

A: Datasheet

Algorithm: visionlabs\_010

Developer: VisionLabs

Submission Date: 2021\_02\_05

Template size: 512 bytes

Template time (2.5 percentile): 731 msec

Template time (median): 731 msec

Template time (97.5 percentile): 741 msec

Investigation:

Frontal mugshot ranking 12 (out of 279) -- FNIR(1600000, 0, 1) = 0.0014 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 22 (out of 241) -- FNIR(1600000, 0, 1) = 0.0104 vs. lowest 0.0062 from sensetime\_005

Mugshot profile ranking 6 (out of 210) -- FNIR(1600000, 0, 1) = 0.0690 vs. lowest 0.0587 from xforwardai\_002

Immigration visa-border ranking 1 (out of 168) -- FNIR(1600000, 0, 1) = 0.0013

Immigration visa-kiosk ranking 3 (out of 165) -- FNIR(1600000, 0, 1) = 0.0694 vs. lowest 0.0568 from cloudwalk\_hr\_000

Identification:

Frontal mugshot ranking 15 (out of 279) -- FNIR(1600000, T, L+1) = 0.0051, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

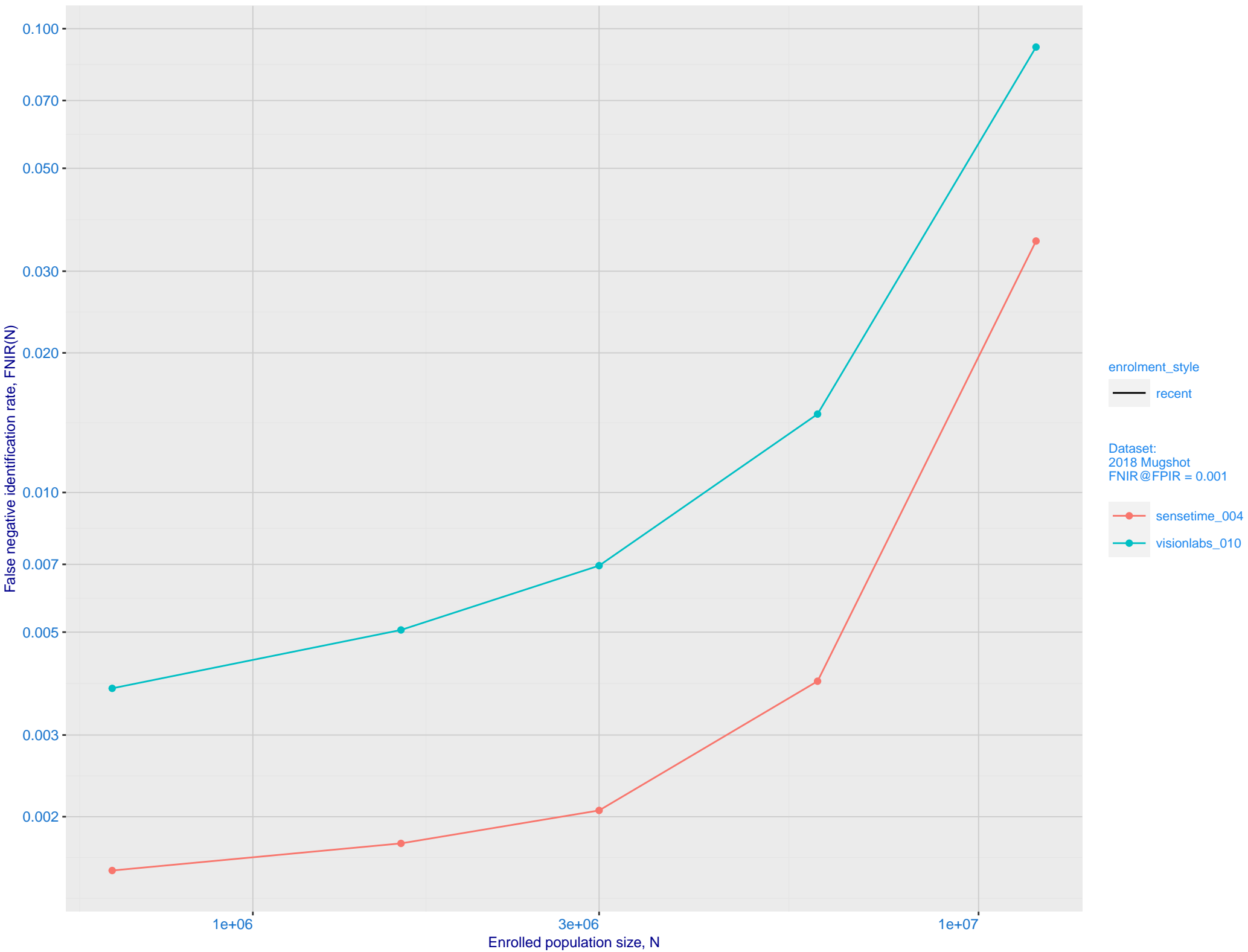
Mugshot webcam ranking 15 (out of 236) -- FNIR(1600000, T, L+1) = 0.0274, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

Mugshot profile ranking 187 (out of 209) -- FNIR(1600000, T, L+1) = 0.9999, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk\_hr\_000

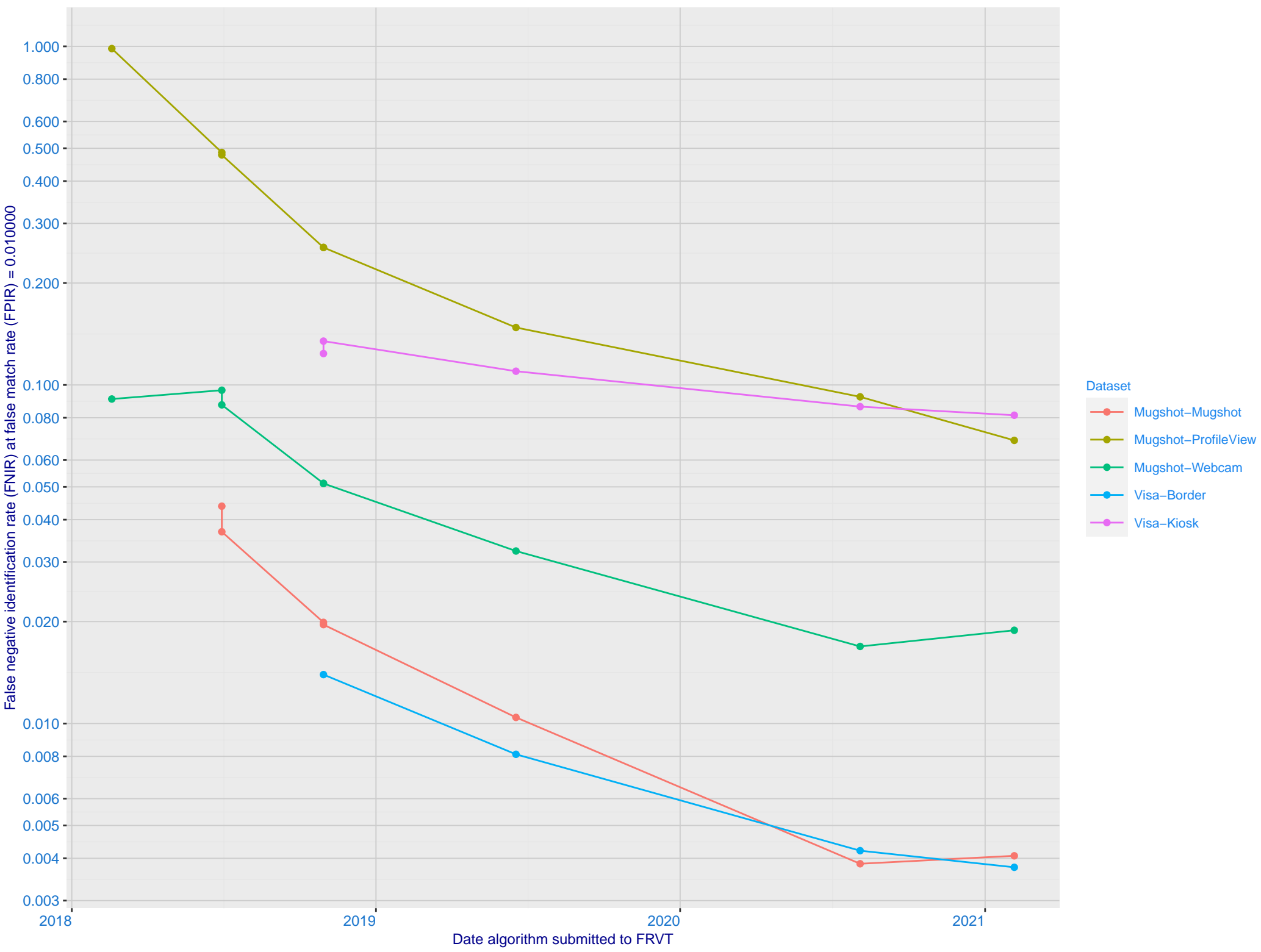
Immigration visa-border ranking 7 (out of 167) -- FNIR(1600000, T, L+1) = 0.0077, FPIR=0.001000 vs. lowest 0.0047 from idemia\_008

