

A: Datasheet

Algorithm: serendipity\_000

Developer: Serendipity Ltd

Submission Date: 2023\_06\_20

Template size: 2048 bytes

Template time (2.5 percentile): 892 msec

Template time (median): 895 msec

Template time (97.5 percentile): 962 msec

Investigation:

Frontal mugshot ranking 87 (out of 428) -- FNIR(1600000, 0, 1) = 0.0015 vs. lowest 0.0008 from intema\_001

Mugshot webcam ranking 164 (out of 390) -- FNIR(1600000, 0, 1) = 0.0146 vs. lowest 0.0054 from sensetime\_009

Mugshot profile ranking 147 (out of 359) -- FNIR(1600000, 0, 1) = 0.2992 vs. lowest 0.0517 from sensetime\_009

Immigration visa-border ranking 139 (out of 317) -- FNIR(1600000, 0, 1) = 0.0043 vs. lowest 0.0006 from cloudwalk\_mt\_002

Immigration visa-kiosk ranking 74 (out of 261) -- FNIR(1600000, 0, 1) = 0.0677 vs. lowest 0.0387 from cloudwalk\_mt\_002

Identification:

Frontal mugshot ranking 111 (out of 428) -- FNIR(1600000, T, L+1) = 0.0125, FPIR=0.001000 vs. lowest 0.0011 from idemia\_010

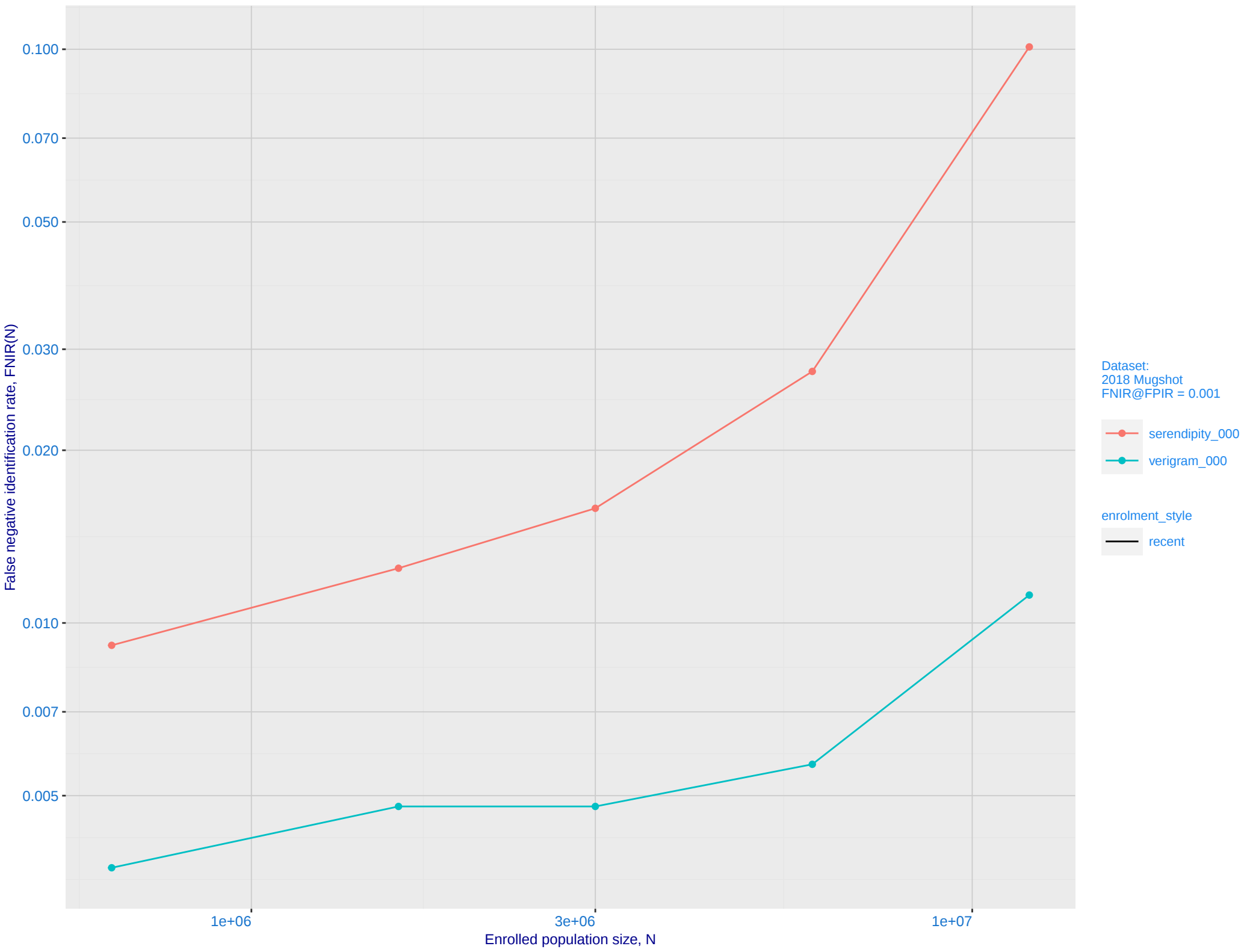
Mugshot webcam ranking 262 (out of 388) -- FNIR(1600000, T, L+1) = 0.2107, FPIR=0.001000 vs. lowest 0.0072 from sensetime\_009

Mugshot profile ranking 85 (out of 358) -- FNIR(1600000, T, L+1) = 0.7476, FPIR=0.001000 vs. lowest 0.0634 from cloudwalk\_mt\_002

