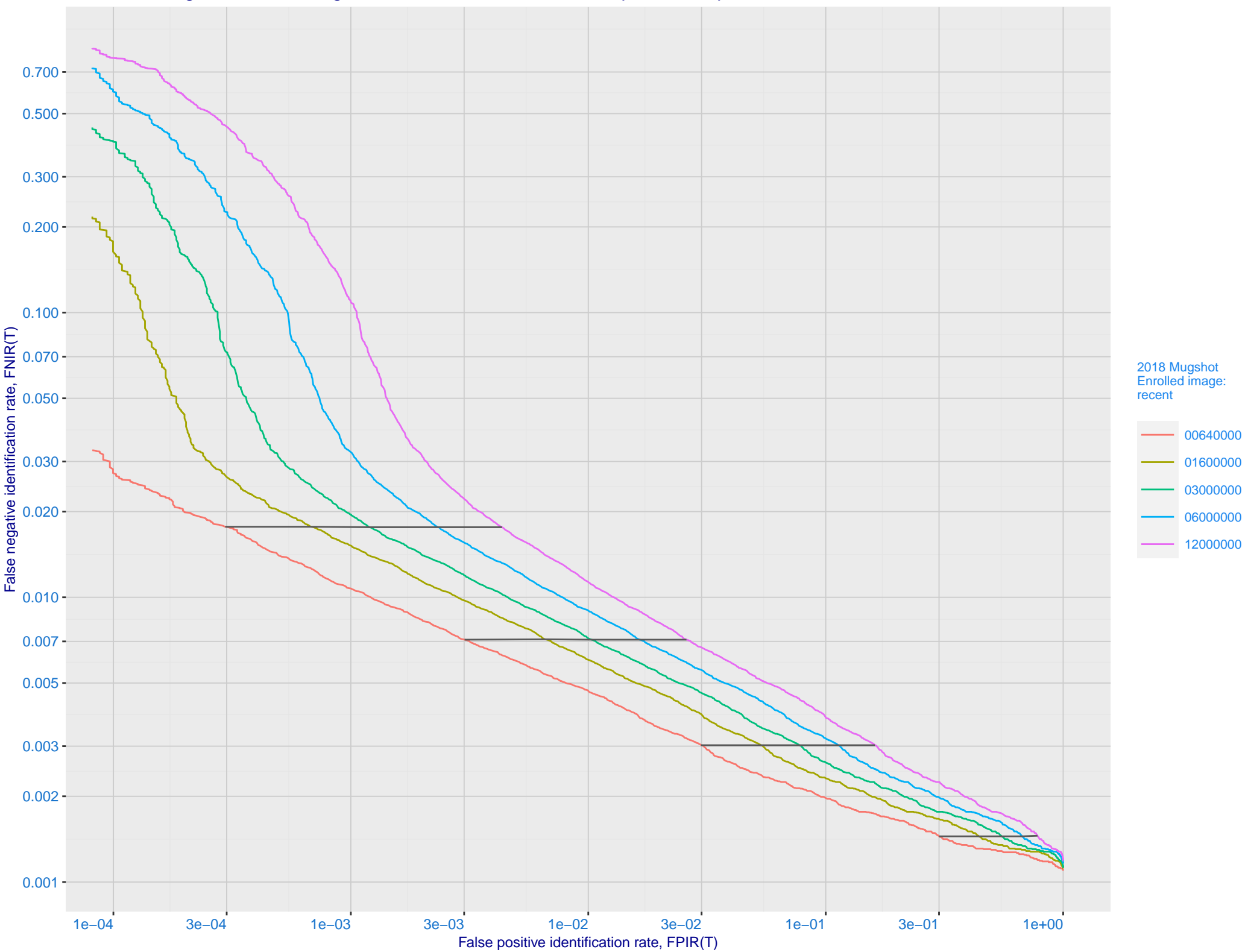here only 1 in 100

Mean candidate list length

