## Tests for the Odds Ratio in Logistic Regression with One Normal X (Wald Test)

### Numeric Results

| Power | N | Events | P1 | P1(μx) | Odds Ratio | Alpha | b0 | b1 |
|---|---|---|---|---|---|---|---|---|
| 0.90052 | 143 | 21 | 0.15 | 0.12456 | 2.26 | 0.05 | -1.94996 | 0.81536 |

### References

Novikov, N., Fund, N., Freedman, L.S. 2010. 'A modified approach to estimating sample size for simple logistic regression with one continuous covariate', Statistics in Medicine, Volume 29(1), pages 97-107.

### Report Definitions

Power is the probability of rejecting a false null hypothesis. It should be close to one.
N is the size of the sample drawn from the population.
Events is the expected number of cases in which Y = 1.
P1 is the overall proportion of the population in which Y = 1.
P1(μx) is the proportion of the population in which Y = 1 if X = μx (mean of X).
Odds Ratio is the ratio: odds(μx + σx)/odds(μx) = [P1(μx + σx)/(1-P1(μx + σx))] / [P1(μx)/(1-P1(μx))].
Alpha is the probability of rejecting a true null hypothesis.
b0 is the intercept in the logit model log(P/(1-P)) = b0 + b1 X.
b1 is slope in the logit model log(P/(1-P)) = b0 + b1 X.

### Summary Statements

A logistic regression of a binary response variable (Y) on a continuous, normally distributed variable (X) with a sample size of 143 observations achieves 90% power at a 0.05 significance level to detect an odds ratio of 2.26 when the prevalence of Y in the population is 0.15. This odds ratio is the ratio of the odds that Y = 1 when X is one standard deviation above its mean to the odds that Y = 1 when X is equal to its mean.

### Dropout-Inflated Sample Size

| Dropout Rate | Sample Size N | Dropout-Inflated Enrollment Sample Size N' | Expected Number of Dropouts D |
|---|---|---|---|
| 20% | 143 | 179 | 36 |

### Definitions

Dropout Rate (DR) is the percentage of subjects (or items) that are expected to be lost at random during the course of the study and for whom no response data will be collected (i.e., will be treated as "missing").
N is the evaluable sample size at which power is computed. If N subjects are evaluated out of the N' subjects that are enrolled in the study, the design will achieve the stated power.
N' is the total number of subjects that should be enrolled in the study in order to end up with N evaluable subjects, based on the assumed dropout rate. After solving for N, N' is calculated by inflating N using the formula N' = N / (1 - DR), with N' always rounded up. (See Julious, S.A. (2010) pages 52-53, or Chow, S.C., Shao, J., Wang, H., and Lokhnygina, Y. (2018) pages 32-33.)
D is the expected number of dropouts. D = N' - N.

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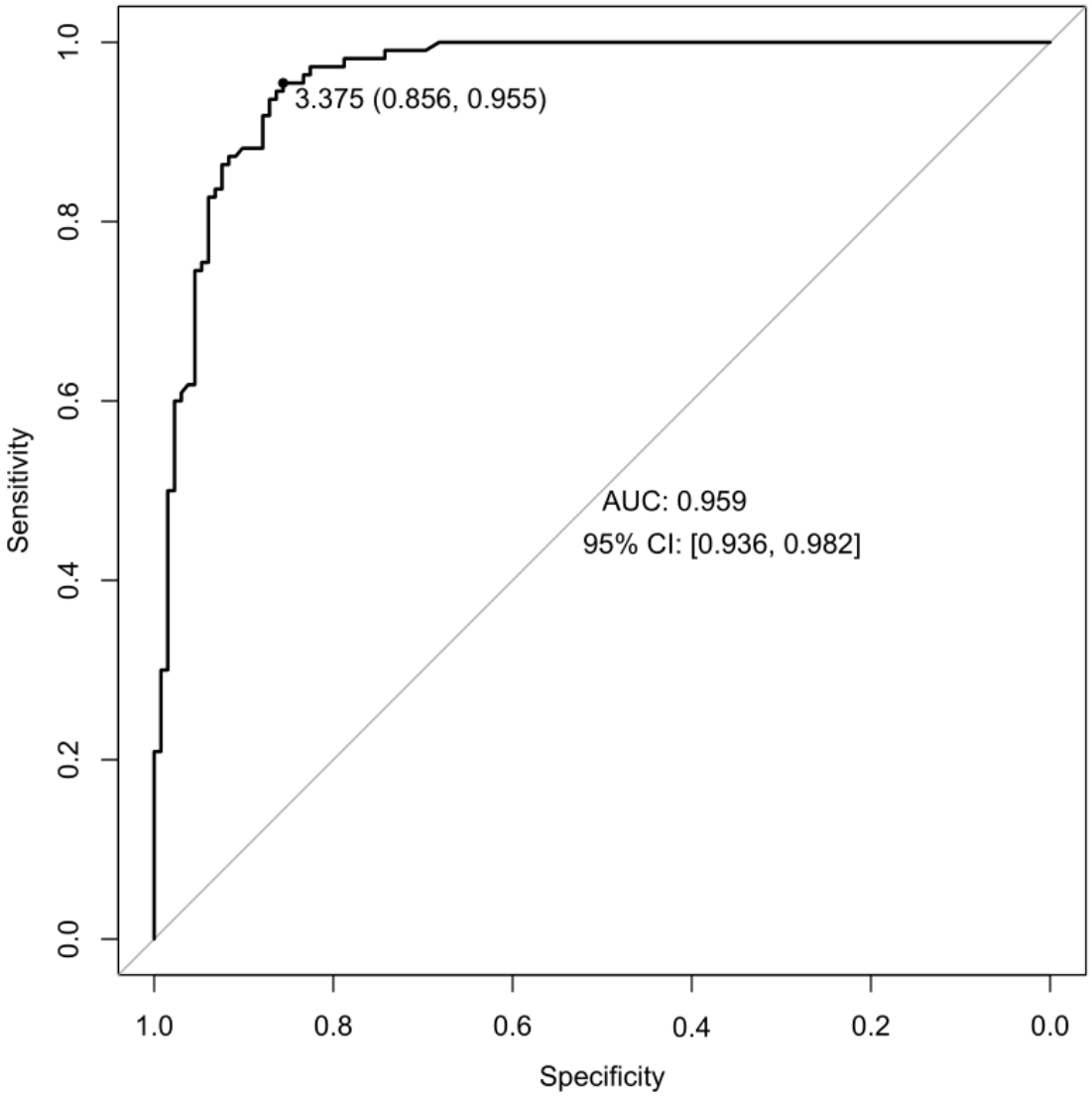
## Procedure Input Settings

