The Illinois Workplace Wellness Study

Problem Set #1

Executive Summary

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Workplace wellness programs have become increasingly popular among U.S. employers, with $8 billion generated within the industry and covering over 50 million American workers. The typical workplace wellness program includes health screenings/assessments and activities employees can participate in which are designed to improve employee health. The Illinois Workplace Wellness Study put the effects of these programs to the test, organizing a randomized controlled trial to evaluate the causal effects of workplace wellness programs. The objective of the case is to see if there is a causal effect of workplace wellness programs on health outcomes and health care usage to provide evidence-based recommendations to employers.

Many prior studies related to workplace wellness programs, which have praised the program's success, have studied firms that have implemented workplace wellness programs compared to firms that have not implemented these programs. An example would be comparing the health care spending between these two groups of firms. In order to effectively estimate the effect of workplace wellness programs on health care spending, it would need to be determined that the firms with and without wellness programs are similar in all relevant characteristics (such as size, industry, employee demographics, health categories). This condition is unlikely to be satisfied as firms would most likely want to decide for themselves if they were to offer a wellness program or not, which would cause the selection bias that should be avoided to estimate a true causal effect of workplace wellness programs. These firms that choose to have wellness programs may be systematically different, perhaps being larger, more profitable, or already health-conscious, compared to firms that do not make this selection.

In the Illinois Workplace Wellness Study, the control group was made illegible to participate in the iThrive wellness program, while the treatment group was eligible to participate in the program. In order for a causal effect to be estimated between these two groups, the

participants of the study would need to be randomly assigned (instead of self-selection) to each group so that employees who are eligible/ineligible for iThrive are similar in all characteristics. This condition is satisfied because the random assignment in large numbers will balance the characteristics of the control and treatment groups and eliminate selection bias.

In the context of this study, the treatment/control groups indicate if they were selected to be eligible to participate in the iThrive wellness program. The control group represents the employees who were a part of the research study but were not assigned to the iThrive program. The treatment group represents the employees who were assigned to the iThrive program. The control group contained 1,534 individuals and the treatment group contained 3,300 individuals. These groups differ from the participants and non-participants, as the participants were individuals within the treatment group who actually took part in the iThrive program. Non-participants, who were also in the treatment group, did not decide to participate in iThrive. Of those in the treatment group, 1,900 individuals (58%) participated in the iThrive programs.

To verify that randomization successfully balanced the treatment and control groups, characteristics and health outcomes between the two groups were measured before the wellness program trial began. For each baseline variable, we estimated the linear regression: $Y = \beta_0 + \beta_1 \times Treatment + \varepsilon$, with β_0 representing the control group mean and β_1 representing the difference between the groups. Our linear regression produced a p-value that tests the null hypothesis that there was no difference in means between the two groups. Each characteristic and health outcome had a p-value greater than the alpha of 0.05, meaning that there was no significant difference between the treatment and control groups and was evident of random assignment.

To estimate the causal effect of being offered the wellness program, we compared year 1 health outcomes of the treated group to the control group. For our first model with no

demographic controls, we estimated the linear regression: $Y = \beta_0 + \beta_1 \times Treatment + \varepsilon$, with β_0 representing the control group mean and β_1 representing the difference between the groups. For our second model with demographic controls, we estimated the linear regression: $Y = \beta_0 + \beta_1 \times Treatment + \beta_2 \times Male + \beta_3 \times White + \beta_4 \times Age37\_49 + \beta_5 \times Age50 + \varepsilon$, which β for each demographic representing the difference in outcomes for that group compared to other groups, holding all things constant. After analyzing the coefficients and standard errors, there were no outcome variables in the first year that had a statistically significant difference in outcomes between the treatment and control groups. Demographic controls have the same result, consistent with our findings pre-randomization as the demographics displayed no significant differences.

When comparing participants and non-participants of the iThrive program within the treatment group, we estimated two linear regressions. The first was: $Y = \beta_0 + \beta_1 \times Participant + \varepsilon$, and the second was: $Y = \beta_0 + \beta_1 \times Participant + \beta_2 \times Male + \beta_3 \times White + \beta_4 \times Age37\_49 + \beta_5 \times Age50 + \varepsilon$, with β_0 now representing the non-participant mean and β_1 now representing the difference in outcomes between participants and non-participants. We can expect to see larger differences between the outcomes and the outcomes with demographic controls because there was no random assignment of employees to participate in the iThrive program, indicating selection bias. Despite this bias, based on analysis of the coefficients and standard errors, we can expect participants to have more health coverage and less spending on hospital care.

To conclude, our analysis provides evidence that randomization before the experiment eliminates selection bias, the causal effects of offering a wellness program to employees were insignificant for health outcomes, and the participation outcomes suffer from selection bias. The workplace wellness provides insight to employers that offering wellness programs do not provide a significant boost to health outcomes and should be avoided if the program is costly to the firm.