

New York State Physicians and the Adoption of Innovation: Use of Internet and E-Mail in Practice, 1999-2004

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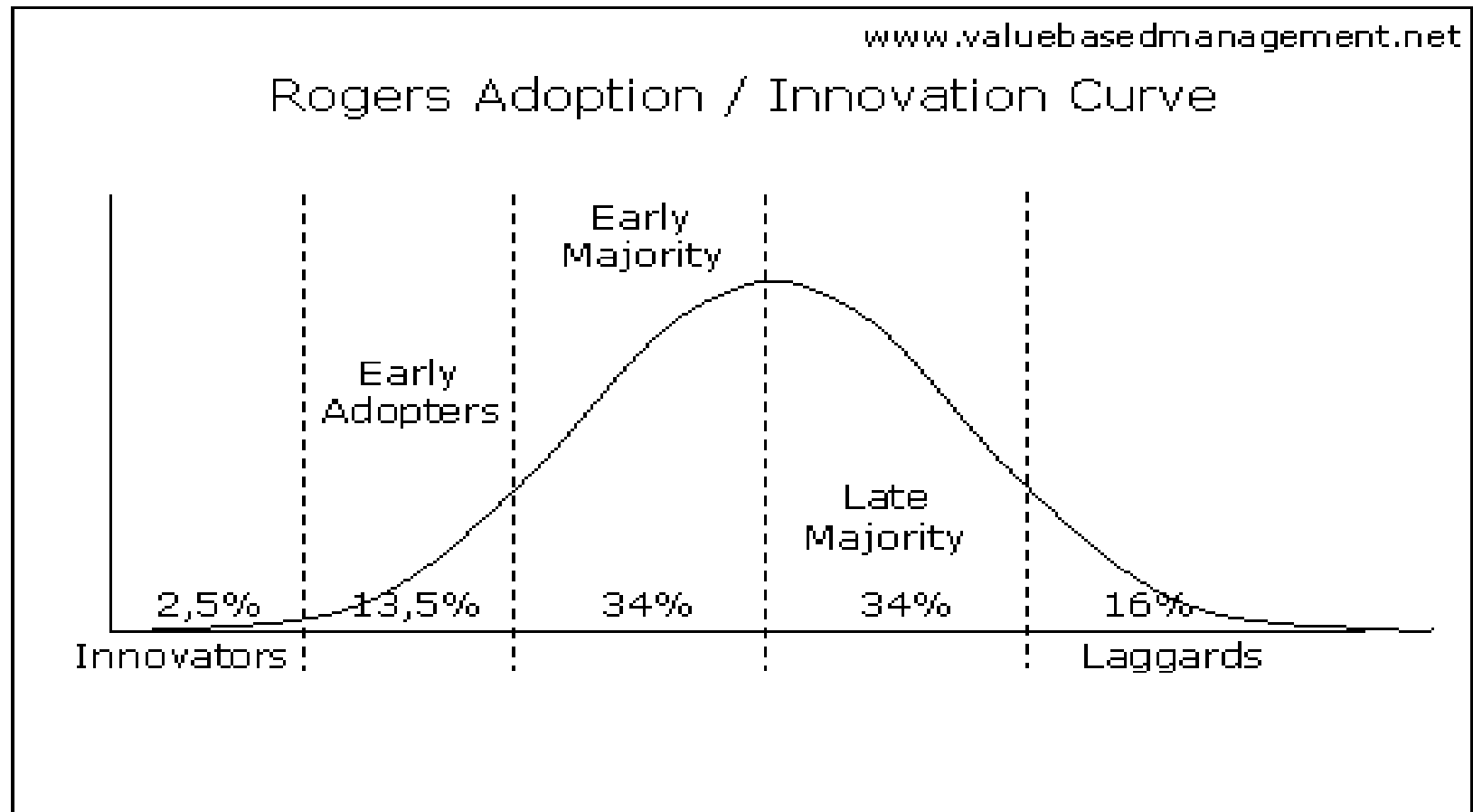
The Center for Health Workforce Studies at the University at Albany

- Conducts studies of the supply, demand, use and education of the health workforce
- Committed to collecting and analyzing data to understand workforce dynamics and trends
- Goal to inform public policies, the health and education sectors and the public
- One of six regional centers with a cooperative agreement with HRSA/Bureau of Health Professions

Health information technology...

- Improves patient outcomes;
- Improves efficiency of care;
- Promotes public health and preparedness

Adoption of technology is both slow and uneven



Innovators

- Venturesome
- Technical/Scientific
- Specialized job
- Multiple information sources
- Outside, impersonal information sources
- Cosmopolitan

Early Adopters

- Social leaders
- Integrated
- Technical
- Seeking a competitive edge

Early Majority

- Many informal social contacts
- Less cautious than average
- Frequent interaction with peers, but not in leadership positions
- Focus on productivity

Late Majority/Laggards

- Conformity/compliance
- Weight of system norms
- Traditional
- Cautious
- Isolated; limited social networks

Data

- New York State Physician Reregistration Survey
 - Data from three survey cycles:
 - Cycle 1: 1999-2001
 - Cycle 2: 2001-2003
 - Cycle 3: 2003-2005 (incomplete)
 - Valid N = 88,756

Dependent variables:

- Use Internet/e-mail for:
 - Obtain lab results, x-rays or hospital records
 - Obtain information about treatment alternatives
 - Communicate with/answer questions from patients
 - Obtain CME
 - Transmit prescriptions to pharmacies

Prevalence of use varied by year

	1999-2001	2001-2003	2003-2005
Obtain CME	18.4%	31.7%	44.3%
Obtain information about treatment alternatives	33.3%	37.8%	42.6%
Obtain test results	13.5%	19.7%	27.9%
Communicate with patients	9.3%	10.5%	11.6%
Transmit prescriptions	1.6%	1.9%	3.0%

Yellow = Innovation; Pink = Early Adoption; Green = Early Majority

Recoded based on Stages of Innovation

- Physicians were classified as innovators, early adopters, early majority or non-adopters depending upon the earliest level of technology they reported for their survey year

Methods

- Multinomial logistic regression
 - Probability of being an innovator, early adopter, or early majority compared to being a non-adopter

Odds Ratios from Multinomial Regression

	Innovator versus Non-Adopter	Early Adopter vs. Non-adopter	Early Majority versus Non-Adopter
Female	0.69***	0.85***	0.93***
Male	1.00	1.00	1.00
Born before 1950	1.03	0.67***	0.66***
Born 1950-1959	1.00	1.00	1.00
Born after 1959	0.76***	0.96	1.10***
Hospital	1.00	1.00	1.00
Solo practice	0.29***	0.50***	0.50***
Group practice	0.62***	0.68***	0.78***
Other settings	0.87	0.75***	0.75***
Non-Hispanic white	1.00	1.00	1.00
Underrepresented minority	1.66***	0.99	1.36***
Asian	1.53***	0.79***	1.10***
U.S. medical graduate	1.00	1.00	1.00
International medical graduate	0.99	0.72***	1.17***
Medical doctor (MD)	1.00	1.00	1.00
Doctor of Osteopathy (DO)	1.04	0.60***	0.96***
Primary Care	1.00	1.00	1.00
Internal medicine subspecialty	0.97	1.50***	1.22***
Surgery/Surgical specialty	0.96	1.29***	0.78***
Psychiatry	0.99	0.69***	0.69***
Other medical specialty	0.53***	0.83***	0.84***

Innovators

- Male
 - Venturesome, technical
- Midcareer or older
 - Multiple information sources
- Hospitalists
 - Multiple information sources, technical
- Minorities
 - Cosmopolitan, outside information sources
- In primary care
- In other medical specialties (non-IM, non-surgical, non-psych)
 - Venturesome, technical, specialized job

Early adopters

- Male
 - Social leader, integrated
- Young or midcareer
 - Technical
- Hospitalists
 - Technical; integrated
- Non-Hispanic whites/USMGs
 - Social leaders, integrated
- MDs
- In primary care, surgery, or IM specialties
 - Integrated; seeking a competitive edge
- Not in psychiatry or other medical specialties

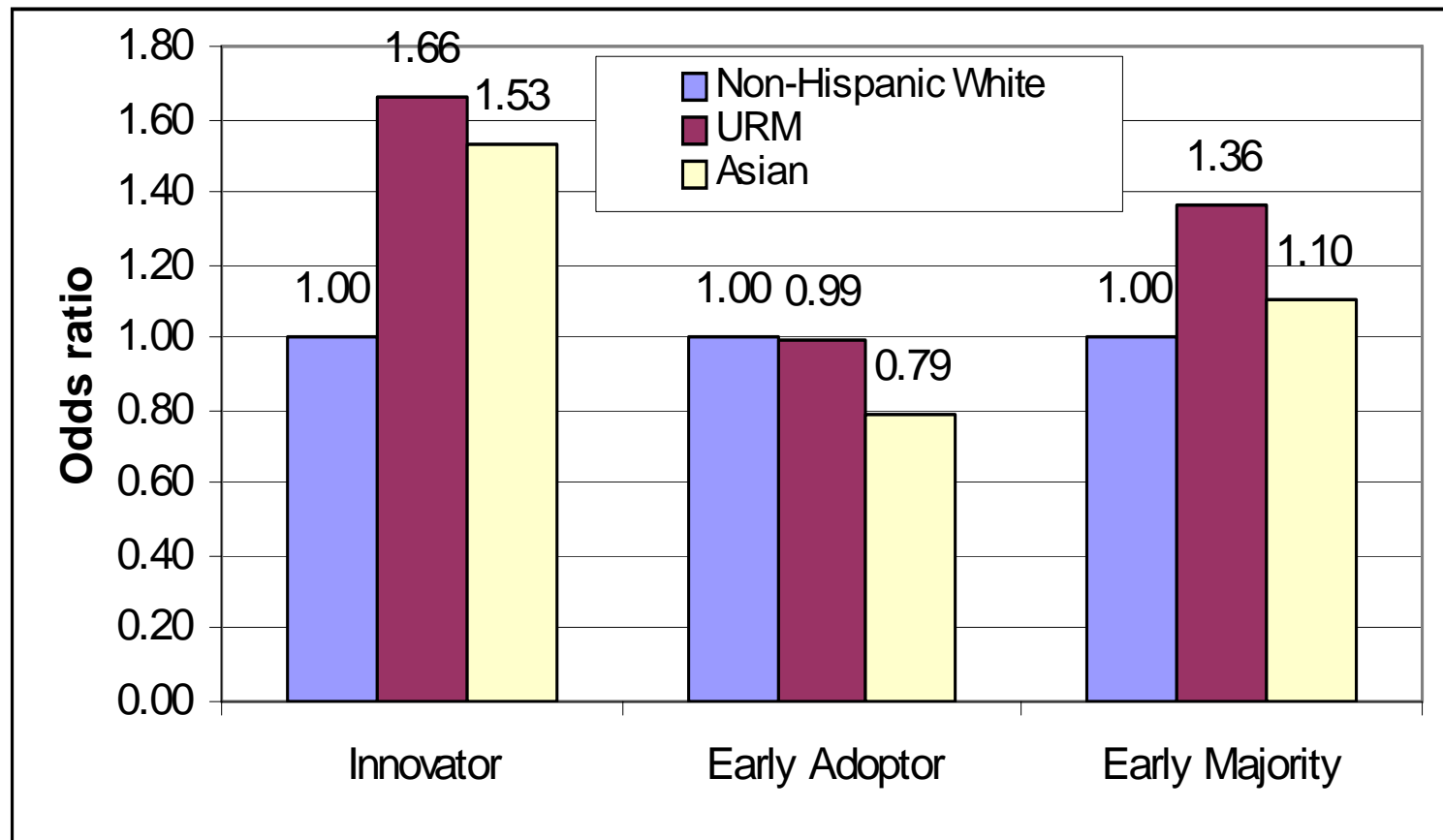
Early majority

- Male
 - Many informal social contacts
- Young or midcareer
 - Less cautious than average
 - Not in leadership positions
- Hospitalists
 - Frequent interaction with peers
- Minorities/IMGs
 - Not in leadership positions
- In primary care, surgery, or IM specialties
 - Many informal social contacts
- Not in psych or other medical specialties

Late majority/Laggards

- Female
 - Isolated (?)
- Older
 - Traditional
- Non-hospitalists
 - Less information
 - Isolated
- Non-Hispanic whites/USMGs
 - Traditional
- DOs
- In surgery, psychiatry, other (non-IM) medical specialties
- Not primary care or IM specialties

There is not necessarily a linear, ordinal relationship between physician characteristics and stage of adoption



Conclusions

- Adoption of innovation among NYS physicians follows patterns consistent with Rogers' theory
- HIT must be effectively targeted to both innovators and early adopters, and the characteristics of these groups differ