

A: Datasheet

Algorithm: nec_3

Developer: NEC

Submission Date: 2018_10_30

Template size: 1712 bytes

Template time (2.5 percentile): 660 msec

Template time (median): 665 msec

Template time (97.5 percentile): 1015 msec

Investigation:

Frontal mugshot ranking 11 (out of 279) -- FNIR(1600000, 0, 1) = 0.0014 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 19 (out of 241) -- FNIR(1600000, 0, 1) = 0.0099 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 43 (out of 210) -- FNIR(1600000, 0, 1) = 0.3523 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 26 (out of 168) -- FNIR(1600000, 0, 1) = 0.0037 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 53 (out of 165) -- FNIR(1600000, 0, 1) = 0.1204 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

Frontal mugshot ranking 6 (out of 279) -- FNIR(1600000, T, L+1) = 0.0024, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

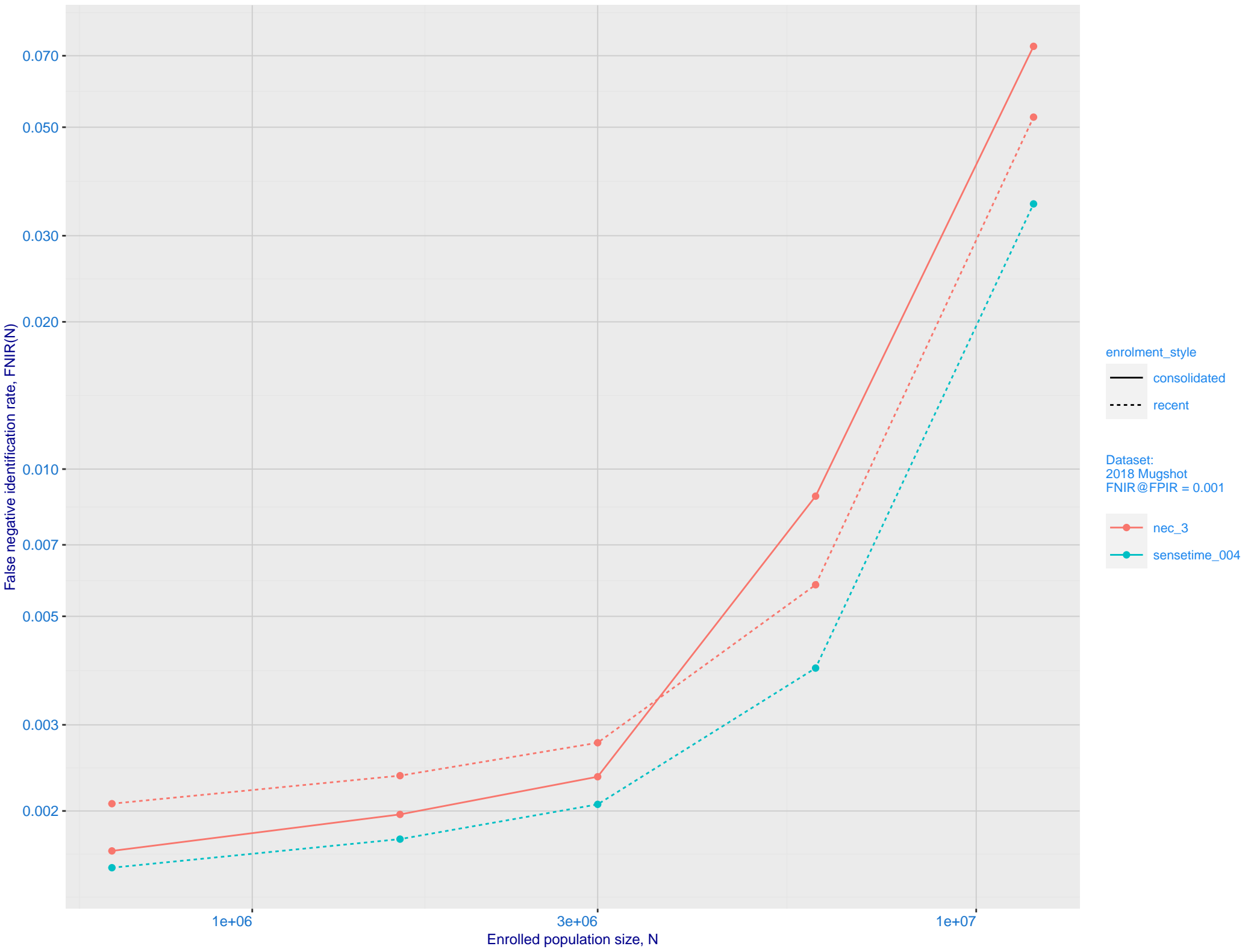
Mugshot webcam ranking 8 (out of 236) -- FNIR(1600000, T, L+1) = 0.0171, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 26 (out of 209) -- FNIR(1600000, T, L+1) = 0.8242, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

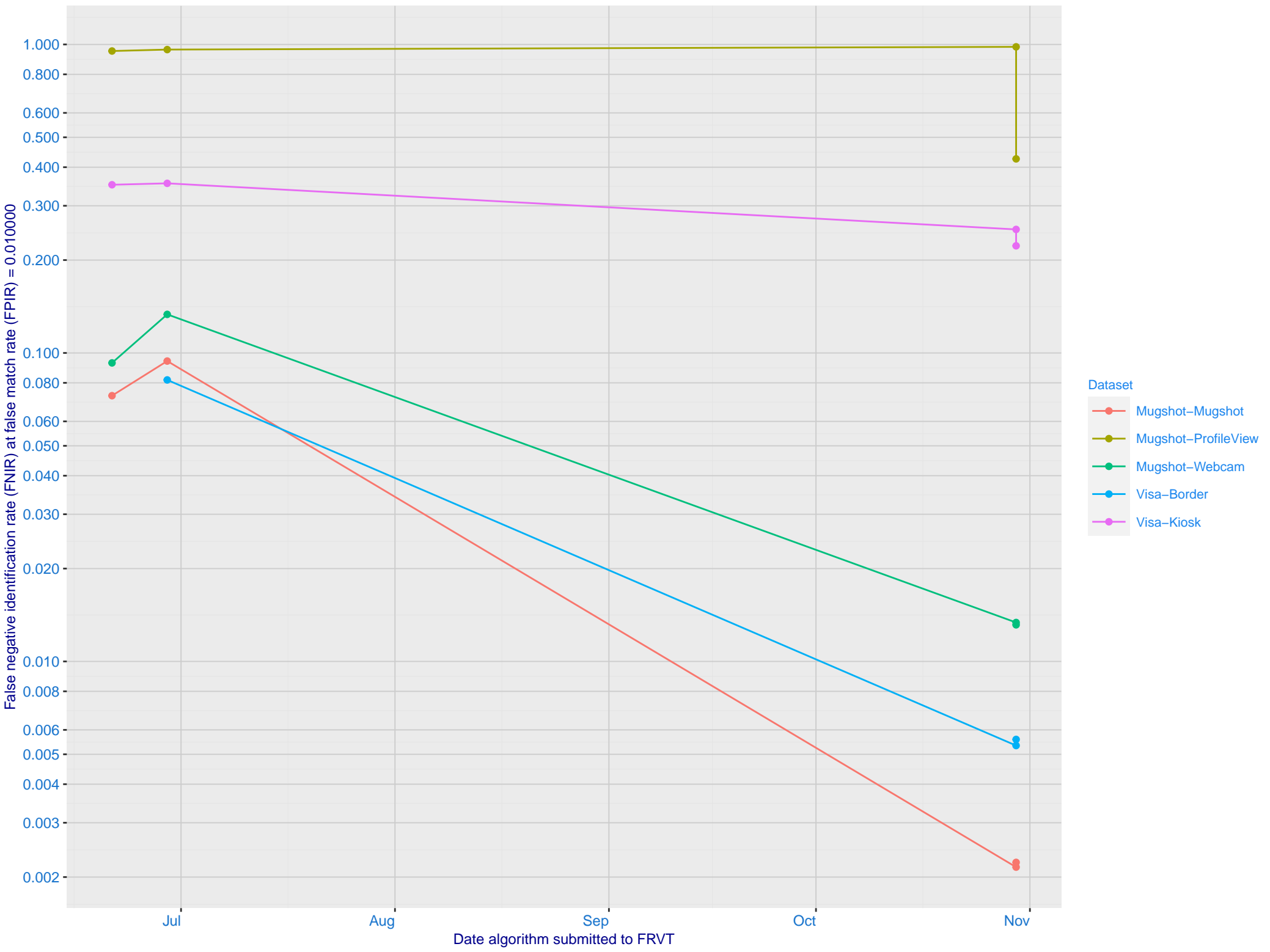
Immigration visa-border ranking 11 (out of 167) -- FNIR(1600000, T, L+1) = 0.0081, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 87 (out of 162) -- FNIR(1600000, T, L+1) = 0.6749, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000

