A: Datasheet

Algorithm: imperial_000

Developer: Imperial College London

Submission Date: 2019_08_28

Template size: 2048 bytes

Template time (2.5 percentile): 568 msec

Template time (median): 577 msec

Template time (97.5 percentile): 790 msec

Investigation:

Frontal mugshot ranking 52 (out of 279) –– FNIR(1600000, 0, 1) = 0.0024 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 52 (out of 241) –– FNIR(1600000, 0, 1) = 0.0148 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 32 (out of 210) –– FNIR(1600000, 0, 1) = 0.2803 vs. lowest 0.0587 from xforwardai_002

Immigration visa–border ranking 37 (out of 168) –– FNIR(1600000, 0, 1) = 0.0044 vs. lowest 0.0013 from visionlabs_010

Immigration visa–kiosk ranking 28 (out of 165) –– FNIR(1600000, 0, 1) = 0.0967 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

Frontal mugshot ranking 52 (out of 279) –– FNIR(1600000, T, L+1) = 0.0259, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004
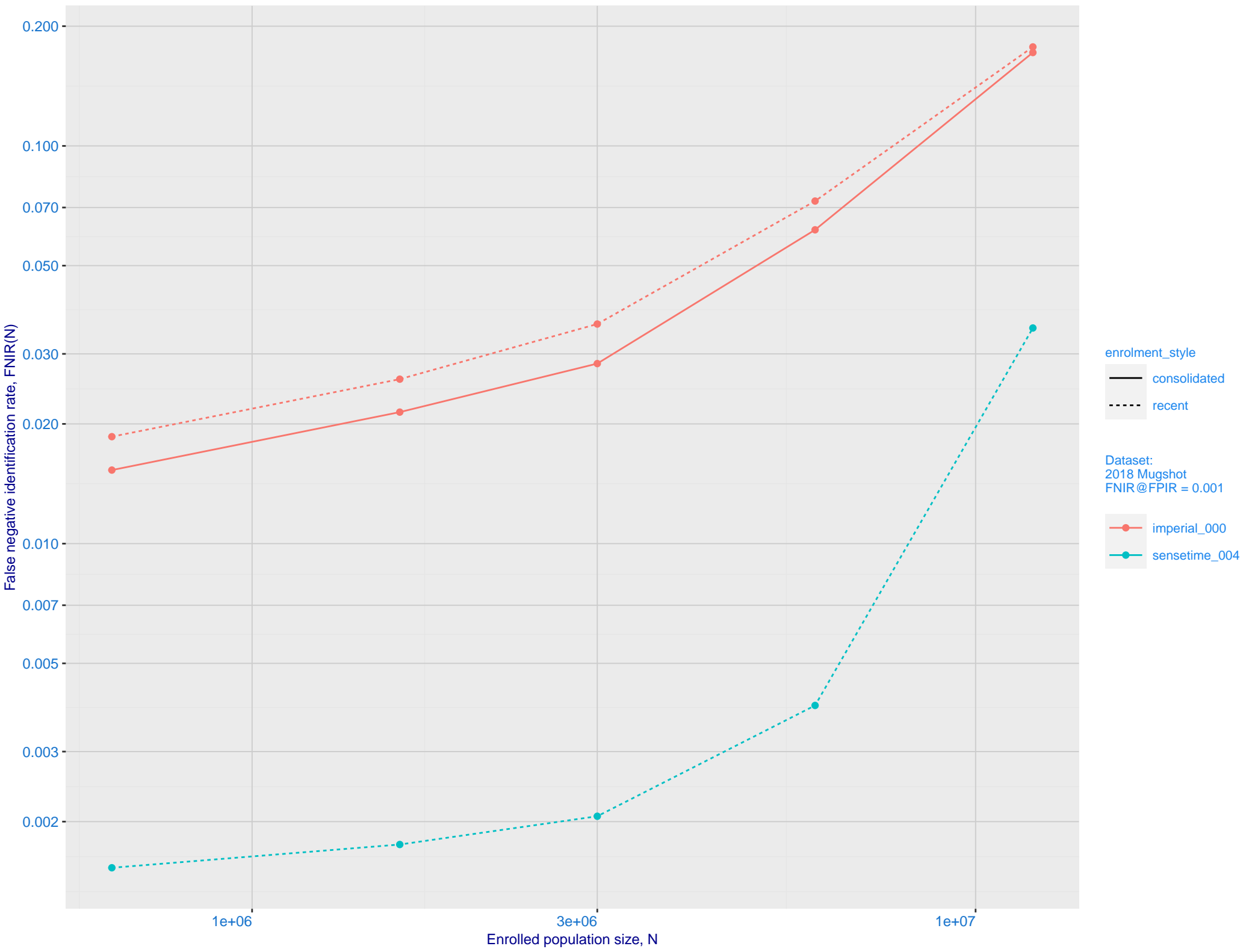
Mugshot webcam ranking 43 (out of 236) –– FNIR(1600000, T, L+1) = 0.0677, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 136 (out of 209) –– FNIR(1600000, T, L+1) = 0.9987, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa–border ranking 45 (out of 167) –– FNIR(1600000, T, L+1) = 0.0418, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa–kiosk ranking 32 (out of 162) –– FNIR(1600000, T, L+1) = 0.2456, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000
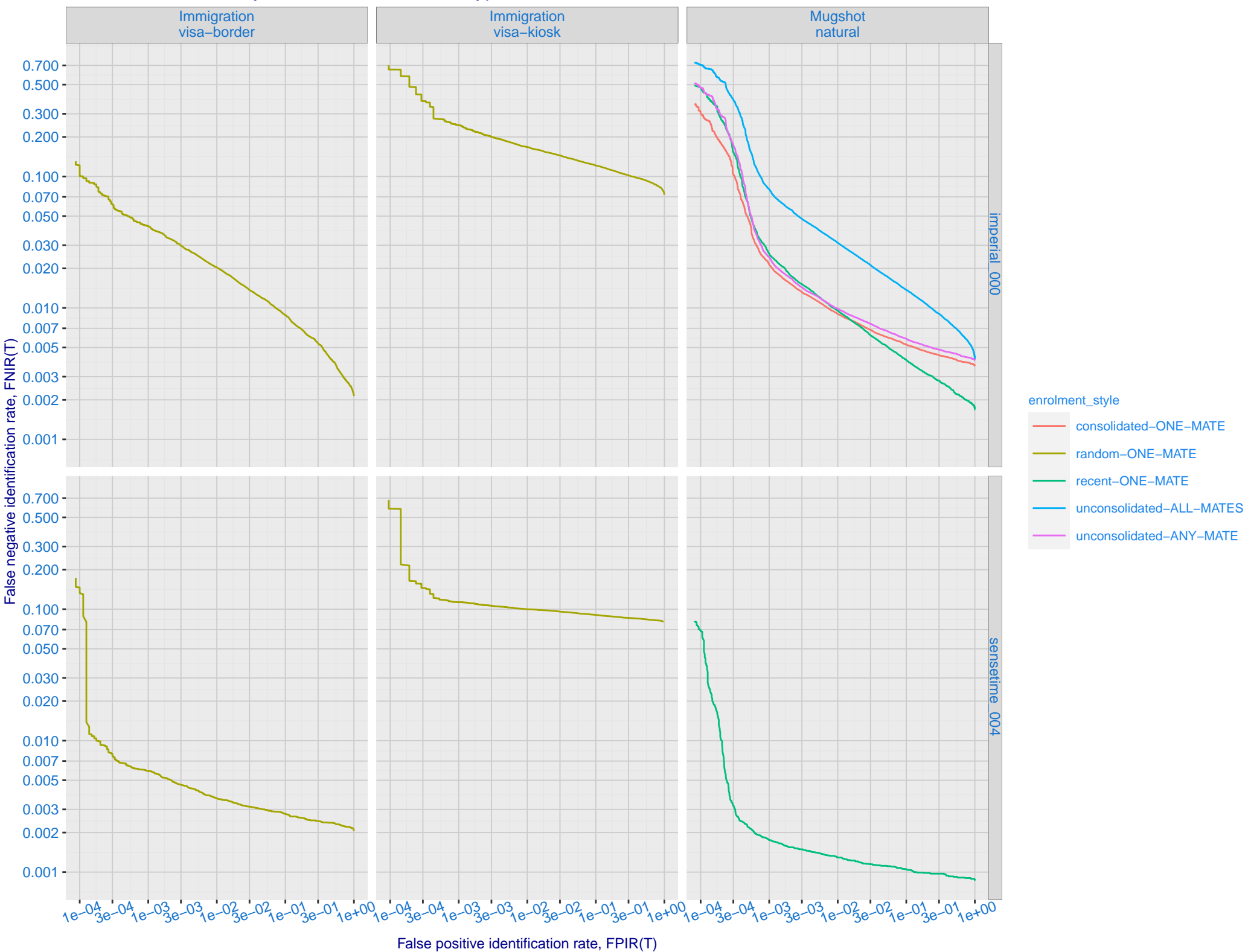
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_004)