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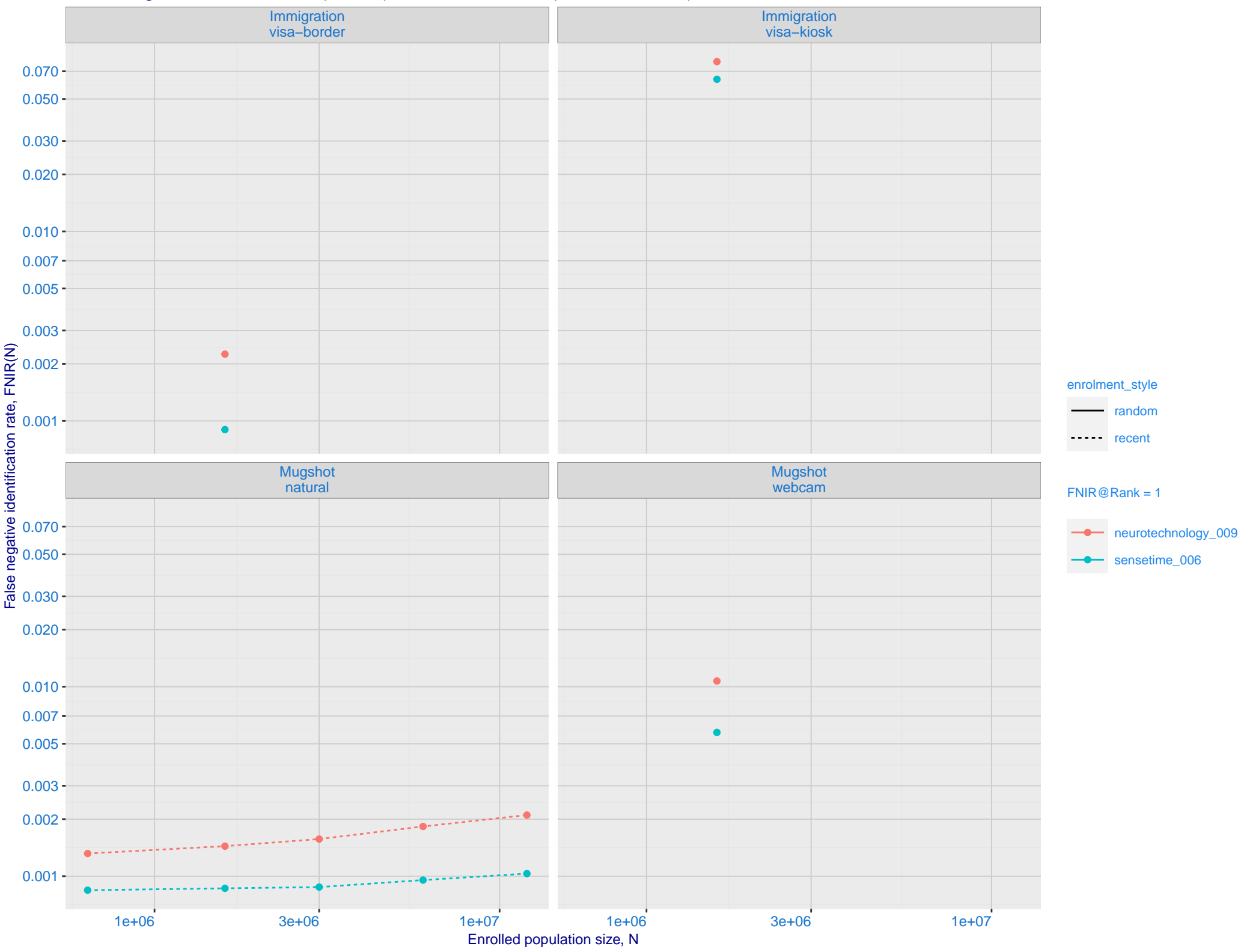
I: FNIR and FPIR dependence on threshold
