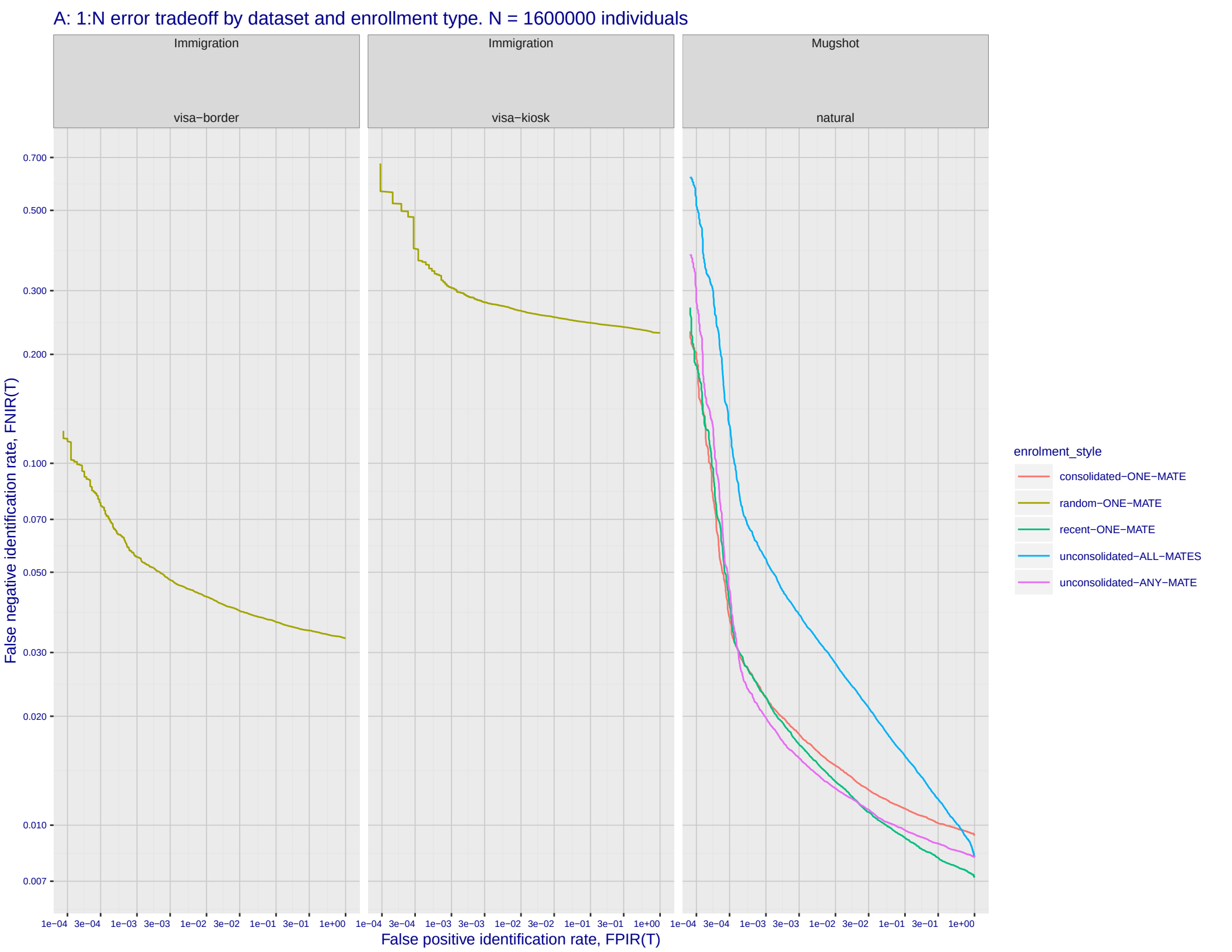
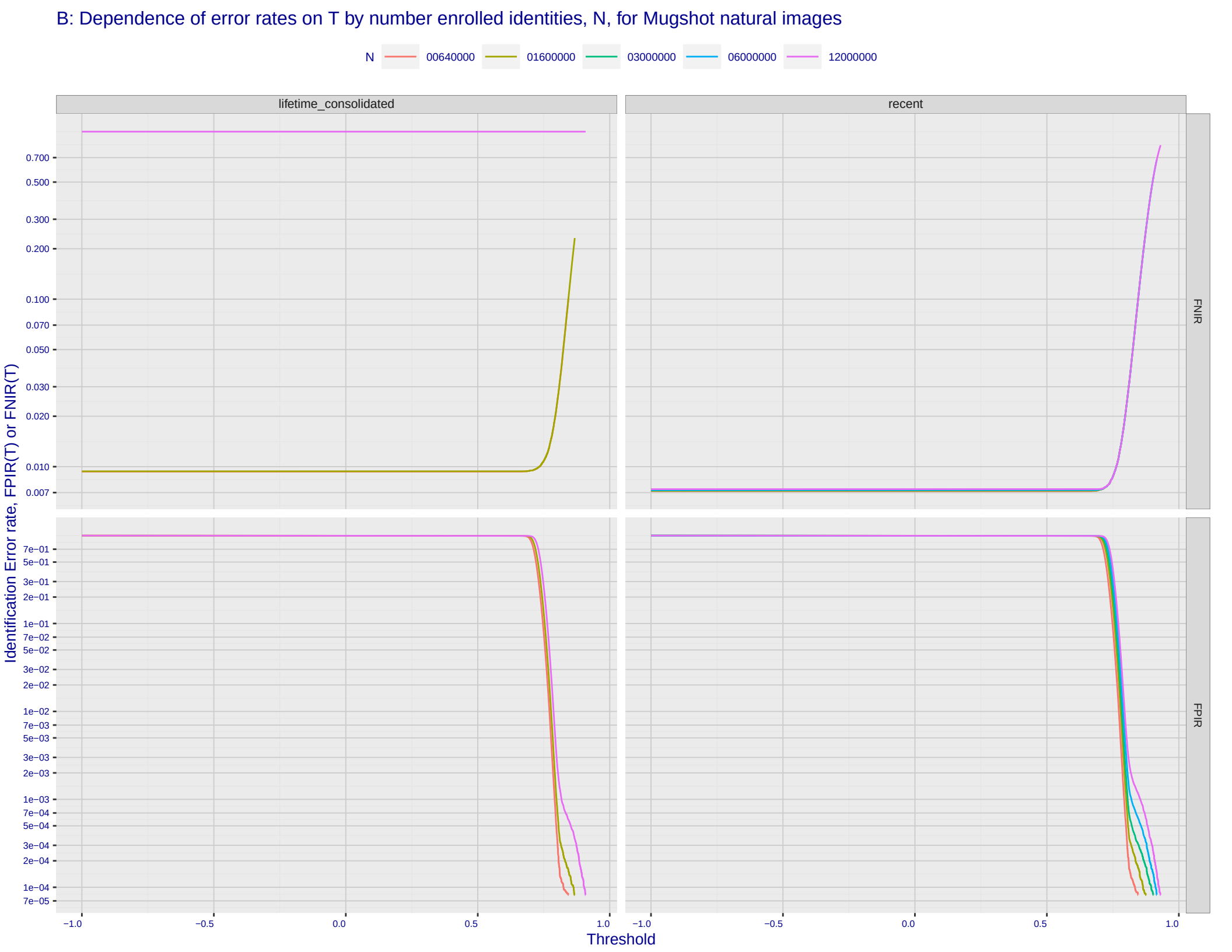
