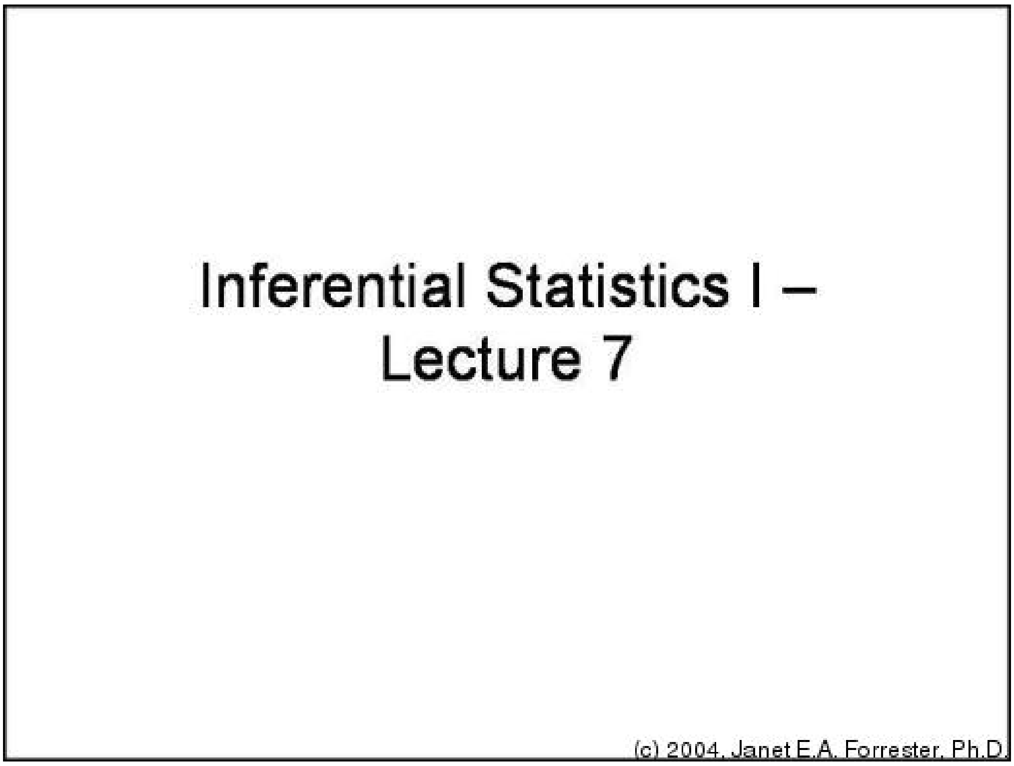
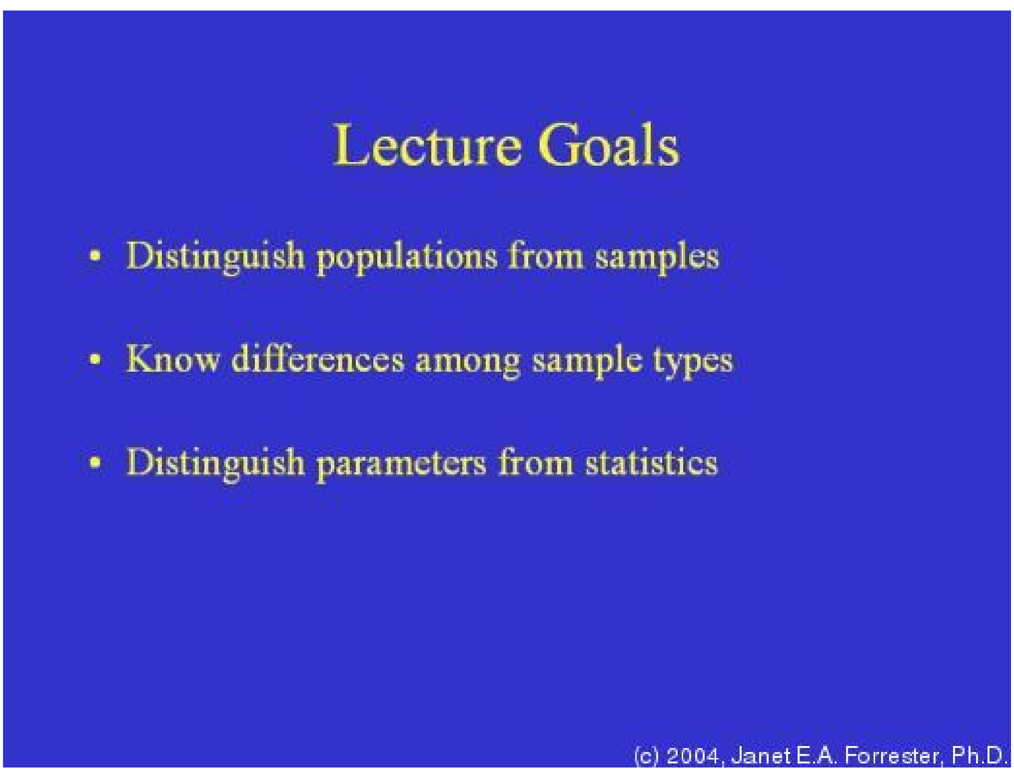
