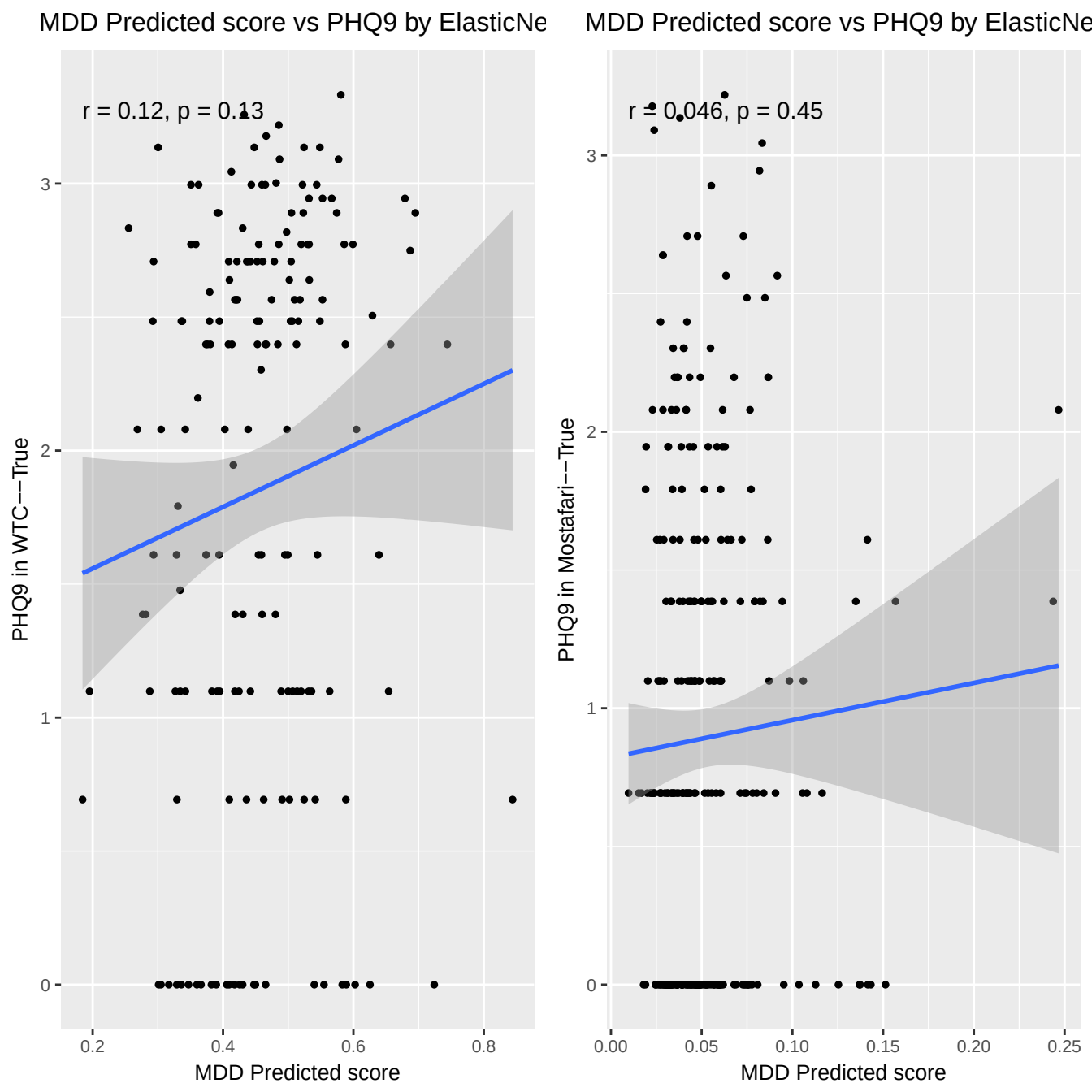
PHQ9 MDD prediction with genes log transformed
 and scale by samples :(x−median(x))/mad(x)
 Design setting are:
 Log transformed PHQ9.
 Only male are tested for Mostafavi.
 Top 2000 genes by 2−step filtering.

 Design setting code are:
 1,1,1

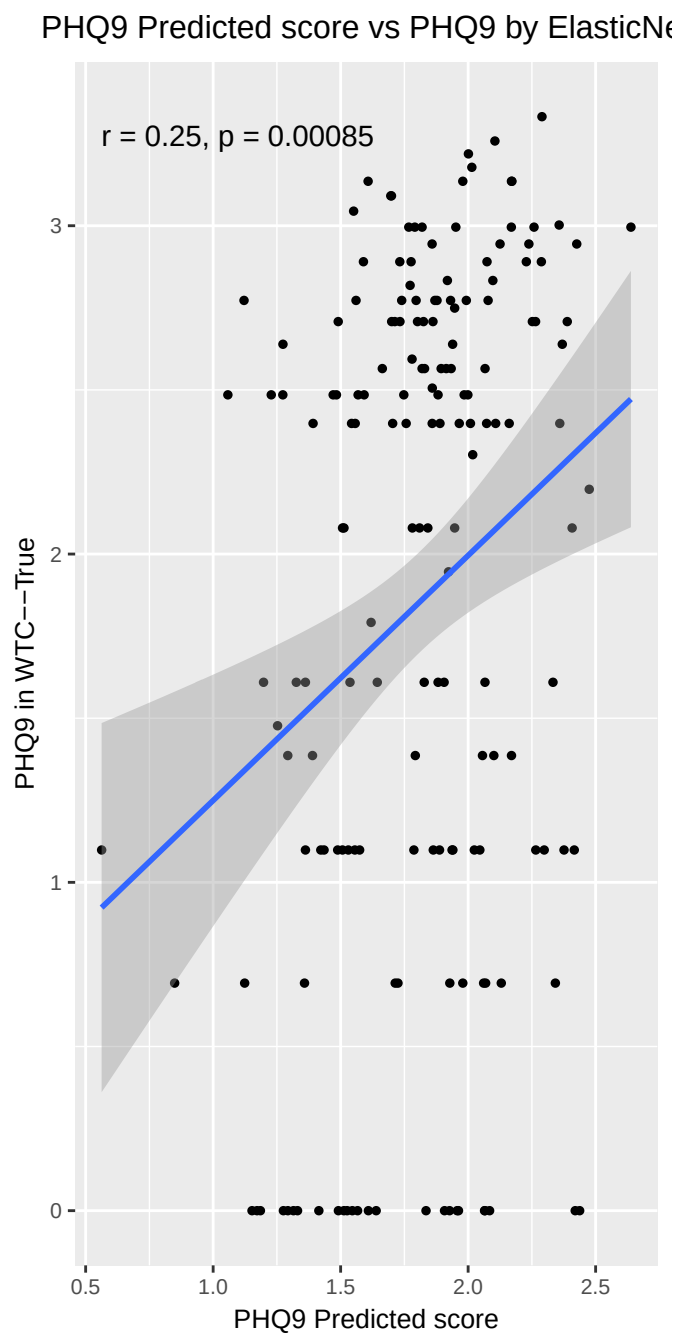
Train on MDD of batch 3
 Test on batch 4 and Mostafavi

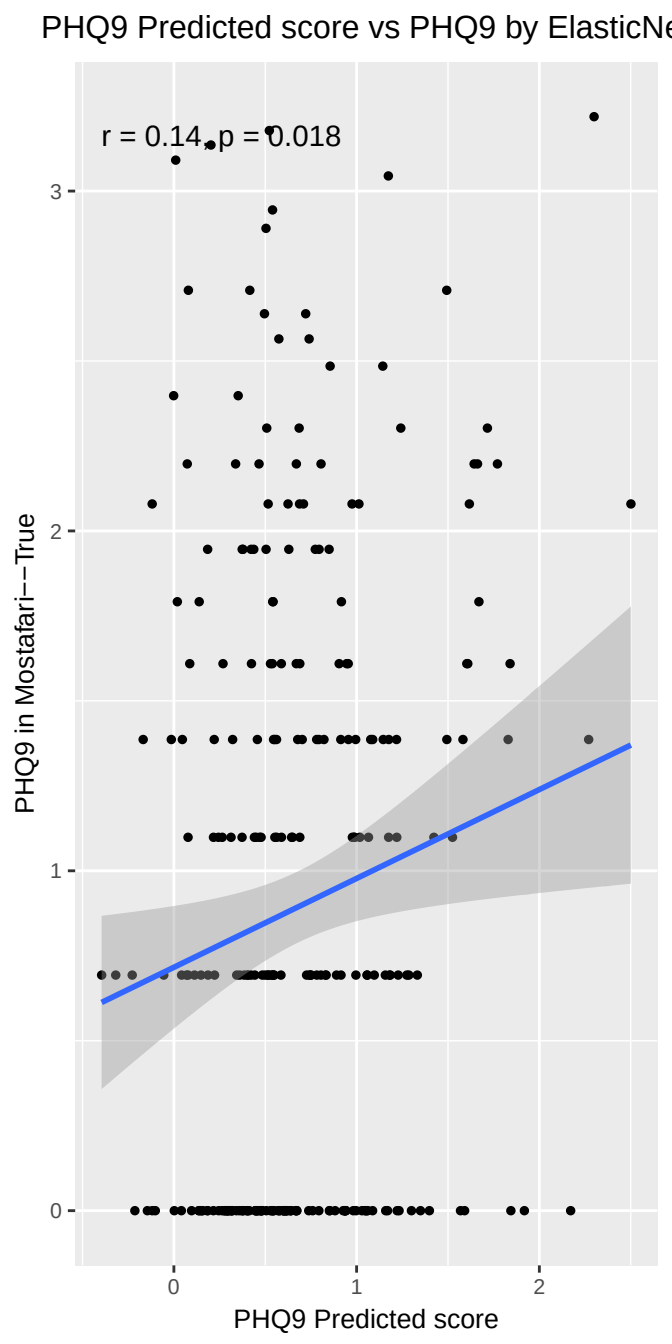
 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.625515463917526 0.576278884914552 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.12, p = 0.13
PHQ9 in WTC—True
MDD Predicted score
0
1
2
3
0.2
0.4
0.6
0.8
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.046, p = 0.45
PHQ9 in Mostafari—True
MDD Predicted score
0
1
2
3
0.00
0.05
0.10
0.15
0.20
0.25

Train on PHQ9 of batch 3
 Test on batch 4 and Mostafavi

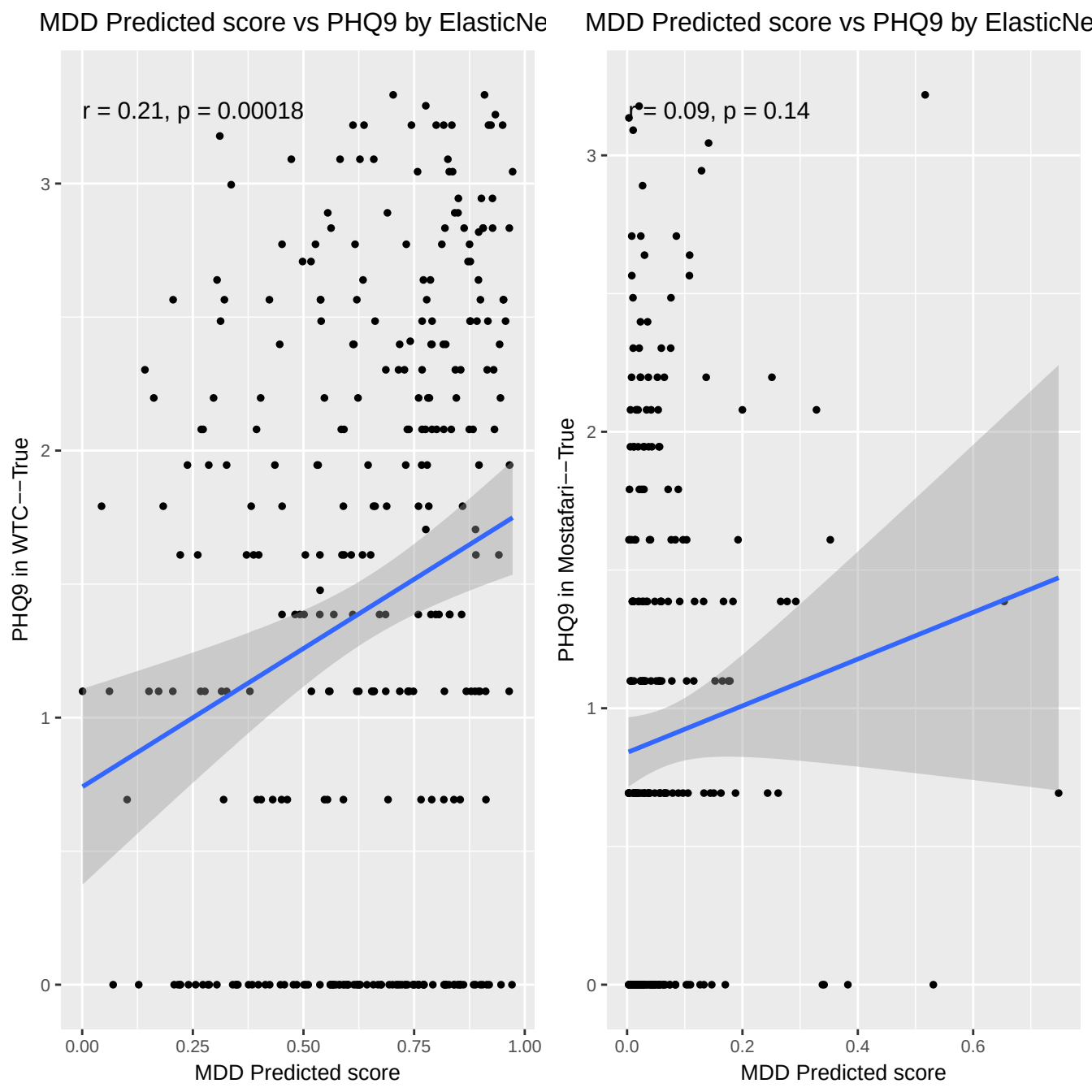
 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.581325711174629 0.631238289899506 respectively


PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.25, p = 0.00085
PHQ9 in WTC−−True
PHQ9 Predicted score
0
1
2
3
0.5
1.0
1.5
2.0
2.5


PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.14, p = 0.018
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
1
2
3
0
1
2

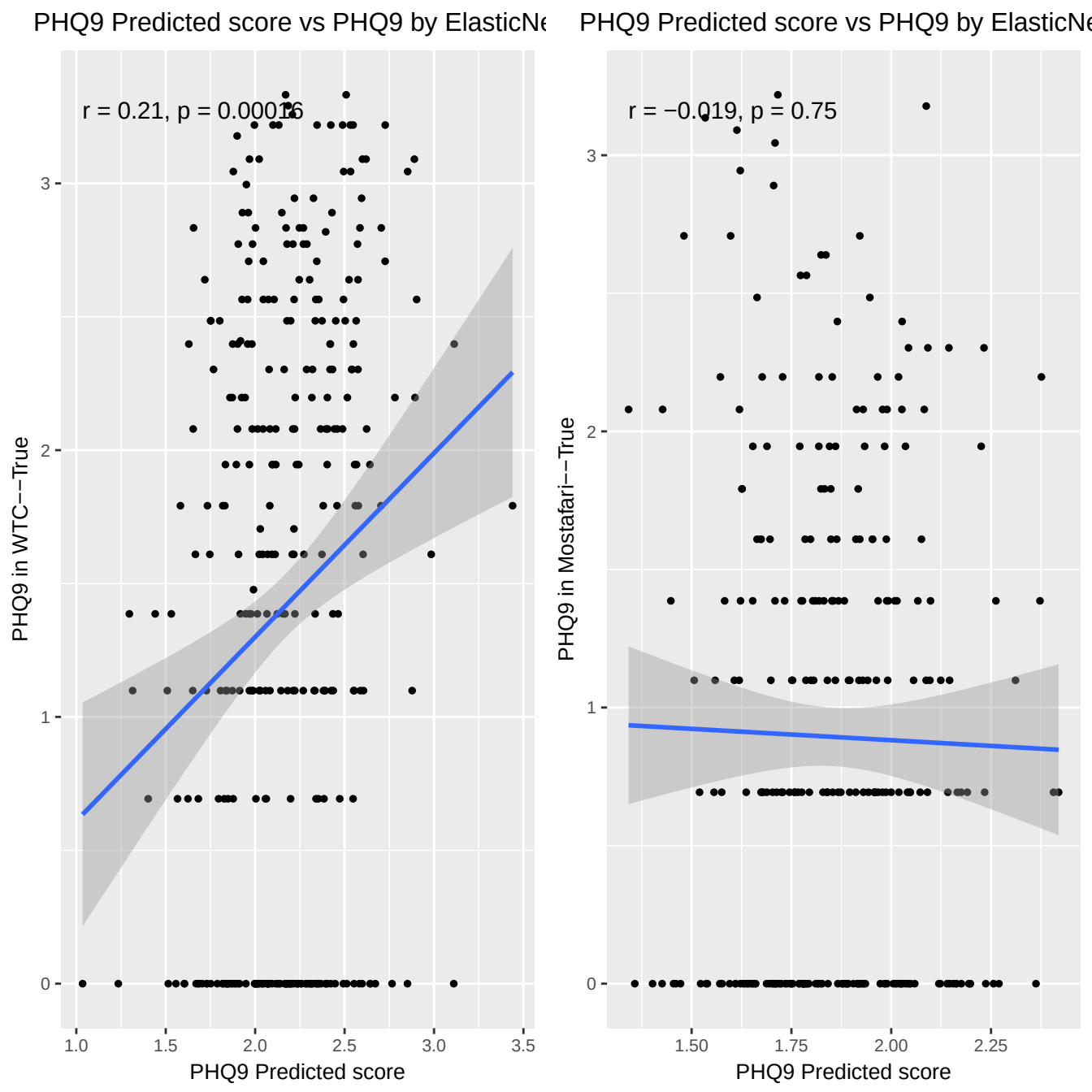
Train on MDD of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.703281378178835 0.523533753477545 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.21, p = 0.00018
PHQ9 in WTC—True
MDD Predicted score
0
1
2
3
0.00
0.25
0.50
0.75
1.00
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.09, p = 0.14
PHQ9 in Mostafari—True
MDD Predicted score
0
1
2
3
0.0
0.2
0.4
0.6

Train on PHQ9 of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.611448769343506 0.466416851189462 respectively

