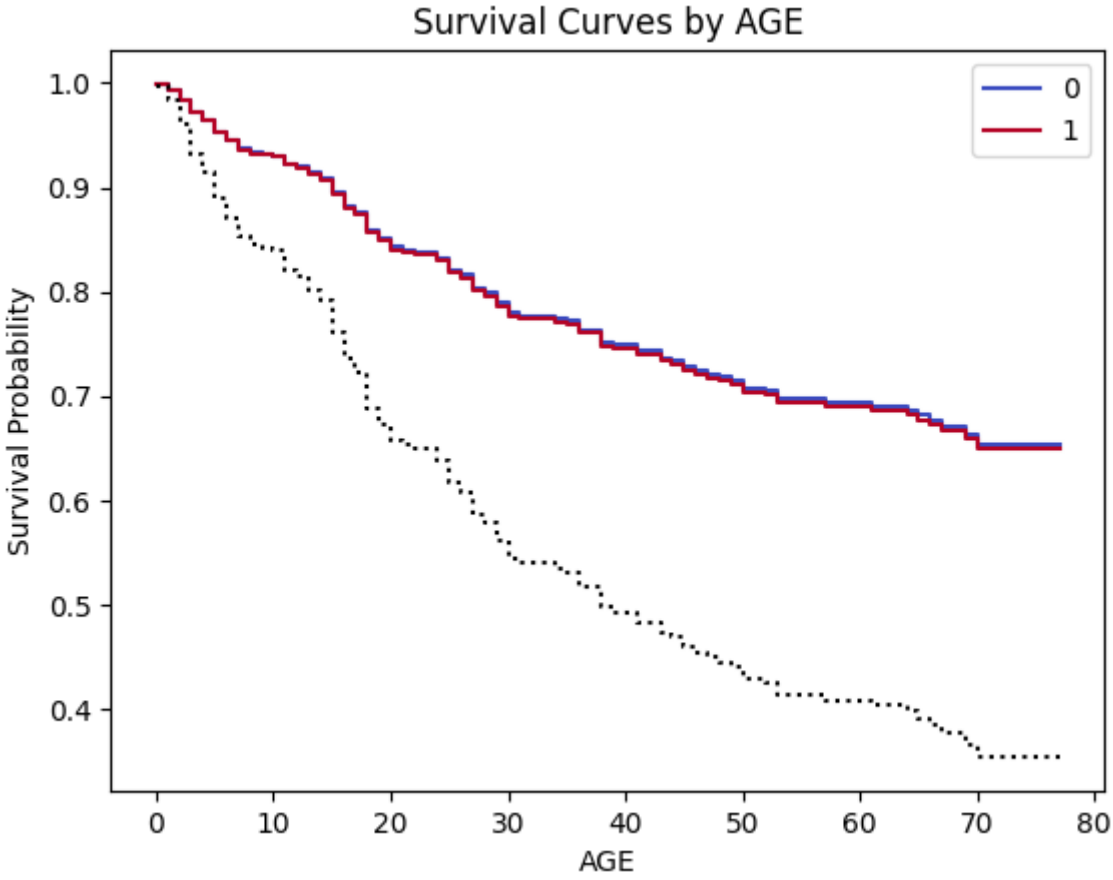
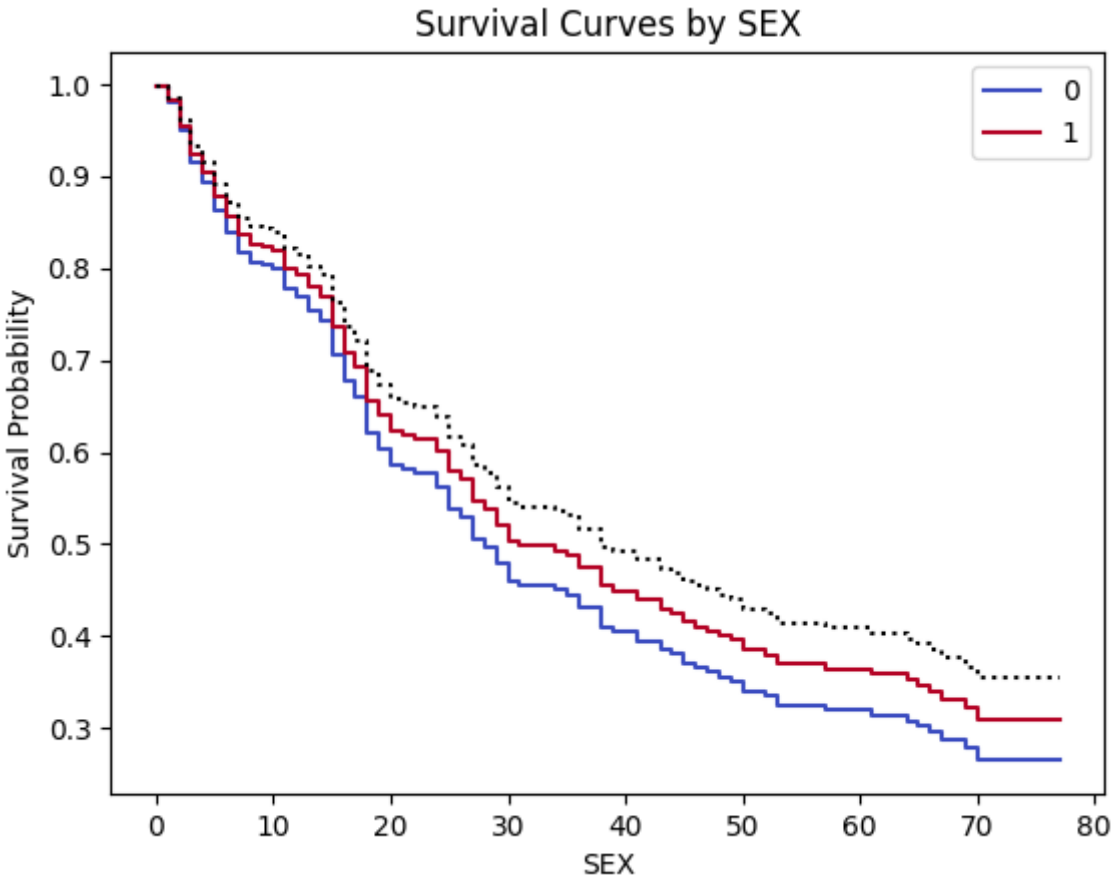
