

A: Datasheet

Algorithm: vts_000

Developer: Viettel Group

Submission Date: 2021_03_12

Template size: 2048 bytes

Template time (2.5 percentile): 492 msec

Template time (median): 492 msec

Template time (97.5 percentile): 497 msec

Investigation:

Frontal mugshot ranking 322 (out of 329) -- FNIR(1600000, 0, 1) = 0.5937 vs. lowest 0.0009 from sensetime_006

Mugshot webcam ranking 282 (out of 291) -- FNIR(1600000, 0, 1) = 0.6075 vs. lowest 0.0057 from sensetime_006

Mugshot profile ranking 175 (out of 260) -- FNIR(1600000, 0, 1) = 0.9086 vs. lowest 0.0550 from sensetime_006

Immigration visa-border ranking 201 (out of 218) -- FNIR(1600000, 0, 1) = 0.6066 vs. lowest 0.0009 from sensetime_006

Immigration visa-kiosk ranking 200 (out of 215) -- FNIR(1600000, 0, 1) = 0.7394 vs. lowest 0.0487 from cubox_000

Identification:

Frontal mugshot ranking 290 (out of 329) -- FNIR(1600000, T, L+1) = 0.5984, FPIR=0.001000 vs. lowest 0.0017 from nec_005

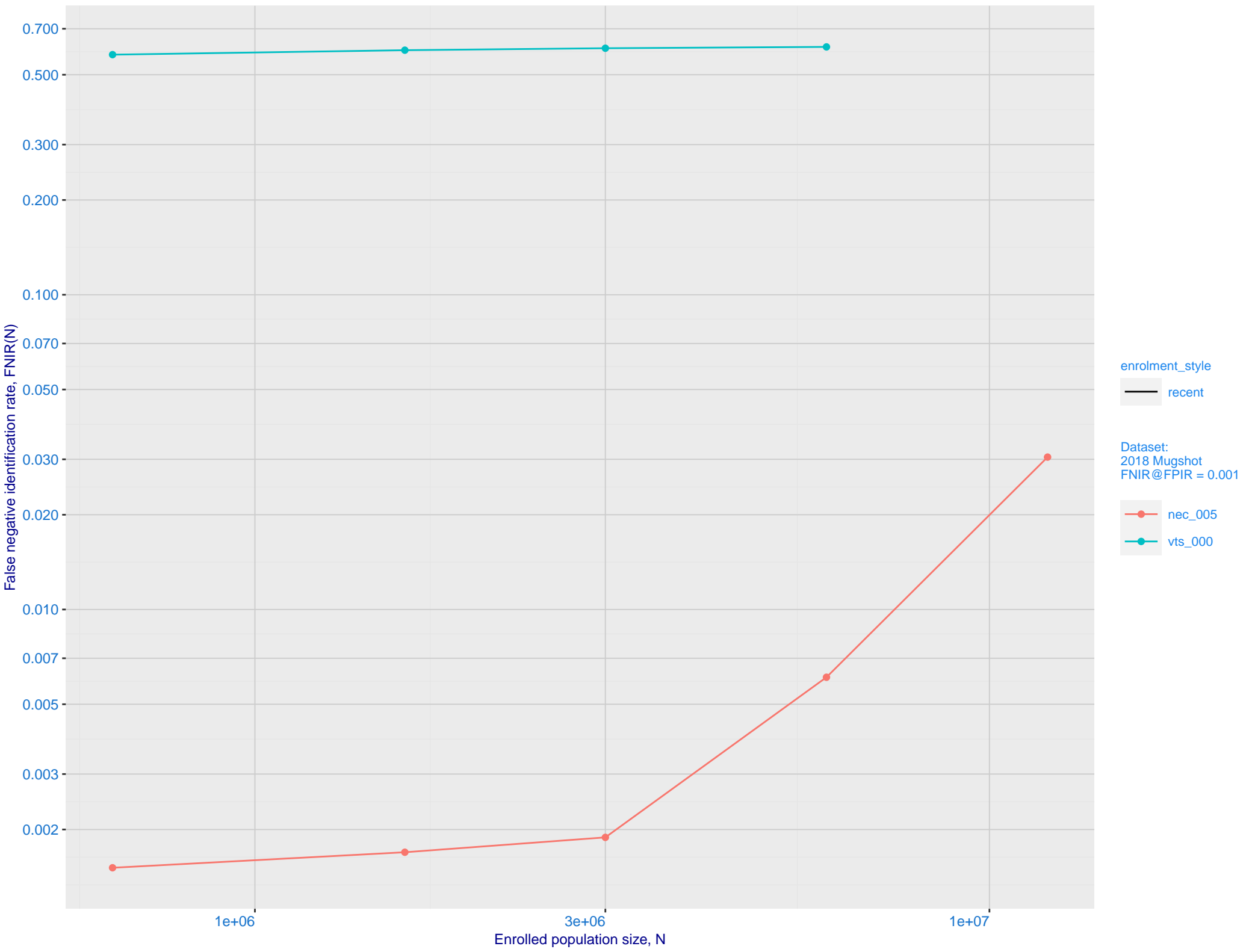
Mugshot webcam ranking 252 (out of 289) -- FNIR(1600000, T, L+1) = 0.6193, FPIR=0.001000 vs. lowest 0.0120 from nec_005

Mugshot profile ranking 181 (out of 259) -- FNIR(1600000, T, L+1) = 0.9993, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

