A: Datasheet

Algorithm: cloudwalk_mt_002

Developer: Cloudwalk – Moontime Smart Technology

Submission Date: 2023_02_24

Template size: 2048 bytes

Template time (2.5 percentile): 974 msec

Template time (median): 976 msec

Template time (97.5 percentile): 1008 msec

Investigation:

Frontal mugshot ranking 88 (out of 397) –– FNIR(1600000, 0, 1) = 0.0018 vs. lowest 0.0008 from intema_001

Mugshot webcam ranking 86 (out of 359) –– FNIR(1600000, 0, 1) = 0.0110 vs. lowest 0.0054 from sensetime_009

Mugshot profile ranking 2 (out of 328) –– FNIR(1600000, 0, 1) = 0.0520 vs. lowest 0.0517 from sensetime_009

Immigration visa–border ranking 1 (out of 286) –– FNIR(1600000, 0, 1) = 0.0006

Immigration visa–kiosk ranking 1 (out of 231) –– FNIR(1600000, 0, 1) = 0.0387

Identification:

Frontal mugshot ranking 13 (out of 397) –– FNIR(1600000, T, L+1) = 0.0019, FPIR=0.001000 vs. lowest 0.0011 from idemia_010
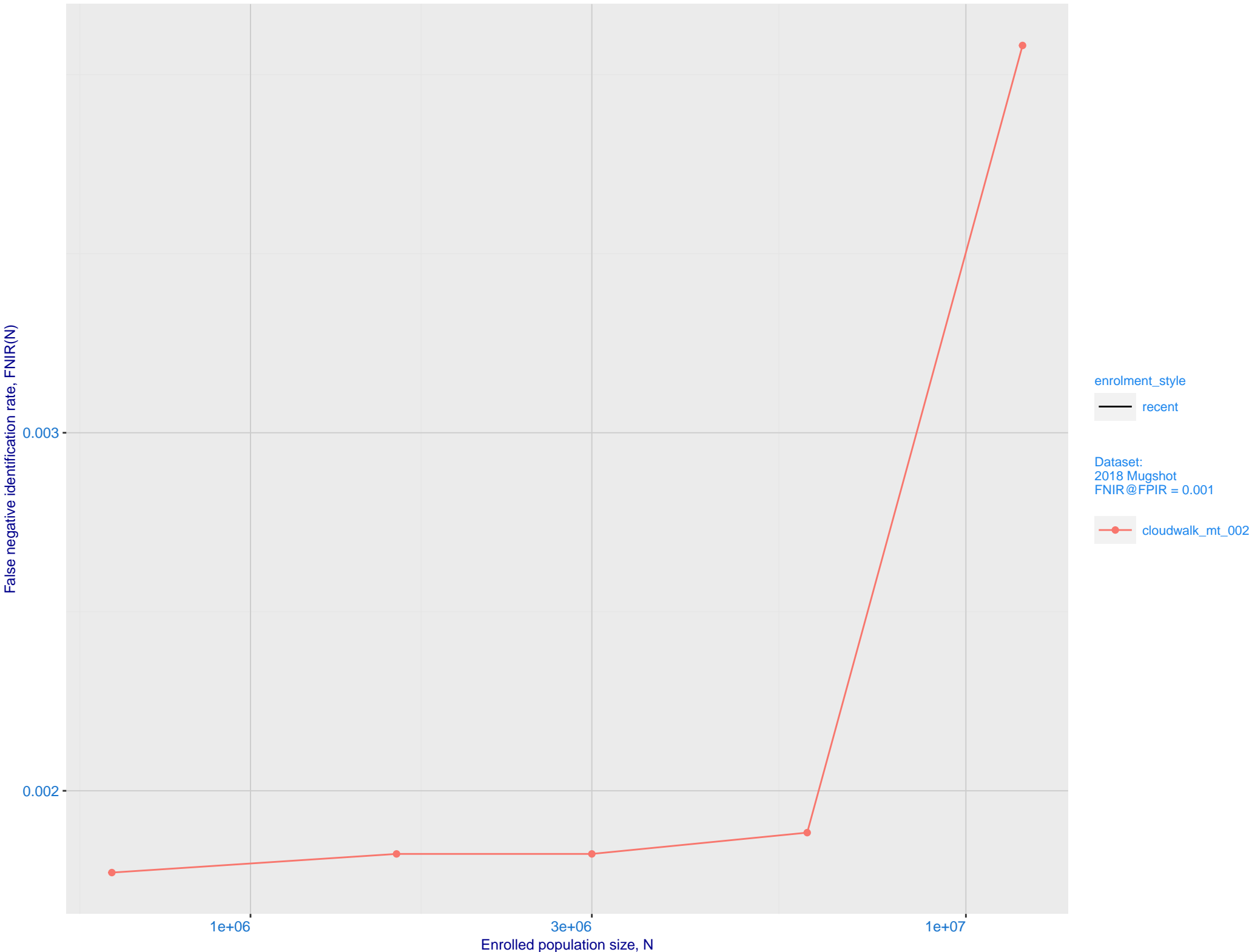
Mugshot webcam ranking 7 (out of 357) –– FNIR(1600000, T, L+1) = 0.0114, FPIR=0.001000 vs. lowest 0.0072 from sensetime_009

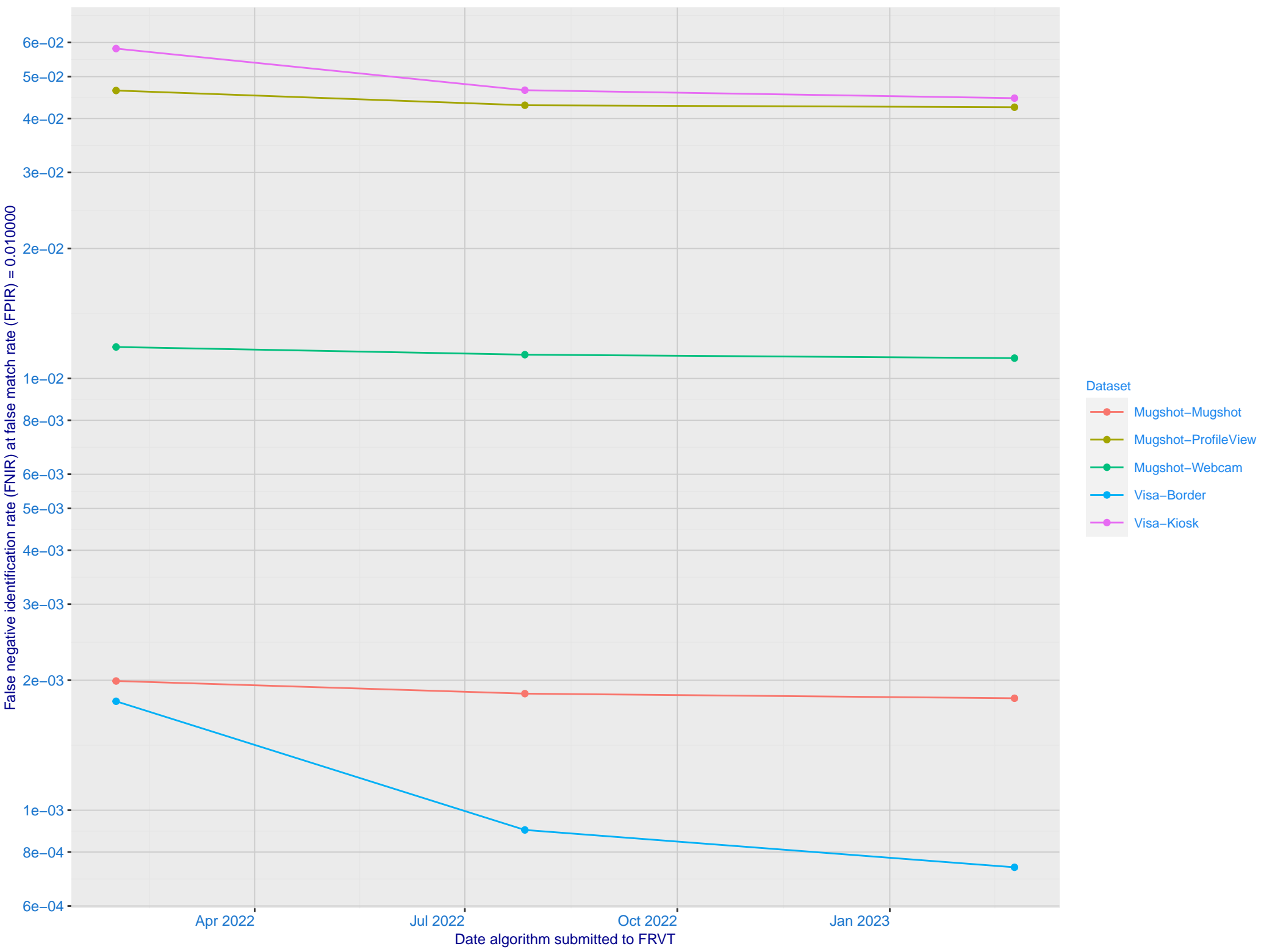Mugshot profile ranking 1 (out of 327) –– FNIR(1600000, T, L+1) = 0.0634, FPIR=0.001000

