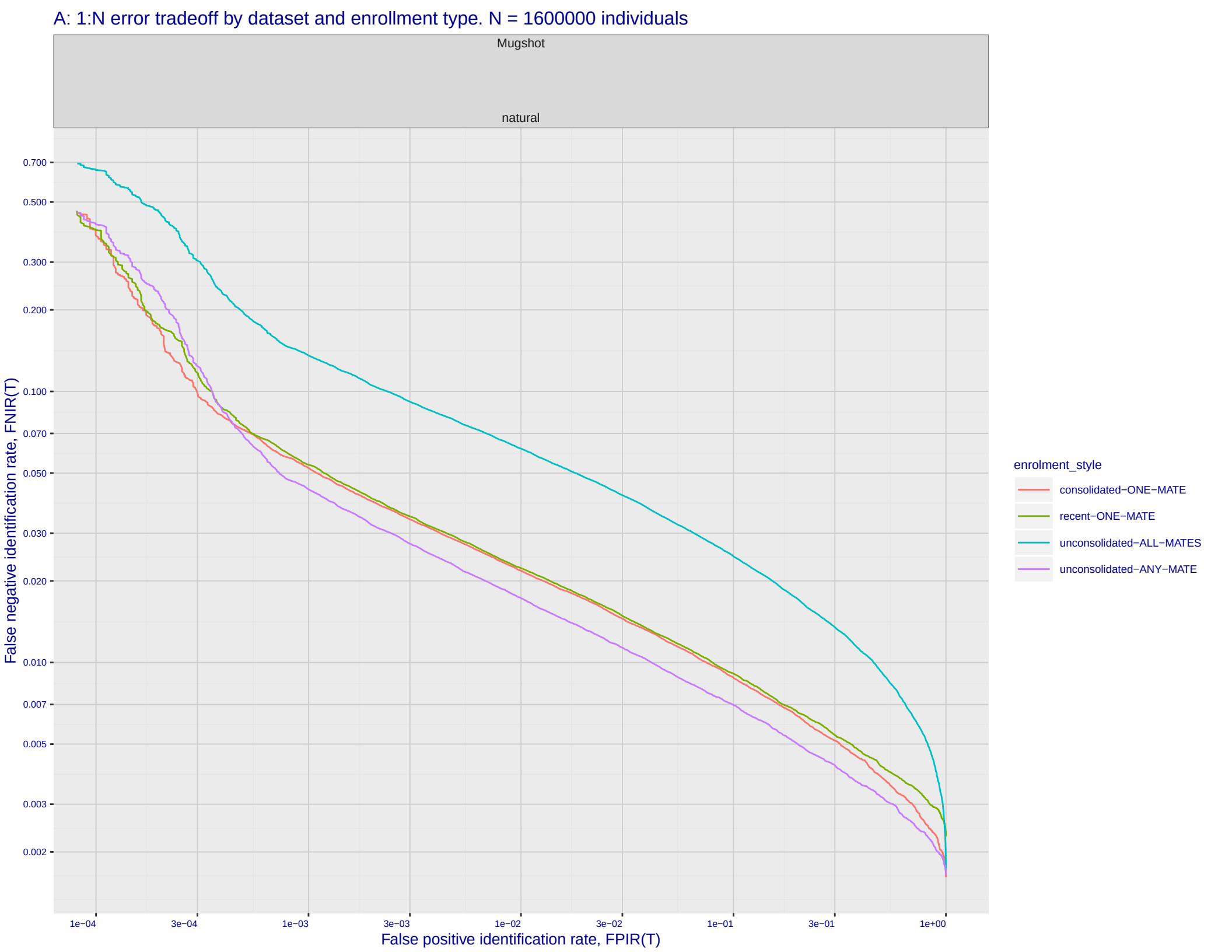
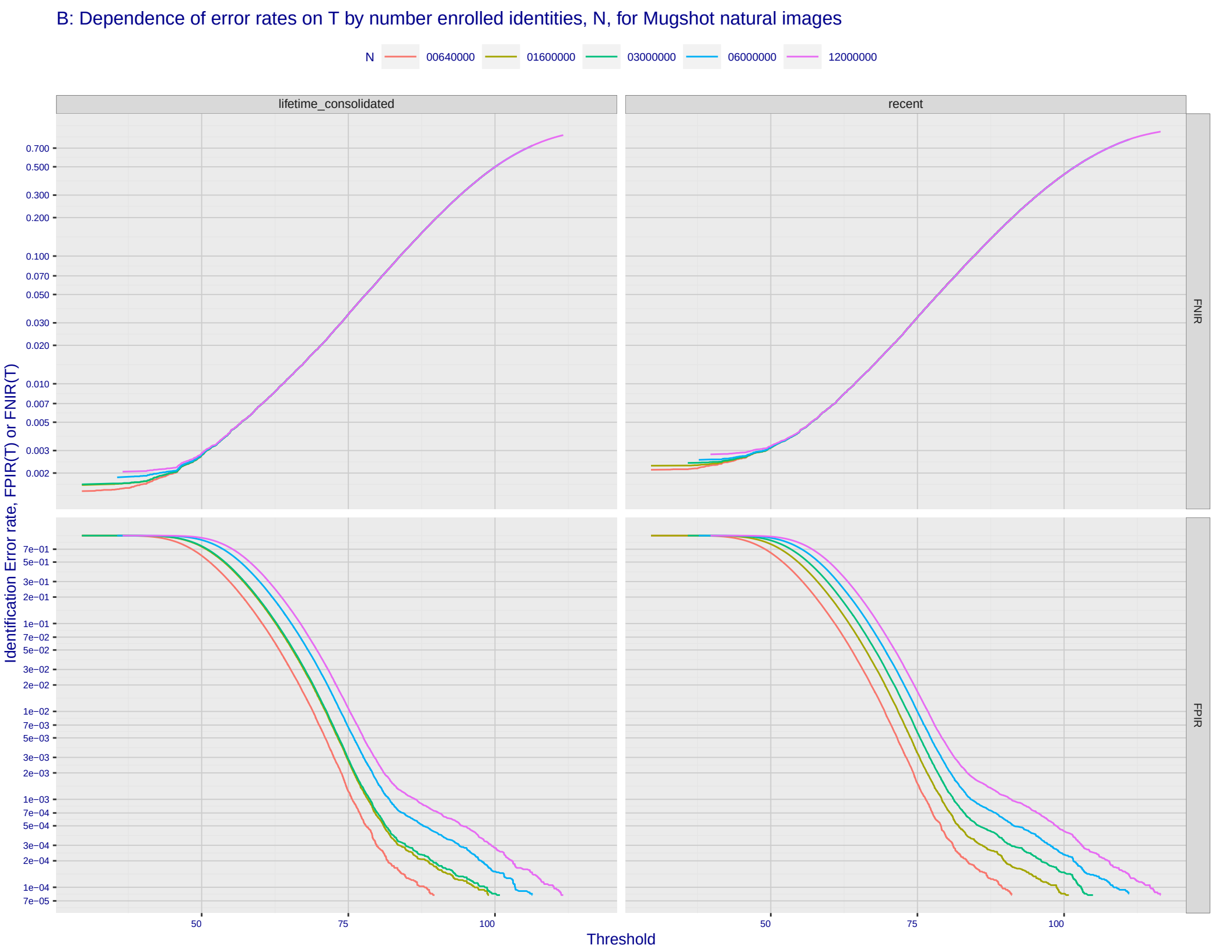
