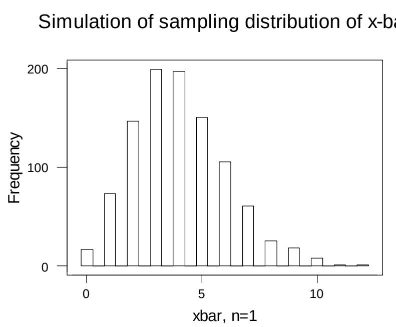
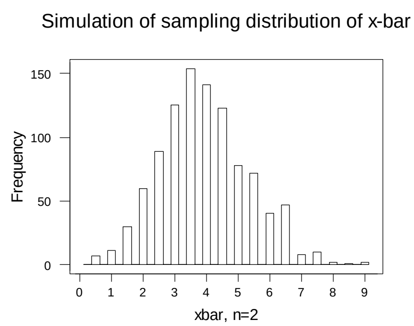
STA362: Introduction to Statistics

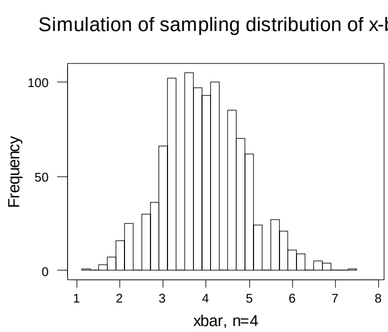
Illustration of sampling distribution characteristics

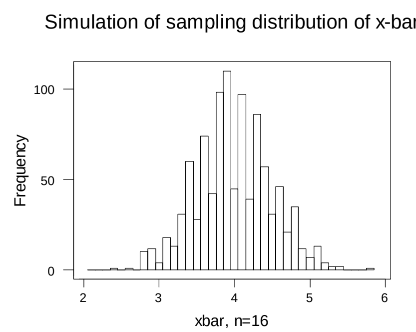
For a certain manufacturing industry, the *average number of industrial accidents per month* is sought. If we define Y = # of accidents per month, a good model for Y would be a Poisson distribution with parameter λ. What we want to find out is the true mean of Y. Since Y is Poisson, $\mu = \lambda$. Also, remember that the standard deviation of Y is $\sigma = \sqrt{\lambda}$. For the following simulation, let $\mu = \lambda = 4.0$.

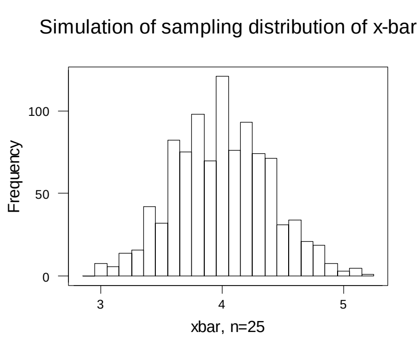
Statistical strategy: Collect a sample of monthly data, and use $\overline{X}$ from the sample to estimate μ (i.e., $\lambda = 4.0$ in this case). What is the key aspect of data collection that will affect the quality of the $\overline{X}$ estimate?

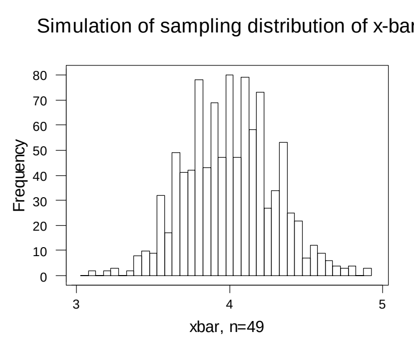












Descriptive Statistics for each simulated sampling distribution

	reps	Mean	Median	StDev
xbar, n=1	1000	4.0180	4.0000	2.0213
xbar, n=2	1000	3.9385	4.0000	1.4126
xbar, n=4	1000	3.9475	4.0000	0.9668
xbar, n=16	1000	3.9861	3.9375	0.4976
xbar, n=25	1000	4.0000	4.0000	0.3989
xbar, n=49	1000	4.0052	4.0000	0.2909