Immigration visa–border ranking 1 (out of 285) –– FNIR(1600000, T, L+1) = 0.0010, FPIR=0.001000

Immigration visa–kiosk ranking 1 (out of 231) –– FNIR(1600000, T, L+1) = 0.0517, FPIR=0.001000

B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (cloudwalk_mt_002)

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

X-axis: Date algorithm submitted to FRVT

Y-axis: False negative identification rate (FNIR) at false match rate (FPIR) = 0.010000

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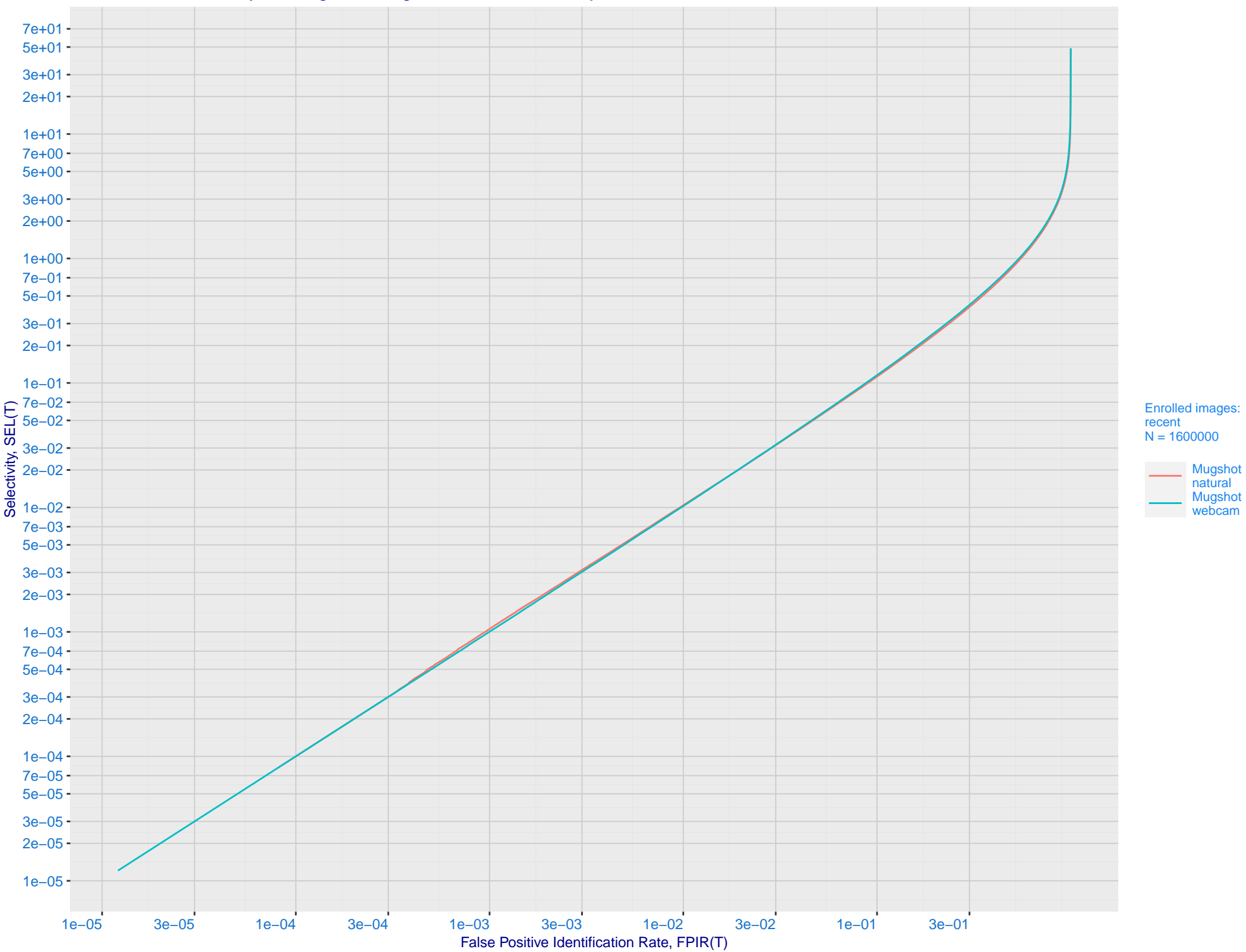- Mugshot–ProfileView
- Mugshot–Webcam
- Visa–Border
- Visa–Kiosk

