A: Datasheet

Algorithm: fujitsulab_000

Developer: Fujitsu Research and Development Center

Submission Date: 2021_10_12

Template size: 1032 bytes

Template time (2.5 percentile): 914 msec

Template time (median): 945 msec

Template time (97.5 percentile): 998 msec

Investigation:

Frontal mugshot ranking 73 (out of 329) –– FNIR(1600000, 0, 1) = 0.0022 vs. lowest 0.0009 from sensetime_006

Mugshot webcam ranking 78 (out of 291) –– FNIR(1600000, 0, 1) = 0.0137 vs. lowest 0.0057 from sensetime_006

Mugshot profile ranking 85 (out of 260) –– FNIR(1600000, 0, 1) = 0.4404 vs. lowest 0.0550 from sensetime_006

Immigration visa–border ranking 62 (out of 218) –– FNIR(1600000, 0, 1) = 0.0039 vs. lowest 0.0009 from sensetime_006

Immigration visa–kiosk ranking 57 (out of 215) –– FNIR(1600000, 0, 1) = 0.0984 vs. lowest 0.0487 from cubox_000

Identification:

Frontal mugshot ranking 75 (out of 329) –– FNIR(1600000, T, L+1) = 0.0204, FPIR=0.001000 vs. lowest 0.0017 from nec_005

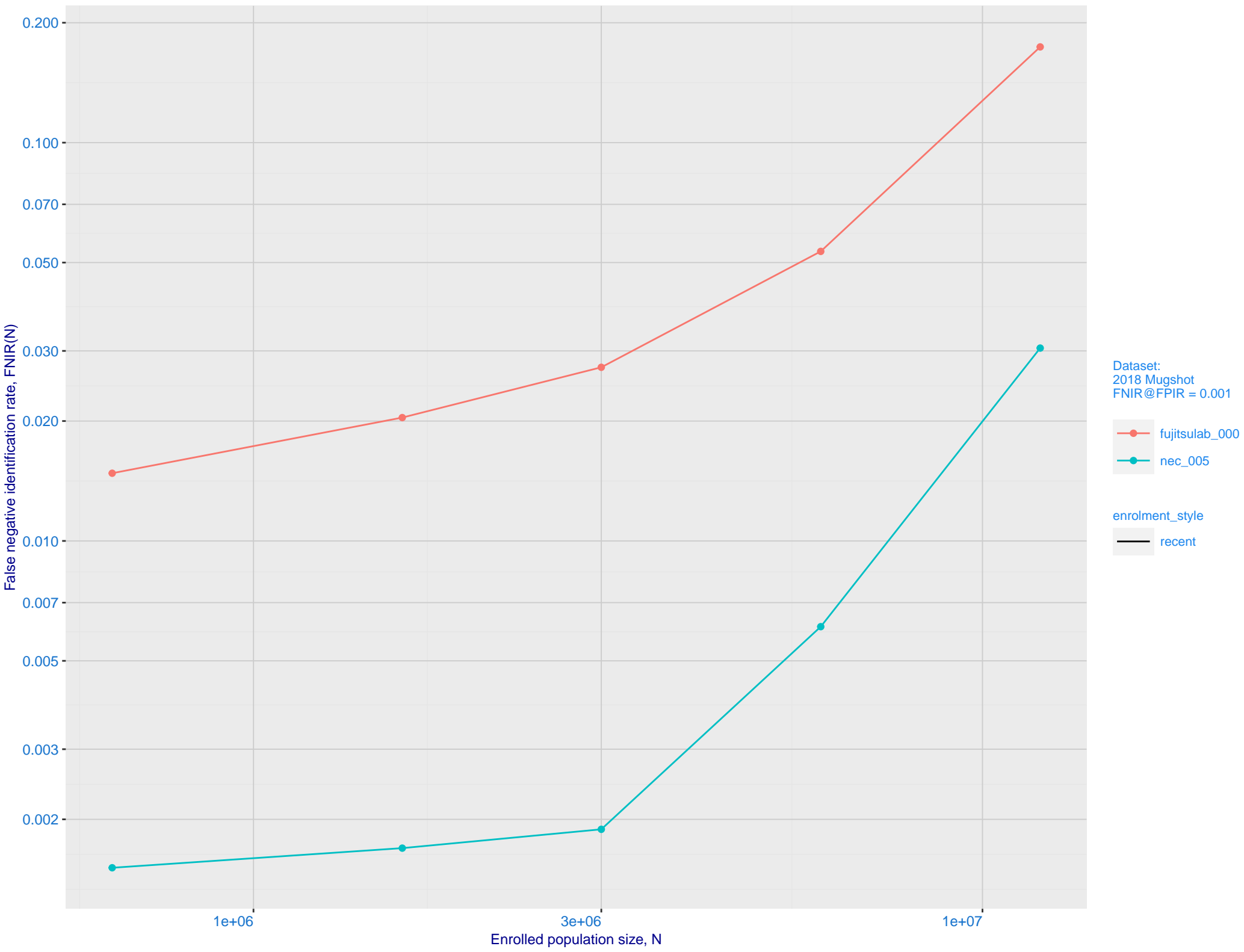Mugshot webcam ranking 65 (out of 289) –– FNIR(1600000, T, L+1) = 0.0560, FPIR=0.001000 vs. lowest 0.0120 from nec_005

