1. Data from an article by Robert Rutledge in Annals of Surgery in 1993

	Survived	Died
No seat belt	1781	135
Seat belt	1443	47

Determine whether wearing a seatbelt has an effect on survival. Interpret your results – should you wear your seat belt?

Answer:

A hypothesis test with null hypothesis that the proportions of Death in both "no seat belt" and "seat belt" returns a p-value of 1.234e-07 and confidence interval is (0.02789984,0.05855832) which does not contain) so we can reject the null hypothesis. So, wearing seat belt does have an effect on the chances of survival. So, we should wear seat belt.

2. Compare the approximate and actual tests for difference in 2 proportions using

	Fatal attack	Nonfatal attack	No attack
Placebo	18	171	10845
Aspirin	5	99	10933

   a. Look at only those groups that had an attack
   b. Look at attacks of any type versus no attack (approximate test only)

Answer:

a. If we look at those groups that had an attack

	Fatal Attack	Total People in Attack Group
Placebo	18	171+18
Aspirin	5	99+5

An approximate test on the difference of two proportions gives a p value of 0.1509 so we cannot reject the null hypothesis that the proportions on attack is same for both aspirin and placebo. It is consistent with the confidence interval (-0.01150587, 0.10582822) which contains 0.

Fisher's Exact test on the same hypothesis that the proportions are same gives a p value of 0.1782 which means we cannot reject the null hypothesis.

b. If we look at the attack vs non-attack

	Attack	No Attack	Total
Placebo	18+171	10845	18+171+10845
Aspirin	5+99	10993	5+99+10993

An approximate test on the difference of two proportions gives a p value of 4.464e-07 so we can reject the null hypothesis that the proportions on attack is same for both aspirin and placebo. It is consistent with the confidence interval (0.004744481 0.010769463) which does not contain 0.