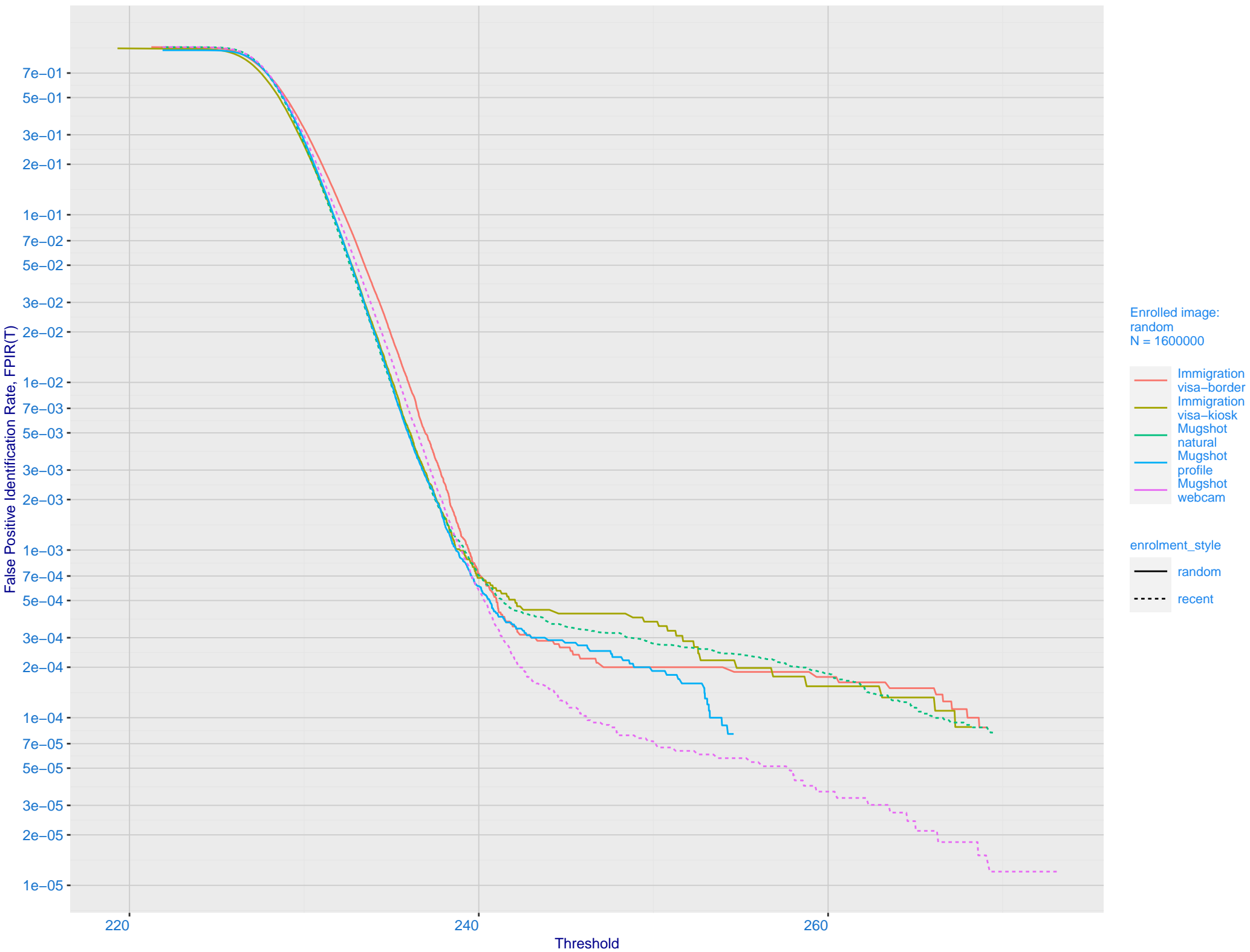D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
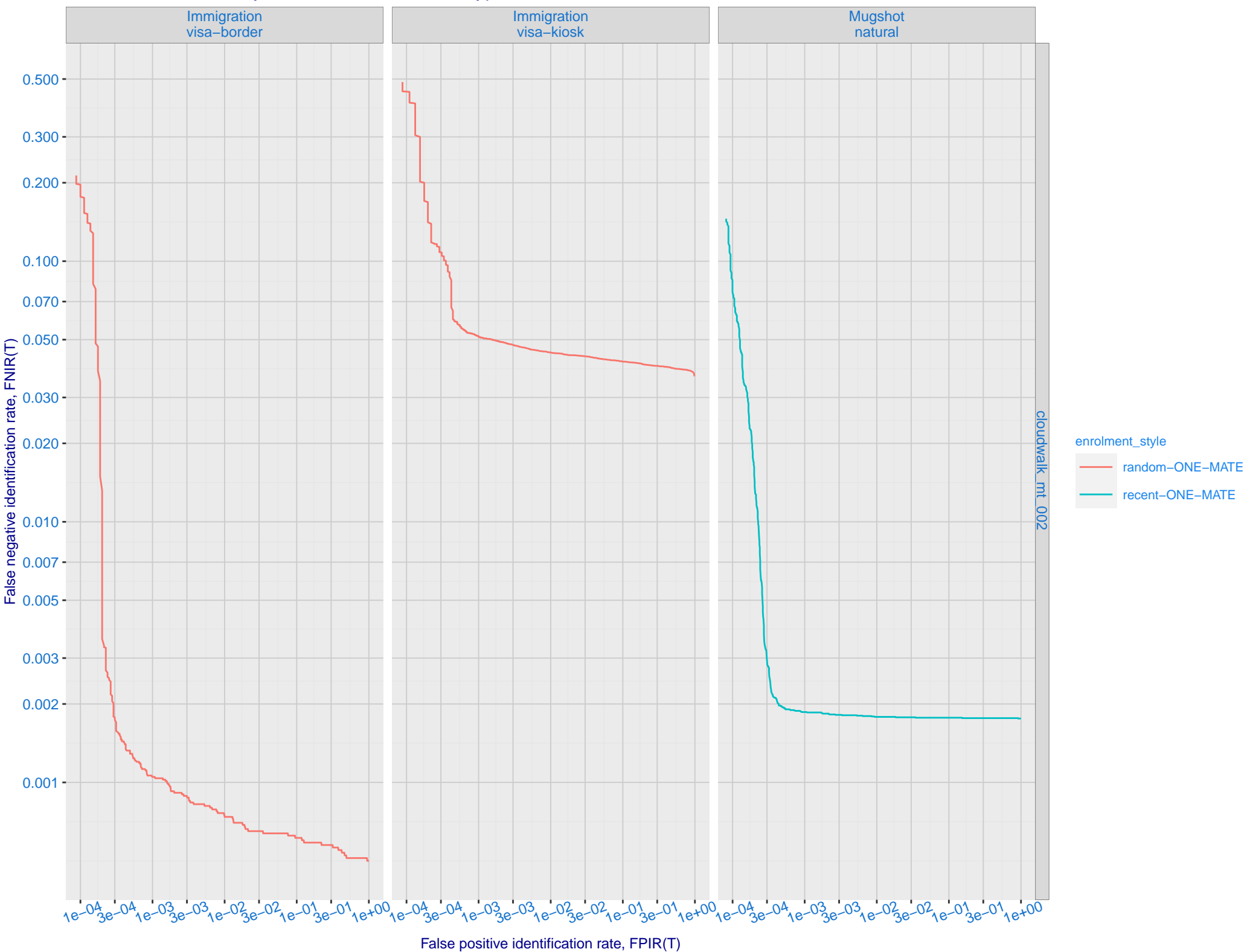
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images
