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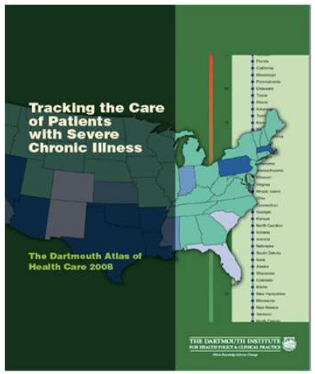
FOR HEALTH POLICY & CLINICAL PRACTICE

Medical Practice Variation in the U.S.
A Tool for Change

David C. Goodman, MD MS
Professor of Pediatrics and of The Dartmouth Institute

Pourquoi et comment réduire les variations de pratiques médicales ?
Des pistes pour améliorer la pertinence des soins

Paris, France
September 5, 2018

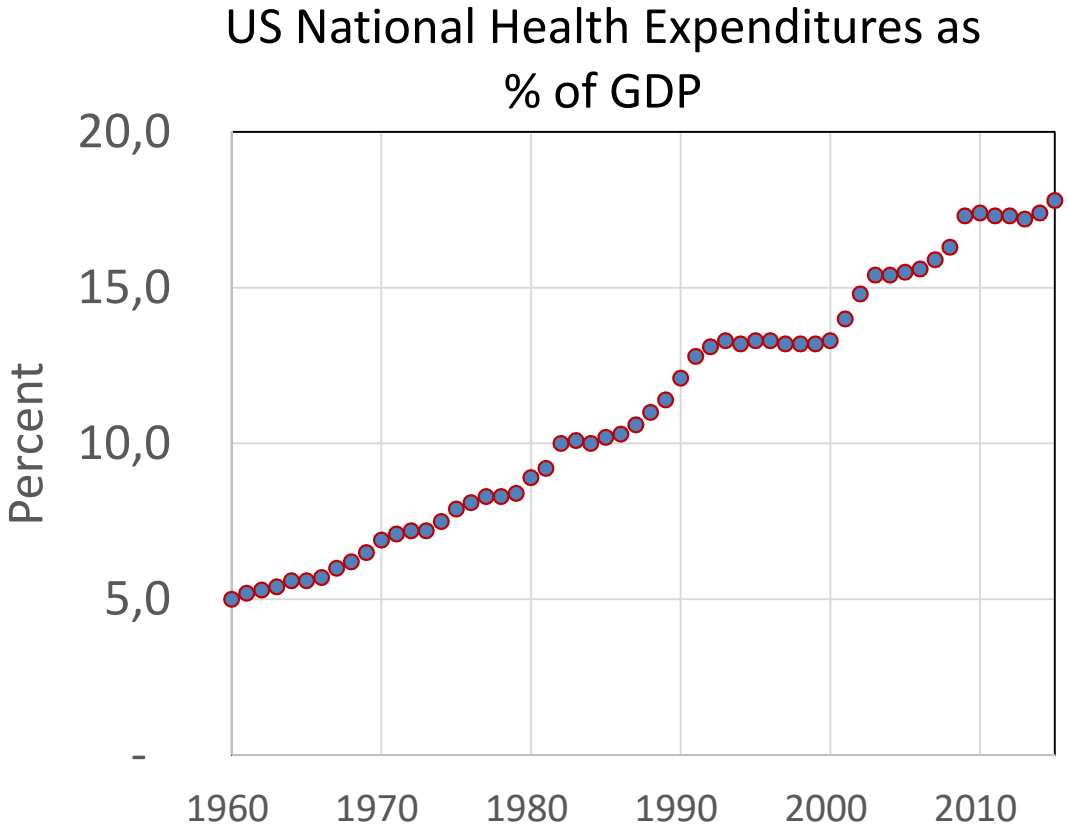


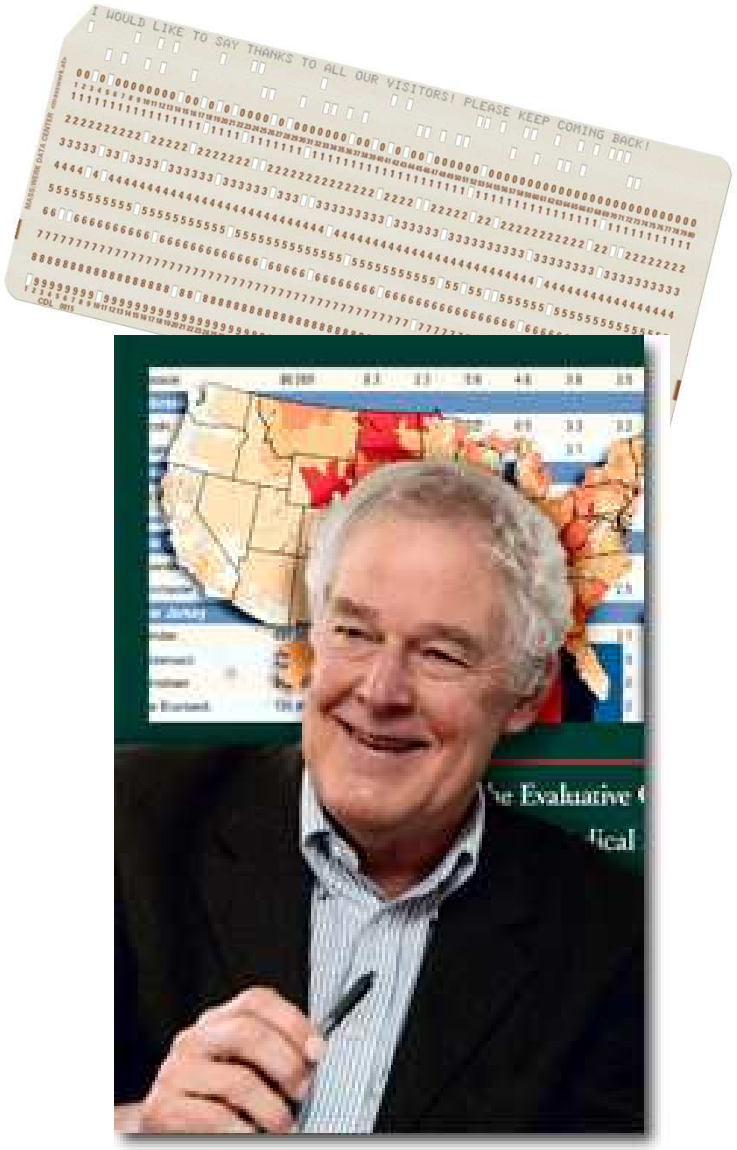
Funded by:
The Robert Wood Johnson Foundation
The National Institute on Aging
The Charles H. Hood Foundation
Texas Health and Human Services Commission
and others

1965: U.S. medical care was perfect...

- Biomedical research was vibrant.
- Medicare and Medicaid were enacted.
- Medical costs were modest.
- Physicians and hospitals were highly respected.
- Everyone agreed that the quality of medical care was excellent.

In the mid 1960s, costs emerge as a serious problem in medical care.





1973 - “A Population-based health information system...”

John E. Wennberg, MD MPH and Alan Gittelsohn, PhD

Small Area Variations in Health Care Delivery

A population-based health information system can guide planning and regulatory decision-making.

