A: Datasheet

Algorithm: sensetime_009

Developer: Sensetime Group

Submission Date: 2023_01_04

Template size: 1032 bytes

Template time (2.5 percentile): 1245 msec

Template time (median): 1320 msec

Template time (97.5 percentile): 1464 msec

Investigation:

Frontal mugshot ranking 2 (out of 416) –– FNIR(1600000, 0, 1) = 0.0008 vs. lowest 0.0008 from intema_001

Mugshot webcam ranking 1 (out of 376) –– FNIR(1600000, 0, 1) = 0.0054

Mugshot profile ranking 1 (out of 345) –– FNIR(1600000, 0, 1) = 0.0517

Immigration visa–border ranking 4 (out of 305) –– FNIR(1600000, 0, 1) = 0.0007 vs. lowest 0.0006 from cloudwalk_mt_002

Immigration visa–kiosk ranking 70 (out of 249) –– FNIR(1600000, 0, 1) = 0.0689 vs. lowest 0.0387 from cloudwalk_mt_002

Identification:

Frontal mugshot ranking 2 (out of 416) –– FNIR(1600000, T, L+1) = 0.0011, FPIR=0.001000 vs. lowest 0.0011 from idemia_010

Mugshot webcam ranking 1 (out of 374) –– FNIR(1600000, T, L+1) = 0.0072, FPIR=0.001000

Mugshot profile ranking 100 (out of 344) –– FNIR(1600000, T, L+1) = 0.8900, FPIR=0.001000 vs. lowest 0.0634 from cloudwalk_mt_002

Immigration visa–border ranking 3 (out of 303) –– FNIR(1600000, T, L+1) = 0.0015, FPIR=0.001000 vs. lowest 0.0010 from cloudwalk_mt_002

