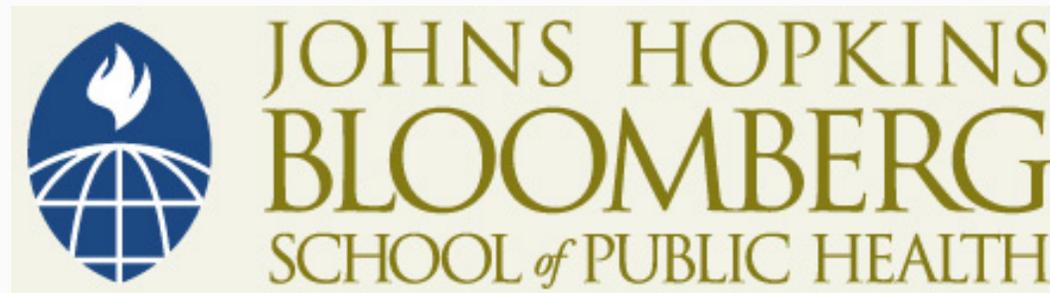


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Lecture 3b: Practice Problem Solutions

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Practice Problems

1. Let's employ Stata to experiment with power and sample size calculations:
 - For the O.C.-B.P. experiment, suppose researchers were interested in looking at finer differences in B.P. between the O.C.-users and non-users
 - Suppose a pilot study estimated the mean B.P. in O.C. users to be 130.1 units and 127.4 units in the non-users
 - This difference is considered scientifically interesting but was not found to be statistically significant in the pilot study
 - Recall that the estimated standard deviation for O.C. users is 15.3 units for non-O.C. users it is 18.3
 - What would the necessary group sizes be to conduct a study with $\alpha = .05$ and 80% power to detect a difference of this size? (assume equal numbers of O.C. users and non-users)

Solutions

```
. sampsi 130.1 127.4, alpha(.05) power(.8) sd1(15.3) sd2(18.3)
```

Estimated sample size for two-sample comparison of means

Test Ho: $m_1 = m_2$, where m_1 is the mean in population 1
and m_2 is the mean in population 2

Assumptions:

```
alpha = 0.0500 (two-sided)
power = 0.8000
m1 = 130.1
m2 = 127.4
sd1 = 15.3
sd2 = 18.3
n2/n1 = 1.00
```

Estimated required sample sizes:

```
n1 = 613
n2 = 613
```

Solutions

2. What would the necessary group sample sizes be to do the same study as in question one, but with three times the number of non-O.C. users as compared to O.C. users?
 - How does the total sample size (both groups together) compare in this scenario relative to the situation with equal group sizes?

Solutions

```
. sampsi 130.1 127.4, alpha(.05) power(.8) sd1(15.3) sd2(18.3) ratio(3)
```

Estimated sample size for two-sample comparison of means

Test Ho: $m_1 = m_2$, where m_1 is the mean in population 1
and m_2 is the mean in population 2

Assumptions:

```
alpha = 0.0500 (two-sided)
power = 0.8000
m1 = 130.1
m2 = 127.4
sd1 = 15.3
sd2 = 18.3
n2/n1 = 3.00
```

Estimated required sample sizes:

```
n1 = 373
n2 = 1119
```