**Paired T-Test and CI: Before Training, After Training**

**Descriptive Statistics**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sample | N | Mean | StDev | SE Mean |
| Before Training | 15 | 69.27 | 9.80 | 2.53 |
| After Training | 15 | 71.53 | 8.81 | 2.28 |

**Estimation for Paired Difference**

|  |  |  |  |
| --- | --- | --- | --- |
| Mean | StDev | SE Mean | 95% Upper Bound for μ\_difference |
| -2.267 | 3.863 | 0.997 | -0.510 |

*µ\_difference: mean of (Before Training - After Training)*

**Test**

|  |  |
| --- | --- |
| Null hypothesis | H₀: μ\_difference = 0 |
| Alternative hypothesis | H₁: μ\_difference < 0 |

|  |  |
| --- | --- |
| T-Value | P-Value |
| -2.27 | 0.020 |





Conclusion

Fot the paired t test it is required that difference of two sample [before – after] is normally distributed. The graph shows that the differences is negatively skewed. Hence it raises the validity of the test. The alternative test could be Wilcoxon signed rank test.

In comparing p-value, it shows that the p-value(=0.02)is lesser than the α-value(0.05),we reject the null hypothesis that the training doesn’t increase the typing speed of the secertaries at 5% level of significance.It means that the secertaries are benefited by the typing training .

The average typing speed before training was 69.27 and the average after training is 71.53 which shows that the average typing speed is increased after training and increment is significant.

Sign Test for Median: Visit Length

Method

|  |
| --- |
| η: median of Visit Length |

Descriptive Statistics

|  |  |  |
| --- | --- | --- |
| Sample | N | Median |
| Visit Length | 20 | 19.2 |

Test

|  |  |
| --- | --- |
| Null hypothesis | H₀: η = 22 |
| Alternative hypothesis | H₁: η < 22 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sample | Number < 22 | Number = 22 | Number > 22 | P-Value |
| Visit Length | 15 | 0 | 5 | 0.021 |

Wilcoxon Signed Rank Test: Visit Length

Method

|  |
| --- |
| η: median of Visit Length |

Descriptive Statistics

|  |  |  |
| --- | --- | --- |
| Sample | N | Median |
| Visit Length | 20 | 19.55 |

Test

|  |  |
| --- | --- |
| Null hypothesis | H₀: η = 22 |
| Alternative hypothesis | H₁: η < 22 |

|  |  |  |  |
| --- | --- | --- | --- |
| Sample | N for Test | Wilcoxon Statistic | P-Value |
| Visit Length | 20 | 38.50 | 0.007 |

Histogram of Visit Length



Boxplot of Visit Length



3) Graph: Box Plot: The box and whisker plot show that the distribution is right skewed which also provides evidence that median visit length is shorter. Shorter visit length are more frequent

Conclusion

Conclusion

1. Sign Test: the p-value =0.021 <αvalue =0.05, we conclude that the median waiting time is significantly lower than the 22. The median time in the sample is 19.2 minutes. There is sufficient evidence to conclude that the median visit length in practice with a large Medicaid load is shorter than 22 minutes.
2. Wilcoxon signed rank test: The p-value =0.007 <αvalue (0.05), the test also conforms that the median visit length is significantly lower than 22 minutes.