A: Datasheet

Algorithm: verihubs–inteligensia_000

Developer: [**Developer name**]

Submission Date: 2022_09_29

Template size: 2048 bytes

Template time (2.5 percentile): 575 msec

Template time (median): 576 msec

Template time (97.5 percentile): 583 msec

Investigation:

Mugshot webcam ranking 96 (out of 337) –– FNIR(1600000, 0, 1) = 0.0123 vs. lowest 0.0055 from sensetime_008

Mugshot profile ranking 76 (out of 306) –– FNIR(1600000, 0, 1) = 0.2103 vs. lowest 0.0521 from sensetime_007

Immigration visa–border ranking 101 (out of 264) –– FNIR(1600000, 0, 1) = 0.0044 vs. lowest 0.0006 from cloudwalk_mt_001

Immigration visa–kiosk ranking 123 (out of 209) –– FNIR(1600000, 0, 1) = 0.1121 vs. lowest 0.0395 from cloudwalk_mt_001

Identification:

Frontal mugshot ranking 118 (out of 375) –– FNIR(1600000, T, L+1) = 0.0243, FPIR=0.001000 vs. lowest 0.0013 from sensetime_008

Mugshot webcam ranking 121 (out of 335) –– FNIR(1600000, T, L+1) = 0.0766, FPIR=0.001000 vs. lowest 0.0090 from sensetime_008

Mugshot profile ranking 61 (out of 305) –– FNIR(1600000, T, L+1) = 0.7877, FPIR=0.001000 vs. lowest 0.0698 from cloudwalk_mt_001

Immigration visa–border ranking 132 (out of 263) –– FNIR(1600000, T, L+1) = 0.0528, FPIR=0.001000 vs. lowest 0.0013 from cloudwalk_mt_001