Immigration visa–kiosk ranking 15 (out of 248) –– FNIR(1600000, T, L+1) = 0.0763, FPIR=0.001000 vs. lowest 0.0517 from cloudwalk_mt_002
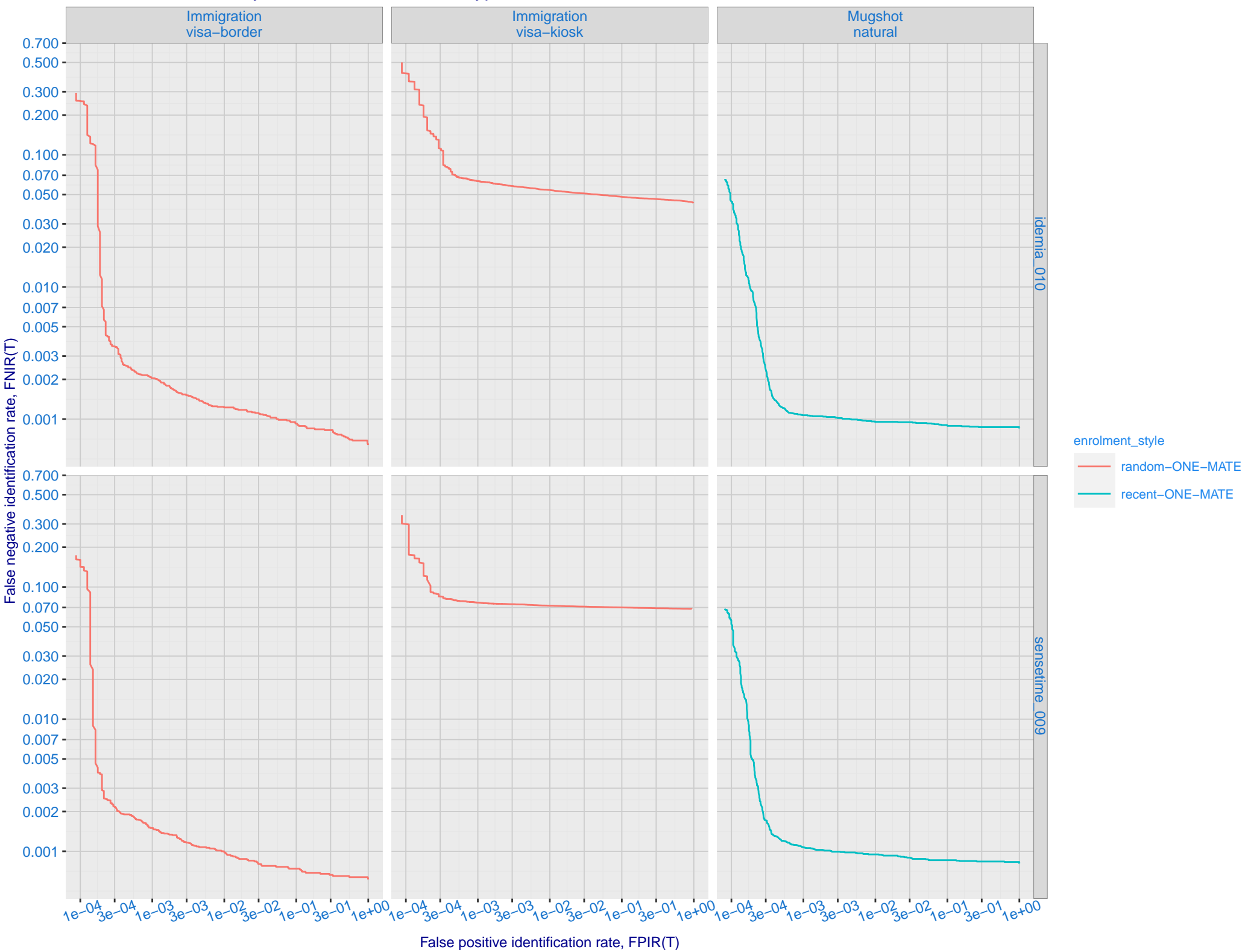
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (idemia_010)
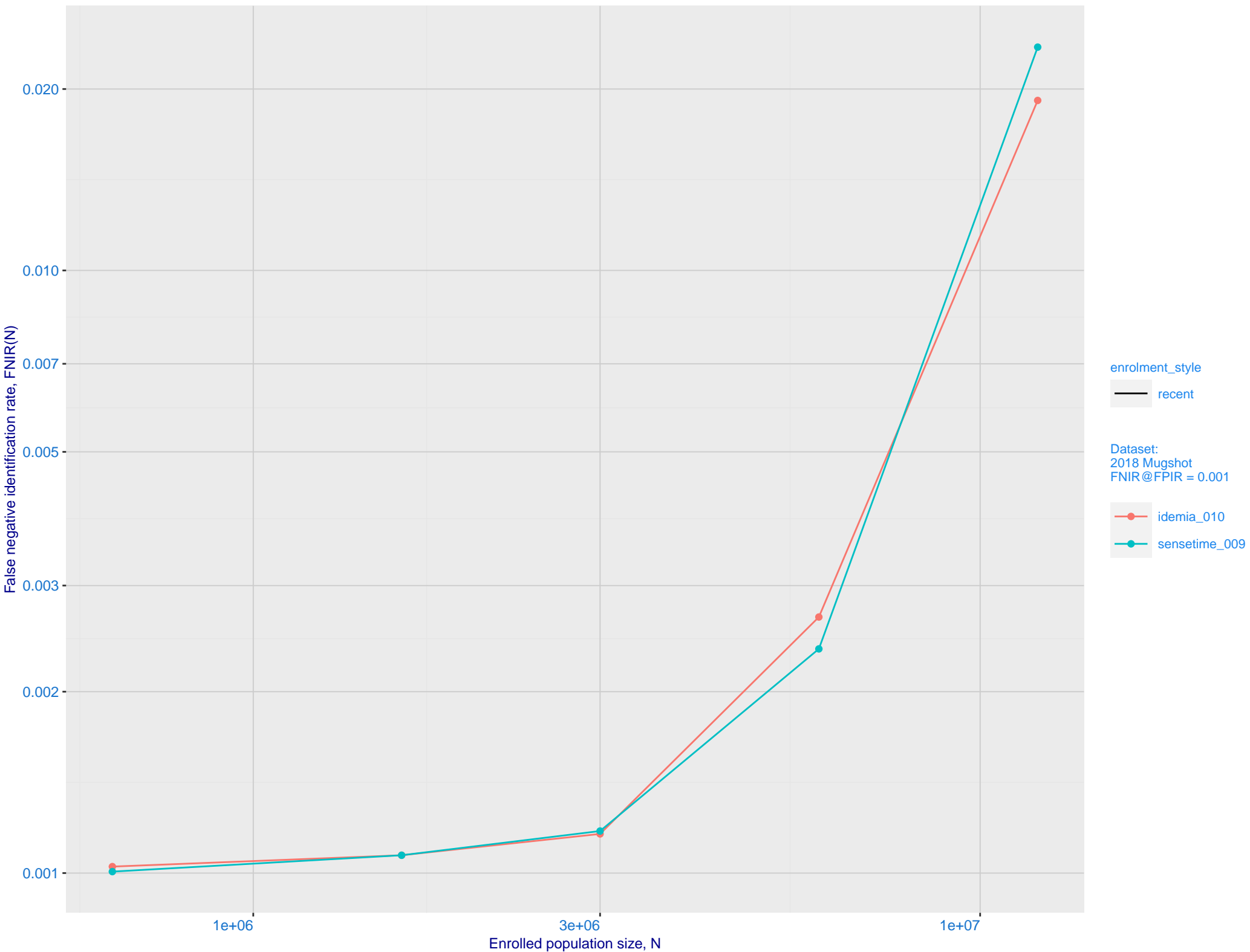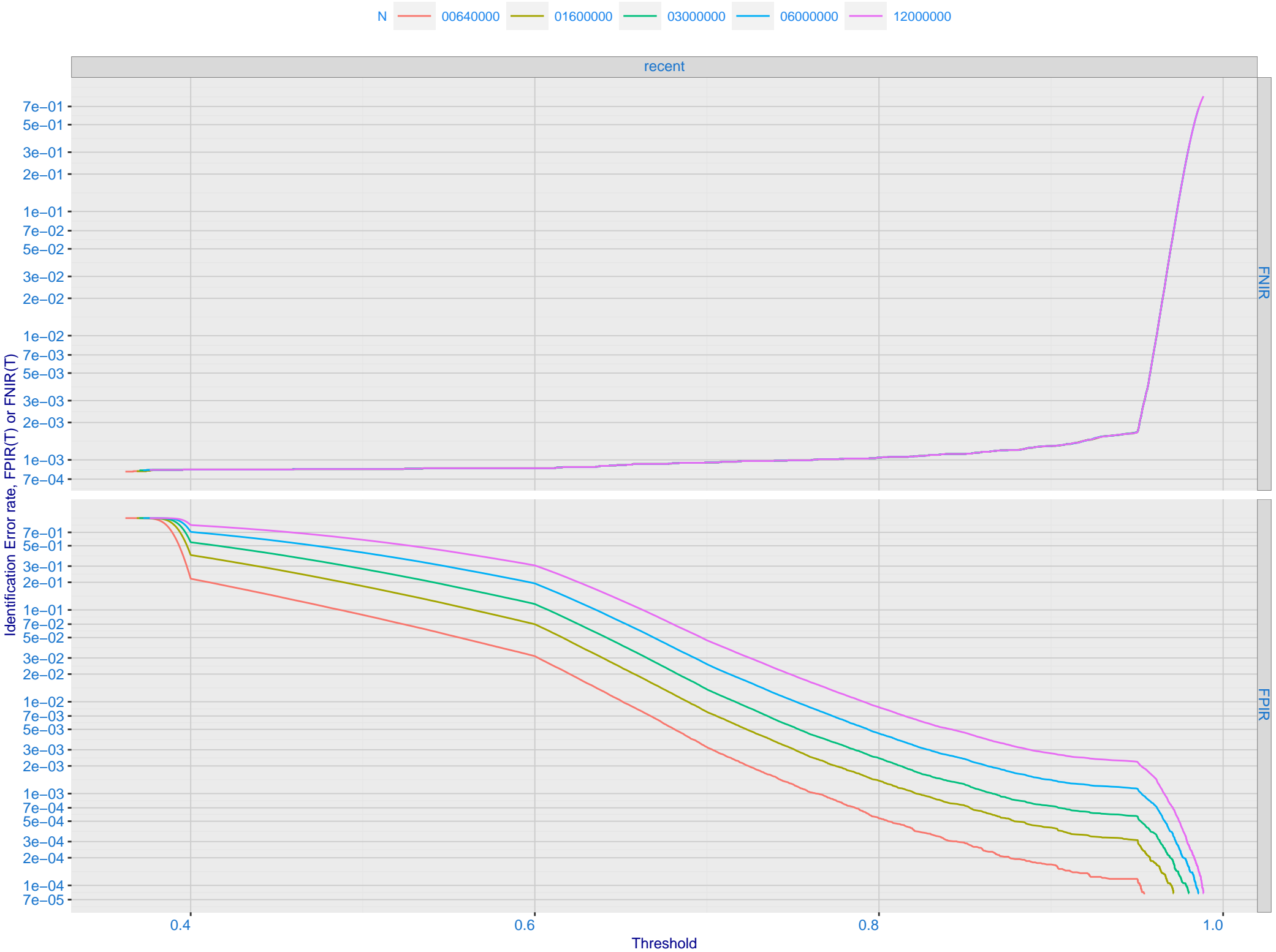
