

A: Datasheet

Algorithm: t4isb\_000

Developer: T4iSB

Submission Date: 2022\_08\_17

Template size: 2048 bytes

Template time (2.5 percentile): 739 msec

Template time (median): 741 msec

Template time (97.5 percentile): 950 msec

Investigation:

Mugshot webcam ranking 187 (out of 331) -- FNIR(1600000, 0, 1) = 0.0235 vs. lowest 0.0055 from sensetime\_008

Mugshot profile ranking 123 (out of 300) -- FNIR(1600000, 0, 1) = 0.4624 vs. lowest 0.0521 from sensetime\_007

Immigration visa-border ranking 59 (out of 258) -- FNIR(1600000, 0, 1) = 0.0025 vs. lowest 0.0006 from cloudwalk\_mt\_001

Immigration visa-kiosk ranking 55 (out of 203) -- FNIR(1600000, 0, 1) = 0.0737 vs. lowest 0.0395 from cloudwalk\_mt\_001

Identification:

Frontal mugshot ranking 87 (out of 369) -- FNIR(1600000, T, L+1) = 0.0157, FPIR=0.001000 vs. lowest 0.0013 from sensetime\_008

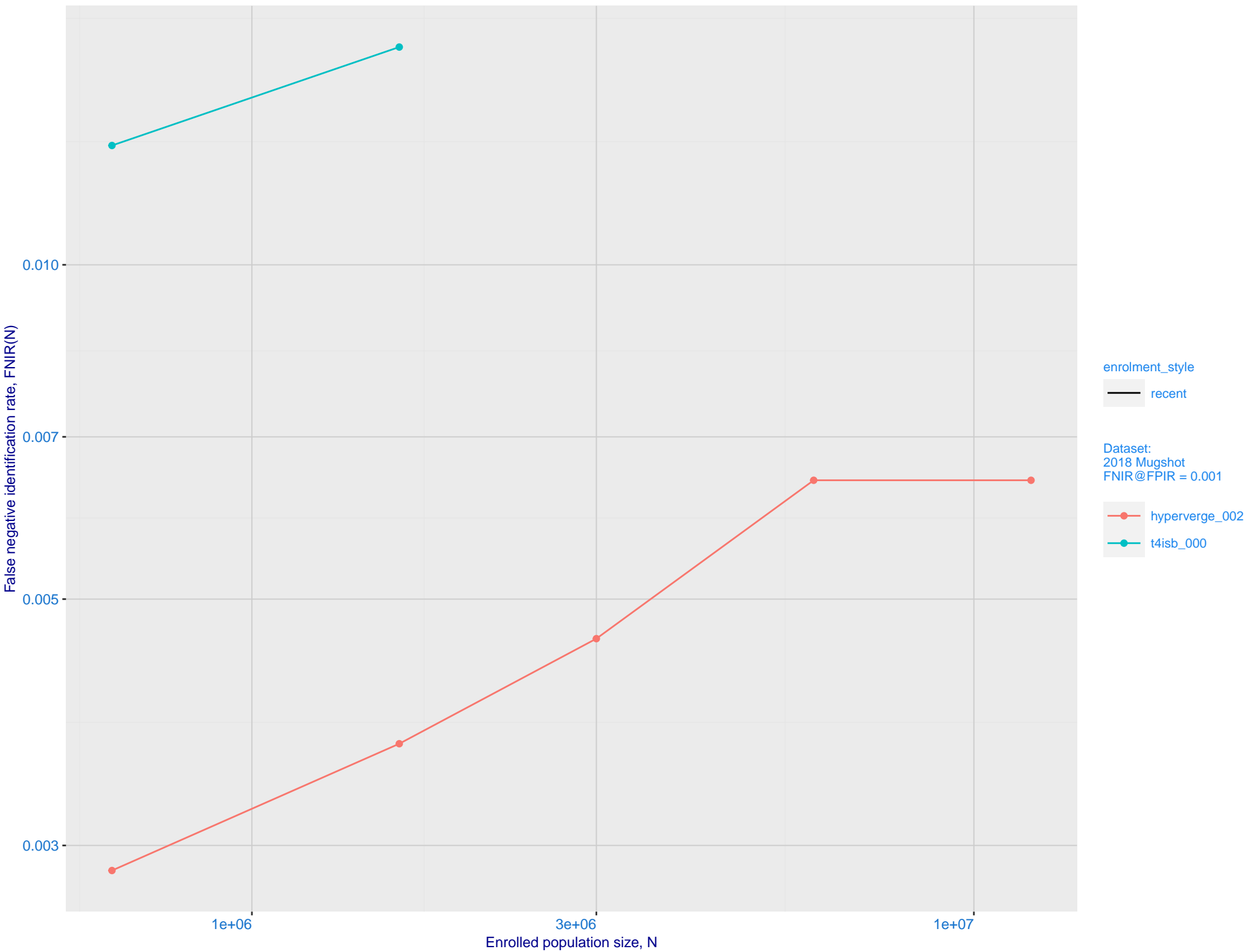
Mugshot webcam ranking 82 (out of 329) -- FNIR(1600000, T, L+1) = 0.0527, FPIR=0.001000 vs. lowest 0.0090 from sensetime\_008

Mugshot profile ranking 33 (out of 299) -- FNIR(1600000, T, L+1) = 0.5104, FPIR=0.001000 vs. lowest 0.0698 from cloudwalk\_mt\_001

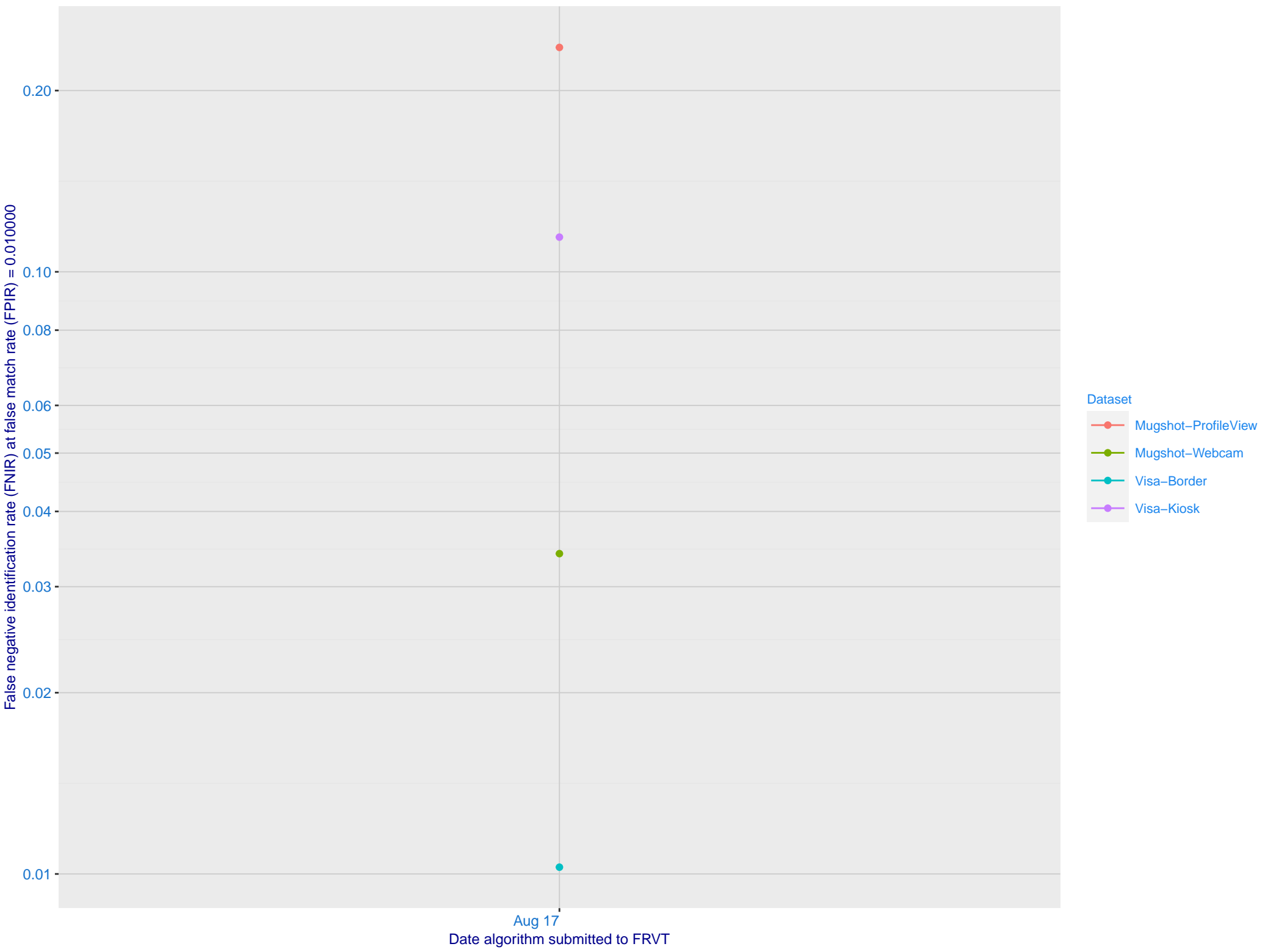
Immigration visa-border ranking 69 (out of 257) -- FNIR(1600000, T, L+1) = 0.0207, FPIR=0.001000 vs. lowest 0.0013 from cloudwalk\_mt\_001