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

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

1.00
0.80
0.60
0.50
0.40
0.30

0.20

0.10
0.08
0.06
0.05
0.04
0.03
0.02

Dataset

Mugshot–Mugshot
Mugshot–ProfileView
Mugshot–Webcam
Visa–Border
Visa–Kiosk

Aug 28
Date algorithm submitted to FRVT

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
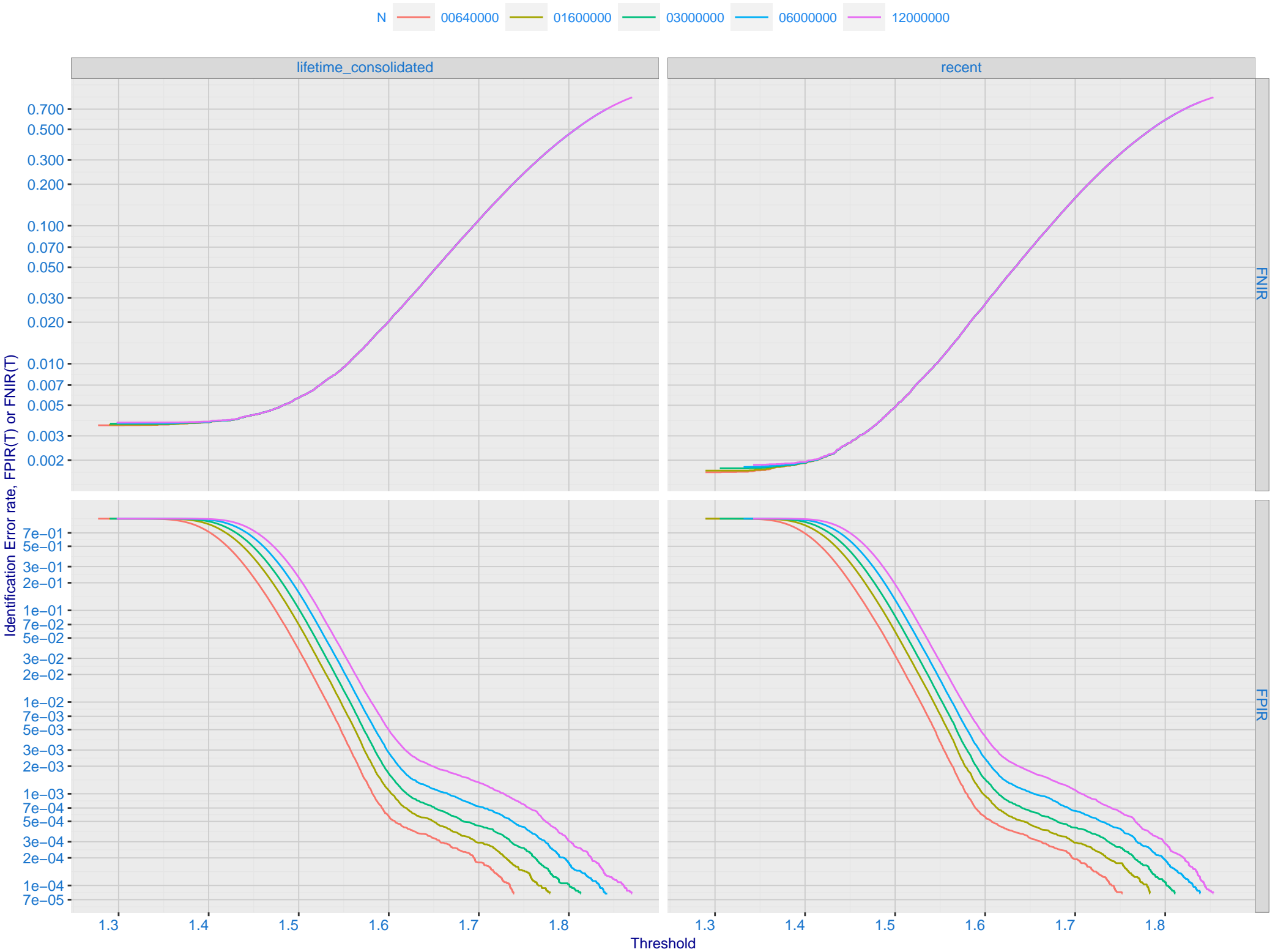