John Wennberg and Alan Gittelsohn

Recent legislation has extended planning and regulatory authority in the health field in a number of important areas. The 1972 amendments to the Social Security Act provide authority for regulating the construction of facilities and establish Professional Standard Review Organizations (PSRO's), which are accountable for setting standards and evaluating professional performance. Phase 3 of the Wage and Stabilization Act of 1970 and state insurance commissions provide authority for regulating dollar flow by controlling

impact of regulatory decisions on the equality of distribution of resources and dollars and the effectiveness of medical care services.

For technical and organizational reasons, documentation of the health care experience of populations has been restricted to large political jurisdictions such as counties, states, or nations. Studies at this level of aggregation have used indicators that support direct comparisons among areas. Relationships between the supply of manpower, facilities, and expenditures and

twice as high in California as in Arkansas. The number of physicians per thousand persons has been up to three times higher in some states than in others. International comparisons and studies of regions within states show that there are large differences in the rate of delivery of specific surgical procedures (*1*).

In 1969, there was implemented in the state of Vermont a data system that monitors aspects of health care delivery in each of the 251 towns of the state. When the population of the state is grouped into 13 geographically distinct hospital catchment, or service, areas, variations in health care are often more apparent than they are when the population is divided into fewer, larger areas. Population rates can be used to make direct statistical comparisons between each of the 13 hospital service areas. Since the medical care in each area is delivered predominantly by local physicians, variations tend to reflect differences in the way particular individuals and groups practice medicine. The specificity of the information in Vermont's data system makes it possible to appraise the impact that decisions controlling facility construction, price of insurance, and

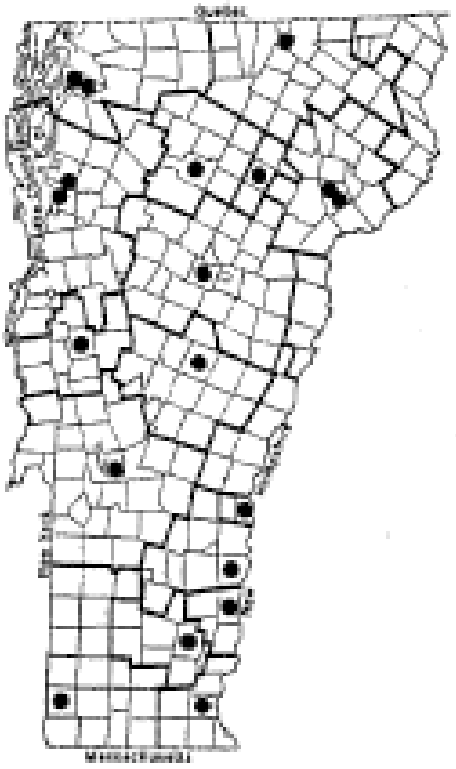
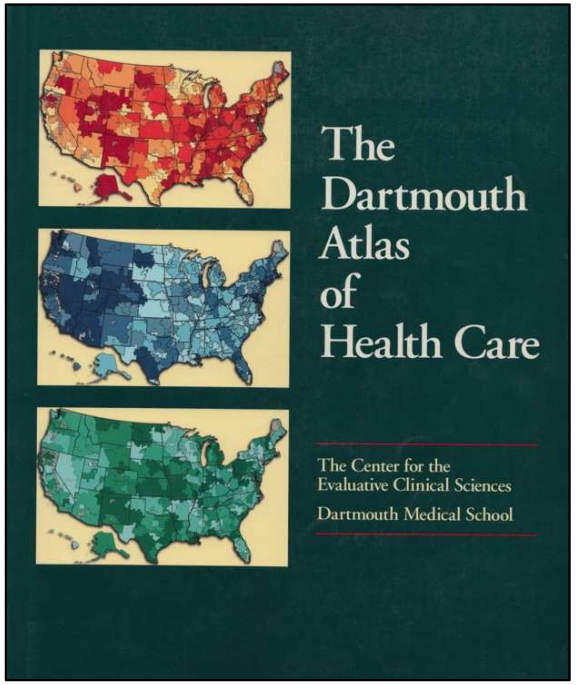


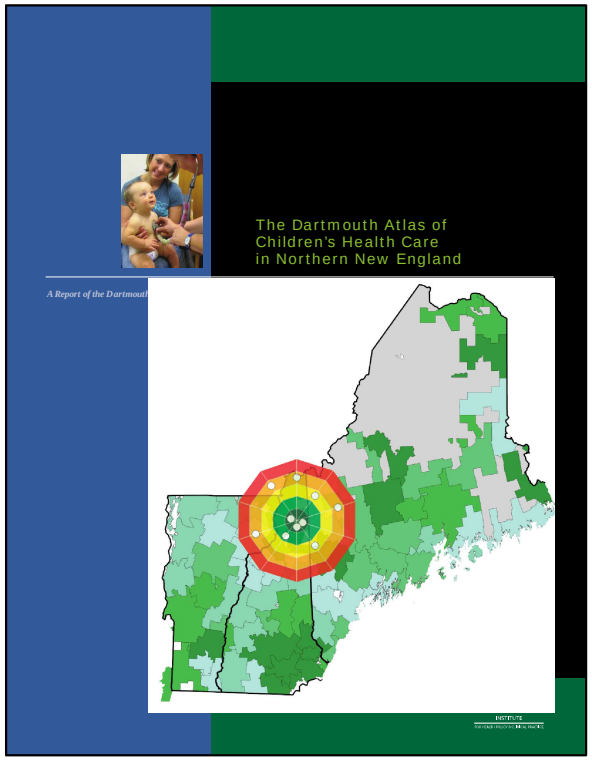
Fig. 1. Map of Vermont showing minor civil divisions, the Vermont town (lighter line). Darker line shows boundaries of hospital service areas. Circles represent hospitals. Areas without circles are served principally by hospitals in New Hampshire.

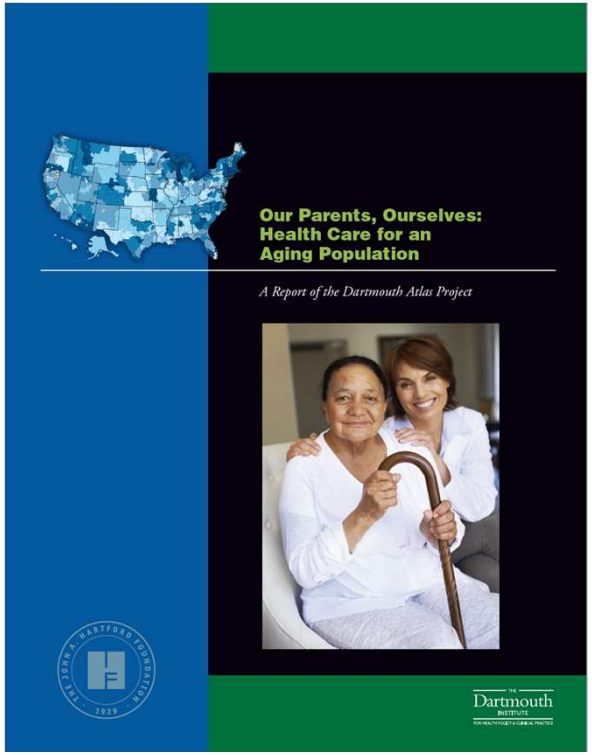
Observed variation could not be explained by population differences in demographics or health status.

