**Therapeutic Touch**

Test healer 100 times to see if she can detect energy fields (i.e., where your hand is)

\[ r \sim N(np, npq) \], \( r \) is the # of correct responses

\[ r = 52 \]

**Hypothesis Testing**

1. Null hypothesis (\( H_0 \))
2. Distribution of statistic: \( r \sim N(np, npq) \)
3. Rejection region (one-tailed or two-tailed)
   - one-tailed: \( P(z > 1.645) = .05 \)
   - two-tailed: \( P(z < -1.96) + P(z > 1.96) = .05 \)
4. Calculate statistic
   \[ z = \frac{(r - E(r))/SD(r)}{\sqrt{npq}} = \frac{(r - np)/\sqrt{npq}}{5} \]
5. Accept or reject null hypothesis
   Calculated \( z \) does not fall in rejection region, so accept null hypothesis.

**IQ Example**

Over the years, mean IQ has been 100 with a standard deviation of 15. Do Carleton students have a higher than average IQ?

You collect a random sample of 36 Carleton students and find their mean IQ to be 108.

Are Carleton students different than (higher than) the norm?

**Hypothesis Testing**

1. Null hypothesis (\( H_0 \))
2. Distribution of statistic: \( M \sim N(100, 15^2/36) \)
3. Rejection region (one-tailed or two-tailed)
   - one-tailed: \( P(z > 1.645) = .05 \)
4. Calculate statistic
   \[ z = \frac{(108 - 100)/(15/6)}{\sqrt{15}} \]
5. Accept or reject null hypothesis
   Calculated \( z \) falls in rejection region, so reject \( H_0 \).