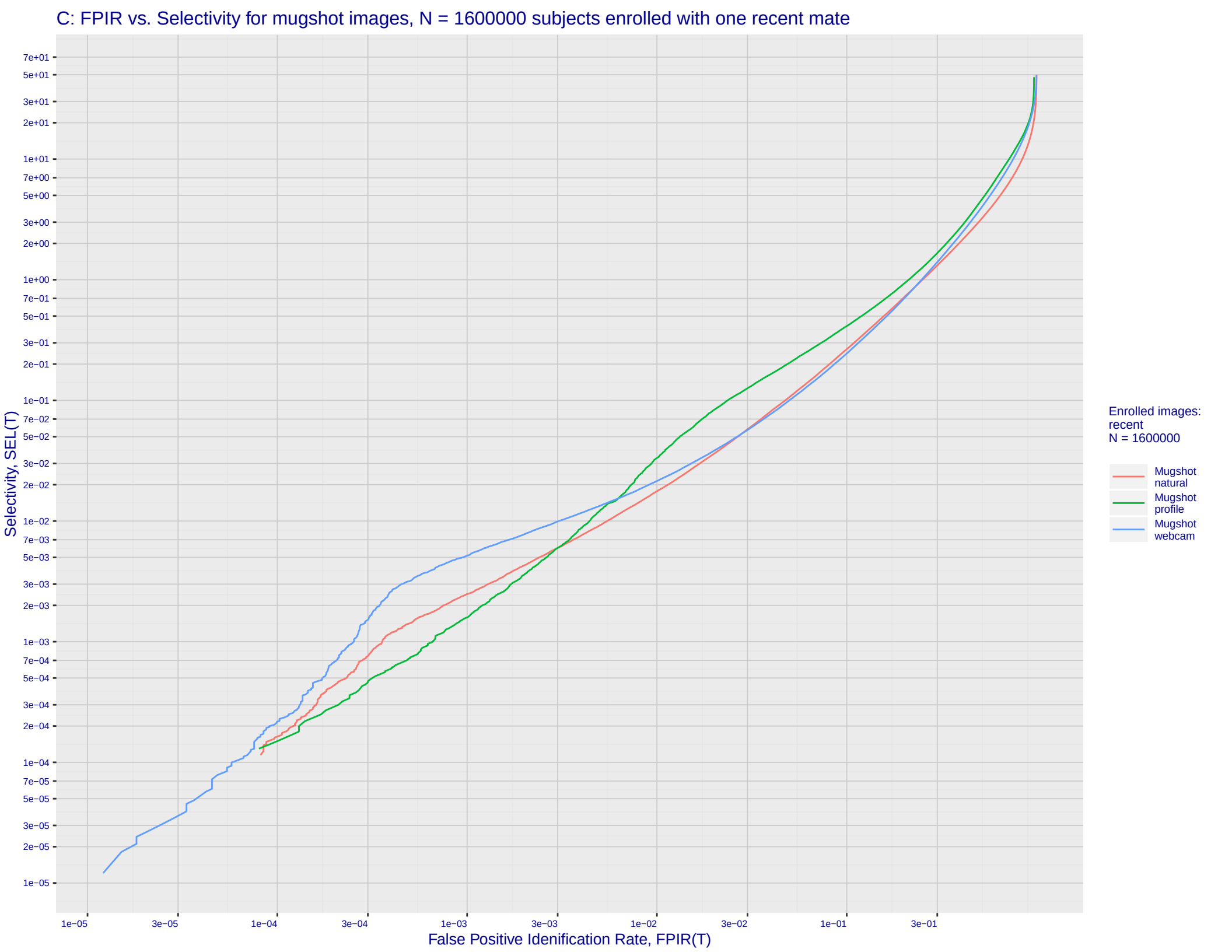