Wennberg J, Gittelsohn A. Small area variations in health care delivery. *Science* 1973;182:1102-8.

The Dartmouth Atlas of Health Care
Over 60 Atlases; > 350 research papers







1996 2013 2016

Future: 2019 - Dartmouth Atlas of Neonatal Intensive Care

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Elliott Fisher, MD MPH (Co-PI)
Jonathan Skinner, PhD
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Kristen Bronner, MA (Managing Editor)

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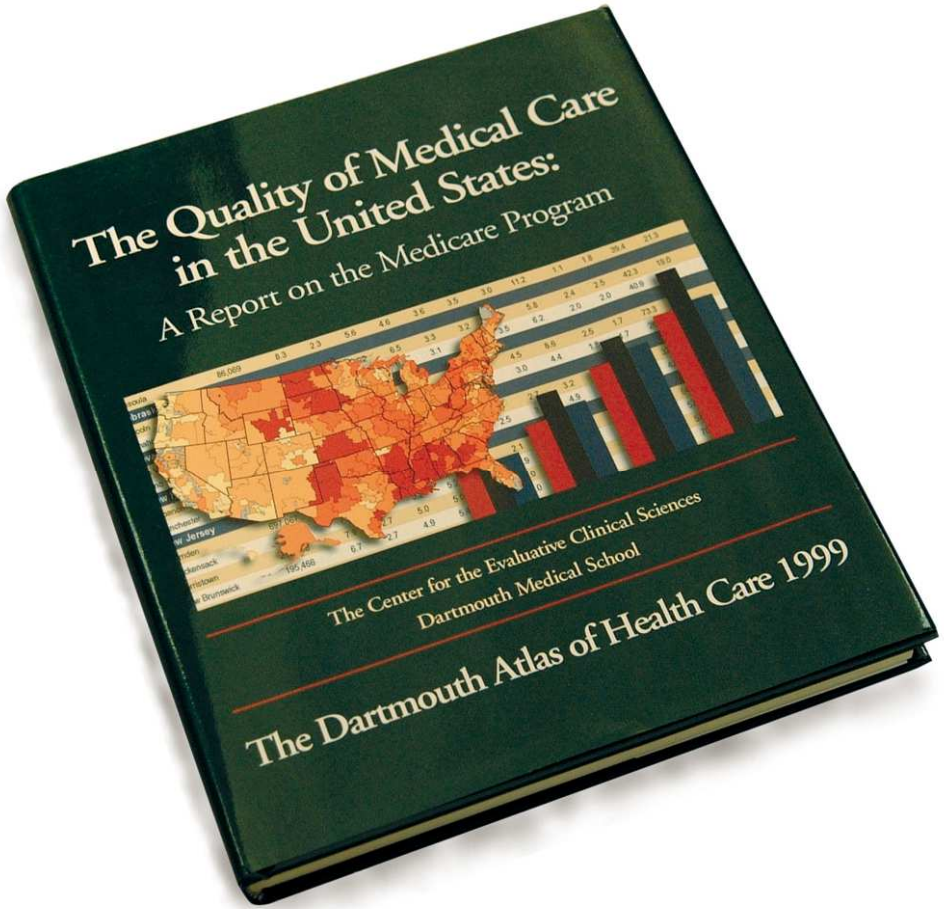
(Institute for Clinical Evaluative Sciences & Dartmouth)



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Birkmeyer, Nancy	Dimick, Justin	Reames, Bradley

Other

Jacobson, Joseph *(Cancer)*

Epidemiology:
Measuring health is essential to building a healthy population

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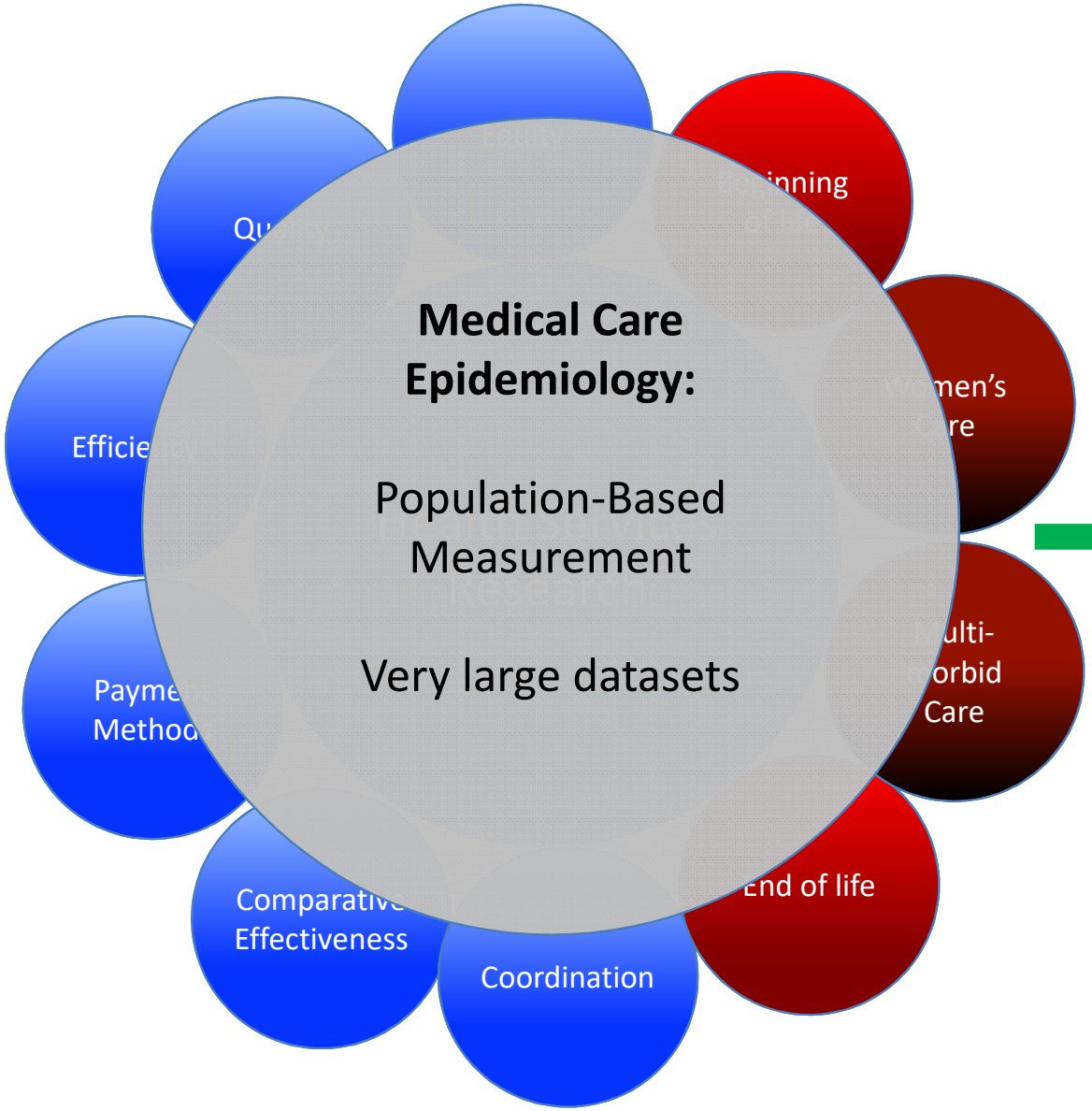
Medical care epidemiology:

Measuring health care across populations is just as important.

