**Bazil LaBomascus Example Code**

**7.18.23**

**EXAMPLE ONE – For Publication:**

Meanht = (ht\_1\_cm + ht\_2\_cm)/**2**;

Heightm = Meanht/**100**;

PPBMI = prepregwt / (Heightm\*\***2**);

/\*creating PP BMI groups\*/

If PPBMI < **30.0** then PPBMIgroup=**0**; else PPBMIgroup=**1**;

If PPBMI < **30.0** then PPBMIgrp2 = **0**;

else If **30.0** <= PPBMI < **35.0** then PPBMIgrp2=**1**;

else if PPBMI > = **35.0** then PPBMIgrp2=**2**;

RateofGWGwk = ((Medrecordlastwt - medrecordfirstwt)/(Medrecordlastwtega - medrecordfirstwtega));

MaternalBMI3rdT = Medrecordlastwt/(Heightm\*\***2**);

/\*creating maternal ferritin groups\*/

If v1labmaternalferritin < **12** then Matfergrpv1 =**0**; else Matfergrpv1 =**1**;

If v3labmaternalferritin < **12** then Matfergrpv3 =**0**; else Matfergrpv3 =**1**;

If v1labmaternalferritin < **20** then Matfergrpv120 =**0**; else Matfergrpv120 =**1**;

If v3labmaternalferritin < **20** then Matfergrpv320 =**0**; else Matfergrpv320 =**1**;

DietaryFe = Food\_Iron\_mg + Supp\_Iron\_\_mg\_;

FoodFeper1000k = Food\_Iron\_mg/( Energy\_kcal/**1000**);

/\*Maternal TBI v1\*/

Tfrchangeunitv1 = v1labmaternaltfr \* **0.0738**;

TfrunitmicroLV1 = TfrchangeunitV1 \* **1000**;

RFratioV1 = TfrunitmicroLV1/ v1labmaternalferritin;

TBIV1 = (- (log10 (RFratioV1) - **2.8229**)/**0.1207**);

/\*Maternal TBI v3\*/

Tfrchangeunitv3 = v3labmaternaltfr \* **0.0738**;

TfrunitmicroLV3 = TfrchangeunitV3 \* **1000**;

RFratioV3 = TfrunitmicroLV3/ v3labmaternalferritin;

TBIV3 = (- (log10 (RFratioV3) - **2.8229**)/**0.1207**);

/\*TBI Cord\*/

Tfrchangeunitbaby = v3labcordtfr \* **0.0738**;

TfrunitmicroLcord = Tfrchangeunitbaby \* **1000**;

RFratiocord = TfrunitmicroLcord/v3labcordferritin;

TBIcord = (- (log10 (RFratiocord) - **2.8229**)/**0.1207**);

Fpntfrproratio = ferroportin/transferrinreceptor;

Fpntfrmrnaratio = qpcrfpn1/ qpcrtfrc;

/\*collapsing sociodemographic vars\*/

If hhq37maritalstatus = **1** then martial = **1**; else if

hhq37maritalstatus = **2** then marital =**1**; else marital = **0**;

If hhq38employmentstatus = **0** then work = **1**; else if

hhq38employmentstatus = **1** then work =**1**; else work = **0**;

If hhq39education < **5** then educ = **0**; else educ =**1**;

If race = **1** then racenew=**1**;

If race =**2** then racenew =**2**;

If race =**3** then racenew =**3**;

If race =**4** then racenew =**3**;

If race =**5** then racenew=**3**;

If medrecorddeliverymode < **6** then delivery = **0**;else delivery=**1**;

/\*obese vs. non-obese and IS and ID groups at V1 and V3\*/

If PPBMIgroup=**0** and Matfergrpv1 = **0** then BMIIRON = **0**;

If PPBMIgroup=**0** and Matfergrpv1 = **1** then BMIIRON =**1**;

If PPBMIgroup=**1** and Matfergrpv1 = **0** then BMIIRON =**2**;

If PPBMIgroup=**1** and Matfergrpv1 = **1** then BMIIRON =**3**;

If PPBMIgroup=**0** and Matfergrpv3 = **0** then BMIIRON2 = **0**;

If PPBMIgroup=**0** and Matfergrpv3 = **1** then BMIIRON2 =**1**;

If PPBMIgroup=**1** and Matfergrpv3 = **0** then BMIIRON2 =**2**;

If PPBMIgroup=**1** and Matfergrpv3 = **1** then BMIIRON2 =**3**;

/\*non-obese obese and extreme obese IS and ID groups at V1 and V3\*/

If PPBMIgrp2 = **0** and Matfergrpv1 = **0** then BMIIRON3=**0**;

If PPBMIgrp2 = **0** and Matfergrpv1 = **1** then BMIIRON3=**1**;

If PPBMIgrp2 = **1** and Matfergrpv1 = **0** then BMIIRON3=**2**;