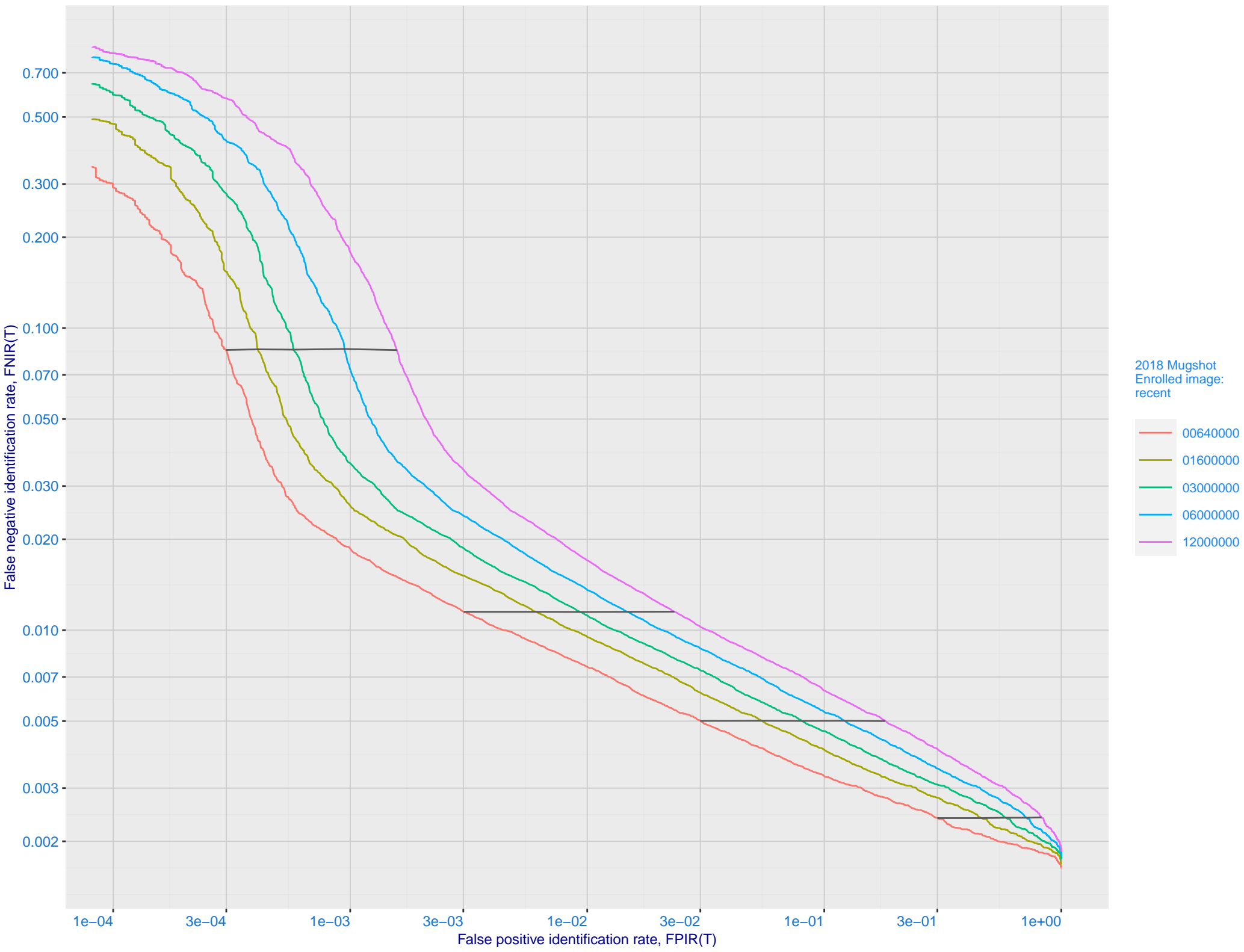F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate
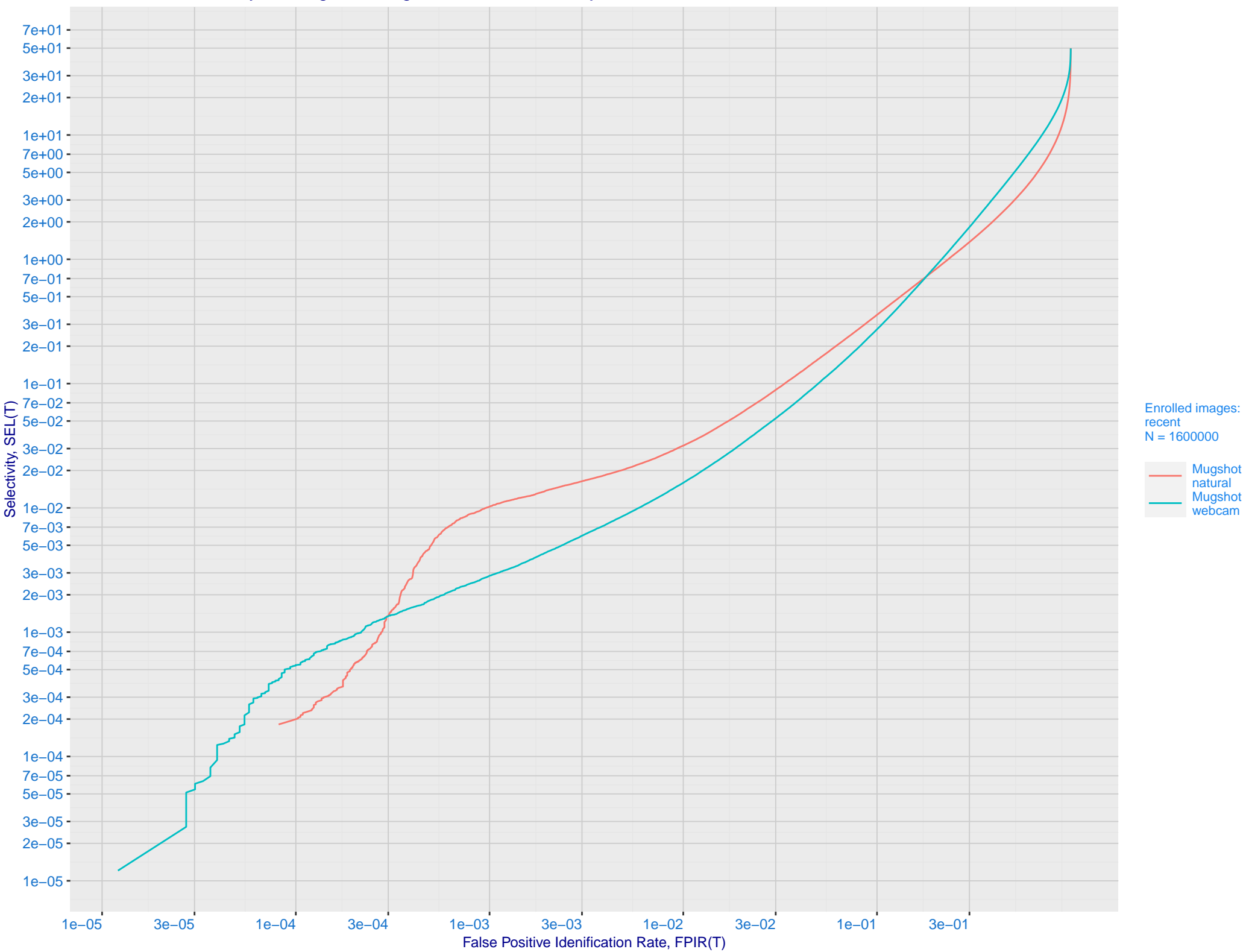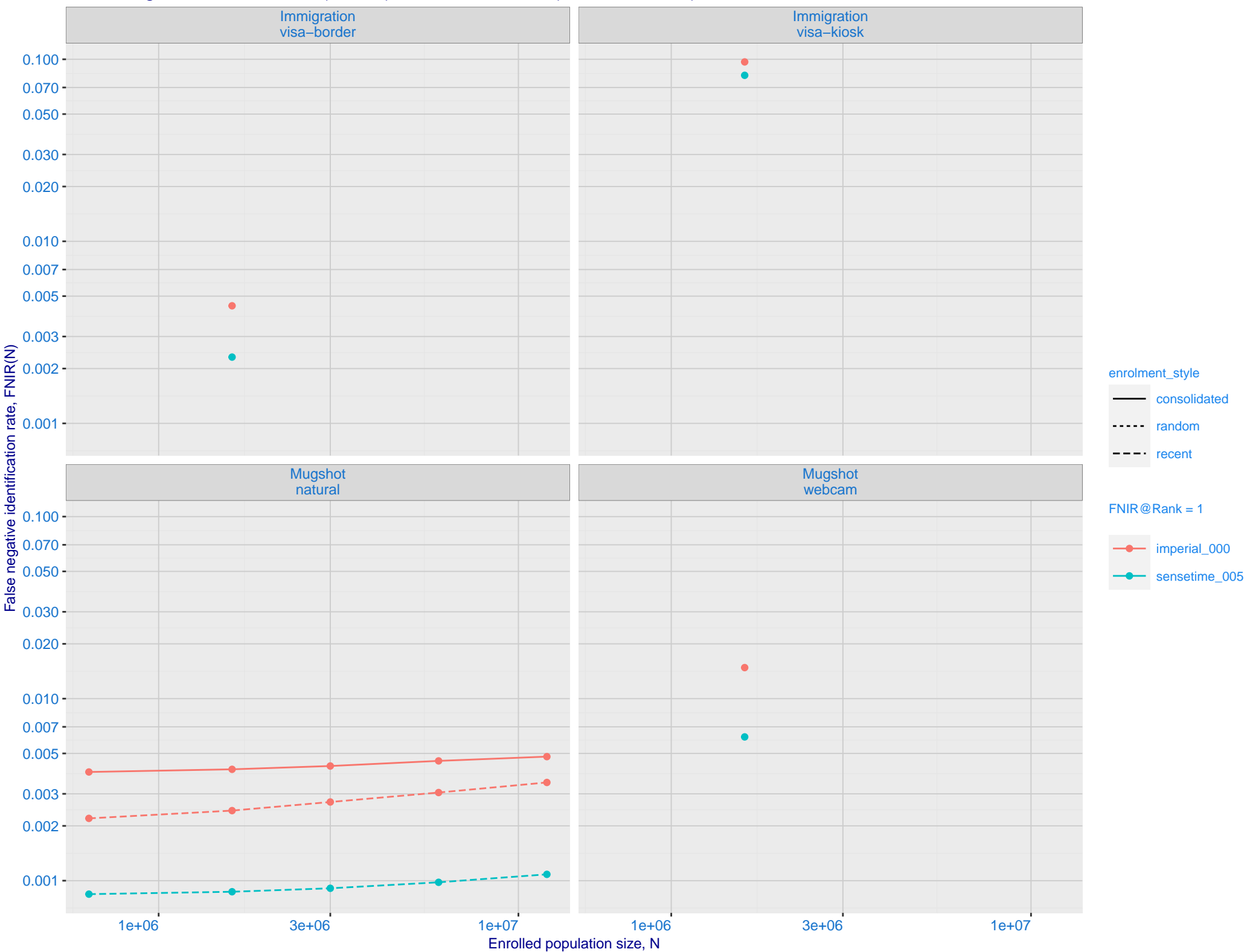
G: FPIR dependence on T by probe type for N = 1600000 subjects

