

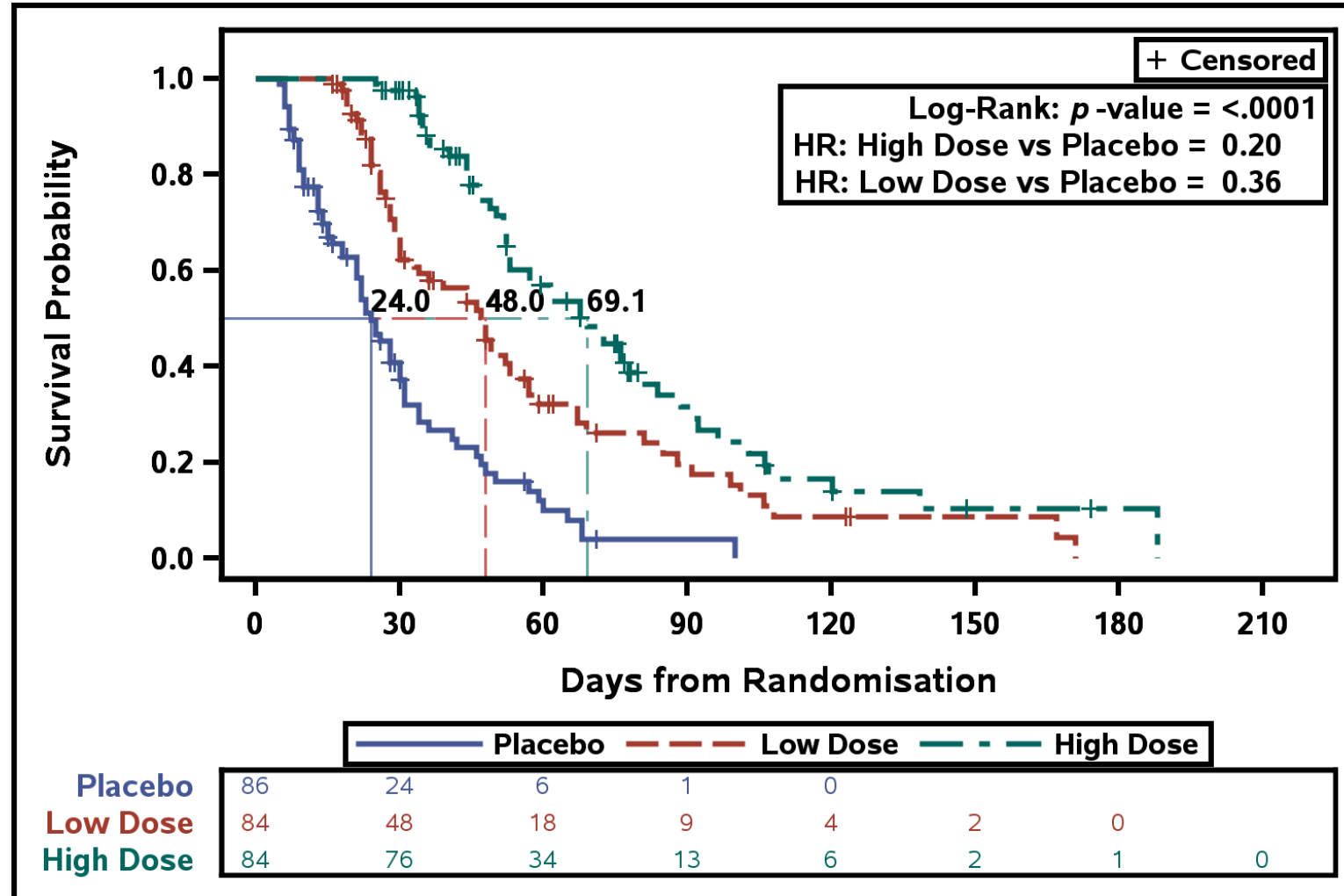
Super Static SG Graphs

Presented by Kriss Harris

Agenda

- Kaplan Meier Plot
- Forest Plot