Mugshot profile ranking 232 (out of 259) –– FNIR(1600000, T, L+1) = 0.9999, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000
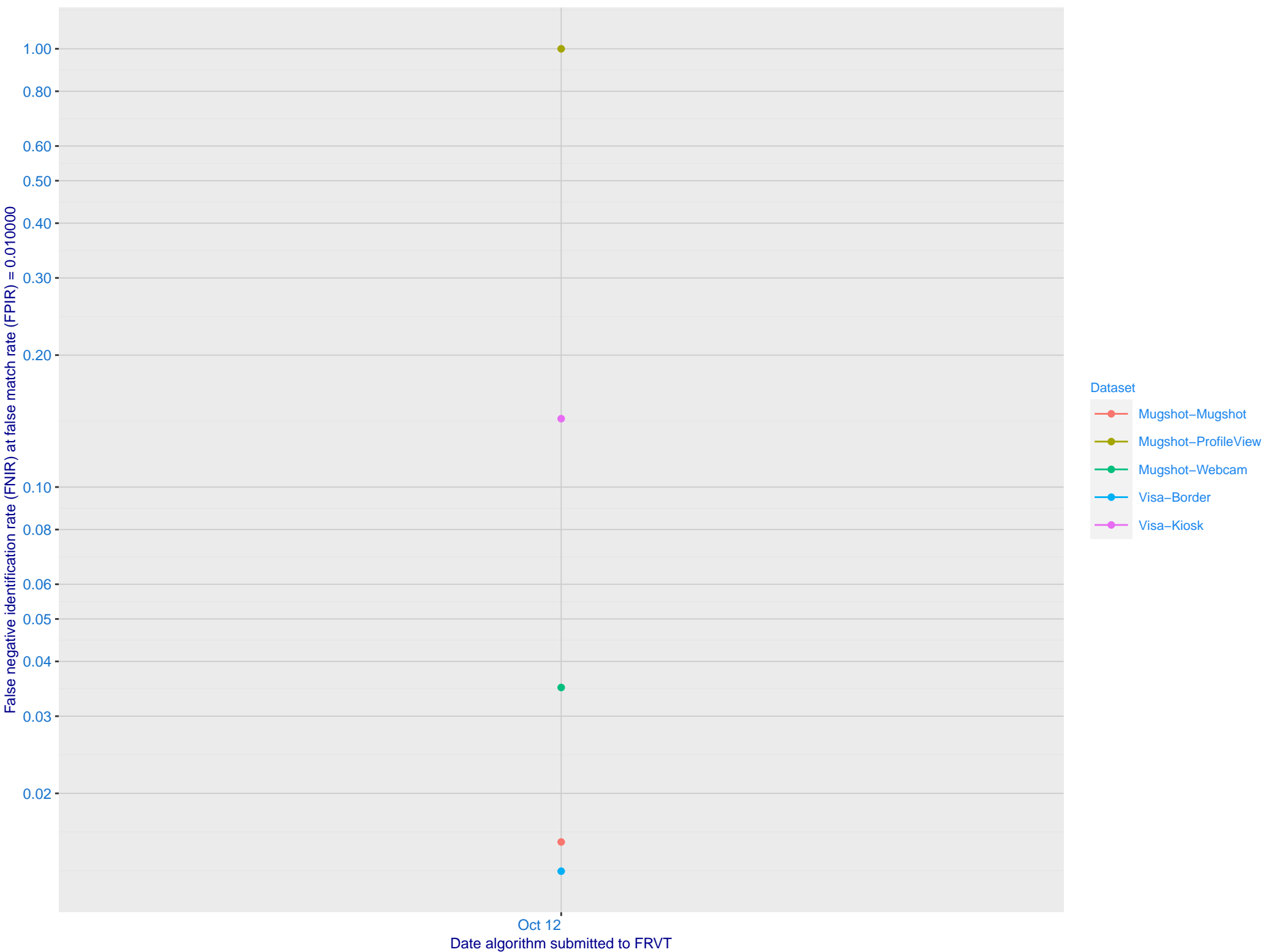
Immigration visa–border ranking 53 (out of 217) –– FNIR(1600000, T, L+1) = 0.0235, FPIR=0.001000 vs. lowest 0.0032 from paravision_009

