A: Datasheet

Algorithm: kedacom_001

Developer: Kedacom International Pte

Submission Date: 2019_09_16

Template size: 292 bytes

Template time (2.5 percentile): 504 msec

Template time (median): 507 msec

Template time (97.5 percentile): 808 msec

Investigation:

Frontal mugshot ranking 118 (out of 279) −− FNIR(1600000, 0, 1) = 0.0077 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 132 (out of 241) −− FNIR(1600000, 0, 1) = 0.0356 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 185 (out of 210) −− FNIR(1600000, 0, 1) = 0.9722 vs. lowest 0.0587 from xforwardai_002

Immigration visa−border ranking 101 (out of 168) −− FNIR(1600000, 0, 1) = 0.0342 vs. lowest 0.0013 from visionlabs_010

Immigration visa−kiosk ranking 101 (out of 165) −− FNIR(1600000, 0, 1) = 0.2366 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

Frontal mugshot ranking 47 (out of 279) −− FNIR(1600000, T, L+1) = 0.0225, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

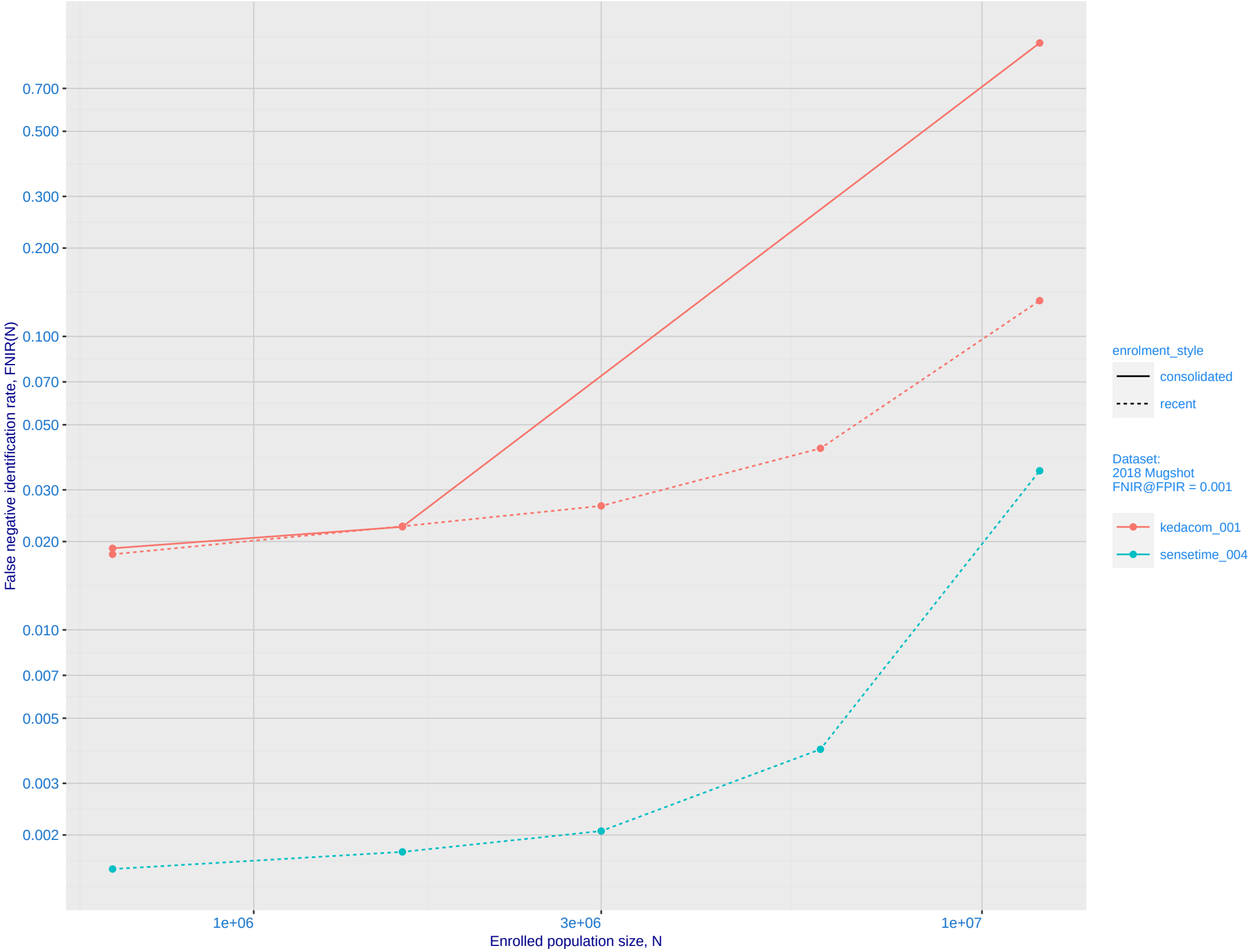
Mugshot webcam ranking 48 (out of 236) −− FNIR(1600000, T, L+1) = 0.0722, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 76 (out of 209) −− FNIR(1600000, T, L+1) = 0.9860, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