Of course.

Medical Care Epidemiology
The foundation of health services research



What can we learn from population-based studies of medical practice variation?

- Detailed measures of quality and efficiency of health care across large populations.
- Patterns of care before, during, and after hospitalization occurs.
- Outcomes, including mortality.

These studies...

- Can identify the causes and consequences of differences in health system performance across clinicians and hospitals.
- Provide transparency, and encourage public engagement.
- Assist in identifying quality and efficiency benchmarks.
- Stimulate and provide methods of improvement.

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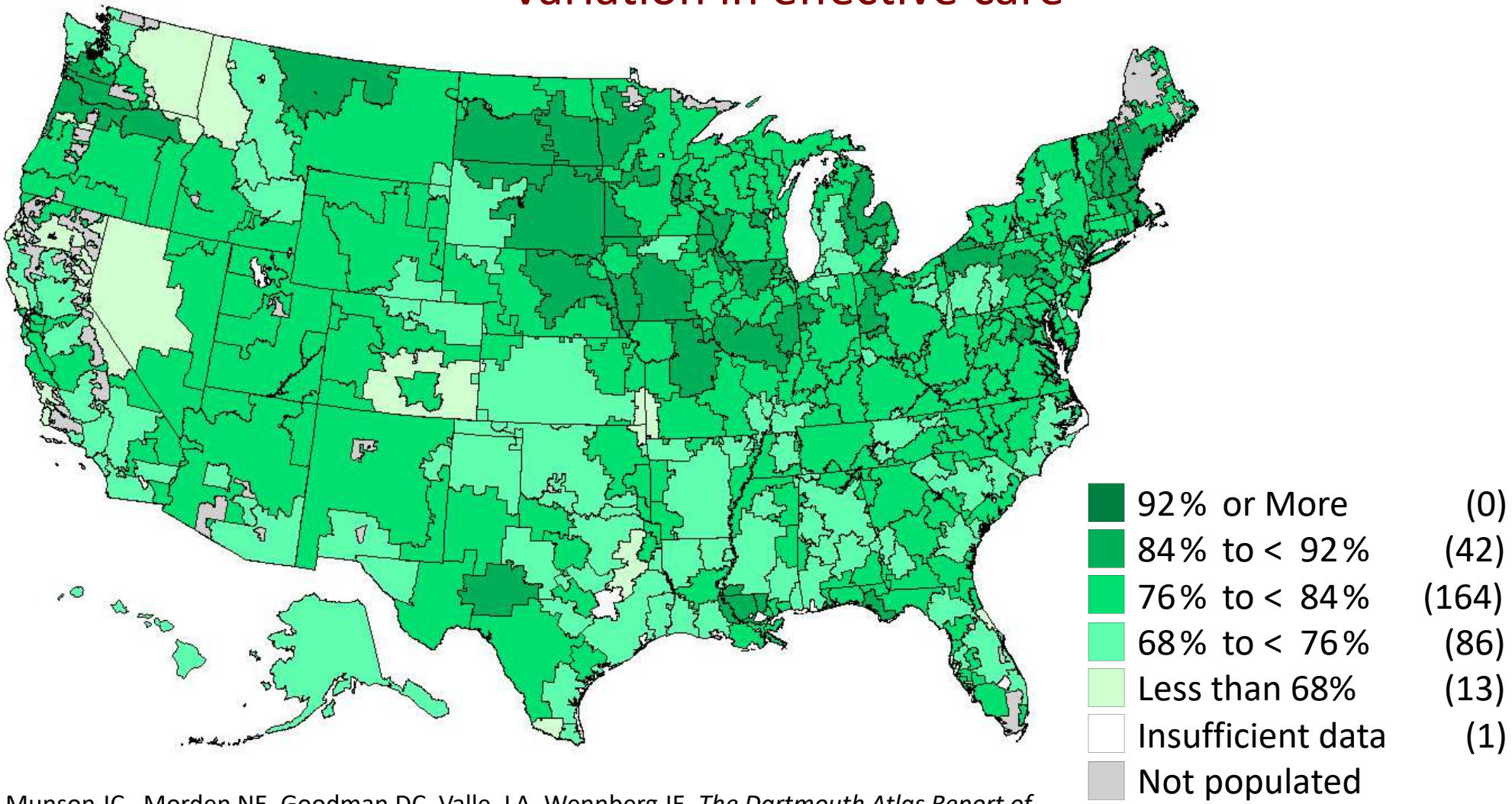
Use of beta-blockers 7-12 months following discharge for AMI (2008-10) in Medicare ≥ 65 yrs