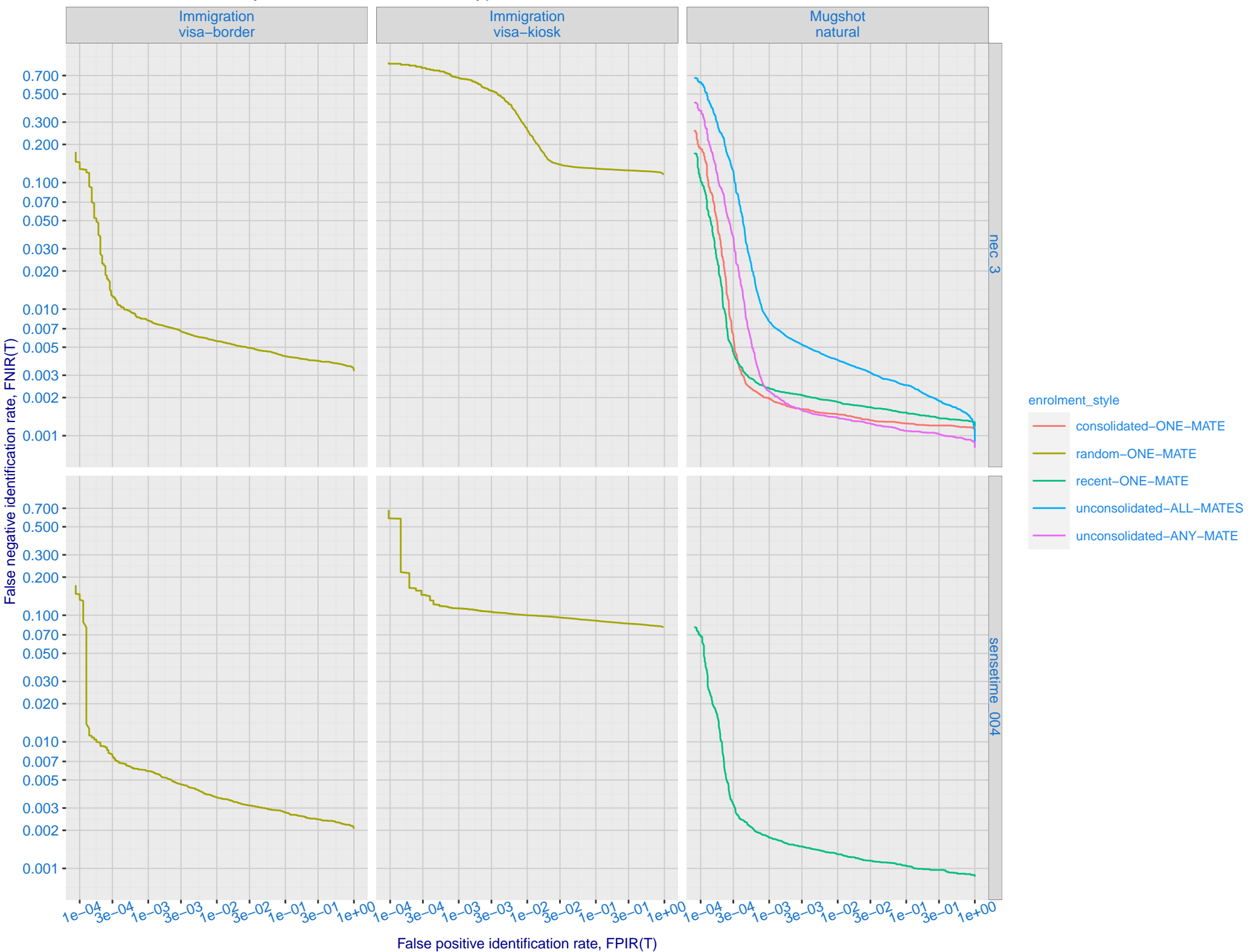
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_004)