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image
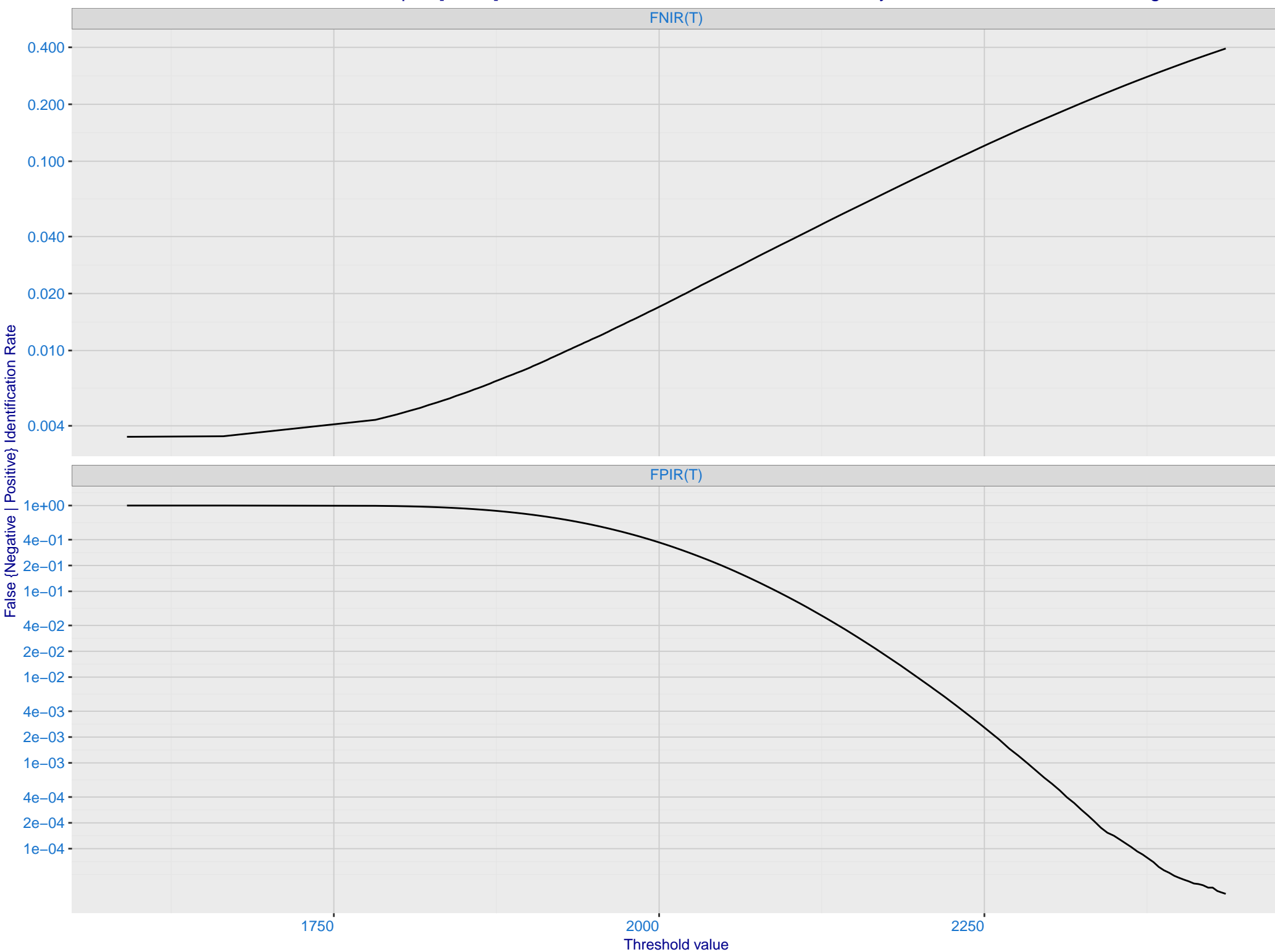