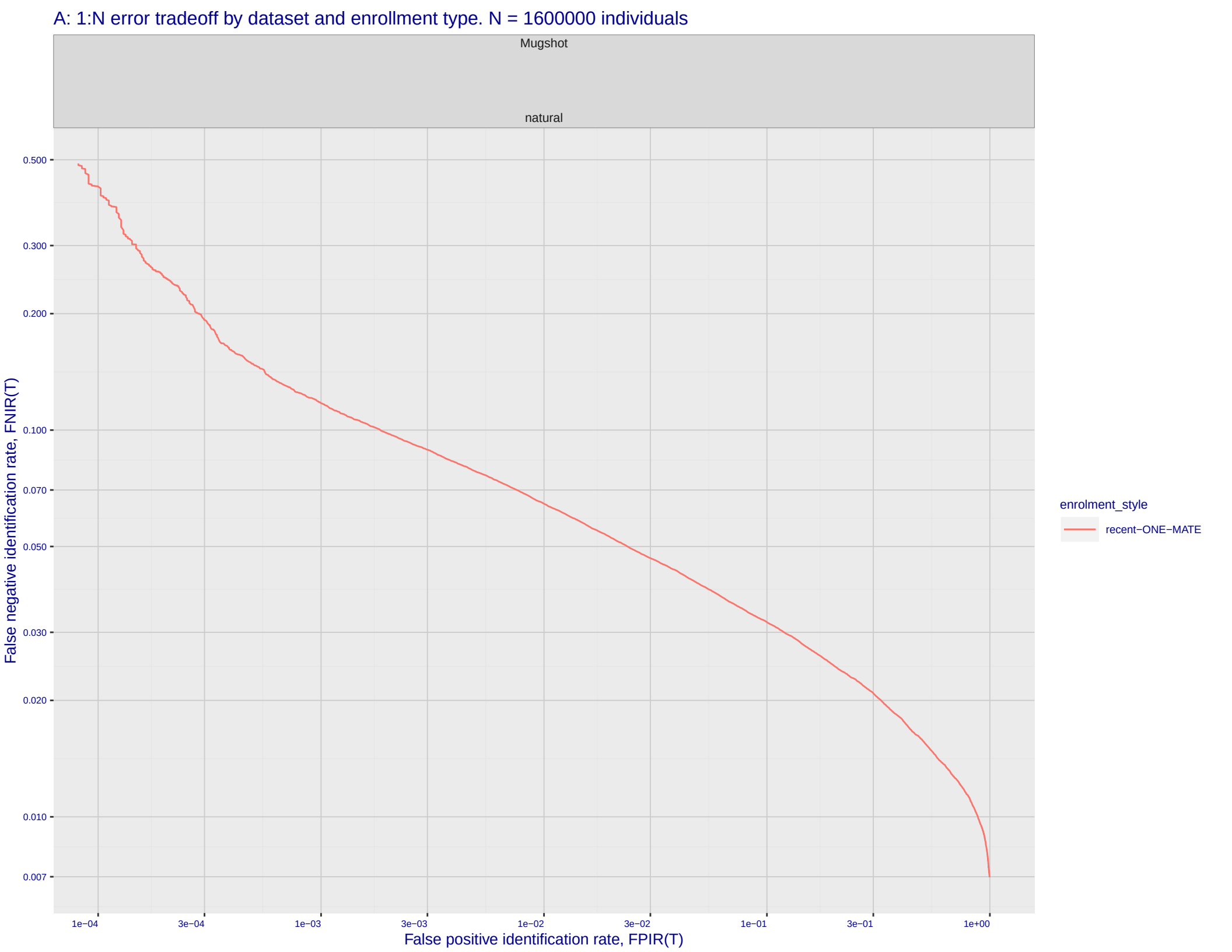