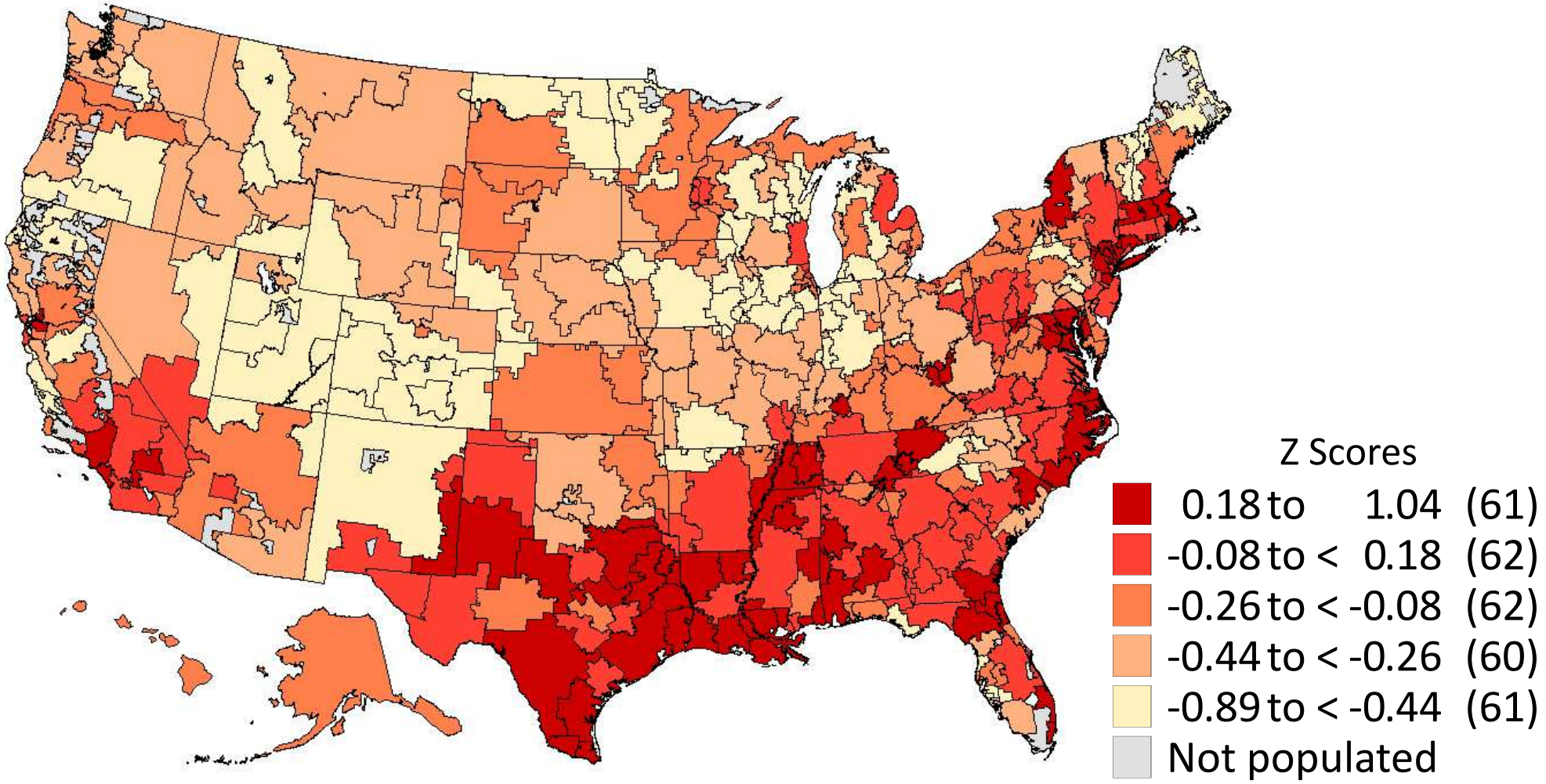
Variation in effective care



Munson JC, Morden NE, Goodman DC, Valle, LA, Wennberg JE. *The Dartmouth Atlas Report of Medicare Prescription Drug Use.* Hanover, NH: The Trustees of Dartmouth College October 2013.

Composite measure of Choosing Wisely test and treatment use (≥ 65 years Medicare beneficiaries)

Colla C, Morden N, et al. J Gen Intern Med. 2014



Variation in ineffective Care

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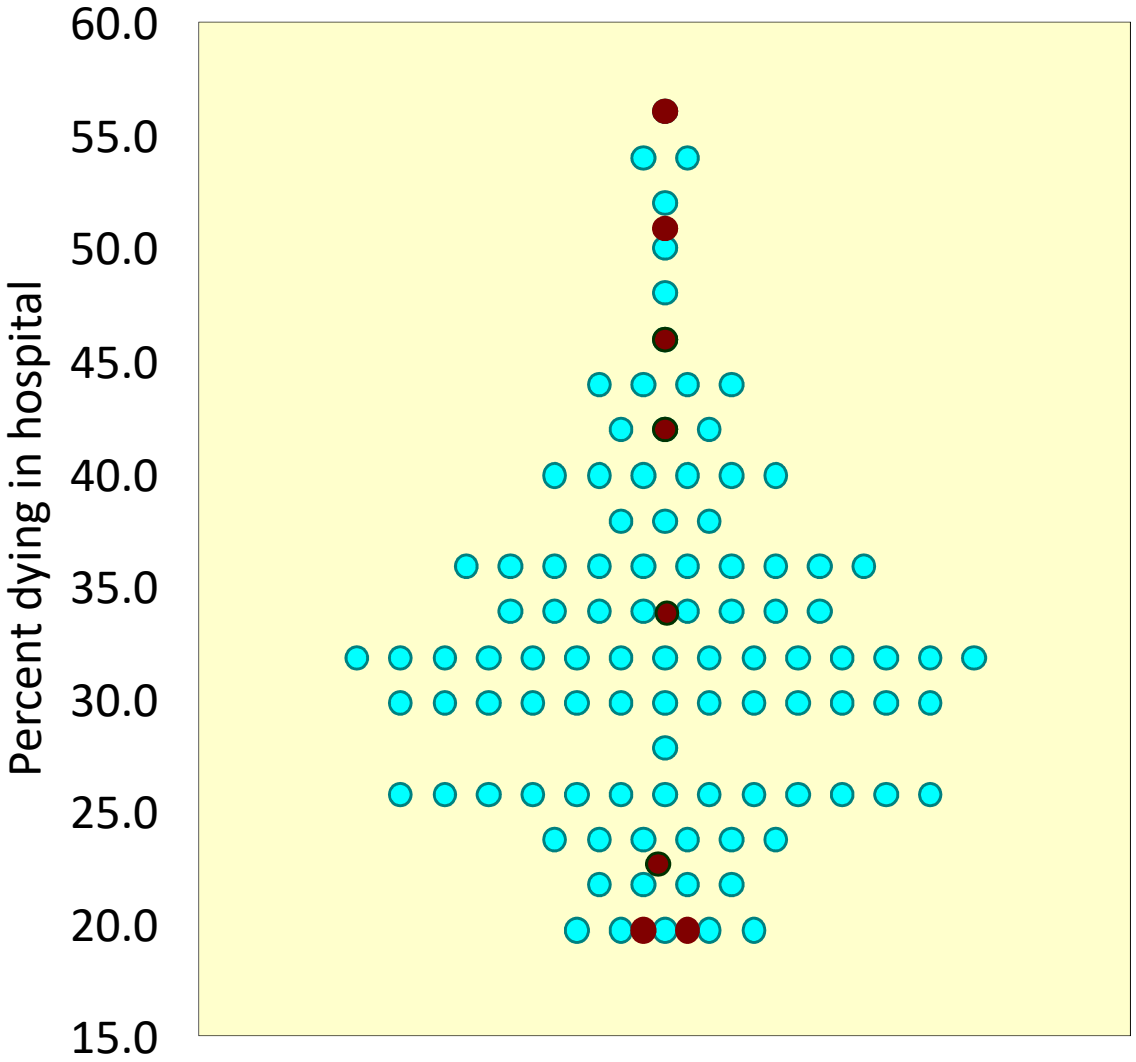
Percent of patients (> age 65) with advanced cancer dying in the hospital, 2010

NCI Cancer Centers and Academic Medical Centers (non-NCI)

(Adjusted for age, sex, race, cancer type, chronic diseases)



Westchester Medical Center, NY	57.1
Cedars-Sinai Med Ctr. LA, CA	51.9
New York-Presbyterian Hospital	46.2
Robert Wood Johnson Univ, NJ	42.4
Yale-New Haven, CT	33.5
Univ. Texas MD Anderson	24.5
Johns Hopkins Hospital	23.7
Evanston Northwestern, IL	18.7