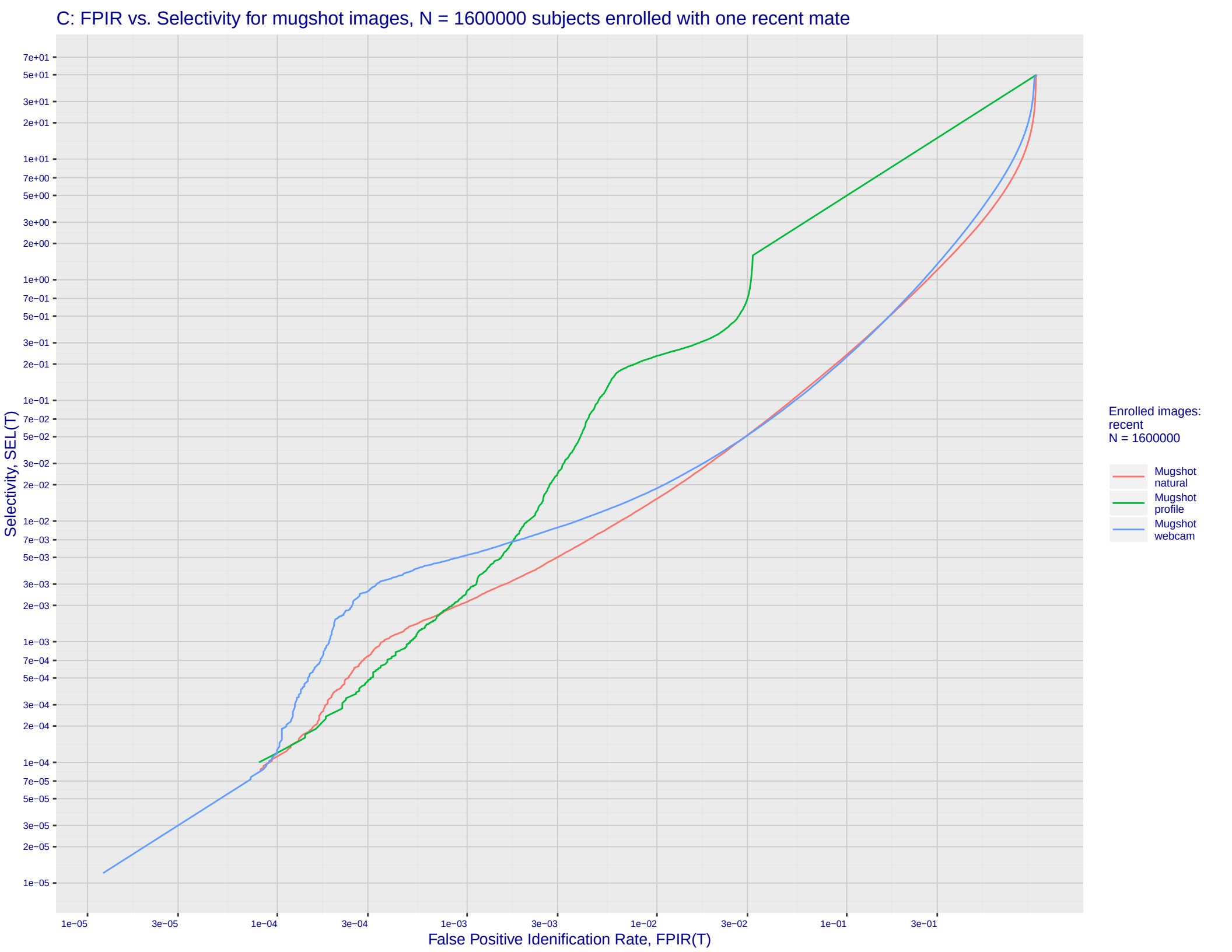
