

A: Datasheet

Algorithm: afrengine_002

Developer: AFR Engine

Submission Date: 2024_07_22

Template size: 2048 bytes

Template time (2.5 percentile): 894 msec

Template time (median): 1110 msec

Template time (97.5 percentile): 1136 msec

Investigation:

Frontal mugshot ranking 180 (out of 547) -- FNIR(1600000, 0, 1) = 0.0013 vs. lowest 0.0004 from qazsmartvisionai_002

Mugshot webcam ranking 204 (out of 509) -- FNIR(1600000, 0, 1) = 0.0120 vs. lowest 0.0051 from qazsmartvisionai_002

Mugshot profile ranking 88 (out of 478) -- FNIR(1600000, 0, 1) = 0.0580 vs. lowest 0.0390 from qazsmartvisionai_002

Immigration visa-border ranking 103 (out of 429) -- FNIR(1600000, 0, 1) = 0.0021 vs. lowest 0.0008 from qazsmartvisionai_002

Immigration visa-kiosk ranking 63 (out of 380) -- FNIR(1600000, 0, 1) = 0.0502 vs. lowest 0.0343 from qazsmartvisionai_002

Identification:

Frontal mugshot ranking 82 (out of 547) -- FNIR(1600000, T, L+1) = 0.0022, FPIR=0.003000 vs. lowest 0.0005 from qazsmartvisionai_002

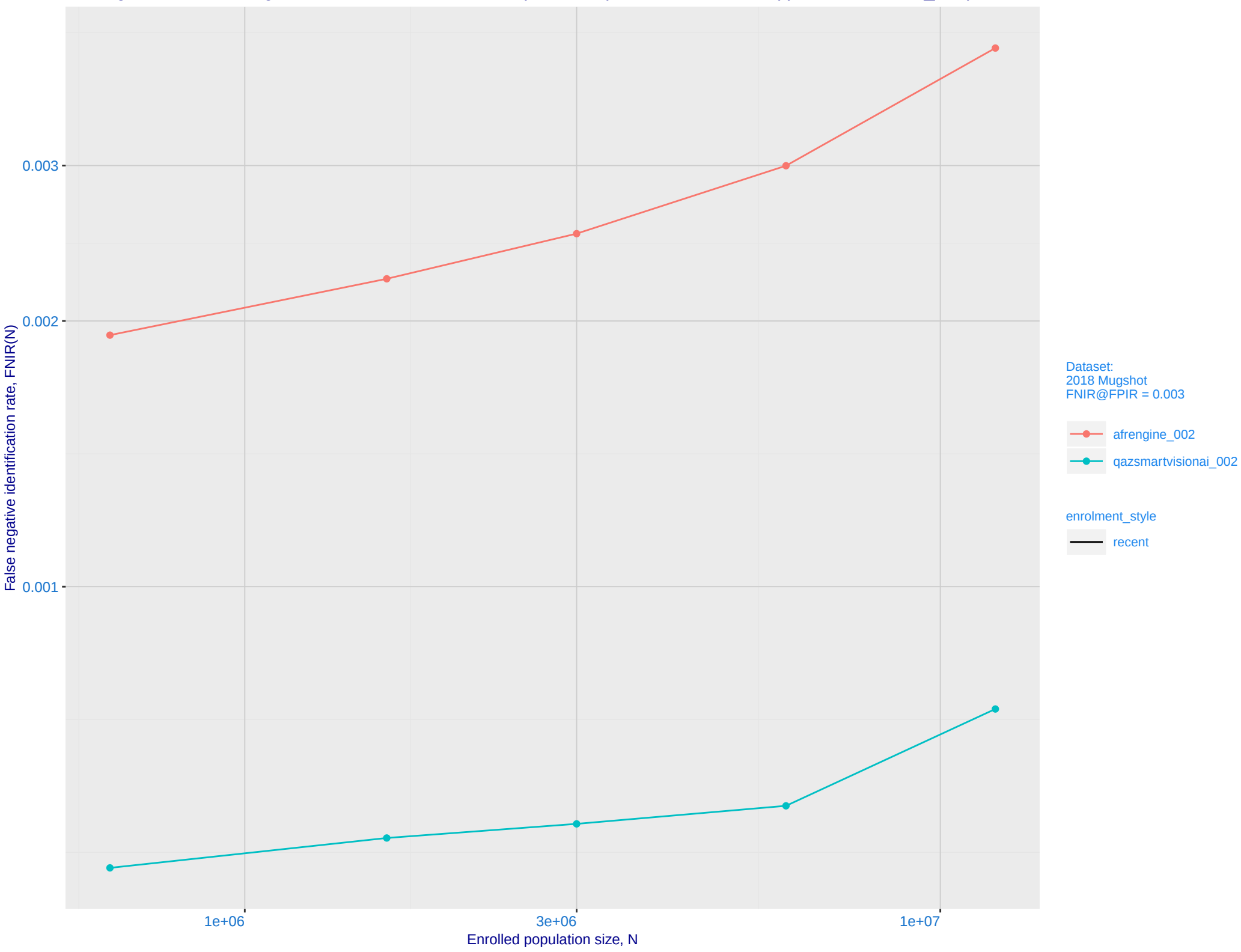
Mugshot webcam ranking 113 (out of 507) -- FNIR(1600000, T, L+1) = 0.0214, FPIR=0.003000 vs. lowest 0.0057 from qazsmartvisionai_002

Mugshot profile ranking 47 (out of 477) -- FNIR(1600000, T, L+1) = 0.1375, FPIR=0.003000 vs. lowest 0.0460 from qazsmartvisionai_002

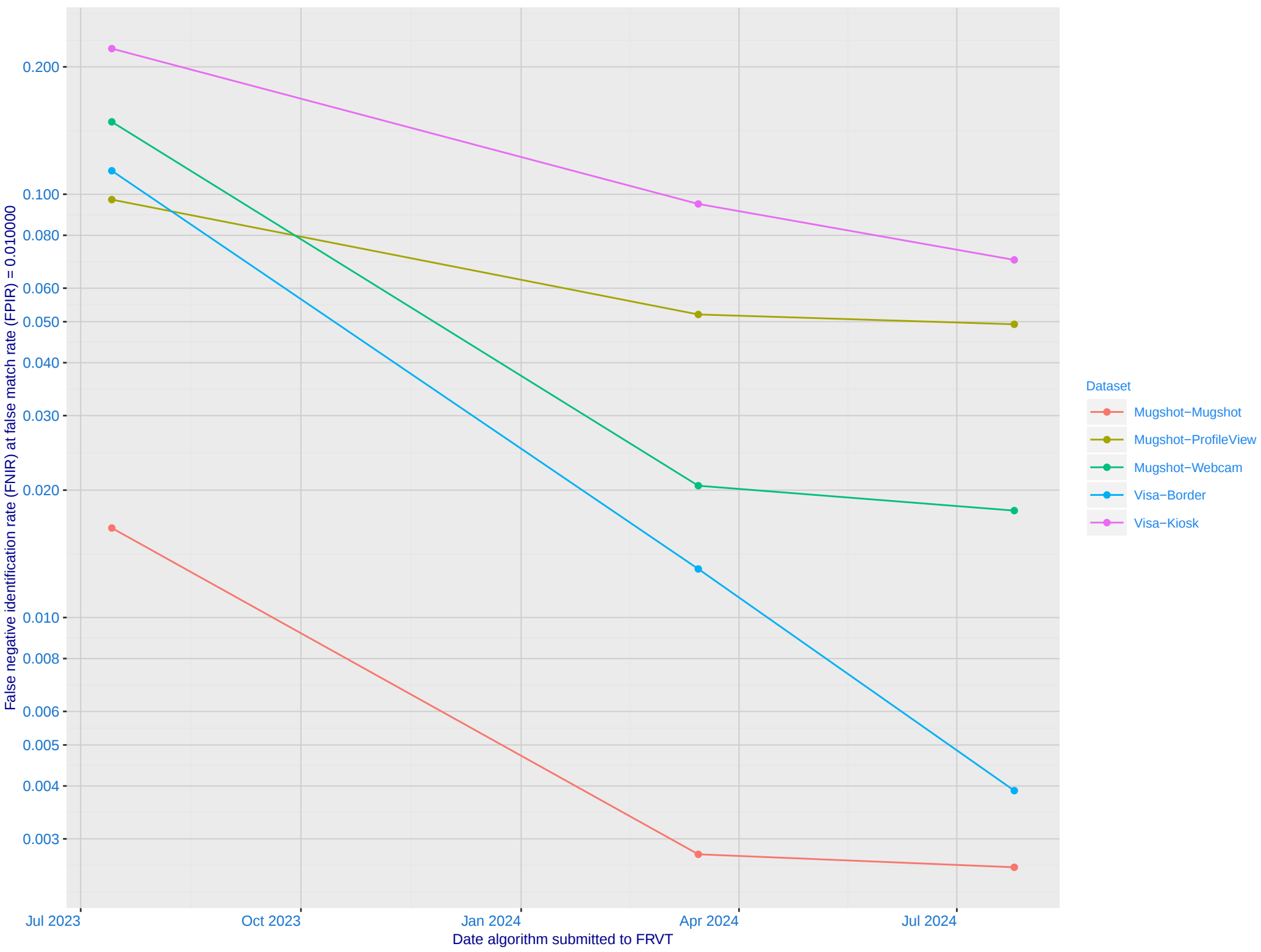
Immigration visa-border ranking 105 (out of 428) -- FNIR(1600000, T, L+1) = 0.0090, FPIR=0.003000 vs. lowest 0.0013 from qazsmartvisionai_002

