**Approaches:**

The R file is recording my sensitivity analysis on four main topics:

1. Changing Y0 (without adding data point)
2. Adding a data point with (small dose, small CA)
3. Adding a data point with (small dose, large CA)
4. Adding a data point with (large dose, large CA)

For cases 2, 3 and 4, I extend the analysis to 4 subcases:

1. Fix dose amount and error, change CA
2. Fix CA and error, change dose amount
3. Fix dose amount and CA, change error
4. Fix dose amount, CA and error, change radiation type

Both horizontal analysis (comparing instances inside each subcase) and vertical analysis (comparing cases 2, 3 and 4) are used.

**Conclusions (please leave it for now if you want to make more guesses):**

**Case 1 (Changing Y0):**

AIC\_TE - AIC\_NTE changes little when Y0<=0.00007 (the actual Y0 which is about one-hundredth of the lowest recorded CA). As Y0 grows, AIC\_TE - AIC\_NTE decreases and then increases. There exists a critical point of Y0 (around Y0=0.0135) that minimizes AIC\_TE - AIC\_NTE. TE could perform better than NTE in specific cases.

**Case 2 (Adding a data point with small dose and small CA):**

For an additional data point with (small dose, small CA, small error), AIC\_TE - AIC\_NTE:

#1) Increases moderately and then decreases sharply as CA gets larger

#2) Decreases very slightly as dose amount gets larger

#3) Increases with decreasing slope as error (inverse weight) gets larger

#4) Changes slightly as types of radiation change and all other variables fixed

Adding a new data point with (small dose, small CA, small error) increases AIC\_TE - AIC\_NTE in all subcases #1, #2, #3, #4.

**Case 3 (Adding a data point with small dose and large CA):**

For an additional data point with (small dose, small CA, small error), AIC\_TE - AIC\_NTE:

#1) Decreases with increasing slope as CA gets larger

#2) Increases very slightly as dose amount gets larger

#3) Increases with decreasing slope as error (inverse weight) gets larger

#4) Changes slightly as types of radiation change and all other variables fixed

Adding a new data point with (small dose, large CA, large error) increases AIC\_TE - AIC\_NTE in subcases #2, #4 and most of #1, #3.

In subcase #1, lower CAs sometimes decrease AIC\_TE - AIC\_NTE

In subcase #3, larger errors sometimes decrease AIC\_TE - AIC\_NTE

Vertical Analysis of data point B (i.e. small dose, large CA, large error) with data point A (i.e. small dose, small CA, small error):

Adding point A, compared to adding point B, is more in favor of the NTE model rather than the TE model.

**Case 4 (Adding a data point with large dose and large CA):**

For an additional data point with (large dose, large CA, large error), AIC\_TE - AIC\_NTE:

#1) Increases moderately and then decreases sharply as CA gets larger

#2) Increases moderately as dose amount gets larger

#3) Decreases with increasing slope as error (inverse weight) gets larger

#4) Changes slightly as types of radiation change and all other variables fixed

Adding a new data point with (large dose, large CA, large error) increases AIC\_TE - AIC\_NTE in subcases #3, #4 and most of #1, #2.

In subcase #1, very high CAs decreases AIC\_TE - AIC\_NTE significantly

In subcase #2, small dose amounts sometimes decrease AIC\_TE - AIC\_NTE

Vertical Comparison of data point C (i.e. large dose, large CA, large error) with data point B (i.e. small dose, large CA, large error) and data point A (i.e. small dose, small CA, small error):

Adding point C, compared to adding point B, is much more in favor of the NTE model; compared to adding point A, adding C is more in favor of the NTE model.

**Central conclusion of the file:**

AIC\_TE - AIC\_NTE measures the extent to which each data point is in favor of the NTE model rather than the TE model

Consider three data points to be added to the data frame:

Point A (i.e. small dose, small CA, small error)

Point B (i.e. small dose, large CA, large error)

Point C (i.e. large dose, large CA, large error)

**Then in terms of the extent to which NTE is better than TE: C > A > B**