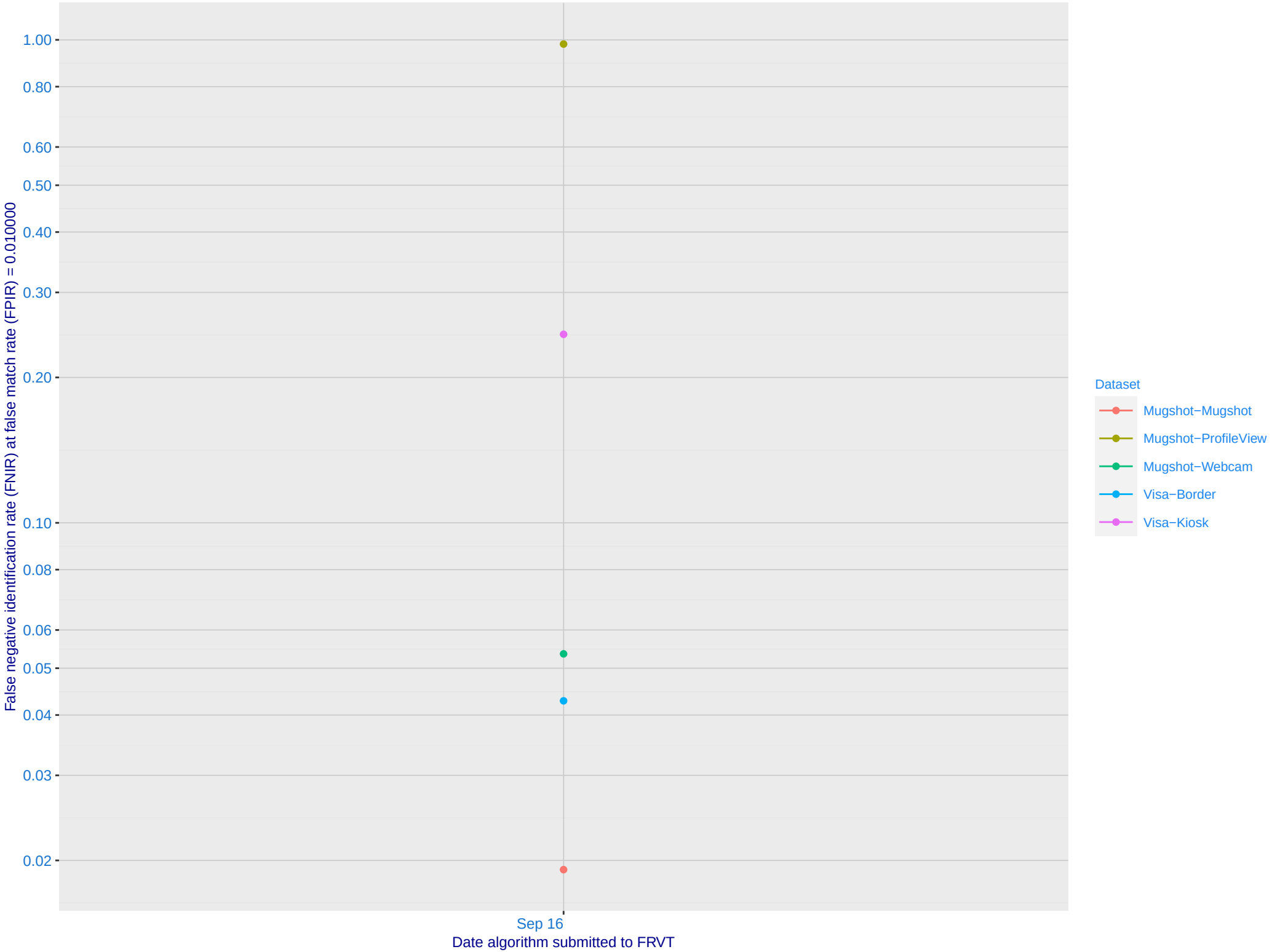
Immigration visa−border ranking 56 (out of 167) −− FNIR(1600000, T, L+1) = 0.0552, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

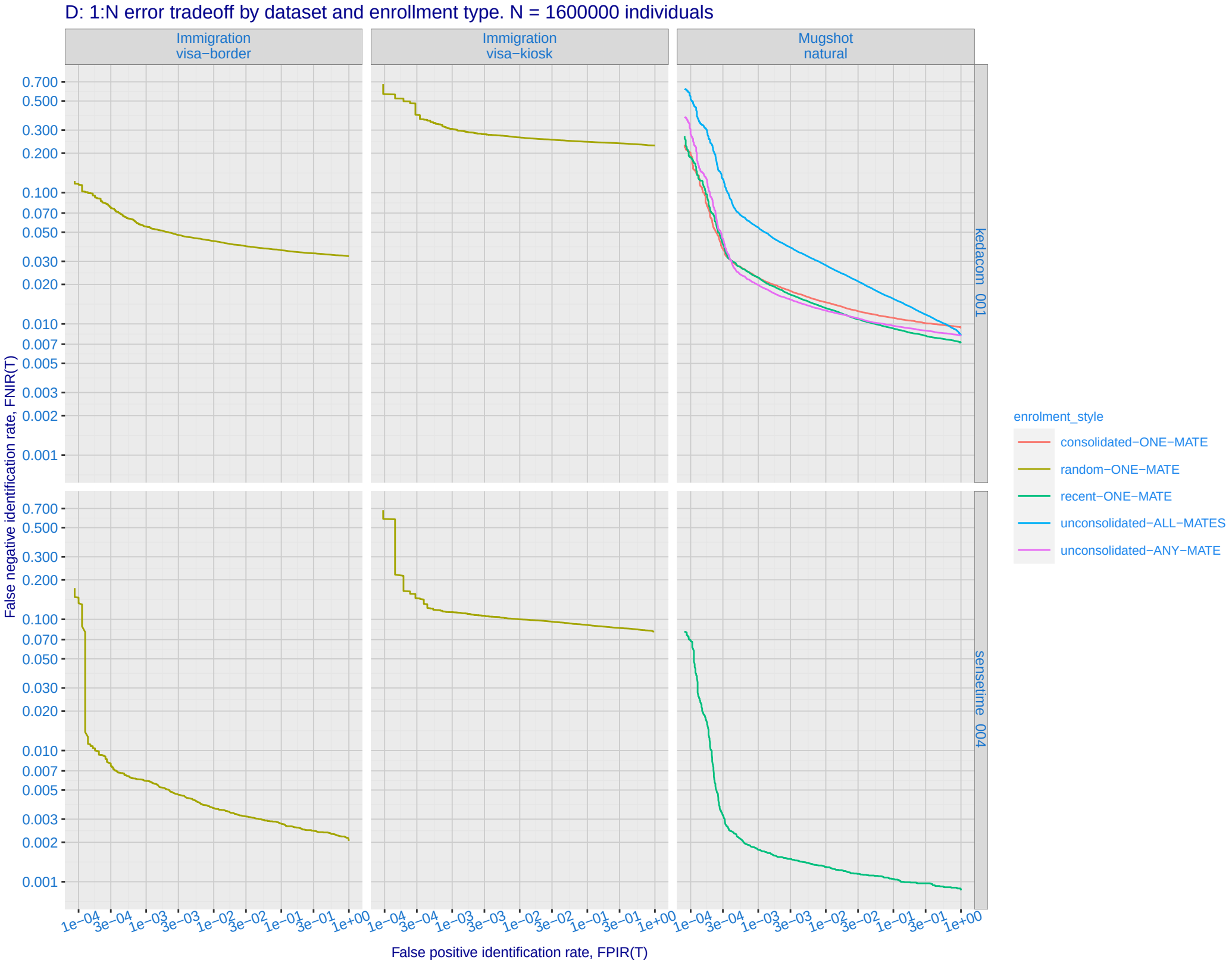
Immigration visa−kiosk ranking 46 (out of 162) −− FNIR(1600000, T, L+1) = 0.3062, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000

