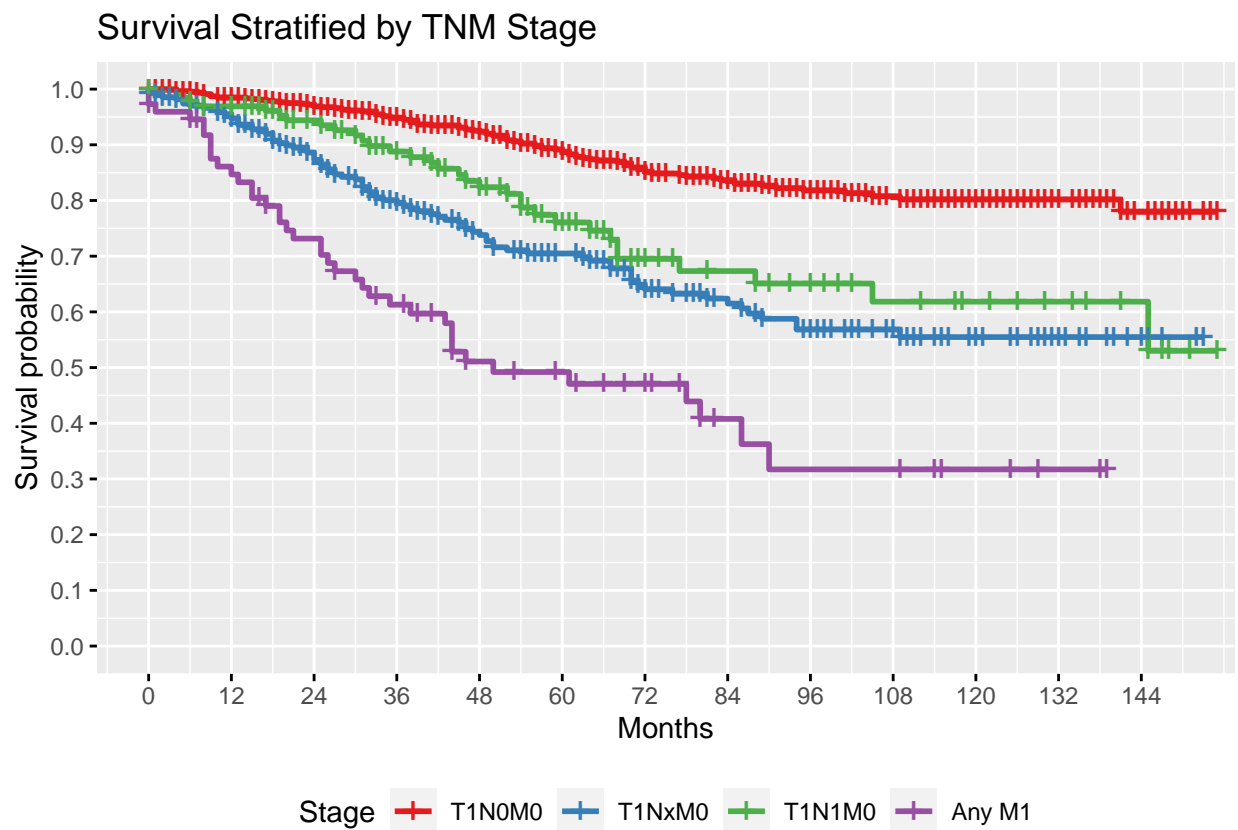# Survival Outcomes of Early-Stage High Grade Serous Ovarian Cancer Using the SEER Cancer Database
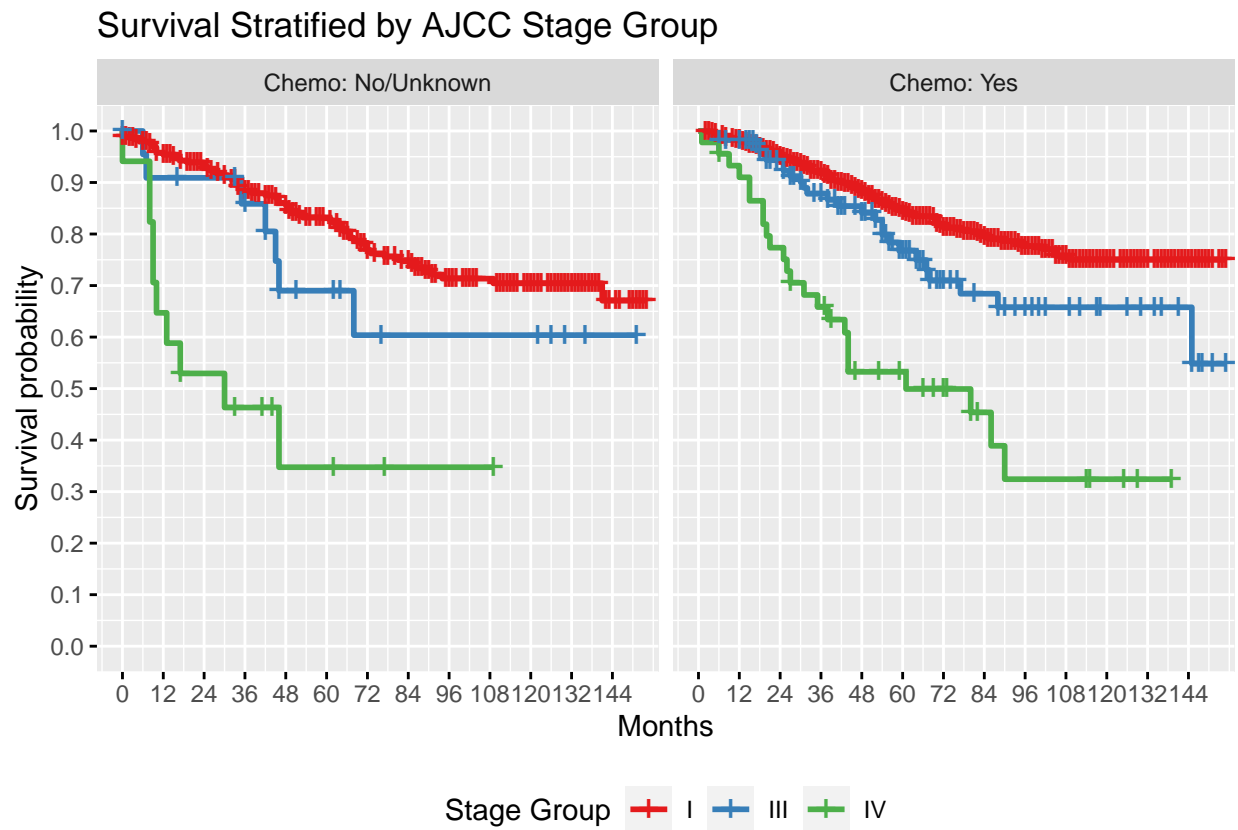
Kevin Kremer

