Outcome Inequalty by Race in Early Stage High Grade Serous Ovarian Cancer

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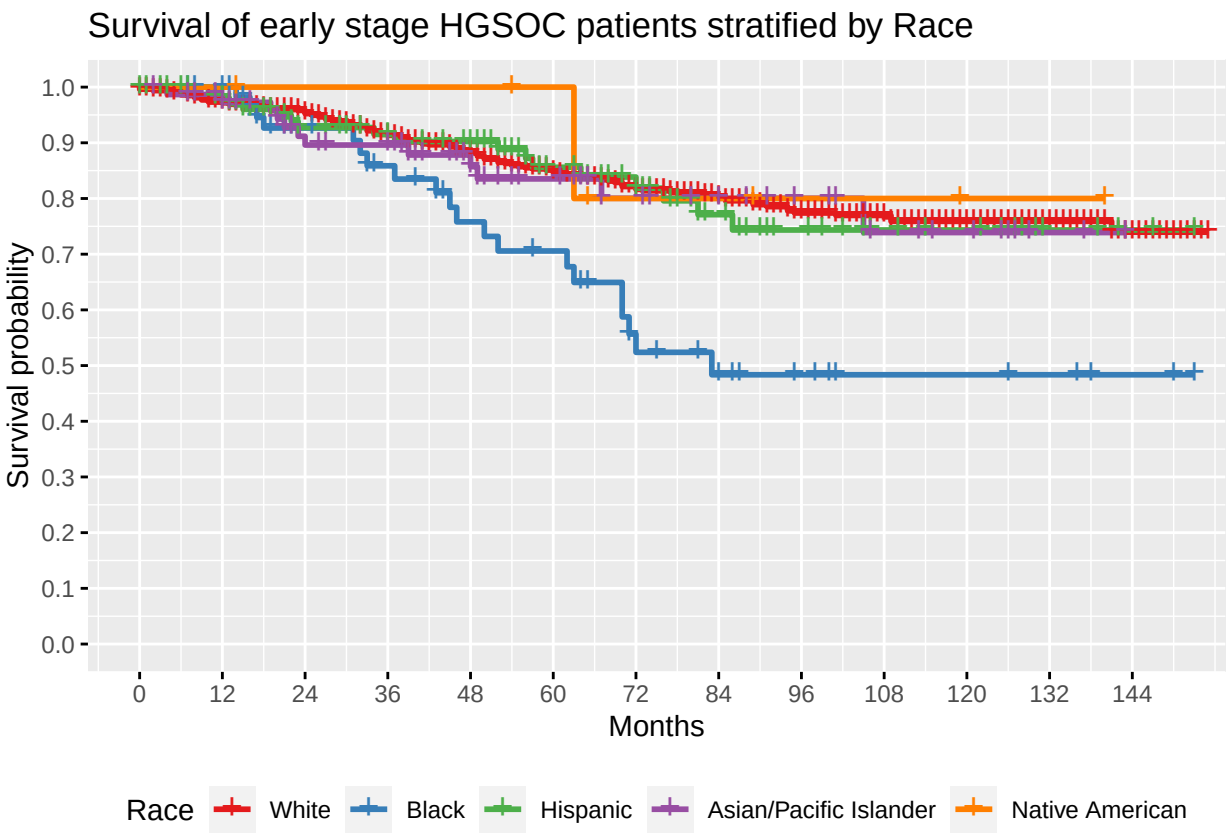
10/16/20

Survival of early-stage HGSOC by race

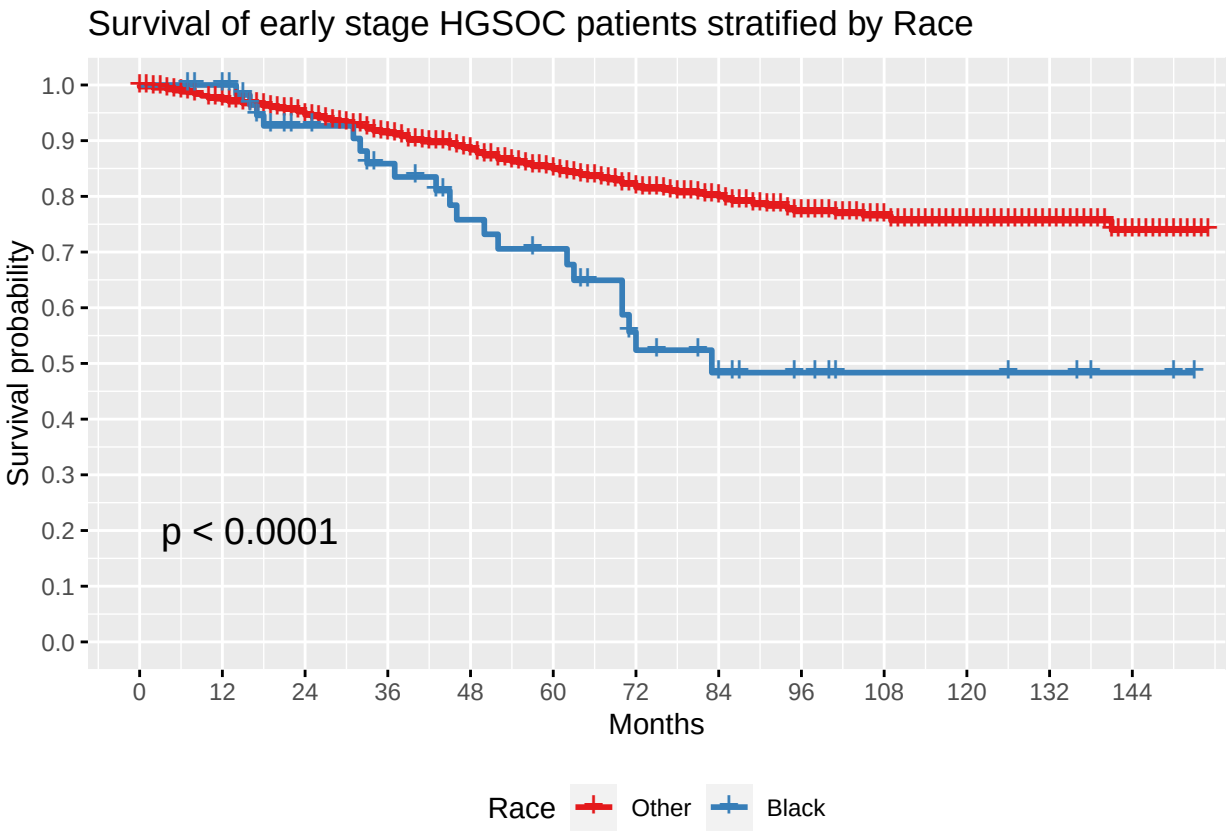



```
##
##  Pairwise comparisons using Log-Rank test
##
## data:  HGS.ES and Race
##
##          White   Black   Hispanic API
## Black    0.00099 -       -        -
## Hispanic 0.88561 0.03049 -        -
```

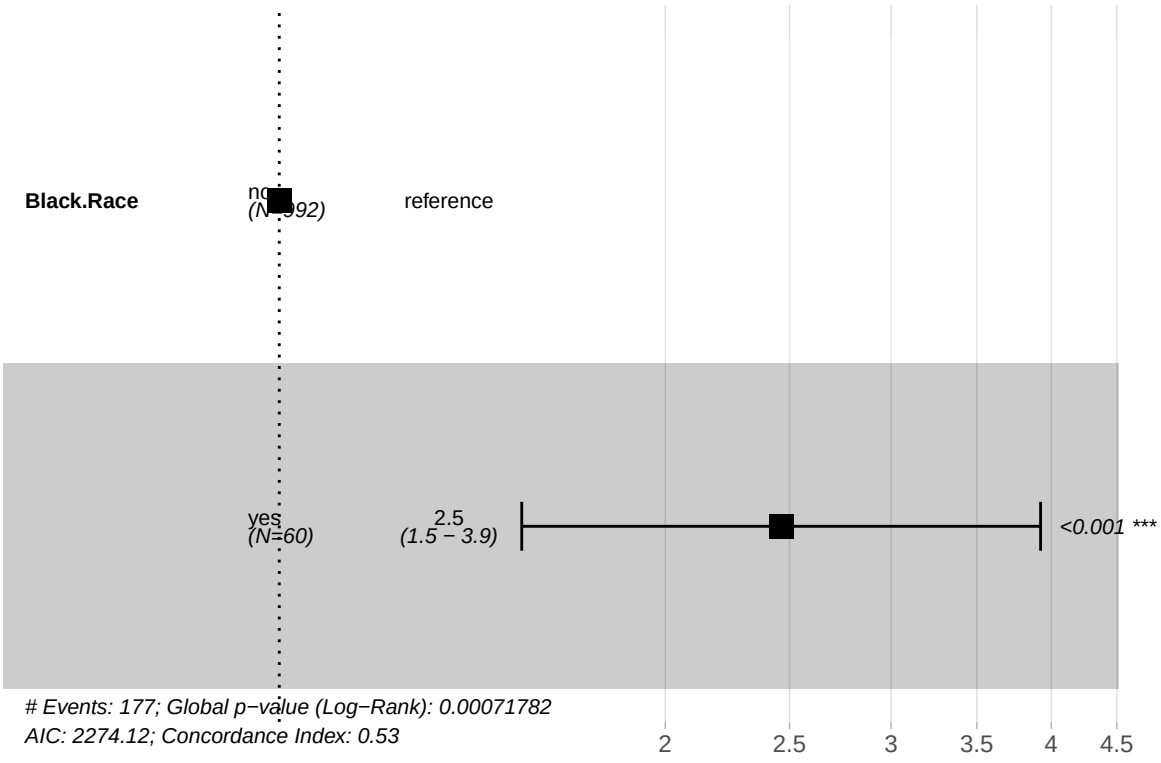
```
## API      0.88561 0.08697 0.88561  -
## Native   0.88561 0.51590 0.88561  0.88561
##
## P value adjustment method: BH
```