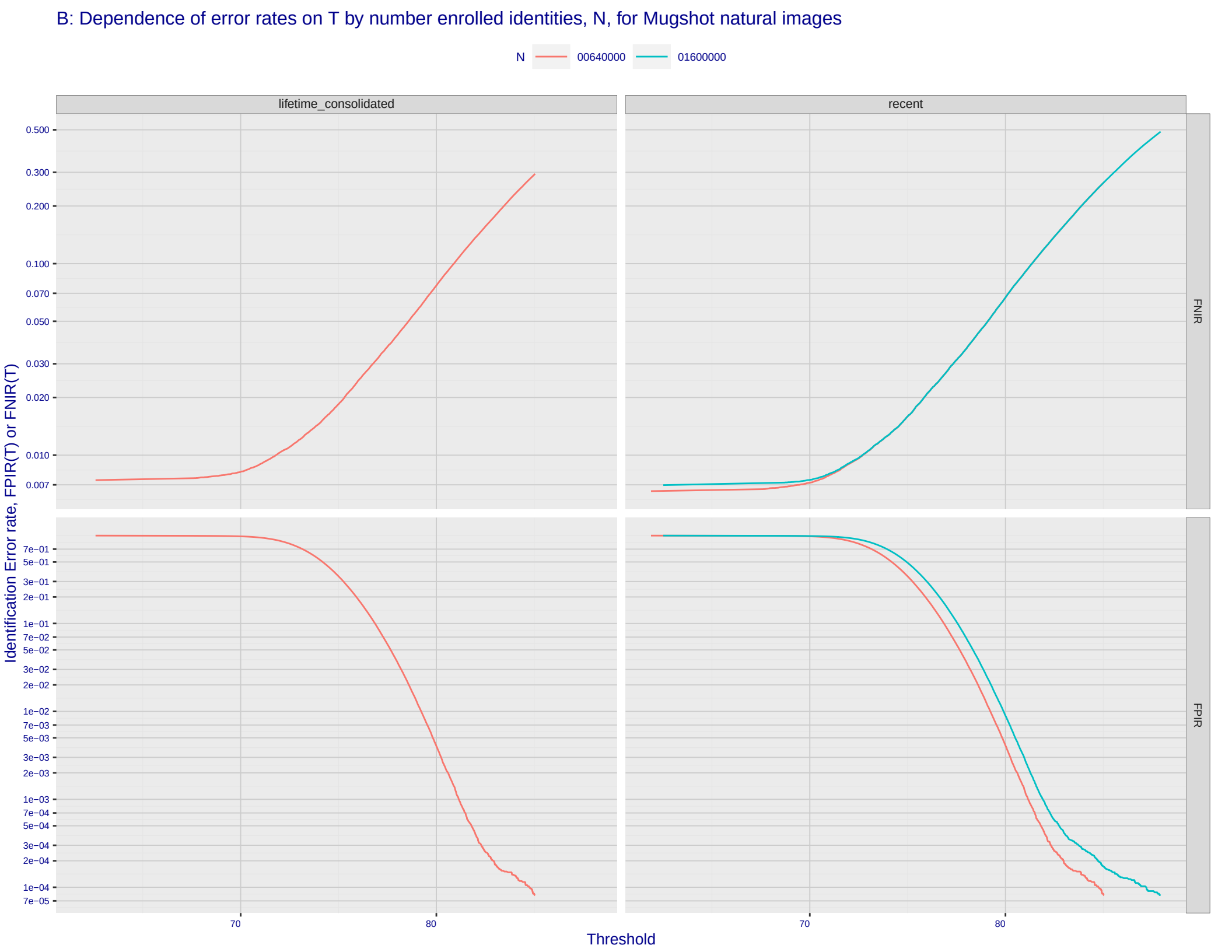
