

A: Datasheet

Algorithm: hzailu\_000

Developer: Hangzhuo Allu Network Information Technology

Submission Date: 2022\_03\_18

Template size: 1024 bytes

Template time (2.5 percentile): 647 msec

Template time (median): 649 msec

Template time (97.5 percentile): 658 msec

Investigation:

Frontal mugshot ranking 85 (out of 345) -- FNIR(1600000, 0, 1) = 0.0022 vs. lowest 0.0008 from sensetime\_007

Mugshot webcam ranking 84 (out of 307) -- FNIR(1600000, 0, 1) = 0.0133 vs. lowest 0.0056 from sensetime\_007

Mugshot profile ranking 64 (out of 276) -- FNIR(1600000, 0, 1) = 0.2439 vs. lowest 0.0521 from sensetime\_007

Immigration visa-border ranking 49 (out of 234) -- FNIR(1600000, 0, 1) = 0.0027 vs. lowest 0.0008 from sensetime\_007

Immigration visa-kiosk ranking 55 (out of 231) -- FNIR(1600000, 0, 1) = 0.0899 vs. lowest 0.0487 from cubox\_000

Identification:

Frontal mugshot ranking 83 (out of 345) -- FNIR(1600000, T, L+1) = 0.0197, FPIR=0.001000 vs. lowest 0.0014 from sensetime\_007

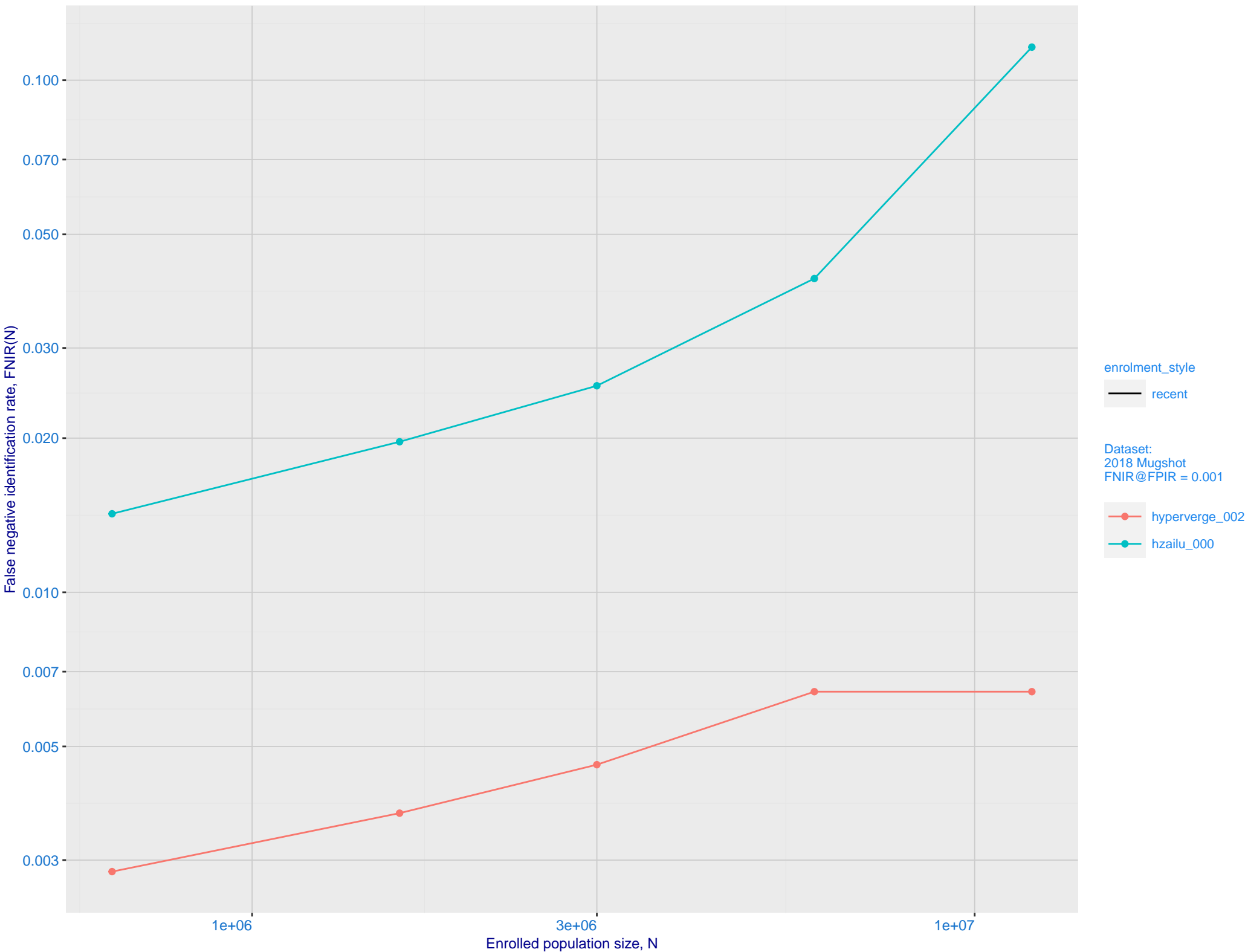
Mugshot webcam ranking 59 (out of 305) -- FNIR(1600000, T, L+1) = 0.0505, FPIR=0.001000 vs. lowest 0.0093 from sensetime\_007

Mugshot profile ranking 76 (out of 275) -- FNIR(1600000, T, L+1) = 0.9673, FPIR=0.001000 vs. lowest 0.1093 from cloudwalk\_mt\_000

