A: Datasheet

Algorithm: cogent_007

Developer: Thales Group

Submission Date: 2023_01_30

Template size: 550 bytes

Template time (2.5 percentile): 983 msec

Template time (median): 984 msec

Template time (97.5 percentile): 1034 msec

Investigation:

Frontal mugshot ranking 24 (out of 402) –– FNIR(1600000, 0, 1) = 0.0011 vs. lowest 0.0008 from intema_001

Mugshot webcam ranking 39 (out of 364) –– FNIR(1600000, 0, 1) = 0.0081 vs. lowest 0.0054 from sensetime_009

Mugshot profile ranking 26 (out of 333) –– FNIR(1600000, 0, 1) = 0.0640 vs. lowest 0.0517 from sensetime_009

Immigration visa–border ranking 27 (out of 291) –– FNIR(1600000, 0, 1) = 0.0012 vs. lowest 0.0006 from cloudwalk_mt_002

Immigration visa–kiosk ranking 112 (out of 236) –– FNIR(1600000, 0, 1) = 0.0903 vs. lowest 0.0387 from cloudwalk_mt_002

Identification:

Frontal mugshot ranking 34 (out of 402) –– FNIR(1600000, T, L+1) = 0.0036, FPIR=0.001000 vs. lowest 0.0011 from idemia_010
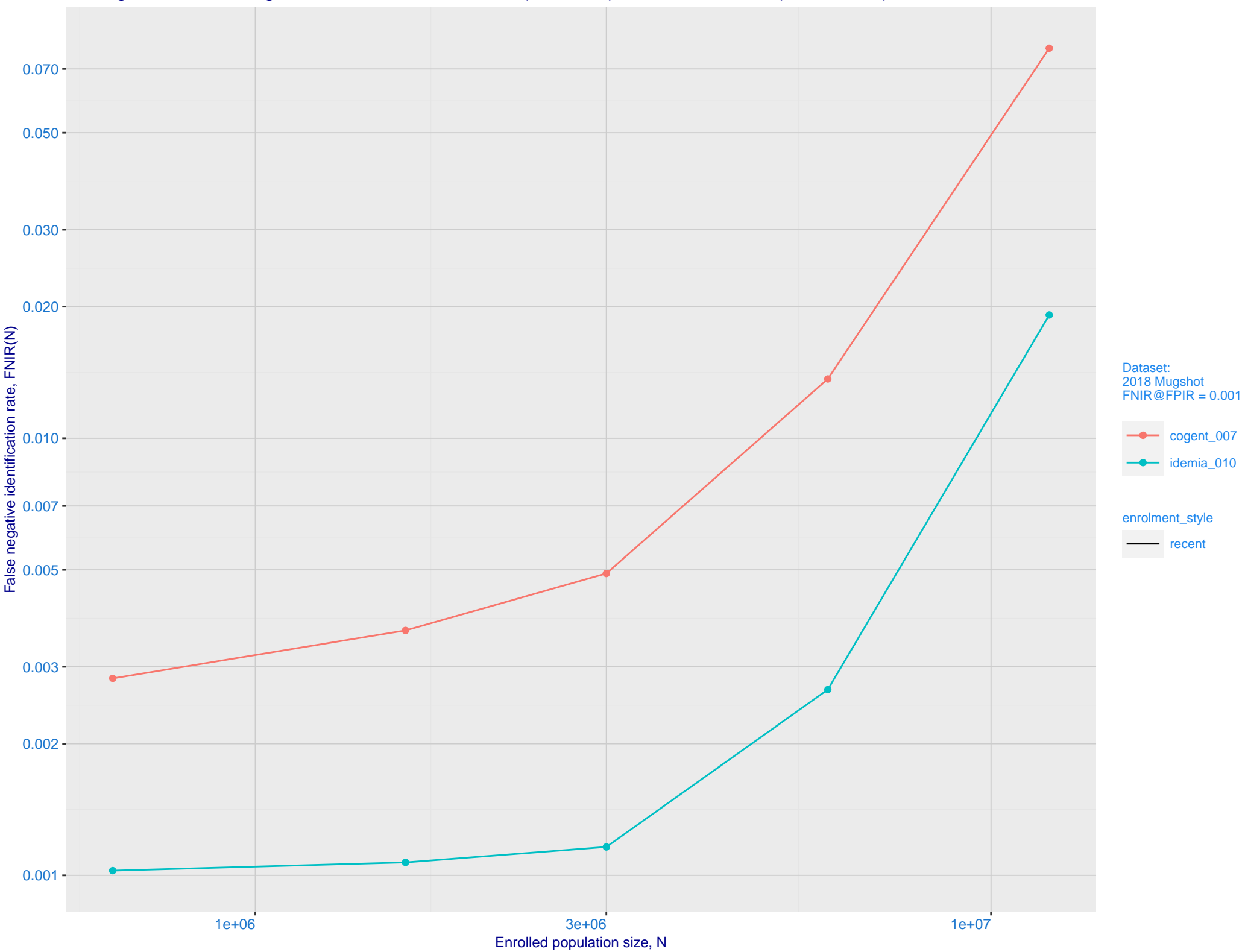
Mugshot webcam ranking 34 (out of 362) –– FNIR(1600000, T, L+1) = 0.0213, FPIR=0.001000 vs. lowest 0.0072 from sensetime_009

