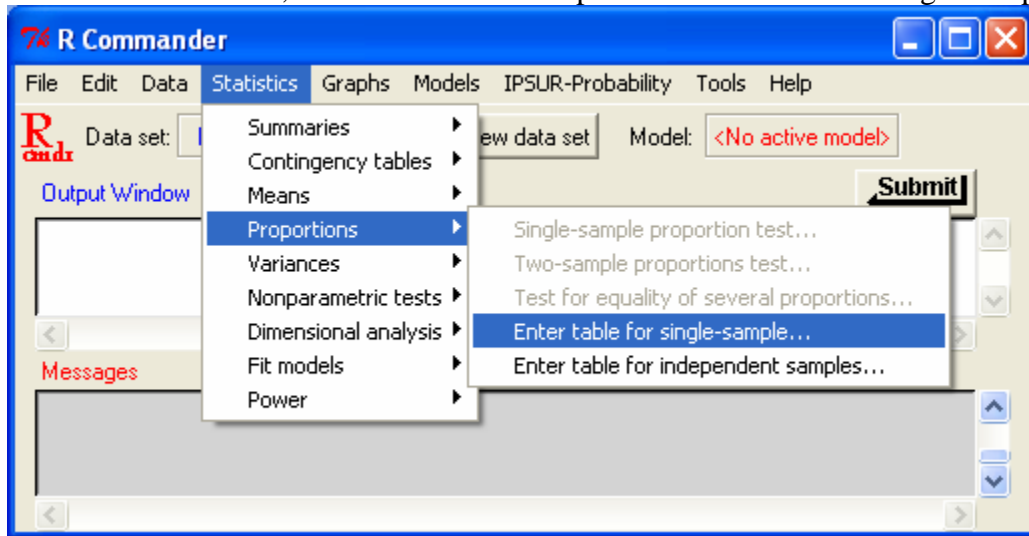


Tests of One Proportion and Equality of Two Proportions

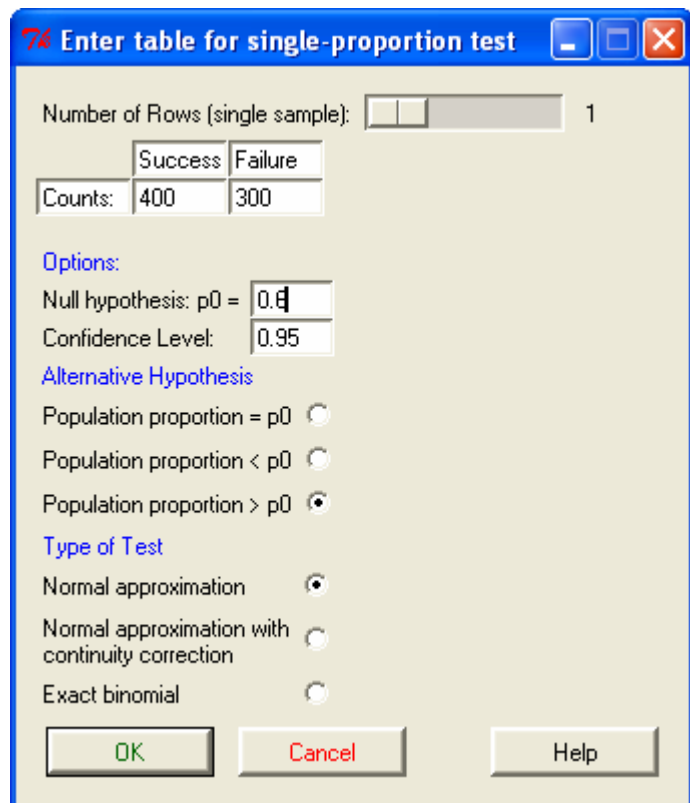
Test of One Proportion

Example: Henning et al. found that 400 of a sample of 700 infants had completed the hepatitis B vaccine series. Can we conclude on the basis of these data that, in the sampled population, **more than 60 percent** have completed the series?

