

A: Datasheet

Algorithm: cognitec\_004

Developer: Cognitec Systems GmbH

Submission Date: 2021\_03\_08

Template size: 2052 bytes

Template time (2.5 percentile): 179 msec

Template time (median): 192 msec

Template time (97.5 percentile): 206 msec

Investigation:

Frontal mugshot ranking 104 (out of 329) -- FNIR(1600000, 0, 1) = 0.0032 vs. lowest 0.0009 from sensetime\_006

Mugshot webcam ranking 98 (out of 291) -- FNIR(1600000, 0, 1) = 0.0159 vs. lowest 0.0057 from sensetime\_006

Mugshot profile ranking 160 (out of 260) -- FNIR(1600000, 0, 1) = 0.8128 vs. lowest 0.0550 from sensetime\_006

Immigration visa-border ranking 123 (out of 218) -- FNIR(1600000, 0, 1) = 0.0128 vs. lowest 0.0009 from sensetime\_006

Immigration visa-kiosk ranking 115 (out of 215) -- FNIR(1600000, 0, 1) = 0.1430 vs. lowest 0.0487 from cubox\_000

Identification:

Frontal mugshot ranking 101 (out of 329) -- FNIR(1600000, T, L+1) = 0.0312, FPIR=0.001000 vs. lowest 0.0017 from nec\_005

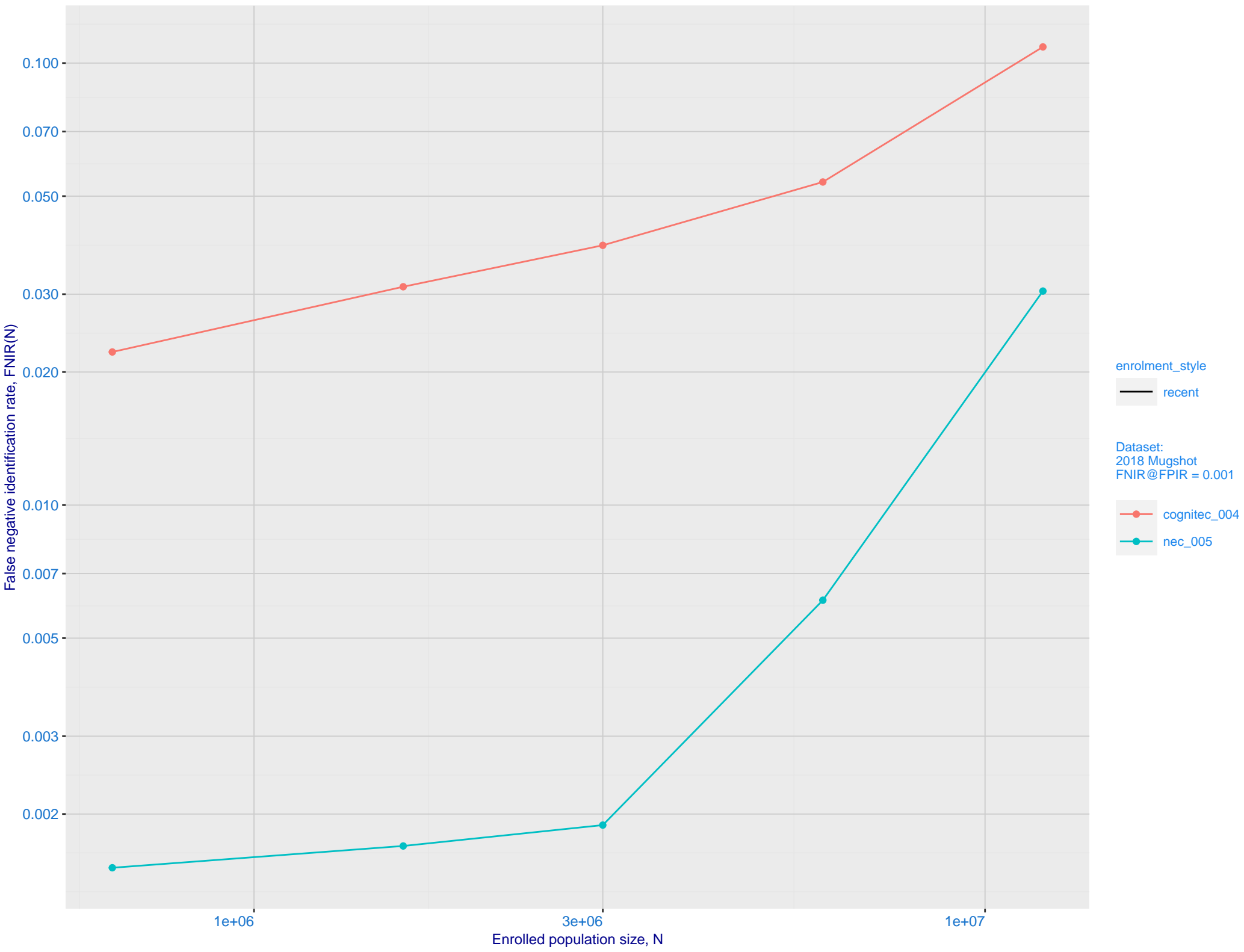
Mugshot webcam ranking 114 (out of 289) -- FNIR(1600000, T, L+1) = 0.0968, FPIR=0.001000 vs. lowest 0.0120 from nec\_005

Mugshot profile ranking 108 (out of 259) -- FNIR(1600000, T, L+1) = 0.9902, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk\_hr\_000

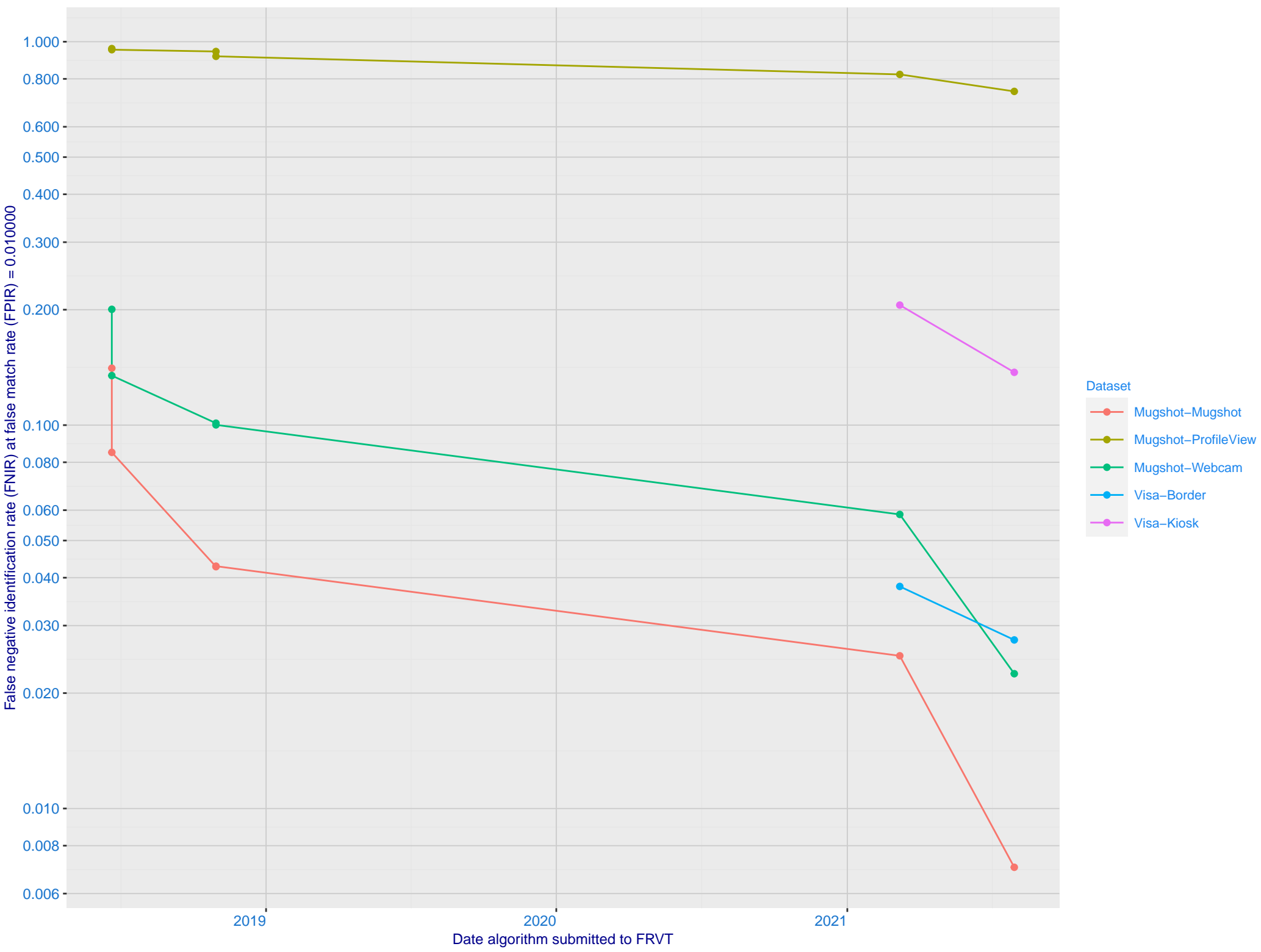
Immigration visa-border ranking 109 (out of 217) -- FNIR(1600000, T, L+1) = 0.0679, FPIR=0.001000 vs. lowest 0.0032 from paravision\_009