Immigration visa-kiosk ranking 5 (out of 162) -- FNIR(1600000, T, L+1) = 0.1095, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk\_hr\_000

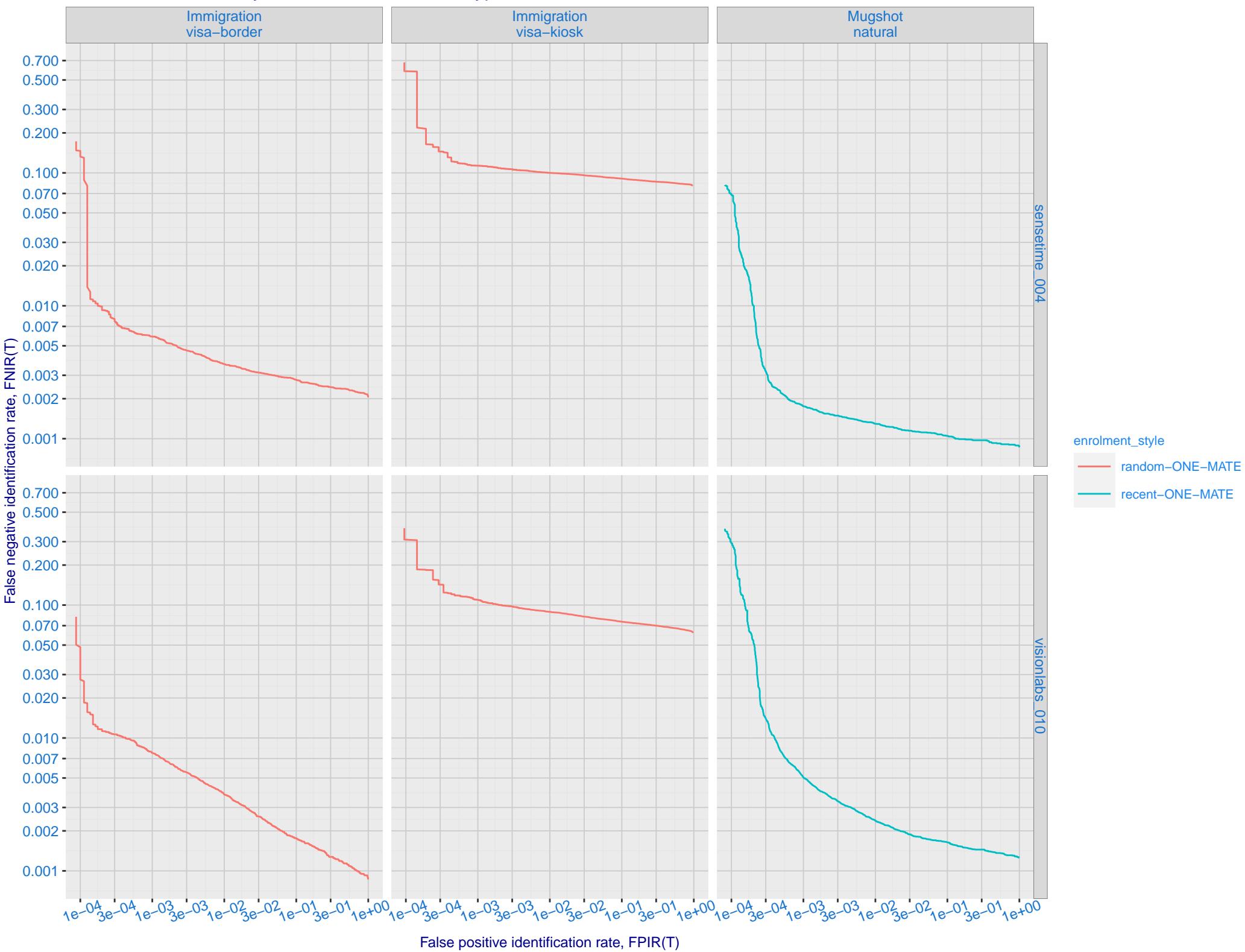
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime\_004)



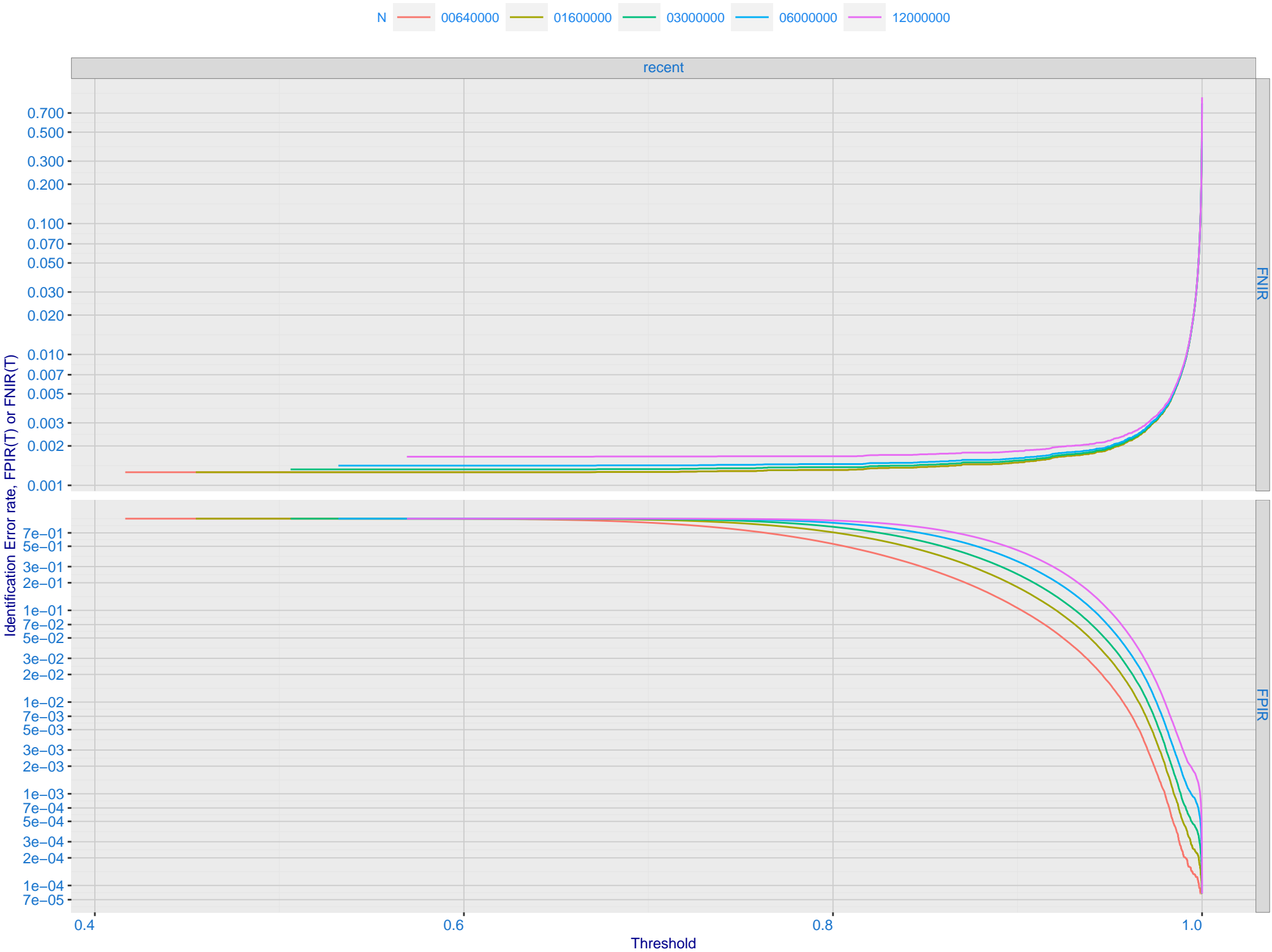
C: Evolution of accuracy for VISIONLABS algorithms on three datasets 2018 – present