Immigration visa-kiosk ranking 77 (out of 380) -- FNIR(1600000, T, L+1) = 0.0802, FPIR=0.003000 vs. lowest 0.0443 from qazsmartvisionai_002

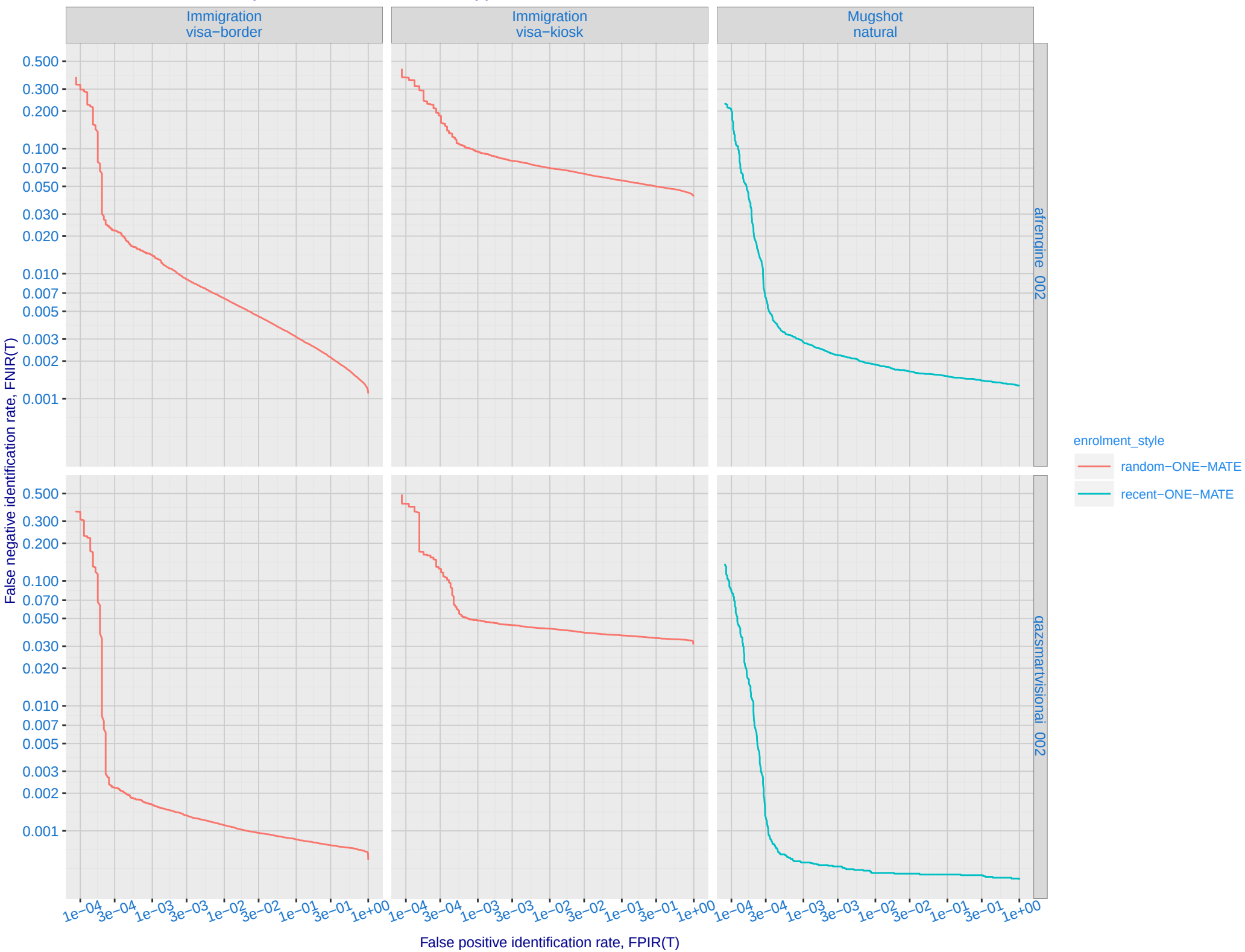
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (qazsmartvisionai_002)



