Problem Set 2

Textbook: Techniques for Censored and Truncated Data (Klein, Moeschberger, 2nd ed.)

Reading: Textbook: Chapter 3

Written: Do exercises 3.2, 3.4, 3.6 of the textbook and the following problems:

1. An investigator, performing an animal study designed to evaluate the effects of vegetable and vegetable-fiber on mammary carcinogenesis risk, randomly assigned female rats to five dietary groups. Mammary tumours were induced by a single oral dose of 7,12-dimethylbenz(a)anthracene (DMBA) administered by intragastric intubation. Starting 6 weeks after DMBA administration, each rat was examined once weekly for 14 weeks (post DMBA administration). Of interest is the estimation of the distribution of the time in day until onset of the first palpable tumour. Describe the types of censoring and/or truncation that is represented by the following rats.

(a) Rat A had palpable tumour at the first examination at 6 weeks after intubation with DMBA.
(b) Rat B survived the study without having any tumours.
(c) Rat C did not have a tumour at week 12 but had a tumour at week 13.
(d) Rat D died (without tumour present) before the first examination at 6 weeks after intubation with DMBA.
(e) Rat E died without tumour present at day 37 after intubation with DMBA.

2. A large number of individuals were enrolled in a study and were followed for 30 years to assess the age at which a disease symptom first appeared. For the selected individuals described below, discuss the type of censoring and/or truncation that is represented by the following individuals.

(a) Individual A, enrolled in the study at age 45, entered the study with the symptom already present.
(b) Individuals $B_1$ and $B_2$ enrolled in the study at ages 30 and 43 and never showed the symptom.
(c) Individuals $C_1$ and $C_2$ enrolled in the study at ages 35 and 40, exhibited the symptom at the second and fifth examination after enrollment (6 years and 15 years after enrollment), respectively. The symptom (which could only be identified by a clinical exam and clinical testing) may have appeared between exams.
(d) Individuals $D_1$ and $D_2$, enrolled in the study at ages 50 and 47, died from causes unrelated to the disease (the symptom was absent) at ages 61 and 65, respectively.
(e) Individuals $E_1$, $E_2$ and $E_3$, enrolled in the study at ages 36, 42, and 50, moved away from the community at ages 40, 55, and 60, respectively, never having showed the symptom.