Biost536_DA project

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```
hospice = read.xlsx("~/Desktop/Biost 536/DA project/hospice with codebook.xlsx")


names(hospice)[names(hospice) == "Enrolled.in.Hospice?"] = "Enrolled.in.Hospice"
names(hospice)[names(hospice) == "Age.at.Metastatic/Locally.Advanced.Diagnosis"] = "Age"
names(hospice)[names(hospice) == "Referred.to.Hospice?"] = "Referred.to.Hospice"
names(hospice)[names(hospice) == "Insurance.Coverage.(Government/Non-Government)"] = "Gover.Insurance"
names(hospice)[names(hospice) == "Insurance,.private.vs.other"] = "Private.Insurance"
names(hospice)[names(hospice) == "Number.of.Prior.Therapies.(Excluding.Radiation)"] = "Number.of.Prior.T
names(hospice)[names(hospice) == "Length.of.Time.from.Initial.Diagnosis.to.Hospice.Enrollment.(Days)"] =
names(hospice)[names(hospice) == "ACP-HCD"] = "ACP_HCD"

table_one = tableby(Enrolled.in.Hospice ~ ., data = hospice)
summary(table_one, title="test")
```

```
##
## Table: test
##
## |                                          |    No (N=87)     |    Yes (N=116)    |   Total (N=203)
## |:-----------------------------------------|:----------------:|:-----------------:|:----------------
## |**X1**                                    |                  |                   |
## |   Mean (SD)               | 103.966 (56.443) | 100.526 (60.615)  | 102.000 (58.745)
## |   Range                   | 2.000 - 203.000  |  1.000 - 202.000  |  1.000 - 203.000
## |**Record.ID**                             |                  |                   |
## |   Mean (SD)               | 103.966 (56.443) | 100.526 (60.615)  | 102.000 (58.745)
## |   Range                   | 2.000 - 203.000  |  1.000 - 202.000  |  1.000 - 203.000
## |**Enrolled.in.a.phase.1**                 |                  |                   |
## |   No                      |    64 (73.6%)    |    75 (64.7%)     |    139 (68.5%)
## |   Yes                     |    23 (26.4%)    |    41 (35.3%)     |    64 (31.5%)
## |**Gender**                                |                  |                   |
## |   Female                  |    33 (37.9%)    |    48 (41.4%)     |    81 (39.9%)
## |   Male                    |    54 (62.1%)    |    68 (58.6%)     |    122 (60.1%)
## |**Ethnicity**                             |                  |                   |
## |   AI/AN/NH/PI             |     5 (5.7%)     |     5 (4.3%)      |     10 (4.9%)
## |   Asian                   |    10 (11.5%)    |    13 (11.2%)     |    