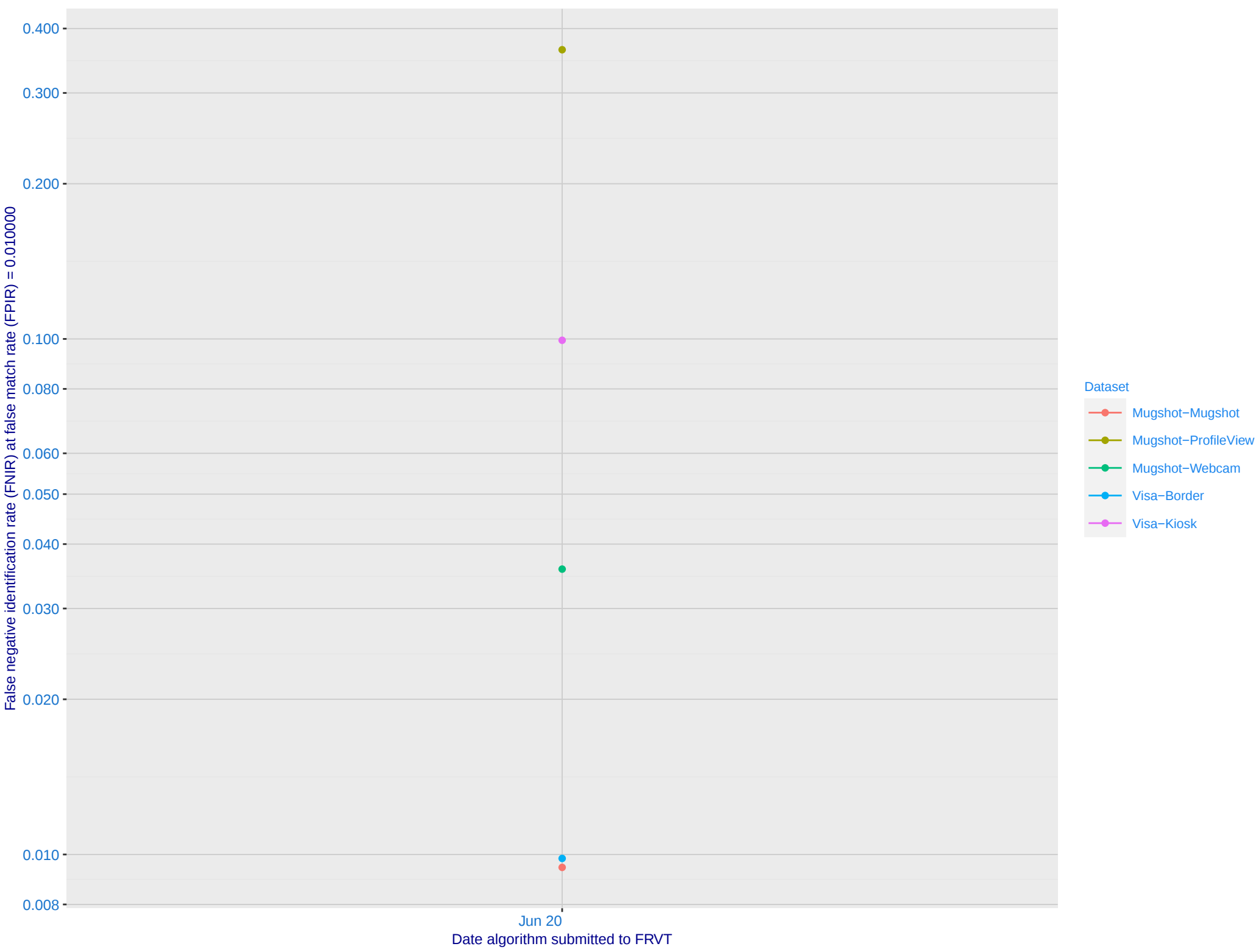
Immigration visa-border ranking 99 (out of 315) -- FNIR(1600000, T, L+1) = 0.0181, FPIR=0.001000 vs. lowest 0.0010 from cloudwalk\_mt\_002

Immigration visa-kiosk ranking 65 (out of 261) -- FNIR(1600000, T, L+1) = 0.1305, FPIR=0.001000 vs. lowest 0.0517 from cloudwalk\_mt\_002

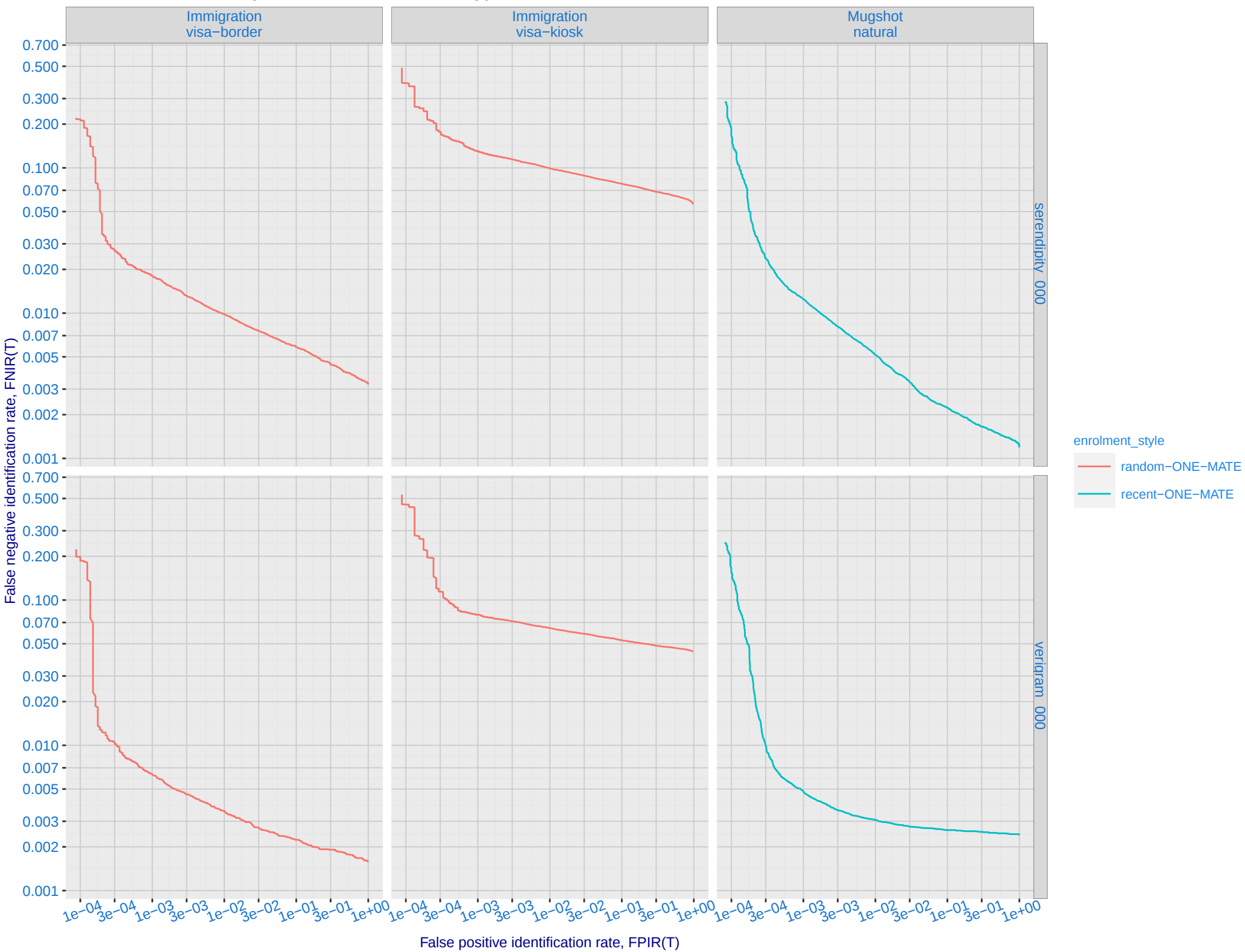
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (verigram\_000)