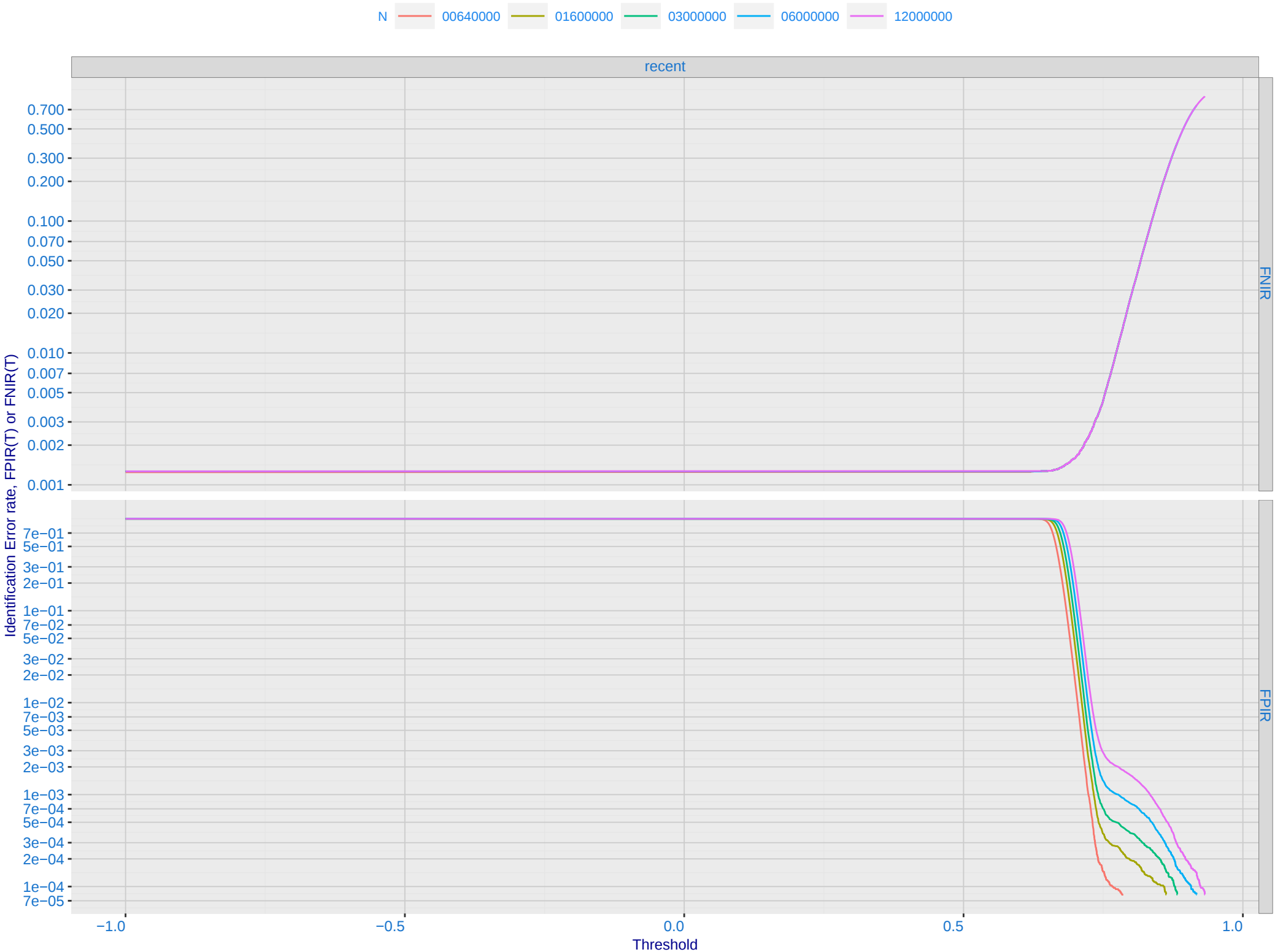
C: Evolution of accuracy for AFRENGINE algorithms on three datasets 2018 – present



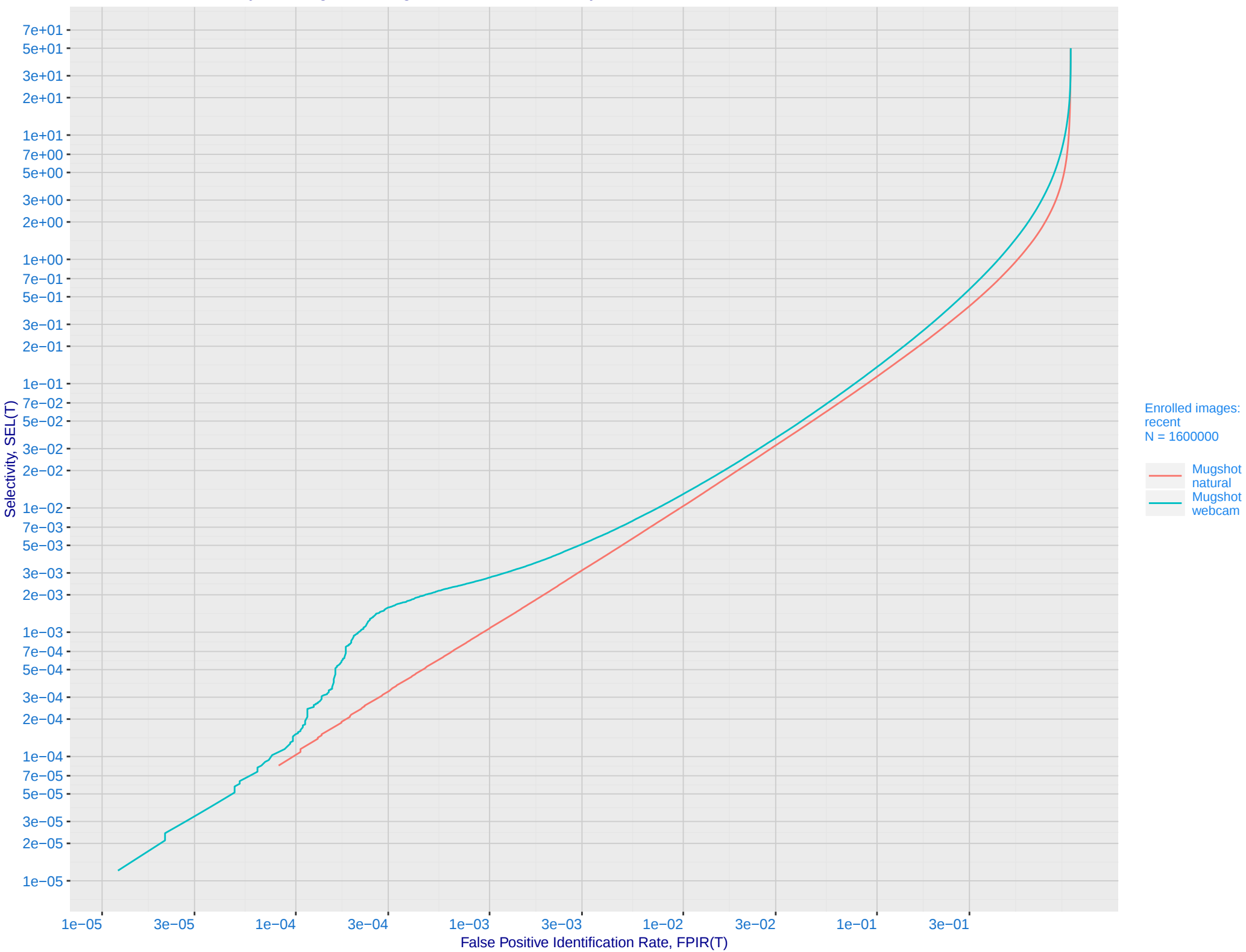
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals



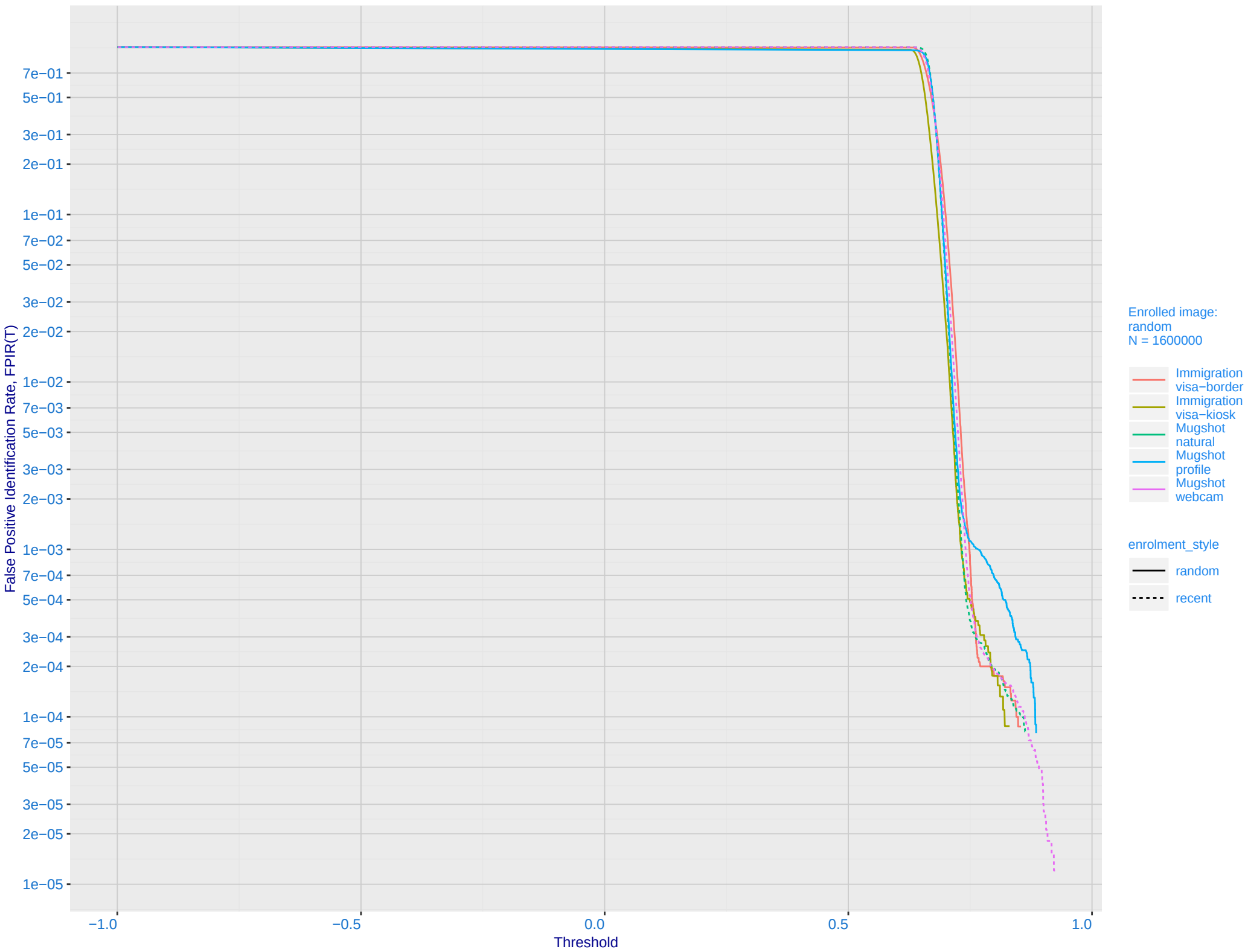
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



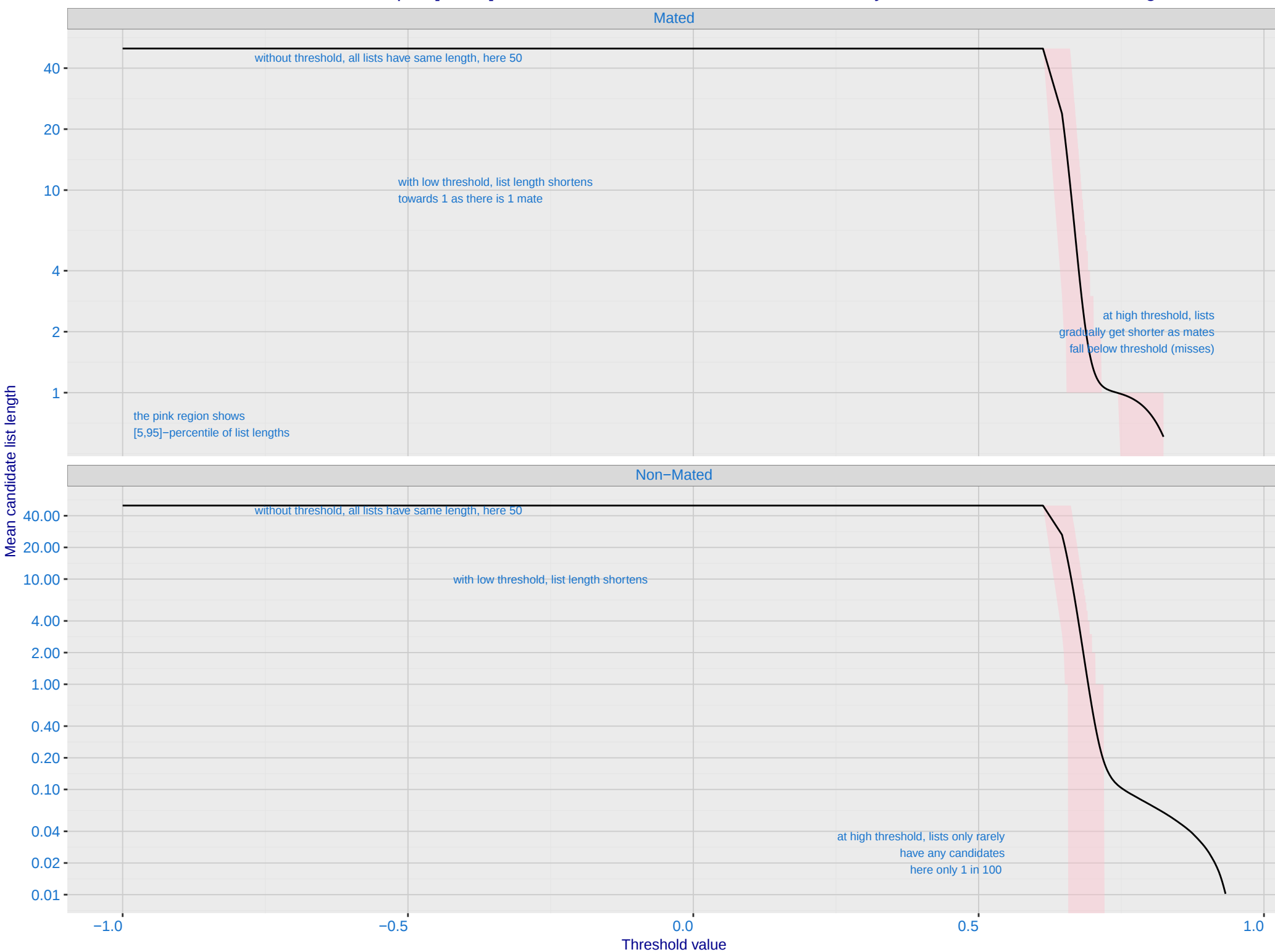
F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate



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

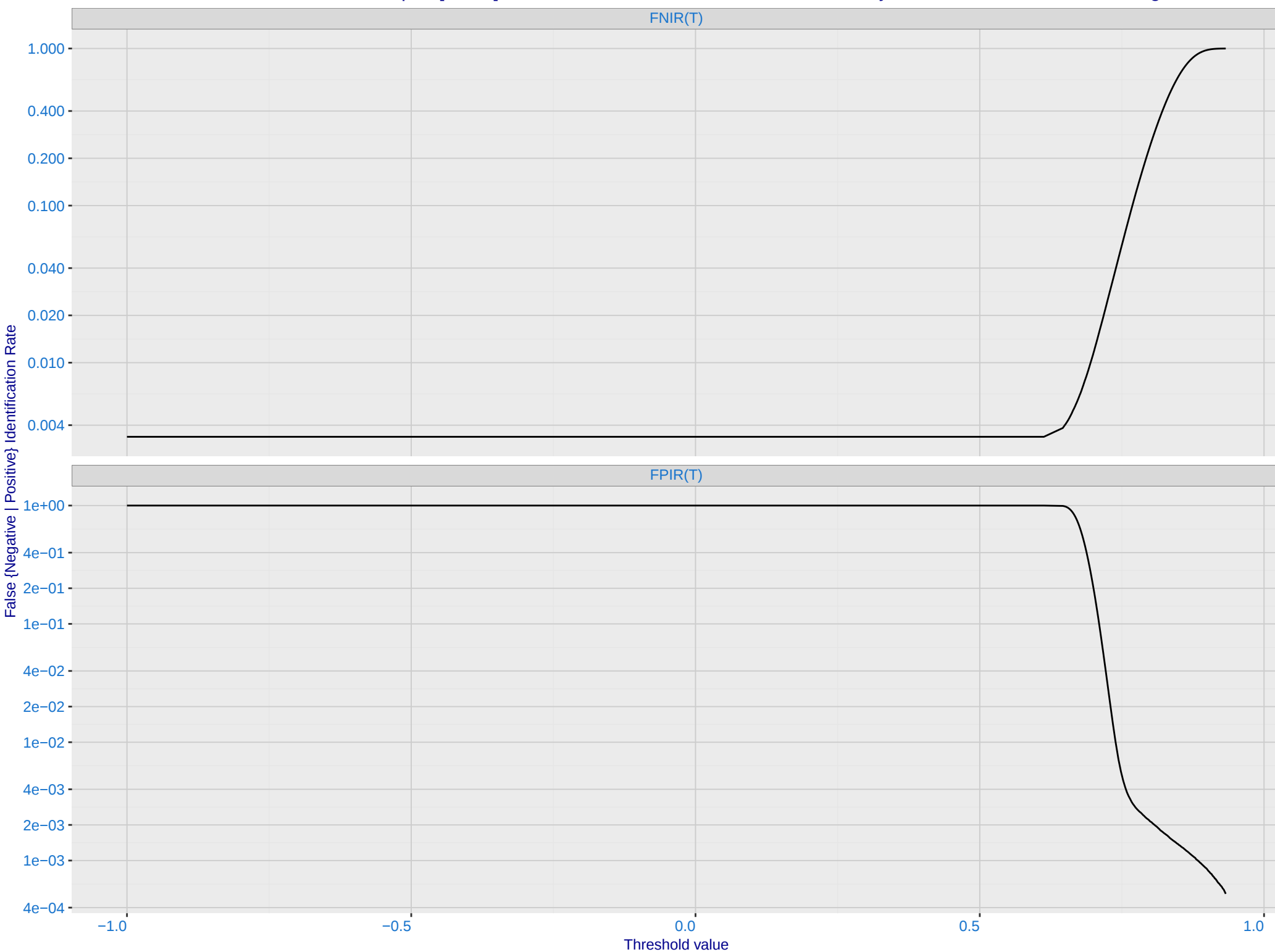


H: Reduced length candidate lists for human review
Dataset is border-border with time-lapse [10,15] YRS with N = 1600000. Probes are 10-15 years later than enrollment image