23 (11.3%)
## |   Black/AA                |     2 (2.3%)     |     2 (1.7%)      |     4 (2.0%)
## |   Hispanic/Latino         |     1 (1.1%)     |     1 (0.9%)      |     2 (1.0%)
## |   Not Reported            |     8 (9.2%)     |     8 (6.9%)      |     16 (7.9%)
## |   White                   |    61 (70.1%)    |    87 (75.0%)     |    148 (72.9%)
## |**Ethnicity.binary**                      |                  |                   |
## |   Non-White               |    26 (29.9%)    |    29 (25.0%)     |    55 (27.1%)
## |   White                   |    61 (70.1%)    |    87 (75.0%)     |    148 (72.9%)
```

Marital.Status			
Married	58 (66.7%)	72 (62.1%)	130 (64.0%)
Single	28 (32.2%)	43 (37.1%)	71 (35.0%)
Unknown	1 (1.1%)	1 (0.9%)	2 (1.0%)
Gover.Insurance			
Both	35 (40.2%)	45 (38.8%)	80 (39.4%)
Government Aid/Charity	23 (26.4%)	39 (33.6%)	62 (30.5%)
Non-Government Aid	29 (33.3%)	32 (27.6%)	61 (30.0%)
Private.Insurance			
Non-Private	23 (26.4%)	39 (33.6%)	62 (30.5%)
Private	64 (73.6%)	77 (66.4%)	141 (69.5%)
Diagnosis.Simplified			
Head and Neck	22 (25.3%)	32 (27.6%)	54 (26.6%)
Lung Cancer	65 (74.7%)	84 (72.4%)	149 (73.4%)
Cancer.Diagnosis			
HNSCC	19 (21.8%)	26 (22.4%)	45 (22.2%)
NSCLC	49 (56.3%)	71 (61.2%)	120 (59.1%)
Salivary Gland	3 (3.4%)	6 (5.2%)	9 (4.4%)
SCLC	16 (18.4%)	13 (11.2%)	29 (14.3%)
Age			
Mean (SD)	64.816 (10.590)	63.328 (11.350)	63.966 (11.029)
Range	34.000 - 92.000	23.000 - 94.000	23.000 - 94.000
Disease.Stage.at.Metastatic.Diagnosis			
N-Miss	39	41	80
IB	1 (2.1%)	0 (0.0%)	1 (0.8%)
III	0 (0.0%)	1 (1.3%)	1 (0.8%)
IIIA	4 (8.3%)	7 (9.3%)	11 (8.9%)
IIIB	5 (10.4%)	3 (4.0%)	8 (6.5%)
IV	35 (72.9%)	61 (81.3%)	96 (78.0%)
IVA	2 (4.2%)	2 (2.7%)	4 (3.3%)
IVB	1 (2.1%)	1 (1.3%)	2 (1.6%)
Number.of.Prior.Therapies			
Mean (SD)	2.460 (2.150)	2.991 (1.863)	2.764 (2.003)
Range	1.000 - 17.000	0.000 - 9.000	0.000 - 17.000
Lines.of.therapy.(ordinal)			
N-Miss	0	2	2
>3	33 (37.9%)	58 (50.9%)	91 (45.3%)
1	34 (39.1%)	23 (20.2%)	57 (28.4%)
2	20 (23.0%)	33 (28.9%)	53 (26.4%)
Referred.to.Palliative.Care?			
No	35 (40.2%)	30 (25.9%)	65 (32.0%)
Yes	52 (59.8%)	86 (74.1%)	138 (68.0%)
Seen.by.Palliative.Care?			
No	51 (58.6%)	63 (54.3%)	114 (56.2%)
Yes	36 (41.4%)	53 (45.7%)	89 (43.8%)
Was.Hospice.Discussed?			
No	31 (35.6%)	6 (5.2%)	37 (18.2%)
Yes	56 (64.4%)	110 (94.8%)	166 (81.8%)
Referred.to.Hospice			
No	59 (67.8%)	0 (0.0%)	59 (29.1%)
Yes	28 (32.2%)	116 (100.0%)	144 (70.9%)
Length.of.Time.Hospice			
N-Miss	87	5	92
Mean (SD)	NA	821.739 (754.736)	821.739 (754.736)