Immigration visa-kiosk ranking 70 (out of 212) -- FNIR(1600000, T, L+1) = 0.2876, FPIR=0.001000 vs. lowest 0.0728 from paravision\_009

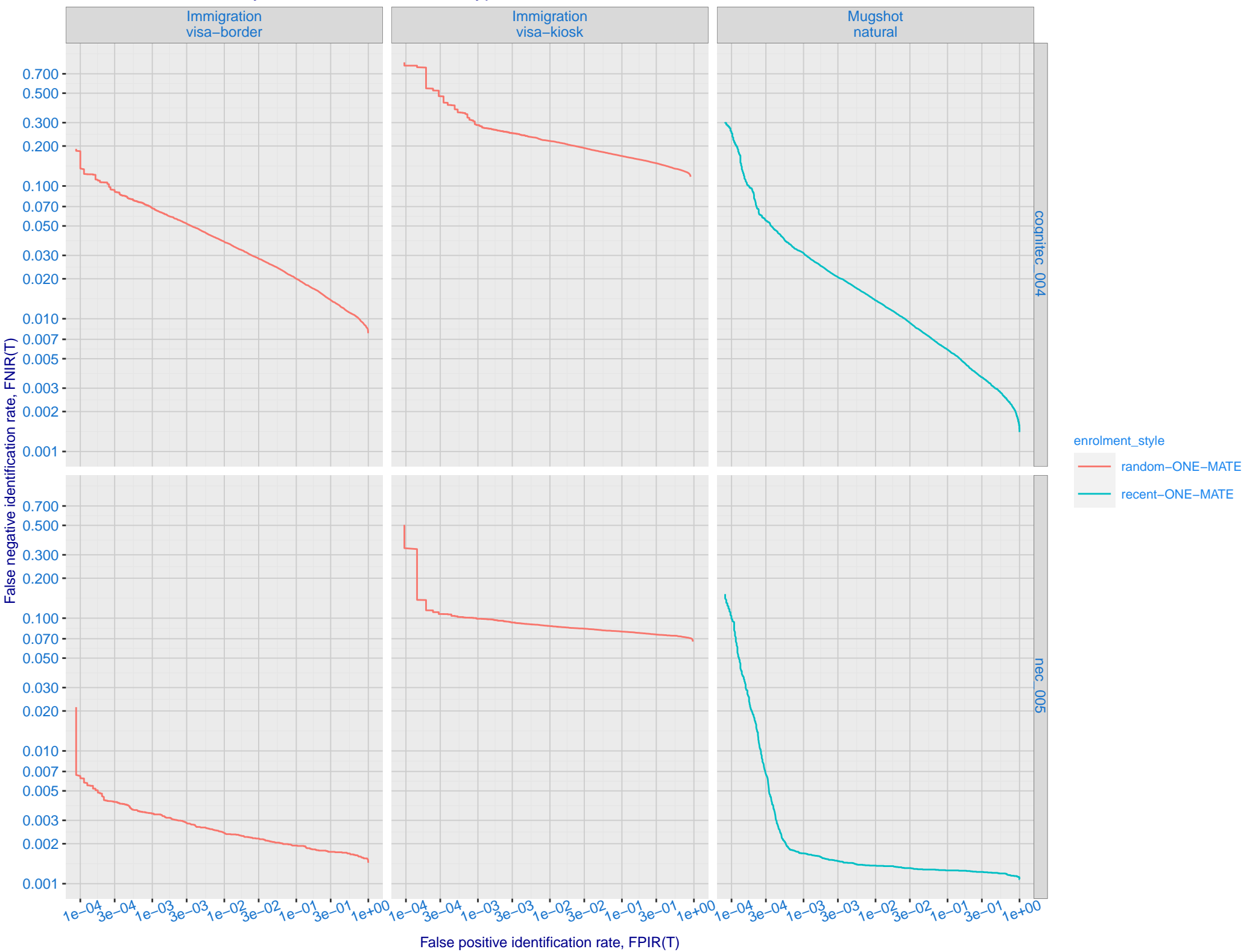
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (nec\_005)