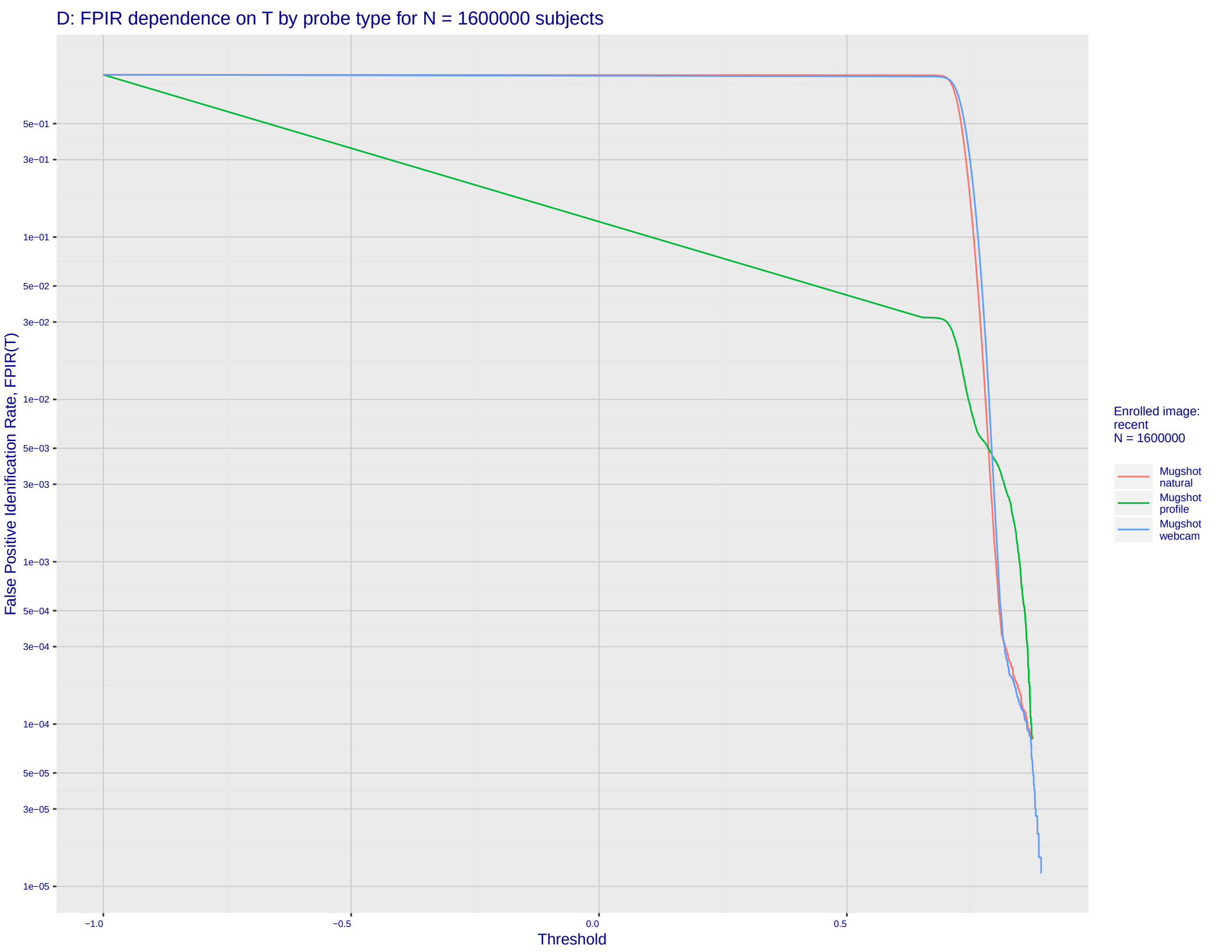
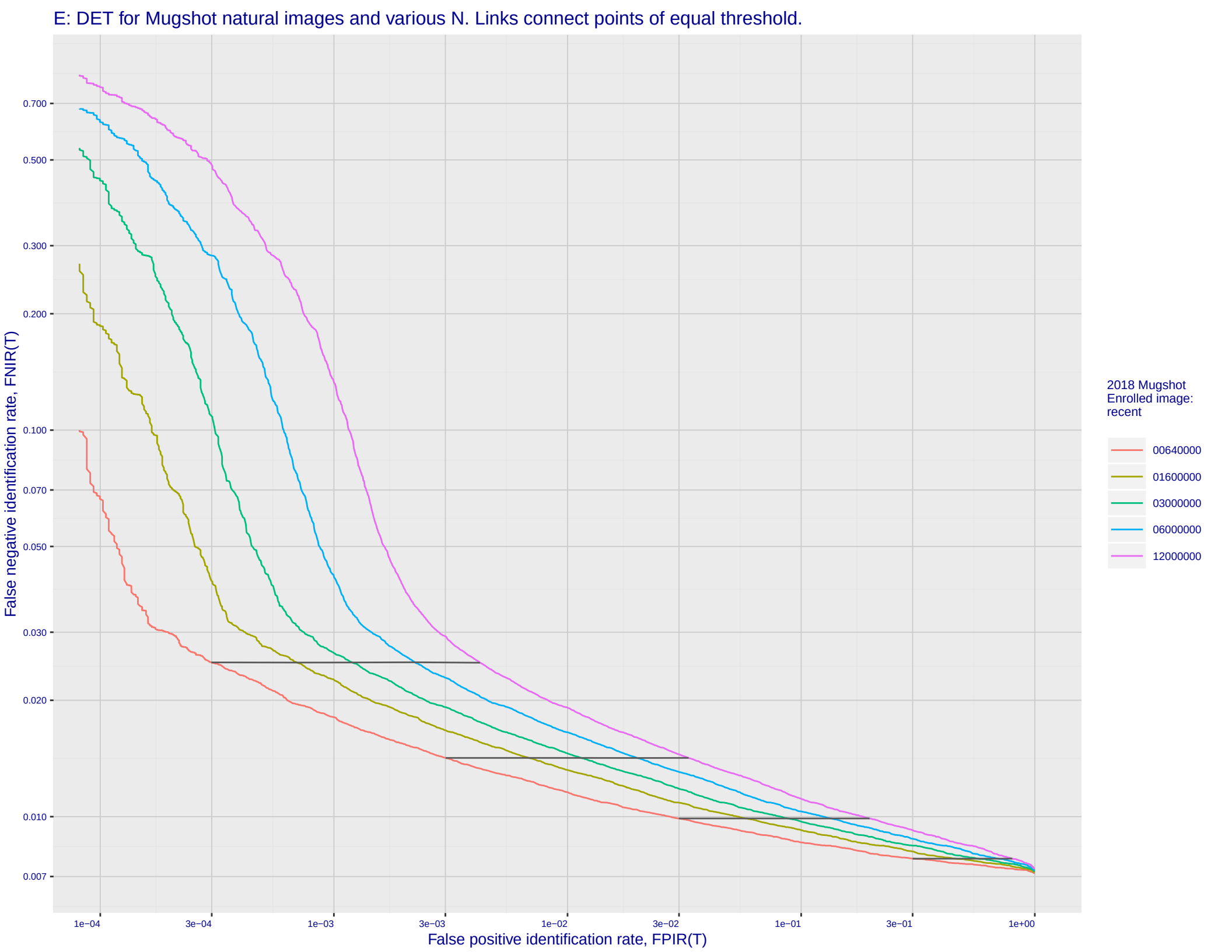
