Assessing the Costs of Fragmented Care: Evidence from Patient Moves

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Research Objective:

Organizational economics has long recognized the tradeoff between the benefits of specialization and costs of coordination (Becker and Murphy 1992). Efficient organizations structure production so as to balance the marginal benefits of specialization against the marginal costs of coordination.

According to many analysts and policy makers, the health care system has not achieved this optimal balance. Rather it is characterized by too much specialization and insufficient coordination among physicians. This perceived imbalance, which is often referred to as fragmented care delivery, has been the driver behind a number of important policy initiatives. In this paper we develop a conceptual model of care fragmentation and seek to estimate how large the resulting inefficiencies might be.

To clarify the organizational and economic issues, think of a primary care physician (PCP) as assembling and organizing a team of specialists for the purpose of treating a patient. By exerting effort, the PCP can: better supervise specialists; make sure that there is not "overtreatment" or duplication; and also reduce specialist referrals by learning some of the specialists' functions.

If the team assembled by the PCP were managed efficiently, the PCP would undertake these investments in coordination if the costs of doing so were less than savings (adjusting for any changes in quality of patient care). In a fragmented healthcare delivery system with fee for service payments, these savings are externalities to the PCPs. Predictably these externalities will result in inefficiently small levels of investment in coordination. From this perspective, many important recent policy initiatives are attempts to either internalize this externality by altering the organization of physician practices and payments (ACOs and Medical Homes) or attempts to reduce the physician costs of coordination by, for example, subsidizing investments in information technology.

Although there is a large clinical literature on fragmented care delivery (and related concepts such as care continuity), little is known about the size of the inefficiencies created by fragmented delivery systems. Understanding the magnitude of the inefficiency resulting from too little coordination is of obvious importance for deciding whether to direct scarce public resources to addressing the problem. In this paper, we investigate the magnitude of the issue by estimating the additional costs resulting from fragmented care delivery.

Study Design:

We estimate the relationship between regional fragmentation and individual healthcare costs using data on Medicare patients who move across regions. Specifically we compare the changes in fragmentation of Medicare enrollees who move to new hospital service areas and use changes in regional fragmentation measures as a plausibly exogenous source of variation in fragmentation. Following Finkelstein, Gentzkow and Williams (2014), we assume that that after controlling for enrollee fixed effects, patient level omitted variables are not correlated with the regional change in fragmentation that results from the move. This assumption seems reasonable and it is also strongly supported by patterns in the data.

In addition we find that Medicare movers experience a substantial and near instantaneous change in fragmentation of care in the direction of the fragmentation level of the destination region. This sharp shift suggests it is highly unlikely that our results are driven by omitted, slowly evolving features of enrollee's clinical conditions.

As a first step in our analysis, we calculate a visit concentration index to measure the level of care fragmentation for each Medicare patient. We also calculate a regional measure of care fragmentation by averaging these individual measures within hospital service areas. We examine how patterns of care utilization, including visit frequency, reliance on primary care and specialty care, and number of treating physicians are associated with this fragmentation index. In addition we investigate whether regional patterns of care fragmentation in the Medicare population correlate with fragmentation patterns in a sample of commercially insured patients with chronic disease. We find that they do—suggesting that our Medicare based measure is capturing patterns of care within regions that extend to other patients as well.