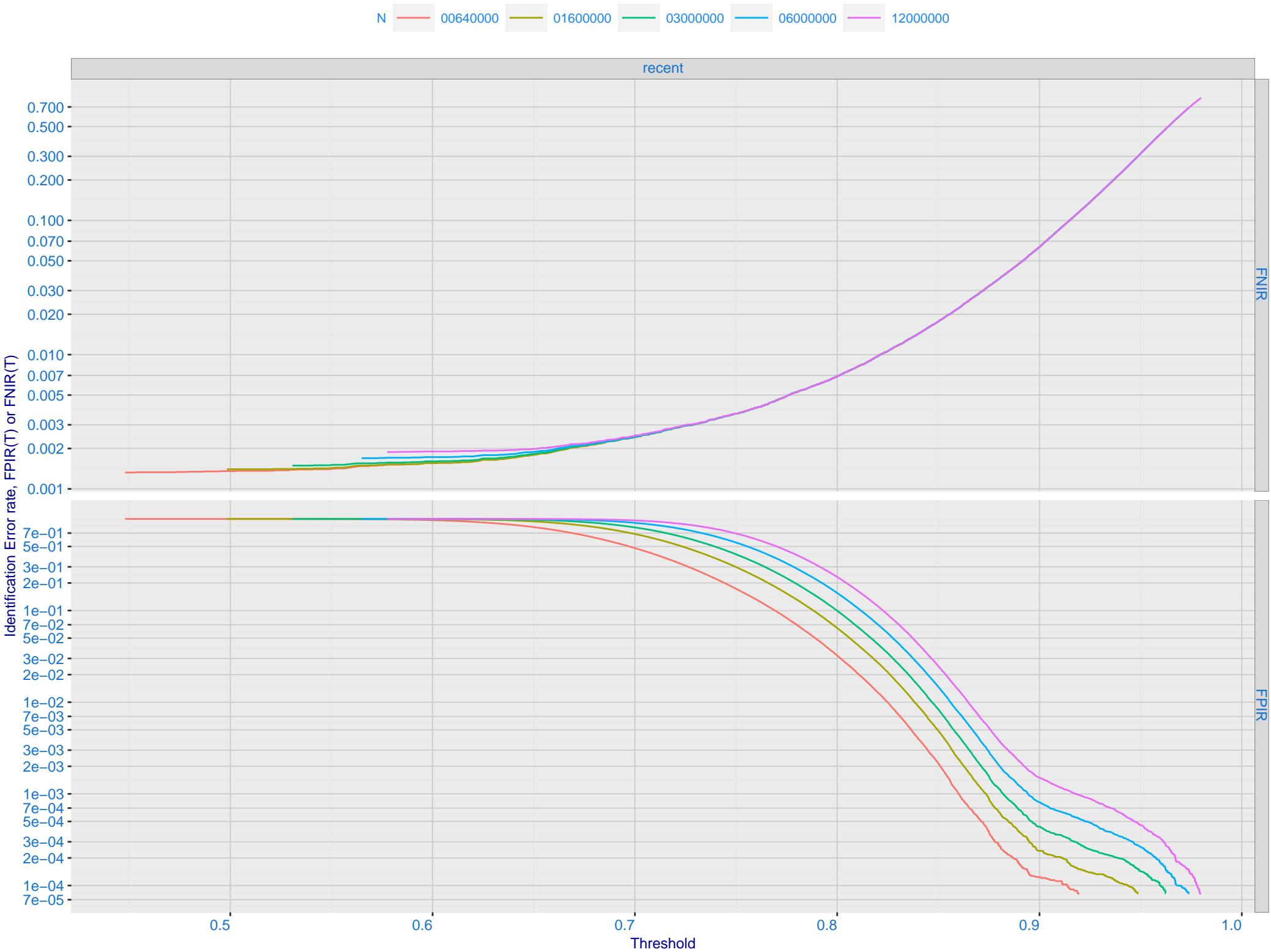
C: Evolution of accuracy for COGNITEC algorithms on three datasets 2018 – present



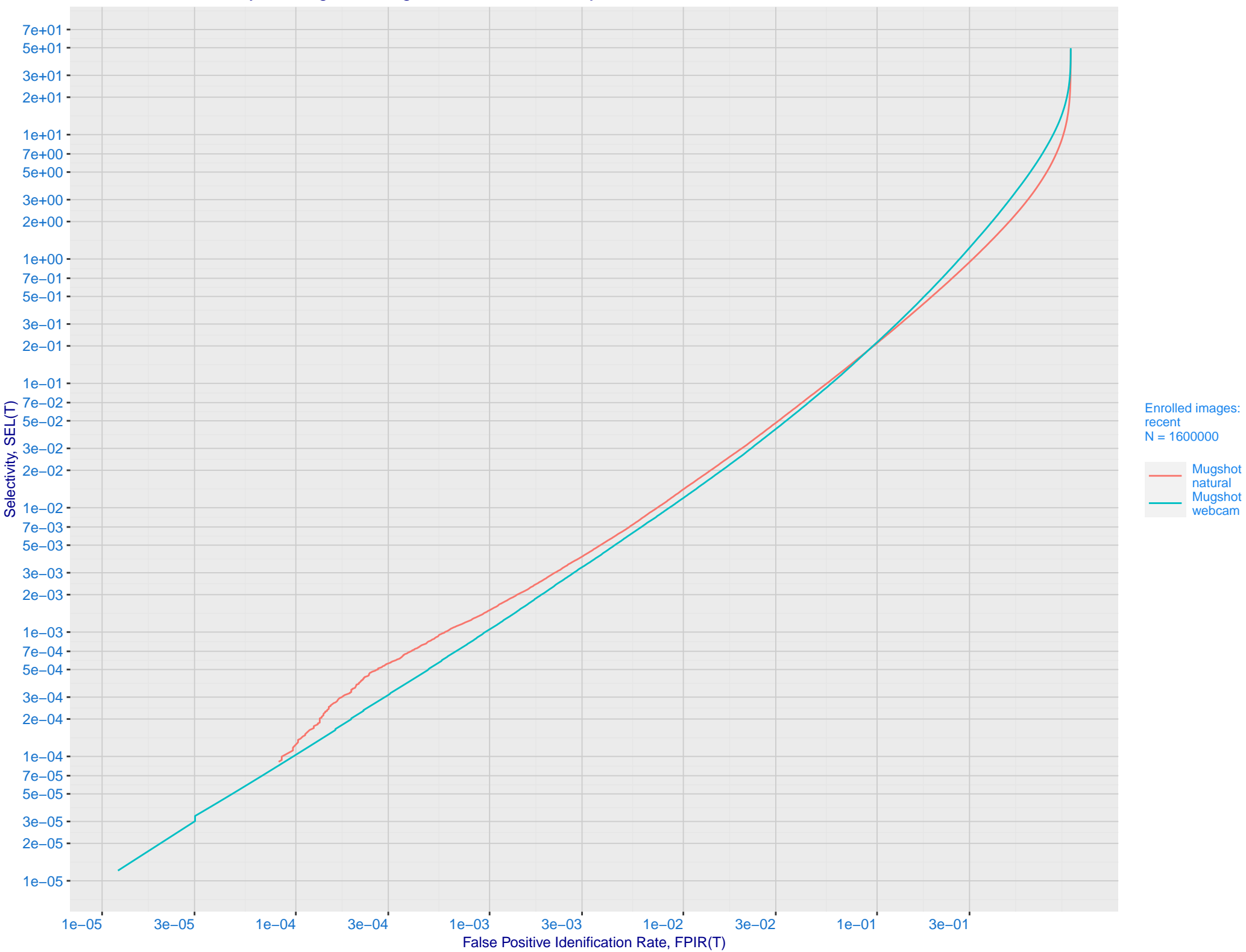
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals



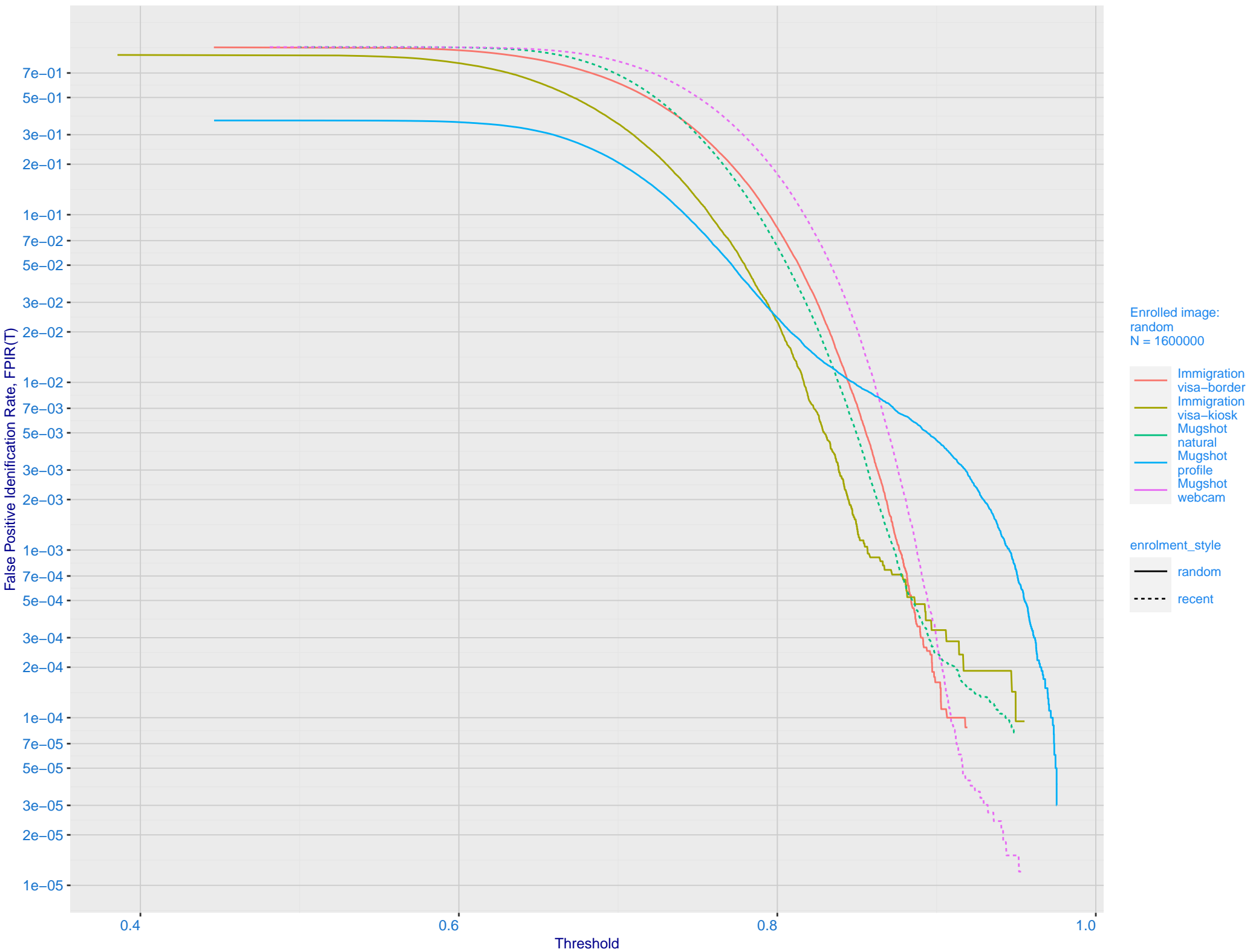
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