10/13/20

OS based on stage


```
##
##  Pairwise comparisons using Log-Rank test
##
## data:  HGS and TNM.Stage
##
##        T1N0M0  T1NxM0  T1N1M0
## T1NxM0 1.2e-13 -       -
## T1N1M0 7.8e-05 0.16627 -
```

```
## Any M1 < 2e-16 0.00019 1.6e-05
##
## P value adjustment method: BH
```

OS based on Stage group with and without chemotherapy

Survival Stratified by AJCC Stage Group

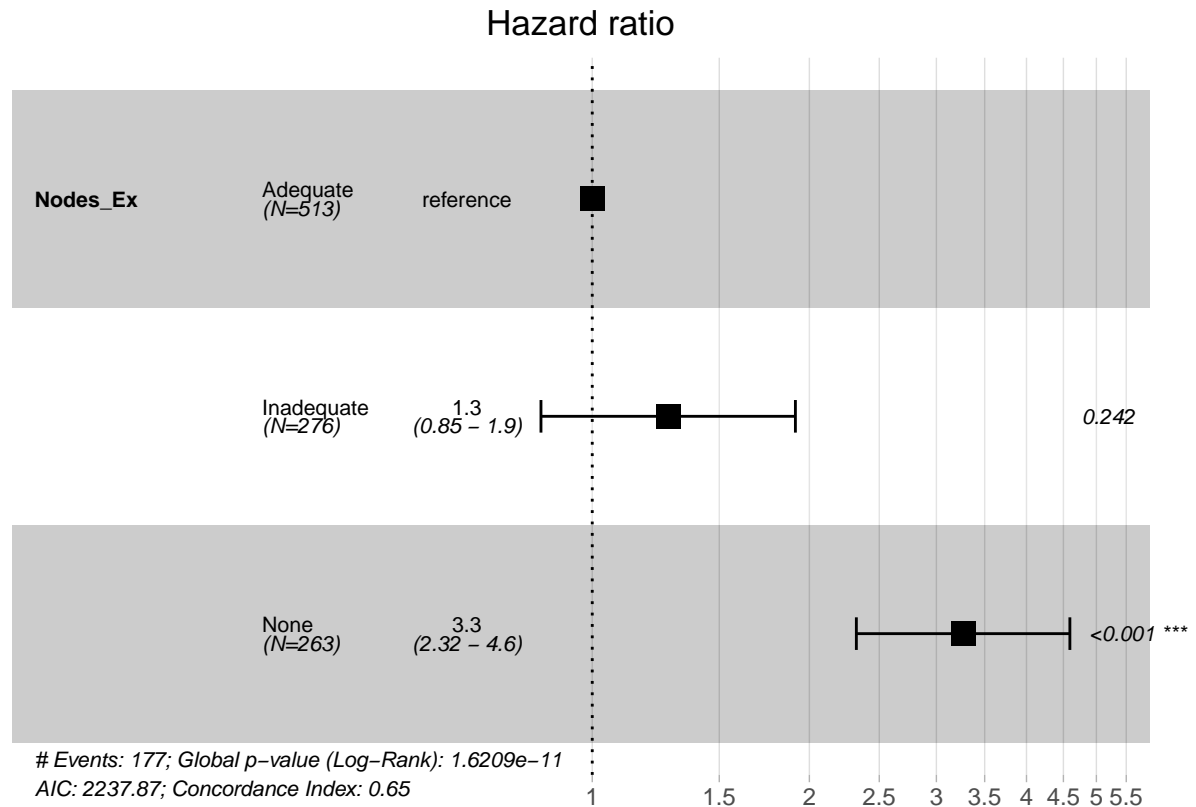Stage Group + I + III + IV

```
##
##  Pairwise comparisons using Log-Rank test
##
## data:  HGS.SG and Stage_Group_Summ
##
##      I        III
## III 0.021    -
## IV  < 2e-16 1.1e-05
##
## P value adjustment method: BH
```

For presumed early-stage HGSOC, does adequacy of LN evaluation matter?