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

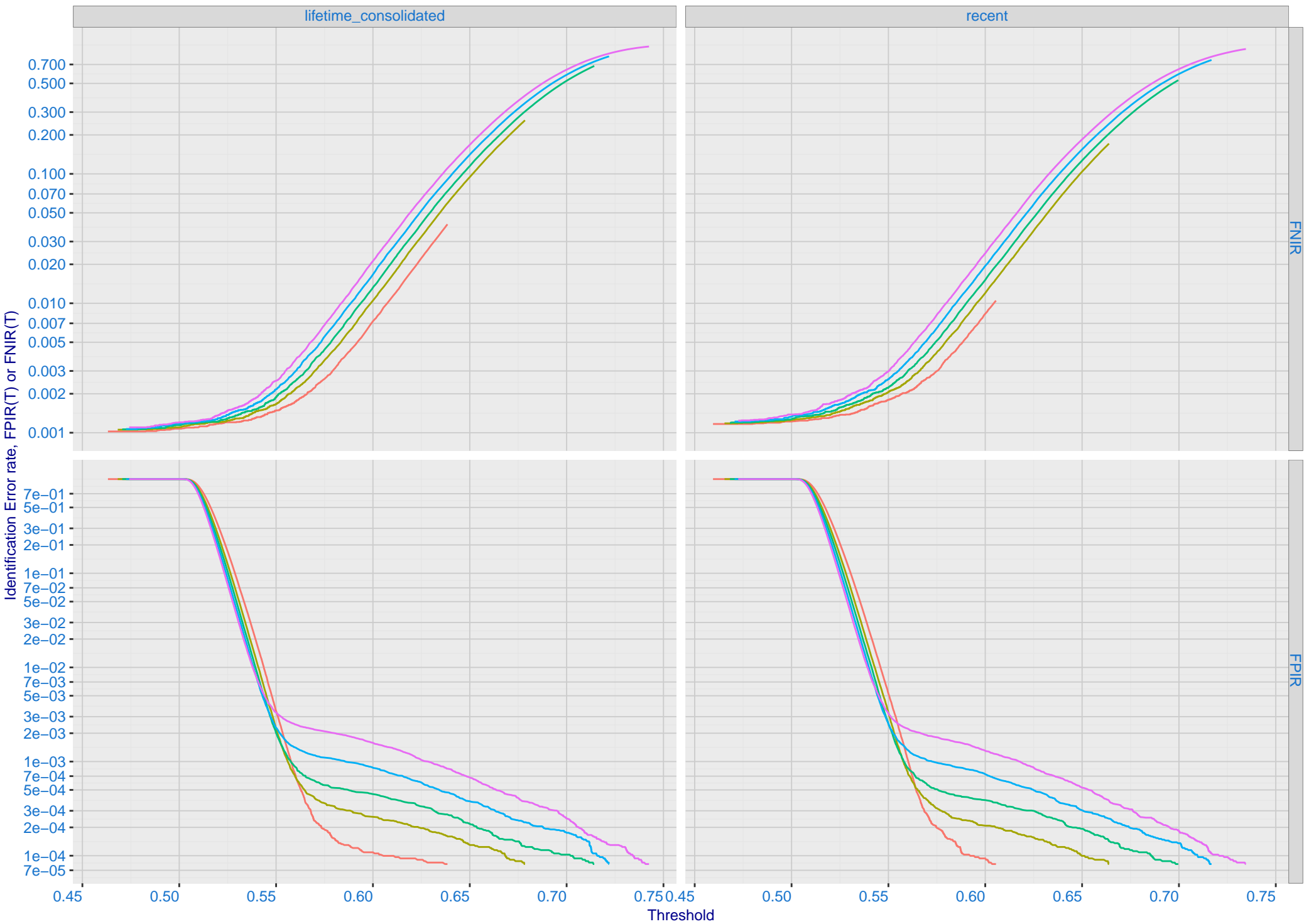


D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals

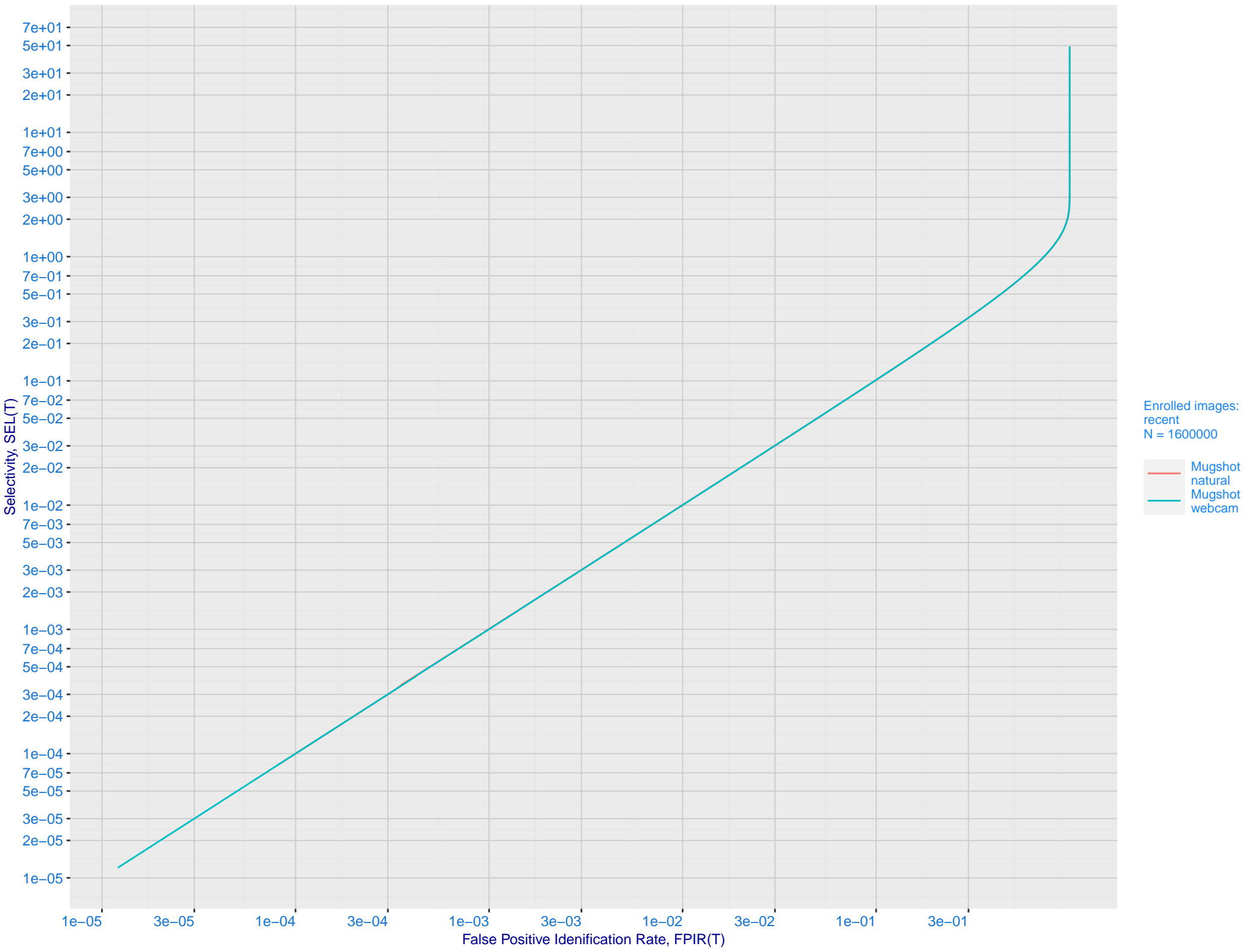


E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images

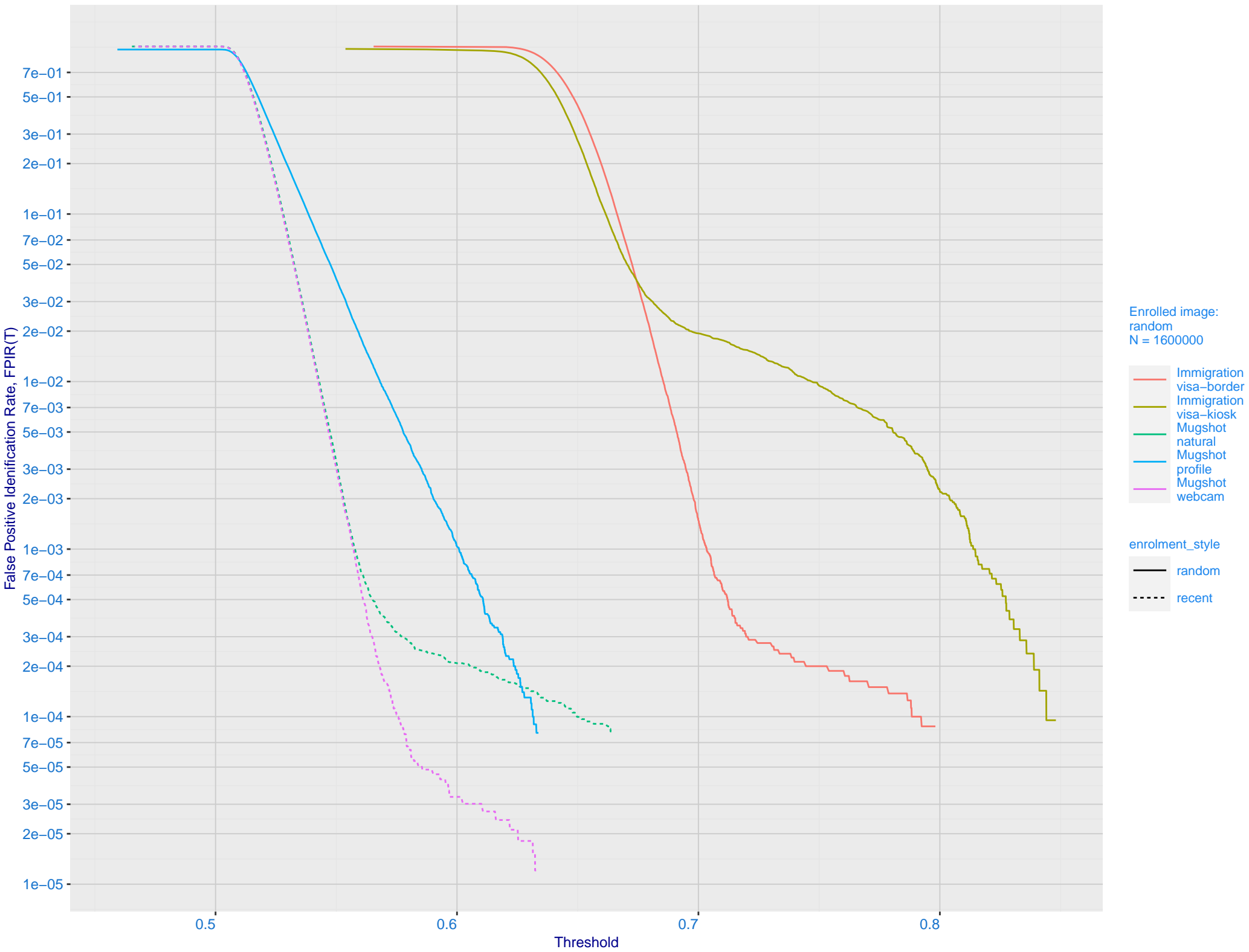
N 00640000 01600000 03000000 06000000 12000000