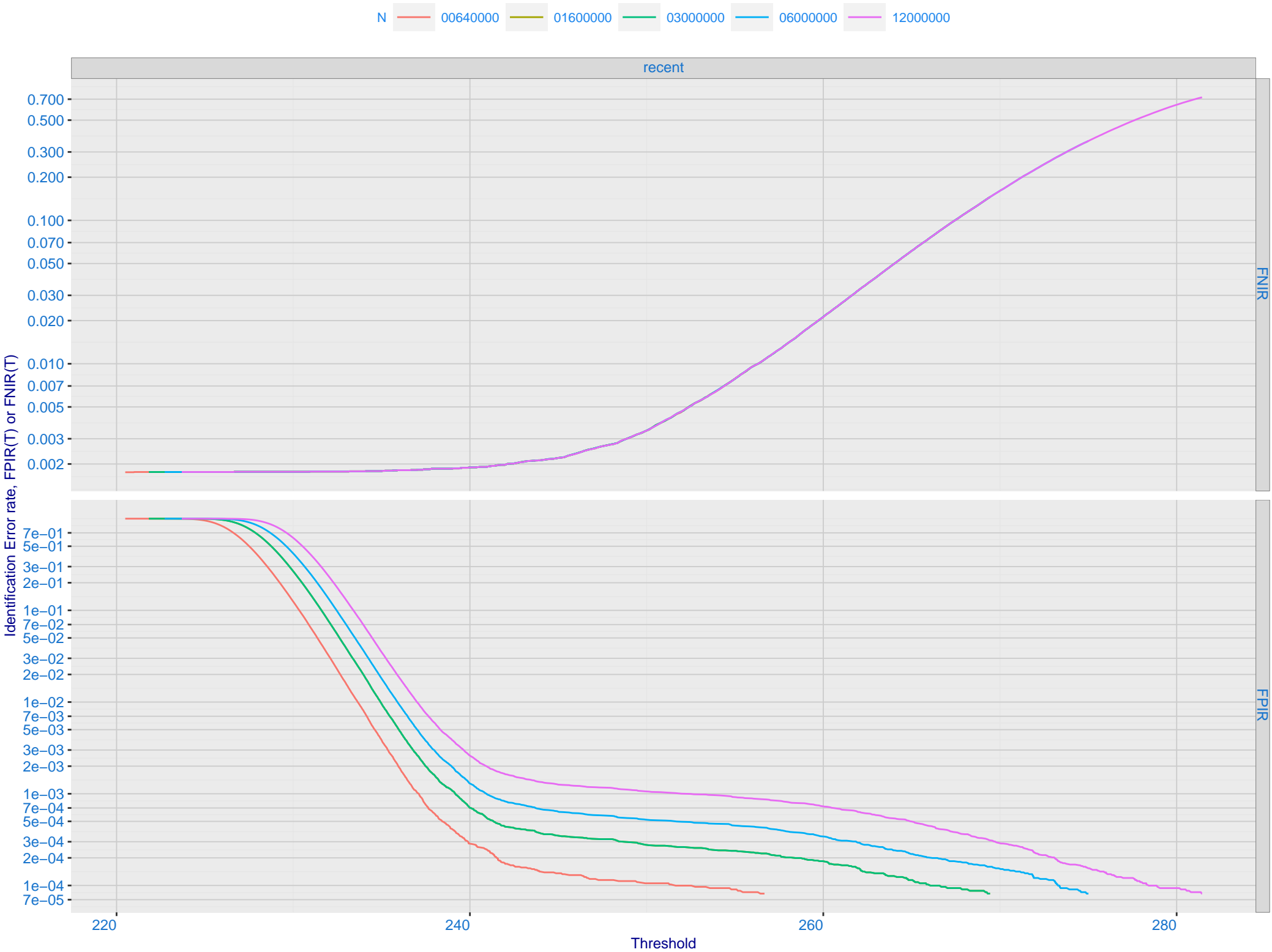
F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate
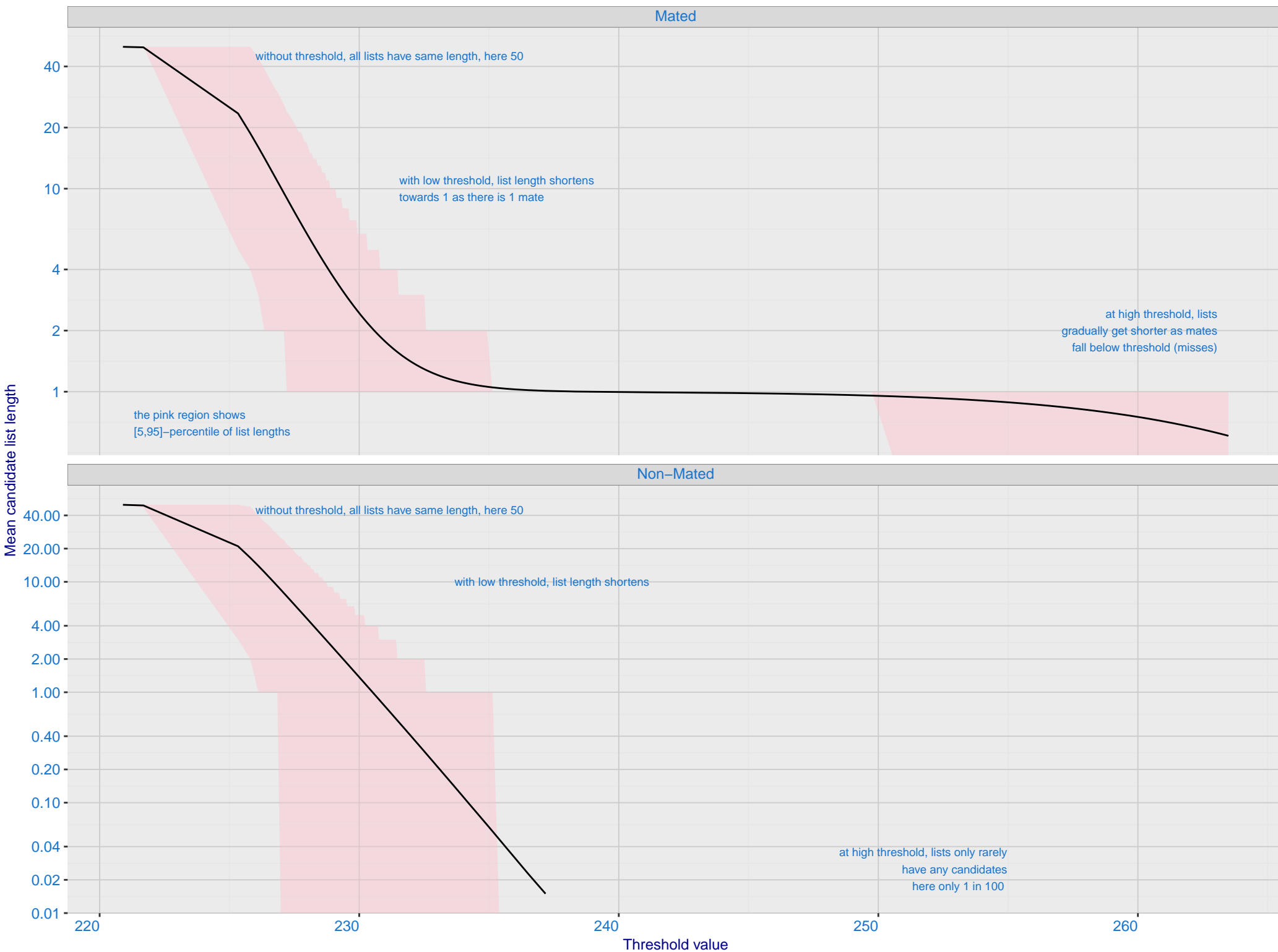
G: FPIR dependence on T by probe type for N = 1600000 subjects

