A: Datasheet

Algorithm: knowutech_000

Developer: Know U Tech LLC

Submission Date: 2023_06_05

Template size: 781 bytes

Template time (2.5 percentile): 831 msec

Template time (median): 832 msec

Template time (97.5 percentile): 840 msec

Investigation:

Frontal mugshot ranking 176 (out of 414) –– FNIR(1600000, 0, 1) = 0.0038 vs. lowest 0.0008 from intema_001

Mugshot webcam ranking 18 (out of 376) –– FNIR(1600000, 0, 1) = 0.0069 vs. lowest 0.0054 from sensetime_009

Mugshot profile ranking 57 (out of 345) –– FNIR(1600000, 0, 1) = 0.0795 vs. lowest 0.0517 from sensetime_009

Immigration visa–border ranking 48 (out of 303) –– FNIR(1600000, 0, 1) = 0.0016 vs. lowest 0.0006 from cloudwalk_mt_002

Immigration visa–kiosk ranking 54 (out of 248) –– FNIR(1600000, 0, 1) = 0.0636 vs. lowest 0.0387 from cloudwalk_mt_002

Identification:

Frontal mugshot ranking 97 (out of 414) –– FNIR(1600000, T, L+1) = 0.0119, FPIR=0.001000 vs. lowest 0.0011 from idemia_010

Mugshot webcam ranking 83 (out of 374) –– FNIR(1600000, T, L+1) = 0.0378, FPIR=0.001000 vs. lowest 0.0072 from sensetime_009

Mugshot profile ranking 34 (out of 344) –– FNIR(1600000, T, L+1) = 0.3195, FPIR=0.001000 vs. lowest 0.0634 from cloudwalk_mt_002

Immigration visa–border ranking 74 (out of 302) –– FNIR(1600000, T, L+1) = 0.0124, FPIR=0.001000 vs. lowest 0.0010 from cloudwalk_mt_002

