Properties of $\hat{p}$ using SRS wor

1. $E(\hat{p}) = p$.

2. $Var(\hat{p}) = \frac{N-n}{N-1} \frac{p(1-p)}{n}$. (corrected from lecture)

Unbiased estimator of $Var(\hat{p})$ is

$$\hat{Var}(\hat{p}) = \frac{N-n}{N} \frac{\hat{p}(1-\hat{p})}{n-1}.$$

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