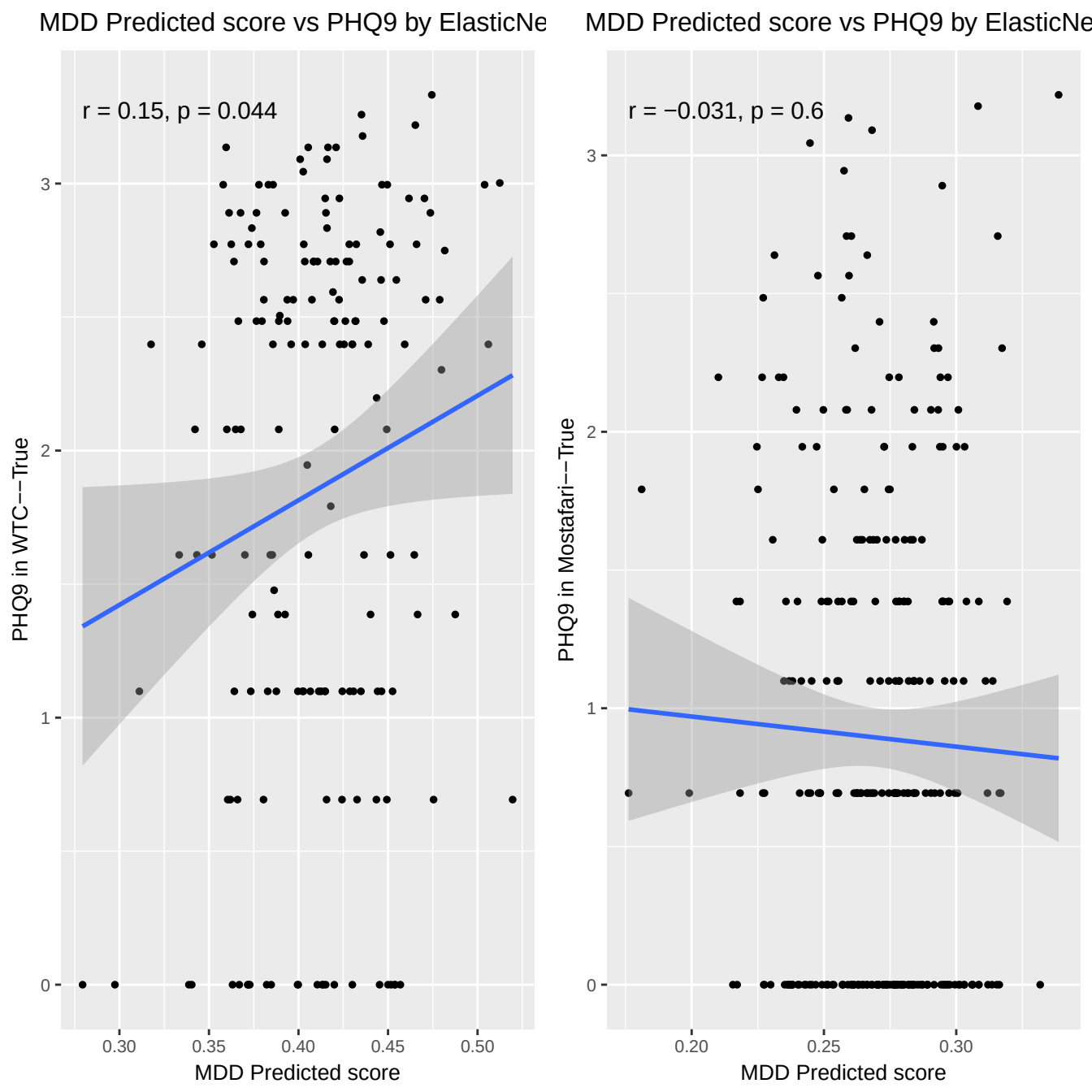

PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.21, p = 0.00016
PHQ9 in WTC−−True
PHQ9 Predicted score
0
1
2
3
1.0
1.5
2.0
2.5
3.0
3.5
PHQ9 Predicted score vs PHQ9 by ElasticNe
r = −0.019, p = 0.75
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
1
2
3
1.50
1.75
2.00
2.25

PHQ9 MDD prediction with genes log transformed
 and scale by samples :(x−median(x))/mad(x)
 Design setting are:
 Log transformed PHQ9.
 Only male are tested for Mostafavi.
 40 candidate genes by 2−step filtering.

 Design setting code are:
 1,1,2

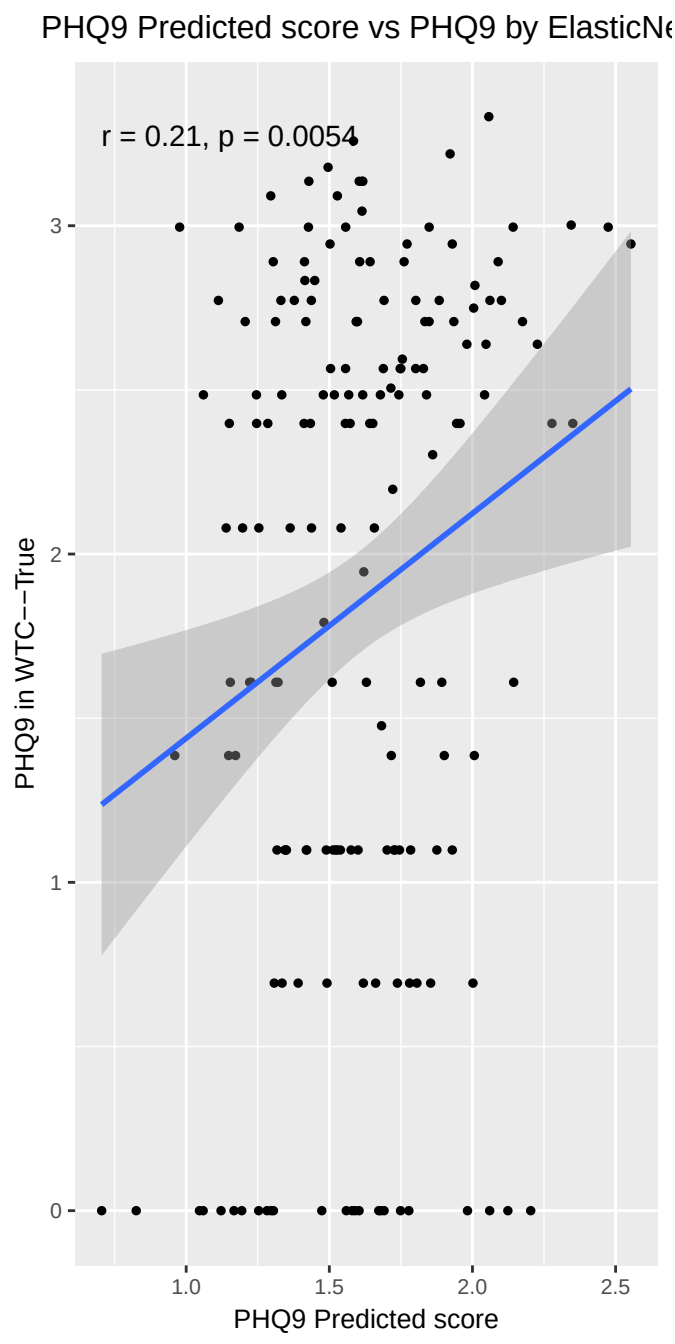
Train on MDD of batch 3
 Test on batch 4 and Mostafavi

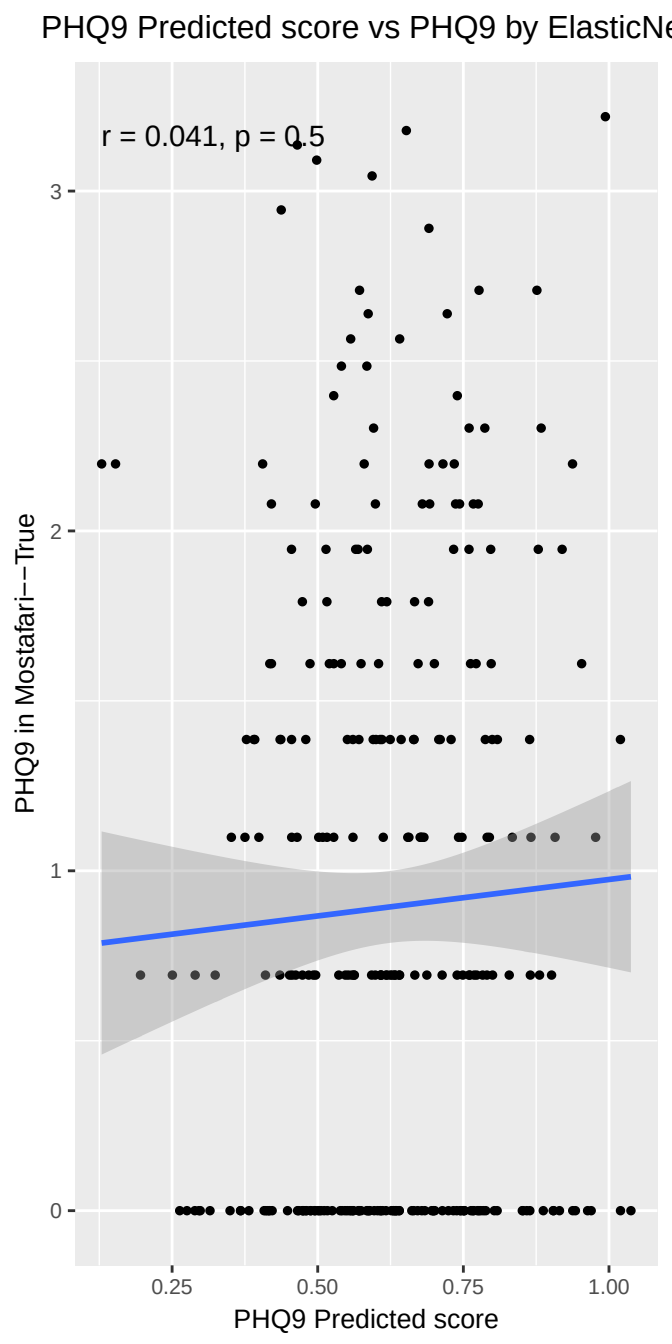
 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.562886597938144 0.468574348492591 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.15, p = 0.044
PHQ9 in WTC—True
MDD Predicted score
0
1
2
3
0.30
0.35
0.40
0.45
0.50
MDD Predicted score vs PHQ9 by ElasticNe
r = −0.031, p = 0.6
PHQ9 in Mostafari—True
MDD Predicted score
0
1
2
3
0.20
0.25
0.30

Train on PHQ9 of batch 3
 Test on batch 4 and Mostafavi

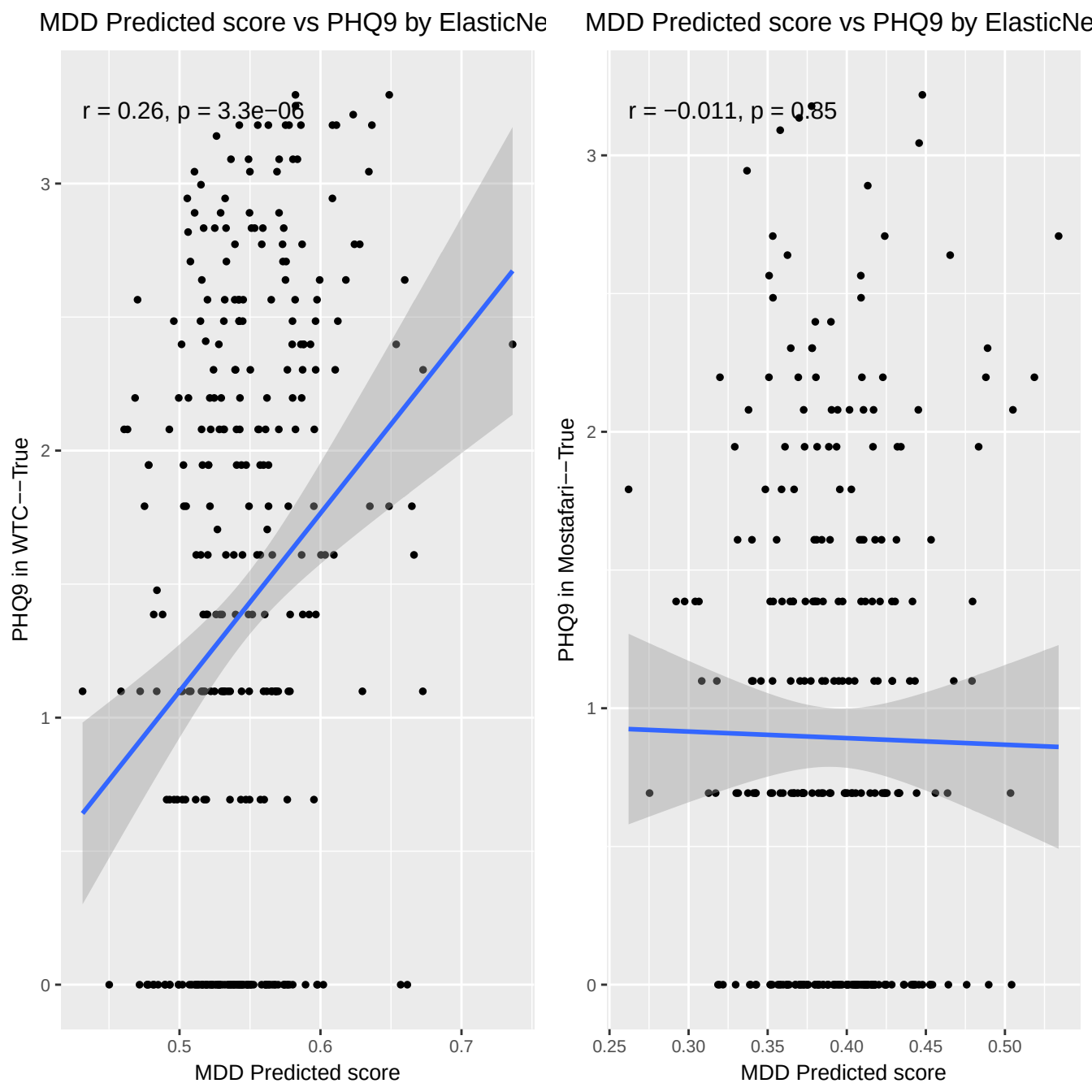
 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.634000272219954 0.494577868619769 respectively


PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.21, p = 0.0054
PHQ9 in WTC−−True
PHQ9 Predicted score
0
1
2
3
1.0
1.5
2.0
2.5


PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.041, p = 0.5
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
1
2
3
0.25
0.50
0.75
1.00

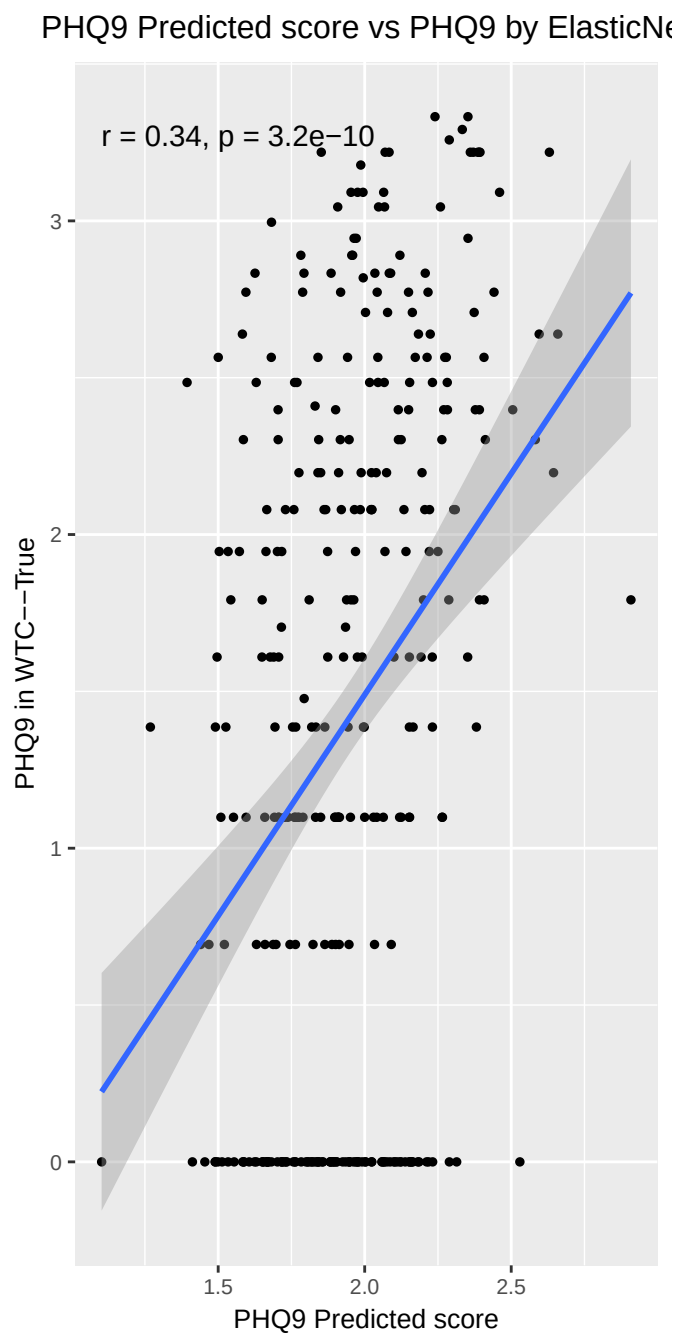
Train on MDD of batch 4
 Test on batch 3 and Mostafavi

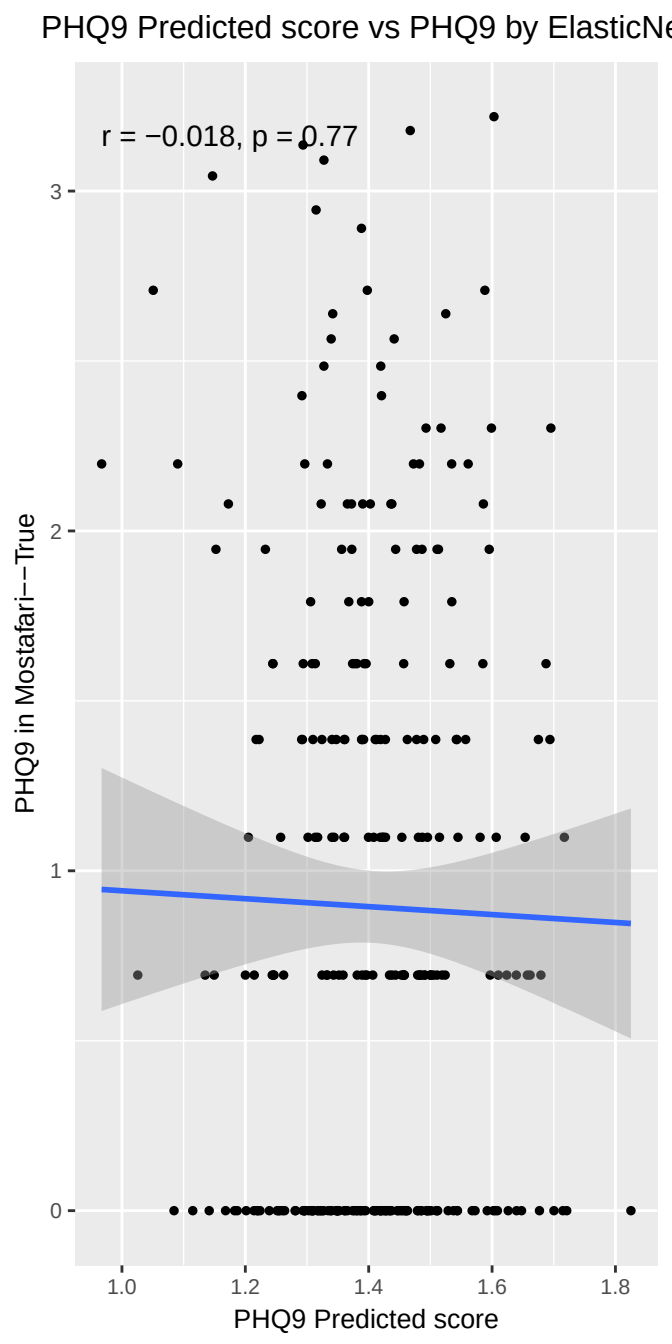
 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.630803937653815 0.520183955033214 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.26, p = 3.3e−06
PHQ9 in WTC−−True
MDD Predicted score
0
1
2
3
0.5
0.6
0.7
MDD Predicted score vs PHQ9 by ElasticNe
r = −0.011, p = 0.85
PHQ9 in Mostafari−−True
MDD Predicted score
0
1
2
3
0.25
0.30
0.35
0.40
0.45
0.50

