

# Summary

Population is  
Normal with  
mean  $\mu$  and variance  $\sigma^2$

Population is skewed  
or population distribution  
unknown, but  $\mu$   
and  $\sigma^2$  known

$n$  can be any size

$$\bar{X} \stackrel{\text{exactly}}{\sim} N(\mu, \sigma^2/n)$$

$$T \stackrel{\text{exactly}}{\sim} N(n\mu, n\sigma^2)$$

If  $n$  is small ( $n \leq 20$ )  
you can conclude  
the mean of the  
sampling distribution  
of sample mean =  $\mu$   
and std dev. of  
sampling distribution  
of sample mean  
=  $\sigma^2/n$ .

But you've no idea  
what the distribution  
is.

( $n \geq 20$ )

If  $n$  is large

$$\bar{X} \stackrel{\text{appr.}}{\sim} N(\mu, \sigma^2/n)$$

(CLT)

$$T \stackrel{\text{appr.}}{\sim} N(n\mu, n\sigma^2)$$