August DRRC and Compliance Amendment

23.25 Provider networks, hospital systems, and changes in practice in response to regulations

Committees Objection:

1. Open-ended request that does not meet minimum necessary requirements.
2. Large amount of identifiable data requested for a long period of time.
3. Needs more specificity.

Adjustment to the Application Part 2 Only:

- Project start date changed from September to December 2023.
- Project end date changed from September to December 2023.

Dr. Zang addressing DRRC concerns:

To provide a general overview, I will use social network analytics to examine the relationship between provider formal network, informal network, and prescribing practices. I will use regression models to assess how changes in provider networks are associated with changes in patient care and leverage several plausibly exogenous shocks that impact the provider networks for causal identification. These include hospital mergers and acquisitions, physician sanctions, or changes in insurance plan features. A difference-in-difference approach will be used to evaluate patterns in prescribing and patient care before and after these plausibly exogenous shocks for "treated" and "control" networks.

Providers' formal networks will be constructed using their formal organizational affiliation (e.g. hospital/clinic) and the insurance plans they are contracted with. Providers' informal networks will be constructed based on patient-sharing from all Medicaid encounter claims. This method of social network construction has been widely applied in prior health care services research, which has shown that patient-sharing networks transmit information and advice between physicians (Barnett et al. 2011), predict the diffusion of expertise and medical innovations (Pollack et al. 2015) as well as collaboration, teamwork, information sharing, health care integration, learning, and teamwork (Everson et al. 2018, Funk et al. 2018, Ghomrawi et al. 2018, Hollingsworth et al. 2016, Zhang and King 2021). Social network methods will then be applied to construct key variables including degree centrality (# of connections) and cohesion (clustering coefficient).

Data needed to answer the research question:

Why does the research need all encounter data?

All patient-physician encounter data are needed in order to construct and accurately map physician networks. This method is needed to capture general relationships between physicians (beyond the drug of study) and has been validated by previous work. For instance, Barnett et al (2011) used claims data from physicians for all specialties in all office-based settings who filed a claim in a given year to construct the physician network.

Why the time period? (this has been adjusted to 2028)

The research will leverage various quasi-exogenous shocks that occurred during different time horizons (including hospital mergers and acquisitions, physician migration across hospitals) as causal identification strategies to increase the rigor of the research. The requested time horizon is needed for constructing multiple control periods for comparison analysis.

Moreover, longitudinal data will provide valuable insight as to how physicians' relationship dynamics co-vary with the institutional and regulatory environment, which has been an important piece of puzzle that is currently missing for research and for policy. It is valuable to understand how the mounting attention targeted toward opioid prescribing *in the past decade* altered the trajectory of social influence of physician networks on their prescribing practices (as well as social exclusion of physicians who do not conform to current regulatory standards).

Why identifiable information on hospitals and physicians?

Hospitals are a basis for the formation of formal networks and therefore hospital affiliations are needed to examine the interplay between physicians' formal and informal networks. Hospital identifications will also be used to construct physician migrations across hospitals and identify hospital M&As, which will be leveraged as quasi-exogenous events that "disrupts" the physicians' networks. Identifiable data on physicians are needed to incorporate physician-characteristics (such as gender, graduation year) as model controls.