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The beginning of life…

Texas Medicaid Insurer for 60% of Births

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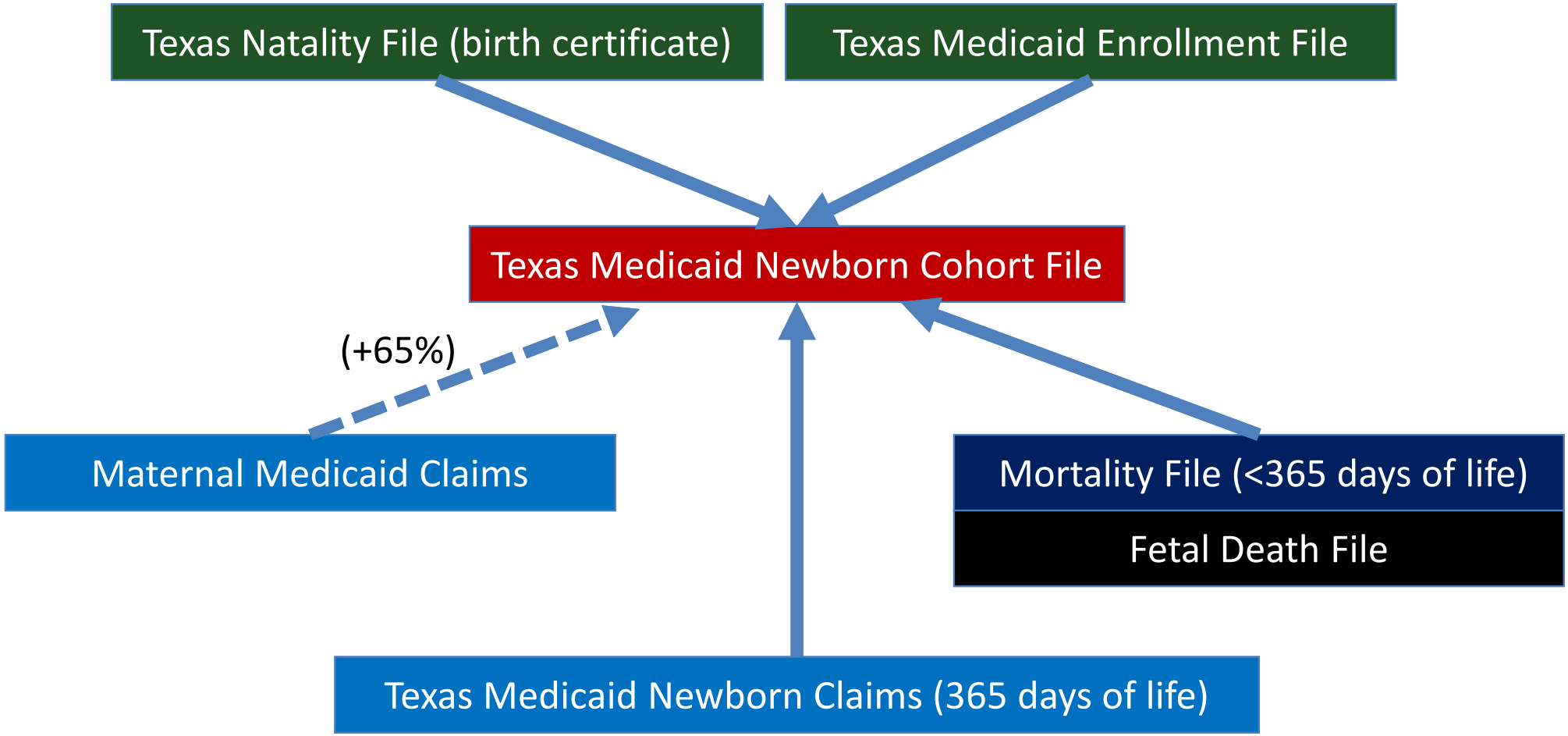
Texas Medicaid Newborn Cohort 2010-2014 (n=1.13 million live births)



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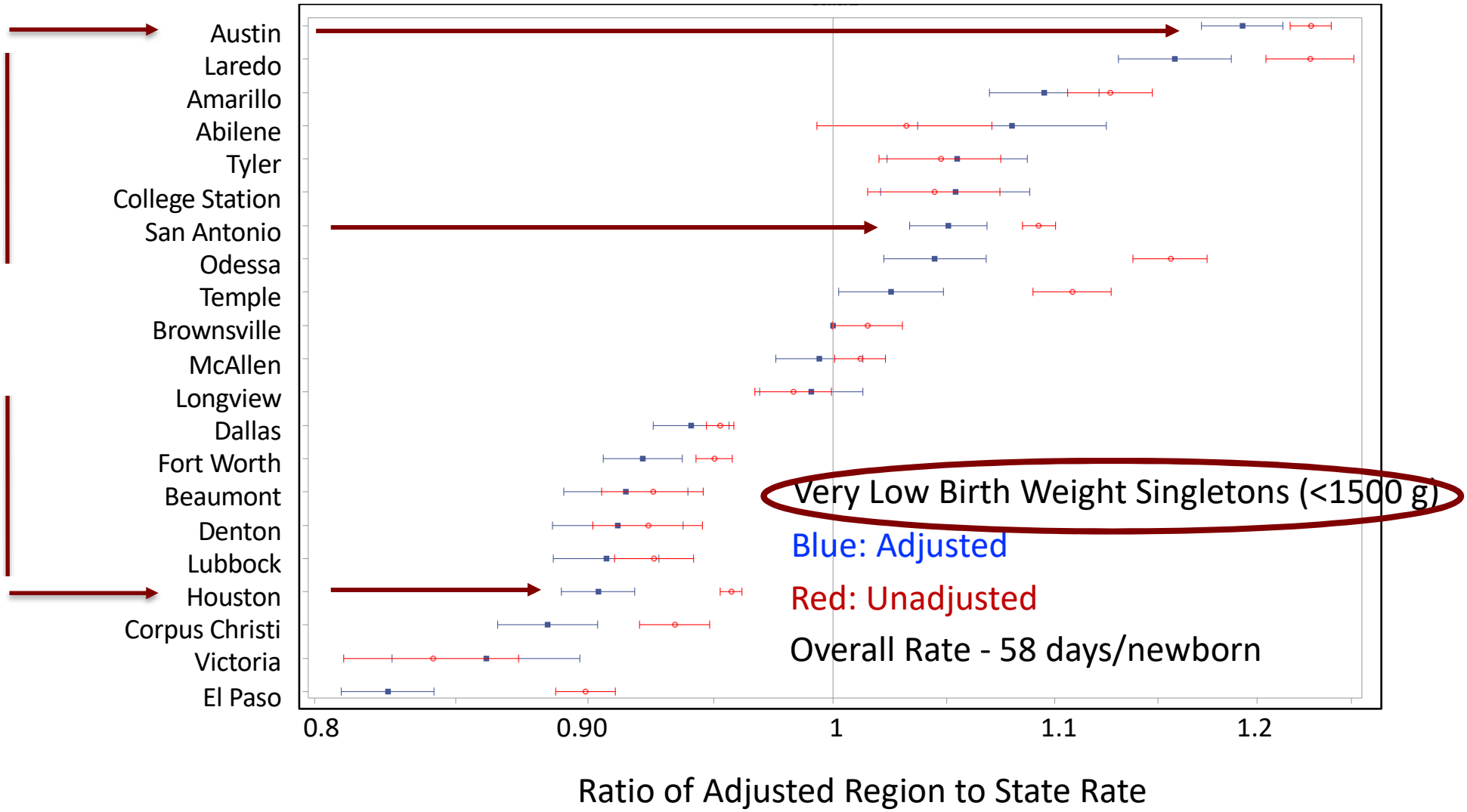
TEXAS NICU PROJECT