Immigration visa–kiosk ranking 86 (out of 209) –– FNIR(1600000, T, L+1) = 0.2382, FPIR=0.001000 vs. lowest 0.0532 from cloudwalk_mt_001
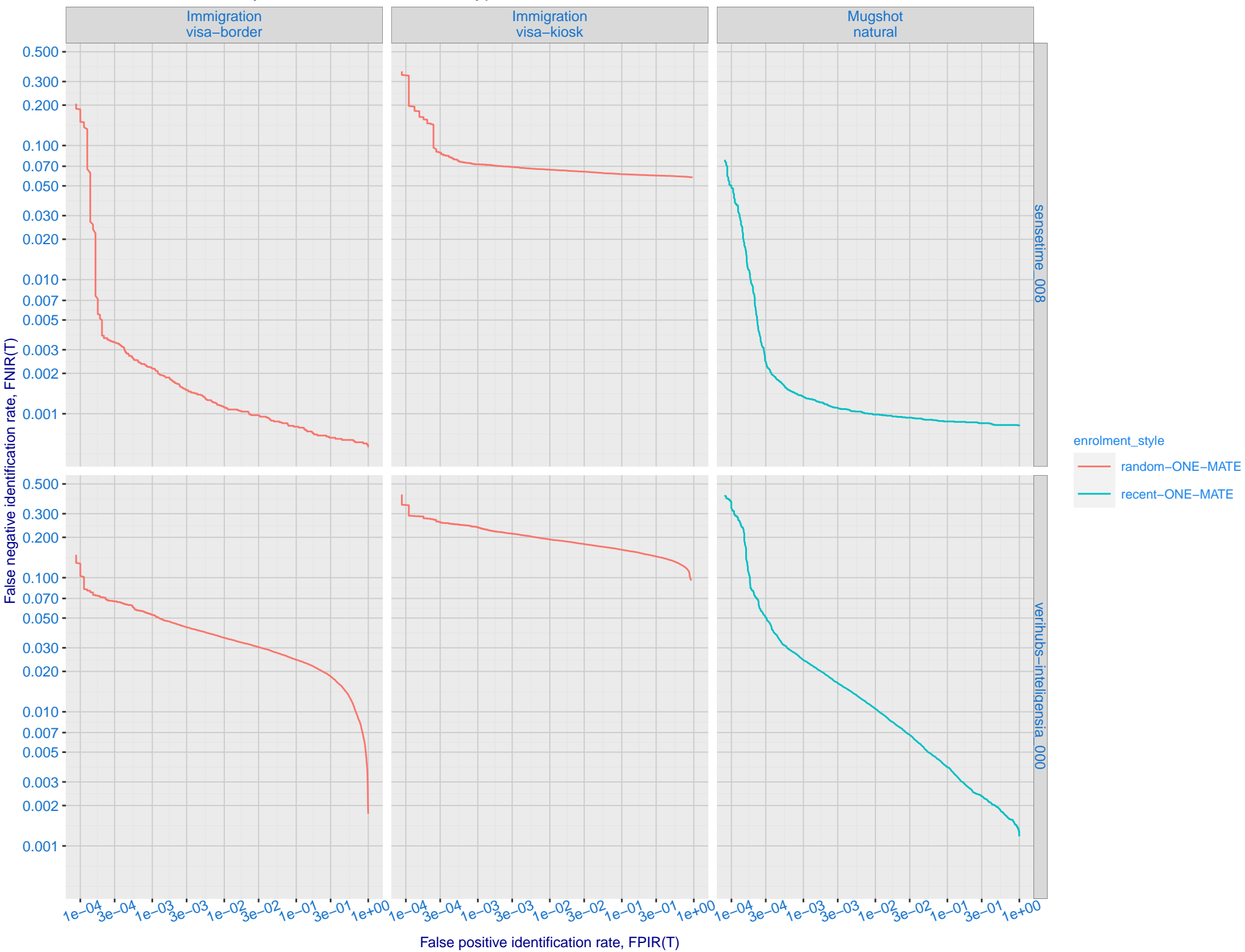