Immigration visa-kiosk ranking 50 (out of 203) -- FNIR(1600000, T, L+1) = 0.1495, FPIR=0.001000 vs. lowest 0.0532 from cloudwalk\_mt\_001

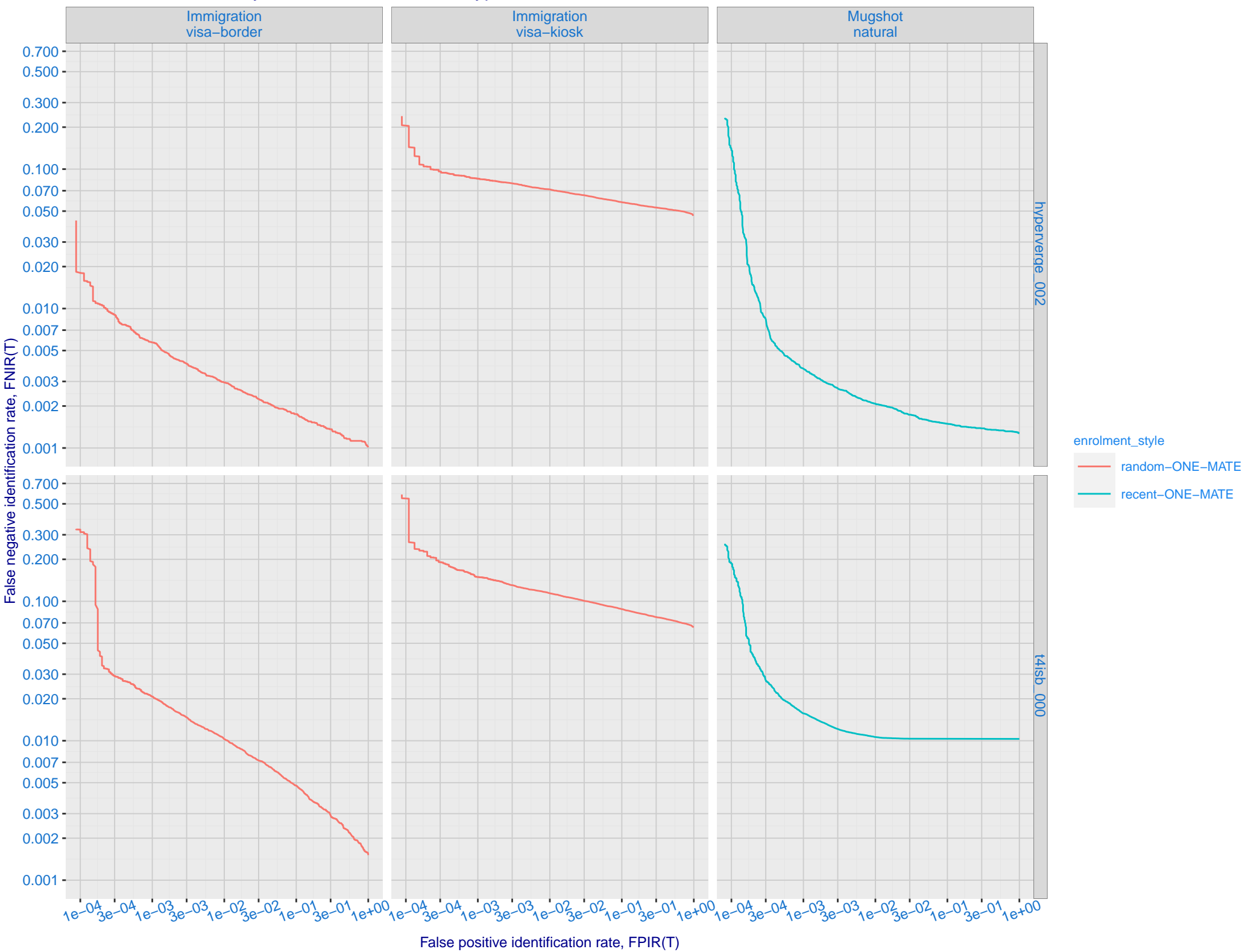
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (hyperverge\_002)



