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Cost Sharing and the Demand for New Drugs: Evidence from the United States

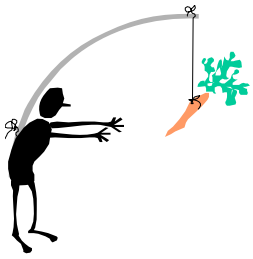
Marin Gemmill

Outline

- Background
- Objectives
- Methodology
- Results
- Discussion and Policy Implications

Background: Why demand for new drugs?

- Pharmaceutical expenditures rising faster than other types of expenditure
- Has led to increased use of cost sharing for prescription drugs in US
- Simultaneous developments in pharmaceutical technologies
- How do higher user fees influence the utilization of these technologies?



Background: Adoption of new technologies

- Limited body of research investigating innovative pharmaceutical adoption from consumer side
- Introduction of new technologies may be partially responsible for socio-economic gradient in health (Goldman and Smith, 2005)
- But evidence of this is lacking

Background: Adoption of new technologies

- Evidence from research on the adoption of other technologies such as mobile phones suggests that price is an important demand-side determinant of adoption
- Yet, little research has explicitly accounted for price as a factor limiting the access to superior new pharmaceuticals

Background: Price and the adoption of new technologies

- Standard demand theory: negative relationship between price and adoption
- But new technologies typically carry higher OOP price tag, and this may signal higher quality leading to a positive relationship

Background: Consumer prices in the US

- Public insurance
  - Medicare, Medicaid, SCHIP, TRICARE, VA Coverage, other public programs
- Private insurance
  - Employer-sponsored, non-group
- No insurance

Objectives

- Primary question:
  - What is the relationship between user charges and technology adoption?
- Secondary questions:
  - What is the role of education in adoption?
  - How do other socioeconomic, demographic, and health factors influence adoption?

Methodology: Data

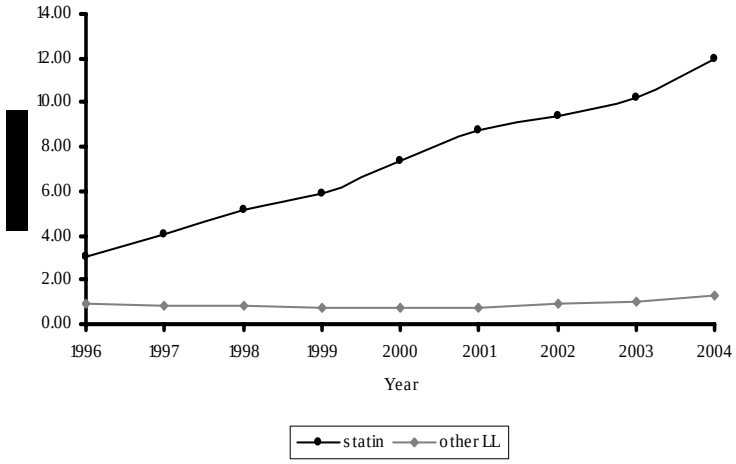
Medical Expenditure Panel Survey (MEPS)

- Nationally representative sample of US civilian, non-institutionalized population
- Rotating panel
- Sample of 186,510 (age>17) persons from 1996-2004

Methodology: Why statins?

- Type of cholesterol-lowering drug
- Breakthrough medicine for primary and secondary prevention of cardiovascular disease
- Cost-effective for high-risk patients

Methodology: Why statins?



Methodology: Dependent variables

- Probability of positive statin use
- Percentage of lipid-lowering drugs that statins comprise
- Annual number of statins purchased based on DDD

Methodology: Independent variables

age	the age of the respondent
male	the respondent was male
black	the individual reported being black
hispanic	the individual reported being Hispanic
other race/ethnicity	another race than white, black, or Hispanic
disposable income	income remaining after total out-of-pocket prescription drug costs are subtracted out
high school degree	the individual reported having a high school degree but not a higher degree
above high school	education beyond high school
health variables	CHD, AMI, stroke, diabetes, hypertension or hypercholesterolemia

Methodology: Considerations for the model

- Non-linearity
  - only observe statin adoption for those with positive drug consumption
  - two-part and Heckman correction models
- Endogeneity
  - unobserved factors that determine adoption may also determine the level of the co-payment
  - instrumental variables methods
- Unobserved heterogeneity
  - panel data models