- Swimmer Plot

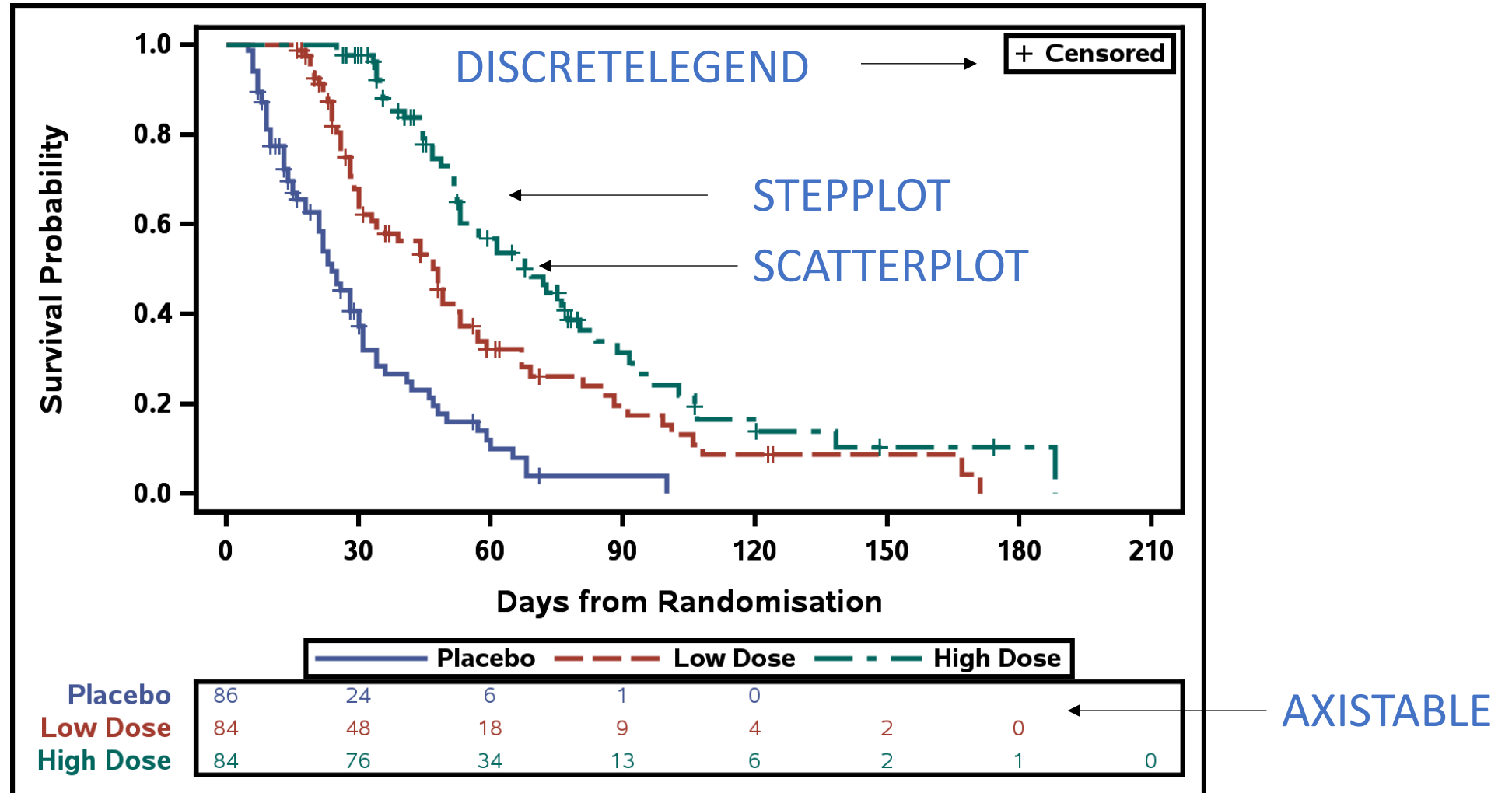
Creating Kaplan-Meier Plot with Median Survival Times and HR table



Creating Kaplan-Meier Plot with Median Survival Times and HR table

- Use Time-to-event Dataset, for example, ADTTE
- Use PROC LIFETEST to obtain Kaplan Meier survival dataset and median survival times
- Use PROC PHREG to obtain hazard ratios
- Create macro variables that contain the median survival times and hazard ratios
- Use GTL (or SGPLOT) to create the Kaplan-Meier plot

Creating Kaplan-Meier Plot – Step 1



Step 1 – SAS Code

KM Curve

```
stepplot x = time y = survival /  
  group = stratum  
  name="Survival"  
  legendlabel="Survival";
```

```
scatterplot x=time y=censored /  
  markerattrs=(symbol=plus)  
  group=stratum;
```

Step 1 – SAS Code

Censored Legend

```
scatterplot x=time y=censored /  
    markerattrs=(symbol=plus color=black)  
    name="Censored";
```

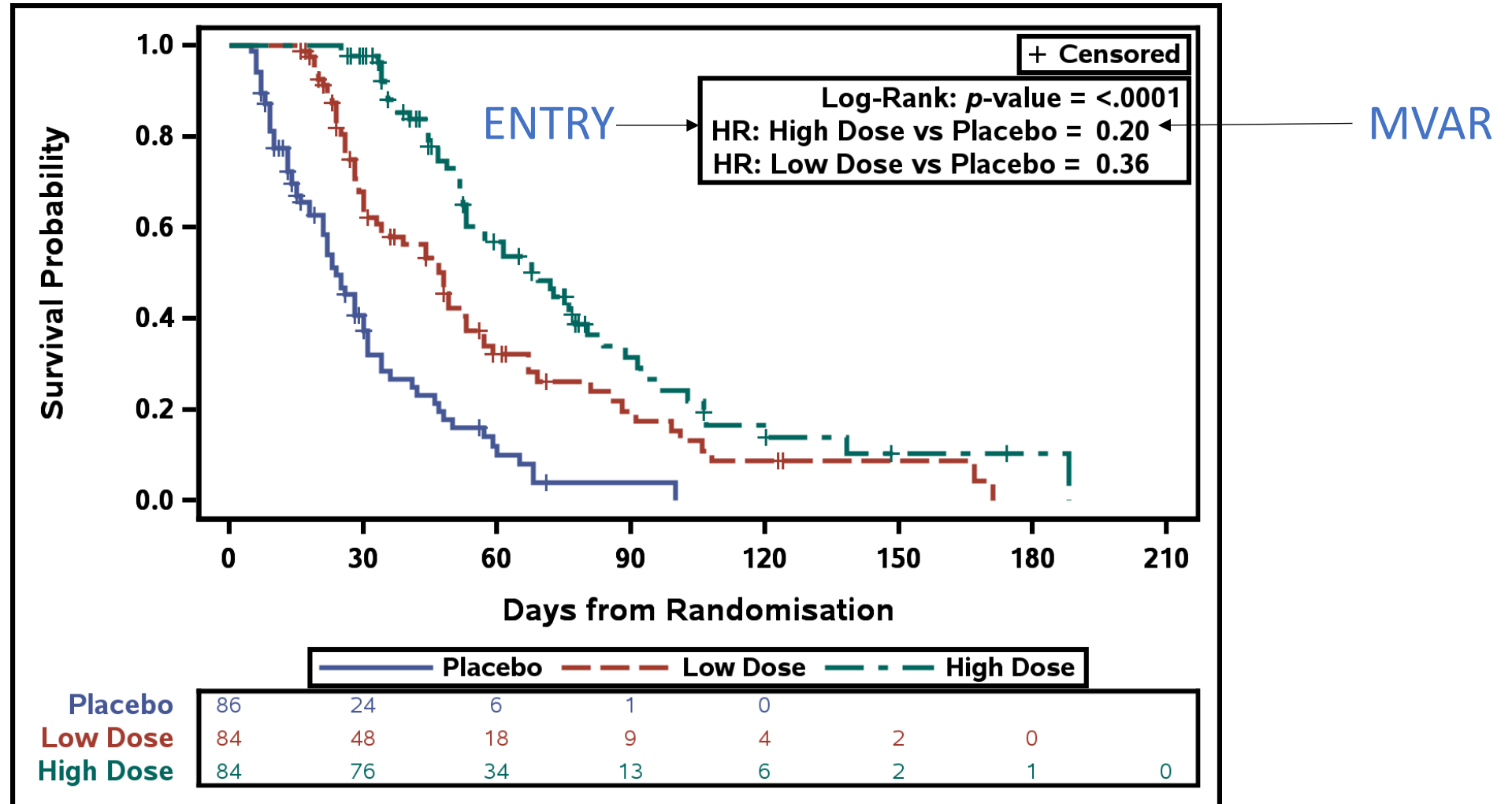
```
discretelegend "Censored" /  
    location = inside  
    autoalign = (topright);
```