Survival of presumed early–stage HGSOC stratified by lymph node dissection
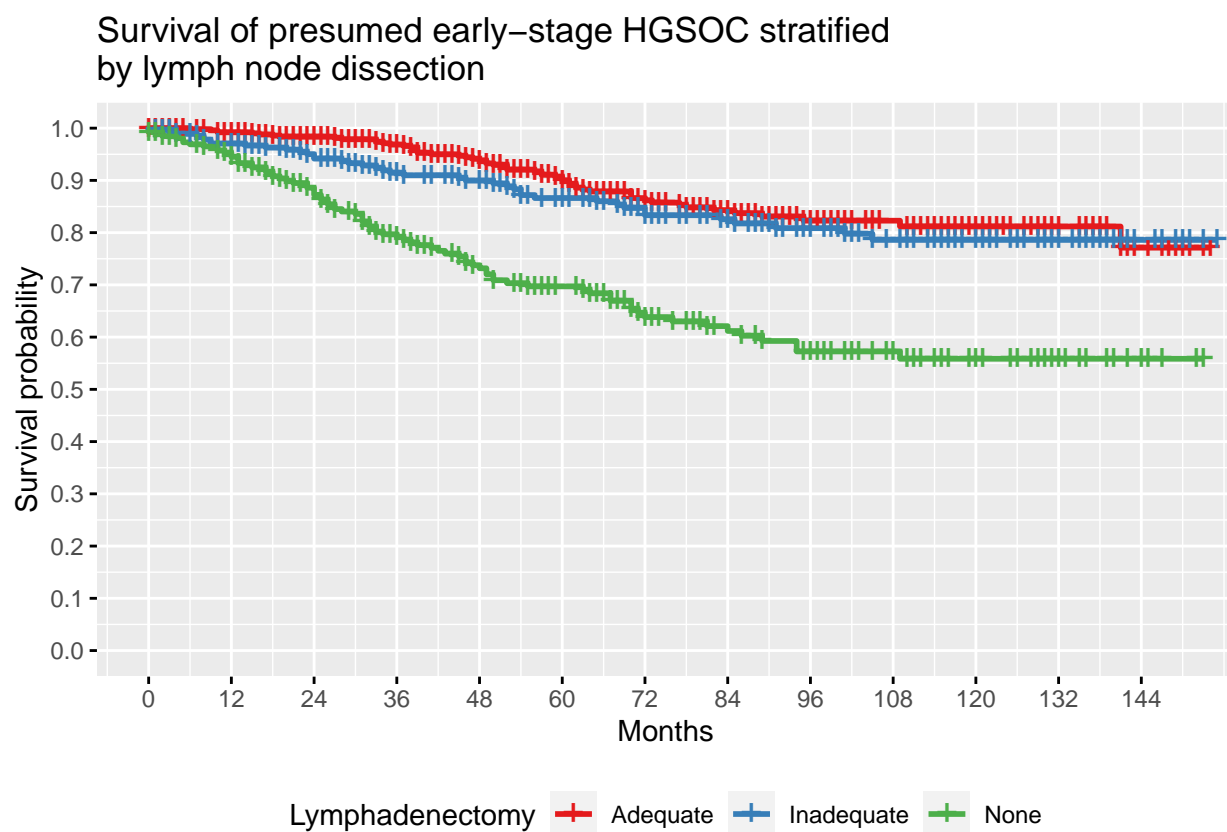

```
##
##   Pairwise comparisons using Log-Rank test
##
## data:  HGS.ES and Nodes_Ex
##
##            Adequate Inadequate
## Inadequate 0.26       -
## None       1.4e-12   1.3e-06
##
## P value adjustment method: BH
```
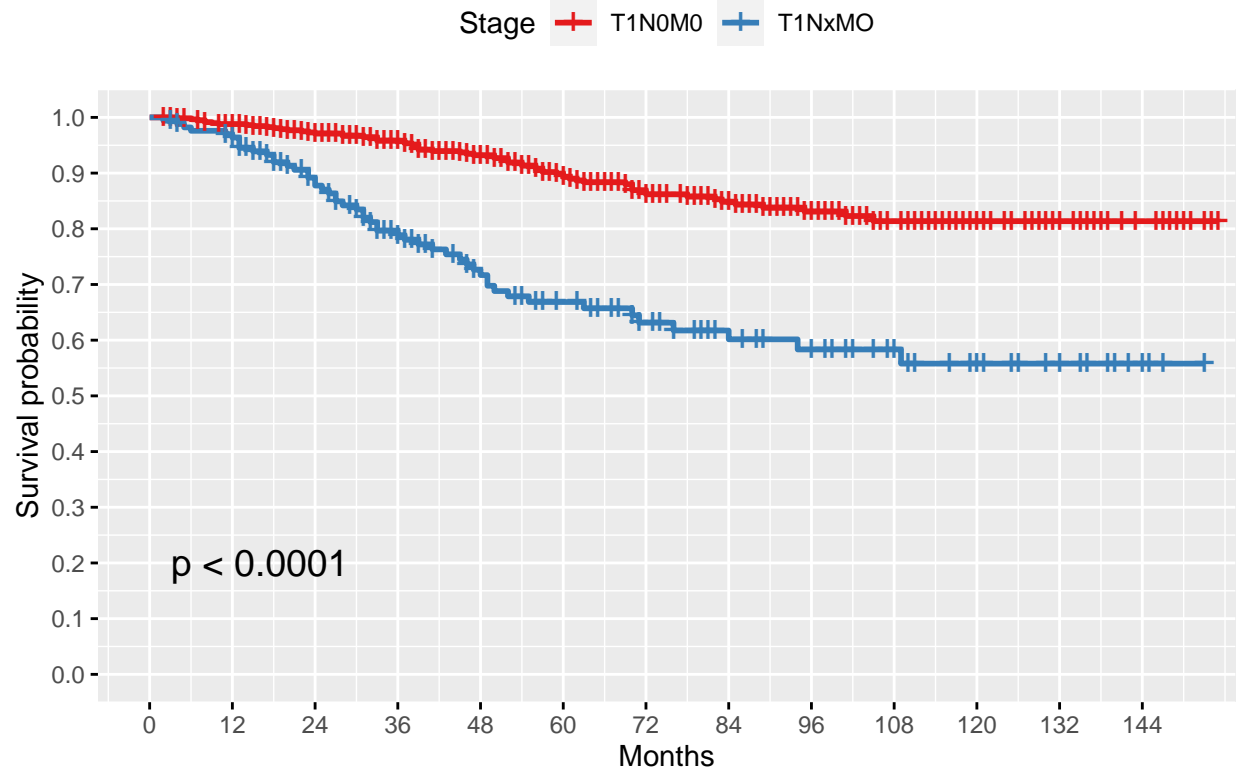
Lymphadenectomy	Count
Adequate	513
Inadequate	276
None	263