```
## |   Range                  |        NA        | 16.000 - 4553.000 | 16.000 - 4553.000
## |**Days.on.hospice**                      |                  |                   |
## |   N-Miss                  |        87        |         0         |        87
## |   Mean (SD)              |        NA        |  48.121 (57.121)  |  48.121 (57.121)
## |   Range                  |        NA        |  1.000 - 324.000  |  1.000 - 324.000
## |**ICU.within.30.days**                   |                  |                   |
## |   No                     |    66 (75.9%)    |    113 (97.4%)    |    179 (88.2%)
## |   Yes                    |    21 (24.1%)    |     3 (2.6%)      |    24 (11.8%)
## |**ICU.death**                            |                  |                   |
## |   No                     |    70 (80.5%)    |    115 (99.1%)    |    185 (91.1%)
## |   Yes                    |    17 (19.5%)    |     1 (0.9%)      |     18 (8.9%)
## |**ED.visit**                             |                  |                   |
## |   No                     |    41 (47.1%)    |    89 (76.7%)     |    130 (64.0%)
## |   Yes                    |    46 (52.9%)    |    27 (23.3%)     |    73 (36.0%)
## |**ED.Inpt.Admit**                        |                  |                   |
## |   No                     |    46 (52.9%)    |    93 (80.2%)     |    139 (68.5%)
## |   Yes                    |    41 (47.1%)    |    23 (19.8%)     |    64 (31.5%)
## |**Chemo.within.30**                      |                  |                   |
## |   No                     |    46 (52.9%)    |    99 (85.3%)     |    145 (71.4%)
## |   Yes                    |    41 (47.1%)    |    17 (14.7%)     |    58 (28.6%)
## |**Chemo.within.14**                      |                  |                   |
## |   No                     |    67 (77.0%)    |    113 (97.4%)    |    180 (88.7%)
## |   Yes                    |    20 (23.0%)    |     3 (2.6%)      |    23 (11.3%)
## |**Chemo.within.7**                       |                  |                   |
## |   No                     |    79 (90.8%)    |   116 (100.0%)    |    195 (96.1%)
## |   Yes                    |     8 (9.2%)     |     0 (0.0%)      |     8 (3.9%)
## |**ACP.polst**                            |                  |                   |
## |   No                     |    73 (83.9%)    |    68 (58.6%)     |    141 (69.5%)
## |   Yes                    |    14 (16.1%)    |    48 (41.4%)     |    62 (30.5%)
## |**ACP_POA**                              |                  |                   |
## |   No                     |    62 (71.3%)    |    79 (68.1%)     |    141 (69.5%)
## |   Yes                    |    25 (28.7%)    |    37 (31.9%)     |    62 (30.5%)
## |**ACP_HCD**                              |                  |                   |
## |   No                     |    68 (78.2%)    |    84 (72.4%)     |    152 (74.9%)
## |   Yes                    |    19 (21.8%)    |    32 (27.6%)     |    51 (25.1%)
## |**ACP.on.file**                          |                  |                   |
## |   No                     |    51 (58.6%)    |    41 (35.3%)     |    92 (45.3%)
## |   Yes                    |    36 (41.4%)    |    75 (64.7%)     |    111 (54.7%)
```

```
table1::label(hospice$Enrolled.in.a.phase.1) = "Enrolled in phase 1 clinical trial"
table1::label(hospice$Enrolled.in.Hospice) = "Enrolled in Hospice"
table1::label(hospice$Age) = "Age"
table1::label(hospice$Ethnicity.binary) = "Binary ethnicity"
table1::label(hospice$Gover.Insurance) = "Government Insurance Coverage"
table1::label(hospice$Private.Insurance) = "Private Insurance Coverage"
table1::label(hospice$ACP.polst) = "Advanced care planning POLST form"
table1::label(hospice$ACP_POA) = "Advanced care planning power of attorney"
table1::label(hospice$ACP_HCD) = "Advanced care planning health care directive"
table1::label(hospice$ACP.on.file) = "Advanced care planning information on file"

table1::table1(~Gender+Ethnicity+Ethnicity.binary+Age+Enrolled.in.a.phase.1+Gover.Insurance+Private.Insu
```