Train on PHQ9 of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.655502392344498 0.469880202123432 respectively


PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.34, p = 3.2e−10
PHQ9 in WTC−−True
PHQ9 Predicted score
0
1
2
3
1.5
2.0
2.5

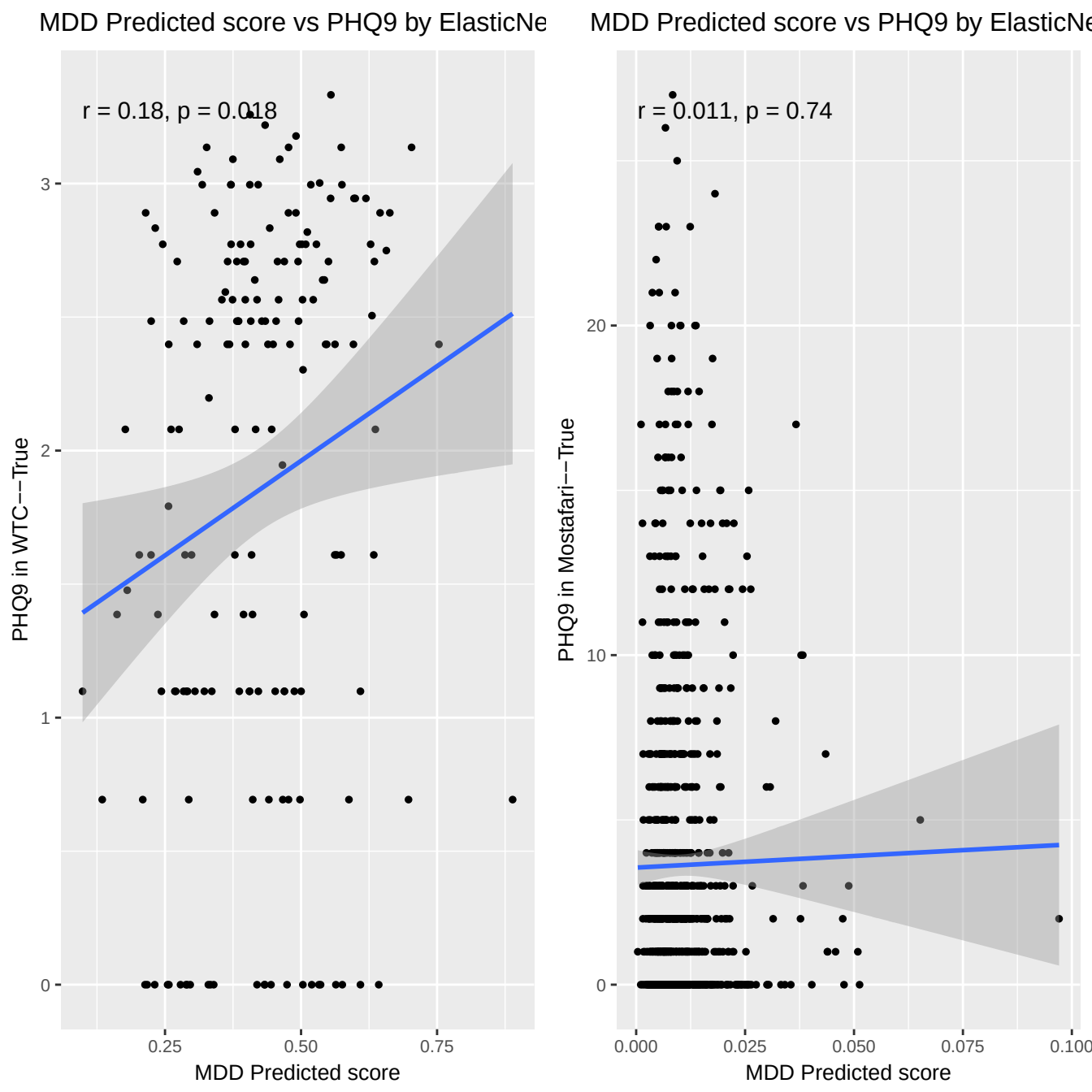

PHQ9 Predicted score vs PHQ9 by ElasticNe
r = −0.018, p = 0.77
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
1
2
3
1.0
1.2
1.4
1.6
1.8

PHQ9 MDD prediction with genes log transformed
 and scale by samples :(x−median(x))/mad(x)
 Design setting are:
 Log transformed PHQ9.
 Both gender are tested.
 Top 2000 genes by 2−step filtering.

 Design setting code are:
 1,2,1

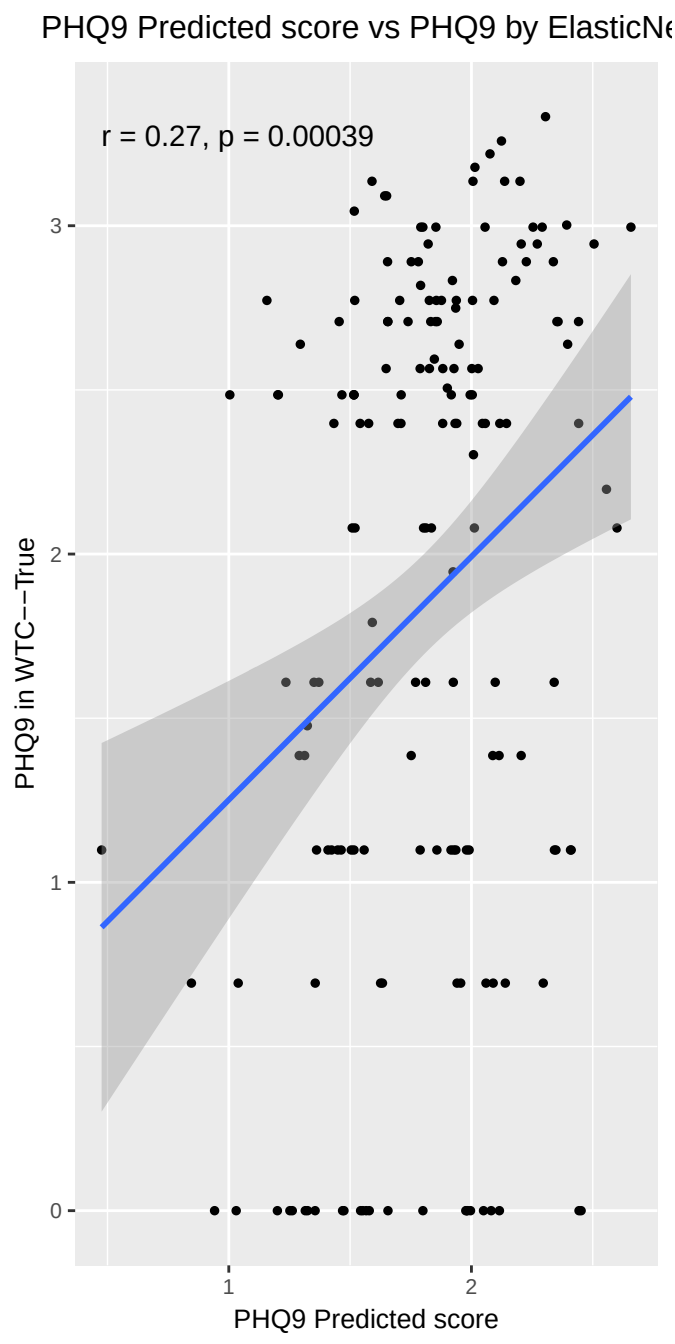
Train on MDD of batch 3
 Test on batch 4 and Mostafavi

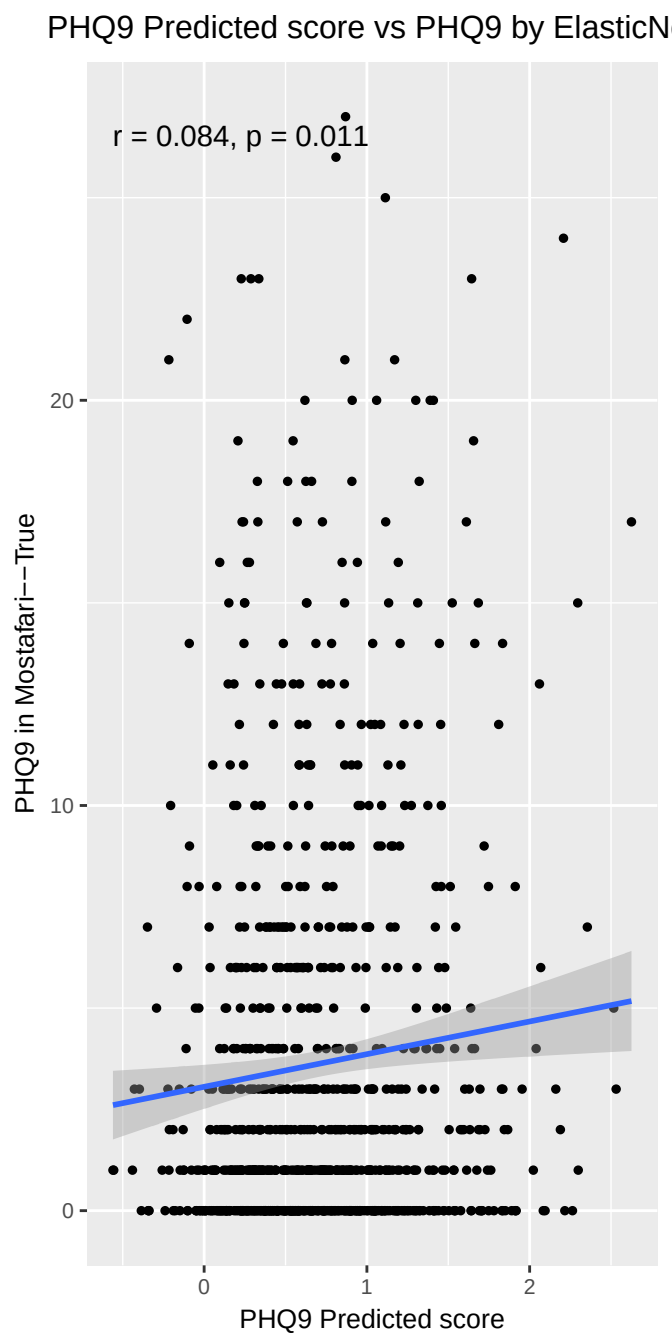
 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.674355670103093 0.542855395097804 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.18, p = 0.018
PHQ9 in WTC—True
MDD Predicted score
0
1
2
3
0.25
0.50
0.75
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.011, p = 0.74
PHQ9 in Mostafari—True
MDD Predicted score
0
10
20
0.000
0.025
0.050
0.075
0.100

Train on PHQ9 of batch 3
 Test on batch 4 and Mostafavi

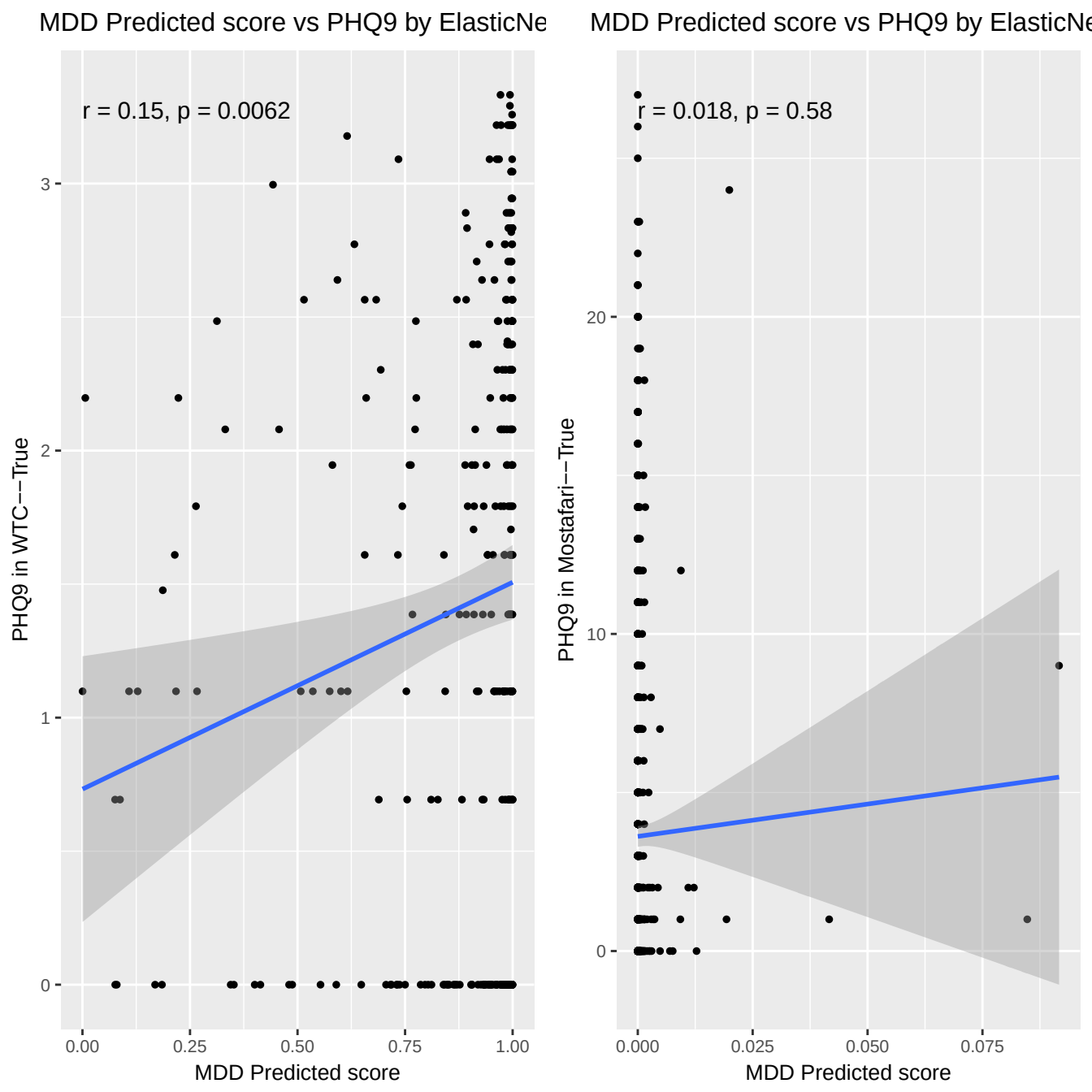
 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.591670069416088 0.573685869836295 respectively


PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.27, p = 0.00039
PHQ9 in WTC−−True
PHQ9 Predicted score
0
1
2
3
1
2


PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.084, p = 0.011
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
10
20
0
1
2

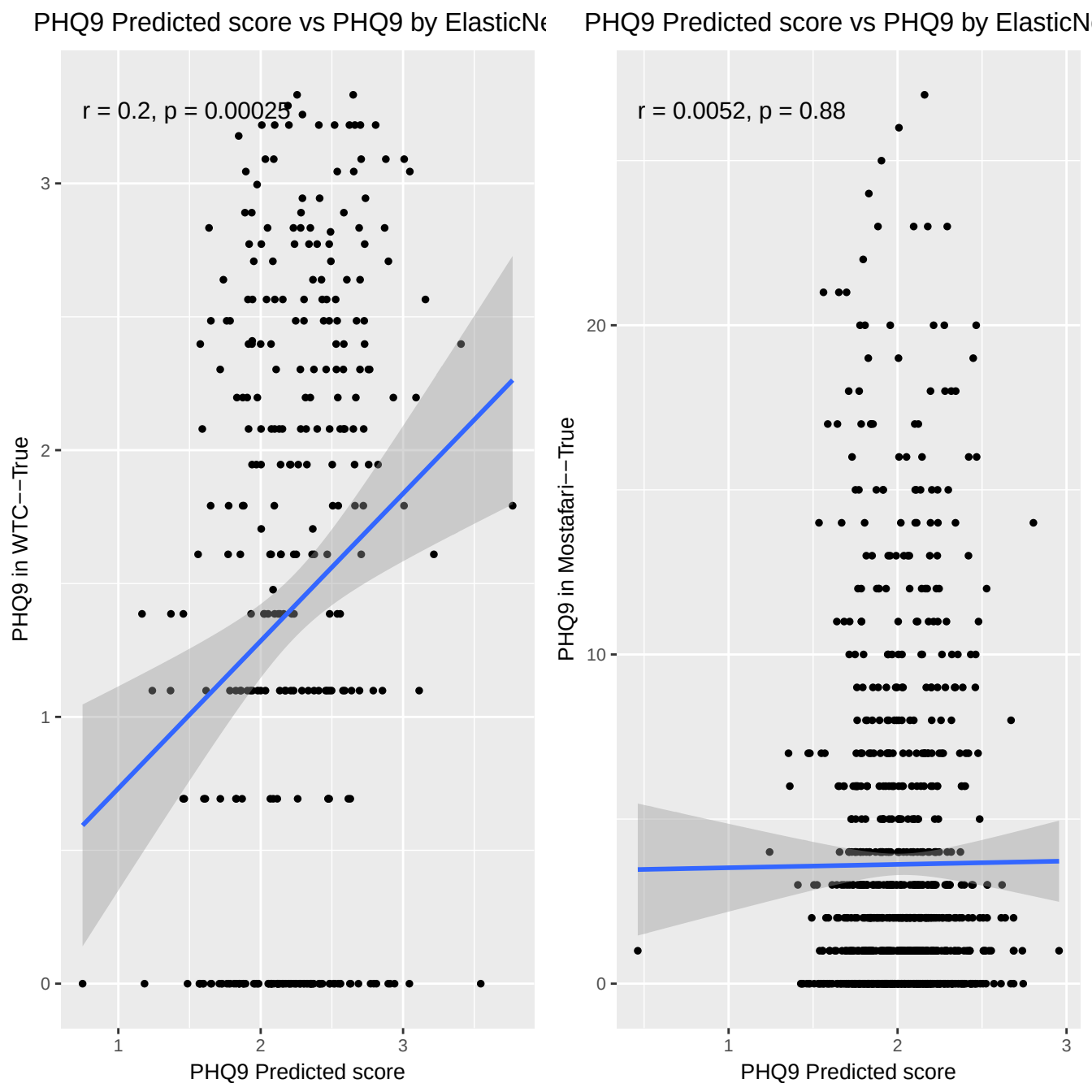
Train on MDD of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.723297785069729 0.471232889604126 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.15, p = 0.0062
PHQ9 in WTC—True
MDD Predicted score
0
1
2
3
0.00
0.25
0.50
0.75
1.00
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.018, p = 0.58
PHQ9 in Mostafari—True
MDD Predicted score
0
10
20
0.000
0.025
0.050
0.075