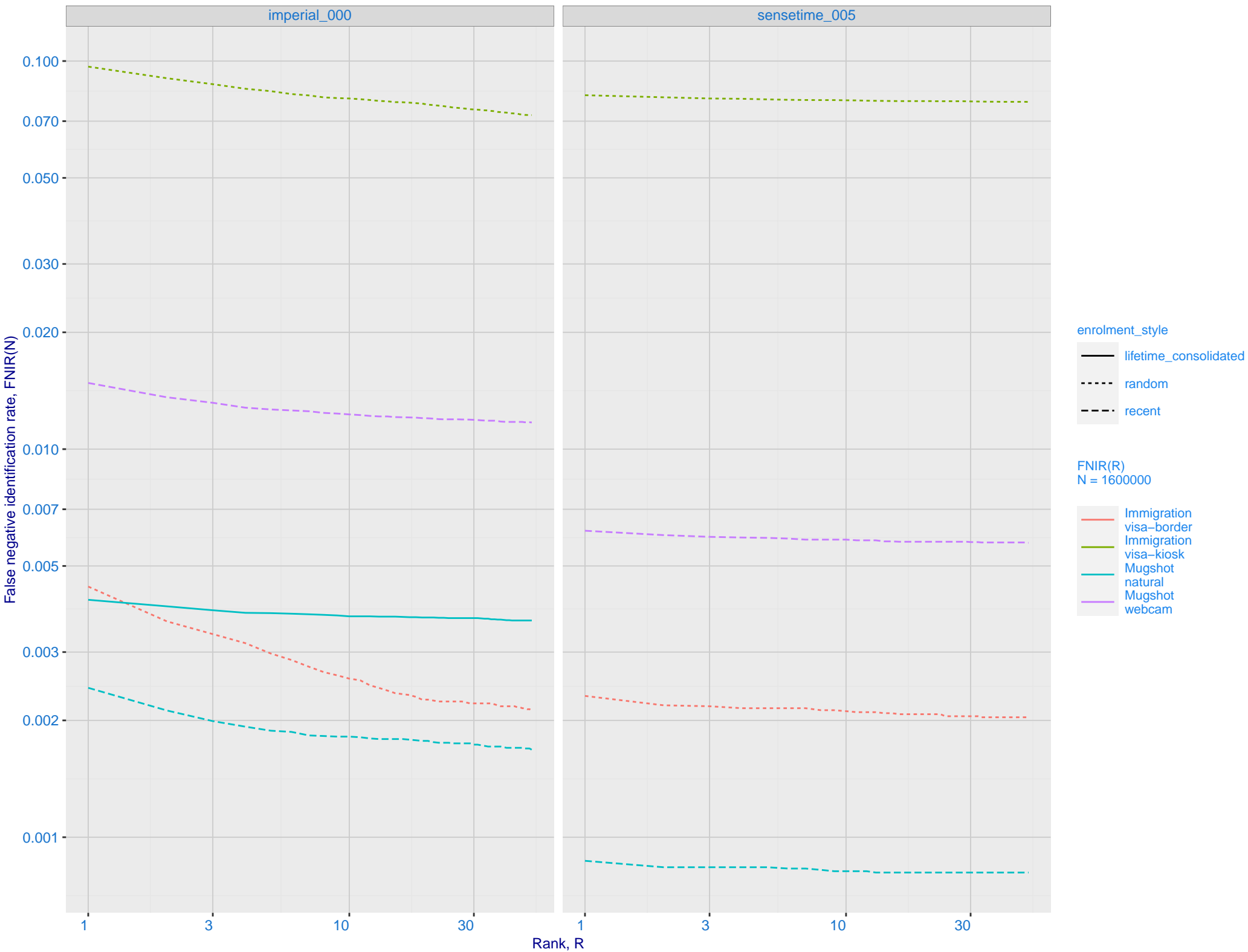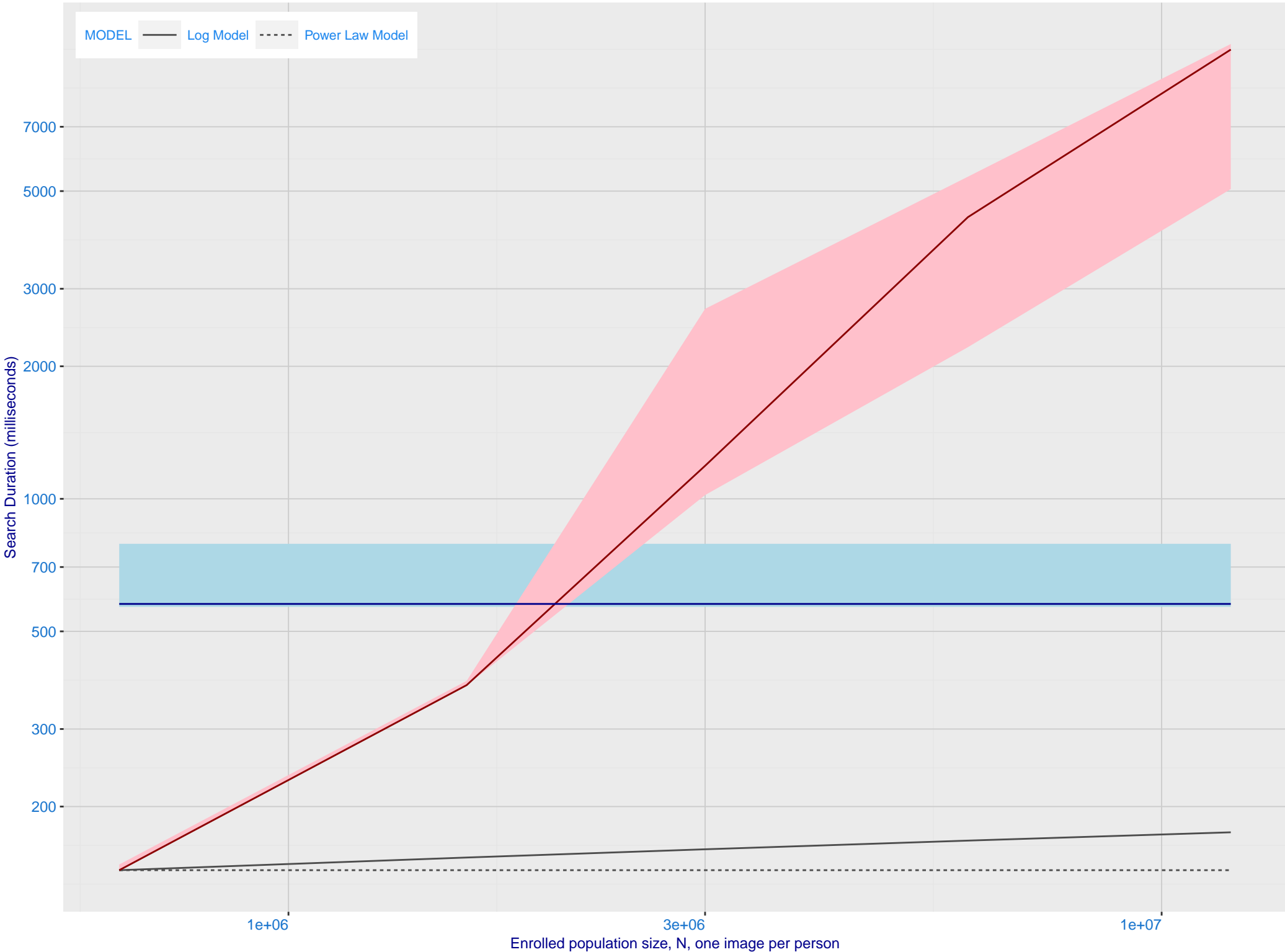J: DET for Mugshot natural images and various N. Links connect points of equal threshold.