Mugshot profile ranking 13 (out of 332) –– FNIR(1600000, T, L+1) = 0.1940, FPIR=0.001000 vs. lowest 0.0634 from cloudwalk_mt_002
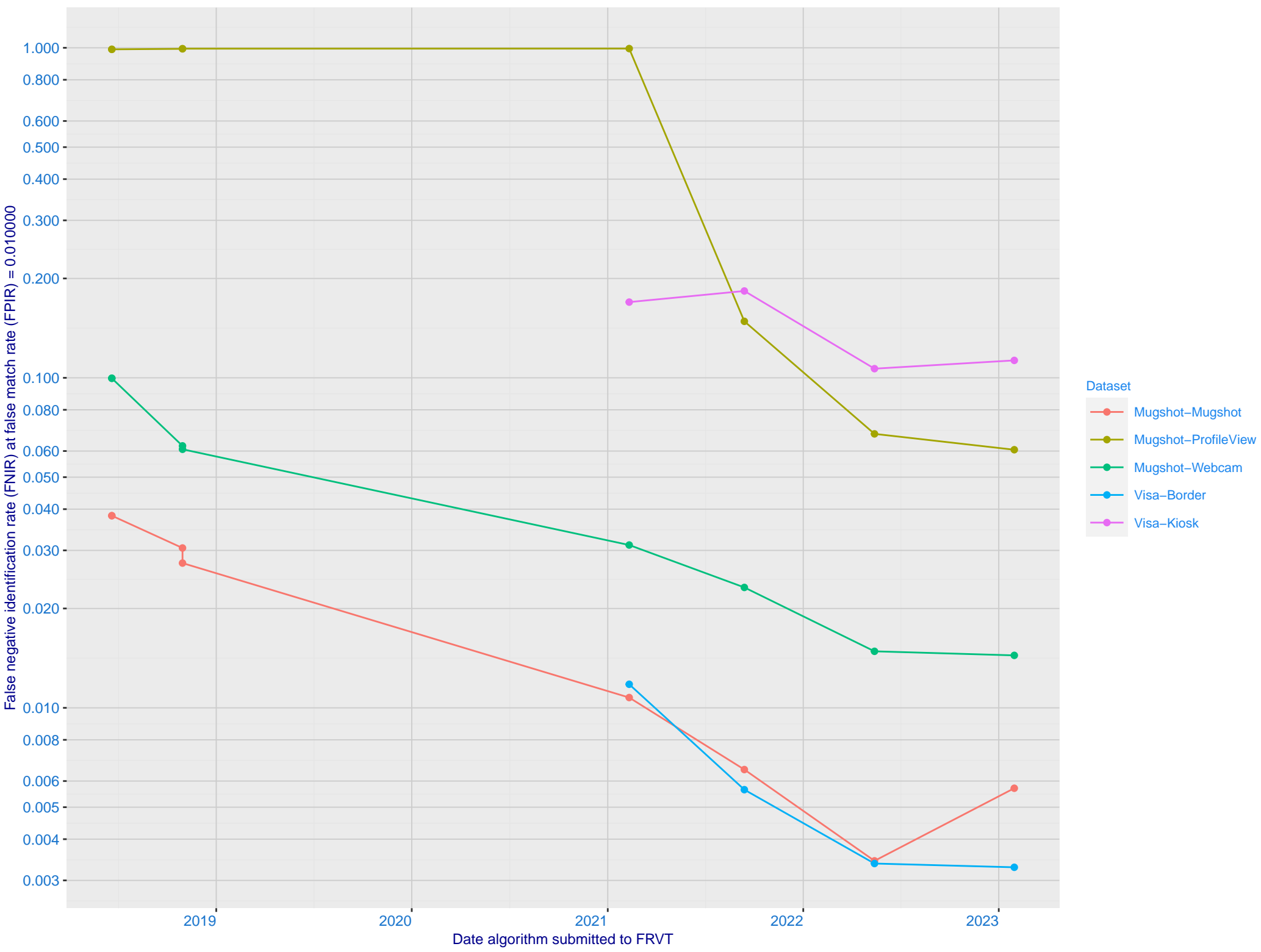
Immigration visa–border ranking 30 (out of 290) –– FNIR(1600000, T, L+1) = 0.0063, FPIR=0.001000 vs. lowest 0.0010 from cloudwalk_mt_002

Immigration visa–kiosk ranking 54 (out of 236) –– FNIR(1600000, T, L+1) = 0.1309, FPIR=0.001000 vs. lowest 0.0517 from cloudwalk_mt_002
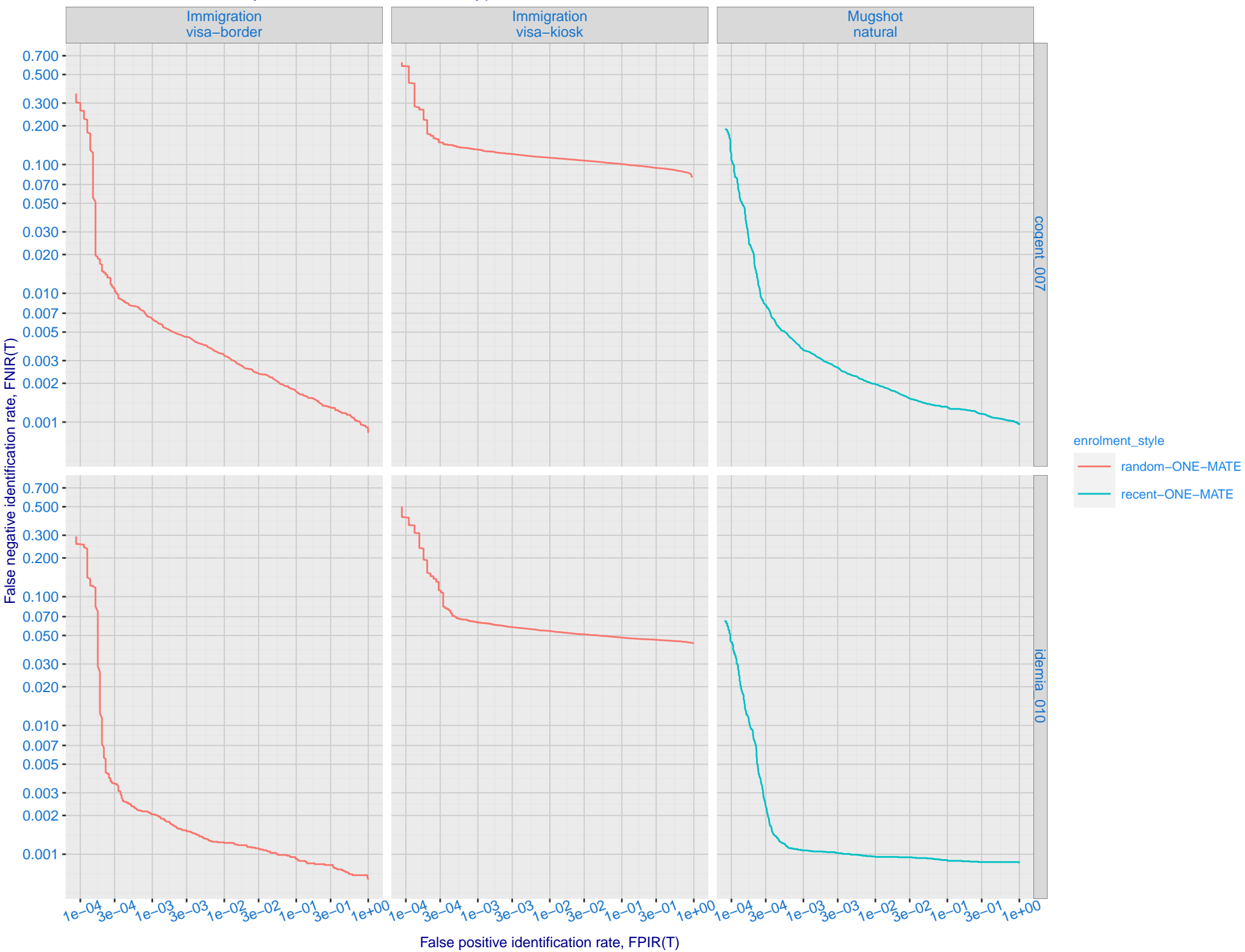
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (idemia_010)