Results 1: Probability of positive statin use

Explanatory variables	Probit
Log drug co-payment	**0.112***
Age 46 to 65	0.731*
Age above 65	0.958*
Male	0.224*
Black	-0.075*
Hispanic	-0.025
Other race/ethnicity	0.039
Log income	-0.002
High school degree	0.074*
Above high school	0.066*
Health variables	All + and sig

Results 1: Probability of positive statin use

Explanatory variables	Probit	Sample selection	Endogen	Fixed Effects
Log drug co-payment	**0.112***	**0.105***	**-0.429**	**0.462***
Age 46 to 65	0.731*	0.615*	0.790*	0.140
Age above 65	0.958*	0.782*	1.148*	0.196
Male	0.224*	0.302*	0.191*	
Black	-0.075*	-0.025	-0.178*	
Hispanic	-0.025	0.050	-0.078	
Other race/ethnicity	0.039	0.106*	-0.067	
Log income	-0.002	-0.005*	-0.002	0.045
High school degree	0.074*	0.059*	0.130*	-0.378
Above high school	0.066*	0.026	0.154*	-0.925
Health variables	All + and sig	All +, 5 sig	All + and sig	All +, 4 sig

Results 2: Statin prescription share

Explanatory variables	OLS
Log drug co-payment	**0.009***
Age 46 to 65	0.039*
Age above 65	0.077*
Male	0.018*
Black	-0.006*
Hispanic	-0.002
Other race/ethnicity	0.003
Log income	0.000
High school degree	0.010*
Above high school	0.010*
Health variables	All + and sig

Results 2: Statin prescription share

Explanatory variables	OLS	Sample selection	Endogen	Fixed Effects
Log drug co-payment	**0.009***	**0.009***	**0.005**	0.007*
Age 46 to 65	0.039*	0.041*	0.040*	0.000
Age above 65	0.077*	0.080*	0.079*	0.012
Male	0.018*	0.015*	0.017*	
Black	-0.006*	-0.008*	-0.007	
Hispanic	-0.002	-0.005*	-0.003	
Other race/ethnicity	0.003	0.001	0.002	
Log income	0.000	0.000	0.000	0.001
High school degree	0.010*	0.011*	0.011*	0.000
Above high school	0.010*	0.011*	0.010	-0.011
Health variables	All + and sig	All + and sig	All + and sig	All +, 5 sig

Results 3: Statin prescription DDD

Explanatory variables	OLS
Log drug co-payment	0.059*
Age 46 to 65	0.199*
Age above 65	0.376*
Male	0.093*
Black	-0.045*
Hispanic	-0.038*
Other race/ethnicity	-0.009
Log income	-0.001
High school degree	0.040*
Above high school	0.035*
Health variables	All + and sig

Results 3: Statin prescription DDD

Explanatory variables	OLS	Sample selection	Endogen	Fixed Effects
Log drug co-payment	0.059*	0.060*	-0.122	0.055*
Age 46 to 65	0.199*	0.229*	0.218*	-0.003
Age above 65	0.376*	0.424*	0.440*	0.044
Male	0.093*	0.045*	0.081*	
Black	-0.045*	-0.072*	-0.079*	
Hispanic	-0.038*	-0.079*	-0.055*	
Other race/ethnicity	-0.009	-0.046*	-0.044	
Log income	-0.001	0.001	-0.001	0.003
High school degree	0.040*	0.046*	0.058*	-0.014
Above high school	0.035*	0.053*	0.064	-0.028
Health variables	All + and sig	All + and sig	All + and sig	All +, 5 sig

Discussion

Primary question:

- What is the relationship between user charges and technology adoption?
  - In most specifications, cost sharing actually appears to ***positively*** influence the uptake of new technologies
  - Will this hold if we combine different econometric considerations (preliminary results suggest not)?

Discussion

Secondary questions:

- What is the role of education in adoption?
  - Depends on specification as education not significant in fixed effects
  - Positive in other specifications
- How do other socioeconomic, demographic, and health factors influence adoption?
  - Depends on specification as only health is significant in fixed effects
  - Income not significant predictor

Discussion

- Thus, need factors seem to drive utilization, especially given the life-threatening nature of cardiovascular disease
- Consumers may distinguish the co-payment as a signal of quality
  - This is in contrast to the typically negative relationship found between co-payment and utilisation

Policy implications

- Do these results hold across other pharmaceutical technologies?
  - If not, why?
- Implications vary depending on goals of health system
  - Efficiency: economic or “Williams”?
  - Equity?
  - Choice?
- In terms of innovation?

Limitations

- No compliance measure available and lack of information on the doctor effect
- Inability to measure experience