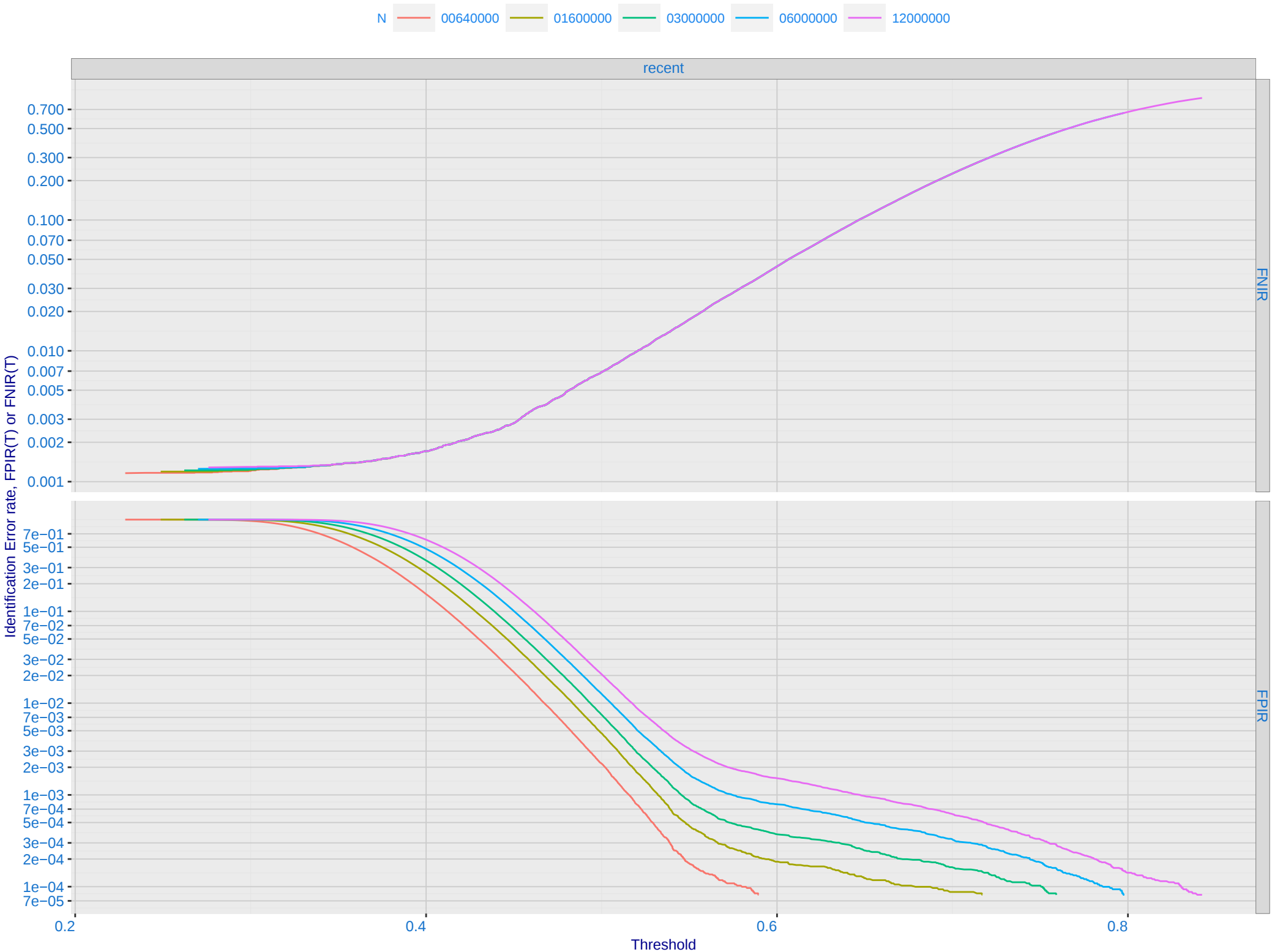
C: Evolution of accuracy for SERENDIPITY algorithms on three datasets 2018 – present



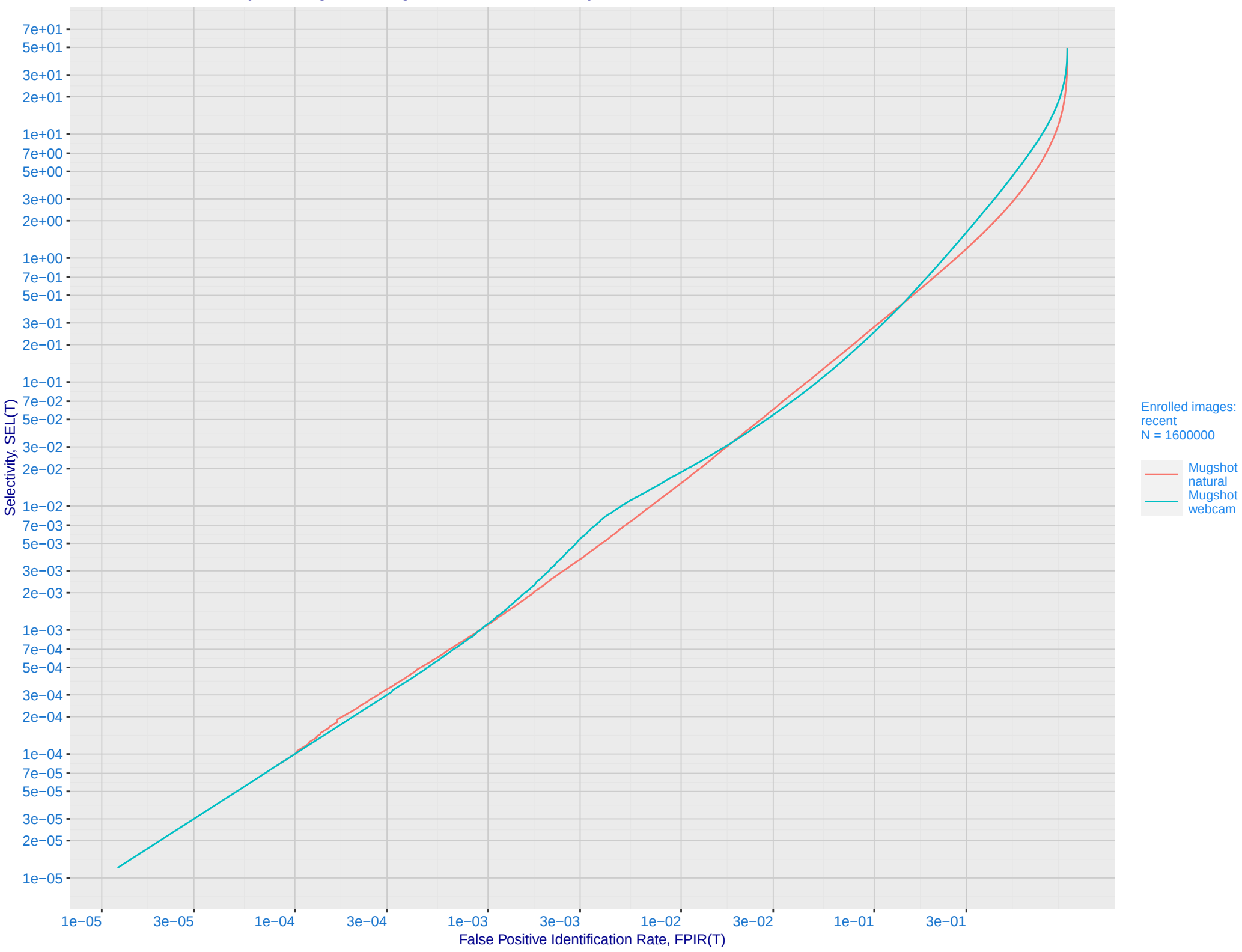
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals



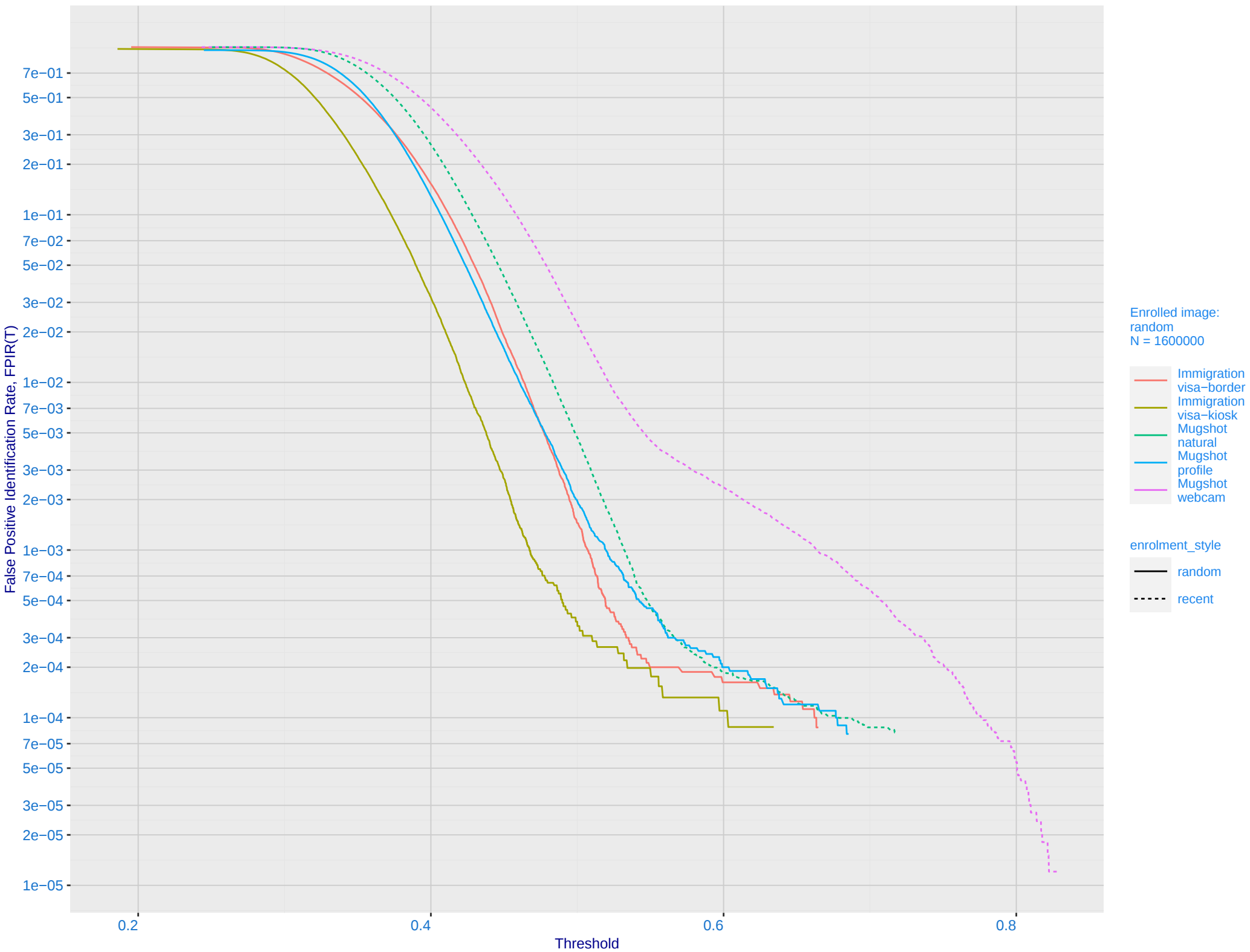
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