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

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

False negative identification rate (FNIR) at false match rate (FPIR) = 0.010000
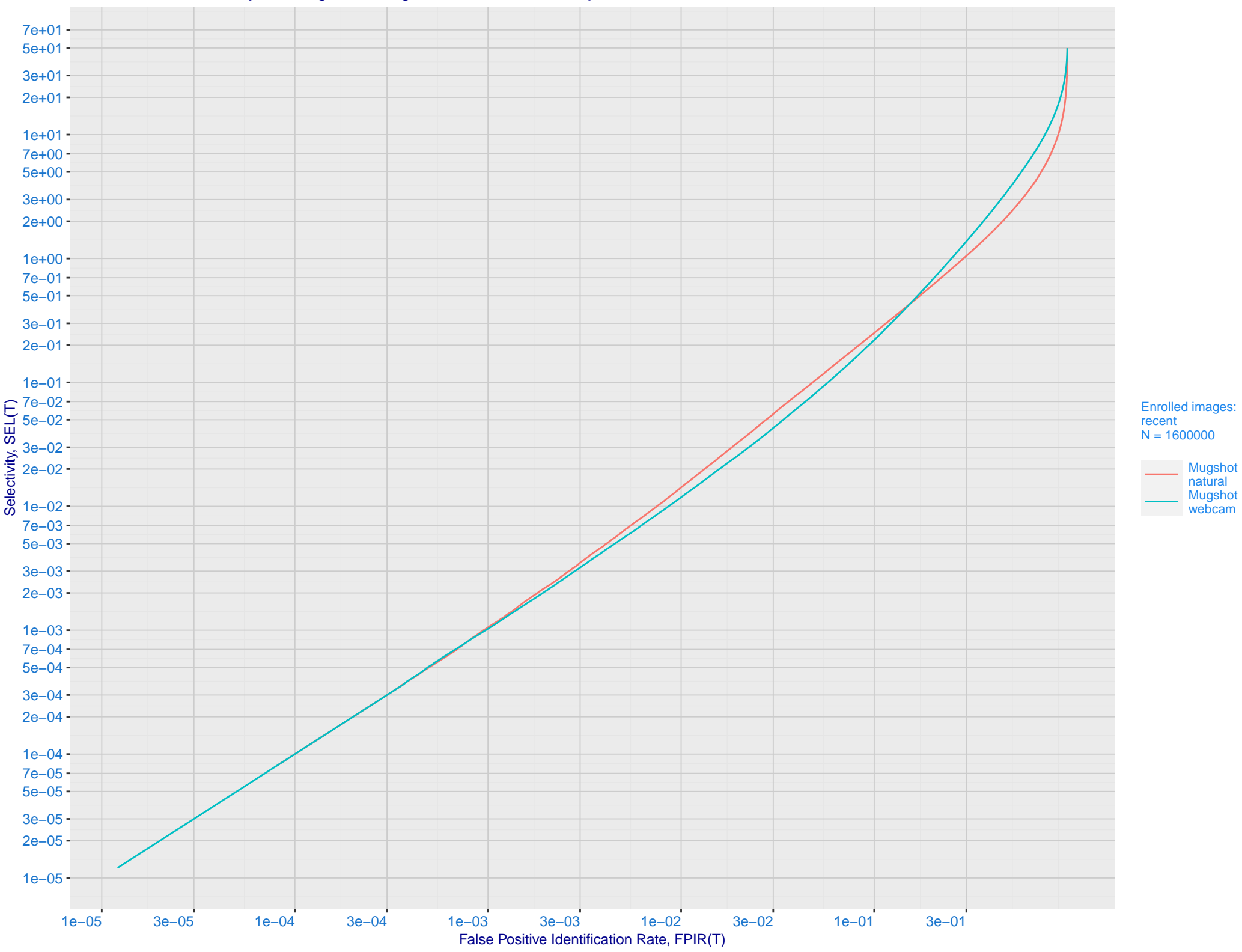
Date algorithm submitted to FRVT

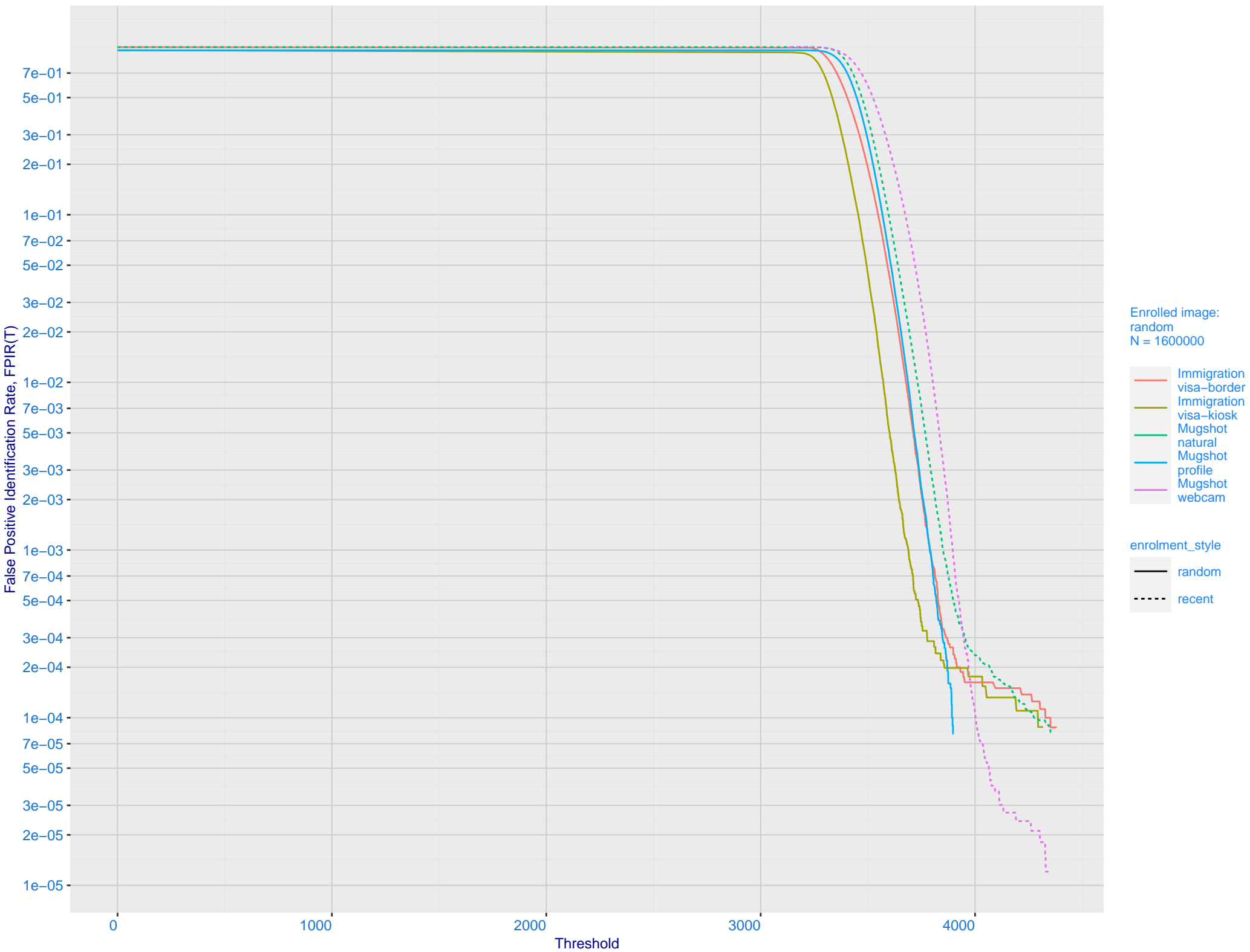D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals

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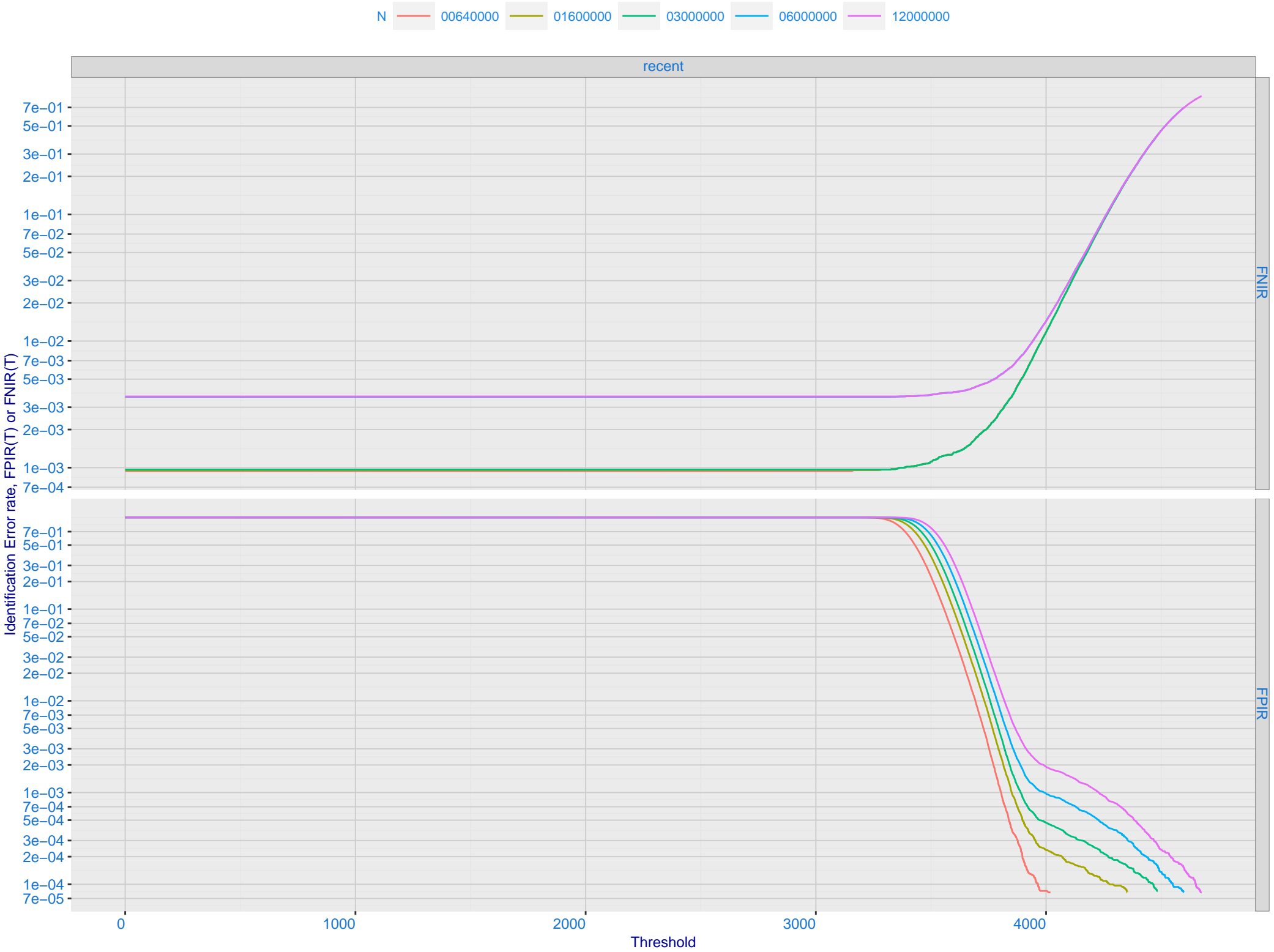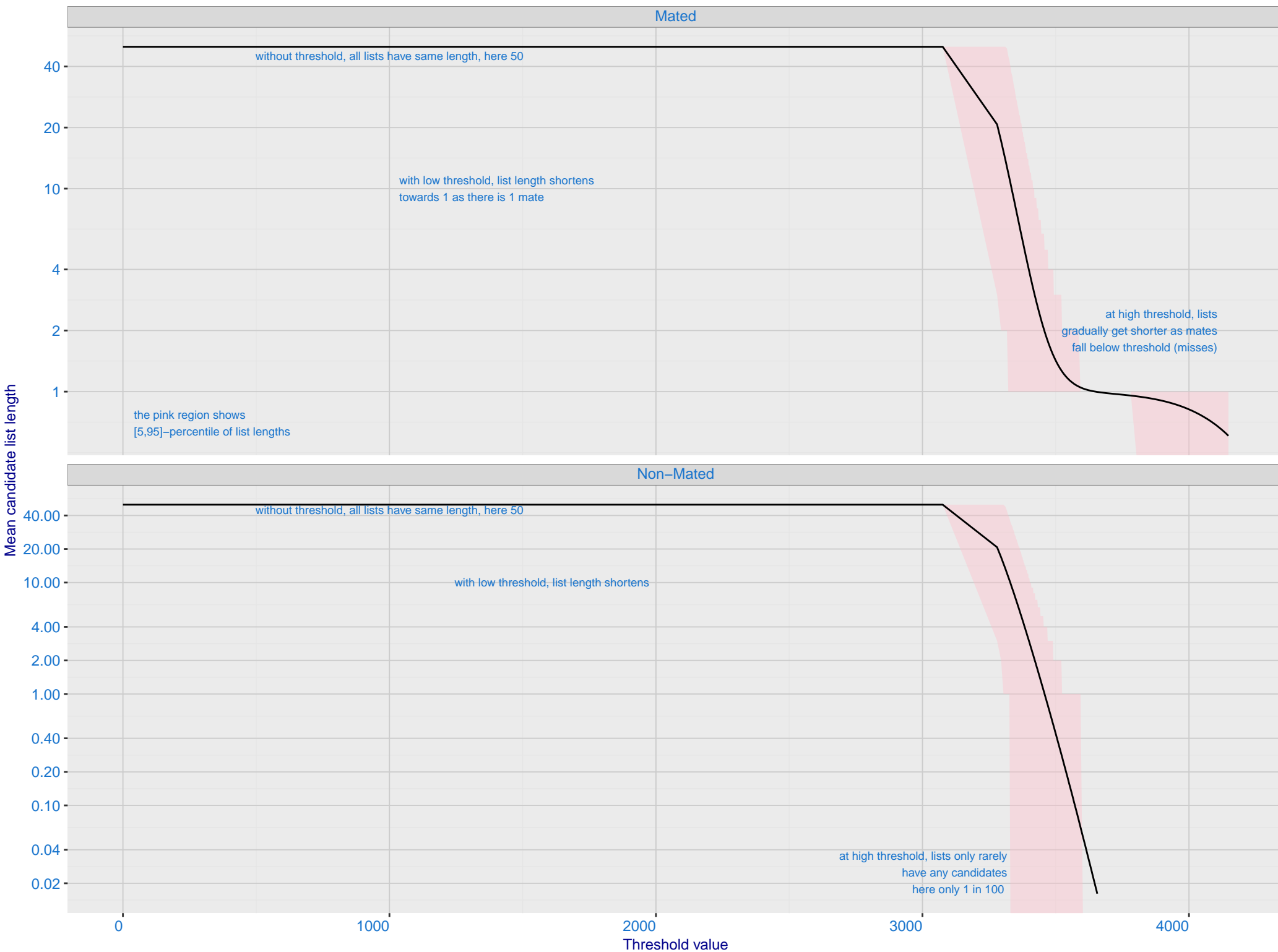
F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate

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

False Positive Identification Rate, FPIR(T)

Threshold

Enrolled image:
random
N = 1600000

Immigration
visa-border
Immigration
visa-kiosk
Mugshot
natural
Mugshot
profile
Mugshot
webcam

enrolment_style

—— random

---- recent

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
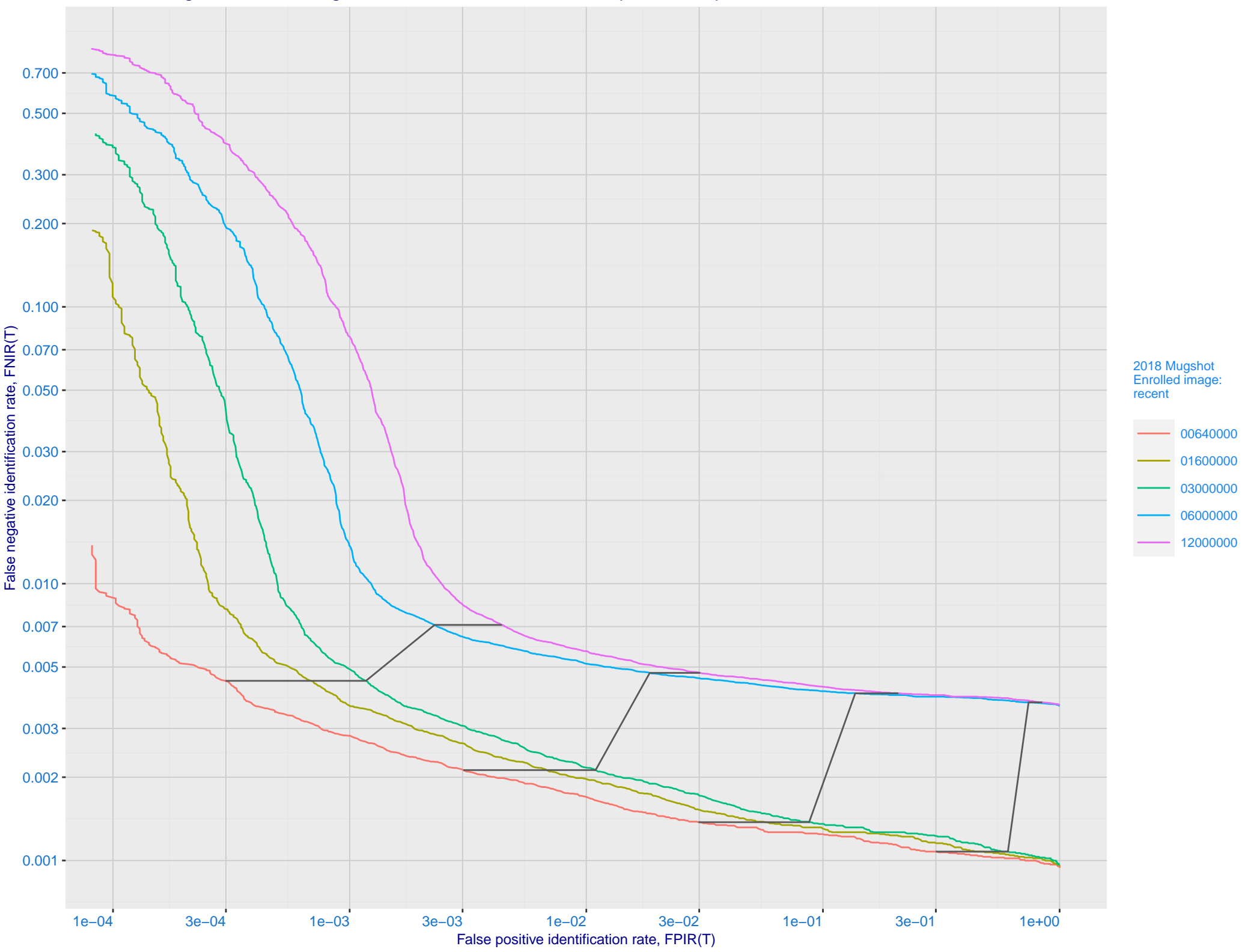
Mean candidate list length

