Aalen additive hazards regression

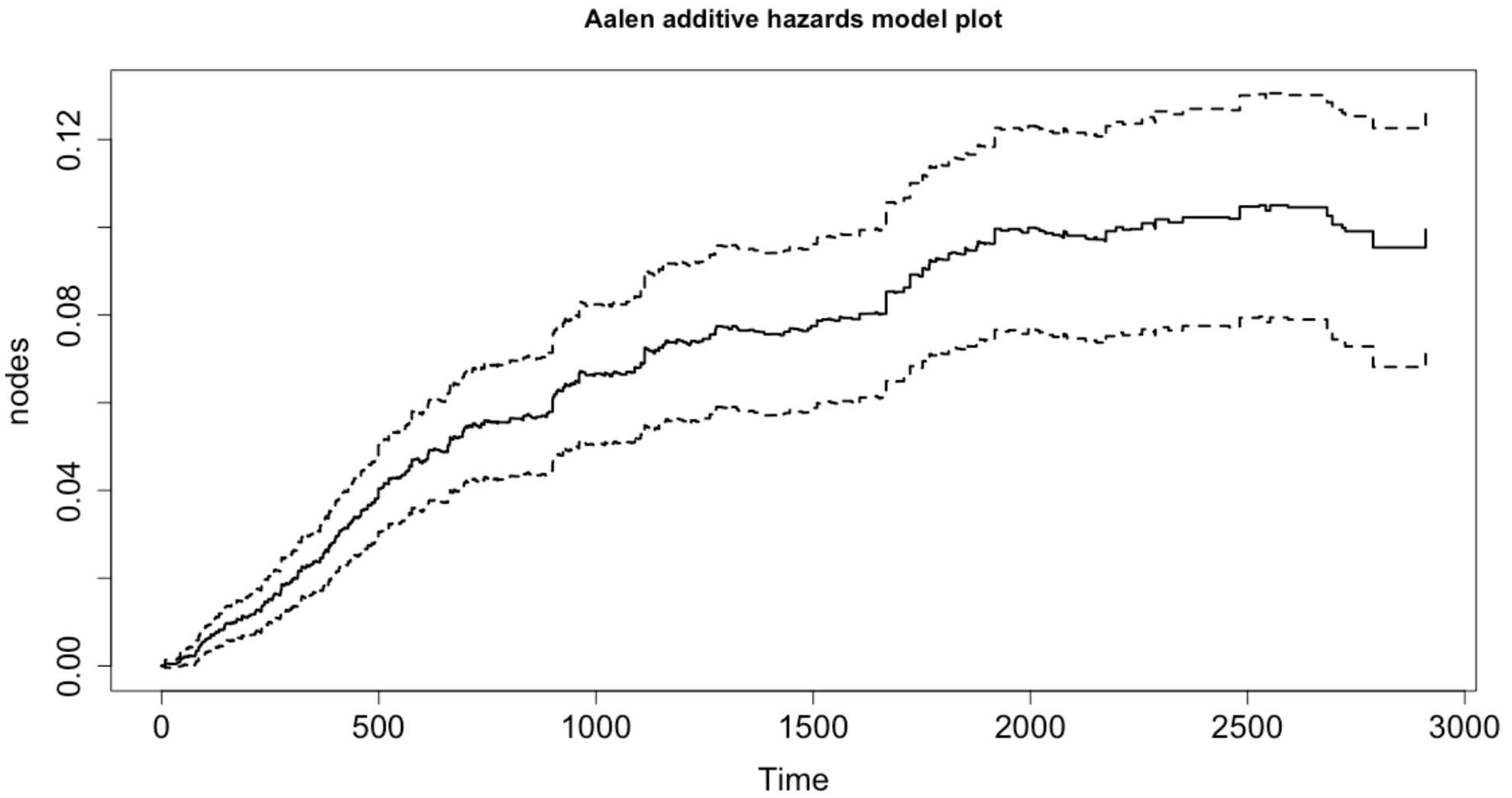
Colon dataset

```
add.haz <- aareg(formula = Surv(time, status) ~ nodes, data = colon)
add.haz
Call:
aareg(formula = Surv(time, status) ~ nodes, data = colon)

  n=1822 (36 observations deleted due to missingness)
    692 out of 692 unique event times used

              slope     coef se(coef)     z
Intercept 0.000313 0.000392 3.69e-05 10.60
nodes     0.000124 0.000106 1.08e-05  9.77
                  p
Intercept 2.85e-26
nodes     1.55e-22

Chisq=95.41 on 1 df, p=<2e-16; test weights=aalen
```