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

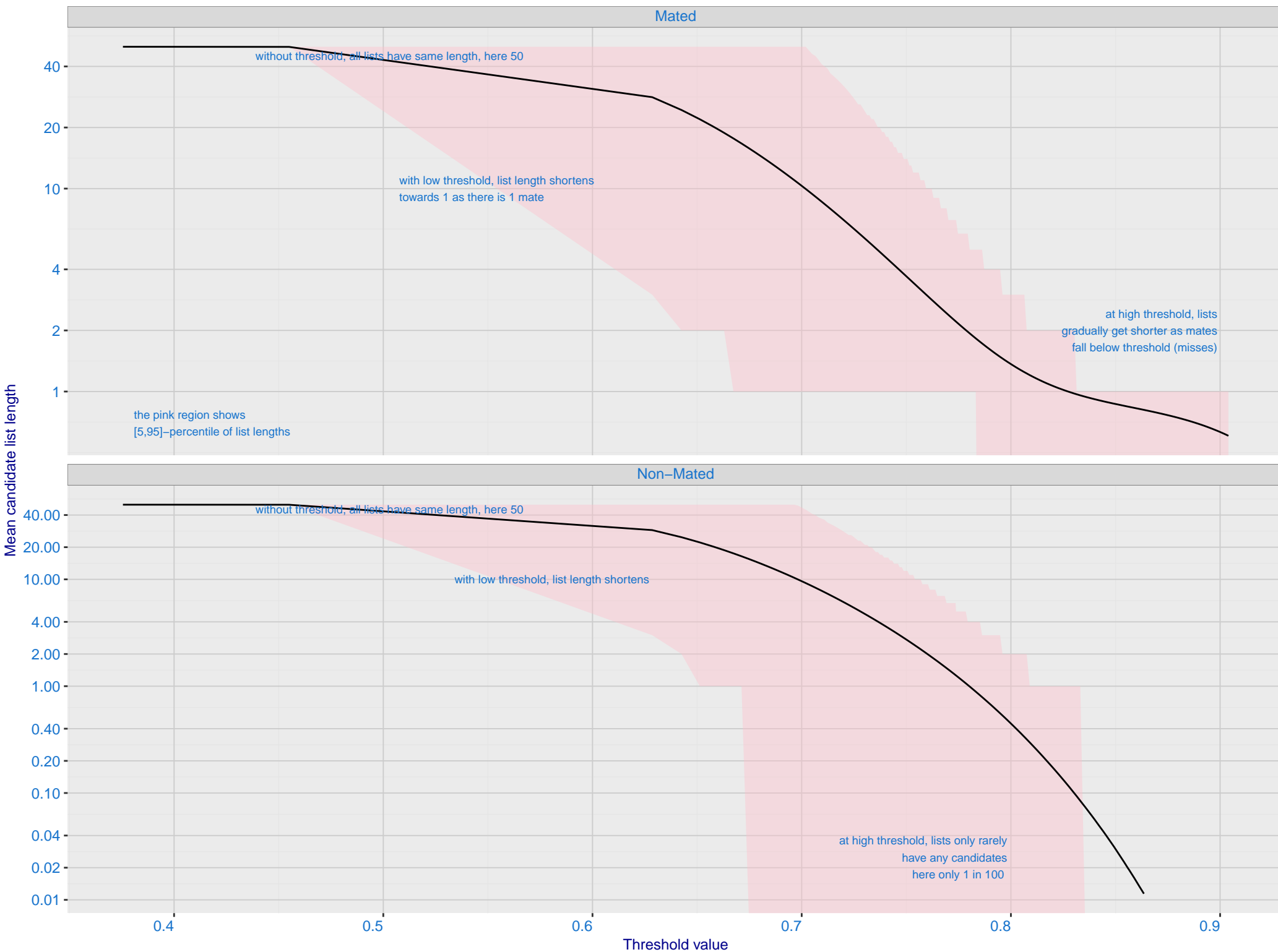


G: FPIR dependence on T by probe type for N = 1600000 subjects



# H: Reduced length candidate lists for human review

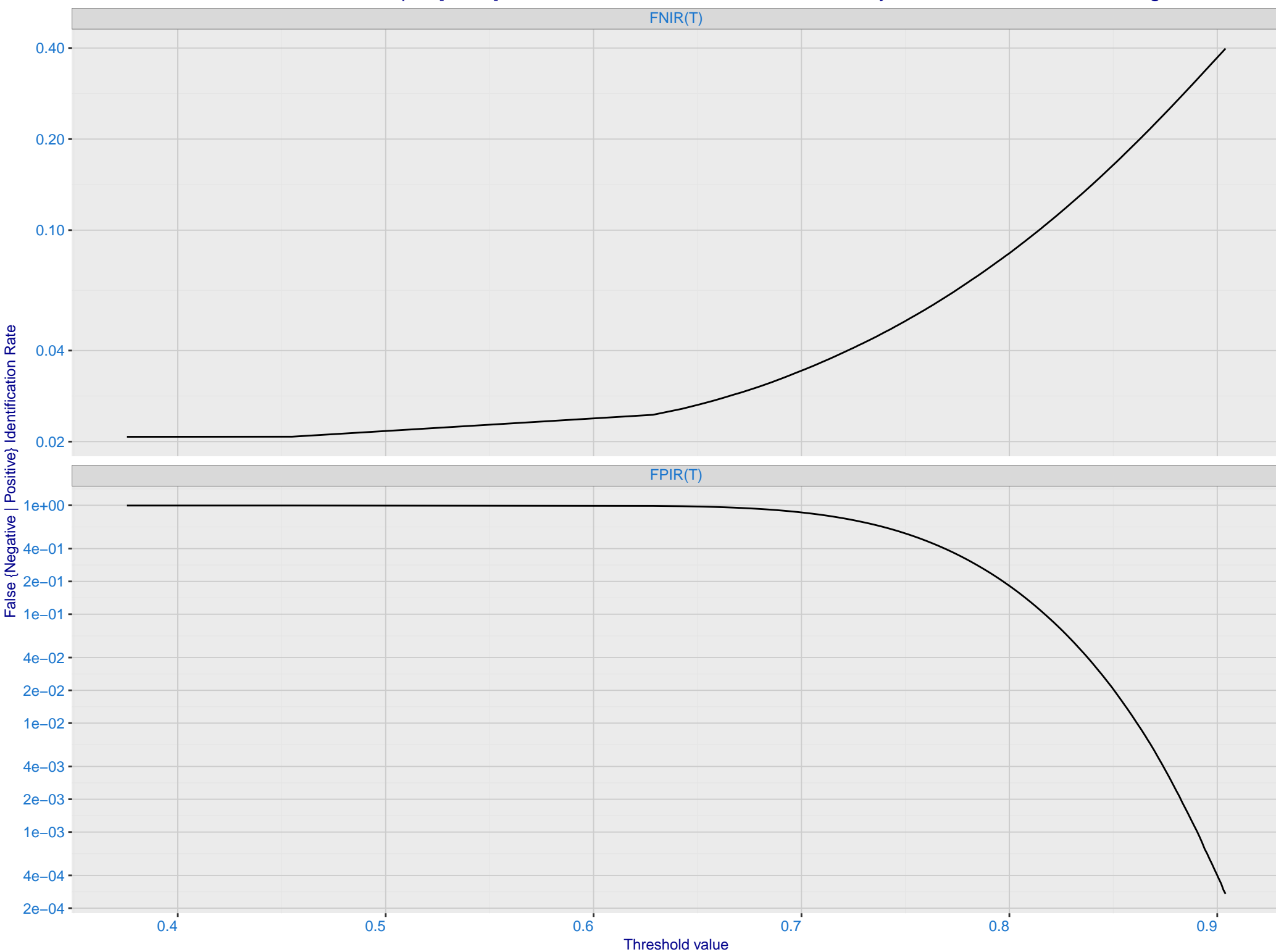
Dataset is border-border with time-lapse [10,15] YRS with N = 1600000. Probes are 10-15 years later than enrollment image