Immigration visa–kiosk ranking 52 (out of 248) –– FNIR(1600000, T, L+1) = 0.1189, FPIR=0.001000 vs. lowest 0.0517 from cloudwalk_mt_002
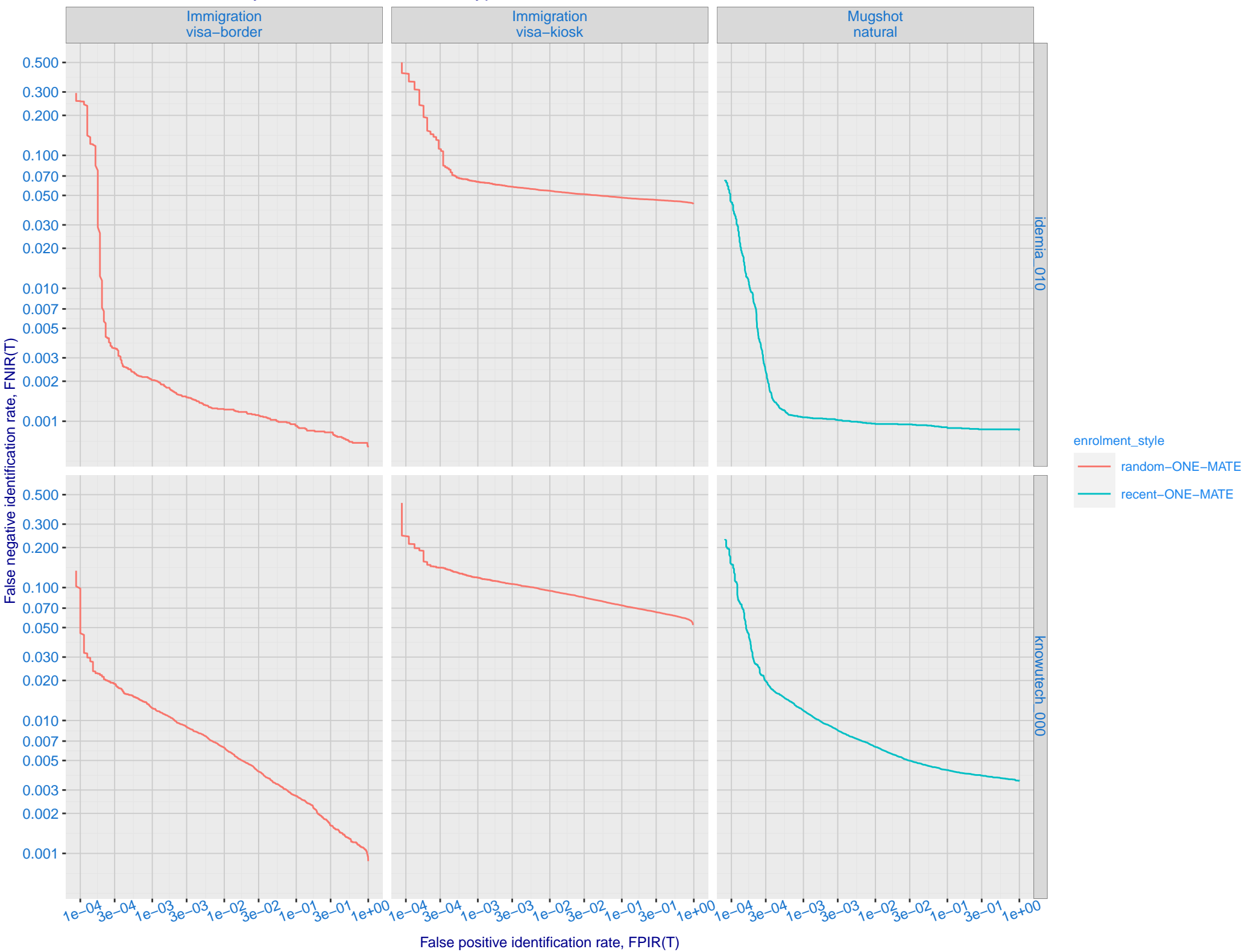
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (idemia_010)