Immigration visa–kiosk ranking 57 (out of 212) –– FNIR(1600000, T, L+1) = 0.2417, FPIR=0.001000 vs. lowest 0.0728 from paravision_009
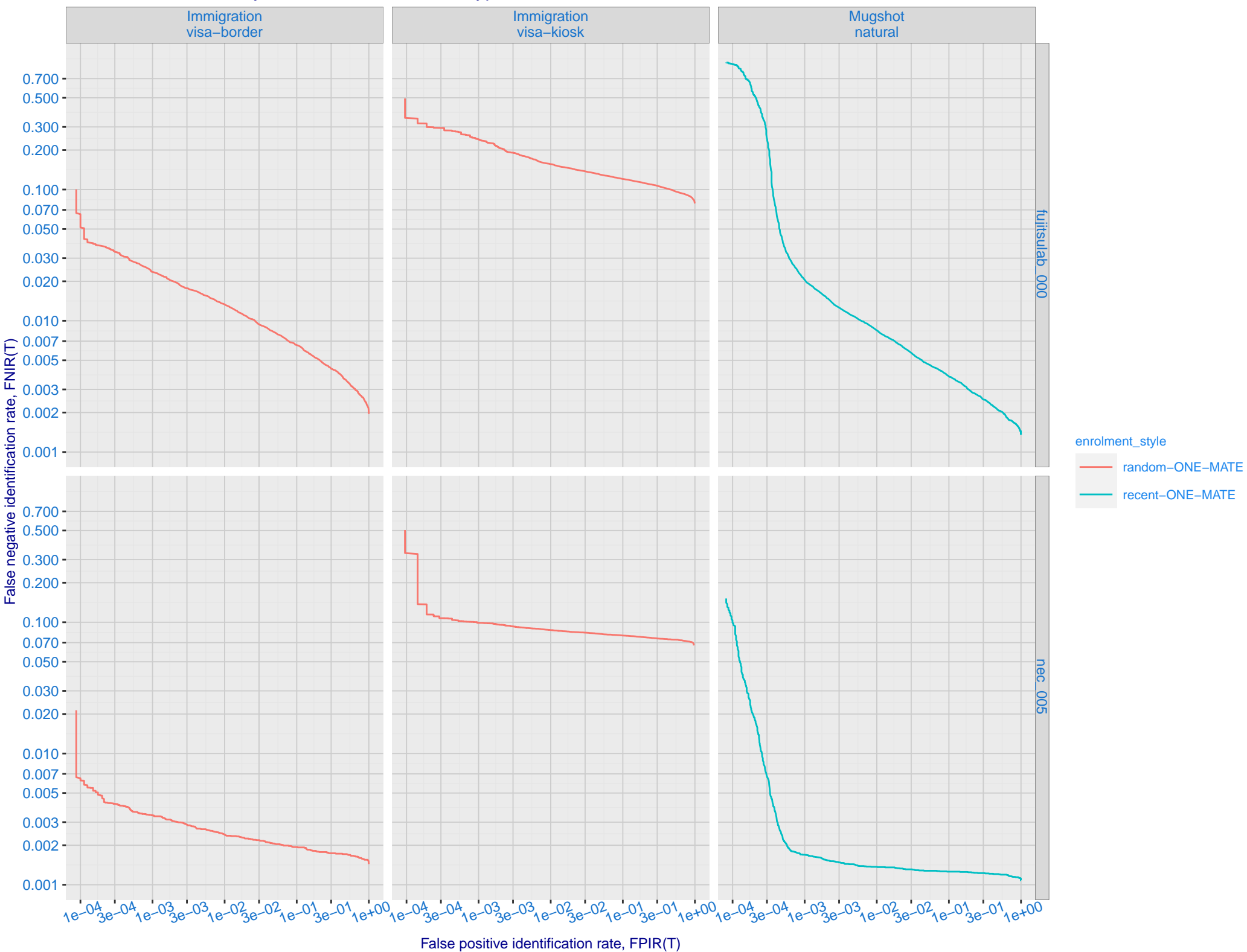
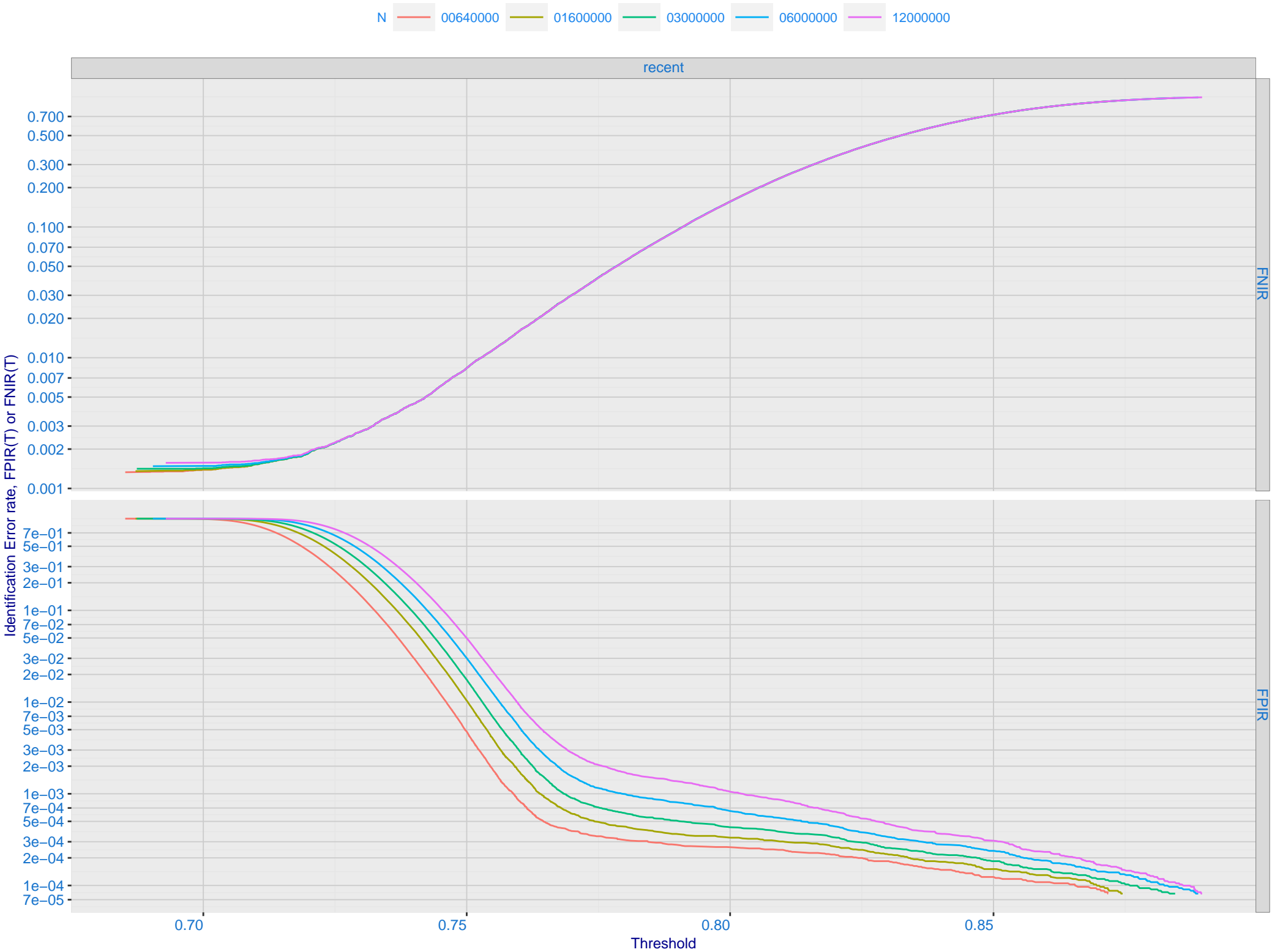B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (nec_005)

