Pilot Proposal: The impact of payment policy for physician-administered drugs Jan. 26, 2022

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Abstract: Current cost-plus Medicare payment policy for physician-administered drugs (Medicare Part B) creates incentives for physicians to prescribe high priced drugs. Patient health may be impacted if a less suitable but more expensive and profitable drug for the physician is prescribed in lieu of a cheaper option. However, because patients face cost-sharing as a percentage of price, there is also an incentive to choose lower priced drugs. Our descriptive analysis examining price levels and market shares suggests that higher reimbursement is not reliably correlated with market share.

We propose to investigate the *causal* relationship between reimbursement and physician drug choices, document the consequences of treatment distortions on patient health outcomes, and evaluate the implications of alternative reimbursement policy for patient health. We will identify effects of policy on treatment choices for disease categories that affect primarily the aging population: inflammatory conditions, cancer, and chronic disease. We will compare first line drugs versus more expensive biologics for inflammatory conditions, chemotherapy versus alternatives for cancer treatment, and infusion/injections versus patient-administered medications for a variety of chronic conditions.

- **Aim 1**: **To identify the causal effect of drug price and physician reimbursement on drug treatment choices.** We will use exogenous variation in drug reimbursement rates from the 2013 Budget Sequester Act, which lowered physician reimbursement while leaving patient cost-sharing unchanged. We will also use discontinuous changes in prices resulting from generic entry.
- **Aim 2: To identify the causal effect of drug price and physician reimbursement on patient health outcomes.** Using estimates from Aim 1, we will examine how these factors affected patient health outcomes, including patient mortality, hospital admissions, and readmissions.
- **Aim 3: To estimate how alternative reimbursement policies would affect treatment choices and patient health outcomes.** We will conduct counterfactual simulations using estimates from Aims 1 and 2 for alternative proposed reimbursement policies.

Introduction: Current cost-plus payment policy for physician administered drugs in Medicare Part B typically reimburses physicians at the average sales price (ASP) plus 6%, lagged by two quarters. The ASP the average price of all sales (net of rebates) within a specific ingredient. Physicians have a financial incentive to choose drugs with higher ASPs, since they are paid a percentage over ASP.

Approach: How do payment incentives affect the volume and type of physician-administered drugs prescribed? We first estimate how prescribing behavior responds to a drug's reimbursement level and how that varies by class of drug. Physicians might be prescribe highly reimbursed drugs because they are more profitable. However, highly reimbursed drugs are also more expensive for patients, and physician may take this into account or patients may choose not to pursue such expensive treatments.

Aim 1: To identify our model, we will use the 2013 Budget Sequester Act. The Act had a significant impact on physician margins, as it reduced the reimbursement fees received by the physician by 2%, to 104.3% of ASP on April 1, 2013. Since the regulation did not affect the statutory reimbursement, the patient cost-sharing component remained unchanged, at 20% of 106% of ASP. This allows us to separately identify the response of physicians to their own profit from the weight they place on patient expenses.

A second source of identification will come from generic entry, which leads to large and discontinuous prices changes. Within chemotherapy treatments, docetaxel and irinotecan had patents expire in 2011

and 2008, respectively, which corresponded to large price drops. Within rheumatoid arthritis treatments, infliximab and pegfilgrastim are biologics that had its patents expire in 2016 and 2015, respectively, and biosimilar entry corresponded with large price drops. Previous work has examined biosimilar entry in Europe (Scott Morton, Stern, and Stern, 2018).

We plan to estimate reduced form elasticities and a discrete choice model of drug demand. Let the value of giving drug j to patient i at time t by physician d be given by

$$v_{idjt} = \alpha_j(r_{jt} - p_{djt}) + \gamma c_{ijt} + \boldsymbol{\beta} X_{ijt} + \varepsilon_{ijt}$$

The first term is physician profit: the reimbursement the physician receives r_{jt} minus p_{jt}, the price the physician pays to the pharmaceutical firm. The second-term is patients' financial costs c_{ijt}. Observable characteristics X_{ijt} also affect utility. We will estimate α_j, the relative weight physicians place on their own profits from prescribing the drug and γ the weight physicians place on patient financial outcomes. This formulation allows us to estimate demand using standard BLP with random coefficients.

Aim 2: To identify the causal effect of drug price and physician reimbursement on patient health outcomes, we rely on claim-based metrics in medical literature that are commonly used to evaluate cancer and rheumatoid arthritis outcomes. For the two chemotherapy medications with generic entry, our health outcomes measure will consist of Progression Free Survival (PFS) using ICD-9 and ICD-10 codes, as in Lamont et. al. (2006). We anticipate generic entry affect whether patients receive docetaxel or irinotecan over other treatment regimens recommended for breast/ovarian and colon cancer. For the two rheumatoid arthritis medications, we will use a claims-based measure developed in Wu et. al (2015) to assess the effectiveness of these therapies. We will also instrument for the probability of prescribing infliximab and pegfilgrastim versus first-line therapy methotrexate and other conventional nonbiologic disease-modifying antirheumatic drugs (DMARDs) by using generic entry date.

Aim 3: To estimate how alternative reimbursement policies would affect treatment and health outcomes**,** we will use estimates to simulate counterfactual drug choices. The first type of policy we will evaluate is a fixed payment per drug that is constant across drugs within a therapeutic class and independent of physician acquisition costs. The second, alternative ASP add-on fees, which will directly speak to the policy debate about Part B payment reform. The third, reimbursement caps which limit the total reimbursement revenues that physicians can receive from Medicare, independent of the volume that they prescribe.

Budget: Our priority for this budget request is access to the Medicare fee-for-service claims and Medicare Part D data files through 2017. If available, support for research assistants and investigator time would be valuable as well.

Bibliography

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