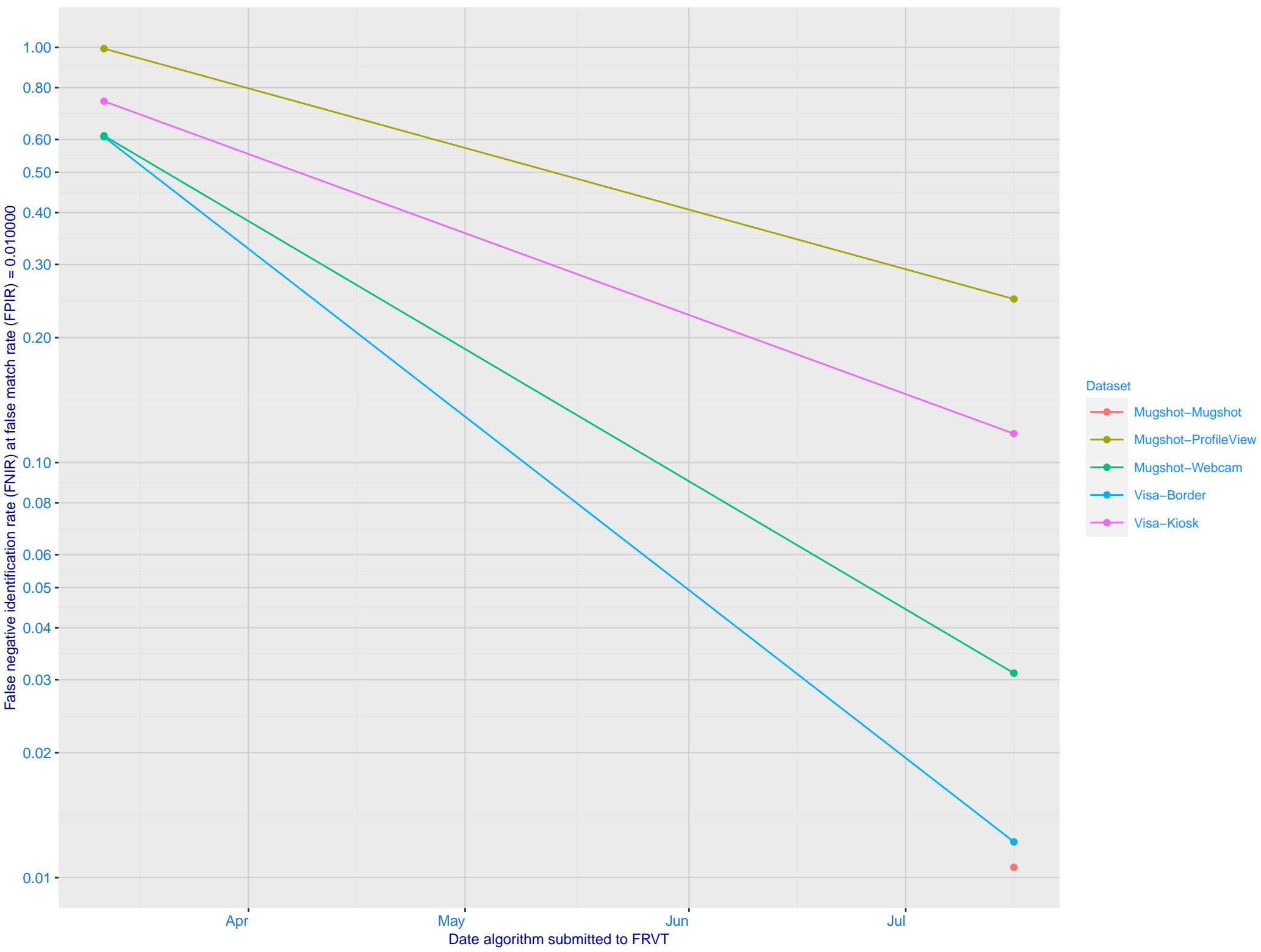
Immigration visa-border ranking 178 (out of 217) -- FNIR(1600000, T, L+1) = 0.6133, FPIR=0.001000 vs. lowest 0.0032 from paravision_009

Immigration visa-kiosk ranking 134 (out of 212) -- FNIR(1600000, T, L+1) = 0.7614, FPIR=0.001000 vs. lowest 0.0728 from paravision_009

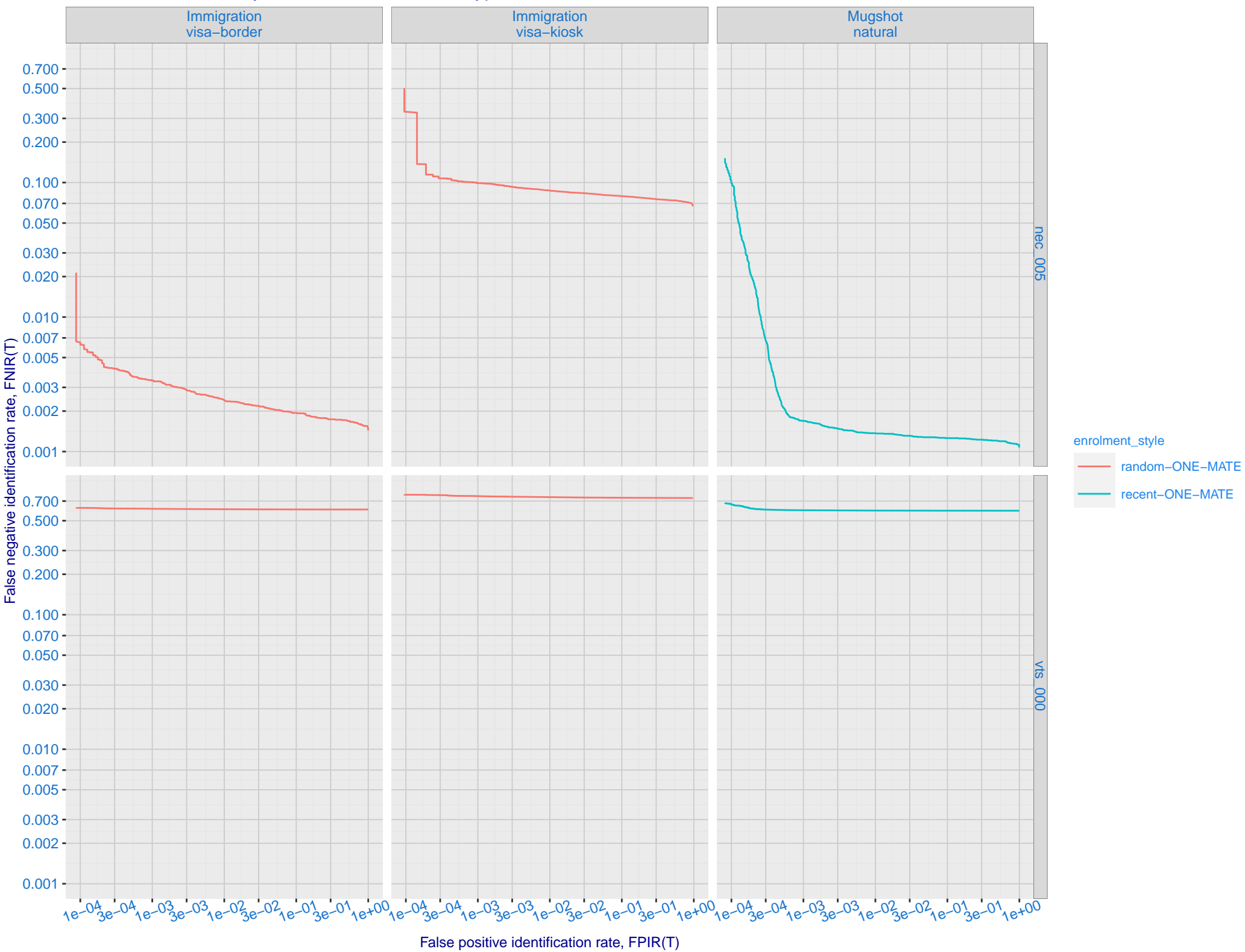
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (nec_005)