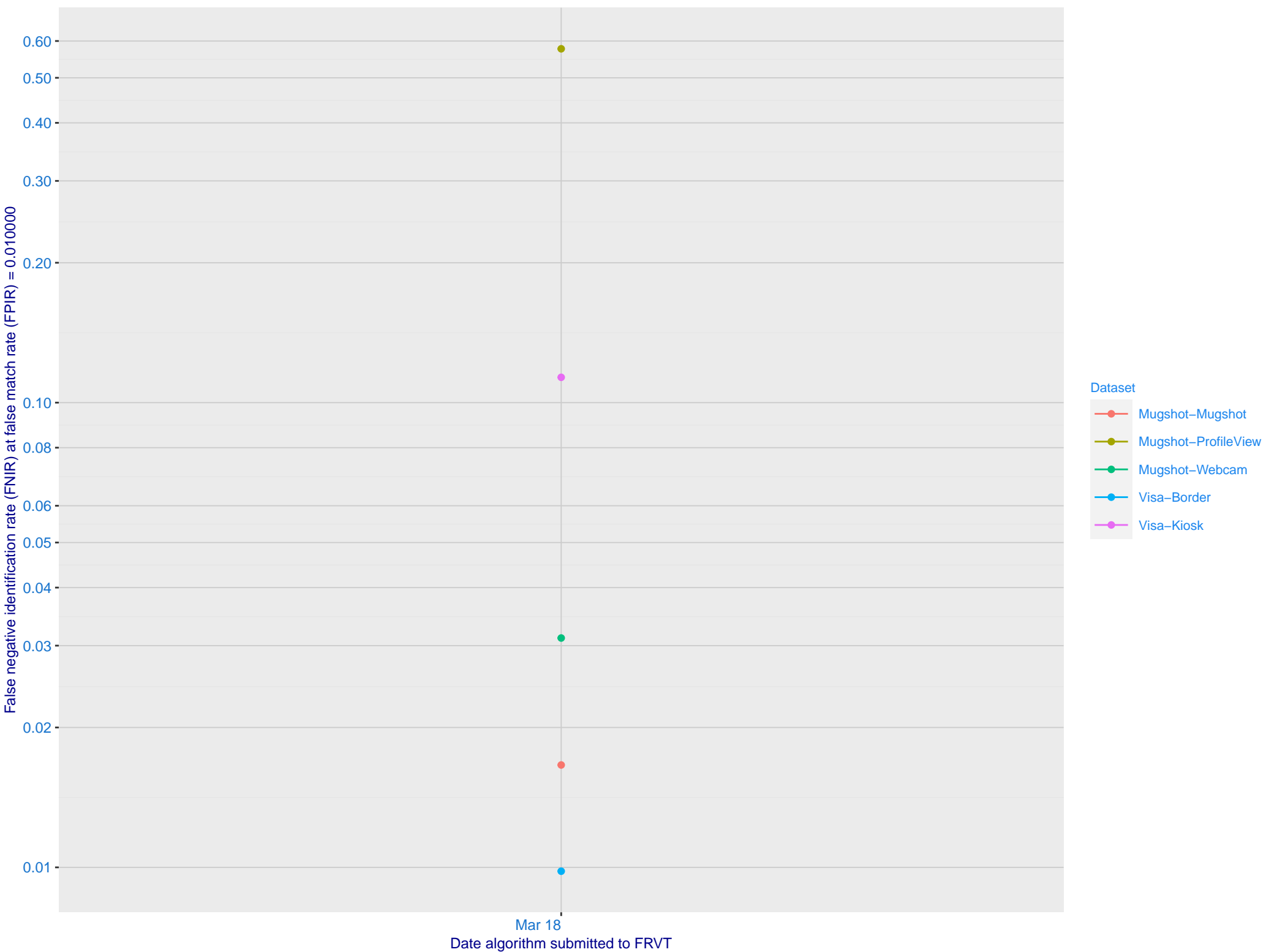
Immigration visa-border ranking 54 (out of 233) -- FNIR(1600000, T, L+1) = 0.0205, FPIR=0.001000 vs. lowest 0.0024 from cloudwalk\_mt\_000

Immigration visa-kiosk ranking 35 (out of 228) -- FNIR(1600000, T, L+1) = 0.1529, FPIR=0.001000 vs. lowest 0.0719 from cloudwalk\_mt\_000

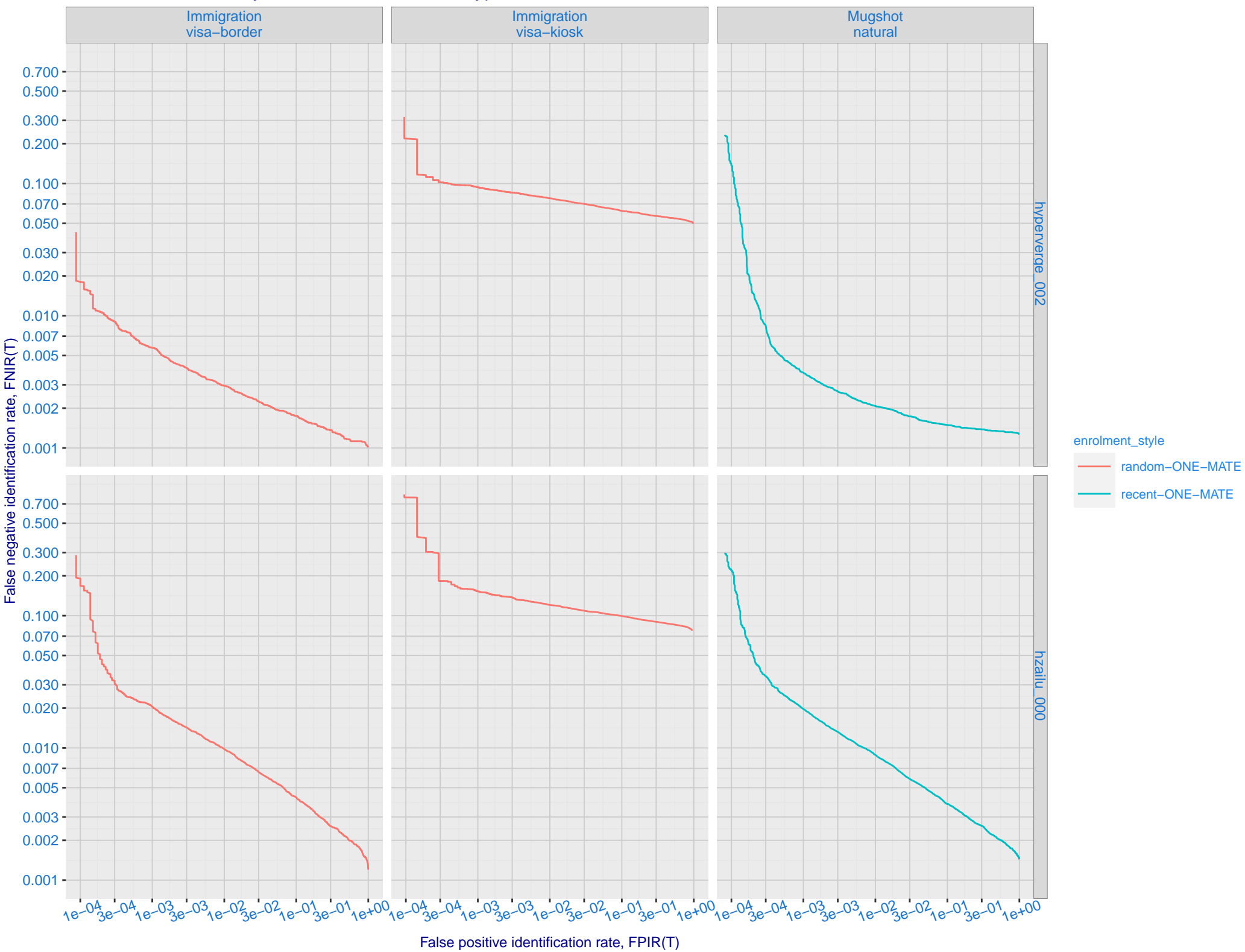
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (hyperverge\_002)



