

A: Datasheet

Algorithm: s1_002

Developer: Samsung S1 Corp

Submission Date: 2022_05_04

Template size: 2048 bytes

Template time (2.5 percentile): 955 msec

Template time (median): 959 msec

Template time (97.5 percentile): 976 msec

Investigation:

Frontal mugshot ranking 36 (out of 353) — FNIR(1600000, 0, 1) = 0.0014 vs. lowest 0.0008 from sensetime_007

Mugshot webcam ranking 30 (out of 315) — FNIR(1600000, 0, 1) = 0.0093 vs. lowest 0.0056 from sensetime_007

Mugshot profile ranking 32 (out of 284) — FNIR(1600000, 0, 1) = 0.0932 vs. lowest 0.0521 from sensetime_007

Immigration visa–border ranking 6 (out of 242) — FNIR(1600000, 0, 1) = 0.0011 vs. lowest 0.0008 from sensetime_007

Immigration visa–kiosk ranking 6 (out of 239) — FNIR(1600000, 0, 1) = 0.0553 vs. lowest 0.0487 from cubox_000

Identification:

Frontal mugshot ranking 34 (out of 353) — FNIR(1600000, T, L+1) = 0.0056, FPIR=0.001000 vs. lowest 0.0014 from sensetime_007

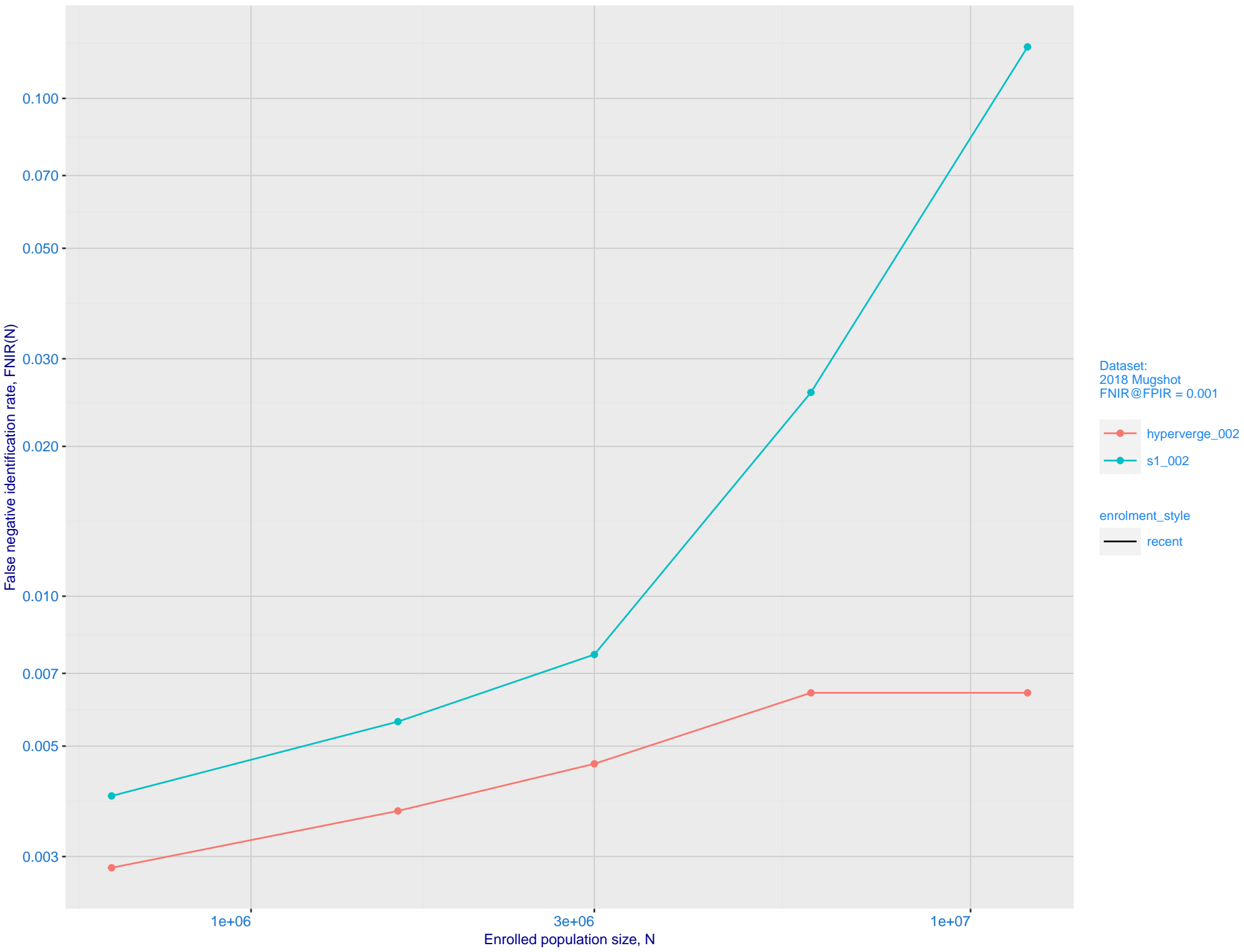
Mugshot webcam ranking 38 (out of 313) — FNIR(1600000, T, L+1) = 0.0306, FPIR=0.001000 vs. lowest 0.0093 from sensetime_007

Mugshot profile ranking 6 (out of 283) — FNIR(1600000, T, L+1) = 0.1960, FPIR=0.001000 vs. lowest 0.1093 from cloudwalk_mt_000

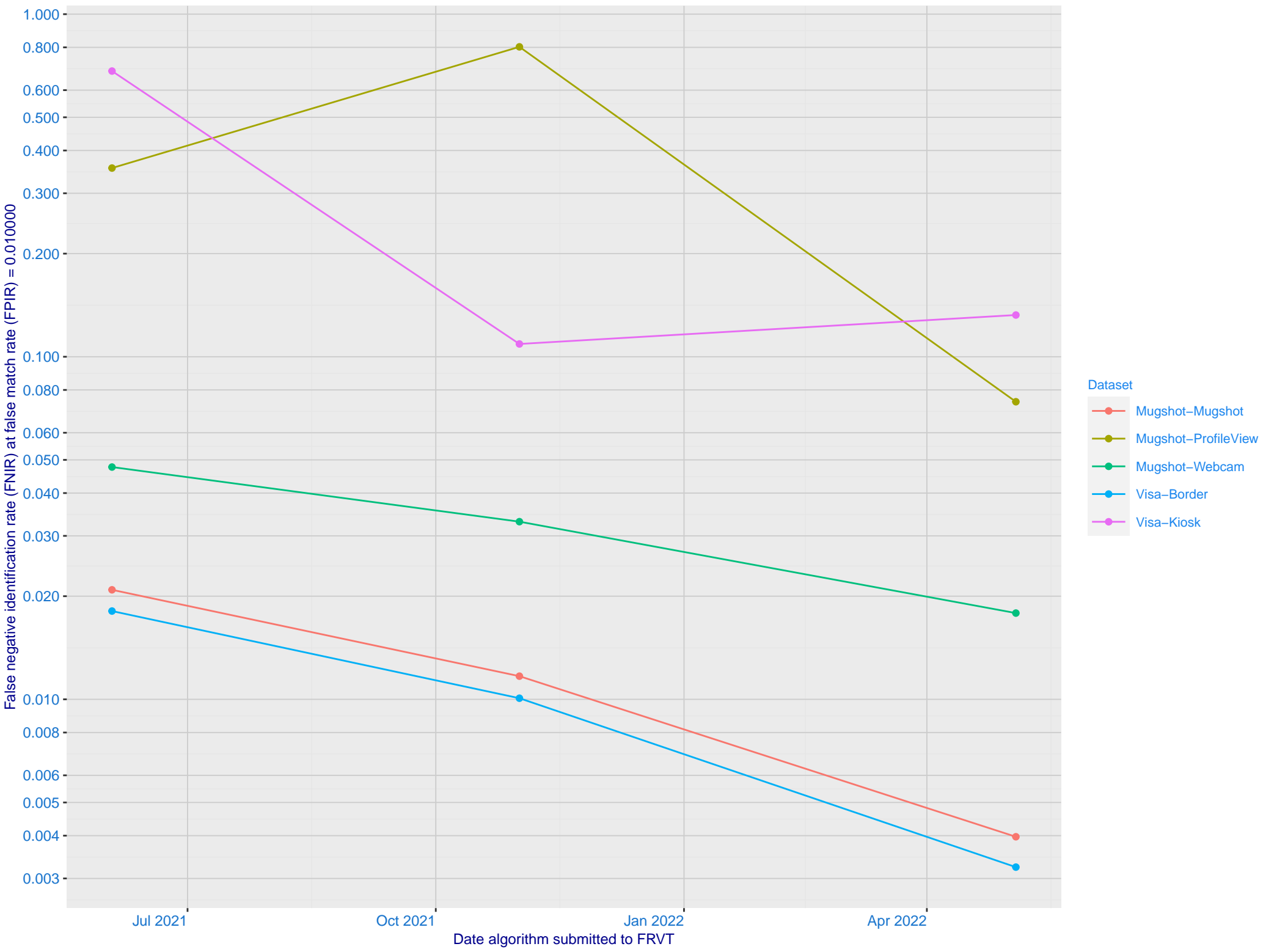
Immigration visa–border ranking 20 (out of 241) — FNIR(1600000, T, L+1) = 0.0070, FPIR=0.001000 vs. lowest 0.0024 from cloudwalk_mt_000