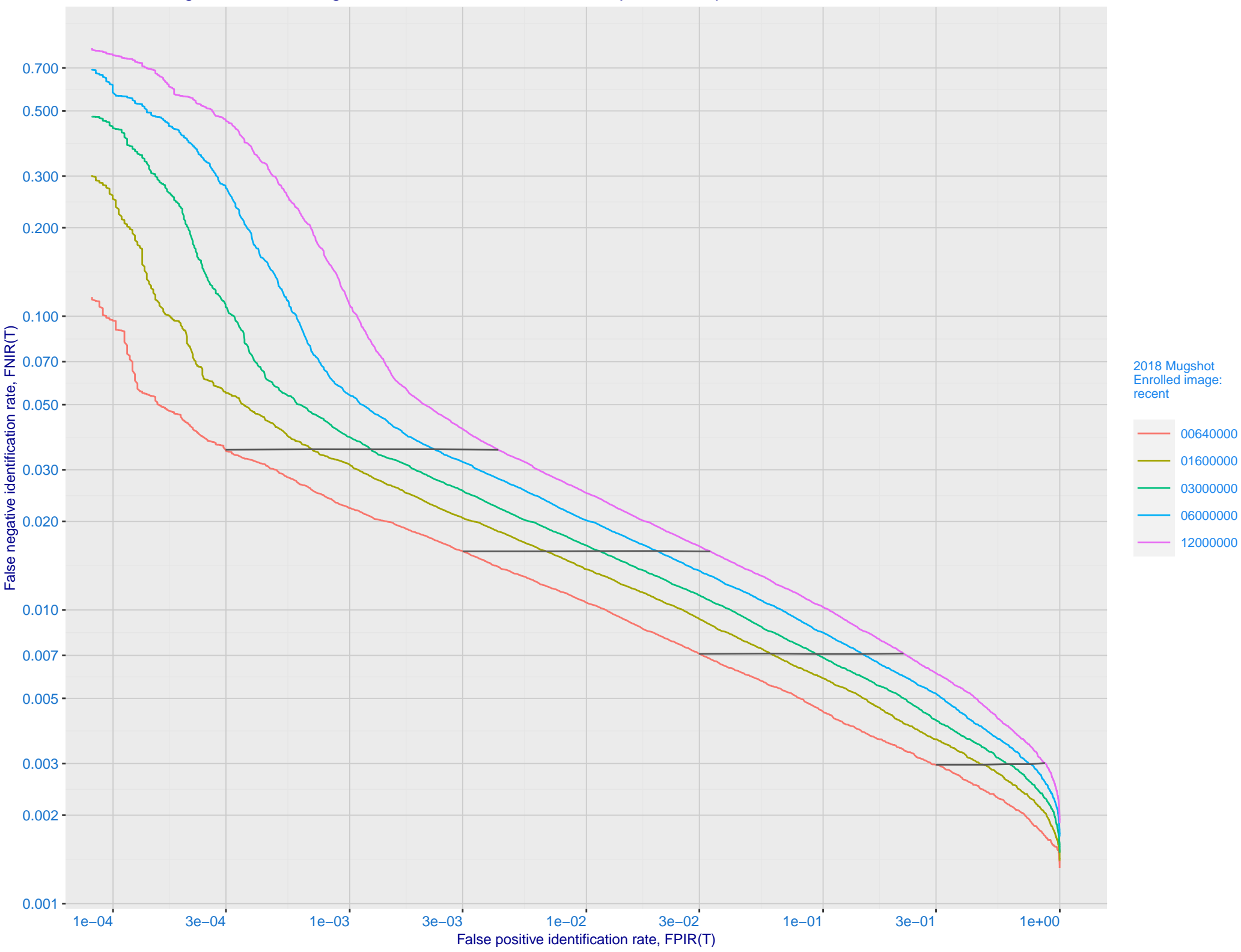


# I: FNIR and FPIR dependence on threshold

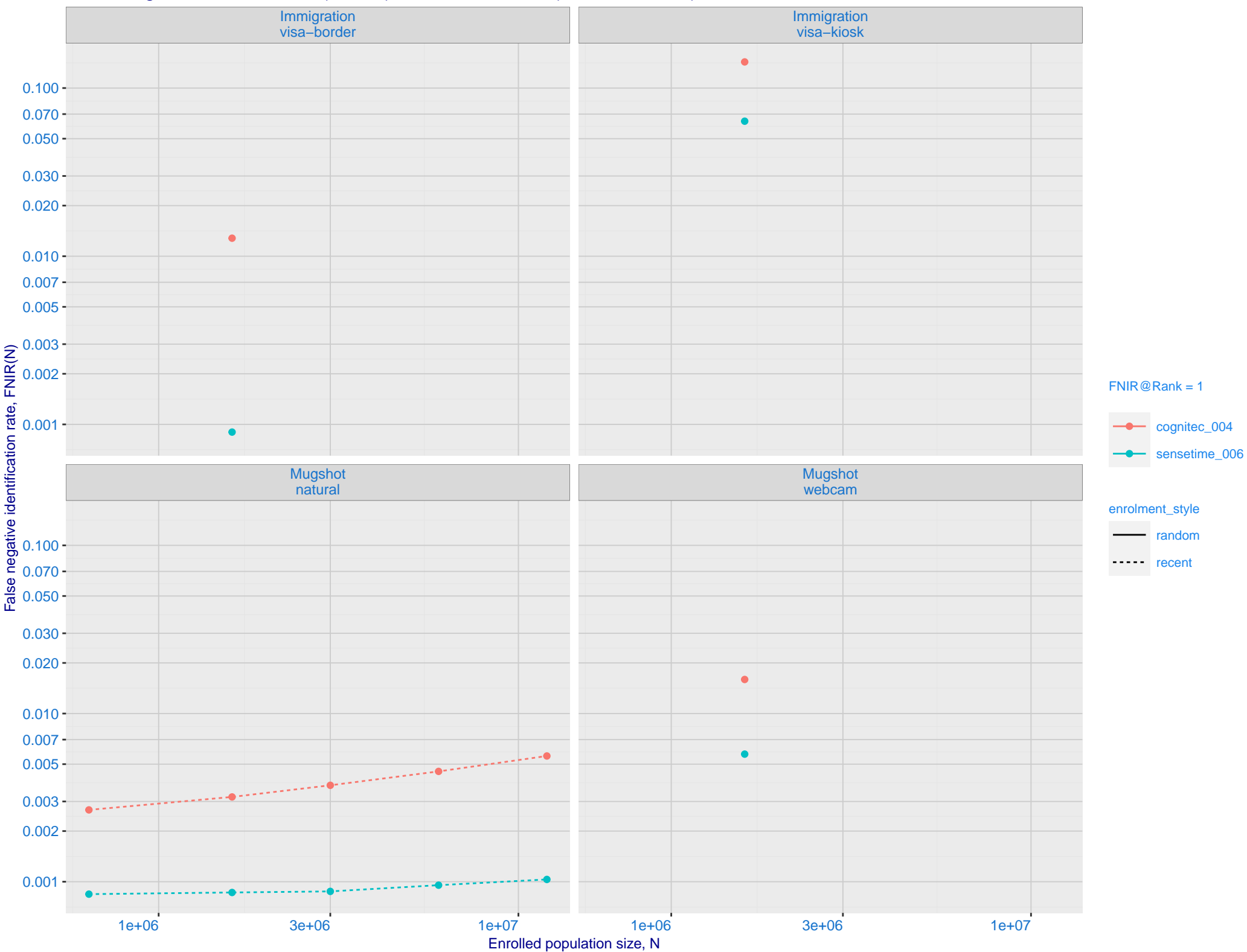
Dataset is border-border with time-lapse [10,15] YRS with N = 1600000. Probes are 10-15 years later than enrollment image



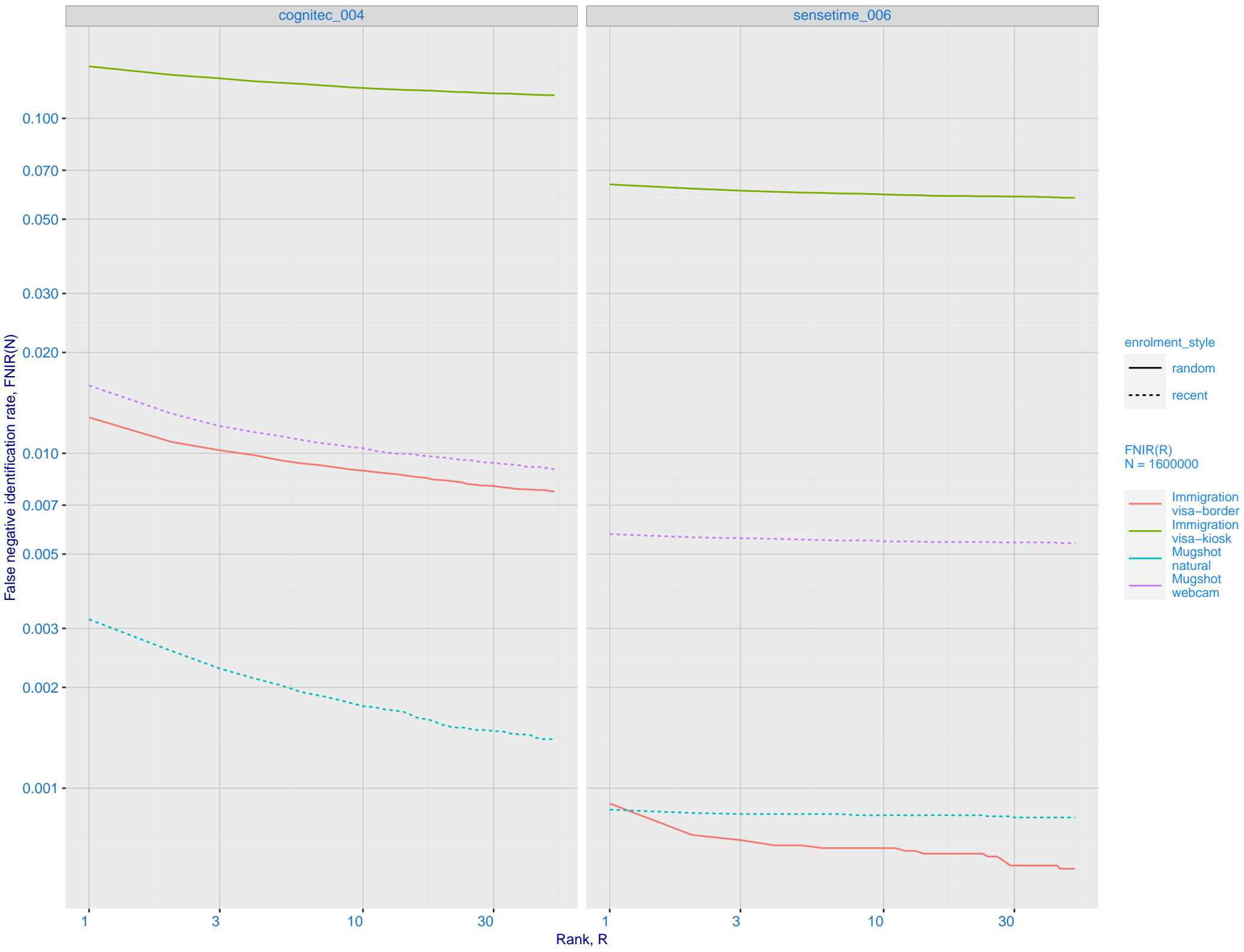
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.