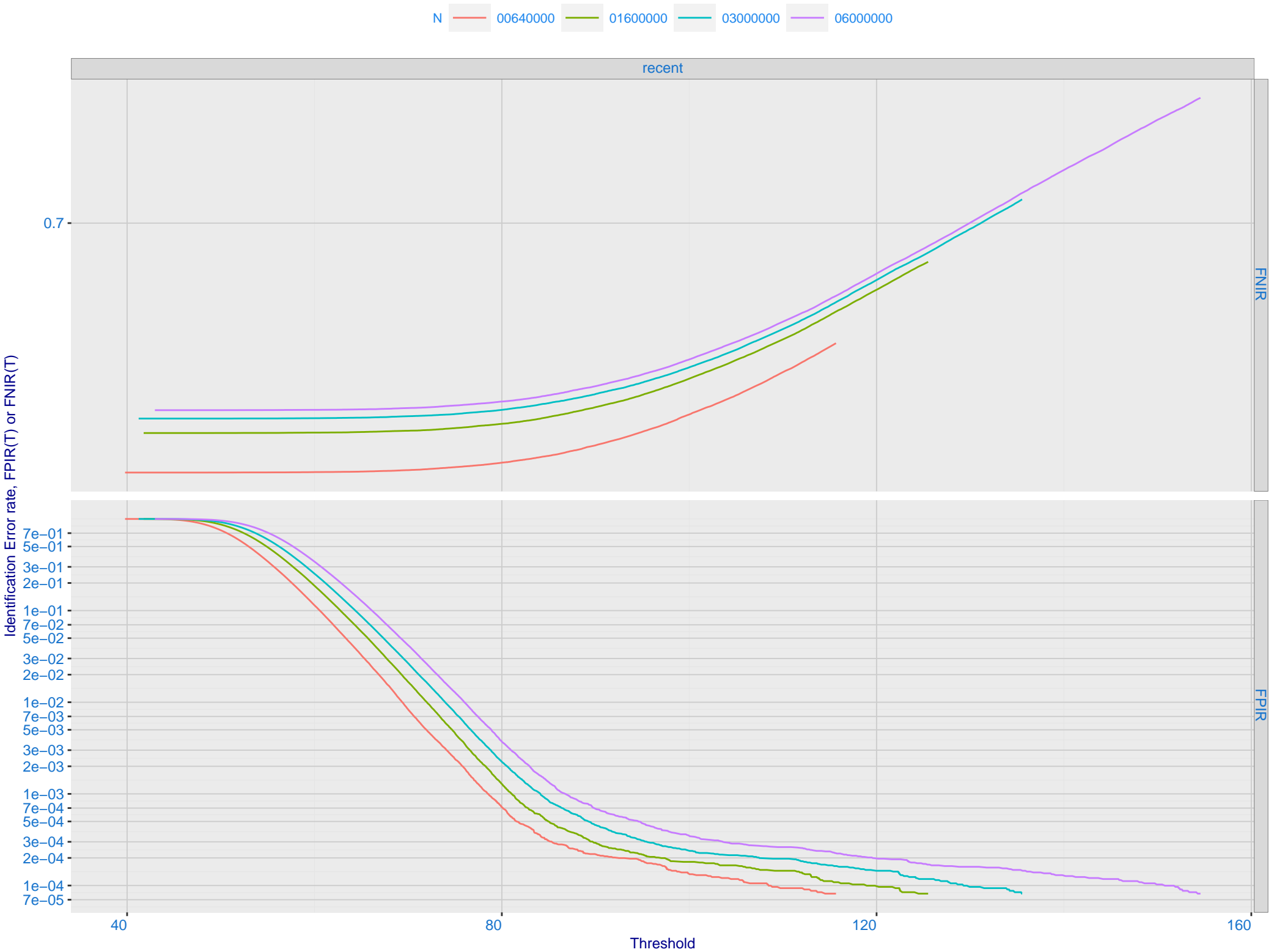
C: Evolution of accuracy for VTS algorithms on three datasets 2018 – present



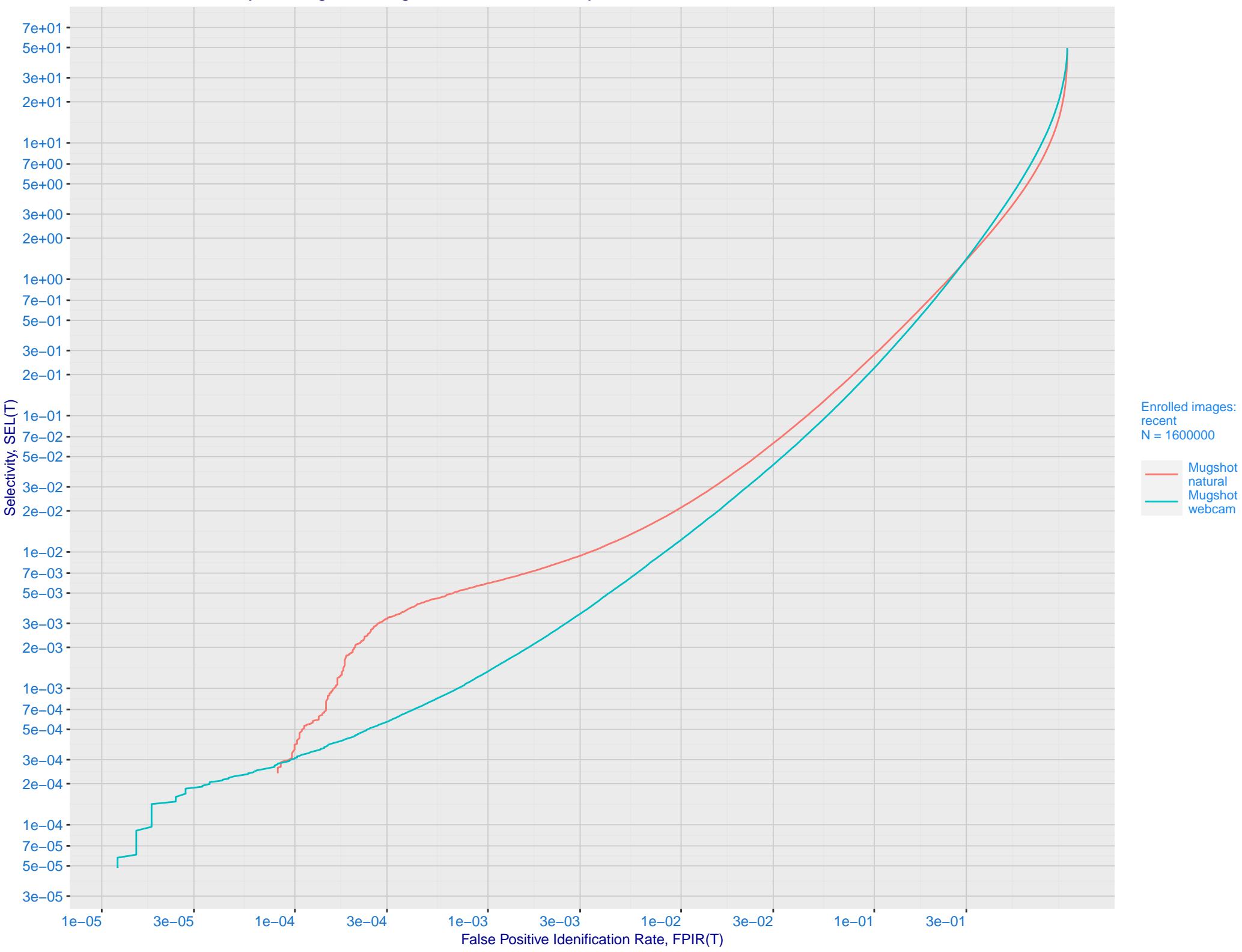
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals



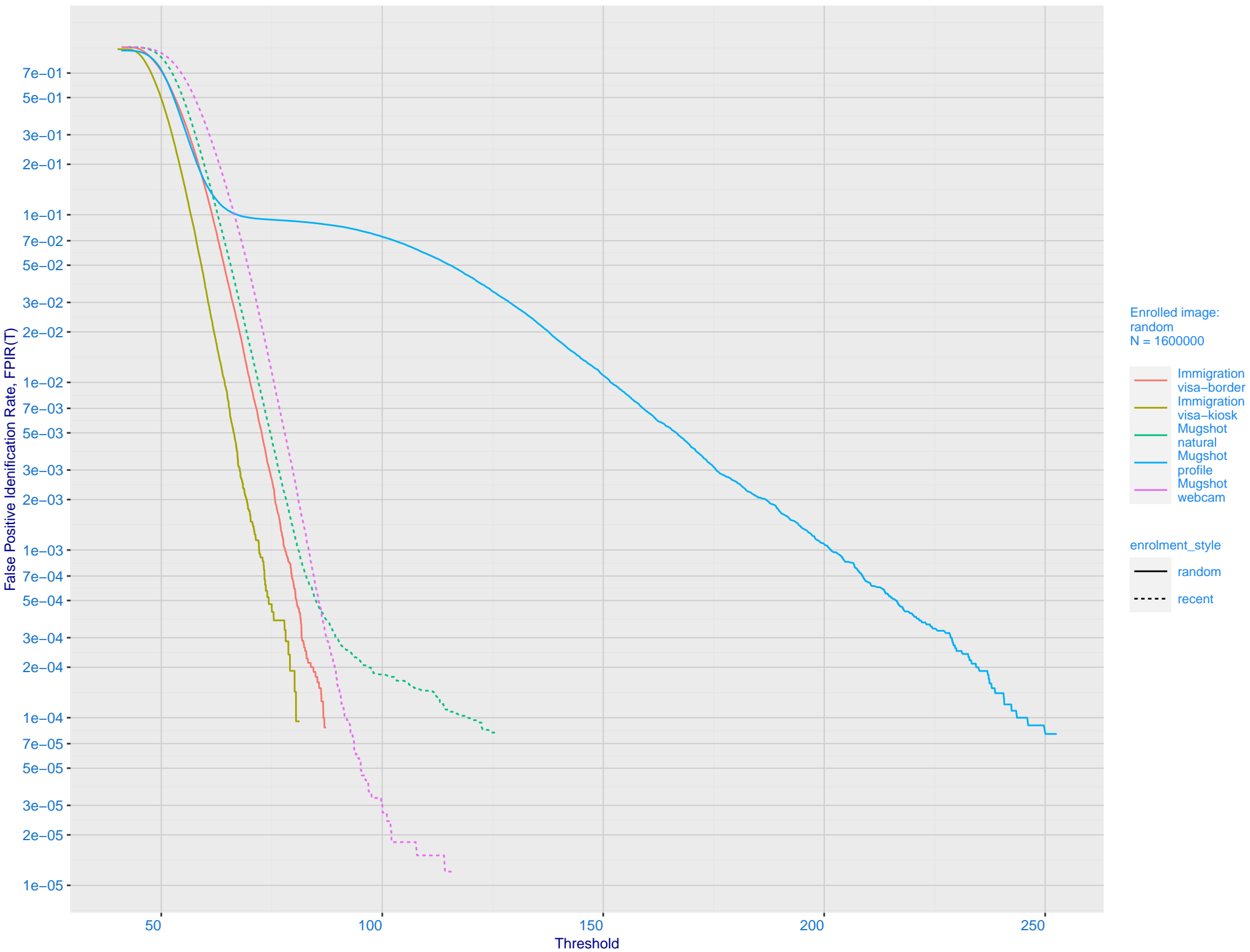
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



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

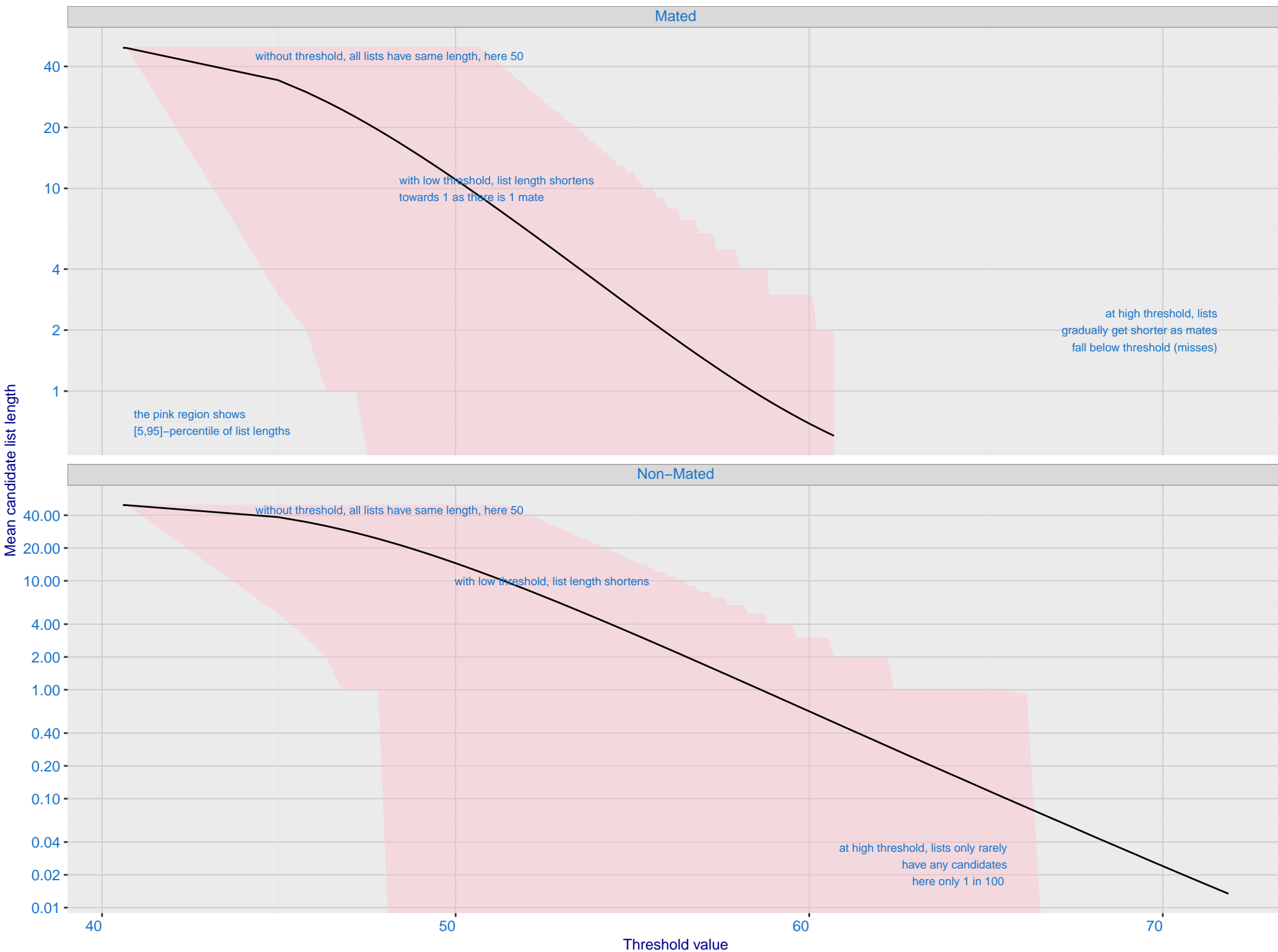


G: FPIR dependence on T by probe type for N = 1600000 subjects



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

False {Negative | Positive} Identification Rate

FNIR(T)