Immigration visa–kiosk ranking 170 (out of 236) — FNIR(1600000, T, L+1) = 0.8611, FPIR=0.001000 vs. lowest 0.0719 from cloudwalk_mt_000

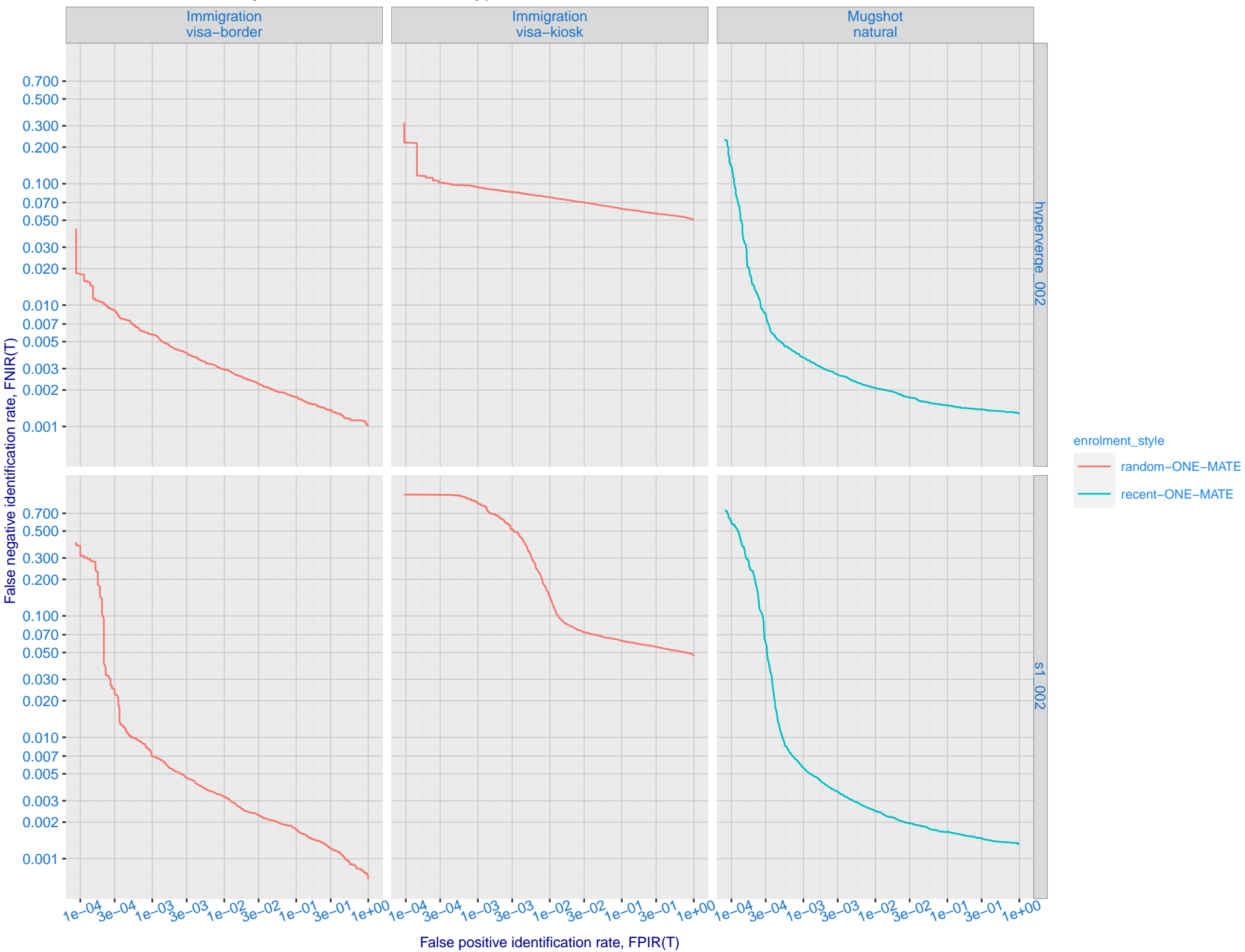
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (hyperverge_002)