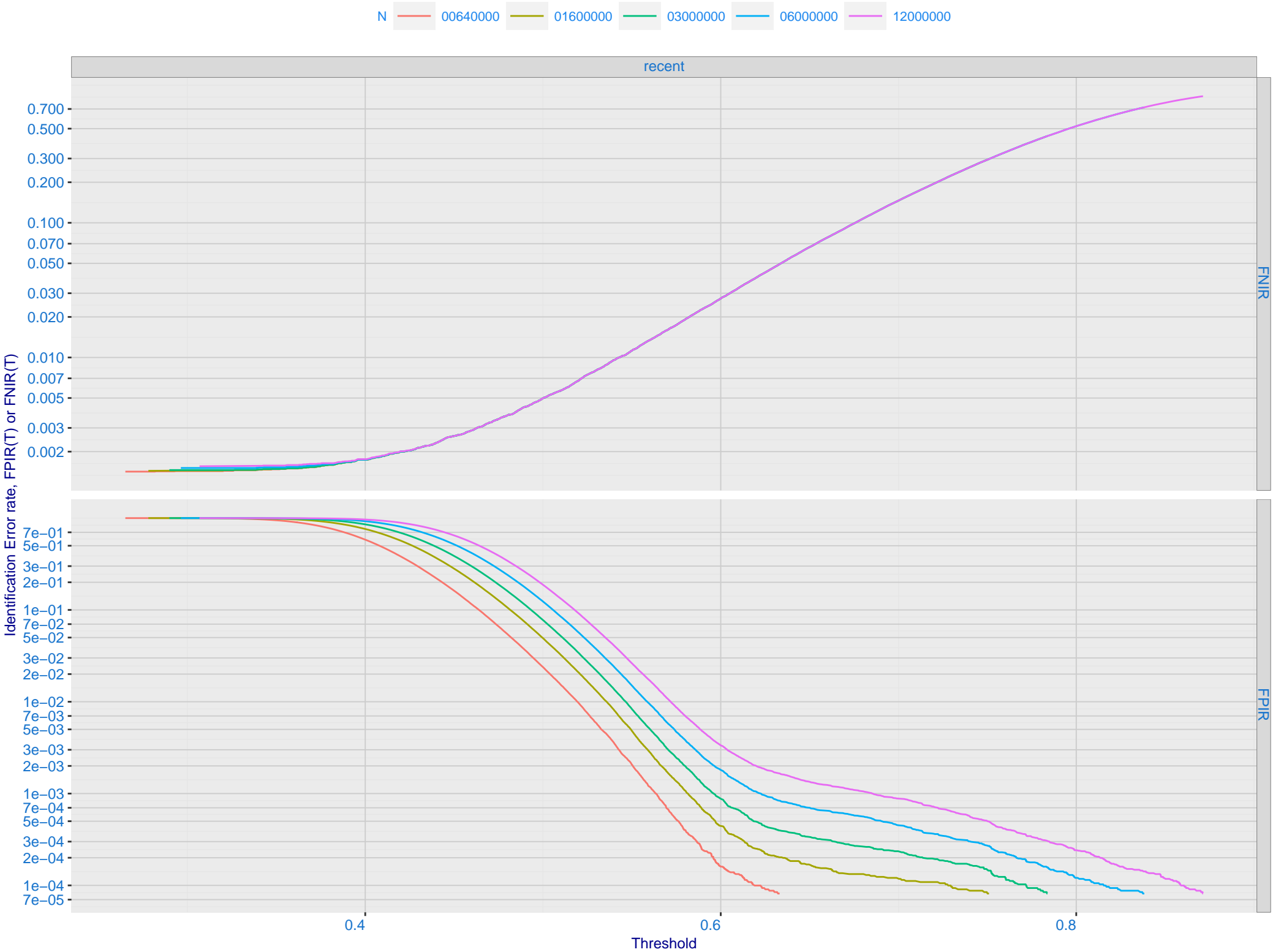
C: Evolution of accuracy for HZAILU algorithms on three datasets 2018 – present



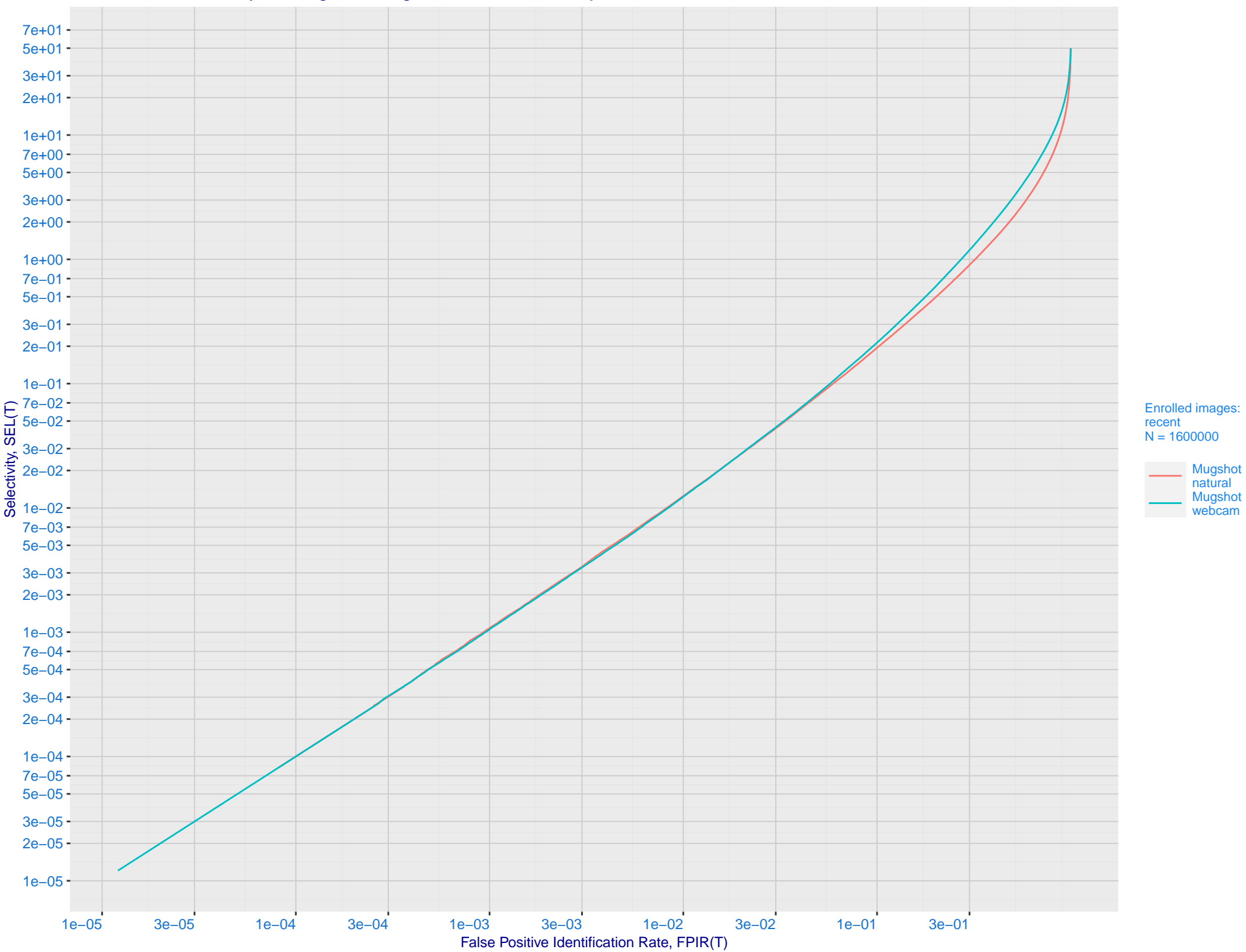
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals



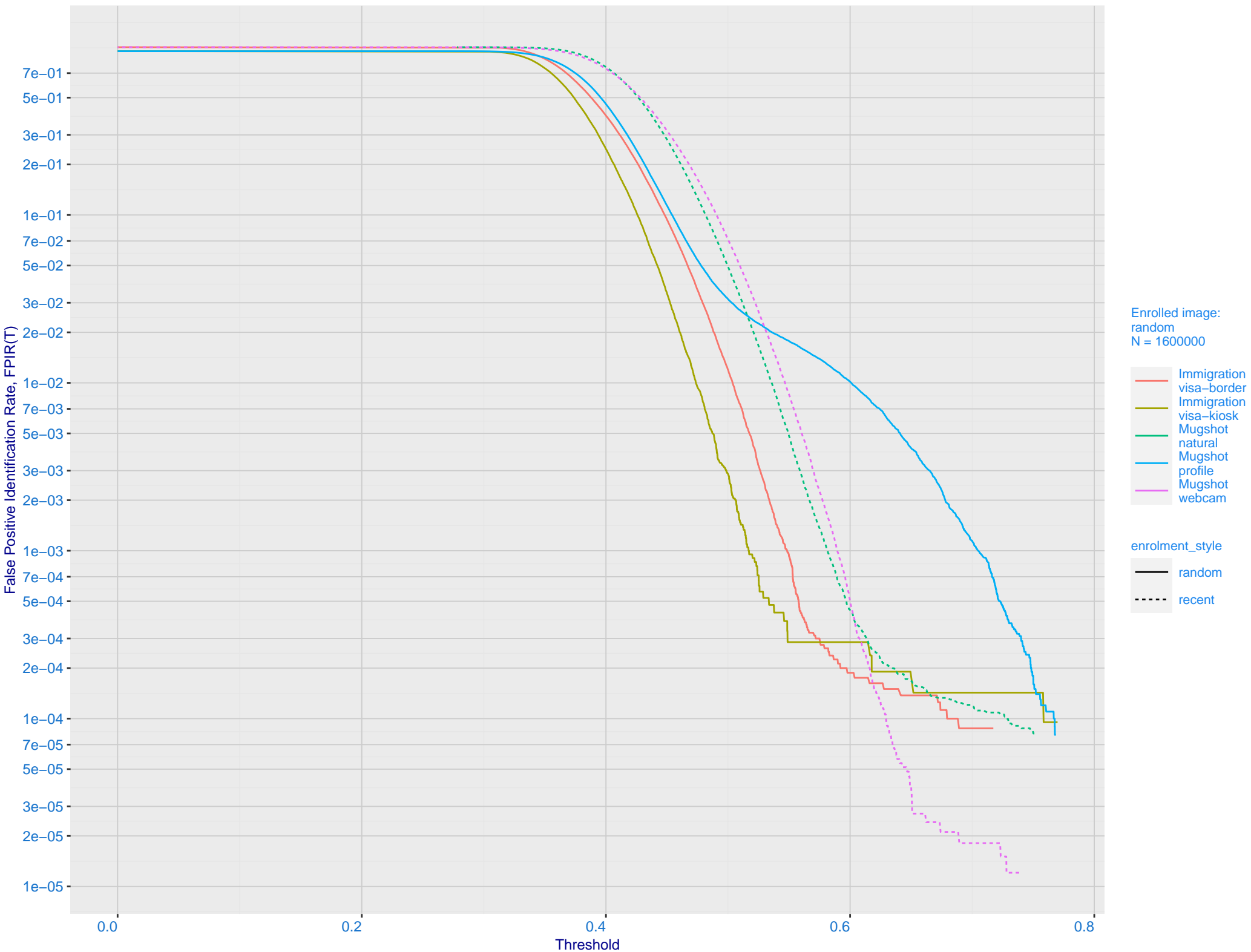
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