K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005)

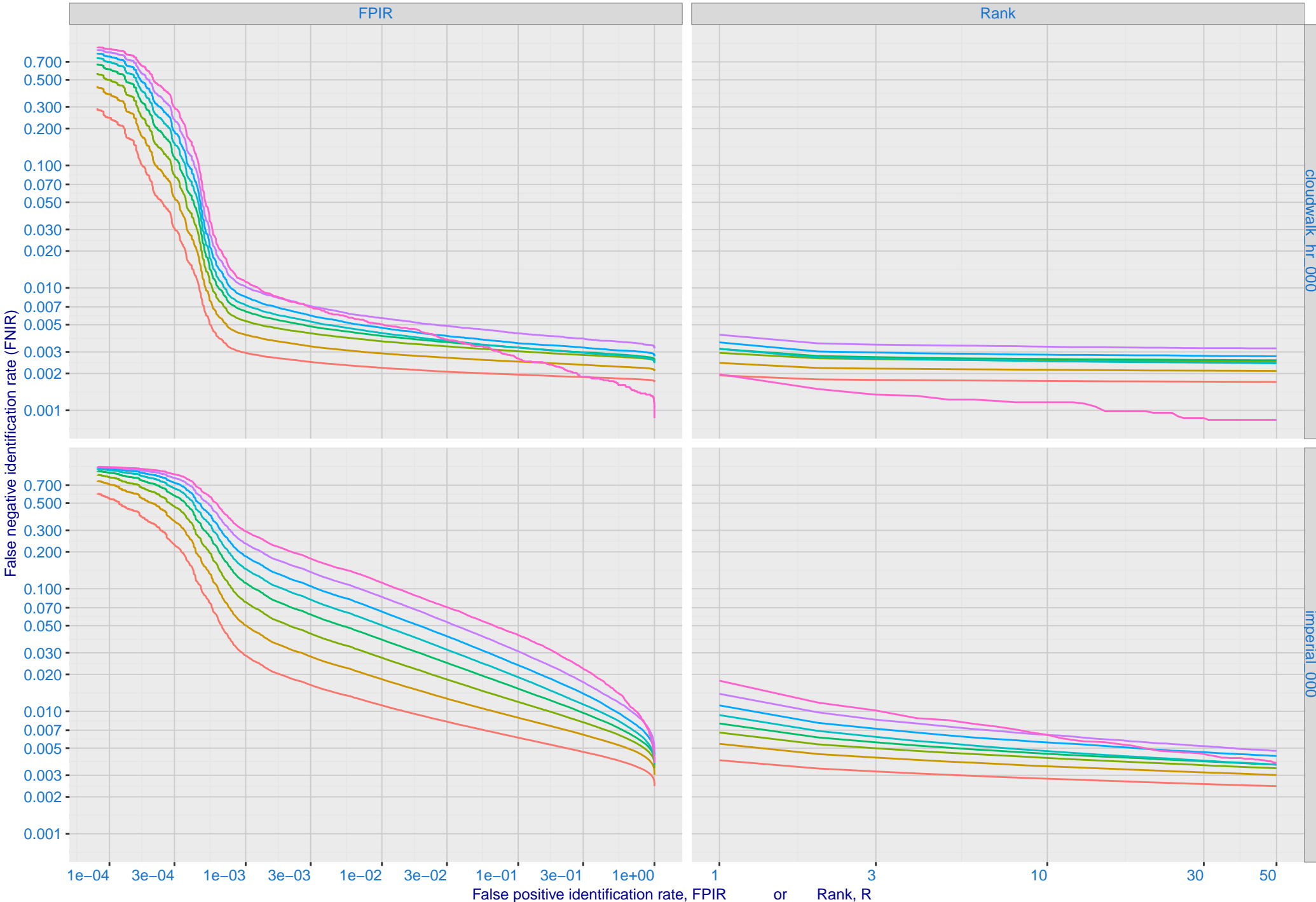L: Investigational mode: FNIR(1600000, R, 0) by probe type

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

MODEL ——— Log Model ------ Power Law Model

Search Duration (milliseconds)

Enrolled population size, N, one image per person

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