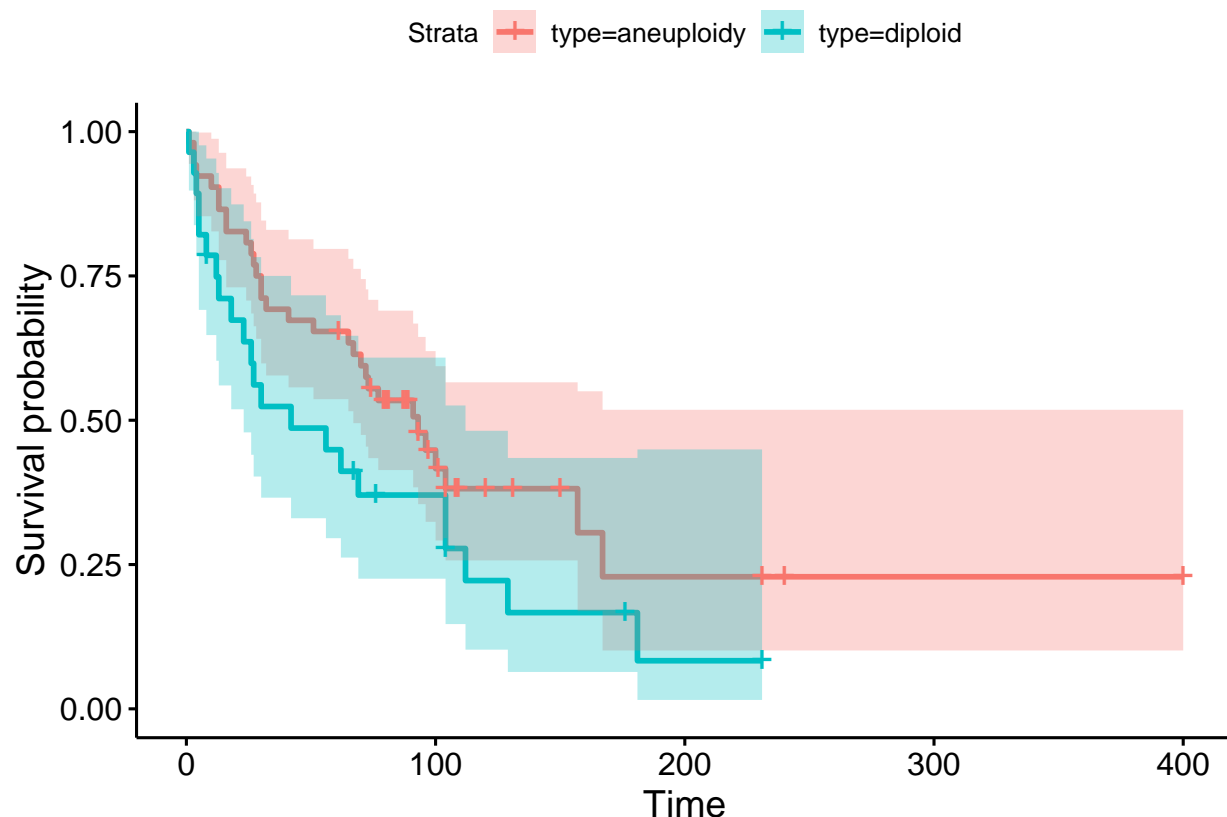## 3. Tongue data

Data Description:

- `type`: Tumor DNA profile (1=Aneuploid Tumor, 2=Diploid Tumor)

- `time`: Time to death or on-study time, weeks

- `delta` Death indicator (0: censored/alive, 1: observed/dead)

```
data(tongue)
tongue <- tongue %>%
  mutate(type = ifelse(type == 1, "aneuploidy", "diploid"))
Surv(tongue$time,tongue$delta,type='right') # 0: censored, 1: observed
```

```
## [1]    1    3    3    4   10   13   13   16   16   24   26   27   28   30   30
## [16]   32   41   51   65   67   70   72   73   77   91   93   96  100  104  157
## [31]  167   61+  74+  79+  80+  81+  87+  87+  88+  89+  93+  97+ 101+ 104+ 108+
## [46]  109+ 120+ 131+ 150+ 231+ 240+ 400+   1    3    4    5    5    8   12   13
## [61]   18   23   26   27   30   42   56   62   69  104  104  112  129  181    8+
## [76]   67+  76+ 104+ 176+ 231+
```

For each tumor type (aneuploidy and diploid), plot the Kaplan-Meier curve of survival function and its pointwise 95% confidence intervals (using the log transformation).

```
#survdiff(Surv(time,cens)~treat, data=gehan) # log rank test
survival.fit <- survfit(Surv(time,delta)~type, data = tongue, conf.type='log')
ggsurvplot(survival.fit, conf.int=TRUE)
```

The estimated 1-year survival rate and 95% CI:

```
summary(survival.fit,time=c(365/7))
```

```
## Call: survfit(formula = Surv(time, delta) ~ type, data = tongue, conf.type = "log")
##
##              type=aneuploidy
##        time      n.risk      n.event      survival      std.err lower 95% CI
##      52.143      34.000       18.000         0.654        0.066        0.537
## upper 95% CI
##       0.797
##
##              type=diploid
##        time      n.risk      n.event      survival      std.err lower 95% CI
##     52.1429     13.0000      14.0000        0.4864       0.0961       0.3302
## upper 95% CI
##      0.7164
```

The estimated 1-year survival rate for patients with aneuploid tumor is about 0.654, with 95% CI $[0.537, 0.797]$, and the estimated 1-year survival rate for patients with diploid tumor is about 0.4864, with 95% CI $[0.3302, 0.7164]$.