Train on PHQ9 of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.616190353032458 0.5082840431589 respectively

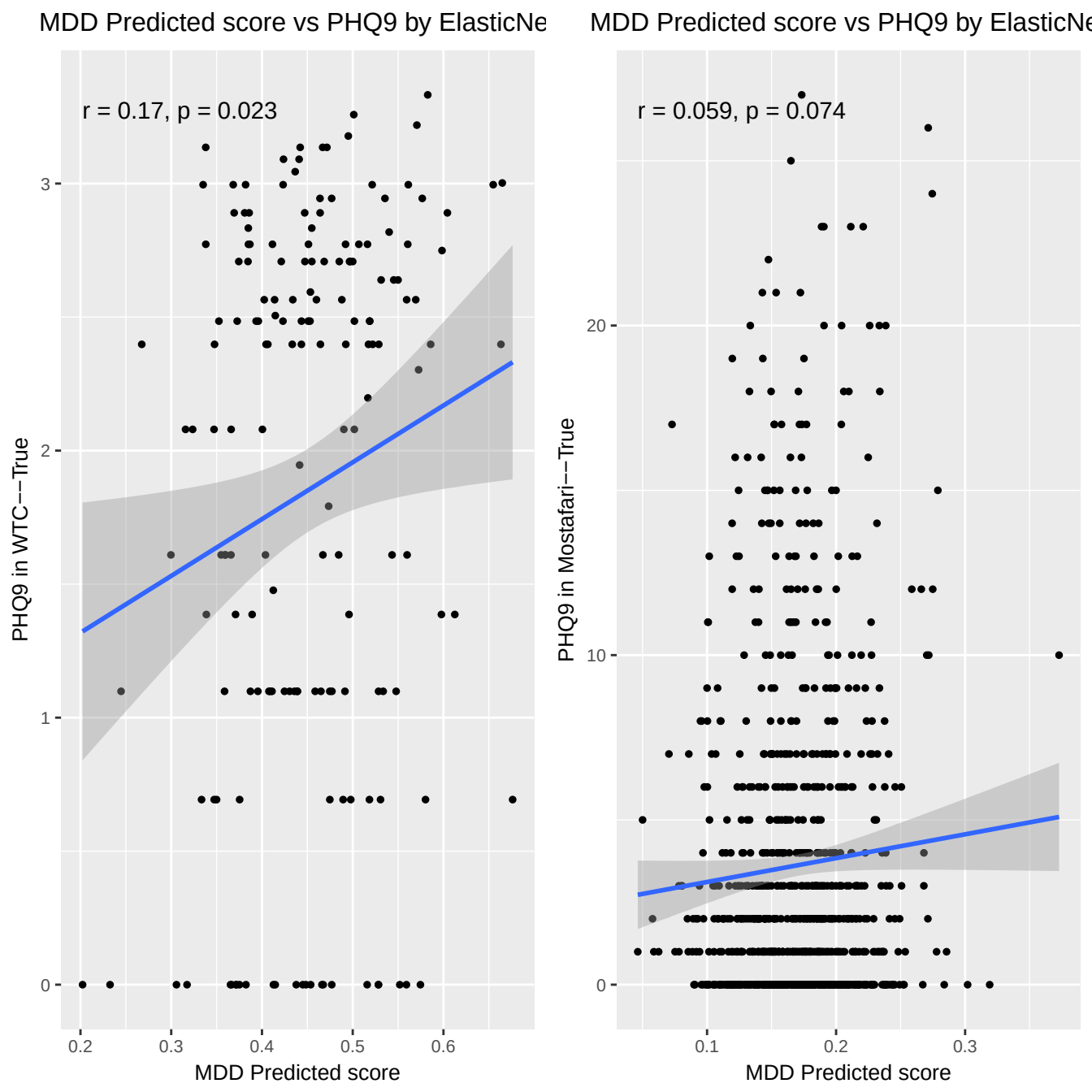

PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.2, p = 0.00025
PHQ9 in WTC−−True
PHQ9 Predicted score
PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.0052, p = 0.88
PHQ9 in Mostafari−−True
PHQ9 Predicted score

PHQ9 MDD prediction with genes log transformed
 and scale by samples :(x−median(x))/mad(x)
 Design setting are:
 Log transformed PHQ9.
 Both gender are tested.
 40 candidate genes by 2−step filtering.

 Design setting code are:
 1,2,2

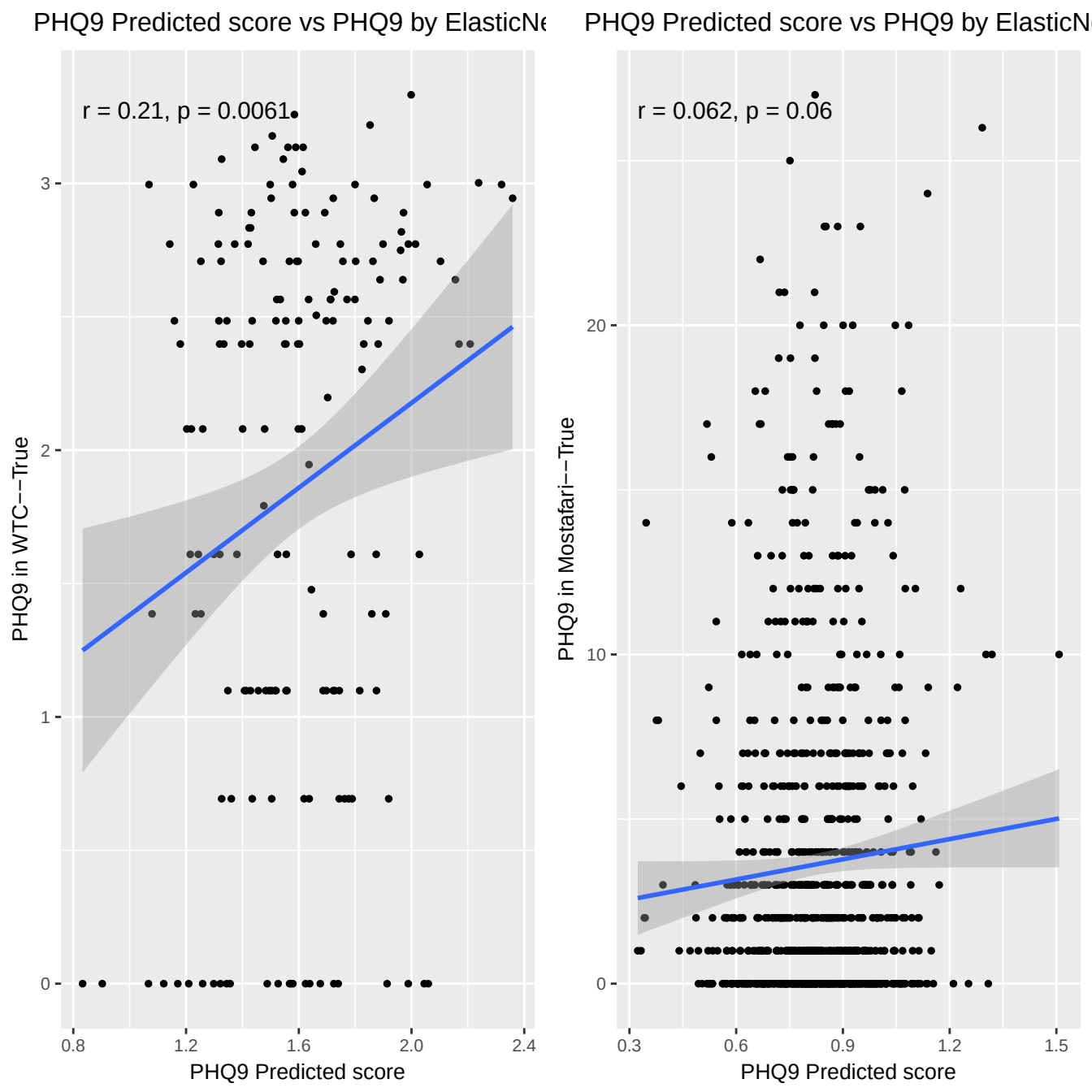
Train on MDD of batch 3
 Test on batch 4 and Mostafavi

 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.598840206185567 0.499484747102585 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.17, p = 0.023
PHQ9 in WTC—True
MDD Predicted score
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.059, p = 0.074
PHQ9 in Mostafari—True
MDD Predicted score

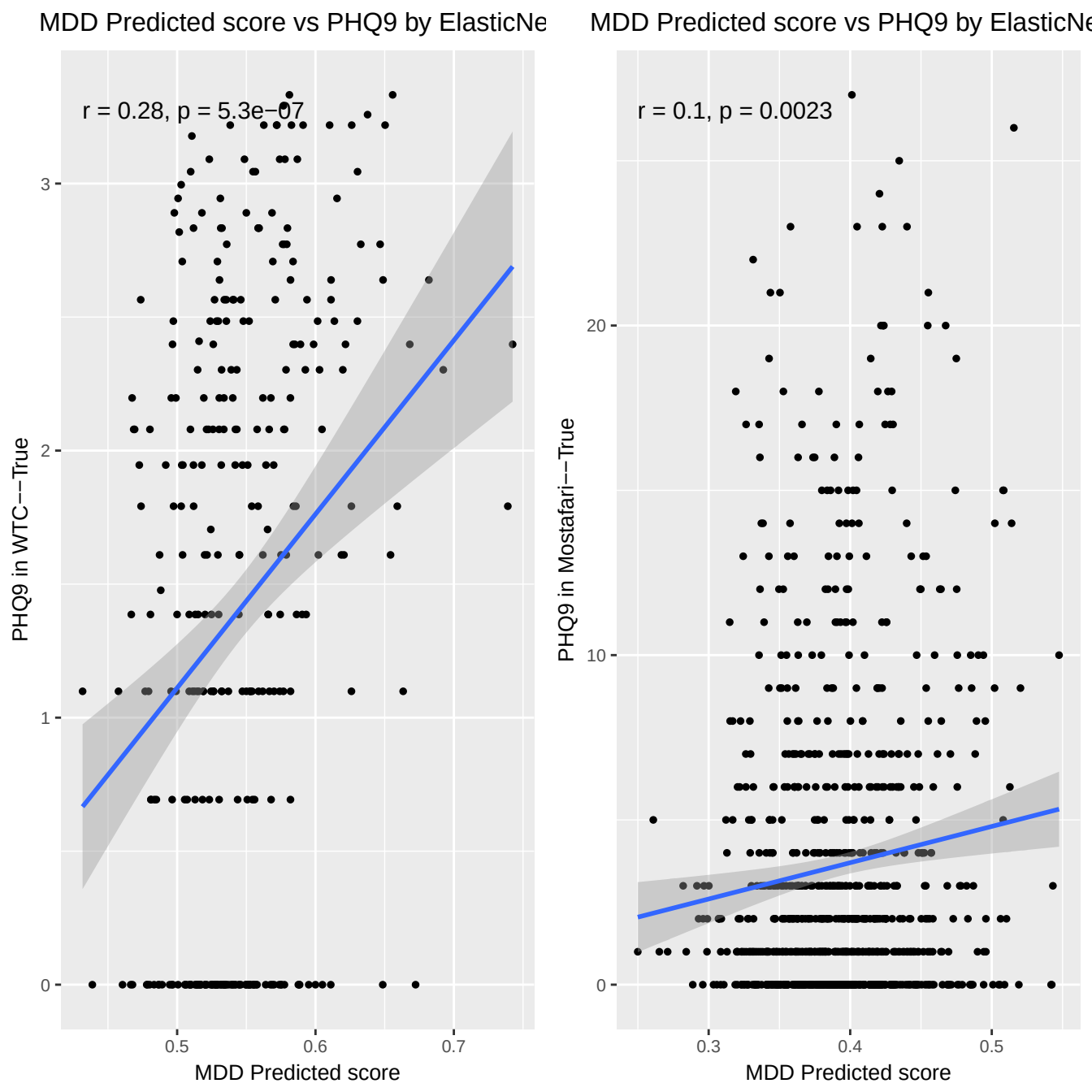
Train on PHQ9 of batch 3
 Test on batch 4 and Mostafavi

 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.62733088335375 0.509766277521328 respectively


PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.21, p = 0.0061
PHQ9 in WTC−−True
PHQ9 Predicted score
0
1
2
3
0.8
1.2
1.6
2.0
2.4
PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.062, p = 0.06
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
10
20
0.3
0.6
0.9
1.2
1.5

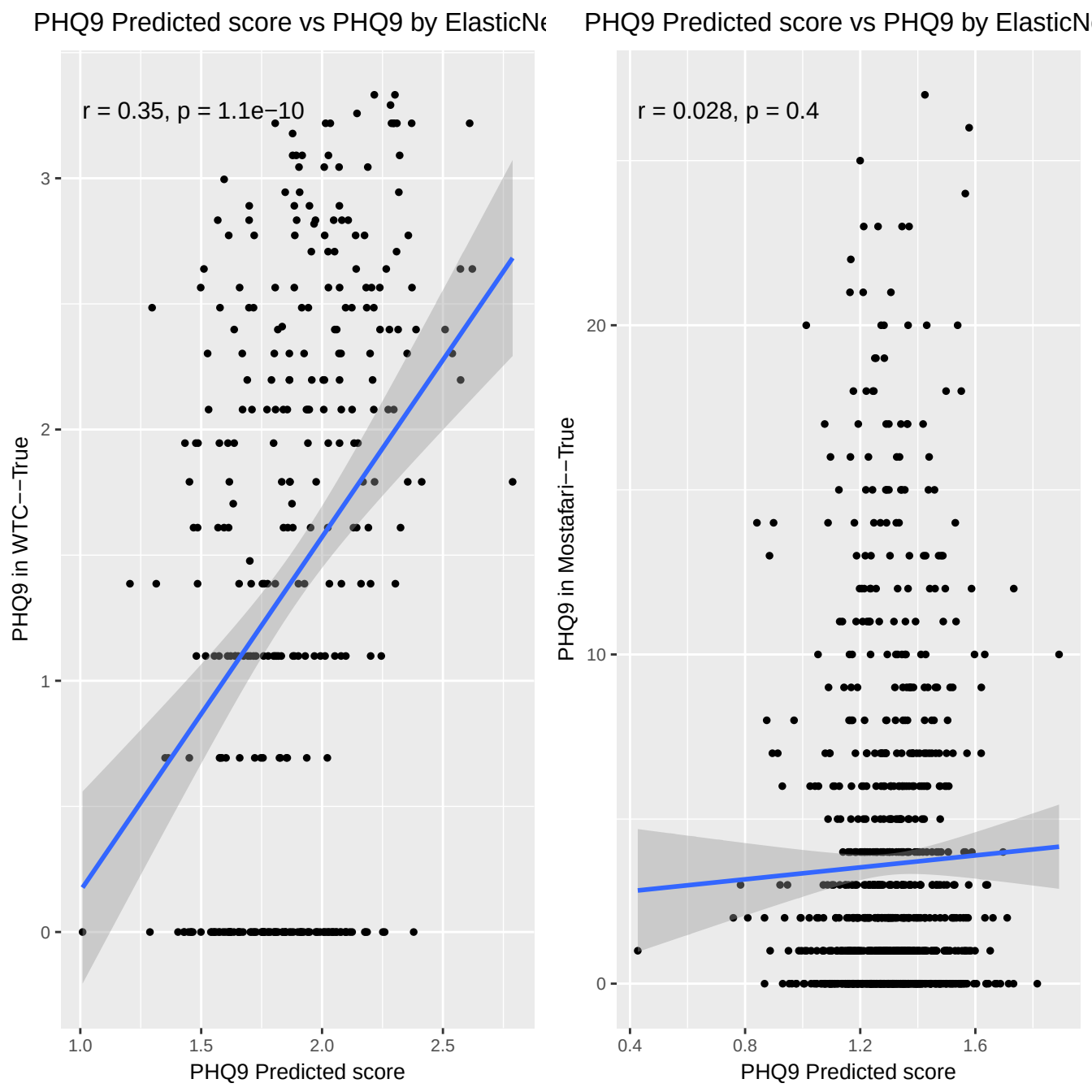
Train on MDD of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.641919606234619 0.552384044570552 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.28, p = 5.3e−07
PHQ9 in WTC−−True
MDD Predicted score
0
1
2
3
0.5
0.6
0.7
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.1, p = 0.0023
PHQ9 in Mostafari−−True
MDD Predicted score
0
10
20
0.3
0.4
0.5

Train on PHQ9 of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.663649295228243 0.506335963711138 respectively

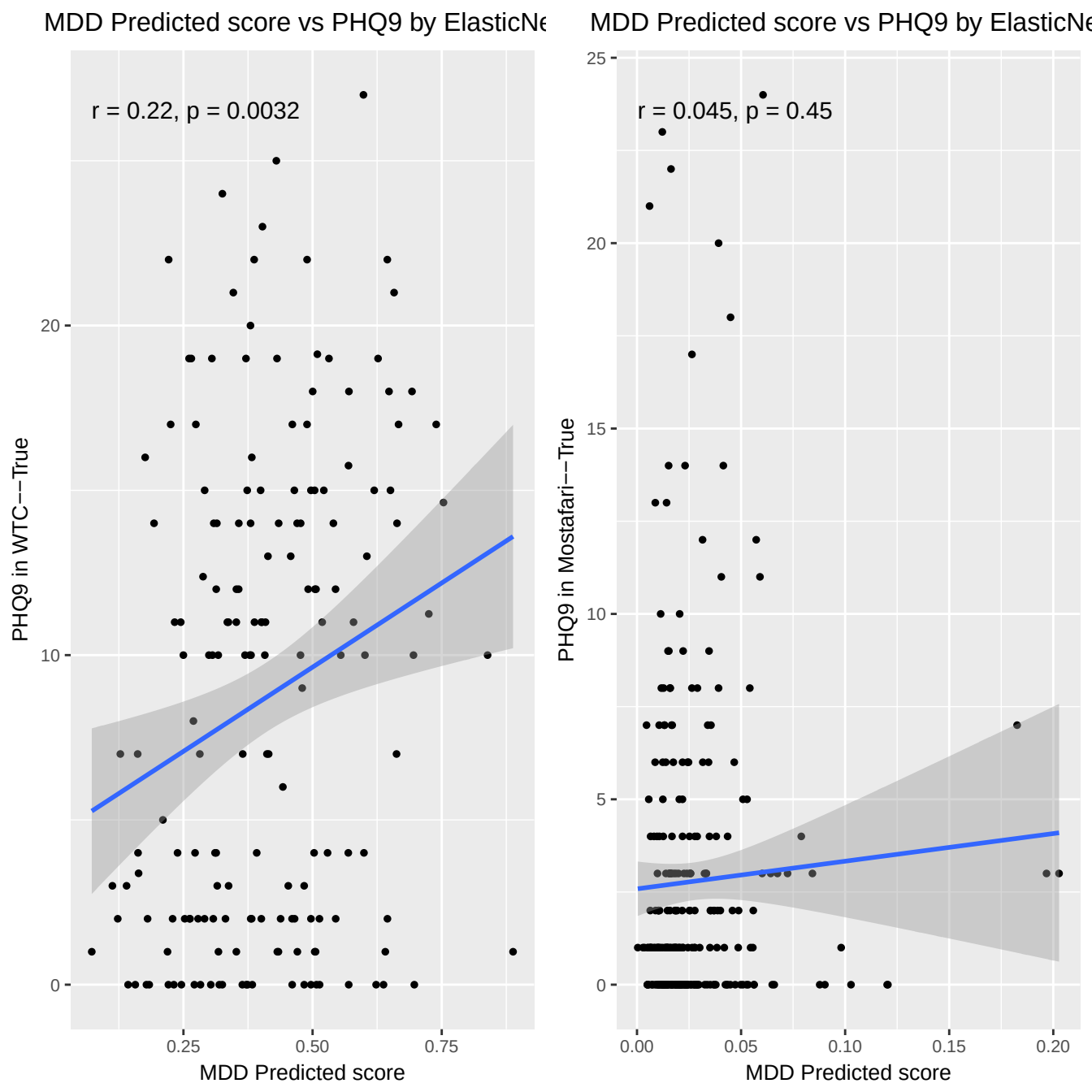

PHQ9 Predicted score vs PHQ9 by ElasticNe
r = 0.35, p = 1.1e−10
PHQ9 in WTC−−True
PHQ9 Predicted score
PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.028, p = 0.4
PHQ9 in Mostafari−−True
PHQ9 Predicted score

PHQ9 MDD prediction with genes log transformed
 and scale by samples :(x−median(x))/mad(x)
 Design setting are:
 Original PHQ9.
 Only male are tested for Mostafavi.
 Top 2000 genes by 2−step filtering.

 Design setting code are:
 2,1,1

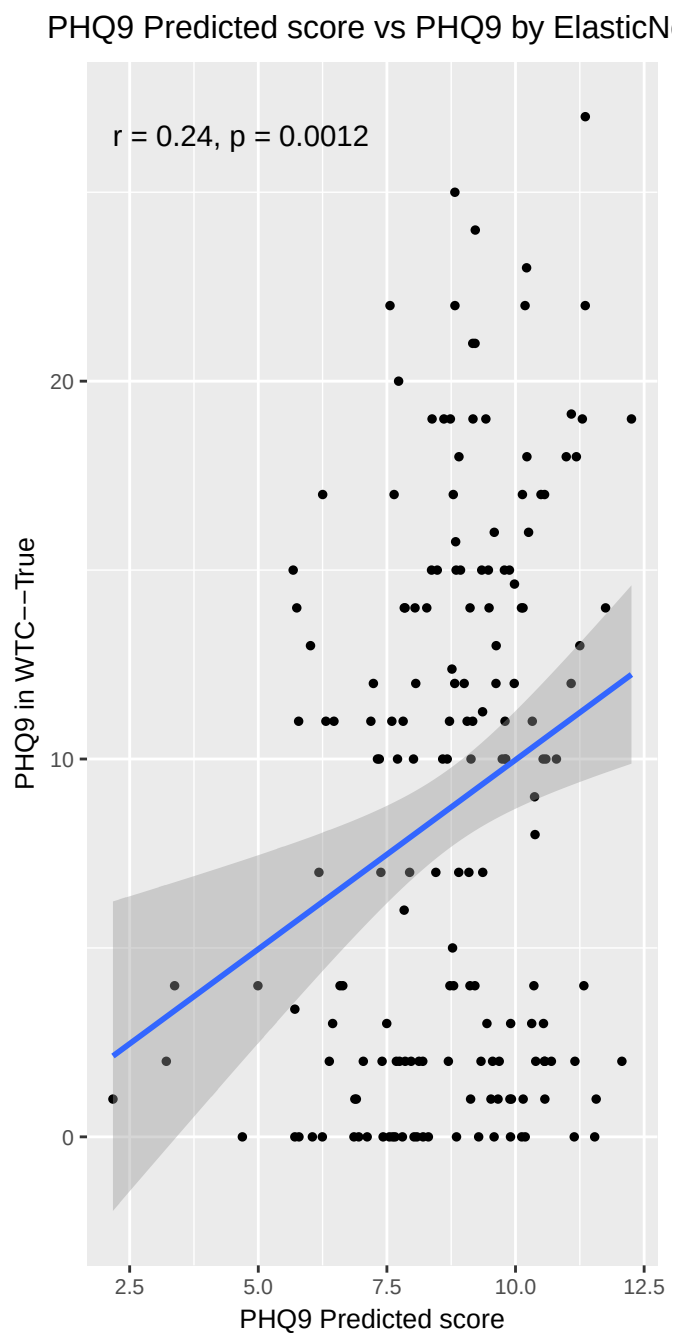
Train on MDD of batch 3
 Test on batch 4 and Mostafavi

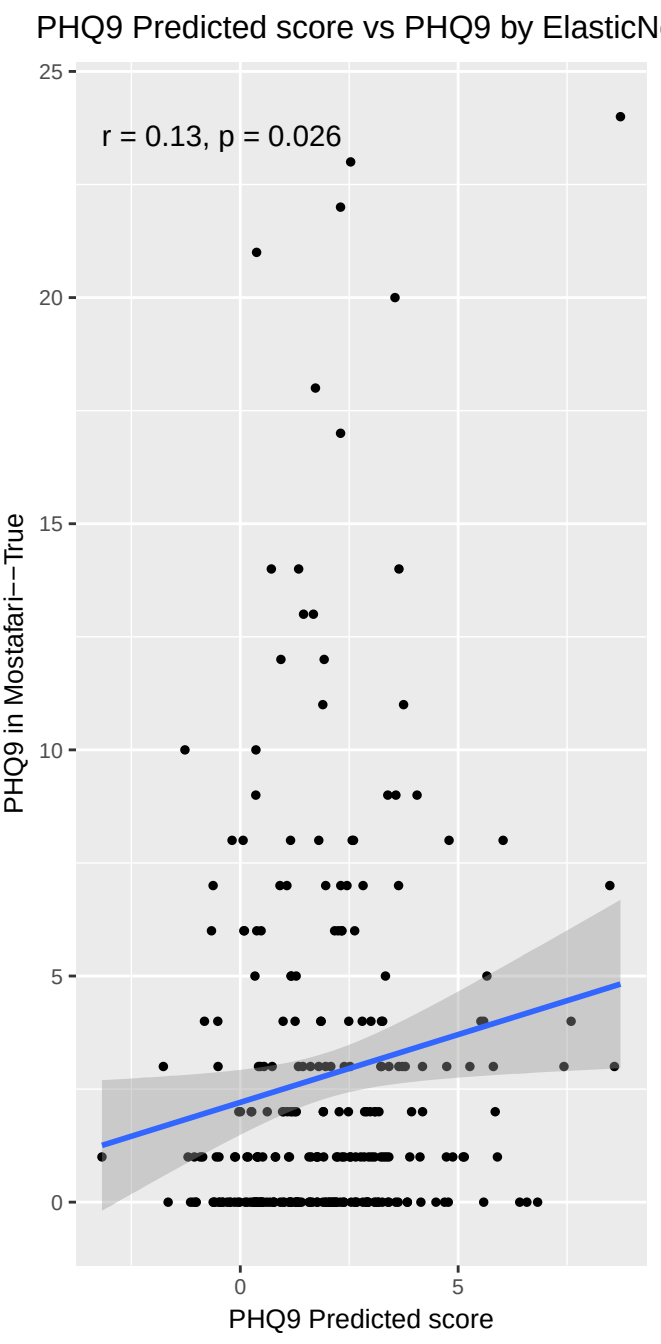
 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.66340206185567 0.596320899335718 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.22, p = 0.0032
PHQ9 in WTC−−True
MDD Predicted score
0
10
20
0.25
0.50
0.75
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.045, p = 0.45
PHQ9 in Mostafari−−True
MDD Predicted score
0
5
10
15
20
25
0.00
0.05
0.10
0.15
0.20

Train on PHQ9 of batch 3
 Test on batch 4 and Mostafavi

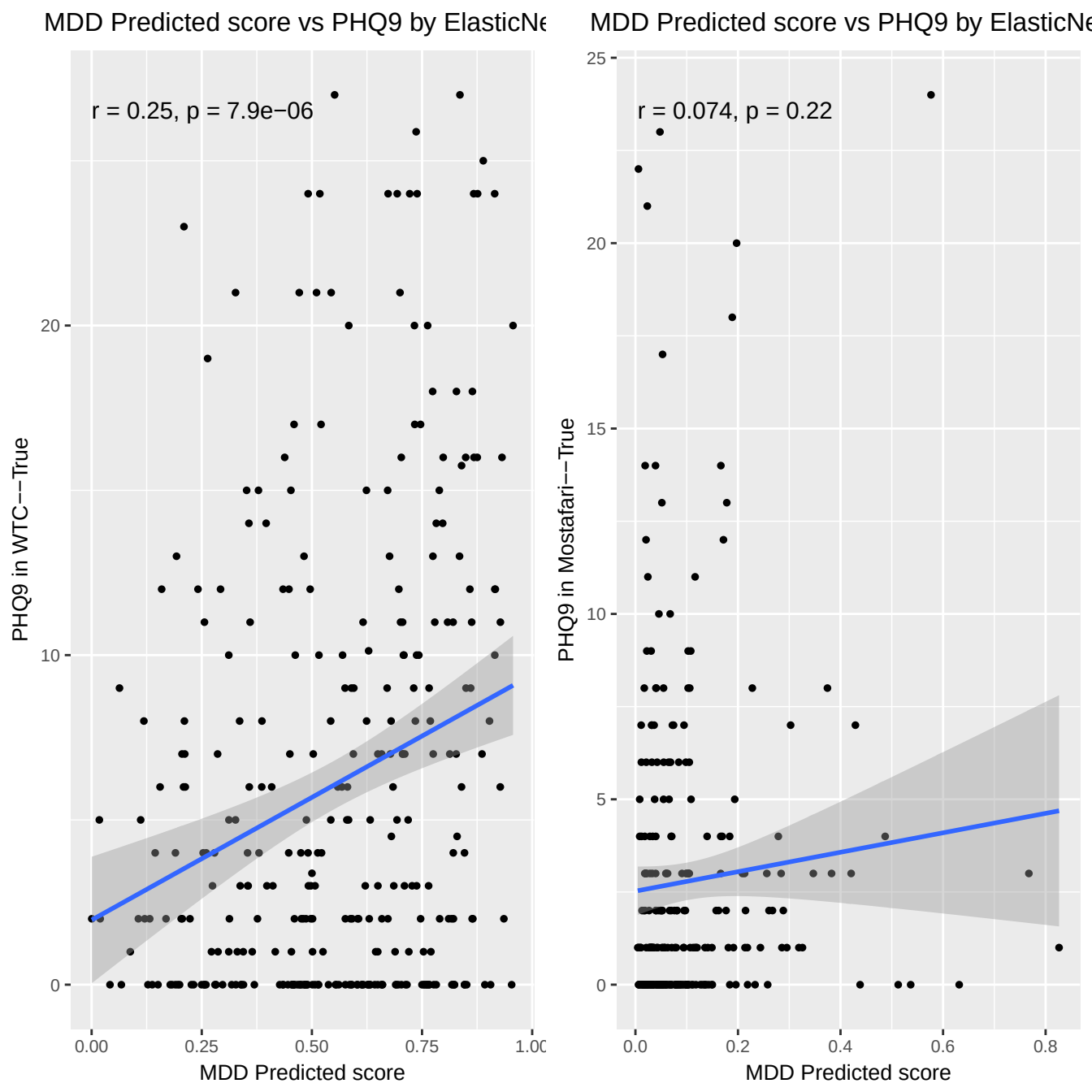
 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.55954811487682 0.626752966558792 respectively


PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.24, p = 0.0012
PHQ9 in WTC−−True
PHQ9 Predicted score
0
10
20
2.5
5.0
7.5
10.0
12.5


PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.13, p = 0.026
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
5
10
15
20
25
0
5

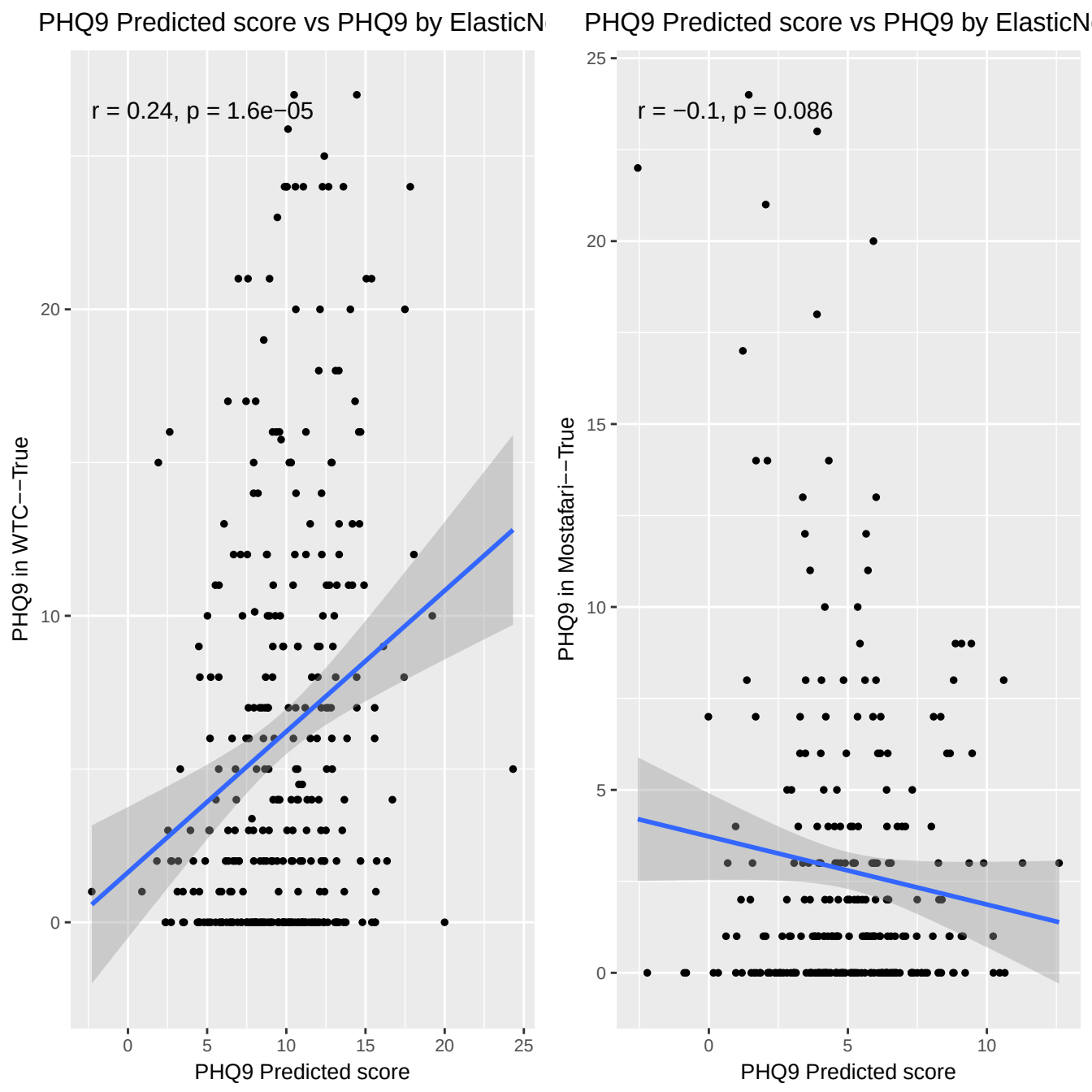
Train on MDD of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.688597210828548 0.523647305967183 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.25, p = 7.9e−06
PHQ9 in WTC−−True
MDD Predicted score
0
10
20
0.00
0.25
0.50
0.75
1.00
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.074, p = 0.22
PHQ9 in Mostafari−−True
MDD Predicted score
0
5
10
15
20
25
0.0
0.2
0.4
0.6
0.8

Train on PHQ9 of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.624682098366309 0.46931243967524 respectively

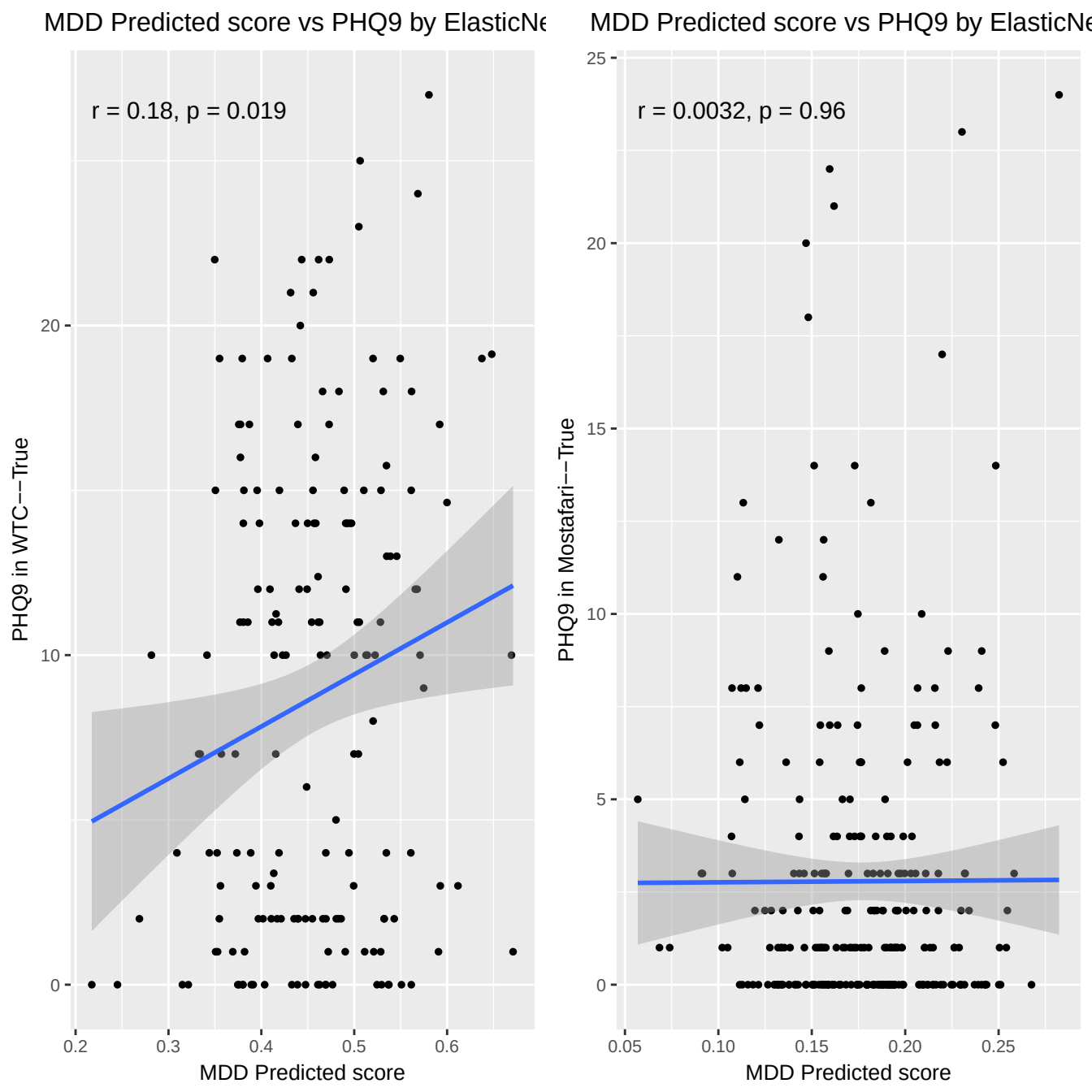

PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.24, p = 1.6e−05
PHQ9 in WTC−−True
PHQ9 Predicted score
PHQ9 Predicted score vs PHQ9 by ElasticN
r = −0.1, p = 0.086
PHQ9 in Mostafari−−True
PHQ9 Predicted score

PHQ9 MDD prediction with genes log transformed
 and scale by samples :(x−median(x))/mad(x)
 Design setting are:
 Original PHQ9.
 Only male are tested for Mostafavi.
 40 candidate genes by 2−step filtering.

 Design setting code are:
 2,1,2

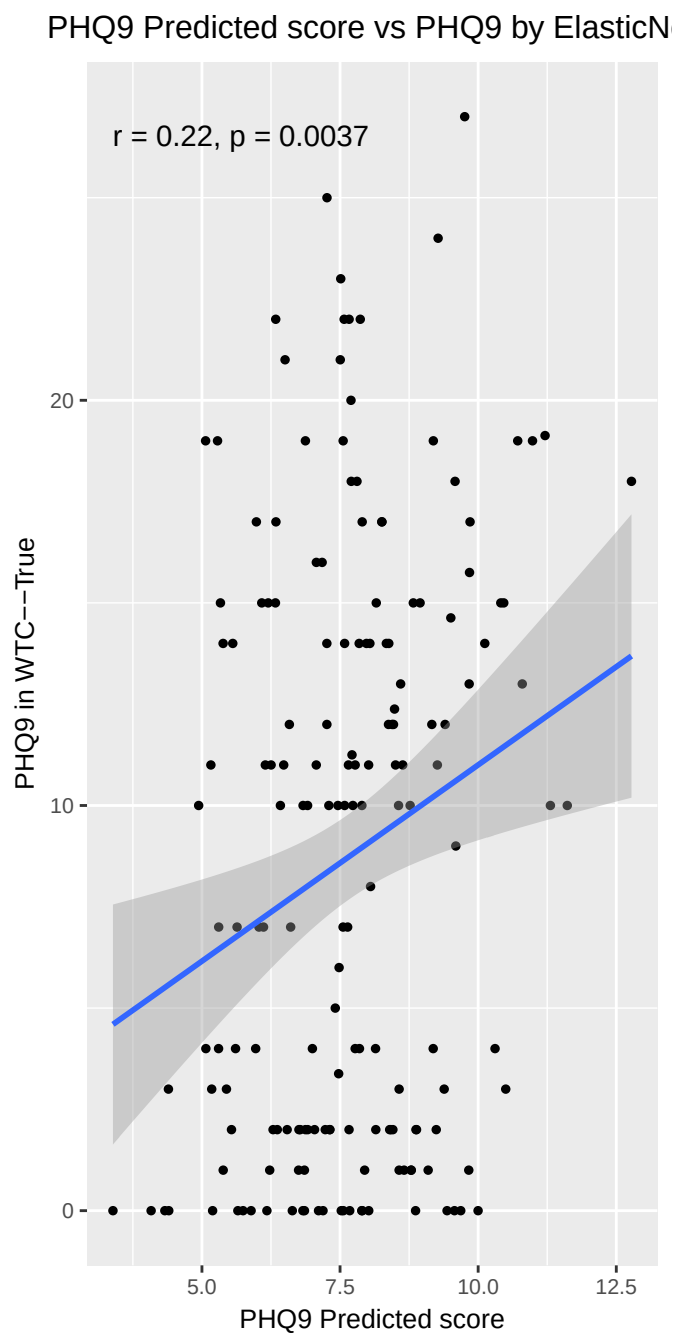
Train on MDD of batch 3
 Test on batch 4 and Mostafavi

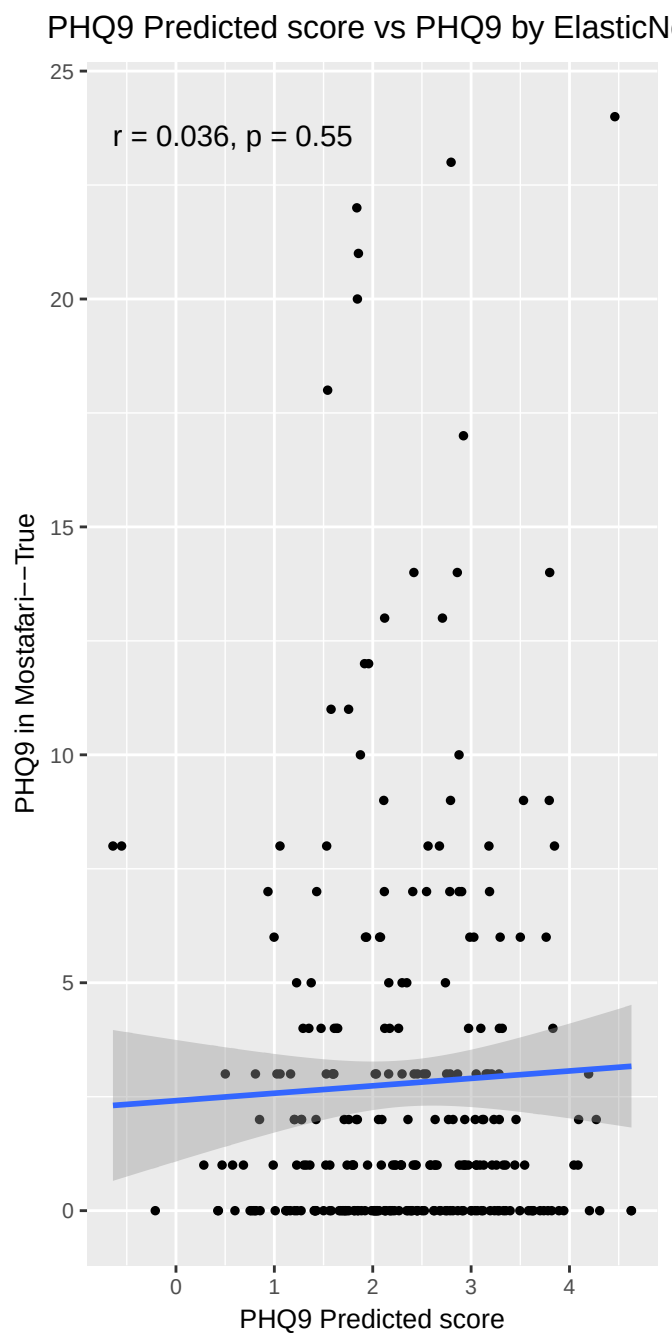
 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.584149484536083 0.473740986771135 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.18, p = 0.019
PHQ9 in WTC—True
MDD Predicted score
0
10
20
0.2
0.3
0.4
0.5
0.6
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.0032, p = 0.96
PHQ9 in Mostafari—True
MDD Predicted score
0
5
10
15
20
25
0.05
0.10
0.15
0.20
0.25

Train on PHQ9 of batch 3
 Test on batch 4 and Mostafavi

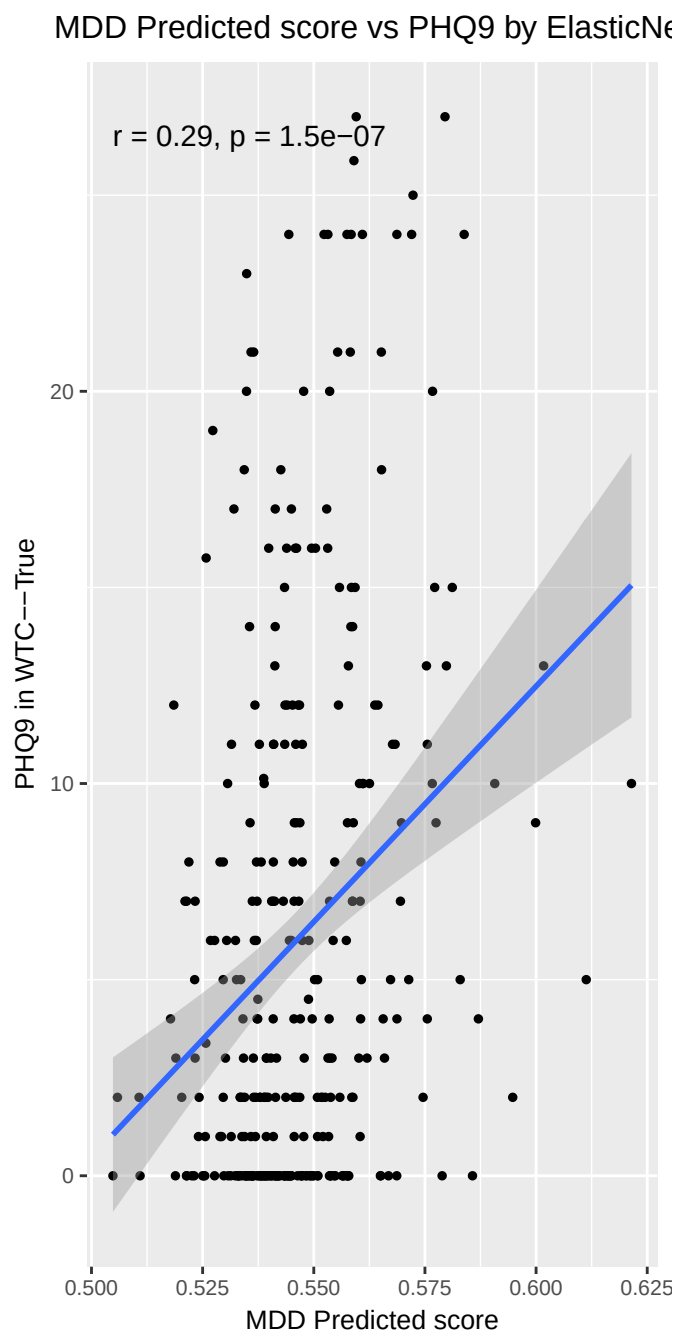
 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.625017013747108 0.483222619655936 respectively

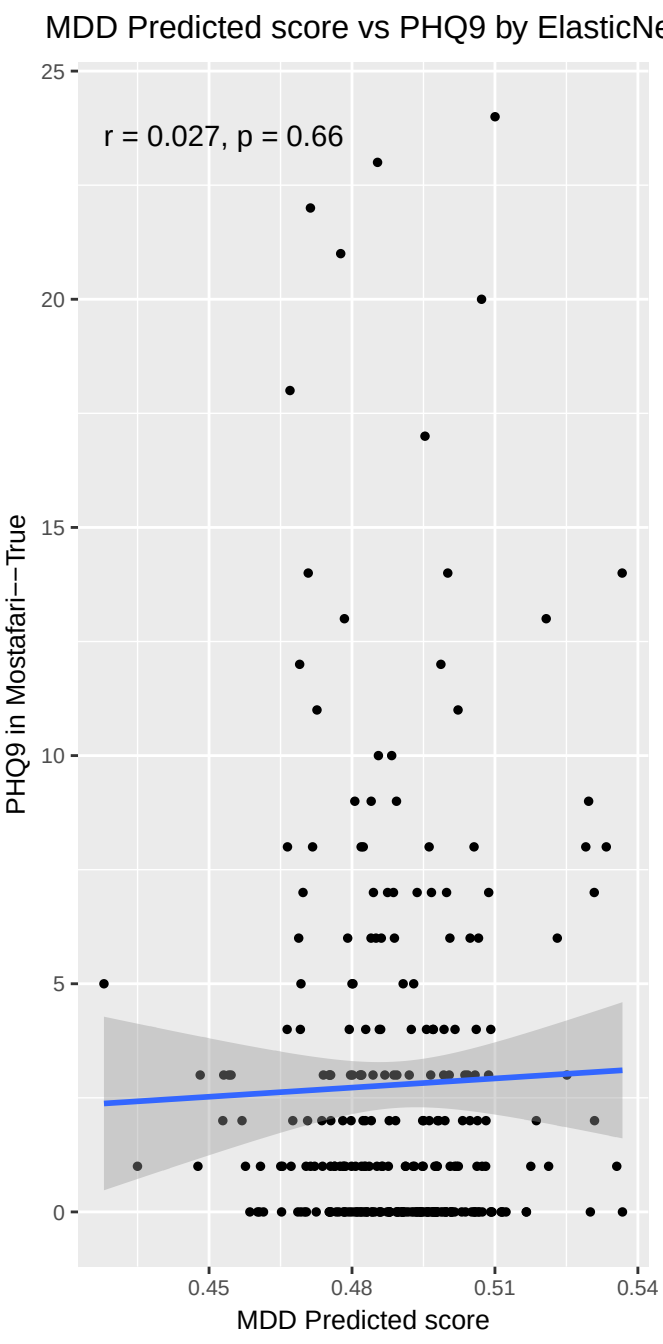

PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.22, p = 0.0037
PHQ9 in WTC−−True
PHQ9 Predicted score
0
10
20
5.0
7.5
10.0
12.5


PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.036, p = 0.55
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
5
10
15
20
25
0
1
2
3
4

Train on MDD of batch 4
 Test on batch 3 and Mostafavi

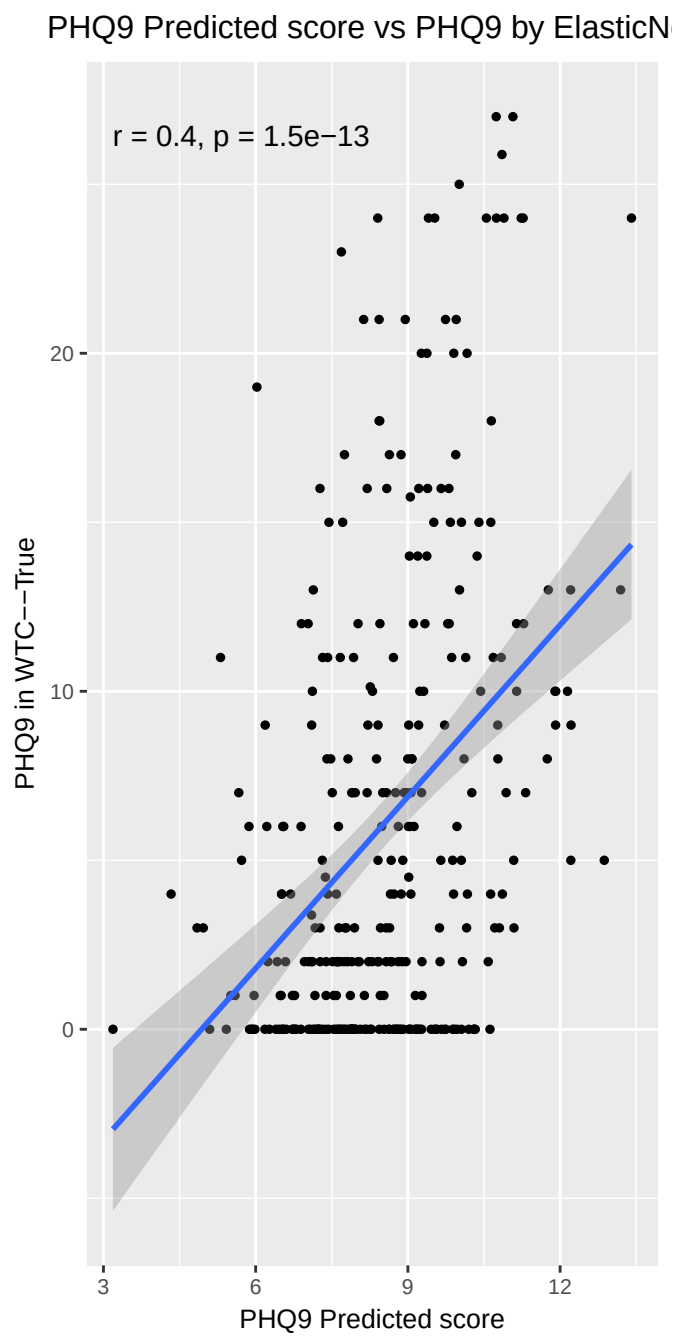
 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.643068088597211 0.530517231590303 respectively

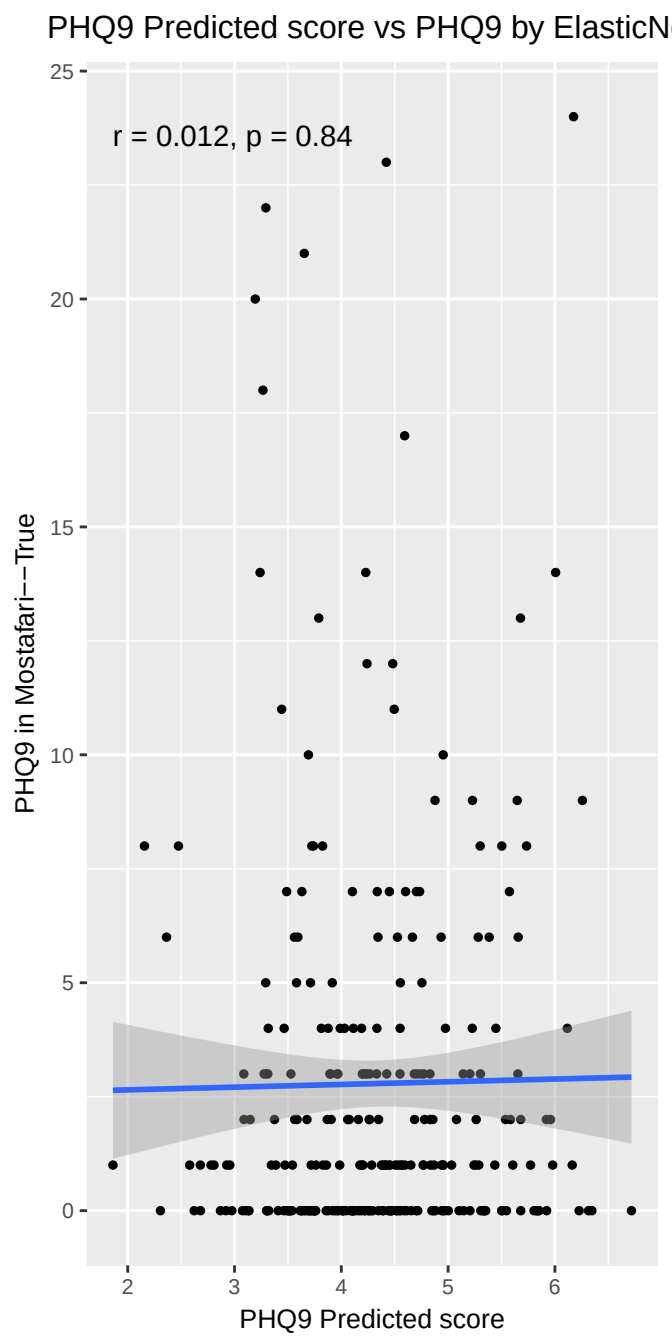

MDD Predicted score vs PHQ9 by ElasticNe
r = 0.29, p = 1.5e−07
PHQ9 in WTC−−True
MDD Predicted score
0
10
20
0.500
0.525
0.550
0.575
0.600
0.625


