

output

```
dat<-read.csv("lymphoma.csv",header = T)

library(survival)

dat1<-dat[-c(2,37,50,61,73,146,151,195,202,384,405,420,424,435,513,514,525,528,554,565,568,572,575,593),]
fit1<-coxph(Surv(os_time,os_event)~as.factor(trt)+as.factor(B_SYM),data = dat1)
summary(fit1)

## Call:
## coxph(formula = Surv(os_time, os_event) ~ as.factor(trt) + as.factor(B_SYM),
##       data = dat1)
##
##      n= 593, number of events= 391
##
##               coef exp(coef)  se(coef)      z Pr(>|z|)
## as.factor(trt)treatment -0.007254  0.992772  0.101300 -0.072    0.943
## as.factor(B_SYM)Y       0.501584  1.651335  0.102900  4.874 1.09e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##               exp(coef) exp(-coef) lower .95 upper .95
## as.factor(trt)treatment  0.9928      1.0073      0.814      1.211
## as.factor(B_SYM)Y       1.6513      0.6056      1.350      2.020
##
## Concordance= 0.576 (se = 0.014 )
## Likelihood ratio test= 22.92 on 2 df,  p=1e-05
## Wald test               = 23.78 on 2 df,  p=7e-06
## Score (logrank) test = 24.28 on 2 df,  p=5e-06

fit2<-coxph(Surv(os_time,os_event)~as.factor(trt),data = dat1)
summary(fit2)

## Call:
## coxph(formula = Surv(os_time, os_event) ~ as.factor(trt), data = dat1)
##
##      n= 593, number of events= 391
##
##               coef exp(coef) se(coef)      z Pr(>|z|)
## as.factor(trt)treatment 0.0135  1.0136  0.1012 0.133    0.894
##
##               exp(coef) exp(-coef) lower .95 upper .95
## as.factor(trt)treatment  1.014    0.9866    0.8312    1.236
##
## Concordance= 0.499 (se = 0.013 )
## Likelihood ratio test= 0.02 on 1 df,  p=0.9
```

```
## Wald test          = 0.02  on 1 df,   p=0.9
## Score (logrank) test = 0.02  on 1 df,   p=0.9
```

```
1-pchisq(2*(fit1$loglik[2]-fit2$loglik[2]),1)
```

```
## [1] 1.705426e-06
```

```
dat2<-dat[-c(66,74,117,140,235,236,238,379,380,439,440,486,607,616,316,345,359,360,361,367,368,369,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,453,454,455,456,457,458,459,460,461,462,463,464,465,466,467,468,469,470,471,472,473,474,475,476,477,478,479,480,481,482,483,484,485,486,487,488,489,490,491,492,493,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,582,583,584,585,586,587,588,589,590,591,592,593,594,595,596,597,598,599,600,601,602,603,604,605,606,607,608,609,610,611,612,613,614,615,616,617,618,619,620,621,622,623,624,625,626,627,628,629,630,631,632,633,634,635,636,637,638,639,640,641,642,643,644,645,646,647,648,649,650,651,652,653,654,655,656,657,658,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,718,719,720,721,722,723,724,725,726,727,728,729,730,731,732,733,734,735,736,737,738,739,740,741,742,743,744,745,746,747,748,749,750,751,752,753,754,755,756,757,758,759,760,761,762,763,764,765,766,767,768,769,770,771,772,773,774,775,776,777,778,779,780,781,782,783,784,785,786,787,788,789,790,791,792,793,794,795,796,797,798,799,800,801,802,803,804,805,806,807,808,809,810,811,812,813,814,815,816,817,818,819,820,821,822,823,824,825,826,827,828,829,830,831,832,833,834,835,836,837,838,839,840,841,842,843,844,845,846,847,848,849,850,851,852,853,854,855,856,857,858,859,860,861,862,863,864,865,866,867,868,869,870,871,872,873,874,875,876,877,878,879,880,881,882,883,884,885,886,887,888,889,890,891,892,893,894,895,896,897,898,899,900,901,902,903,904,905,906,907,908,909,910,911,912,913,914,915,916,917,918,919,920,921,922,923,924,925,926,927,928,929,930,931,932,933,934,935,936,937,938,939,940,941,942,943,944,945,946,947,948,949,950,951,952,953,954,955,956,957,958,959,960,961,962,963,964,965,966,967,968,969,970,971,972,973,974,975,976,977,978,979,980,981,982,983,984,985,986,987,988,989,990,991,992,993,994,995,996,997,998,999,1000)]
```

```
fit3<-coxph(Surv(os_time,os_event)~as.factor(trt)+as.factor(RACE),data = dat2)
summary(fit3)
```

```
## Call:
## coxph(formula = Surv(os_time, os_event) ~ as.factor(trt) + as.factor(RACE),
##       data = dat2)
##
## n= 594, number of events= 391
##
##               coef exp(coef) se(coef)      z Pr(>|z|)
## as.factor(trt)treatment -0.00837  0.99167  0.10168 -0.082  0.934
## as.factor(RACE)3         0.26215  1.29972  0.30663  0.855  0.393
## as.factor(RACE)5         0.24971  1.28365  0.18057  1.383  0.167
## as.factor(RACE)6         0.26180  1.29927  0.41247  0.635  0.526
##
##               exp(coef) exp(-coef) lower .95 upper .95
## as.factor(trt)treatment  0.9917    1.0084    0.8125    1.210
## as.factor(RACE)3         1.2997    0.7694    0.7126    2.371
## as.factor(RACE)5         1.2836    0.7790    0.9011    1.829
## as.factor(RACE)6         1.2993    0.7697    0.5789    2.916
##
## Concordance= 0.516 (se = 0.014 )
## Likelihood ratio test= 2.7  on 4 df,   p=0.6
## Wald test              = 2.87  on 4 df,   p=0.6
## Score (logrank) test = 2.89  on 4 df,   p=0.6
```

```
fit4<-coxph(Surv(os_time,os_event)~as.factor(trt),data = dat2)
summary(fit4)
```

```
## Call:
## coxph(formula = Surv(os_time, os_event) ~ as.factor(trt), data = dat2)
##
## n= 594, number of events= 391
##
##               coef exp(coef) se(coef)      z Pr(>|z|)
## as.factor(trt)treatment -0.01435  0.98575  0.10116 -0.142  0.887
##
##               exp(coef) exp(-coef) lower .95 upper .95
## as.factor(trt)treatment  0.9857    1.014    0.8085    1.202
##
## Concordance= 0.506 (se = 0.013 )
## Likelihood ratio test= 0.02  on 1 df,   p=0.9
```

```
## Wald test          = 0.02  on 1 df,   p=0.9
## Score (logrank) test = 0.02  on 1 df,   p=0.9
```

```
1-pchisq(2*(fit3$loglik[2]-fit4$loglik[2]),3)
```

```
## [1] 0.4440447
```

```
fit0<-coxph(Surv(os_time,os_event)~as.factor(PERF_STA)+AGE+as.factor(STAGE)+as.factor(SEX)+as.factor(PR_RAD)+
summary(fit0)
```

```
## Call:
```

```
## coxph(formula = Surv(os_time, os_event) ~ as.factor(PERF_STA) +
##      AGE + as.factor(STAGE) + as.factor(SEX) + as.factor(PR_RAD) +
##      as.factor(B_SYM) + as.factor(r_score) + as.factor(pr_resp) +
##      as.factor(pr_drug) + as.factor(trt), data = dat)
##
```

```
##      n= 619, number of events= 409
```

```
##
```