B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_008)
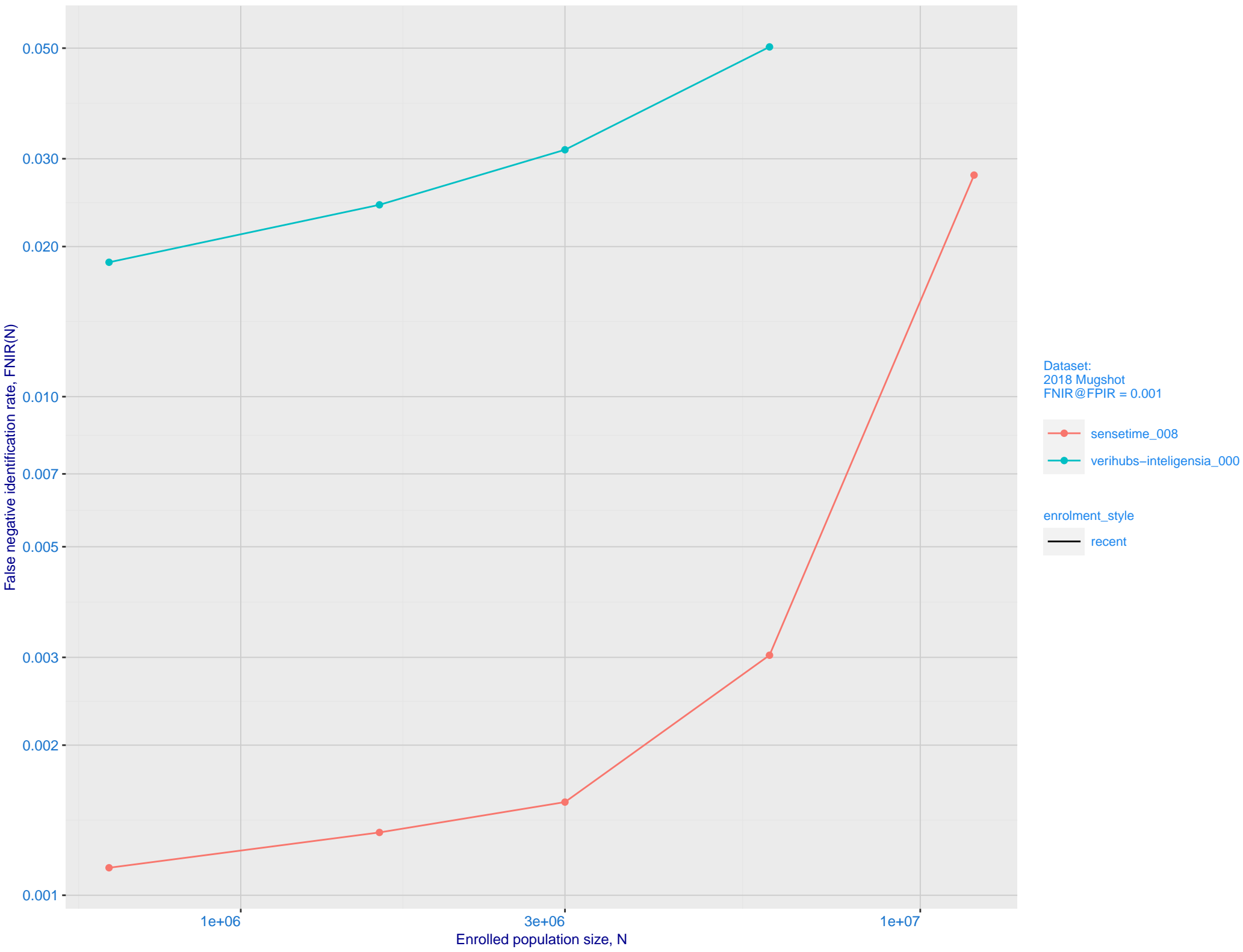
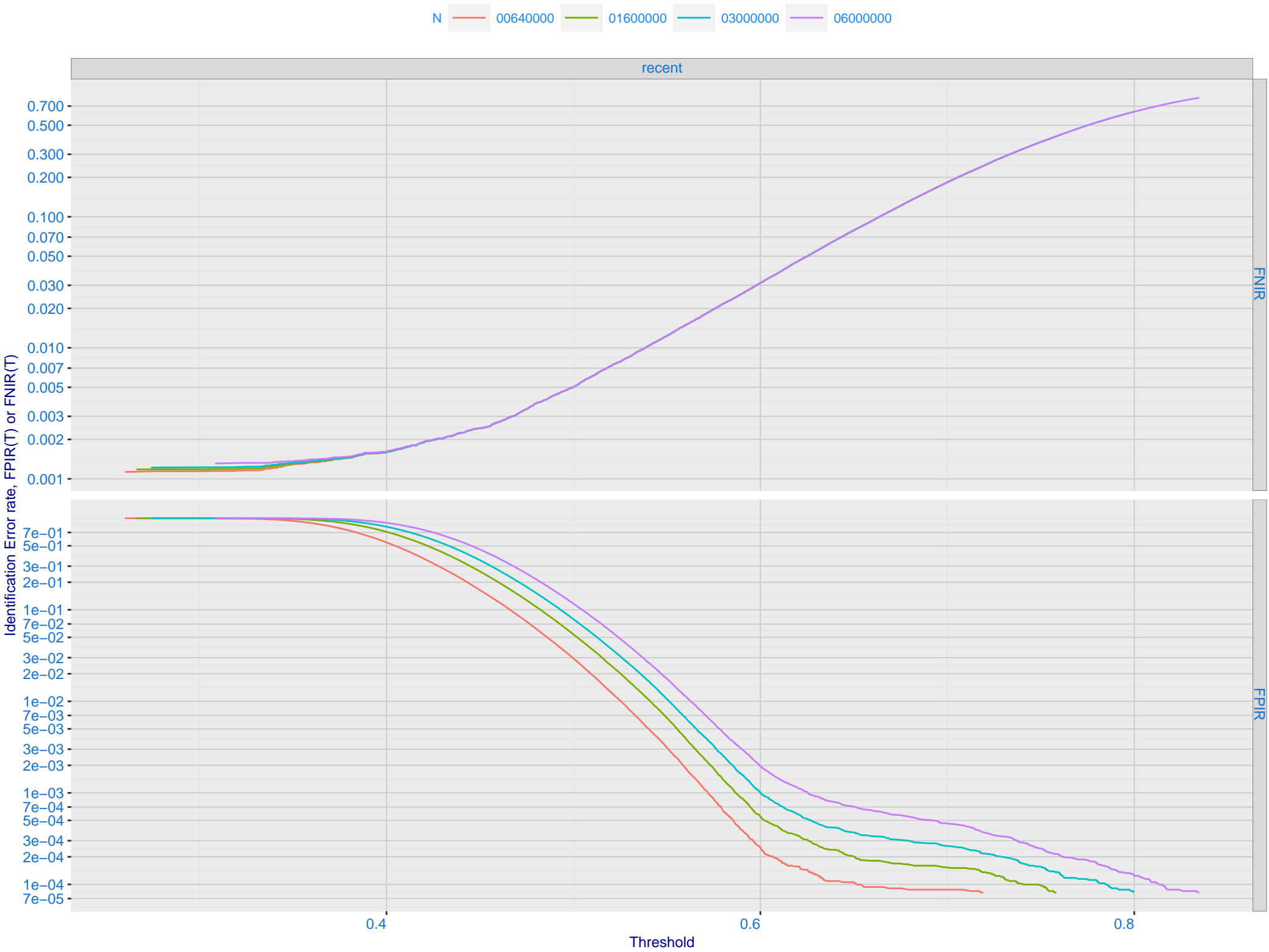C: Evolution of accuracy for VERIHUBS–INTELIGENSIA algorithms on three datasets 2018 – present