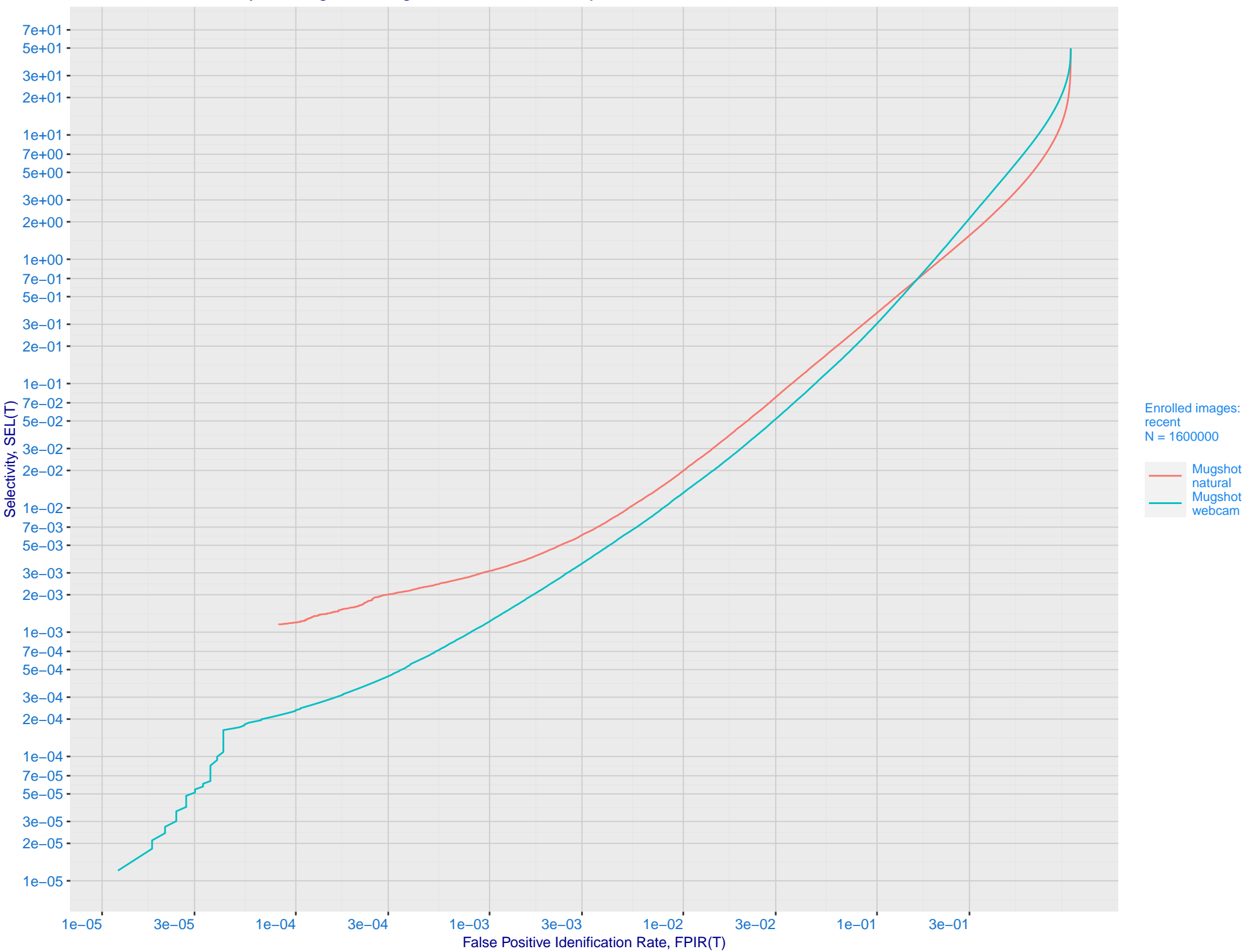
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals



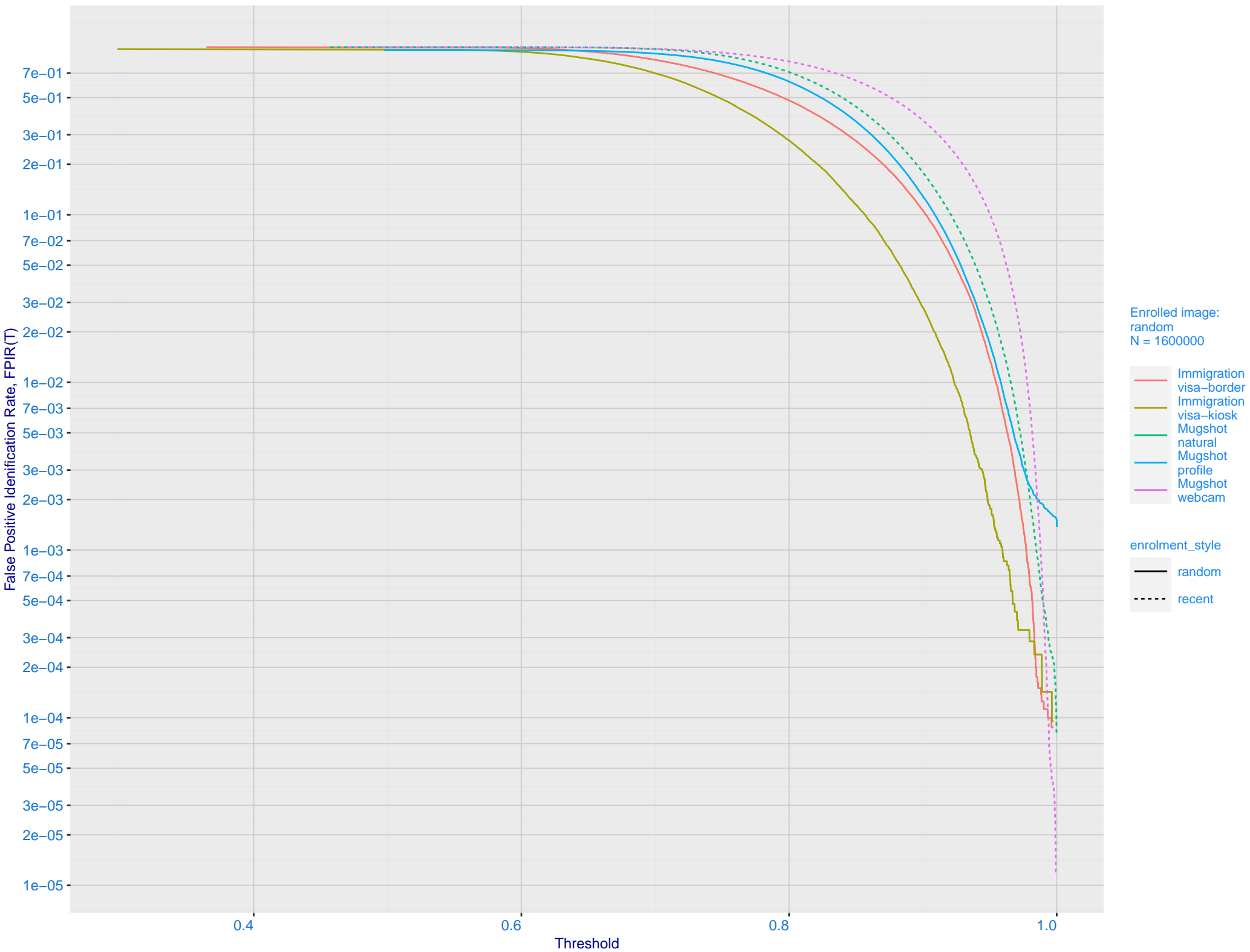
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



