**Key points**

* The null hypothesis is the hypothesis that there is no effect. In this case, the null hypothesis is that the spread is 0, or p=0.5.
* The p-value is the probability of detecting an effect of a certain size or larger when the null hypothesis is true.
* We can convert the probability of seeing an observed value under the null hypothesis into a standard normal random variable. We compute the value of z that corresponds to the observed result, and then use that z to compute the p-value.
* If a 95% confidence interval does not include our observed value, then the p-value must be smaller than 0.05.
* It is preferable to report confidence intervals instead of p-values, as confidence intervals give information about the size of the estimate and p-values do not.

**Code: Computing a p-value for observed spread of 0.02**

N <- 100 # sample size

z <- sqrt(N) \* 0.02/0.5 # spread of 0.02

1 - (pnorm(z) - pnorm(-z))