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

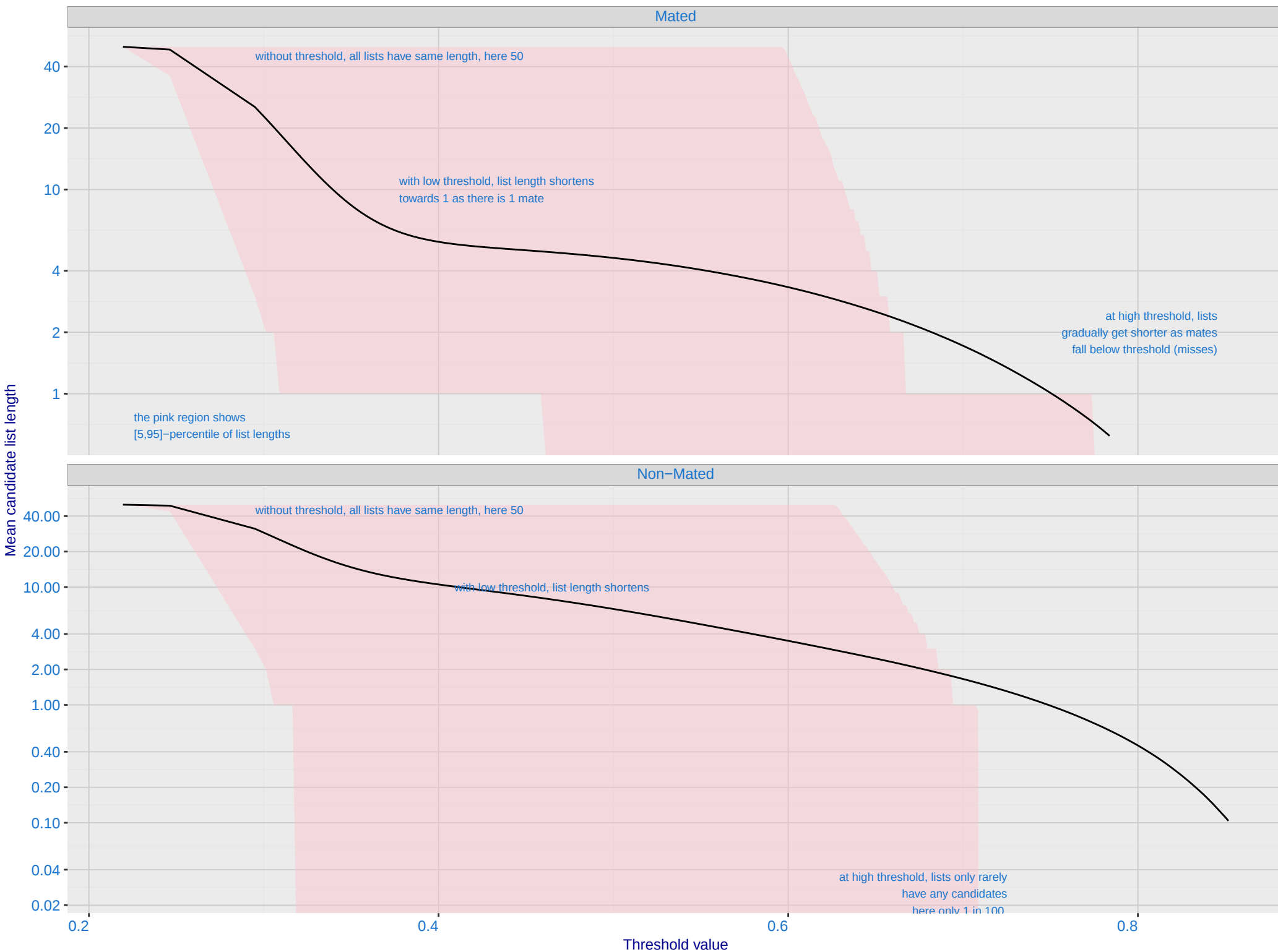


G: FPIR dependence on T by probe type for N = 1600000 subjects



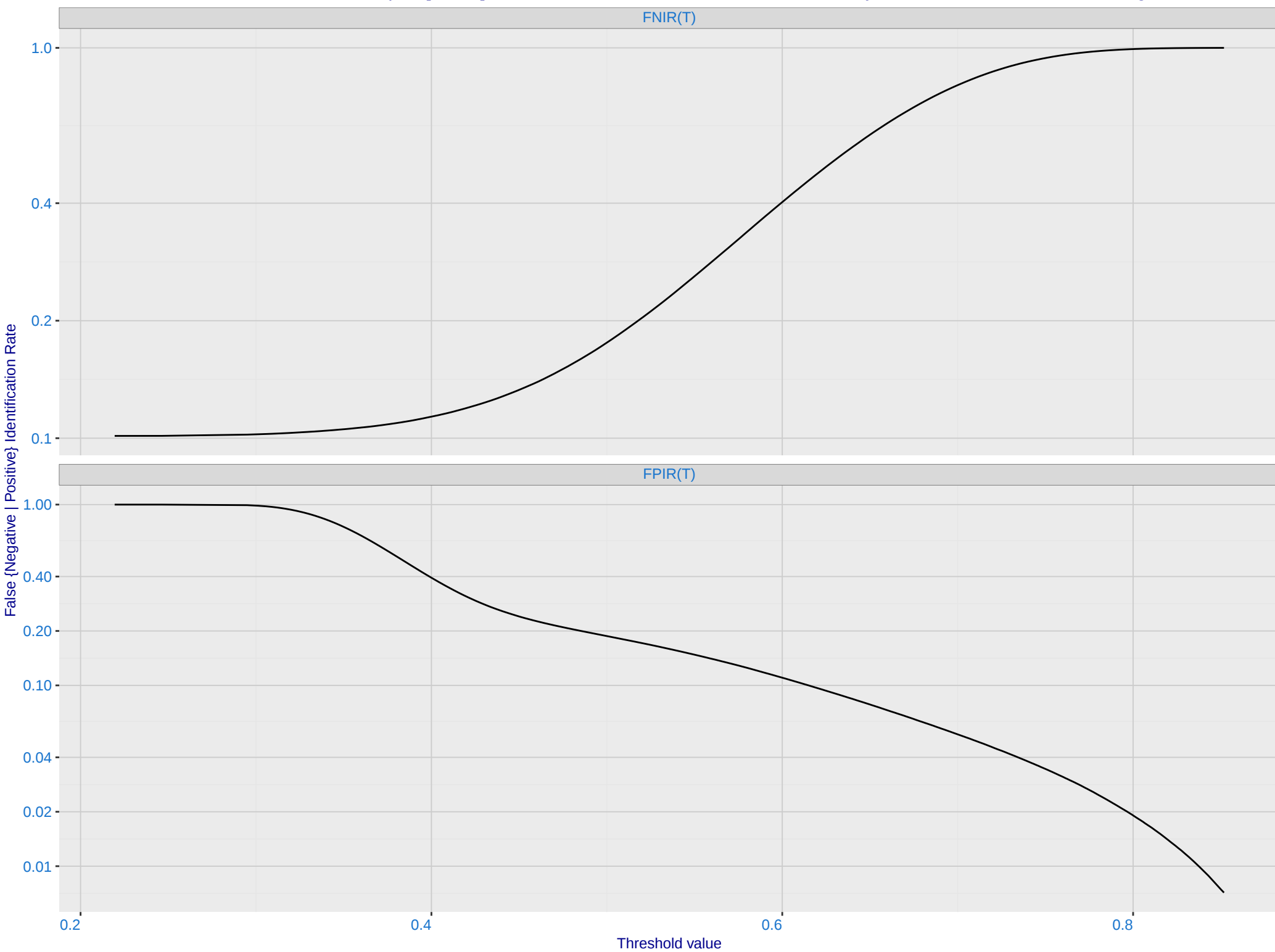
# H: Reduced length candidate lists for human review