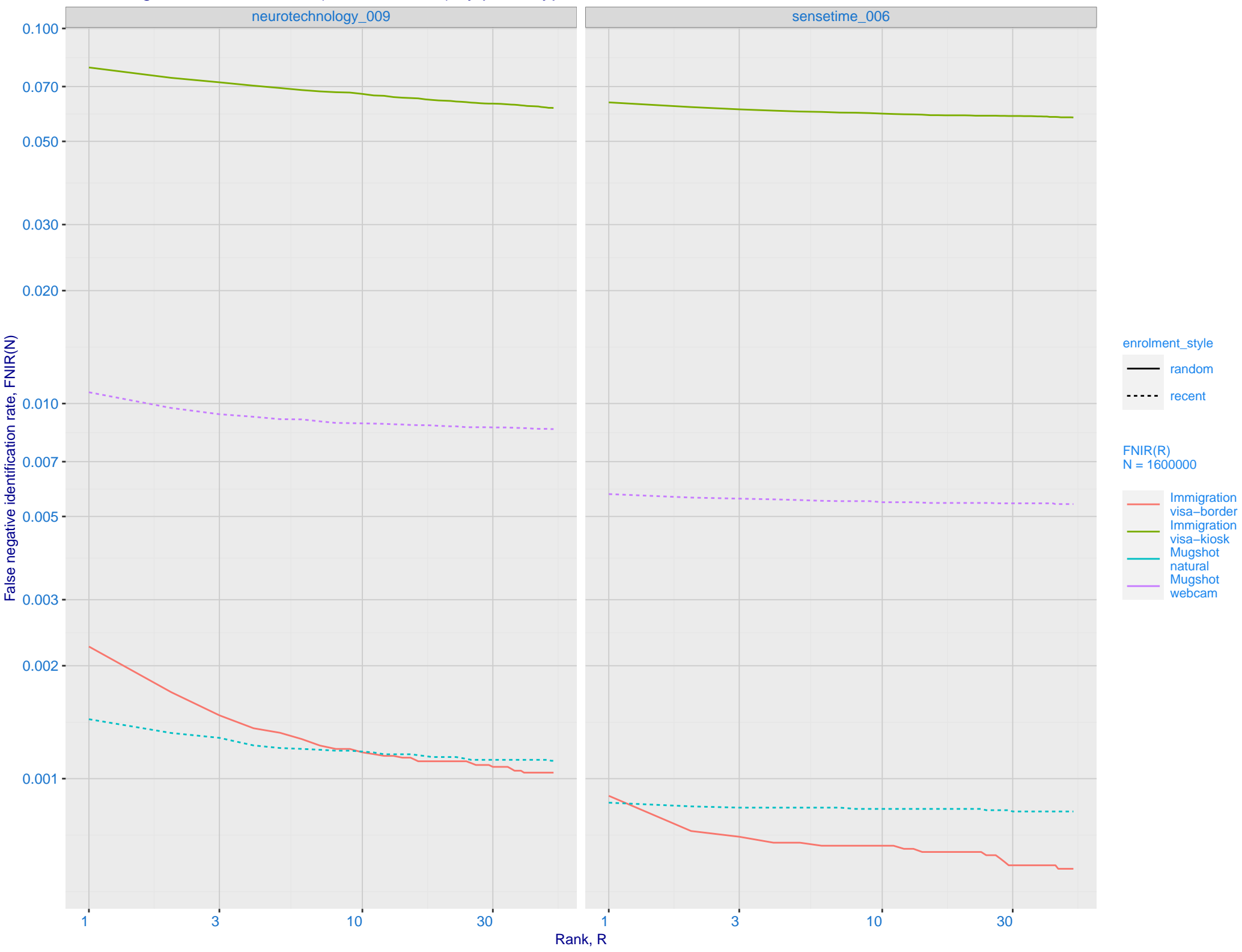
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.

