Answer on Question #44856 – Math - Statistics and Probability

Plavix is a drug that is given to angioplasty patients to help prevent blood clots. A researcher at McMaster University organized a study that involved 12,562 patients in 482 hospitals in 28 countries. All the patients had acute coronary syndrome, which produces mild heart attacks or unstable angina, chest pain that may precede a heart attack. The patients were divided into two equal groups. Group 1 received daily Plavix pills; group 2 received a placebo. After 1 year, 9.3% of patients on Plavix suffered a stroke or new heart attack or had died of cardiovascular disease, compared with 11.5% of those who took the placebo. Can we infer that Plavix is effective?

Solution

$$H_0: p_1 - p_2 = 0 \;\; H_a: p_1 - p_2 > 0$$

$$\widehat{p_1} = 0.093;\; \widehat{p_2} = 0.115;\; n_1 = n_2 = \frac{12{,}562}{2} = 6{,}281;$$

$$\hat{p} = \frac{n_1\widehat{p_1} + n_2\widehat{p_2}}{n_1 + n_2} = \frac{6281 \cdot 0.093 + 6281 \cdot 0.115}{6281 + 6281} = 0.104$$

$$z = \frac{\widehat{p_1} - \widehat{p_2}}{\sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} = \frac{0.093 - 0.115}{\sqrt{0.104(1-0.104)\left(\frac{1}{6281} + \frac{1}{6281}\right)}} = -4.04.$$

$$p - value = 0 < 0.05 = \alpha.$$

We reject H_0.

There is enough evidence to infer that Plavix is effective.