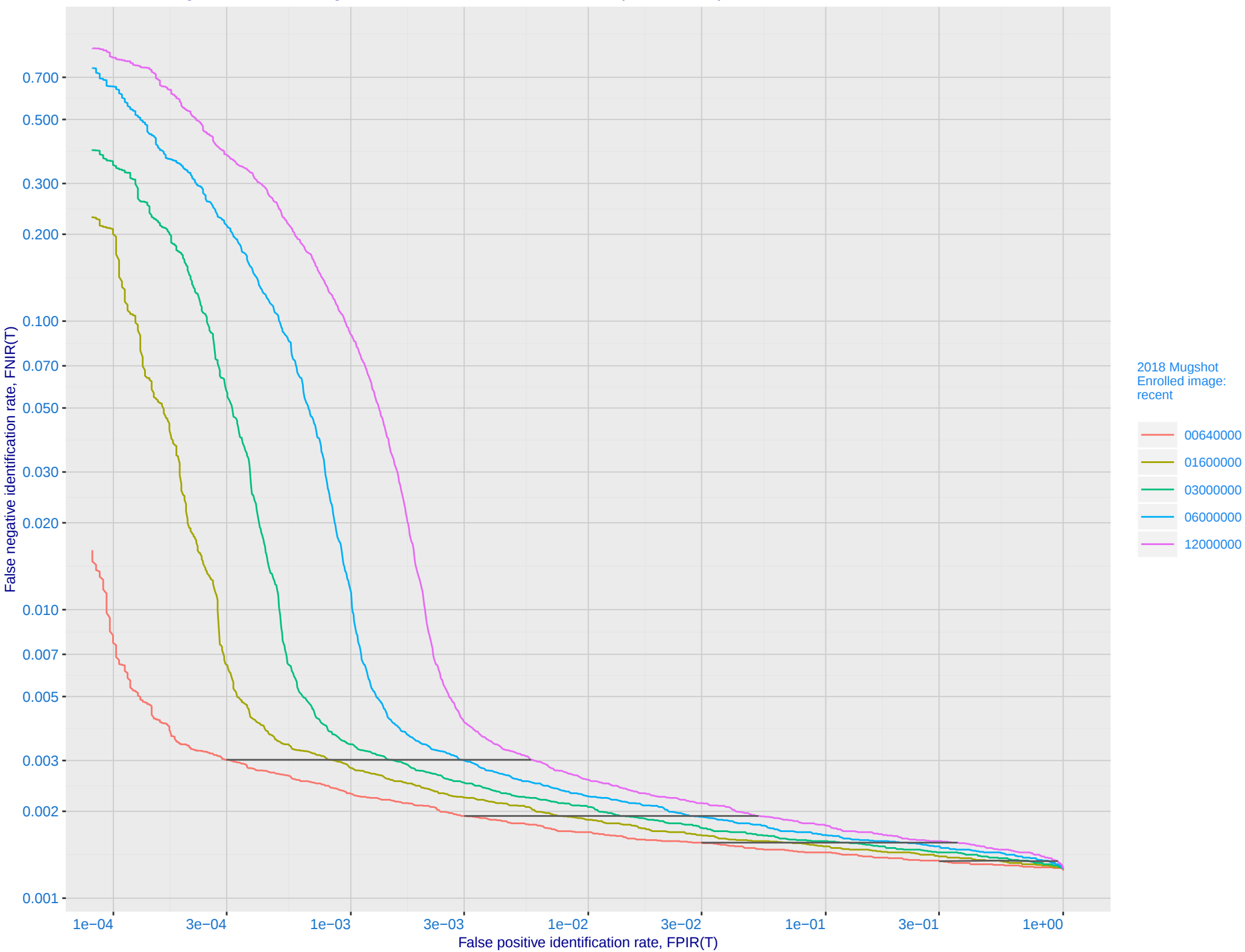


I: FNIR and FPIR dependence on threshold

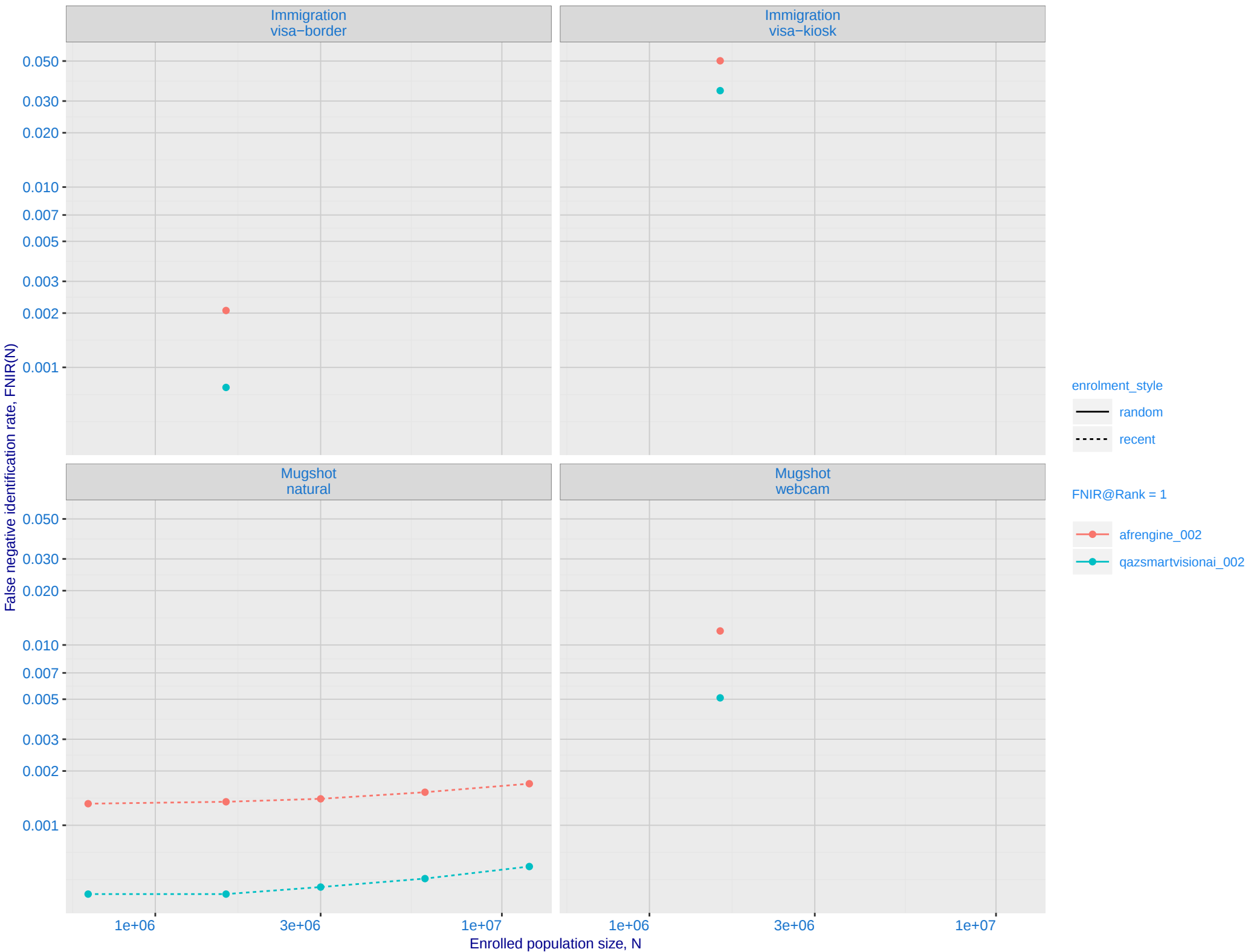
Dataset is border-border with time-lapse [10,15] YRS with N = 1600000. Probes are 10-15 years later than enrollment image



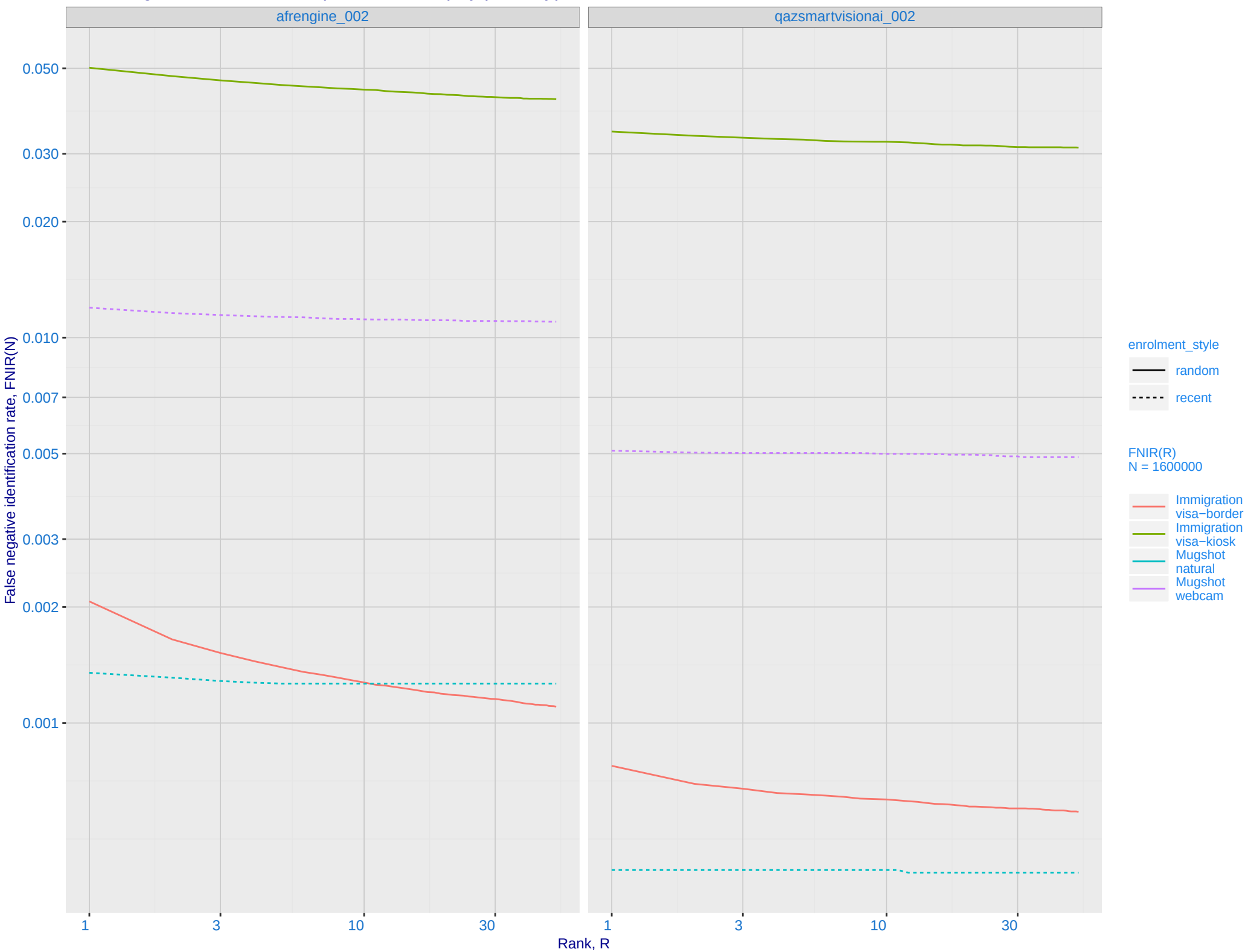
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.