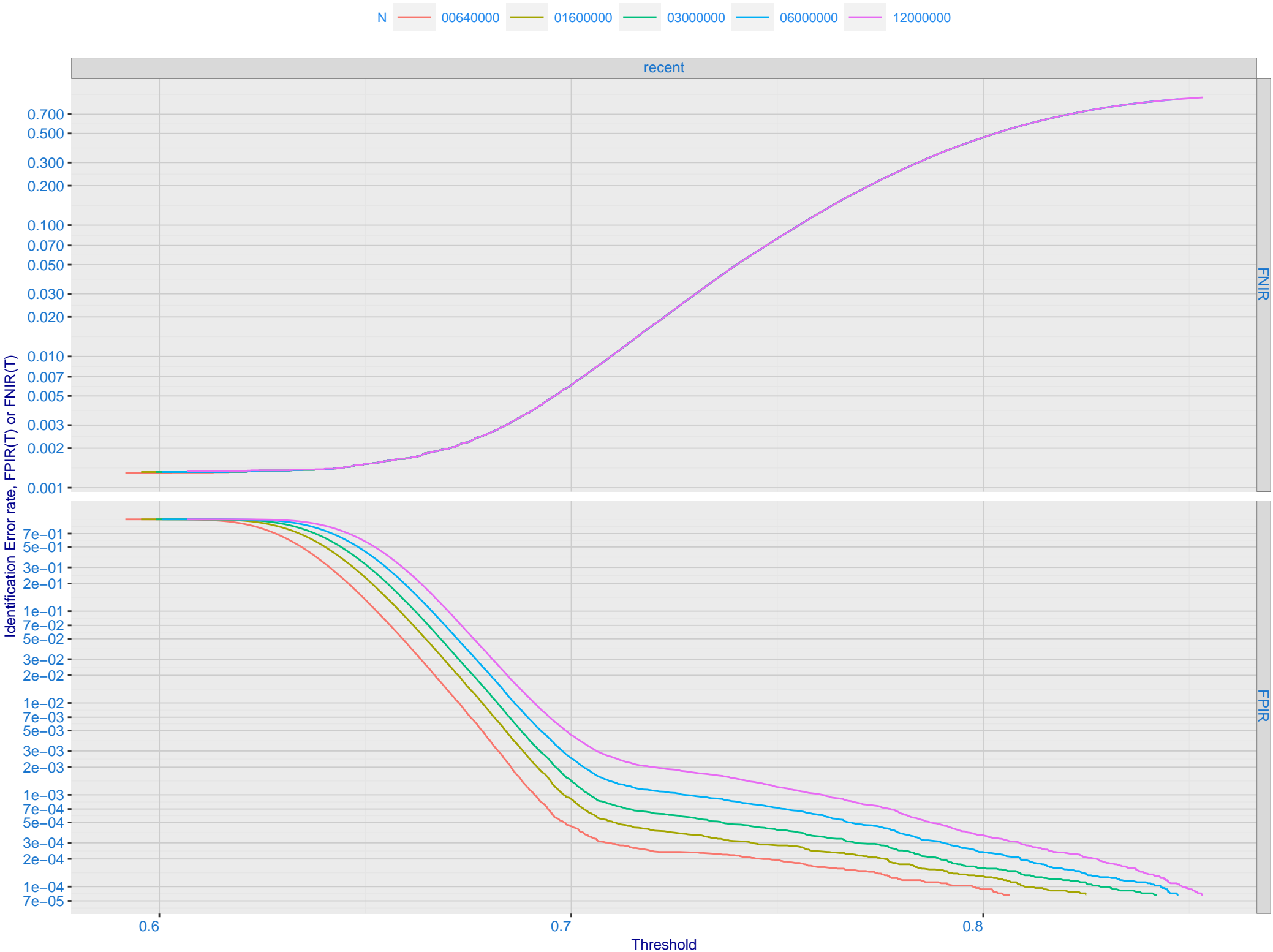
C: Evolution of accuracy for S1 algorithms on three datasets 2018 – present



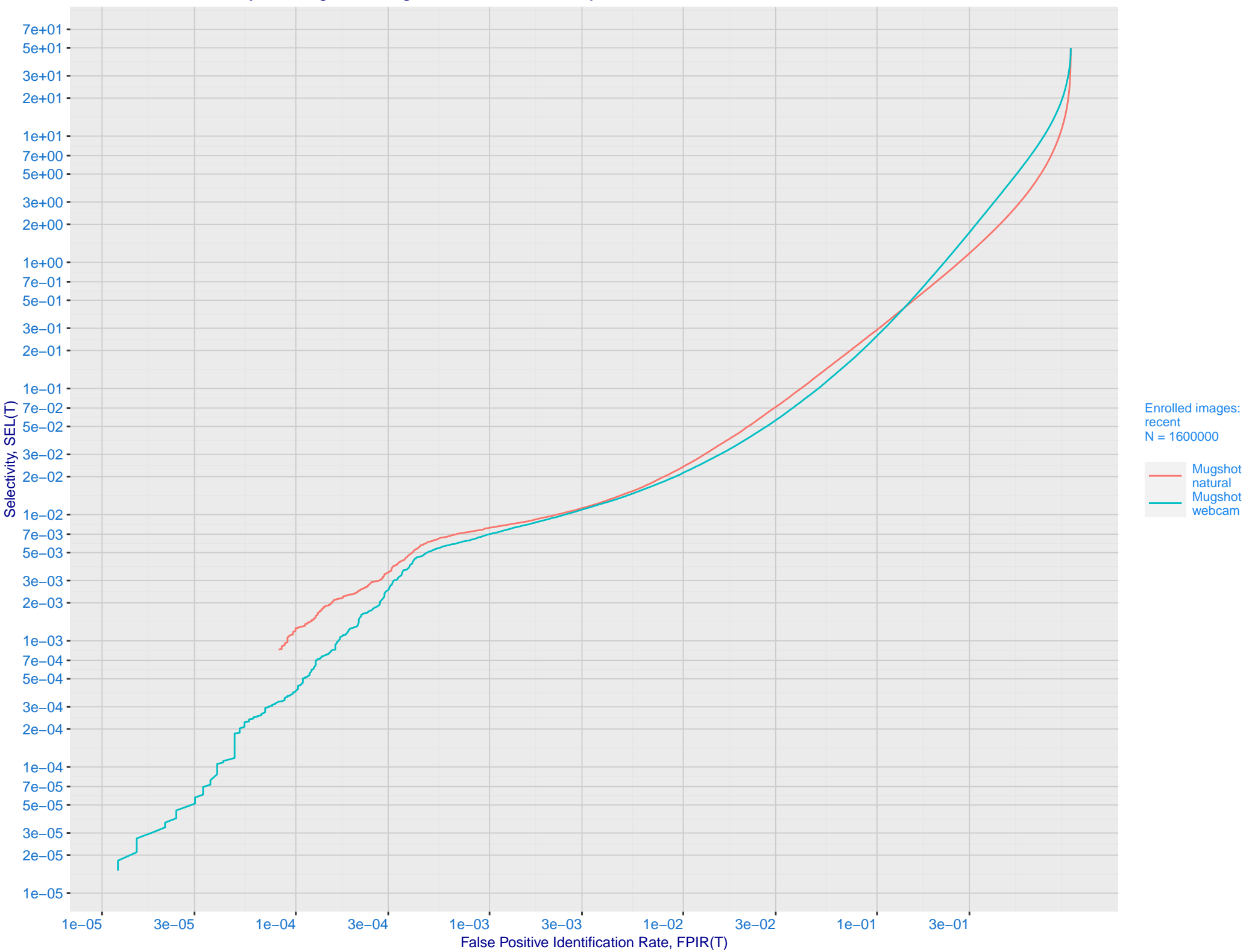
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals



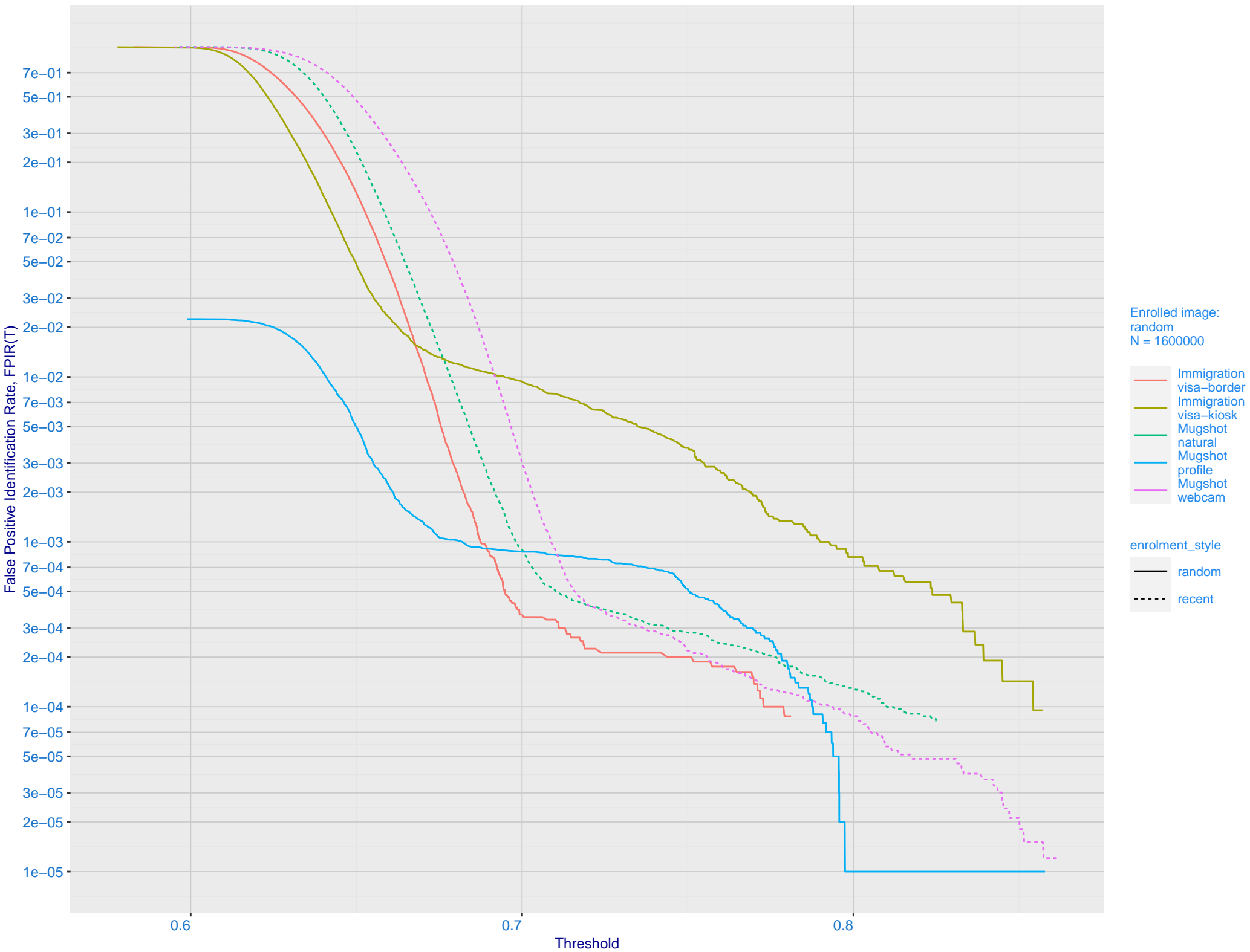
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



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

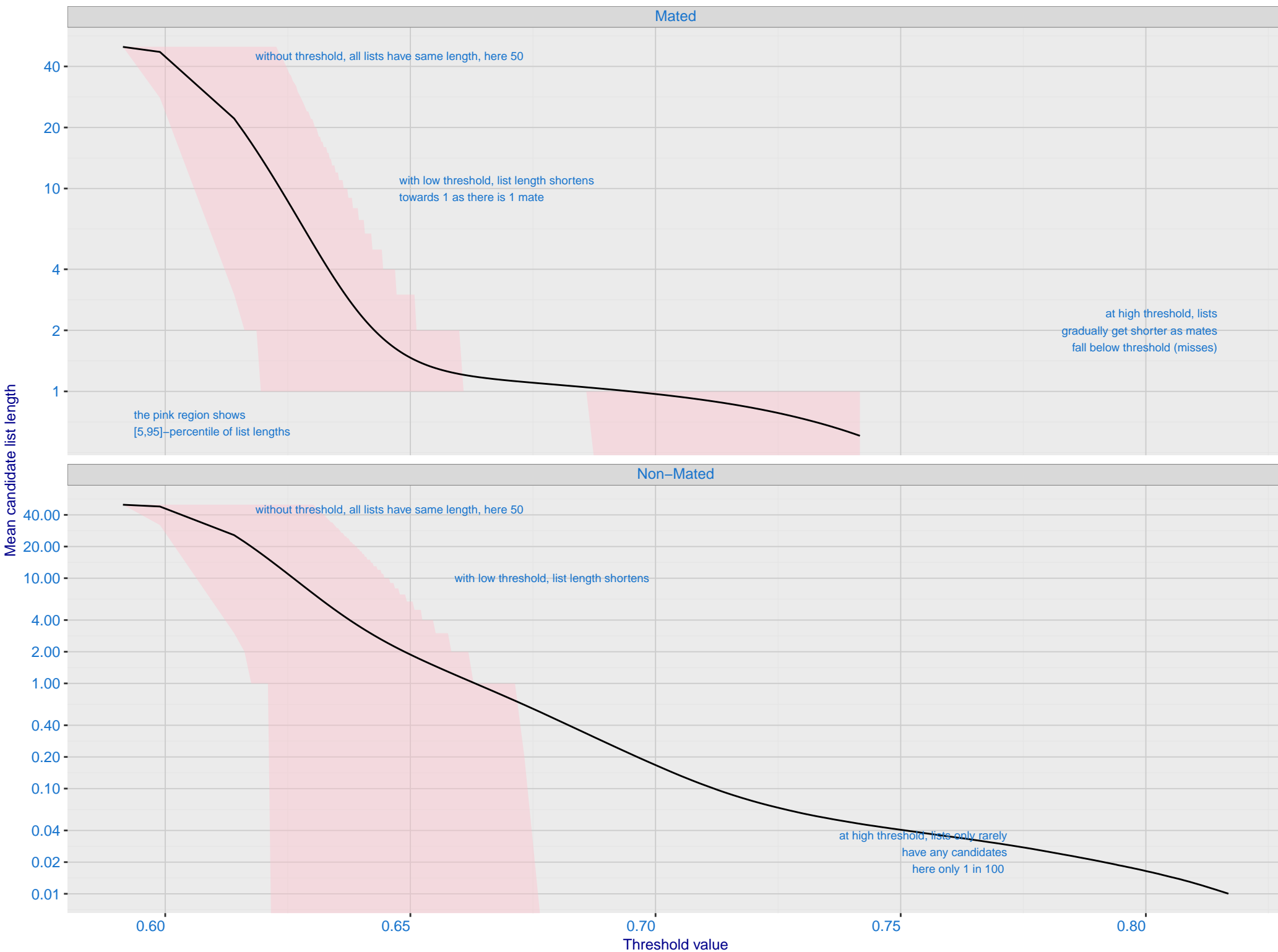


G: FPIR dependence on T by probe type for N = 1600000 subjects



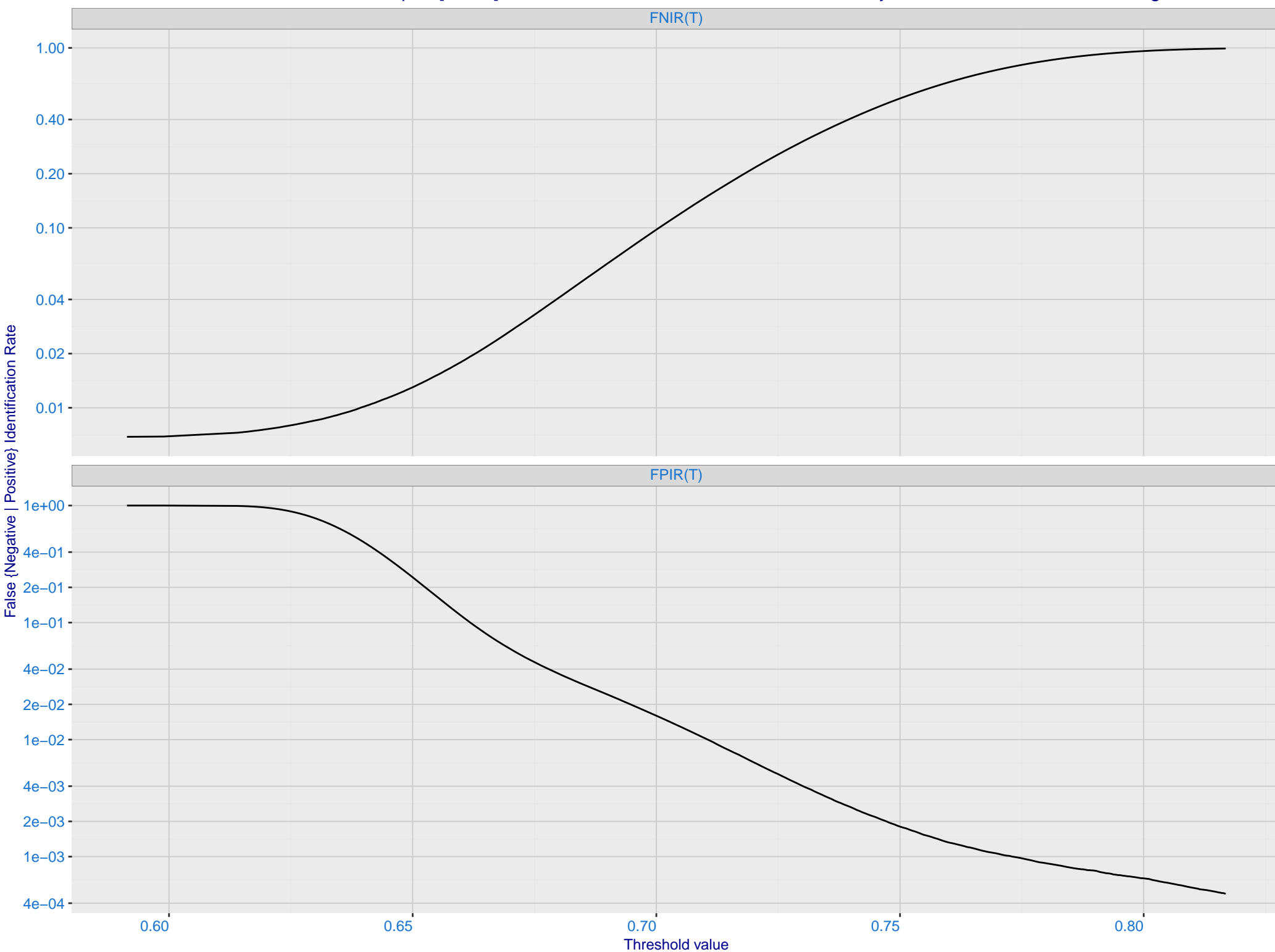
H: Reduced length candidate lists for human review

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

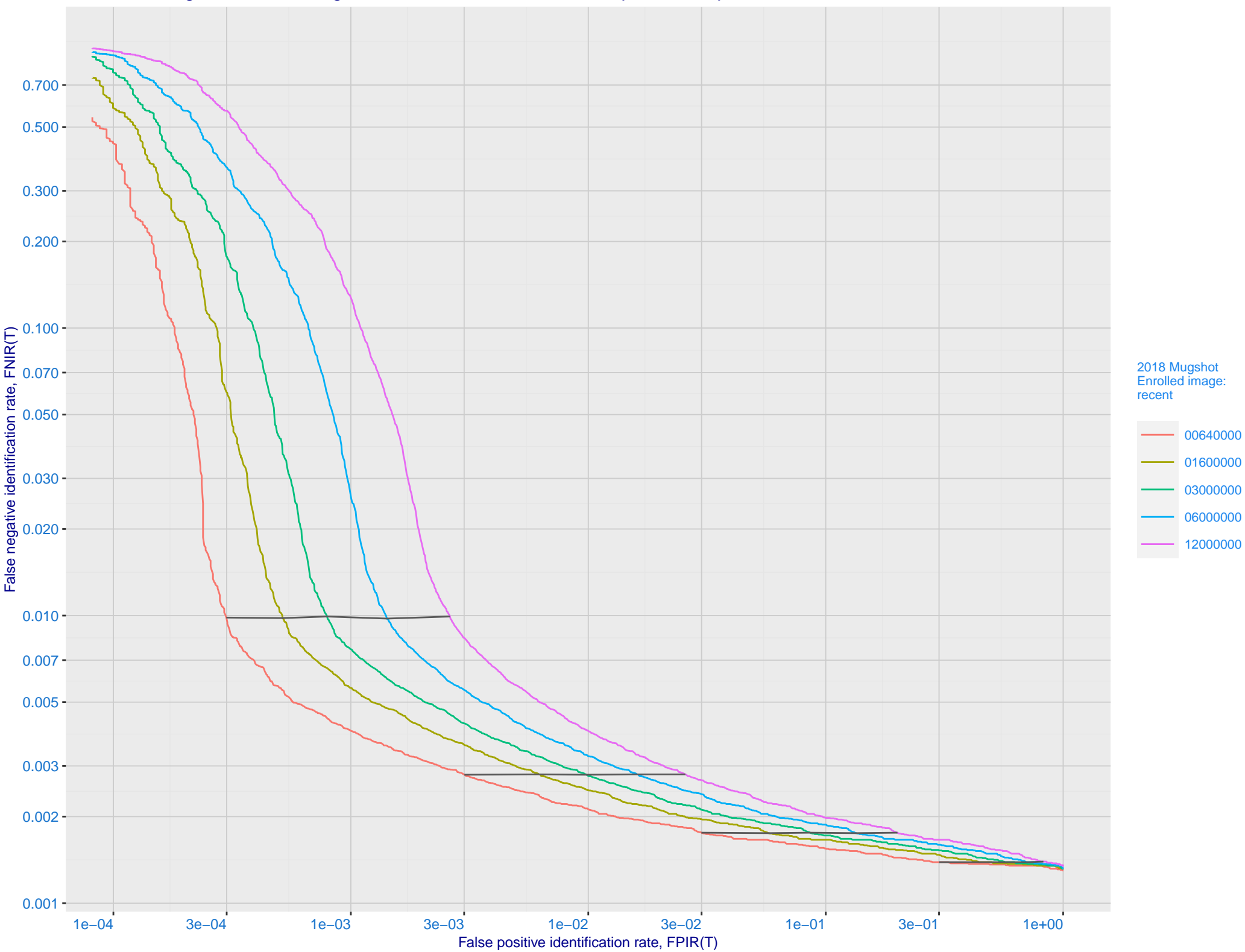


I: FNIR and FPIR dependence on threshold

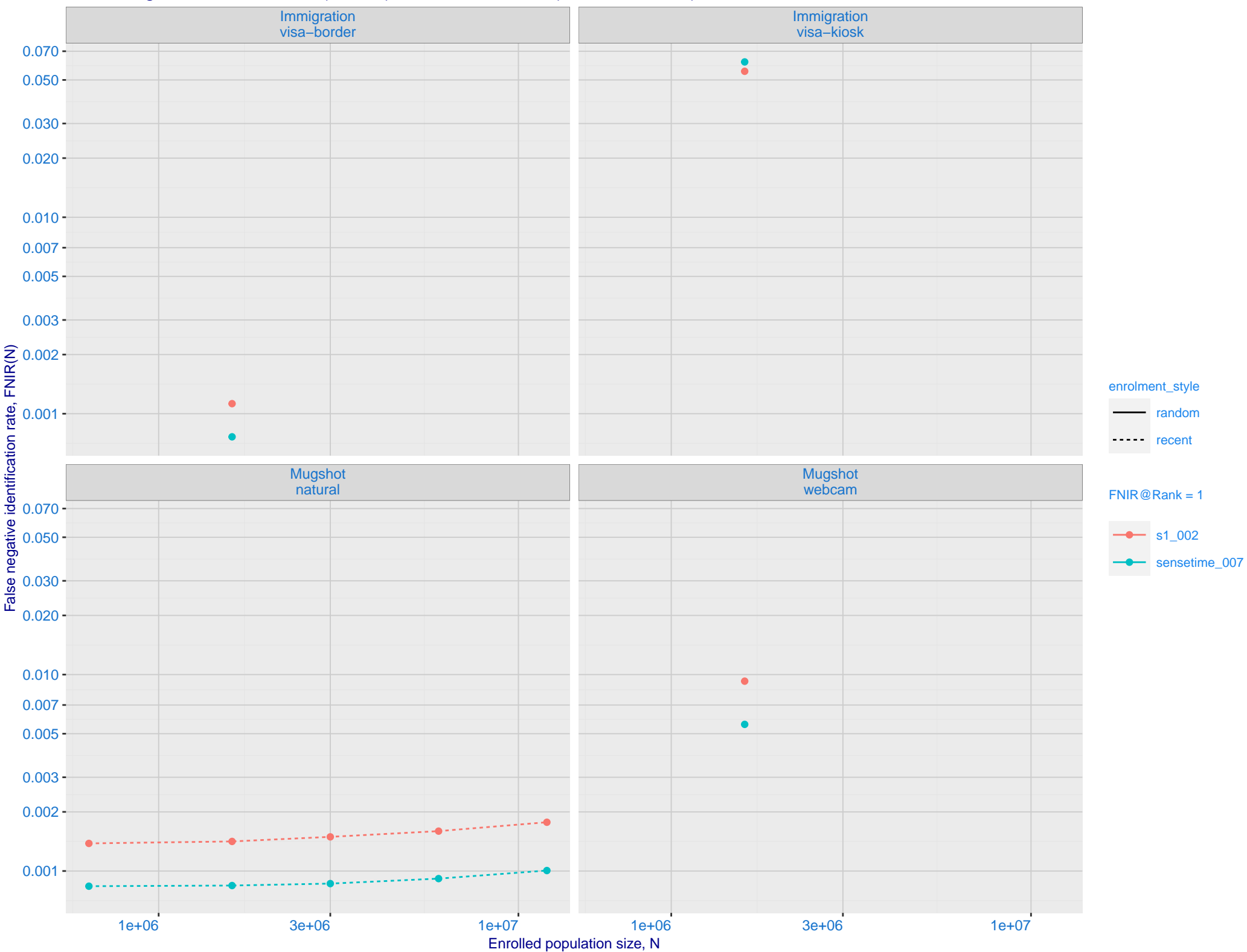
Dataset is border-border with time-lapse [10,15] YRS with N = 1600000. Probes are 10-15 years later than enrollment image



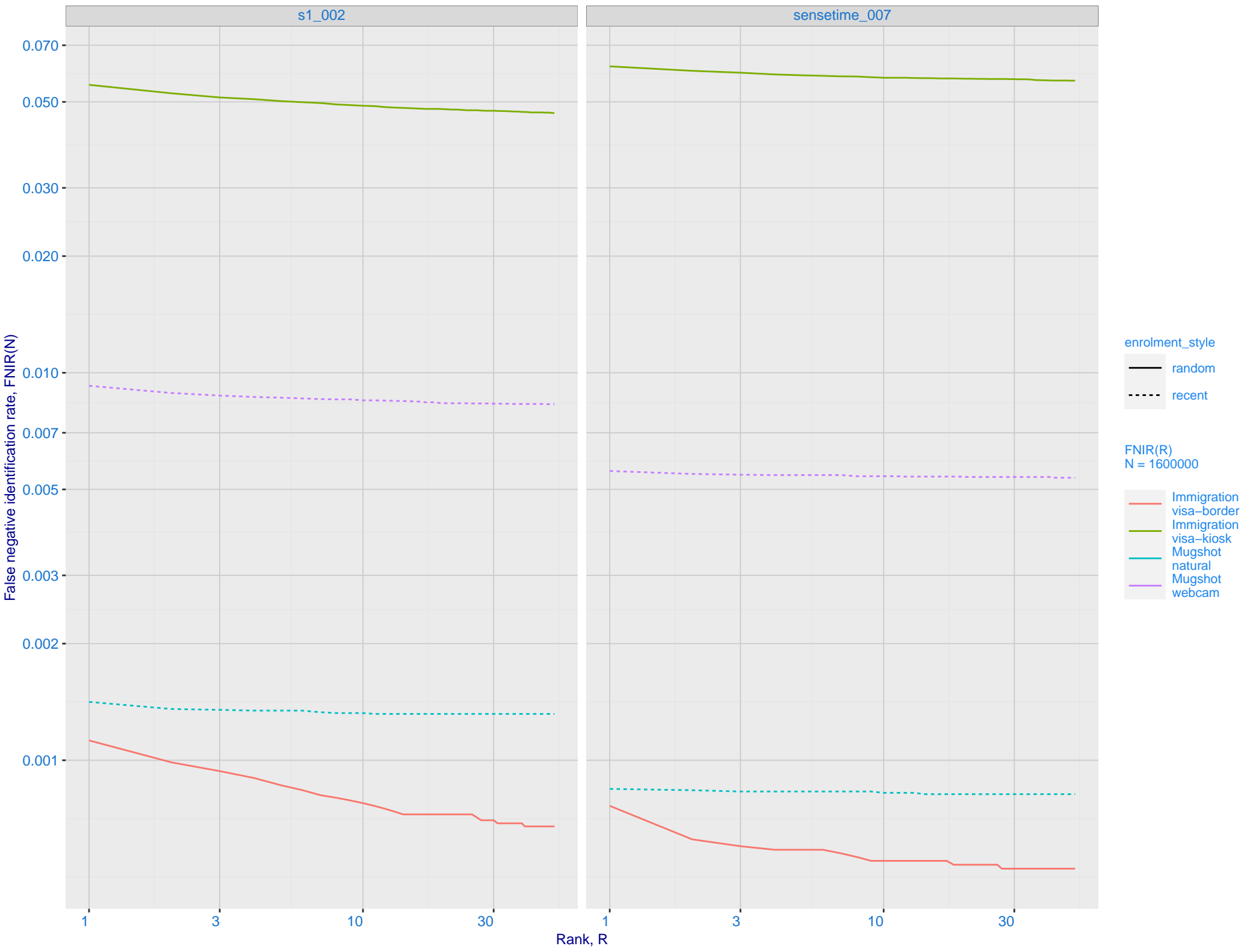
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.



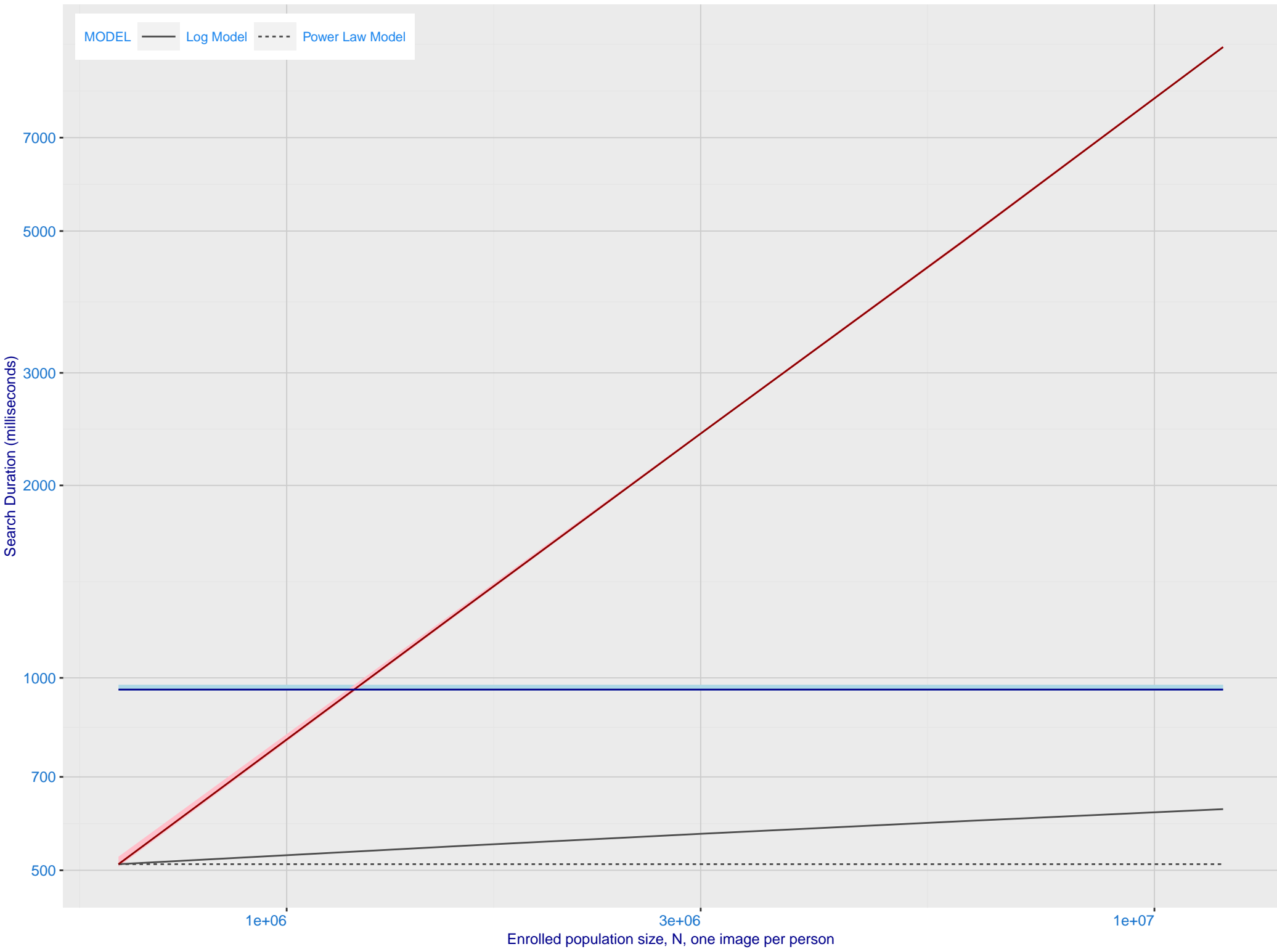
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_007)



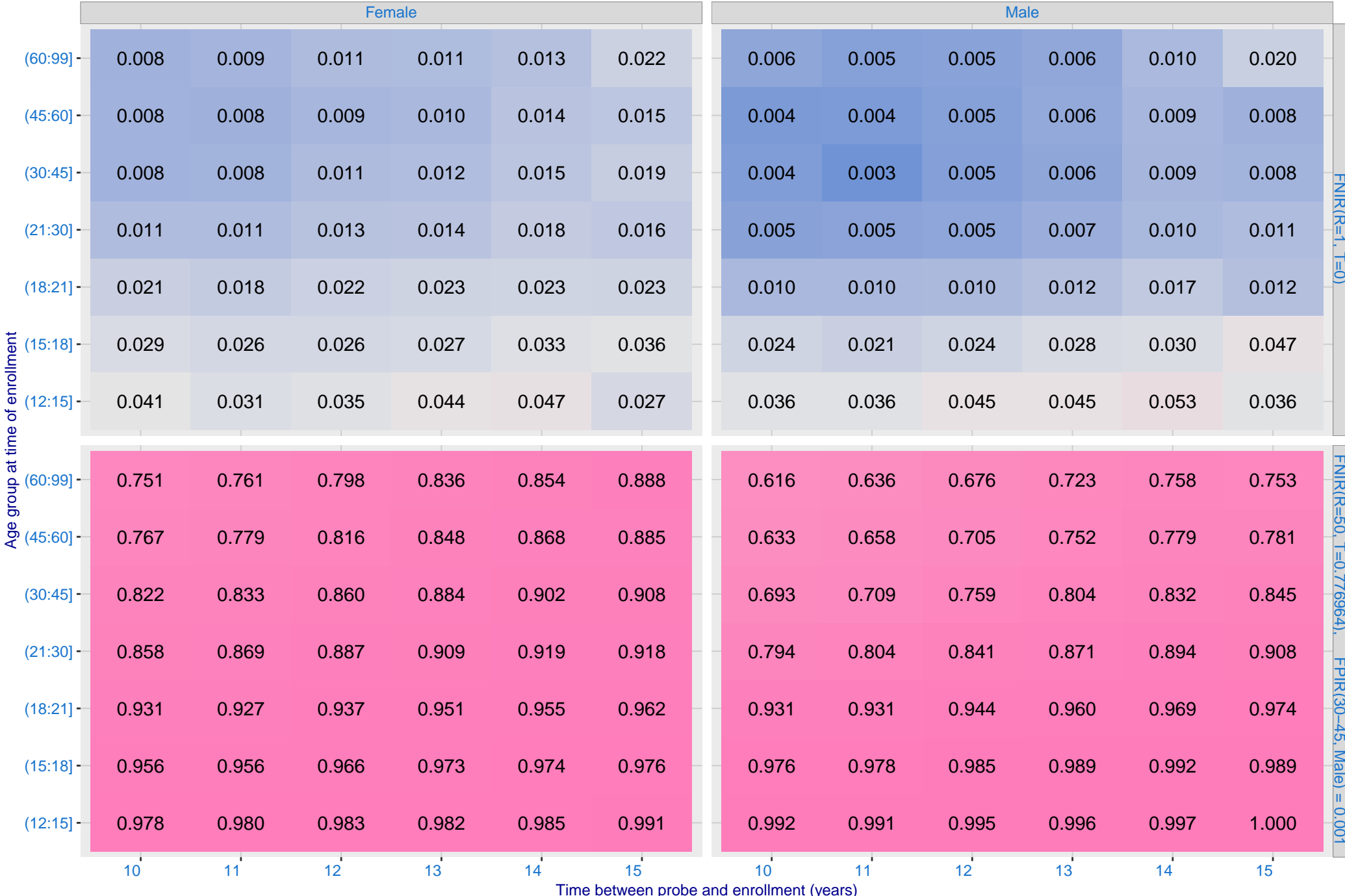
L: Investigational mode: FNIR(1600000, R, 0) by probe type



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



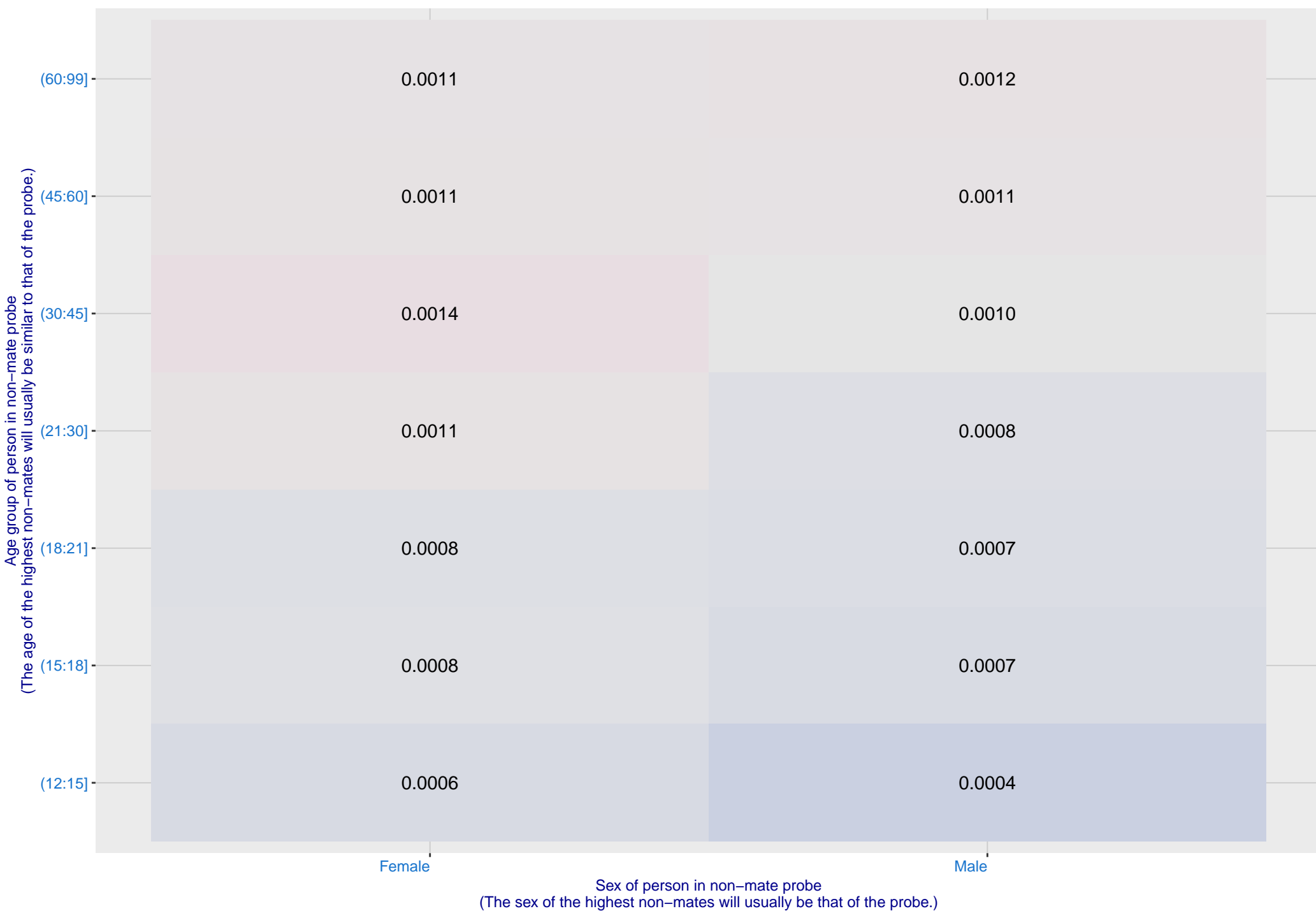
O: FNIR(T, N = 1.6 million) by sex, age and time-lapse. The top row gives investigational rank-1 miss rates. The bottom panels give high threshold for more lights-out identification with low FPIR.



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.

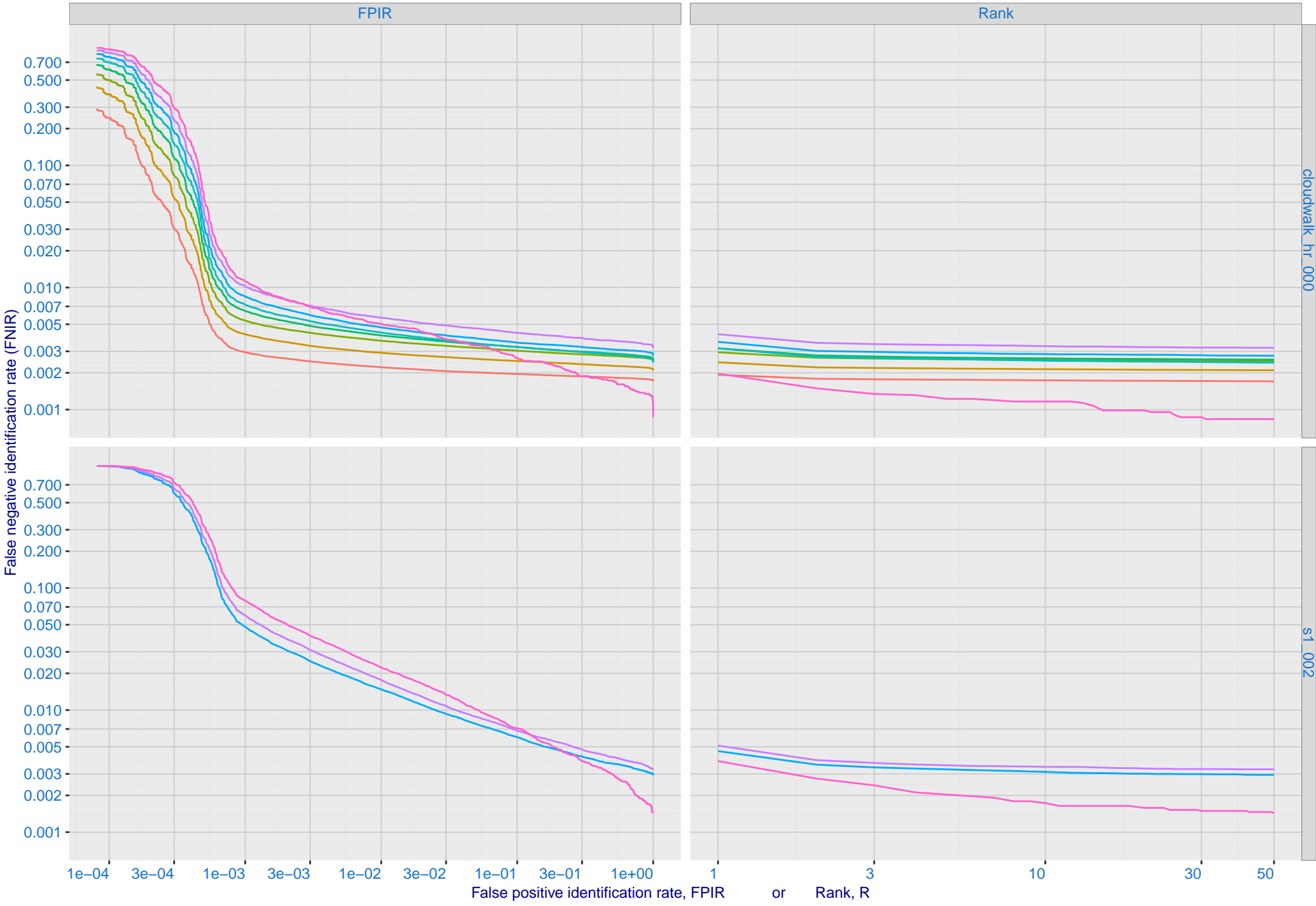
Algorithm: s1_002, Dataset: Border-Crossing Ageing
Threshold: 0.776964 set to achieve FPIR(30–45, Male) = 0.001

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