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

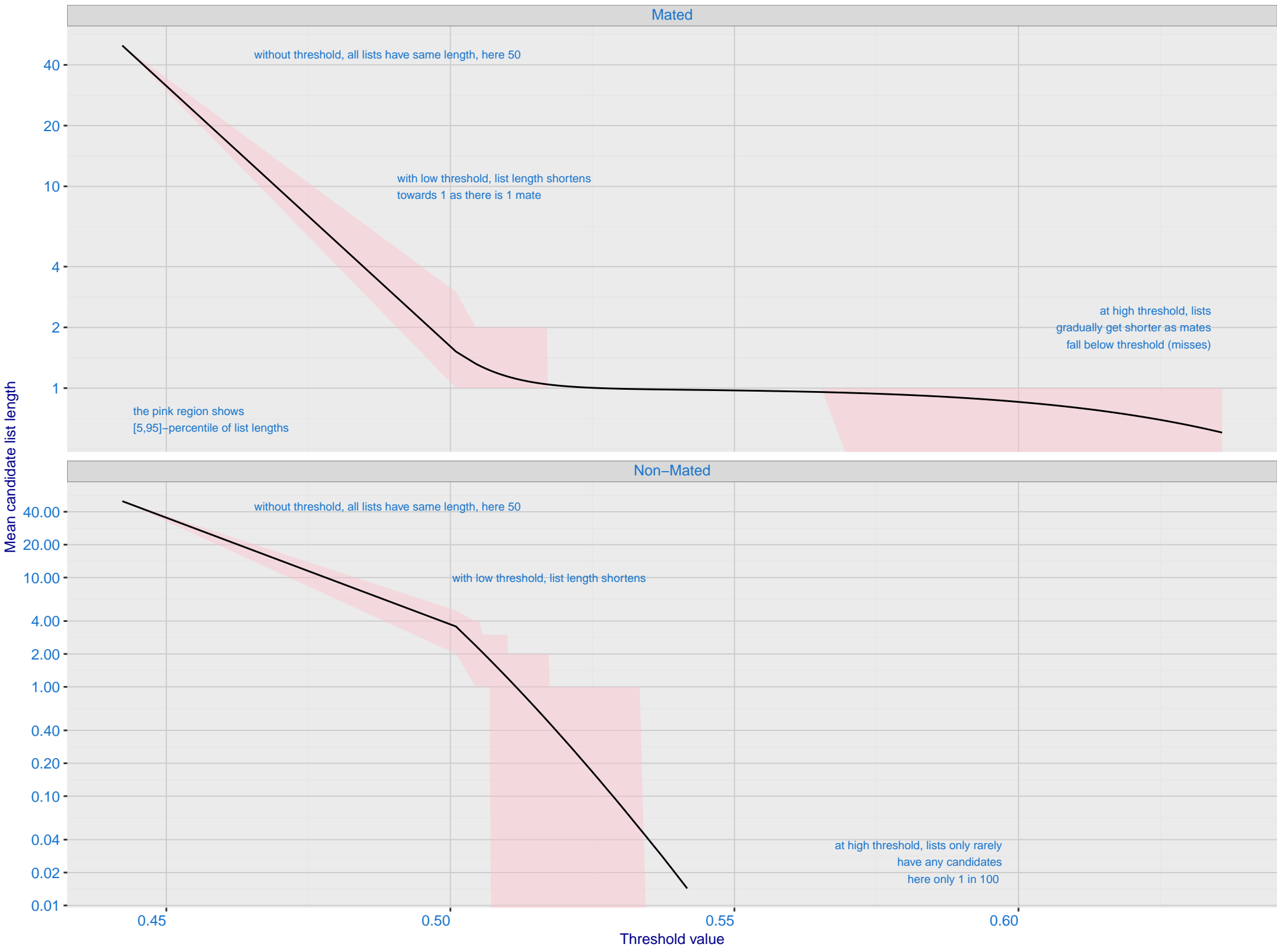


G: FPIR dependence on T by probe type for N = 1600000 subjects



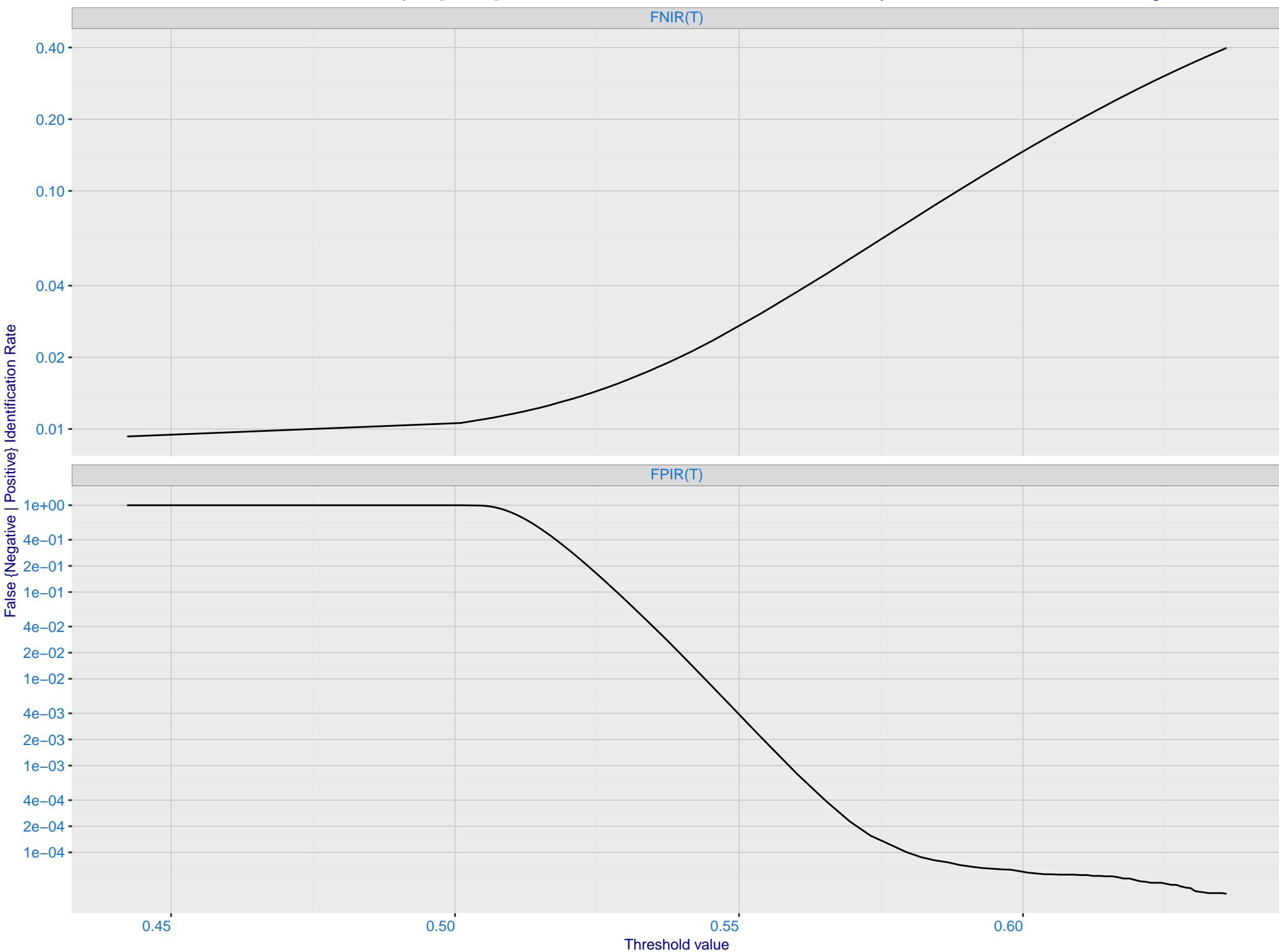
H: Reduced length candidate lists for human review