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

False negative identification rate (FNIR) at false match rate (FPIR) = 0.010000

Date algorithm submitted to FRVT

Oct 12

Dataset
- Mugshot–Mugshot
- Mugshot–ProfileView
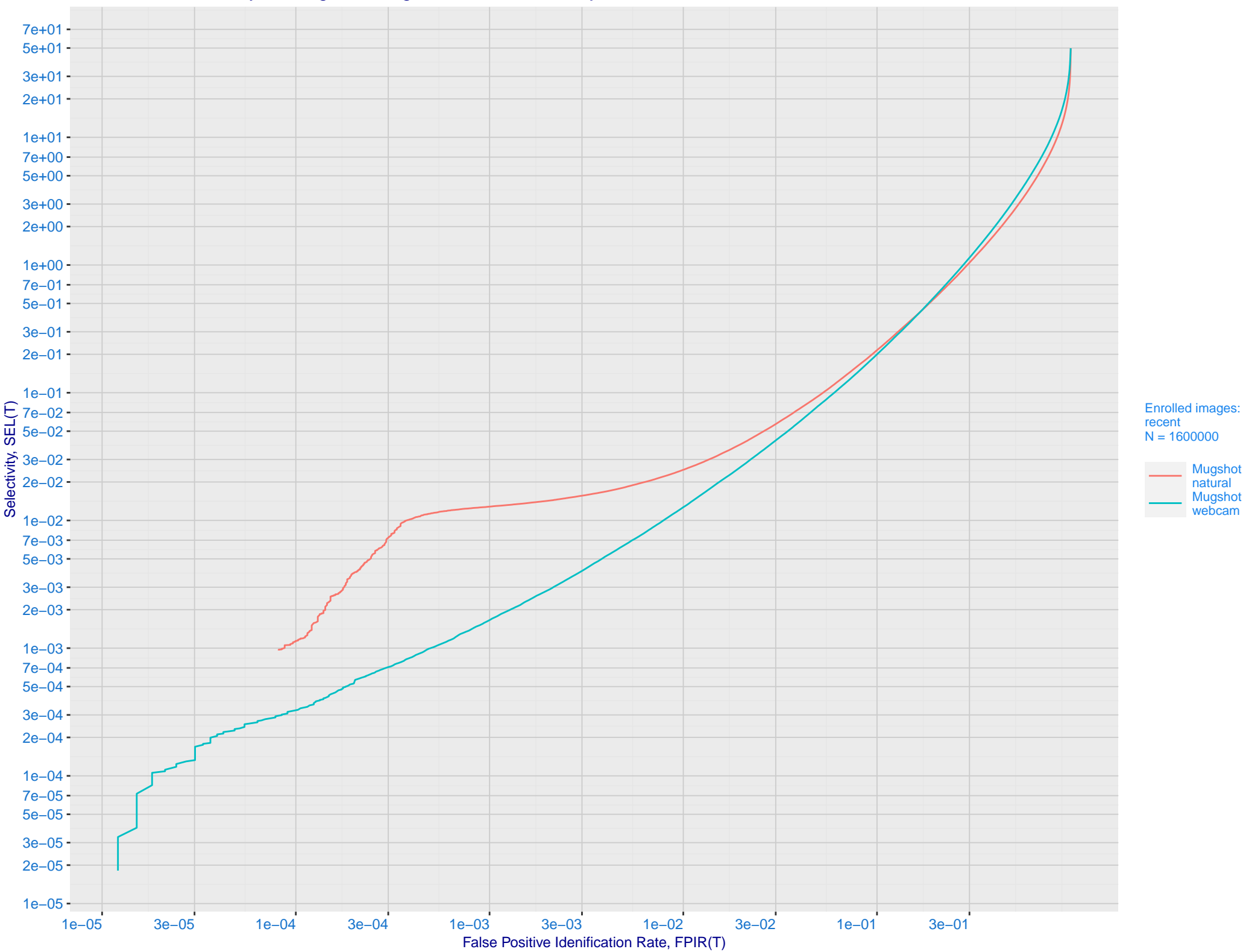- Mugshot–Webcam
- Visa–Border
- Visa–Kiosk