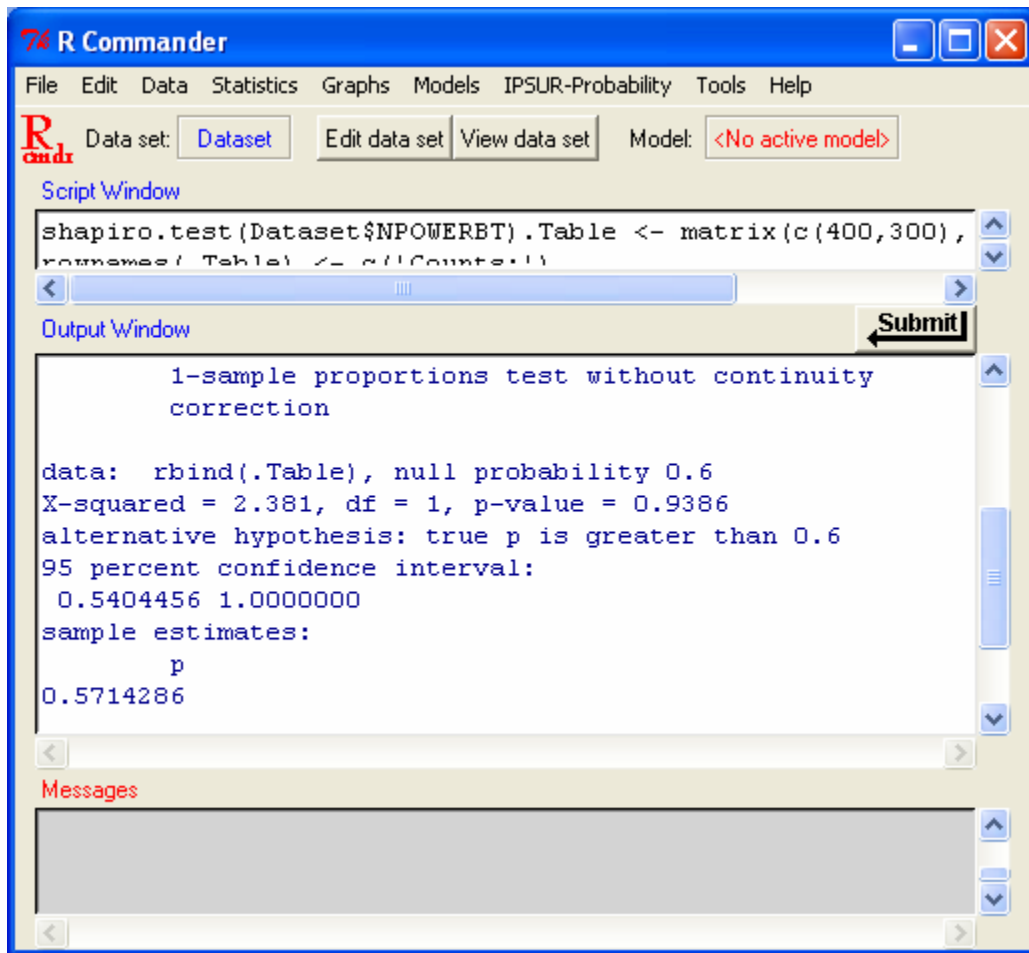
- 1) In the IPSUR window, click on Statistics/Proportions/Enter table for single-sample...



- 2) Enter the number of infants who have completed the vaccine series in the Successes box, the total samples minus the number of infants who have completed the series in the failures box, and the probability for which you are testing in the p_0 box (0.6 or 60 percent) and the confidence level in the confidence level box. Check the box that says population proportion $> p_0$ to test whether the proportion is actually greater than 60%.



- 3) Check the p-value in the output window of IPSUR to check whether or not the null hypothesis (that the proportion is equal to 60%) would be rejected.