Race	Count
White	795
Black	60
Hispanic	111
API	76
Native	7

Comparing Black Race to All Other Races Combined

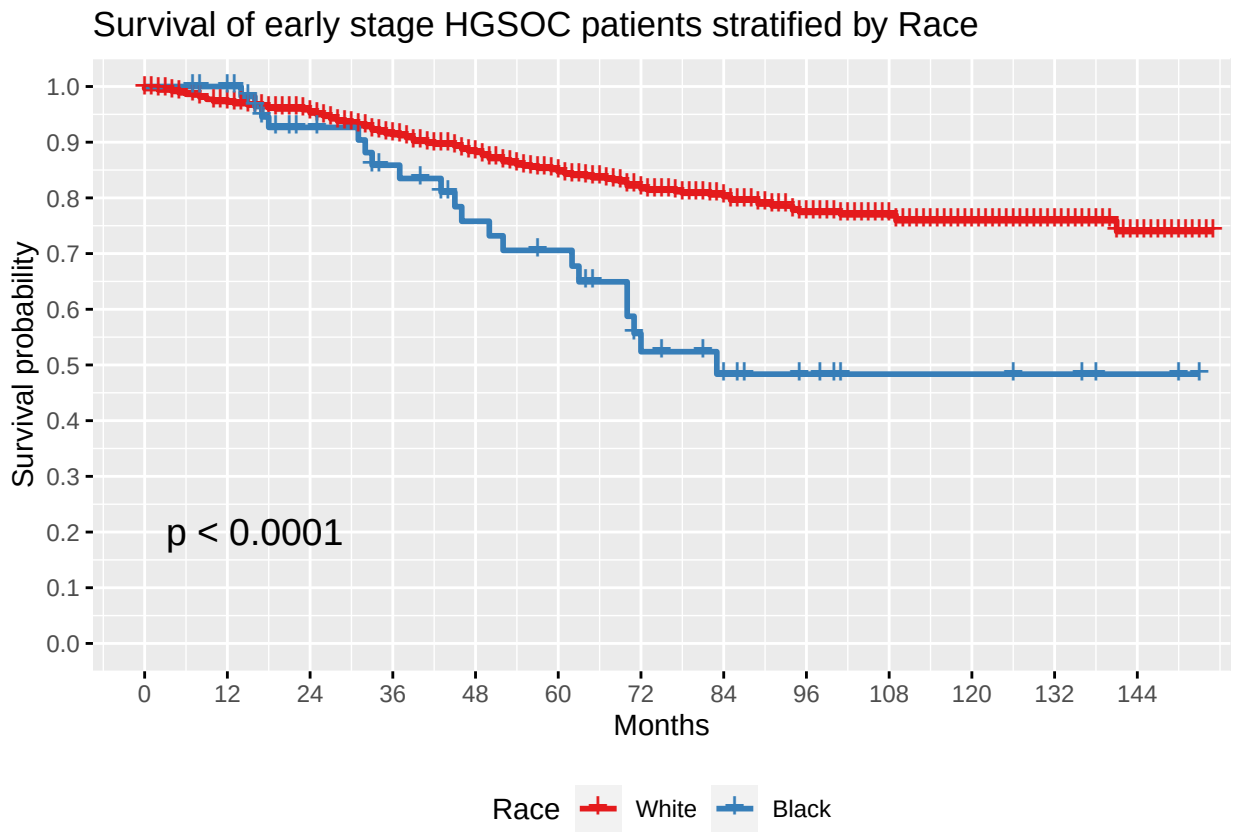


Black Race	Count
no	992
yes	60

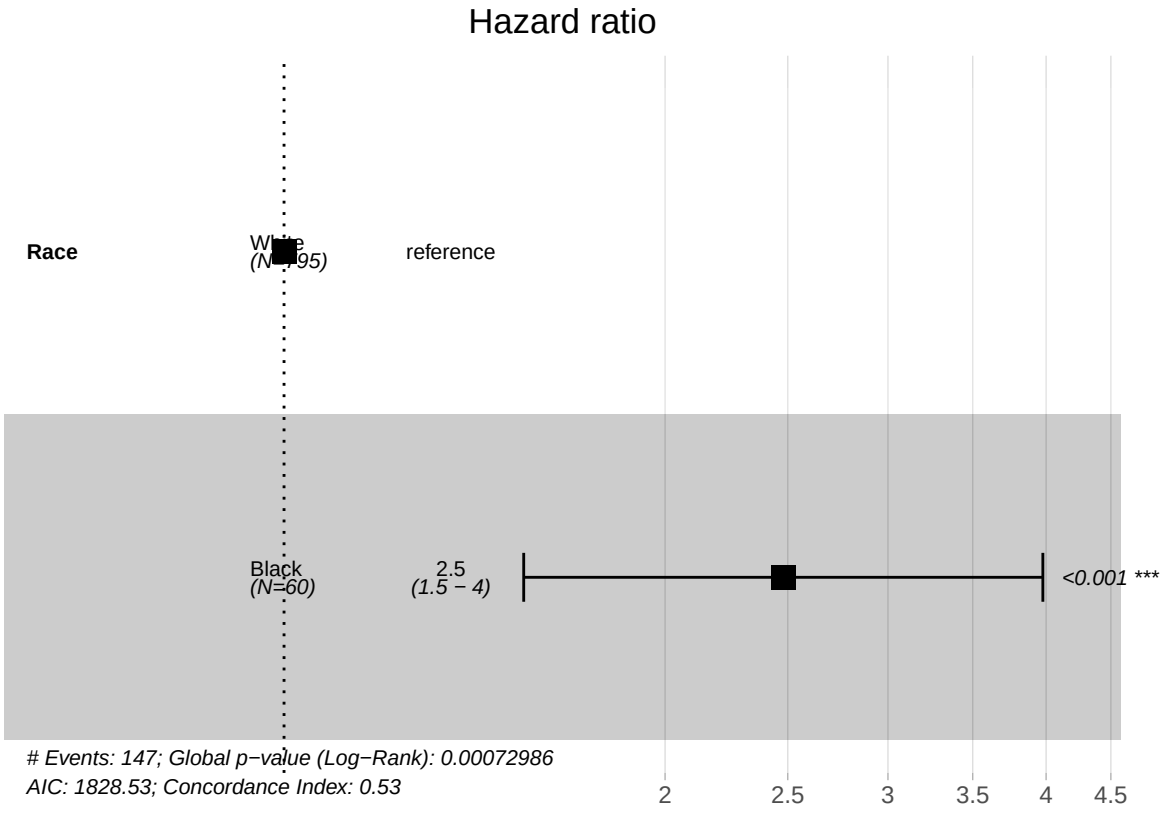



```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Black.Race, data = HGS.ES)
##
##   n= 1052, number of events= 177
##
##                 coef exp(coef) se(coef)     z Pr(>|z|)
## Black.Raceyes 0.9013    2.4628   0.2377 3.792  0.00015 ***
## ---
## Signif. codes:  0 ’***’ 0.001 ’**’ 0.01 ’*’ 0.05 ’.’ 0.1 ’ ’ 1
##
##               exp(coef) exp(-coef) lower .95 upper .95
## Black.Raceyes     2.463      0.406     1.546     3.924
##
## Concordance= 0.527  (se = 0.011 )
## Likelihood ratio test= 11.44  on 1 df,   p=7e-04
## Wald test            = 14.38  on 1 df,   p=1e-04
## Score (logrank) test = 15.38  on 1 df,   p=9e-05
```

Comparing Black Race to White Race

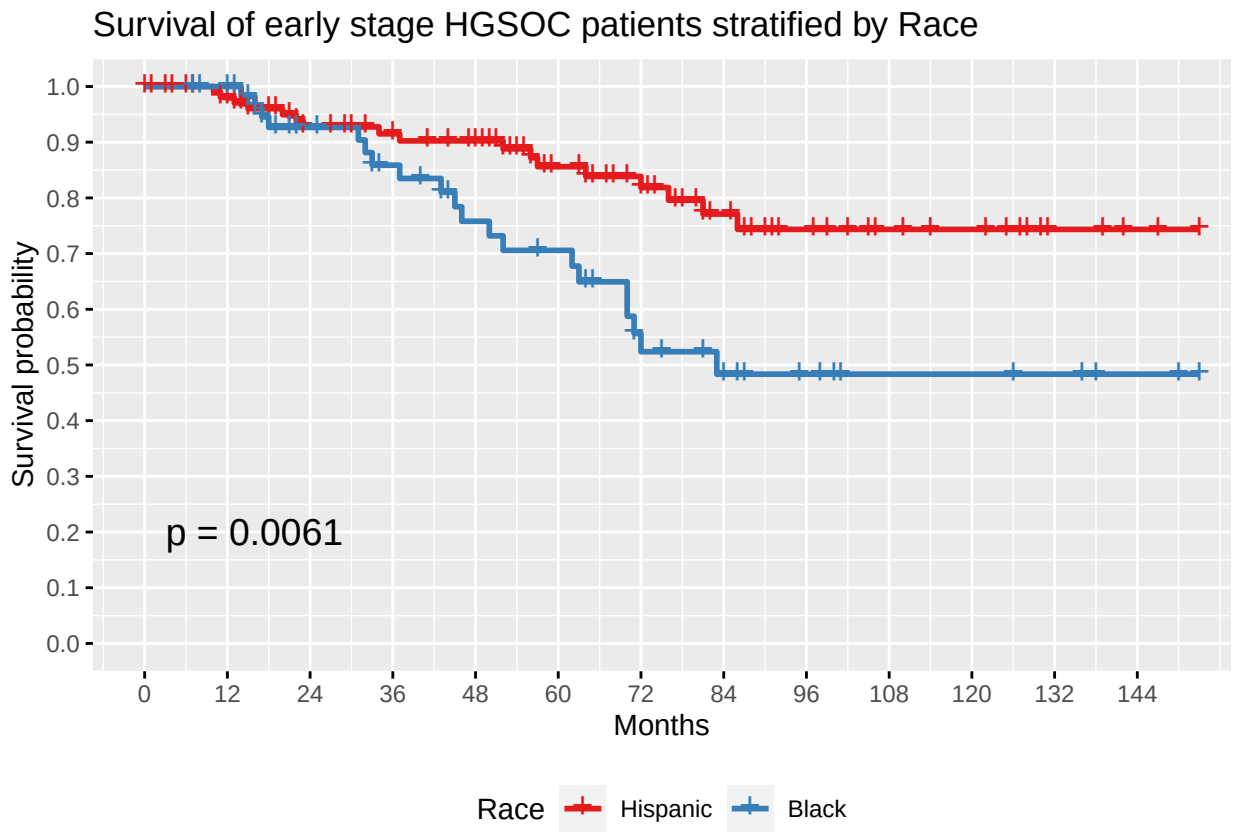


Race	Count
White	795
Black	60

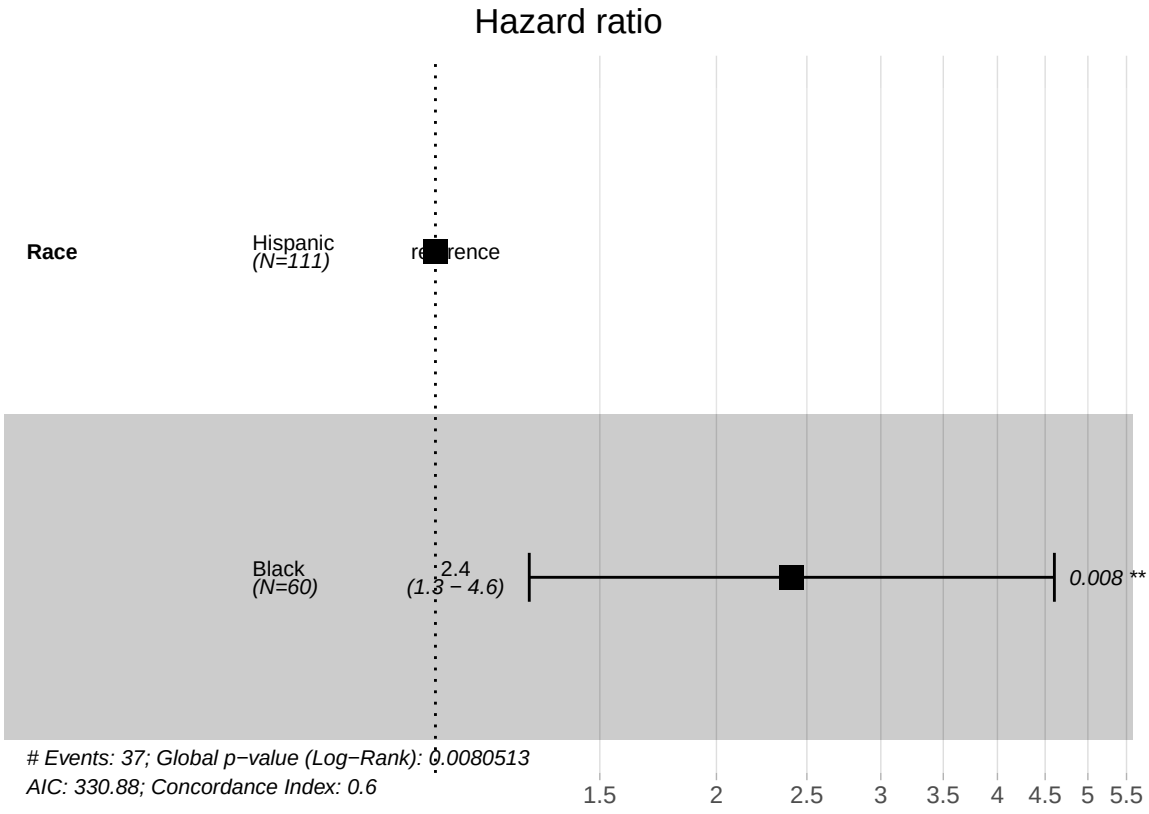



```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Race, data = HGS.WB)
##
##   n= 855, number of events= 147
##
##             coef exp(coef) se(coef)    z Pr(>|z|)
## RaceBlack 0.9082    2.4798   0.2409 3.77 0.000164 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##           exp(coef) exp(-coef) lower .95 upper .95
## RaceBlack      2.48     0.4033     1.546     3.977
##
## Concordance= 0.533  (se = 0.013 )
## Likelihood ratio test= 11.41  on 1 df,   p=7e-04
## Wald test            = 14.21  on 1 df,   p=2e-04
## Score (logrank) test = 15.21  on 1 df,   p=1e-04
```