	coef	exp(coef)	se(coef)	z	Pr(> z)
## as.factor(PERF_STA)1	0.4084825	1.5045329	0.1166565	3.502	0.000463 ***
## as.factor(PERF_STA)2	0.2784330	1.3210581	0.1913682	1.455	0.145680
## as.factor(PERF_STA)3	0.5446499	1.7240047	0.2766028	1.969	0.048945 *
## AGE	0.0009183	1.0009187	0.0050880	0.180	0.856776
## as.factor(STAGE)II	0.1898212	1.2090334	0.2308249	0.822	0.410872
## as.factor(STAGE)III	-0.2211755	0.8015760	0.2494703	-0.887	0.375305
## as.factor(STAGE)IV	-0.0545541	0.9469073	0.2483972	-0.220	0.826164
## as.factor(SEX)M	0.0858786	1.0896740	0.1051110	0.817	0.413913
## as.factor(PR_RAD)Y	0.2950777	1.3432307	0.1175759	2.510	0.012084 *
## as.factor(B_SYM)Y	0.3014278	1.3517875	0.1046236	2.881	0.003963 **
## as.factor(r_score)0, 1	-0.9969286	0.3690111	0.1915293	-5.205	1.94e-07 ***
## as.factor(r_score)2	-0.2295609	0.7948825	0.1373280	-1.672	0.094598 .
## as.factor(pr_resp)DU>1	-0.9556796	0.3845507	0.1485807	-6.432	1.26e-10 ***
## as.factor(pr_resp)SDPD	0.2338077	1.2634016	0.1143081	2.045	0.040814 *
## as.factor(pr_drug)Y	0.1583919	1.1716253	0.1178601	1.344	0.178981
## as.factor(trt)treatment	-0.0084628	0.9915729	0.0997096	-0.085	0.932361

```
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
```

	exp(coef)	exp(-coef)	lower .95	upper .95
## as.factor(PERF_STA)1	1.5045	0.6647	1.1970	1.8910
## as.factor(PERF_STA)2	1.3211	0.7570	0.9079	1.9223
## as.factor(PERF_STA)3	1.7240	0.5800	1.0025	2.9647
## AGE	1.0009	0.9991	0.9910	1.0110
## as.factor(STAGE)II	1.2090	0.8271	0.7691	1.9007
## as.factor(STAGE)III	0.8016	1.2475	0.4916	1.3071
## as.factor(STAGE)IV	0.9469	1.0561	0.5819	1.5408
## as.factor(SEX)M	1.0897	0.9177	0.8868	1.3390
## as.factor(PR_RAD)Y	1.3432	0.7445	1.0668	1.6913
## as.factor(B_SYM)Y	1.3518	0.7398	1.1012	1.6595
## as.factor(r_score)0, 1	0.3690	2.7099	0.2535	0.5371
## as.factor(r_score)2	0.7949	1.2580	0.6073	1.0404
## as.factor(pr_resp)DU>1	0.3846	2.6004	0.2874	0.5145
## as.factor(pr_resp)SDPD	1.2634	0.7915	1.0098	1.5807

```
## as.factor(pr_drug)Y      1.1716      0.8535      0.9300      1.4761
## as.factor(trt)treatment  0.9916      1.0085      0.8156      1.2056
##
## Concordance= 0.718 (se = 0.012 )
## Likelihood ratio test= 197.4 on 16 df, p=<2e-16
## Wald test              = 182.4 on 16 df, p=<2e-16
## Score (logrank) test = 194.1 on 16 df, p=<2e-16
```

```
fit6<-coxph(Surv(os_time,os_event)~as.factor(PERF_STA)+as.factor(STAGE)+as.factor(SEX)+as.factor(PR_RAD),
summary(fit6)
```

```
## Call:
## coxph(formula = Surv(os_time, os_event) ~ as.factor(PERF_STA) +
##       as.factor(STAGE) + as.factor(SEX) + as.factor(PR_RAD) + as.factor(B_SYM) +
##       as.factor(r_score) + as.factor(pr_resp) + as.factor(pr_drug),
##       data = dat)
##
## n= 619, number of events= 409
```