B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_004)

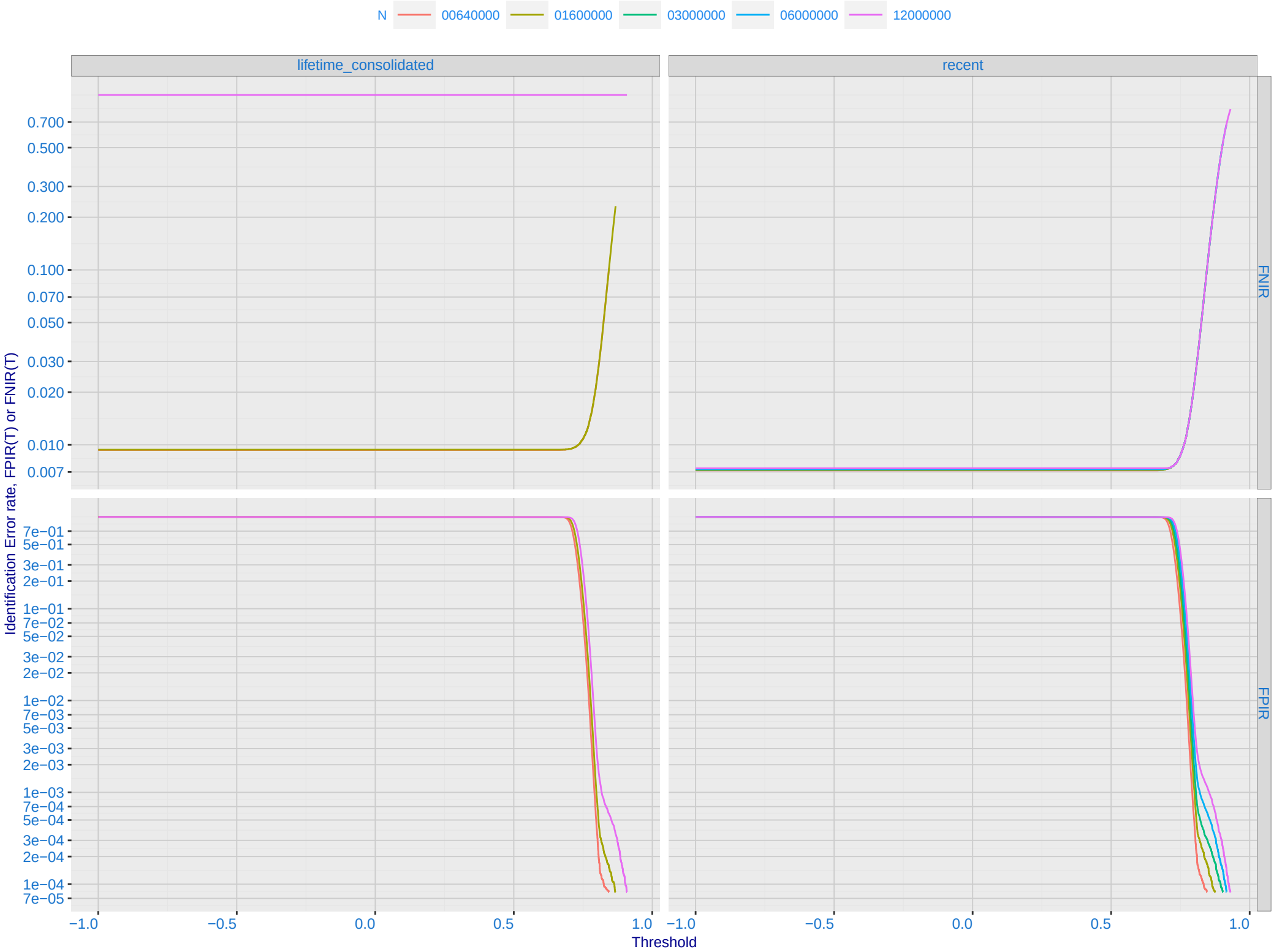


C: Evolution of accuracy for KEDACOM algorithms on three datasets 2018 − present

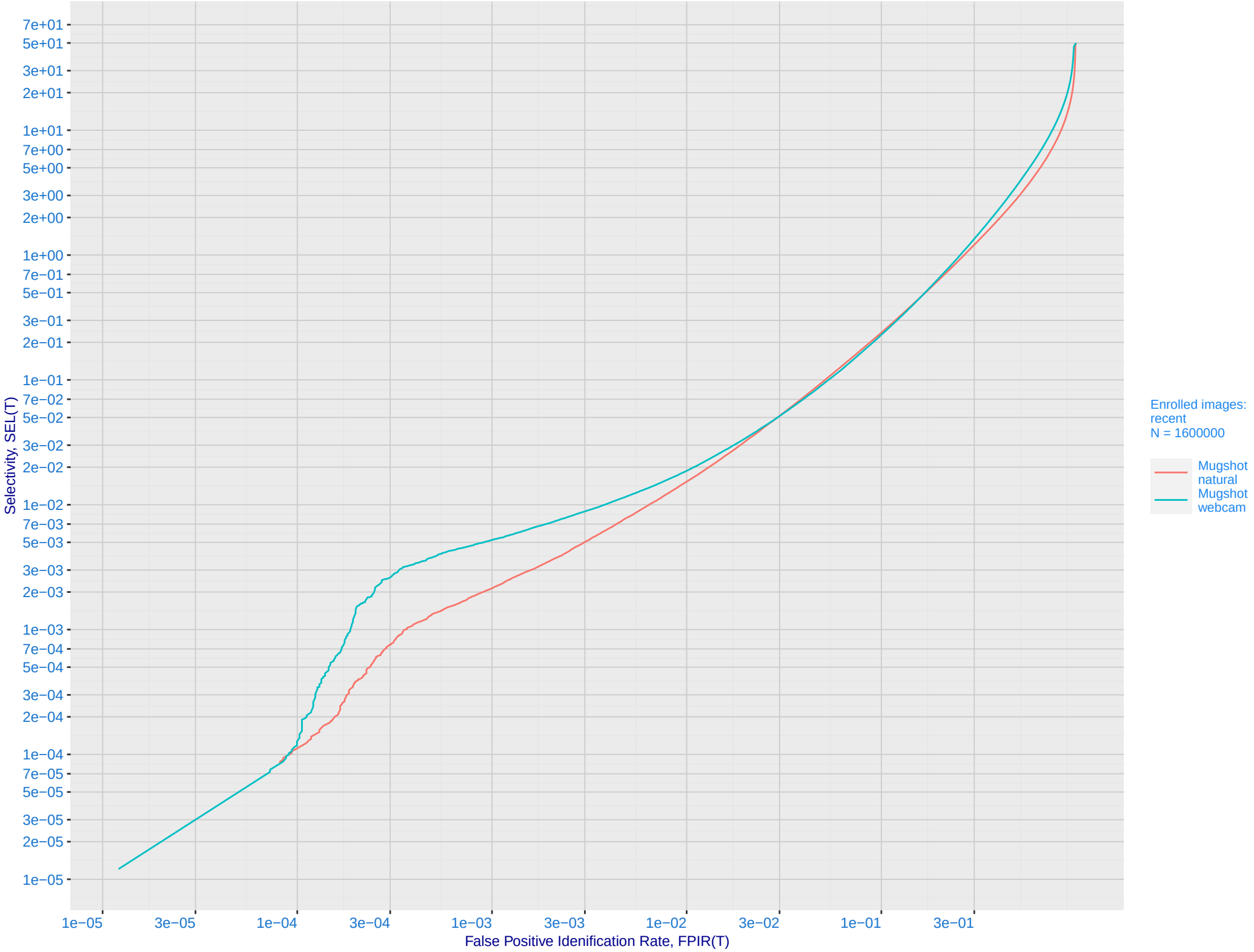


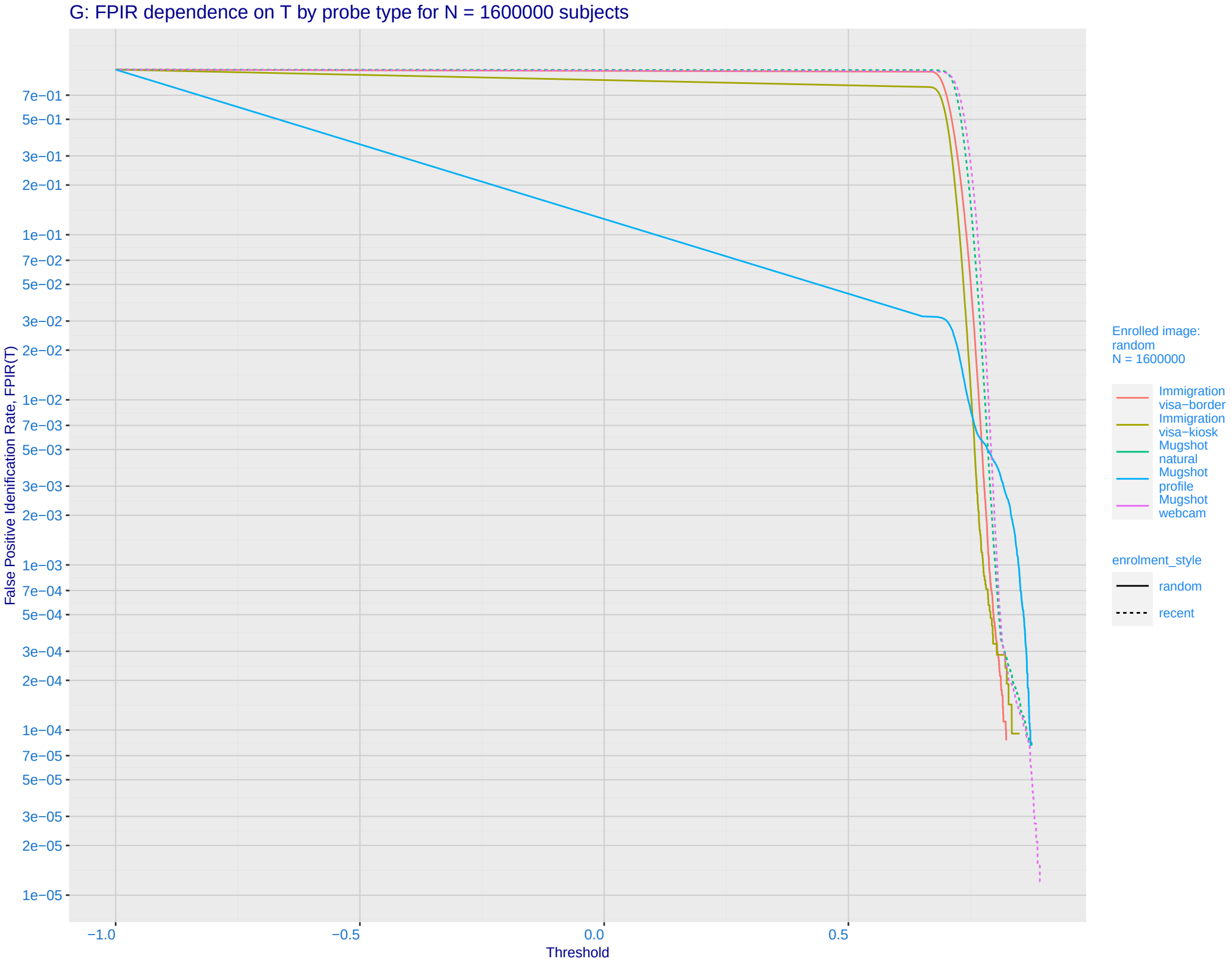

D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
kedacom_001
sensetime_004
False negative identification rate, FNIR(T)
False positive identification rate, FPIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
0.001
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
enrolment_style
consolidated−ONE−MATE
random−ONE−MATE
recent−ONE−MATE
unconsolidated−ALL−MATES
unconsolidated−ANY−MATE