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
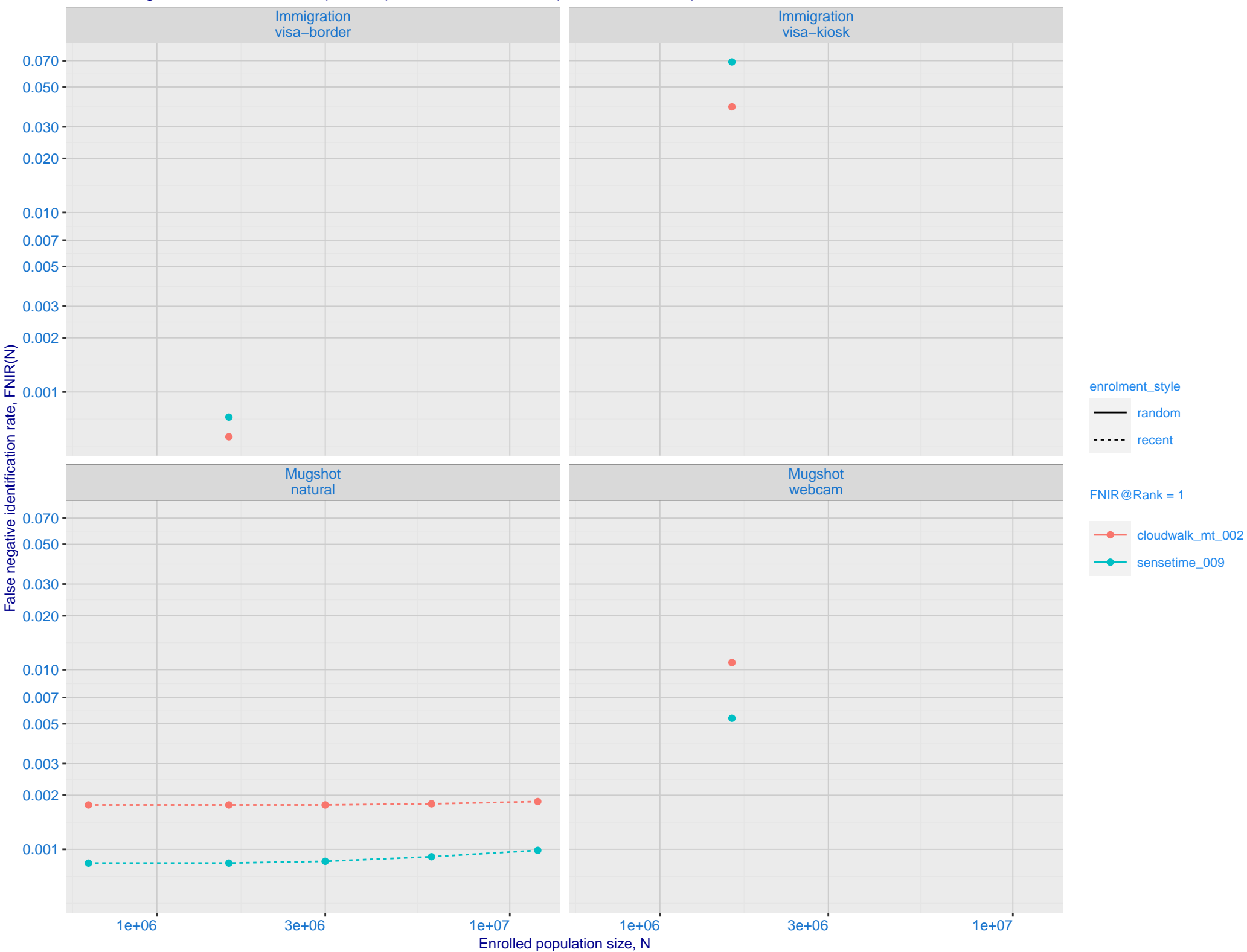
I: FNIR and FPIR dependence on threshold
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image
