Subjects were enrolled in a study and were asked to take a pill daily. Biomarker measurements were collected before the subjects started taking the drug (week 0) and on weekly basis thereafter. Some subjects had an adverse event while on study.

Attached are two datasets. One contains the biomarker data, and the other contains the time of adverse events. The following questions are of interest:

1. Which biomarkers are changing as a result of treatment?
2. The change (fold change) in which markers is related to the event?
3. Can you come up with an algorithm that can predict the event based on biomarker values or fold changes in biomarkers collected at least a week prior to the actual event?

Fold change is calculated as: biomarker value at week t/ biomarker value at week 0

Subjects who had those events were taken off the drug, however, their biomarker data was still collected through the end of the study. You should therefore exclude all biomarker data that was collected after the occurrence of the event for the analyses.

All data manipulation should strictly be done by the code. No data will be manually entered or removed. If you need to combine the data from the two files, you should do that in a code.

Summarize all your results in a word document and send it to me. Also include your codes. Your code should easy to follow, so include as many comments as possible.