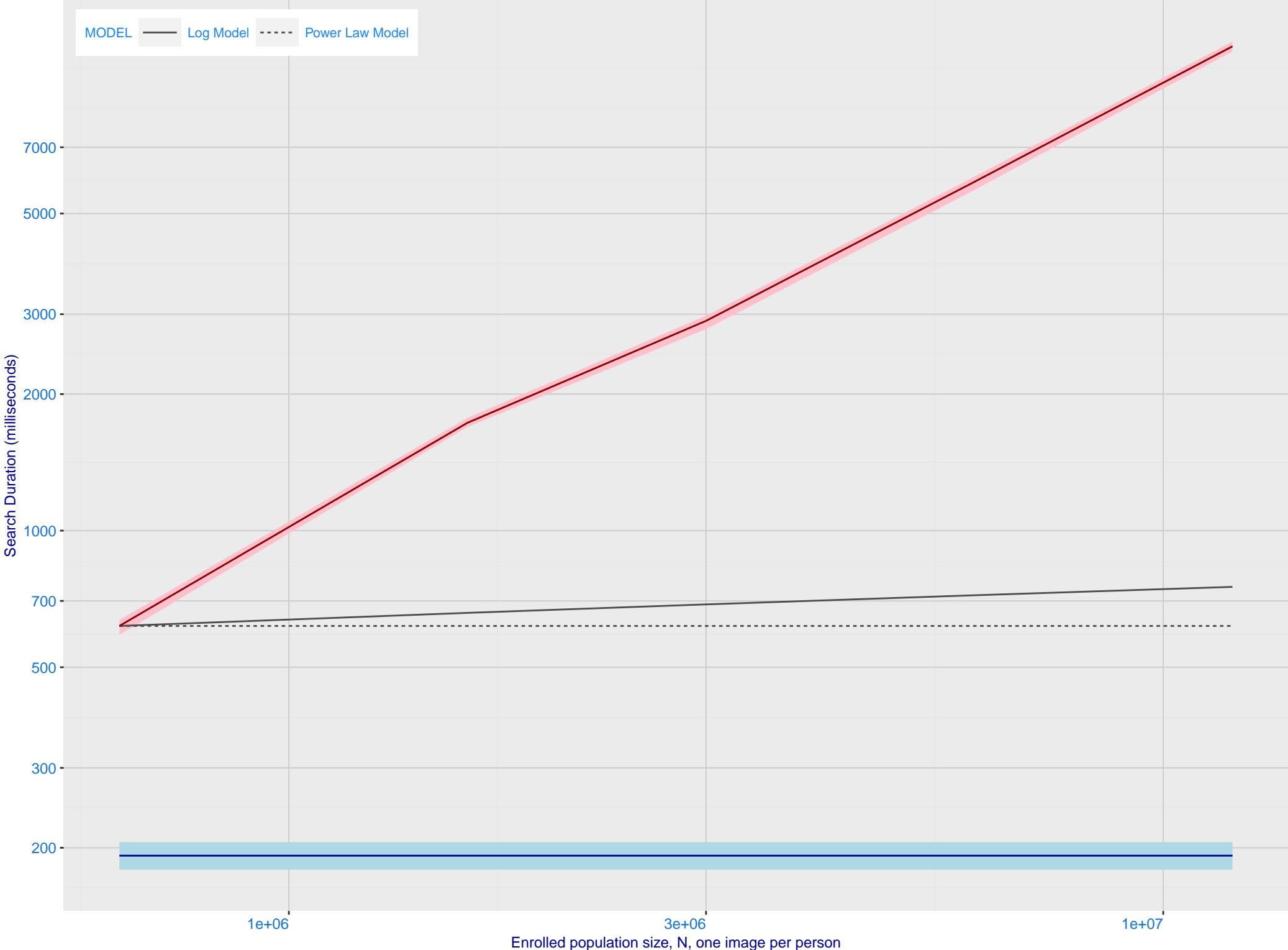
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_006)



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

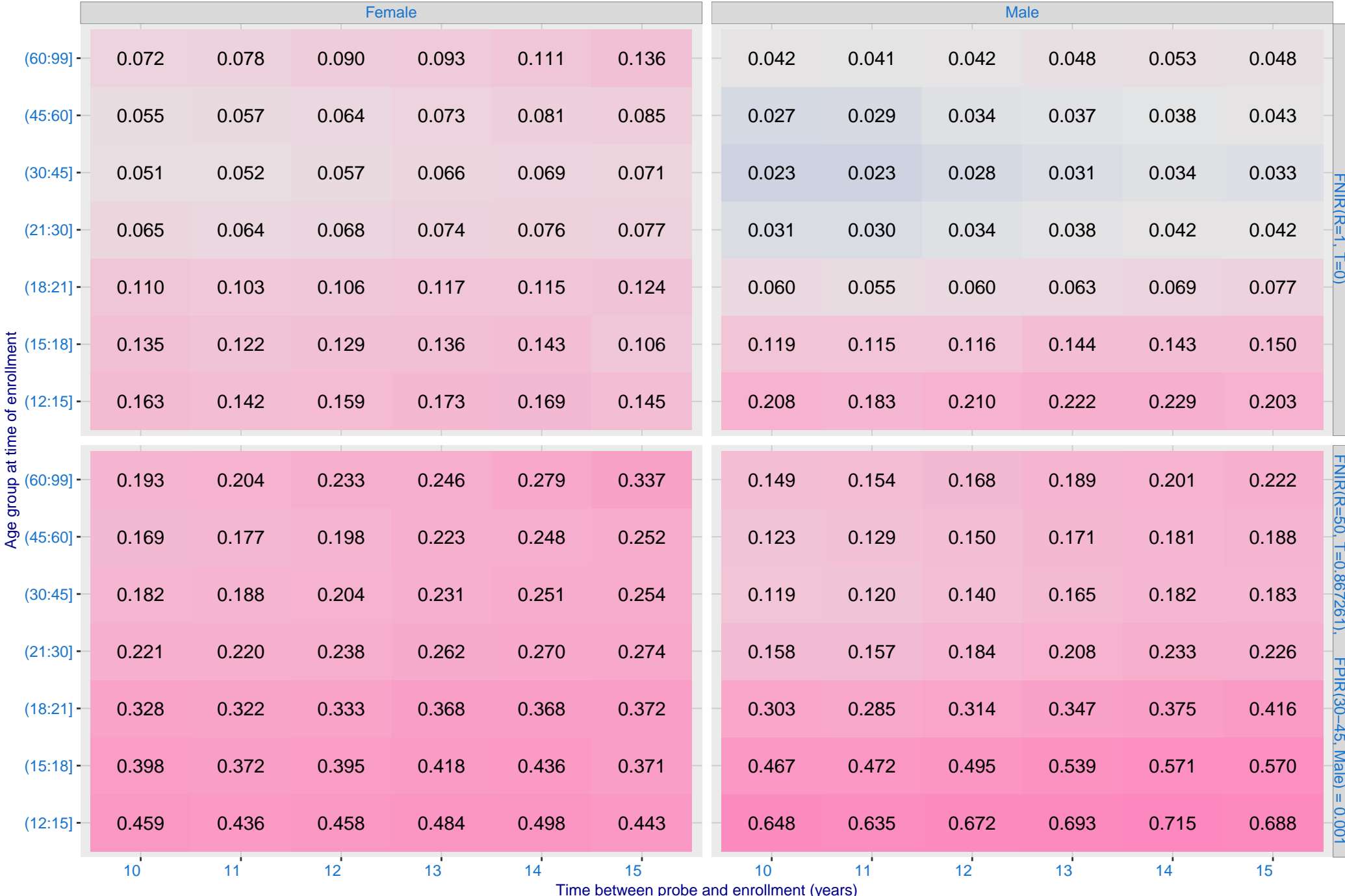


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power-law models are fit to the first two (N,T) observations



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.