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

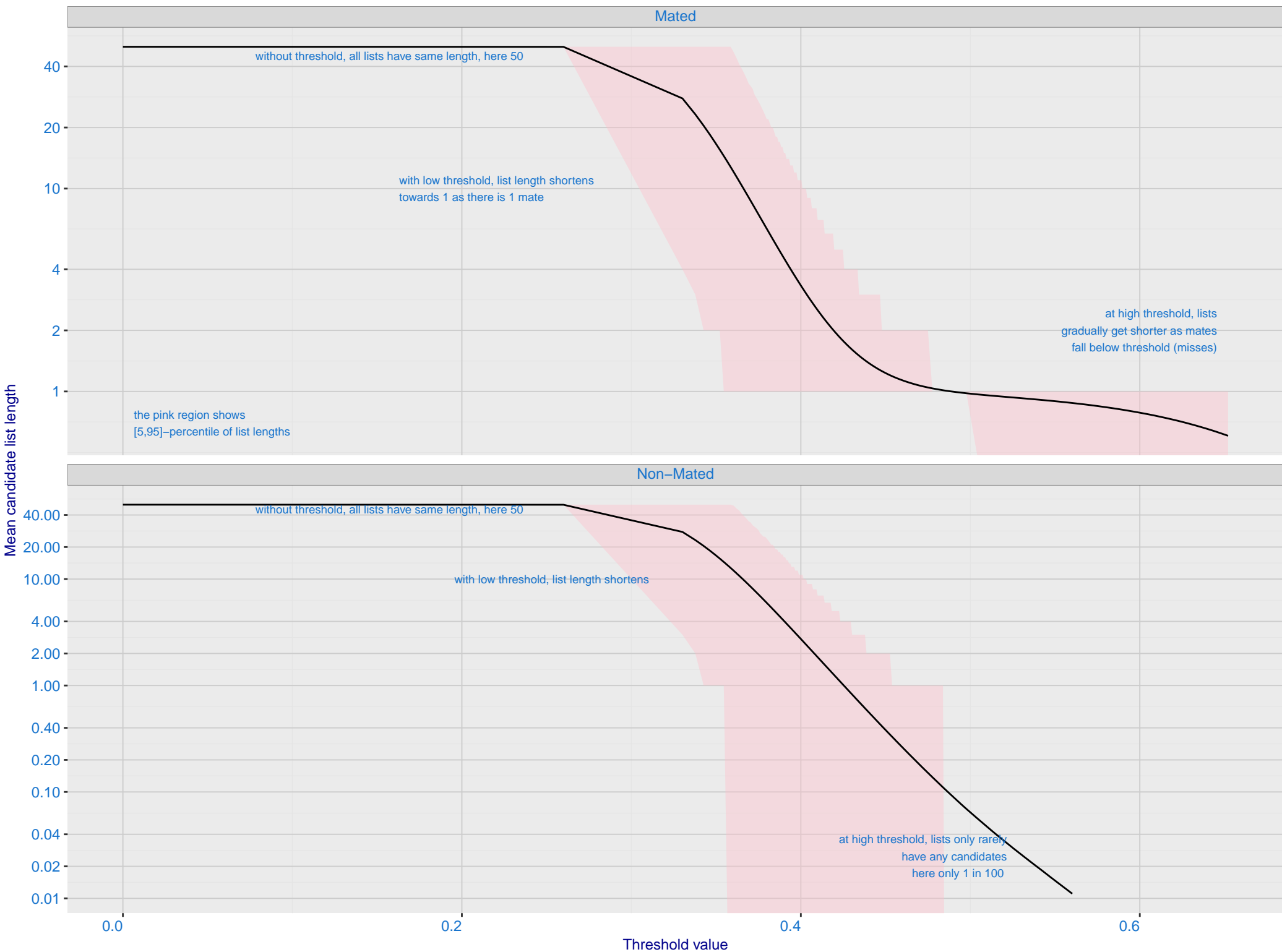


G: FPIR dependence on T by probe type for N = 1600000 subjects



# H: Reduced length candidate lists for human review

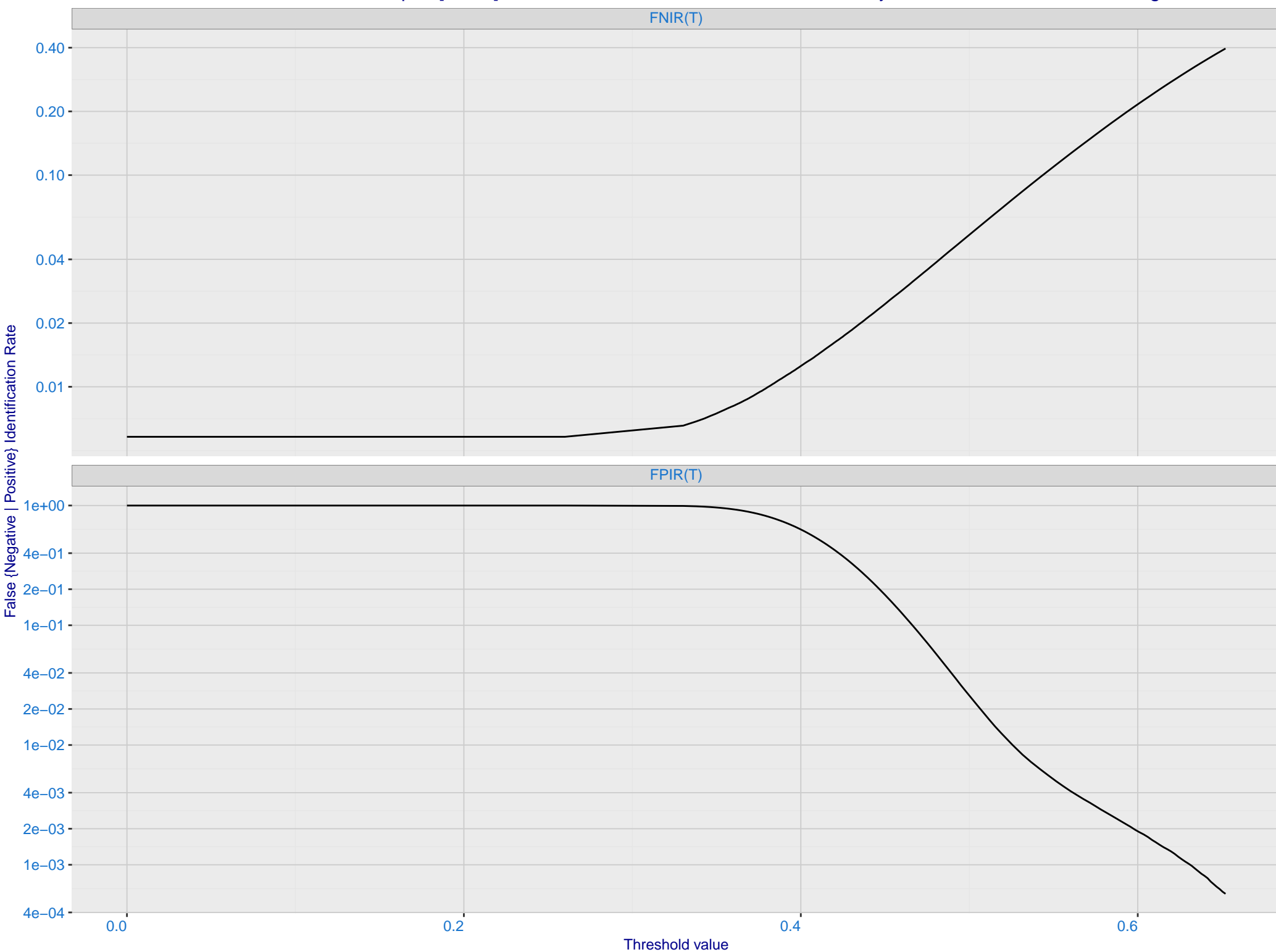
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image