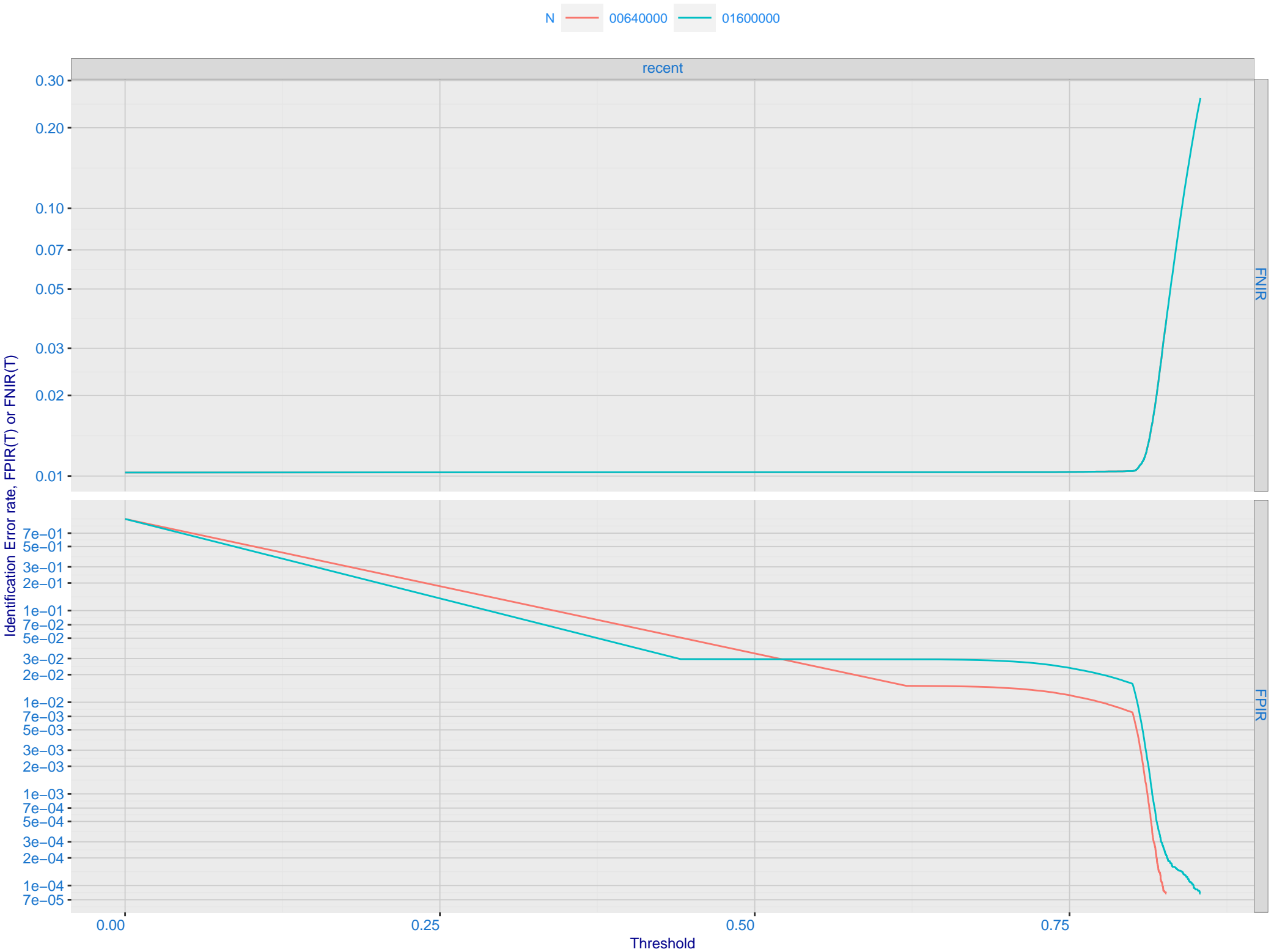
C: Evolution of accuracy for T4ISB algorithms on three datasets 2018 – present



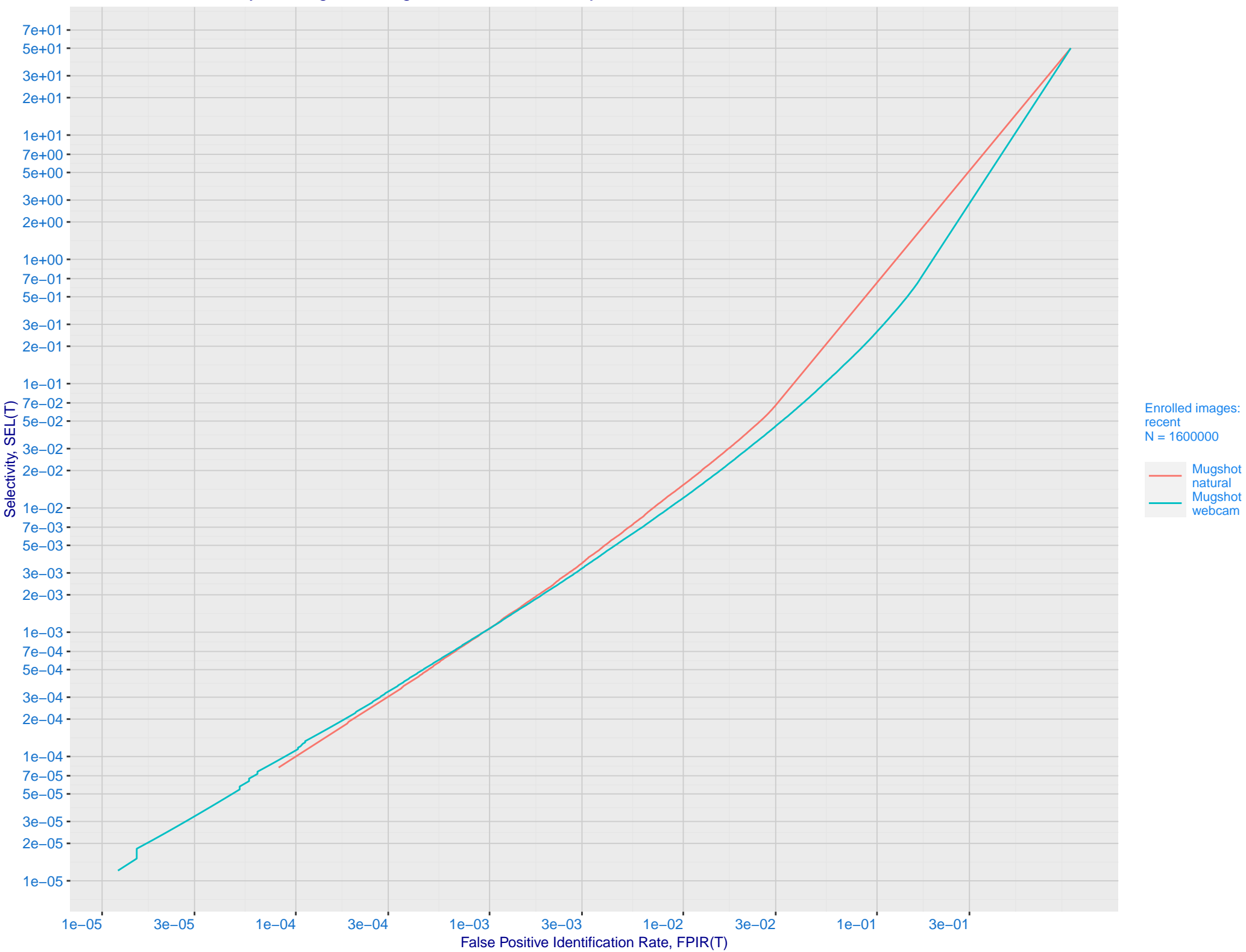
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals



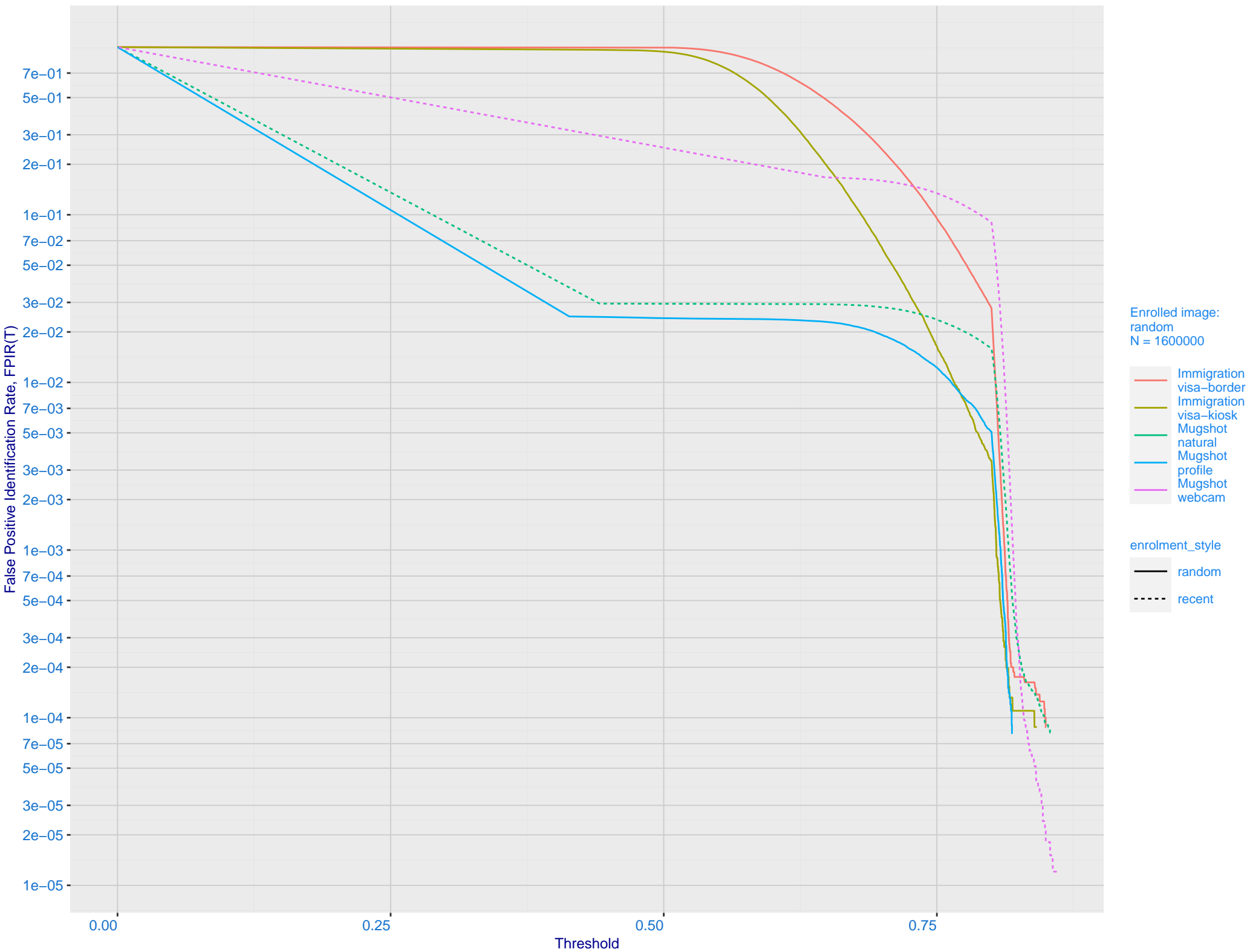
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



