

The Spatial Diffusion of Knowledge

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February 2017

Preliminary, Incomplete, and Speculative

ABSTRACT

How do geography and other barriers to the free flow of information shape agents incentive to learn and hence the equilibrium diffusion of knowledge? We analyze this question in the context of statin drug prescriptions by doctors over decades during a period characterized by the invention of new chemical entities and the entry of generics. Using data on the universe of statin prescriptions in the U.S., first we describe statistical patterns of initial drug use and subsequent adoption as a function of doctor characteristics and location. There are clear spatial patterns to the timing and dispersion of adoption. We then develop a micro-founded structural model of learning and diffusion with many doctors per region and many regions. Doctors want to prescribe the right drug to each patient, given a vector of patient characteristics. Doctors are uncertain about the best drug to prescribe for each patient and through learning they increase the probability of providing the proper prescription. In any location, there is a distribution of doctors with different amounts of knowledge. Doctors learn by treating their own patients, but also from other doctors. There is also some randomness in whom a doctor interacts with from whom he or she learns. The ease, efficacy, and probability of learning from other doctors is a function of geography and other observables, like attending a common med school. We perform counterfactual analysis to see how decreases in the barriers to diffusion of knowledge affects effort dedicated to learning and, ultimately, patient outcomes.

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