C: Evolution of accuracy for SENSETIME algorithms on three datasets 2018 – present
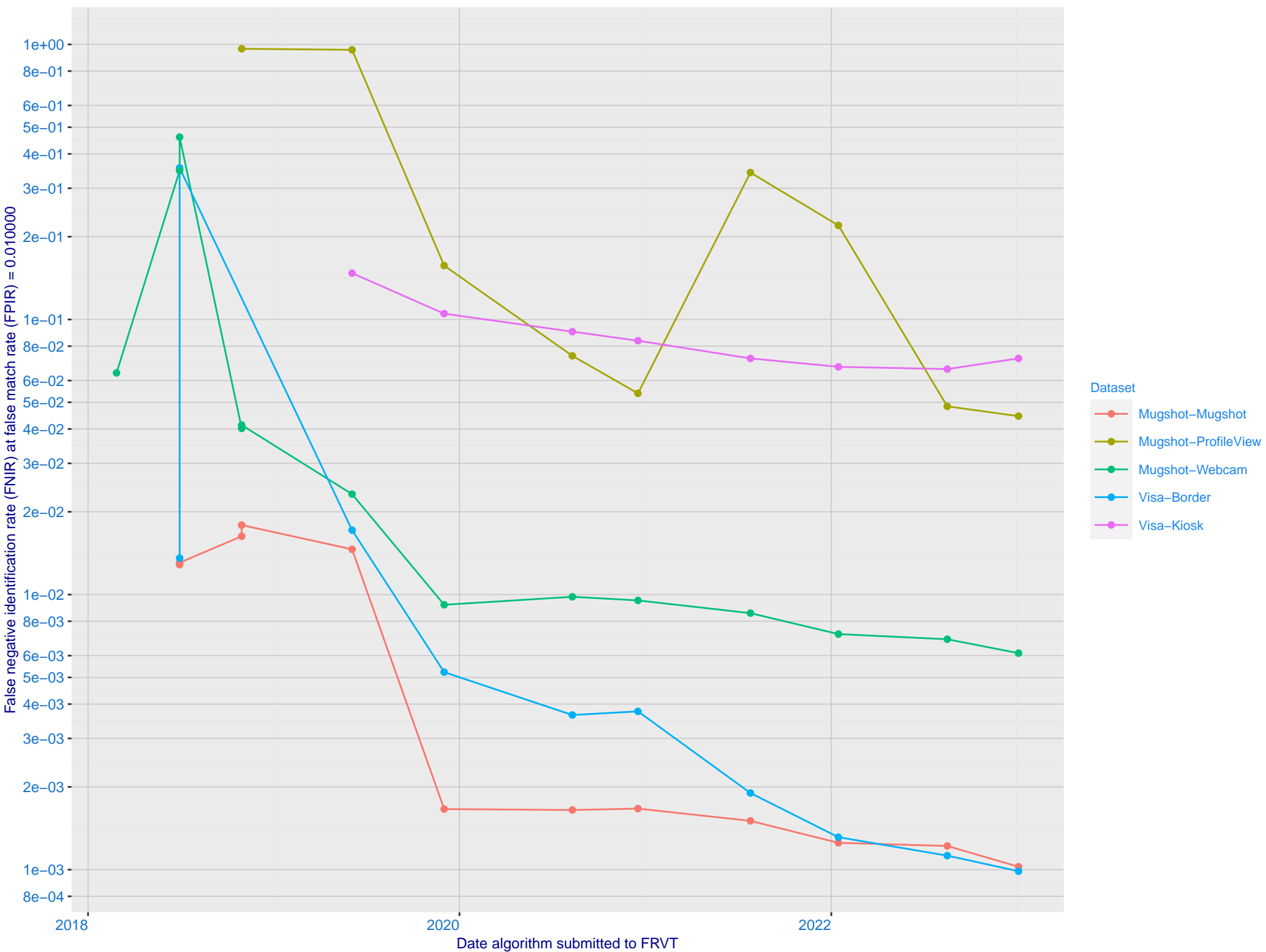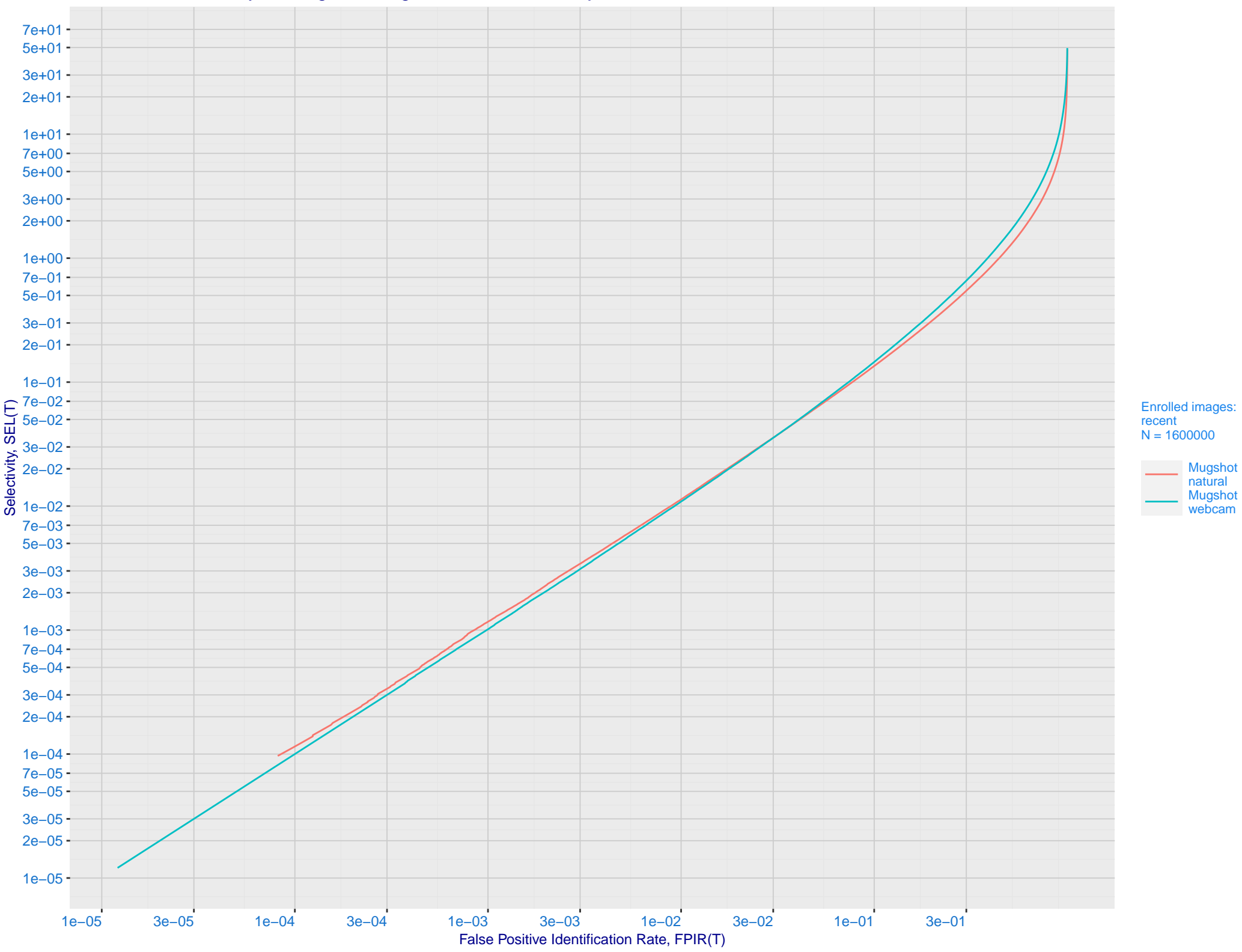
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
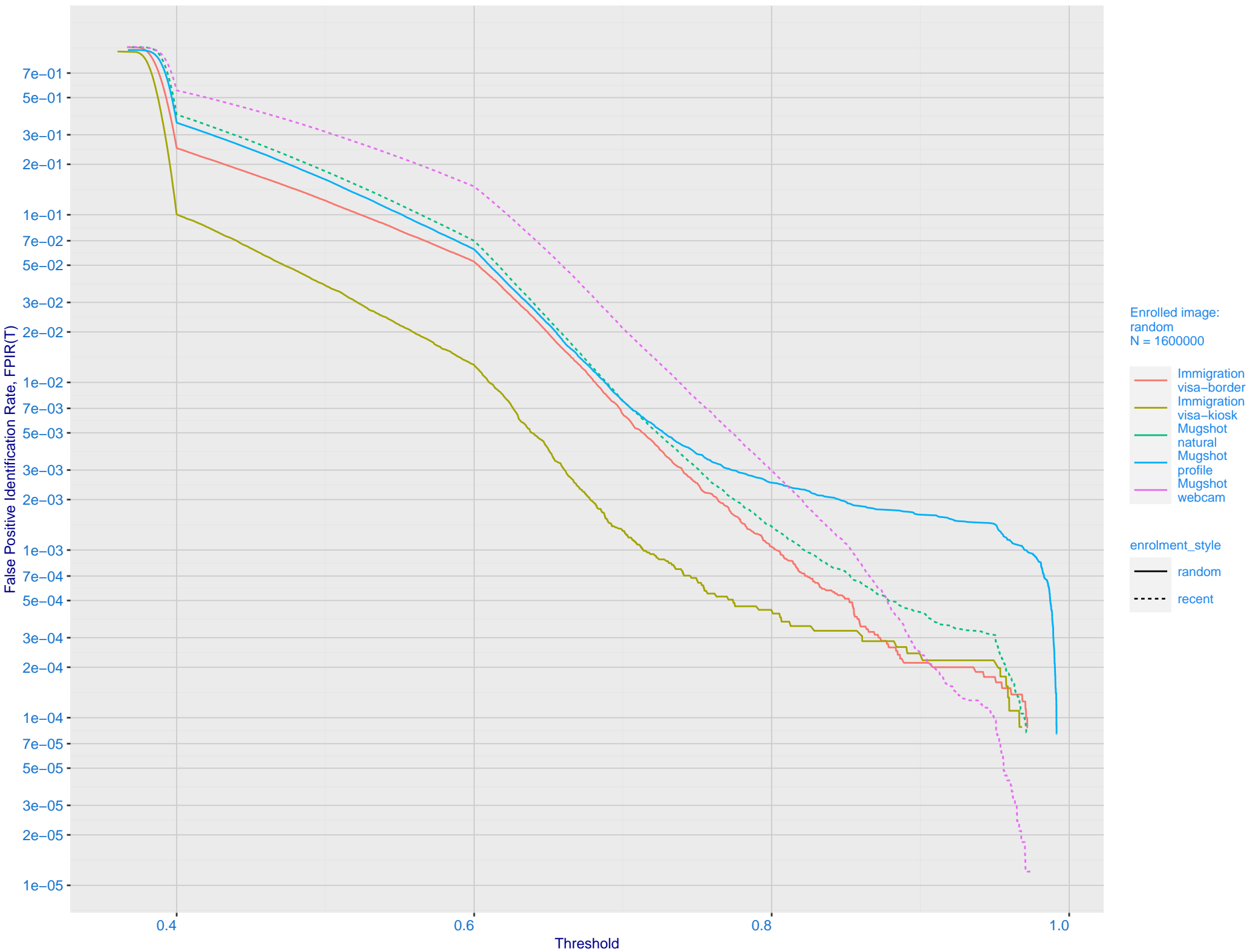
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images