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

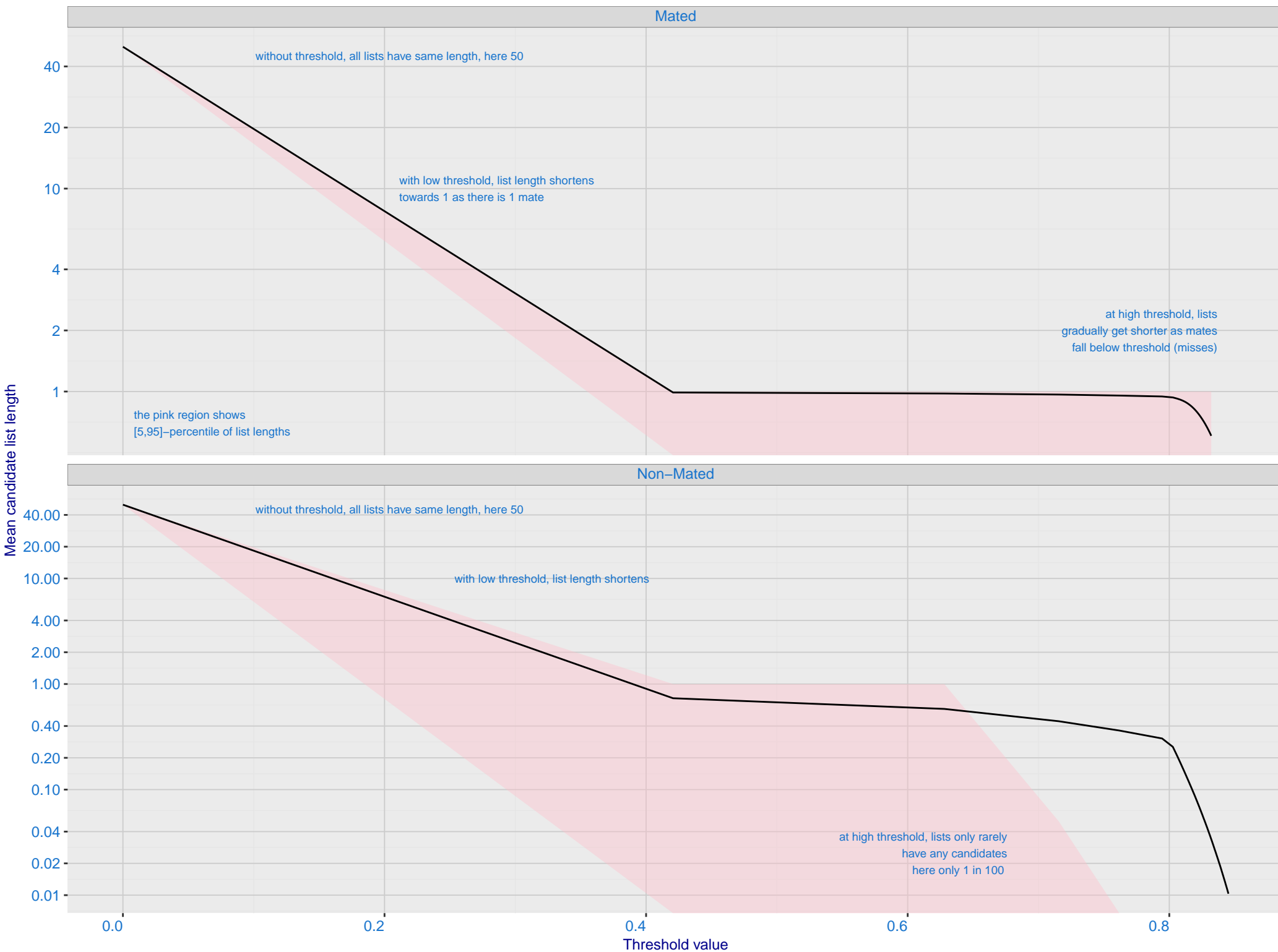


G: FPIR dependence on T by probe type for N = 1600000 subjects



# H: Reduced length candidate lists for human review

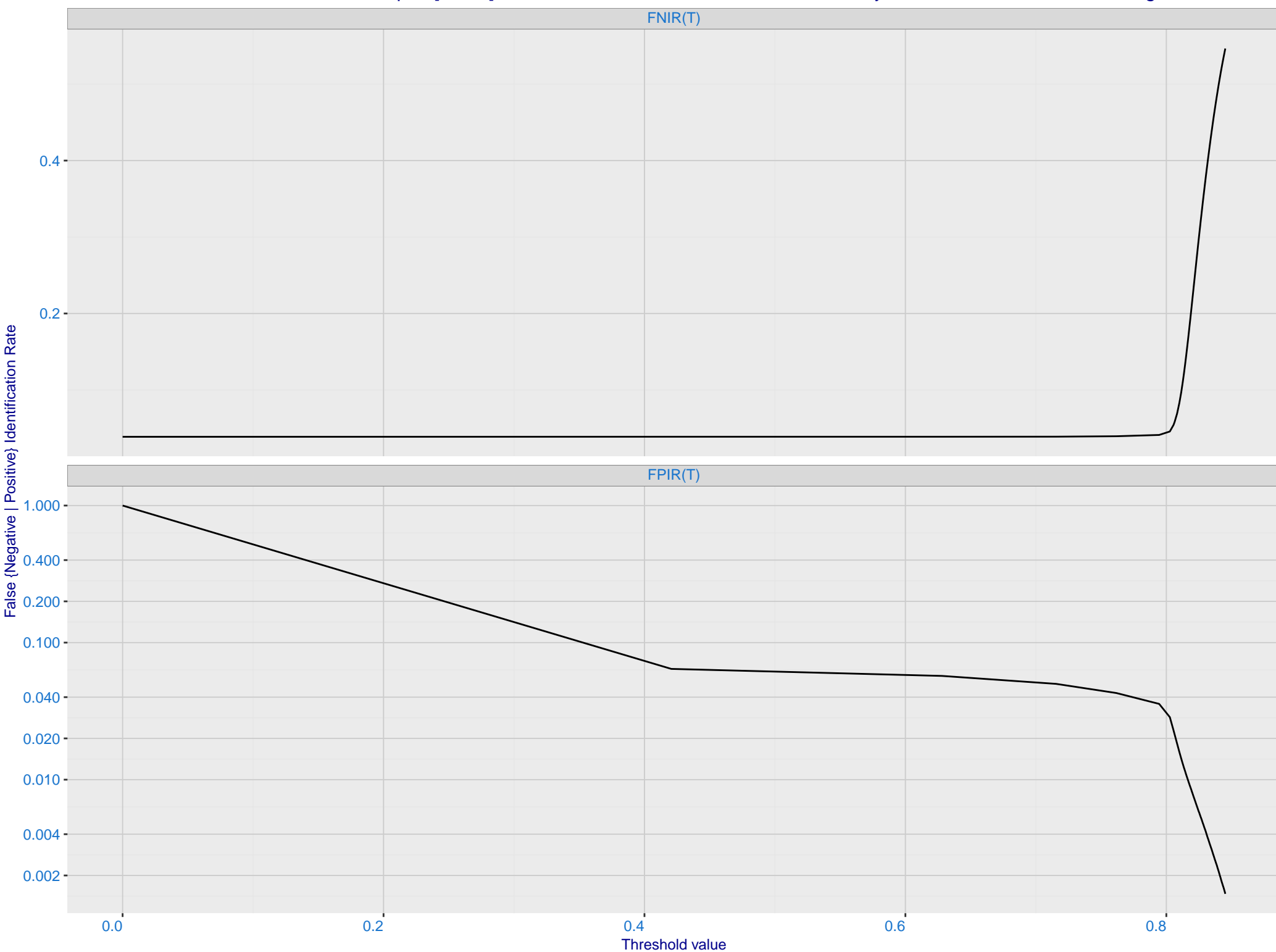
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image



