**Q1.** Among subjects that who did not have an observed death during the study, the earliest censoring time was 5.002 years. For this reason, it is valid to dichotomize subjects based on whether or not they achieved 5-year survival, since no observations were censored prior to 5 years.

**Observation time in years among those who did not have an observed death (N=602)**

|  |  |  |  |
| --- | --- | --- | --- |
| Mean  | Std. Dev. | Min | Max |
| 5.327 | 0.297 | 5.002 | 5.911 |

**Q2.**

**Table 1. Descriptive Statistics (N=735)**

|  |  |  |
| --- | --- | --- |
|  | **Not High LDL (<160), N=618** | **High LDL (≥160), N=117** |
| **Variable** | **Mean (stdev)\*** | **Median** | **25th, 75th %****Percentile** | **Mean (stdev)\*** | **Median** | **25th, 75th %****Percentile** |
| Age (years) | 74.5 (5.4) | 73 | 71, 78 | 74.84 (5.78) | 74 | 70, 78 |
| Weight (lbs) | 159.4 (30.8) | 158 | 138, 178 | 163.09 (30.45) | 158 | 143, 182 |
| LDL (mg/dl)\*\* | 116.4 (25.7) | 118 | 98, 137 | 180.36 (18.26) | 175 | 166, 188 |
| Pack years (among smokers) | 35.2 (28.5) | 30.8 | 14.5, 48 | 32.783 (24.18) | 26.75 | 14.92, 50 |
| Smokers, n (%) | 349 (56.47) | - | - | 64 (54.70) | - | - |
| Male sex, n (%)  | 315 (50.97) | - | - |  51 (43.59) | - | - |
| CHD (prior to MRI), n (%) None Diagnosis of angina Diagnosis of MI | 488 (78.96)54 (8.74)76 (12.30) | - | - |  92 (78.63)10 (8.55) 15 (12.82) | - | - |
| CHF (prior to MRI), n (%) | 37 (5.99) | - | - |  4 (3.42) | - | - |
| Stroke (prior to MRI), n (%) None Transient Ischemic Attack Stroke diagnosis | 541 (87.54)18 (2.91)59 (9.55) | - | - |  95 (81.20) 6 (5.13)16 (13.68) | - | - |
| Survival to 5 years, n (%) | 513 (83.01) | - | - | 101 (86.32) | - | - |

**\***Mean and standard deviation for continuous variables, n (%) for binary and categorical variables.

\*\*LDL (low density lipoprotein cholesterol) information is missing for 10 subjects with High LDL.

\*\*\*CHD: coronary heart disease; CHF: congestive heart failure; MI: myocardial infarction

**Q3.**  A 2-sided t-test assuming unequal variance was performed comparing the mean LDL (low-density lipoprotein cholesterol) between those who survived (n=606) and who did not survive (n=119) to 5 years from study entry. The mean LDL level was 119 mg/dlfor those who did not survive to 5 years, and 127 mg/dl for those who survived to 5 years or longer. This was a difference of 8.5 mg/dl (95% CI: 1.44, 15.56 mg/dl; P=0.0186). From these results, we can reject the null that there is no difference in mean LDL between those who did and those who did not survive to 5 years. We observe a higher mean LDL in those who survive longer than 5 years compared to those who do not survive to 5 years.

**Q4.** A 2-sided t-test assuming unequal variance was performed comparing the geometric mean LDL (low-density lipoprotein cholesterol) between those who survived (n=606) and who did not survive (n=119) to 5 years from study entry. The geometric mean LDL among those who died within 5 years was 112 mg/dl, and was 123 mg/dl among those who survived at least 5 years. Comparing the geometric means showed that those who survived to 5 years had a 9.7% higher geometric mean LDL than those who did not survive to year 5 (95% CI: 2%, 18%, P=0.0128). From these results, we can reject the null that there is no difference in mean LDL between those who survived and those who did not survive to year 5. We observe a higher geometric mean LDL in those who survived longer than 5 years compared to those who did not survive to 5 years.

**Q5.** A chi-squared test was performed comparing those who survived and who did not survive to 5 years by whether or not they had high a LDL level (≥160 mg/dl). 14% of those with high LDL, and 17% of those without high LDL, did not survive to 5 years. The difference in risk of dying with within 5 years is 3% lower among those with high LDL compared to those without high LDL (95% CI: 1%, 4%; P=0.3753). However, there is insufficient evidence to reject the null that there is no difference in the risk of dying within 5 years between those with and without high LDL, and we therefore fail to reject the null of no association between high LDL and survival

**Q6.** A chi-squared test comparing the odds of those who survived and who did not survive to 5 years by whether or not they had high LDL (≥160 mg/dl). The odds of not surviving to 5 years among those who had high LDL was 0.77 (95% CI: 0.44, 1.36; P=0.3753) times the odds among those who did not have high LDL. However, there is insufficient evidence to reject the null that there is no association between high LDL and 5 year survival.

**Q7.**  Cox proportional hazards regression was performed comparing the survival curves of those with and without high LDL (≥160 mg/dl). The results were a hazard ratio of 0.75 (95% CI: 0.45, 1.3; P=0.2703). From these results, there is insufficient evidence to reject the null of no association between high LDL and risk of death. The figure below illustrates compares the Kaplan-Meier survival curves of those with and without high LDL. We do not detect a significant association between LDL and survival.

**Q8.** A priori, it would be help to test whether the assumptions required for the statistical analyses were valid for the distributions of this data. For the t-test, we assumed unequal variance, which is valid whether or not there is equal or unequal variance. It would be important to first understand the mean-variance relationship, linearity, and kurtosis prior to performing these tests, to help inform what the best statistical test may be for these data.