	coef	exp(coef)	se(coef)	z	Pr(> z)
## as.factor(PERF_STA)1	0.40790	1.50365	0.11665	3.497	0.000471 ***
## as.factor(PERF_STA)2	0.27509	1.31664	0.19033	1.445	0.148372
## as.factor(PERF_STA)3	0.53959	1.71531	0.27513	1.961	0.049854 *
## as.factor(STAGE)II	0.18985	1.20907	0.23082	0.823	0.410780
## as.factor(STAGE)III	-0.22176	0.80111	0.24959	-0.888	0.374283
## as.factor(STAGE)IV	-0.05960	0.94214	0.24692	-0.241	0.809275
## as.factor(SEX)M	0.08819	1.09220	0.10444	0.844	0.398453
## as.factor(PR_RAD)Y	0.29352	1.34114	0.11724	2.504	0.012292 *
## as.factor(B_SYM)Y	0.30103	1.35126	0.10458	2.879	0.003994 **
## as.factor(r_score)0, 1	-1.00768	0.36507	0.18198	-5.537	3.07e-08 ***
## as.factor(r_score)2	-0.23516	0.79044	0.13321	-1.765	0.077500 .
## as.factor(pr_resp)DU>1	-0.95314	0.38553	0.14800	-6.440	1.19e-10 ***
## as.factor(pr_resp)SDPD	0.23340	1.26289	0.11422	2.043	0.041019 *
## as.factor(pr_drug)Y	0.16128	1.17502	0.11691	1.380	0.167707

```
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

	exp(coef)	exp(-coef)	lower .95	upper .95
## as.factor(PERF_STA)1	1.5037	0.6650	1.1963	1.8899
## as.factor(PERF_STA)2	1.3166	0.7595	0.9067	1.9120
## as.factor(PERF_STA)3	1.7153	0.5830	1.0003	2.9413
## as.factor(STAGE)II	1.2091	0.8271	0.7691	1.9008
## as.factor(STAGE)III	0.8011	1.2483	0.4912	1.3066
## as.factor(STAGE)IV	0.9421	1.0614	0.5807	1.5286
## as.factor(SEX)M	1.0922	0.9156	0.8900	1.3403
## as.factor(PR_RAD)Y	1.3411	0.7456	1.0658	1.6876
## as.factor(B_SYM)Y	1.3513	0.7401	1.1008	1.6586
## as.factor(r_score)0, 1	0.3651	2.7392	0.2555	0.5215
## as.factor(r_score)2	0.7904	1.2651	0.6088	1.0263
## as.factor(pr_resp)DU>1	0.3855	2.5938	0.2885	0.5153
## as.factor(pr_resp)SDPD	1.2629	0.7918	1.0096	1.5798
## as.factor(pr_drug)Y	1.1750	0.8511	0.9344	1.4776

```
## Concordance= 0.717 (se = 0.012 )
```

```
## Likelihood ratio test= 197.4 on 14 df, p=<2e-16
## Wald test = 182.3 on 14 df, p=<2e-16
## Score (logrank) test = 194 on 14 df, p=<2e-16
```

```
1-pchisq(2*(fit0$loglik[2]-fit6$loglik[2]),16-14)
```

```
## [1] 0.981192
```

```
fit7<-coxph(Surv(os_time,os_event)~as.factor(PERF_STA)+as.factor(PR_RAD)+as.factor(B_SYM)+as.factor(r_s
summary(fit7)
```

```
## Call:
## coxph(formula = Surv(os_time, os_event) ~ as.factor(PERF_STA) +
##       as.factor(PR_RAD) + as.factor(B_SYM) + as.factor(r_score) +
##       as.factor(pr_resp) + as.factor(pr_drug), data = dat)
##
## n= 619, number of events= 409
##
##               coef exp(coef) se(coef)      z Pr(>|z|)
## as.factor(PERF_STA)1  0.4198   1.5217  0.1162  3.614 0.000302 ***
## as.factor(PERF_STA)2  0.3359   1.3991  0.1873  1.794 0.072872 .
## as.factor(PERF_STA)3  0.6072   1.8352  0.2738  2.218 0.026584 *
## as.factor(PR_RAD)Y    0.2969   1.3457  0.1158  2.565 0.010330 *
## as.factor(B_SYM)Y     0.3073   1.3597  0.1040  2.954 0.003137 **
## as.factor(r_score)0, 1 -0.8354  0.4337  0.1367 -6.110 9.99e-10 ***
## as.factor(r_score)2   -0.1994  0.8192  0.1290 -1.547 0.121966
## as.factor(pr_resp)DU>1 -0.9389  0.3911  0.1474 -6.371 1.87e-10 ***
## as.factor(pr_resp)SDPD 0.2584   1.2949  0.1126  2.296 0.021660 *
## as.factor(pr_drug)Y   0.1849   1.2031  0.1156  1.599 0.109857
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##               exp(coef) exp(-coef) lower .95 upper .95
## as.factor(PERF_STA)1    1.5217    0.6572    1.2118    1.911
## as.factor(PERF_STA)2    1.3991    0.7147    0.9693    2.020
## as.factor(PERF_STA)3    1.8352    0.5449    1.0731    3.139
## as.factor(PR_RAD)Y      1.3457    0.7431    1.0725    1.689
## as.factor(B_SYM)Y       1.3597    0.7355    1.1089    1.667
## as.factor(r_score)0, 1  0.4337    2.3057    0.3317    0.567
## as.factor(r_score)2     0.8192    1.2207    0.6362    1.055
## as.factor(pr_resp)DU>1  0.3911    2.5571    0.2930    0.522
## as.factor(pr_resp)SDPD  1.2949    0.7722    1.0386    1.615
## as.factor(pr_drug)Y     1.2031    0.8312    0.9591    1.509
##
## Concordance= 0.713 (se = 0.012 )
## Likelihood ratio test= 190.7 on 10 df, p=<2e-16
## Wald test = 174.8 on 10 df, p=<2e-16
## Score (logrank) test = 186.4 on 10 df, p=<2e-16
```

```
1-pchisq(2*(fit6$loglik[2]-fit7$loglik[2]),4)
```

```
## [1] 0.1550231
```

```
fit8<-coxph(Surv(os_time,os_event)~as.factor(PERF_STA)+as.factor(PR_RAD)+as.factor(B_SYM)+as.factor(r_s
summary(fit8)
```