Step 1 – SAS Code

At-Risk Table

```
layout overlay /  
    xaxisopts=(display=none  
        linearopts=(tickvaluessequence=(start=0  
            end=210 increment=30))) border=off;  
  
    axistable value=atrisk x=tatrisk /  
        class=stratum colorgroup=stratum;  
endlayout;
```

Creating Kaplan-Meier Plot – Step 2



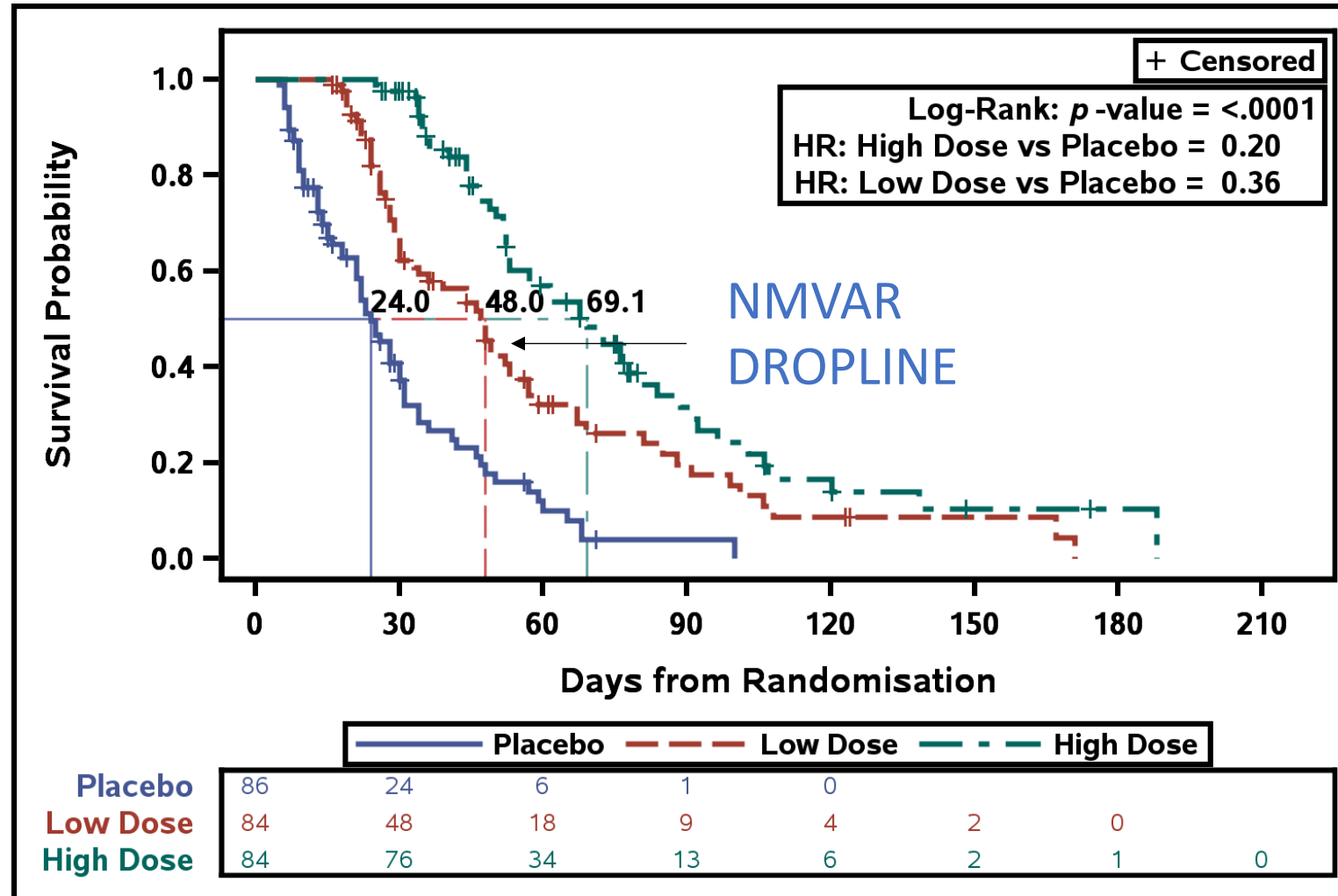
Step 2 – SAS Code

Summary Statistics Table

```
mvar log_rank_pvalue HazardRatio1 HazardRatio2;

layout gridded / columns=2 rows = 3 border = true
    halign = right valign = top outerpad=(top=25px);
    entry halign = right "Log-Rank: "
        textattrs=(style=italic) "p"
        textattrs=(style=normal) "-value = ";
    <Other Entry Statements>
endlayout;
```

