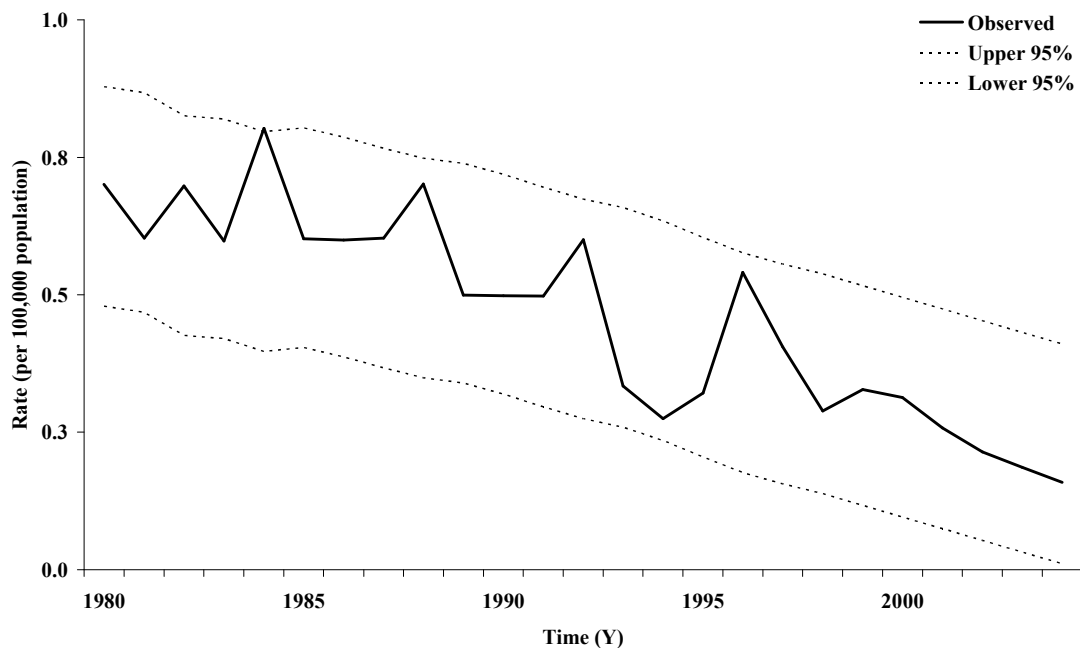


Flawed Analysis or Flawed Understanding: What's In a Confidence Interval?

The concept of a confidence interval (CI) can sometimes be difficult for students and commentators to grasp. Essentially, the CI is the range where you expect something to be. By saying "expect" you are also open to the possibility of the value being outside the interval.

The following graph, reproduced from Baker & McPhedran (2006), shows observed rates of firearm homicide in Australia, 1979-2004. The dotted lines represent the 95% CI for the data, based on the period 1979-1996 and forecast out to 2004.



If the observed rate fell outside the CI, it would be said that what 'actually' happened post-1996 differed from what was expected to happen – suggesting the rate of decline in firearm homicide was significantly affected by the 1996 legislative changes. However, the observed rate remains within the CI, indicating the rate of decline did not change significantly post-1996.

It has been argued that the test used by Baker & McPhedran would not allow a significant result to be found. It is claimed the observed rate could not fall below the lower CI without also falling below zero, and that as a consequence the test is invalid.

Is this correct? No.

The lower CI remains positive (i.e., above zero) throughout the 1997-2004 period. The observed rate could, therefore, have fallen below this level at any time. The fact that it did not fall below that limit does not mean it could not have fallen below the limit. Did not and could not are two separate propositions.