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

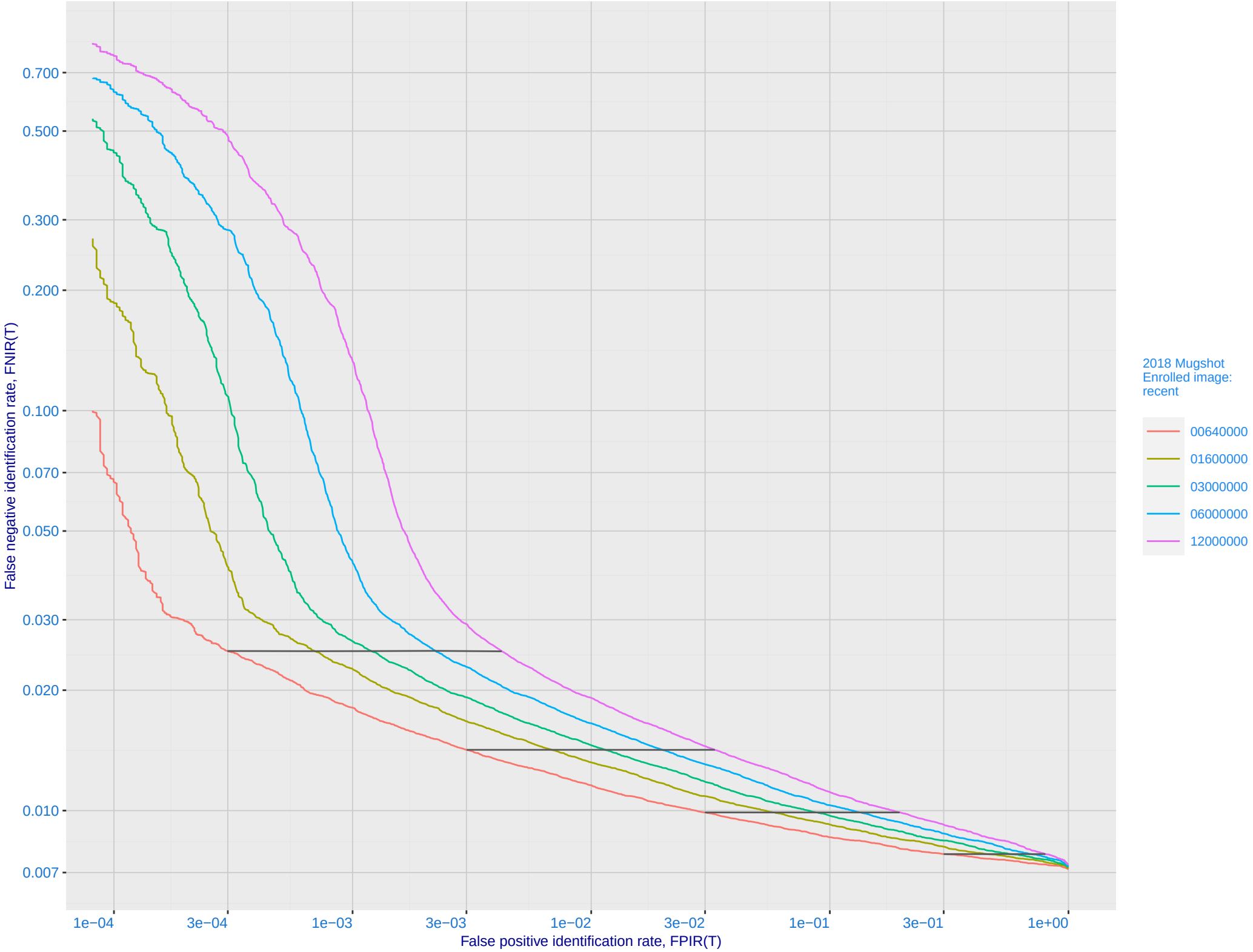


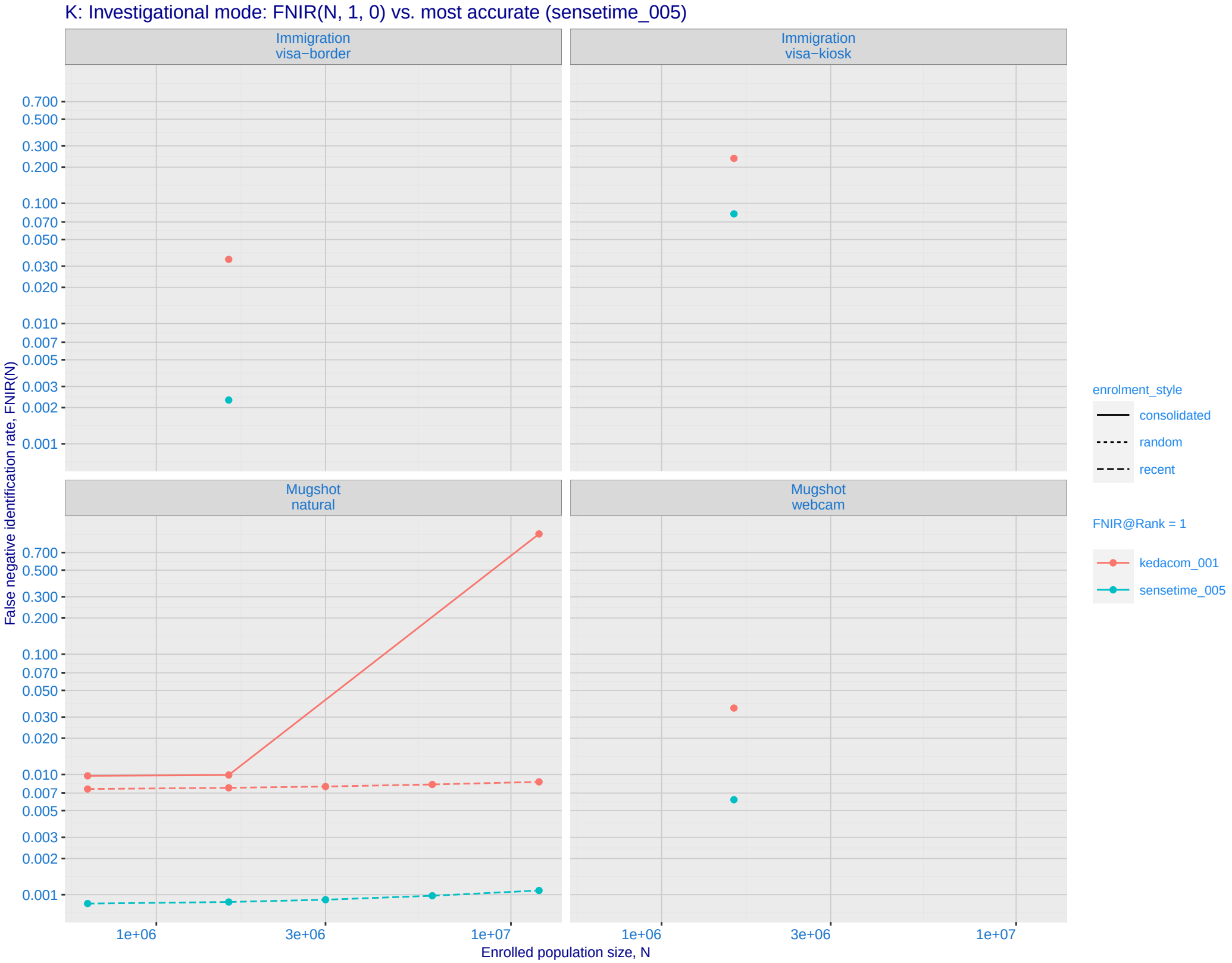
F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate

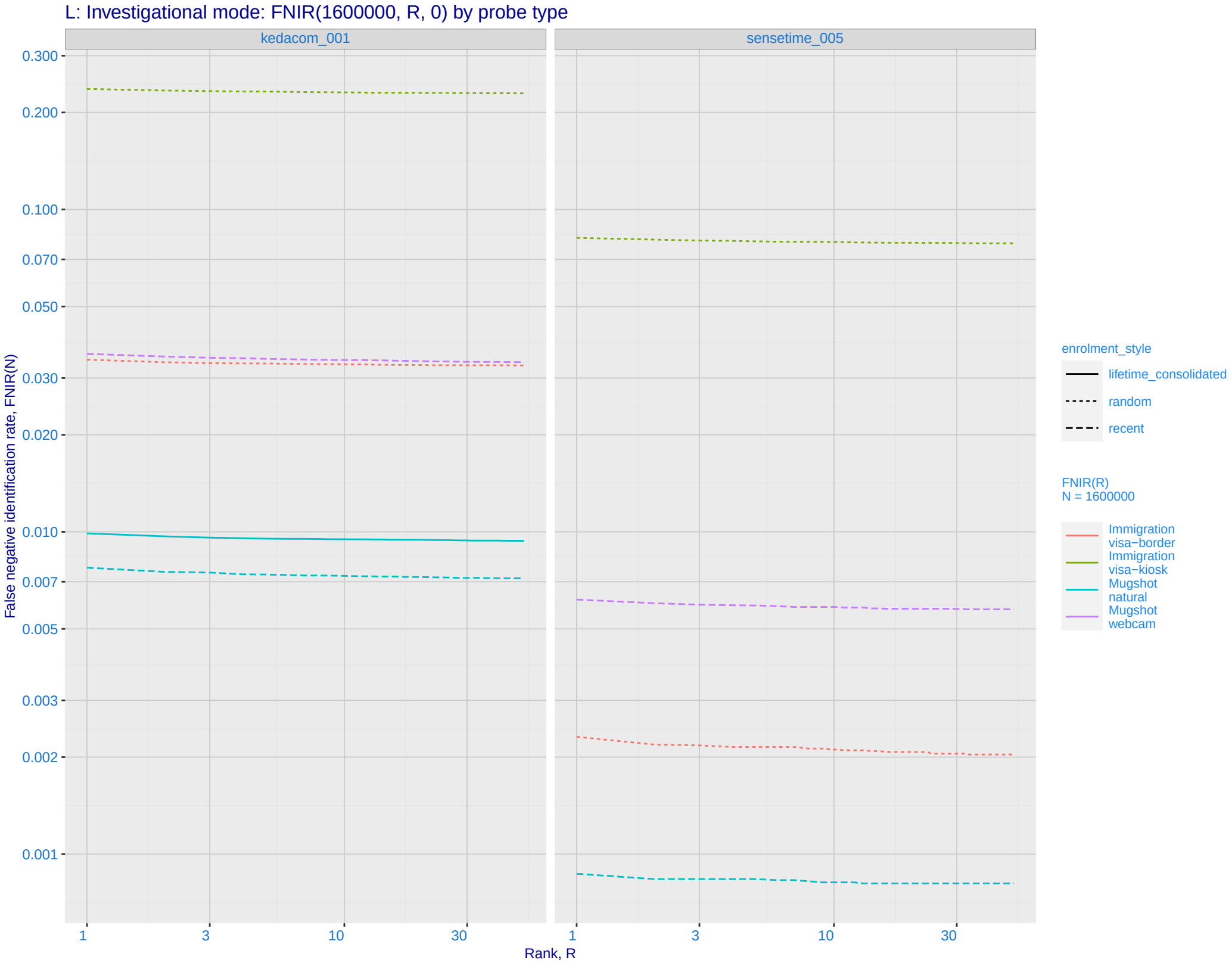



G: FPIR dependence on T by probe type for N = 1600000 subjects
False Positive Idenification Rate, FPIR(T)
7e−01
5e−01
3e−01
2e−01
1e−01
7e−02
5e−02
3e−02
2e−02
1e−02
7e−03
5e−03
3e−03
2e−03
1e−03
7e−04
5e−04
3e−04
2e−04
1e−04
7e−05
5e−05
3e−05
2e−05
1e−05
−1.0
−0.5
0.0
0.5
Threshold
Enrolled image:
random
N = 1600000
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
Mugshot profile
Mugshot webcam
enrolment_style
random
recent