```
## [1] "<table class=\"Rtable1\">\n<thead>\n<tr>\n<th class='rowlabel firstrow lastrow'></th>\n<th class
```

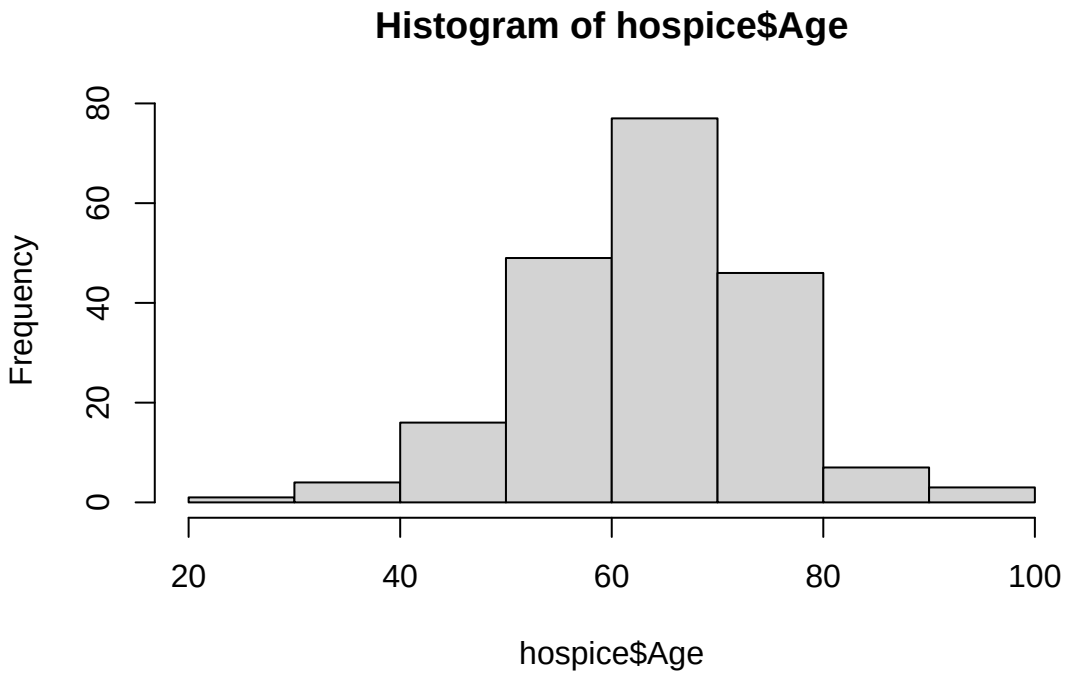
```
#kable(table1, row.names=F)
```

```
table1::label(hospice$Days.on.hospice) = "Days on Hospice"
table1::label(hospice$Referred.to.Hospice) = "Referred to Hospice"
table1::label(hospice$Length.of.Time.Hospice) = "Length of Time in Hospice"
table1::label(hospice$Diagnosis.Simplified) = "Simplified Diagnosis"
table1::label(hospice$Cancer.Diagnosis) = "Cancer Diagnosis"
table1::label(hospice$Number.of.Prior.Therapies) = "Number of Prior non-radiation Therapies"
table1::label(hospice$Disease.Stage.at.Metastatic.Diagnosis) = "Disease Stage"
table1::label(hospice$ICU.within.30.days) = "ICU within 30days"
table1::label(hospice$ICU.death) = "ICU death"
table1::label(hospice$ED.visit) = "ED visit"
table1::label(hospice$Chemo.within.30) = "Chemotherapy within 30days of death"
table1::label(hospice$Chemo.within.14) = "Chemotherapy within 14days of death"
table1::label(hospice$Chemo.within.7) = "Chemotherapy within 7days of death"

table1::table1(~Diagnosis.Simplified+Cancer.Diagnosis+Number.of.Prior.Therapies+Disease.Stage.at.Metasta
```

```
## [1] "<table class=\"Rtable1\">\n<thead>\n<tr>\n<th class='rowlabel firstrow lastrow'></th>\n<th class
```

```
hist(hospice$Age)
```




```
quantile(hospice$Age, 0.25)
```

```
## 25%
##  57
```

```
quantile(hospice$Age, 0.75)
```

```
## 75%
##  71
```

```
hospice$Enrolled.in.Hospice.binary = as.factor(ifelse(hospice$Enrolled.in.Hospice == "No", 0, 1))
hospice$Enrolled.in.a.phase.1.binary = as.factor(ifelse(hospice$Enrolled.in.a.phase.1 == "No", 0, 1))
```