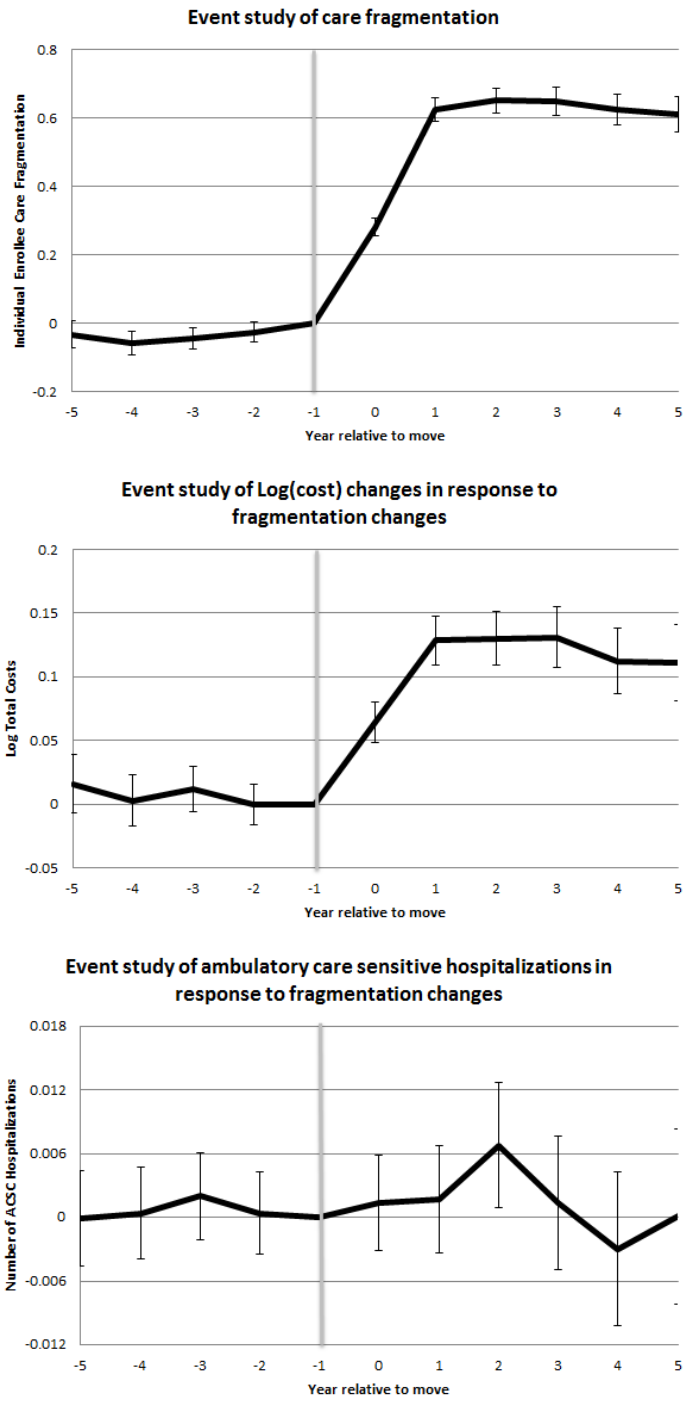


Figure 1 Notes: These plots display coefficients (and 95% confidence intervals) on variables indicating the year relative to the move interacted with the change in regional fragmentation between the destination and origin hospital service area for the mover. The coefficient for year -1, the year prior to the patient's move, is normalized to zero. The top panel displays results from a regression where the patient's individual yearly care fragmentation index is the outcome variable; the middle panel displays results from a regression where the patient's individual log of annual costs is the outcome measure; the bottom panel displays results from a regression where the patient's total annual number of ambulatory care sensitive hospitalizations is the outcome.

Each regression includes beneficiary fixed effects, as well as controls for age bins and calendar year. Finally, each regression includes a full vector of indicator variables for each year relative to the move, allowing for movers to experience health shocks or differential trends in health status relative to non-movers, as long as those trends are not correlated with the regional fragmentation change associated with each move. There are 5,251,833 patient-year observations.

We then identify the impact of care fragmentation by analyzing how care patterns evolve for the 116,000 patients who move to new regions during our sample period. Controlling for patient fixed effects and allowing movers to experience differential health shocks, we test whether patients who move to regions with higher levels of care fragmentation experience increases in their individual fragmentation index, costs, and quality of care. The great advantage of focusing on movers is that the relationship between care fragmentation and outcomes is not the result of unobserved variation in the health conditions across patients, preferences of individual patients, or features of their specific physicians.