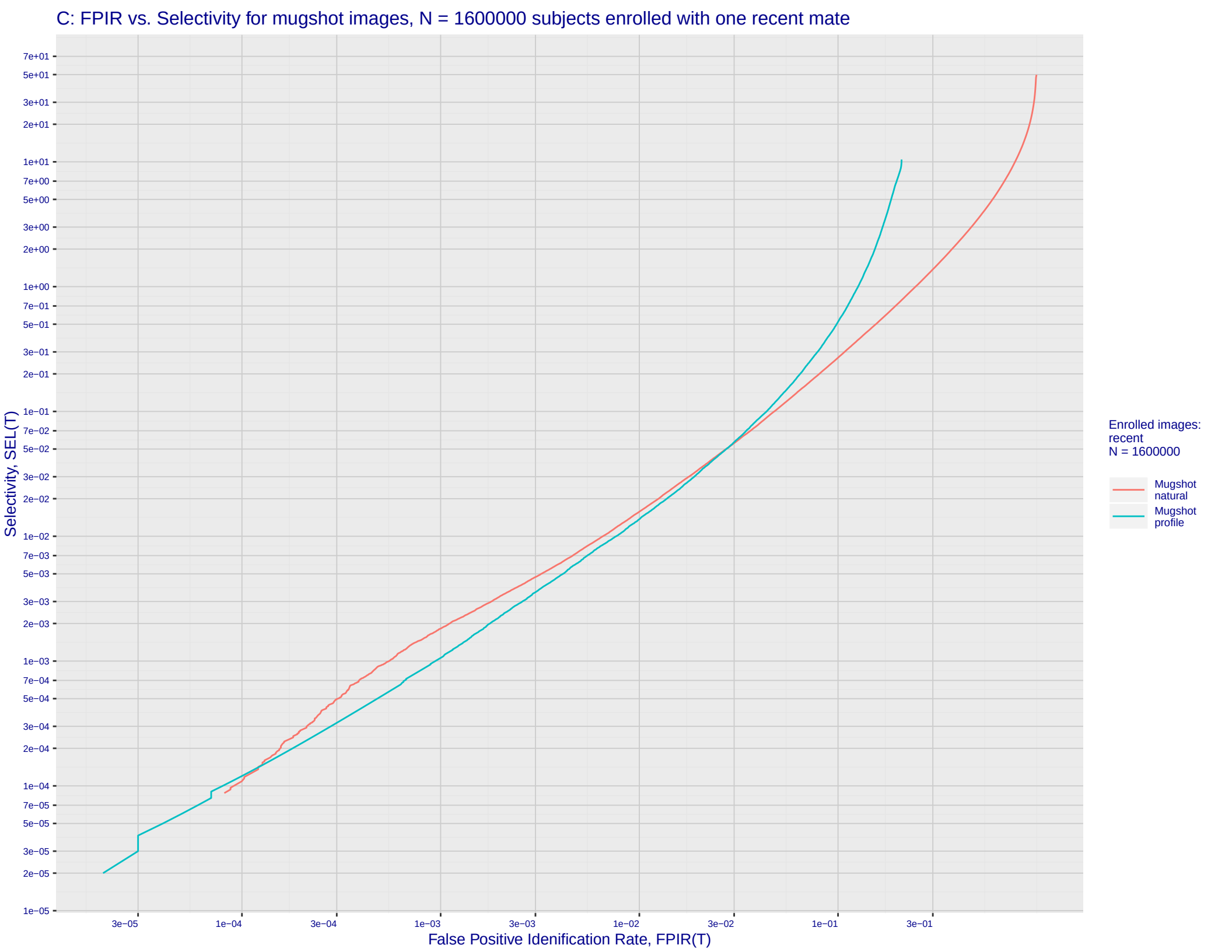
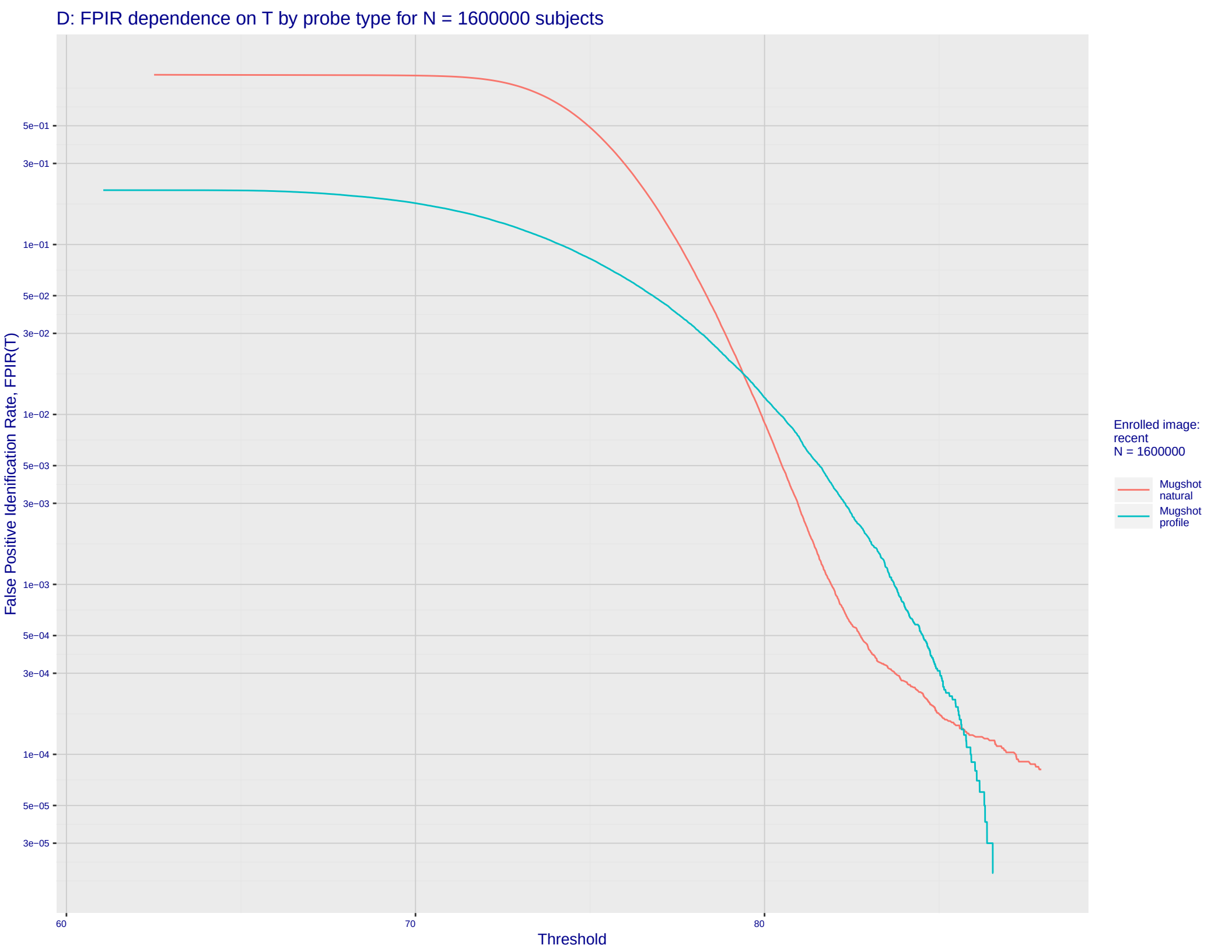
