Generate ALS cohort descriptive statistics and illustrative timeline figures

Table 1. Demographics of study patients by diagnosis

```
##### Descriptive Statistics
vars <- c("age", "dx_delay", "simp_site", "censor_time", "countlong",
          "First_alsfrs_t_mnths", "first_from_dx", "First_ALSFRS_Total")
factorVars <- c("simp_site")
tab1 <- CreateTableOne(vars = vars, factorVars = factorVars, data=df_ind,
                       test = TRUE, includeNA = TRUE)
tab1.export <- print(tab1, quote = FALSE, noSpaces = TRUE,
                     printToggle = FALSE, showAllLevels = TRUE,
                     nonnormal = c("dx_delay","censor_time", "First_alsfrs_t_mnths", "first_from_dx"))

print(tab1.export)
```

```
##
##                                      level    Overall
##   n                                  ""       "526"
##   age (mean (SD))                    ""       "64.70 (9.82)"
##   dx_delay (median [IQR])            ""       "11.00 [6.80, 18.70]"
##   simp_site (%)                      "Spinal" "364 (69.2)"
##                                      "Bulbar" "162 (30.8)"
##   censor_time (median [IQR])         ""       "31.40 [21.10, 46.03]"
##   countlong (mean (SD))              ""       "3.89 (3.42)"
##   First_alsfrs_t_mnths (median [IQR]) ""       "14.76 [9.77, 23.90]"
##   first_from_dx (median [IQR])       ""       "2.68 [1.34, 5.08]"
##   First_ALSFRS_Total (mean (SD))     ""       "36.55 (7.07)"
```

Fit a lognormal distibution to delayed entry times for this cohort

```
tidy ( fitdistr(df_ind$dx_delay, "lognormal") )
```

```
## # A tibble: 2 x 3
##   term    estimate std.error
##   <chr>      <dbl>     <dbl>
## 1 meanlog    2.37     0.0335
## 2 sdlog      0.768    0.0237
```

Note - these values differ slightly to those used in the simulation study because we were able to include more patients after we had run the simulation study.

What is the mean value of the first ALSFRSR, mean time from onset, and mean time from diagnosis at time of first ALSFRSR

```
summary(df_ind$First_ALSFRS_Total)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   10.00   32.00   38.00   36.55   42.00   47.00
```

```
summary(df_ind$First_alsfrs_t_mnths)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.611   9.773  14.762  17.966  23.901  59.507
```

```
summary(df_ind$First_alsfrs_t_mnths - df_ind$dx_delay)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  -8.779   1.336   2.679   3.996   5.079  49.364
```

Fit the Joint models used in the simulation study - A thru F

Note the for models E and F splines terms with 2 d.f. were used instead of polynomial terms.

Summary of Cox model hazard ratios

Variable	Model	Parameter	HazRatio	CI_2.5	CI_97.5	p.value
dx_delay	A	-0.067	0.935	0.925	0.946	0.000
dx_delay	B	-0.041	0.960	0.948	0.972	0.000
dx_delay	D	-0.012	0.988	0.977	0.999	0.039
simp_siteBulbar	A	0.303	1.354	1.112	1.648	0.003
simp_siteBulbar	B	0.288	1.334	1.096	1.624	0.004
simp_siteBulbar	C	0.315	1.370	1.128	1.663	0.001
simp_siteBulbar	D	0.278	1.320	1.084	1.607	0.006

Summary of JM event coefficients

Variable	Model	Parameter	Std.Err	HazRatio	CI_2.5	CI_97.5	P
Assoct	A	-0.066	0.001	0.936	0.925	0.947	0.000
Assoct	B	-0.062	0.001	0.940	0.928	0.950	0.000
Assoct	C	-0.064	0.000	0.938	0.929	0.947	0.000
Assoct	D	-0.067	0.001	0.935	0.923	0.945	0.000
dx_delay	A	-0.045	0.000	0.956	0.945	0.968	0.000
dx_delay	B	-0.017	0.000	0.983	0.970	0.998	0.025
dx_delay	D	-0.018	0.000	0.982	0.970	0.993	0.001
simp_siteBulbar	A	0.254	0.006	1.289	1.014	1.608	0.044
simp_siteBulbar	B	0.239	0.007	1.270	1.012	1.561	0.042
simp_siteBulbar	C	0.257	0.004	1.293	1.047	1.602	0.020
simp_siteBulbar	D	0.215	0.006	1.240	1.012	1.513	0.038

Summary of JM longtudinal coefficients

Variable	Model	Parameter	Std.Err	CI_2.5	CI_97.5	P
(Intercept)	A	48.477	0.056	47.430	49.462	0
(Intercept)	B	48.477	0.056	47.468	49.473	0
(Intercept)	C	39.938	0.013	39.344	40.551	0
(Intercept)	D	39.935	0.014	39.316	40.550	0
alsfrs_t_mnths	A	-0.818	0.002	-0.876	-0.760	0
alsfrs_t_mnths	B	-0.818	0.003	-0.875	-0.753	0
adj_time	C	-1.003	0.001	-1.073	-0.937	0
adj_time	D	-1.000	0.001	-1.069	-0.934	0