Problem Set 1: Research Interests

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Research Interest

Does patient-directed advertising (TV commercials, online ads, and discounts) slow down the patient from switching to a cheaper medicine at the time of patent expiration? Before the time of a drug's patent expiration, we see many drug companies making an effort to reduce the number of patients moving to generic drugs. I saw many papers focused on how these companies promote their drug to doctors, but there are few papers focused on patient-directed advertising strategy.

To study whether these patient-directed ads work, I am interested in using a Difference-in-Differences (DID) approach to study. Those that had patient ads launched soon after patent expiration will be treated as (treatment group). Those who didn't use this method will be treated as (control group). Then I will look at how the rate of patients switching to generics changes before and after the patent expires. If patient ads are effective, I would expect to see less switching to generics in the treatment group (compared to the control group) after the patent ends.

There might be some challenges with this method. For example, The two groups (treatment and control) might already be on different paths before the patent expires. That would make the comparison unfair. So I will use event study graphs to check if both groups had similar trends before the patent expiration. If they did, the DID results will be more trustful. Also, the advertising may not be random. Maybe they advertise when they are already afraid of losing customers so it is not random. I will control for things like drug type, price, and past sales to make the treatment and control groups more comparable.

Overall, I want to find out whether patient-directed advertising really works as a defensive strategy like it is helping companies hold on to market share even after losing their patent protection. If I find that these ads reduce patients to switch to generic medicine, then we can say that patient- directed advertising did help them keep their customers. Previous studies have found that advertising can alter switching behavior between branded and generic drugs (Desai et al., 2018). Similarly, drug prices are known to fall substantially after patent expiry (Vondeling et al., 2018).

Empirical Approach

The Difference-in-Differences (DID) estimation can be written as:

$$Y_{it} = \alpha + \beta(Treatment_i \times Post_t) + \gamma_i + \delta_t + \epsilon_{it} \tag{1}$$

where Y_{it} is the rate of generic substitution for drug i at time t.

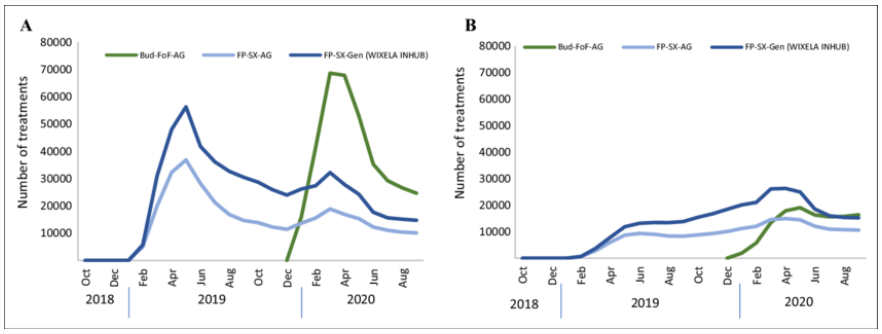

Figure 1: Hypothetical trends in generic substitution before and after patent expiration.

References

Desai, R. J., Sarpatwari, A., et al. (2018). Differences in rates of switchbacks after switching from branded to authorized generic and branded to generic drug products: cohort study. *BMJ*, 361:k1180.

Vondeling, G. T., Cao, Q., Postma, M. J., and Rozenbaum, M. H. (2018). The impact of patent expiry on drug prices: A systematic literature review. *Applied Health Economics and Health Policy*, 16:653–660.