

Panel 1

Central Limit Theorem: Say we have a distribution of unknown shape. If we select samples of size  $N$  and compute the sample mean  $\bar{X}$ , they will have a Normal distribution.

If original distribution has mean  $\mu$  and std dev.  $\sigma$ , then the  $\bar{X}$  are normal with mean  $\mu$  as well and std. dev.  $\frac{\sigma}{\sqrt{N}}$  i.e.

$$\bar{X} \text{ are } N\left(\mu, \frac{\sigma}{\sqrt{N}}\right)$$