Update_Writeup

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```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in I1195 / R1195C9: got 'l00'
```

```
## Warning: NAs introduced by coercion
```

Effective Dose and Contrast

Summary Statistics

Numerical summaries of both effective dose and contrast are given in Table 1. Using the fixed data for effective dosage of radiation administered to patients, we retrieve the plots shown in Figure 1. Here we can see the right-skew in the histogram suggesting several patients recieved much higher amounts of radiation than average.

Table 1: Summary Statistics of Radiation and Contrast

	Min	1st Q	Median	Mean	3rd Q	Max
Effective Dose	0.10	3.06	4.30	5.631	6.36	48.83
Contrast	5.0	75.0	95.0	88.5	98.0	150.0

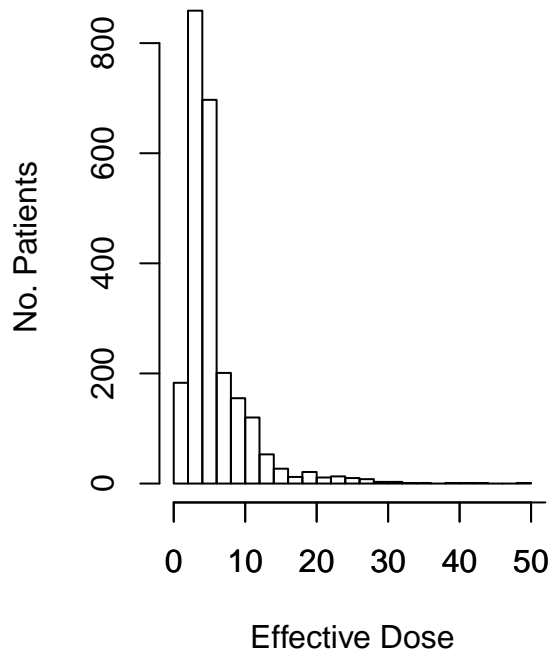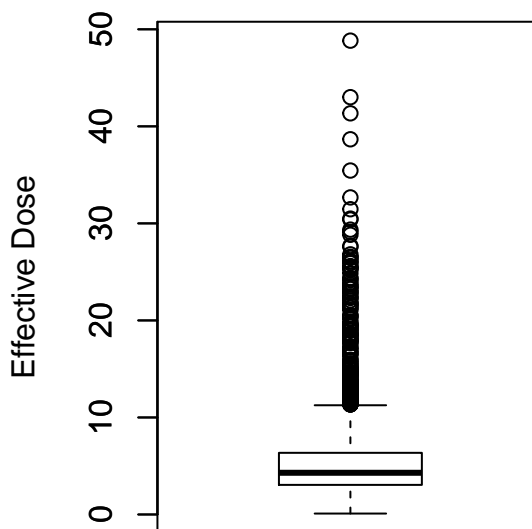**Figure 1a: Histogram of Effective Dose**   **Figure 1b: Boxplot of Effective Dose**