```r
mod1 = glm(Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary*Cancer.Diagnosis + Age + Ethnicity
summary(mod1)
```

```
##
## Call:
## glm(formula = Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary *
##     Cancer.Diagnosis + Age + Ethnicity, family = binomial, data = hospice)
##
## Deviance Residuals:
##    Min      1Q  Median      3Q     Max
## -1.903  -1.219   0.725   1.101   1.404
##
## Coefficients:
##                                                          Estimate
## (Intercept)                                               1.2346
## Enrolled.in.a.phase.1.binary1                            -0.5367
## Cancer.DiagnosisNSCLC                                    -0.5144
## Cancer.DiagnosisSalivary Gland                            0.8705
## Cancer.DiagnosisSCLC                                     -0.9432
## Age                                                      -0.0108
## EthnicityAsian                                           -0.0279
## EthnicityBlack/AA                                        -0.0922
## EthnicityHispanic/Latino                                 -0.4194
## EthnicityNot Reported                                    -0.2652
## EthnicityWhite                                            0.1764
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisNSCLC       1.5358
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisSalivary Gland  -1.7524
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisSCLC        1.3700
##                                                          Std. Error z value
## (Intercept)                                                  1.2013    1.03
## Enrolled.in.a.phase.1.binary1                                0.6232   -0.86
## Cancer.DiagnosisNSCLC                                        0.5376   -0.96
## Cancer.DiagnosisSalivary Gland                               1.2102    0.72
## Cancer.DiagnosisSCLC                                         0.6338   -1.49
## Age                                                          0.0145   -0.75
## EthnicityAsian                                               0.8029   -0.03
## EthnicityBlack/AA                                            1.2211   -0.08
## EthnicityHispanic/Latino                                     1.5887   -0.26
## EthnicityNot Reported                                        0.8477   -0.31
## EthnicityWhite                                               0.6824    0.26
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisNSCLC          0.7787    1.97
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisSalivary Gland  1.7761   -0.99
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisSCLC           1.4528    0.94
##                                                          Pr(>|z|)
## (Intercept)                                                 0.304
## Enrolled.in.a.phase.1.binary1                               0.389
## Cancer.DiagnosisNSCLC                                       0.339
## Cancer.DiagnosisSalivary Gland                              0.472
## Cancer.DiagnosisSCLC                                        0.137
## Age                                                         0.455
## EthnicityAsian                                              0.972
## EthnicityBlack/AA                                           0.940
## EthnicityHispanic/Latino                                    0.792
## EthnicityNot Reported                                       0.754
```

```
## EthnicityWhite                                                  0.796
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisNSCLC             0.049 *
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisSalivary Gland    0.324
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisSCLC              0.346
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 277.26  on 202  degrees of freedom
## Residual deviance: 264.60  on 189  degrees of freedom
## AIC: 292.6
##
## Number of Fisher Scoring iterations: 4
```

```
or1 = round(exp(coef(mod1)), 2)
orci1 = round(exp(suppressMessages(confint(mod1))), 2)
cbind(OR = or1, orci1)
```

```
##                                                   OR 2.5 % 97.5 %
## (Intercept)                                     3.44  0.33  37.88
## Enrolled.in.a.phase.1.binary1                   0.58  0.17   1.96
## Cancer.DiagnosisNSCLC                           0.60  0.20   1.68
## Cancer.DiagnosisSalivary Gland                  2.39  0.29  51.67
## Cancer.DiagnosisSCLC                            0.39  0.11   1.32
## Age                                             0.99  0.96   1.02
## EthnicityAsian                                  0.97  0.20   4.83
## EthnicityBlack/AA                               0.91  0.08  11.02
## EthnicityHispanic/Latino                        0.66  0.02  21.12
## EthnicityNot Reported                           0.77  0.14   4.13
## EthnicityWhite                                  1.19  0.30   4.73
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisNSCLC          4.64  1.03  22.20
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisSalivary Gland 0.17  0.00   4.66
## Enrolled.in.a.phase.1.binary1:Cancer.DiagnosisSCLC           3.94  0.24 112.64
```