```
## Call:
## coxph(formula = Surv(os_time, os_event) ~ as.factor(PERF_STA) +
##       as.factor(PR_RAD) + as.factor(B_SYM) + as.factor(r_score) +
##       as.factor(pr_resp), data = dat)
##
## n= 619, number of events= 409
##
##               coef exp(coef) se(coef)      z Pr(>|z|)
## as.factor(PERF_STA)1  0.4063   1.5013   0.1157  3.511 0.000447 ***
## as.factor(PERF_STA)2  0.3073   1.3597   0.1859  1.653 0.098340 .
## as.factor(PERF_STA)3  0.5838   1.7929   0.2734  2.136 0.032718 *
## as.factor(PR_RAD)Y    0.2937   1.3414   0.1158  2.536 0.011209 *
## as.factor(B_SYM)Y     0.3087   1.3617   0.1039  2.972 0.002963 **
## as.factor(r_score)0, 1 -0.8509   0.4270   0.1362 -6.246 4.2e-10 ***
## as.factor(r_score)2   -0.2063   0.8136   0.1287 -1.603 0.108972
## as.factor(pr_resp)DU>1 -0.9936   0.3702   0.1435 -6.924 4.4e-12 ***
## as.factor(pr_resp)SDPD 0.2649   1.3032   0.1125  2.354 0.018589 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##               exp(coef) exp(-coef) lower .95 upper .95
## as.factor(PERF_STA)1    1.5013    0.6661    1.1966    1.8836
## as.factor(PERF_STA)2    1.3597    0.7355    0.9445    1.9574
## as.factor(PERF_STA)3    1.7929    0.5578    1.0492    3.0637
## as.factor(PR_RAD)Y      1.3414    0.7455    1.0690    1.6832
## as.factor(B_SYM)Y       1.3617    0.7344    1.1108    1.6693
## as.factor(r_score)0, 1   0.4270    2.3417    0.3270    0.5577
## as.factor(r_score)2     0.8136    1.2291    0.6322    1.0470
## as.factor(pr_resp)DU>1   0.3702    2.7009    0.2795    0.4905
## as.factor(pr_resp)SDPD   1.3032    0.7673    1.0453    1.6248
##
## Concordance= 0.714 (se = 0.012 )
## Likelihood ratio test= 188.1 on 9 df,  p=<2e-16
## Wald test              = 171.4 on 9 df,  p=<2e-16
## Score (logrank) test = 183.1 on 9 df,  p=<2e-16
```

```
1-pchisq(2*(fit7$loglik[2]-fit8$loglik[2]),1)
```

```
## [1] 0.1056428
```

```
fit9<-coxph(Surv(os_time,os_event)~as.factor(PERF_STA)+as.factor(B_SYM)+as.factor(r_score)+as.factor(pr
summary(fit9)
```

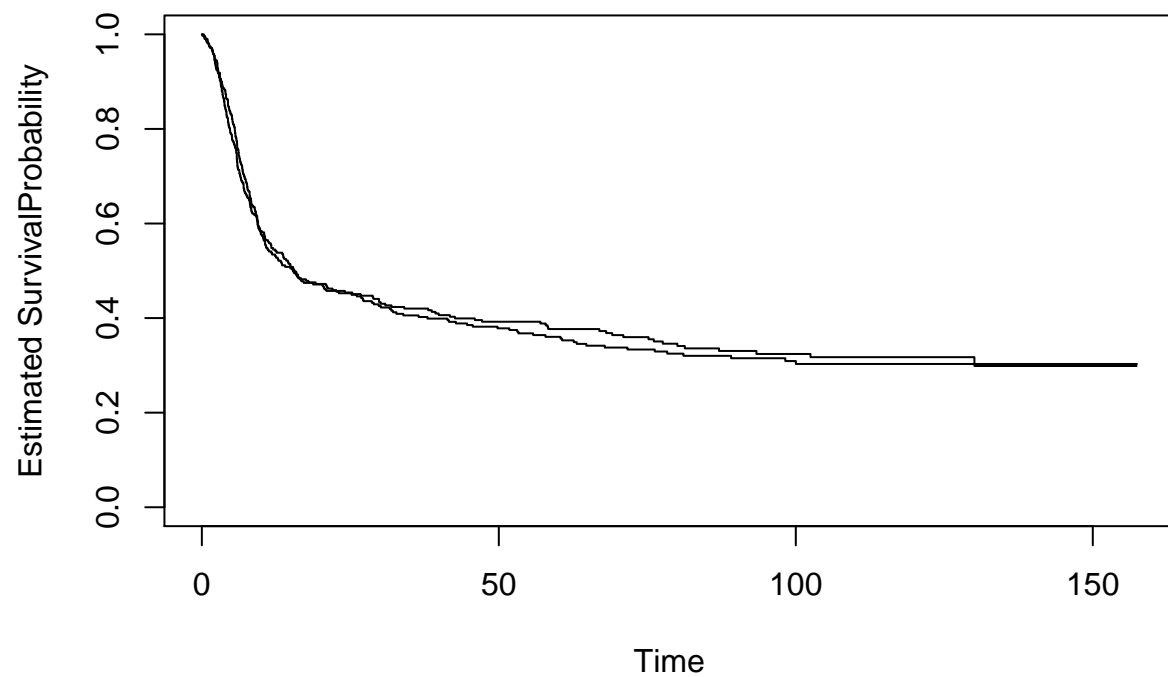
```
## Call:
## coxph(formula = Surv(os_time, os_event) ~ as.factor(PERF_STA) +
##       as.factor(B_SYM) + as.factor(r_score) + as.factor(pr_resp),
##       data = dat)
##
```