Comparing Black Race to Hispanic Race



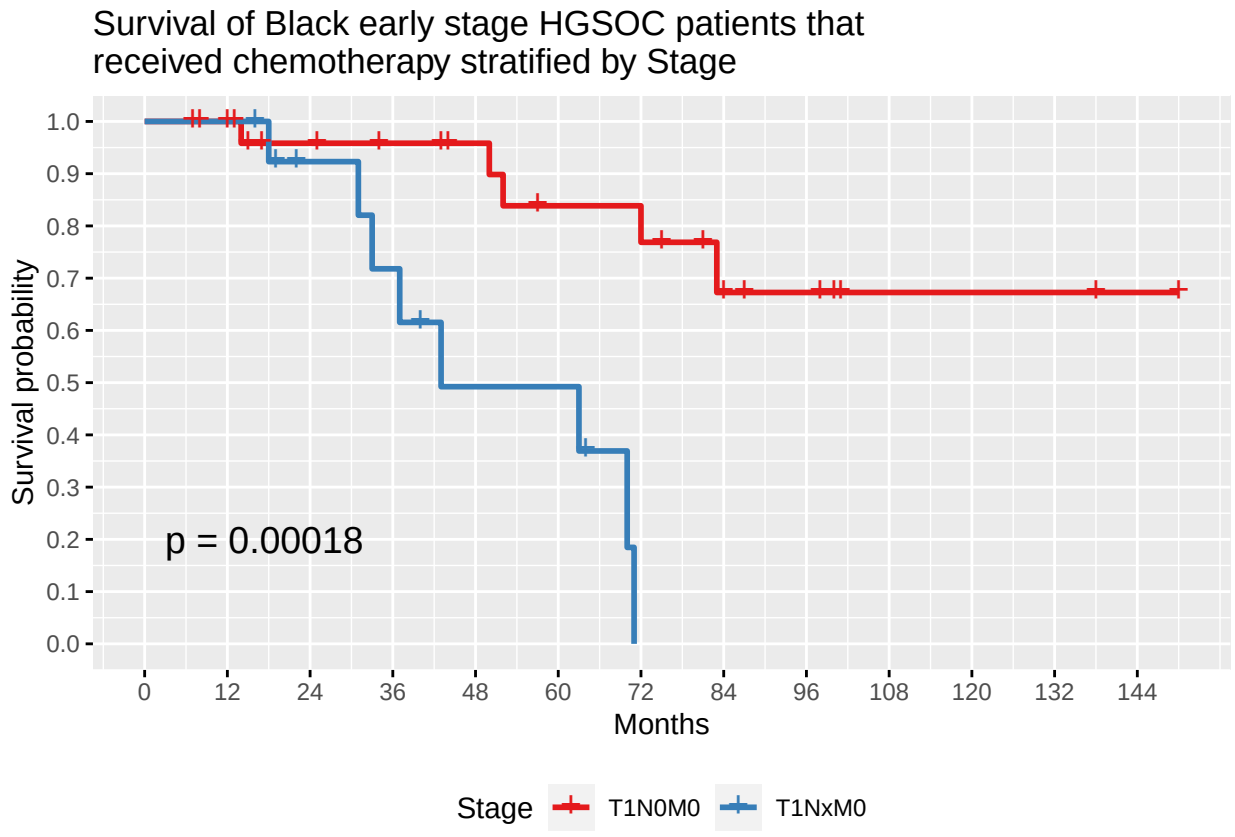
Race	Count
Hispanic	111
Black	60



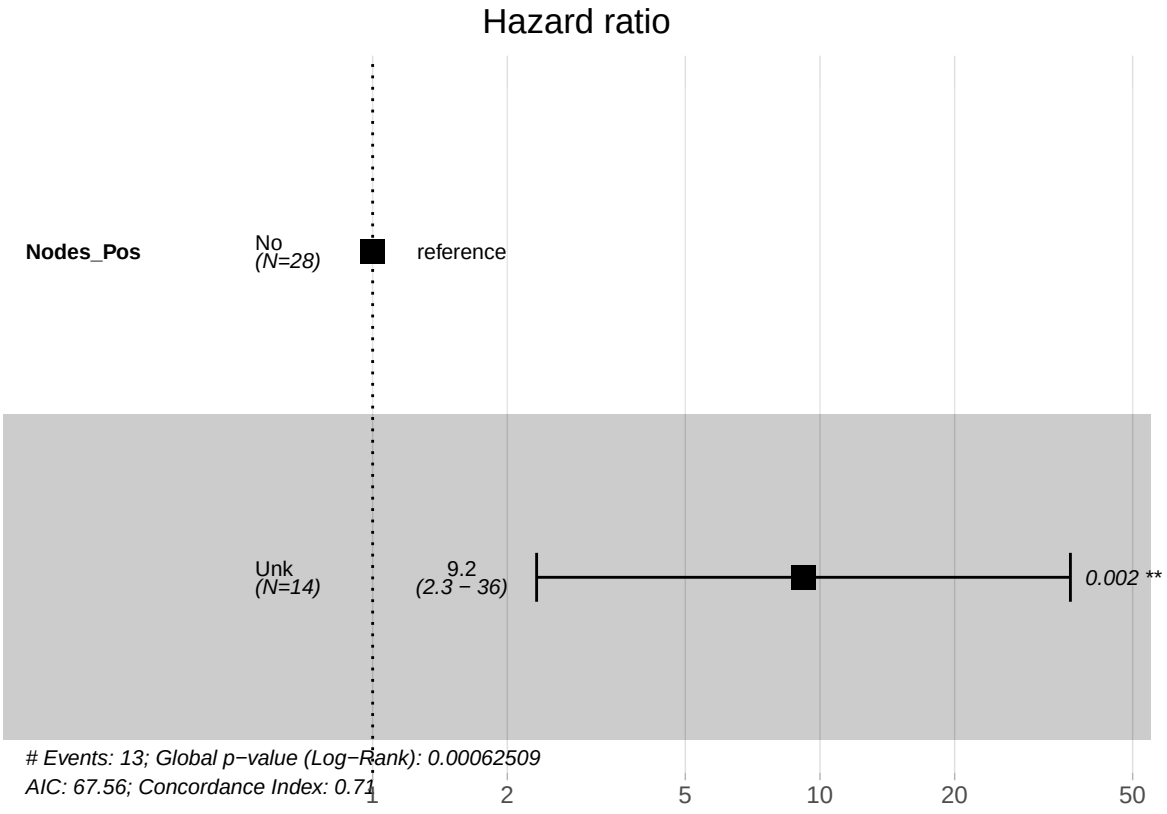

```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Race, data = HGS.HB)
##
##   n= 171, number of events= 37
##
##             coef exp(coef) se(coef)    z Pr(>|z|)
## RaceBlack 0.8791    2.4088   0.3304 2.66  0.00781 **
## ---
## Signif. codes:  0 ’***’ 0.001 ’**’ 0.01 ’*’ 0.05 ’.’ 0.1 ’ ’ 1
##
##           exp(coef) exp(-coef) lower .95 upper .95
## RaceBlack     2.409     0.4152      1.26     4.603
##
## Concordance= 0.596  (se = 0.044 )
## Likelihood ratio test= 7.02  on 1 df,   p=0.008
## Wald test            = 7.08  on 1 df,   p=0.008
## Score (logrank) test = 7.54  on 1 df,   p=0.006
```

Does the addition of chemotherapy in patients with unknown nodal status improve outcomes in different races?