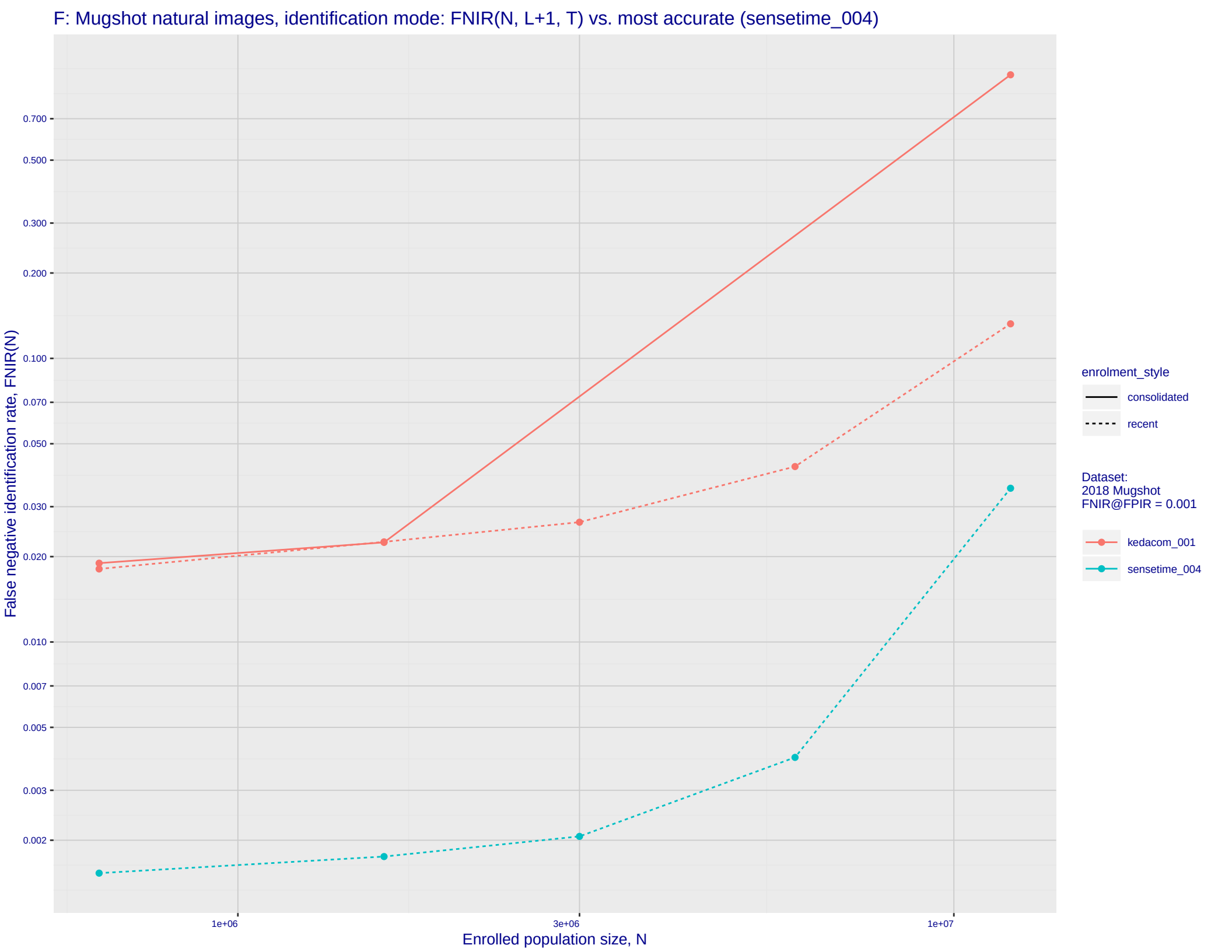