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

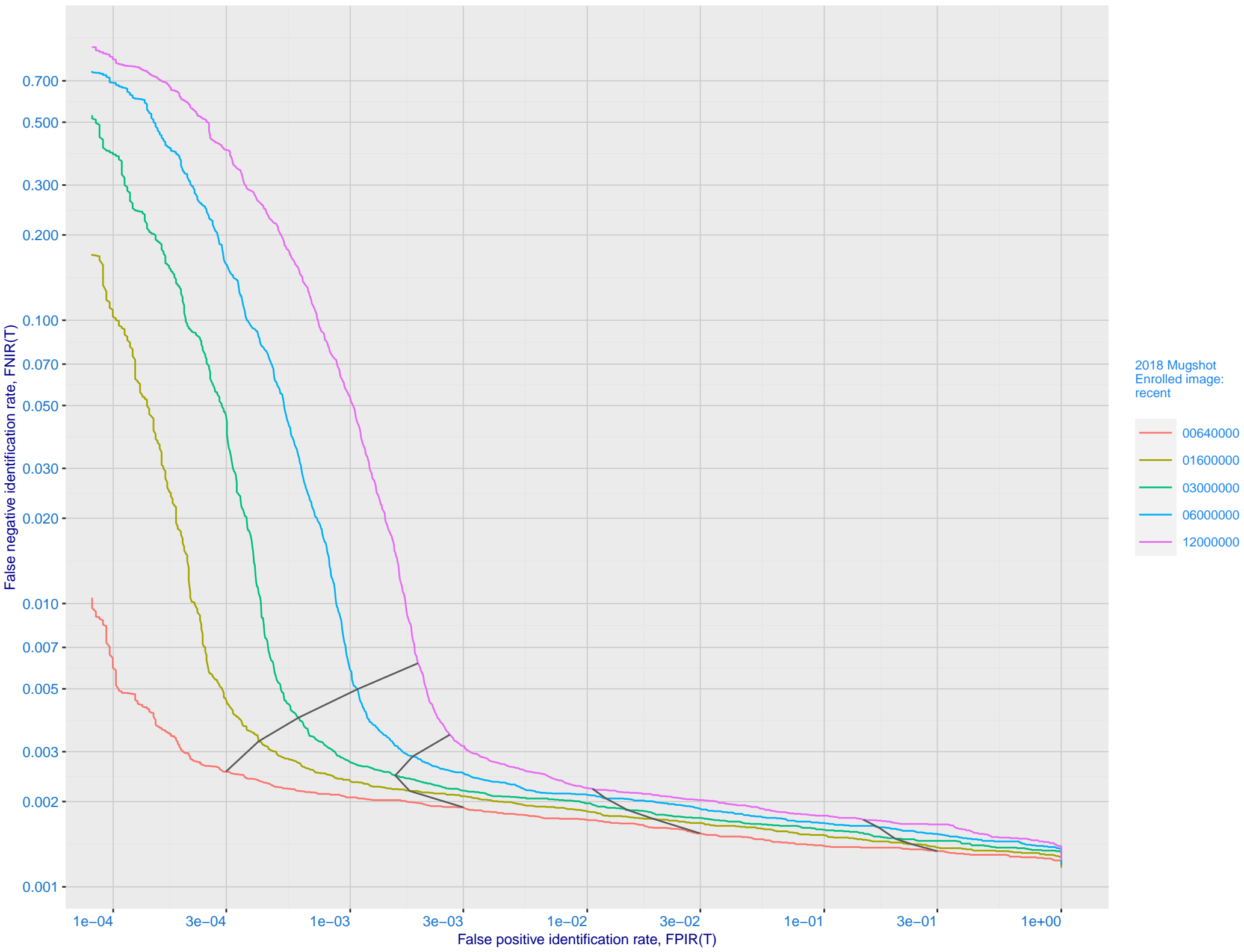


I: FNIR and FPIR dependence on threshold

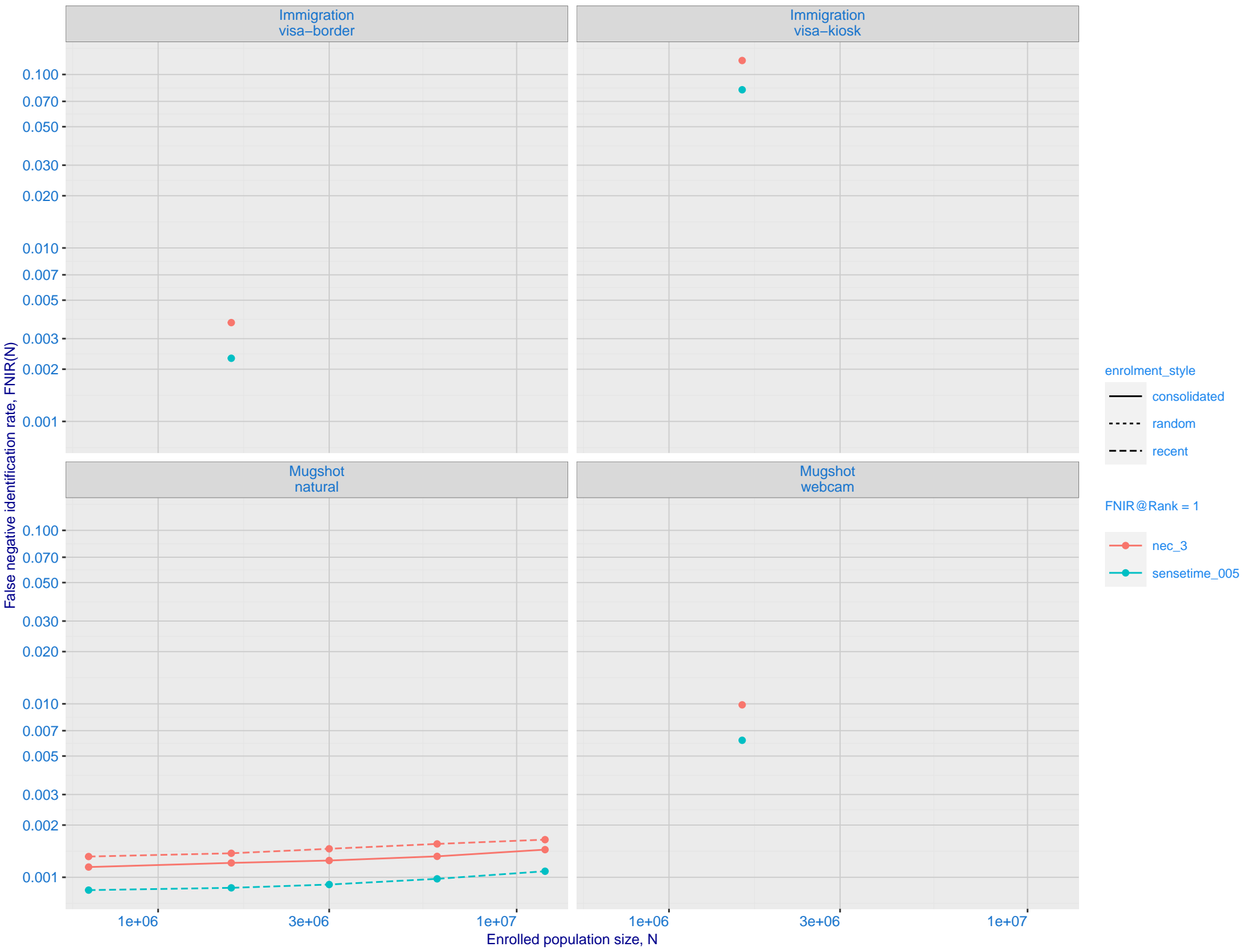
Dataset is border-border with time-lapse [10,15] YRS with N = 1600000. Probes are 10-15 years later than enrollment image



