

Healthcare across Boundaries: Urban-Rural Differences in the Financial and Healthcare Consequences of Telehealth Adoption

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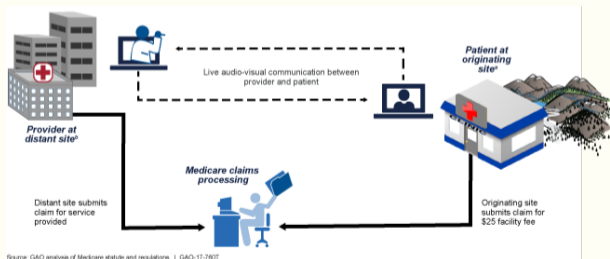
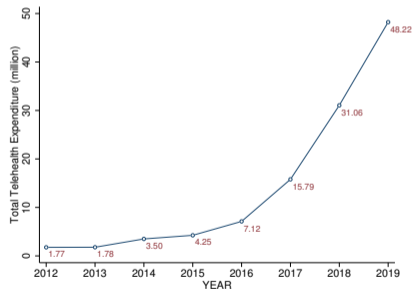
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- ▶ Telehealth adoption has expanded by an order of magnitude in the US
- ▶ Telehealth (Telemedicine): use of technologies to support remote, digitally-enabled clinical healthcare



Related Work

- ▶ Effects on healthcare (Hersh et al 2001, Jennett et al 2003)
- ▶ What is under explored: the competition among healthcare providers
 - Rural providers face greater competition from urban telehealth adopters
 - Telehealth may backfire as rural hospitals are closing rapidly (135 from 2010 to 2020)

We address the following research questions:

1. How does telehealth adoption affect competition, especially the financial performance, of healthcare providers across geographic regions?
2. What are the underlying channels that redistribute patient flows through telehealth services?
3. What are urban providers' competitive edges in serving patients virtually?

▶ Research Design

- Challenge: The adoption of Telehealth is **endogenous**
- **Telemedicine Licensure Compact** is a nationwide quasi-random, geographic shock that lowers providers' cost of delivering interstate telehealth
- We estimate a staggered difference-in-differences (DID) regression

▶ Data

- **Physician sample:** Open Payment database (2013-2018) for quarterly licensure information and CMS Medicare Provider Utilization and Payment Data
- **Hospital sample:** CMS Healthcare Cost Report Information System (HCRIS, 2012-2018) for hospitals' annual patient services and revenues, etc.
- **Patient sample:** IBM MarketScan database (2012-2019) for de-identified patient healthcare reimbursement info such as procedure and revenue codes

- ▶ Financial effects: a shift of service from rural to urban providers
 - Physician level: Medicare payments of affected **rural physicians drop** by 5.6%, and those of affected **urban physicians increase** 1.9%
 - Hospital level: affected **rural hospitals** experience a 4.5% **decline** in total revenue, whereas their **urban** counterparts experience a **gain** of 2.6%
- ▶ Two channels (shown by the patient sample):
 - Substitution effect: affected rural patients **increase** telehealth expenditures to **urban** providers by 7.6% and **reduce** telehealth expenditures to **rural** suppliers by 15.1%
 - Gateway effect: an affected rural patient's **follow-up in-person** visits to an **urban** provider after the first telehealth visit significantly increases by 8.6%
- ▶ Heterogeneous effects: affected urban providers receive more financial benefits if their hospitals have **better telehealth equipment** or if their hospitals have **higher ratings** (high-quality services)