FPIR(T)

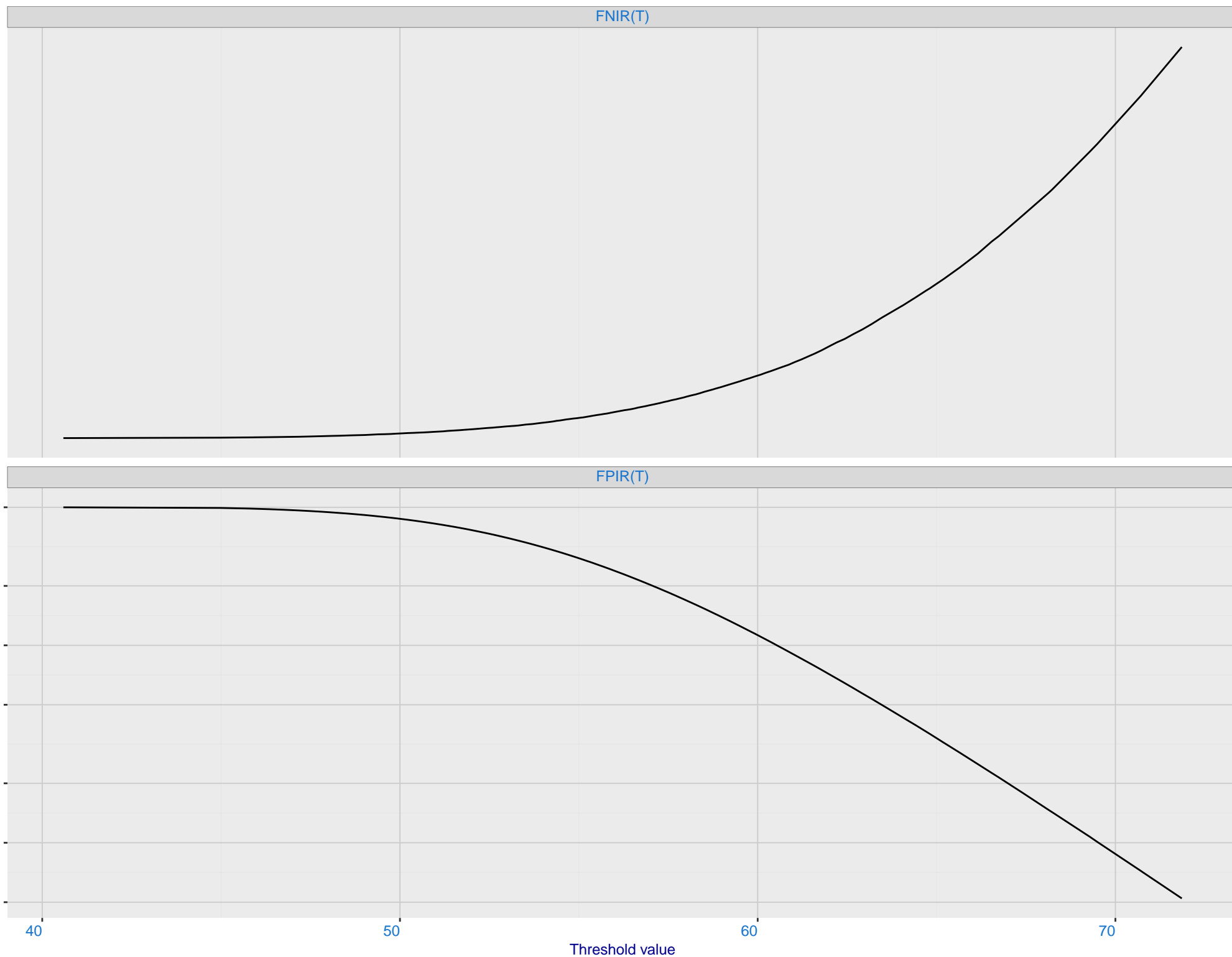
40

50

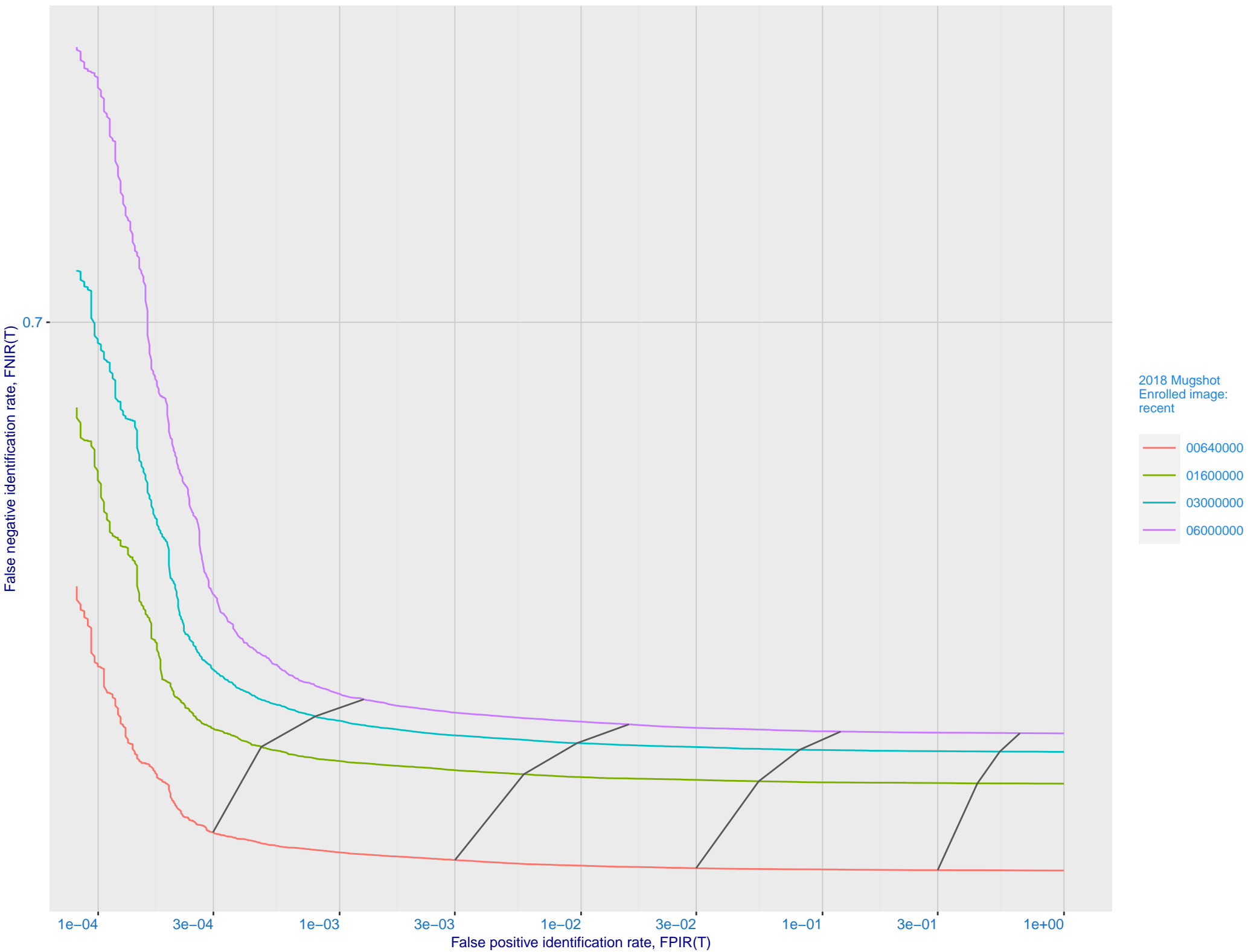
60

70