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

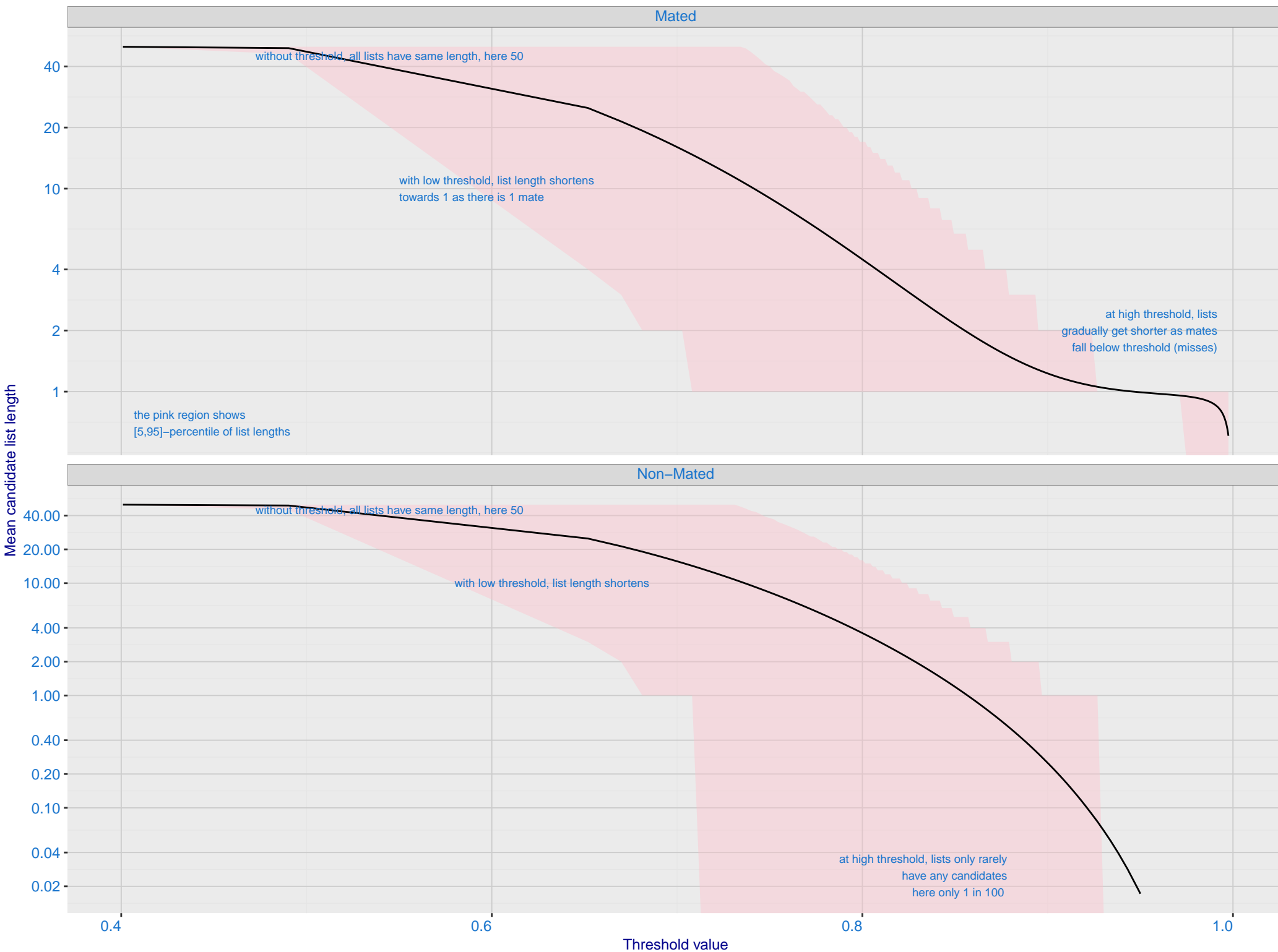


G: FPIR dependence on T by probe type for N = 1600000 subjects



# H: Reduced length candidate lists for human review

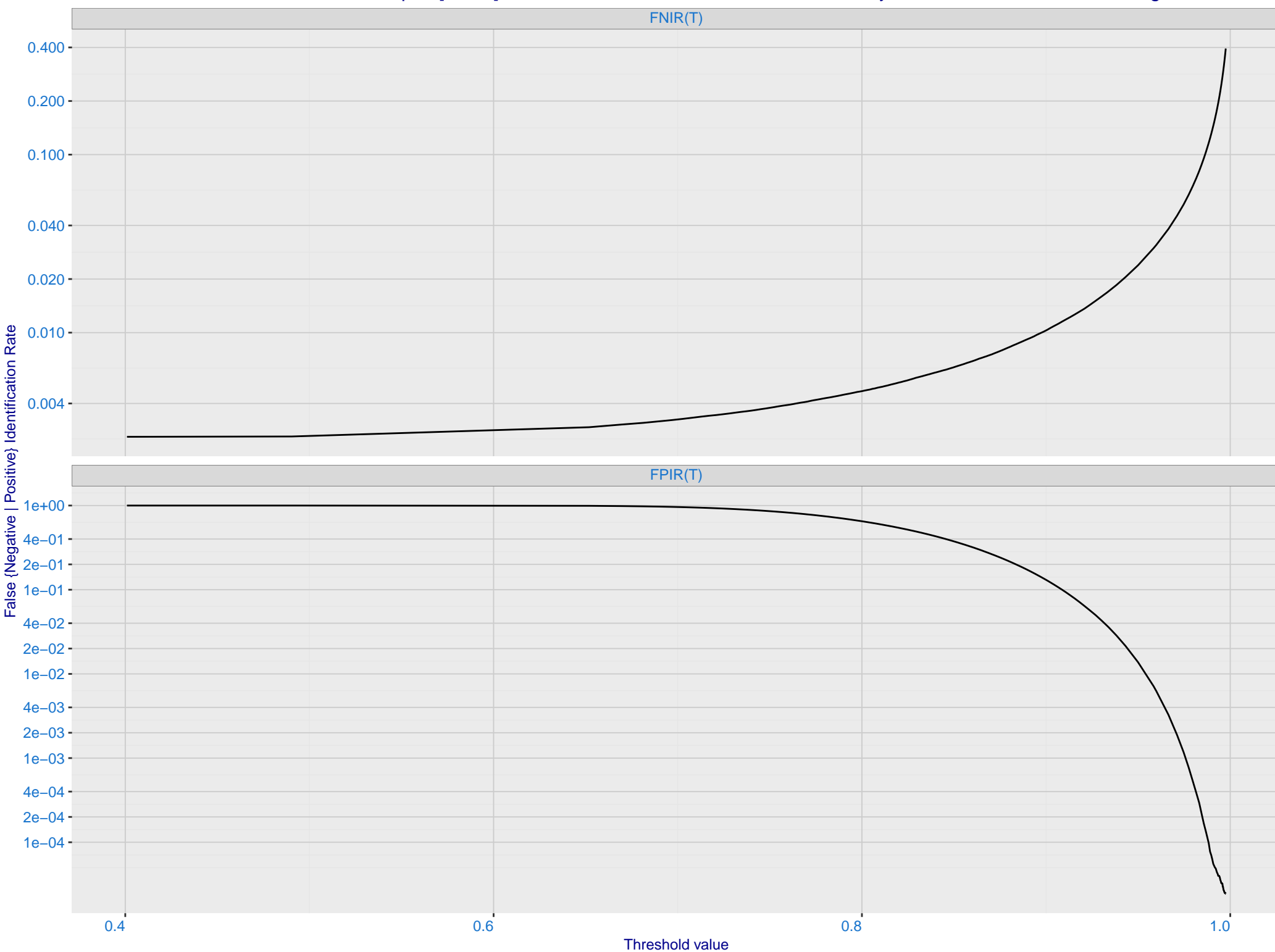
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image