Population Studied:

We study two sets of medical claims records. The first is from a 20% sample of Medicare fee for service patients from 2000-2010. The second is from a sample of commercially insured patients with chronic disease from 2004-2007.

Principal Findings:

Care fragmentation is highly variable across regions, with more fragmented care patterns associated with fewer visits to primary care providers and increased reliance on specialists. Regional patterns of care fragmentation among Medicare patients are positively correlated with regional fragmentation levels in a population of commercially insured patients with chronic conditions. Medicare patients who move to regions with greater care fragmentation experience increases in their individual levels of fragmentation; moving to a region with 1 standard deviation greater care fragmentation leads to a 0.6 standard deviation increase in individual fragmentation and a 13% increase in costs of care. There is no evidence of reductions in hospitalization rates, including for ambulatory care sensitive conditions, and 30-day readmissions.

Our main results are displayed graphically in Figure 1 at left. The stable coefficients shown to the left of the grey bar in each panel indicate that, after controlling for patient fixed effects, there are no differences in outcomes prior to the move that are related to the size of the regional fragmentation change experienced during the move. The sharp break to the right of the grey bar in the top panel indicates that moving to a new region has an immediate effect on the individual patient's fragmentation index. Specifically the mover experiences a change in her fragmentation index that is 60% as large as the total change in average regional fragmentation between the destination and origin HSAs.

Interpretation and Implications:
Our results suggest that increased fragmentation results in higher costs and that this cannot be explained on the basis of omitted patient or physician characteristics.

Using the Medicare data, we find no evidence that the higher costs associated with fragmented care yield better quality outcomes. Our quality measures (hospitalizations, 30 day re-hospitalizations and ambulatory care sensitive hospitalizations) are very imperfect, but less general and less well-identified studies of fragmentation with better quality measures report little evidence of improved care quality. Indeed, the bulk of the evidence appears to point in the opposite direction.

If we conservatively assume that quality is not much affected by fragmentation, then we can interpret the cost differentials linked to regional fragmentation as reflecting the magnitude of the externality resulting from fragmented care delivery. From this perspective, the externality leading to excess fragmentation is substantial.

A natural issue raised by these findings is the extent to which regional variations in fragmentation could contribute to regional variations in costs. To assess this, we use the machinery of instrumental variables as a computational device to compare the effects of regional cost variation when we "force" it to work only through regional fragmentation variation to the effects when costs can operate through other channels as well. This exercise suggests that regional variations in fragmentation *are not* the primary cause of regional variations in costs. We find that *at most* 25% of the regional variations in costs (not due to patient or physician characteristics) can be attributed to regional fragmentation. Clearly other forces are also important in explaining regional cost variations among Medicare beneficiaries.

Limitations
The first limitation of our analysis is there does not yet exist a generally accepted and empirically verified theory of variations in regional fragmentation patterns. Without a strong theory, our findings are vulnerable to the criticism that they simply reflect other regional differences that correlate with fragmentation.

A second limitation of the study is that our Medicare-based quality measures are poor. It may be that there are important quality gains resulting from fragmentation and that failure to account for these overstates the inefficiencies resulting from fragmentation.

A third limitation of our results is that our estimate of the externality associated with fragmentation is not an estimate of the welfare gains from adopting less fragmented care styles. As our conceptual model suggests, asking PCPs to more closely coordinate with the other doctors treating their patients likely requires costly investments in skill and organizational infrastructure and these costs need to be included in any welfare estimate. It also may be that quality will suffer if some physicians fail to adapt to new styles of care.

References:

Becker, Gary S. and Kevin M. Murphy. 1992."The Division of Labor, Coordination Costs, and Knowledge." *Quarterly Journal of Economics* 107:4, pp. 1137-60.

Finkelstein, Amy, Matthew Gentzkow and Heidi Williams. 2014."Sources of Geographic Variation in Health Care: Evidence from Patient Migration." *NBER Working Paper Series* 20789.