

Privacy Protection and Technology Diffusion: The
Case of Electronic Medical Records

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Overview

- Interesting and important problem
 - Slow diffusion of ICT frequently pointed to as one reason for high medical cost
 - Innovation policy perspective - technological innovation in health care is usually cost-increasing rather than cost-reducing, but this technology is an exception
- Paper - diffusion of interoperable EMR is slower when states have privacy laws
 - Use of placebo technology is especially persuasive
- Slides go further and compute an example of the foregone benefits and compare to costs

Comments

- What's missing from paper?
 - a framework or model, with perhaps a fuller discussion of the determinants of diffusion
 - The cost-benefit computation
- Some suggestions for future research
 - Technological solutions?

Usual modeling framework

- Heterogeneous adopters
 - Benefits have a unimodal distribution
 - Costs decline monotonically over time
 - Adopt when $\text{benefit} > \text{cost}$
- Epidemics (spread of information)
 - Small share adopt
 - They encounter the remainder randomly; those contacted adopt
 - Implies 3-parameter logistic

Both => s-shaped curve for diffusion

Geroski 2001 - survey

Sunk cost models

- Adoption as investment under uncertainty
 - Compares an upfront cost with a stream of future benefits
- => by and large, an absorbing state in the sense that once costs incurred, they are sunk
- Decision is
 - **not** “adopt or do not adopt”
 - **instead** “adopt now or wait to decide later”
- Therefore real options models might be appropriate (Stoneman 2001)

Economic determinants

- Model ingredients:
 - Benefits
 - Costs
 - Uncertainty/information
 - Environment

Benefits

- Complicated - as in health care more broadly, not clear whether decision-maker/payer coincides with the beneficiary
- Networks and standards
 - Externalities more important if hospitals can share information (patient approval?)
 - Proxy by installed base
- Learning and experience? – proxies?
- Closeness of substitute technologies

Costs

- Factors proxied by time dummies
 - Cost of finance
 - Price
 - how has this changed over time?
- Factors that vary across units:
 - Complementary investments, incl. training
 - Does this vary by hospital (e.g., prior ICT adoption)
 - Age of doctors
 - Scale
 - fixed cost nature of adoption in many cases
 - Hard to tell here, given inclusion of both payroll and staffed beds (were they logged?)

Environment – market structure

Size and/or market power

- Accelerates diffusion
 - Scale economies
 - Sponsoring a standard (e.g., IBM and the personal computer)
- Delays diffusion
 - Slower and less flexible
 - Less fear of market share loss to entry (see ATT in 1960s)
- Can we learn anything about this using these data?

Environment - regulatory

- Accelerates adoption
 - mandates pollution or safety standards
 - solves coordination problems in network industries
- Delays adoption
 - Safety regulation, e.g., new pharmaceuticals and medical instruments
 - Standard-setting process – e.g., Hi-def DVDs
 - Privacy protection

Suggestions

- Hazard models instead of probits?
- Changes in law – can we see evidence of sunk costs?
 - 4 states increase protection
 - 15 reduce it