EPI 5143 Quiz 3

Due by 11:59pm on Monday March 13th, 2023
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In a recent paper, a diagnostic code from a National Patient Registry was used to identify cases of inflammatory bowel disease (IBD). They cited a previous study in which this diagnostic code was validated for a jurisdiction within the same country, and they found that out of 100 children with IBD, 90 had the code recorded, while 2 out of 100 children who didn't have IBD had the code recorded.

1.

a) **Using PROC FREQ, construct the appropriate 2x2 frequency table from the information given, and output a dataset with the frequency counts and percentages for the table.**

Done in SAS

a) **Using a data step and the information in the PROC FREQ output dataset: calculate 1) sensitivity, 2) specificity, 3) positive predictive value and 4) positive likelihood ratio.**

Done in SAS
The sensitivity was 90%, the specificity was 98%, the positive predictive value was 97.83% and the positive likelihood ratio was 45.

b) **Assuming that 1 out of every 750 children in this national registry truly have IBD, what is the probability that a child coded with IBD in this study actually has the condition? Store all of these calculations in the resulting dataset which should have one row, and print the results.**

Done in SAS
The probability that a child coded with IBD actually had the condition is 0.05654 or 5.65%.

For the next 2 questions you can use SAS or calculate by other means, but show all of the steps in your calculations.

2. You are planning on using a diagnostic code to identify cases of type II diabetes in a provincial health administrative database. The diagnostic code has been previously validated, and the authors reported that the positive likelihood ratio for the diagnostic code is PLR=29.9. If the true prevalence of diabetes in the provincial population is 2.5%, what is the probability that someone with the diagnostic code for diabetes truly has the disease?

Done in SAS
The probability that someone in the diagnostic code for diabetes truly has the disease is. 0.43396 or 43.396%.

3. You want to use a diagnostic code to identify cases of acute myocardial infarction in a national CVD registry. The diagnostic code has been validated in a chart review validation study and the authors only reported that sensitivity=80% and specificity=97.5%. If you know the true occurrence of acute MI in the population of interest is 2.5 in 100, what is the probability that someone with the diagnostic code really had an acute MI?

We know, Positive likelihood test (PLR) = sensitivity / 1-specificity
= 0.80/1-0.975
= 32
Using this value in SAS,
The probability that someone with the diagnostic code really had an acute MI is 0.45070 or 45.07%.