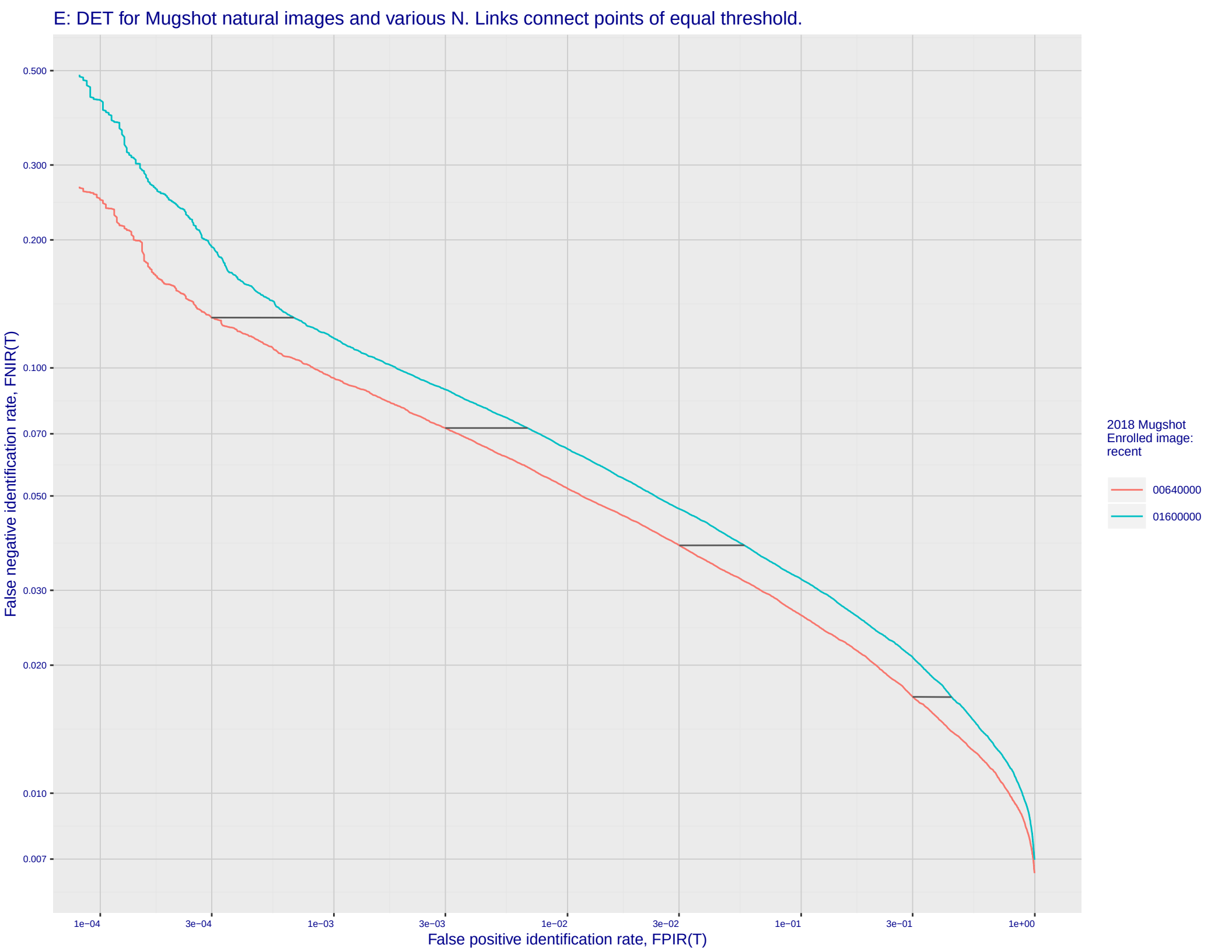