Creating Kaplan-Meier Plot – Final Step

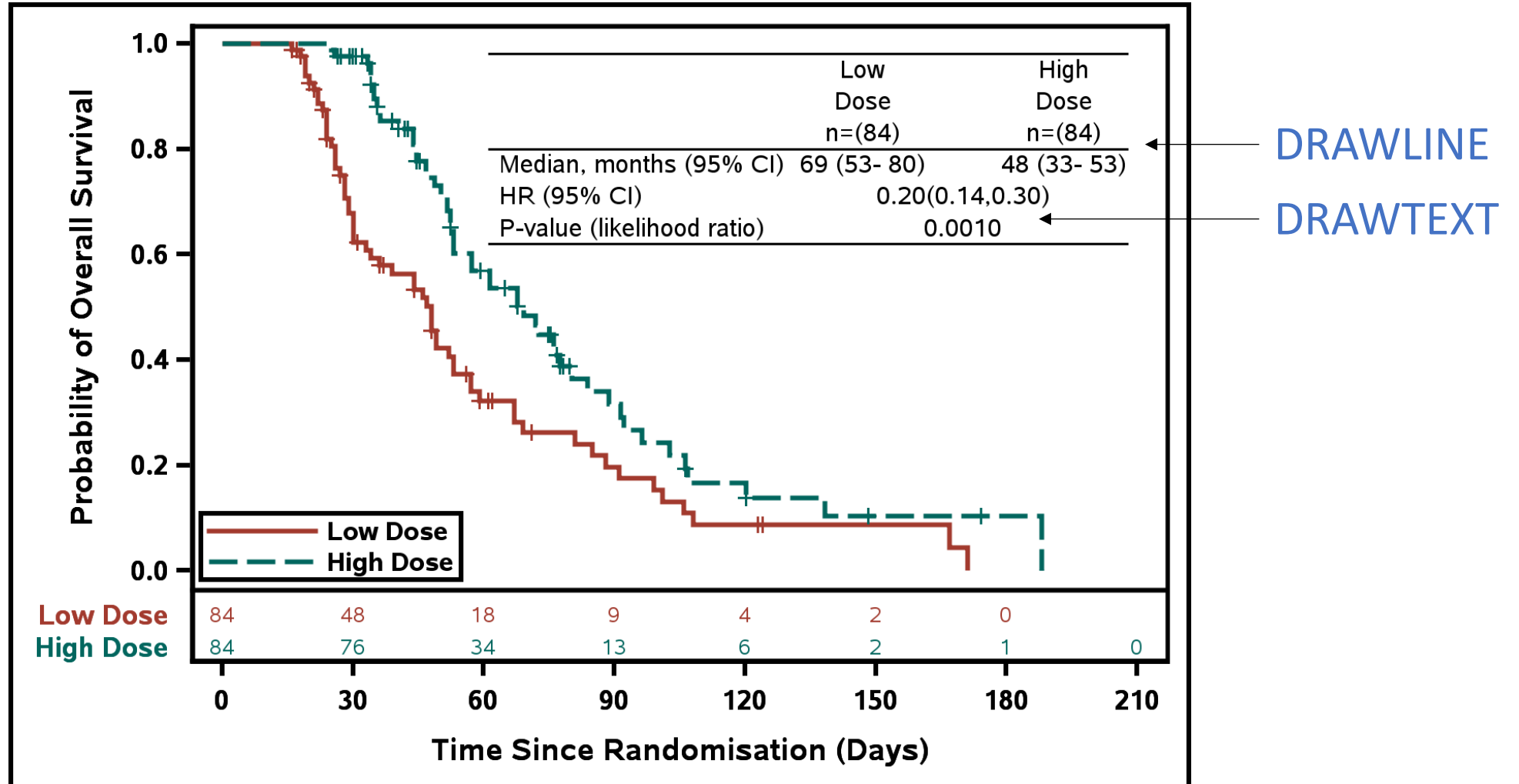


Final Step – SAS Code

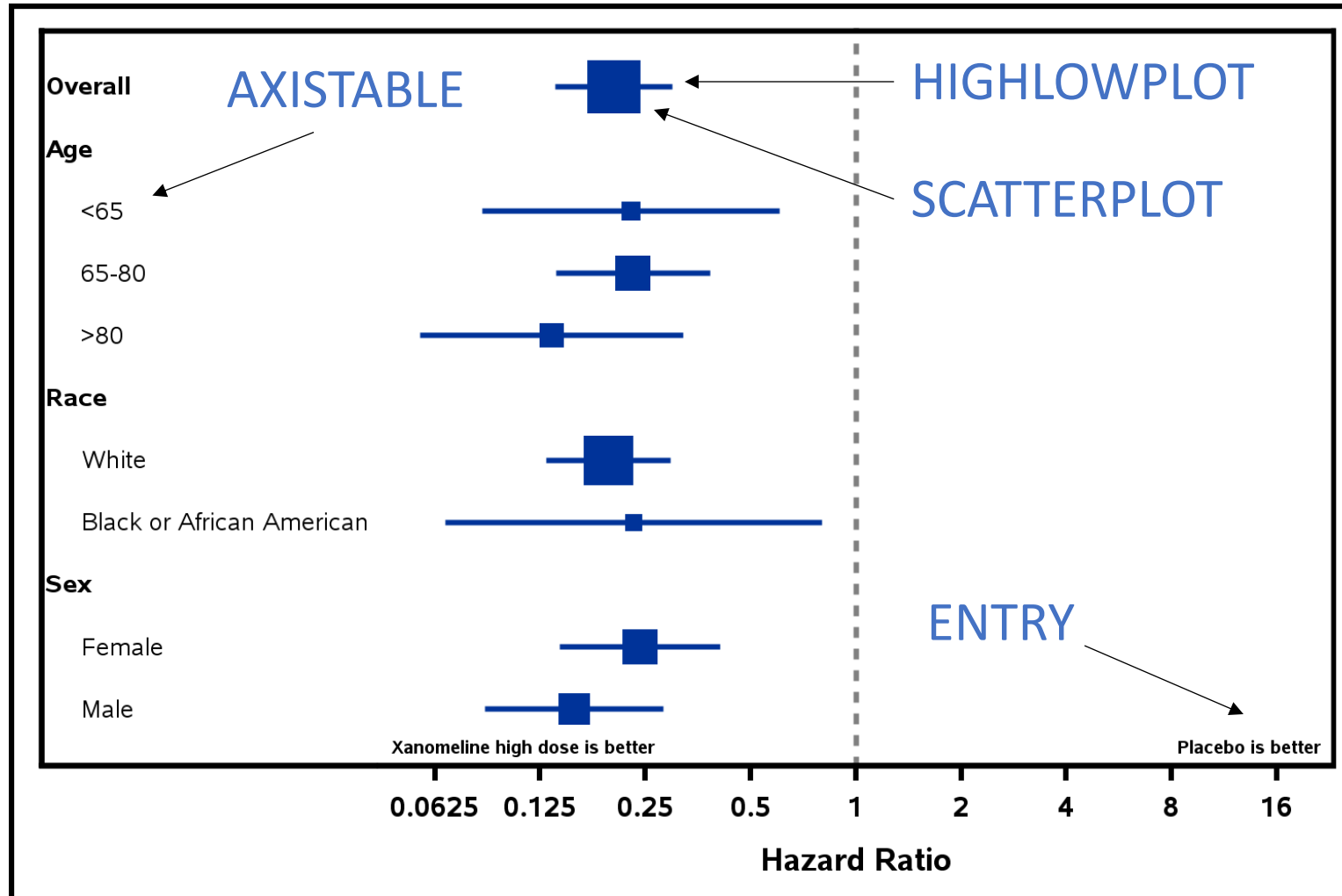
Median Survival Time

```
nmvar MedianSurvival1 MedianSurvival2 MedianSurvival3;  
mvar CMedianSurvival1 CMedianSurvival2 CMedianSurvival3;  
  
%do i = 3 %to 1 %by -1;  
    dropline y = 0.50 x = MedianSurvival&i /  
        dropto = both  
        lineattrs=(thickness=1px  
            color=graphdata&i:color  
            pattern=graphdata&i:linestyle)  
        label=CMedianSurvival&i;  
%end;
```

