**Lab 7 :Wilcoxon signed test**

**Recent studies of the private practices of physicians who saw no Medical patients suggested that the median length of each patient visit was 22 minutes. It is believed that the median visit length in practices with a large Medical load is shorter than 22 minutes. A random sample of 20 visits in practices with a large Medicaid load yielded, in order, the following visit length:**

**9.4 13.4 15.6 16.2 16.4 16.8 18.1 18.7 18.9 19.1 19.3 20.1 20.4 21.6 23.4 23.5 24.8 24.9 26.8**

Sign Test for Median: Length of each visit

Method

|  |
| --- |
| η: median of Length of each visit |

Descriptive Statistics

|  |  |  |
| --- | --- | --- |
| Sample | N | Median |
| Length of each visit | 20 | 19.2 |

Test

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sample | Number < 22 | Number = 22 | Number > 22 | P-Value |
| Length of each visit | 15 | 0 | 5 | 0.021 |

Wilcoxon Signed Rank Test: Length of each visit

Method

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| --- |
| η: median of Length of each visit |

Descriptive Statistics

|  |  |  |
| --- | --- | --- |
| Sample | N | Median |
| Length of each visit | 20 | 19.55 |

Test

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

|  |  |  |  |
| --- | --- | --- | --- |
| Sample | N for Test | Wilcoxon Statistic | P-Value |
| Length of each visit | 20 | 38.50 | 0.007 |

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.



The box and whisker plot shows that the distribution is right skewed, which also provides evidence that the median visit length is shorter. Shorter visit length is more frequent.