

PbAf 527: Quantitative Methods**Hypothesis testing and P value Examples**

The state of Oregon is interested in the cost-effectiveness of a life-skills program for female inmates in one of its prisons. The program's goal is to reduce re-convictions (recidivism) by providing women with life and job skills prior to release from prison. The evaluation used administrative data and interviews to assess the effects of the program. The data were collected for 187 women who participated in the program over 3 years and 292 women chosen as a control group (did not participate).

	Program Participants (N=187)	Non-Participants (N=292)
Proportion Re-convicted	.235	.257
Average number of Opportunity days (days between release and data collection)	807.5 (S=355)	766.3 (S=375)
Average Age at conviction	31.1 (S=6.9)	33.3 (S=8.4)
Proportion High Risk (evaluation)	.34	.38

1. *How can we assess the effectiveness of the program?* Describe the research design—What is the outcome variable? What are the explanatory and control variables? Which comparisons will help us to assess the program effectiveness? How long were the inmates followed? What factors might “confound” our measure of the program effects?
2. *What was the re-conviction rate under the program?* Provide a confidence interval for the proportion of women in the program re-convicted (at the 90 percent confidence level). Also, provide a range estimate of the total number of program participants re-convicted by the end of the evaluation period.
3. *Are re-convictions for program participants lower than the prison average?* The historical re-conviction rate for all prisoners has been 25 percent. Test the hypothesis that the rate for program participants is different than the historical average. [Use a 10% significance level.] Provide a p value (observed significance level) for this test. How do these results compare to your part 2 confidence interval results? Also test the hypothesis using 5% and 1% significance levels.

Part II:

4. *Does the program affect re-convictions?* Are the re-conviction rates different for women in the program and women who did not have access to this program? Test the statistical significance of the difference (using a 10% significance level). Then provide a p value for the difference. Also provide a 10% confidence interval for this difference.
5. *What else affects re-conviction chances?* The table provides information on other average differences between the participants and non-participants. Included are the number of “opportunity days” (the number of days between release and the collection of the re-conviction data), average age at the time of release, and the proportion of the group evaluated as being at high risk for re-conviction. How does this information affect your assessment of the meaning of the re-conviction comparison? [Use your sampling skills and analytic reasoning to say why.]
6. *Is the program cost-effective?* The evaluation estimated that the annual budget for this program was \$150,000 for serving about 60 women per year. [They relied heavily on volunteers to provide instruction and mentoring.] The only monetary benefit of the program is the savings from prevention of re-conviction. How much would it have to save per re-conviction to pay off? Are there other considerations that you would want to include in a more detailed analysis of the costs and benefits?
7. *What does it all mean?* Write a paragraph describing your results for the Oregon state panel assessing this project (non-statisticians). Be sure to present the specific numerical results you have found, as well as to describe the policy implications and any caveats or study limitations.