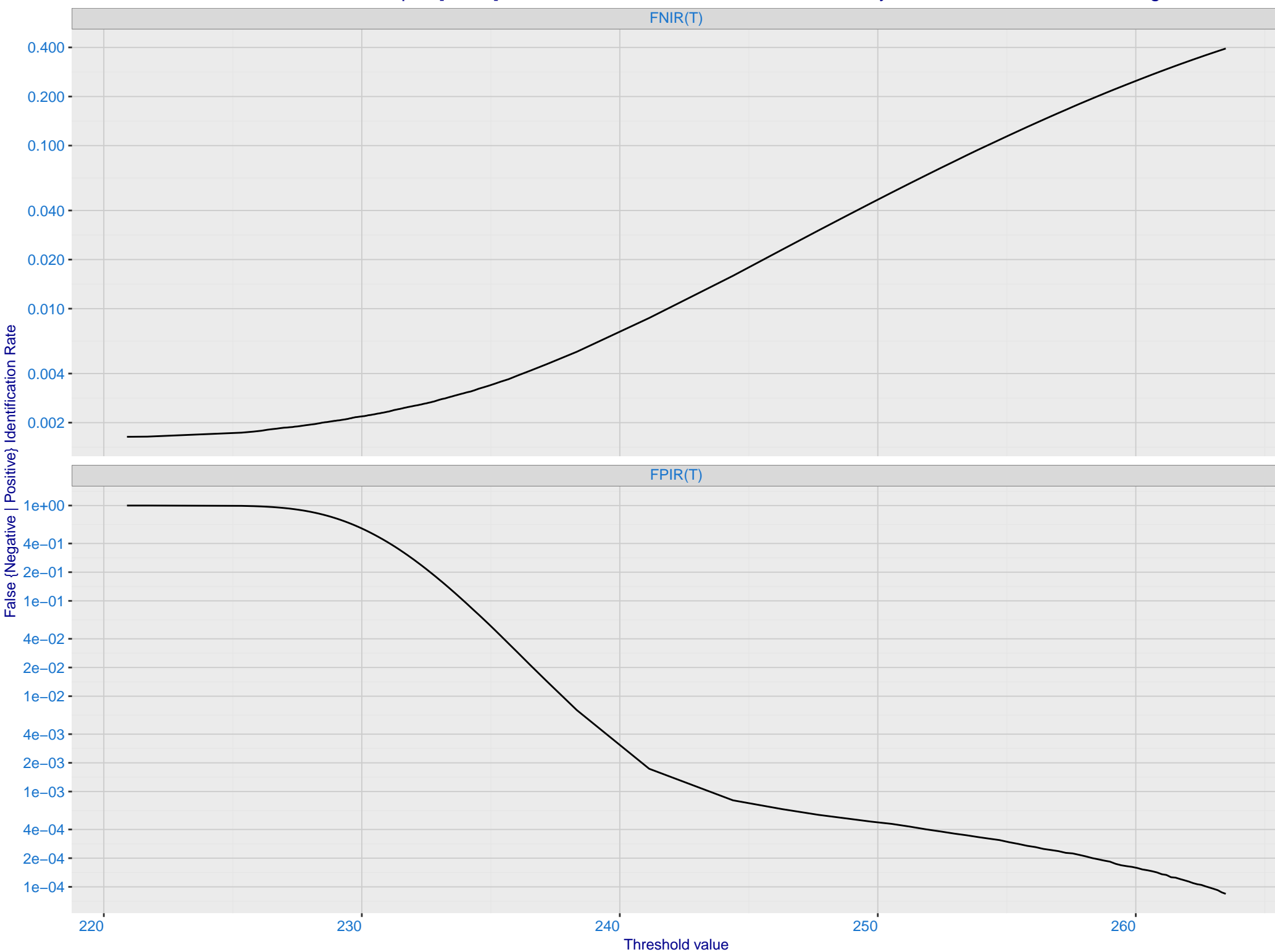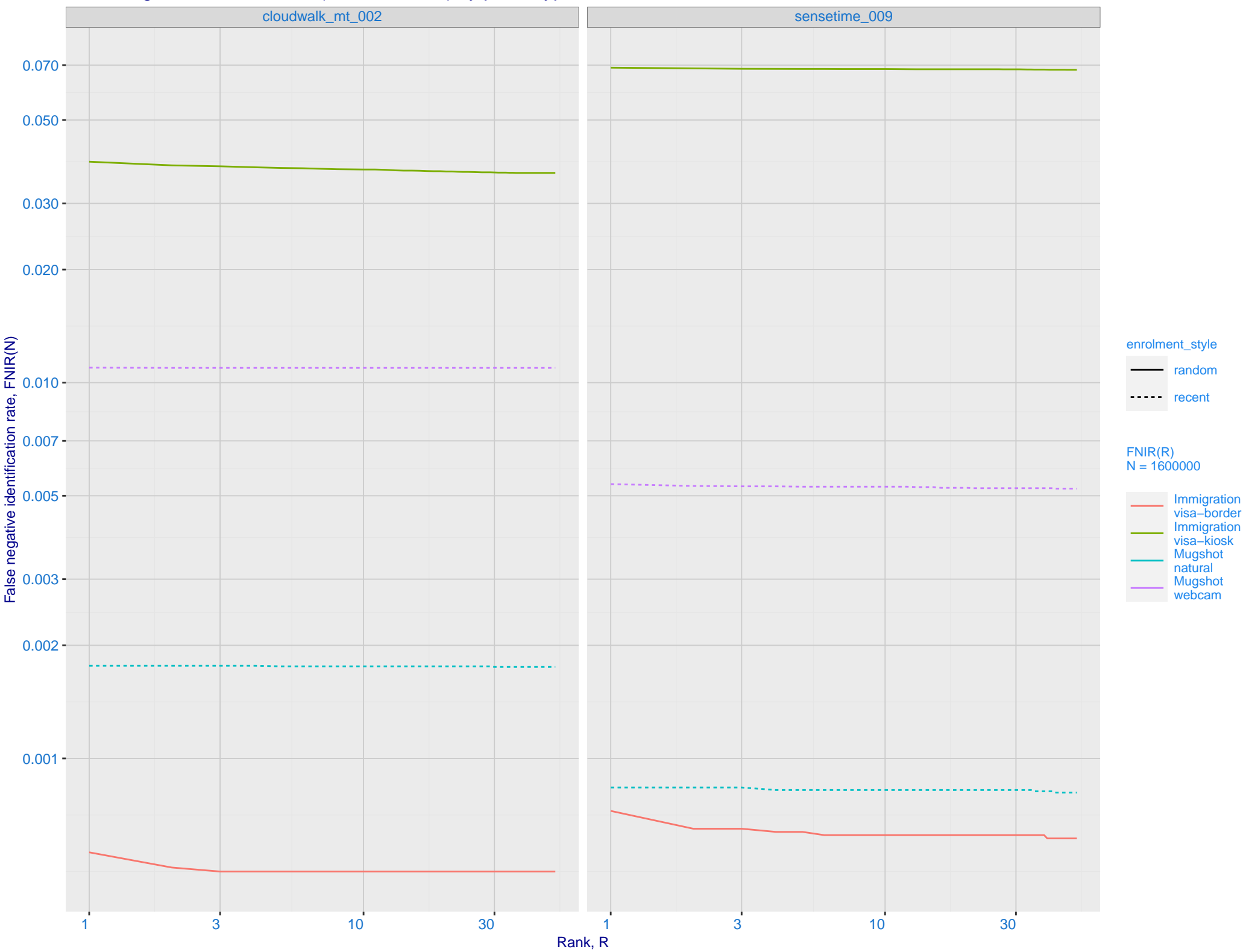
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.
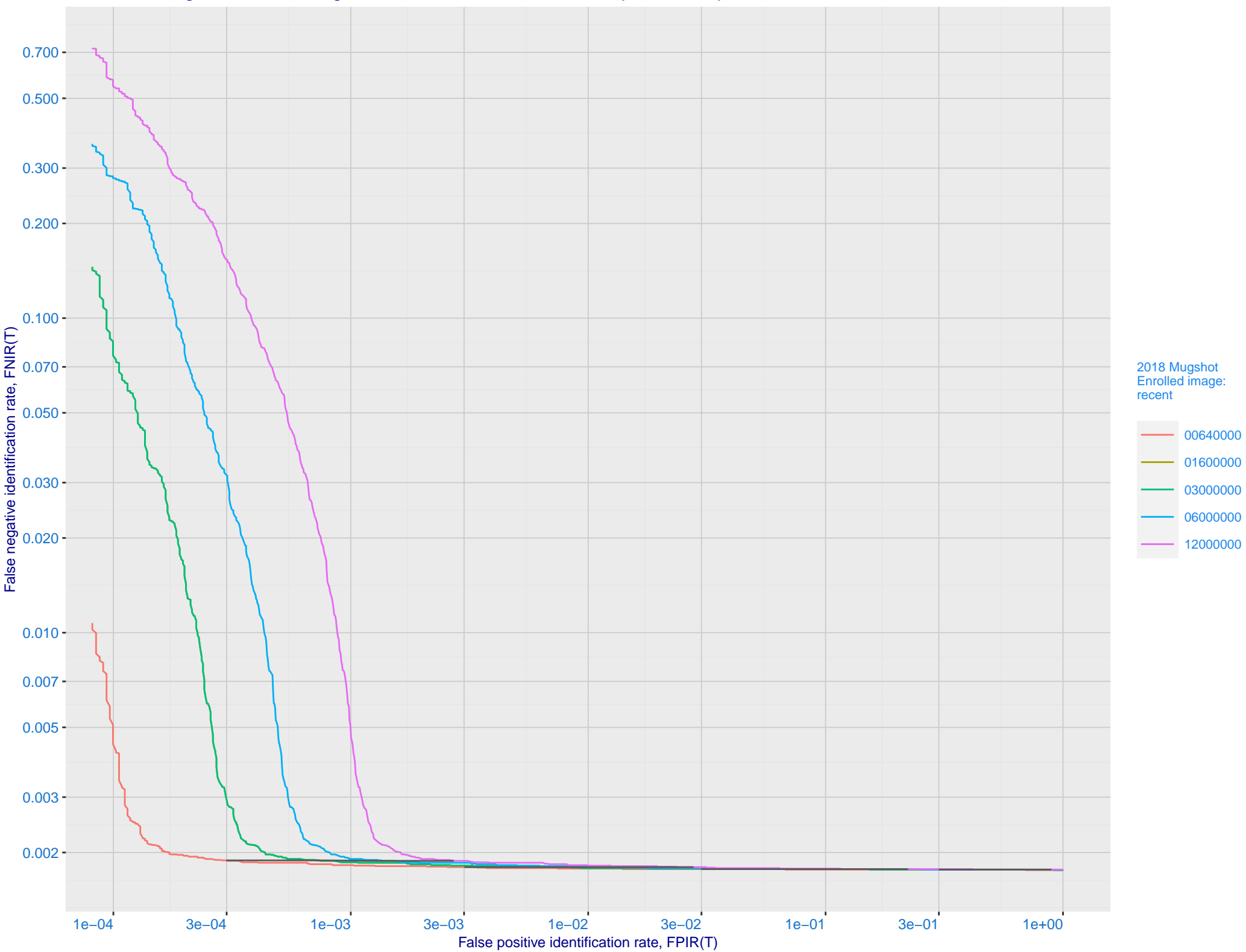
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_009)