D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
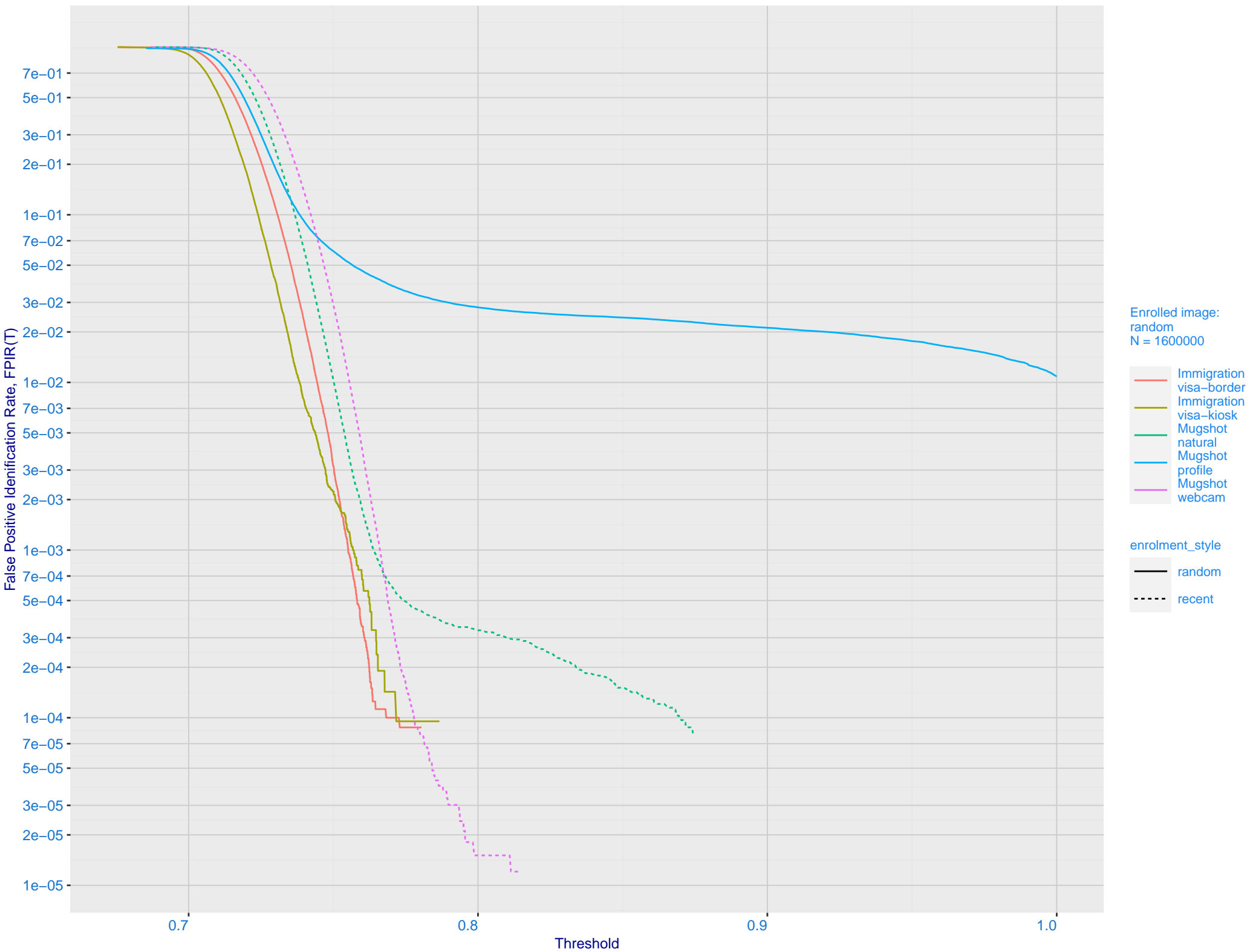
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images