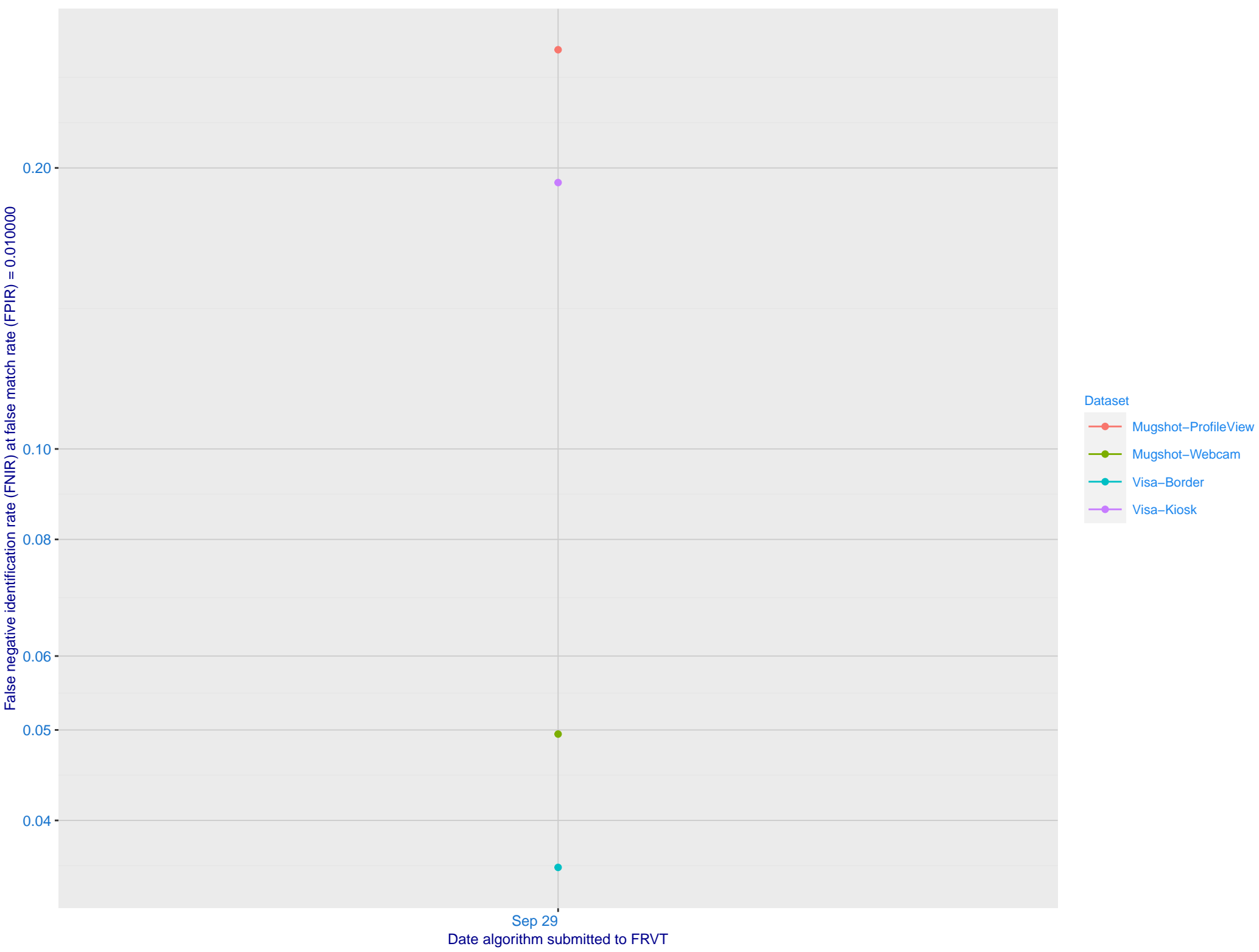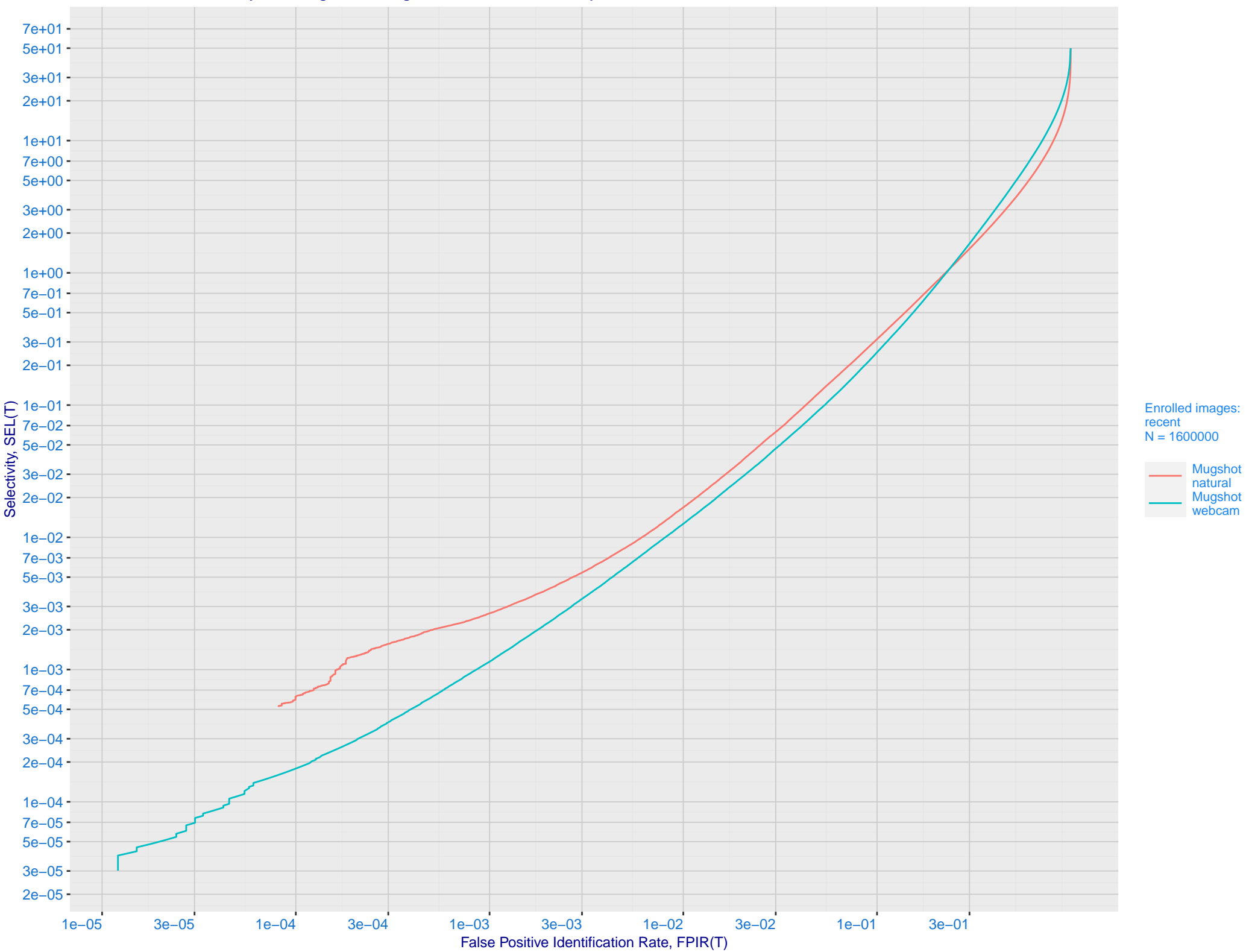
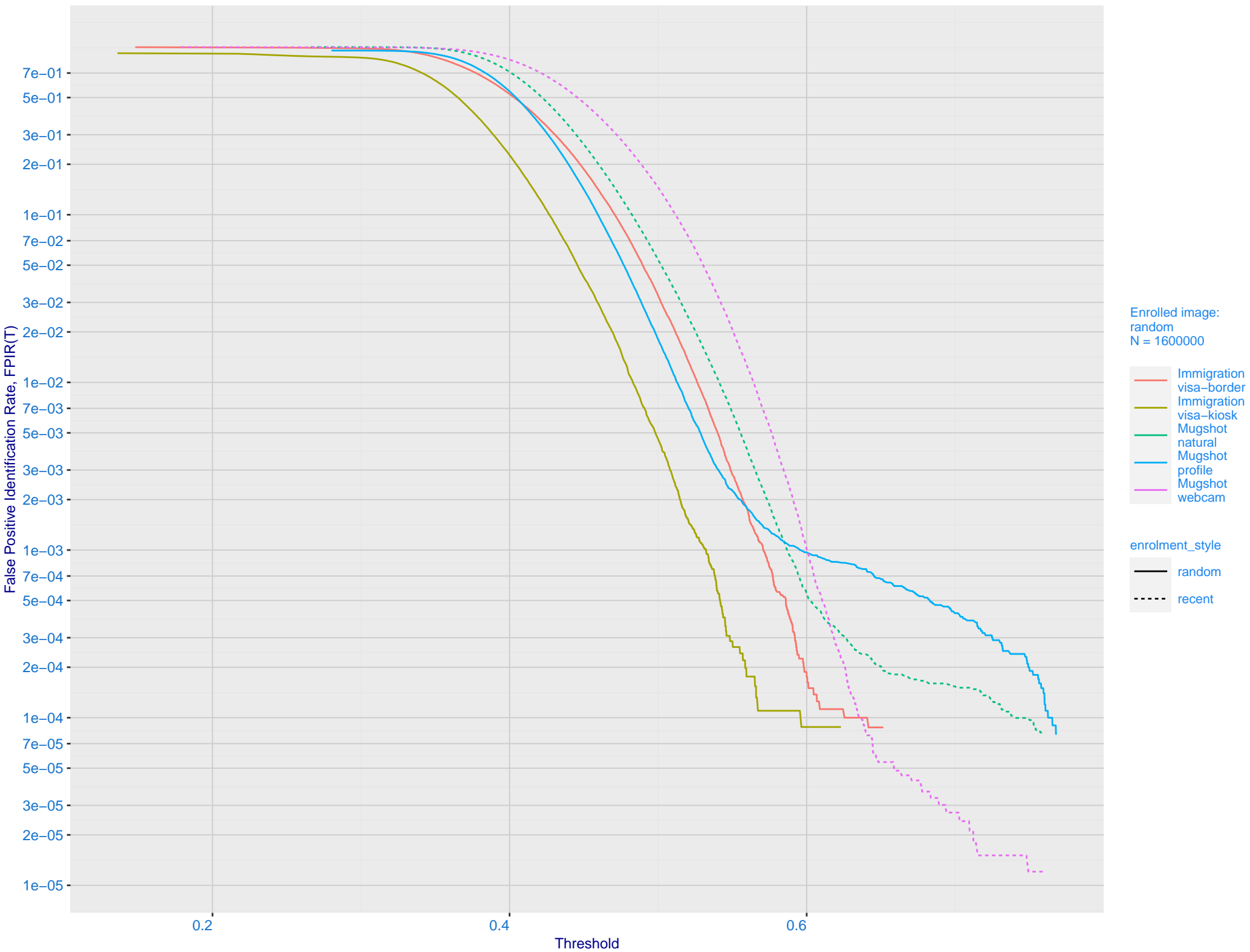D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals

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
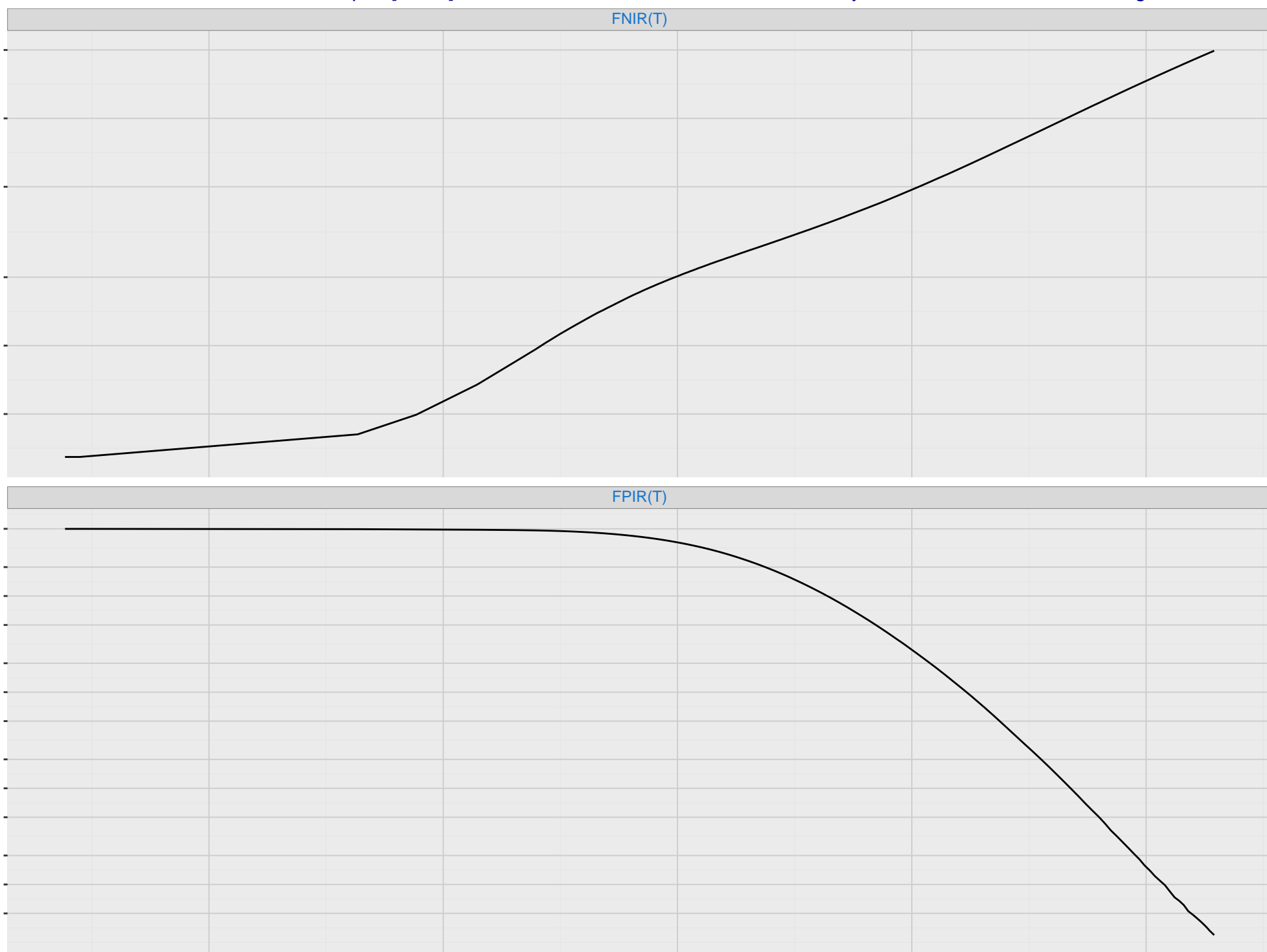
J: DET for Mugshot natural images and various N. Links connect points of equal threshold.
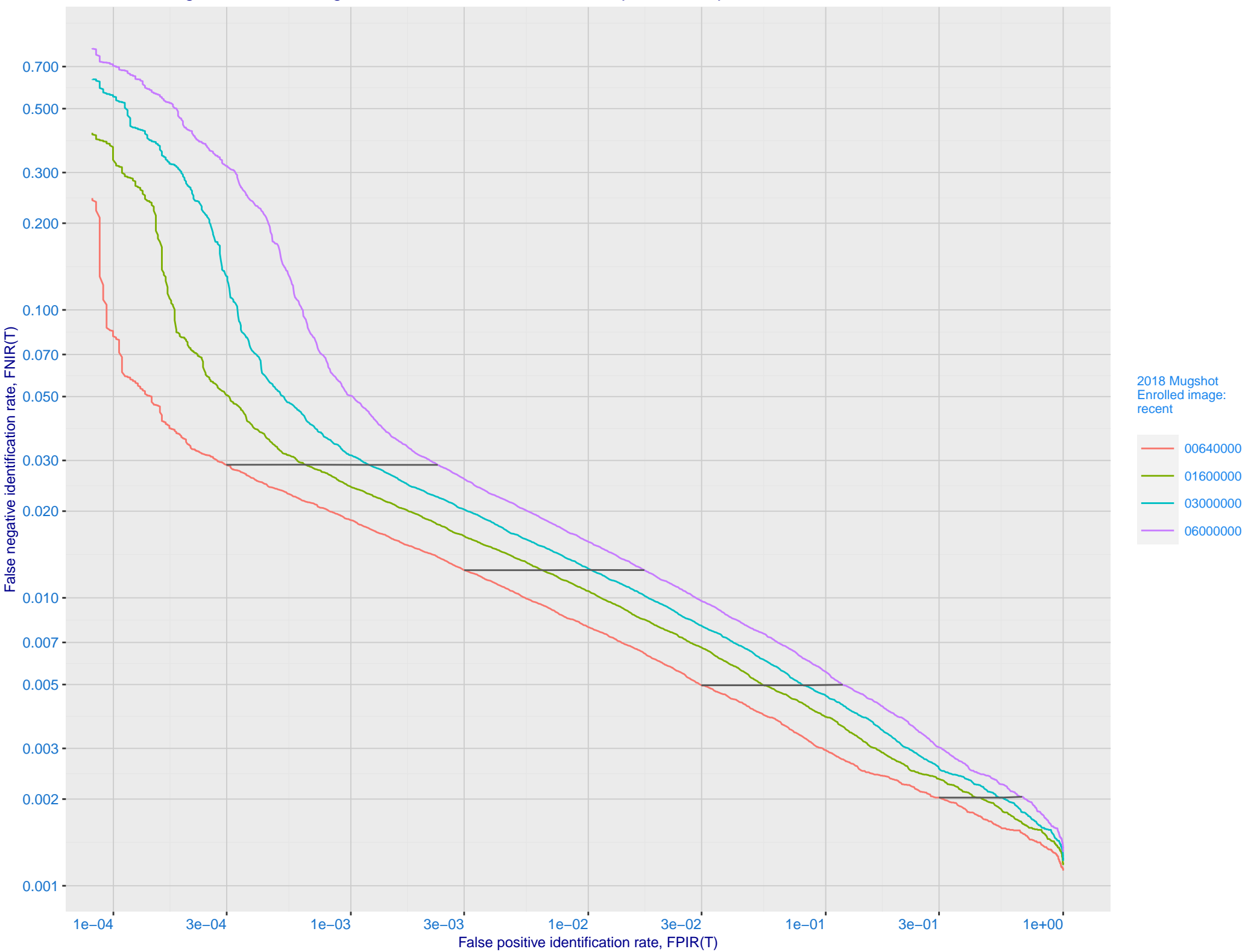