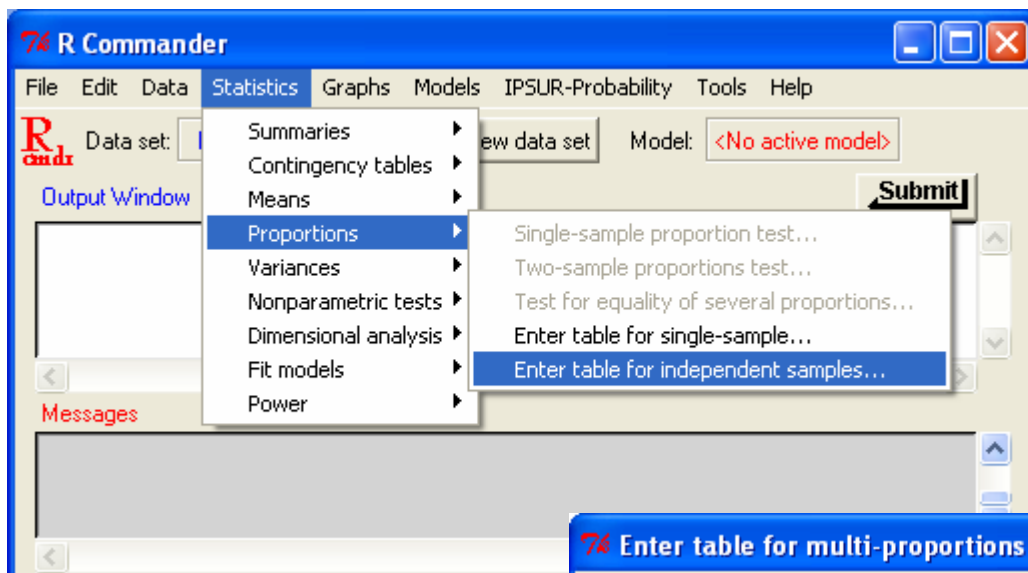


Because the p-value = **.9386** is greater than 0.05, we do not reject the null hypothesis and so there is not sufficient evidence to support the alternative (the proportion is greater than 60%). This **does not imply** that the proportion is about 60%.

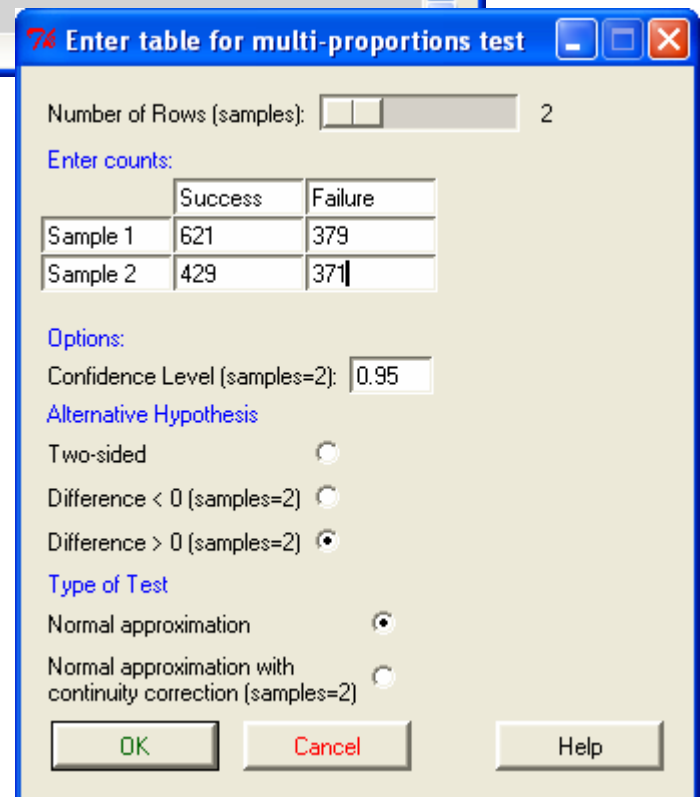
Test of Two Proportions

Example: A research company did a survey on preference of a new policy. They reported that out of 1000 male participants, 621 were in favor of this policy, and out of 900 female participants, 429 were in favor of this policy. Test whether there is a statistically significantly **higher percentage in male population** in favor of the policy than the female population. Use p-value approach to perform the test, at 5% level of significance.