**Autosaved Template File**
C:\Users\Administrator\Documents\PASS 2021\Procedure Templates\Autosave\Tests for the Odds Ratio in Logistic Regression with One Normal X (Wald Test) - Autosaved 2026_4_6-16_56_56.t440

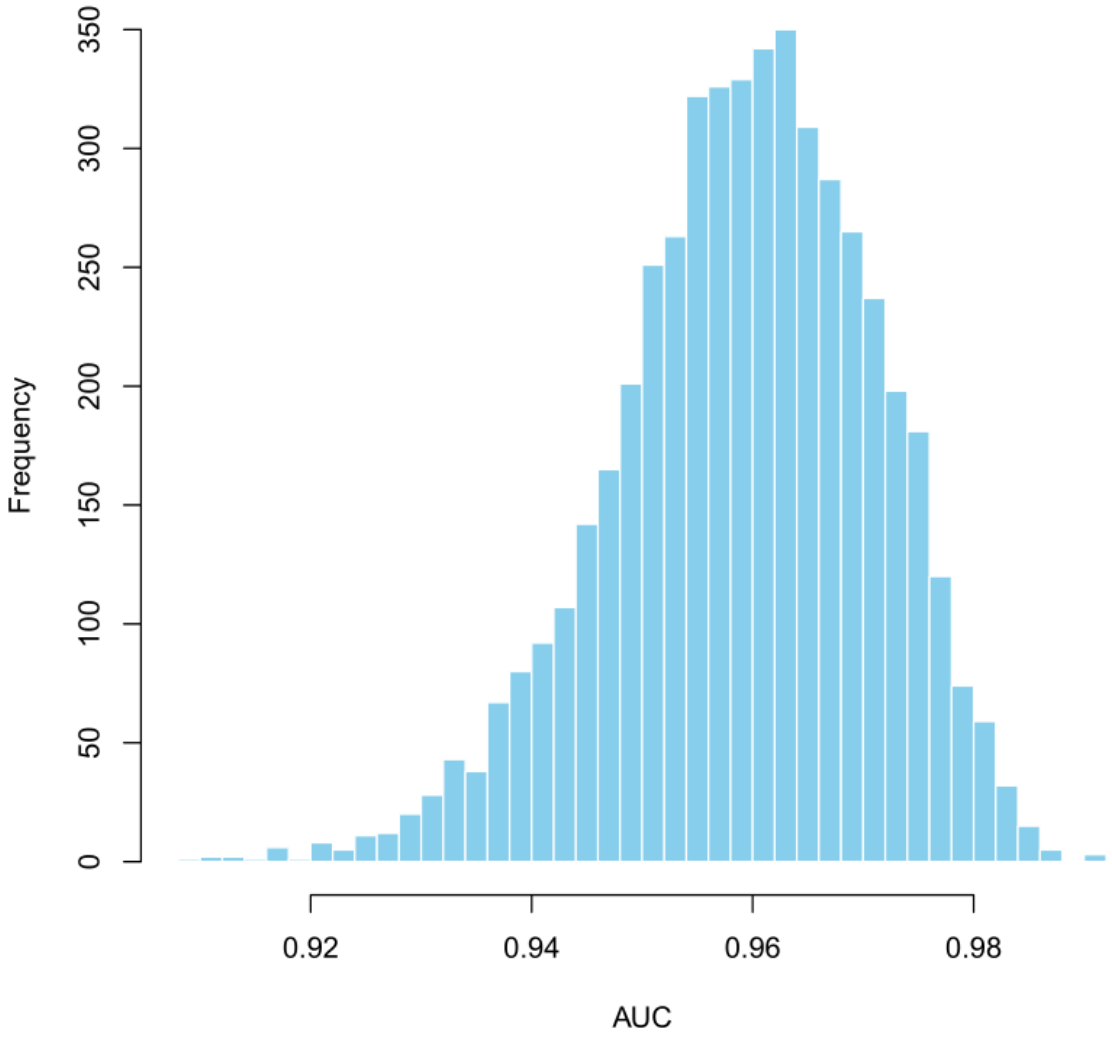
**Design Tab**

| | |
|---|---|
| Solve For: | Sample Size |
| Alternative Hypothesis: | Two-Sided |
| Power: | 0.90 |
| Alpha: | 0.05 |
| P1 (Prevalence of Y): | 0.15 |
| Odds Ratio (Odds[x+σx] / Odds[x]): | 2.26 |




**Supplementary figure 1** Receiver operating characteristic curve of SIRI among DFI patients (ROC curve with Bootstrap CI, n = 242).

**Abbreviations:** SIRI, Systemic Inflammatory Response Index; DFI, diabetic foot infection.




**Supplementary figure 2** Area under the receiver operating characteristic curve assessed by Bootstrapping (Bootstrap distribution of AUC, n = 242).