```
## n= 619, number of events= 409
##
##
##          coef exp(coef) se(coef)      z Pr(>|z|)
## as.factor(PERF_STA)1    0.4029    1.4962    0.1160    3.472 0.000517 ***
## as.factor(PERF_STA)2    0.3257    1.3850    0.1859    1.752 0.079728 .
## as.factor(PERF_STA)3    0.5984    1.8191    0.2730    2.191 0.028416 *
## as.factor(B_SYM)Y       0.3065    1.3586    0.1038    2.953 0.003151 **
## as.factor(r_score)0, 1 -0.8586    0.4238    0.1362   -6.306 2.87e-10 ***
## as.factor(r_score)2     -0.2148    0.8067    0.1282   -1.676 0.093815 .
## as.factor(pr_resp)DU>1 -0.9304    0.3944    0.1410   -6.601 4.08e-11 ***
## as.factor(pr_resp)SDPD  0.2502    1.2843    0.1122    2.230 0.025735 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##          exp(coef) exp(-coef) lower .95 upper .95
## as.factor(PERF_STA)1    1.4962    0.6684    1.1918    1.8783
## as.factor(PERF_STA)2    1.3850    0.7220    0.9621    1.9937
## as.factor(PERF_STA)3    1.8191    0.5497    1.0653    3.1065
## as.factor(B_SYM)Y       1.3586    0.7360    1.1085    1.6651
## as.factor(r_score)0, 1    0.4238    2.3598    0.3245    0.5534
## as.factor(r_score)2      0.8067    1.2397    0.6274    1.0371
## as.factor(pr_resp)DU>1    0.3944    2.5356    0.2992    0.5199
## as.factor(pr_resp)SDPD    1.2843    0.7787    1.0308    1.6001
##
## Concordance= 0.711 (se = 0.012 )
## Likelihood ratio test= 181.9 on 8 df,  p=<2e-16
## Wald test              = 164.2 on 8 df,  p=<2e-16
## Score (logrank) test = 176.2 on 8 df,  p=<2e-16
```

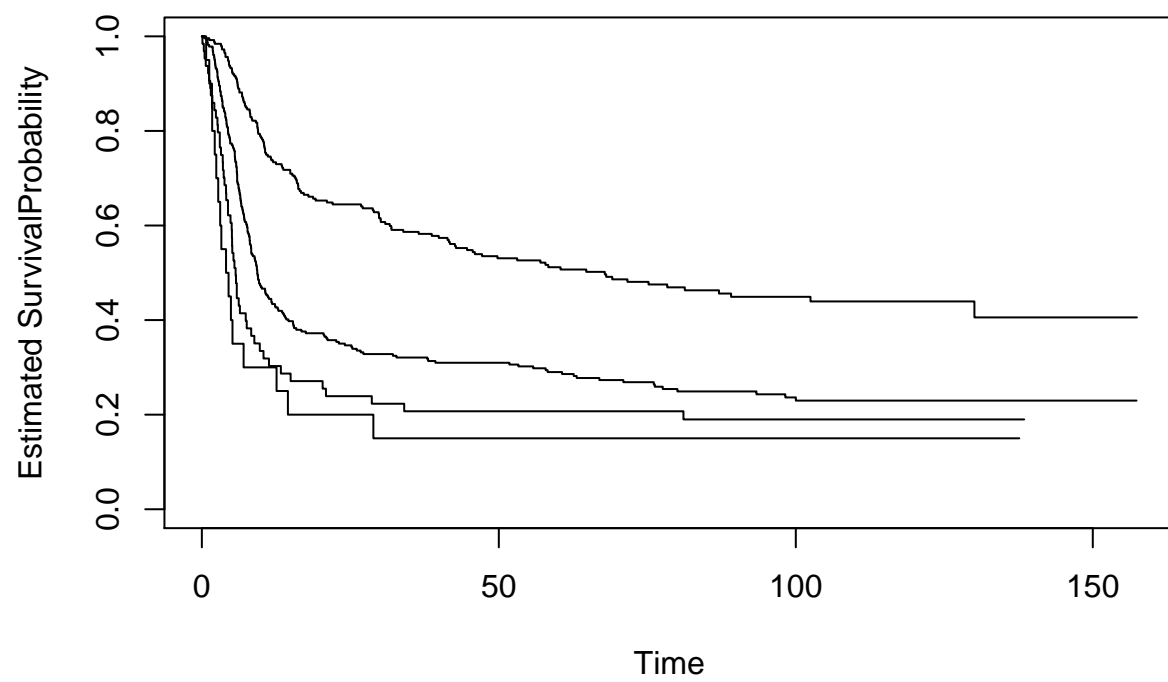
```
1-pchisq(2*(fit8$loglik[2]-fit9$loglik[2]),1)
```