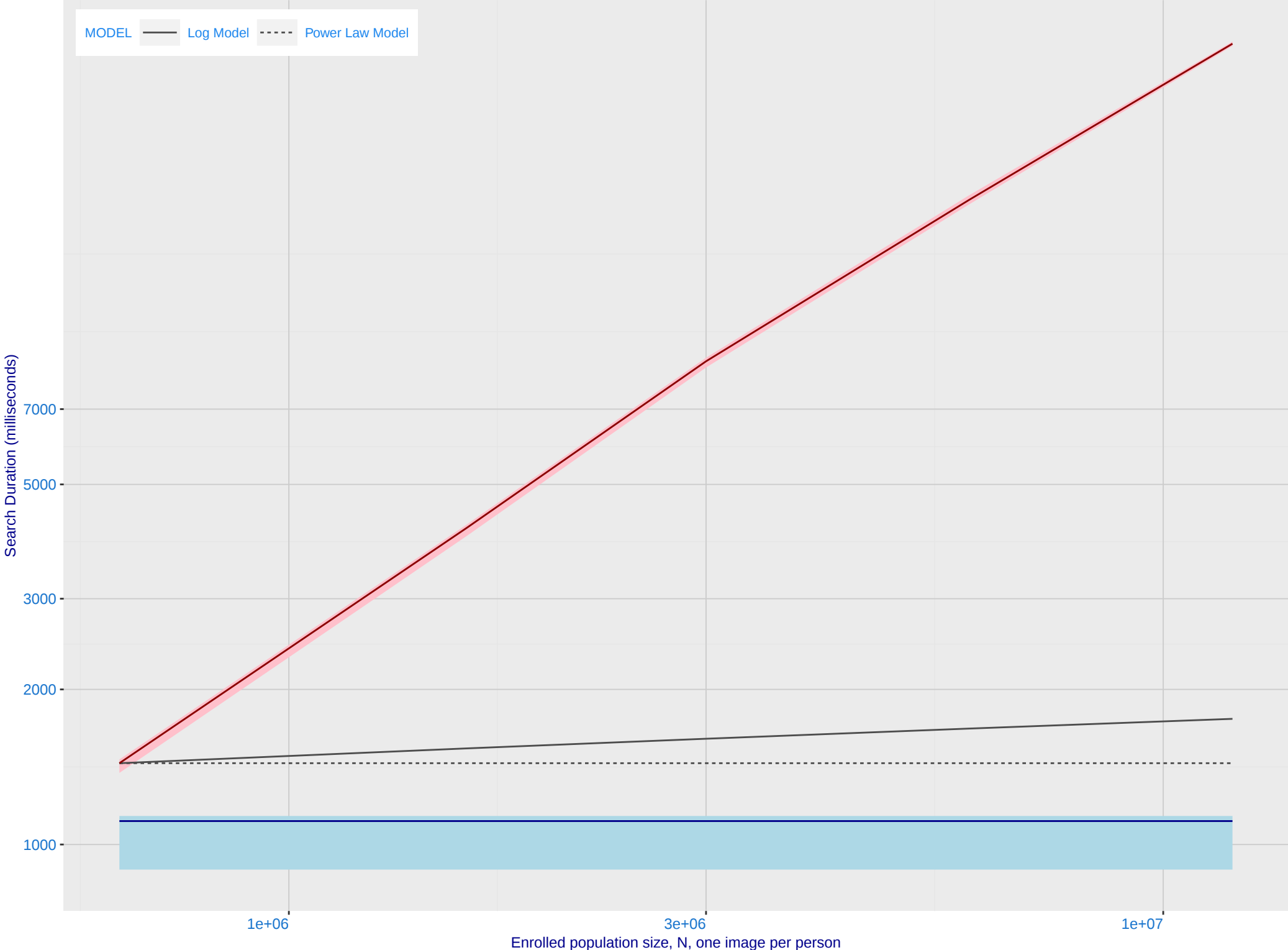
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (qazsmartvisionai_002)



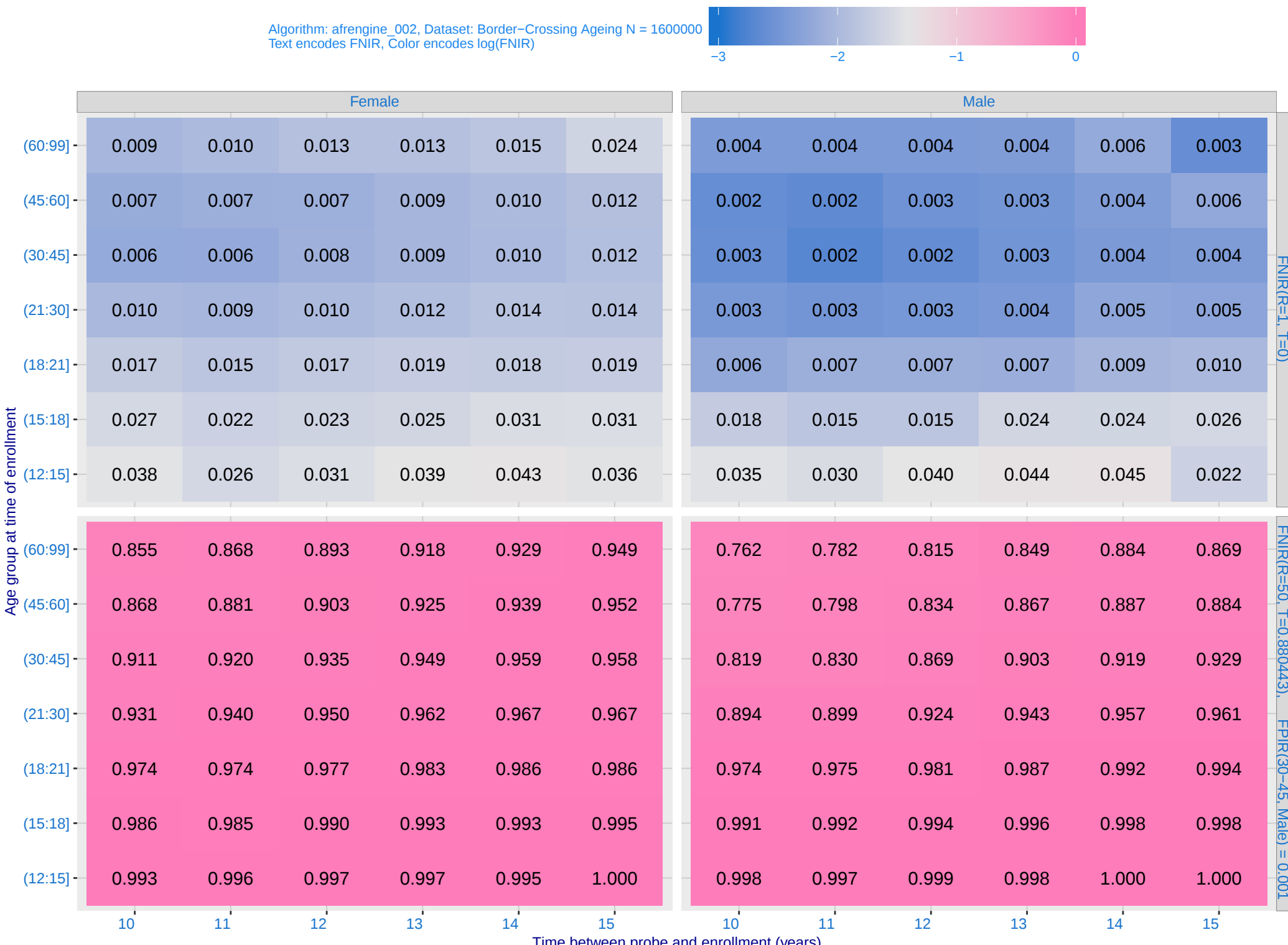
L: Investigational mode: FNIR(1600000, R, 0) by probe type