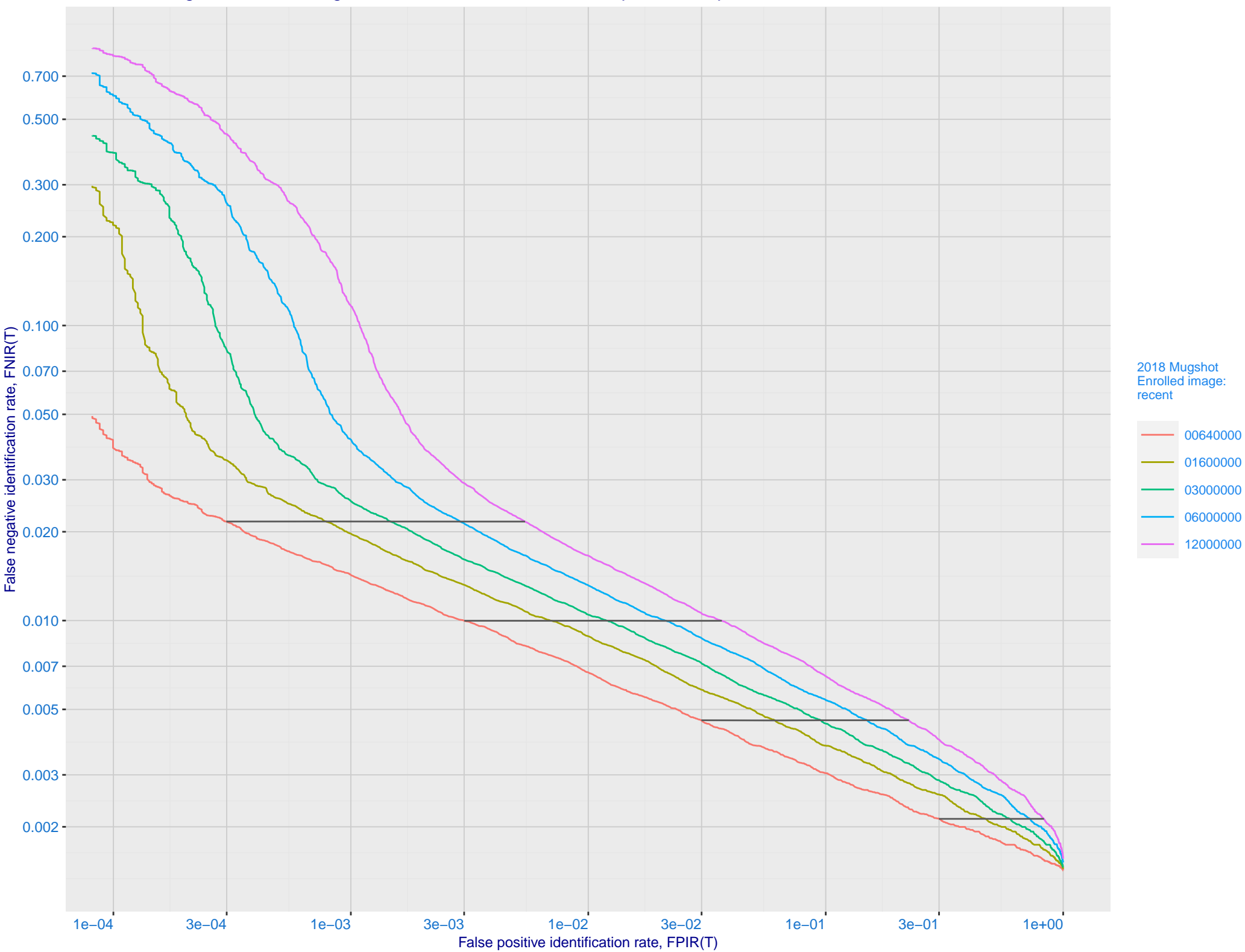


# I: FNIR and FPIR dependence on threshold

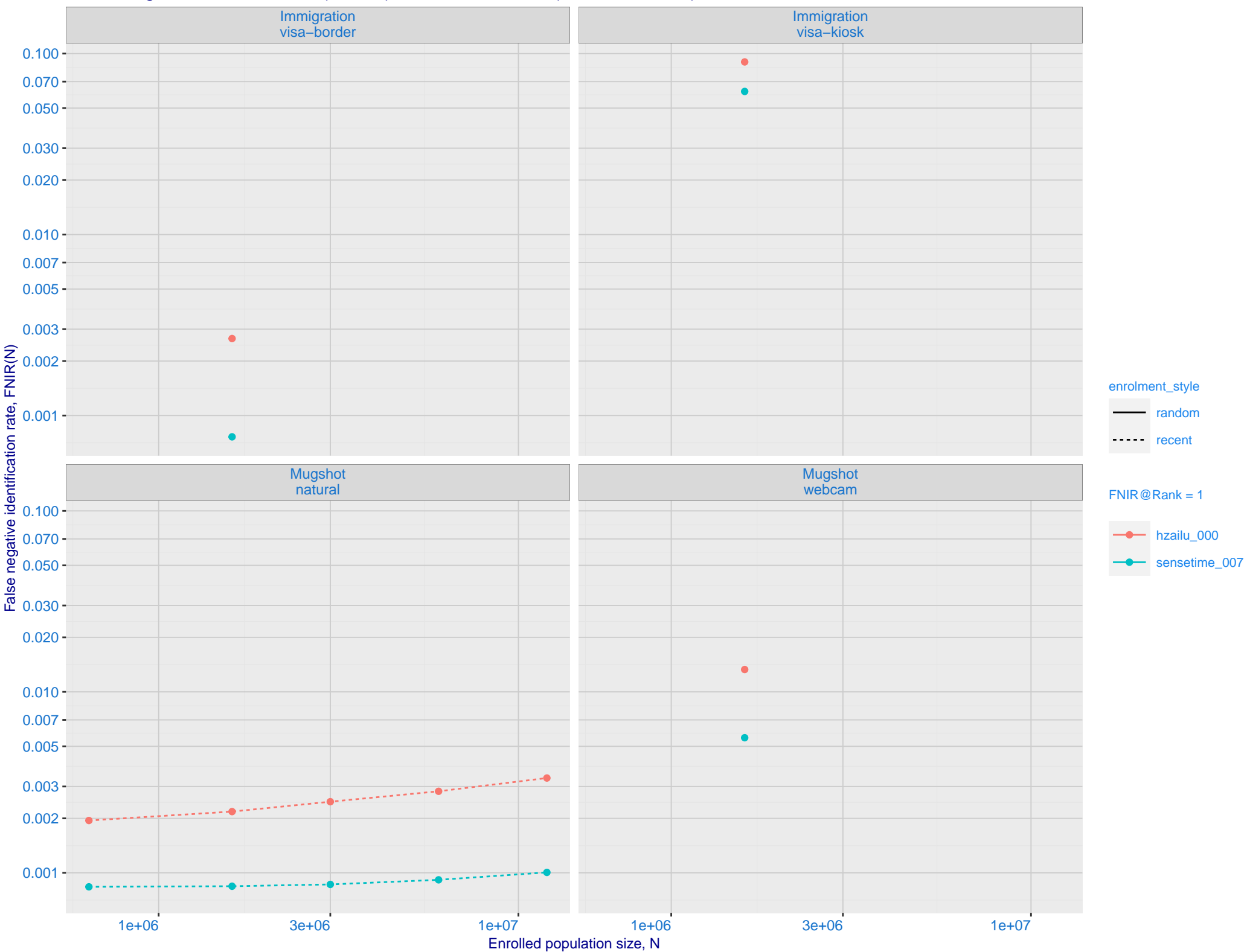
Dataset is border-border with time-lapse [10,15] YRS with N = 1600000. Probes are 10-15 years later than enrollment image