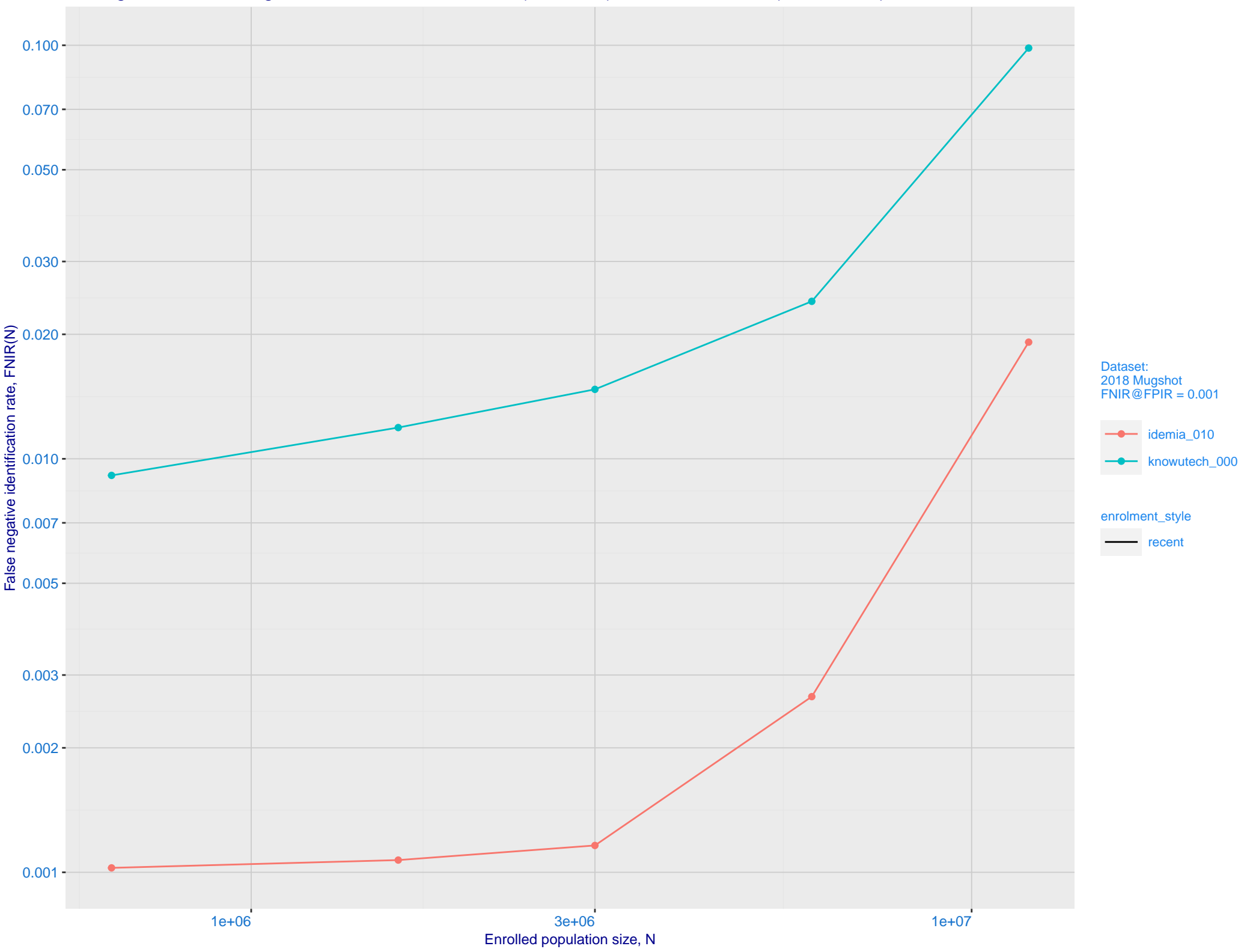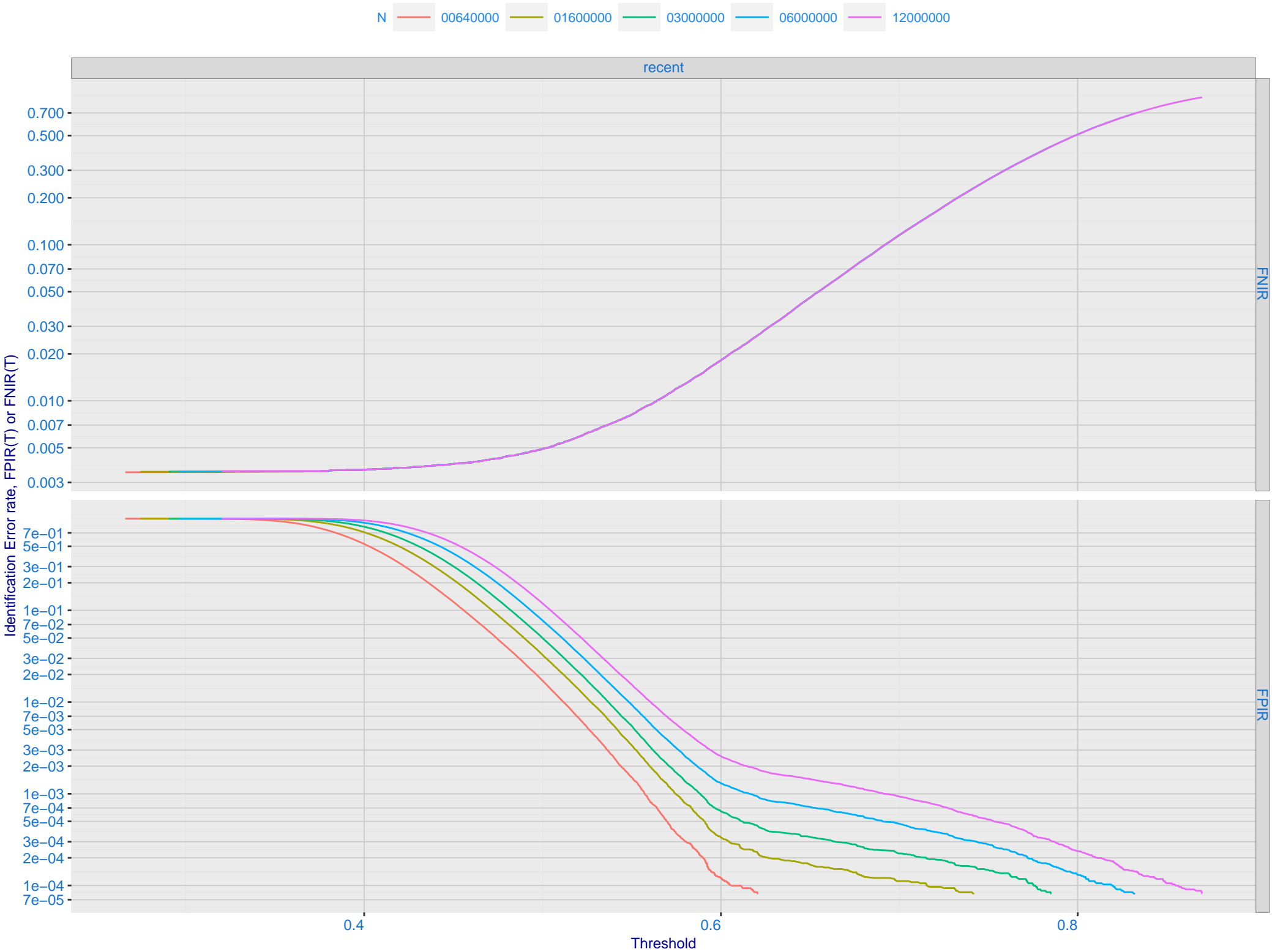
C: Evolution of accuracy for KNOWUTECH algorithms on three datasets 2018 – present
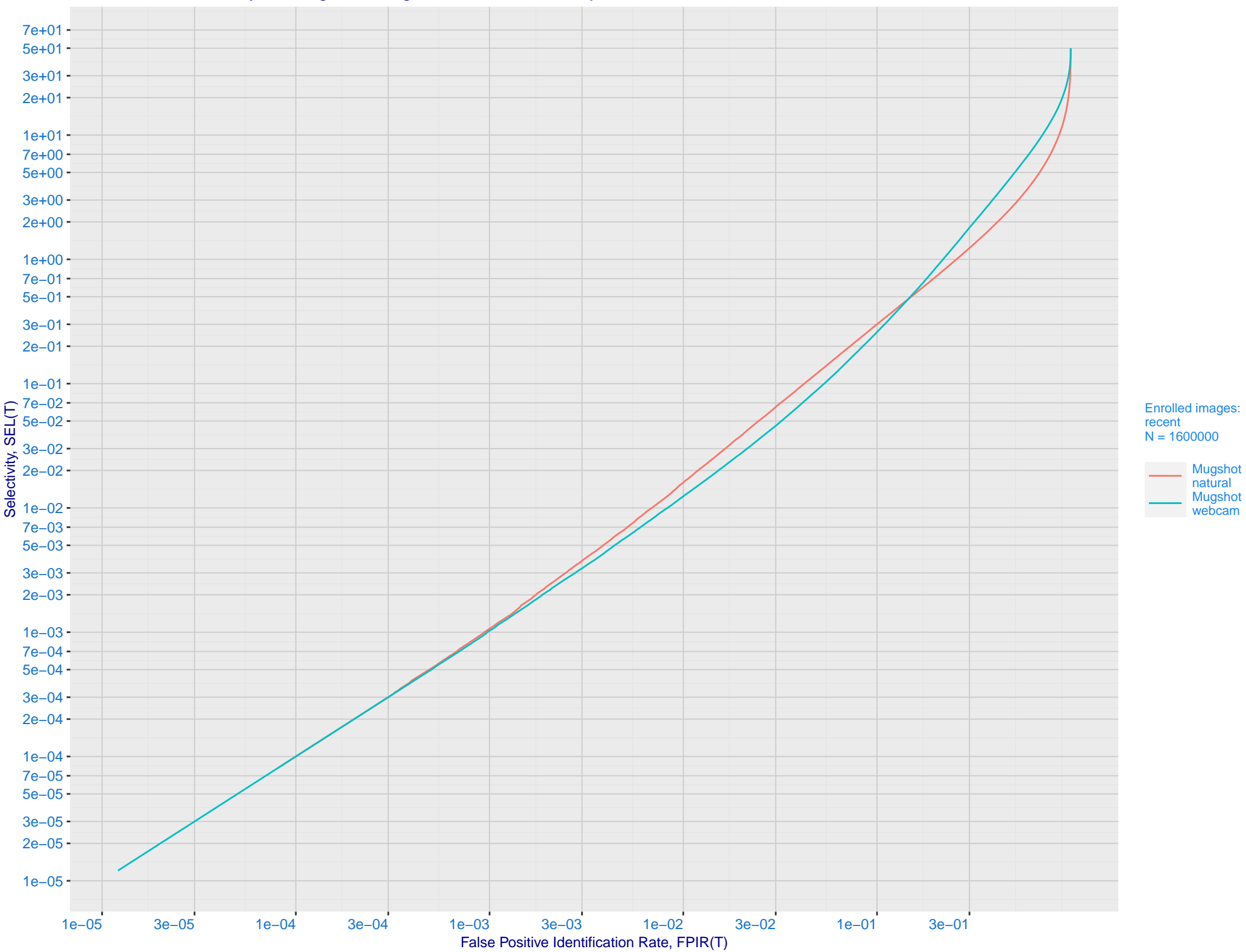
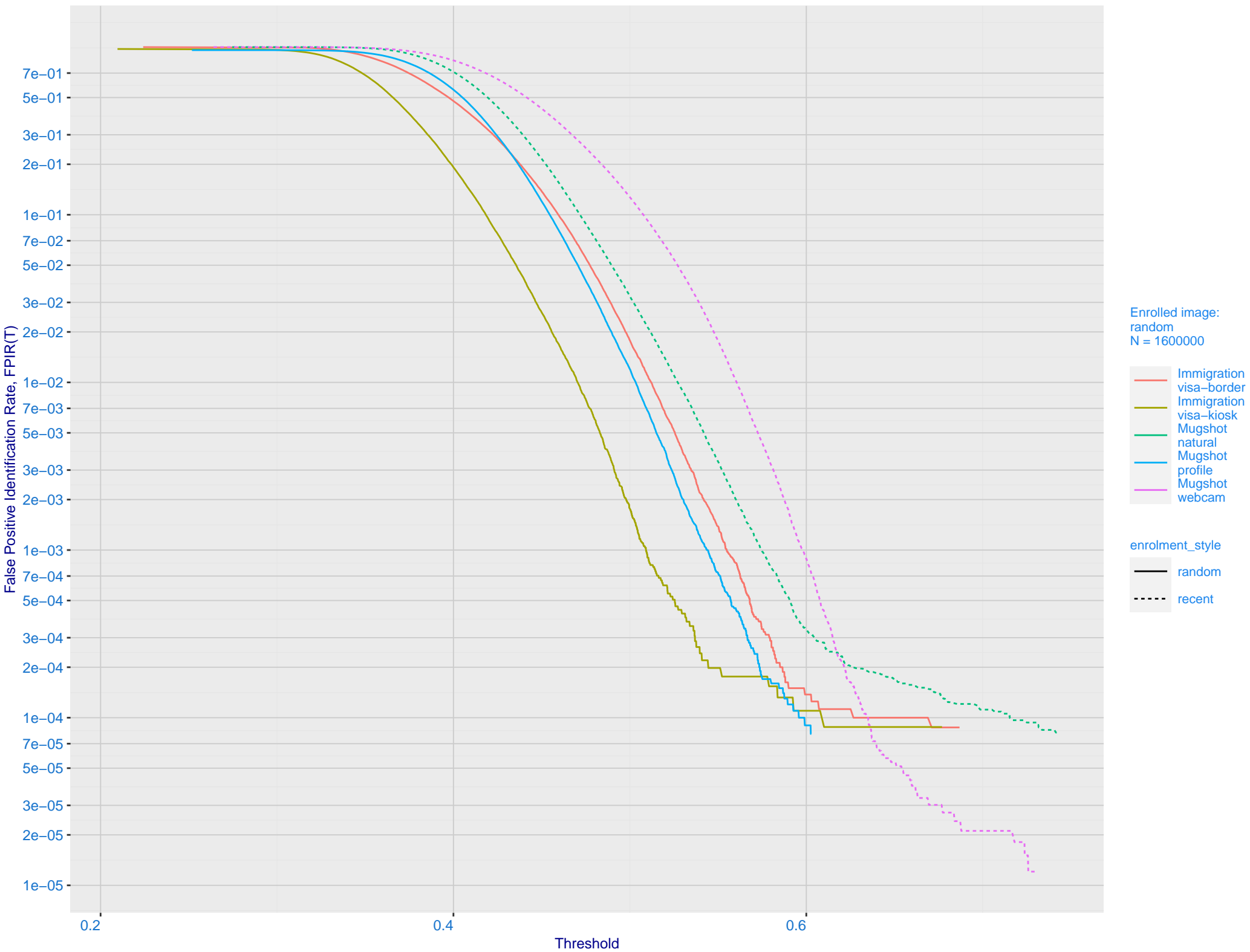D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals

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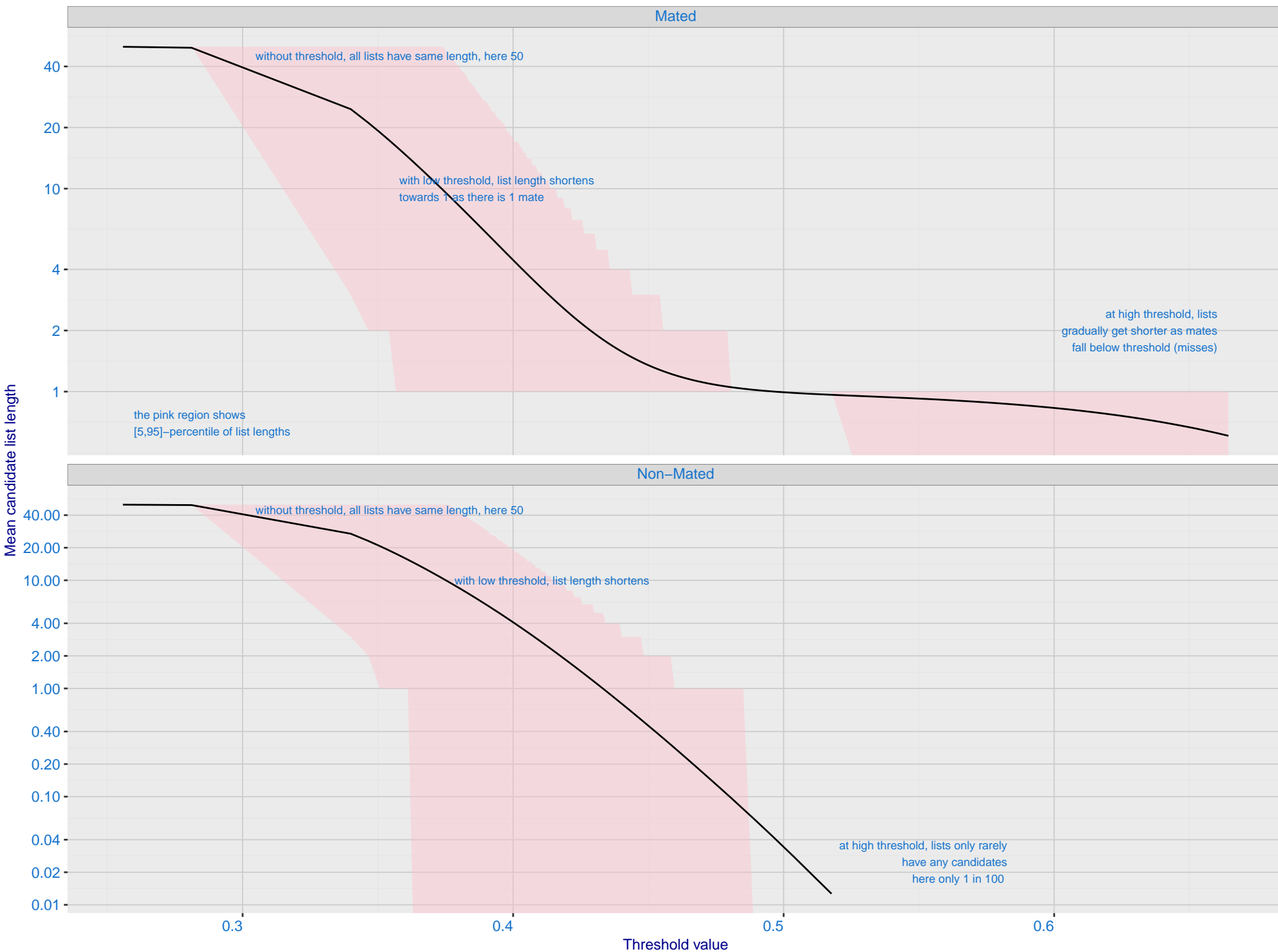
G: FPIR dependence on T by probe type for N = 1600000 subjects