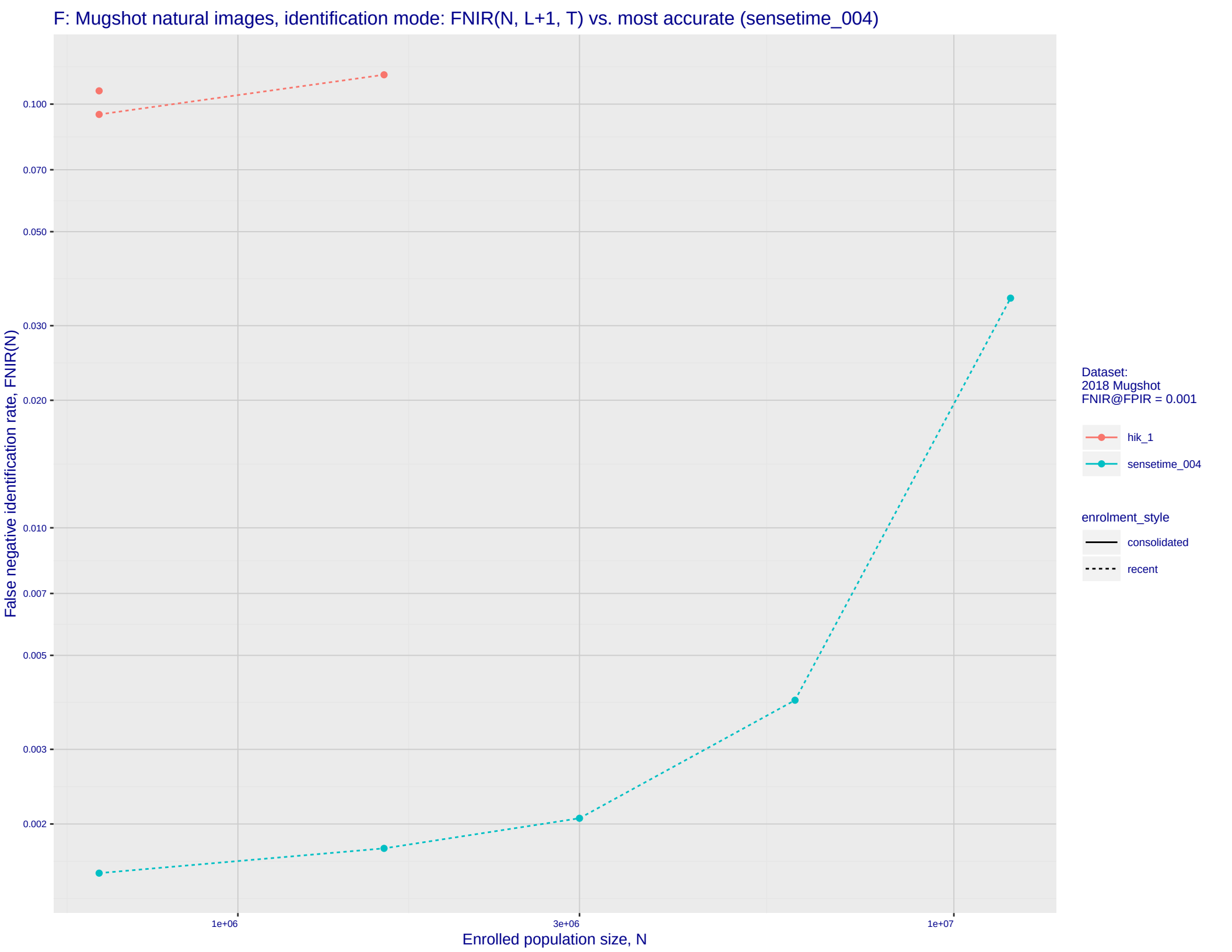

