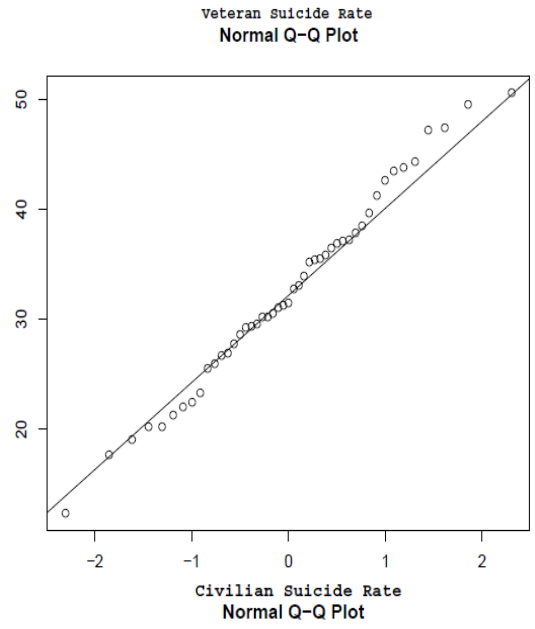
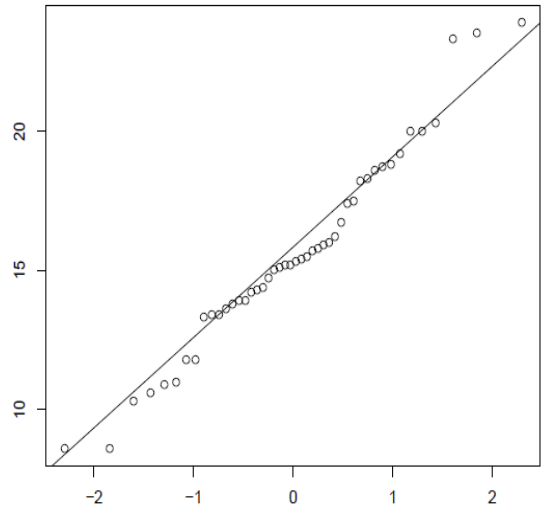
Veterans Suicide Rate





Vet Suicides Rate - 5 point indicator		
Min	12.3	(Massachussets)
Max	50.6	(Nevada)
Median	31.5	
Average (mean)	32.5	
Variance	79.0	
Std Deviation (σ)	8.9	

Min	12.3
Q1	26.8
Q2	31.5
Q3	37.5
Max	50.6

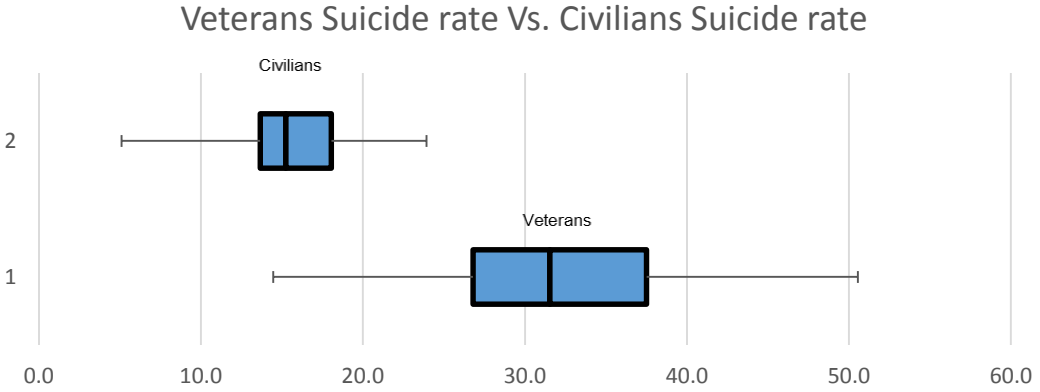
IQR (Q3 - Q1)	10.72

Civ Suicides Rate - 5 point indicator		
Min	8.55	(New Jersey)
Max	23.93	(Montana)
Median	15.24	
Average (mean)	15.58	
Variance	12.79	
Std Deviation (σ)	3.58	

Min	8.55
Q1	13.66
Q2	15.24
Q3	18.06
Max	23.93

IQR (Q3 - Q1)	4.40

*Rates are based per 100,000 people



95% confidence interval for a Population Proportion with large sample size method

$$X_1, X_2, \ldots \sim Bernoulli\ (p)$$

$$\widehat{P} - Z_{\alpha/2}\sqrt{\frac{\widehat{P}\left(1-\widehat{P}\right)}{n}} \leq p \leq \widehat{P} + Z_{\alpha/2}\sqrt{\frac{\widehat{P}\left(1-\widehat{P}\right)}{n}}$$

$\widehat{P} = \frac{31.1}{100{,}000} = 3.11 * 10^{-4}$ $\quad Z_{\alpha/2} = Z_{.05/2} = 1.96$ $\quad n = 100{,}000$

$$\mathbf{2.02 * 10^{-4} \leq p \leq 4.20 * 10^{-4}}$$

95% confident that p falls somewhere between $2.02 * 10^{-4}$ *and* $4.20 * 10^{-4}$

The suicide rate for veterans was calculated to be *31.1 per 100,000 people* while civilians suicide rate was calculated to be *13.8 per 100,000 people*.

$$p = \frac{13.8}{100{,}000} * 2 = 2.76 * 10^{-4} \qquad Z_{0.05} = 1.65$$

Null hypothesis: $H_0: p = 2.76 * 10^{-4}$

Alternative hypothesis: $H_1: p > 2.76 * 10^{-4}$

$$Pvalue = 1 - \phi\ (Z_0) = 1 - \phi(3.29) = 1 - 1 = 0$$

Conclusions: Since p-value is less than (α = 0.05), we reject the null hypothesis. Thus, the suicide rate proportion p is bigger than $2.76 * 10^{-4}$. This further confirms that veterans suicide rate is more than double the rate of civilians suicide rate