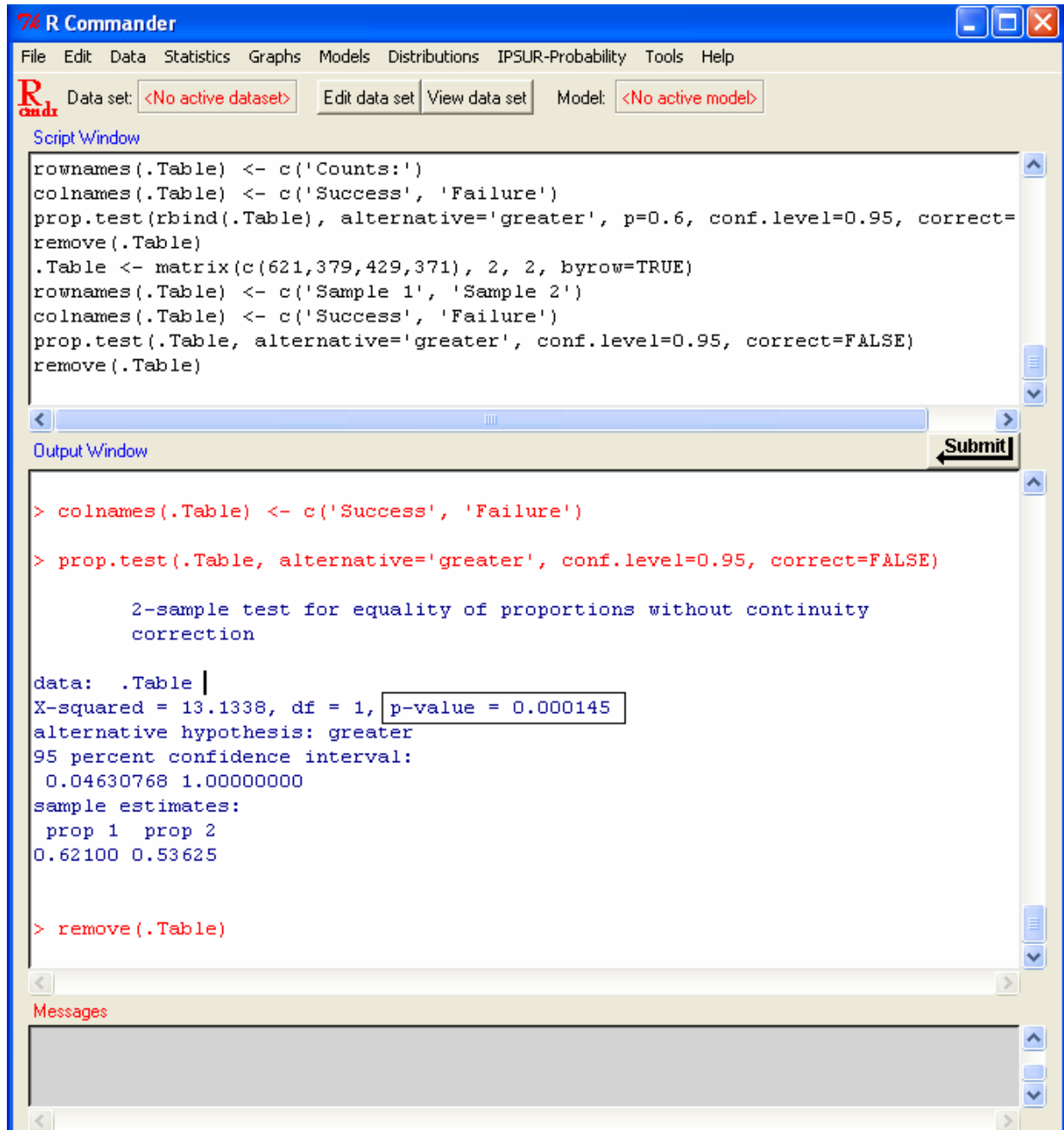
- 1) In the IPSUR window, click on Statistics/Proportions/Enter table for independent samples...



- 2) Enter the number of male participants who supported the policy (621) in the sample 1 success box, and the total number of male participants supporting the policy (379) in the failure box. Enter the number of female participants who supported the policy (429) in the sample 2 success box, and the total number of female participants supporting the policy (371) in the failure box. Put the confidence level into the confidence level box. Then set the alternative hypothesis to the Difference > 0 to test whether there are more males in favor than females.



- 3) In the output window of IPSUR, the p-value is shown. Because the p-value is less than the level of significance (usually 5%), we reject the null hypothesis (that proportion of males in favor is equal to the proportion of females in favor) and support the alternative (that the proportion of males in favor is larger than the proportion of females in favor).



The screenshot displays the R Commander interface. The menu bar includes File, Edit, Data, Statistics, Graphs, Models, Distributions, IPSUR-Probability, Tools, and Help. The status bar shows 'Data set: <No active dataset>' and 'Model: <No active model>'. The Script Window contains the following R code:

```
rownames(.Table) <- c('Counts:')
colnames(.Table) <- c('Success', 'Failure')
prop.test(rbind(.Table), alternative='greater', p=0.6, conf.level=0.95, correct=
remove(.Table)
.Table <- matrix(c(621,379,429,371), 2, 2, byrow=TRUE)
rownames(.Table) <- c('Sample 1', 'Sample 2')
colnames(.Table) <- c('Success', 'Failure')
prop.test(.Table, alternative='greater', conf.level=0.95, correct=FALSE)
remove(.Table)
```

The Output Window shows the execution results:

```
> colnames(.Table) <- c('Success', 'Failure')
> prop.test(.Table, alternative='greater', conf.level=0.95, correct=FALSE)

      2-sample test for equality of proportions without continuity
      correction

data:  .Table |
X-squared = 13.1338, df = 1, p-value = 0.000145
alternative hypothesis: greater
95 percent confidence interval:
 0.04630768 1.00000000
sample estimates:
 prop 1 prop 2
0.62100 0.53625

> remove(.Table)
```

The Messages window is currently empty.