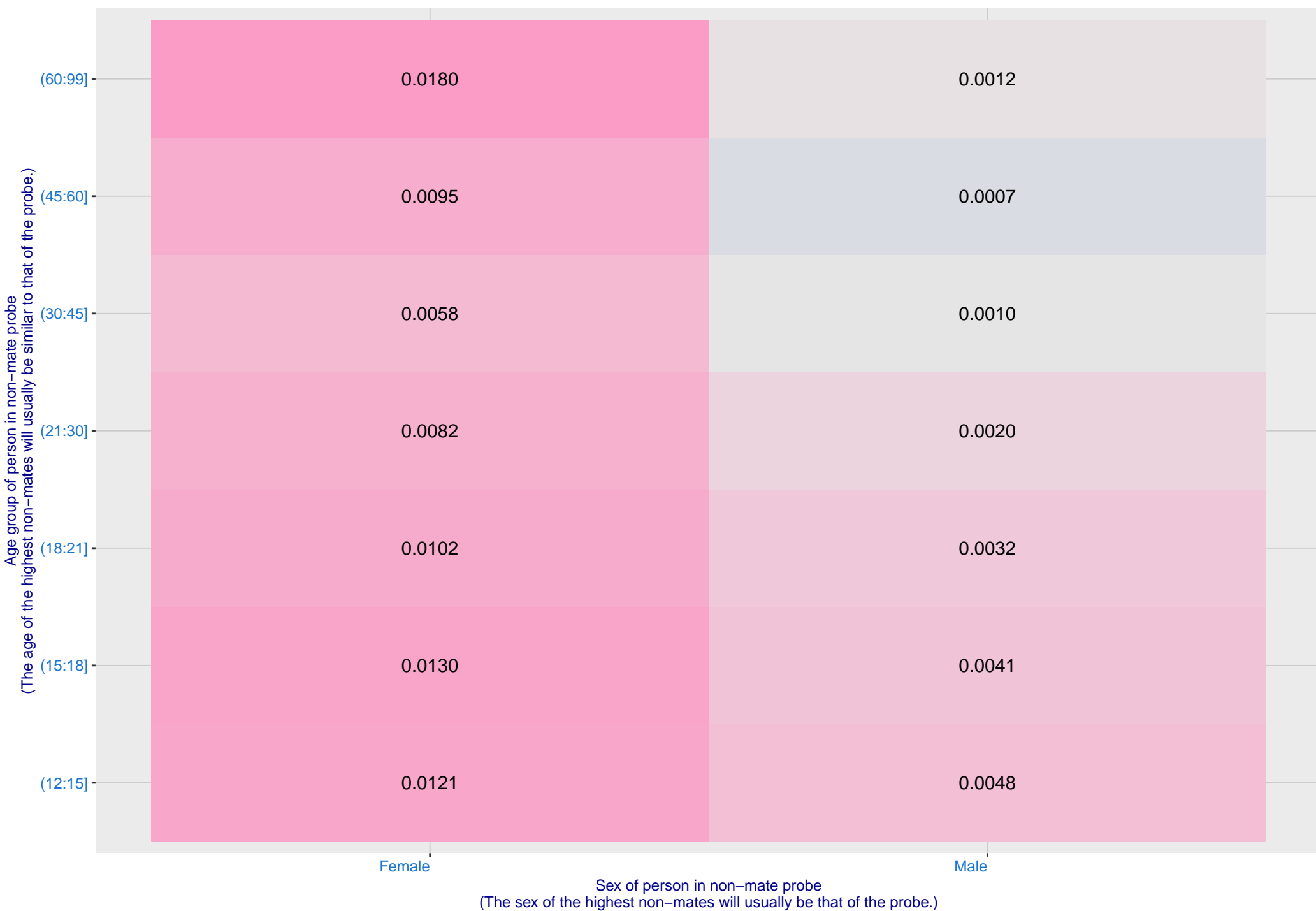
Algorithm: cognitec\_004, Dataset: Border-Crossing Ageing N = 1600000  
Text encodes FNIR, Color encodes log(FNIR)



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.

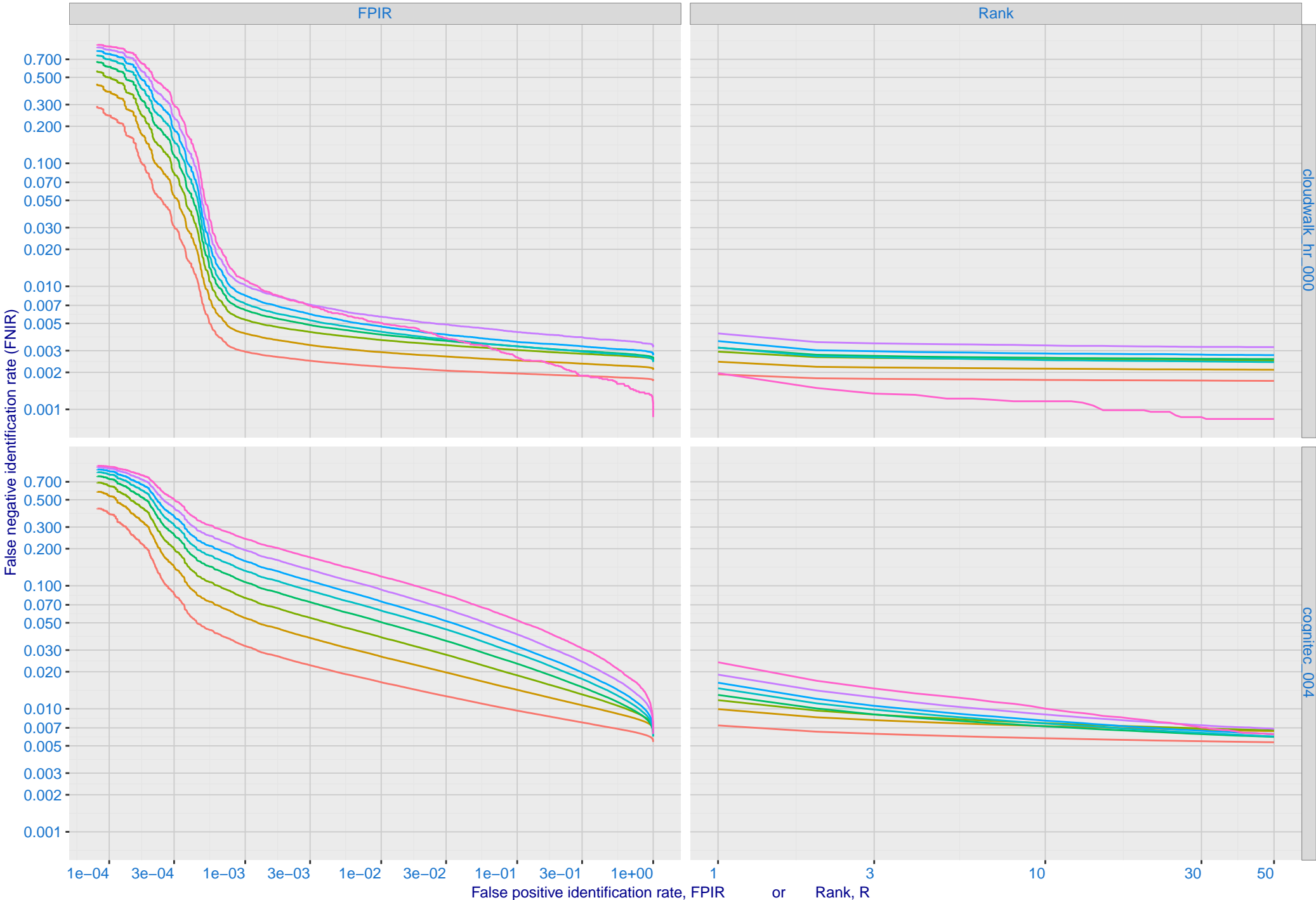
Algorithm: cognitec\_004, Dataset: Border-Crossing Ageing  
Threshold: 0.867261 set to achive FPIR(30–45, Male) = 0.001

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