F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate
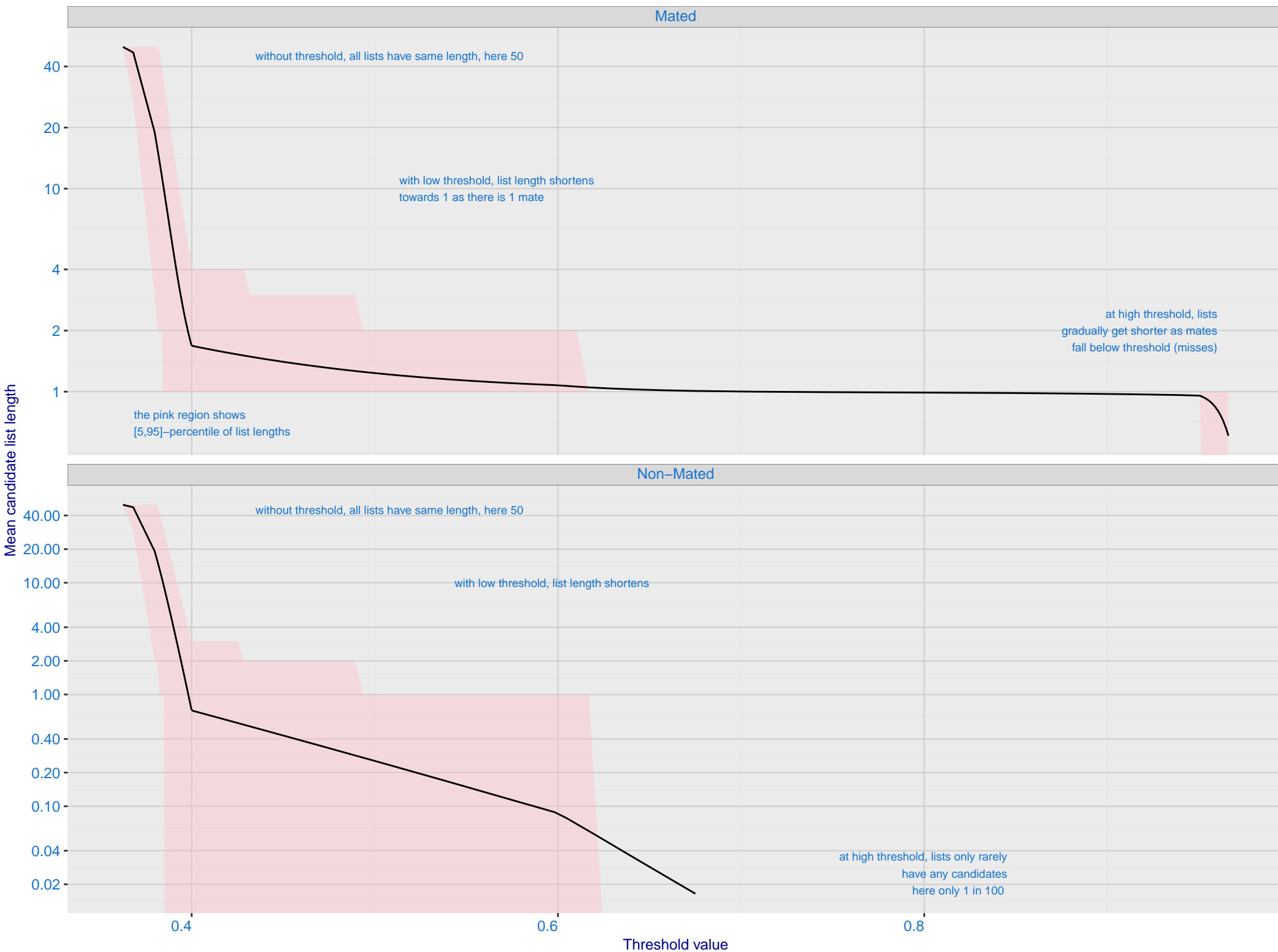
Selectivity, SEL(T) *(y-axis)*