If PPBMIgrp2 = **1** and Matfergrpv1 = **1** then BMIIRON3=**3**;

If PPBMIgrp2 = **2** and Matfergrpv1 = **0** then BMIIRON3=**4**;

If PPBMIgrp2 = **2** and Matfergrpv1 = **1** then BMIIRON3=**5**;

If PPBMIgrp2 = **0** and Matfergrpv3 = **0** then BMIIRON4=**0**;

If PPBMIgrp2 = **0** and Matfergrpv3 = **1** then BMIIRON4=**1**;

If PPBMIgrp2 = **1** and Matfergrpv3 = **0** then BMIIRON4=**2**;

If PPBMIgrp2 = **1** and Matfergrpv3 = **1** then BMIIRON4=**3**;

If PPBMIgrp2 = **2** and Matfergrpv3 = **0** then BMIIRON4=**4**;

If PPBMIgrp2 = **2** and Matfergrpv3 = **1** then BMIIRON4=**5**;

/\*Smoke variable\*/

If HHq34 = **4** then smoke=**1**; else smoke=**0**;

/\* maternal stfr/log10 ferritin ratio at v1 and v3\*/

stfrferratioV1 = v1labmaternaltfr / (log10(v1labmaternalferritin));

stfrferratioV3 = v3labmaternaltfr / (log10(v3labmaternalferritin));

/\*maternal anemia at v1\*/

If dosing\_hgb < **11.0** then anemia =**1**; else anemia=**0**;

/\*cord ferritin cut-off\*/

If v3labcordferritin < = **34** then cordferrgrp=**1**; else cordferrgrp=**0**;

/\*natural log transformation\*/;

lnPPBMI = log(PPBMI);

lnRateofGWGwk = log(RateofGWGwk + **2**);

lnDietaryFe = log(DietaryFe);

lnFoodFeper1000k = log(FoodFeper1000k);

lnV3labmaternaliron = log(V3labmaternaliron);

lnV3labmaternaltsat = log(V3labmaternaltsat);

lnV3labmaternalferritin = log(V3labmaternalferritin);

lnV1labmaternalferritin = log(V1labmaternalferritin);

lnV3labmaternalhepcidin = log(V3labmaternalhepcidin + **1**);

lnV1labmaternalhepcidin = log(V1labmaternalhepcidin + **1**);

lnPlacentaht = log(Placentaht);

lnTBIV3 = log(TBIV3 + **10**);

lnTBIV1 = log(TBIV1 + **10**);

lnv1labmaternaltfr = log (v1labmaternaltfr);

lnv3labcordferritin = log (v3labcordferritin);

lnv3labcordhepcidin = log (v3labcordhepcidin);

lnv3labcordepo = log (v3labcordepo);

lnv3labcordtfr = log(v3labcordtfr);

lncordbloodhgb1 = log (cordbloodhgb1);

lnv3labmaternalepo = log(v3labmaternalepo);

lnv1labmaternalepo = log(v1labmaternalepo);

lnv3labmaternalil6 = log(v3labmaternalil6 + **1**);

lnv1labmaternalil6 = log(v1labmaternalil6 + **1**);

lnv1labmaternalhscrp = log (v1labmaternalhscrp);

lnmatexcessfe57= log(maternalassumedpercent +**2**);

lncordpercentexcess = log(cordpercentexcess+**2**);

\*\*took the natural log because we wanted it to be more normally distributed

**EXAMPLE TWO:**

libname WB4 "C:\Users\bbrain2\Documents\My SAS Files\BT 505\505";   
   
data WB4.strsurv\_baseline;   
set WB4.strsurv\_baseline;   
   
/\*create the MMSE variable as binary (low/high)\*/   
if MMSE0 le 25 then MMSE=0;   
if MMSE0 gt 25 then MMSE=1;   
   
/\*combine coordinating months and years into date formats\*/   
start=mdy(month0,1,year0);   
 format start mmddyy10.;   
last=mdy(last0,1,lastyr);   
 format last mmddyy10.;   
death=mdy(deathmo,1,deathyr);   
 format death mmddyy10.;   
   
/\*calculate survival time using death date and start date\*/   
survtime=INTCK('MONTH',start,death);   
   
run;   
   
proc contents varnum data=WB4.strsurv\_baseline; run;   
   
/\*Q1-4\*/   
proc lifetest data= WB 4.strsurv\_baseline plots=(s, lls)   
outsurv= WB 4.wb4a; /\*outsurv needs to be a different name since this creates a different dataset\*/   
time survtime\*status (0);   
strata MMSE; /\*this will stratify by MMSE=0 (low) vs MMSE=1 (high)\*/   
run;

proc phreg;

model MMSE0=survtime;

run;

proc phreg;

model MMSE0=dementia survtime;

run;

proc phreg;

model survtime=MMSE0 dementia;

run;