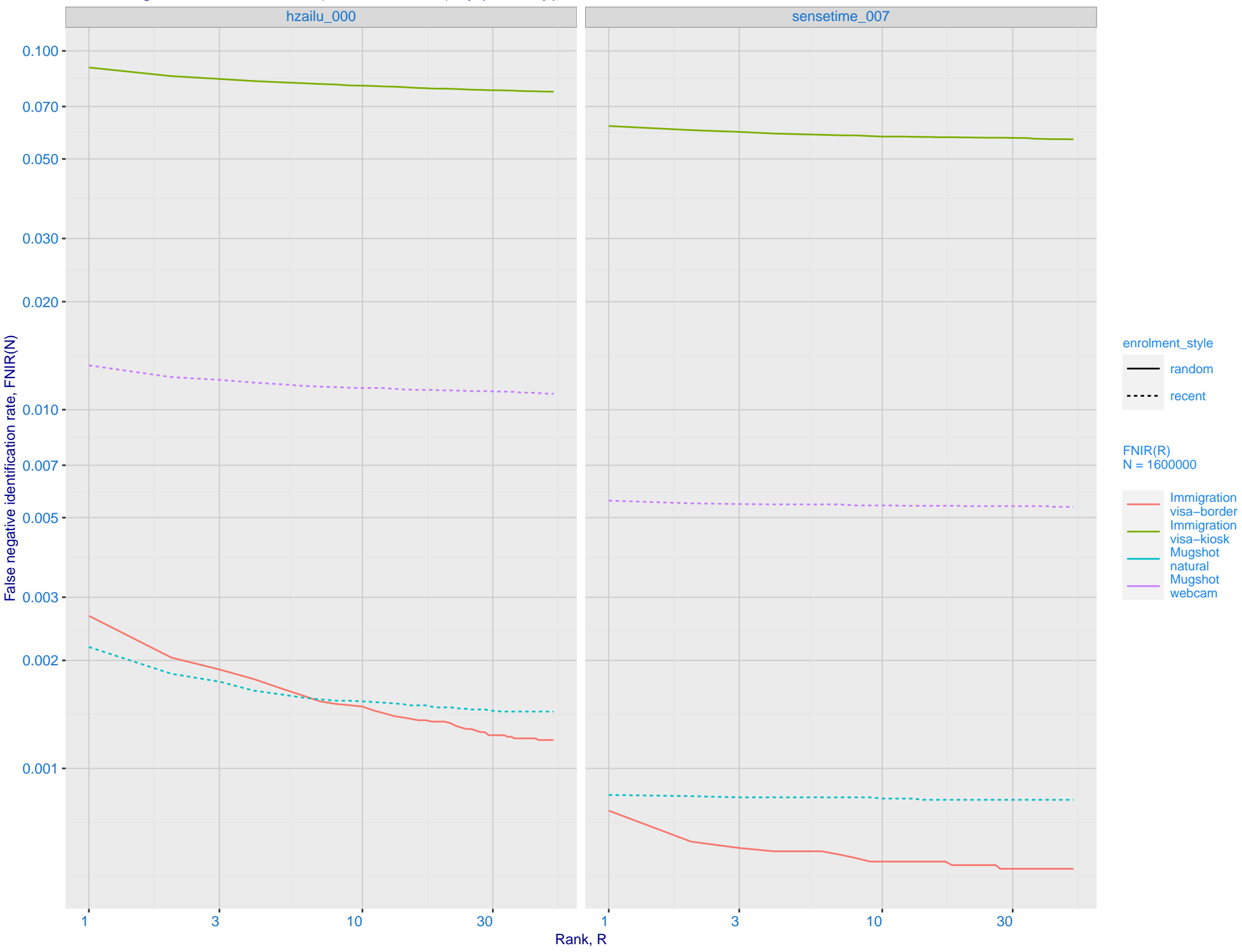
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.