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
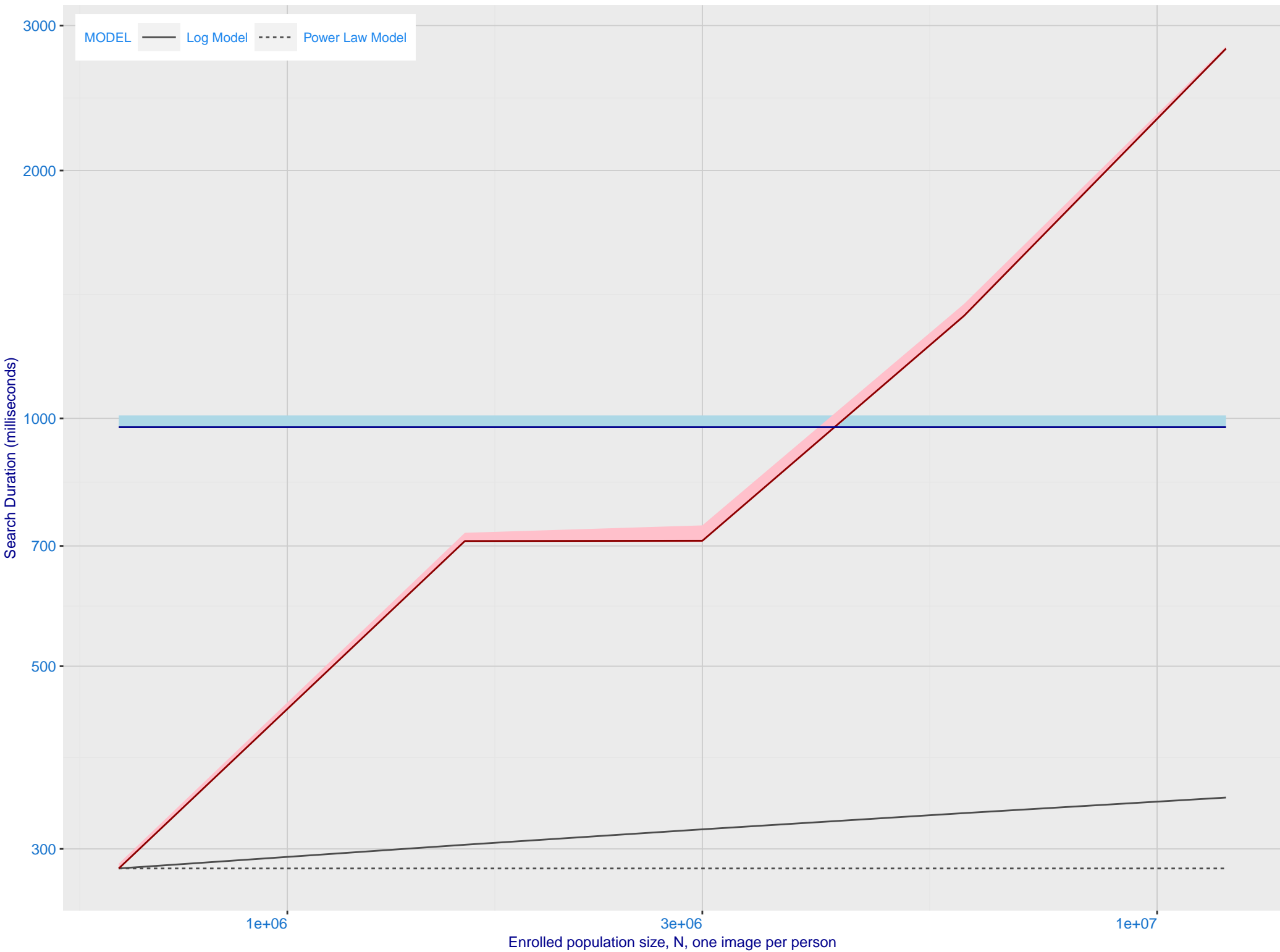
O: FNIR(T, N = 1.6 million) by sex, age and time−lapse. The top row gives investigational rank−1 miss rates. The bottom panels give high threshold for more lights−out identification with low FPIR.
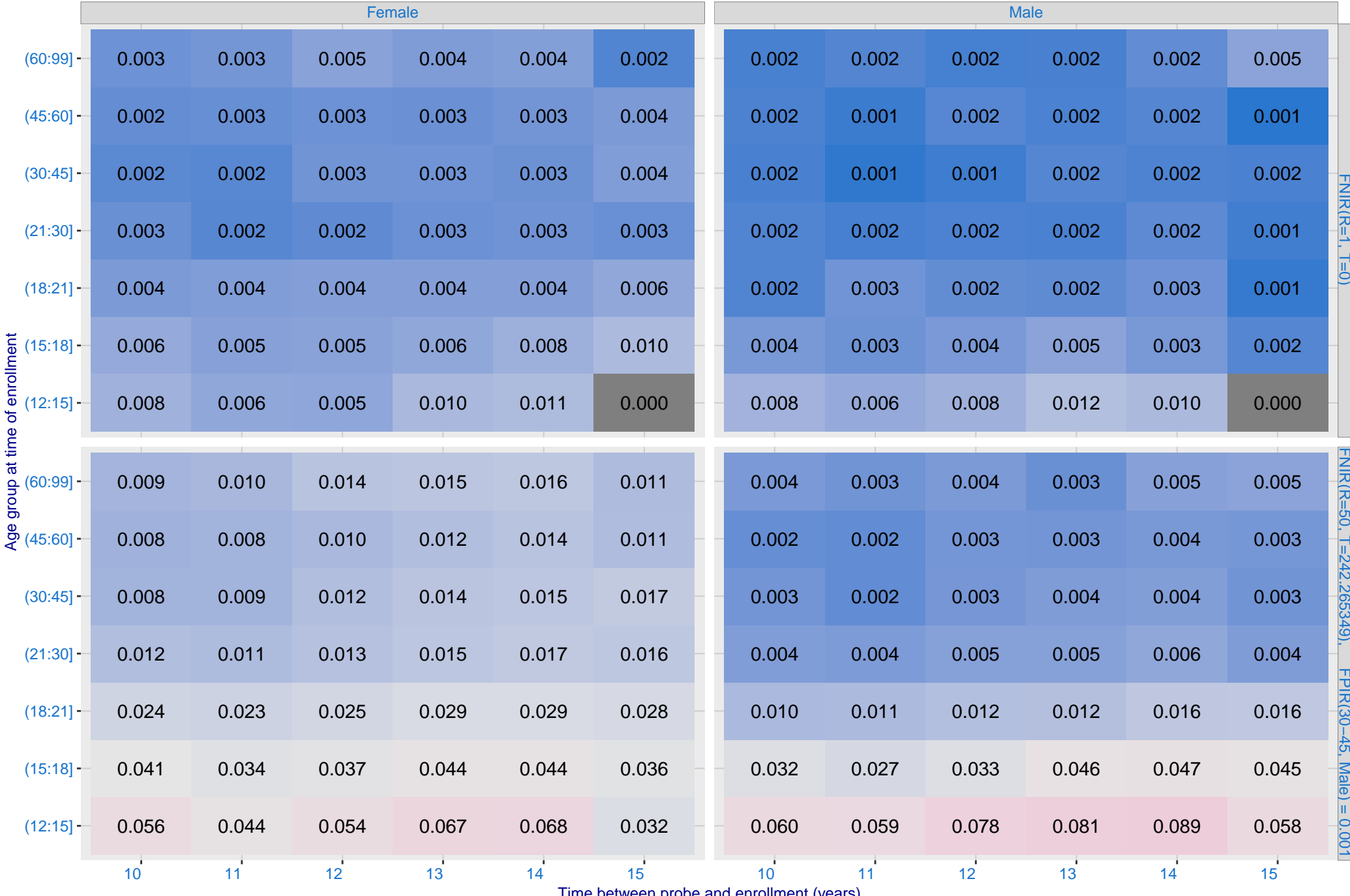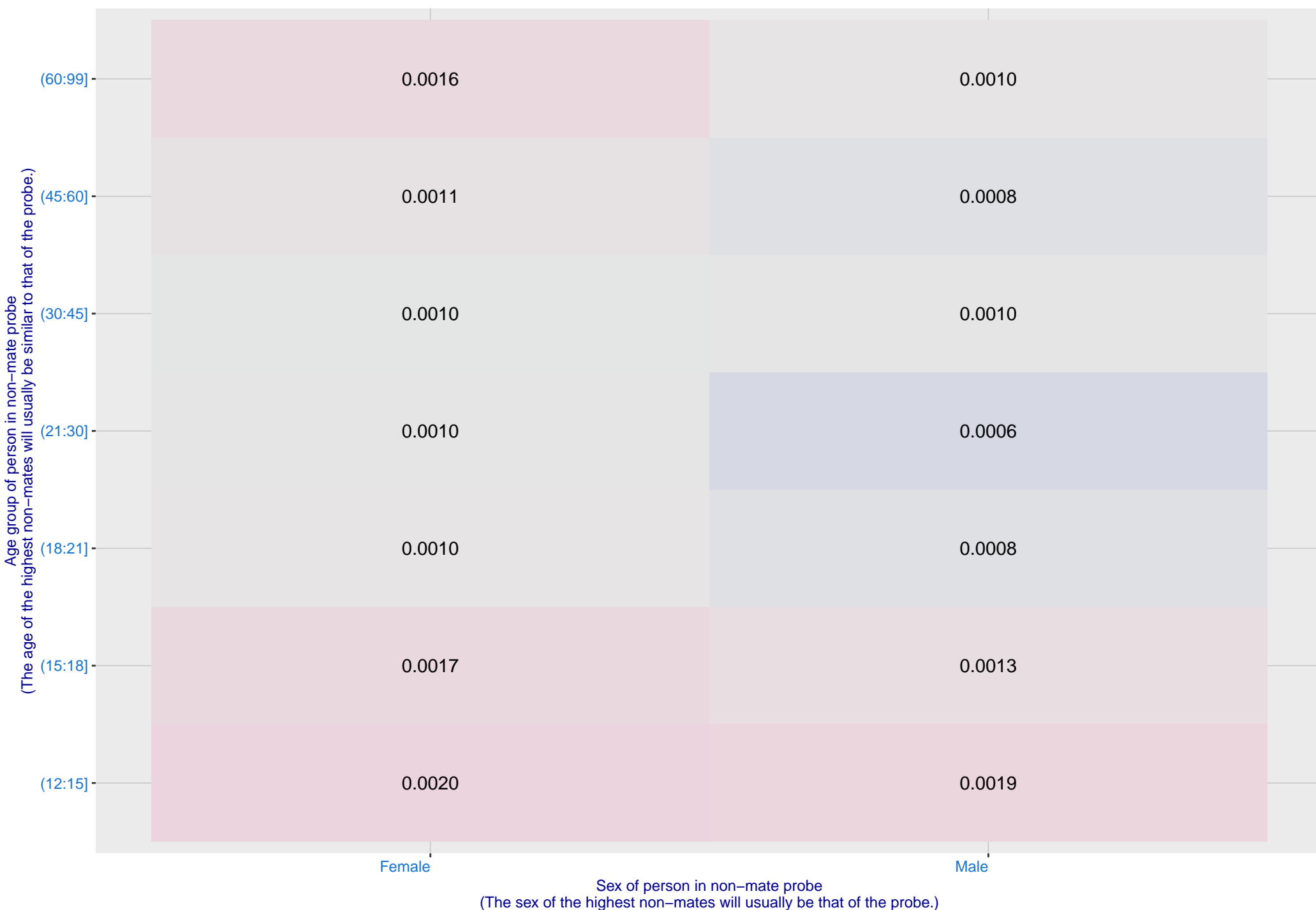