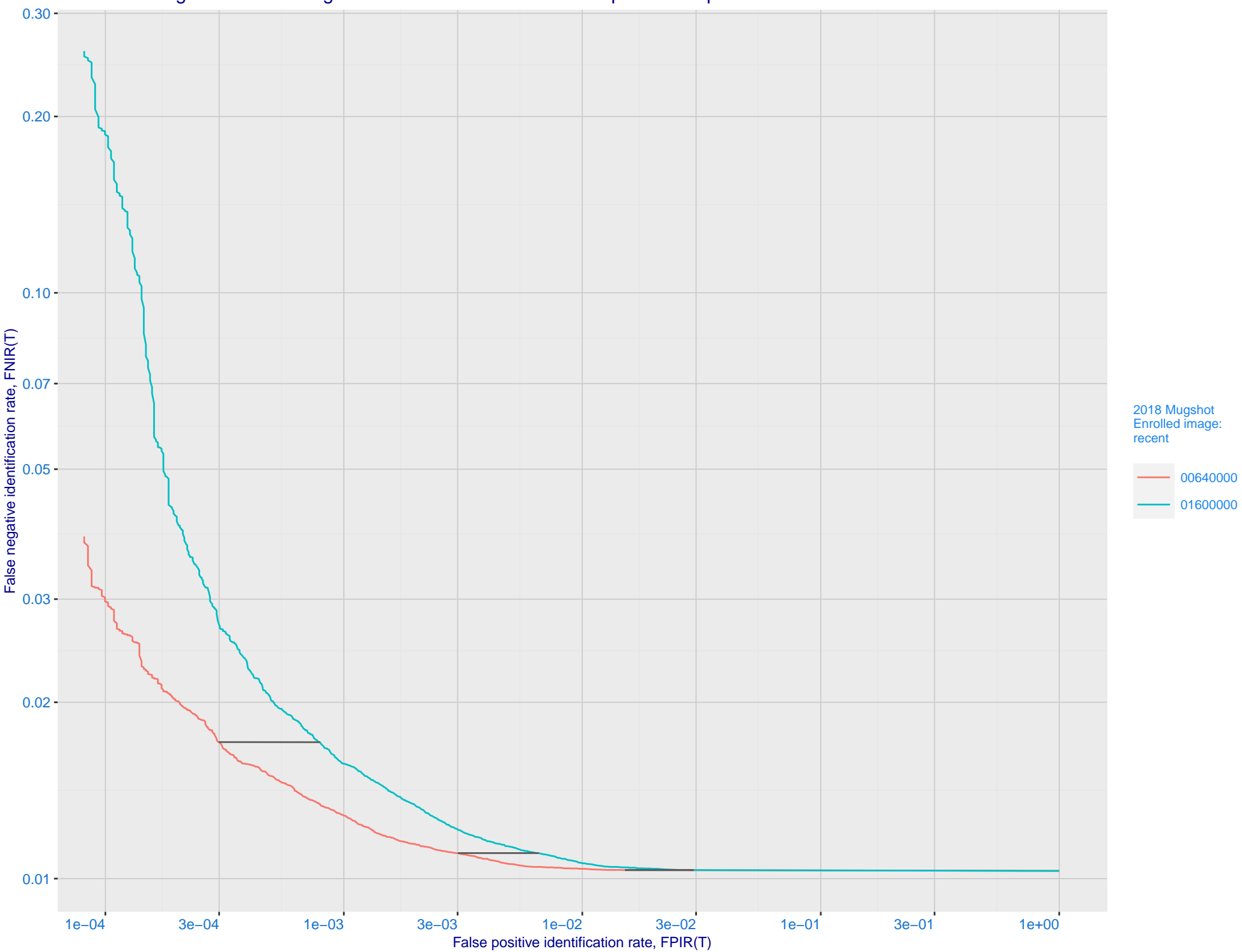


# I: FNIR and FPIR dependence on threshold

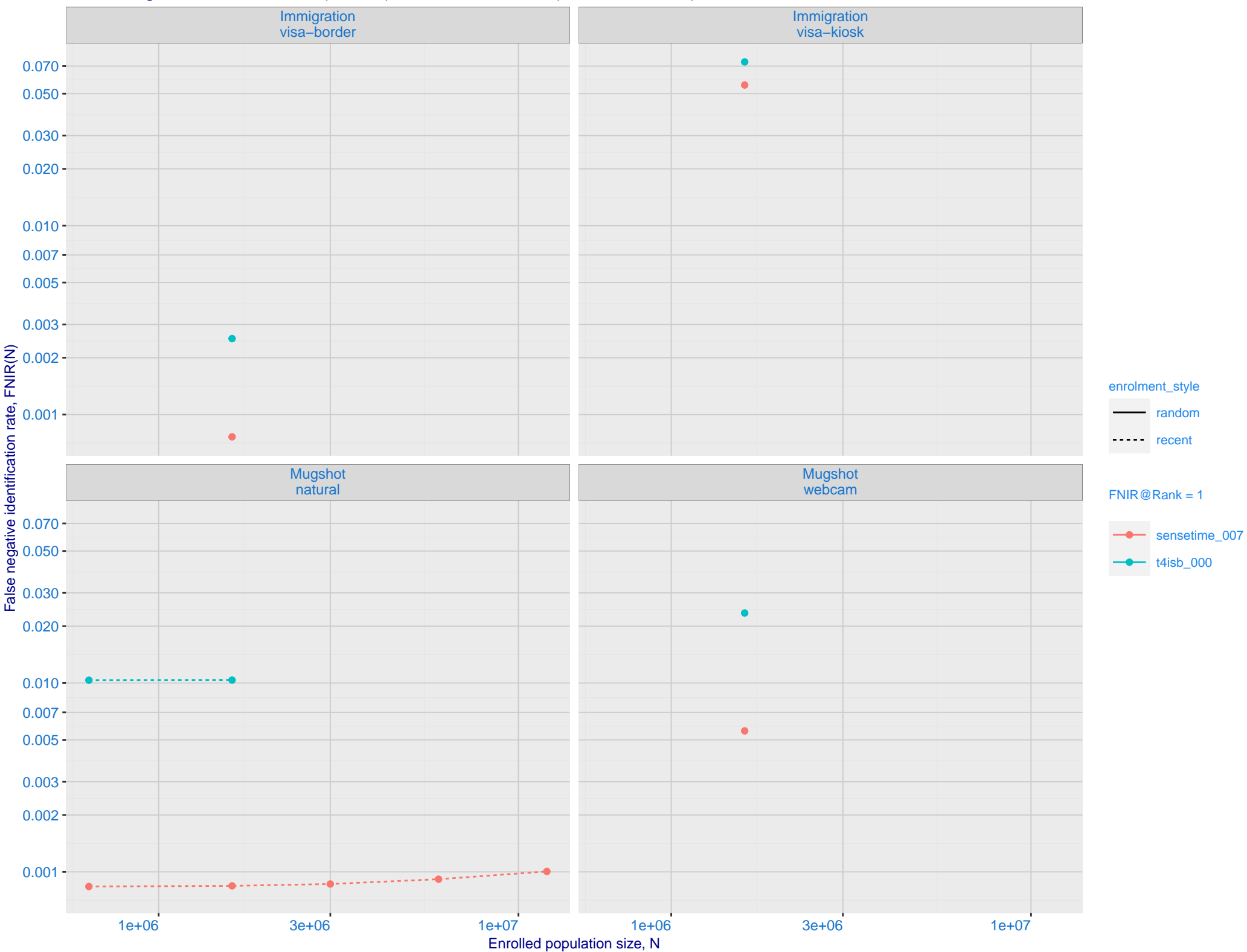
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image



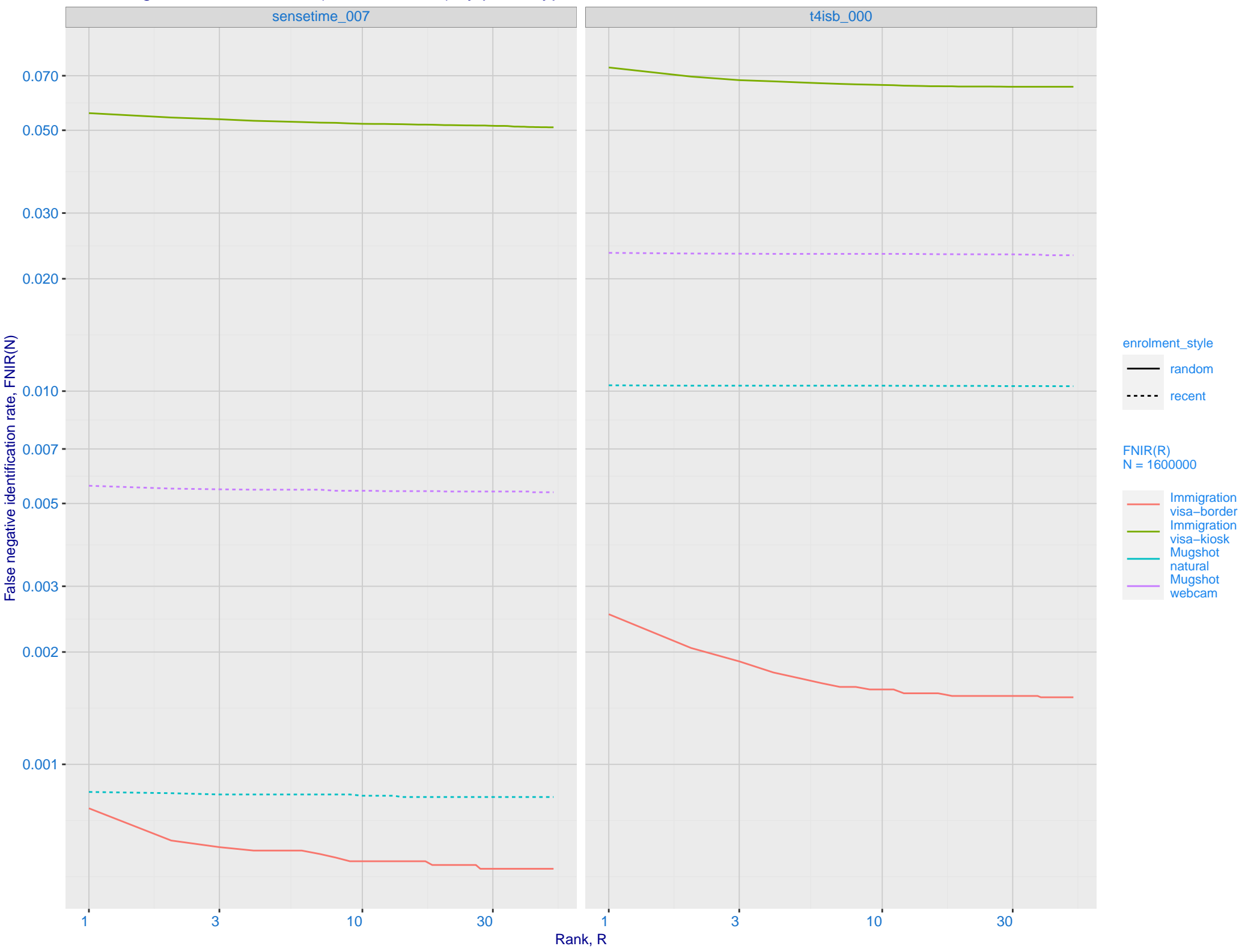
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.