Creating Kaplan-Meier Plot with Summary Statistics



Creating Forest Plot



SAS Code

Subgroup Headers

```
innermargin / align=left;  
    axistable y = variable value=variable /  
        display=(values)  
        indentweight=indent  
        textgroup=factortext;  
endinnermargin;
```

SAS Code

Hazard Ratio Plot

```
highlowplot y=variable  
    low=WaldLower  
    high=WaldUpper;
```

```
scatterplot y=variable x=HazardRatio /  
    markerattrs=(symbol=squarefilled)  
    sizeresponse=total_n ;
```

SAS Code

Text Statements Related to Placebo

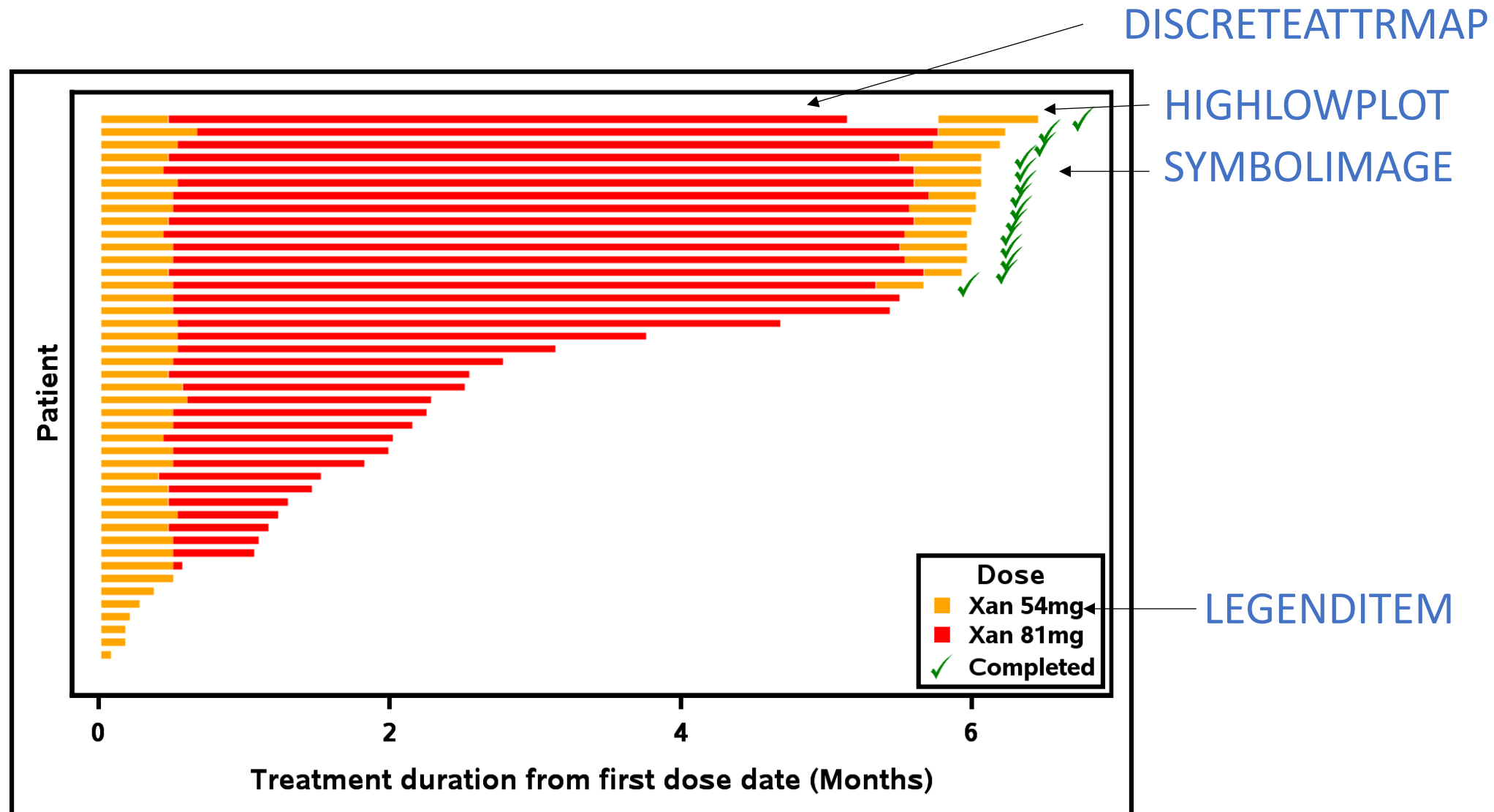
```
layout gridded / Border=false halign=left valign=bottom;  
    entry halign=left "Xanomeline high dose is better" /  
        textattrs=(size=5) ;  
endlayout;
```

```
layout gridded / border=false halign=right  
    valign=bottom;  
    entry halign=left "Placebo is better" /  
        textattrs=(size=5) ;  
endlayout;
```

Creating Forest Plot

- Use PROC PHREG to obtain the hazard ratios. Sometimes you may want to plot the odds ratio, and this can be done with PROC LOGISTIC or PROC GENMOD.
- Calculate the number of subjects in each subgroup. This can be used to display the number of subjects that went into calculating the hazard ratio.
- It is very important to order your data appropriately when creating Forest plots.