F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate
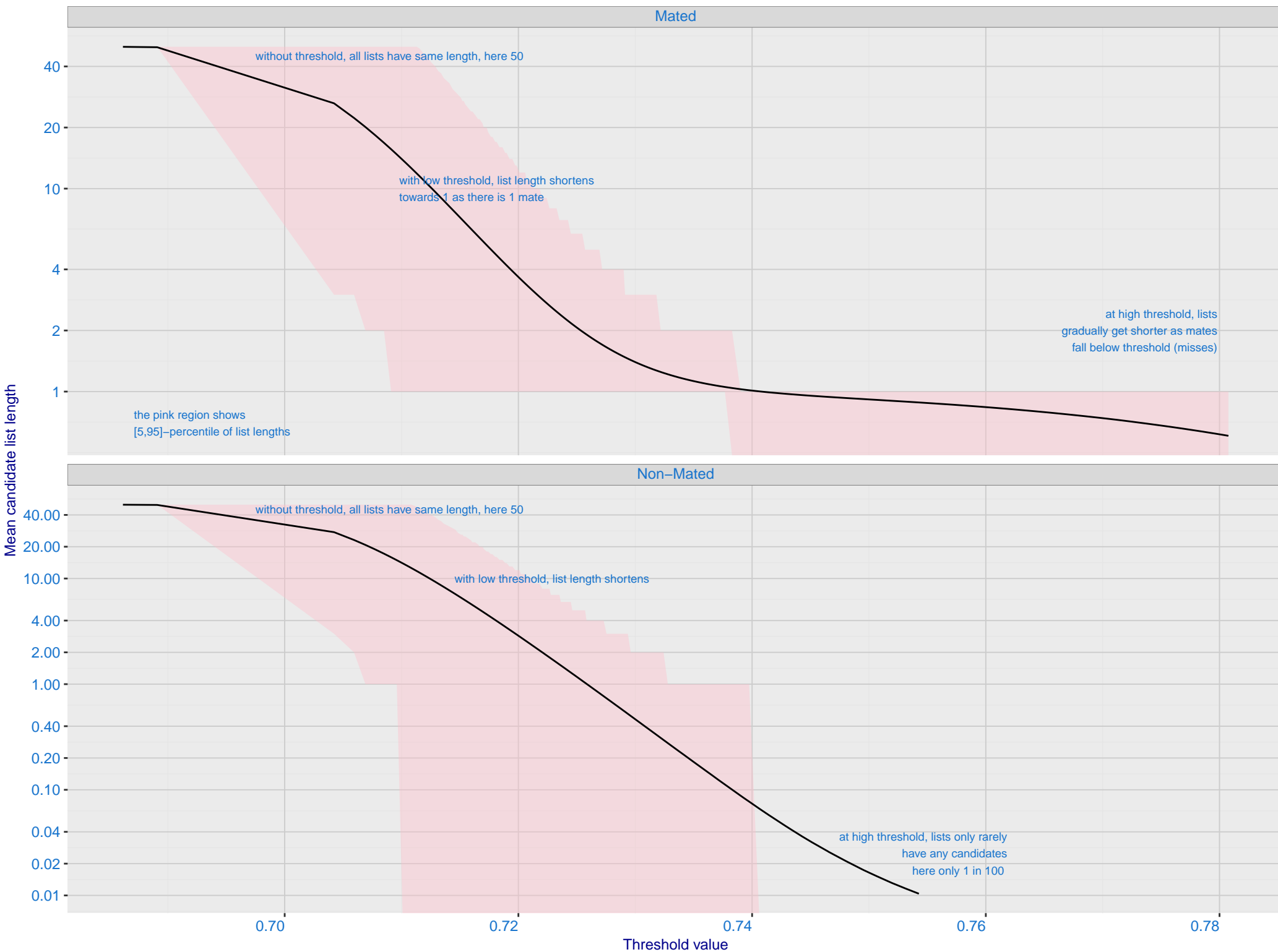
G: FPIR dependence on T by probe type for N = 1600000 subjects
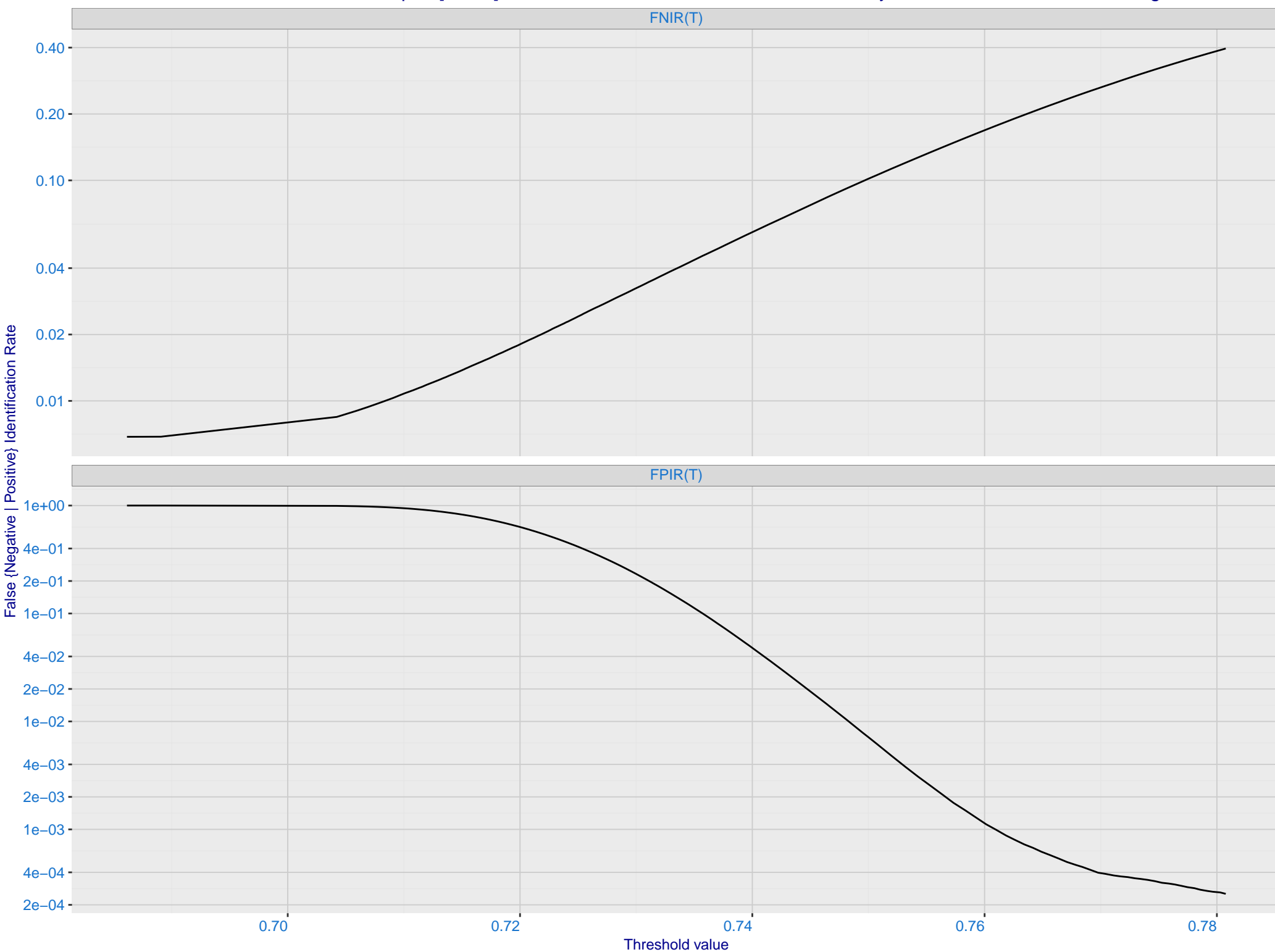
H: Reduced length candidate lists for human review
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image
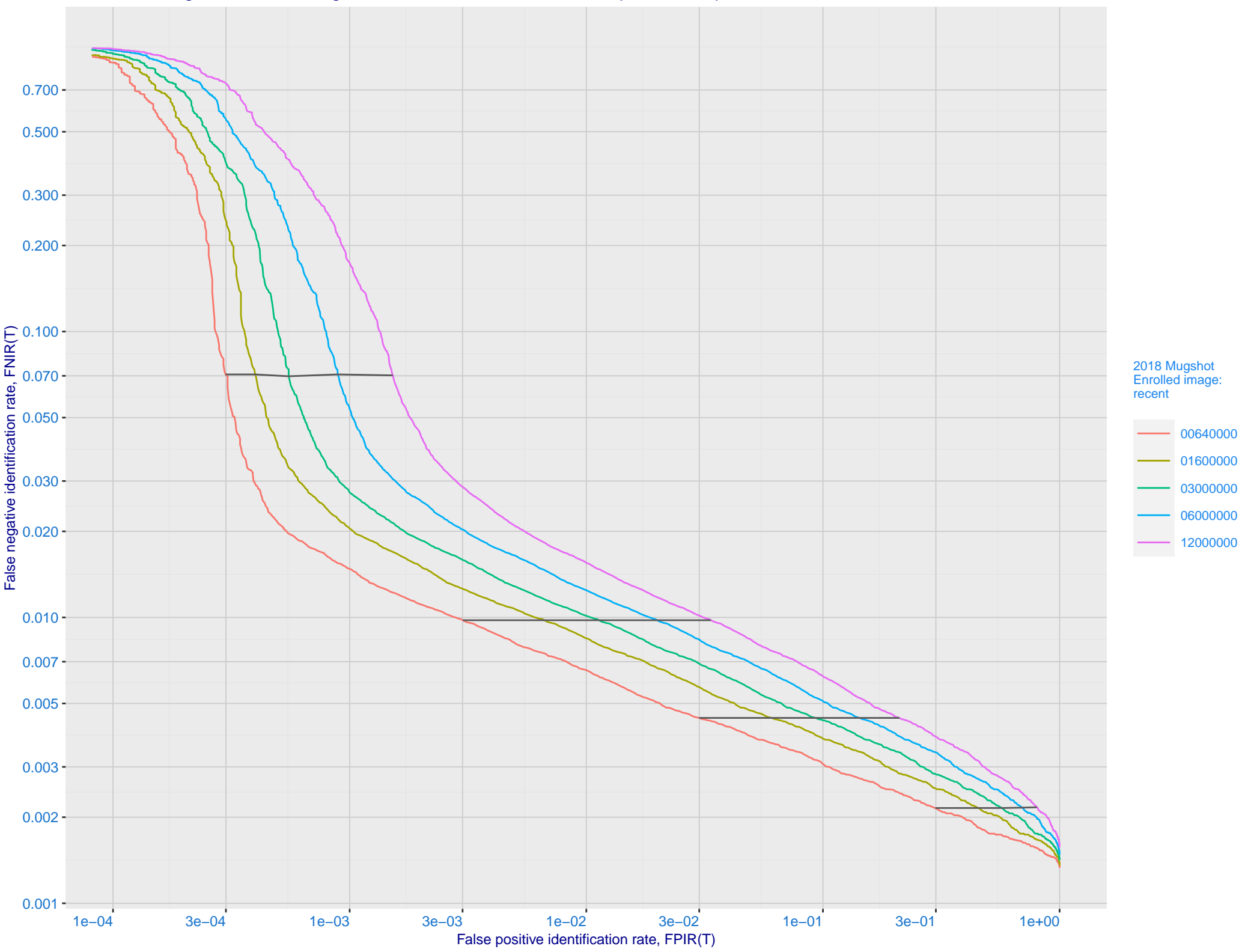
Mated