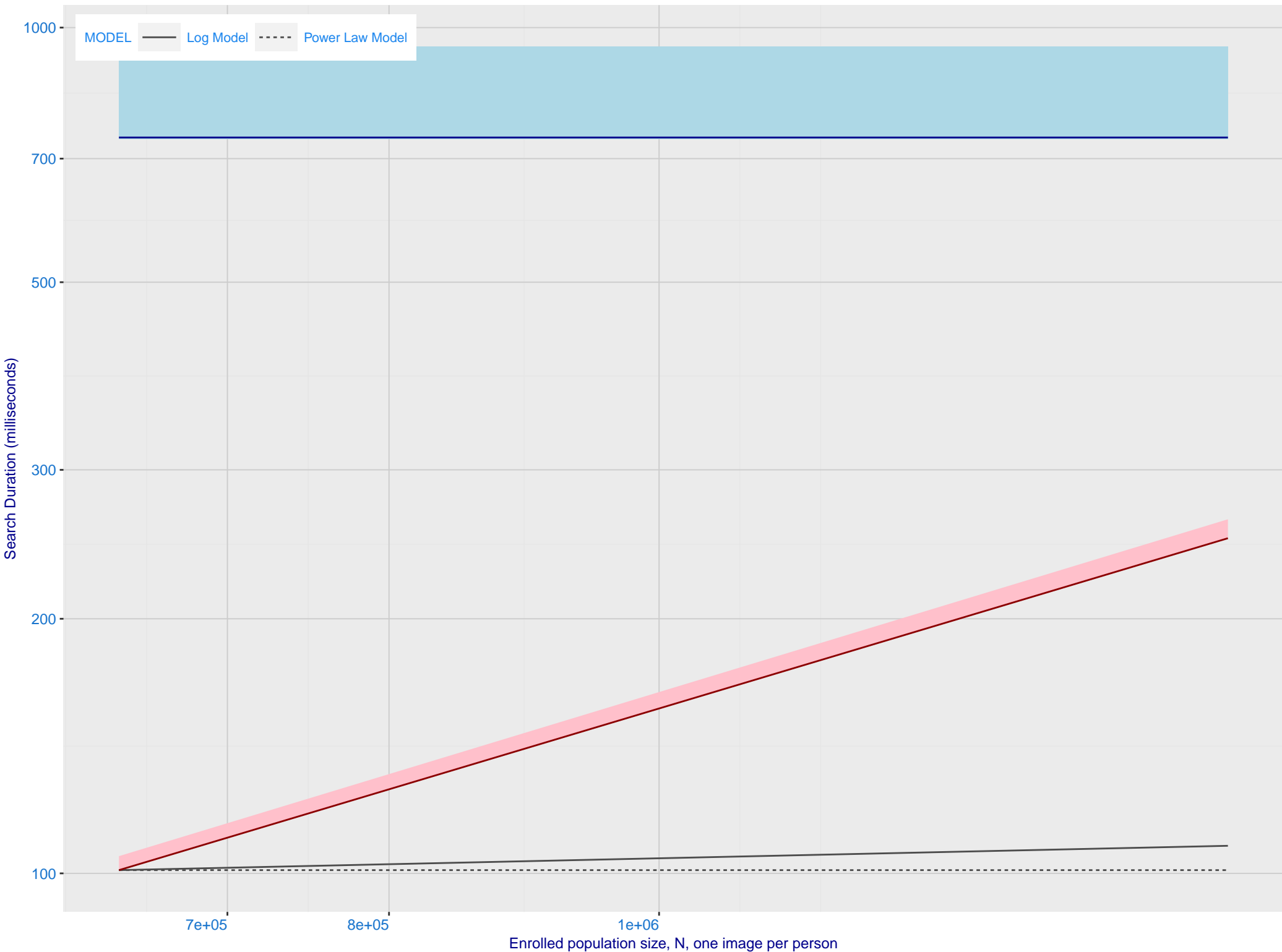
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_007)



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

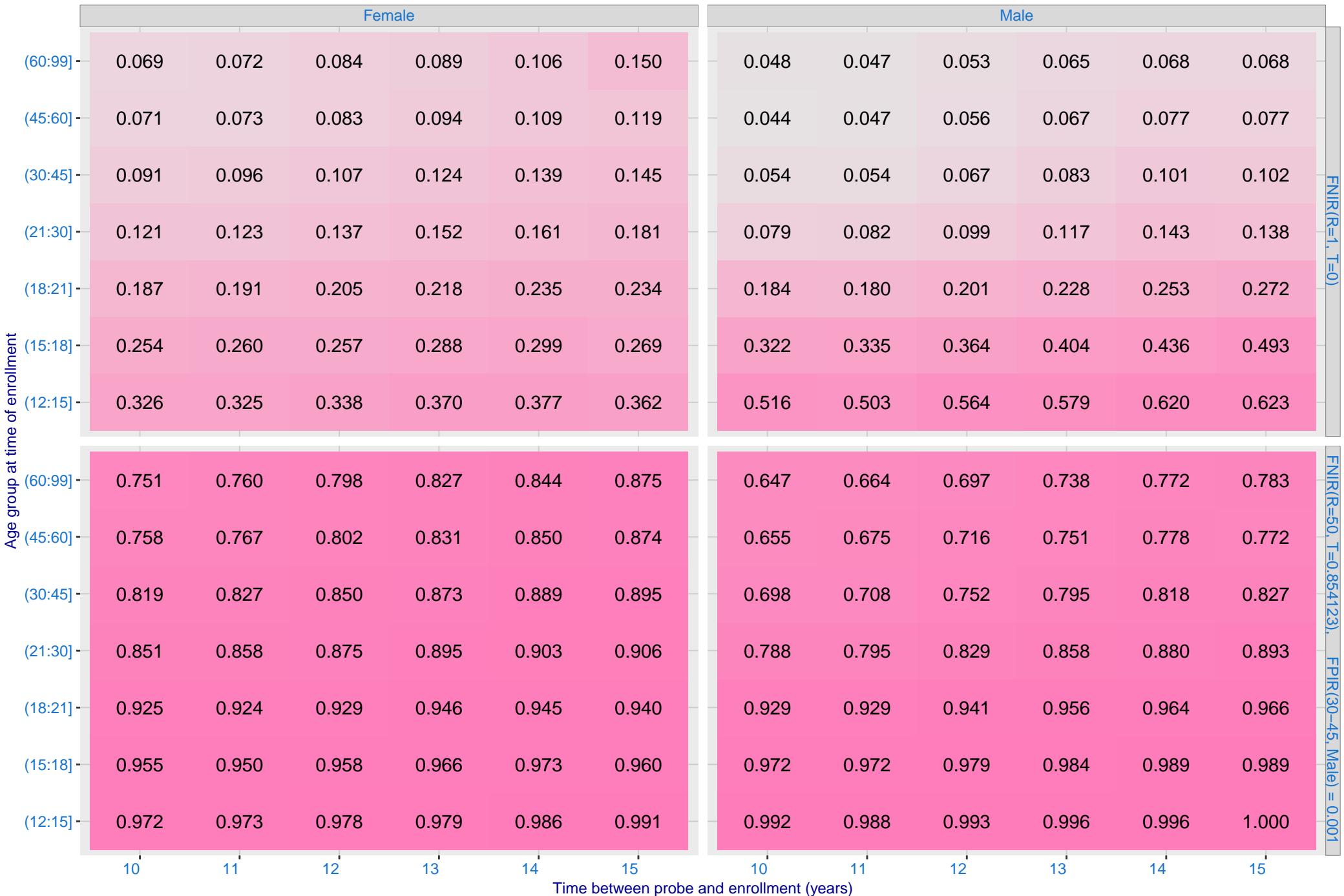


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power-law models are fit to the first two (N,T) observations



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.