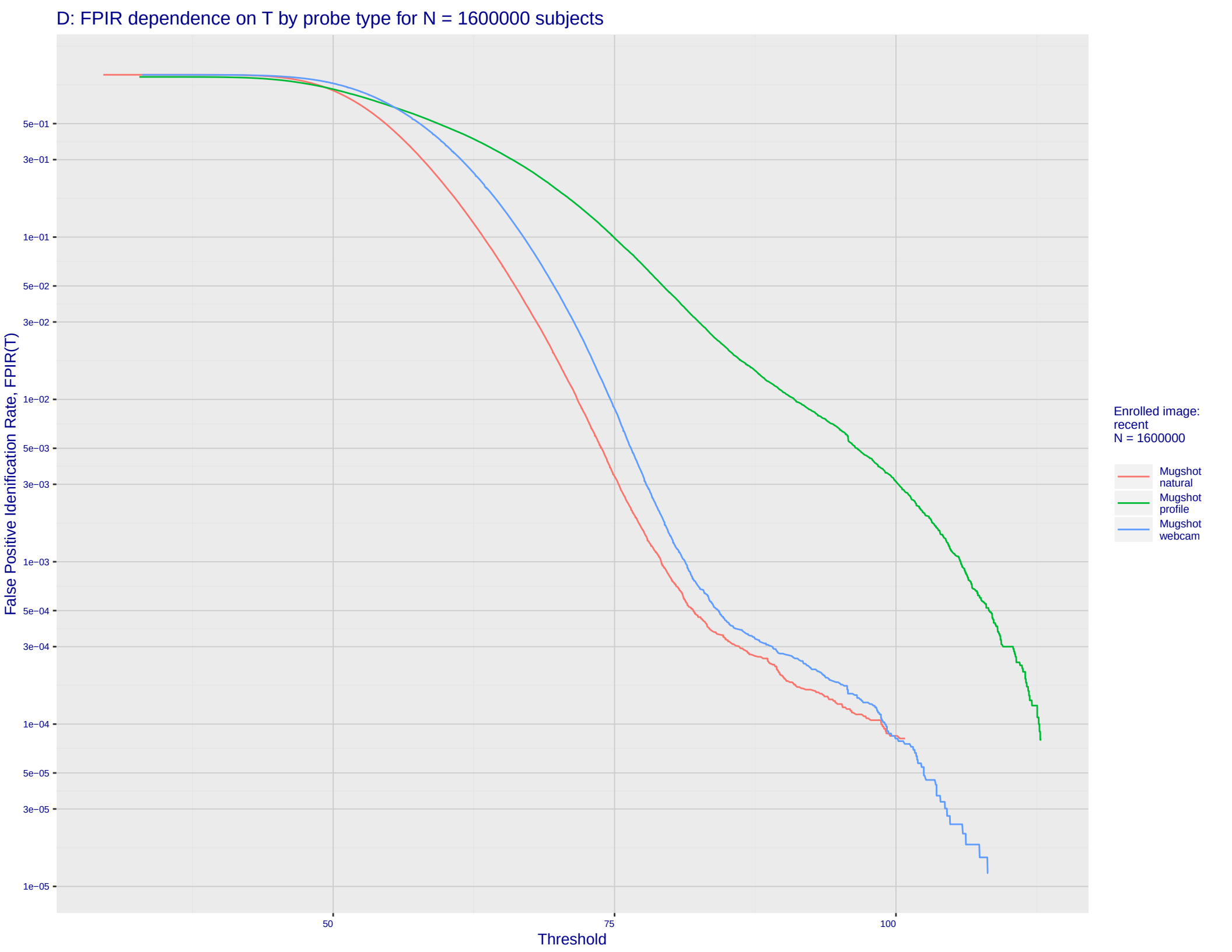
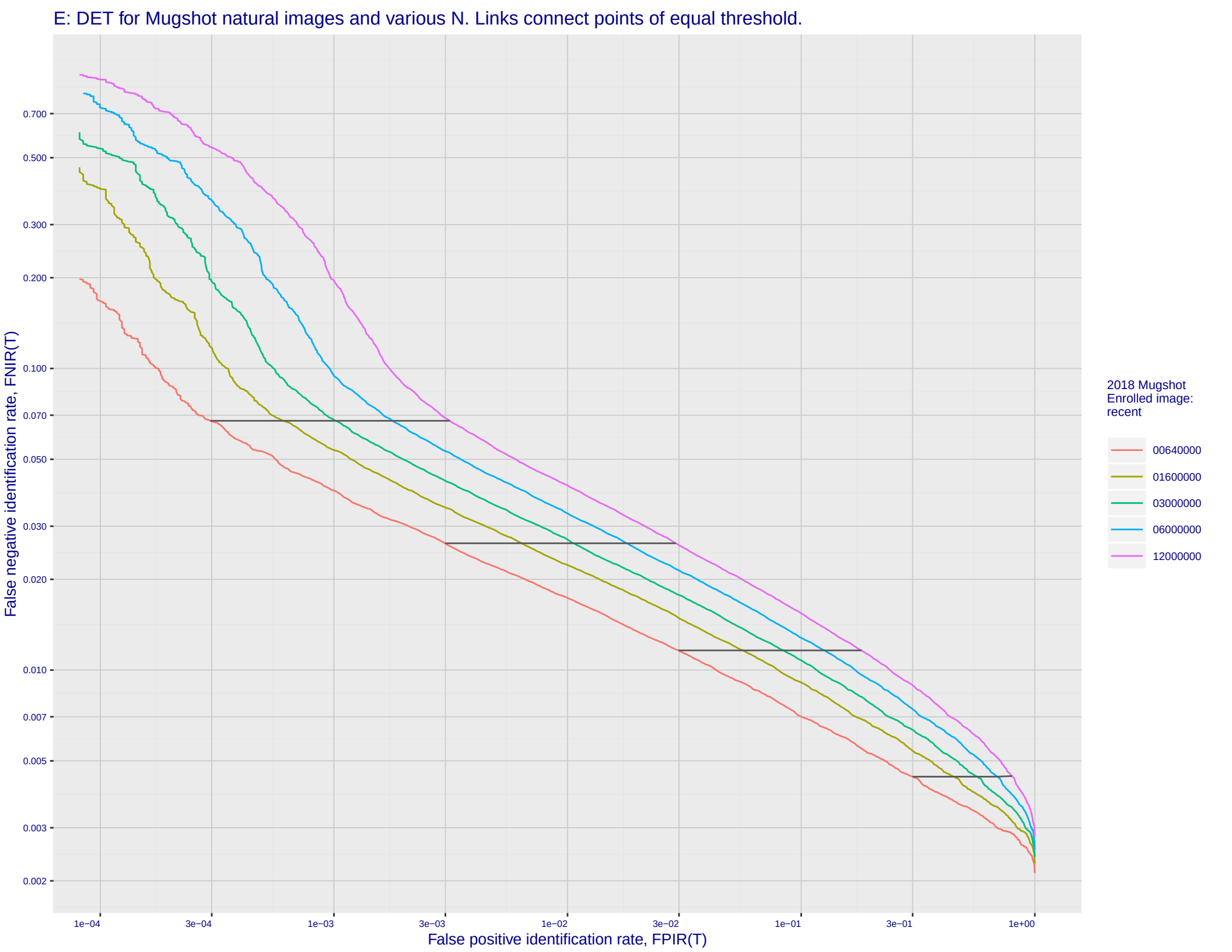
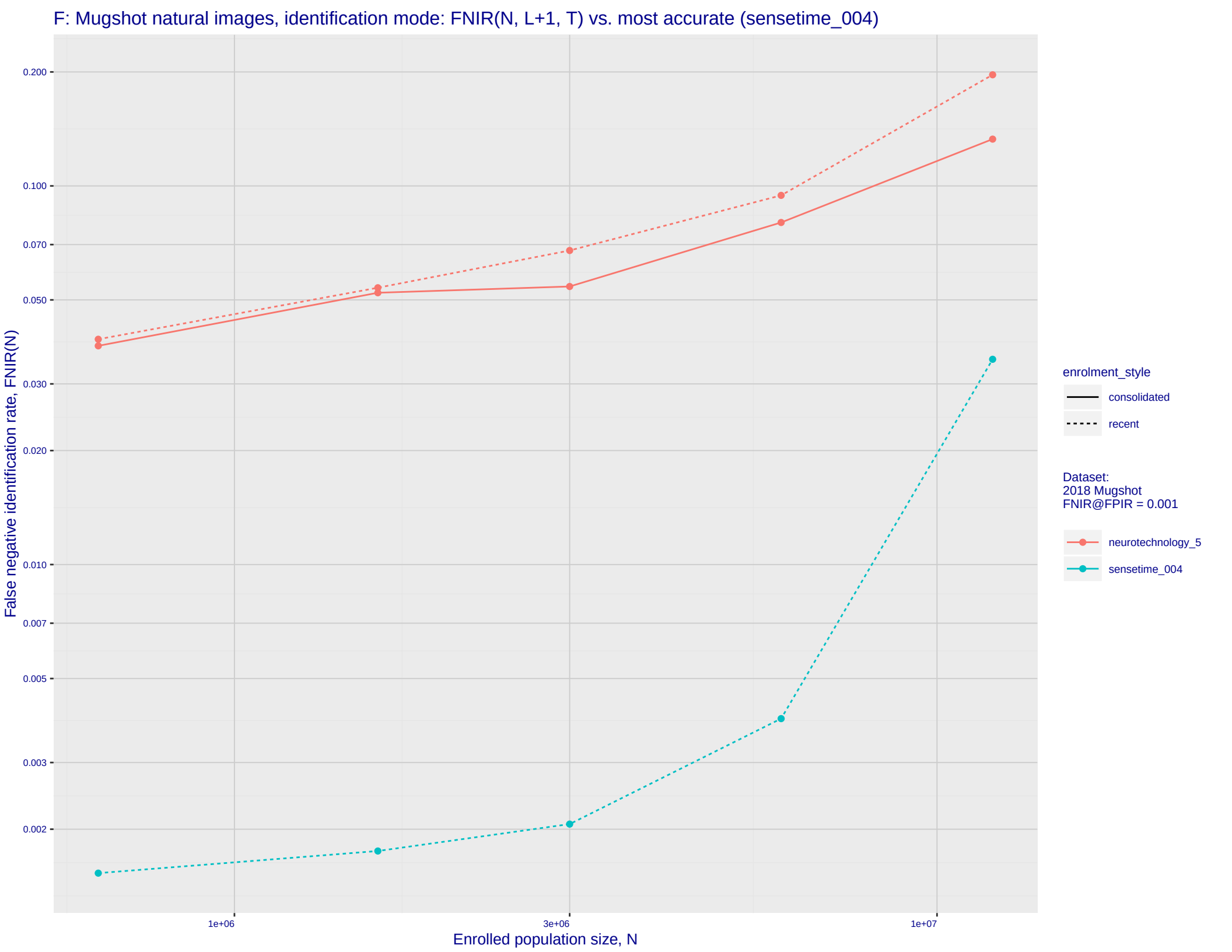

A: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
Mugshot
natural
False negative identification rate, FNIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
False positive identification rate, FPIR(T)
enrolment_style
consolidated−ONE−MATE
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
0.005
0.003
0.002
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
50
75
100
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
50
75
100
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
0.005
0.003
0.002
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)
0.200
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
neurotechnology_5
sensetime_004

G: Datasheet

Algorithm: neurotechnology_5

Developer: Neurotechnology

Submission Date: 2018_10_30

Template size: 256 bytes

Template time (2.5 percentile): 402 msec

Template time (median): 402 msec

Template time (97.5 percentile): 442 msec

Frontal mugshot investigation rank 60 −− FNIR(1600000, 0, 1) = 0.0043 vs. lowest 0.0010 from sensetime_004

natural investigation rank 84 −− FNIR(1600000, 0, 1) = 0.0242 vs. lowest 0.0067 from sensetime_003

natural investigation rank 199 −− FNIR(1600000, 0, 1) = 0.8395 vs. lowest 0.0492 from paravision_005

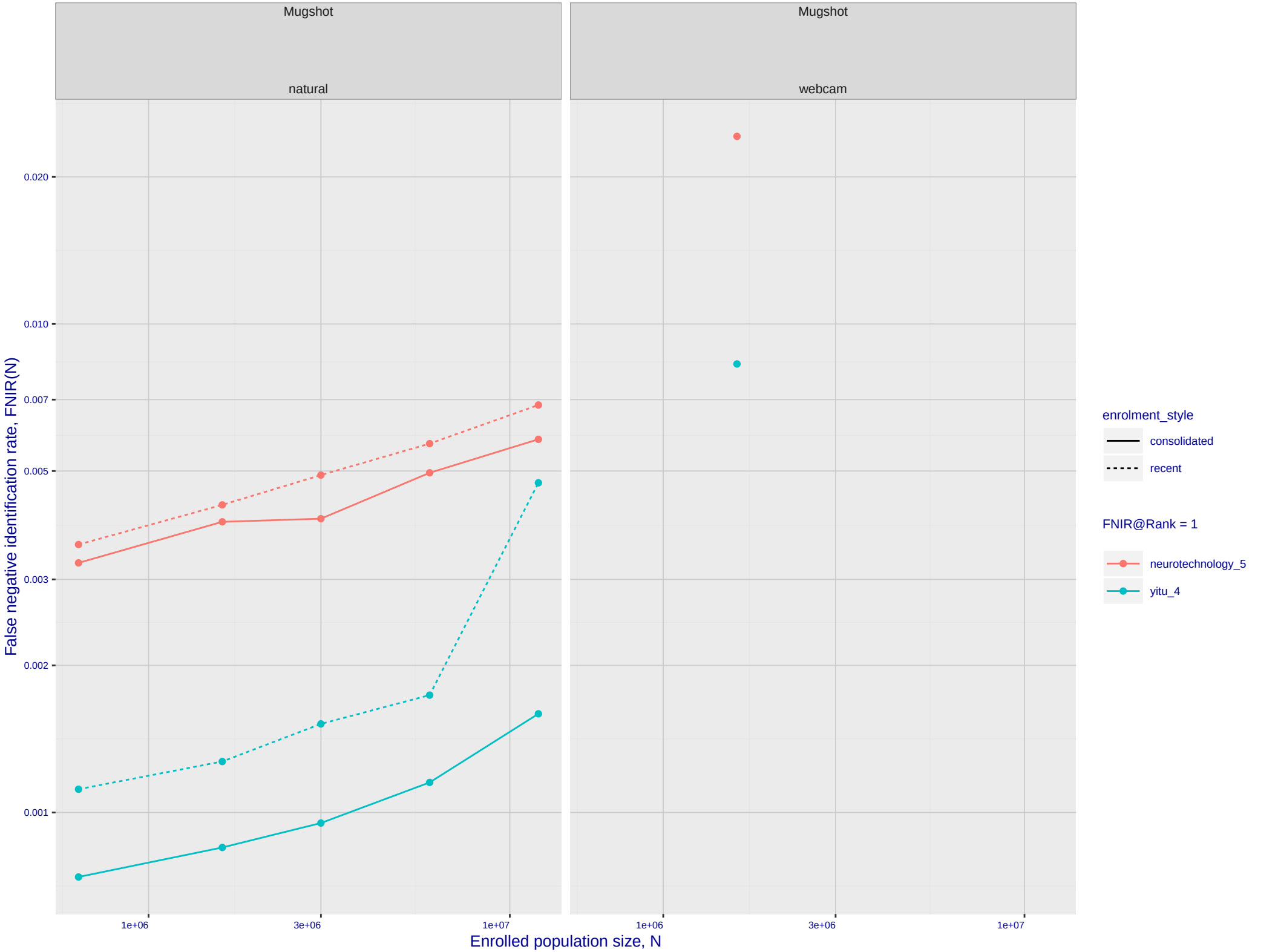
natural investigation rank 199 −− FNIR(1600000, 0, 1) = 0.8395 vs. lowest 0.0492 from paravision_005

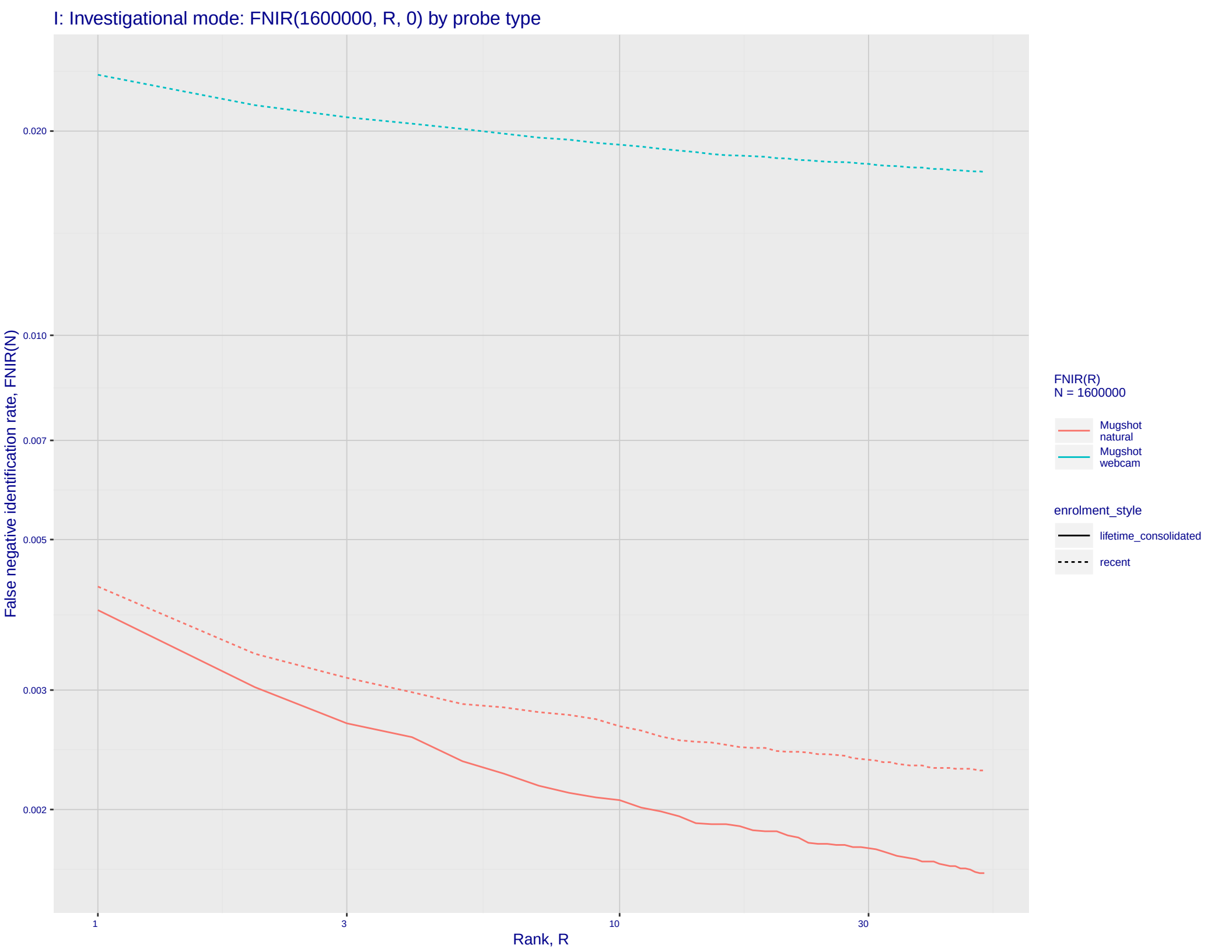
Frontal mugshot identification rank 82 −− FNIR(1600000, T, L+1) = 0.0538 vs. lowest 0.0018 from sensetime_004