A: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
Immigration
visa−border
Immigration
visa−kiosk
Mugshot
natural
False negative identification rate, FNIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
1e−04 3e−04 1e−03 3e−03 1e−02 3e−02 1e−01 3e−01 1e+00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


B: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images
N
00640000
01600000
03000000
06000000
12000000
lifetime_consolidated
recent
FNIR
FPIR
Identification Error rate, FPIR(T) or FNIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
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
−1.0
−0.5
0.0
0.5
1.0
Threshold


C: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate
Selectivity, SEL(T)
7e+01
5e+01
3e+01
2e+01
1e+01
7e+00
5e+00
3e+00
2e+00
1e+00
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
1e−05
3e−05
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
False Positive Idenification Rate, FPIR(T)
Enrolled images:
recent
N = 1600000
Mugshot
natural
Mugshot
profile
Mugshot
webcam


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


E: DET for Mugshot natural images and various N. Links connect points of equal threshold.
False negative identification rate, FNIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
False positive identification rate, FPIR(T)
2018 Mugshot
Enrolled image:
recent
00640000
01600000
03000000
06000000
12000000


F: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_004)
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
1e+06
3e+06
1e+07
Enrolled population size, N
enrolment_style
consolidated
recent
Dataset:
2018 Mugshot
FNIR@FPIR = 0.001
kedacom_001
sensetime_004

G: 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

Frontal mugshot investigation rank 94 −− FNIR(1600000, 0, 1) = 0.0077 vs. lowest 0.0010 from sensetime_004

natural investigation rank 106 −− FNIR(1600000, 0, 1) = 0.0356 vs. lowest 0.0067 from sensetime_003

natural investigation rank 334 −− FNIR(1600000, 0, 1) = 0.9795 vs. lowest 0.0492 from paravision_005

natural investigation rank 334 −− FNIR(1600000, 0, 1) = 0.9795 vs. lowest 0.0492 from paravision_005

natural investigation rank 69 −− FNIR(1600000, 0, 1) = 0.0342 vs. lowest 0.0014 from visionlabs_009

natural investigation rank 68 −− FNIR(1600000, 0, 1) = 0.2366 vs. lowest 0.0694 from cib_000

Frontal mugshot identification rank 33 −− FNIR(1600000, T, L+1) = 0.0225 vs. lowest 0.0018 from sensetime_004

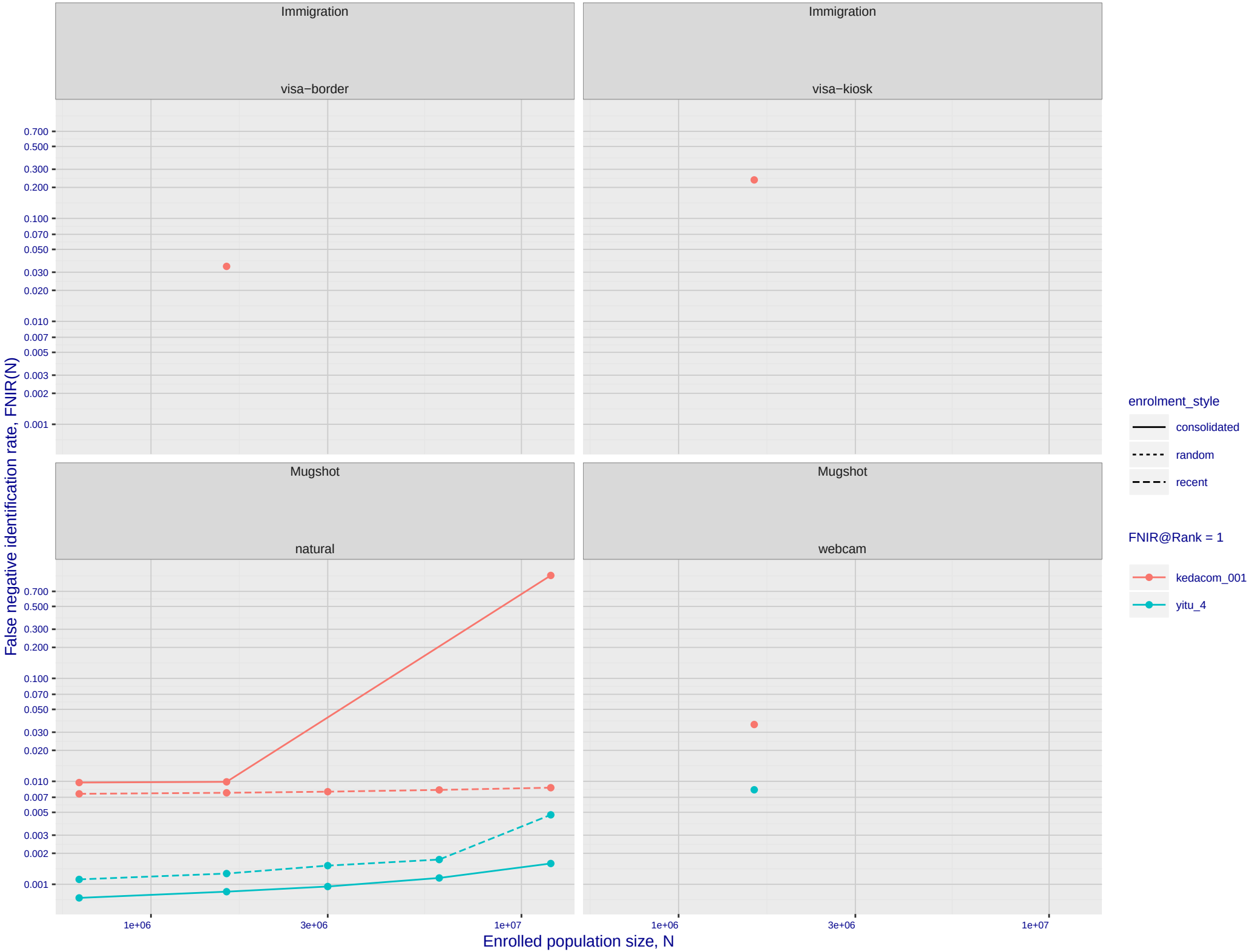
natural identification rank 30 −− FNIR(1600000, T, L+1) = 0.0722 vs. lowest 0.0122 from sensetime_003