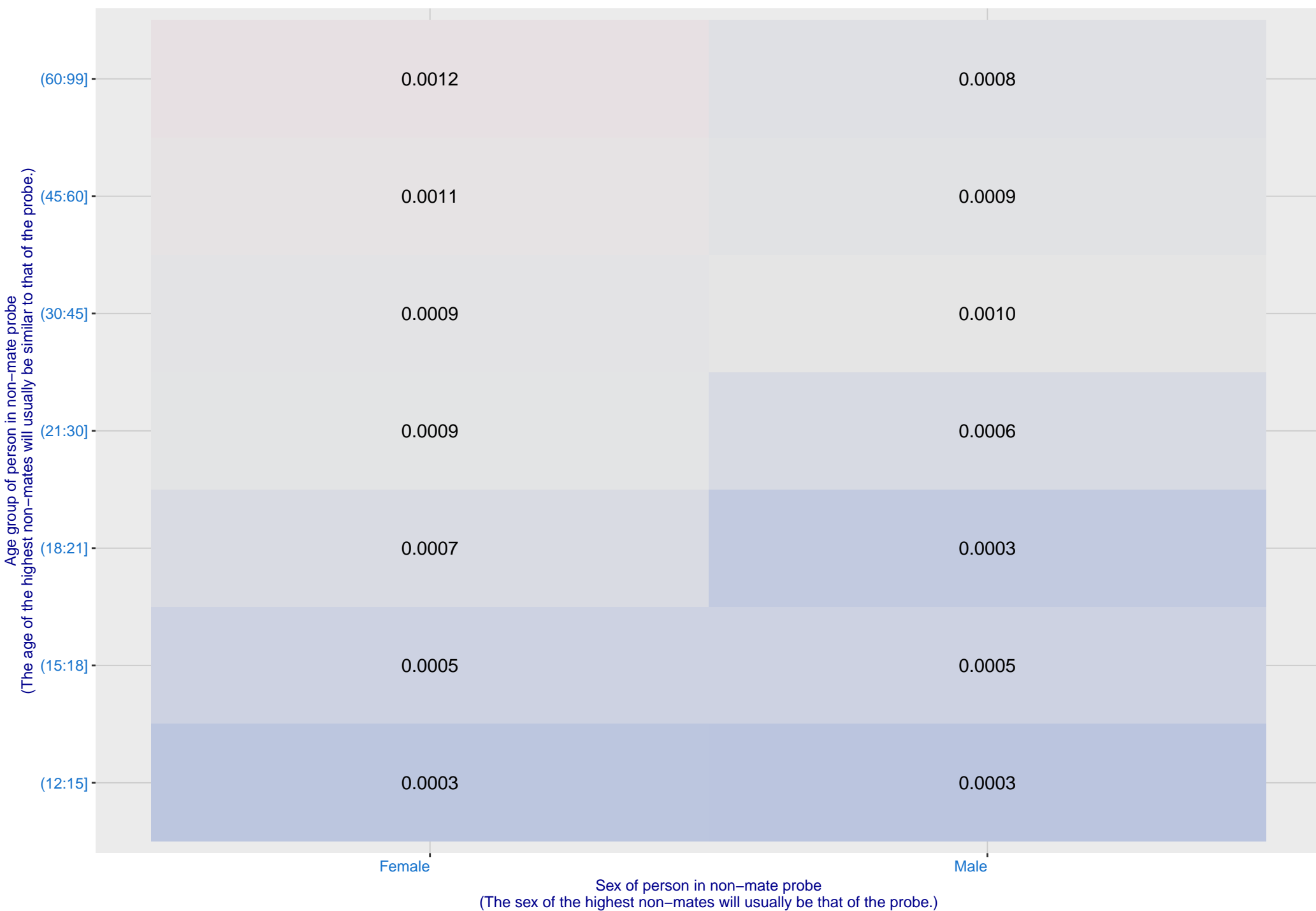
Algorithm: t4isb\_000, Dataset: Border-Crossing Ageing N = 1600000  
Text encodes FNIR, Color encodes log(FNIR)



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.

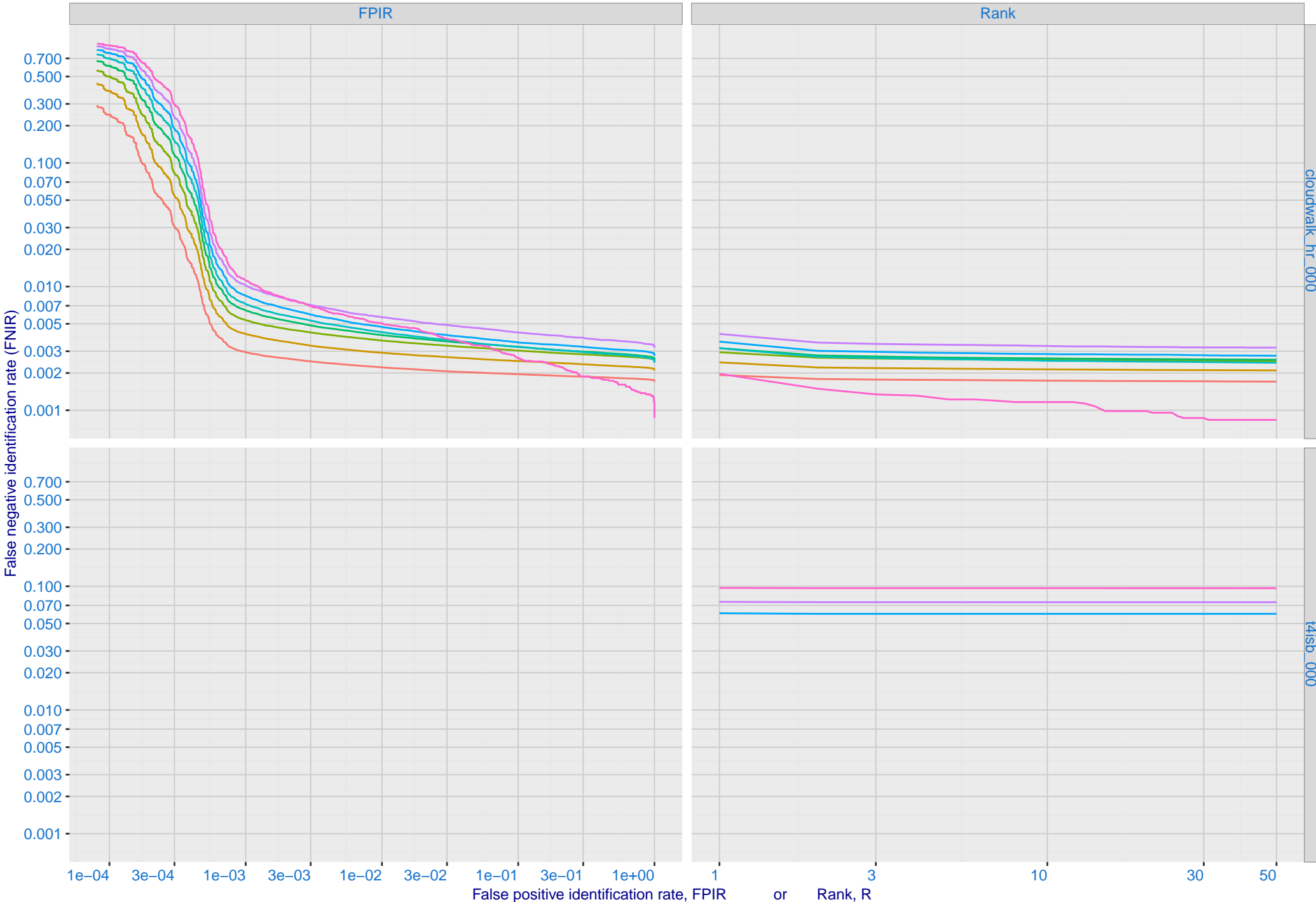
Algorithm: t4isb\_000, Dataset: Border-Crossing Ageing  
Threshold: 0.854123 set to achieve FPIR(30–45, Male) = 0.001

Color encodes  $\log(\text{FPIR})$



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