natural identification rank 79 −− FNIR(1600000, T, L+1) = 0.1291 vs. lowest 0.0122 from sensetime_003

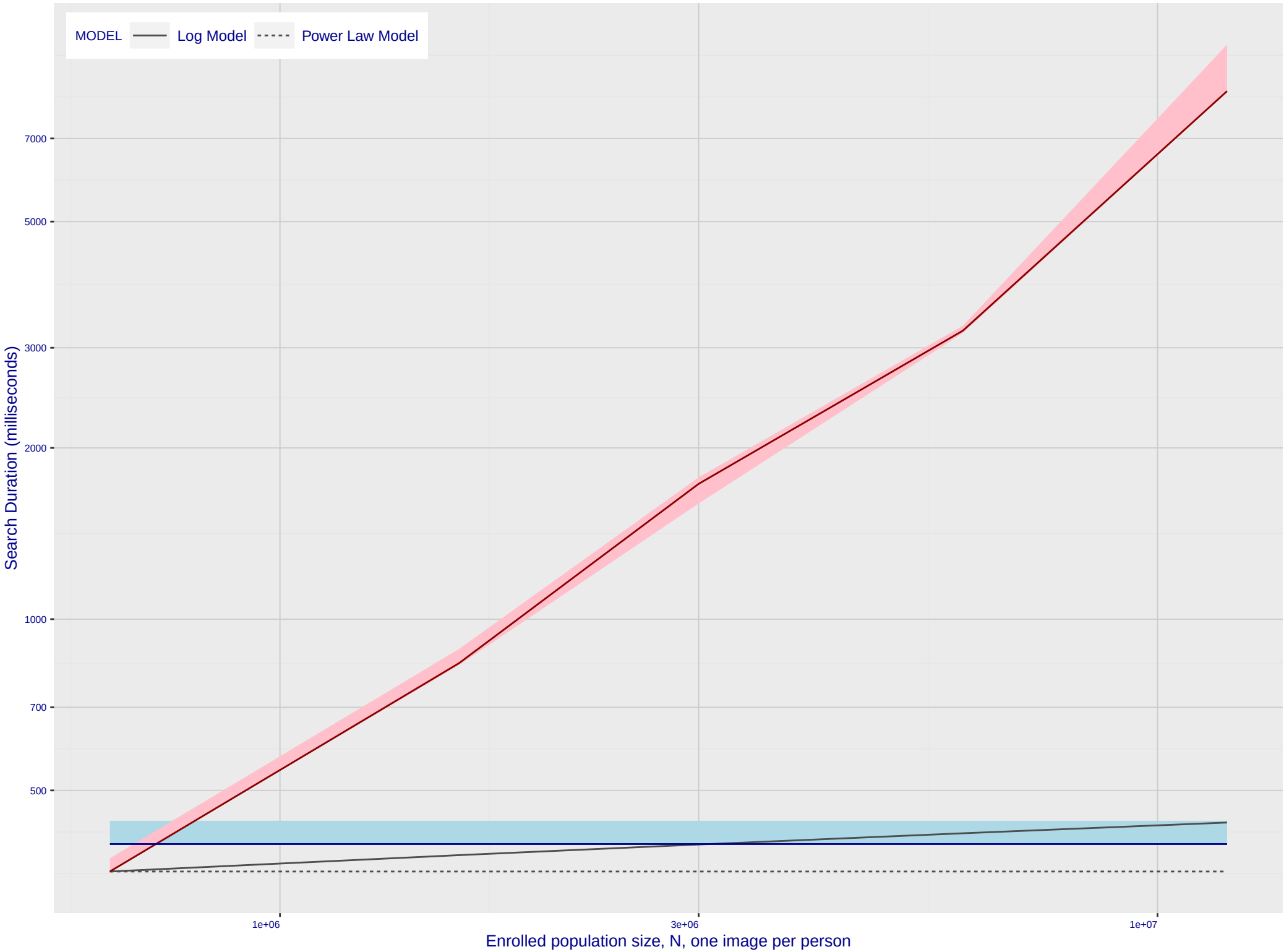
natural identification rank 101 −− FNIR(1600000, T, L+1) = 0.9958 vs. lowest 0.1020 from sensetime_004