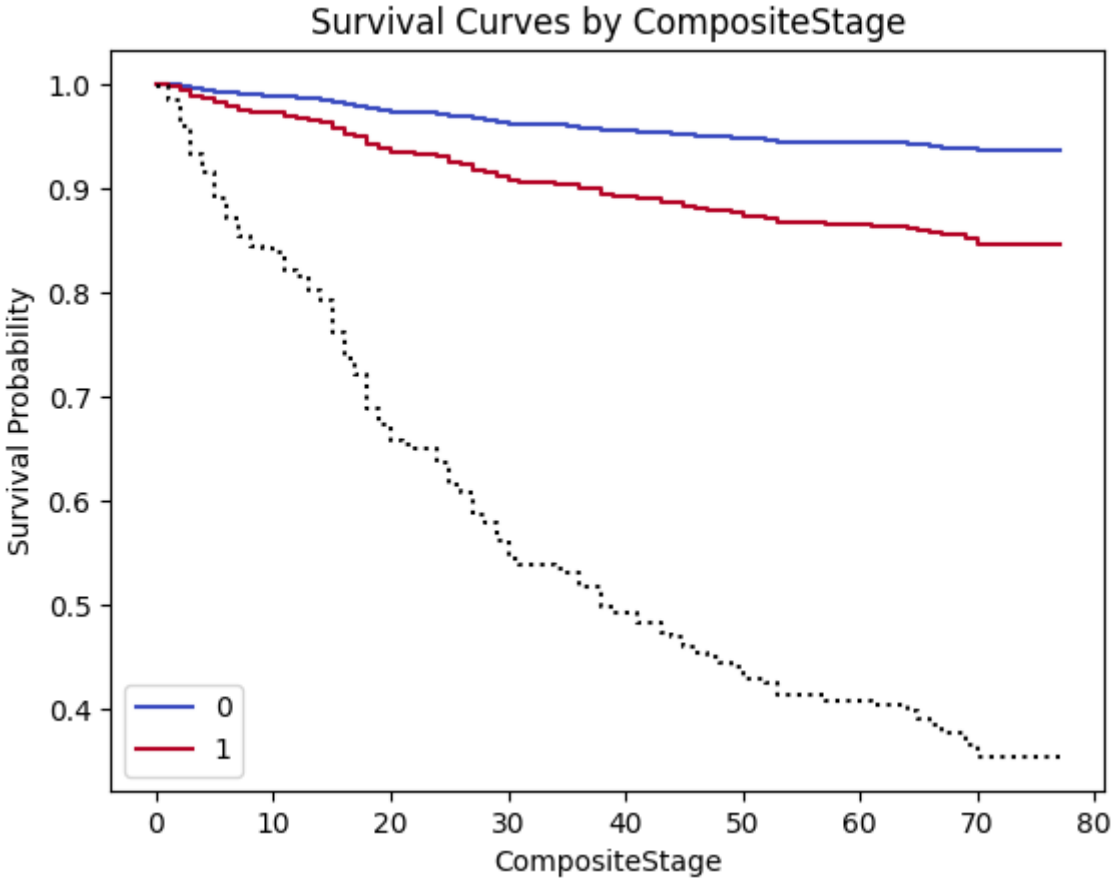
In [7]:

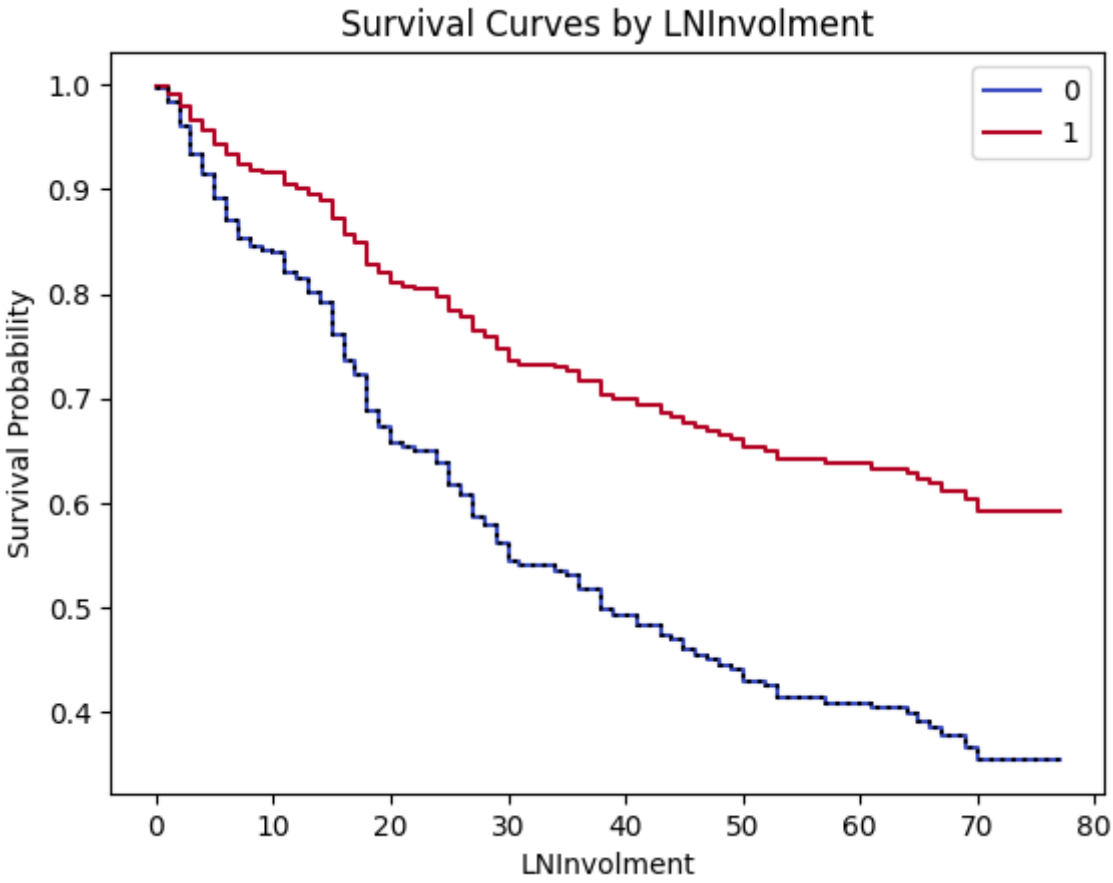
```
import pandas as pd
import numpy as np
from lifelines import CoxPHFitter
import matplotlib.pyplot as plt

# Load the data from the Excel file
data = pd.read_excel('data1.xlsx')

# Create a new instance of the CoxPHFitter class
cph = CoxPHFitter()

# Fit the Cox Proportional Hazard model to the data
cph.fit(data, duration_col='Months', event_col='DEATH')
n = len(data)
llf = cph.log_likelihood_
k = cph.params_.shape[0]
aic = -2 * llf + 2 * k
bic = -2 * llf + k * np.log(n)

# Print AIC and BIC
print("AIC:", aic)
print("BIC:", bic)
# Plot the survival curves for different covariate values
covariates_to_plot = ['AGE', 'SEX', 'CompositeStage', 'LNInvolment', 'Comorbidit
for covariate in covariates_to_plot:
    cph.plot_partial_effects_on_outcome(covariates=covariate, values=[0, 1], cma
    plt.xlabel(covariate)
    plt.ylabel('Survival Probability')
    plt.title('Survival Curves by ' + covariate)
    plt.legend(['0', '1'])
    plt.show()
```