Black Race

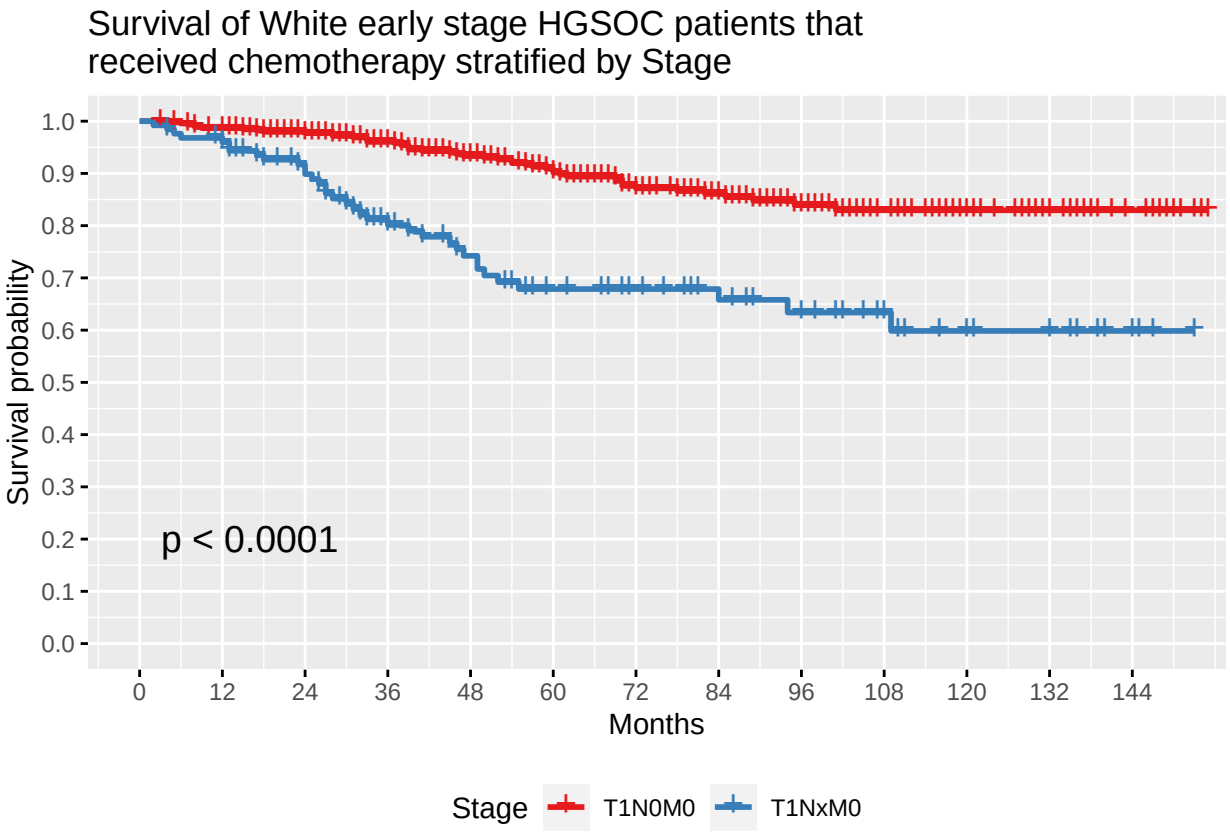


Positive Nodes	Count
No	28
Unk	14

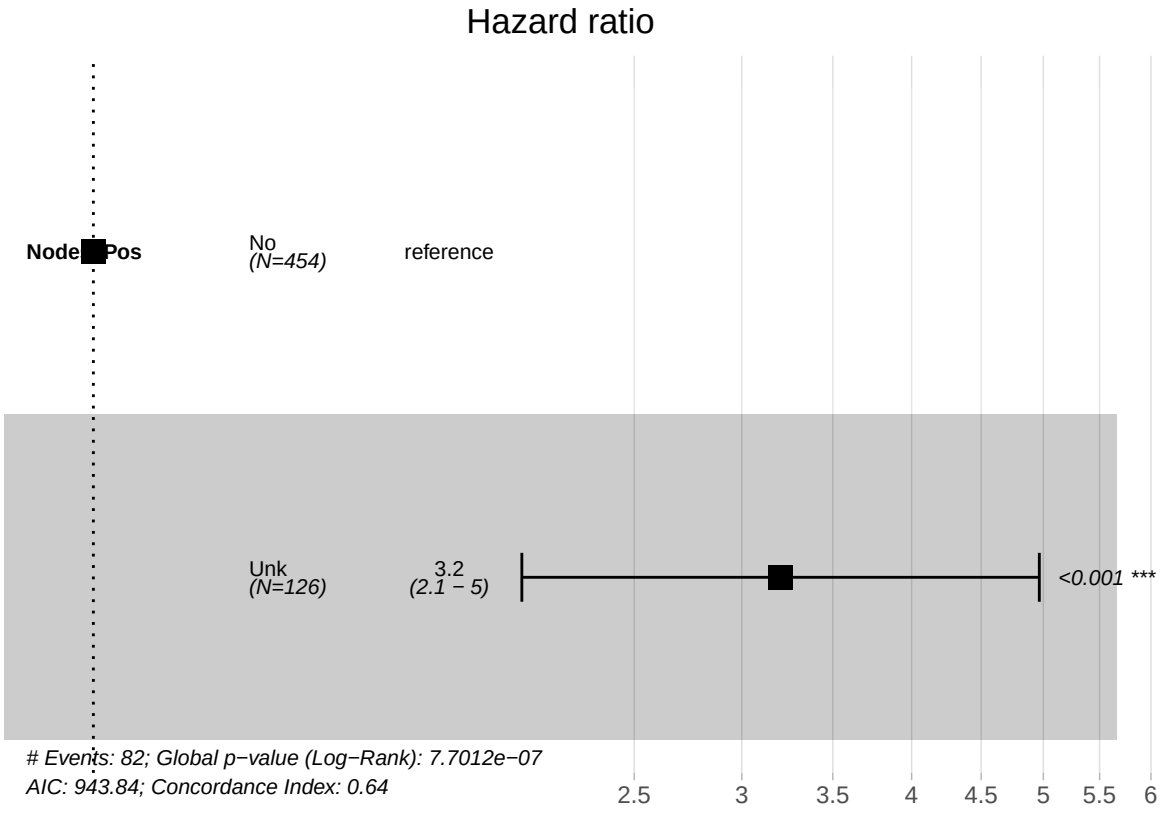



```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Nodes_Pos, data = HGS.ES.Black.Chemo)
##
##   n= 42, number of events= 13
##
##               coef exp(coef) se(coef)     z Pr(>|z|)
## Nodes_PosUnk 2.218     9.188    0.701 3.164  0.00156 **
## ---
## Signif. codes:  0 ’***’ 0.001 ’**’ 0.01 ’*’ 0.05 ’.’ 0.1 ’ ’ 1
##
##              exp(coef) exp(-coef) lower .95 upper .95
## Nodes_PosUnk     9.187     0.1088     2.326      36.3
##
## Concordance= 0.706  (se = 0.07 )
## Likelihood ratio test= 11.7  on 1 df,   p=6e-04
## Wald test            = 10.01  on 1 df,   p=0.002
## Score (logrank) test = 13.98  on 1 df,   p=2e-04
```

White Race

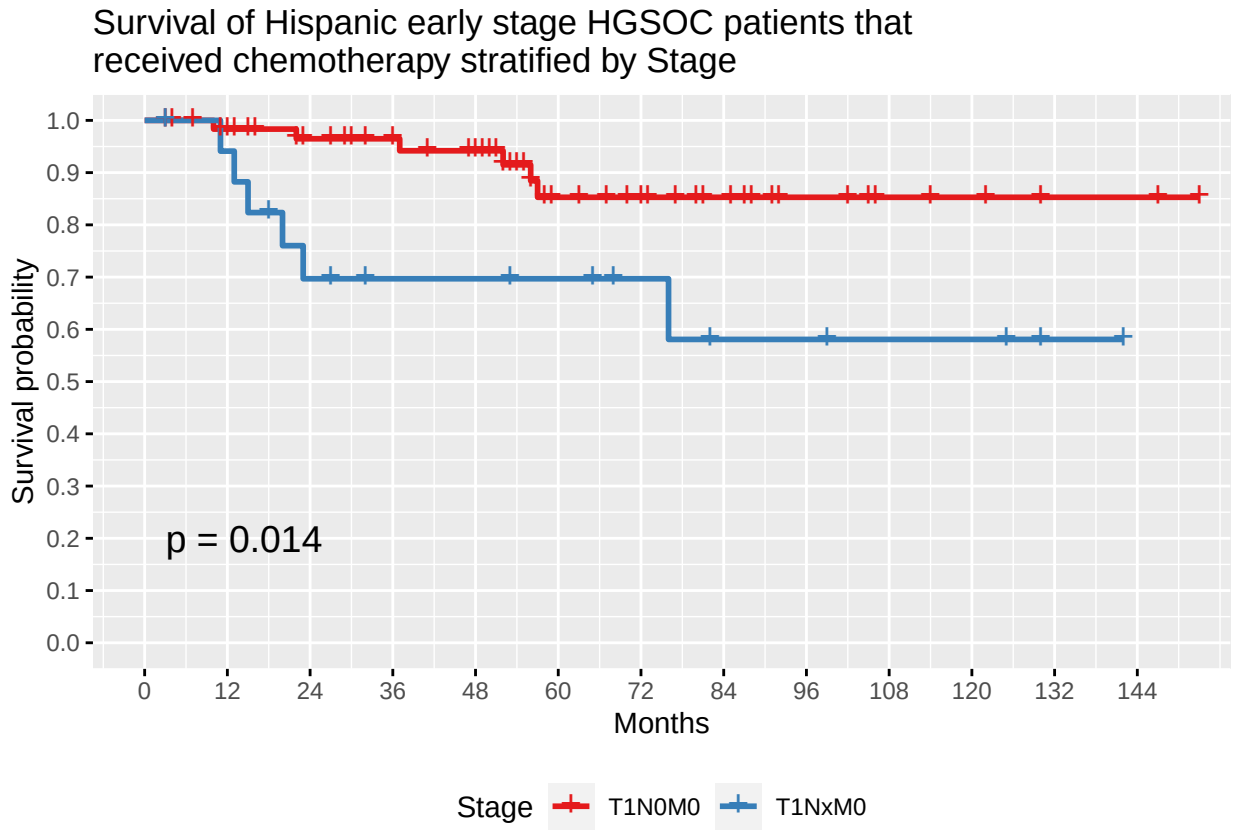


Positive Nodes	Count
No	454
Unk	126

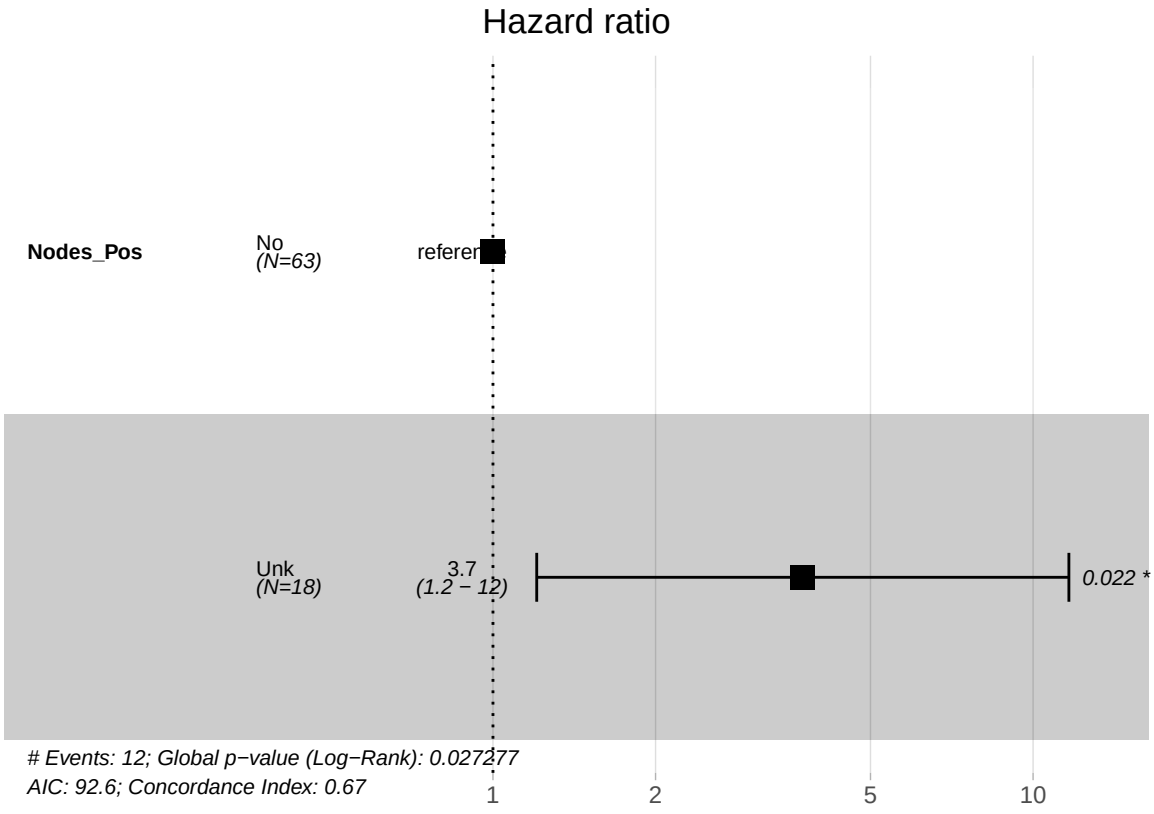



```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Nodes_Pos, data = HGS.ES.White.Chemo)
##
##   n= 580, number of events= 82
##
##                coef exp(coef) se(coef)     z Pr(>|z|)
## Nodes_PosUnk 1.1643    3.2036   0.2237 5.206 1.93e-07 ***
## ---
## Signif. codes:  0 ’***’ 0.001 ’**’ 0.01 ’*’ 0.05 ’.’ 0.1 ’ ’ 1
##
##              exp(coef) exp(-coef) lower .95 upper .95
## Nodes_PosUnk     3.204     0.3122     2.067     4.966
##
## Concordance= 0.637  (se = 0.028 )
## Likelihood ratio test= 24.43  on 1 df,   p=8e-07
## Wald test            = 27.1  on 1 df,   p=2e-07
## Score (logrank) test = 30.28  on 1 df,   p=4e-08
```

