

Diffusion of Innovation Science & Physician Behavior Change

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This morning

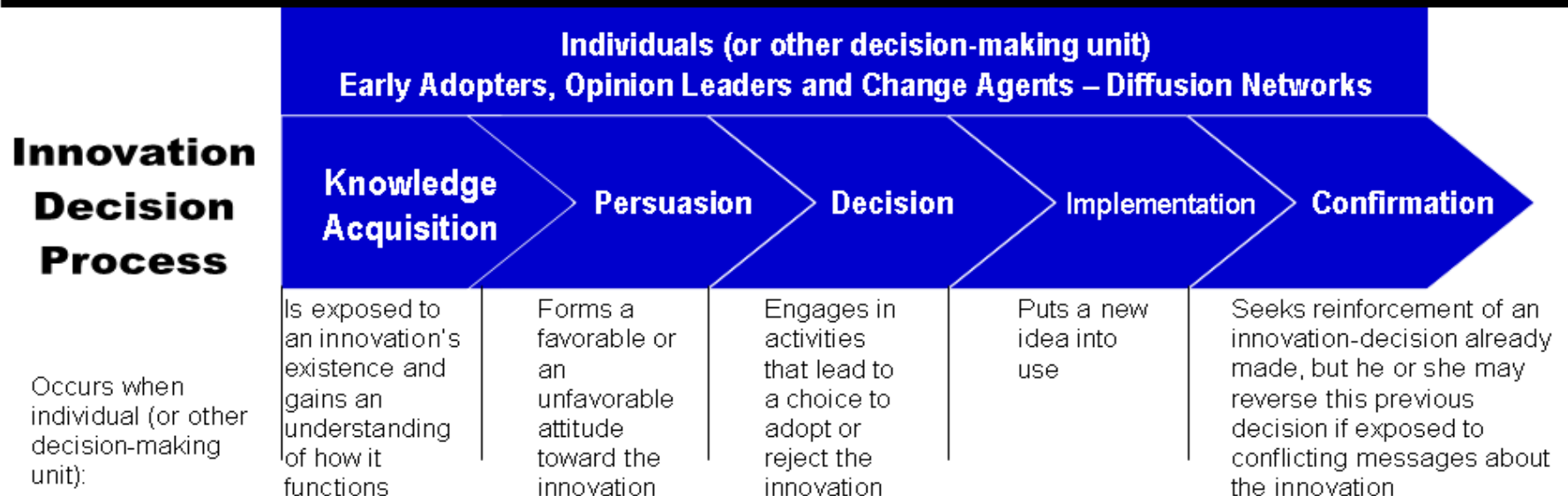
- What have we learned from 30 years of guideline dissemination research?
- Dissemination efforts are efficient when they lead to diffusion
- What is diffusion?
- 3 factors affect diffusion
- Lessons from research about implementation and sustainability

Terminology

- **Dissemination:** Proactive efforts by which an innovation is communicated to potential adopters
- **Diffusion:** Reactive social process by which an innovation is communicated among the members of a social system
- **Implementation:** A time-ordered stage during which people try to use an innovation

The innovation-decision process

- According to Rogers, all Individuals or Decision-Making Units go through the *Innovation-Decision Process*. **Early Adopters tend to have shorter Innovation-Decision processes** than Early and Late Majorities and Laggards. But all adopters must go through the process.
- Rogers Definition: Change Agents tend to be more senior individuals and have a broader view of how the innovation will be beneficial to the individuals and / or decision-making units. They are the first to see the need for change and innovations and have the formal authority to initiate innovation activities.
- Roger's Definition: Opinion Leaders can be senior level individuals as well but this is not a necessary characteristic. Opinion Leaders can be found at all levels of the organization. Opinion Leaders are the key influencers within the Diffusion Network. It is the Opinion Leaders who move the adoption curve into an inflection and beyond. They are the "S-Curve Accelerators".
- All Opinion Leaders are generally Early Adopters. **Not all Early Adopters are Opinion Leaders**.



Standard dissemination of clinical guidelines fails to produce diffusion

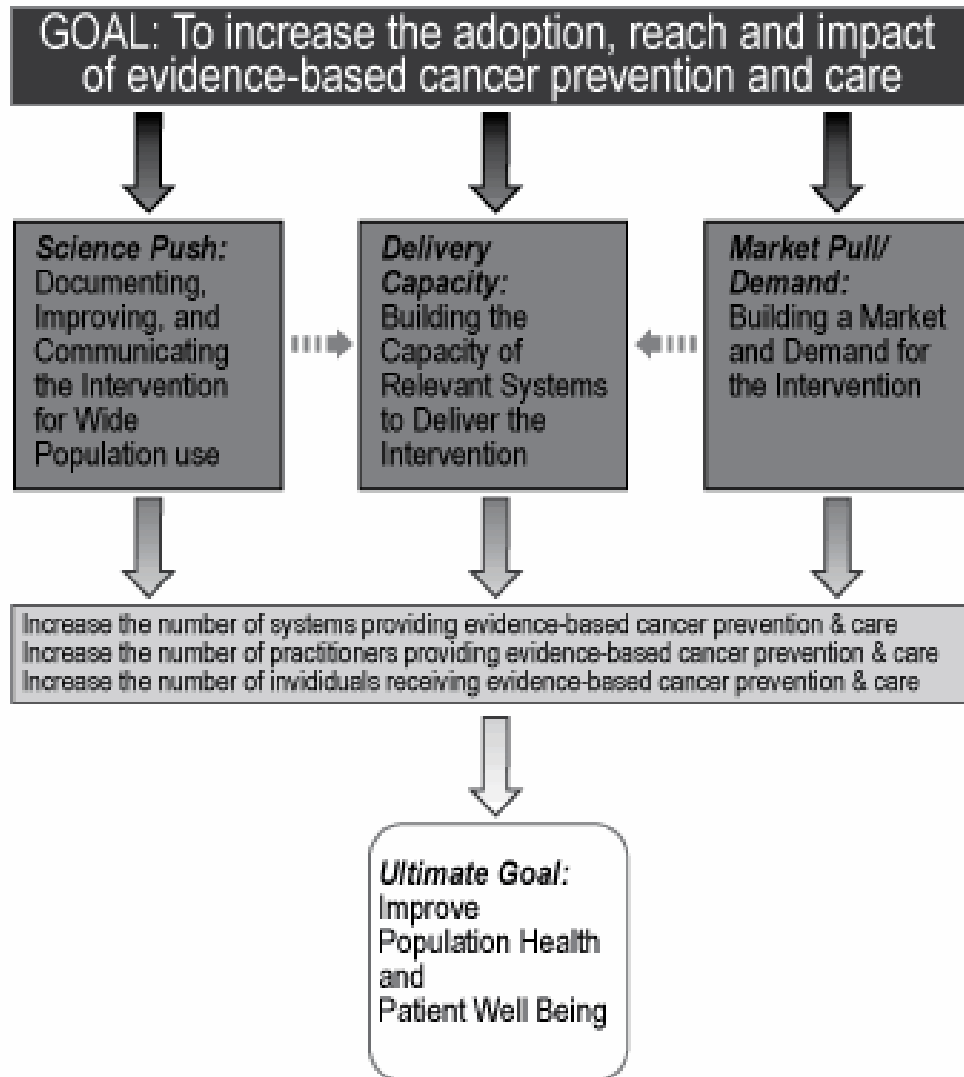
- Just providing (“pushing”) information is insufficient to change physician behavior
- Repetition helps but does not justify cost
- Multiple formats are not enough
- Practice variability persists
- **“Push” activities need to be balanced with the triggering of “pull” motivations and capacity support**

How do we know this?

- Lomas 1991. Words without action? The production, dissemination, and impact of consensus recommendations.
Annual Review of Public Health, 12:41-65.
- Lomas et al. 1989. Do practice guidelines guide practice?
New England Journal of Medicine 321: 1306-1311.
- Cameron & Naylor 1999. No impact from active dissemination....
Canadian Medical Association Journal 160(8): 165-168.
- Cabana et al. 1999. Why don't physicians follow clinical practice guidelines? ***Journal of the American Medical Association***, 282(15):1458-1465.
- Moulding, Silagy, & Weller 1999. A framework for effective management of change in clinical practice: Dissemination and implementation of clinical practice guidelines.
Quality in Health Care 8: 177-183.

Push-pull capacity model

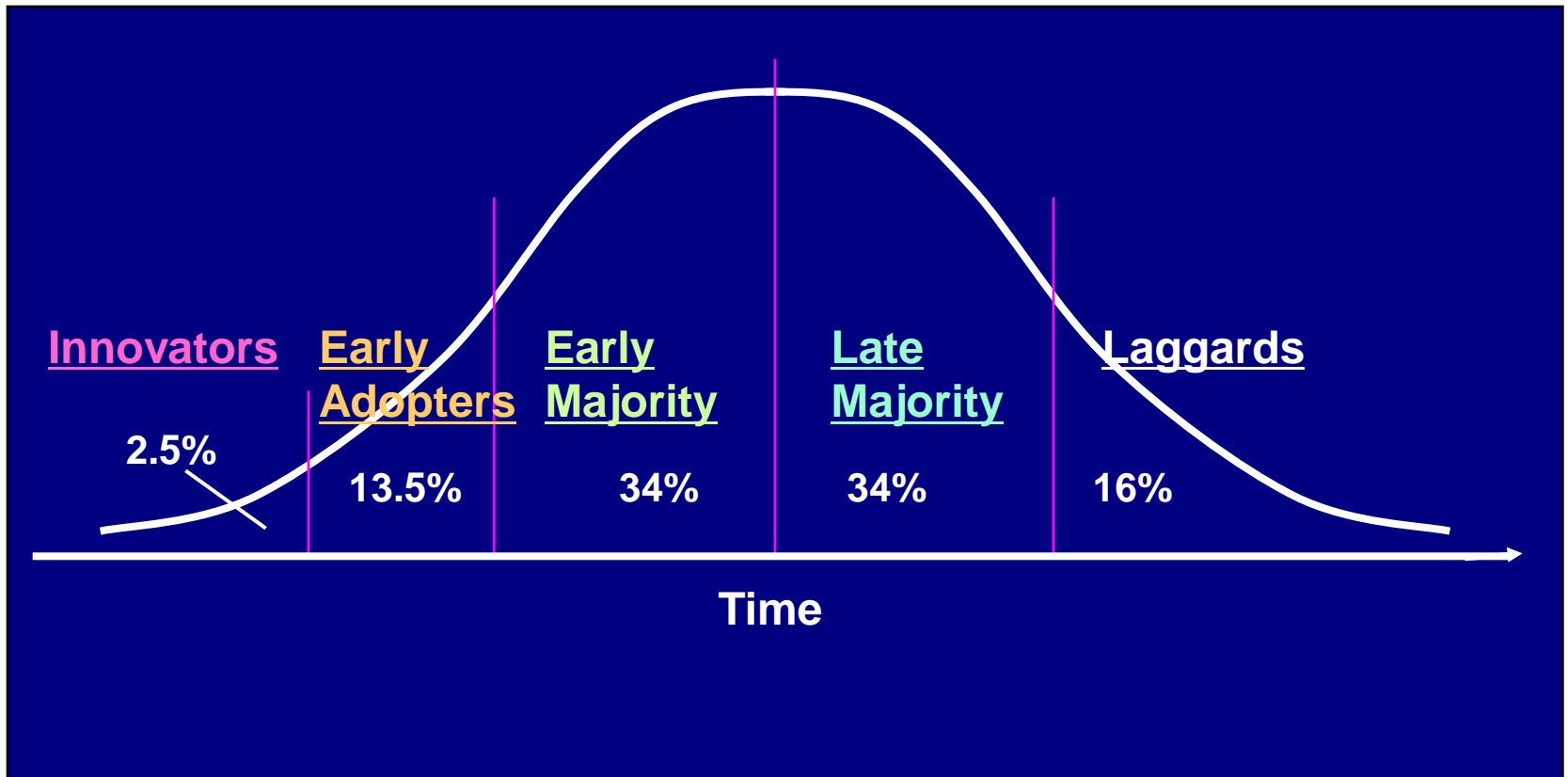
Bridging the Research - Practice Gap



**So from whom do you generate pull,
and when?**

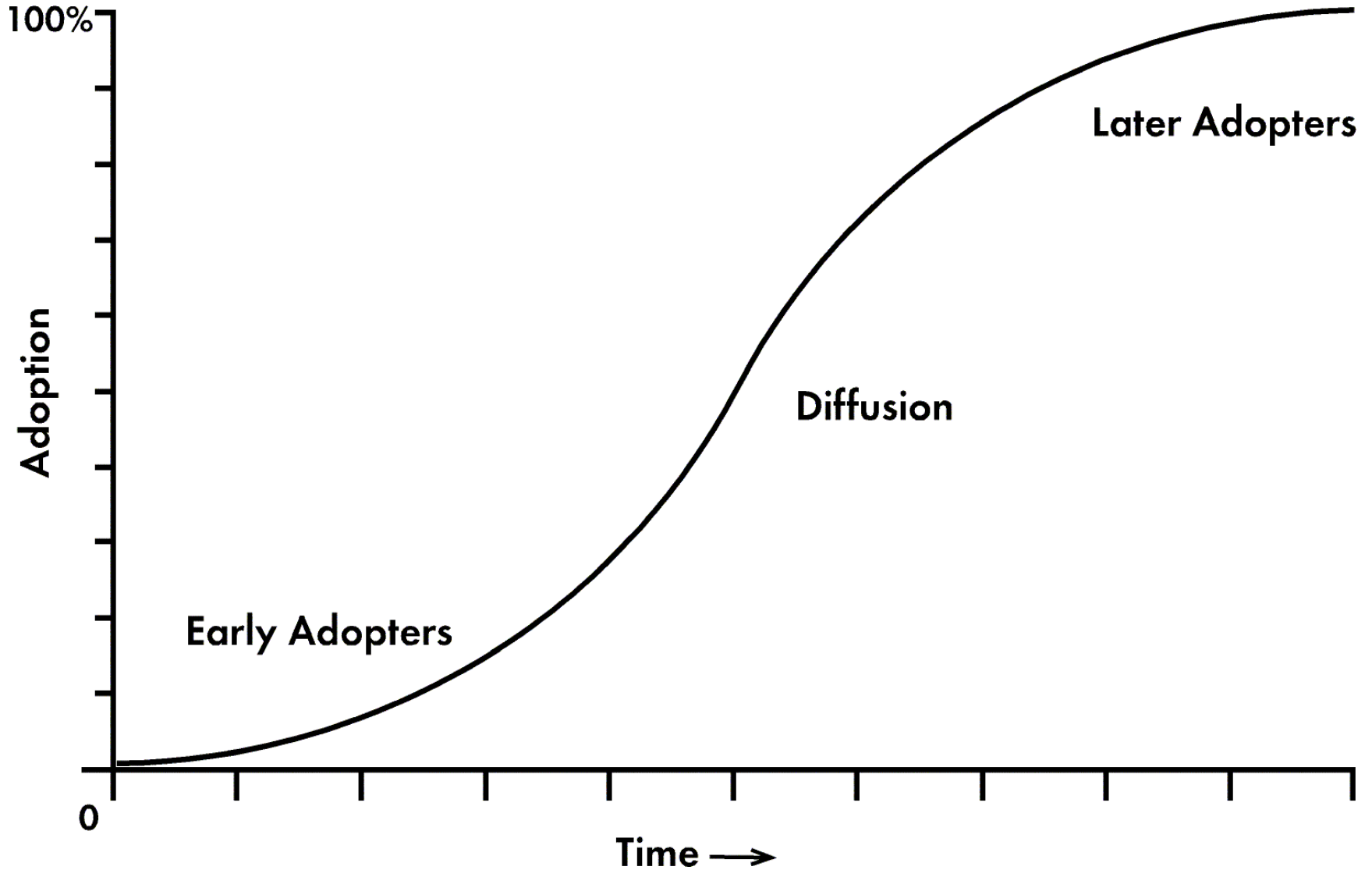
Innovativeness

Percent of population in each adoption phase



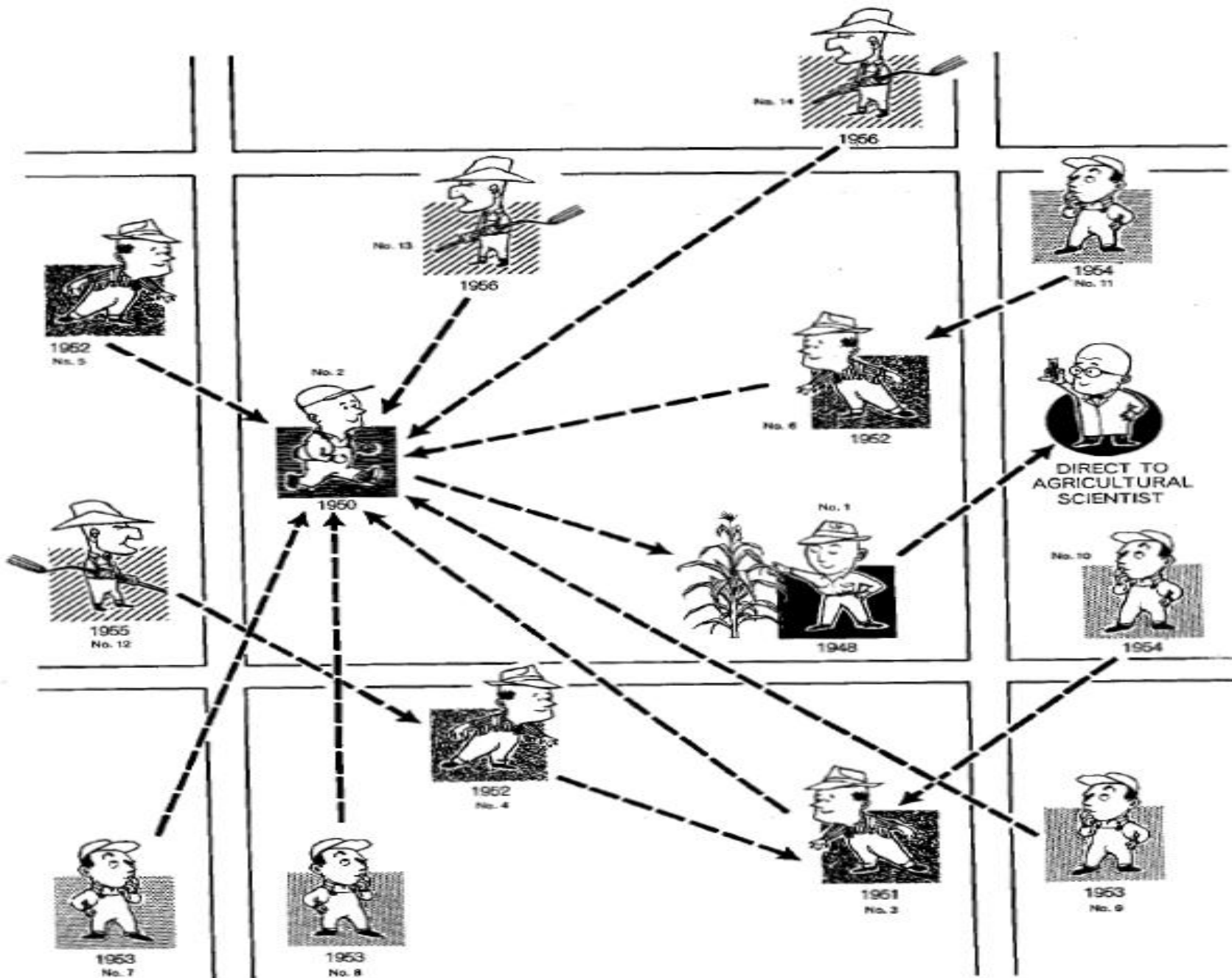
Source: Everett M. Rogers

Classic diffusion model



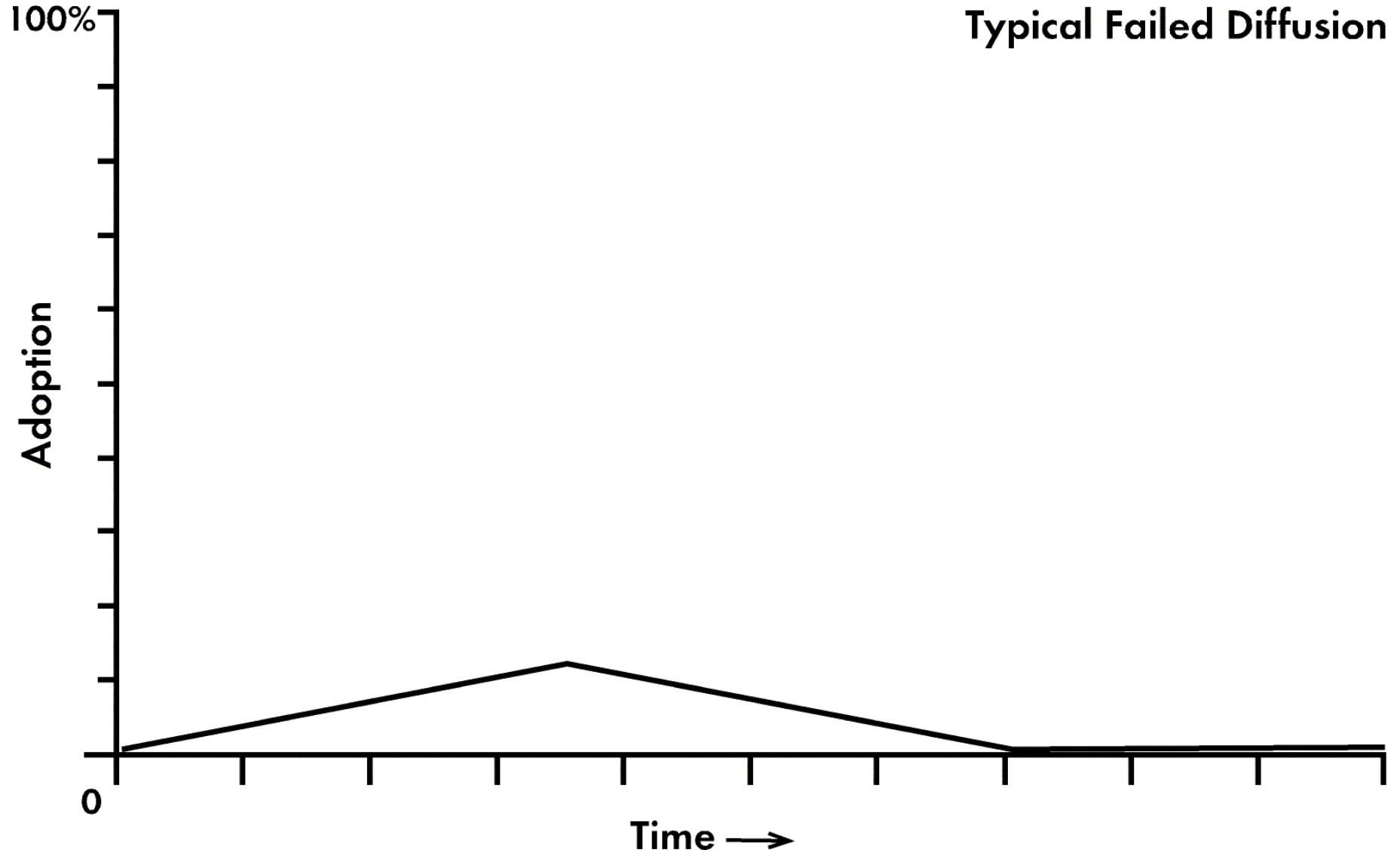
What's required to graph a diffusion curve?

- Clarity about the innovation
- Clarity about the unit of adoption
- Clarity about social system parameters
- Time of adoption for each unit



Does diffusion usually occur as a result of dissemination efforts?

Typical dissemination outcome



The diffusion of innovation paradigm as I know it

- Intentionality and spontaneity
Dissemination, diffusion
- Insights from Simmel (1892) Tarde (1902) were mostly correct
- Uncertainty reduction
- Information is distinct from influence
- Heuristics play a major role*

* Conell C & Cohn S (1995). Learning from other people's actions: Environmental variation and diffusion in French coal mining strikes, 1890-1935. *American Journal of Sociology* 101(2): 366-403.

The most efficient and effective dissemination effort is one that triggers diffusion

Three factors drive diffusion

- I. Innovation attributes (what potential adopters think about the *innovation*)
- II. Social influence (what potential adopters think *others* think about the innovation)
- III. Timing and framing of introducing the innovation

Can these factors be affected?

Yes

- Attribute research by marketing scientists
- Social influence research by health services researchers
- Readiness assessments of key stakeholders, media environments, policy priorities by community psychologists

Dearing JW, Maibach EW, Buller DB (2006). A convergent diffusion and social marketing approach for disseminating proven approaches to physical activity promotion. *Am J Preventive Medicine* 31(4S):S11-S23.

Dearing JW, Kreuter MW (2010). Designing for diffusion of cancer control interventions. *Patient Education & Counseling* 81S:100-110.

Can informed dissemination speed the adoption of innovations?

- Yes; generally efficacious*
- The recruitment appeal should be normative
- Ask them to apply their judgment
- Ask them to communicate as they normally do
- Personal evaluation must be positive

Althabe F et al. (2008). A behavioral intervention to improve obstetrical care. *The New England Journal of Medicine* 358(18): 1929-1940.

Kelly JA et al. (1997). Randomized, controlled community-level HIV prevention intervention for sexual-risk behavior among homosexual men in U.S. cities. *The Lancet* 350: 155-1505.

Valente TW, Davis RL (1999). Accelerating the diffusion of innovations using opinion leaders. *The Annals* 566:55-67.

Factor 1: Innovation attributes

Learning about and stimulating psychological pull

- Focus on perceived pros & cons
 - Cost ****
 - Simplicity ****
 - Compatibility ****
 - Evidence **
 - Trialability *
 - Observability *

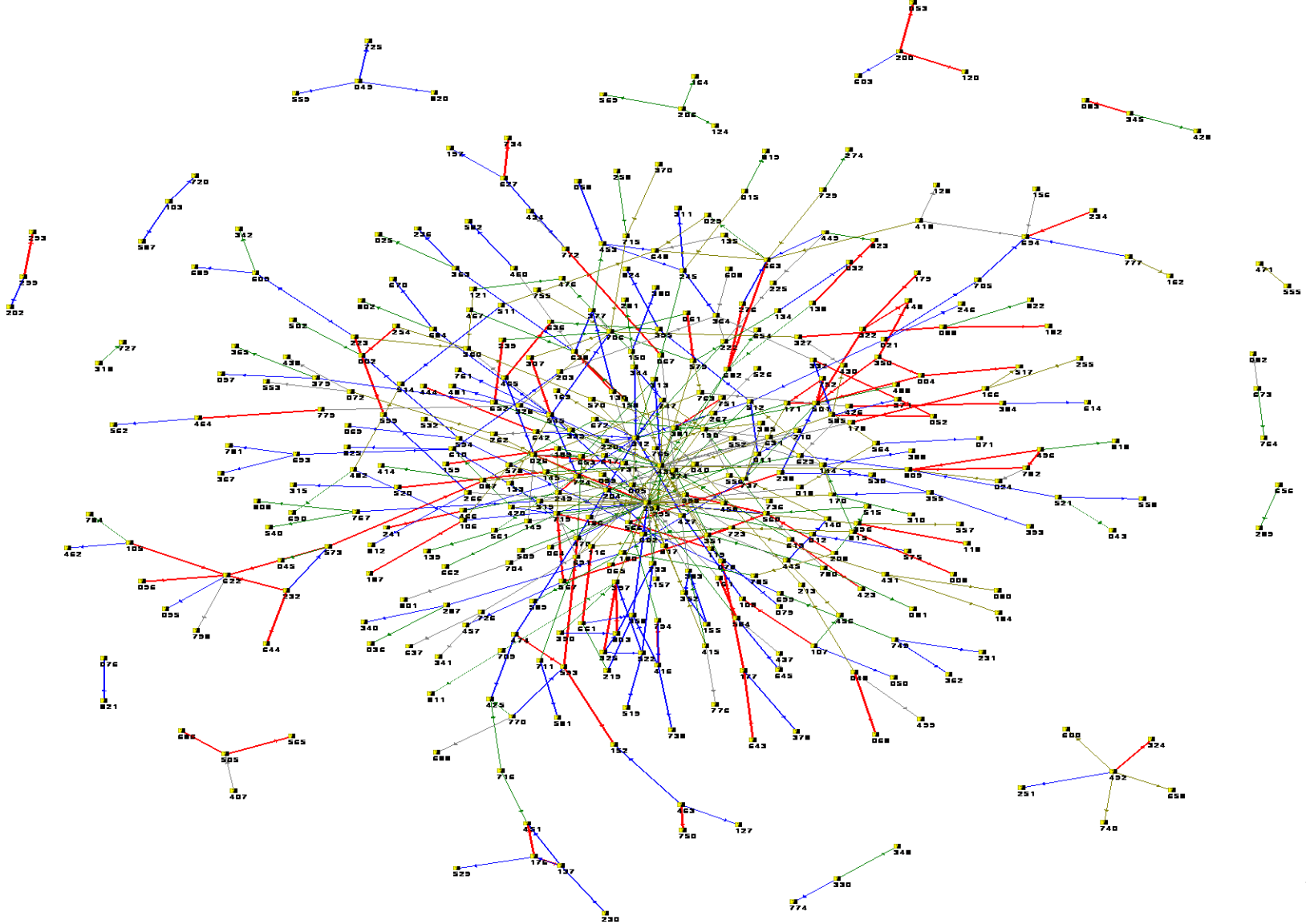
Using survey items such as

- Quality would improve if we used _____.
(effectiveness)
- Staff could try _____ and stop it if they didn't like it.
(trialability)
- Using _____ would save our physicians time.
(cost advantage)
- _____ meets our organizational objectives.
(compatibility)
- Our staff could quickly learn _____.
(simplicity)

Perception of innovation attributes depends on who communicates the message and what they say

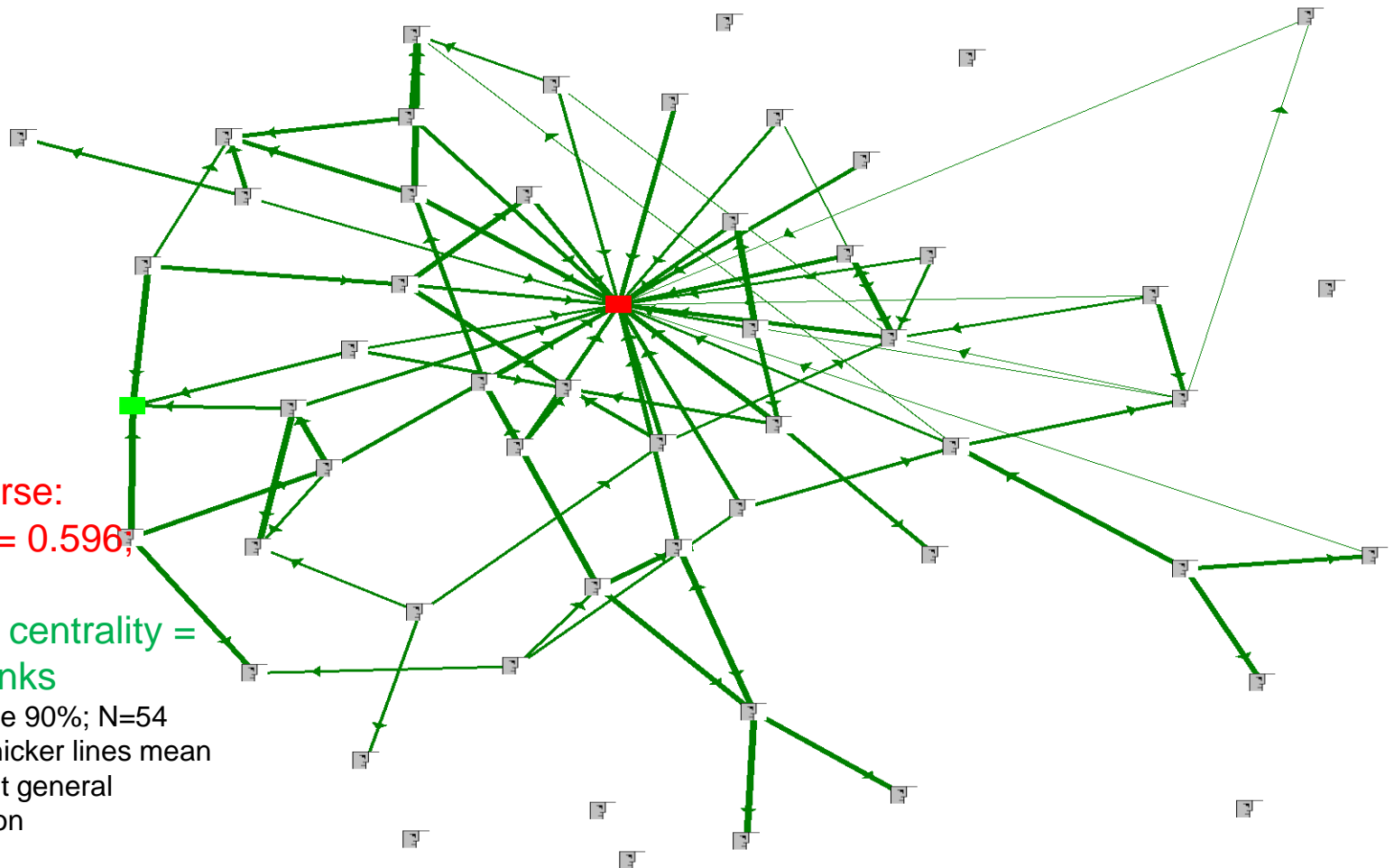
Factor 2: Social influence

Know the social system you want to affect



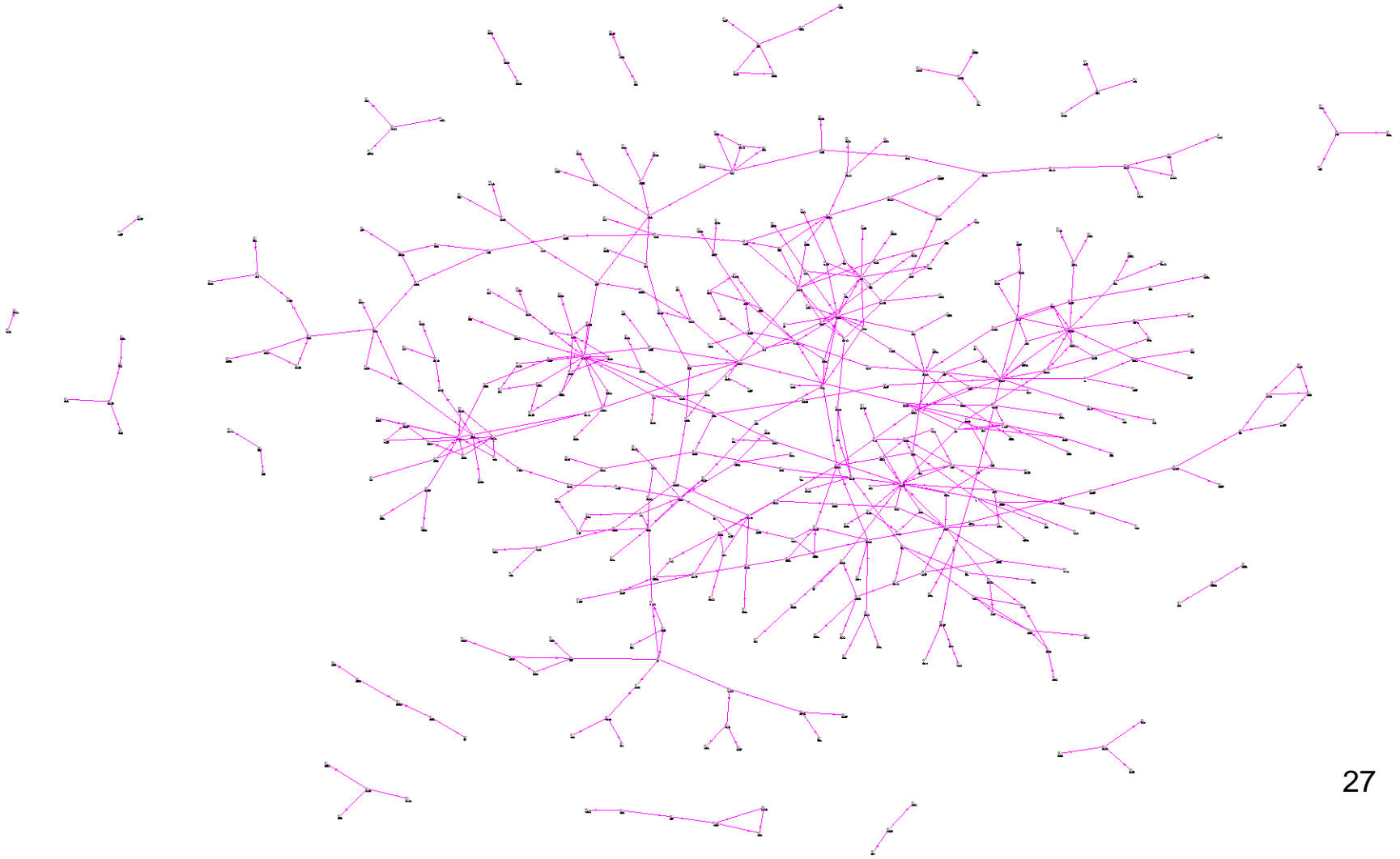
The formal leader is not always the informal opinion leader

“At your school, whose advice do you most value for new ideas or better ways of doing things in the curriculum related to health education?”



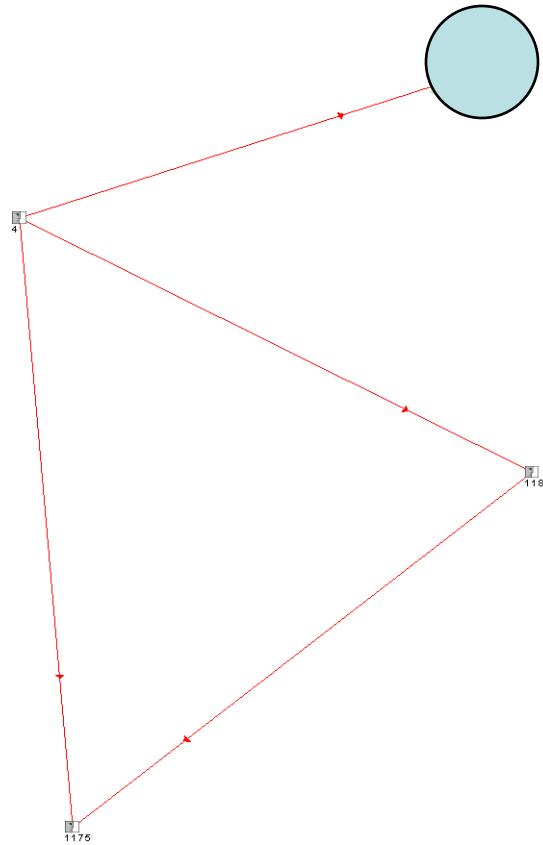
Cancer care advice network in an inter-organizational system

General surgery, Oncology, OBGYN, Radiology, Radiation therapy, Palliative care;
435 nodes, 544 links

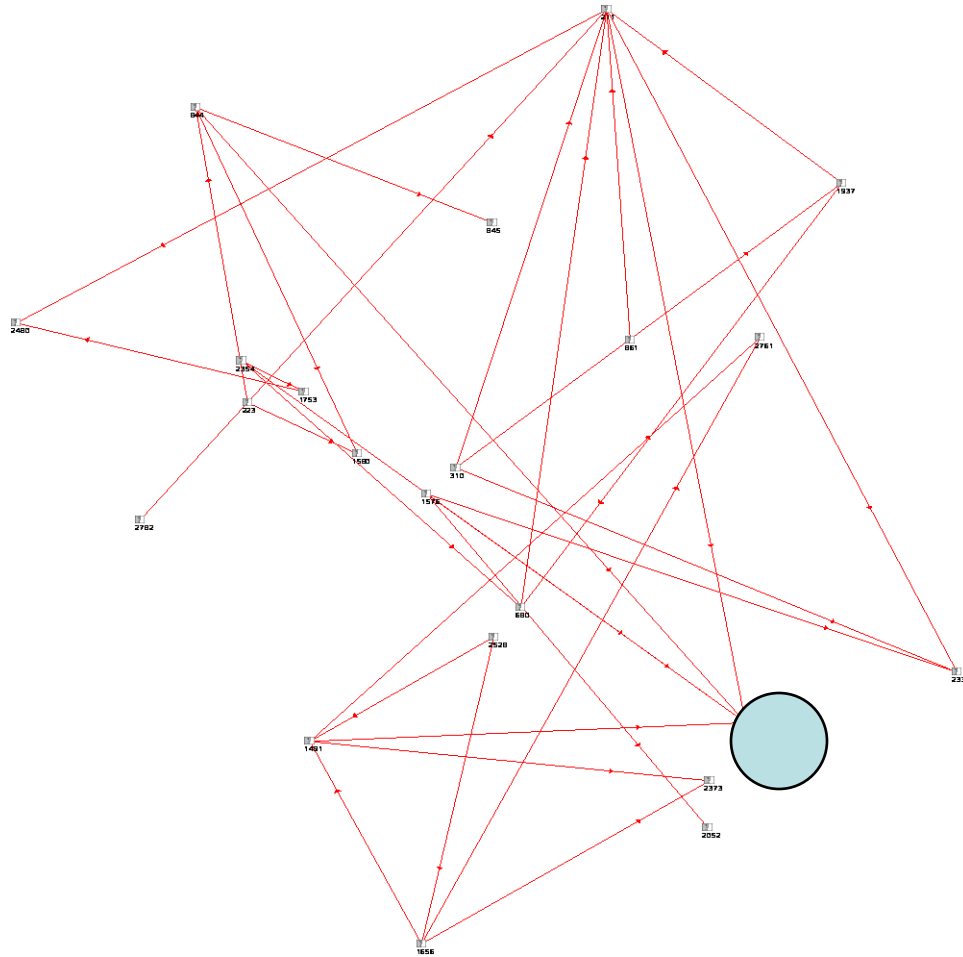


**Who you involve early on really does
matter**

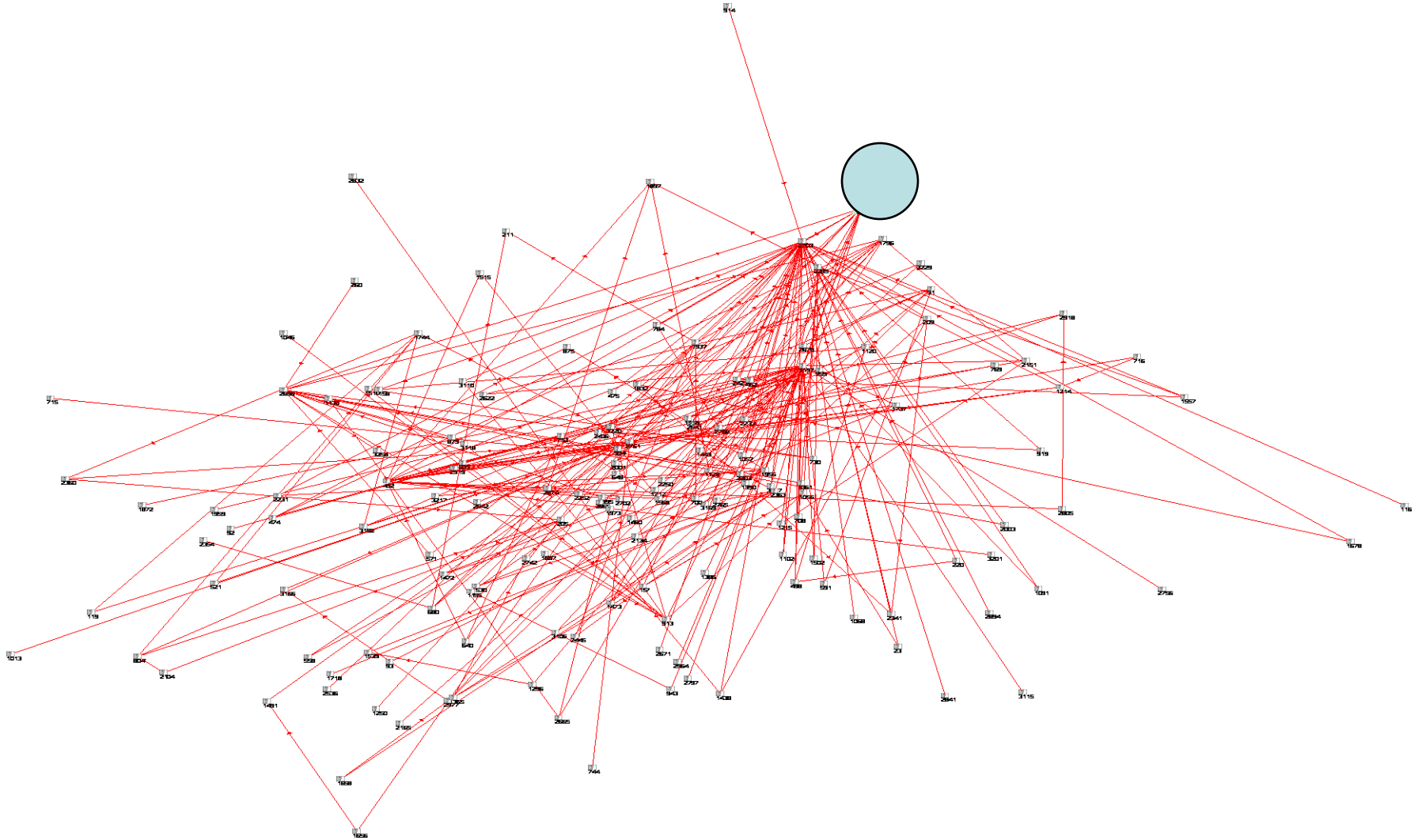
Typical employee's advice relationships in Kaiser Permanente



Established employee's advice relationships in Kaiser Permanente



Bridging employee's advice relationships in Kaiser Permanente



Factor 3: Timing and framing

- *Timing and framing* in terms of
 1. Organizational priorities
 2. Environmental (societal sector) priorities
 3. Mass or specialty media issue attention
 4. Reinforcing policy attention and initiatives

So being strategic about diffusion means gathering and assessing data prior to innovation introduction

- About potential adopter perceptions
- About potential adopter advice-seeking
- About the context (environmental and organizational agenda-setting, framing, timing)

Fortunately, formative research techniques are inexpensive, fast, proven, & highly adaptive to operations and sponsor needs

What about past the time of adoption?

- Implementation
- Sustainability

Guided Adaptation

- Specification of core components
 - i.e., sludge sessions, work team units
- Communication of theoretic components
 - i.e., social confirmation, collective efficacy
- Specification of customizable components
 - What should be changed to best achieve compatibility in each adopting site?
- Examples (demonstrations) of enactment
- Communities of practice networks

Create an implementation support system to guide adaptation

- To model effective use
- To model causal effect
- To model appropriate adaptation
- To showcase creativity among users
- To recognize organizational uniqueness
- To increase felt ownership among implementers
- To acknowledge the expertise of practice leads

Questions?