# Stat 2630: BMR Data

A 2-week study on the effects of an adrenaline drug on Basal Metabolic Rate (BMR) was conducted. Of the fifteen volunteers for the study, ten were randomly selected to receive 20 mg adrenaline pills (Drug), five volunteers received sugar pills (Placebo) that looked like adrenaline pills. BMR was measured at the start of the study (Week 0) and at the end of the study (Week 2). In addition, the safety variable Hemoglobin (Hemo) was measured at Week 0 and Week 2 to monitor possible side effects of the drug. Hemoglobin was recorded as either falling within normal laboratory ranges (N) or outside normal lab ranges (AB). The data follows:

| Subject | Group | BMR Week 0 | BMR Week 2 | Hemo Week 0 | Hemo Week 2 | BMR range Week 2 |
|---|---|---|---|---|---|---|
| 1 | Drug | 220 | 255 | N | N | Normal |
| 2 | Drug | 218 | 220 | AB | N | Low |
| 3 | Drug | 270 | 260 | N | AB | Normal |
| 4 | Drug | 245 | 250 | N | N | Normal |
| 5 | Drug | 230 | 244 | N | N | Normal |
| 6 | Drug | 210 | 275 | N | AB | High |
| 7 | Drug | 230 | 289 | N | AB | High |
| 8 | Drug | 238 | 250 | N | AB | Normal |
| 9 | Drug | 225 | 295 | N | N | High |
| 10 | Drug | 230 | 254 | N | N | Normal |
| 11 | Placebo | 221 | 243 | N | N | Normal |
| 12 | Placebo | 232 | 240 | N | N | Normal |
| 13 | Placebo | 245 | 238 | N | N | Normal |
| 14 | Placebo | 230 | 272 | N | AB | High |
| 15 | Placebo | 228 | 220 | N | N | Low |

Investigator's questions:

1. Is there a drug effect? How large? (Calculate an estimate, standard error, and p-value for assessing statistical significance.)

2. Is the drug effect larger than placebo effect? By how much? (Calculate an estimate, standard error, and p-value for assessing statistical significance.)

3. For the drug group, are the rate of hemoglobin abnormalities different between Week 0 and Week 2?

4. At Week 2, are there more High than Low BMR for the drug group?