Hispanic Race



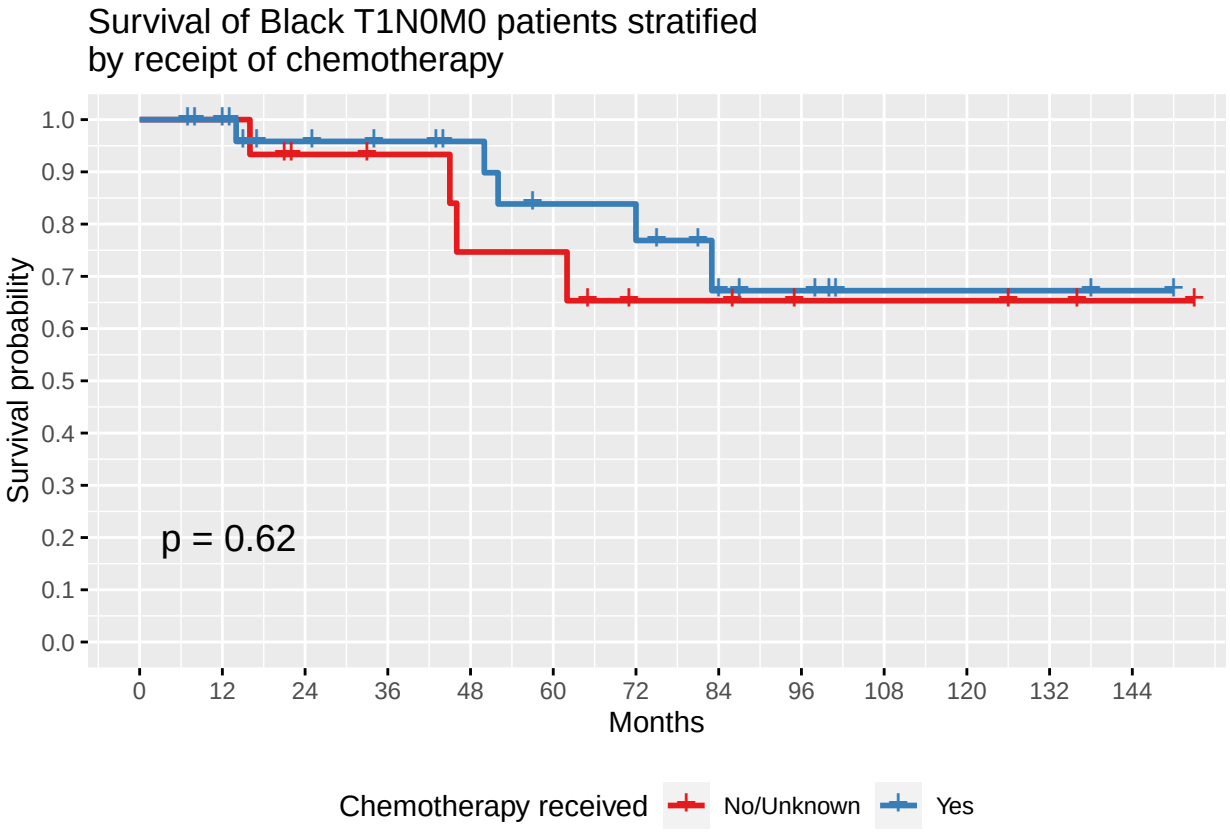
Positive Nodes	Count
No	63
Unk	18



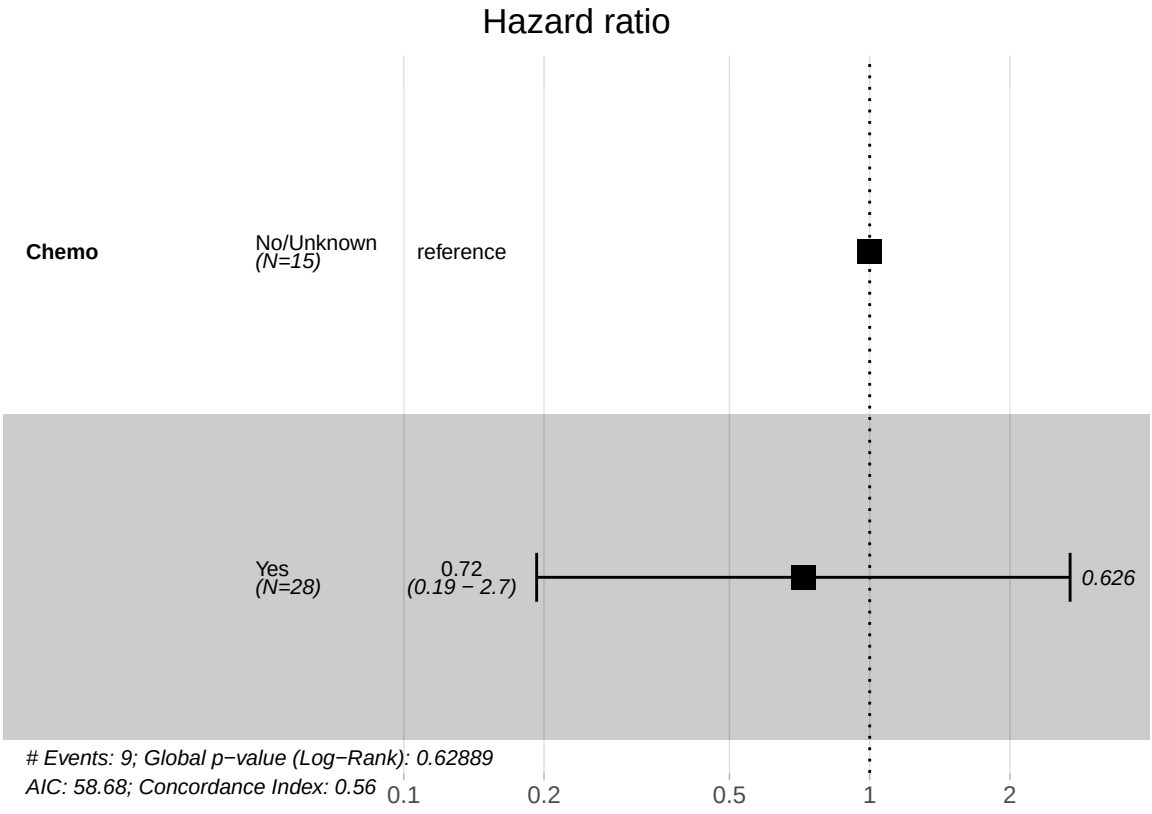

```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Nodes_Pos, data = HGS.ES.Hisp.Chemo)
##
##   n= 81, number of events= 12
##
##                coef exp(coef) se(coef)     z Pr(>|z|)
## Nodes_PosUnk 1.3209    3.7468   0.5787 2.282   0.0225 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##              exp(coef) exp(-coef) lower .95 upper .95
## Nodes_PosUnk     3.747     0.2669     1.205     11.65
##
## Concordance= 0.67  (se = 0.074 )
## Likelihood ratio test= 4.87  on 1 df,   p=0.03
## Wald test            = 5.21  on 1 df,   p=0.02
## Score (logrank) test = 6  on 1 df,   p=0.01
```

Does use of chemotherapy matter by stage for each race?

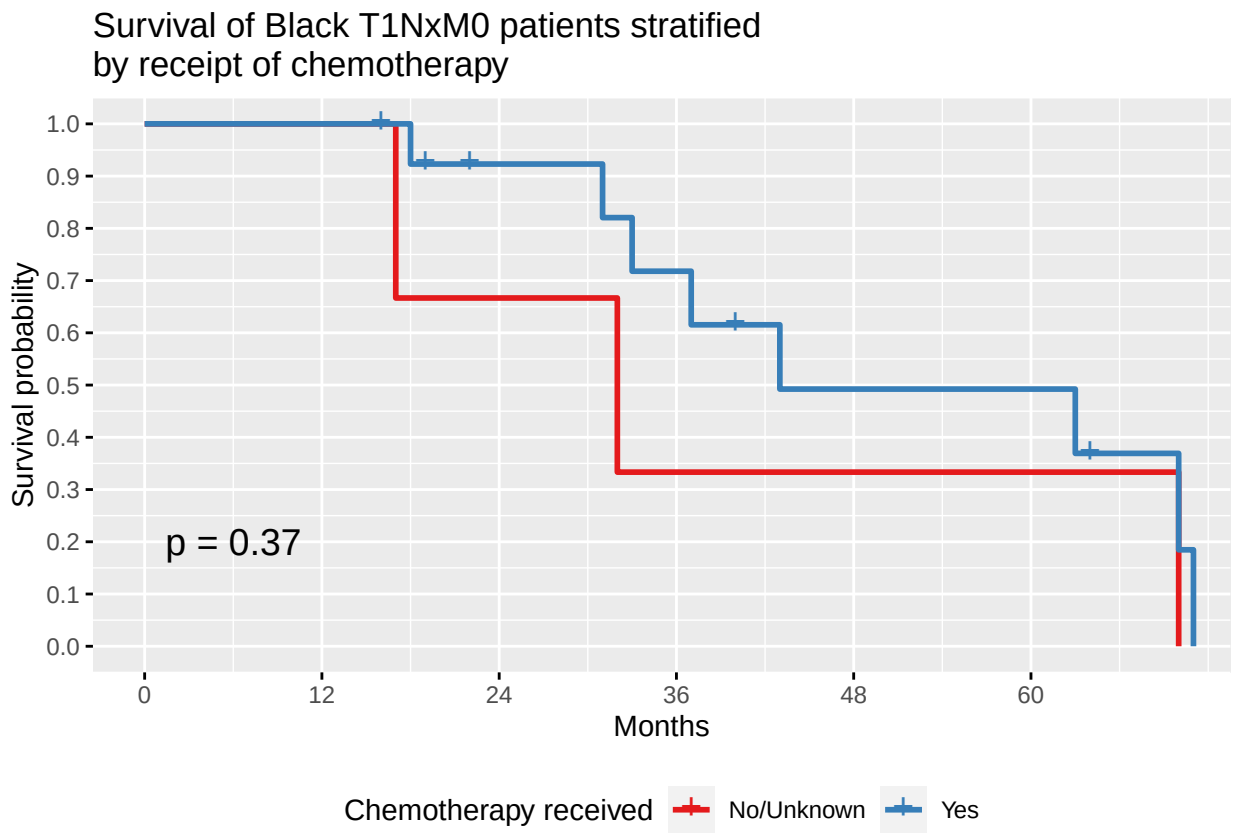
Black Race



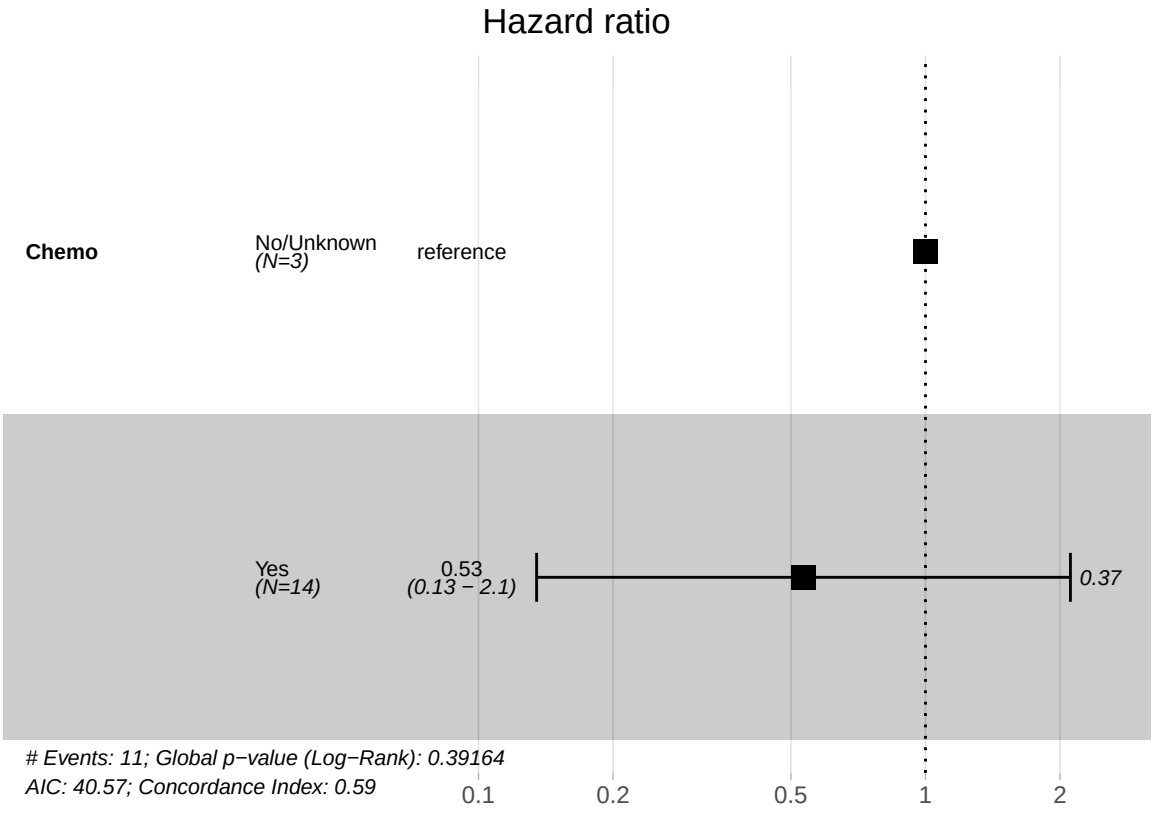
Chemotherapy received	Count
No/Unknown	15
Yes	28




```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Chemo, data = HGS.Black.N0)
##
##   n= 43, number of events= 9
##
##             coef exp(coef) se(coef)      z Pr(>|z|)
## ChemoYes -0.3277    0.7206   0.6726 -0.487    0.626
##
##          exp(coef) exp(-coef) lower .95 upper .95
## ChemoYes    0.7206      1.388    0.1928     2.693
##
## Concordance= 0.558  (se = 0.089 )
## Likelihood ratio test= 0.23  on 1 df,   p=0.6
## Wald test            = 0.24  on 1 df,   p=0.6
## Score (logrank) test = 0.24  on 1 df,   p=0.6
```