Creating Swimmerplot



SAS Code

Attribute Maps

```
discreteattrmap name="Dose_Group";  
    value "54" / fillattrs = (color = orange)  
        lineattrs = (color = orange  
            pattern = solid);  
    value "81" / fillattrs = (color = red)  
        lineattrs = (color = red pattern = solid);  
enddiscreteattrmap;
```

SAS Code

Symbol Image

```
symbolimage name = completed  
image="C:\Kliponious-green-tick.png";
```

```
scatterplot y = number x = eval((max_aendy +  
                                10) / 30.4375) /  
markerattrs = (symbol = completed  
               size = 12px);
```

SAS Code

Legend Items

```
legenditem type = marker name = "54_marker" /  
    markerattrs = (symbol = squarefilled  
                    color = orange)  
    label = "Xan 54mg";
```

<Other Legend Items>

```
discretelegend "54_marker" "81_marker"  
"completed_marker"/ type = marker  
    autoalign = (bottomright)  
    across = 1 location = inside title="Dose";
```

Creating Swimmerplot

- If you are showing exposure, then you can use the ADEX dataset for the swimmer plot.

Conclusions

- It is relatively simple to create Kaplan-Meier plots, forest plots and swimmer plots using SAS.
 - The STEPLOT statement creates the Kaplan-Meier curves
 - The HIGHLOWPLOT statement largely creates the forest plots, and the swimmer plot.