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

Mated

without threshold, all lists have same length, here 50

with low threshold, list length shortens
towards 1 as there is 1 mate

at high threshold, lists
gradually get shorter as mates
fall below threshold (misses)

the pink region shows
[5,95]−percentile of list lengths

Non−Mated

without threshold, all lists have same length, here 50

with low threshold, list length shortens

at high threshold, lists only rarely
have any candidates
here only 1 in 100

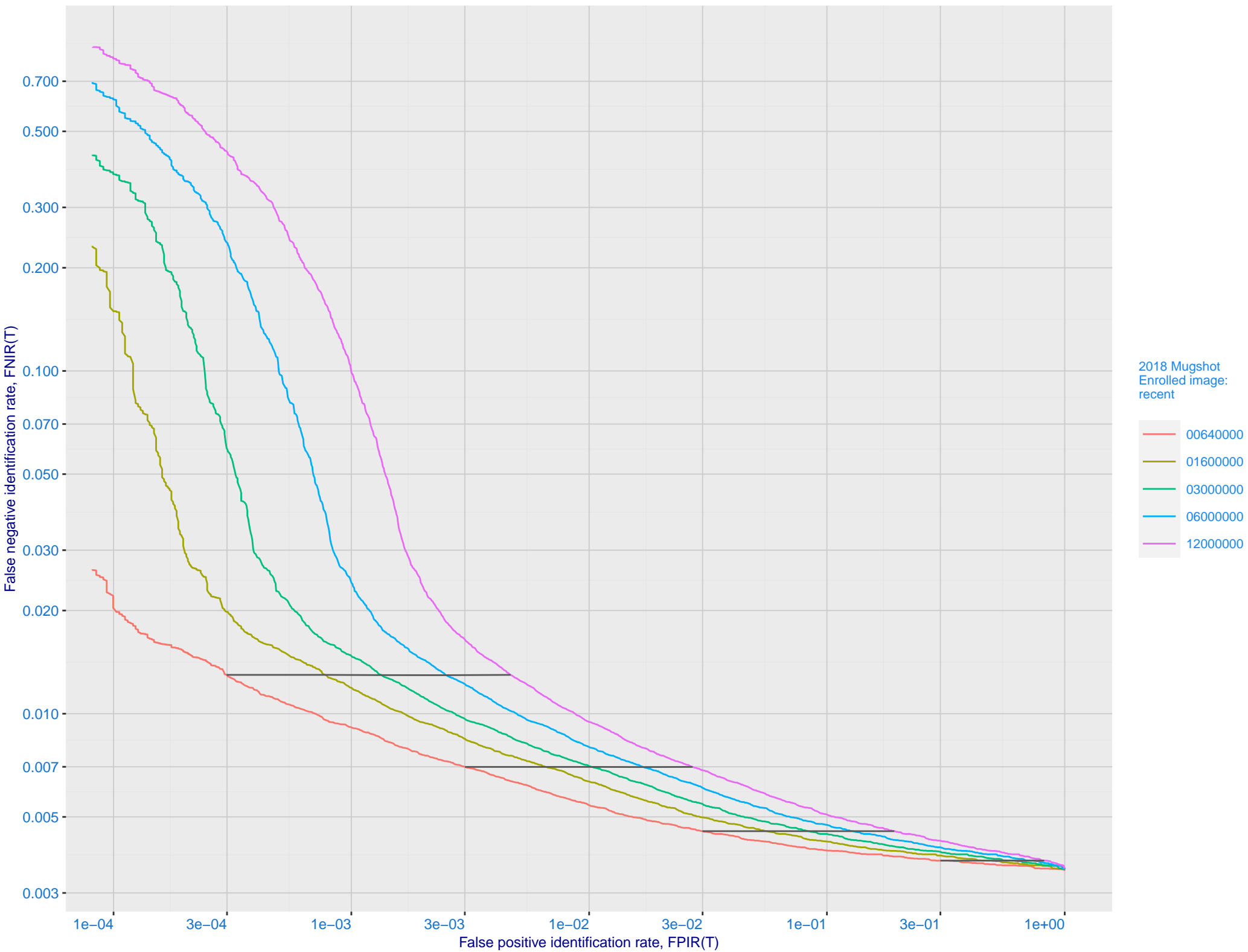Mean candidate list length

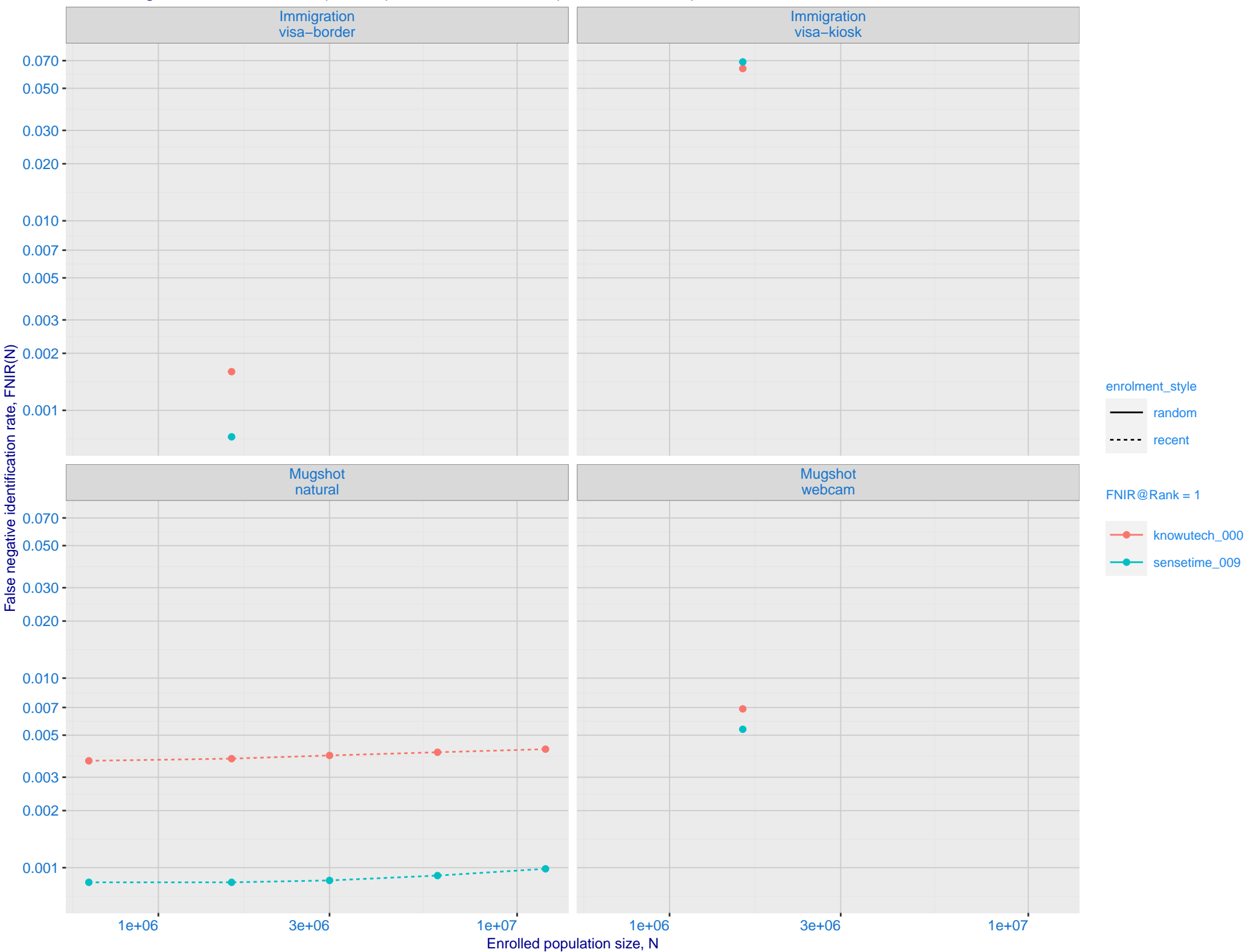Threshold value

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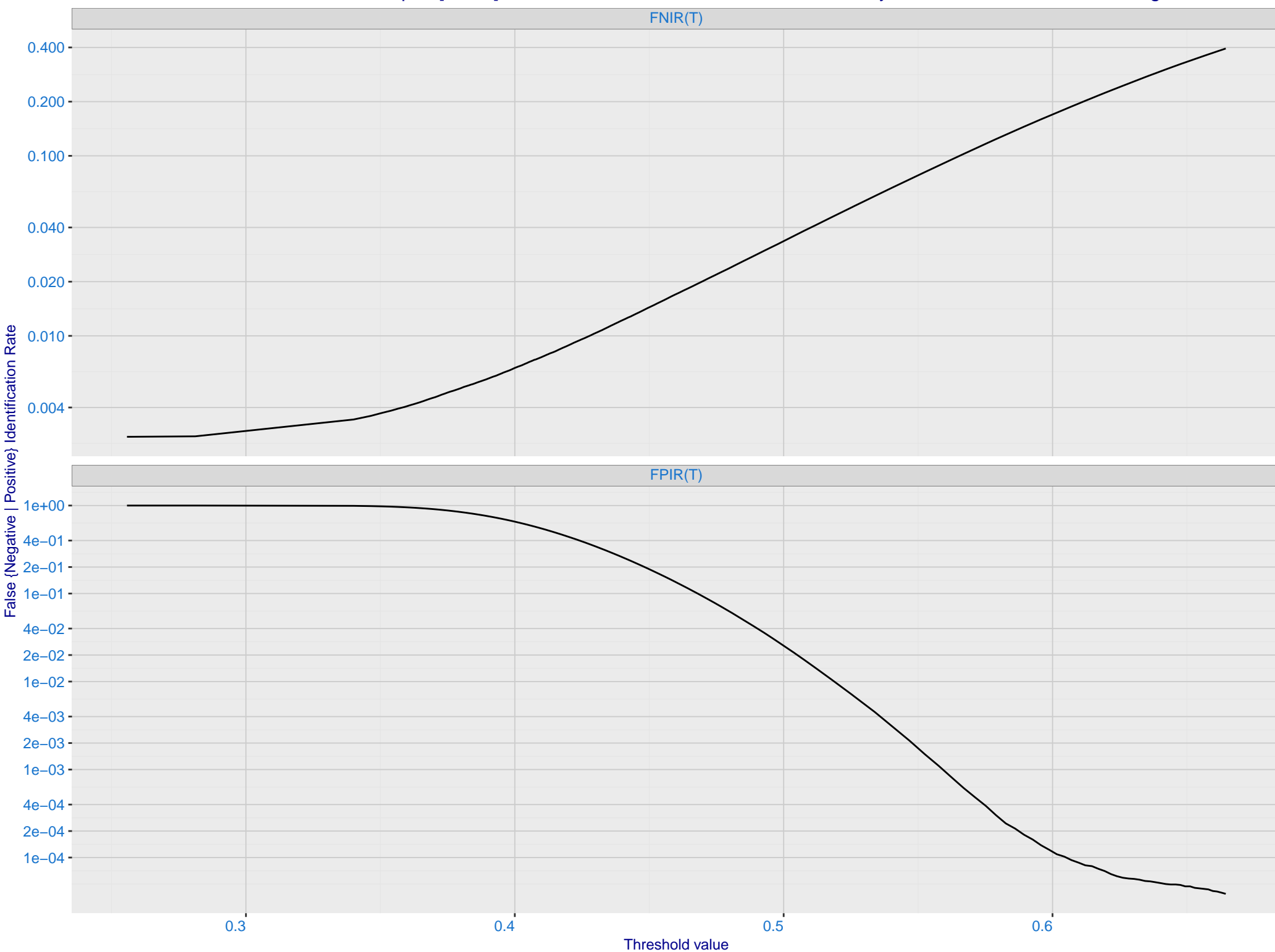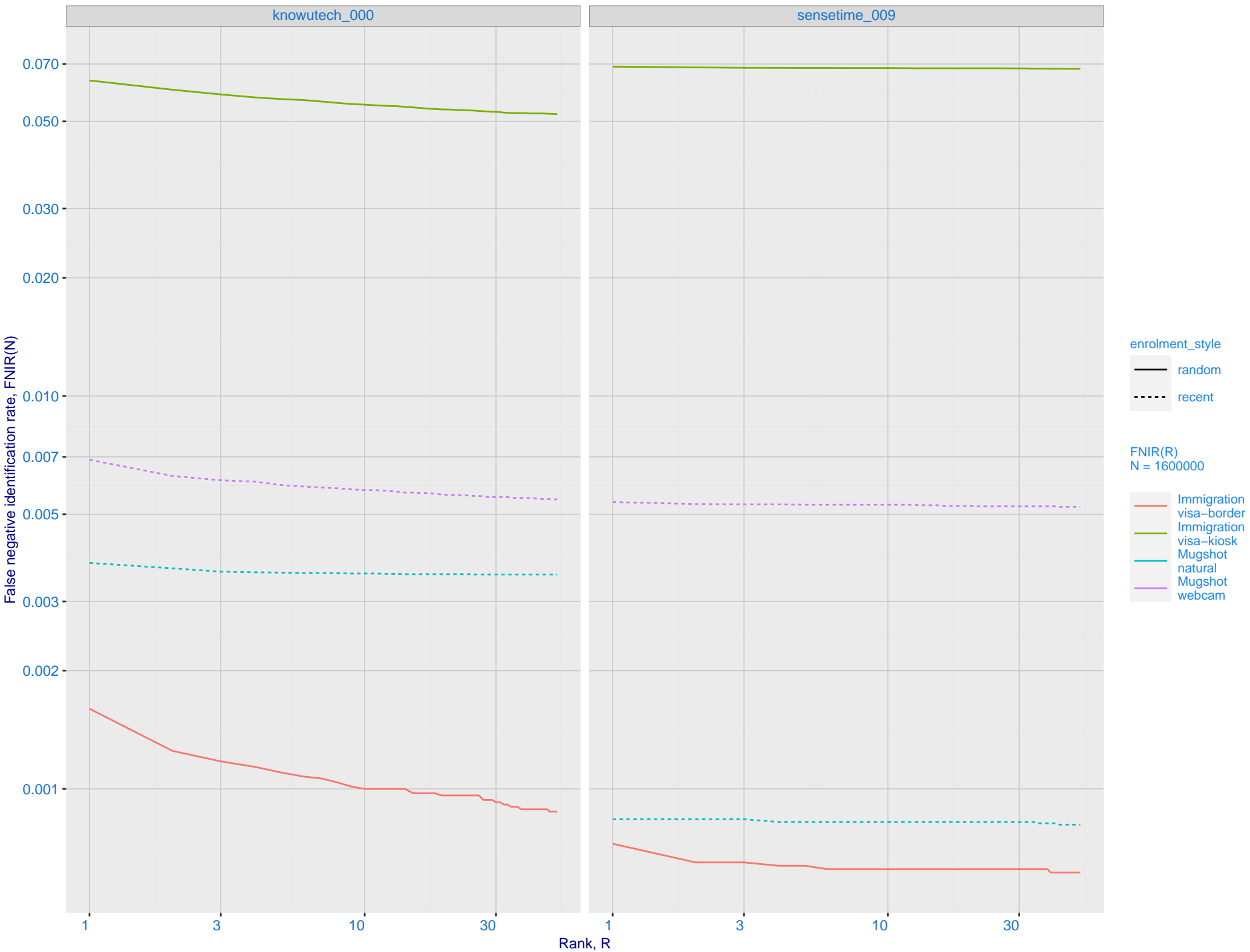
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.