Special Care Days (Intensive or Intermediate) per Birth, By Neonatal Intensive Care Regions



Data: CYs 2010-14

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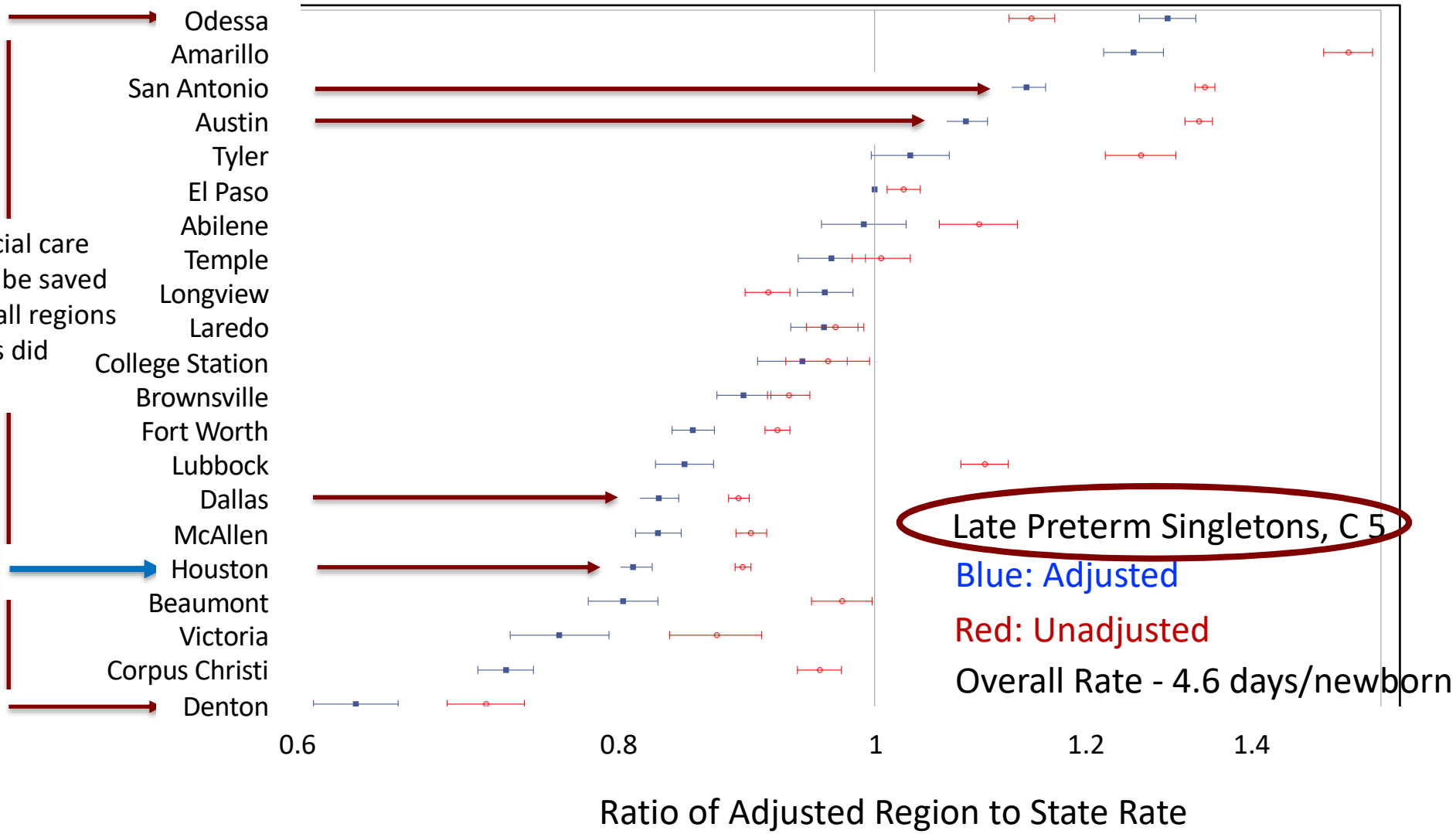
TEXAS NICU PROJECT

Special Care Days (Intensive or Intermediate) per Birth, By Neonatal Intensive Care Regions

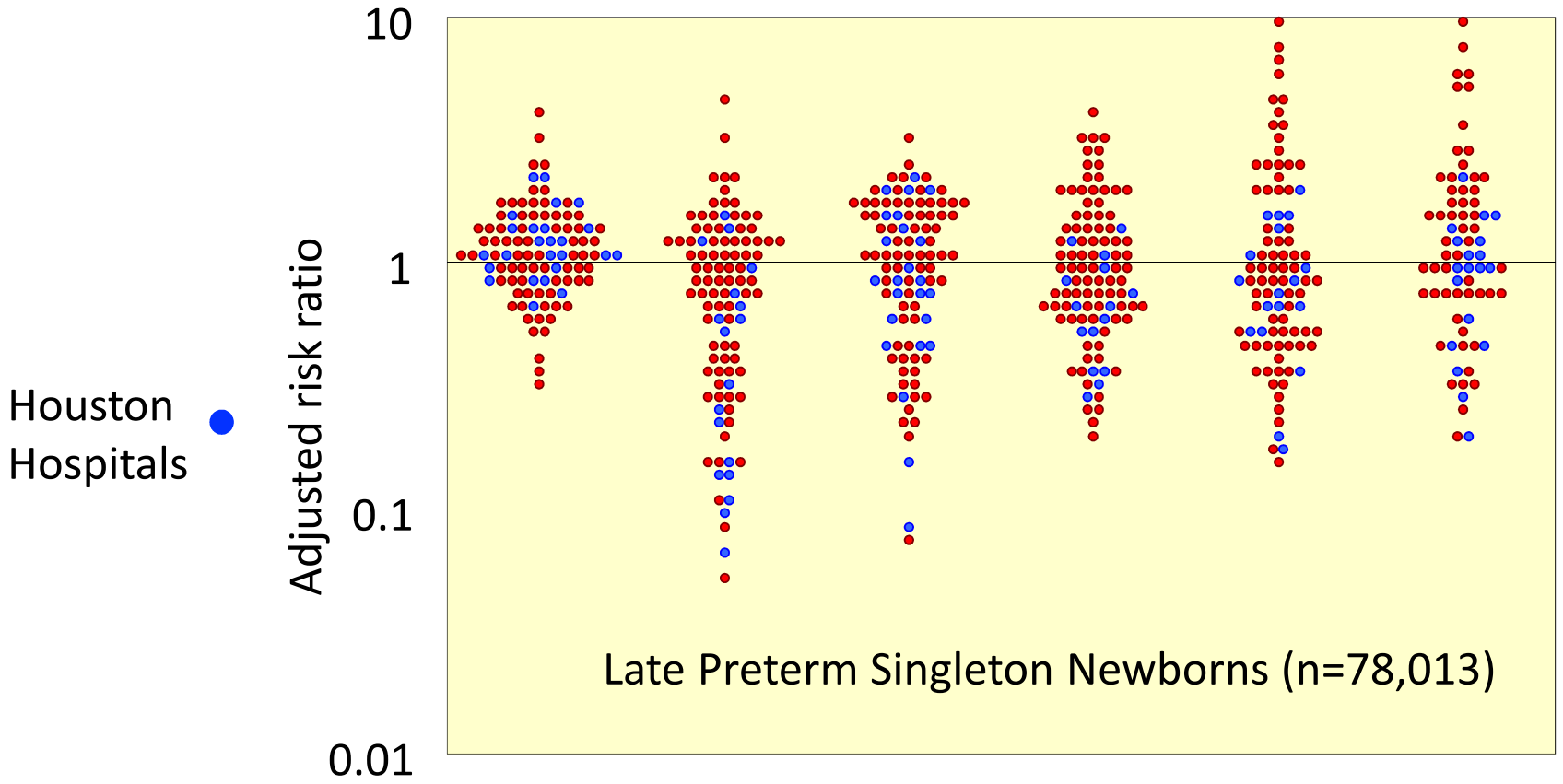


14,852 special care days would be saved per year, if all regions practiced as did Houston.

