### Section 8.1

<table>
<thead>
<tr>
<th>Parameter to be examined</th>
<th>Corresponding statistical estimate</th>
<th>Criteria for approx. normality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Proportion $\hat{p}$</td>
<td>Sample Proportion $\hat{p} = \frac{\sum x}{n}$</td>
<td>$np \geq 10$ or $nq \geq 10$</td>
</tr>
<tr>
<td>Population Mean $\mu$</td>
<td>Sample Mean $\bar{x} = \frac{\sum x}{n}$</td>
<td>Use actual number of successes and failures at least 10 if $p \hat{q}$ are unknown or the population is normal.</td>
</tr>
</tbody>
</table>

### Mean of statistic

- $M_{\hat{p}} = \hat{p}$ (unbiased)
- $M_{\bar{x}} = \mu$ (unbiased)

### Z-score a.k.a. "Test Statistic"

- T.S.: $Z = \frac{\hat{p} - \hat{p}}{\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}}$
- T.S.: $Z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$

### P-value

- 3 Types of p-values:
  - Right-tailed
  - Left-tailed
  - 2-tailed

### Conclusions

- If the p-value is small (less than a "level of significance"), then a significant change or difference has occurred.

### Critical Value

- The required number of standard deviations for significance.