Hazard ratio

Nodes_Ex	Adequate (N=513)	reference		
	Inadequate (N=276)	1.3 (0.85 – 1.9)		0.242
	None (N=263)	3.3 (2.32 – 4.6)		<0.001 ***

Events: 177; Global p-value (Log–Rank): 1.6209e–11
AIC: 2237.87; Concordance Index: 0.65

```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Nodes_Ex, data = HGS.ES)
##
##   n= 1052, number of events= 177
##
##                      coef exp(coef) se(coef)      z Pr(>|z|)
## Nodes_ExInadequate 0.2424    1.2743   0.2072 1.170    0.242
## Nodes_ExNone       1.1840    3.2673   0.1739 6.808 9.89e-12 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##                    exp(coef) exp(-coef) lower .95 upper .95
## Nodes_ExInadequate     1.274     0.7847     0.849     1.913
## Nodes_ExNone           3.267     0.3061     2.324     4.594
##
## Concordance= 0.653  (se = 0.02 )
## Likelihood ratio test= 49.69  on 2 df,    p=2e-11
## Wald test            = 52.81  on 2 df,    p=3e-12
## Score (logrank) test = 58.41  on 2 df,    p=2e-13
```

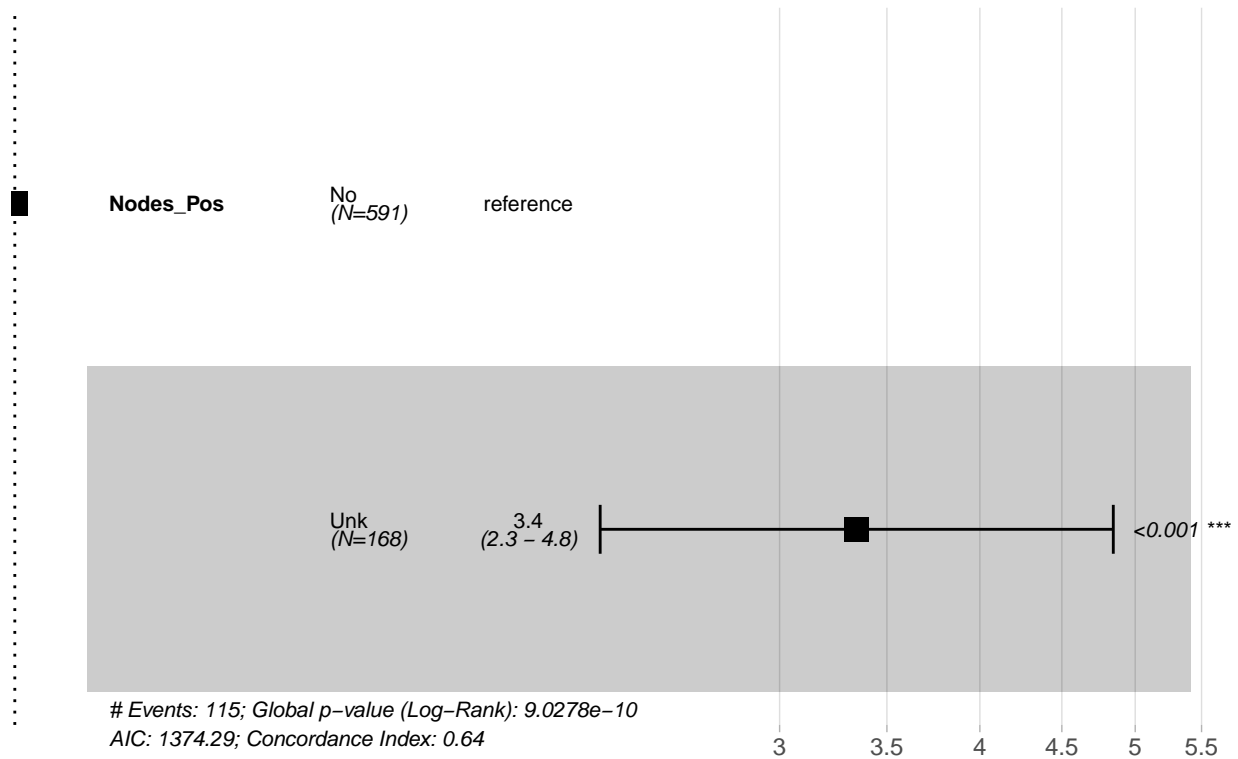**In patient's without LND, does adding chemo change their survival?**
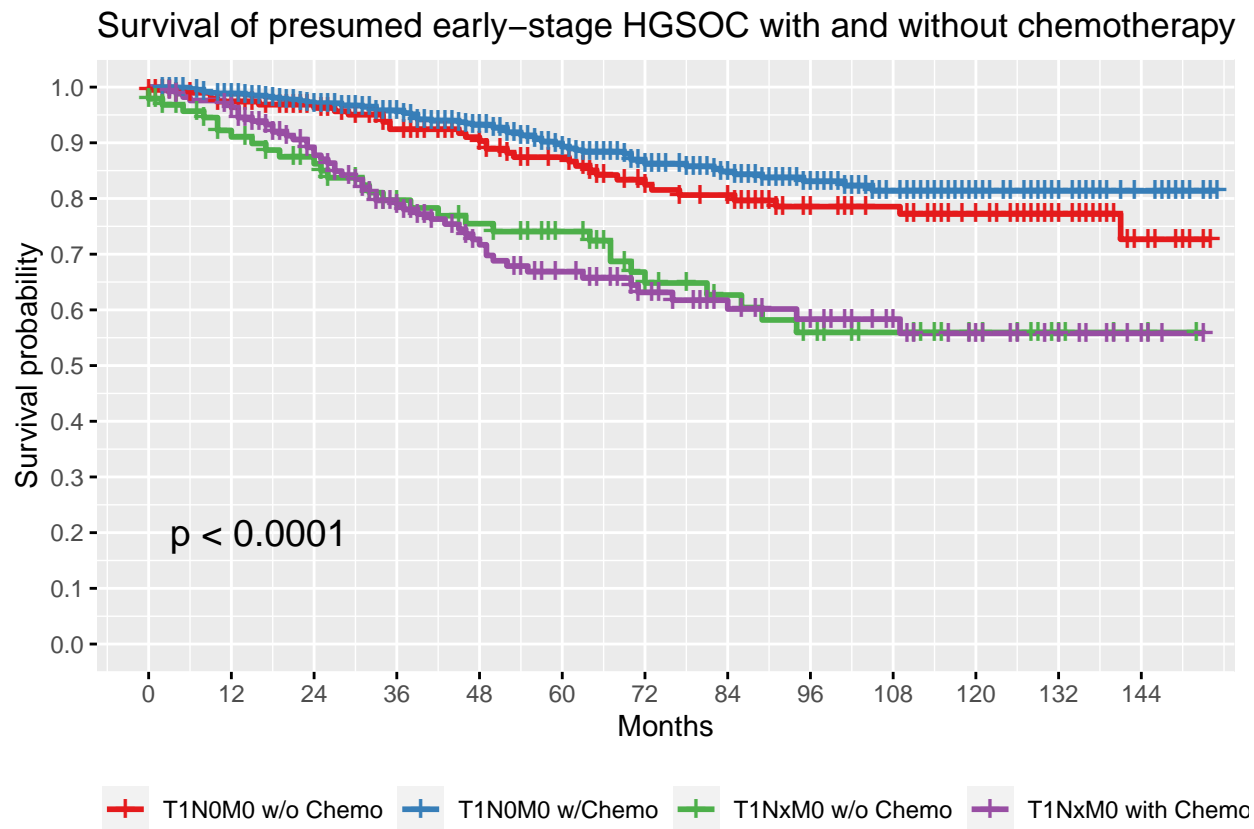
Survival of presumed early-stage HGSOC with chemotherapy

Stage ── T1N0M0 ── T1NxMO

p < 0.0001

Positive Nodes	Count
No	591
Unk	168

Hazard ratio

Nodes_Pos   No *(N=591)*   reference

Unk *(N=168)*   3.4 *(2.3 – 4.8)*   <0.001 ***

 # Events: 115; Global p–value (Log–Rank): 9.0278e–10
AIC: 1374.29; Concordance Index: 0.64

3   3.5   4   4.5   5   5.5
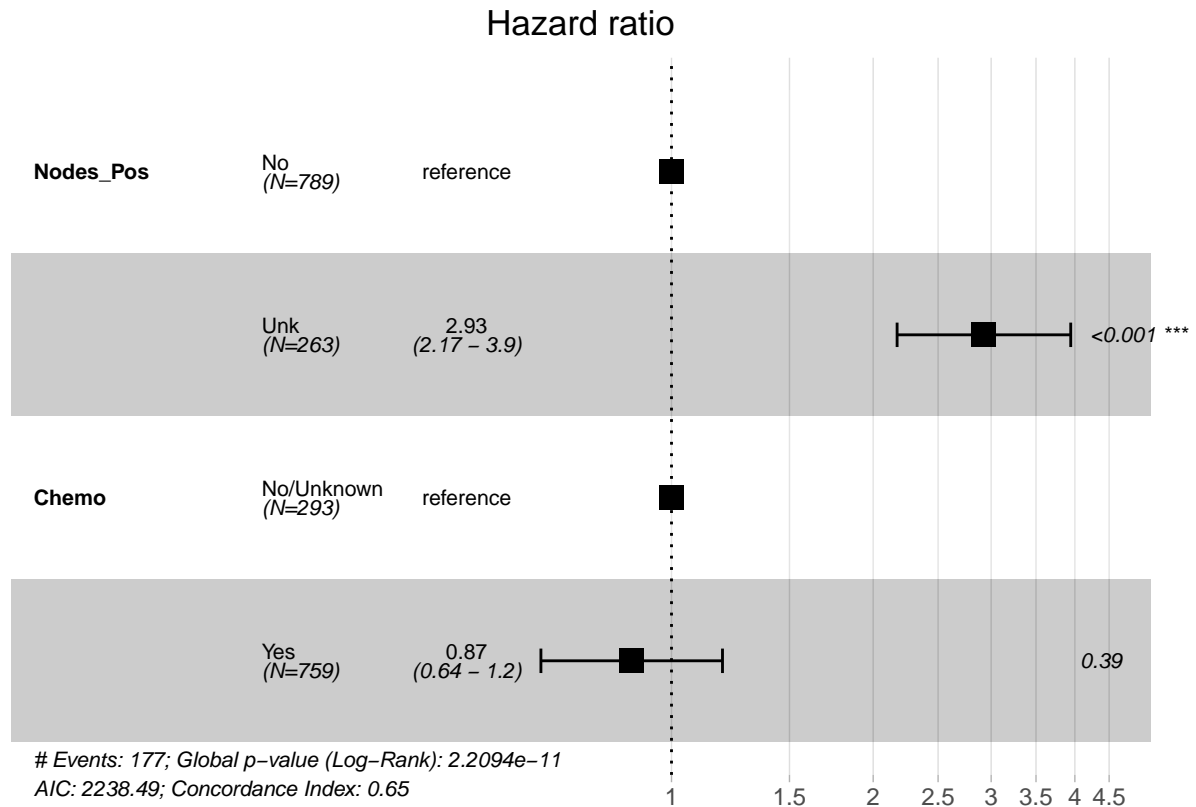
```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Nodes_Pos, data = HGS.ES.chemo)
##
##   n= 759, number of events= 115
##
##               coef exp(coef) se(coef)      z Pr(>|z|)
## Nodes_PosUnk 1.209     3.352    0.188 6.432 1.26e-10 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##              exp(coef) exp(-coef) lower .95 upper .95
## Nodes_PosUnk     3.351     0.2984     2.318     4.845
##
## Concordance= 0.642  (se = 0.024 )
## Likelihood ratio test= 37.52  on 1 df,    p=9e-10
## Wald test            = 41.37  on 1 df,    p=1e-10
## Score (logrank) test = 46.62  on 1 df,    p=9e-12
```

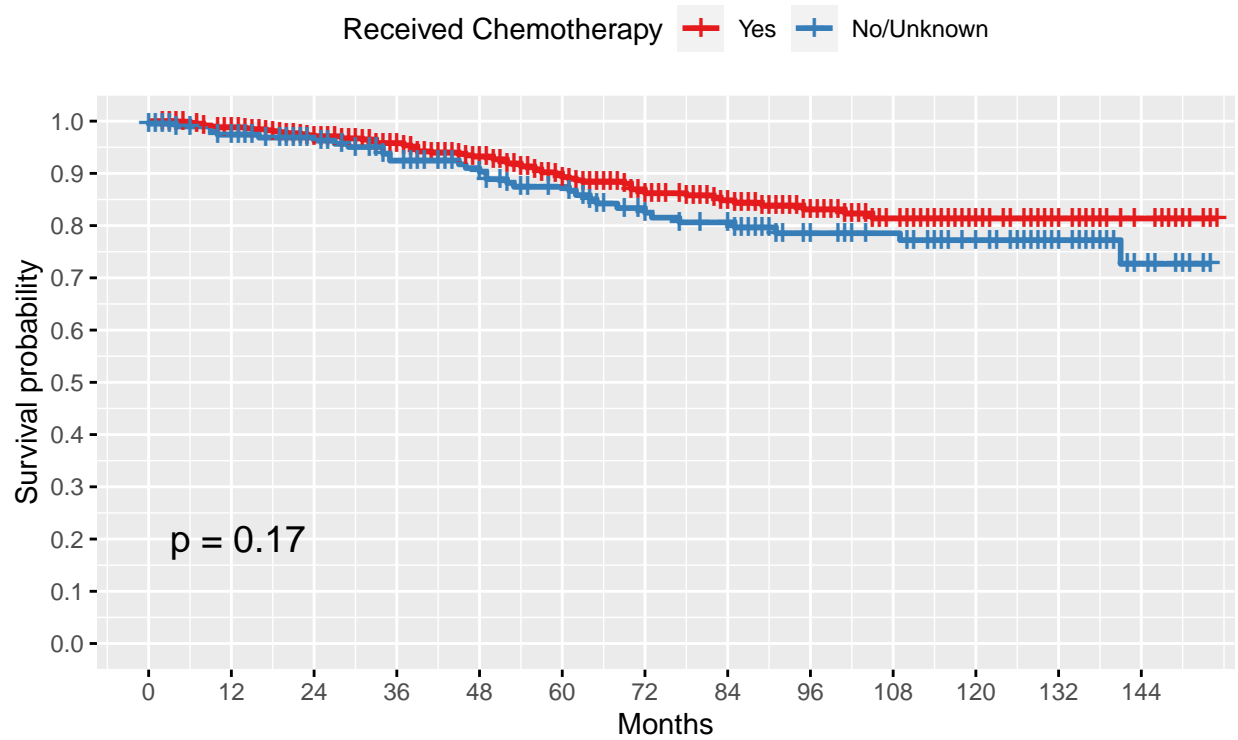**All early stage stratified by N Stage and receipt of Chemotherapy**

Survival of presumed early−stage HGSOC with and without chemotherapy

Positive Nodes	Chemotherapy received	
	No/Unknown	Yes
No	198	591
Unk	95	168

Hazard ratio

Nodes_Pos	No (N=789)	reference		
	Unk (N=263)	2.93 (2.17 – 3.9)	⊢■⊣	<0.001 ***
Chemo	No/Unknown (N=293)	reference		
	Yes (N=759)	0.87 (0.64 – 1.2)	⊢■⊣	0.39

 # Events: 177; Global p-value (Log-Rank): 2.2094e-11
AIC: 2238.49; Concordance Index: 0.65

Axis: 1   1.5   2   2.5   3   3.5   4   4.5
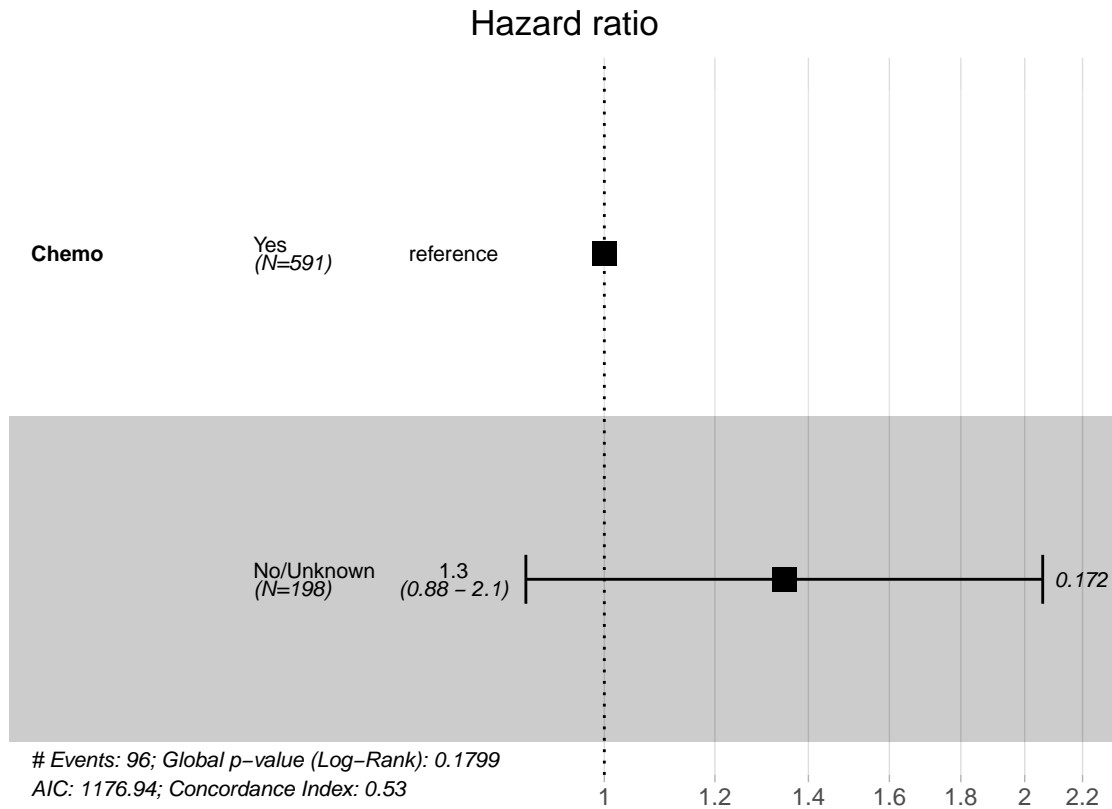
```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Nodes_Pos + Chemo, data = HGS.ES)
##
##   n= 1052, number of events= 177
##
##                 coef exp(coef) se(coef)      z Pr(>|z|)
## Nodes_PosUnk  1.0738    2.9264   0.1522  7.054 1.74e-12 ***
## ChemoYes     -0.1368    0.8722   0.1592 -0.859     0.39
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##              exp(coef) exp(-coef) lower .95 upper .95
## Nodes_PosUnk    2.9264     0.3417    2.1715     3.944
## ChemoYes        0.8722     1.1466    0.6384     1.192
##
## Concordance= 0.647  (se = 0.021 )
## Likelihood ratio test= 49.07  on 2 df,   p=2e-11
## Wald test            = 52.89  on 2 df,   p=3e-12
## Score (logrank) test = 58.24  on 2 df,   p=2e-13
```

Survival difference between N0 patients with and without chemotherapy

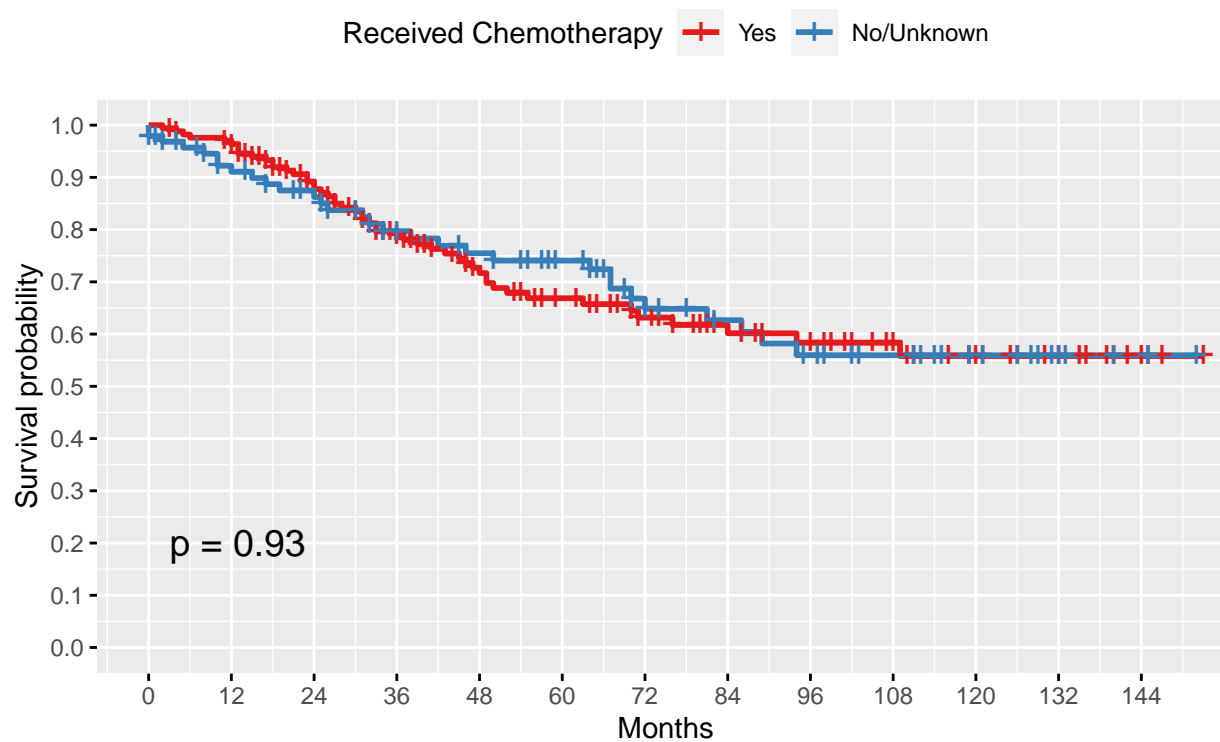Survival of T1N0M0 patients stratified
by receipt of chemotherapy

Received Chemotherapy	Count
Yes	591
No/Unknown	198

Hazard ratio

Chemo	Yes (N=591)	reference	
	No/Unknown (N=198)	1.3 (0.88 – 2.1)	0.172

 # Events: 96; Global p–value (Log–Rank): 0.1799
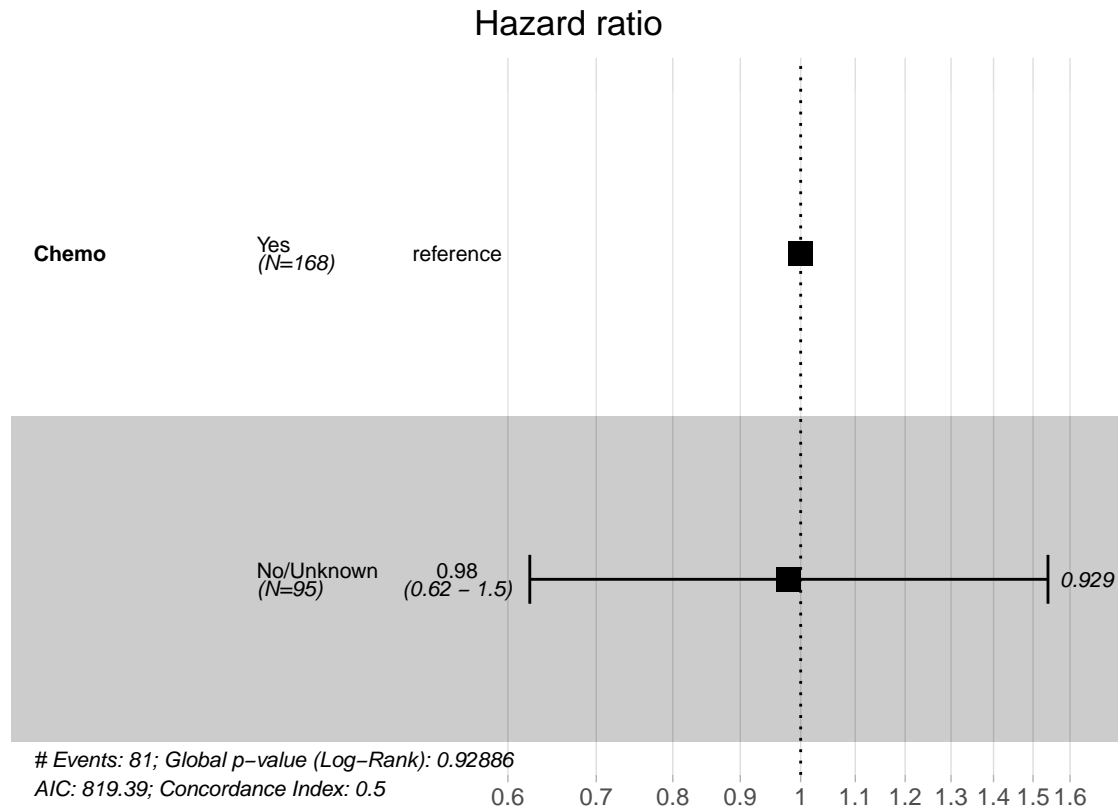*AIC: 1176.94; Concordance Index: 0.53*

```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Chemo, data = HGS.NO)
##
##   n= 789, number of events= 96
##
##                   coef exp(coef) se(coef)     z Pr(>|z|)
## ChemoNo/Unknown 0.2967    1.3455   0.2174 1.365    0.172
##
##                 exp(coef) exp(-coef) lower .95 upper .95
## ChemoNo/Unknown     1.345     0.7432    0.8787      2.06
##
## Concordance= 0.533  (se = 0.025 )
## Likelihood ratio test= 1.8  on 1 df,   p=0.2
## Wald test            = 1.86  on 1 df,   p=0.2
## Score (logrank) test = 1.88  on 1 df,   p=0.2
```

Survival difference between Nx patients with and without chemotherapy

Survival of T1NxM0 patients stratified
by receipt of chemotherapy

Received Chemotherapy ╋ Yes ╋ No/Unknown

p = 0.93

Received Chemotherapy	Count
Yes	168
No/Unknown	95

Hazard ratio

Chemo	Yes (N=168)	reference	
	No/Unknown (N=95)	0.98 (0.62 − 1.5)	0.929

Events: 81; Global p−value (Log−Rank): 0.92886
AIC: 819.39; Concordance Index: 0.5

0.6   0.7   0.8   0.9   1   1.1 1.2 1.3 1.4 1.5 1.6

```
## Call:
## coxph(formula = Surv(SurvMonths, COD) ~ Chemo, data = HGS.Nx)
##
##   n= 263, number of events= 81
##
##                    coef exp(coef) se(coef)      z Pr(>|z|)
## ChemoNo/Unknown -0.02057   0.97964  0.23065 -0.089    0.929
##
##                 exp(coef) exp(-coef) lower .95 upper .95
## ChemoNo/Unknown    0.9796      1.021    0.6234      1.54
##
## Concordance= 0.498  (se = 0.029 )
## Likelihood ratio test= 0.01  on 1 df,   p=0.9
## Wald test            = 0.01  on 1 df,   p=0.9
## Score (logrank) test = 0.01  on 1 df,   p=0.9
```