```
## [1] 0.01309516
```

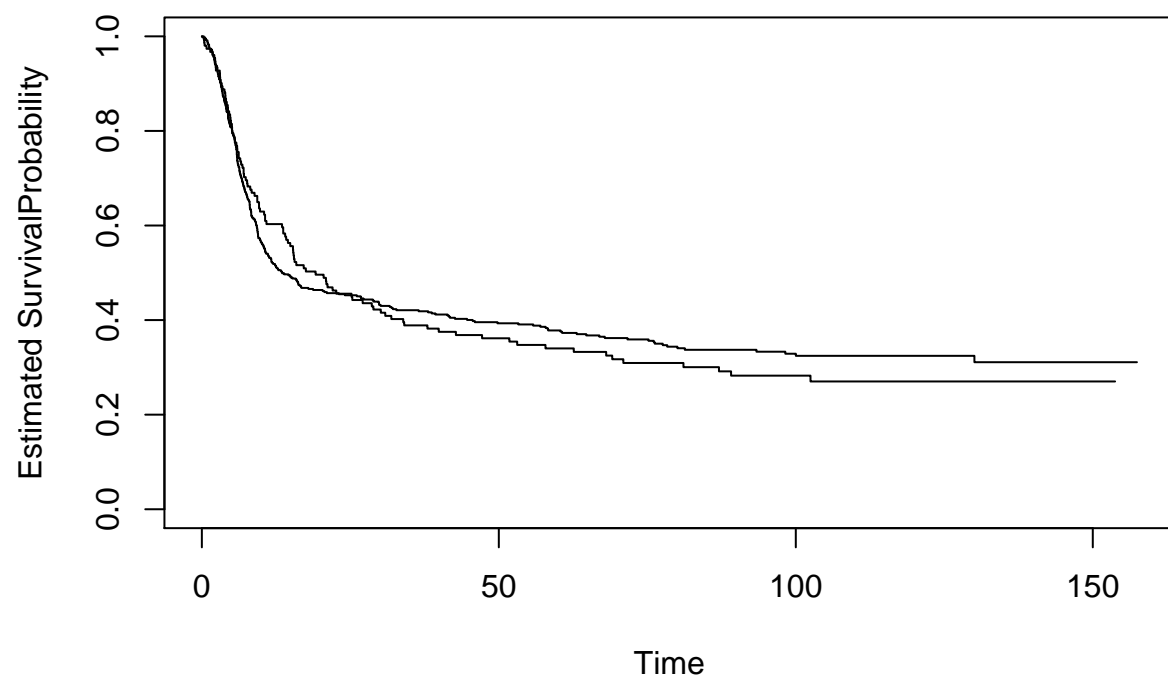
```
fit.km <-survfit(Surv(os_time, os_event)~trt, data=dat)
plot(fit.km,xlab="Time", ylab="Estimated SurvivalProbability")
```



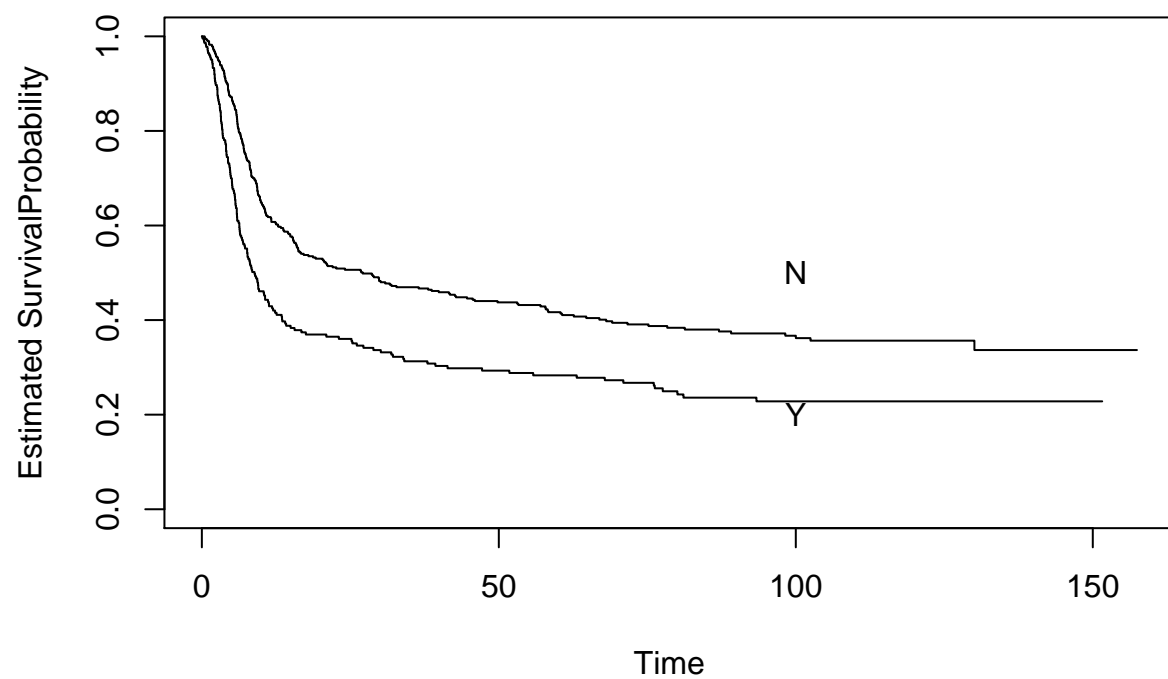
```
fit.km1<-survfit(Surv(os_time,os_event)~ PERF_STA,data = dat)
fit.km2<-survfit(Surv(os_time,os_event)~ PR_RAD, data = dat)
fit.km3<-survfit(Surv(os_time,os_event)~ B_SYM,data = dat)
fit.km4<-survfit(Surv(os_time,os_event)~ r_score,data = dat)
fit.km5<-survfit(Surv(os_time,os_event)~ pr_resp,data = dat)
plot(fit.km1,xlab="Time", ylab="Estimated SurvivalProbability")
```

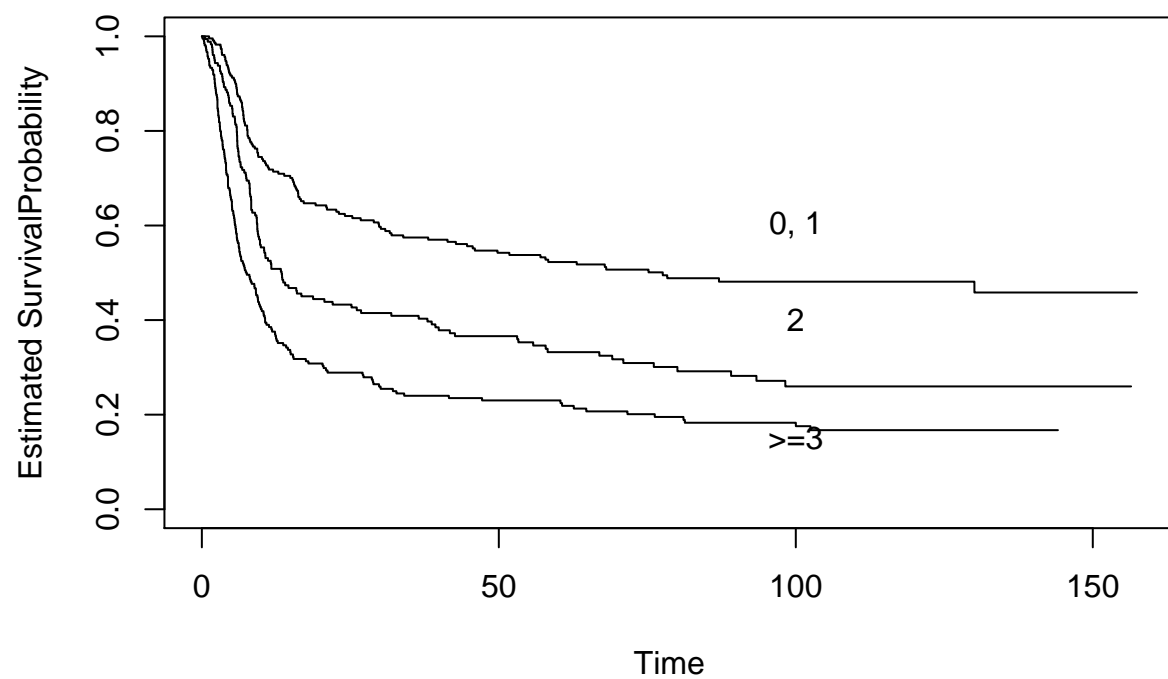
```
plot(fit.km2,xlab="Time", ylab="Estimated SurvivalProbability")
```



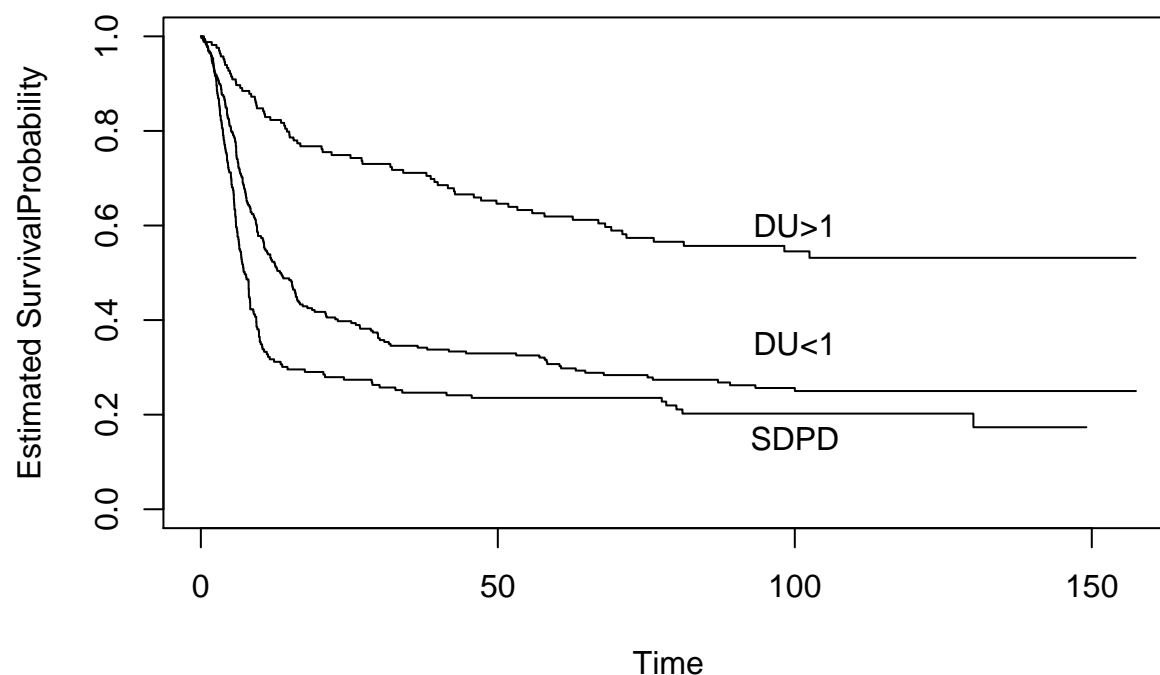
```
plot(fit.km3,xlab="Time", ylab="Estimated SurvivalProbability")
text(100,0.2,"Y")
text(100,0.5,"N")
```