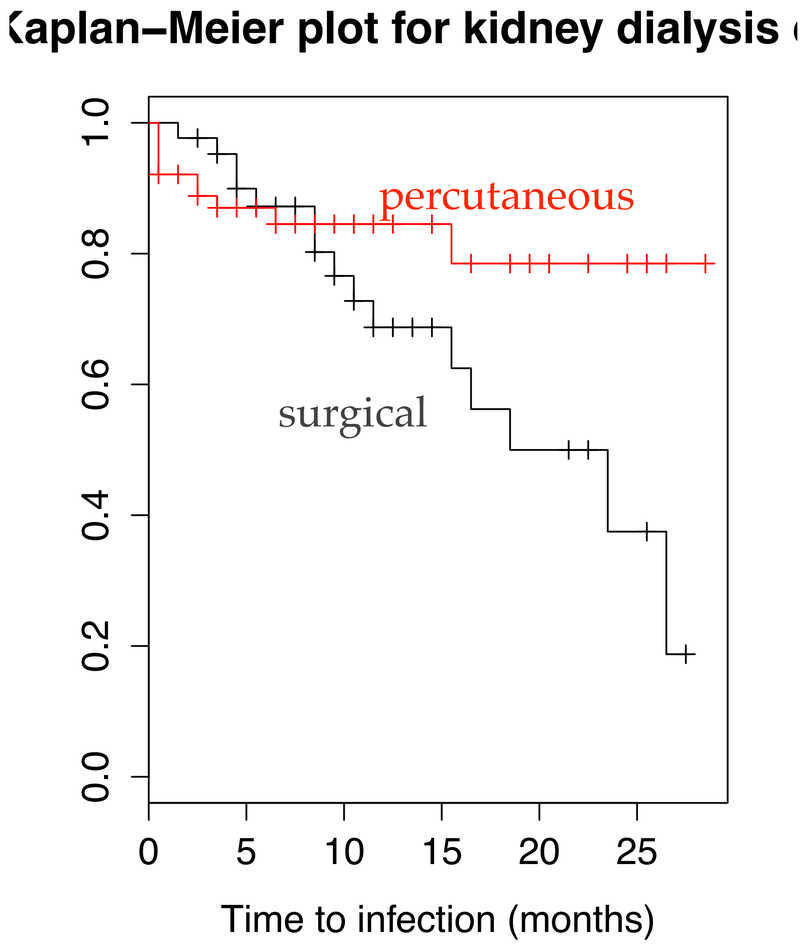
This one is meaningless. Test for hazard = 0.

Test for slope (i.e., average effect on hazard) =0

```
plot(add.haz,cex.lab=1.5,cex.axis=1.5,lwd=2,conf.int = TRUE,
            main= 'Aalen additive hazards model plot')
```