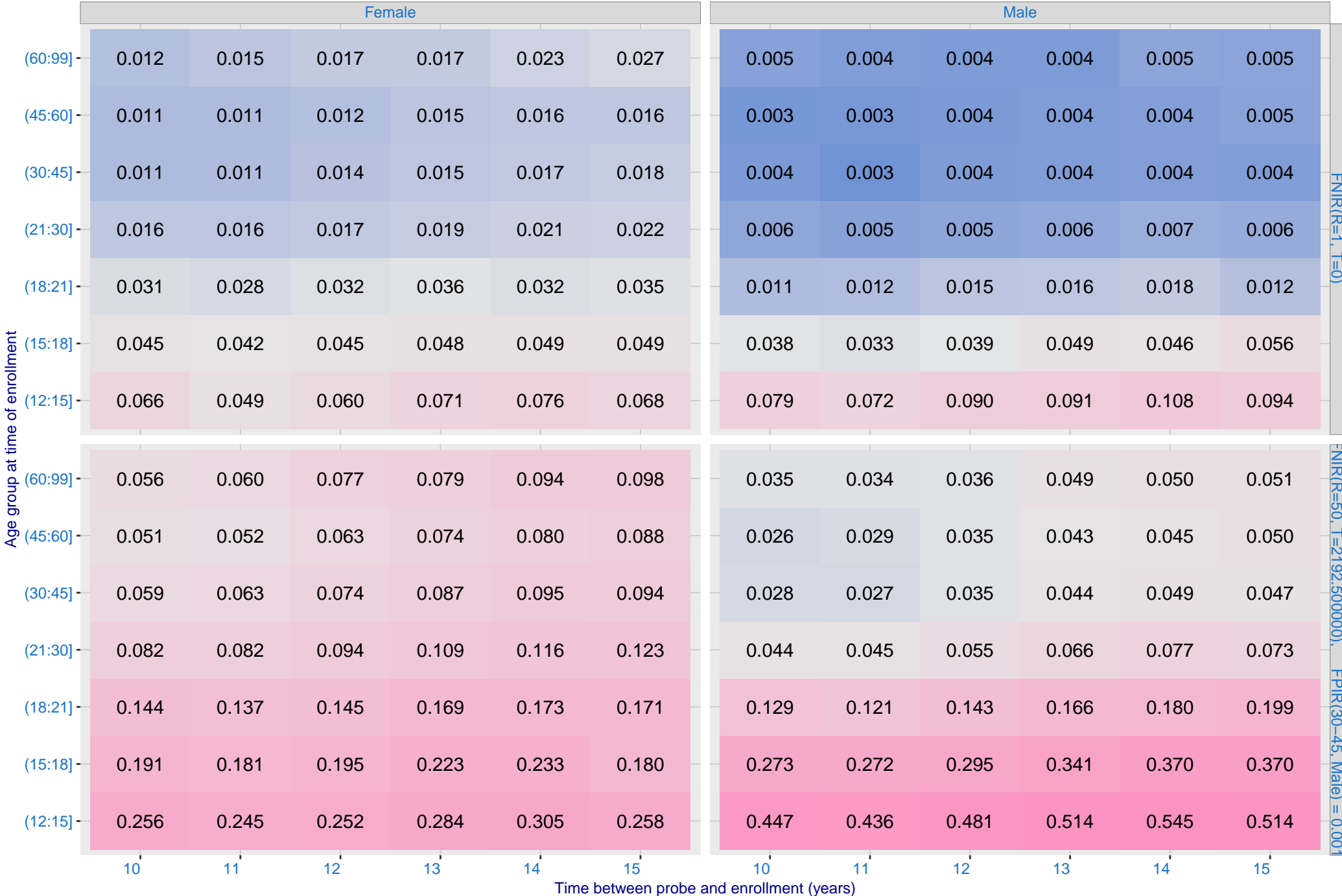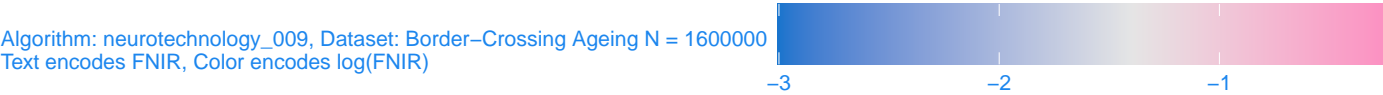K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_006)

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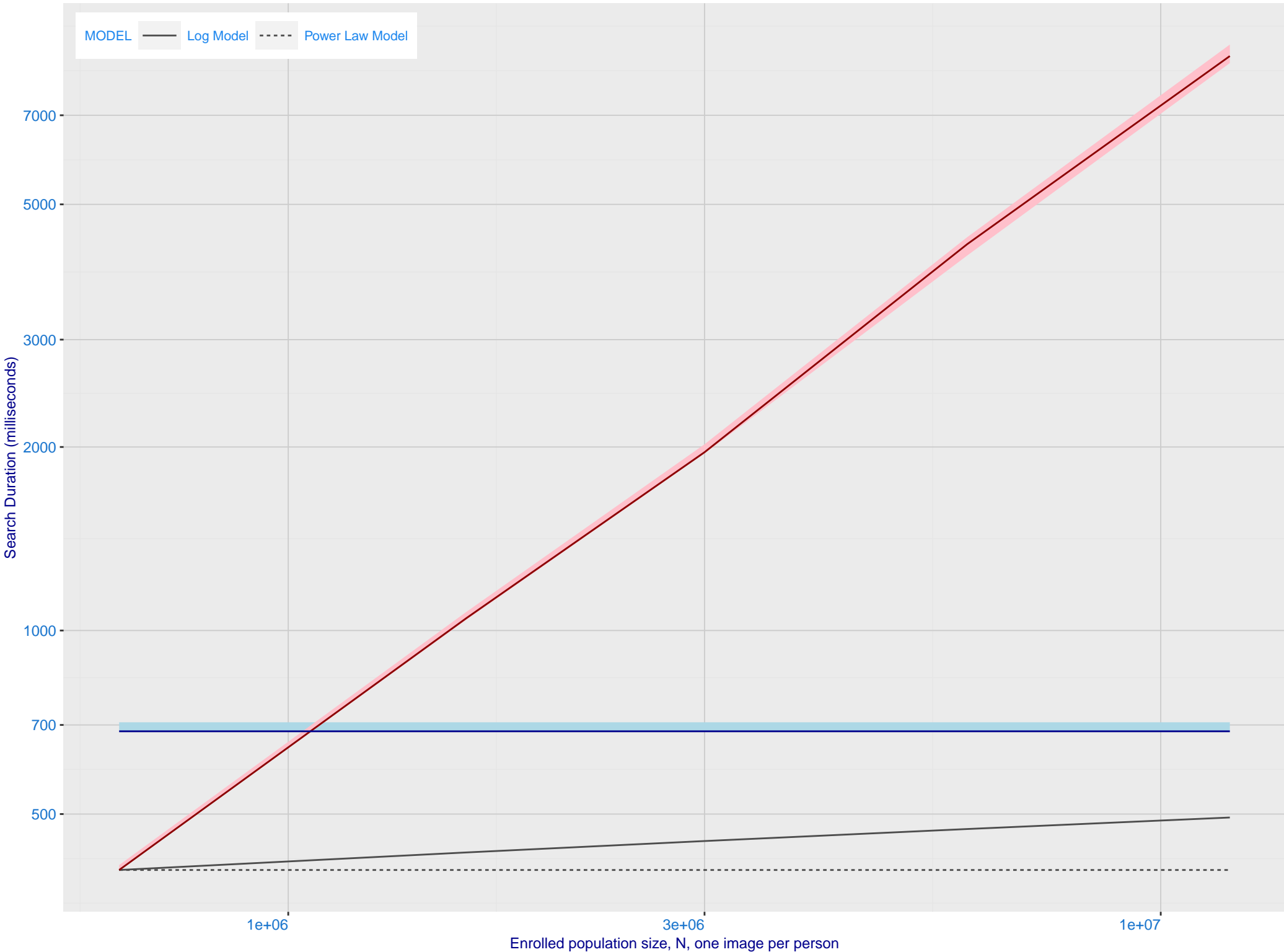
O: FNIR(T, N = 1.6 million) by sex, age and time−lapse. The top row gives investigational rank−1 miss rates. The bottom panels give high threshold for more lights−out identification with low FPIR.

Algorithm: neurotechnology_009, 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

Dataset: 2018 Mugshot   N = 3068801   (00,02]   (04,06]   (08,10]   (12,14]
                                        (02,04]   (06,08]   (10,12]   (14,18]

FPIR | Rank

cloudwalk_hr_000

False negative identification rate (FNIR)

False positive identification rate, FPIR   or   Rank, R