False Positive Identification Rate, FPIR(T) *(x-axis)*

Enrolled images:
recent
N = 1600000

Mugshot
natural
Mugshot
webcam

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
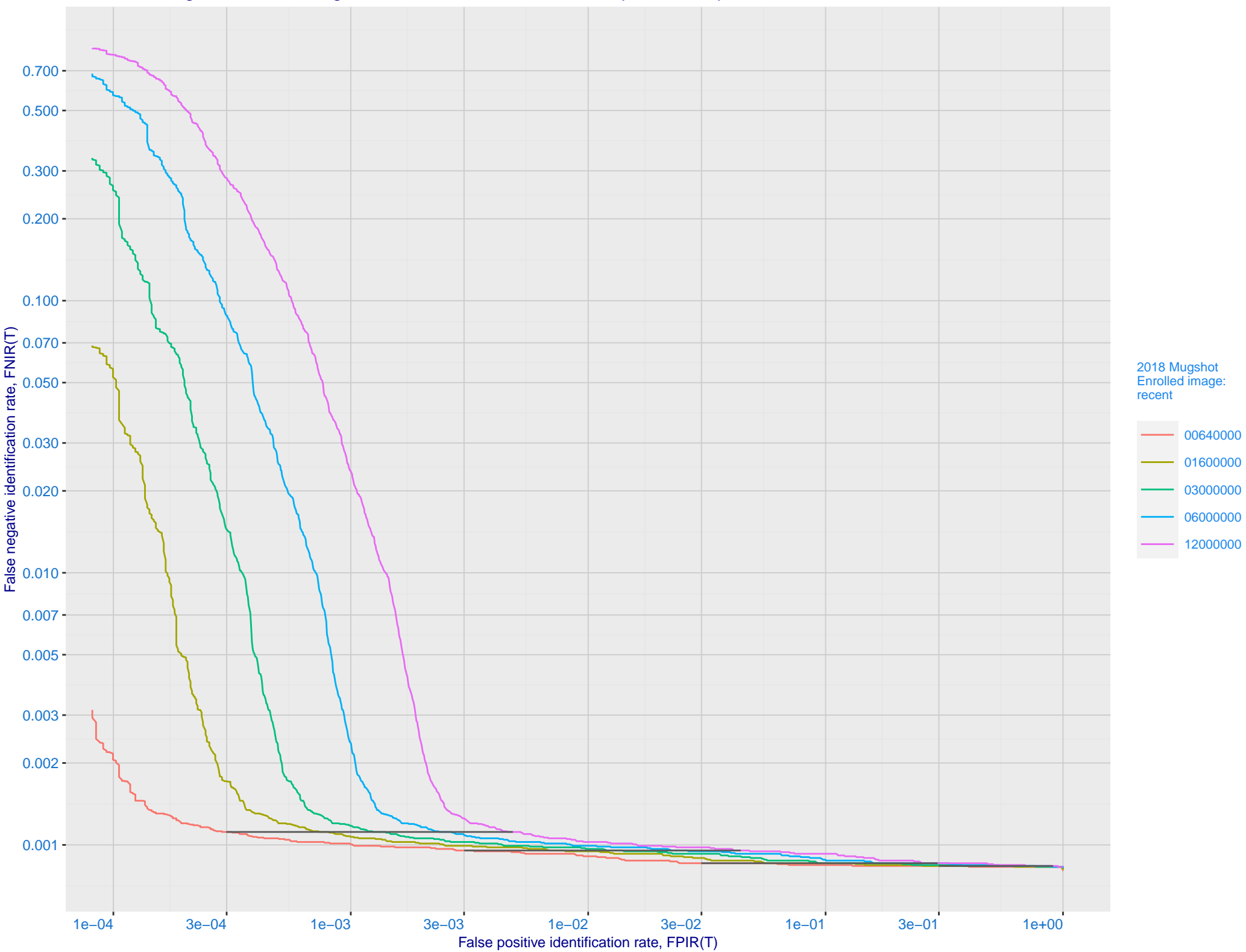
Mean candidate list length