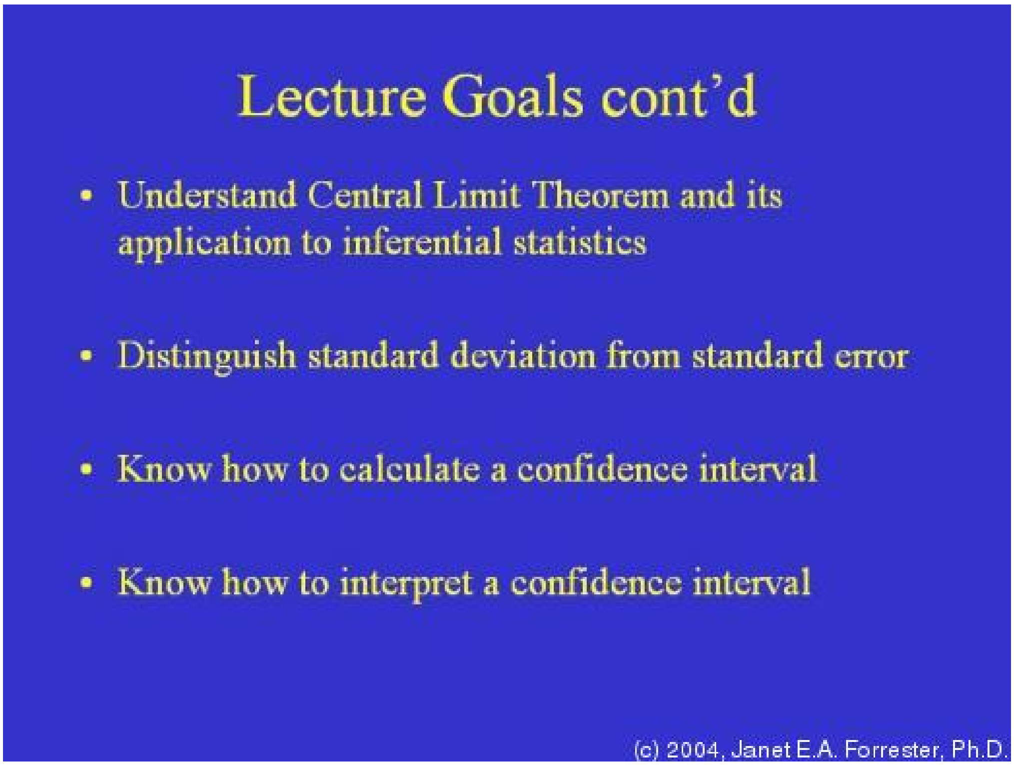
1. Introduction Slide



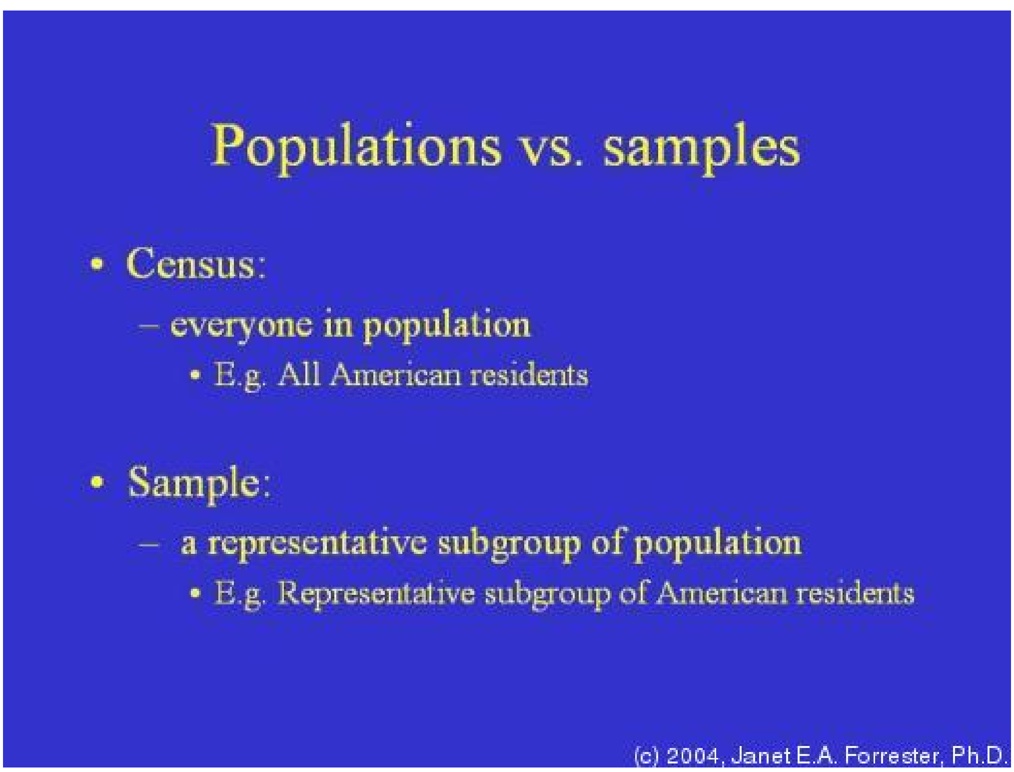
2. Lecture Goals



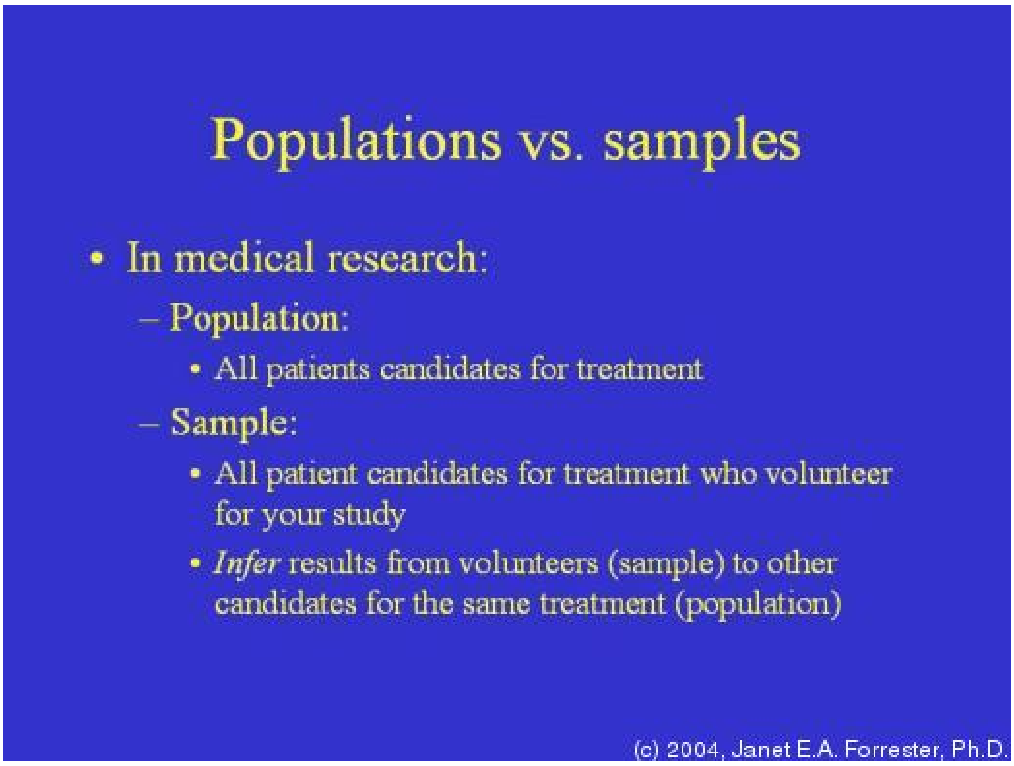
3. Lecture Goals, cont.



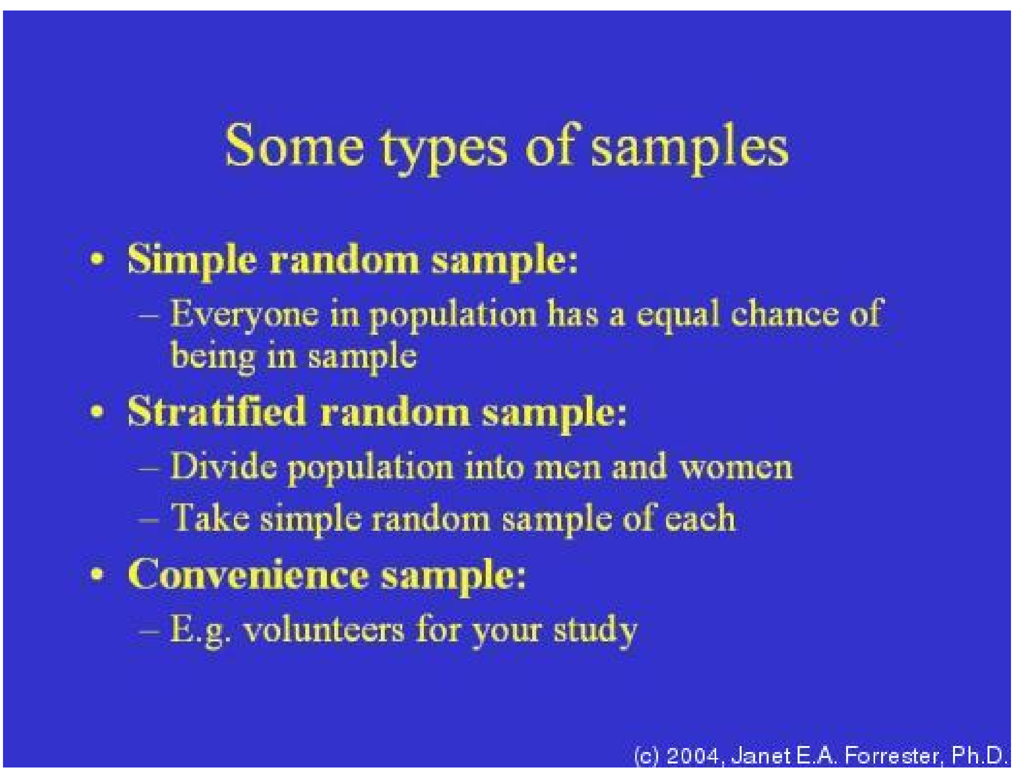
4. Populations vs. samples 1



5. Populations vs. samples 2



6. Some types of samples



7. Populations vs. samples 3

Populations vs. samples

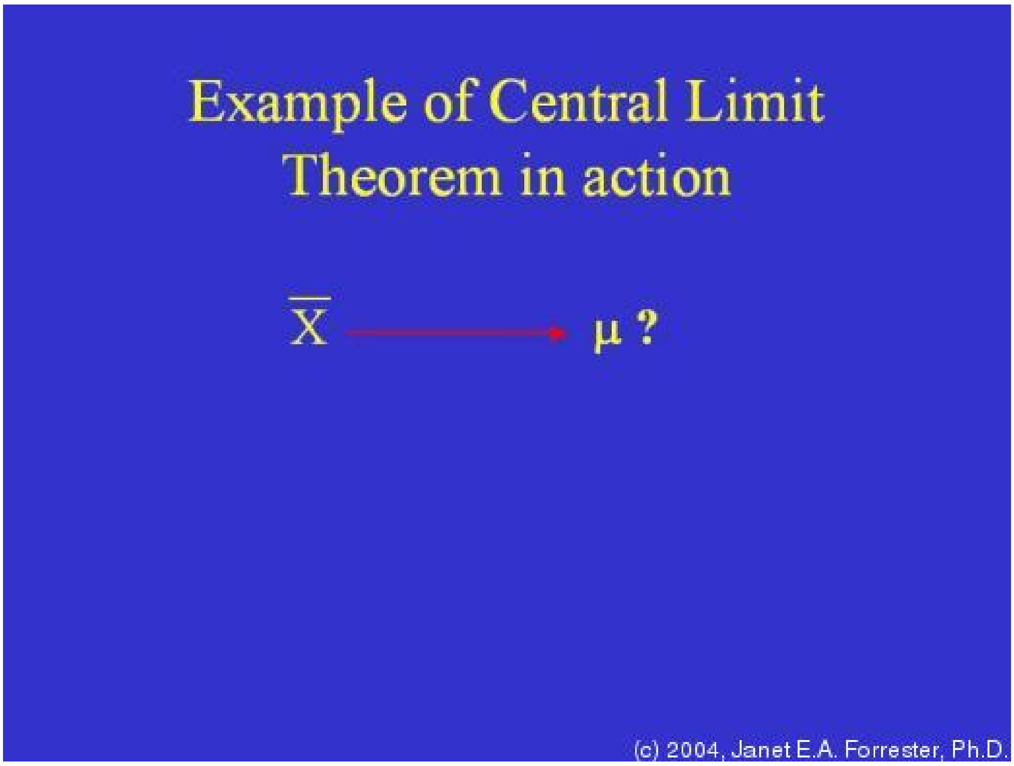
Characteristics	Population (Parameter)	Sample (Statistic)
Mean	μ	$\overline{X}$
Proportion	π	p
Standard deviation	σ	S or SD
Variance	σ^2	S^2
Correlation coefficient	ρ	r
Slope of a line	β	b
Relative risk	RR	rr
Odds ratio	OR	or

8. Populations vs. samples 4

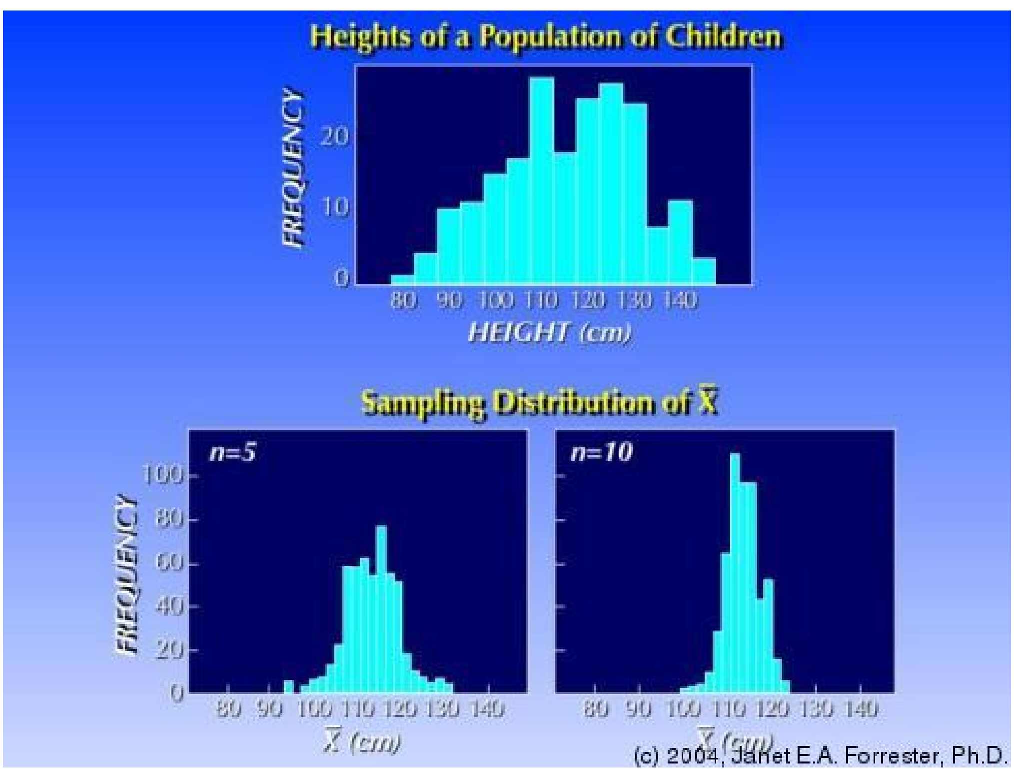
Populations vs. samples

- Parameters represent "truth"
- Statistics have associated error
  - The study of statistics is about estimating that error
  - Central limit theorem tells us how much error to expect in our sample estimates (i.e.sample statistics)

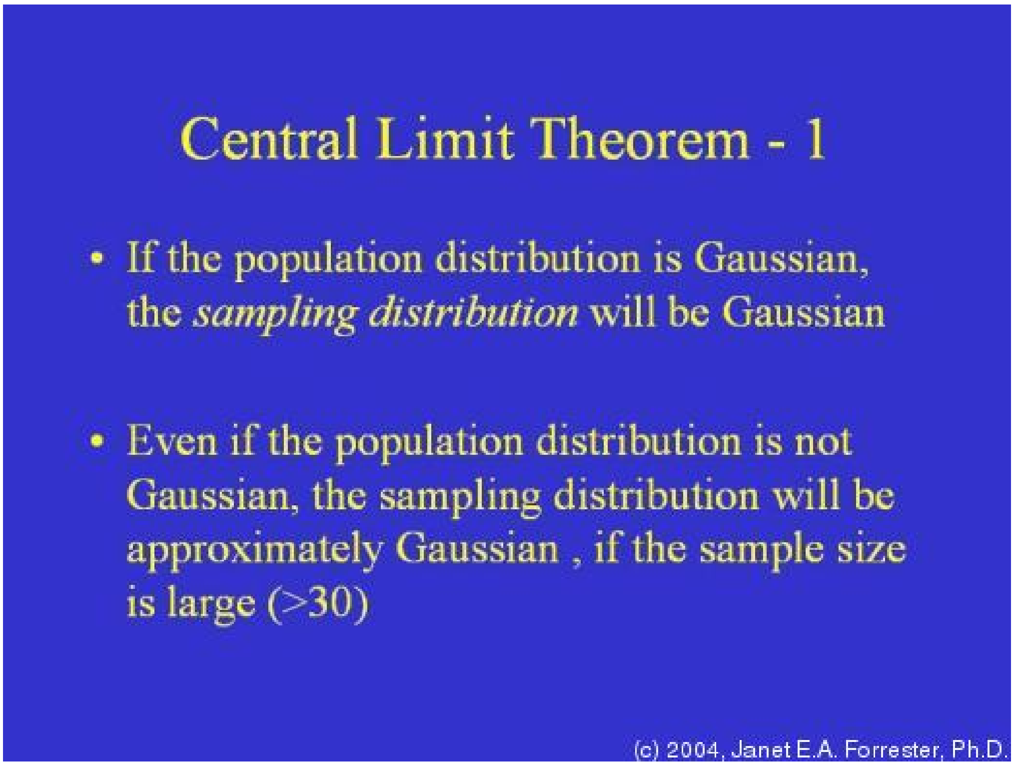
9. Example of Central Limit Theorem in action



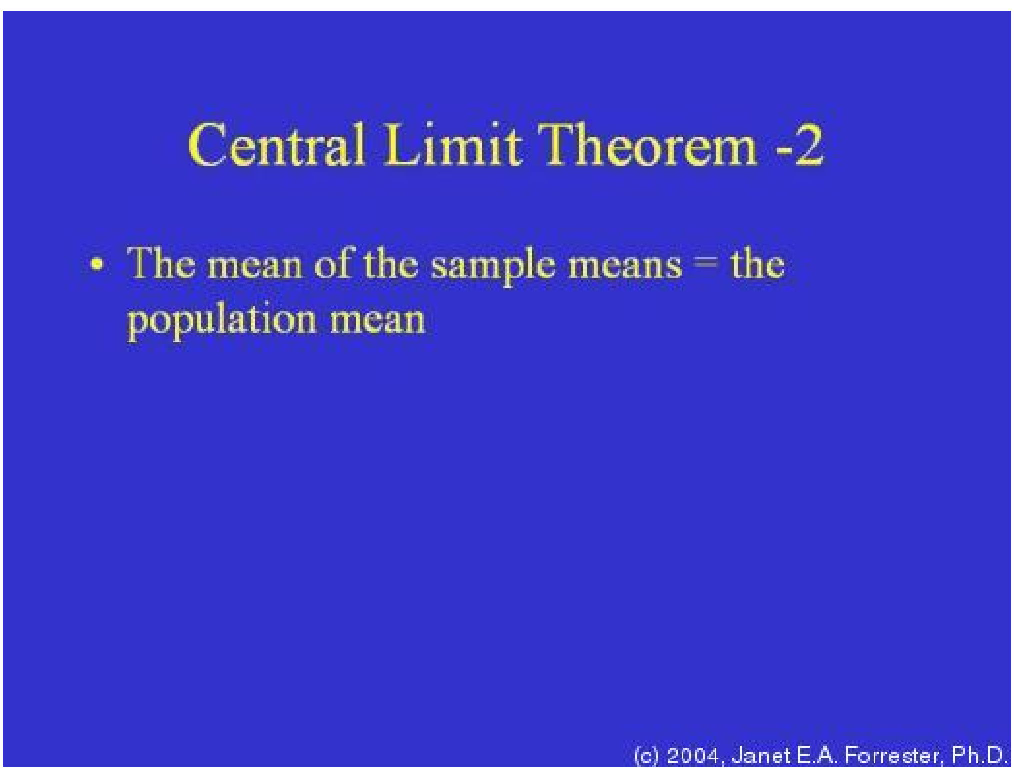
10. Inferential Statistics I: Sampling Distribution - 1



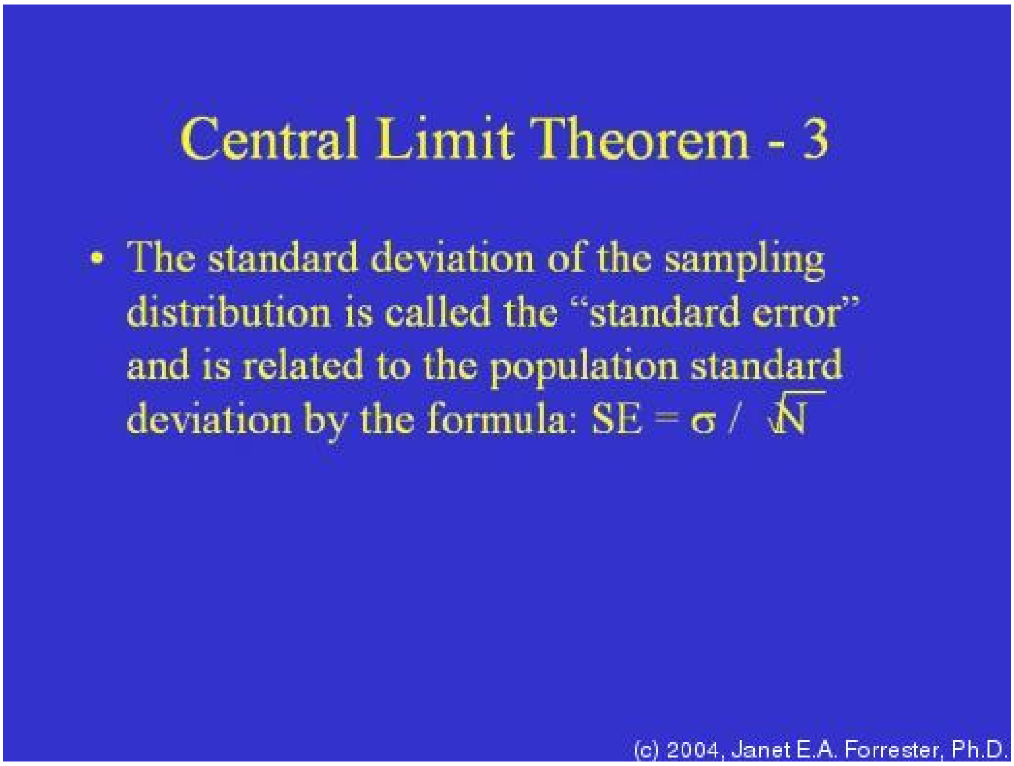
11. Central Limit Theorem - 1



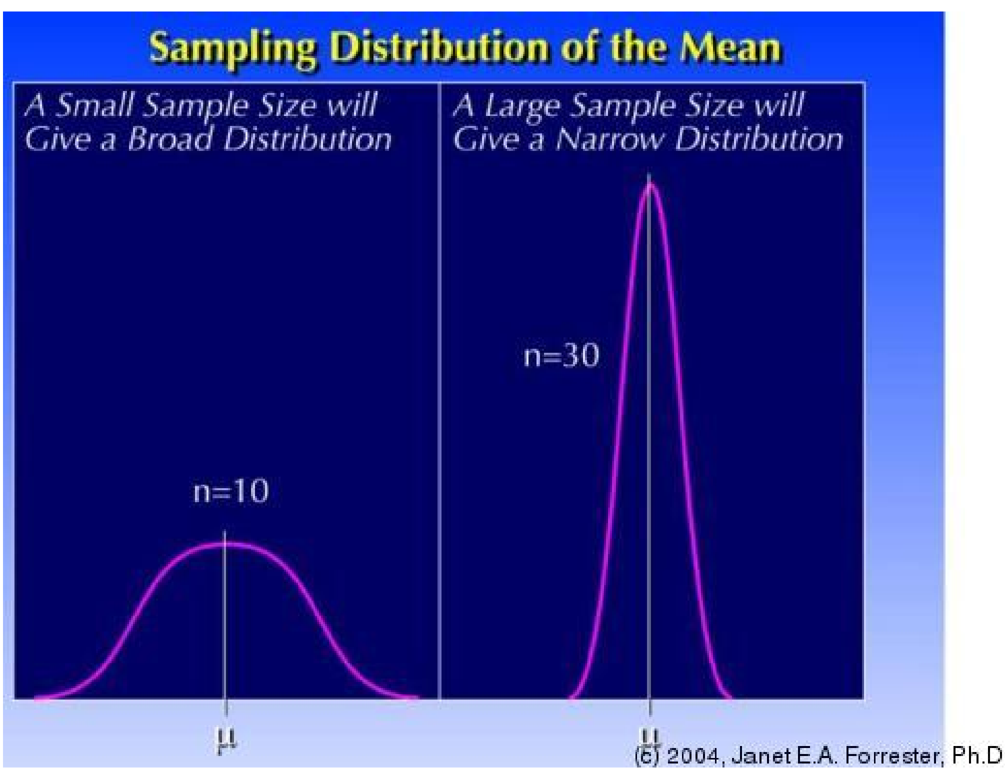
12. Central Limit Theorem -2



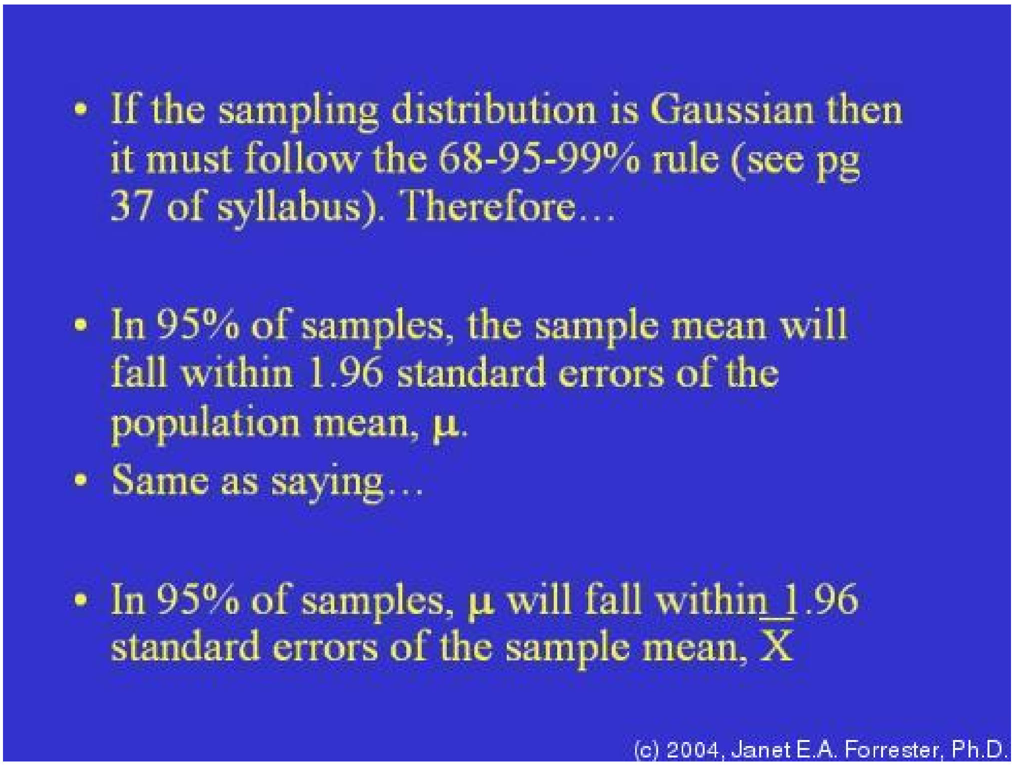
13. Central Limit Theorem - 3



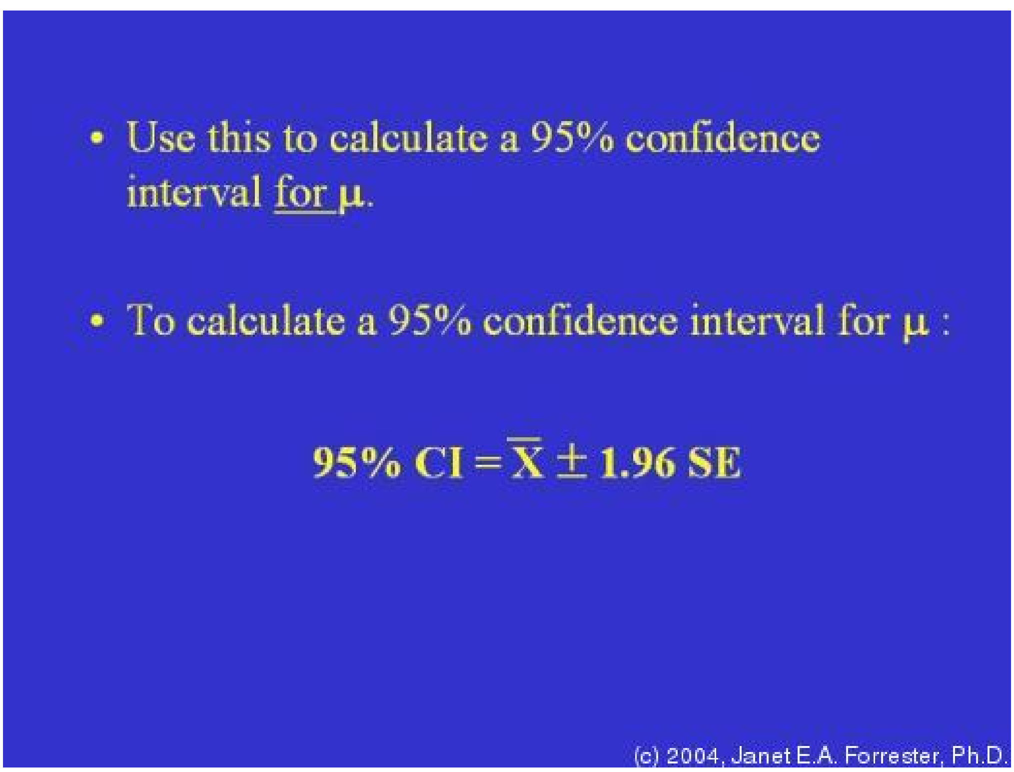
14. Sampling Distribution of the Mean



15. Sampling



16. Confidence Interval



17. General formula for a confidence interval

General formula for a confidence interval

$$\bar{X} \pm Z\sigma / \sqrt{N}$$

Confidence	$\alpha/2$	Z score
90%	0.05	1.65
95%	0.025	1.96
99%	0.005	2.58

The *higher* the confidence level, the *wider* the confidence interval.

18. Inferential Statistics I: Sampling Distribution - 2

95% of Confidence Intervals will include μ