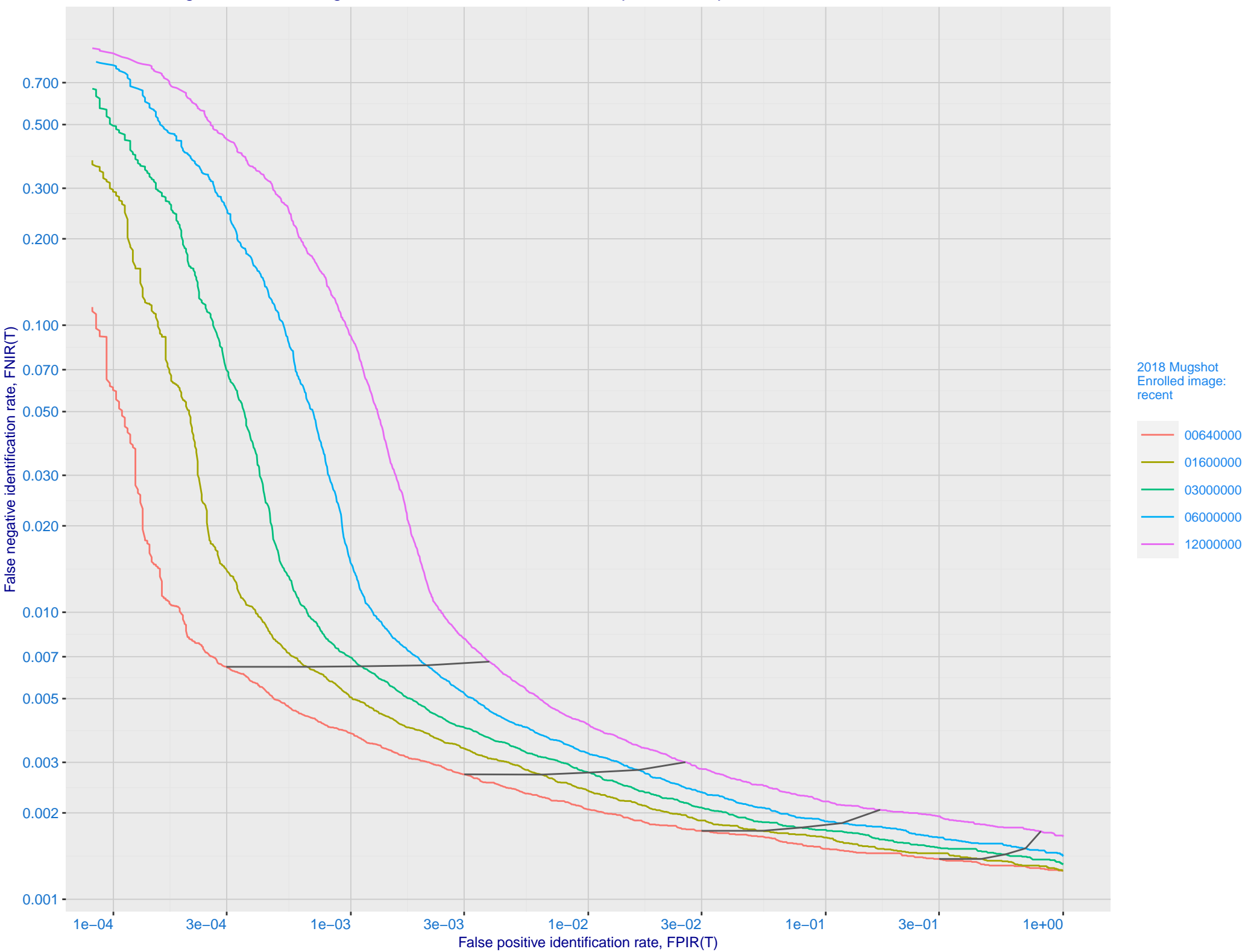


# I: FNIR and FPIR dependence on threshold

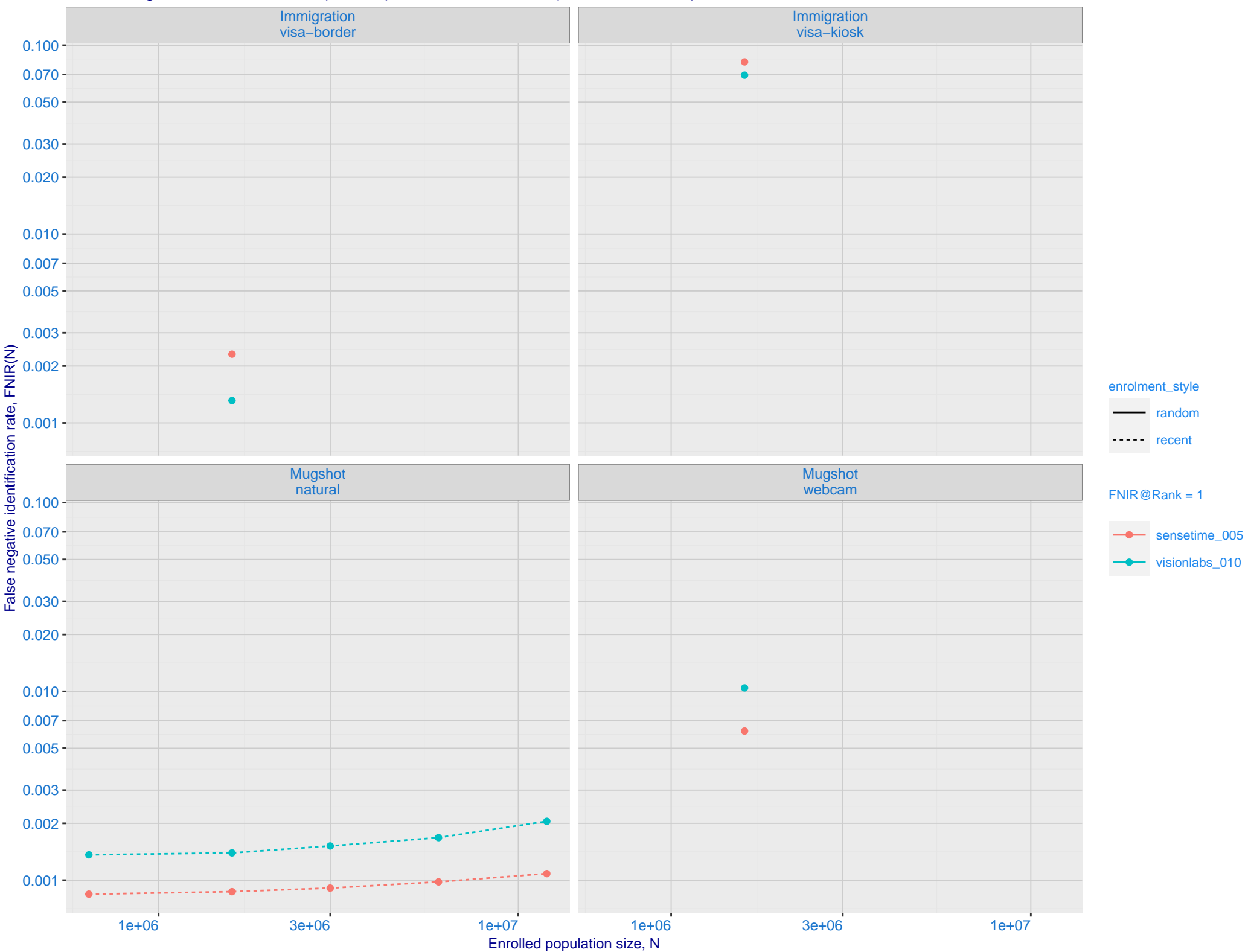
Dataset is border-border with time-lapse [10,15] YRS with N = 1600000. Probes are 10-15 years later than enrollment image



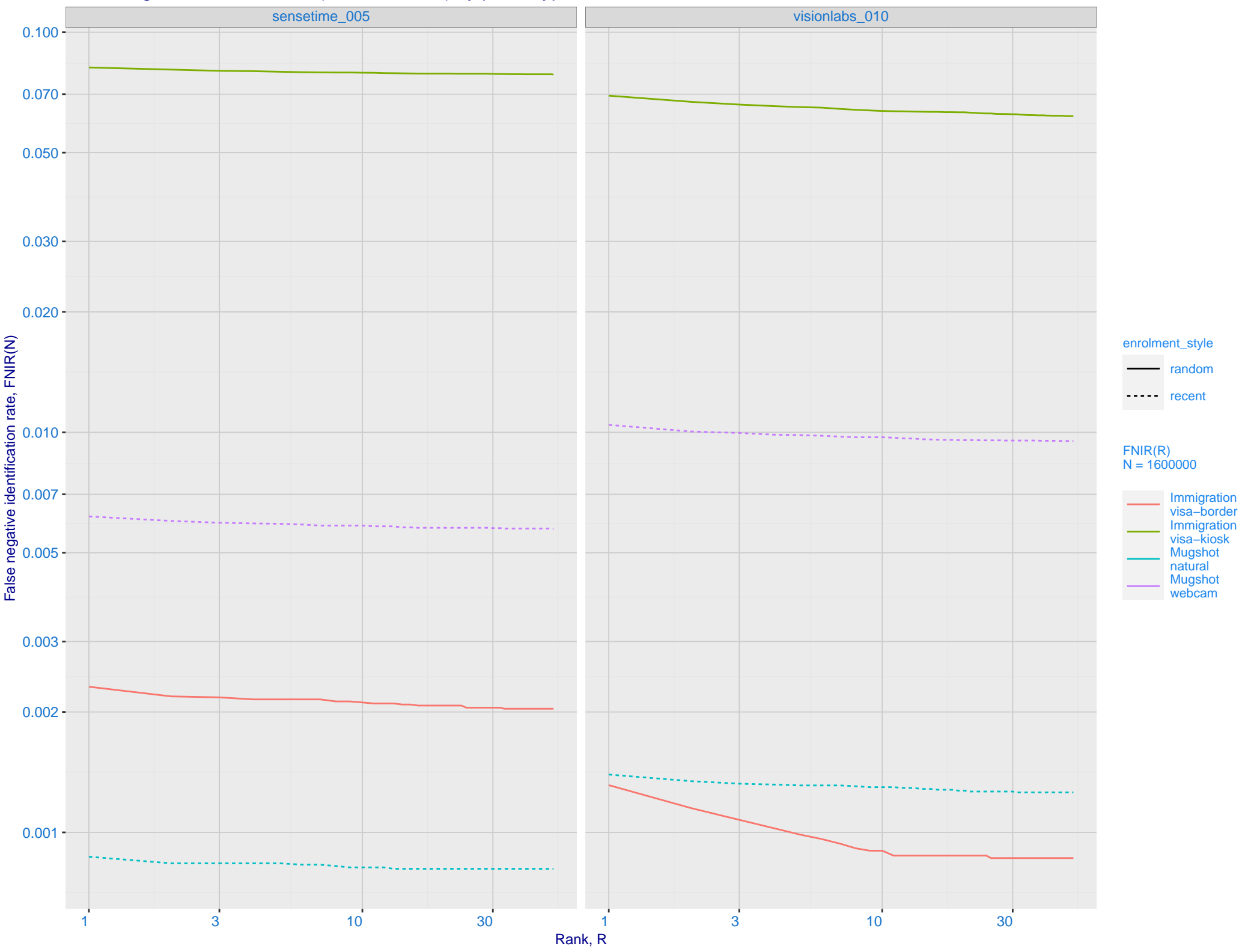
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.