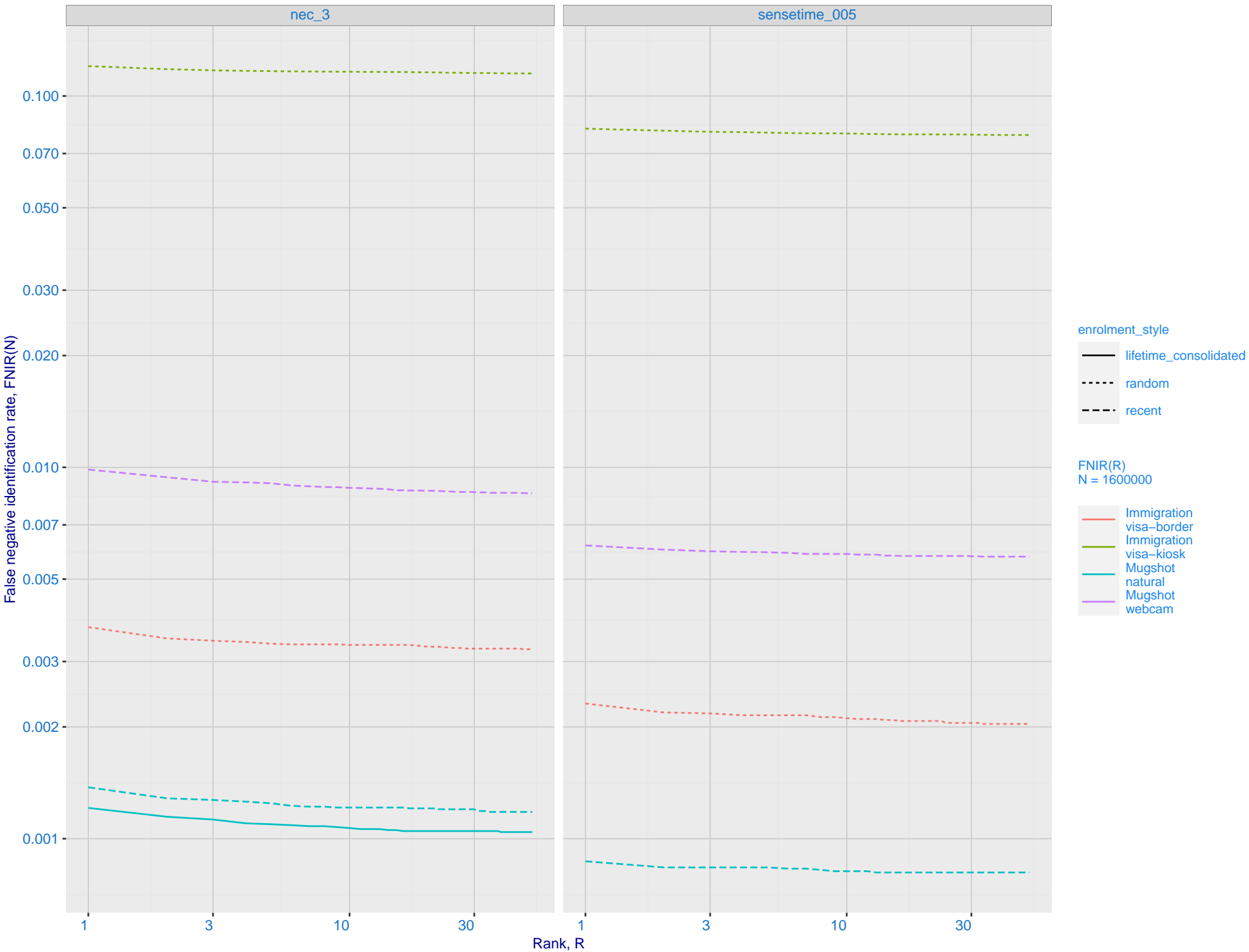
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.



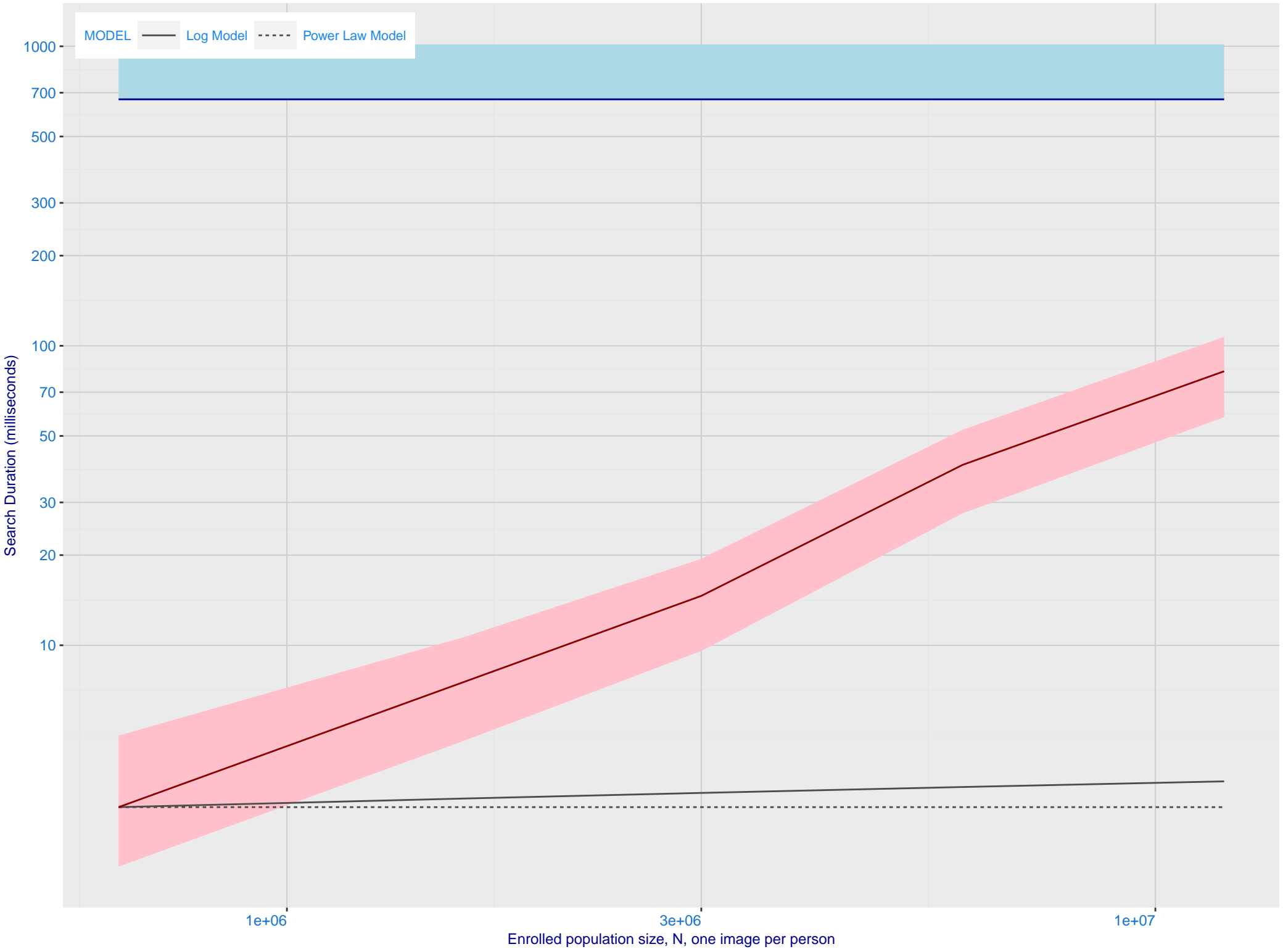
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005)