```
mod2 = glm(Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary*Diagnosis.Simplified + Age + Ethni
summary(mod2)
```

```
##
## Call:
## glm(formula = Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary *
##     Diagnosis.Simplified + Age + Ethnicity, family = binomial,
##     data = hospice)
##
## Deviance Residuals:
##    Min      1Q  Median      3Q     Max
## -1.724  -1.194   0.753   1.135   1.344
##
## Coefficients:
##                                                  Estimate
## (Intercept)                                       1.2730
## Enrolled.in.a.phase.1.binary1                    -0.7874
## Diagnosis.SimplifiedLung Cancer                  -0.7904
## Age                                              -0.0105
## EthnicityAsian                                    0.2042
```

```
## EthnicityBlack/AA                                                  0.1260
## EthnicityHispanic/Latino                                          -0.3495
## EthnicityNot Reported                                             -0.1984
## EthnicityWhite                                                     0.2803
## Enrolled.in.a.phase.1.binary1:Diagnosis.SimplifiedLung Cancer      1.8415
##                                                                 Std. Error
## (Intercept)                                                        1.1448
## Enrolled.in.a.phase.1.binary1                                      0.5753
## Diagnosis.SimplifiedLung Cancer                                    0.4828
## Age                                                                0.0141
## EthnicityAsian                                                     0.7770
## EthnicityBlack/AA                                                  1.2023
## EthnicityHispanic/Latino                                           1.5806
## EthnicityNot Reported                                              0.8322
## EthnicityWhite                                                     0.6705
## Enrolled.in.a.phase.1.binary1:Diagnosis.SimplifiedLung Cancer      0.7183
##                                                                 z value Pr(>|z|)
## (Intercept)                                                        1.11     0.27
## Enrolled.in.a.phase.1.binary1                                     -1.37     0.17
## Diagnosis.SimplifiedLung Cancer                                   -1.64     0.10
## Age                                                               -0.74     0.46
## EthnicityAsian                                                     0.26     0.79
## EthnicityBlack/AA                                                  0.10     0.92
## EthnicityHispanic/Latino                                          -0.22     0.83
## EthnicityNot Reported                                             -0.24     0.81
## EthnicityWhite                                                     0.42     0.68
## Enrolled.in.a.phase.1.binary1:Diagnosis.SimplifiedLung Cancer      2.56     0.01
##
## (Intercept)
## Enrolled.in.a.phase.1.binary1
## Diagnosis.SimplifiedLung Cancer
## Age
## EthnicityAsian
## EthnicityBlack/AA
## EthnicityHispanic/Latino
## EthnicityNot Reported
## EthnicityWhite
## Enrolled.in.a.phase.1.binary1:Diagnosis.SimplifiedLung Cancer *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 277.26  on 202  degrees of freedom
## Residual deviance: 266.67  on 193  degrees of freedom
## AIC: 286.7
##
## Number of Fisher Scoring iterations: 4
```

```
or2 = round(exp(coef(mod2)), 2)
orci2 = round(exp(suppressMessages(confint(mod2))), 2)
cbind(OR = or2, orci2)
```

```
##                                                                OR 2.5 % 97.5 %
## (Intercept)                                                 3.57  0.38  35.25
```