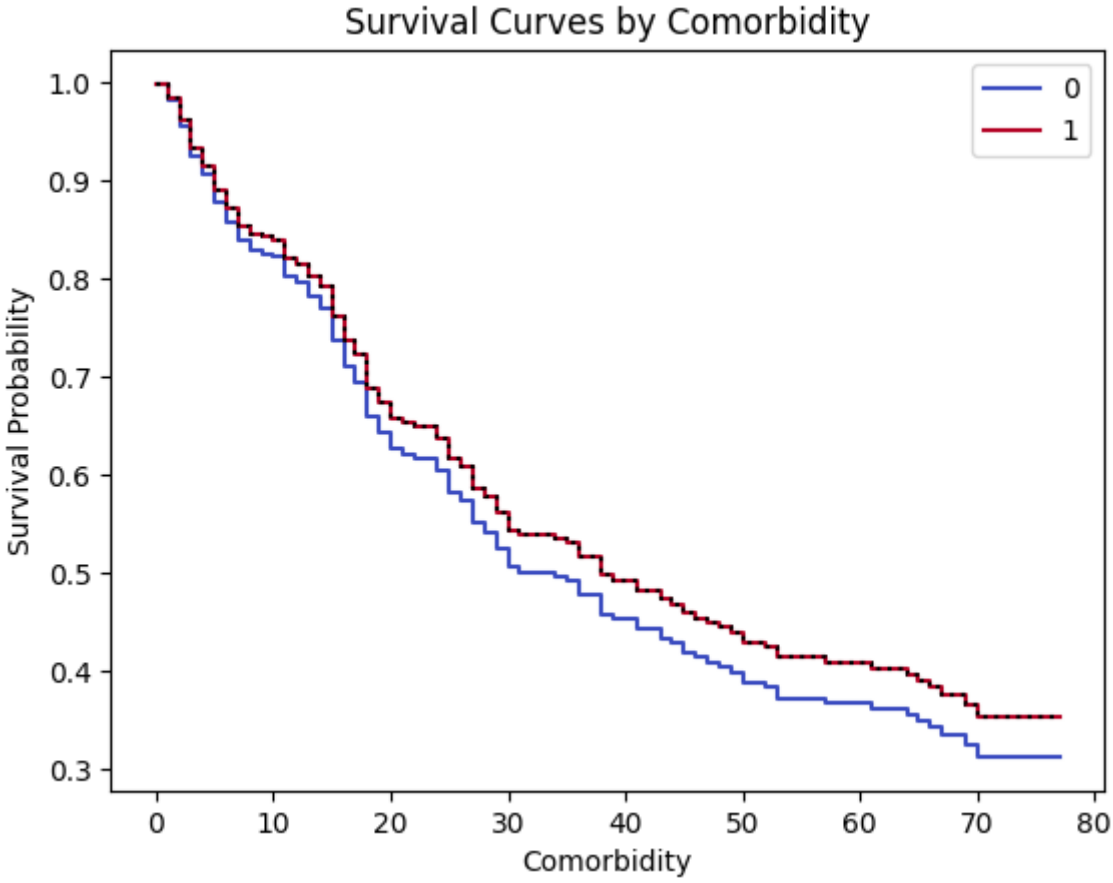
```
AIC: 1769.942369337933
BIC: 1796.8064824680946
```