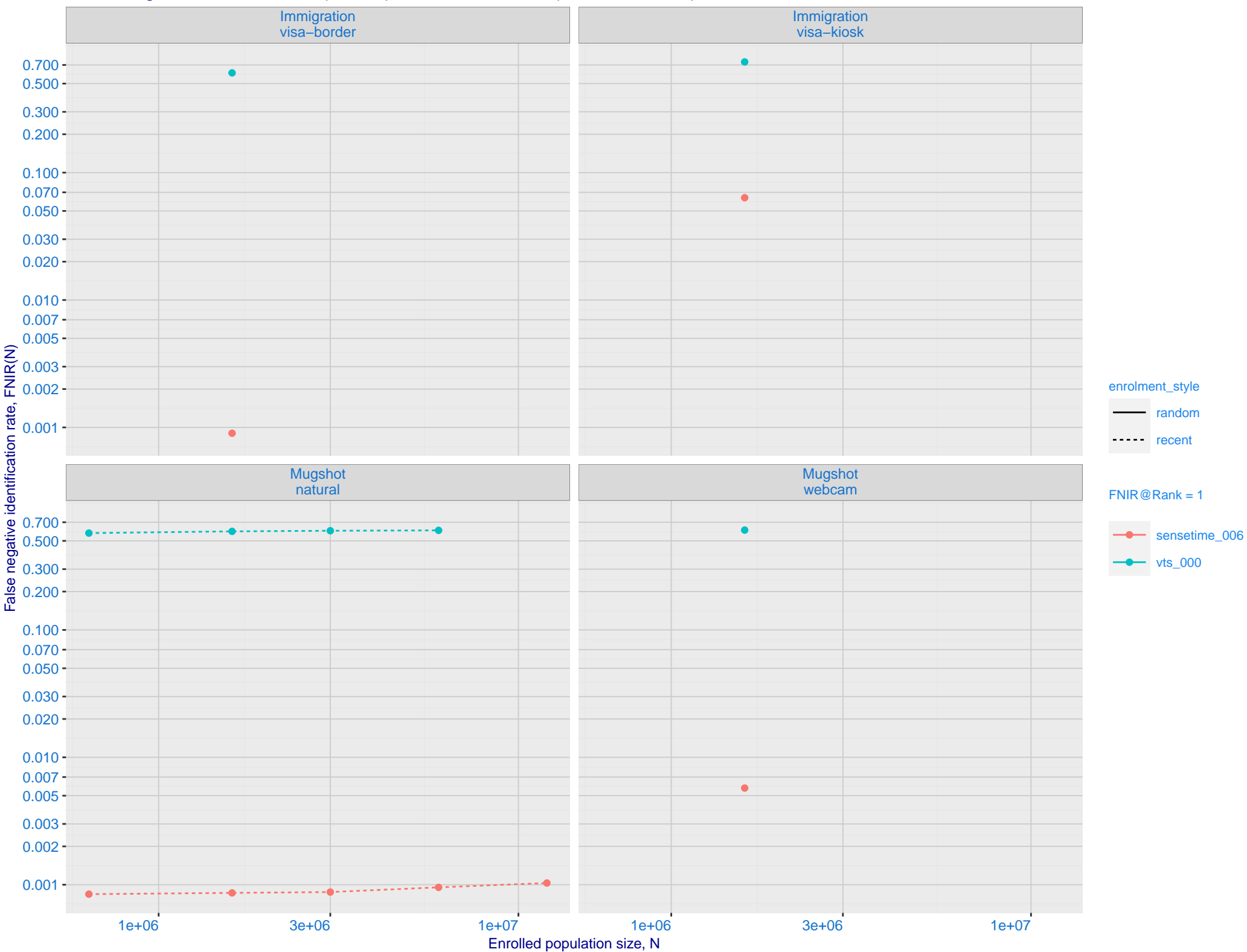
Threshold value



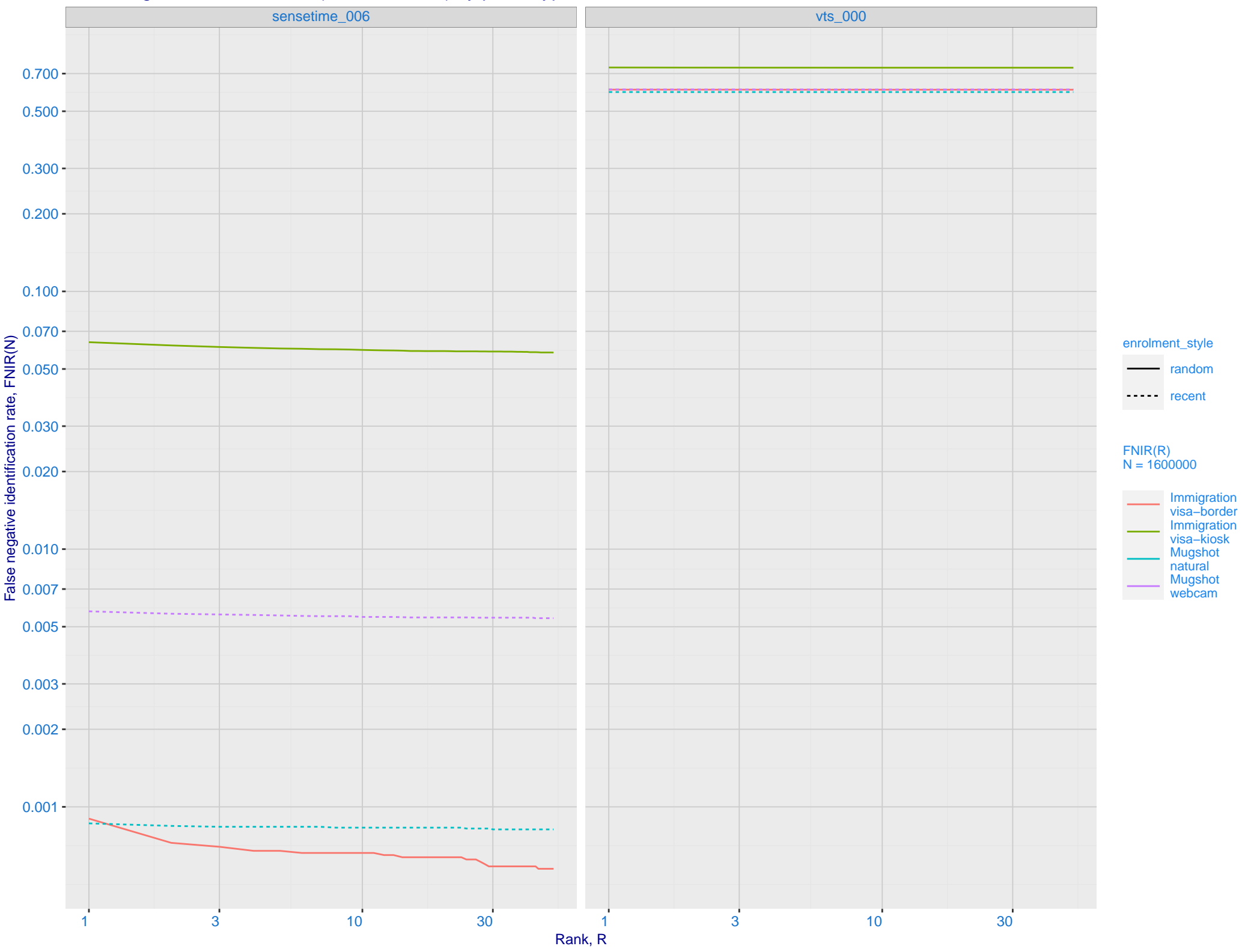
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.



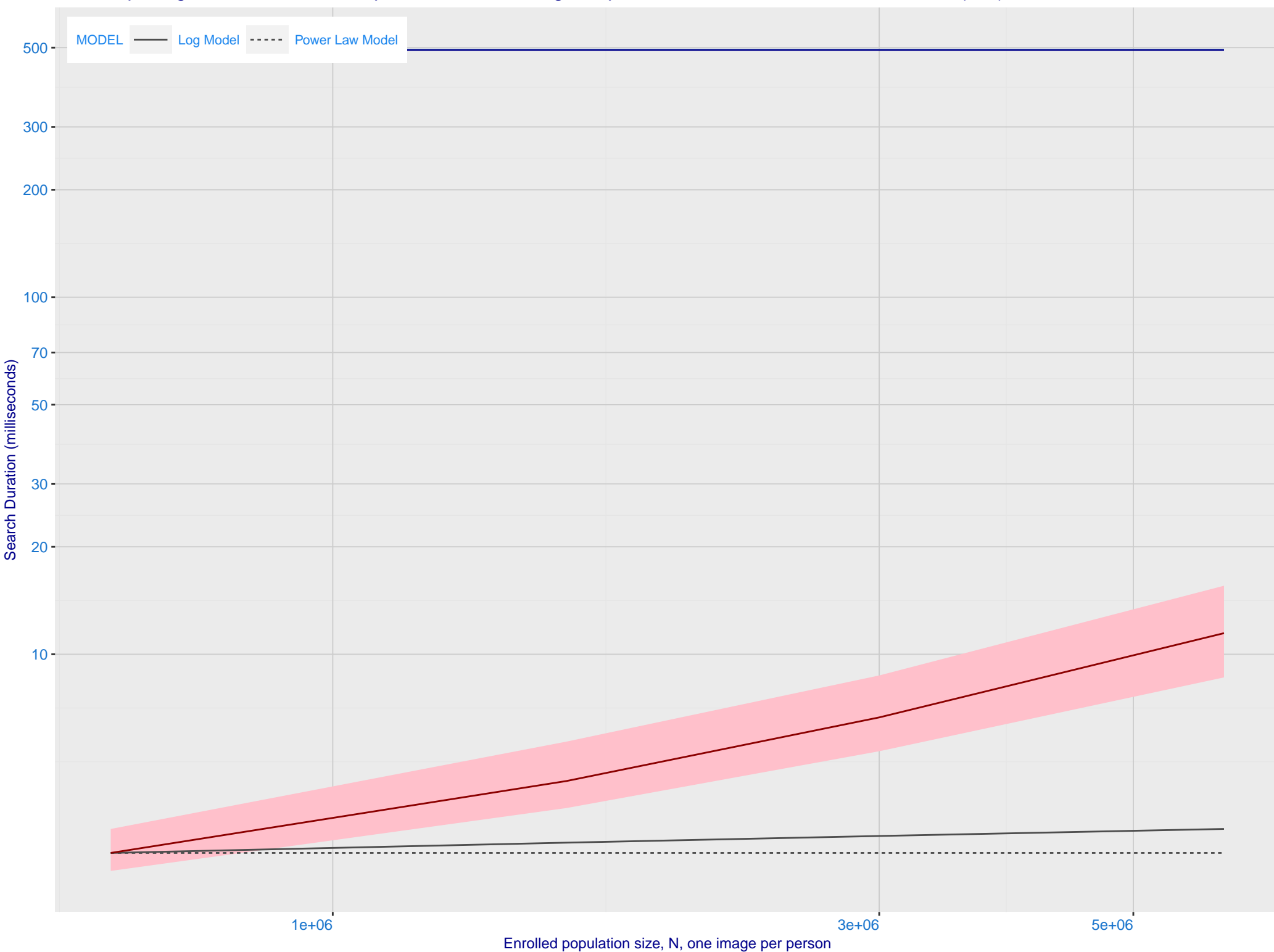
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_006)



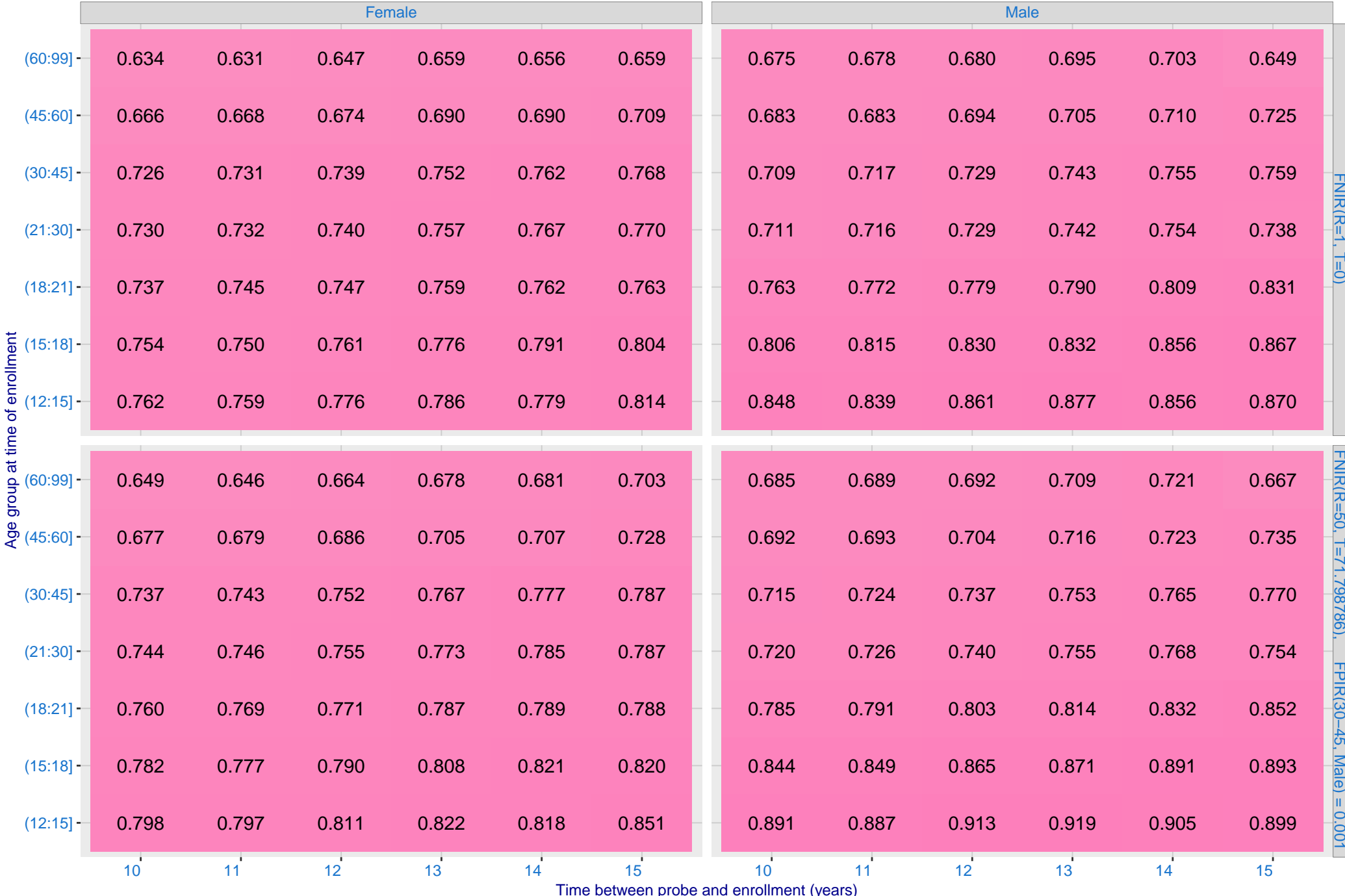
L: Investigational mode: FNIR(1600000, R, 0) by probe type



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.



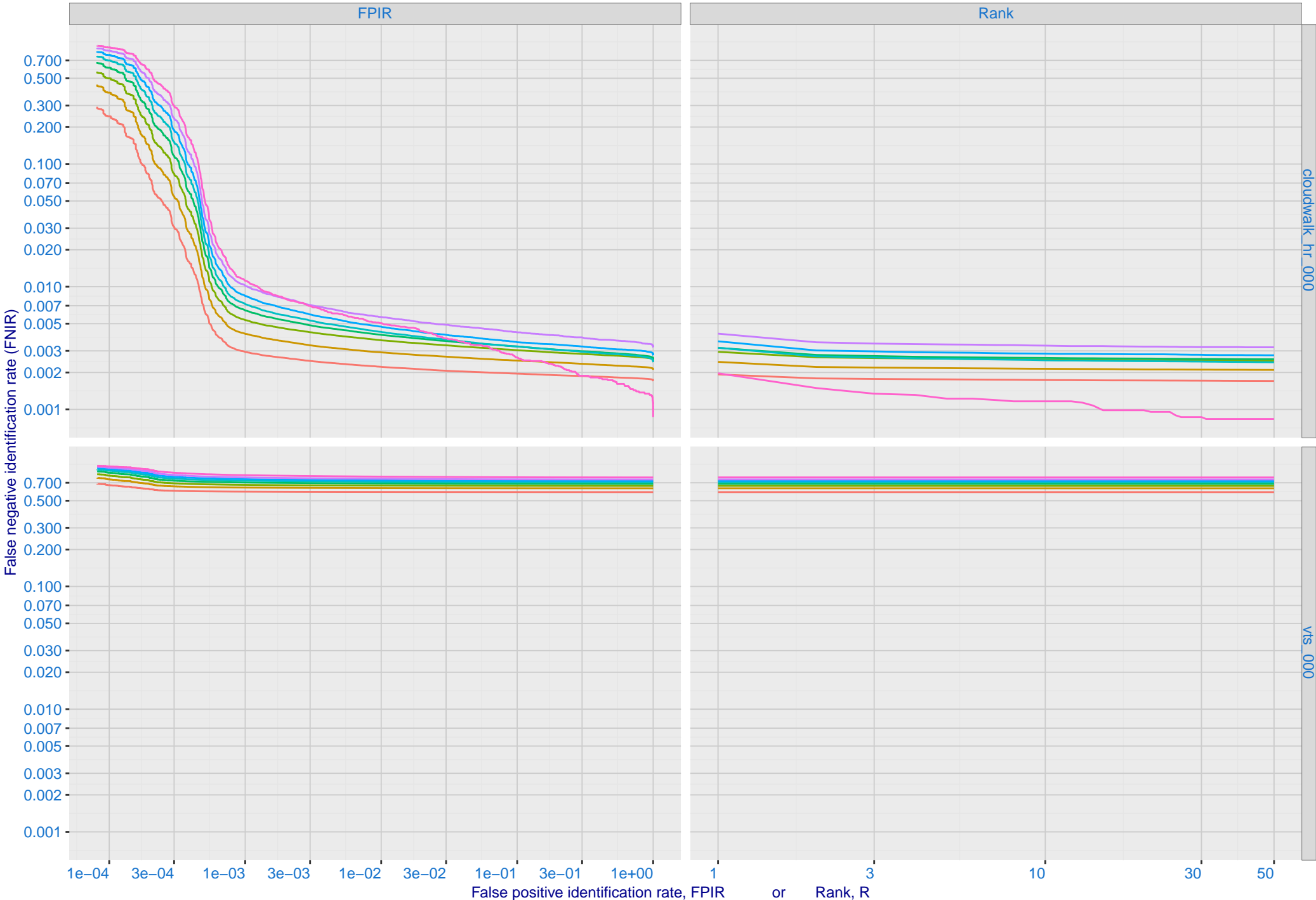
P: FPIR(N = 1.6 million) by sex and age. It is typical for false positive identification rates to be higher in women except in their teens.

Algorithm: vts_000, Dataset: Border-Crossing Ageing
Threshold: 71.798786 set to achieve FPIR(30–45, Male) = 0.001



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