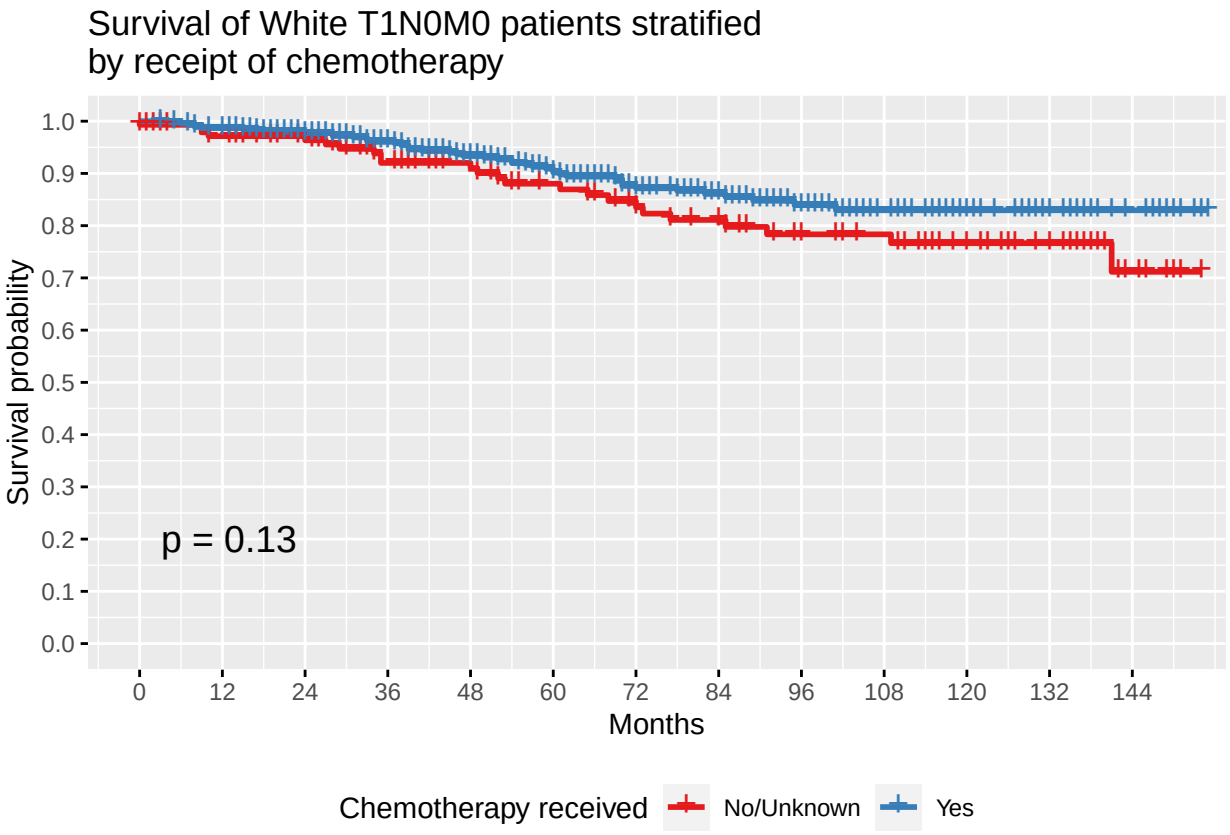


Chemotherapy received	Count
No/Unknown	3
Yes	14

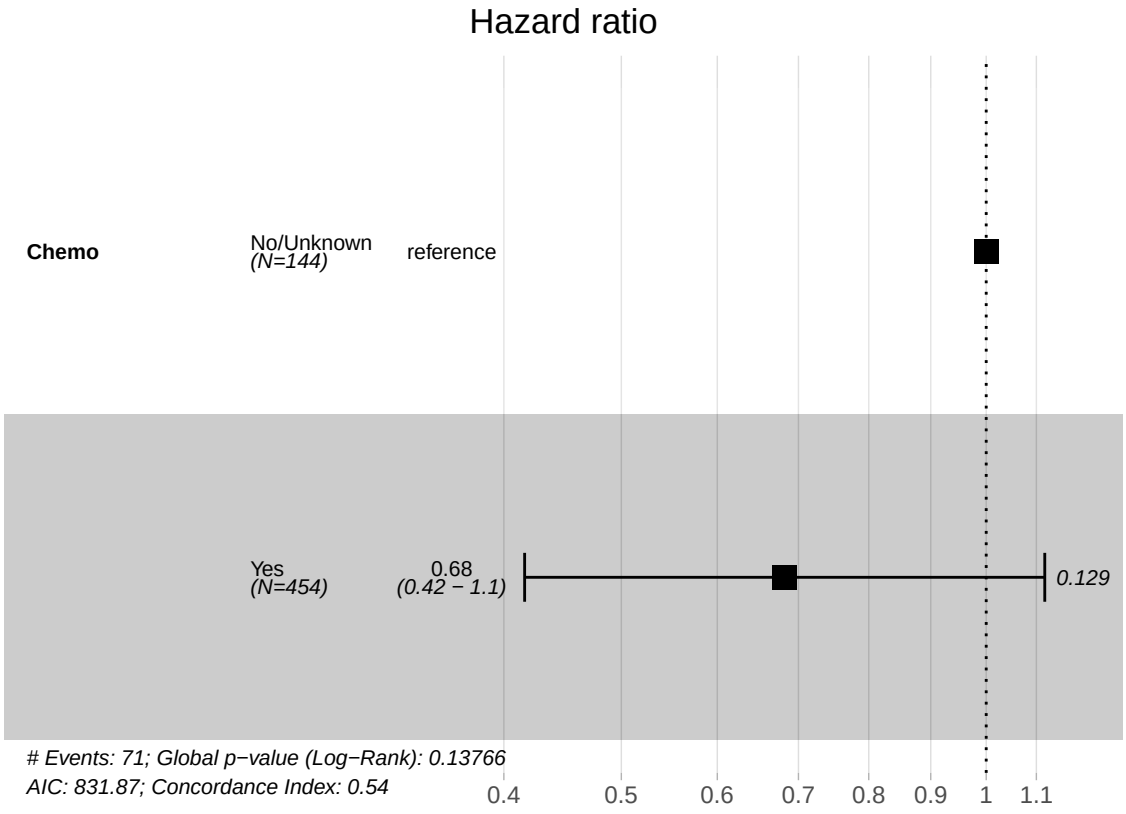



```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Chemo, data = HGS.Black.Nx)
##
##   n= 17, number of events= 11
##
##             coef exp(coef) se(coef)      z Pr(>|z|)
## ChemoYes -0.6283    0.5335   0.7016 -0.896     0.37
##
##          exp(coef) exp(-coef) lower .95 upper .95
## ChemoYes    0.5335      1.874    0.1349      2.11
##
## Concordance= 0.595  (se = 0.095 )
## Likelihood ratio test= 0.73  on 1 df,   p=0.4
## Wald test            = 0.8  on 1 df,   p=0.4
## Score (logrank) test = 0.83  on 1 df,   p=0.4
```