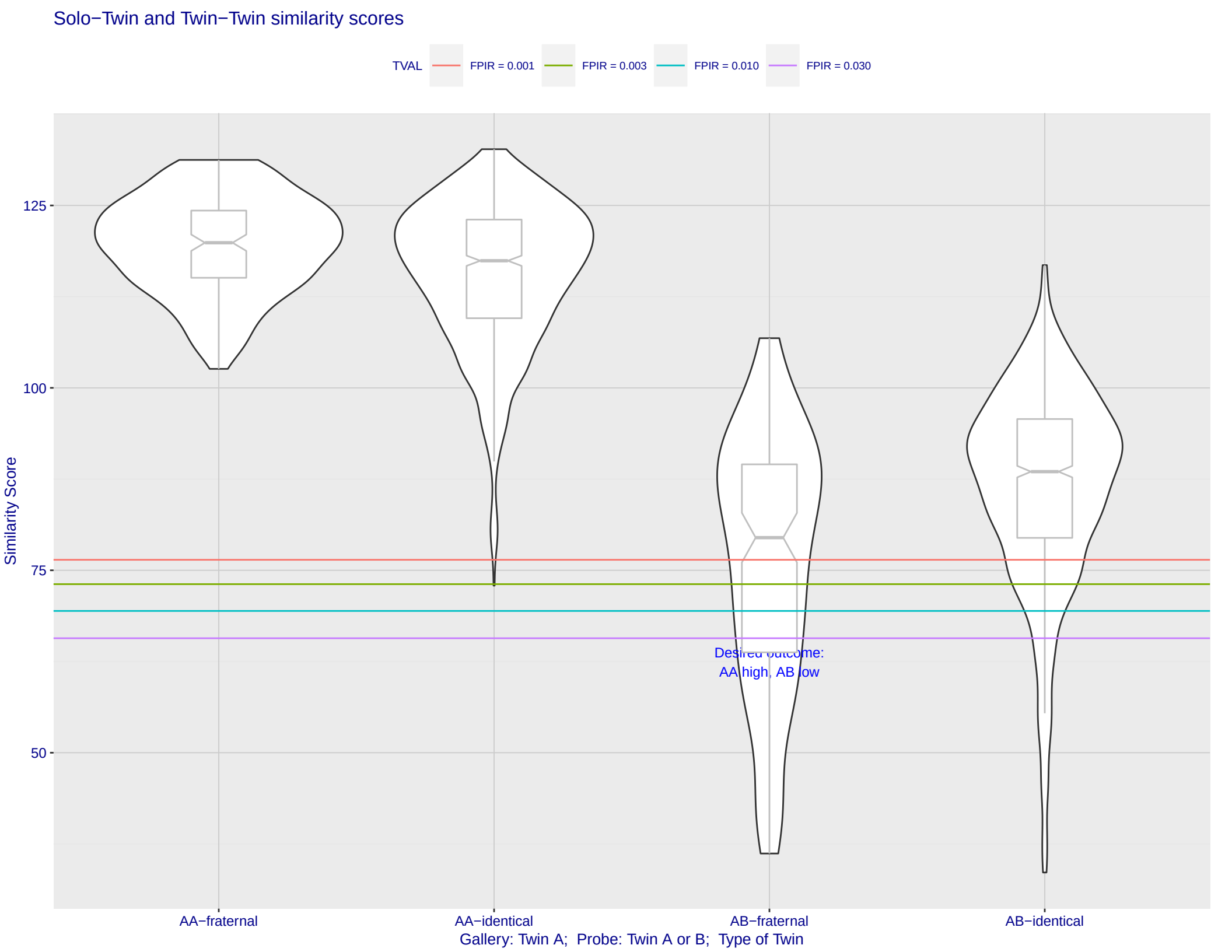
H: Investigational mode: FNIR(N, 1, 0) vs. most accurate (yitu_4)

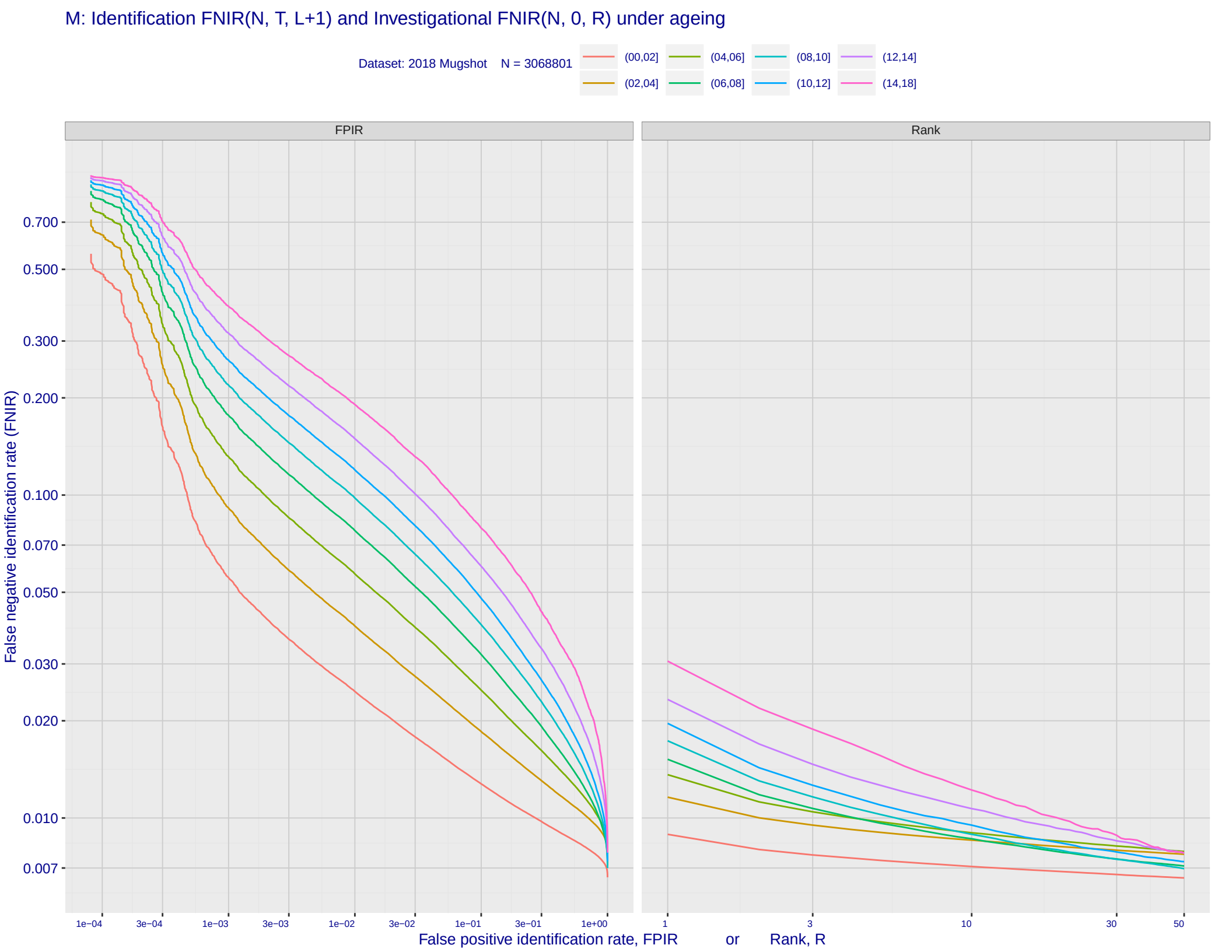


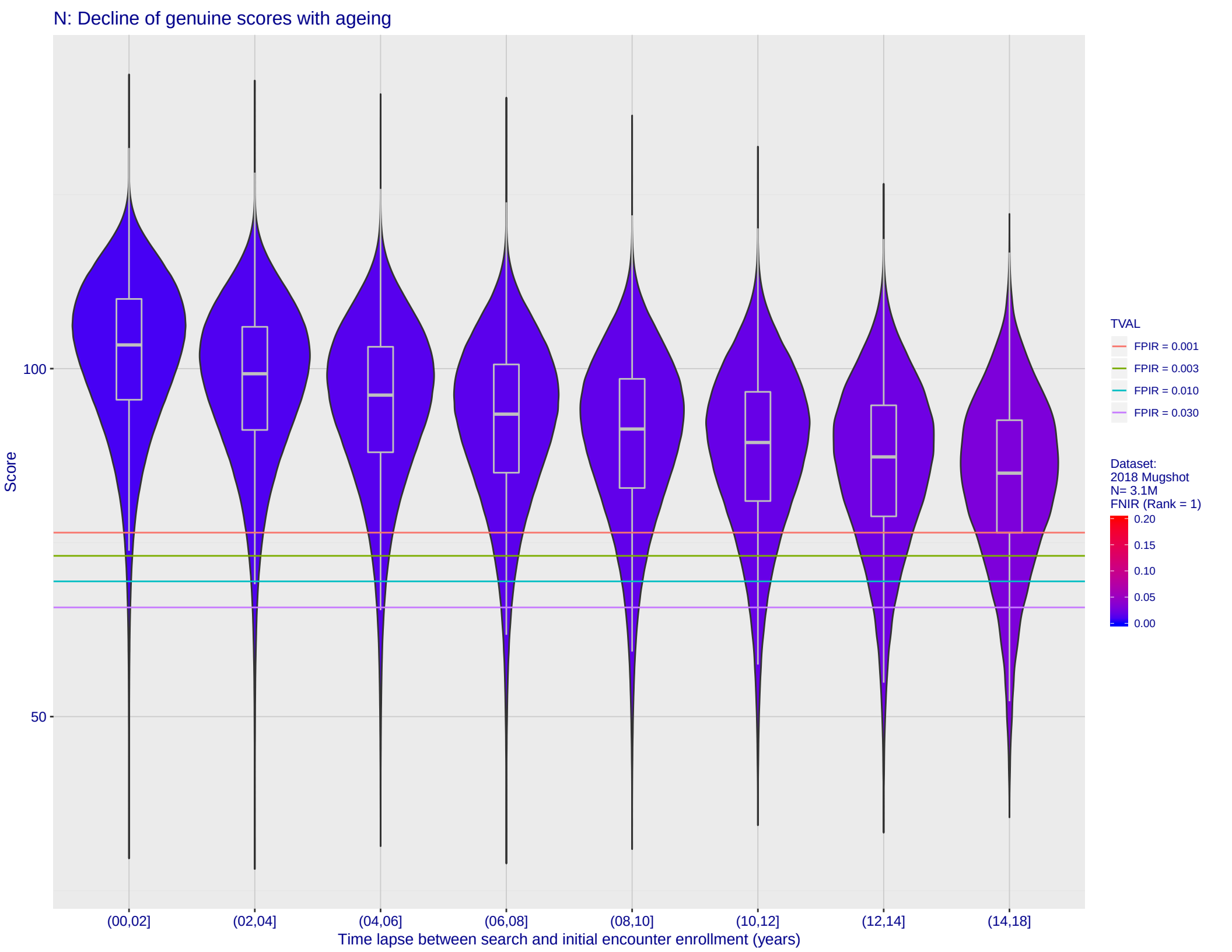

I: Investigational mode: FNIR(1600000, R, 0) by probe type
False negative identification rate, FNIR(N)
0.020
0.010
0.007
0.005
0.003
0.002
1
3
10
30
Rank, R
FNIR(R)
N = 1600000
Mugshot natural
Mugshot webcam
enrolment_style
lifetime_consolidated
recent

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




Solo−Twin and Twin−Twin similarity scores
TVAL
FPIR = 0.001
FPIR = 0.003
FPIR = 0.010
FPIR = 0.030
Similarity Score
125
100
75
50
Desired outcome:
AA high, AB low
AA−fraternal
AA−identical
AB−fraternal
AB−identical
Gallery: Twin A; Probe: Twin A or B; Type of Twin


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)
0.700
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
1
3
10
30
50
False positive identification rate, FPIR or Rank, R


N: Decline of genuine scores with ageing
Score
100
50
(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