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| --- |
| The SAS System |

The CONTENTS Procedure

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| --- | --- | --- | --- |
| **Data Set Name** | WB4.STRSURV\_BASELINE | **Observations** | 108 |
| **Member Type** | DATA | **Variables** | 15 |
| **Engine** | V9 | **Indexes** | 0 |
| **Created** | 11/05/2018 13:40:47 | **Observation Length** | 120 |
| **Last Modified** | 11/05/2018 13:40:47 | **Deleted Observations** | 0 |
| **Protection** |  | **Compressed** | NO |
| **Data Set Type** |  | **Sorted** | NO |
| **Label** |  |  |  |
| **Data Representation** | WINDOWS\_64 |  |  |
| **Encoding** | wlatin1 Western (Windows) |  |  |

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| --- | --- |
| **Engine/Host Dependent Information** | |
| **Data Set Page Size** | 65536 |
| **Number of Data Set Pages** | 1 |
| **First Data Page** | 1 |
| **Max Obs per Page** | 545 |
| **Obs in First Data Page** | 108 |
| **Number of Data Set Repairs** | 0 |
| **ExtendObsCounter** | YES |
| **Filename** | C:\Users\bbrain2\Documents\My SAS Files\BT 505\505\strsurv\_baseline.sas7bdat |
| **Release Created** | 9.0401M3 |
| **Host Created** | X64\_DSRV12 |

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| --- | --- | --- | --- | --- |
| **Variables in Creation Order** | | | | |
| **#** | **Variable** | **Type** | **Len** | **Format** |
| **1** | dementia | Num | 8 |  |
| **2** | status | Num | 8 |  |
| **3** | lastmo | Num | 8 |  |
| **4** | lastyr | Num | 8 |  |
| **5** | deathmo | Num | 8 |  |
| **6** | deathyr | Num | 8 |  |
| **7** | month0 | Num | 8 |  |
| **8** | year0 | Num | 8 |  |
| **9** | mmse0 | Num | 8 |  |
| **10** | MMSE | Num | 8 |  |
| **11** | start | Num | 8 | MMDDYY10. |
| **12** | last | Num | 8 | MMDDYY10. |
| **13** | last0 | Num | 8 |  |
| **14** | death | Num | 8 | MMDDYY10. |
| **15** | survtime | Num | 8 |  |

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| The SAS System |

The LIFETEST Procedure

Stratum 1: MMSE = 0

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Product-Limit Survival Estimates** | | | | | | |
| **survtime** |  | **Survival** | **Failure** | **Survival Standard**  **Error** | **Number**  **Failed** | **Number**  **Left** |
| **0.0000** |  | 1.0000 | 0 | 0 | 0 | 23 |
| **12.0000** |  | 0.9565 | 0.0435 | 0.0425 | 1 | 22 |
| **13.0000** |  | 0.9130 | 0.0870 | 0.0588 | 2 | 21 |
| **14.0000** |  | 0.8696 | 0.1304 | 0.0702 | 3 | 20 |
| **15.0000** |  | 0.8261 | 0.1739 | 0.0790 | 4 | 19 |
| **17.0000** |  | 0.7826 | 0.2174 | 0.0860 | 5 | 18 |
| **32.0000** |  | . | . | . | 6 | 17 |
| **32.0000** |  | . | . | . | 7 | 16 |
| **32.0000** |  | 0.6522 | 0.3478 | 0.0993 | 8 | 15 |
| **34.0000** |  | 0.6087 | 0.3913 | 0.1018 | 9 | 14 |
| **37.0000** |  | 0.5652 | 0.4348 | 0.1034 | 10 | 13 |
| **38.0000** |  | 0.5217 | 0.4783 | 0.1042 | 11 | 12 |
| **39.0000** |  | 0.4783 | 0.5217 | 0.1042 | 12 | 11 |
| **40.0000** |  | . | . | . | 13 | 10 |
| **40.0000** |  | 0.3913 | 0.6087 | 0.1018 | 14 | 9 |
| **46.0000** |  | 0.3478 | 0.6522 | 0.0993 | 15 | 8 |
| **48.0000** |  | 0.3043 | 0.6957 | 0.0959 | 16 | 7 |
| **51.0000** |  | 0.2609 | 0.7391 | 0.0916 | 17 | 6 |
| **57.0000** |  | . | . | . | 18 | 5 |
| **57.0000** |  | . | . | . | 19 | 4 |
| **57.0000** |  | 0.1304 | 0.8696 | 0.0702 | 20 | 3 |
| **58.0000** |  | 0.0870 | 0.9130 | 0.0588 | 21 | 2 |
| **59.0000** |  | 0.0435 | 0.9565 | 0.0425 | 22 | 1 |
| **61.0000** |  | 0 | 1.0000 | . | 23 | 0 |