```
plot(fit.km4,xlab="Time", ylab="Estimated SurvivalProbability")
text(100,0.15,">=3" )
text(100,0.4,"2" )
text(100,0.6,"0, 1" )
```



```
plot(fit.km5,xlab="Time", ylab="Estimated SurvivalProbability")
text(100,0.15,"SDPD")
text(100,0.35,"DU<1")
text(100,0.6,"DU>1")
```



```
logrk1<-survdif(Surv(os_time,os_event)~as.factor(PERF_STA),data = dat)
logrk0<-survdif(Surv(os_time,os_event)~as.factor(trt),data = dat)
logrk0
```

```
## Call:
## survdiff(formula = Surv(os_time, os_event) ~ as.factor(trt),
## data = dat)
##
##               N Observed Expected (O-E)^2/E (O-E)^2/V
## as.factor(trt)=control  309      201      202   0.0105   0.0208
## as.factor(trt)=treatment 310      208      207   0.0103   0.0208
##
## Chisq= 0 on 1 degrees of freedom, p= 0.9
```

```
logrk1
```

```
## Call:
## survdiff(formula = Surv(os_time, os_event) ~ as.factor(PERF_STA),
## data = dat)
##
##               N Observed Expected (O-E)^2/E (O-E)^2/V
## as.factor(PERF_STA)=0 257      133     209.50   27.9   58.0
## as.factor(PERF_STA)=1 278      208     163.86   11.9   20.0
## as.factor(PERF_STA)=2  64       51      28.33   18.1   19.6
## as.factor(PERF_STA)=3  20       17       7.31   12.8   13.1
```

```
##
## Chisq= 71.7 on 3 degrees of freedom, p= 2e-15
```

```
logrk2<-survdif(Surv(os_time,os_event)~as.factor(PR_RAD),data = dat)
logrk2
```

```
## Call:
## survdiff(formula = Surv(os_time, os_event) ~ as.factor(PR_RAD),
## data = dat)
##
##              N Observed Expected (O-E)^2/E (O-E)^2/V
## as.factor(PR_RAD)=N 467      302      305   0.0343    0.136
## as.factor(PR_RAD)=Y 152      107      104   0.1009    0.136
##
## Chisq= 0.1 on 1 degrees of freedom, p= 0.7
```

```
logrk3<-survdif(Surv(os_time,os_event)~as.factor(B_SYM),data = dat)
logrk3
```

```
## Call:
## survdiff(formula = Surv(os_time, os_event) ~ as.factor(B_SYM),
## data = dat)
##
##              N Observed Expected (O-E)^2/E (O-E)^2/V
## as.factor(B_SYM)=N 394      242      285    6.58    21.9
## as.factor(B_SYM)=Y 225      167      124   15.19    21.9
##
## Chisq= 21.9 on 1 degrees of freedom, p= 3e-06
```

```
logrk4<-survdif(Surv(os_time,os_event)~as.factor(r_score),data = dat)
logrk4
```

```
## Call:
## survdiff(formula = Surv(os_time, os_event) ~ as.factor(r_score),
## data = dat)
##
##              N Observed Expected (O-E)^2/E (O-E)^2/V
## as.factor(r_score)=>=3 211      170      105   39.489   53.665
## as.factor(r_score)=0, 1 230      115      187   27.919   52.134
## as.factor(r_score)=2   178      124      116    0.521    0.731
##
## Chisq= 68.8 on 2 degrees of freedom, p= 1e-15
```