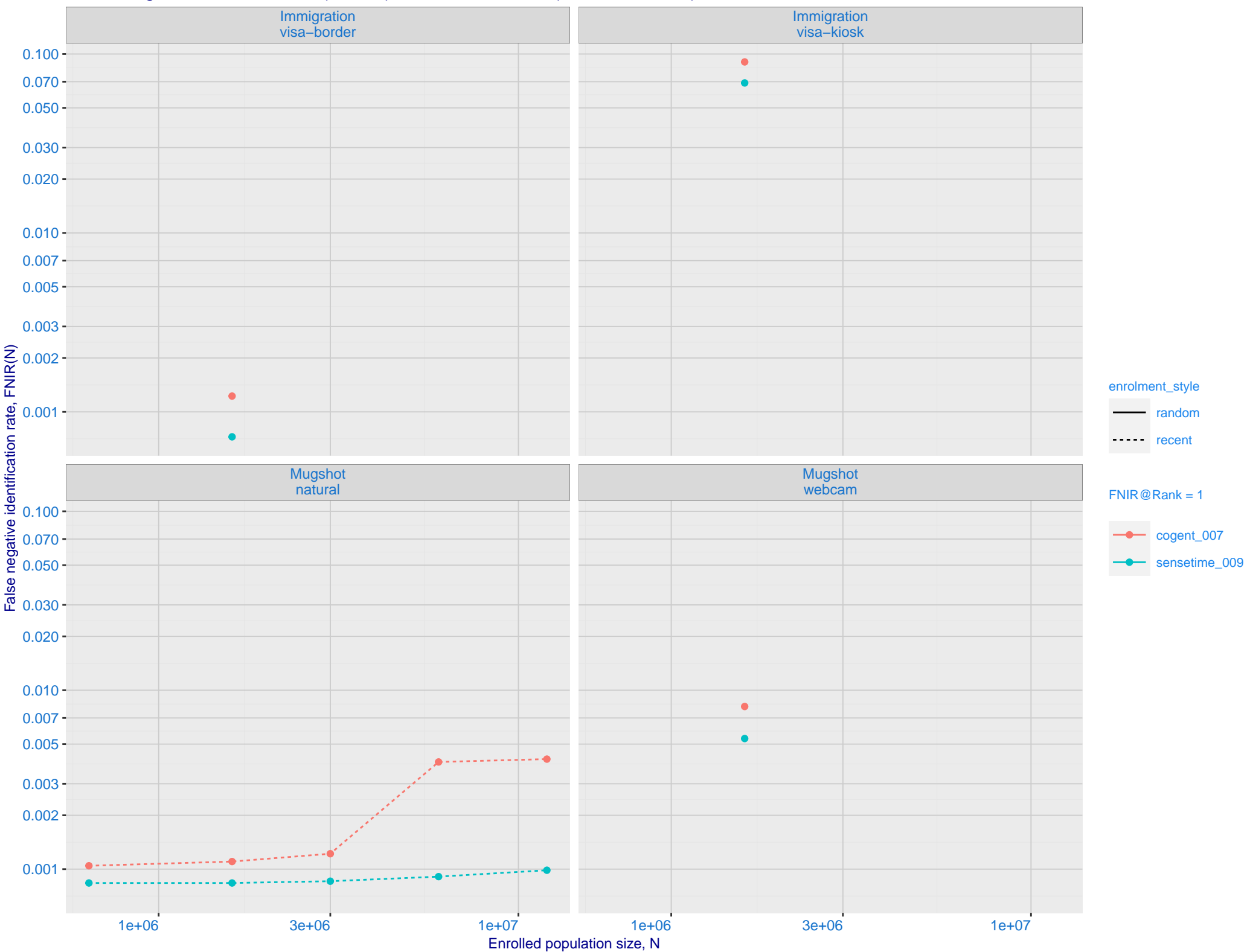Threshold value

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
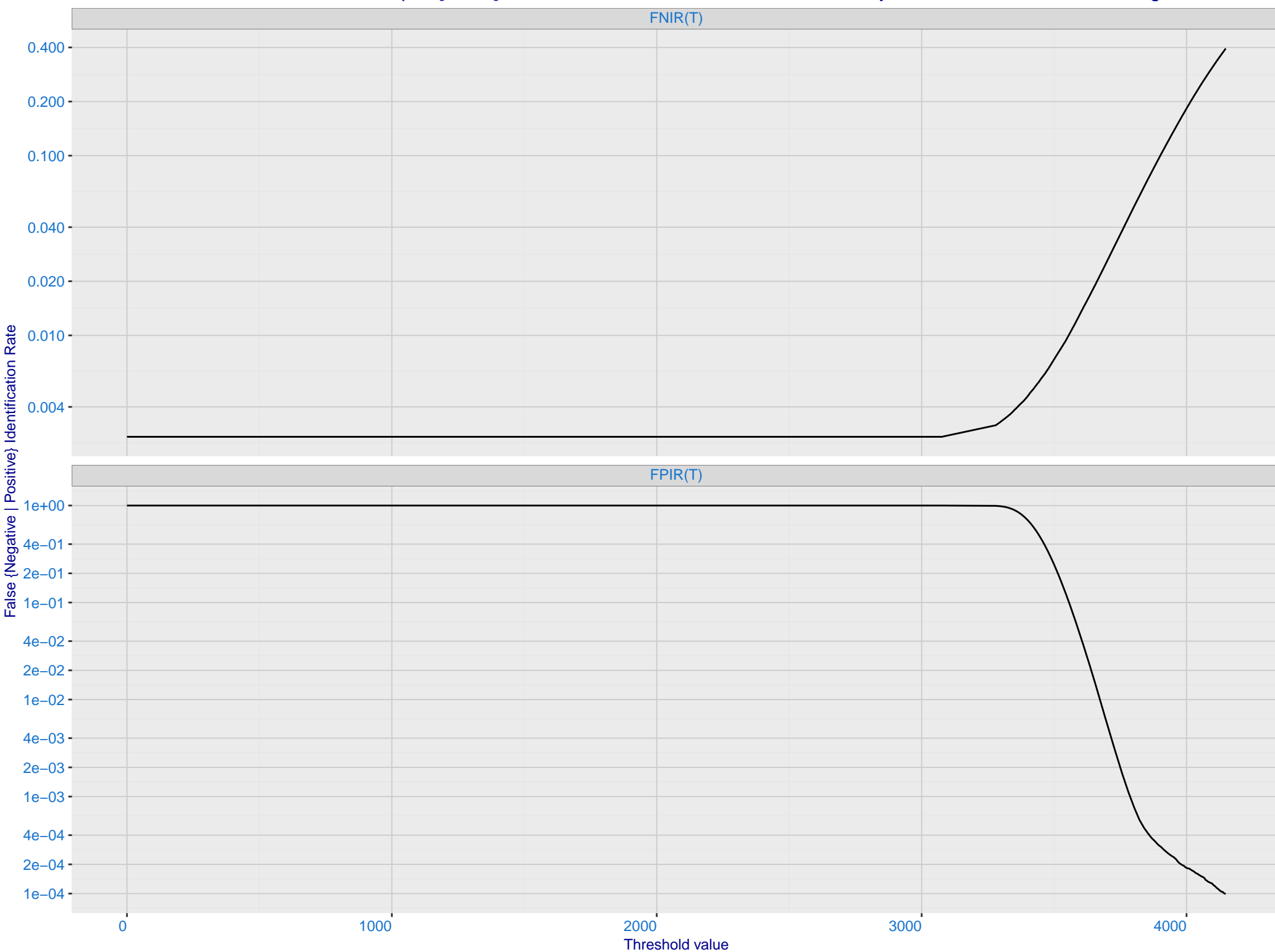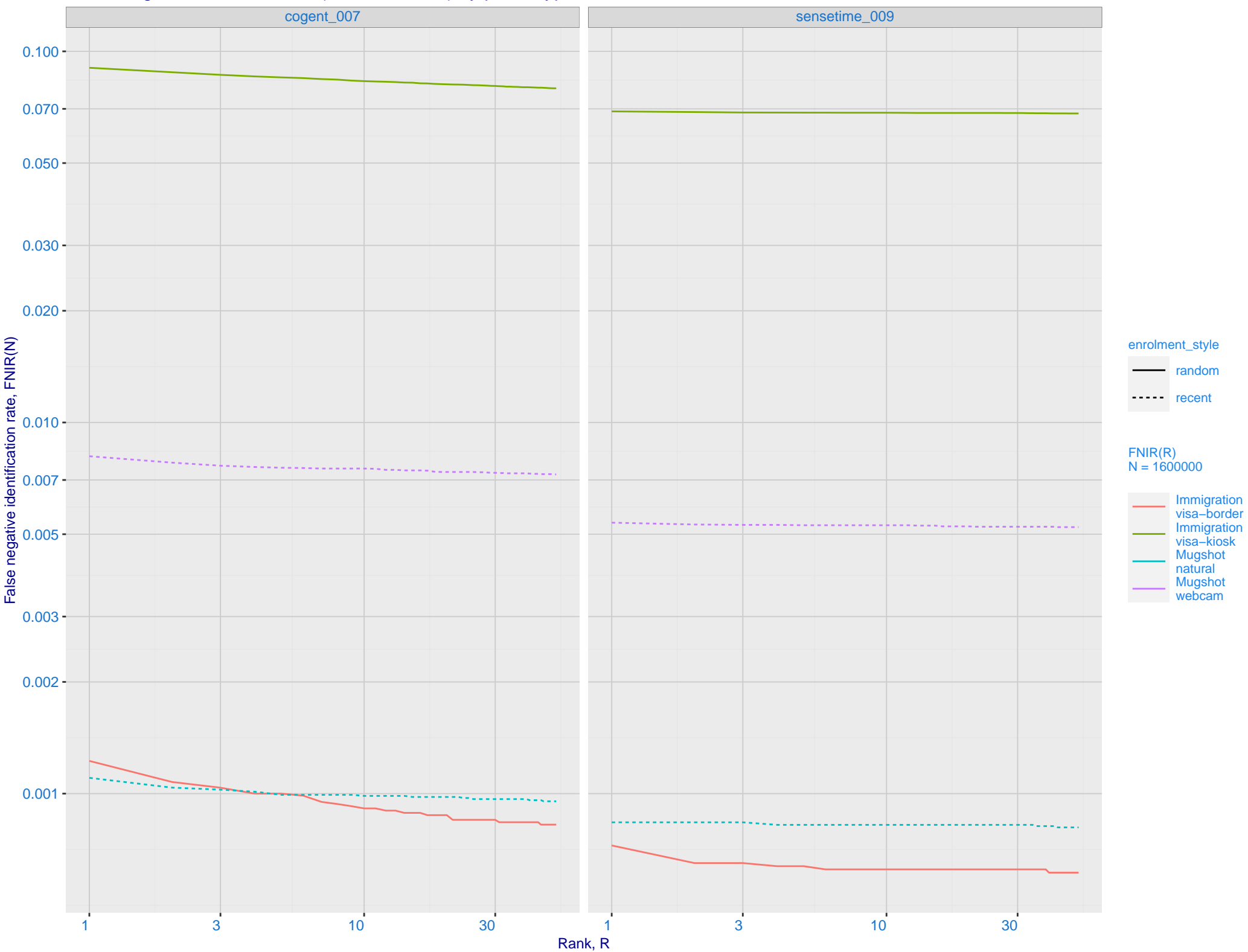
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.