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.027, p = 0.66
PHQ9 in Mostafari−−True
MDD Predicted score
0
5
10
15
20
25
0.45
0.48
0.51
0.54

Train on PHQ9 of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.691883270830639 0.492136490092545 respectively


PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.4, p = 1.5e−13
PHQ9 in WTC−−True
PHQ9 Predicted score
0
10
20
3
6
9
12

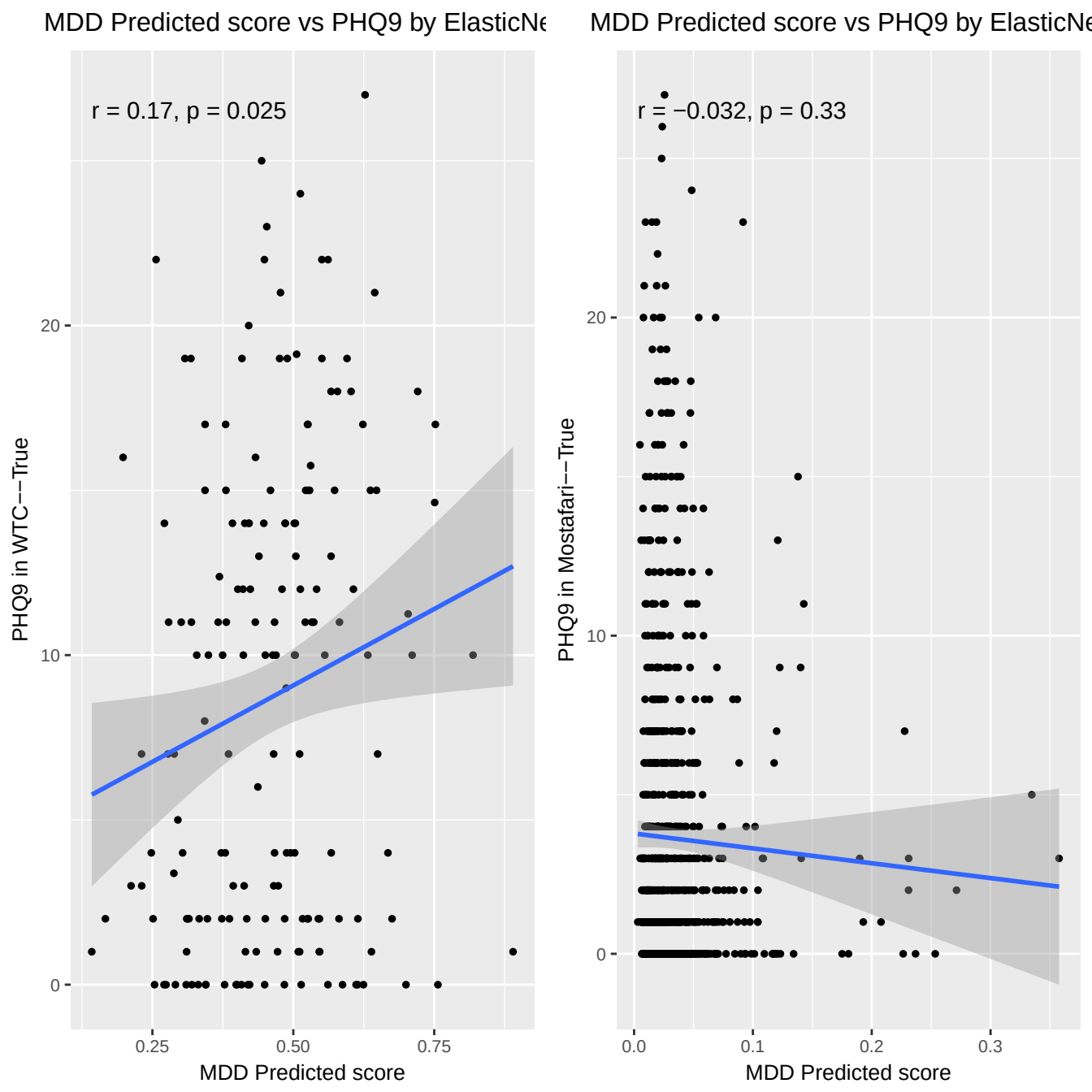

PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.012, p = 0.84
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
5
10
15
20
25
2
3
4
5
6

PHQ9 MDD prediction with genes log transformed
 and scale by samples :(x−median(x))/mad(x)
 Design setting are:
 Original PHQ9.
 Both gender are tested.
 Top 2000 genes by 2−step filtering.

 Design setting code are:
 2,2,1

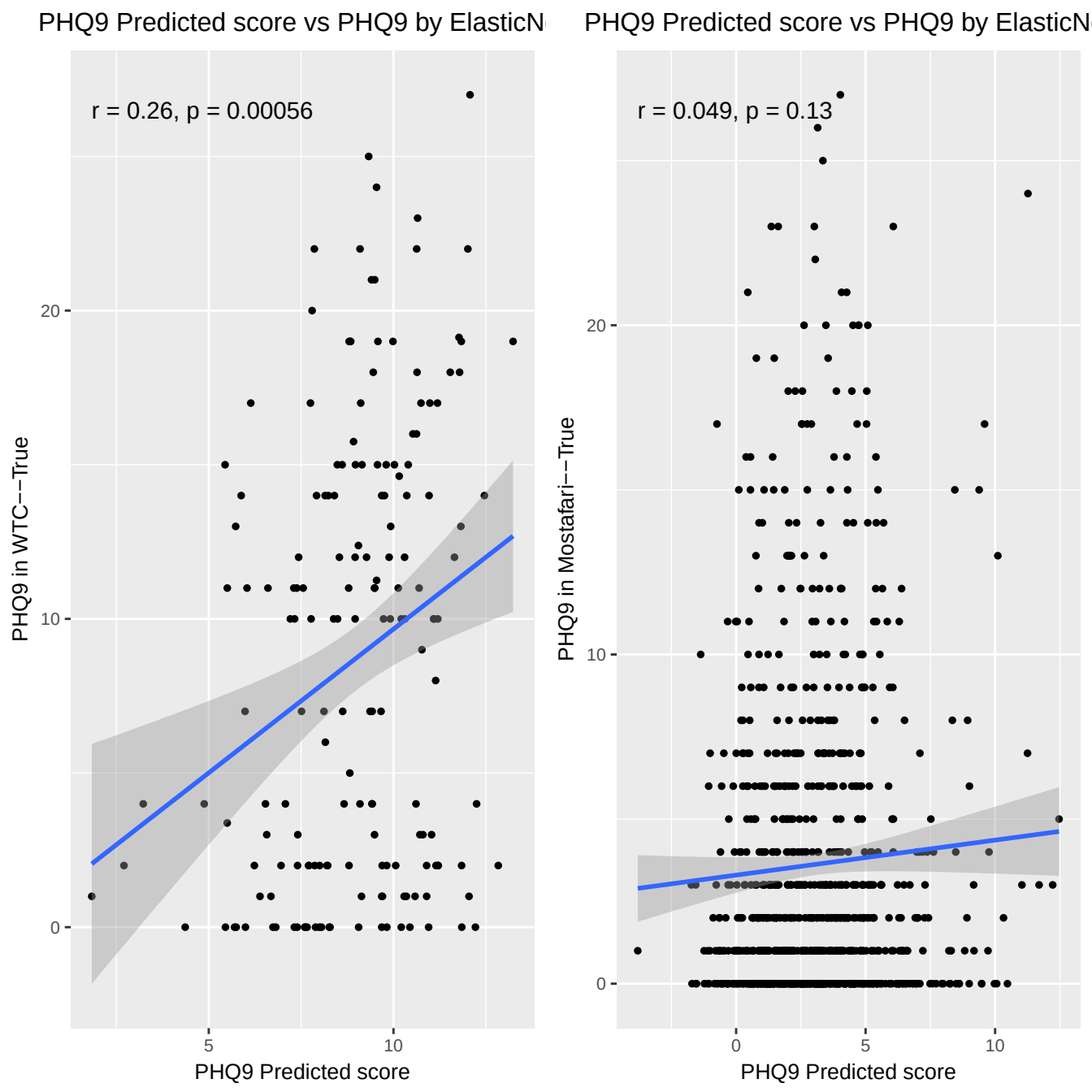
Train on MDD of batch 3
 Test on batch 4 and Mostafavi

 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.633118556701031 0.522555842591416 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.17, p = 0.025
PHQ9 in WTC—True
MDD Predicted score
MDD Predicted score vs PHQ9 by ElasticNe
r = −0.032, p = 0.33
PHQ9 in Mostafari—True
MDD Predicted score

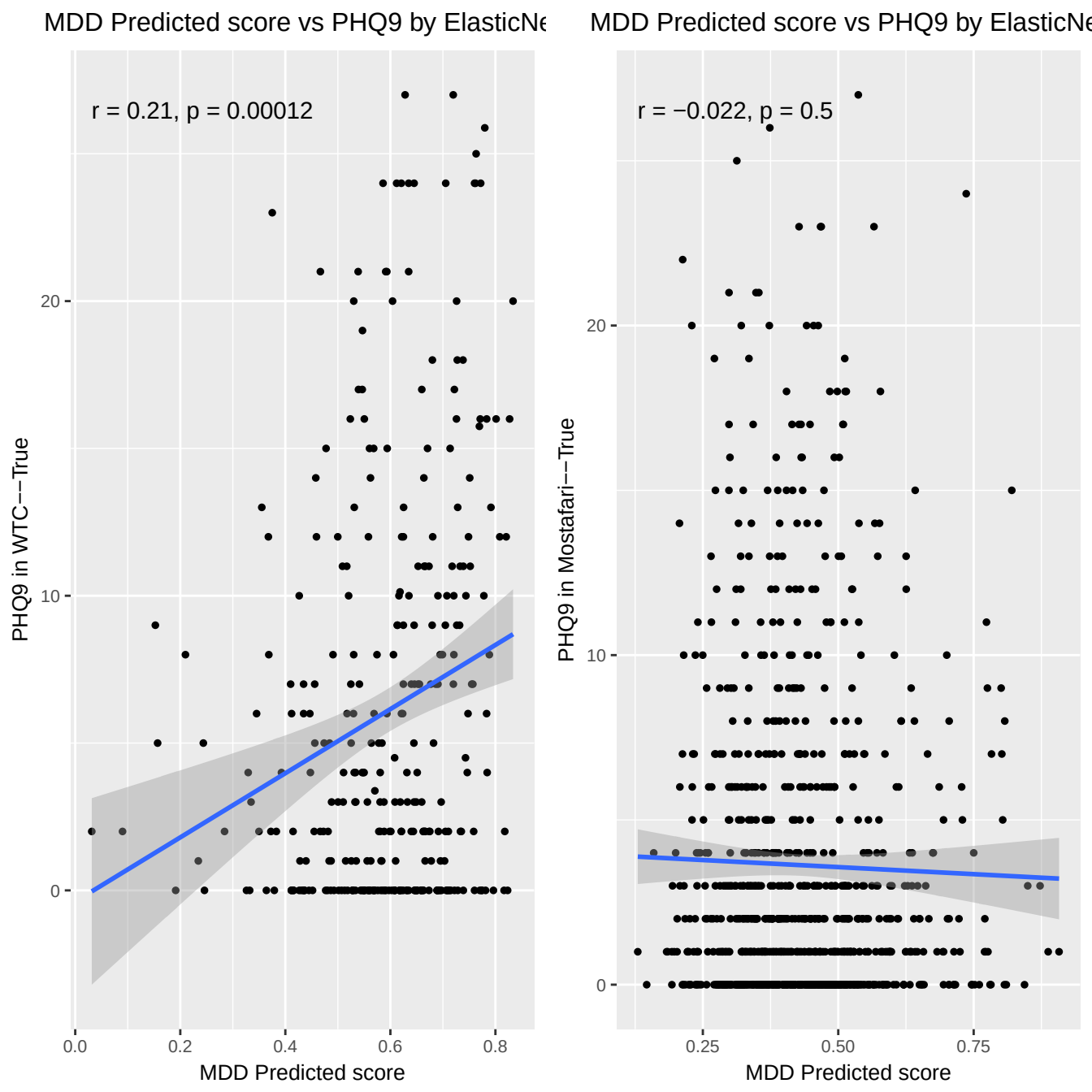
Train on PHQ9 of batch 3
 Test on batch 4 and Mostafavi

 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.567578603511637 0.555466150943219 respectively


PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.26, p = 0.00056
PHQ9 in WTC−−True
PHQ9 Predicted score
PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.049, p = 0.13
PHQ9 in Mostafari−−True
PHQ9 Predicted score

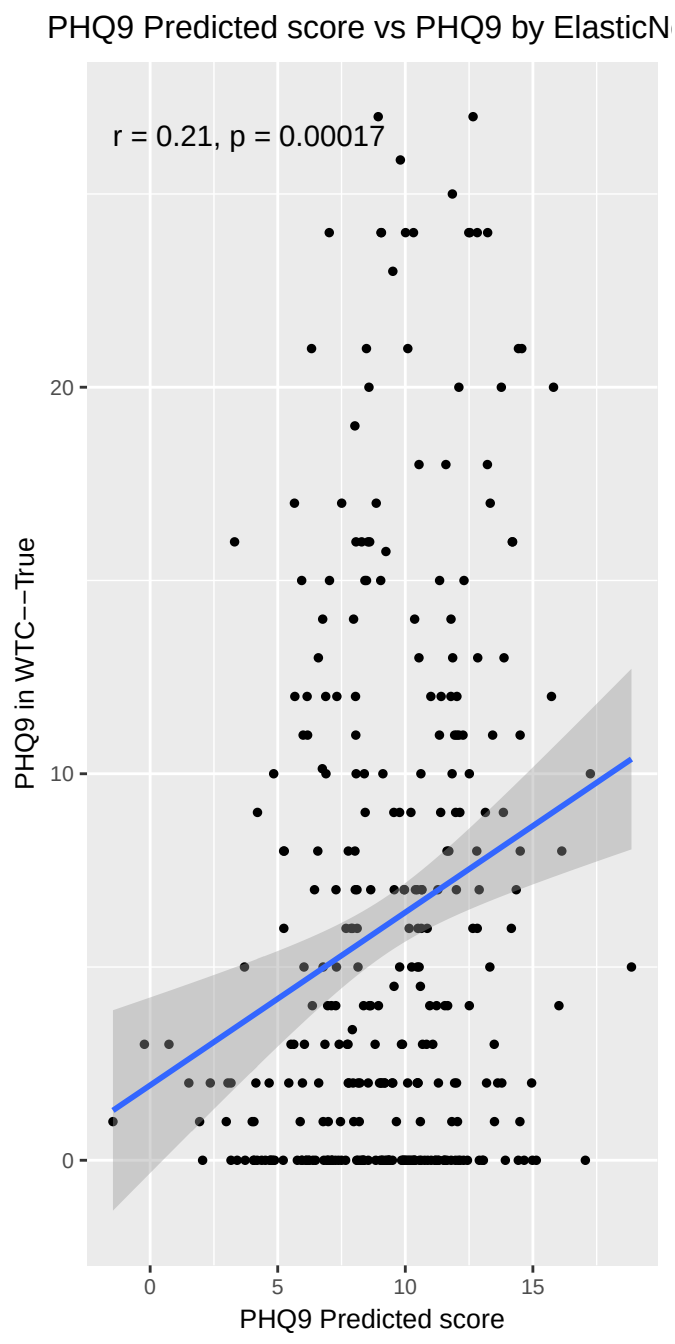
Train on MDD of batch 4
 Test on batch 3 and Mostafavi

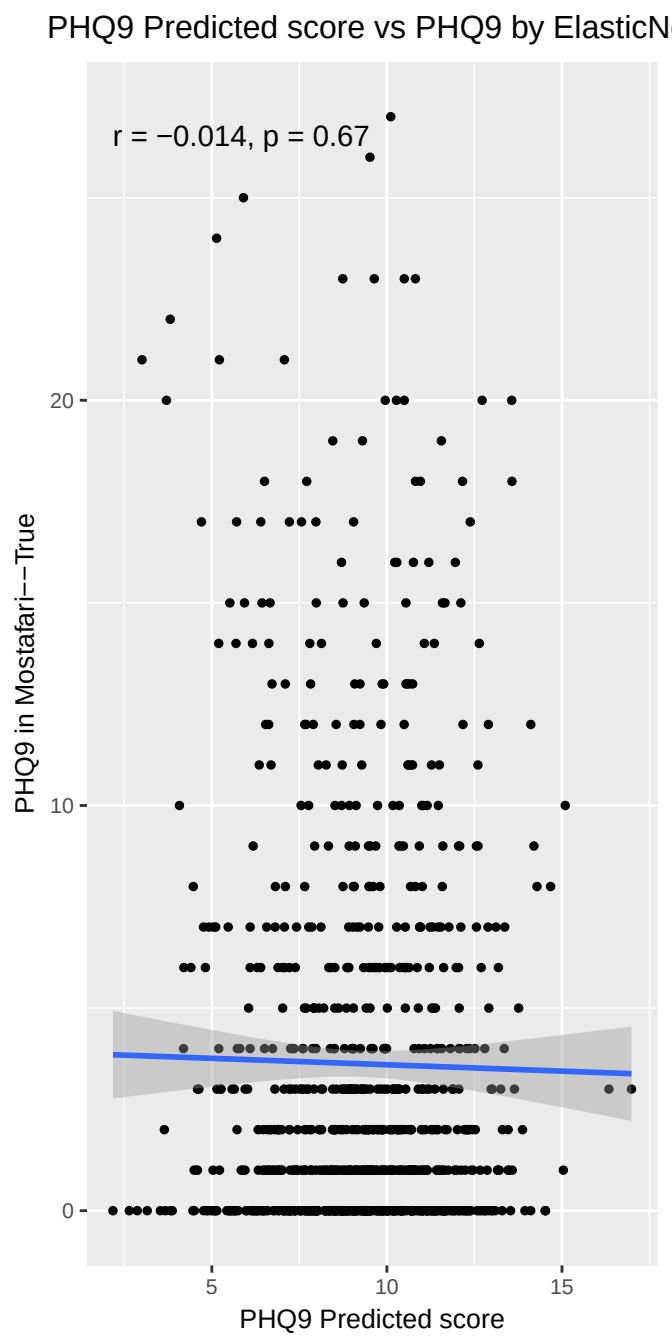
 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.662920426579163 0.487730393333239 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.21, p = 0.00012
PHQ9 in WTC−−True
MDD Predicted score
0.0
0.2
0.4
0.6
0.8
0
10
20
MDD Predicted score vs PHQ9 by ElasticNe
r = −0.022, p = 0.5
PHQ9 in Mostafari−−True
MDD Predicted score
0.25
0.50
0.75
0
10
20