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

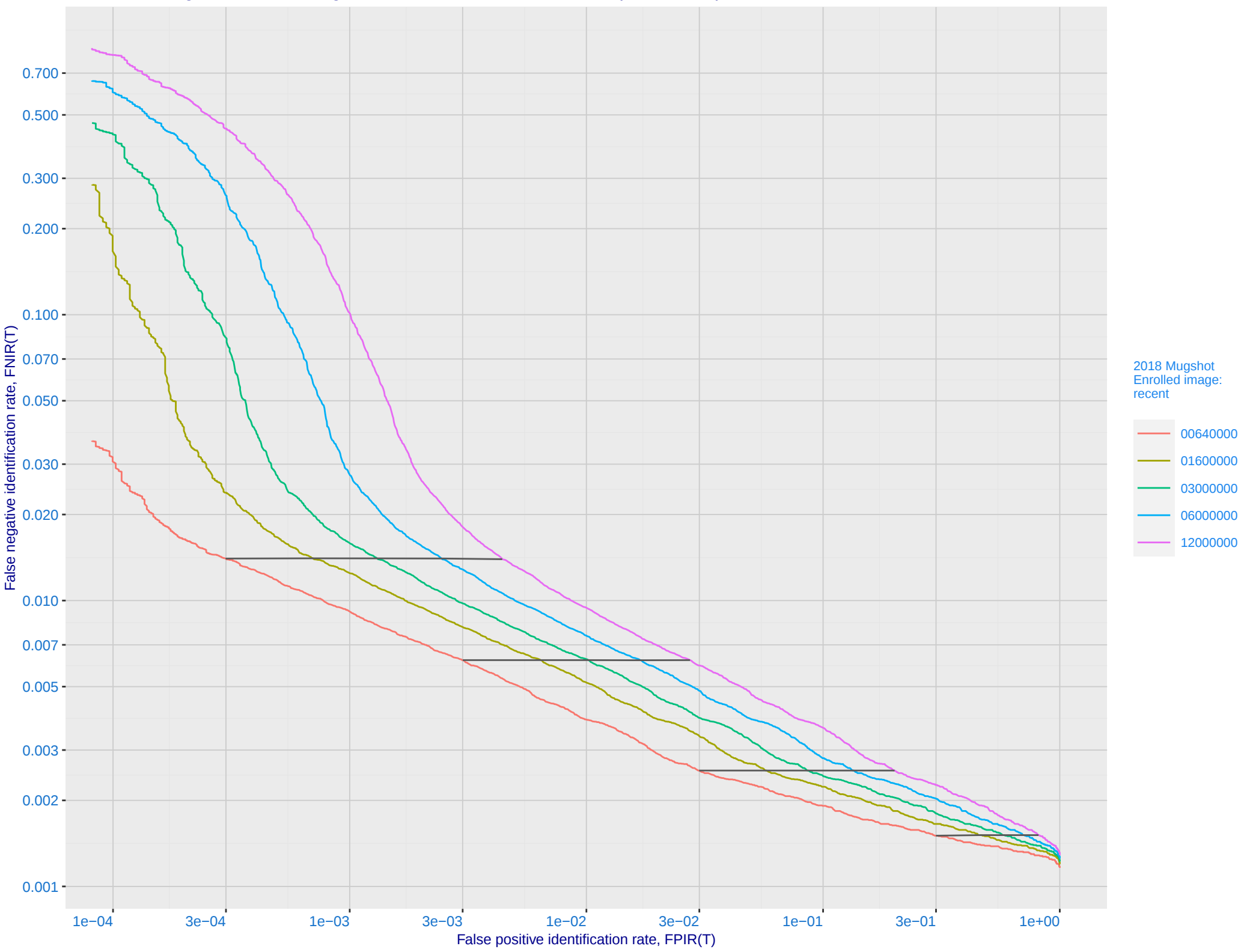


# I: FNIR and FPIR dependence on threshold

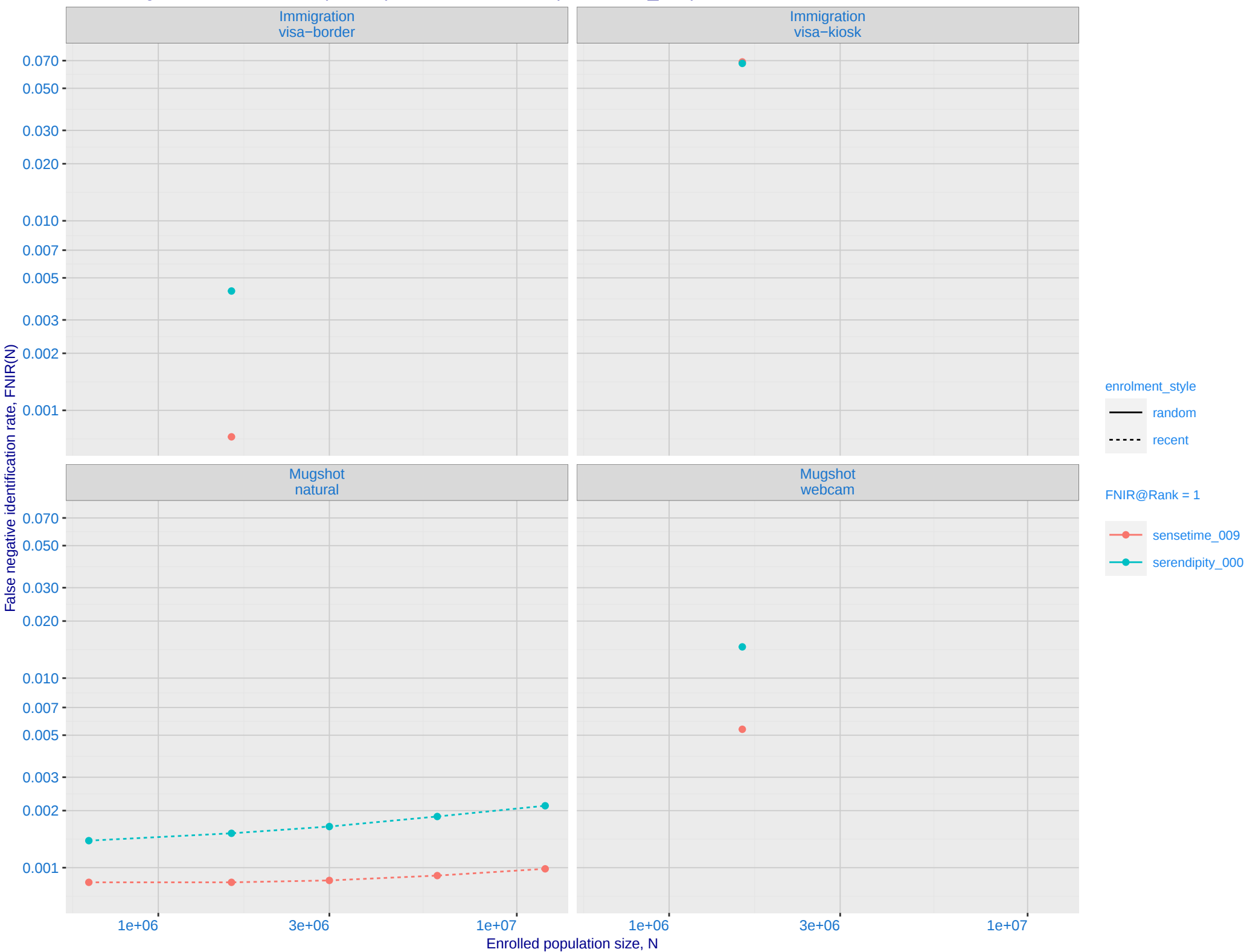
Dataset is border-border with time-lapse [10,15] YRS with N = 1600000. Probes are 10-15 years later than enrollment image