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_007)
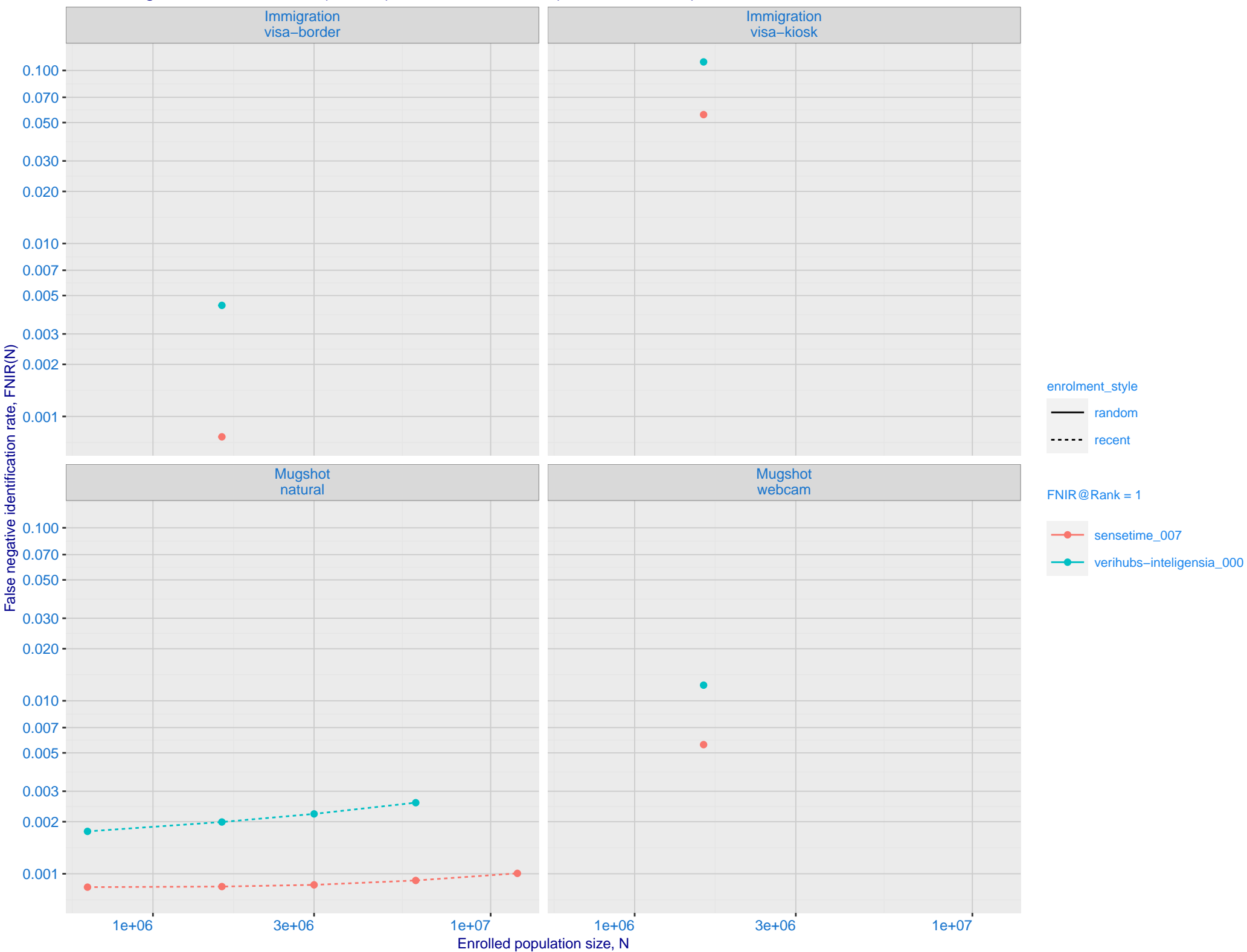
L: Investigational mode: FNIR(1600000, R, 0) by probe type
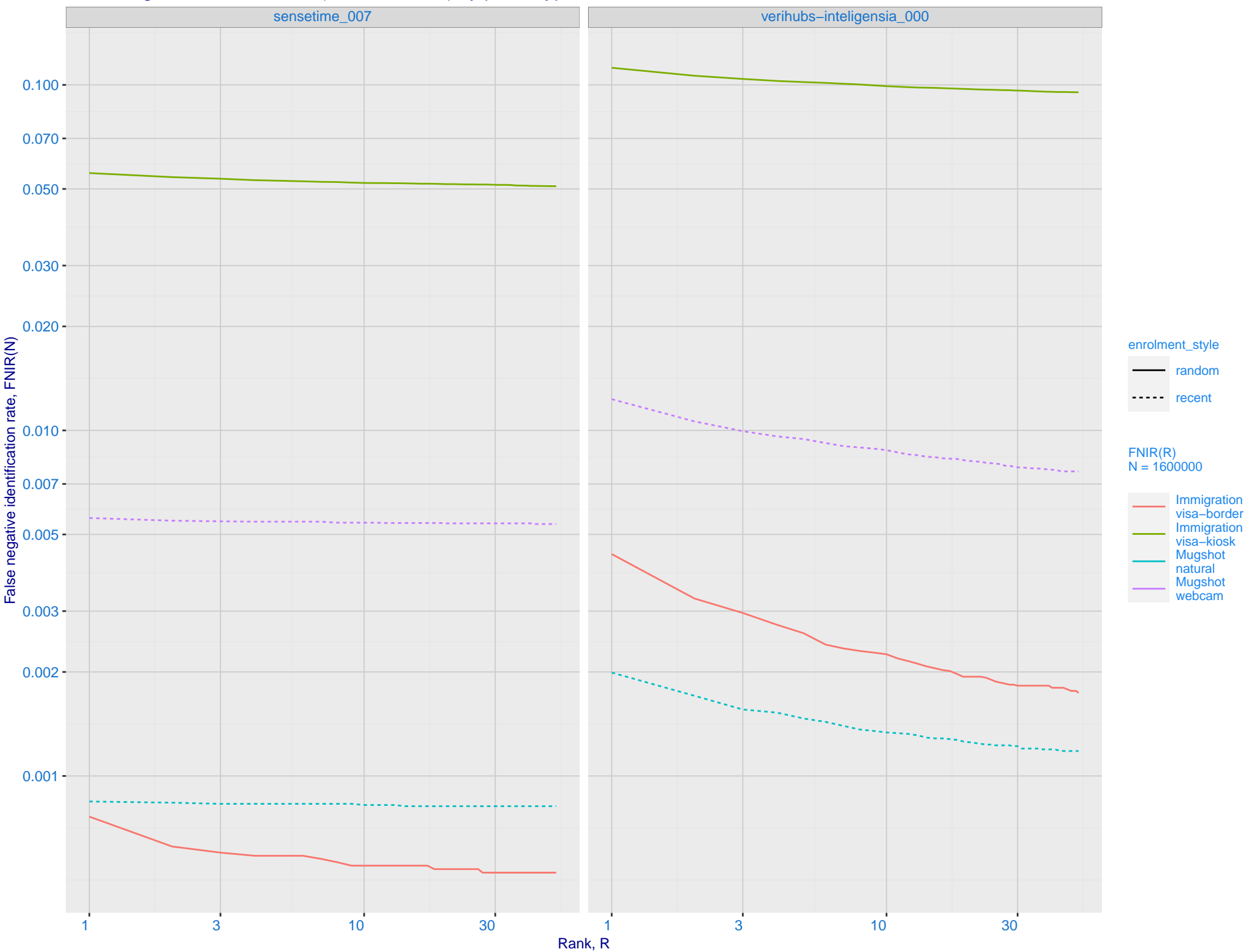
M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations

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: verihubs-inteligensia_000, Dataset: Border-Crossing Ageing N = 1600000
Text encodes FNIR, Color encodes log(FNIR)

Female

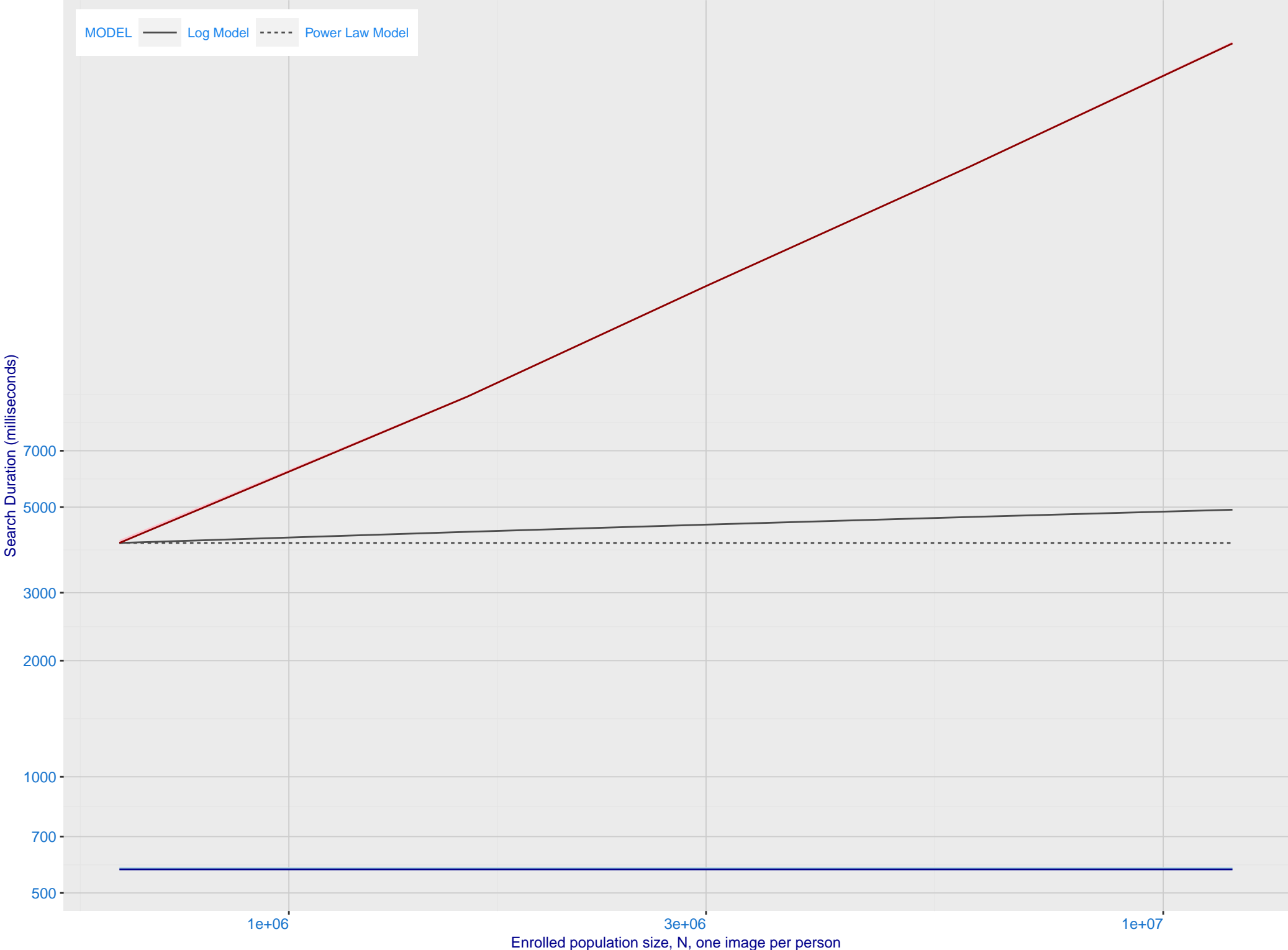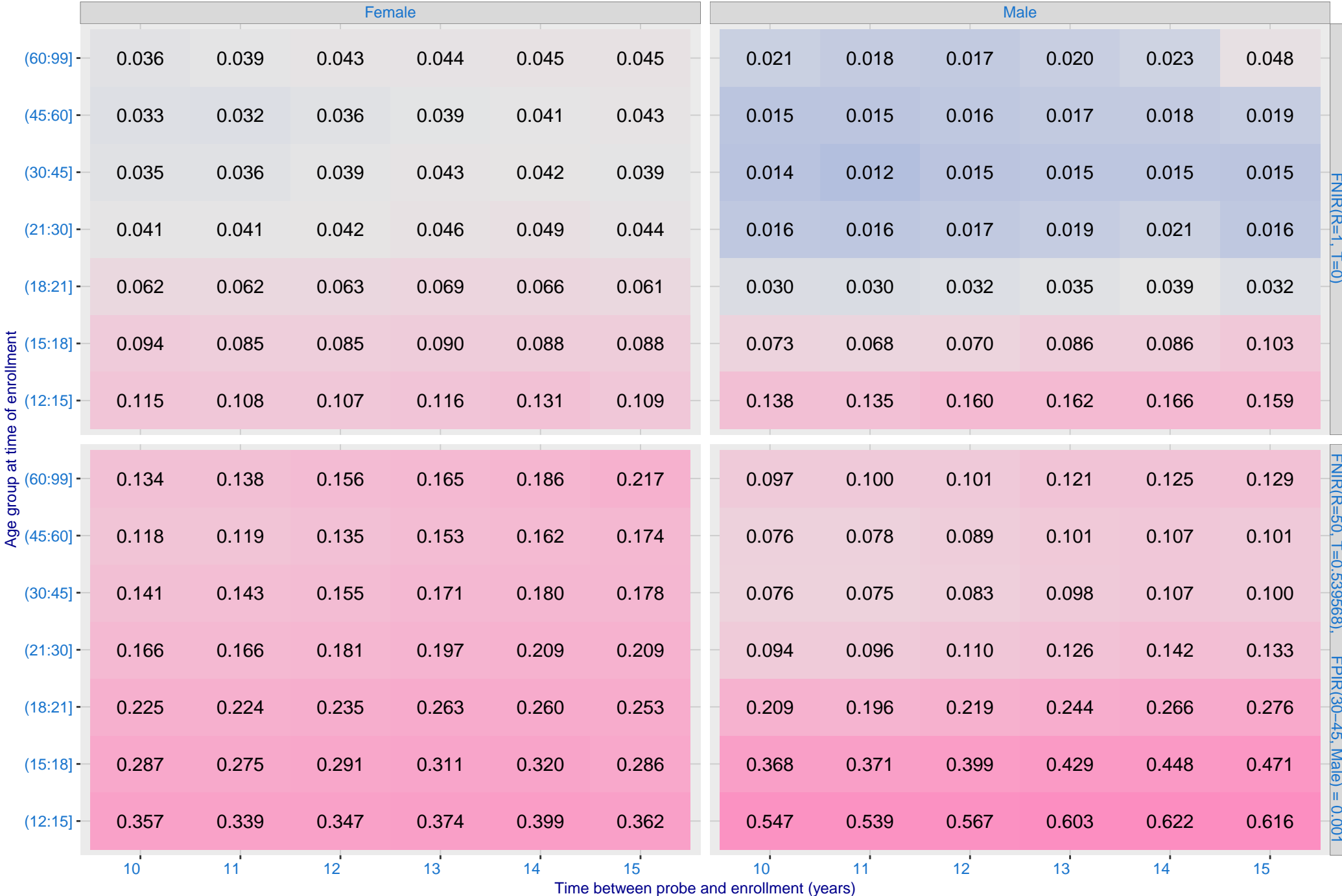| Age group	10	11	12	13	14	15
(60:99]	0.036	0.039	0.043	0.044	0.045	0.045
(45:60]	0.033	0.032	0.036	0.039	0.041	0.043
(30:45]	0.035	0.036	0.039	0.043	0.042	0.039
(21:30]	0.041	0.041	0.042	0.046	0.049	0.044
(18:21]	0.062	0.062	0.063	0.069	0.066	0.061
(15:18]	0.094	0.085	0.085	0.090	0.088	0.088
(12:15]	0.115	0.108	0.107	0.116	0.131	0.109

Male — FNIR(R=1, T=0)

Age group	10	11	12	13	14	15
(60:99]	0.021	0.018	0.017	0.020	0.023	0.048
(45:60]	0.015	0.015	0.016	0.017	0.018	0.019
(30:45]	0.014	0.012	0.015	0.015	0.015	0.015
(21:30]	0.016	0.016	0.017	0.019	0.021	0.016
(18:21]	0.030	0.030	0.032	0.035	0.039	0.032
(15:18]	0.073	0.068	0.070	0.086	0.086	0.103
(12:15]	0.138	0.135	0.160	0.162	0.166	0.159

Female

Age group	10	11	12	13	14	15