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

Threshold value

Mean candidate list length
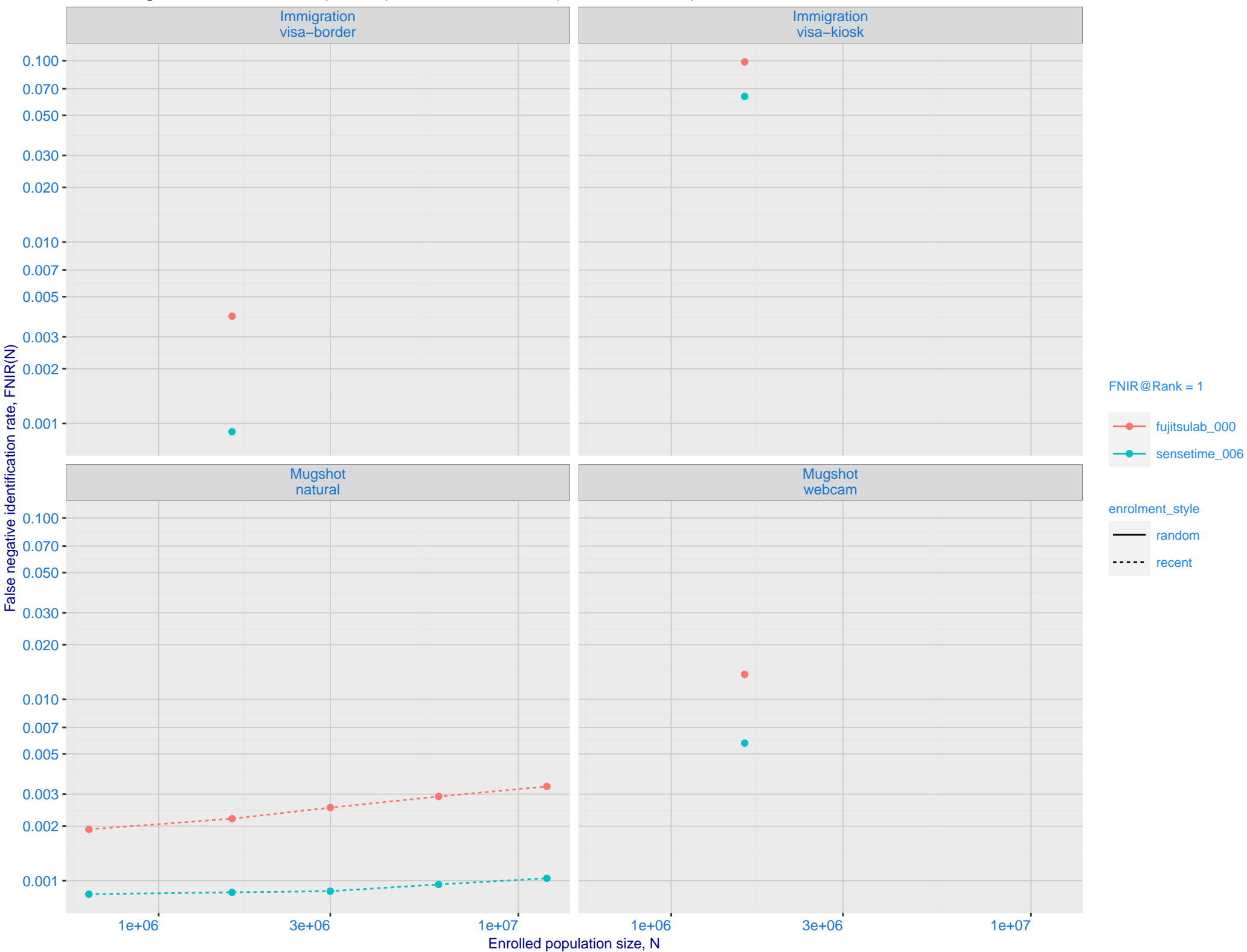
I: FNIR and FPIR dependence on threshold
Dataset is border–border with time–lapse [10,15] YRS with N = 1600000. Probes are 10–15 years later than enrollment image
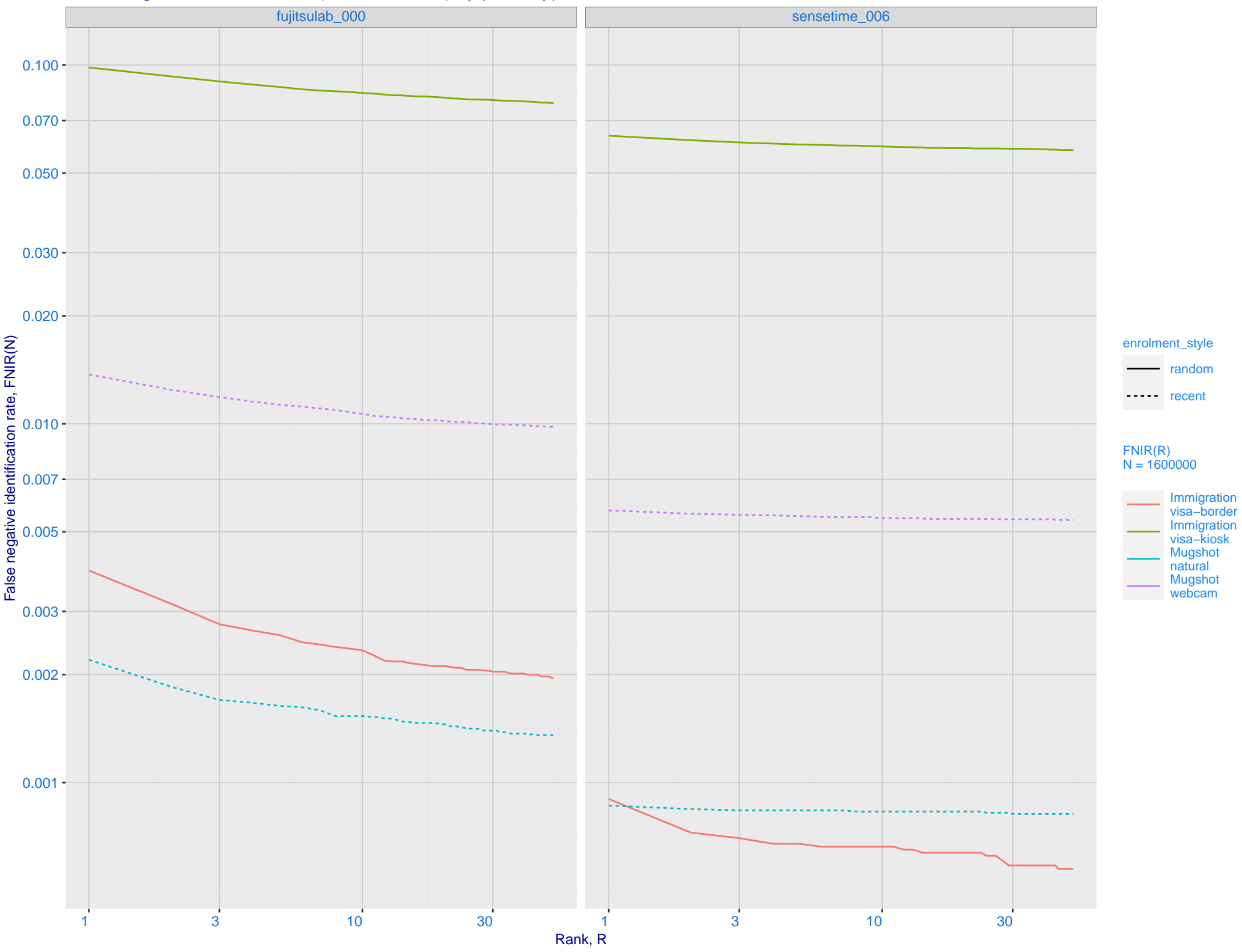
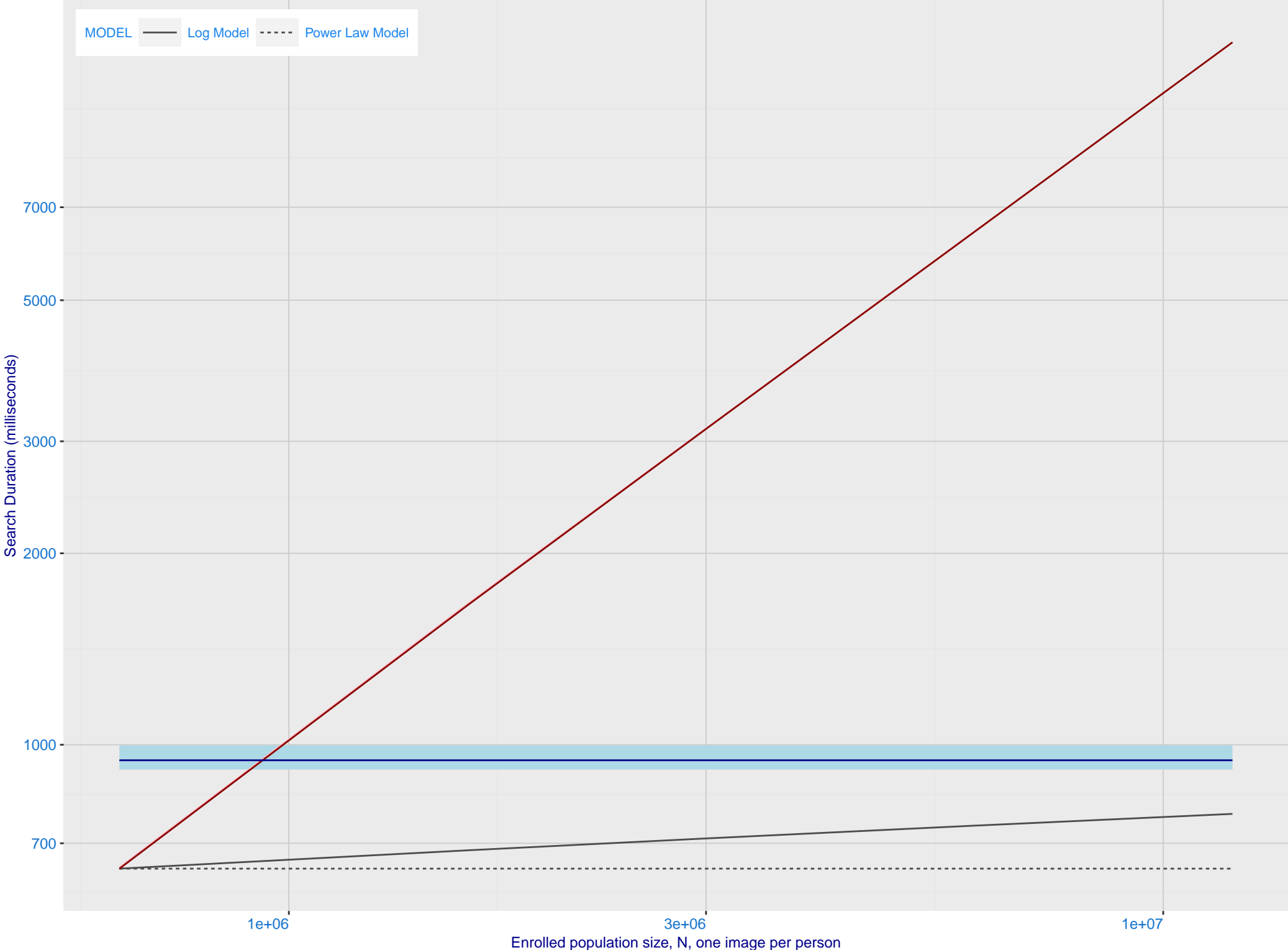J: DET for Mugshot natural images and various N. Links connect points of equal threshold.