Threshold value

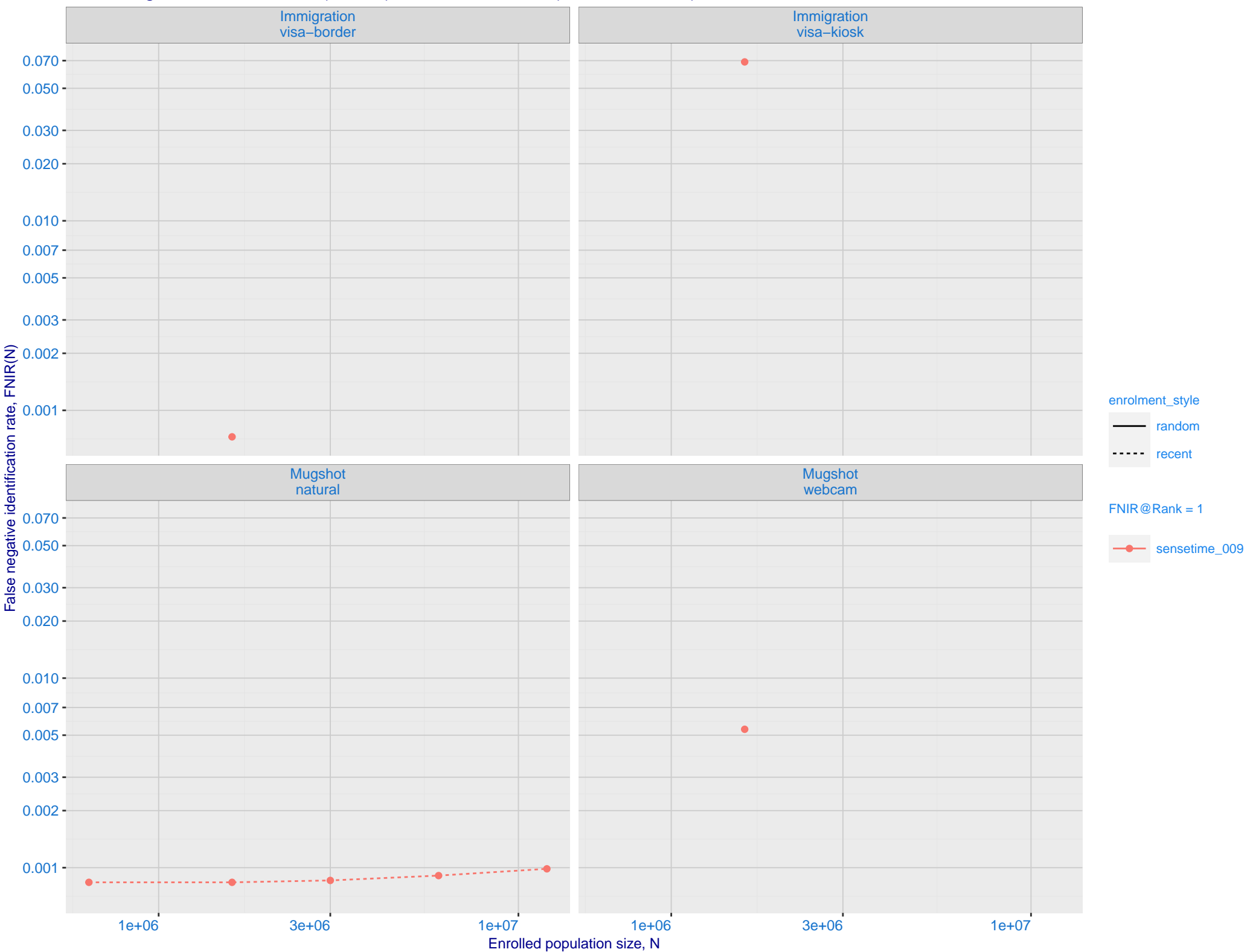# I: FNIR and FPIR dependence on threshold
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image
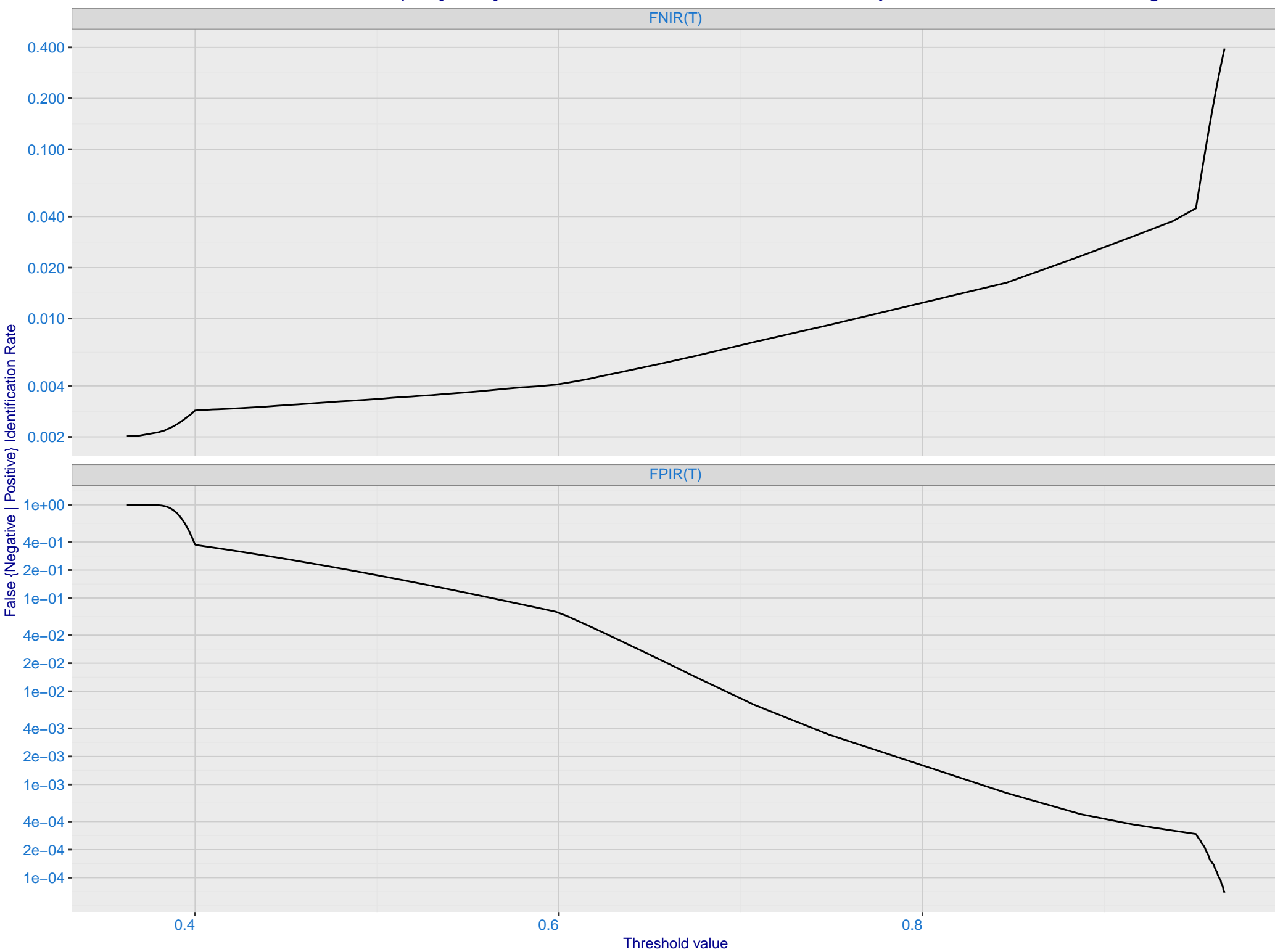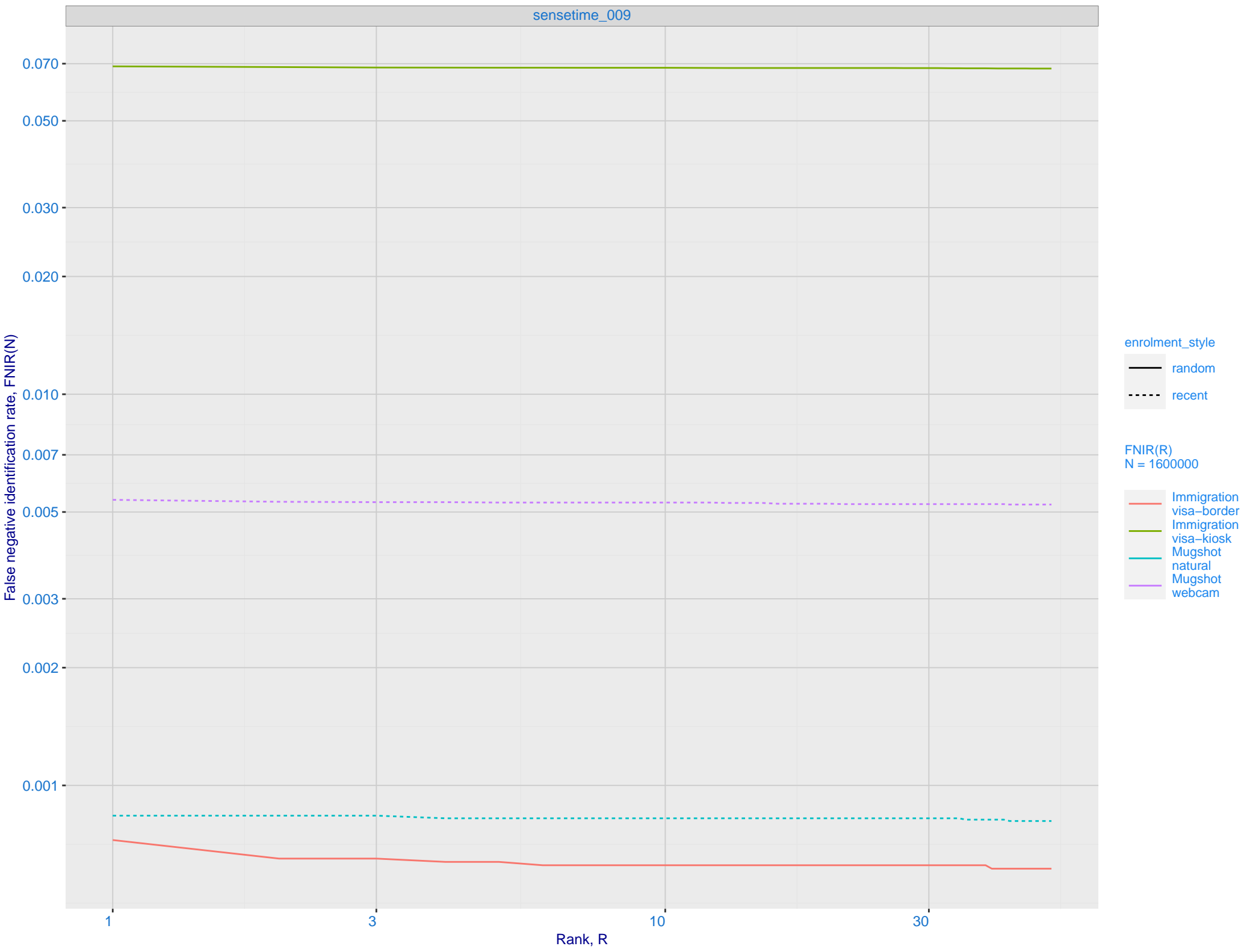
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.