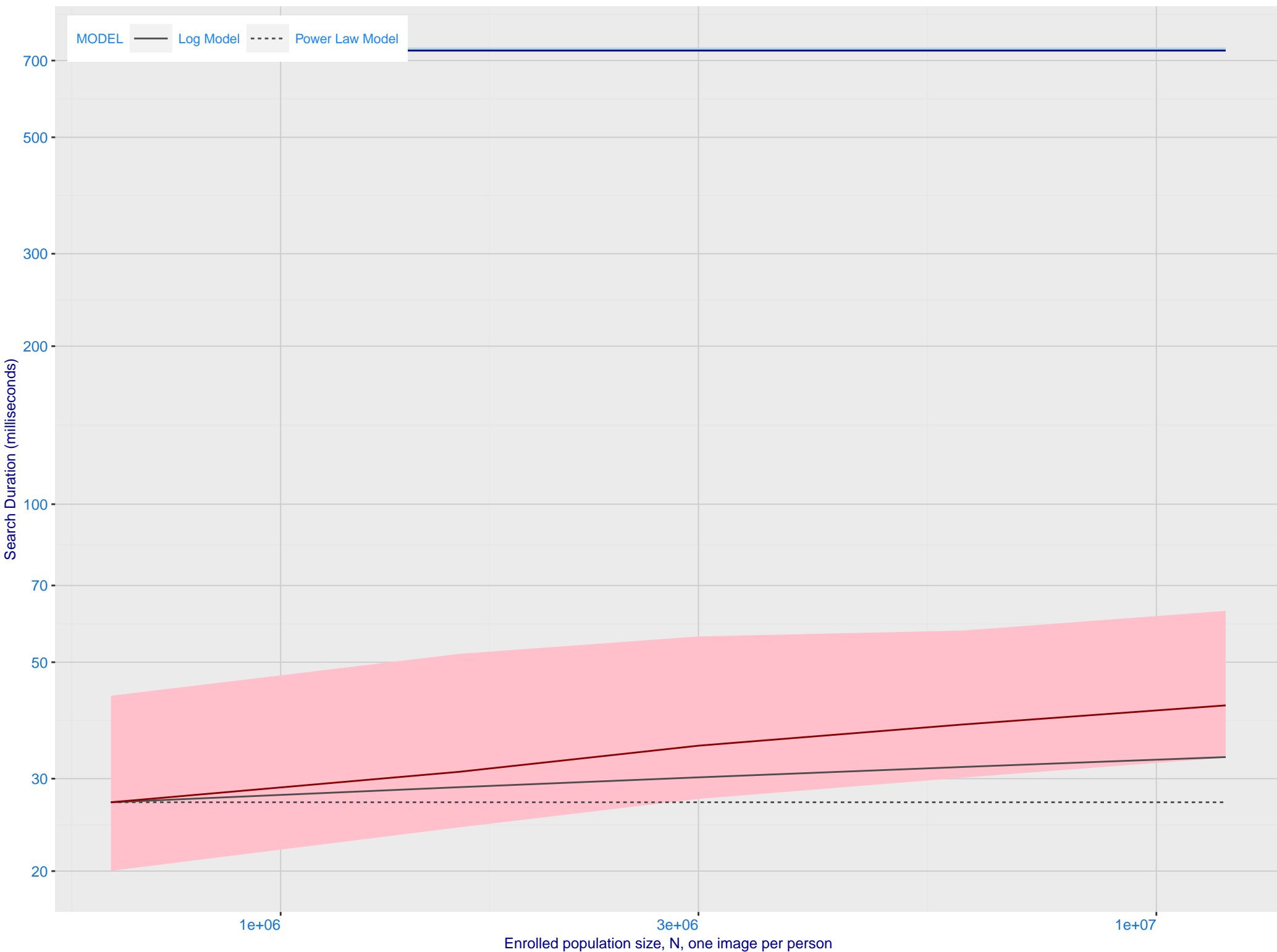
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005)



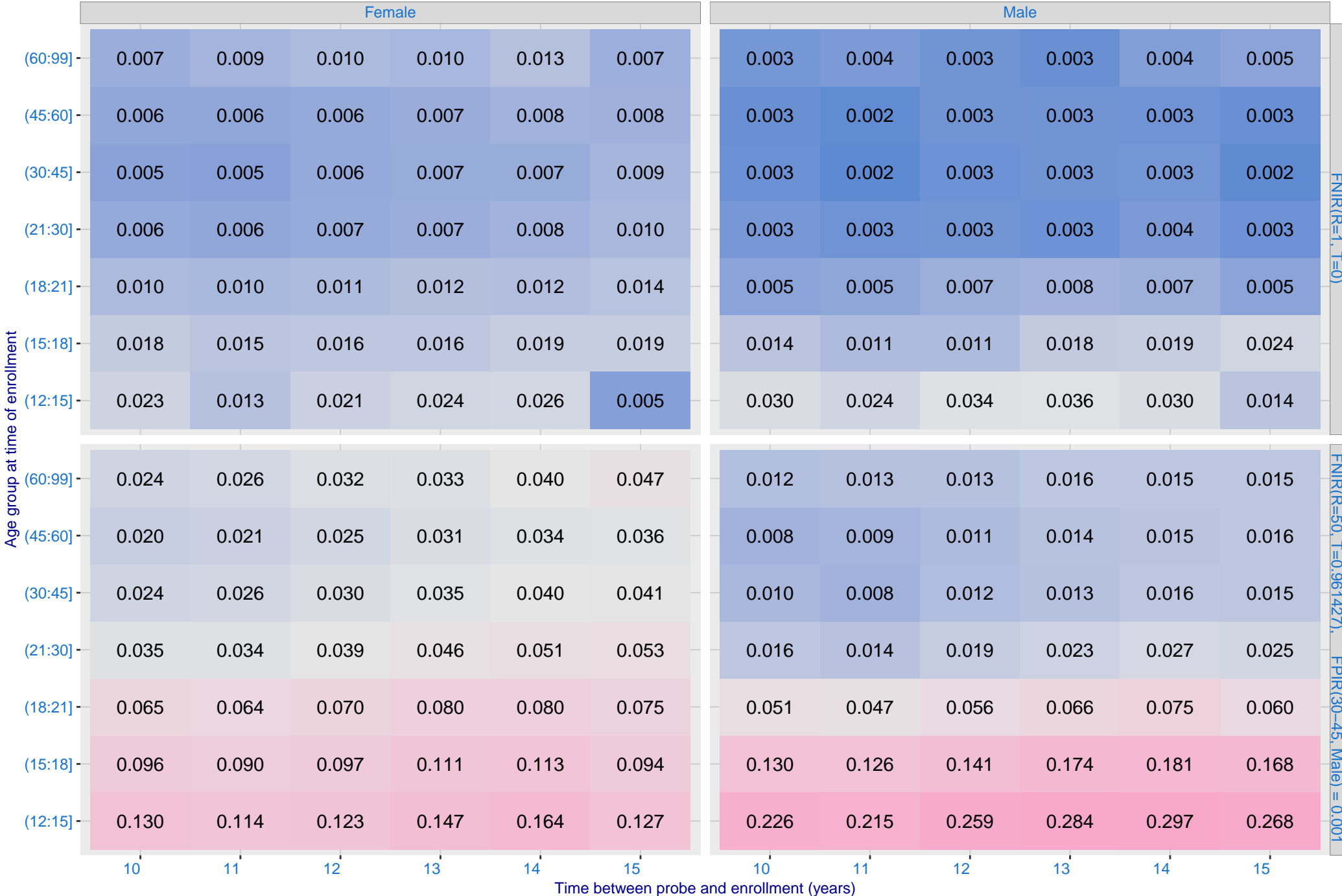
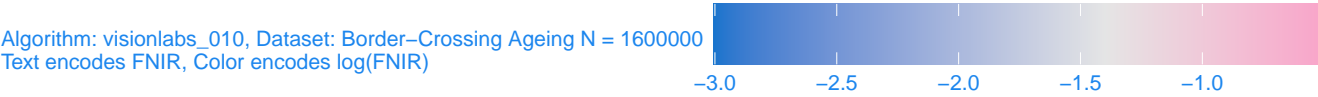
L: Investigational mode: FNIR(1600000, R, 0) by probe type