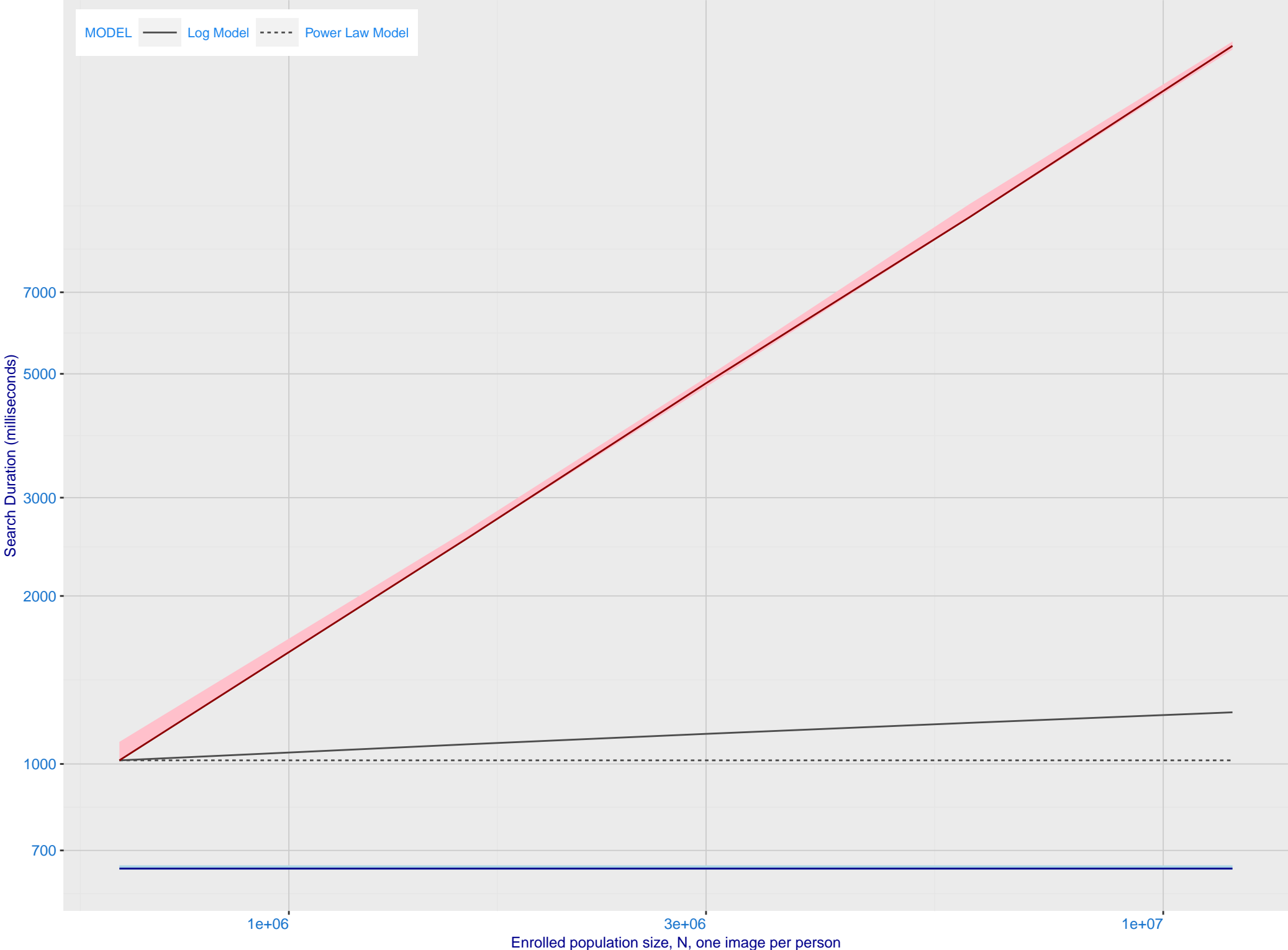
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_007)



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

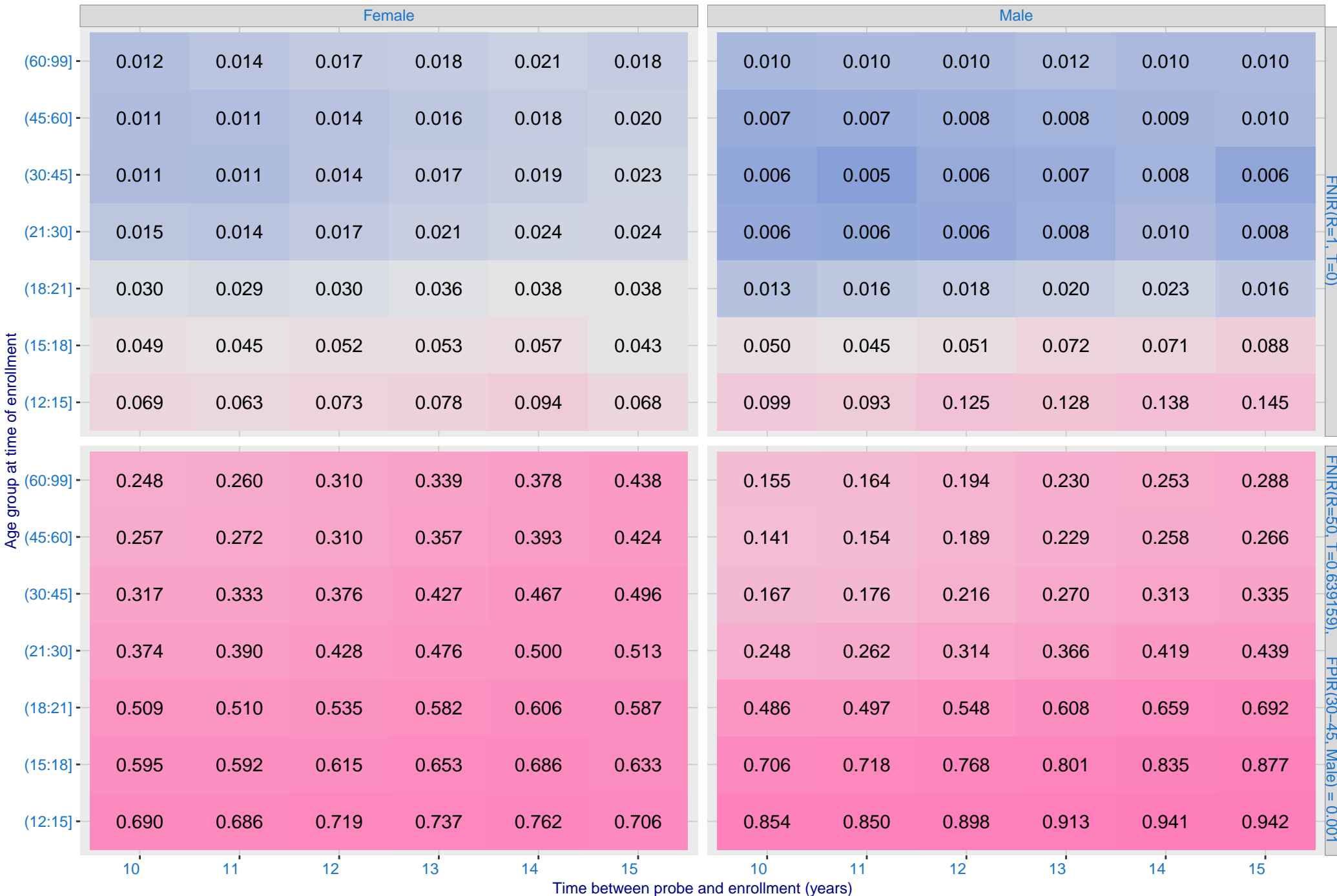


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power-law models are fit to the first two (N,T) observations



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.

Algorithm: hzailu\_000, 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: hzailu\_000, Dataset: Border-Crossing Ageing  
Threshold: 0.639159 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