K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_009)

L: Investigational mode: FNIR(1600000, R, 0) by probe type

sensetime_009

enrolment_style
— random
---- recent

FNIR(R)
N = 1600000

Immigration
visa–border
Immigration
visa–kiosk
Mugshot
natural
Mugshot
webcam

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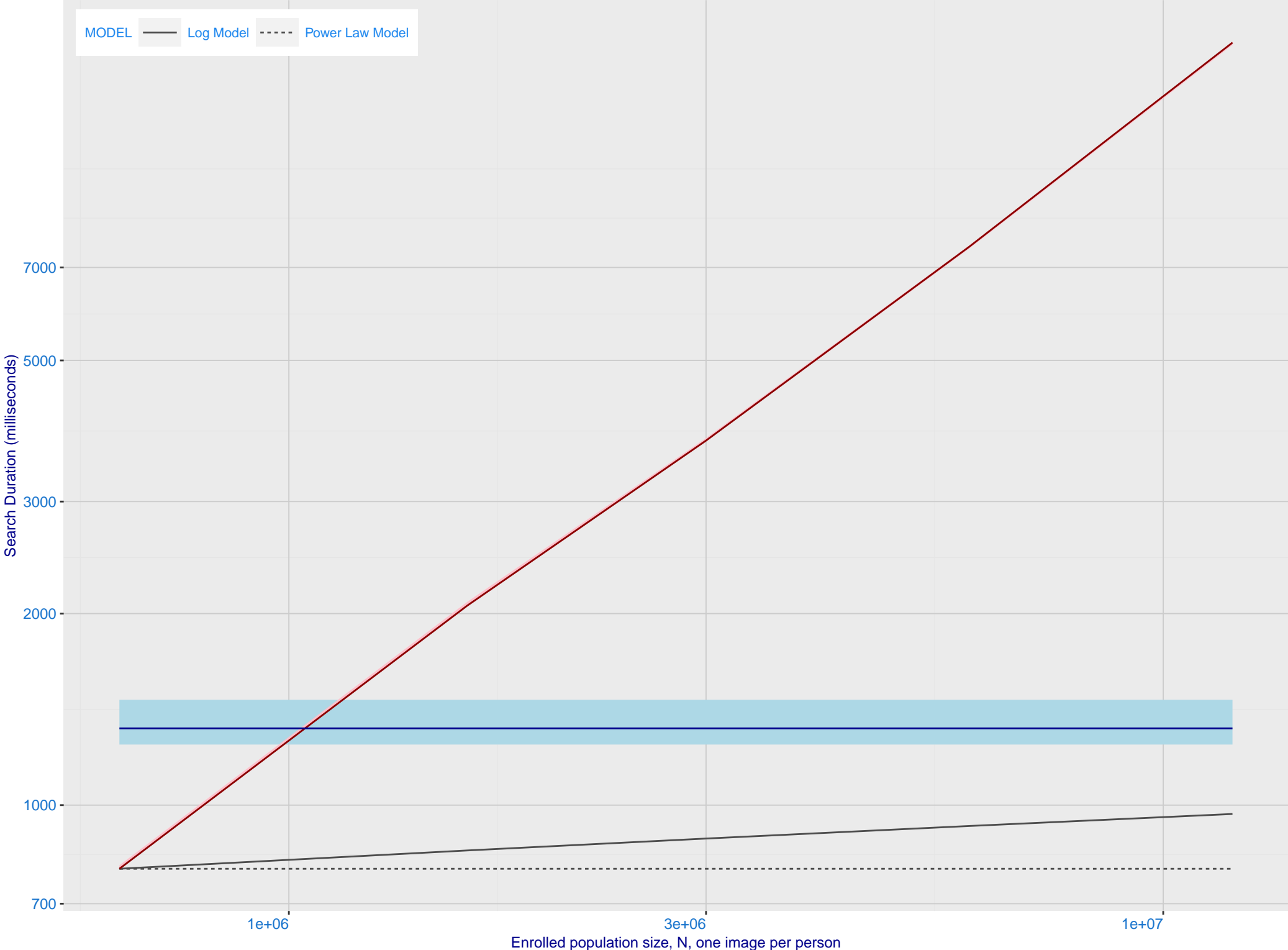
O: FNIR(T, N = 1.6 million) by sex, age and time−lapse. The top row gives investigational rank−1 miss rates.
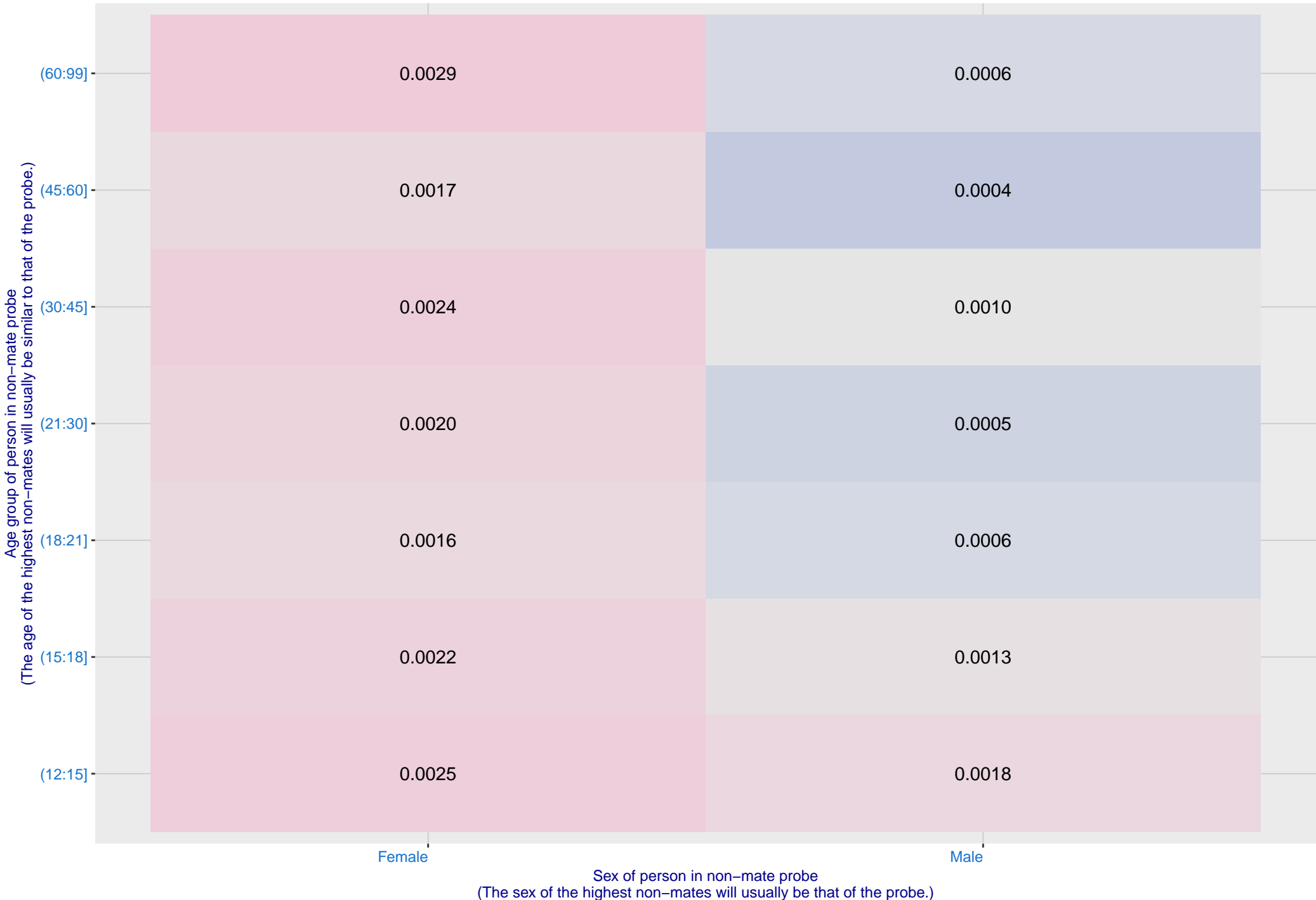The bottom panels give high threshold for more lights−out identification with low FPIR.