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



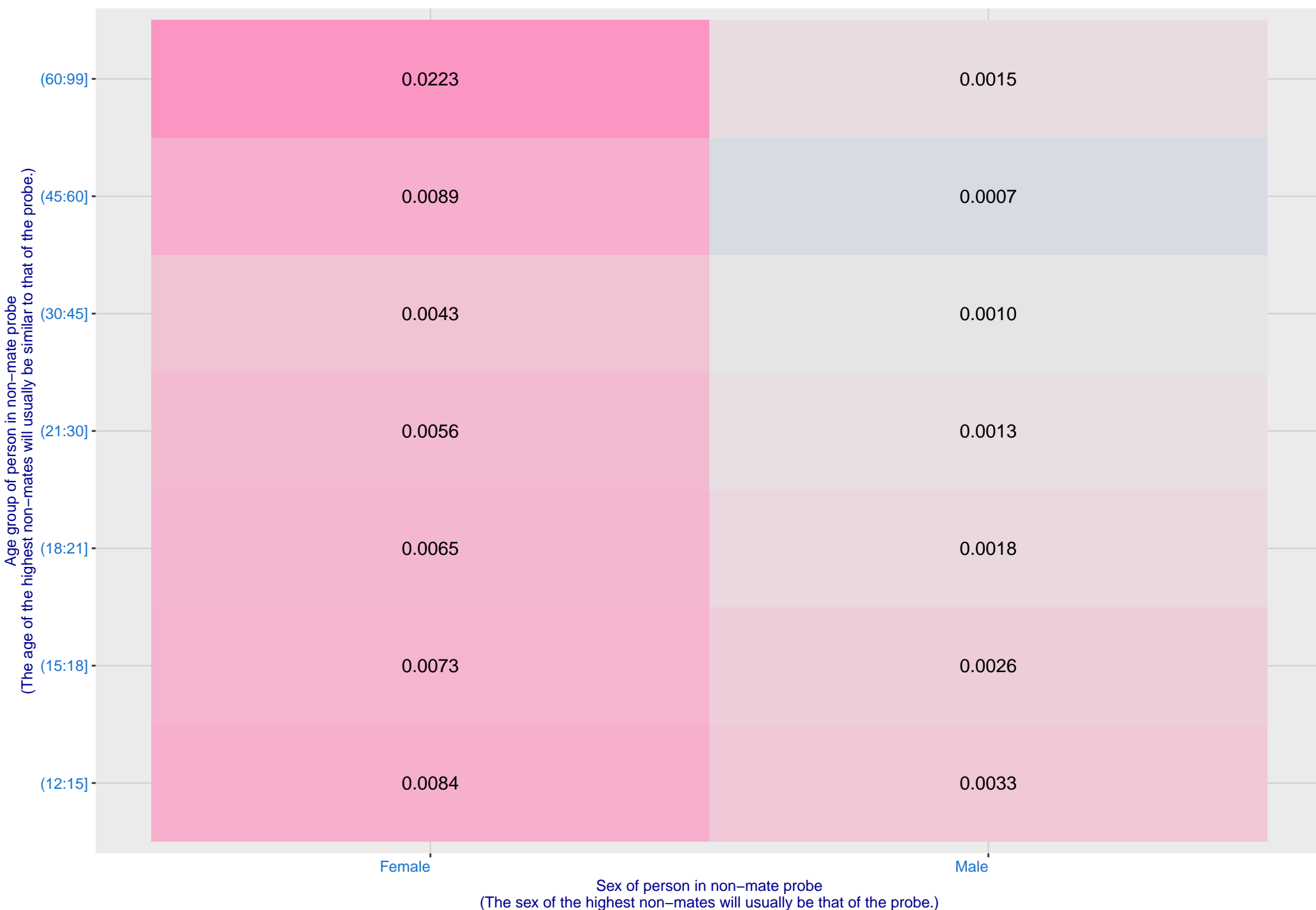
O: FNIR(T, N = 1.6 million) by sex, age and time-lapse. The top row gives investigational rank-1 miss rates. The bottom panels give high threshold for more lights-out identification with low FPIR.



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.

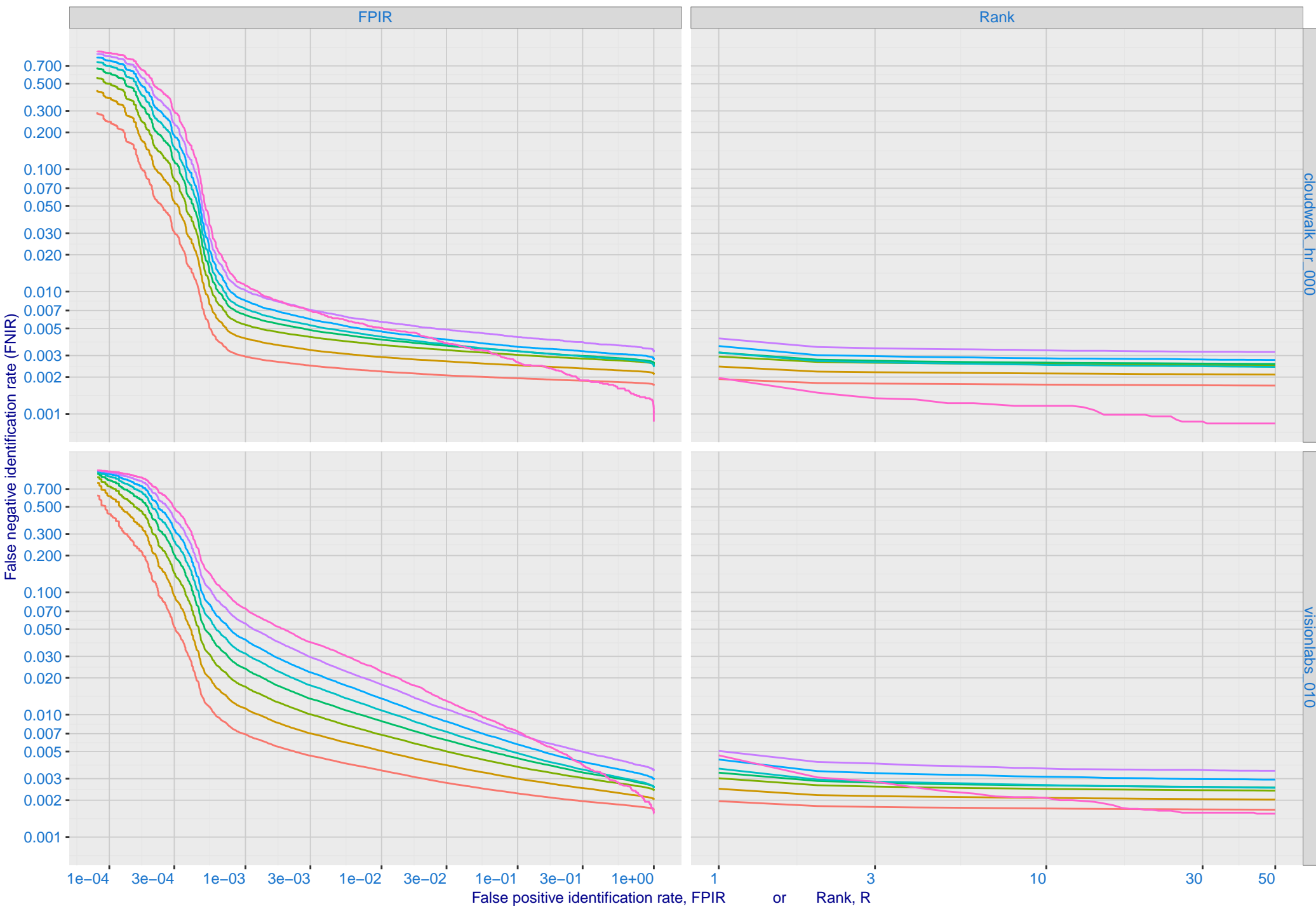
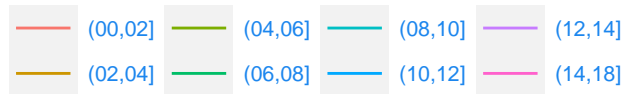
Algorithm: visionlabs\_010, Dataset: Border-Crossing Ageing  
Threshold: 0.961427 set to achieve FPIR(30–45, Male) = 0.001

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

