Case Study 2
What is a p-Value ?

Case Presentation:

For this case study, first read the article on interpreting P-values.

Olson, D. M., & Kolls, B. J. (2011). Understanding P values. *Nursing, 6*(6), 8-11. doi: 10.1097/01.CCN.0000407124.76718.93

Discussion 1a:
In the callout box on the bottom left of page 1,
the authors write "P(R) = P(W)"
If you were to read this out loud, what words would be used to explain the notation?
Answer:

Discussion 1b.
The bottom of page 1 uses the notation P(R) = 0.5. What does this notation signify?
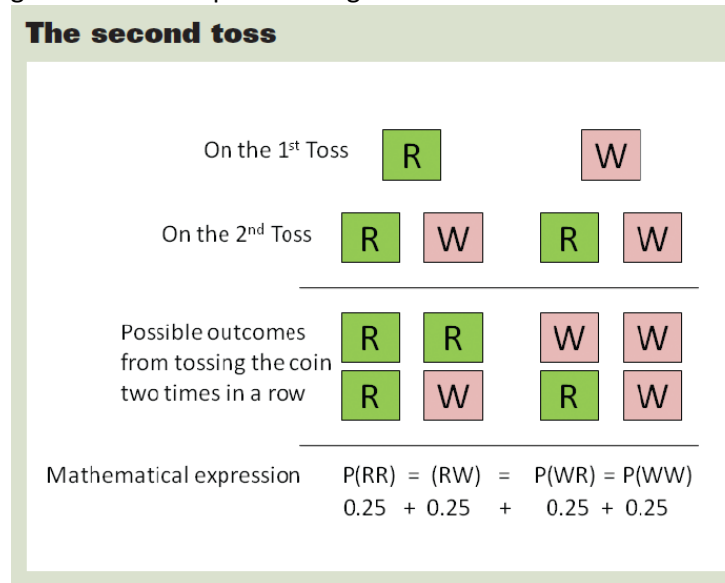**Answer:**

Discussion 1c.
In the callout box on the top right of page 2,
the authors write "P(RR) = P(RW) = P(WR) = P(WW)"
Translate this into a short sentence.
(in other words: what does this mean?)
Answer:

Digging deeper (methods):

Note that at the bottom of page 9 the authors provide a figure to describe the second toss of the coin (see below).

The second toss

On the 1st Toss	R		W
On the 2nd Toss	R W		R W
Possible outcomes from tossing the coin two times in a row	R R R W		W W R W
Mathematical expression	P(RR) = (RW) 0.25 + 0.25	=	P(WR) = P(WW) 0.25 + 0.25

Discussion 2a:
The authors write that there are four equal probabilities.
What are the four equal probabilities presented in this paper?
Answer:

Discussion 2b:
If you were speaking to someone, how would you read this set of probabilities?
Answer:

Digging deeper

Probability has a bit of logic and algebra.

Discussion 3a:
How would you write the probability of being right twice in a row versus not being right ever?
Answer:

Discussion 3b:
We would expect that by chance and chance alone,
exactly half (0.5) of the time we toss a coin twice in a row
you would guess both right or both wrong.
How is this expressed as a probability?
Answer:

Discussion 3c.
How would you write the probability of being right twice in a row
versus not being right twice in a row?
Answer:

Coming to consensus

In the first full paragraph at the top of page 11, the authors write "We can say that p = 0.03125"

Discussion 4a:

Where does the number 0.03125 come from?

<mark>**Answer:**</mark>

Discussion 4b:

The authors correctly identify that the decision point for statistical significance is most often set by tradition.
What is the 'traditional' set threshold for statistical significance?

<mark>**Answer:**</mark>

Discussion 4c:

According to the traditional threshold
Which of the following values are statistically significant?

A. $P = 0.1234$
B. $P = 0.0123$
C. $P = 0.0012$
D. $P = 0.0001$

<mark>**Answer:**</mark>