Homework due Sep 18, 2024 07:30 CST Completed

Due to the high costs of medical insurance, and the adverse effects that unpaid medical leave might have, prominent politicians have put forward proposals to increase medical leave benefits. Other politicians argue that this would decrease the incentive to return to work and therefore largely increase the duration of medical leave. The following questions examine the effect of increasing medical leave benefits on time out of work.

2.1

5.0/5.0 points (graded)

Let $X_i = 1$ if recipient i gets a high benefit and $X_i = 0$ if he/she receives a low benefit. We would like to know $Y_{i1} - Y_{i0}$ where Y_{i1} is the time out of work of recipient i when $X_i = 1$ and Y_{i0} is the time out of work of recipient i when $X_i = 0$. The Fundamental Problem of Causal Inference here is that we only observe:

- $Y_i = X_i Y_{i1}$
- $Y_i = (1 - X_i) Y_{i0}$
- $Y_i = X_i Y_{i1} + (1 - X_i) Y_{i0}$ ✔
- $Y_i = X_i Y_{i0} + (1 - X_i) Y_{i1}$

Explanation
The Fundamental Problem of Causal Inference here is that we only observe either $(Y_{i1}$ or $(Y_{i0}$. Mathematically, this can be expressed as $Y_i = X_i Y_{i1} + (1 - X_i) Y_{i0}$

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Answers are displayed within the problem

Average benefit (1983 $)	**Amount**	**Standard Error**
high earnings	151.08	(0.96)
low earnings	118.58	(0.64)

2.2

5.0/5.0 points (graded)
Meyer and co-authors have an administrative data set that allows them to see the maximum amount of weekly medical leave benefits that different workers are entitled to. They have aggregated the data above showing the average medical leave benefits for two different groups of workers, high earners and low earners (standard errors in paratheses). You are their research assistant. You notice that the first group is granted substantially higher medical benefits than the second group. You also see that from the data set you can calculate the average weeks of sick leave that both groups take.

True or False? Using the data described above you can calculate the causal effect of the right to higher sick leave benefits on the amount of sick leave that people take. Note: numbers in parentheses are standard errors.

- ○ True
- ◉ False

✔

Explanation
Following this approach, you would define high earners the treatment group because they are entitled to high medical leave benefits (X=1). The control group would be formed by low earners who happen to be granted substantially lower benefits (X=0). The difference $E[Y_1|X=1] - E[Y_0|X=0]$ would only correctly calculate the Average Treatment Effect on the Treated (ATT) if the treatment-control balance condition holds. However, this is almost certainly not the case since both groups are very different along dimensions that affect the outcome through other channels than the treatment. For instance, high-income earners might have more wealth which allows them to stay out of work longer when they face illness. We would then wrongfully attribute the effect of wealth on sick leave to the treatment.

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ℹ Answers are displayed within the problem

Variable	**High earnings**		**Low earnings**	
	Before increase (1)	After increase (2)	Before increase (3)	After increase (4)

Mean duration (weeks) Kentucky	11.16 (0.83)	12.89 (0.83)	6.25 (0.30)	7.01 (0.41)
Michigan	14.76 (2.25)	19.42 (2.67)	10.94 (1.09)	13.64 (1.56)
Median duration (weeks) Kentucky	4.00 (0.14)	5.00 (0.20)	3.00 (0.11)	3.00 (0.12)
Michigan	5.00 (0.45)	7.00 (0.67)	4.00 (0.22)	4.00 (0.28)

Excerpt from Table 4 in Meyer, Viscusi, Durbin (1995): "Workers' Compensation and Injury Duration: Evidence from a Natural Experiment", American Economic Review.

Meyer et al. (1995) used a difference-in-difference (diff-in-diff) approach to estimate the effects of benefit rates on medical leave. They used a legal reform that affected the level of medical leave benefits for high-income earners but left the benefits unchanged for low-income earners. The table above shows various statistics for the two groups considered. Note: the policy which changed the benefits of high earners was introduced separately in both Kentucky and Michigan. The numbers in parentheses are standard errors.

2.3

5.0/5.0 points (graded)

Compute the diff-in-diff estimates for “Median duration (weeks)” separately for Kentucky and Michigan. Please give the answers in whole numbers. (2.5 points for each answer)

Kentucky

1 ✔ Answer: 1

1

Michigan

2 ✔ Answer: 2

2

Explanation
The diff-in-diff estimates for median duration in Kentucky is given by: (5-4)-(3-3)=1. For Michigan, it is given by (7-5)-(4-4)=2.

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Answers are displayed within the problem

2.4

5.0/5.0 points (graded)

Suppose that you learn that at the same time that the reform was passed, a new law was introduced to increase the cost of medical insurance for high-income earners. True or False? This would likely violate the parallel trend assumption of the diff-in-diff approach. (5 points)

- (●) True
- ( ) False

✔

Explanation
Differential exposure to the reform might lead to a violation of the parallel trend assumption. In particular, the group of high-income earners might seek less effective treatment, thus increasing their need for medical leave differentially relative to non-affected low-income earners.

Submit You have used 1 of 1 attempt

ⓘ Answers are displayed within the problem

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