```
## Enrolled.in.a.phase.1.binary1                                    0.46  0.14   1.38
## Diagnosis.SimplifiedLung Cancer                                  0.45  0.17   1.14
## Age                                                              0.99  0.96   1.02
## EthnicityAsian                                                   1.23  0.26   5.79
## EthnicityBlack/AA                                                1.13  0.10  13.27
## EthnicityHispanic/Latino                                         0.71  0.02  22.44
## EthnicityNot Reported                                            0.82  0.16   4.28
## EthnicityWhite                                                   1.32  0.34   5.11
## Enrolled.in.a.phase.1.binary1:Diagnosis.SimplifiedLung Cancer 6.31  1.58  26.70
```

```
null_model1 = glm(Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary + Cancer.Diagnosis + Age + E
lrtest(mod1, null_model1)
```

```
## Likelihood ratio test
##
## Model 1: Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary * Cancer.Diagnosis +
##     Age + Ethnicity
## Model 2: Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary + Cancer.Diagnosis +
##     Age + Ethnicity
##   #Df LogLik Df Chisq Pr(>Chisq)
## 1  14   -132
## 2  11   -136 -3  7.21      0.066 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
null_model2 = glm(Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary + Diagnosis.Simplified + Age
lrtest(mod2, null_model2)
```

```
## Likelihood ratio test
##
## Model 1: Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary * Diagnosis.Simplified +
##     Age + Ethnicity
## Model 2: Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary + Diagnosis.Simplified +
##     Age + Ethnicity
##   #Df LogLik Df Chisq Pr(>Chisq)
## 1  10   -133
## 2   9   -137 -1  6.84     0.0089 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
mod3 = glm(Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary + Cancer.Diagnosis + Age + Ethnicit
summary(mod3)
```

```
##
## Call:
## glm(formula = Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary +
##     Cancer.Diagnosis + Age + Ethnicity, family = binomial, data = hospice)
##
## Deviance Residuals:
##    Min      1Q  Median      3Q     Max
## -1.584  -1.288   0.891   1.048   1.381
##
## Coefficients:
##                                Estimate Std. Error z value Pr(>|z|)
## (Intercept)                      0.7050     1.1263    0.63     0.53
## Enrolled.in.a.phase.1.binary1    0.3655     0.3372    1.08     0.28
```

```
## Cancer.DiagnosisNSCLC            0.1385     0.3874    0.36     0.72
## Cancer.DiagnosisSalivary Gland   0.3437     0.7912    0.43     0.66
## Cancer.DiagnosisSCLC            -0.3979     0.5216   -0.76     0.45
## Age                             -0.0111     0.0141   -0.79     0.43
## EthnicityAsian                   0.0178     0.7939    0.02     0.98
## EthnicityBlack/AA               -0.1976     1.2188   -0.16     0.87
## EthnicityHispanic/Latino        -0.3253     1.6214   -0.20     0.84
## EthnicityNot Reported           -0.2945     0.8346   -0.35     0.72
## EthnicityWhite                   0.2393     0.6761    0.35     0.72
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 277.26  on 202  degrees of freedom
## Residual deviance: 271.81  on 192  degrees of freedom
## AIC: 293.8
##
## Number of Fisher Scoring iterations: 4
```

```
or3 = round(exp(coef(mod3)), 2)
orci3 = round(exp(suppressMessages(confint(mod3))), 2)
cbind(OR = or3, orci3)
```

```
##                                 OR 2.5 % 97.5 %
## (Intercept)                   2.02  0.22  19.14
## Enrolled.in.a.phase.1.binary1  1.44  0.75   2.82
## Cancer.DiagnosisNSCLC          1.15  0.53   2.45
## Cancer.DiagnosisSalivary Gland 1.41  0.31   7.62
## Cancer.DiagnosisSCLC           0.67  0.24   1.86
## Age                            0.99  0.96   1.02
## EthnicityAsian                 1.02  0.21   4.94
## EthnicityBlack/AA              0.82  0.07   9.86
## EthnicityHispanic/Latino       0.72  0.02  24.17
## EthnicityNot Reported          0.74  0.14   3.89
## EthnicityWhite                 1.27  0.33   4.94
```

```
mod4 = glm(Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary + Diagnosis.Simplified + Age + Eth
summary(mod4)
```