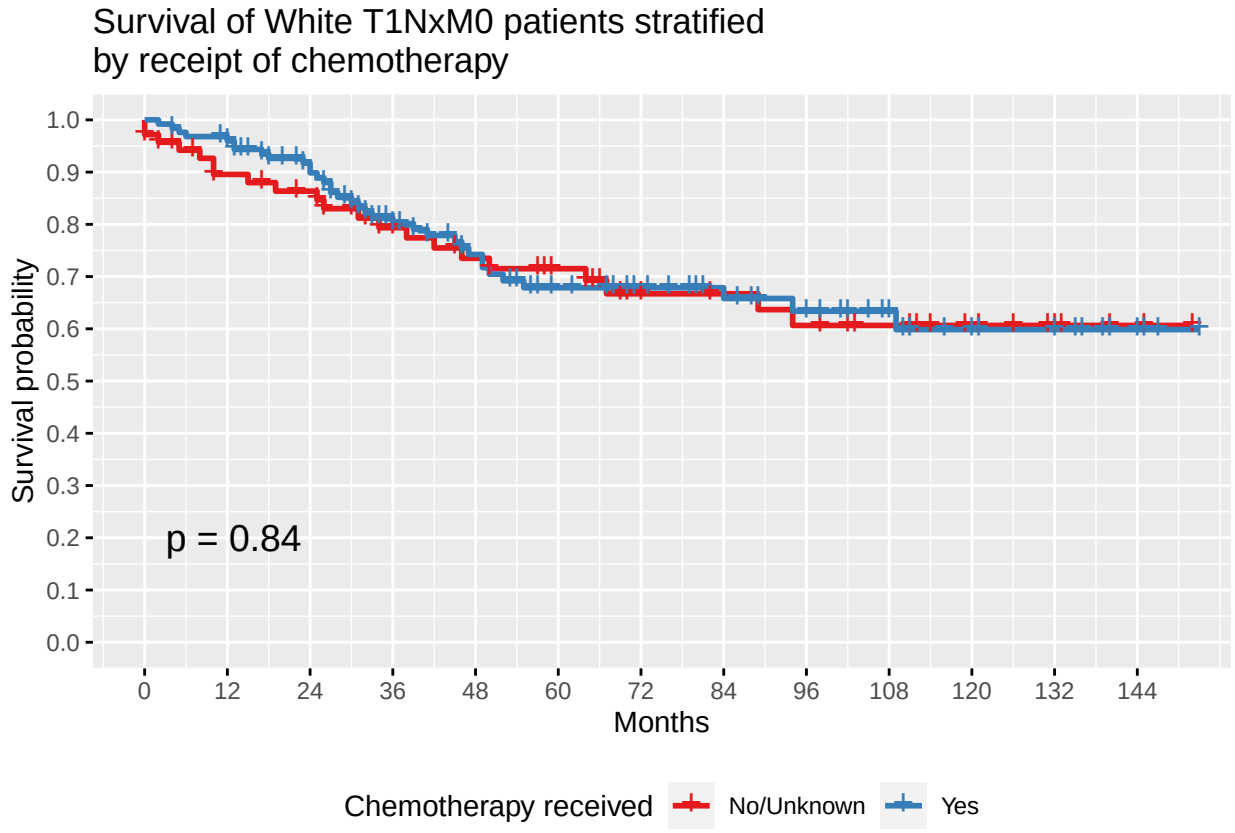
White Race



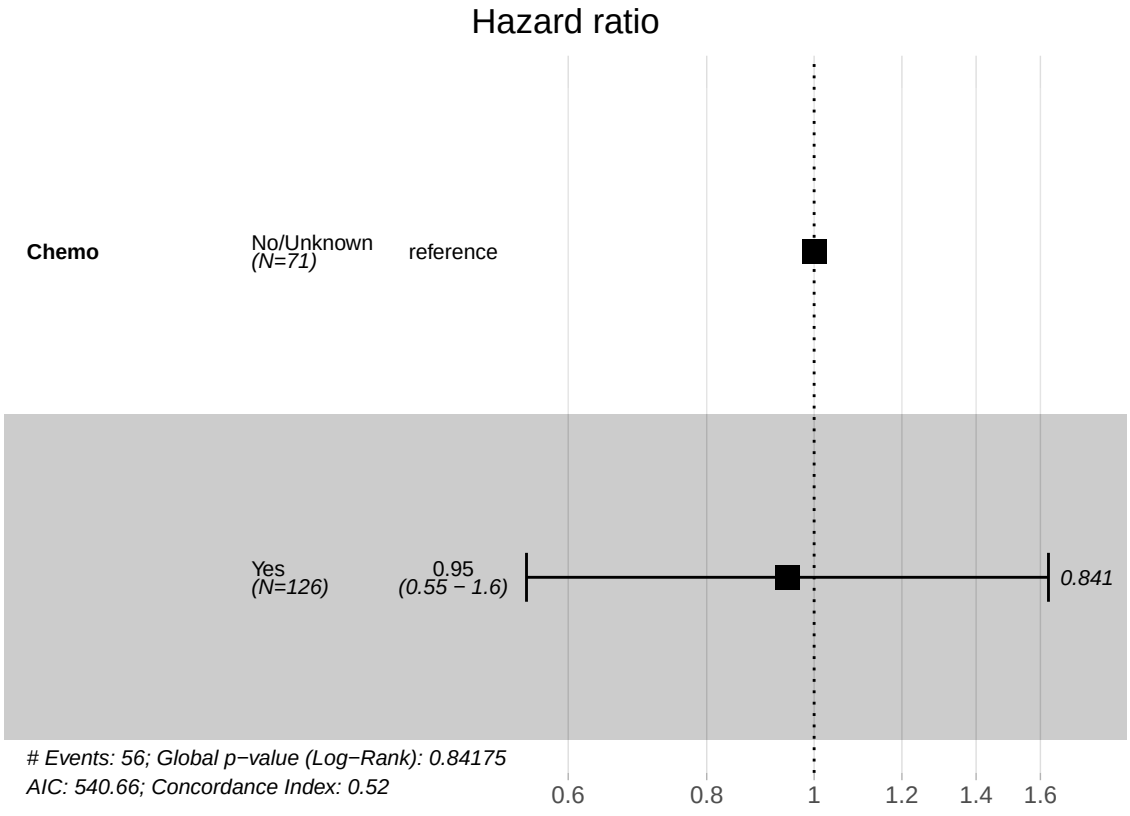
Chemotherapy received	Count
No/Unknown	144
Yes	454




```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Chemo, data = HGS.White.N0)
##
##   n= 598, number of events= 71
##
##             coef exp(coef) se(coef)      z Pr(>|z|)
## ChemoYes -0.3828    0.6820   0.2521 -1.519    0.129
##
##          exp(coef) exp(-coef) lower .95 upper .95
## ChemoYes     0.682      1.466    0.4161     1.118
##
## Concordance= 0.538  (se = 0.029 )
## Likelihood ratio test= 2.2  on 1 df,   p=0.1
## Wald test            = 2.31  on 1 df,   p=0.1
## Score (logrank) test = 2.33  on 1 df,   p=0.1
```

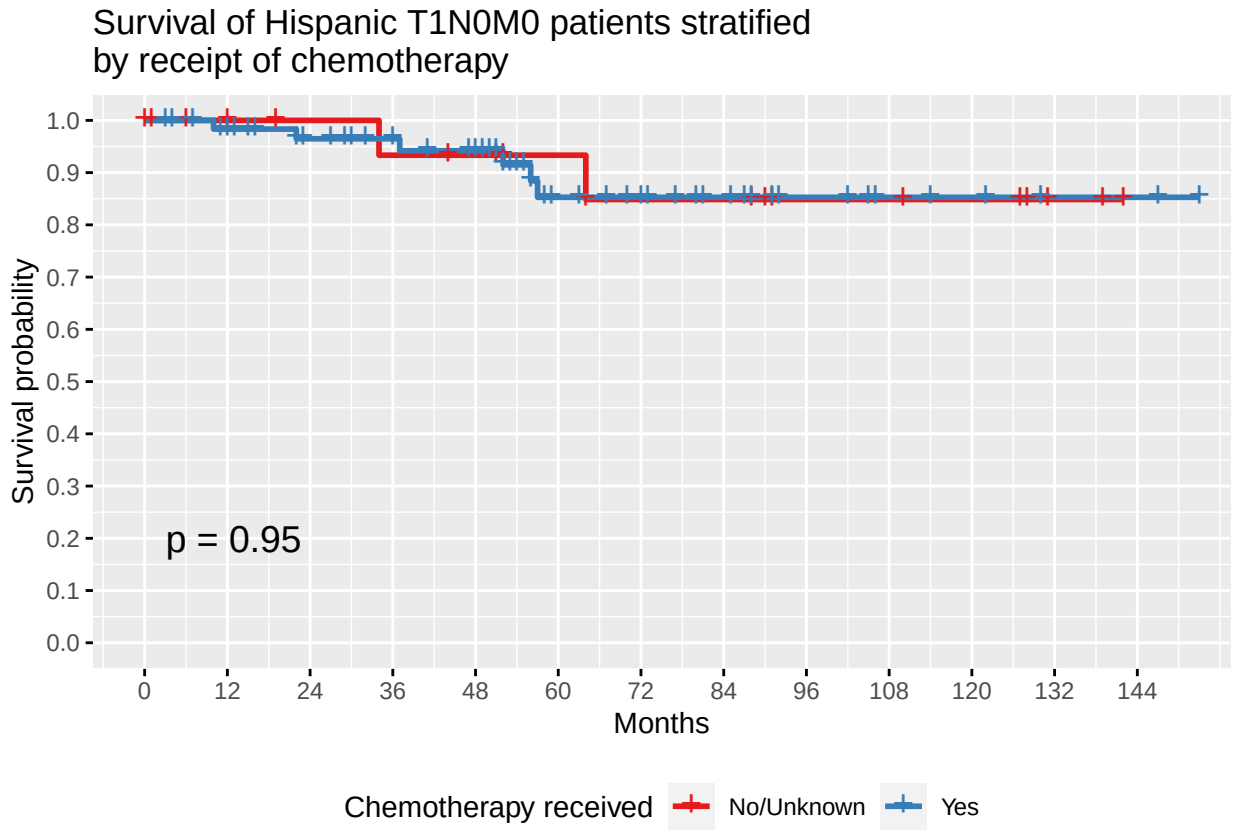


Chemotherapy received	Count
No/Unknown	71
Yes	126

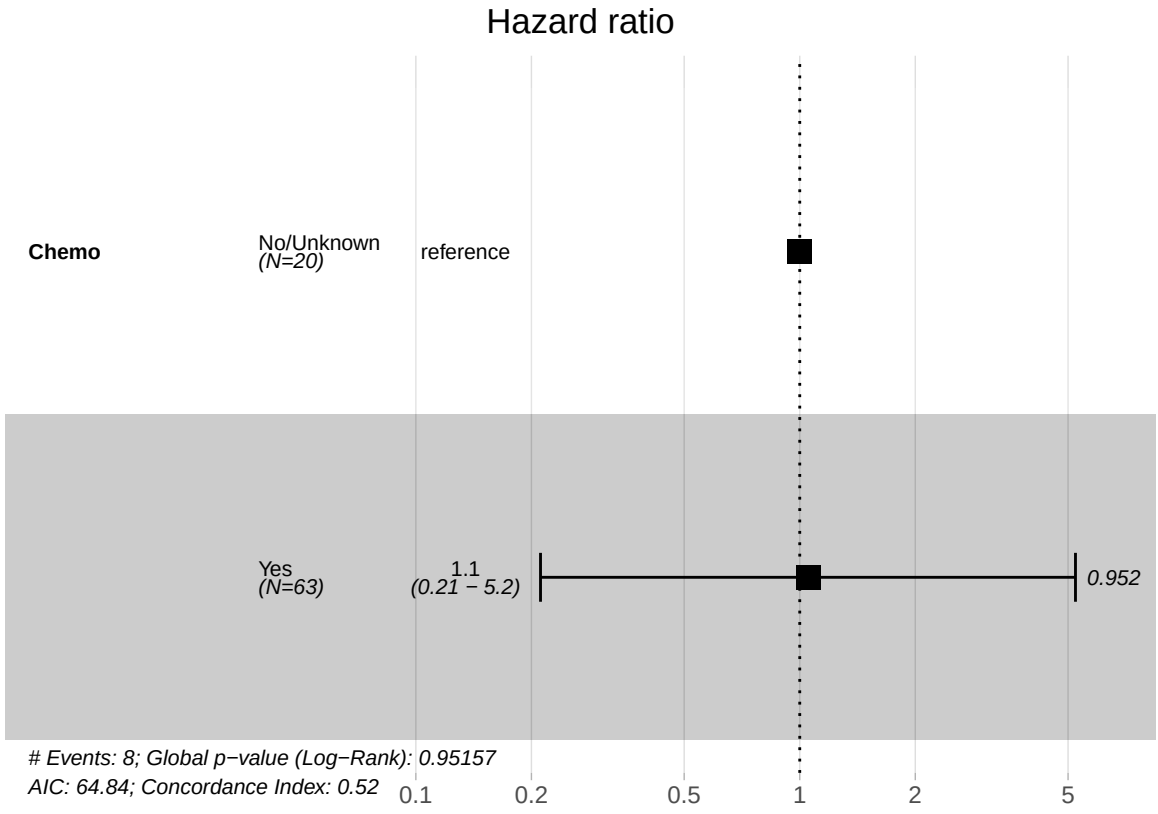



```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Chemo, data = HGS.White.Nx)
##
##   n= 197, number of events= 56
##
##              coef exp(coef) se(coef)    z Pr(>|z|)
## ChemoYes -0.05535   0.94615  0.27660 -0.2    0.841
##
##          exp(coef) exp(-coef) lower .95 upper .95
## ChemoYes    0.9461      1.057    0.5502     1.627
##
## Concordance= 0.516  (se = 0.035 )
## Likelihood ratio test= 0.04  on 1 df,   p=0.8
## Wald test            = 0.04  on 1 df,   p=0.8
## Score (logrank) test = 0.04  on 1 df,   p=0.8
```