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



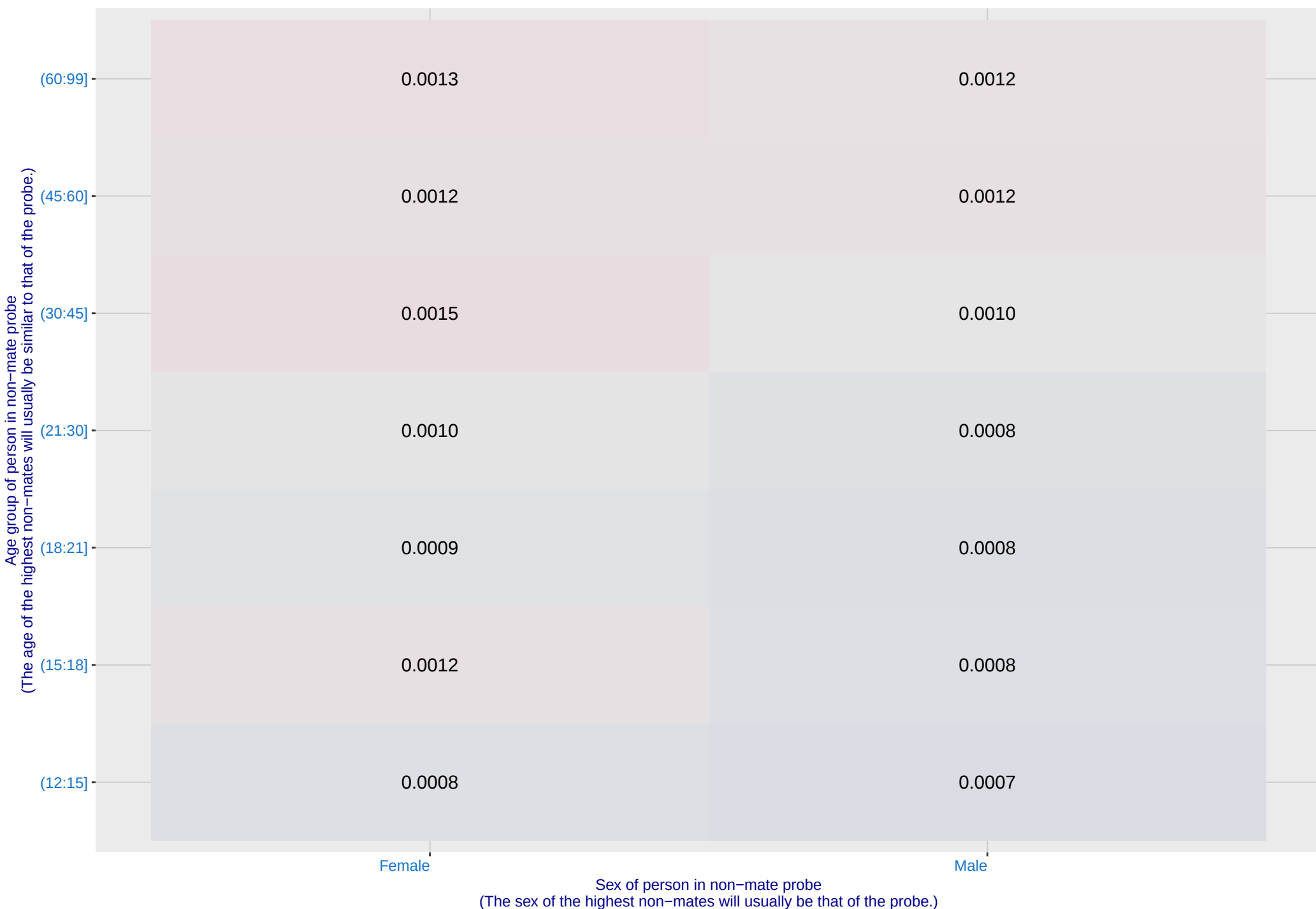
O: FNIR(T, N = 1.6 million) by sex, age and time-lapse. The top row gives investigational rank-1 miss rates. The bottom panels give high threshold for more lights-out identification with low FPIR.



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.

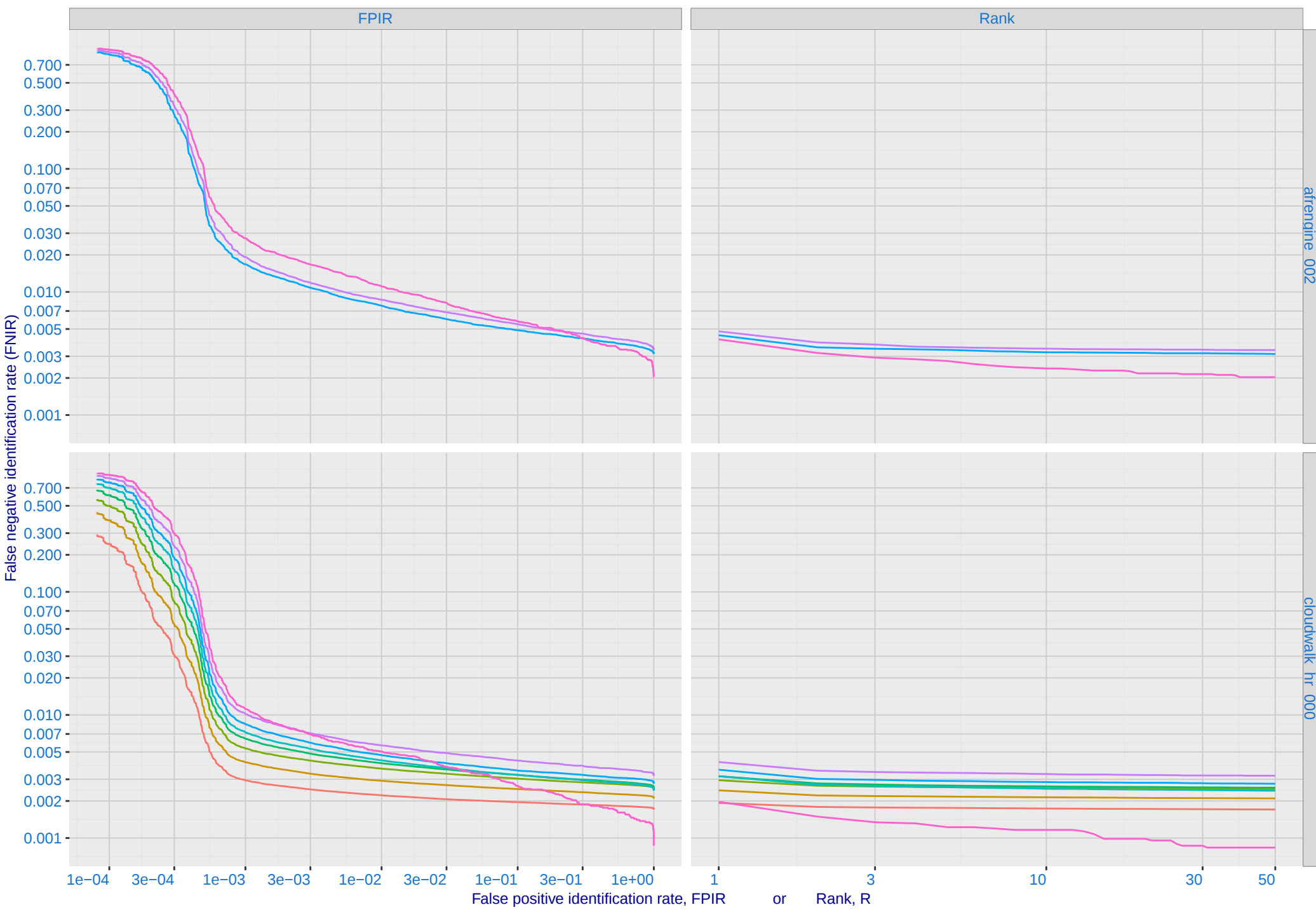
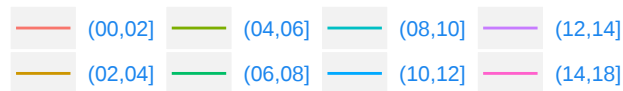
Algorithm: afrengine_002, Dataset: Border-Crossing Ageing
Threshold: 0.880443 set to achive FPIR(30-45, Male) = 0.001

Color encodes log(FPIR)



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