(60:99]	0.134	0.138	0.156	0.165	0.186	0.217
(45:60]	0.118	0.119	0.135	0.153	0.162	0.174
(30:45]	0.141	0.143	0.155	0.171	0.180	0.178
(21:30]	0.166	0.166	0.181	0.197	0.209	0.209
(18:21]	0.225	0.224	0.235	0.263	0.260	0.253
(15:18]	0.287	0.275	0.291	0.311	0.320	0.286
(12:15]	0.357	0.339	0.347	0.374	0.399	0.362

Male — FNIR(R=50, T=0.539568), FPIR(30-45, Male) = 0.001

Age group	10	11	12	13	14	15
(60:99]	0.097	0.100	0.101	0.121	0.125	0.129
(45:60]	0.076	0.078	0.089	0.101	0.107	0.101
(30:45]	0.076	0.075	0.083	0.098	0.107	0.100
(21:30]	0.094	0.096	0.110	0.126	0.142	0.133
(18:21]	0.209	0.196	0.219	0.244	0.266	0.276
(15:18]	0.368	0.371	0.399	0.429	0.448	0.471
(12:15]	0.547	0.539	0.567	0.603	0.622	0.616

Age group at time of enrollment

Time between probe and enrollment (years)

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: verihubs−inteligensia_000, Dataset: Border−Crossing Ageing
Threshold: 0.539568 set to achive FPIR(30−45, Male) = 0.001   Color encodes log(FPIR)

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