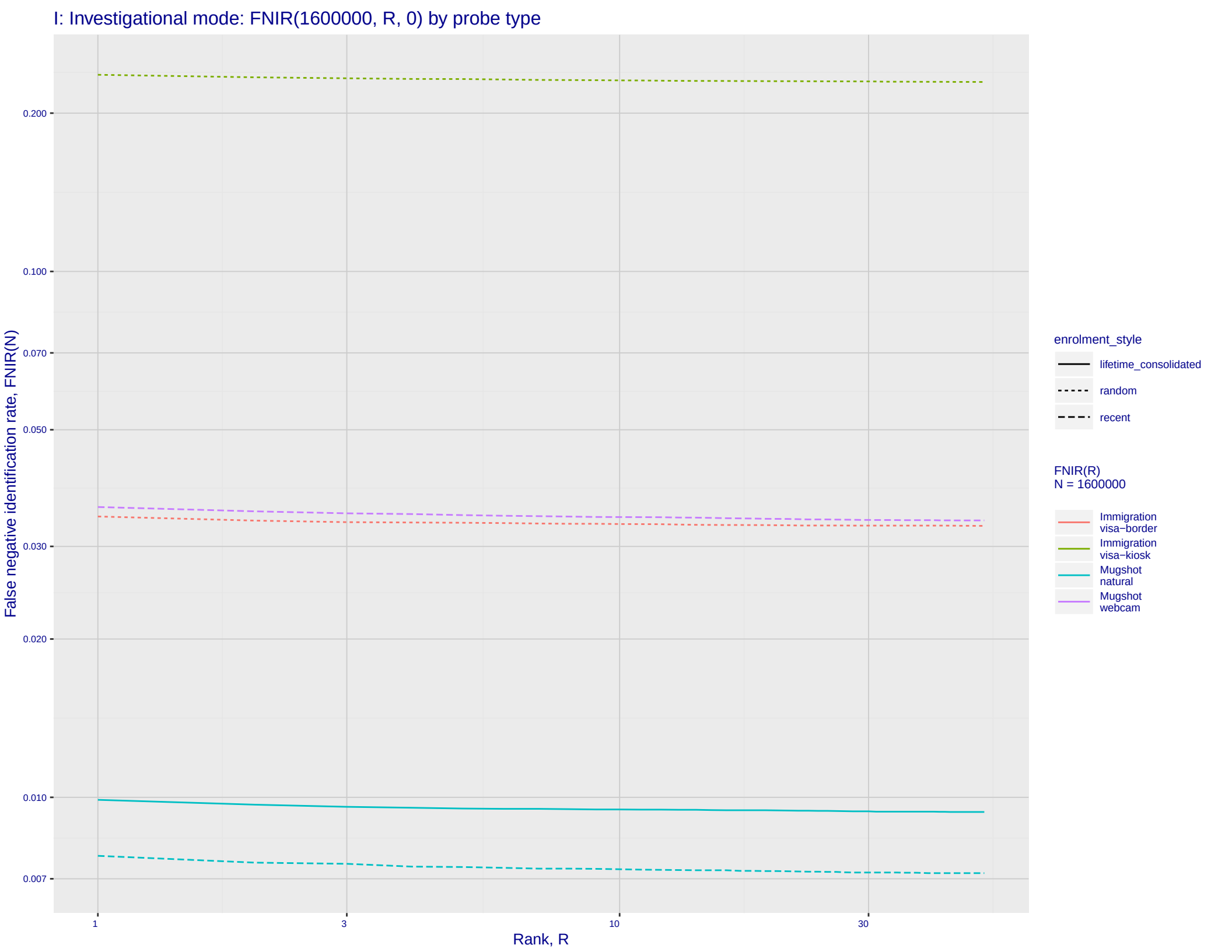
natural identification rank 83 −− FNIR(1600000, T, L+1) = 0.9860 vs. lowest 0.1020 from sensetime_004

natural identification rank 35 −− FNIR(1600000, T, L+1) = 0.0552 vs. lowest 0.0059 from sensetime_004