```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.098   3.055   4.298   5.631   6.356  48.832
```

We also have constructed an updated histogram and boxplot for the amount of contrast given to patients, which are shown in Figure 2. Here we see a centralized distribution with some extreme values on both sides.
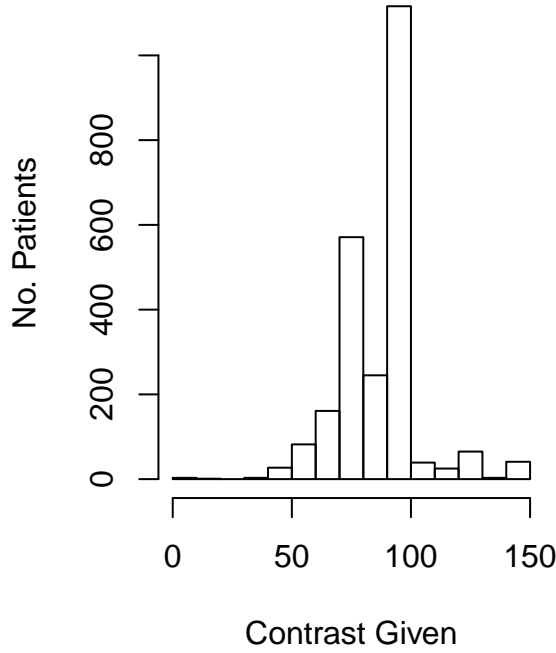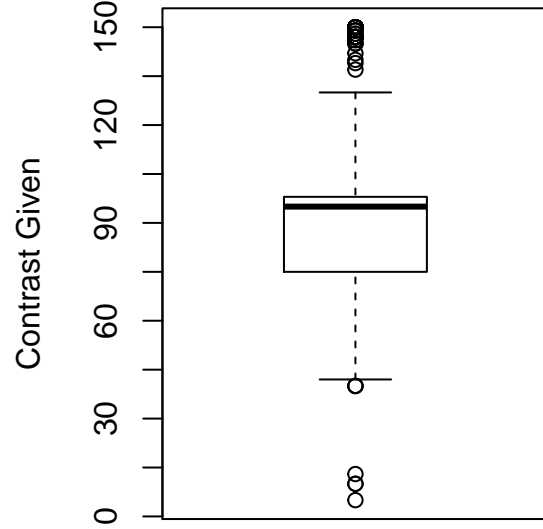
Figure 2a: Histogram of Contrast Given   **Figure 2b: Boxplot of Contrast Given**

We are also interested in the relationship of the effecive dose and contrast administered with both the age and BMI of the patient. Patients were divided into 10-year age groups and 5-unit BMI groups. In both cases, cut-off values were determined based on the number of patients that fell into the extreme groups. For example, there was only one patient in the data under the age of 10, so they were added into the "<20" group. The number of patients that belong to each age group and BMI group is given in Table 2 and 3 respectively.

Table 2: Breakdown Patients by Age Group

<20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	>90
55	133	222	294	514	562	397	179	26

Table 3: Breakdown Patients by BMI Group

<15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	>60
14	158	486	595	467	276	171	106	56	21	32

Figure 3 shows the average radiation and contrast administered for each of the age groups, and Figure 4 shows the average radiation and contrast administered for the BMI groups.

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Figure 3a: Mean Effective Dose by Age

Effective Dose

Age Group

Figure 3b: Mean Contrast Administered by Age

Contrast Given

Age Group
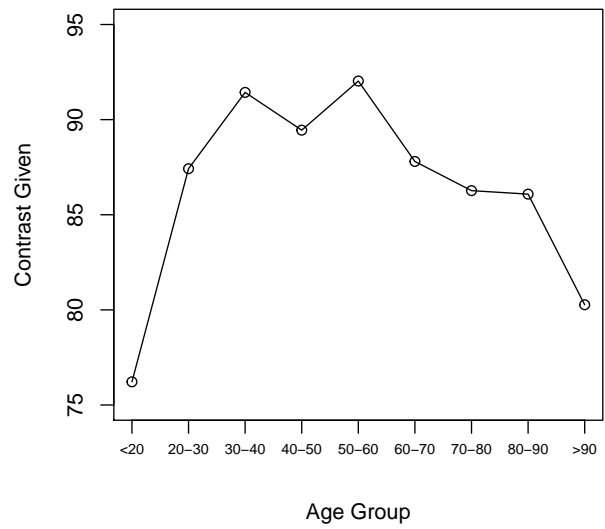
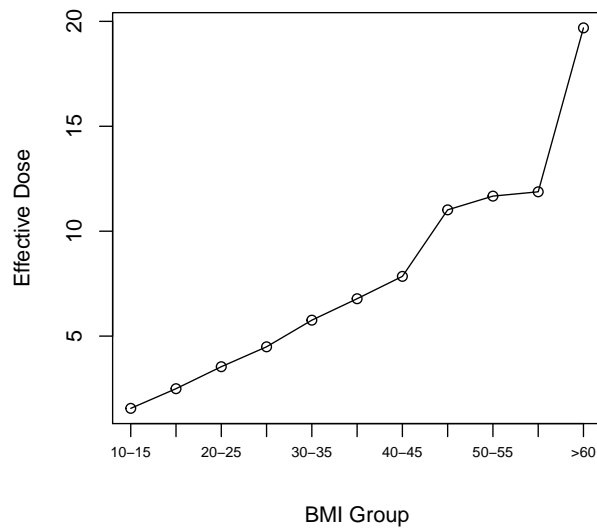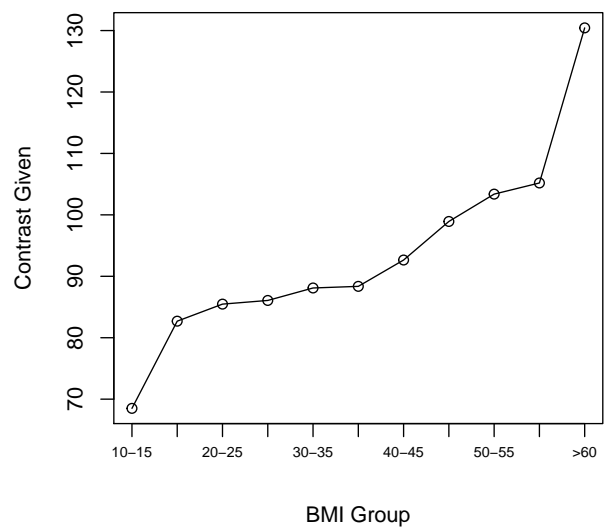**Figure 4a: Mean Effective Dose by BMI**

Effective Dose

BMI Group

Figure 4b: Mean Contrast Administered by BMI

Contrast Given

BMI Group

Contrast Given