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

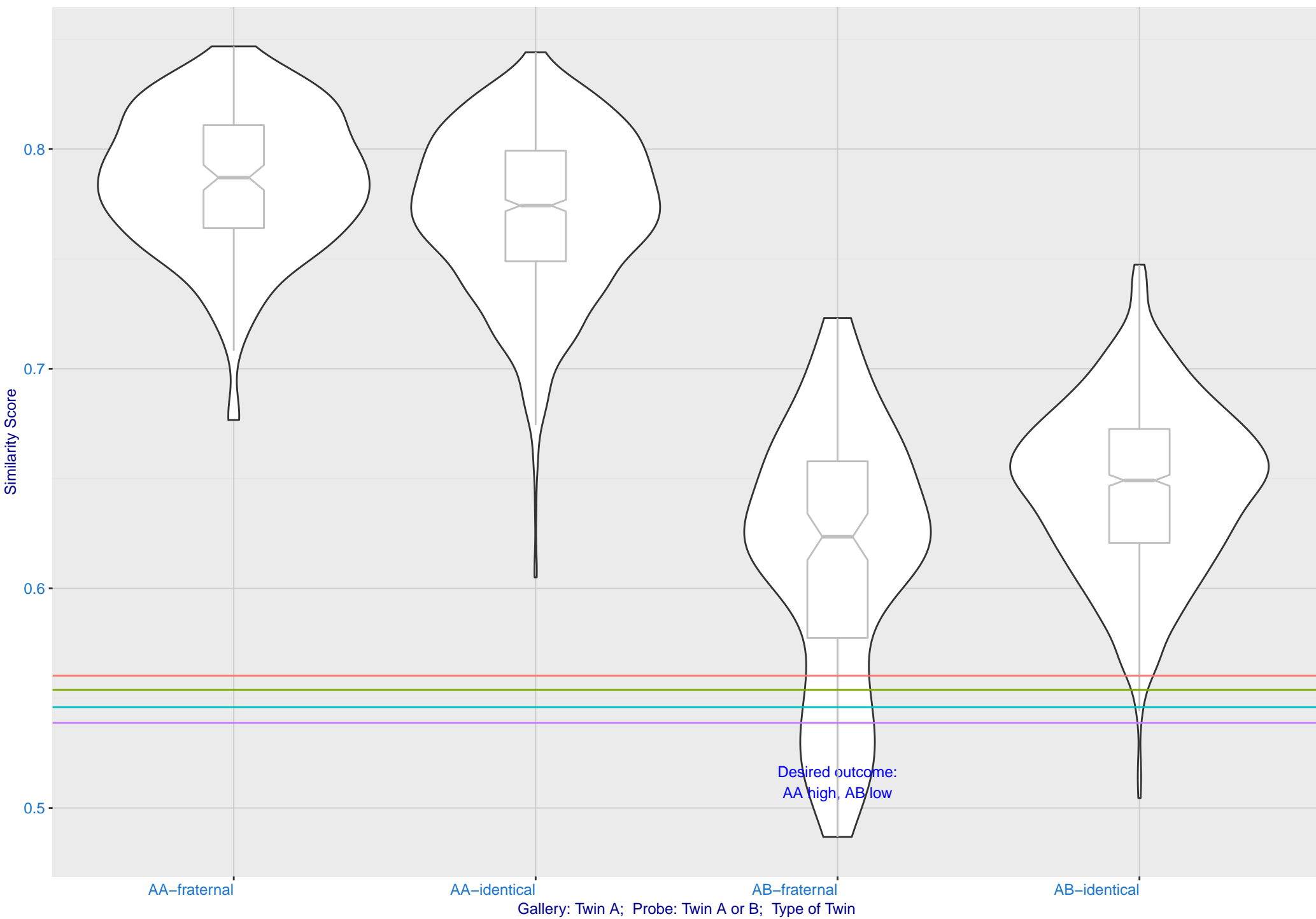


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power-law models are fit to the first two (N,T) observations



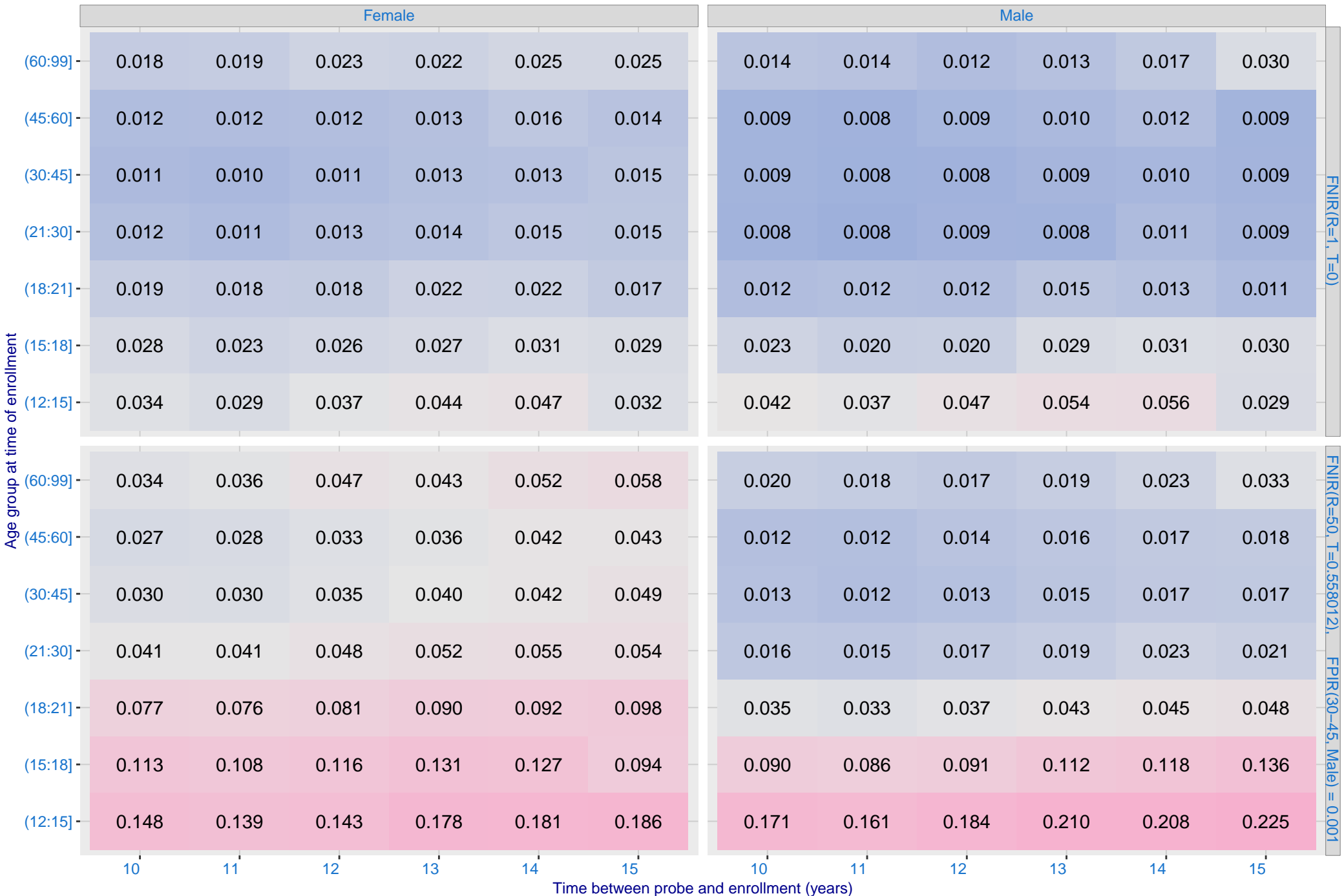
N: Solo-Twin and Twin-Twin similarity scores

TVAL — FPIR = 0.001 — FPIR = 0.003 — FPIR = 0.010 — FPIR = 0.030



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.