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| Summary Statistics for Time Variable survtime |

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| --- | --- | --- | --- | --- |
| **Quartile Estimates** | | | | |
| **Percent** | **Point**  **Estimate** | **95% Confidence Interval** | | |
| **Transform** | **[Lower** | **Upper)** |
| **75** | 57.0000 | LOGLOG | 40.0000 | 58.0000 |
| **50** | 39.0000 | LOGLOG | 32.0000 | 48.0000 |
| **25** | 32.0000 | LOGLOG | 12.0000 | 37.0000 |

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| **Mean** | **Standard**  **Error** |
| 38.6522 | 3.3731 |

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| The SAS System |

The LIFETEST Procedure

Stratum 2: MMSE = 1

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| **Product-Limit Survival Estimates** | | | | | | |
| **survtime** |  | **Survival** | **Failure** | **Survival Standard**  **Error** | **Number**  **Failed** | **Number**  **Left** |
| **0.0000** |  | 1.0000 | 0 | 0 | 0 | 15 |
| **16.0000** |  | 0.9333 | 0.0667 | 0.0644 | 1 | 14 |
| **17.0000** |  | 0.8667 | 0.1333 | 0.0878 | 2 | 13 |
| **24.0000** |  | 0.8000 | 0.2000 | 0.1033 | 3 | 12 |
| **25.0000** |  | 0.7333 | 0.2667 | 0.1142 | 4 | 11 |
| **27.0000** |  | 0.6667 | 0.3333 | 0.1217 | 5 | 10 |
| **32.0000** |  | 0.6000 | 0.4000 | 0.1265 | 6 | 9 |
| **34.0000** |  | 0.5333 | 0.4667 | 0.1288 | 7 | 8 |
| **42.0000** |  | 0.4667 | 0.5333 | 0.1288 | 8 | 7 |
| **45.0000** |  | 0.4000 | 0.6000 | 0.1265 | 9 | 6 |
| **49.0000** |  | 0.3333 | 0.6667 | 0.1217 | 10 | 5 |
| **59.0000** |  | 0.2667 | 0.7333 | 0.1142 | 11 | 4 |
| **60.0000** |  | 0.2000 | 0.8000 | 0.1033 | 12 | 3 |
| **61.0000** |  | 0.1333 | 0.8667 | 0.0878 | 13 | 2 |
| **65.0000** |  | 0.0667 | 0.9333 | 0.0644 | 14 | 1 |
| **66.0000** |  | 0 | 1.0000 | . | 15 | 0 |

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| Summary Statistics for Time Variable survtime |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Quartile Estimates** | | | | |
| **Percent** | **Point**  **Estimate** | **95% Confidence Interval** | | |
| **Transform** | **[Lower** | **Upper)** |
| **75** | 60.0000 | LOGLOG | 42.0000 | 66.0000 |
| **50** | 42.0000 | LOGLOG | 24.0000 | 59.0000 |
| **25** | 25.0000 | LOGLOG | 16.0000 | 34.0000 |

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| **Mean** | **Standard**  **Error** |
| 41.4667 | 4.5959 |

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| **Summary of the Number of Censored and Uncensored Values** | | | | | |
| **Stratum** | **MMSE** | **Total** | **Failed** | **Censored** | **Percent**  **Censored** |
| **1** | **0** | 23 | 23 | 0 | 0.00 |
| **2** | **1** | 15 | 15 | 0 | 0.00 |
| **Total** |  | 38 | 38 | 0 | 0.00 |

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| Note: | 70 observations with invalid time, censoring, or strata values were deleted. |

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| The SAS System |

The LIFETEST Procedure

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| Testing Homogeneity of Survival Curves for survtime over Strata |

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| **Rank Statistics** | | |
| **MMSE** | **Log-Rank** | **Wilcoxon** |
| **0** | 3.6310 | 44.000 |
| **1** | -3.6310 | -44.000 |

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| --- | --- | --- |
| **Covariance Matrix for**  **the Log-Rank Statistics** | | |
| **MMSE** | **0** | **1** |
| **0** | 7.89028 | -7.89028 |
| **1** | -7.89028 | 7.89028 |

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| --- | --- | --- |
| **Covariance Matrix for**  **the Wilcoxon Statistics** | | |
| **MMSE** | **0** | **1** |
| **0** | 4540.52 | -4540.52 |
| **1** | -4540.52 | 4540.52 |

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| --- | --- | --- | --- |
| **Test of Equality over Strata** | | | |
| **Test** | **Chi-Square** | **DF** | **Pr >**  **Chi-Square** |
| **Log-Rank** | 1.6710 | 1 | 0.1961 |
| **Wilcoxon** | 0.4264 | 1 | 0.5138 |
| **-2Log(LR)** | 0.0451 | 1 | 0.8319 |