A: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
Mugshot
natural
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
False negative identification rate, FNIR(T)
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
False positive identification rate, FPIR(T)
enrolment_style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


B: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images
N
00640000
01600000
lifetime_consolidated
recent
FNIR
FPIR
Identification Error rate, FPIR(T) or FNIR(T)
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
70
80
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
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


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
60
70
80
Threshold
Enrolled image:
recent
N = 1600000
Mugshot
natural
Mugshot
profile


E: DET for Mugshot natural images and various N. Links connect points of equal threshold.
False negative identification rate, FNIR(T)
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


F: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_004)
False negative identification rate, FNIR(N)
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
Dataset:
2018 Mugshot
FNIR@FPIR = 0.001
hik_1
sensetime_004
enrolment_style
consolidated
recent

G: Datasheet

Algorithm: hik_1

Developer: Hikvision Research Institute

Submission Date: 2018_02_12

Template size: 1808 bytes

Template time (2.5 percentile): 815 msec

Template time (median): 820 msec

Template time (97.5 percentile): 842 msec

Frontal mugshot investigation rank 137 −− FNIR(1600000, 0, 1) = 0.0147 vs. lowest 0.0010 from sensetime_004

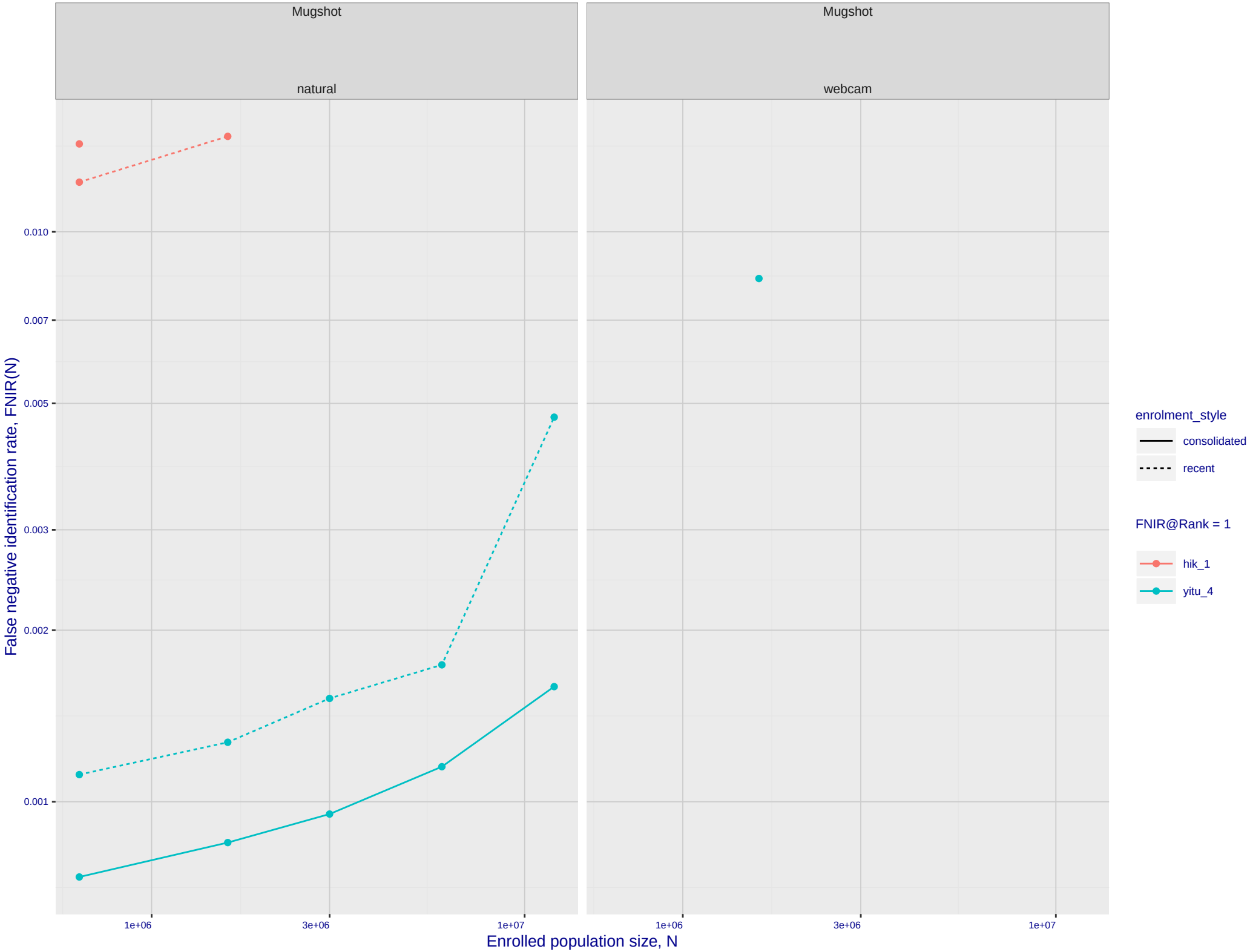
natural investigation rank 264 −− FNIR(1600000, 0, 1) = 0.9456 vs. lowest 0.0492 from paravision_005