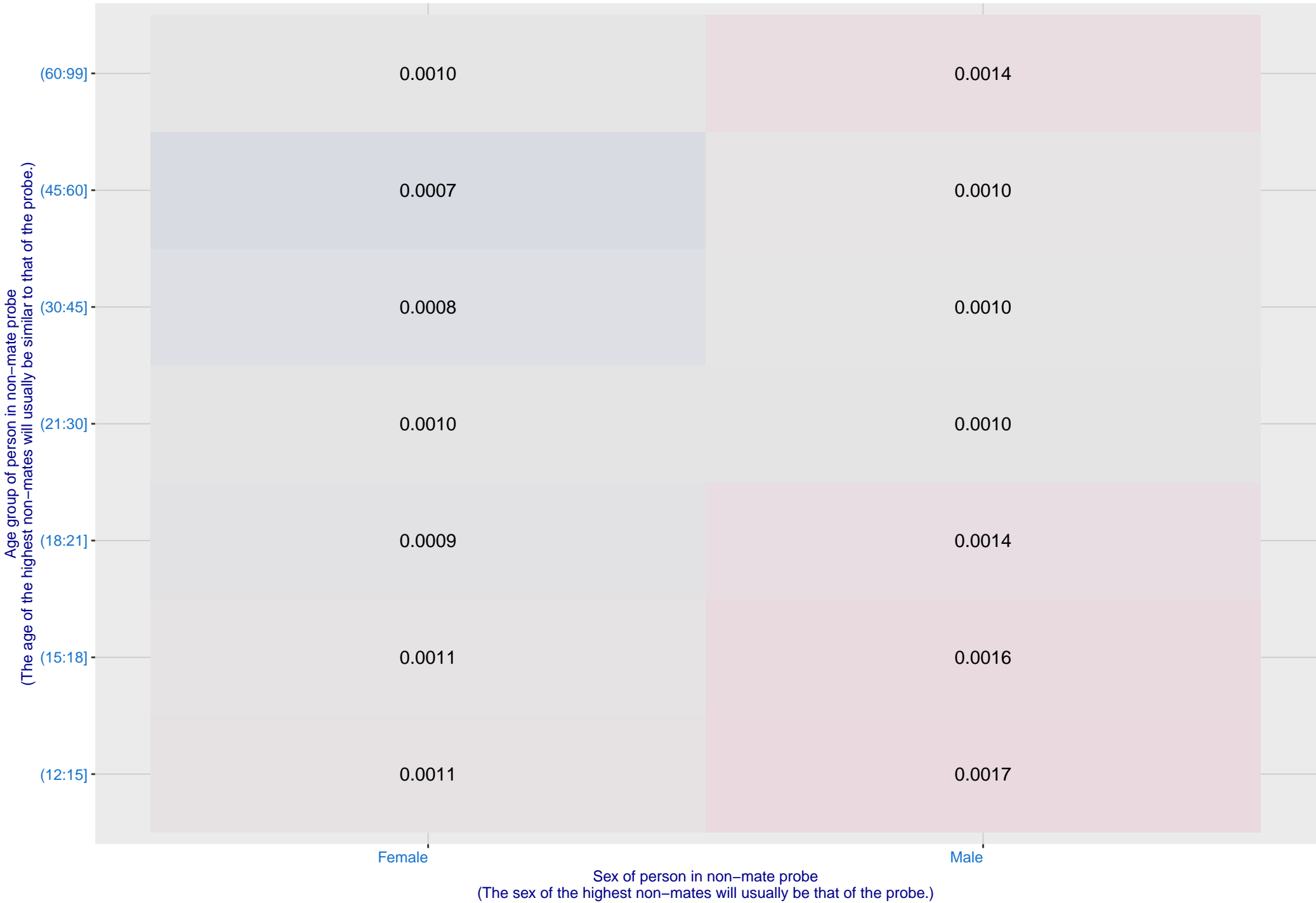
Algorithm: nec_3, Dataset: Border-Crossing Ageing N = 1600000
Text encodes FNIR, Color encodes log(FNIR)



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.

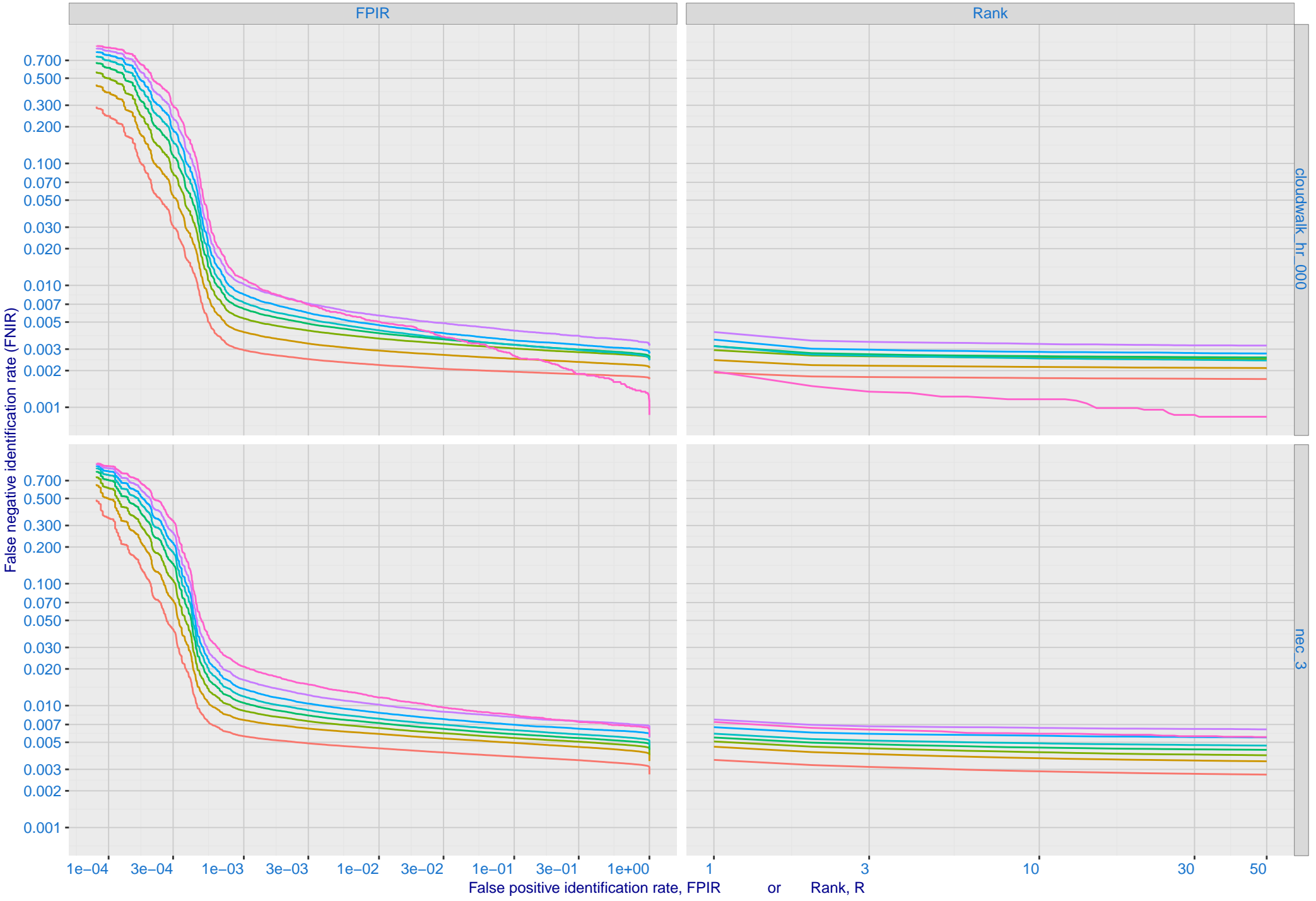
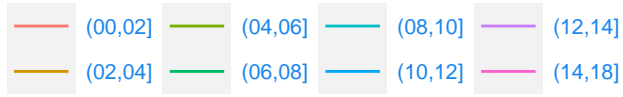
Algorithm: nec_3, Dataset: Border-Crossing Ageing
Threshold: 0.558012 set to achive FPIR(30-45, Male) = 0.001

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