P: FPIR(N = 1.6 million) by sex and age. It is typical for false positive identification rates to be higher in women except in their teens.
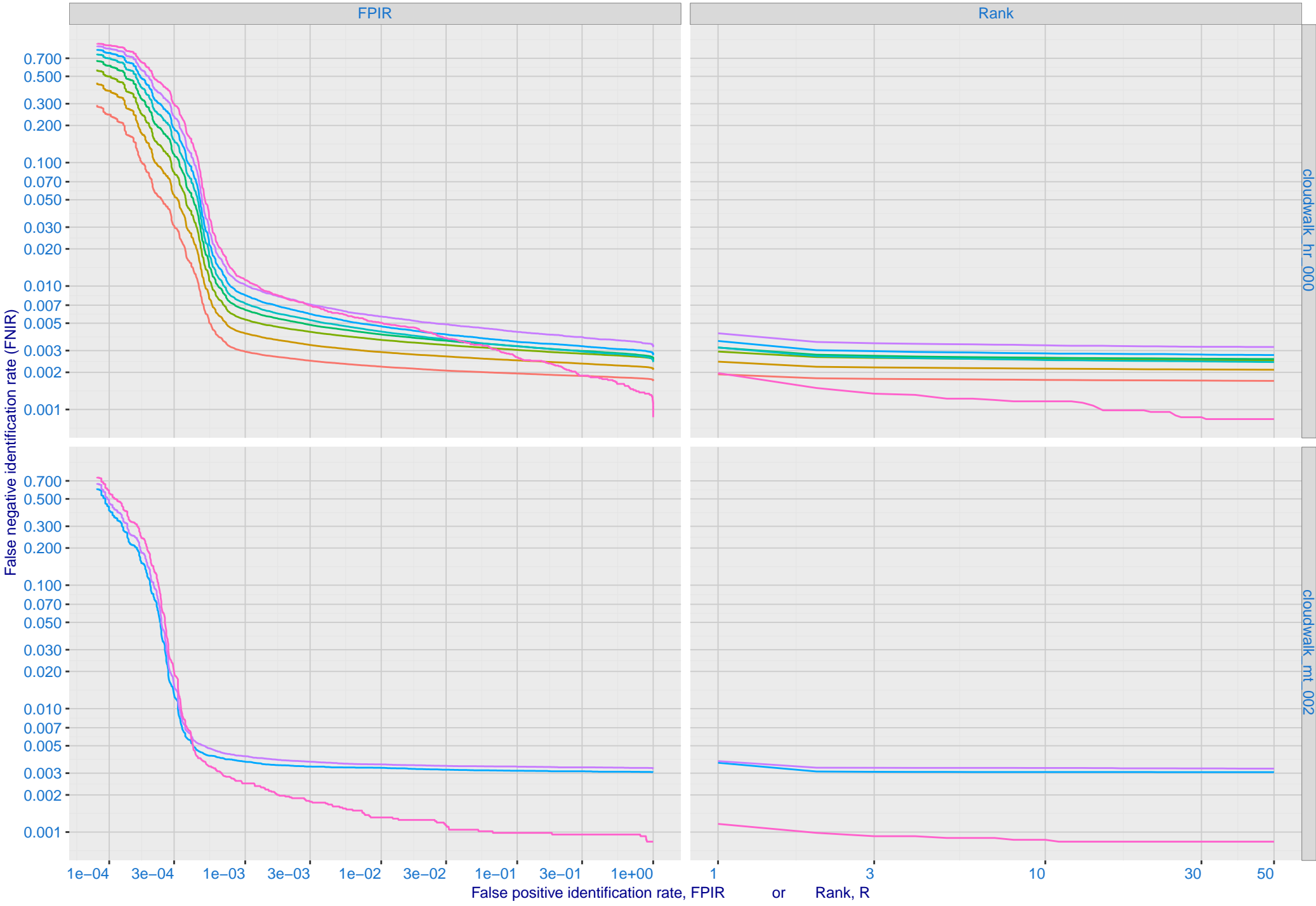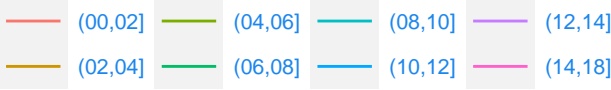
Q: Identification FNIR(N, T, L+1) and Investigational FNIR(N, 0, R) under ageing

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