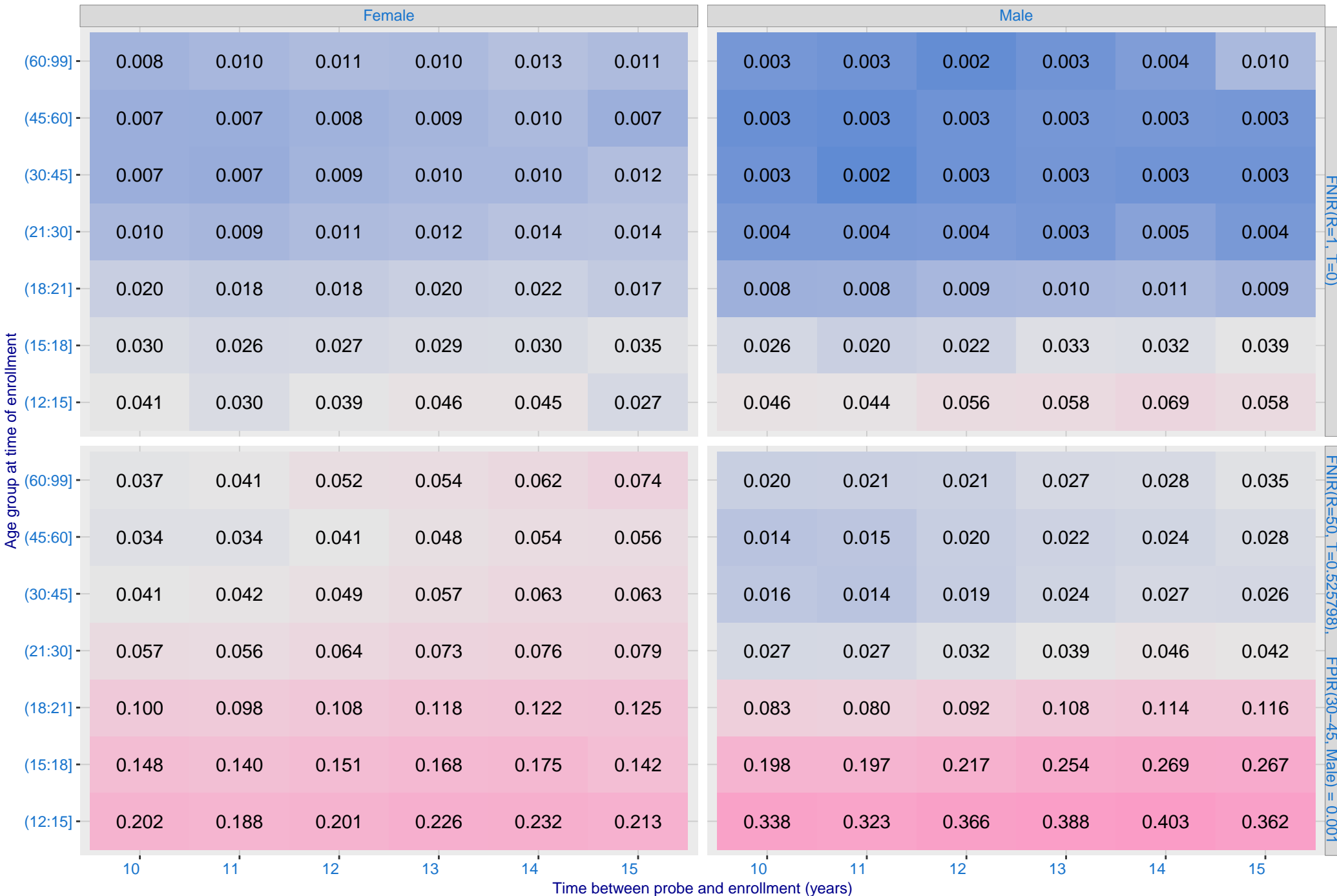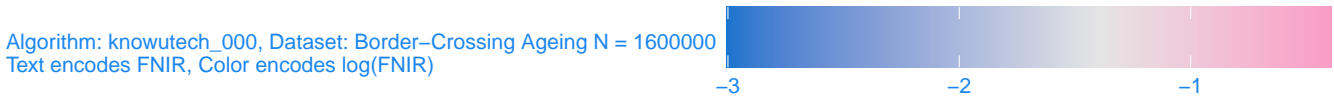K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_009)