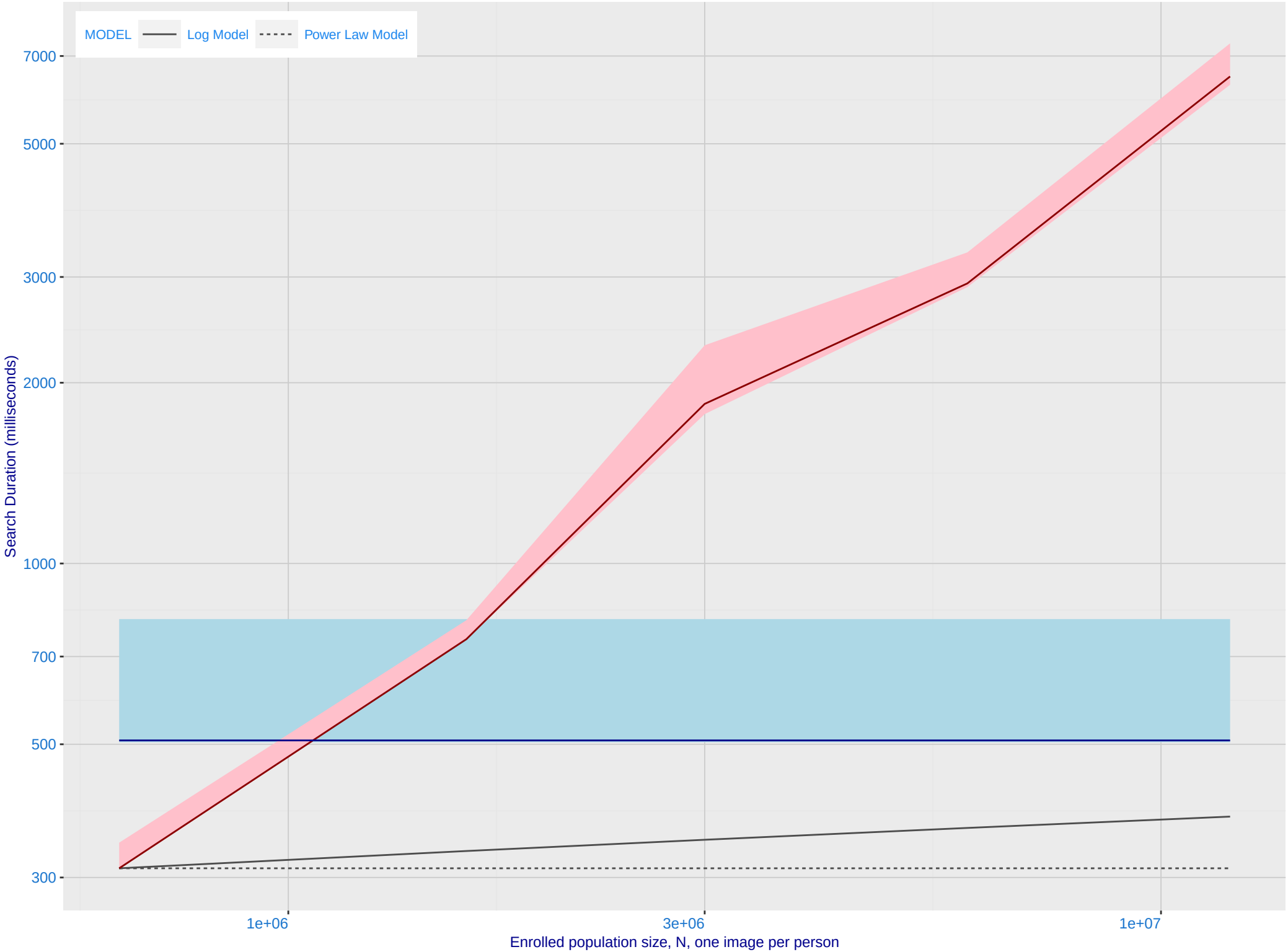
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.