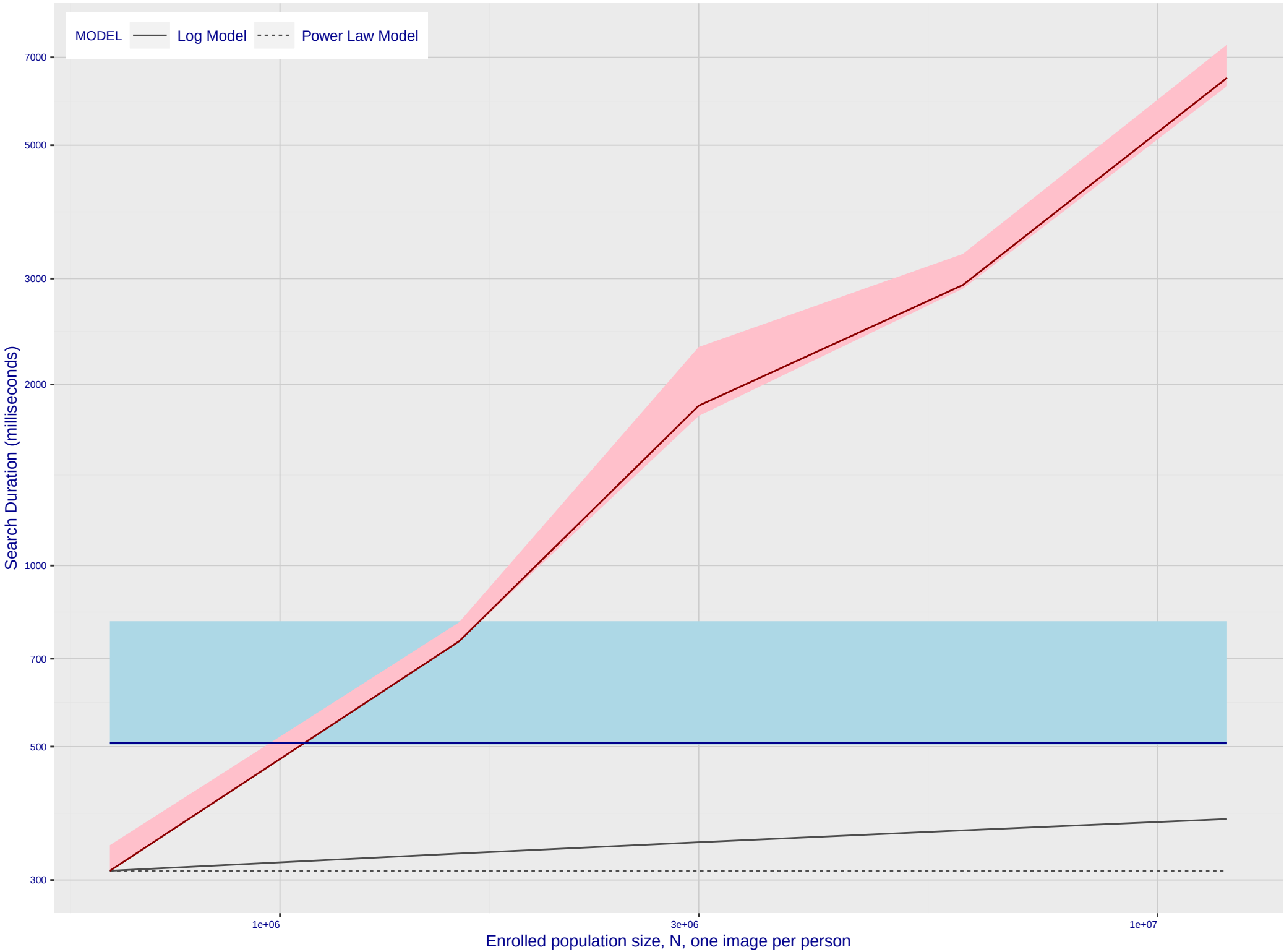
natural identification rank 32 −− FNIR(1600000, T, L+1) = 0.3062 vs. lowest 0.1129 from visionlabs_009

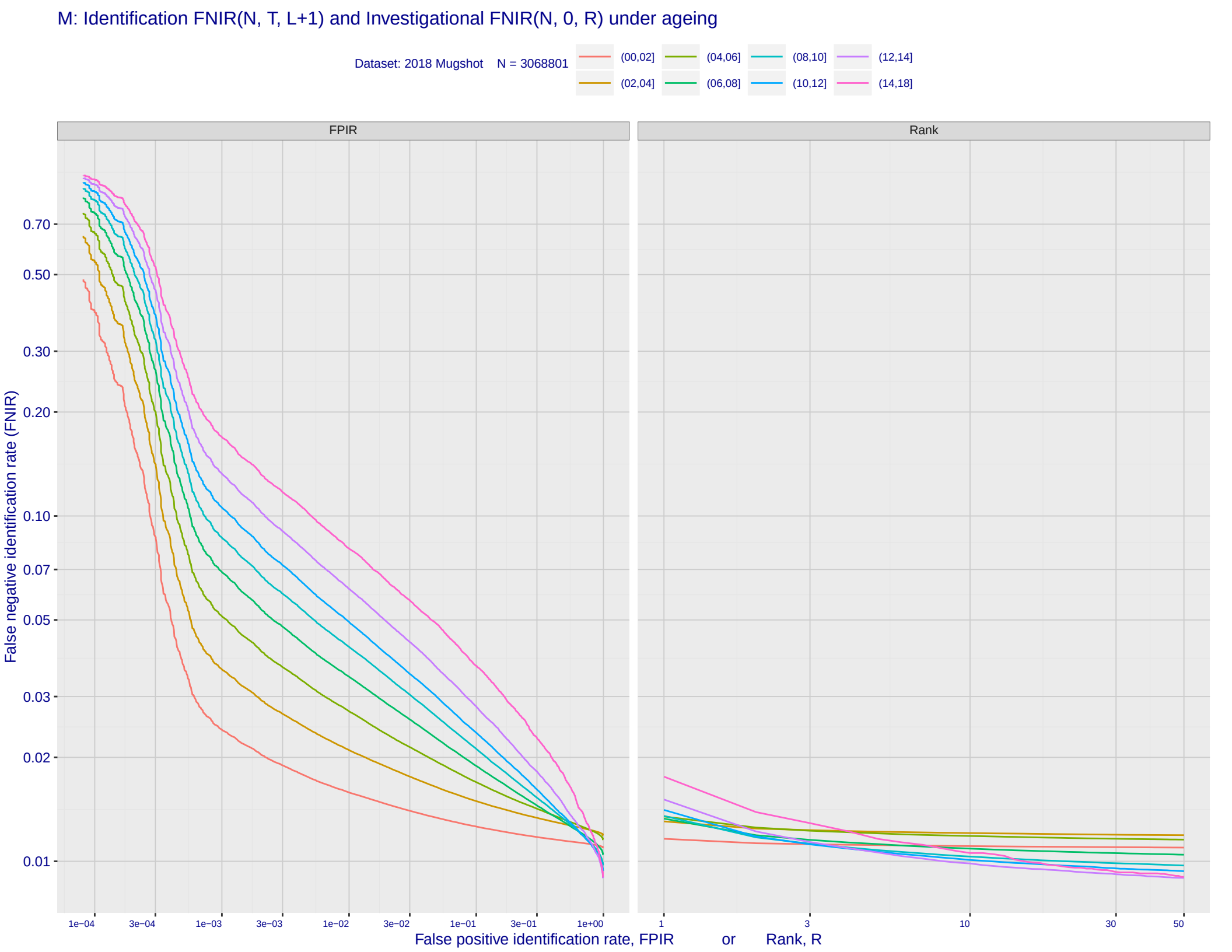
H: Investigational mode: FNIR(N, 1, 0) vs. most accurate (yitu_4)