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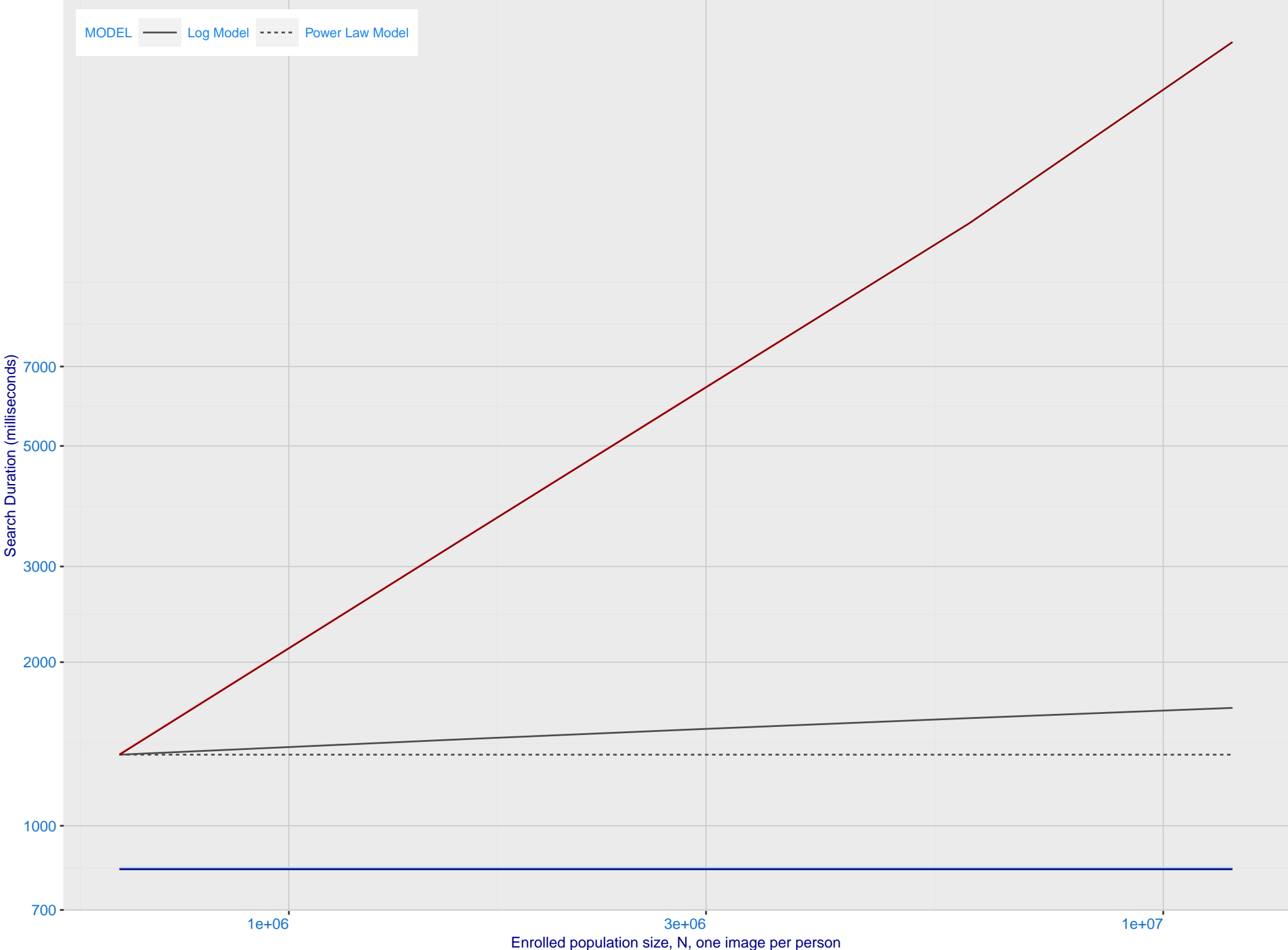
O: FNIR(T, N = 1.6 million) by sex, age and time−lapse. The top row gives investigational rank−1 miss rates. The bottom panels give high threshold for more lights−out identification with low FPIR.

Algorithm: knowutech_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.
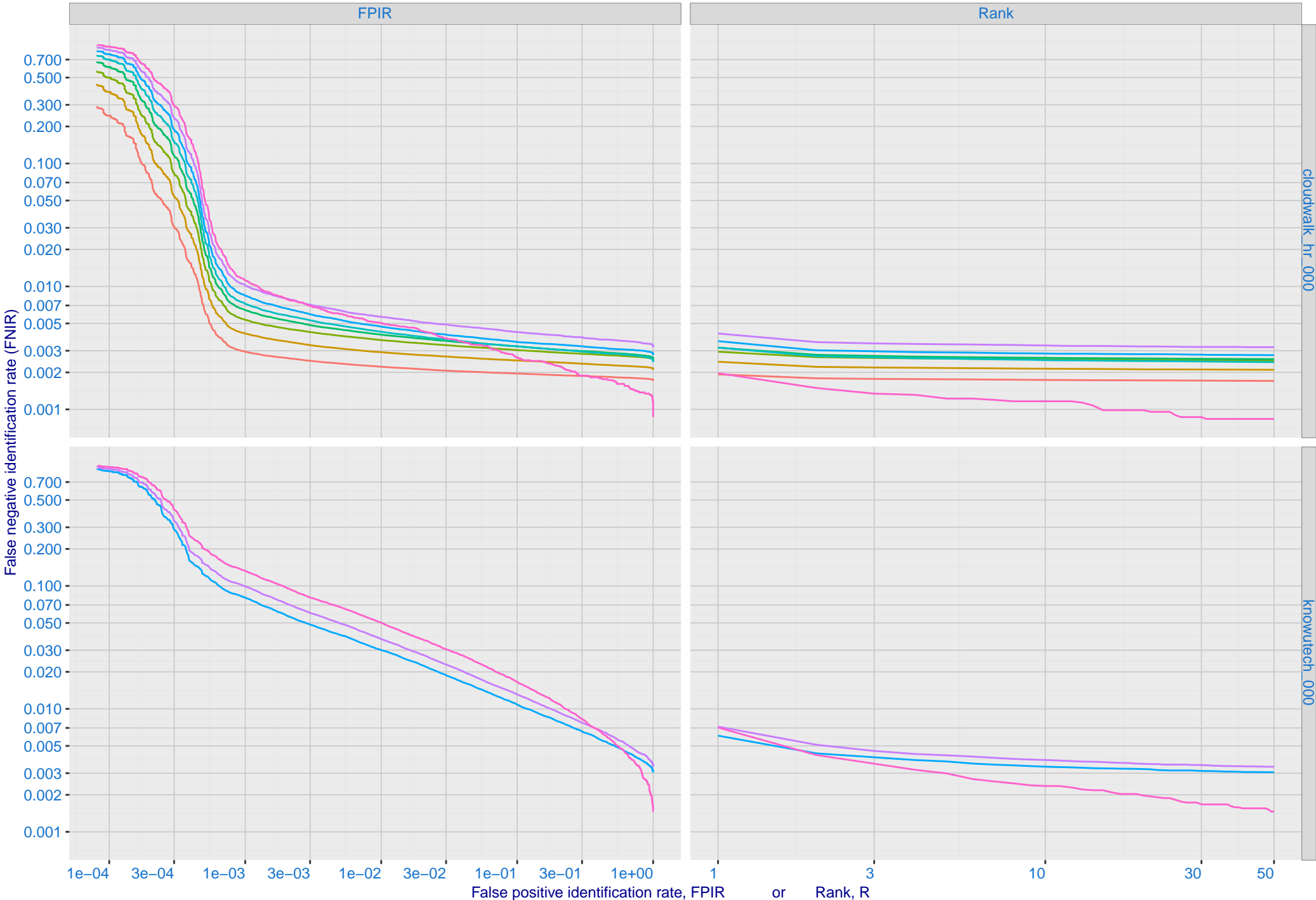
Q: Identification FNIR(N, T, L+1) and Investigational FNIR(N, 0, R) under ageing

R: Decline of genuine scores with ageing, with some eventually dropping below typical thresholds shown by the horizontal lines