A recent community health survey conducted on the teens of Testalot suggested an alarmingly high rate of smoking. The concerned parents of Testalot, never ones to let a reason for public advocacy go unrealized, have started picketing the storefront of the only convenience store in town that sells cigarettes. The parents have assumed that if they can stop the selling of cigarettes at the source, then they will stop the teens of Testalot from either starting or continuing to smoke. This goes on for several months despite the protests of the convenience store owner who believes that the solution for preventing teenage smoking is more complicated that just stopping the purchase of cigarettes. The convenience store owner, Richarde, approaches the Testalot University Community Health department for some assistance. Richarde reviews the concerns of the parents of Testalot with the university staff and asks them to conduct an observational study examining if there are other determinants of teen smoking that are important, if not more important, than just stopping cigarette sales in his convenience store.

Your PhD supervisor approaches you to help answer Richarde’s question. As always, you create a panel of experts and stakeholders to develop a testable causal model that may shed light on Richarde’s questions. Your expert/stakeholder committee also includes members of the concerned parents of Testalot to ensure that there is consensus on the causal model that you plan to test. After much debate, the panel unanimously agrees to test the following causal model.

Diagram

Description automatically generated

Outcome=TeenSmoker

Exposure=StoreAccess

Common Cause=Gender, PeerInfluence, & Age

The consensus data definitions for the random variables in the causal model are as follows:

|  |  |  |
| --- | --- | --- |
| Random Variable | Definition | Levels/Range |
| TeenSmoker | Smoked ≥ 1 cigarette in last 7 days | Yes//No |
| StoreAccess | # times visited Richarde’s convenience store in last 7 days | Never/Between 1-3 times/More than 3 times |
| Age | Age in years | 13 to 19 |
| PeerInfluence | Perceived degree of peer influence on teen smoking | None/Moderate/Strong |
| Gender | Biologic sex | Male/Female |

The consensus research question: Is there an association between access to Richarde’s convenience store and teen smoking?

Your plan is to take a random sample of teens in Testalot and test the total effect of the exposure on the outcome. Both parties, the concerned parents of Testalot and Richarde, have agreed that they will abide by your interpretation and conclusion of the data analysis. Richarde has agreed to stop selling cigarettes if your analysis suggests that the exposure is related to the outcome. The concerned parents of Testalot have not only agreed to stop picketing Richarde’s convenience store if there is no evidence of association between the exposure and the outcome, but they have even promised to start smoking cigarettes themselves to help make up for all of Richarde’s lost income from their activist activities. Your supervisor takes you aside and whispers. “You can’t get this wrong, your entire academic and professional career is riding on your correctly specifying the relationship between this convenience store and teen smoking in Testalot!” Richarde confides in you that he is worried about losing his store if the results are not in his ‘favour’. The concerned parents of Testalot have also told you that they plan to hire an expert outside researcher to review your work in the event that you might make an ‘error’ in your analysis and interpretation if the results are not in their ‘favour’. The stakes are high!

You have finally collected all your data. The dataset is now available for your analysis. The concerned parents of Testalot and Richarde are aware that you will be providing them with the final results and interpretation on March 31, 2022. They have told you that this deadline will not be extended and any attempt to do so might cause a riot in Testalot!

What do you conclude from your analysis, and what will you tell Richarde and the concerned parents of Testalot? (Show all your work and STATA code that has led you to this conclusion because the outside expert hired by the concerned parents of Testalot will try to reproduce all your analyses and results using this STATA code. If this hired gun can’t reproduce your analyses and results, this will be reported back to the concerned parents of Testalot who have threatened to call your conclusions “fake news”!)