Kidney dialysis example



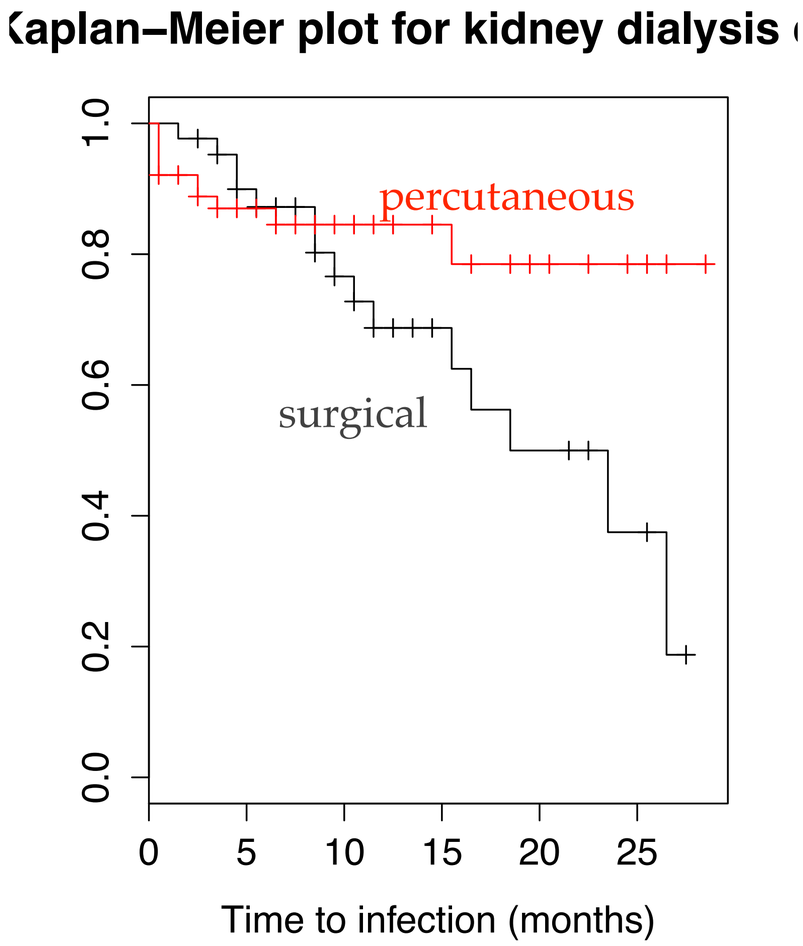
t_i	$Y_0(t_i)$	$Y_1(t_i)$	$d_0(t_i)$	$d_1(t_i)$	σ_i^2	Peto wt.	H–F $(0,1)$ wt.
0.5	43	76	0	6	1.326	0.992	0.000
1.5	43	60	1	0	0.243	0.941	0.050
2.5	42	56	0	2	0.485	0.931	0.059
3.5	40	49	1	1	0.489	0.912	0.078
4.5	36	43	2	0	0.490	0.890	0.099
5.5	33	40	1	0	0.248	0.867	0.121
6.5	31	35	0	1	0.249	0.854	0.133
8.5	25	30	2	0	0.487	0.839	0.146
9.5	22	27	1	0	0.247	0.807	0.176
10.5	20	25	1	0	0.247	0.790	0.193
11.5	18	22	1	0	0.247	0.770	0.210
15.5	11	14	1	1	0.472	0.741	0.230
16.5	10	13	1	0	0.246	0.681	0.289
18.5	9	11	1	0	0.247	0.649	0.319
23.5	4	3	1	0	0.245	0.568	0.351
26.5	2	3	1	0	0.240	0.473	0.432

Z_{LR}=1.59

Z_{Peto}=1.12

Z_{HF}=3.11

Kidney dialysis example




```
> kS=Surv(kidney$time,kidney$delta)
> survdiff(kS~kidney$type) #log-rank test
Call:
survdiff(formula = kS ~ kidney$type)

                N Observed Expected (O-E)^2/E (O-E)^2/V
kidney$type=1 43       15       11      1.42      2.53
kidney$type=2 76       11       15      1.05      2.53

 Chisq= 2.5  on 1 degrees of freedom, p= 0.112
> survdiff(kS~kidney$type,rho=1) #H-F(1,0) test
Call:
survdiff(formula = kS ~ kidney$type, rho = 1)

                N Observed Expected (O-E)^2/E (O-E)^2/V
kidney$type=1 43     12.0     9.48     0.686      1.39
kidney$type=2 76     10.4    12.98     0.501      1.39

 Chisq= 1.4  on 1 degrees of freedom, p= 0.239
```

$Z_{LR}=1.59$

$Z_{Peto}=1.12$

$Z_{HF(1,0)}=1.18=\text{sqrt}(1.39)$