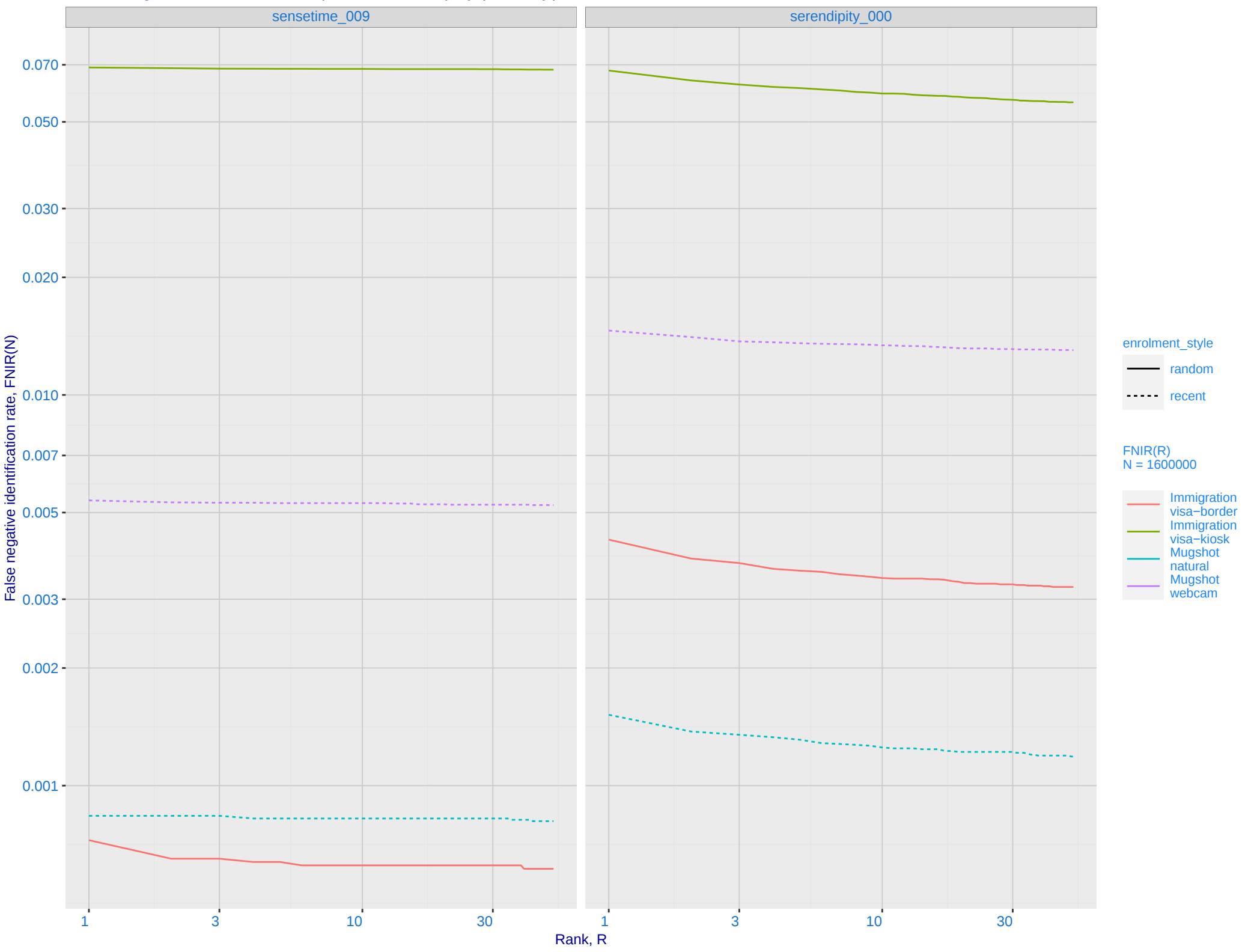
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.



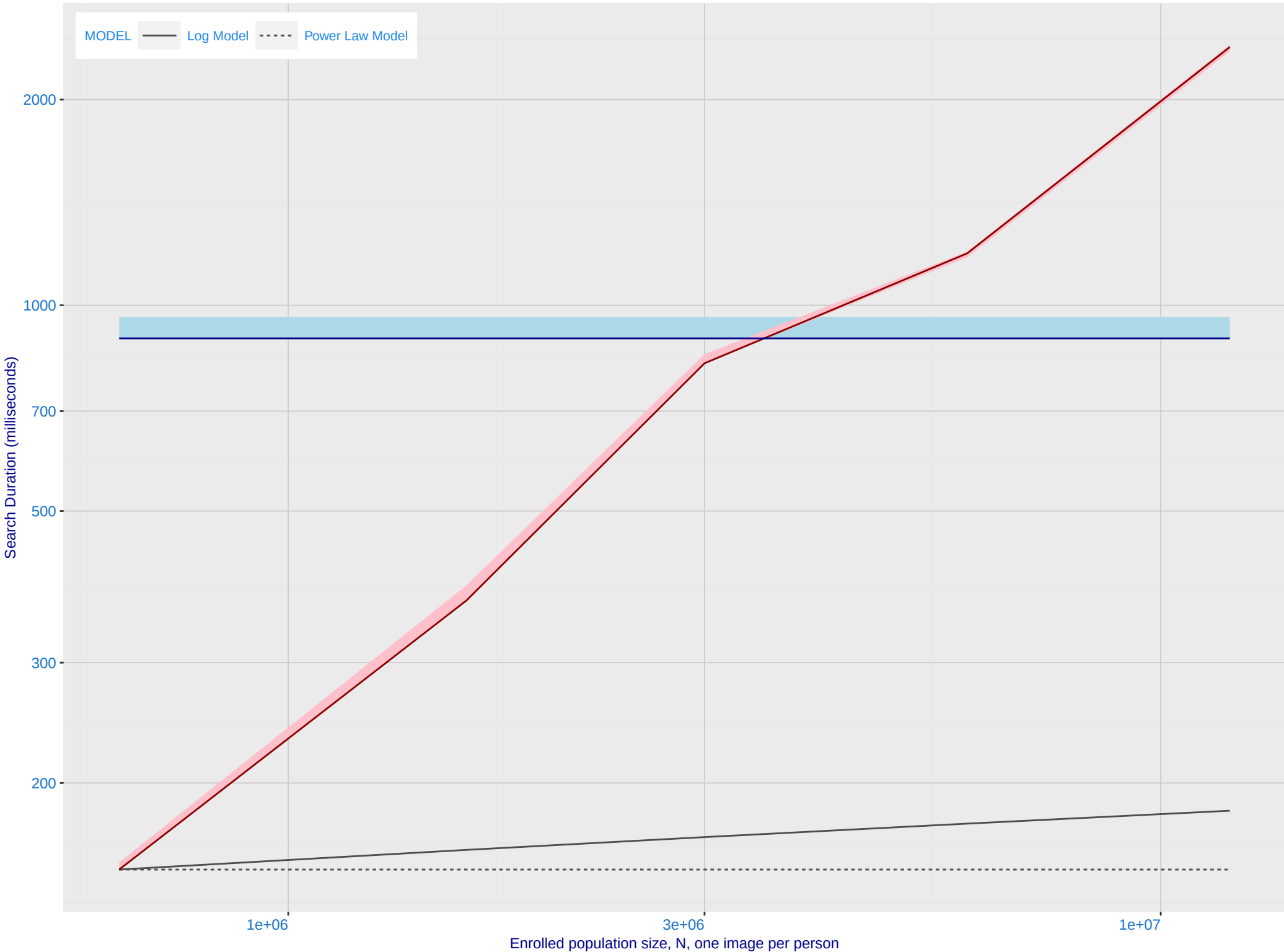
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_009)