```
logrk5<-survdif(Surv(os_time,os_event)~as.factor(pr_resp),data = dat)
logrk5
```

```
## Call:
## survdiff(formula = Surv(os_time, os_event) ~ as.factor(pr_resp),
## data = dat)
##
##              N Observed Expected (O-E)^2/E (O-E)^2/V
```

```
## as.factor(pr_resp)=DU<1 261      188    165.9      2.94      4.96
## as.factor(pr_resp)=DU>1 165       71    147.7     39.86     63.63
## as.factor(pr_resp)=SDPD 193      150     95.3     31.33     41.42
##
## Chisq= 75.8 on 2 degrees of freedom, p= <2e-16
```

```
delta<-dat$os_event
x<-dat$os_time
PS<-dat$PERF_STA
PR<-dat$PR_RAD
BS<-dat$B_SYM
rs<-dat$r_score
pr_resp<-dat$pr_resp
PERF_STA<-dat$PERF_STA
AGE<-dat$AGE
STAGE<-dat$STAGE
SEX<-dat$SEX
B_SYM<-dat$B_SYM
r_score<-dat$r_score
PR_RAD<-dat$PR_RAD
pr_drug<-dat$pr_drug
pr_resp<-dat$pr_resp
trt<-dat$trt
```

```
fit.lognm0<-survreg(Surv(os_time,os_event)~as.factor(PERF_STA)+AGE+as.factor(STAGE)+as.factor(SEX)+as.f
summary(fit.lognm0)
```

```
##
## Call:
## survreg(formula = Surv(os_time, os_event) ~ as.factor(PERF_STA) +
## AGE + as.factor(STAGE) + as.factor(SEX) + as.factor(PR_RAD) +
## as.factor(B_SYM) + as.factor(r_score) + as.factor(pr_resp) +
## as.factor(pr_drug) + as.factor(trt), data = dat, dist = "lognormal")
##
```

	Value	Std. Error	z	p
## (Intercept)	3.58145	0.58541	6.12	9.5e-10
## as.factor(PERF_STA)1	-0.59524	0.16290	-3.65	0.00026
## as.factor(PERF_STA)2	-0.55171	0.27517	-2.00	0.04497
## as.factor(PERF_STA)3	-1.04369	0.40685	-2.57	0.01031
## AGE	-0.00673	0.00705	-0.95	0.34004
## as.factor(STAGE)II	-0.34514	0.29742	-1.16	0.24587
## as.factor(STAGE)III	0.38752	0.33129	1.17	0.24211
## as.factor(STAGE)IV	0.07356	0.33034	0.22	0.82378
## as.factor(SEX)M	-0.06648	0.14507	-0.46	0.64674
## as.factor(PR_RAD)Y	-0.41054	0.16844	-2.44	0.01480
## as.factor(B_SYM)Y	-0.47319	0.14891	-3.18	0.00148
## as.factor(r_score)0, 1	1.42165	0.26574	5.35	8.8e-08
## as.factor(r_score)2	0.32789	0.19612	1.67	0.09455
## as.factor(pr_resp)DU>1	1.43819	0.19310	7.45	9.5e-14
## as.factor(pr_resp)SDPD	-0.30490	0.16388	-1.86	0.06282
## as.factor(pr_drug)Y	-0.30992	0.15806	-1.96	0.04991
## as.factor(trt)treatment	0.04958	0.13988	0.35	0.72302
## Log(scale)	0.48380	0.03749	12.91	< 2e-16

```
##
## Scale= 1.62
##
## Log Normal distribution
## Loglik(model)= -1816.1   Loglik(intercept only)= -1927.8
##   Chisq= 223.33 on 16 degrees of freedom, p= 1.5e-38
## Number of Newton-Raphson Iterations: 4
## n= 619

fit.lognm7<-survreg(Surv(os_time,os_event)~as.factor(PERF_STA)+as.factor(PR_RAD)+as.factor(B_SYM)+as.factor(r_score)+as.factor(pr_resp)+as.factor(pr_drug), data = dat, dist = "lognormal")
summary(fit.lognm7)
```

```
##
## Call:
## survreg(formula = Surv(os_time, os_event) ~ as.factor(PERF_STA) +
##   as.factor(PR_RAD) + as.factor(B_SYM) + as.factor(r_score) +
##   as.factor(pr_resp) + as.factor(pr_drug), data = dat, dist = "lognormal")
##
##              Value Std. Error      z      p
## (Intercept)      3.3962      0.2482 13.68 < 2e-16
## as.factor(PERF_STA)1  -0.6090      0.1635  -3.72  0.0002
## as.factor(PERF_STA)2  -0.6099      0.2745  -2.22  0.0263
## as.factor(PERF_STA)3  -1.0994      0.4086  -2.69  0.0071
## as.factor(PR_RAD)Y    -0.4308      0.1682  -2.56  0.0104
## as.factor(B_SYM)Y    -0.4604      0.1494  -3.08  0.0021
## as.factor(r_score)0, 1  1.1832      0.1922   6.16 7.5e-10
## as.factor(r_score)2    0.3341      0.1867   1.79  0.0735
## as.factor(pr_resp)DU>1  1.4176      0.1930   7.34 2.1e-13
## as.factor(pr_resp)SDPD -0.3153      0.1638  -1.92  0.0543
## as.factor(pr_drug)Y    -0.3521      0.1582  -2.23  0.0261
## Log(scale)            0.4925      0.0375 13.13 < 2e-16
##
## Scale= 1.64
##
## Log Normal distribution
## Loglik(model)= -1821.5   Loglik(intercept only)= -1927.8
##   Chisq= 212.55 on 10 degrees of freedom, p= 3.9e-40
## Number of Newton-Raphson Iterations: 4
## n= 619
```

```
1-pchisq(2*((-1815.7)-(-1821.1)),16-10)
```

```
## [1] 0.09475787
```

```
fit.resids7<-resid(fit.lognm7, type="deviance")
par(mfrow=c(1,2))
plot(predict(fit.lognm7),fit.resids7,ylab="Deviance Residuals",xlab="Risk Score")
qqnorm(fit.resids7,ylab="Deviance Residuals",xlab="N(0,1) Quantiles")
abline(0,1)
```