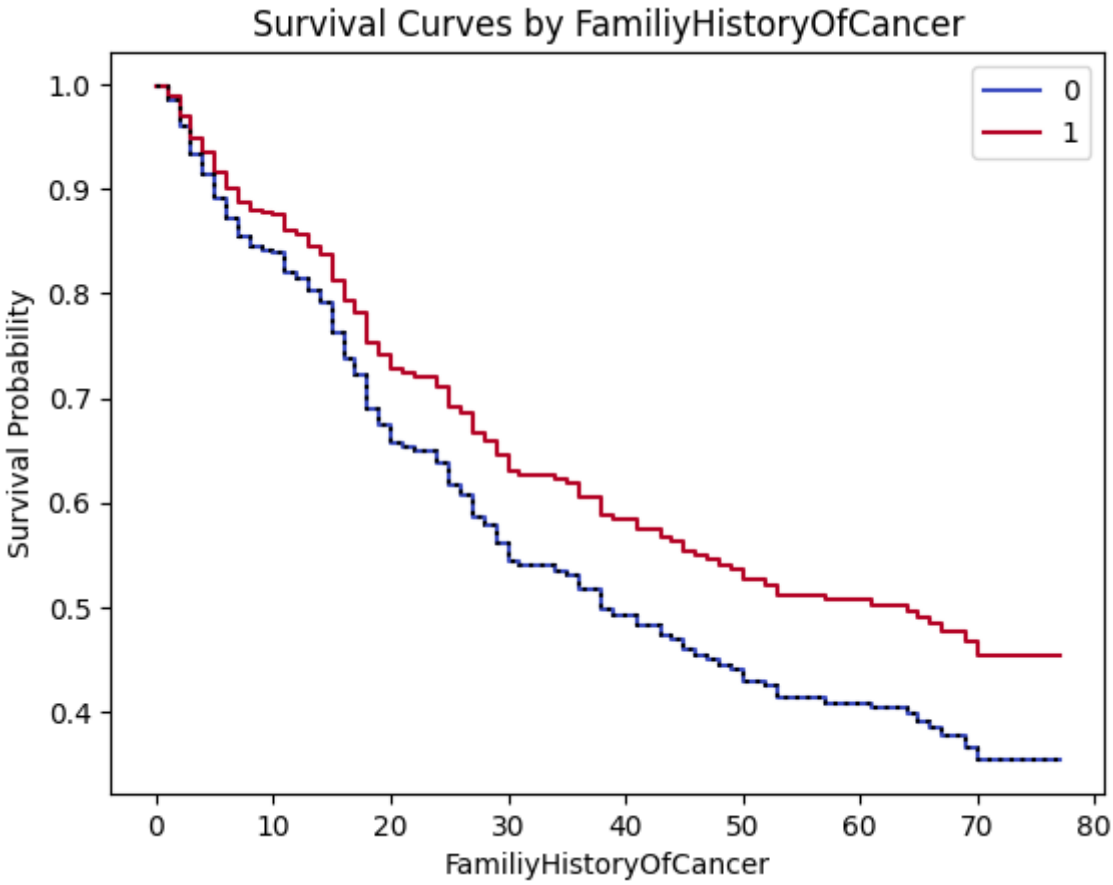

Survival Curves by AGE
Survival Probability
AGE
0
1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0
10
20
30
40
50
60
70
80


Survival Curves by SEX
Survival Probability
SEX
0
1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0
10
20
30
40
50
60
70
80


Survival Curves by CompositeStage
Survival Probability
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0
1
0
10
20
30
40
50
60
70
80
CompositeStage


Survival Curves by LNInvolment
Survival Probability
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0
1
0
10
20
30
40
50
60
70
80
LNInvolment


Survival Curves by Comorbidity
Survival Probability
Comorbidity
0
1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0
10
20
30
40
50
60
70
80


Survival Curves by FamiliyHistoryOfCancer
Survival Probability
FamiliyHistoryOfCancer
0
1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0
10
20
30
40
50
60
70
80

In [ ]: