- The gamma distribution can be parameterized in terms of a shape parameter $\alpha = \mathrm{k}$ and an inverse scale parameter $\beta$, called a rate parameter.
- A random variable X that is gamma-distributed with shape $\alpha$ and rate $\beta$ is denoted

$$X \sim \text{Gamma}(\alpha, \beta)$$

$$\mathbf{E}[X]{=}\frac{\alpha}{\beta}$$

$$\text{Var}[X]{=}\frac{\alpha}{\beta^2}$$

- By the central limit theorem, if $\alpha$ is large, then gamma distribution can be approximated by the normal distribution with mean and standard deviation

$$\mu = \frac{\alpha}{\beta}$$

$$\sigma = \frac{\sqrt{\alpha}}{\beta}$$

- That is, the distribution of the variable

$$Z = \frac{X - \frac{\alpha}{\beta}}{\frac{\sqrt{\alpha}}{\beta}}$$

tends to the standard normal distribution as $\alpha \longrightarrow \infty$.

$$\text{Point Estimate} \pm [\text{Quantile} \times \text{StandardError}]$$