Algorithm: sensetime_009, Dataset: Border−Crossing Ageing N = 1600000
Text encodes FNIR, Color encodes log(FNIR)
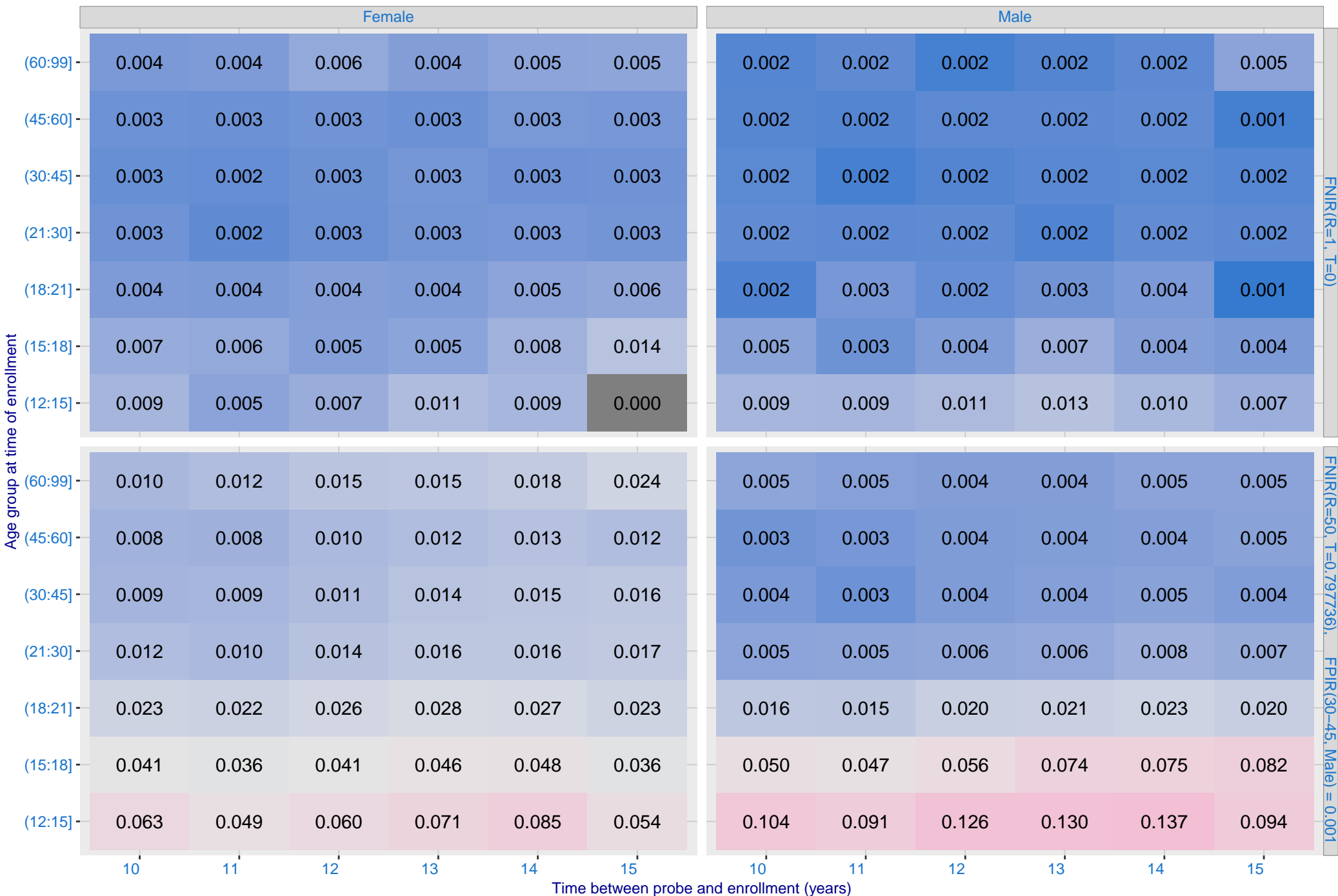
P: FPIR(N = 1.6 million) by sex and age. It is typical for false positive identification rates to be higher in women except in their teens.

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