```
##
## Call:
## glm(formula = Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary +
##     Diagnosis.Simplified + Age + Ethnicity, family = binomial,
##     data = hospice)
##
## Deviance Residuals:
##    Min      1Q  Median      3Q     Max
## -1.579  -1.261   0.902   1.079   1.348
##
## Coefficients:
##                                Estimate Std. Error z value Pr(>|z|)
## (Intercept)                      0.6431     1.0913    0.59     0.56
## Enrolled.in.a.phase.1.binary1    0.4048     0.3309    1.22     0.22
## Diagnosis.SimplifiedLung Cancer -0.0147     0.3553   -0.04     0.97
## Age                             -0.0120     0.0139   -0.86     0.39
## EthnicityAsian                   0.2674     0.7681    0.35     0.73
```

```
## EthnicityBlack/AA                 0.0680     1.1989    0.06     0.95
## EthnicityHispanic/Latino         -0.2392     1.6200   -0.15     0.88
## EthnicityNot Reported            -0.1466     0.8222   -0.18     0.86
## EthnicityWhite                    0.3888     0.6627    0.59     0.56
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 277.26  on 202  degrees of freedom
## Residual deviance: 273.51  on 194  degrees of freedom
## AIC: 291.5
##
## Number of Fisher Scoring iterations: 4
```

```
or4 = round(exp(coef(mod4)), 2)
orci4 = round(exp(suppressMessages(confint(mod4))), 2)
cbind(OR = or4, orci4)
```

```
##                                  OR 2.5 % 97.5 %
## (Intercept)                    1.90  0.22  16.72
## Enrolled.in.a.phase.1.binary1  1.50  0.79   2.90
## Diagnosis.SimplifiedLung Cancer 0.99  0.49   1.97
## Age                            0.99  0.96   1.02
## EthnicityAsian                 1.31  0.28   6.07
## EthnicityBlack/AA              1.07  0.09  12.45
## EthnicityHispanic/Latino       0.79  0.02  26.30
## EthnicityNot Reported          0.86  0.17   4.41
## EthnicityWhite                 1.48  0.39   5.61
```

```
mod5 = glm(Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary + Diagnosis.Simplified + Age + Eth
summary(mod5)
```

```
##
## Call:
## glm(formula = Enrolled.in.Hospice.binary ~ Enrolled.in.a.phase.1.binary +
##     Diagnosis.Simplified + Age + Ethnicity.binary, family = binomial,
##     data = hospice)
##
## Deviance Residuals:
##    Min      1Q  Median      3Q     Max
## -1.504  -1.272   0.912   1.073   1.261
##
## Coefficients:
##                                Estimate Std. Error z value Pr(>|z|)
## (Intercept)                      0.6930     0.8950    0.77     0.44
## Enrolled.in.a.phase.1.binary1    0.3839     0.3264    1.18     0.24
## Diagnosis.SimplifiedLung Cancer  0.0193     0.3465    0.06     0.96
## Age                             -0.0120     0.0138   -0.87     0.39
## Ethnicity.binaryWhite            0.3176     0.3276    0.97     0.33
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 277.26  on 202  degrees of freedom
## Residual deviance: 273.95  on 198  degrees of freedom
## AIC: 284
##
```

```
## Number of Fisher Scoring iterations: 4
```

```
or5 = round(exp(coef(mod5)), 2)
orci5 = round(exp(suppressMessages(confint(mod5))), 2)
cbind(OR = or5, orci5)
```

```
##                                   OR 2.5 % 97.5 %
## (Intercept)                     2.00  0.35  11.90
## Enrolled.in.a.phase.1.binary1   1.47  0.78   2.81
## Diagnosis.SimplifiedLung Cancer 1.02  0.51   2.01
## Age                             0.99  0.96   1.02
## Ethnicity.binaryWhite           1.37  0.72   2.62
```