Train on PHQ9 of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.608517608517608 0.526066150002117 respectively


PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.21, p = 0.00017
PHQ9 in WTC−−True
PHQ9 Predicted score
0
5
10
15
0
10
20

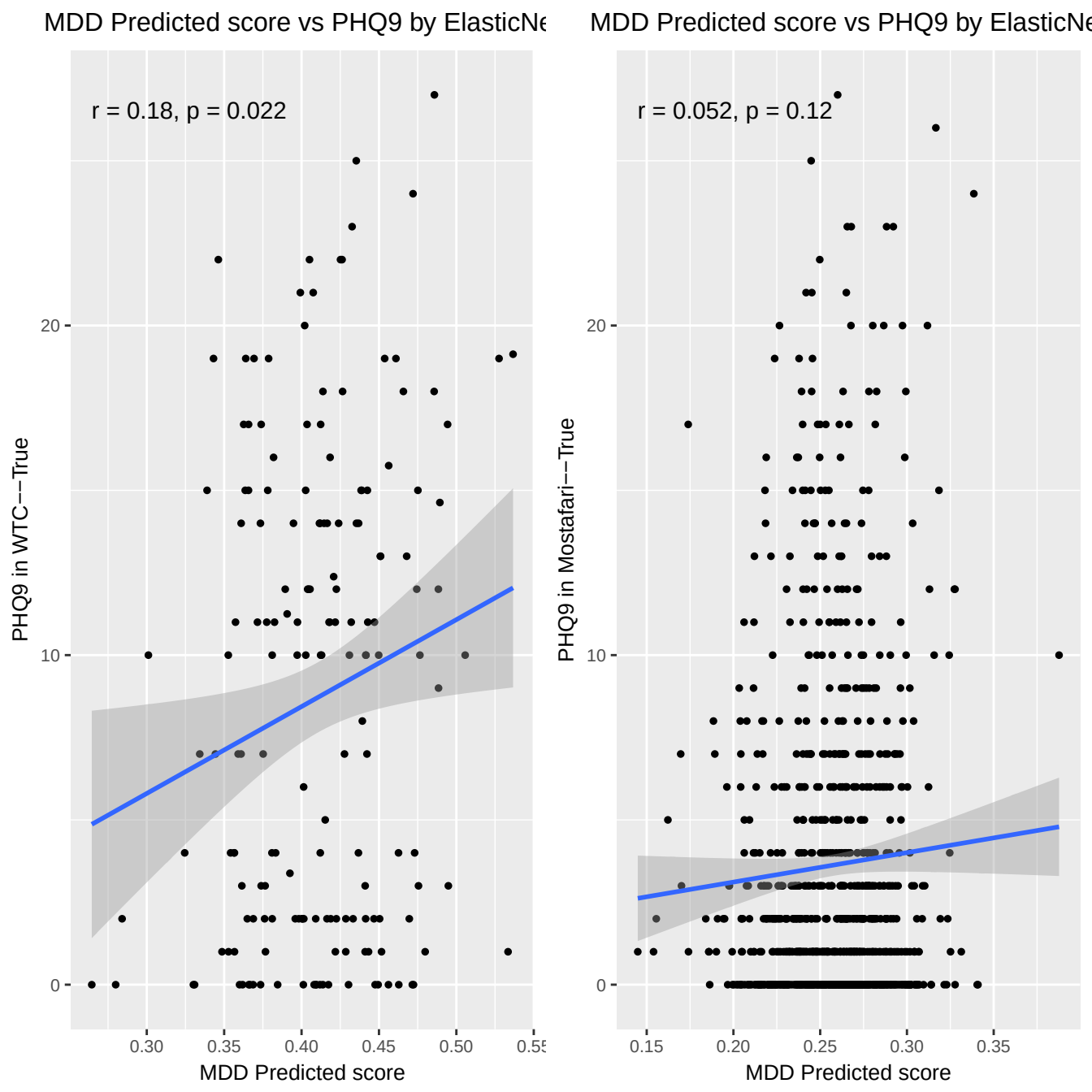

PHQ9 Predicted score vs PHQ9 by ElasticN
r = −0.014, p = 0.67
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
5
10
15
0
10
20

PHQ9 MDD prediction with genes log transformed
and scale by samples :(x−median(x))/mad(x)
Design setting are:
Original PHQ9.
Both gender are tested.
40 candidate genes by 2−step filtering.

Design setting code are:
2,2,2

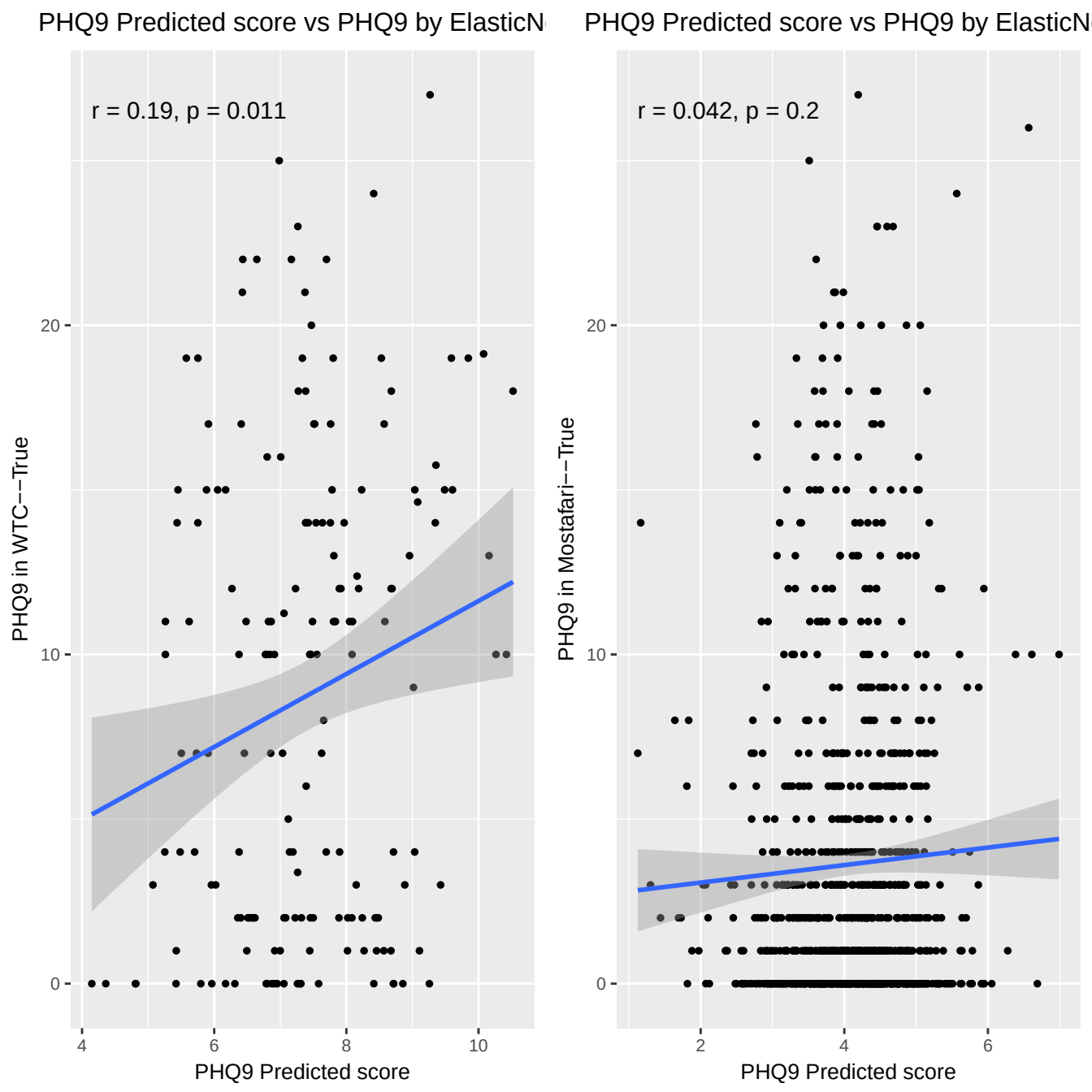
Train on MDD of batch 3
 Test on batch 4 and Mostafavi

 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.581443298969072 0.490737211611306 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.18, p = 0.022
PHQ9 in WTC−−True
MDD Predicted score
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.052, p = 0.12
PHQ9 in Mostafari−−True
MDD Predicted score

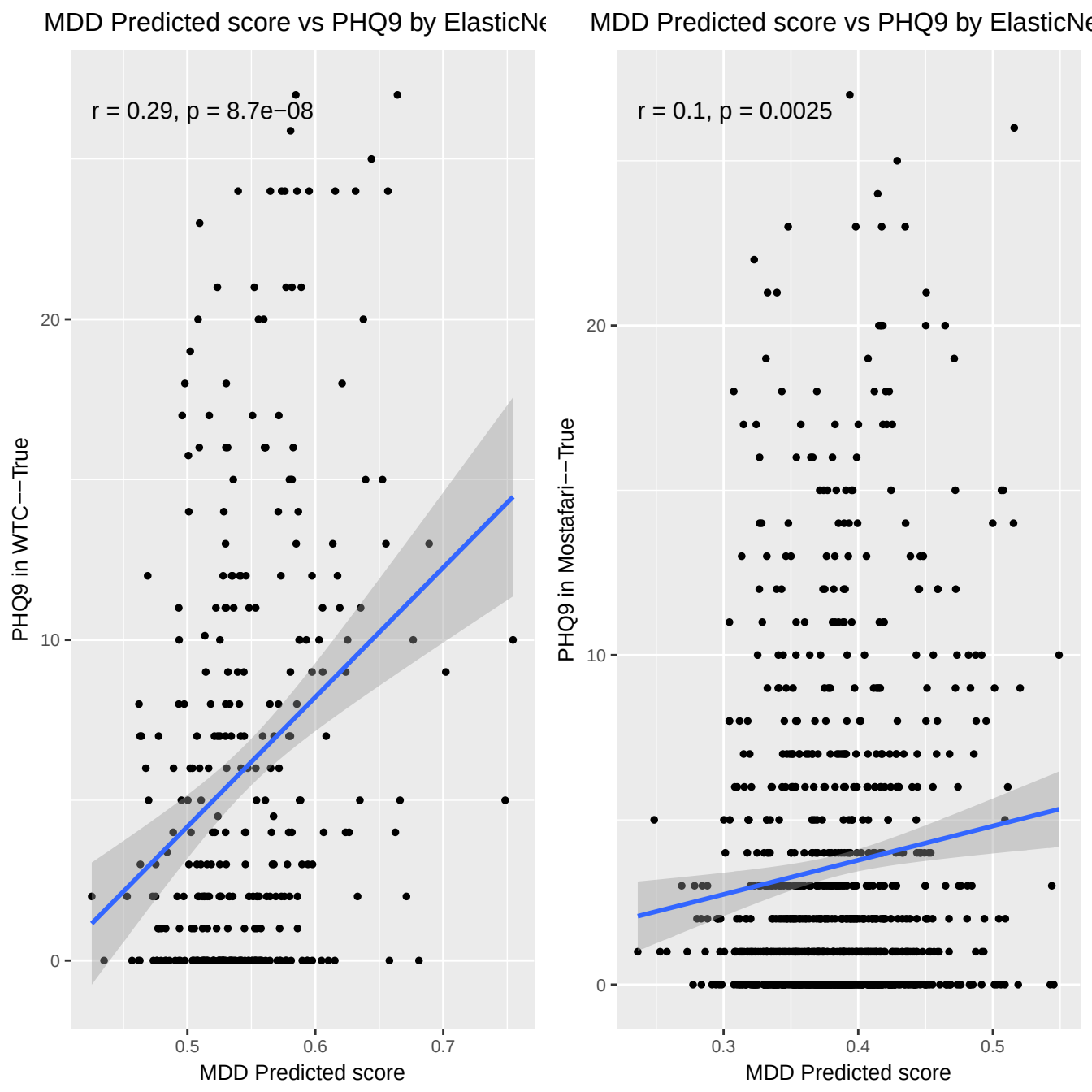
Train on PHQ9 of batch 3
 Test on batch 4 and Mostafavi

 Prediction Model on MDD of Batch 4 and Mostafavi:
 AUC are 0.613992105621342 0.499390636984335 respectively


PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.19, p = 0.011
PHQ9 in WTC−−True
PHQ9 Predicted score
PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.042, p = 0.2
PHQ9 in Mostafari−−True
PHQ9 Predicted score

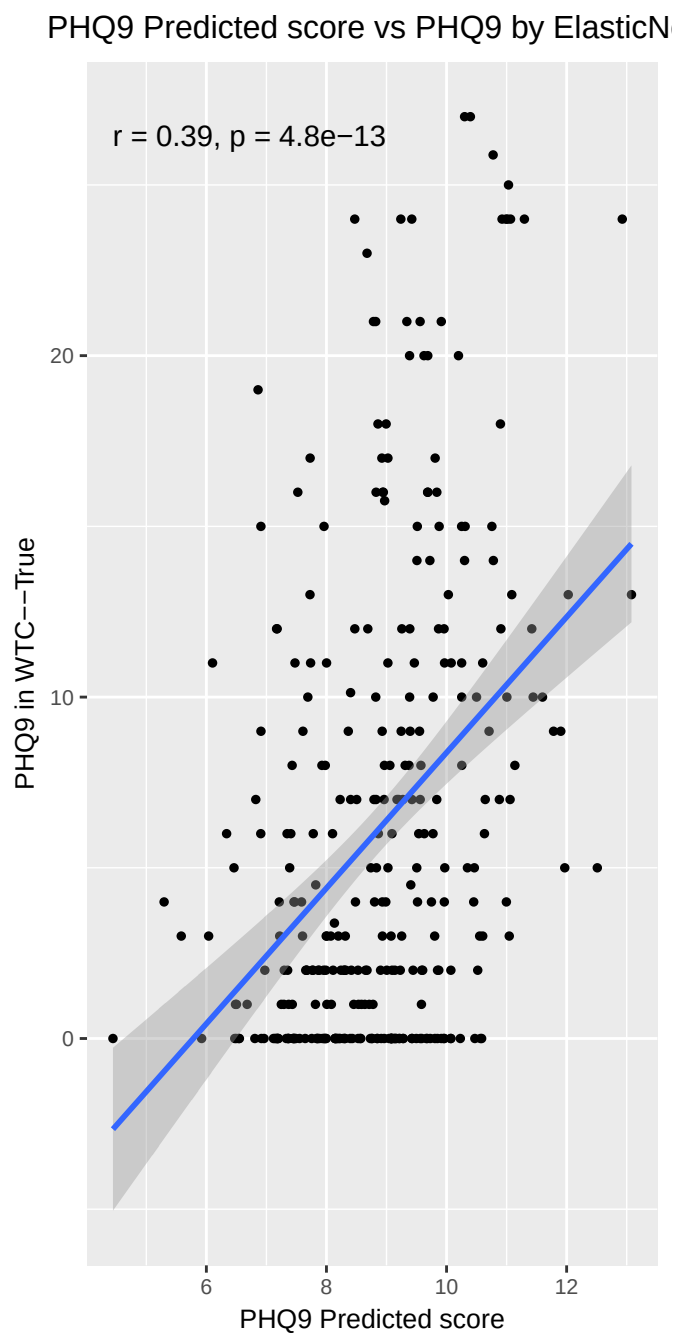
Train on MDD of batch 4
 Test on batch 3 and Mostafavi

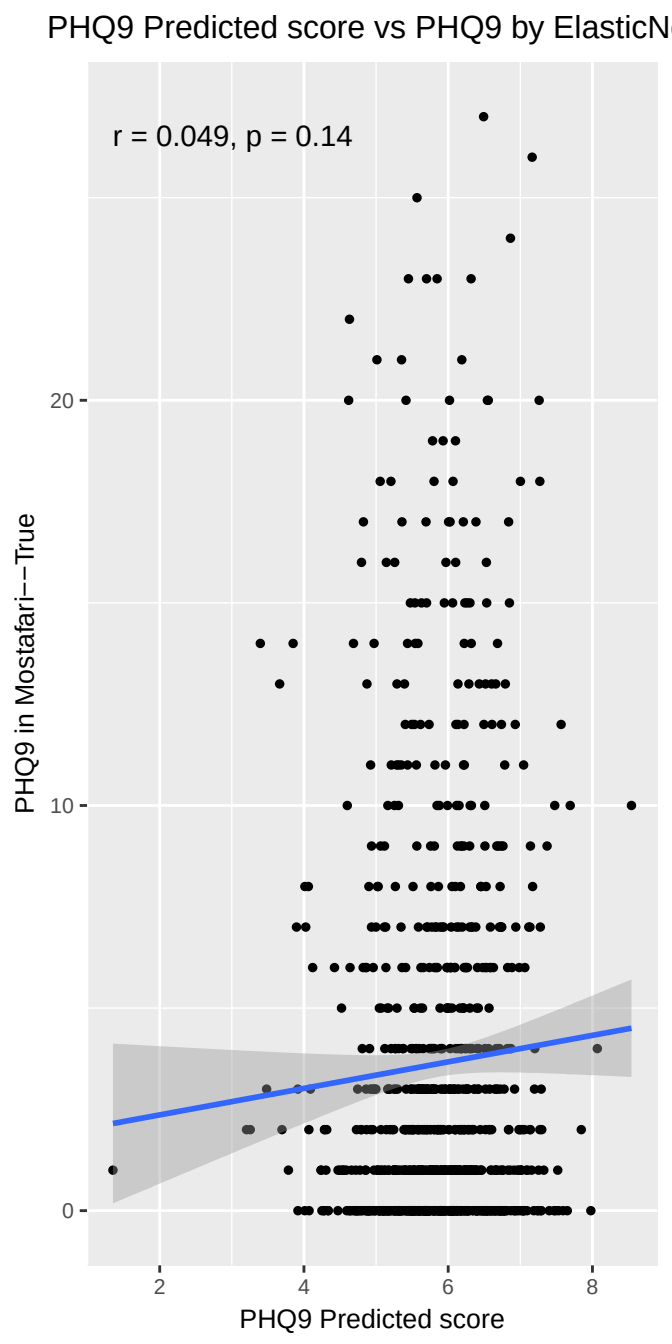
 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.641837571780148 0.551640574636382 respectively


MDD Predicted score vs PHQ9 by ElasticNe
r = 0.29, p = 8.7e−08
PHQ9 in WTC−−True
20
10
0
0.5
0.6
0.7
MDD Predicted score
MDD Predicted score vs PHQ9 by ElasticNe
r = 0.1, p = 0.0025
PHQ9 in Mostafari−−True
20
10
0
0.3
0.4
0.5
MDD Predicted score

Train on PHQ9 of batch 4
 Test on batch 3 and Mostafavi

 Prediction Model on MDD of Batch 3 and Mostafavi:
 AUC are 0.670287512392776 0.52565206548182 respectively


PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.39, p = 4.8e−13
PHQ9 in WTC−−True
PHQ9 Predicted score
0
10
20
6
8
10
12


PHQ9 Predicted score vs PHQ9 by ElasticN
r = 0.049, p = 0.14
PHQ9 in Mostafari−−True
PHQ9 Predicted score
0
10
20
2
4
6
8