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

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

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
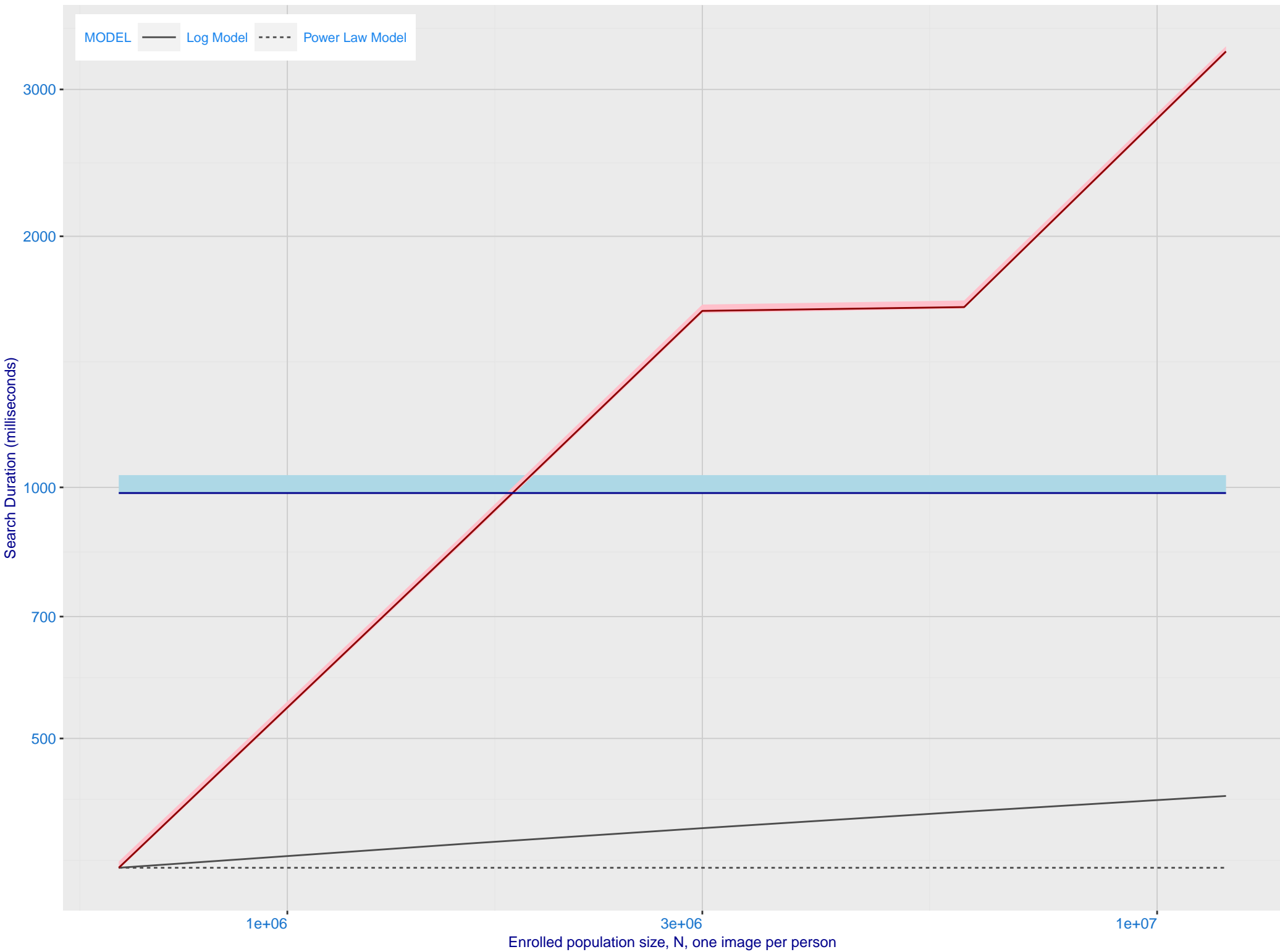
O: FNIR(T, N = 1.6 million) by sex, age and time-lapse. The top row gives investigational rank-1 miss rates. The bottom panels give high threshold for more lights-out identification with low FPIR.
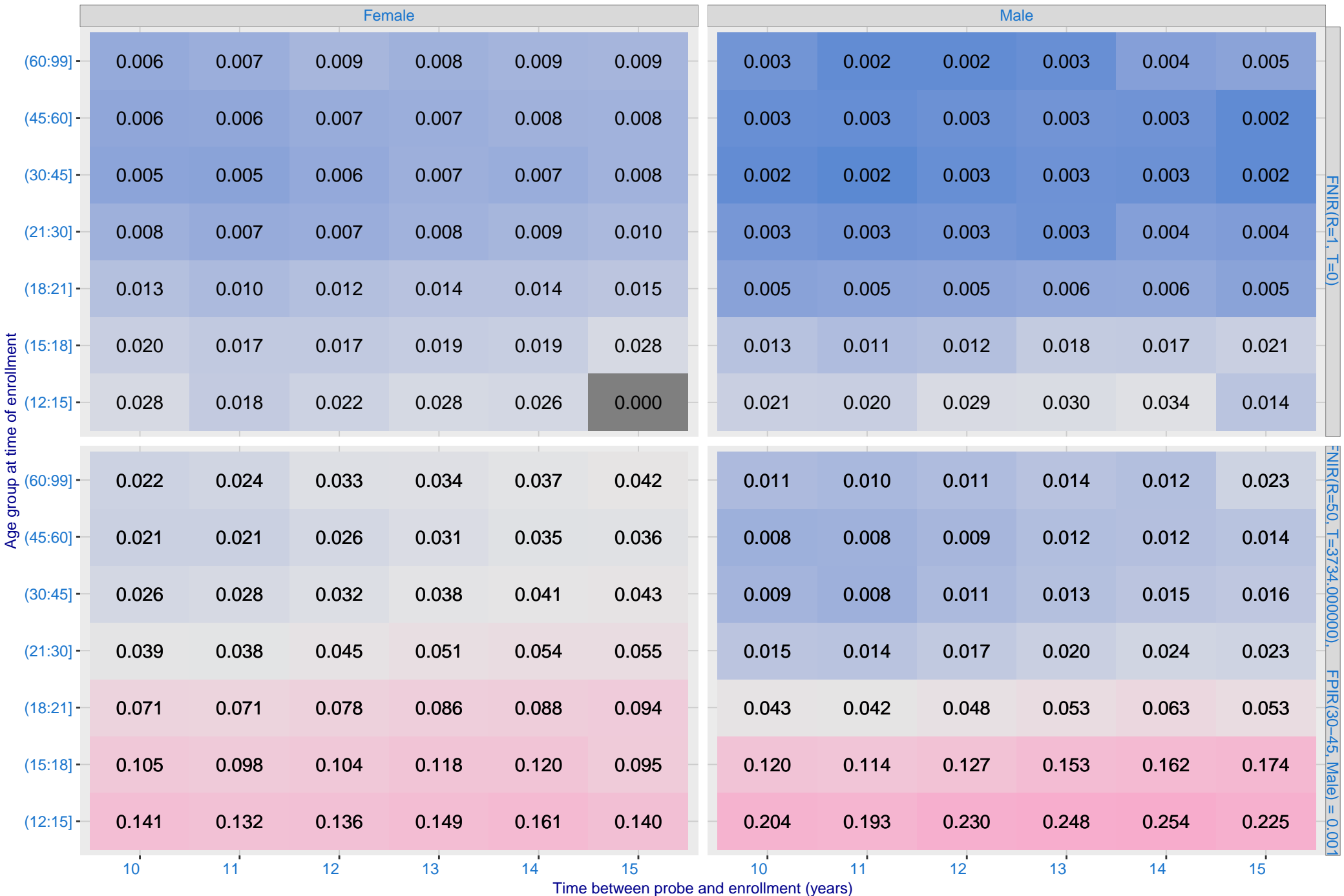
P: FPIR(N = 1.6 million) by sex and age. It is typical for false positive identification rates to be higher in women except in their teens.
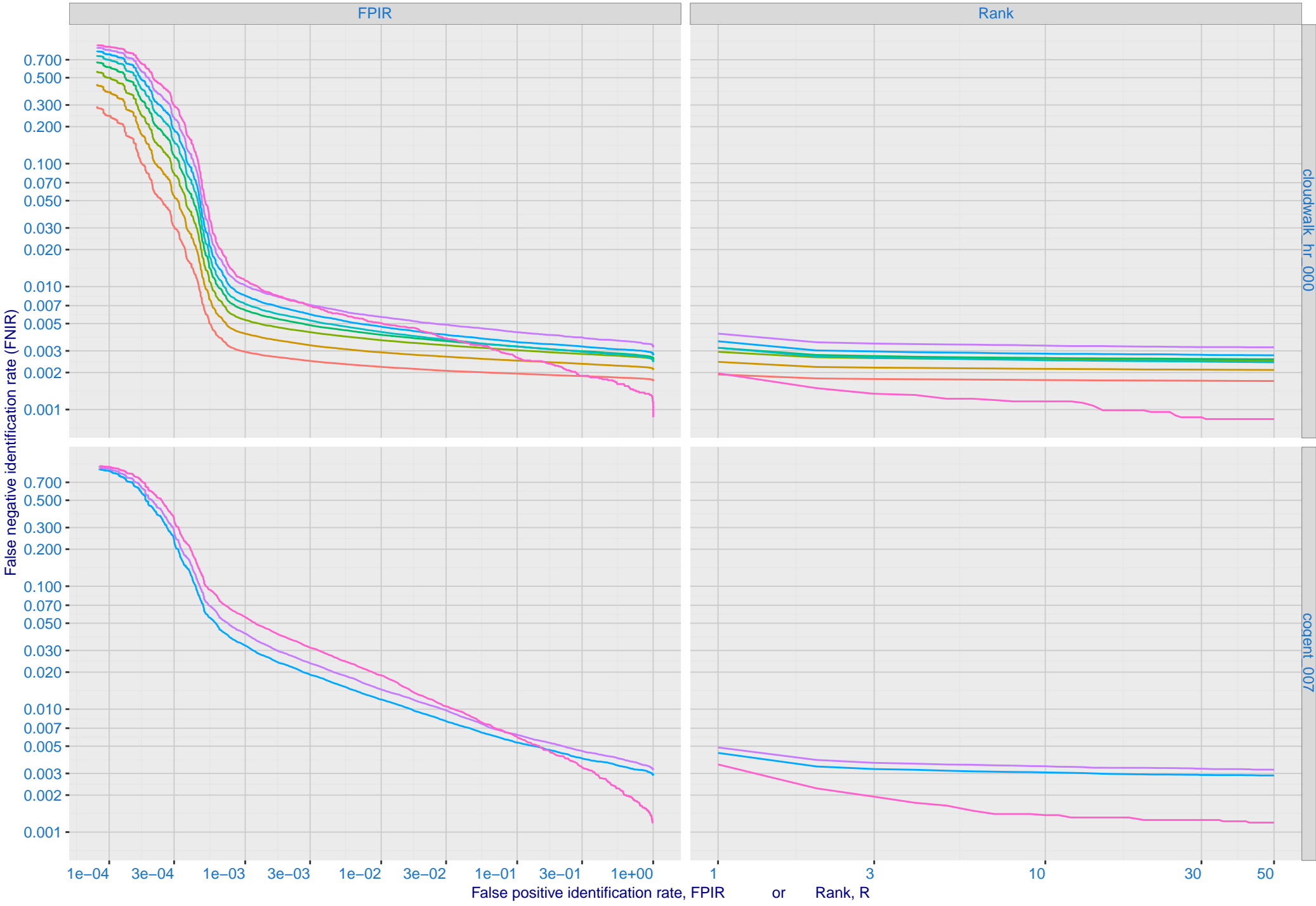
Algorithm: cogent_007, Dataset: Border−Crossing Ageing
Threshold: 3734.000000 set to achive FPIR(30−45, Male) = 0.001

Color encodes log(FPIR)

−4   −3   −2   −1

Age group of person in non−mate probe (The age of the highest non−mates will usually be similar to that of the probe.)	Female	Male
(60:99]	0.0094	0.0009
(45:60]	0.0044	0.0007
(30:45]	0.0029	0.0010
(21:30]	0.0027	0.0011
(18:21]	0.0027	0.0013
(15:18]	0.0035	0.0018
(12:15]	0.0038	0.0027

Sex of person in non−mate probe
(The sex of the highest non−mates will usually be that of the probe.)

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