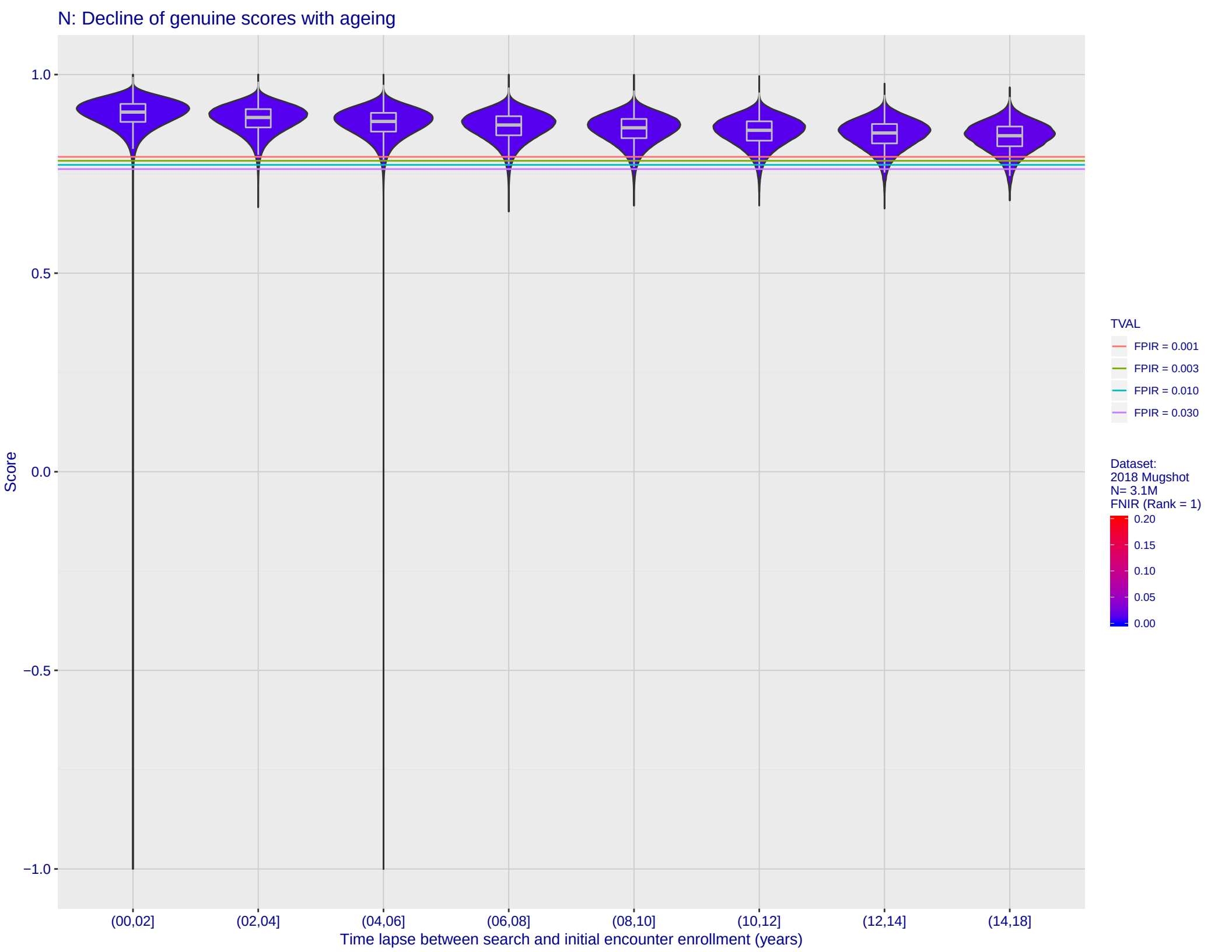



I: Investigational mode: FNIR(1600000, R, 0) by probe type
False negative identification rate, FNIR(N)
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
1
3
10
30
Rank, R
enrolment_style
lifetime_consolidated
random
recent
FNIR(R)
N = 1600000
Immigration visa−border
Immigration visa−kiosk
Mugshot natural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

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




M: Identification FNIR(N, T, L+1) and Investigational FNIR(N, 0, R) under ageing
Dataset: 2018 Mugshot N = 3068801
(00,02]
(02,04]
(04,06]
(06,08]
(08,10]
(10,12]
(12,14]
(14,18]
FPIR
Rank
False negative identification rate (FNIR)
0.70
0.50
0.30
0.20
0.10
0.07
0.05
0.03
0.02
0.01
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
1
3
10
30
50
False positive identification rate, FPIR
or
Rank, R


N: Decline of genuine scores with ageing
1.0
0.5
0.0
−0.5
−1.0
Score
(00,02]
(02,04]
(04,06]
(06,08]
(08,10]
(10,12]
(12,14]
(14,18]
Time lapse between search and initial encounter enrollment (years)
TVAL
FPIR = 0.001
FPIR = 0.003
FPIR = 0.010
FPIR = 0.030
Dataset:
2018 Mugshot
N= 3.1M
FNIR (Rank = 1)
0.20
0.15
0.10
0.05
0.00