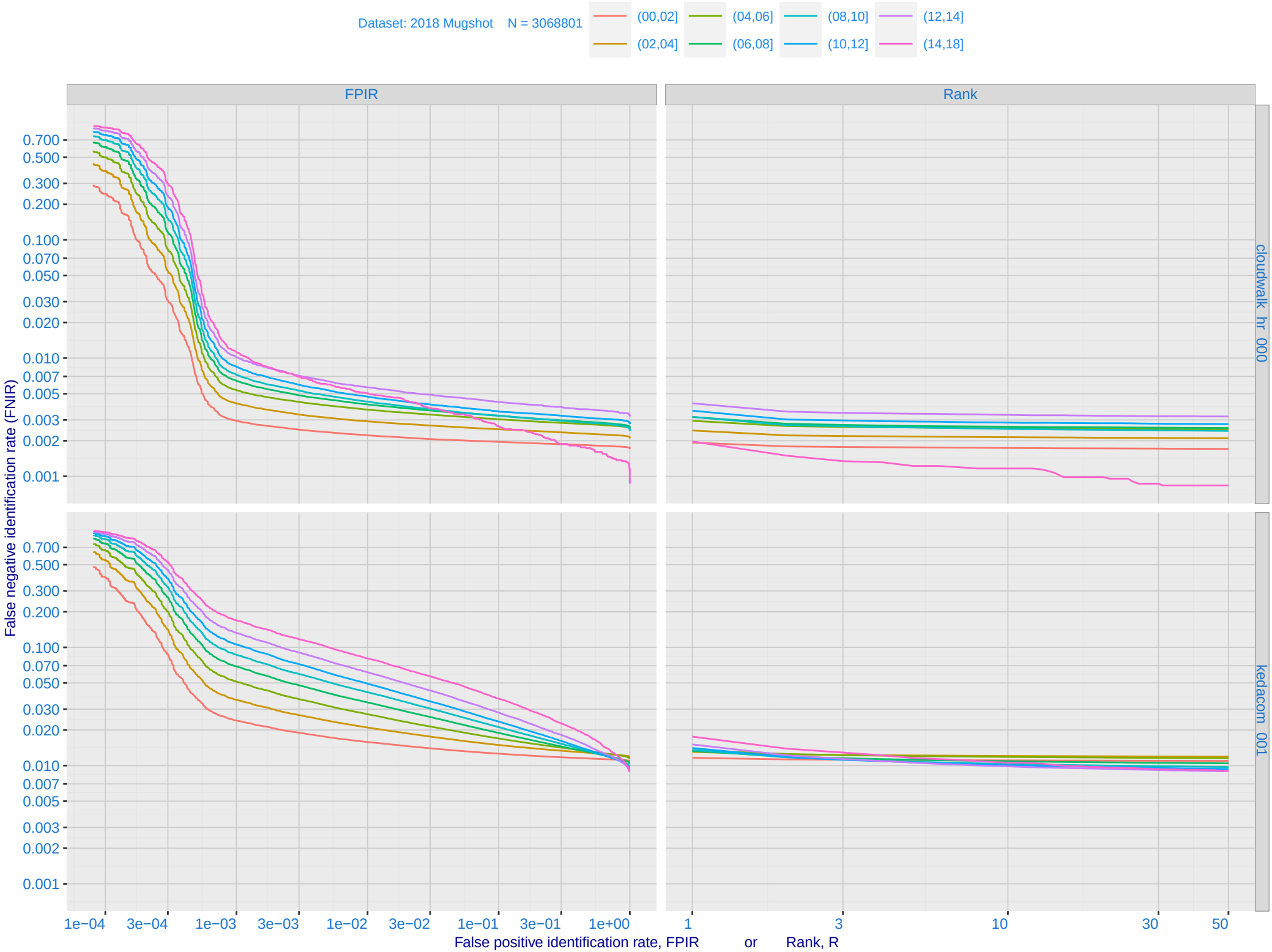
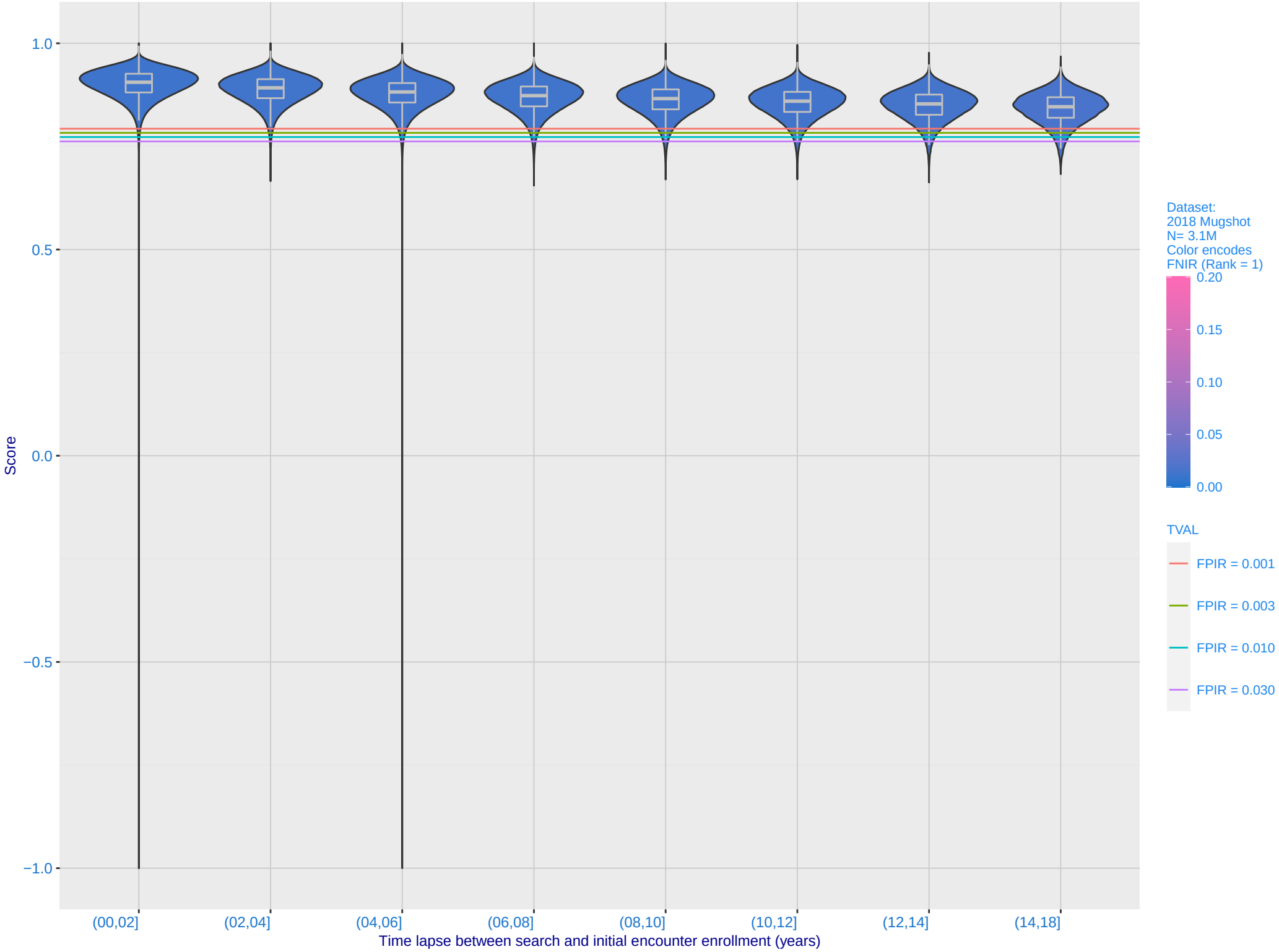

K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005)
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
Mugshot webcam
False negative identification rate, FNIR(N)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
0.001
1e+06
3e+06
1e+07
Enrolled population size, N
enrolment_style
consolidated
random
recent
FNIR@Rank = 1
kedacom_001
sensetime_005


L: Investigational mode: FNIR(1600000, R, 0) by probe type
kedacom_001
sensetime_005
False negative identification rate, FNIR(N)
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
0.001
1
3
10
30
Rank, R
enrolment_style
lifetime_consolidated
random
recent
FNIR(R)
N = 1600000
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
Mugshot webcam

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



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