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

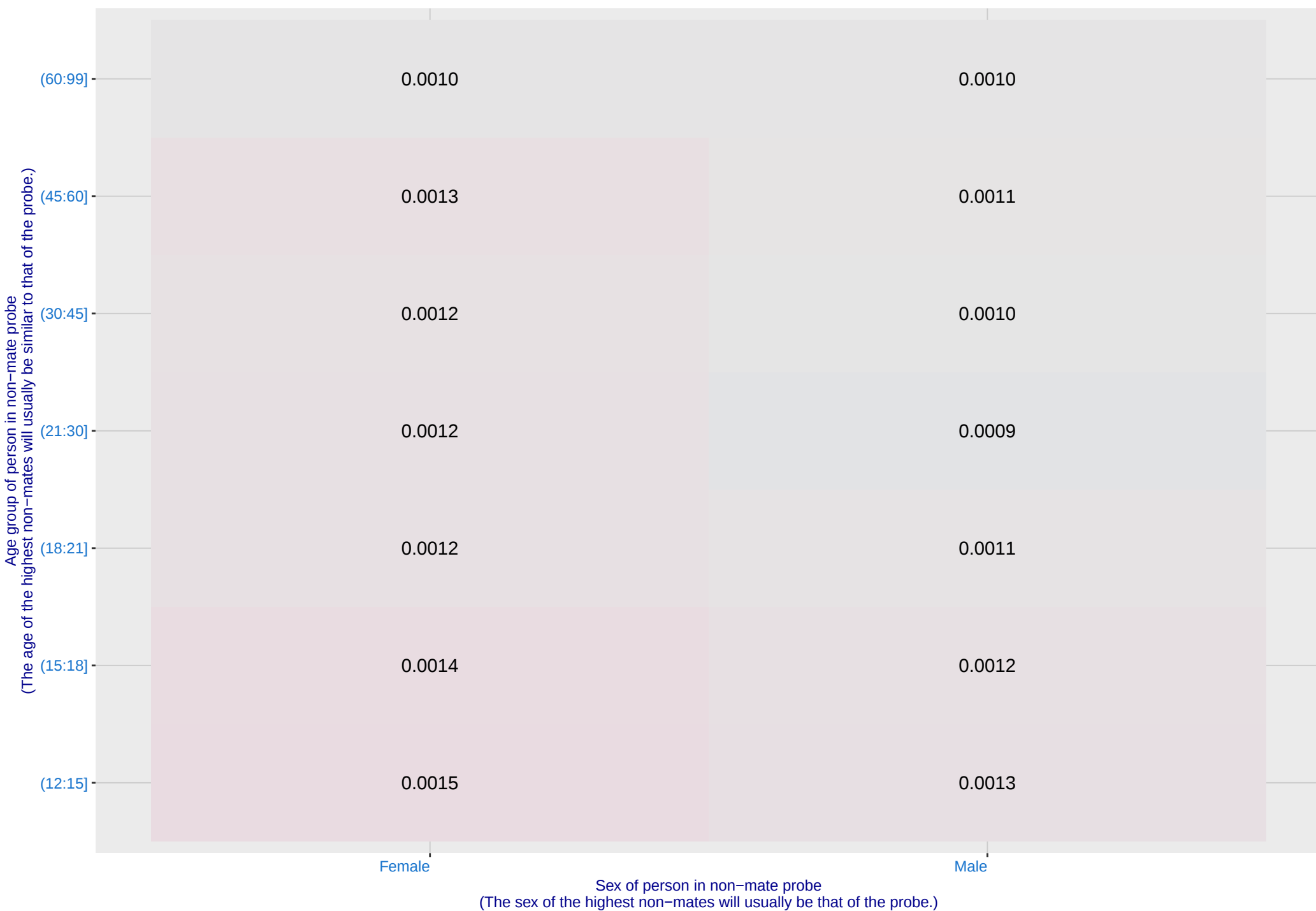




P: FPIR(N = 1.6 million) by sex and age. It is typical for false positive identification rates to be higher in women except in their teens.

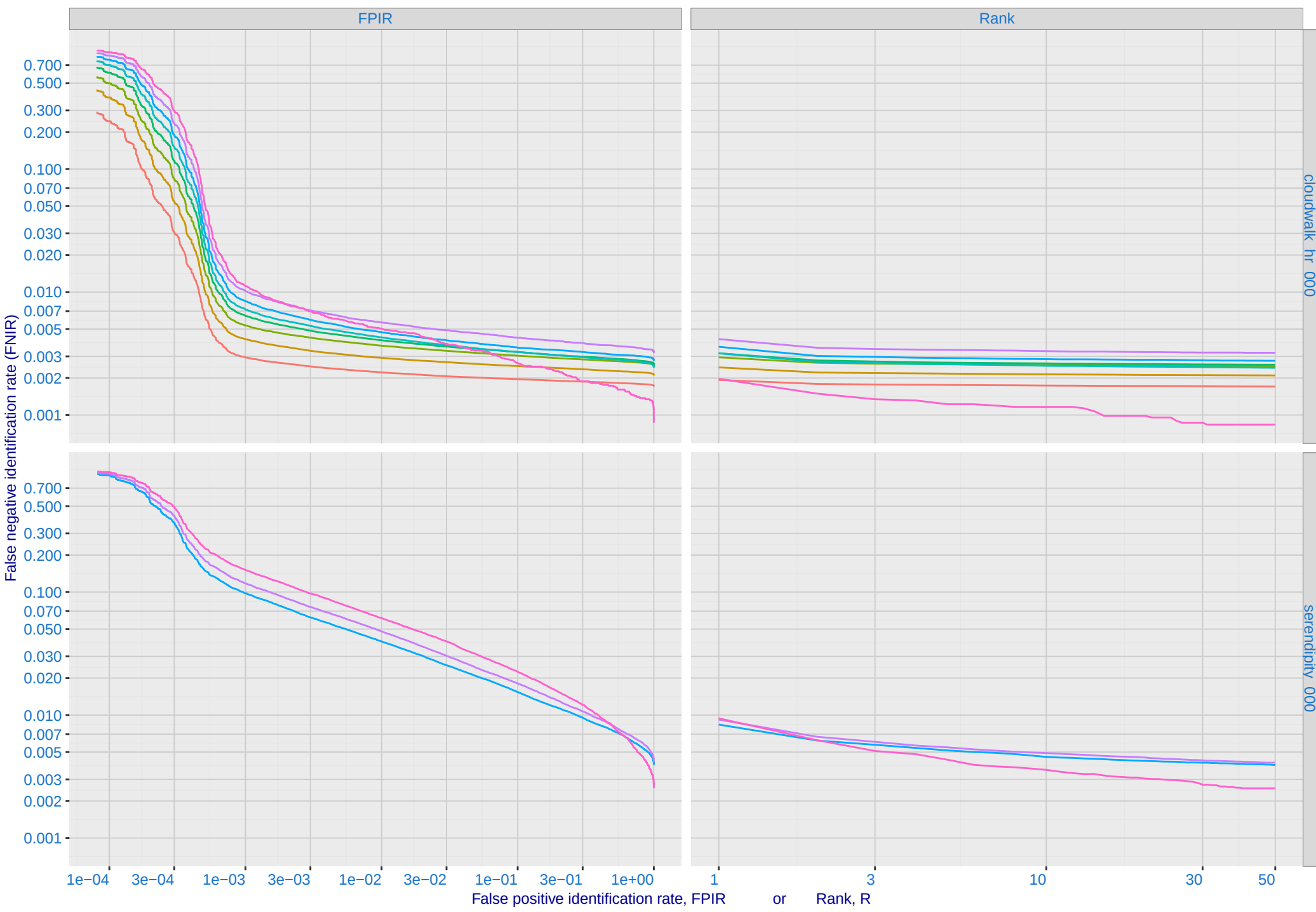
Algorithm: serendipity\_000, Dataset: Border-Crossing Ageing  
Threshold: 0.897611 set to achive FPIR(30-45, Male) = 0.001

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