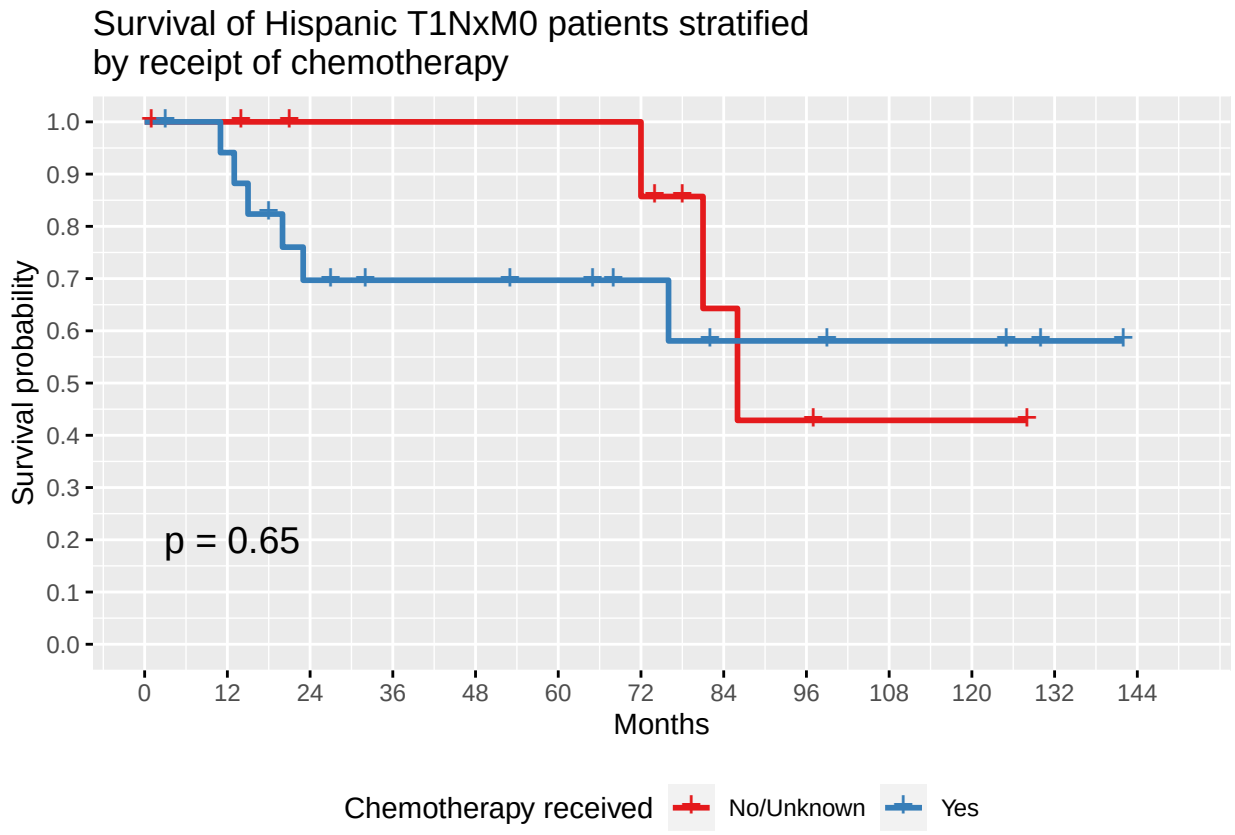
Hispanic



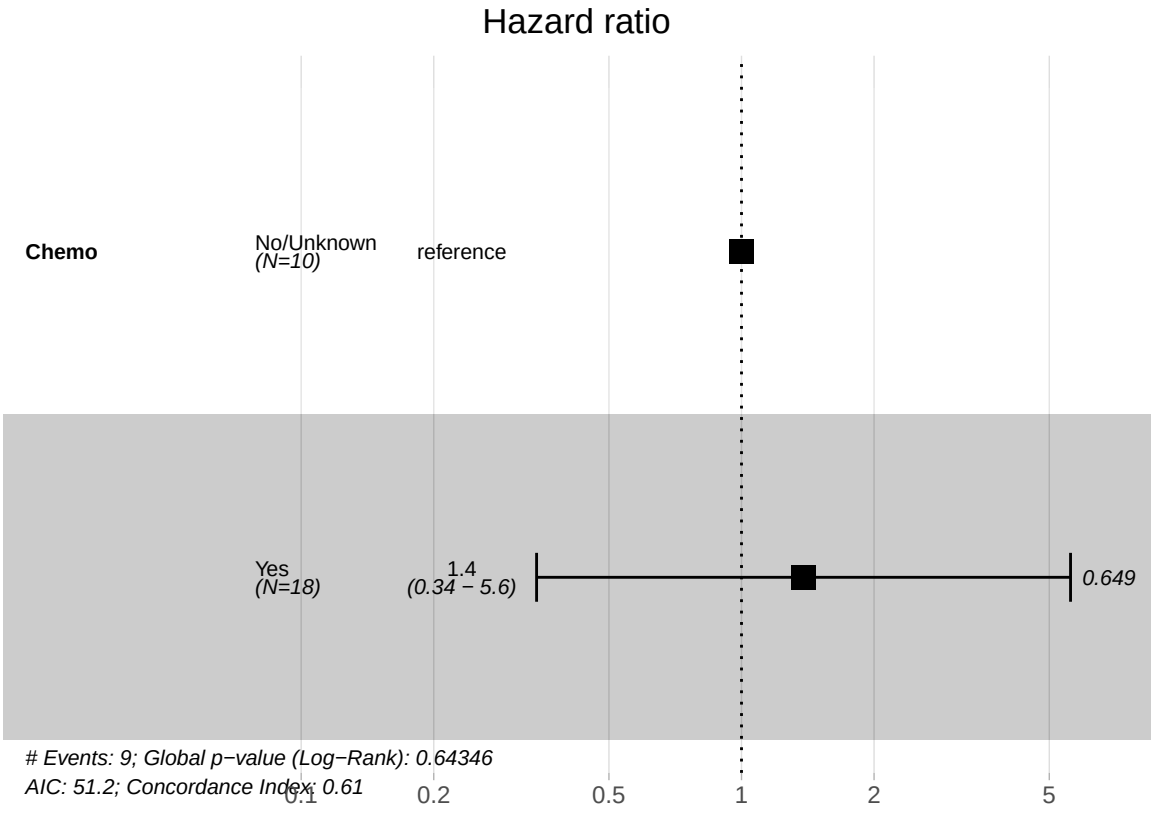
Chemotherapy received	Count
No/Unknown	20
Yes	63




```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Chemo, data = HGS.Hisp.N0)
##
##   n= 83, number of events= 8
##
##             coef exp(coef) se(coef)    z Pr(>|z|)
## ChemoYes 0.04951   1.05076  0.81854 0.06    0.952
##
##          exp(coef) exp(-coef) lower .95 upper .95
## ChemoYes     1.051     0.9517    0.2112     5.227
##
## Concordance= 0.516  (se = 0.072 )
## Likelihood ratio test= 0  on 1 df,   p=1
## Wald test            = 0  on 1 df,   p=1
## Score (logrank) test = 0  on 1 df,   p=1
```

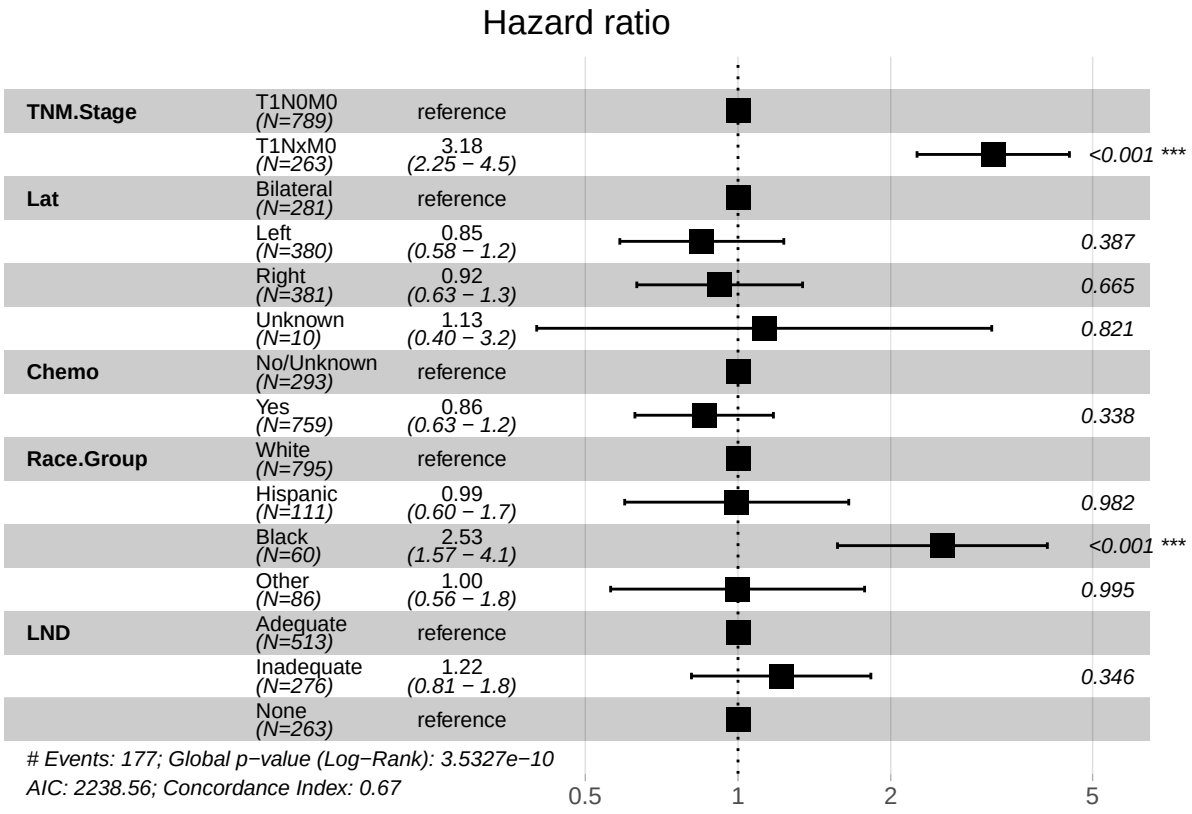


Chemotherapy received	Count
No/Unknown	10
Yes	18




```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Chemo, data = HGS.Hisp.Nx)
##
##   n= 28, number of events= 9
##
##            coef exp(coef) se(coef)     z Pr(>|z|)
## ChemoYes 0.3245    1.3834   0.7123 0.456    0.649
##
##          exp(coef) exp(-coef) lower .95 upper .95
## ChemoYes     1.383     0.7229    0.3425     5.587
##
## Concordance= 0.607  (se = 0.057 )
## Likelihood ratio test= 0.21  on 1 df,   p=0.6
## Wald test            = 0.21  on 1 df,   p=0.6
## Score (logrank) test = 0.21  on 1 df,   p=0.6
```

Overall CoxPH and Forest plot




```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ TNM.Stage + Lat + Chemo +
##     Race.Group + LND, data = HGS.ES)
##
##   n= 1052, number of events= 177
##
##                         coef exp(coef)  se(coef)      z Pr(>|z|)
## TNM.StageT1NxM0     1.158405  3.184850  0.176442  6.565 5.19e-11 ***
## LatLeft            -0.164370  0.848428  0.189861 -0.866 0.386635
## LatRight           -0.083209  0.920159  0.191995 -0.433 0.664732
## LatUnknown          0.118951  1.126314  0.526900  0.226 0.821392
## ChemoYes           -0.153641  0.857580  0.160357 -0.958 0.338002
## Race.GroupHispanic -0.005811  0.994206  0.259451 -0.022 0.982132
## Race.GroupBlack     0.927706  2.528703  0.243005  3.818 0.000135 ***
## Race.GroupOther    -0.001817  0.998185  0.294047 -0.006 0.995070
## LNDInadequate       0.195856  1.216351  0.207715  0.943 0.345729
## LNDNone                 NA        NA  0.000000     NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##                     exp(coef) exp(-coef) lower .95 upper .95
## TNM.StageT1NxM0        3.1848     0.3140    2.2537     4.501
## LatLeft                0.8484     1.1787    0.5848     1.231
```

```
## LatRight              0.9202     1.0868    0.6316     1.341
## LatUnknown            1.1263     0.8879    0.4010     3.163
## ChemoYes              0.8576     1.1661    0.6263     1.174
## Race.GroupHispanic    0.9942     1.0058    0.5979     1.653
## Race.GroupBlack       2.5287     0.3955    1.5705     4.071
## Race.GroupOther       0.9982     1.0018    0.5609     1.776
## LNDInadequate         1.2164     0.8221    0.8096     1.828
## LNDNone                   NA         NA        NA        NA
##
## Concordance= 0.667  (se = 0.021 )
## Likelihood ratio test= 63  on 9 df,   p=4e-10
## Wald test            = 68.56  on 9 df,   p=3e-11
## Score (logrank) test = 75.54  on 9 df,   p=1e-12
```