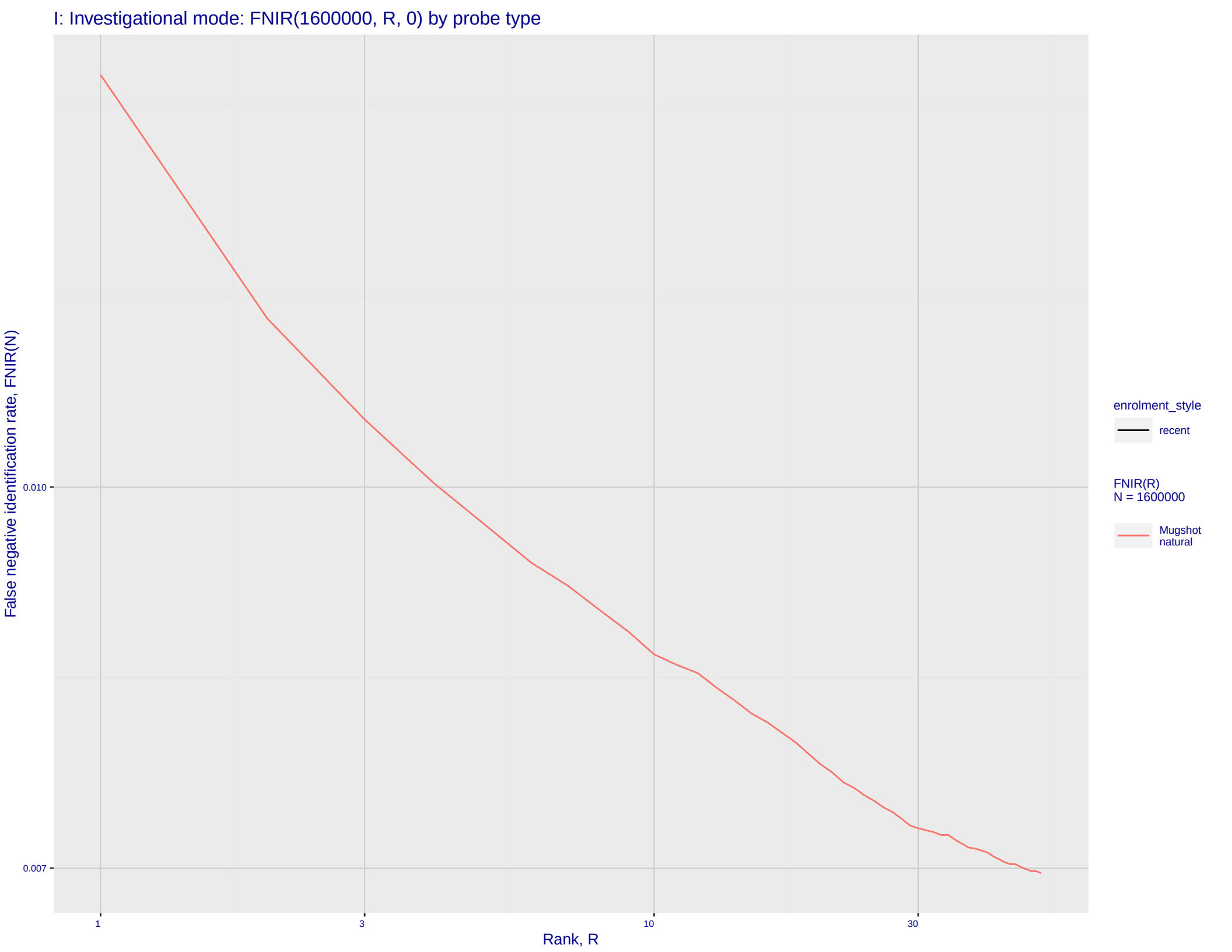
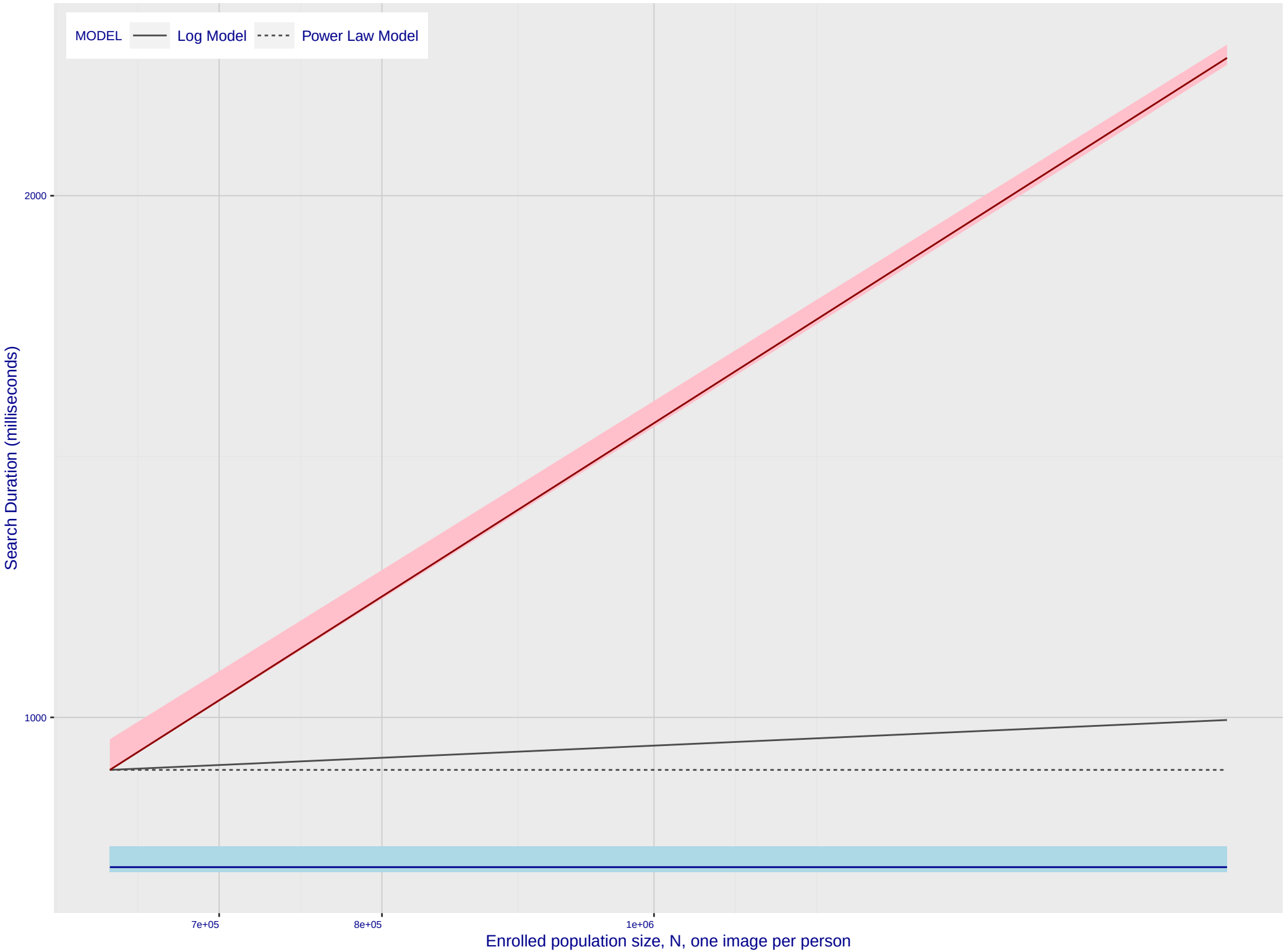
natural investigation rank 264 −− FNIR(1600000, 0, 1) = 0.9456 vs. lowest 0.0492 from paravision_005

Frontal mugshot identification rank 133 −− FNIR(1600000, T, L+1) = 0.1173 vs. lowest 0.0018 from sensetime_004

natural identification rank 77 −− FNIR(1600000, T, L+1) = 0.9827 vs. lowest 0.1020 from sensetime_004

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)
0.010
0.007
1
3
10
30
Rank, R
enrolment_style
recent
FNIR(R)
N = 1600000
Mugshot
natural

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