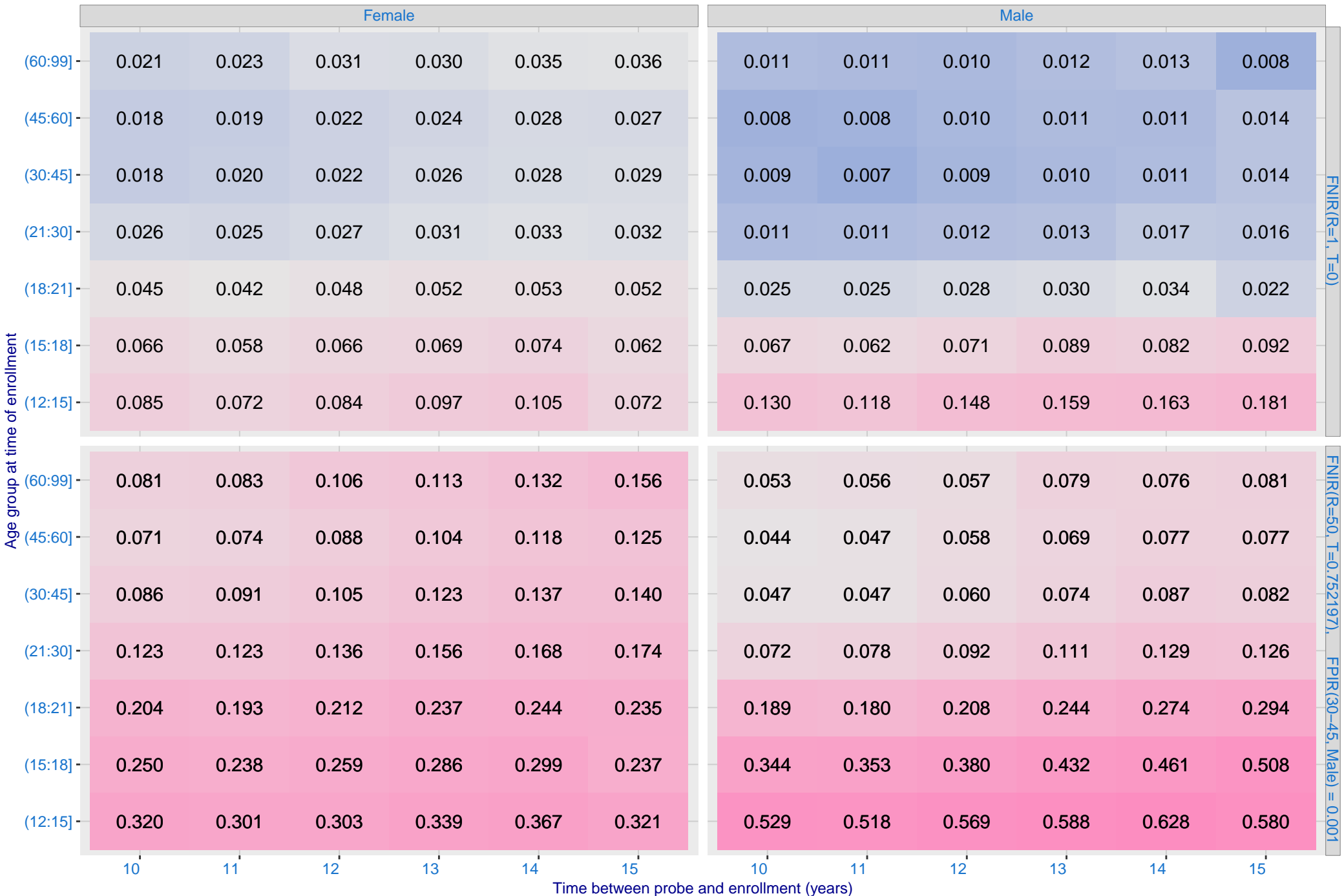K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_006)

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: fujitsulab_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