Data: CYs 2010-14

Utilization for 100 hospitals, Texas Medicaid, CY 2010-14

100 TX hospitals with the highest number of newborns receiving care,
representing 82% of late preterm newborns



	Overall SC Days	Intensive SC Days	Intermediate SC Days	Chest X-Films	Abdominal Films	Head Ultrasounds
State rate (per newborn)	**4.5**	**2.5**	**2.0**	**0.93**	**0.41**	**0.09**
Extremal ratio	14.0	87.0	480.0	21.3	62.3	53.1
Interquartile ratio	1.66	3.28	2.85	2.27	3.30	2.29
Coefficient of variation	48	77	60	69	116	106

Successes of Medical Care Epidemiology and Investigation into Medical Practice Variation

- Markedly greater transparency in health system performance.
- The development of outcomes research - using observational study designs to measure the effectiveness of health care interventions.
- New payment mechanisms:
  - Bundled payments, Pay for performance, Accountable Care Organizations
- Better patient engagement: Shared decision making and decision aids
- Continuous quality improvement - and the birth of the Institute for Healthcare Improvement
- Improvements in U.S. health workforce policy in planning, funding, and training the physician and nursing workforce.
- *Choosing Wisely*
- Establishment of national and NGO foundation funding of health services research

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But the rest of the world?

Systematic review of medical practice variation papers in OECD countries

Corallo A, Coxford R, Goodman D, Bryan E, Srivatava D, Stukel T. *Health Policy* 2013.

Published during the period 2000 – 2011.

	Number of studies	Percent
United States	319	38
United Kingdom	123	15
Canada	111	13
Australia/N.Z.	53	6
Netherlands	22	3
Denmark	13	2
Germany	13	2
Sweden	12	1
Spain	11	1
Switzerland	11	1
Japan	10	1
France	10	1

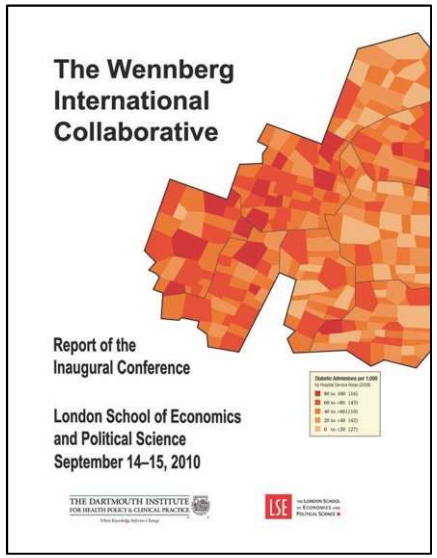
	Number of studies	Percent
Norway	8	1
Ireland	8	1
Italy	7	>1
Finland	6	>1
Belgium	3	>1
Austria	2	>1
Estonia	1	>1
Greece	1	>1
Hungary	1	>1
Portugal	1	>1

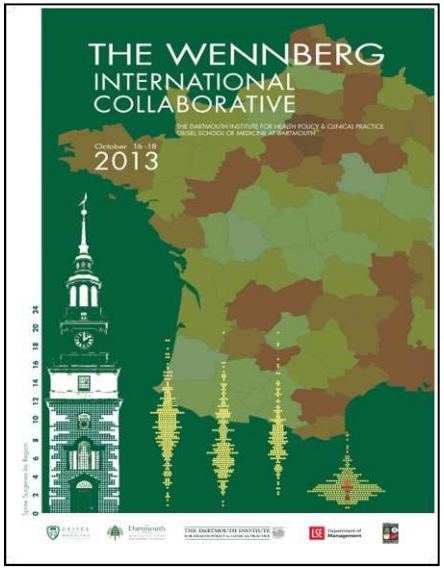
Why did (and do) many countries lag in measuring and understanding variation in population-based health system performance?

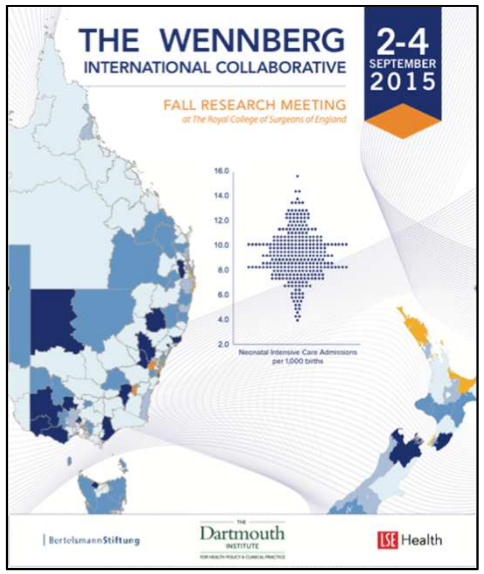
- Data is held by governments, insurers, and providers who often refuse legitimate data use requests by researchers.
- Measurement and public reporting makes providers, insurance plans, and politicians nervous.
- Most studies are descriptive and do not investigate the causes of variation.
- Without theories of cause, the results have limited value in remediating problems.
- There are few forums to share ideas and methods.
- There is a lack of training in medical care epidemiology at most universities.

The Wennberg International Collaborative Research Meetings 2010-18

(Co-founded by Goodman and Bevan)







Wennberg International Collaborative Spring Meetings
Open Registration

Berlin, Germany June 2015

Pisa, Italy
April 2016

Melbourne
May 2017

Zurich
April 2018

41 years after the Wennberg's *Science* paper

OECD Health Policy Studies

Geographic Variations in Health Care

WHAT DO WE KNOW AND WHAT CAN BE DONE TO IMPROVE HEALTH SYSTEM PERFORMANCE?

Edited by Divya Srivastava, Gaétan Lafortune, Valérie Paris and Annalisa Belloni

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Consult this publication on line at ***http://dx.doi.org/10.1787/9789264216594-en.***

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OECD Health Policy Studies Geographic Variations in Health Care WHAT DO WE KNOW AND WHAT CAN BE DONE TO IMPROVE HEALTH SYSTEM PERFORMANCE?

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Geographic Variations in Health Care

WHAT DO WE KNOW AND WHAT CAN BE DONE TO IMPROVE HEALTH SYSTEM PERFORMANCE?

OECD

Population-based Studies of Health Care: Stages of Development

Exploratory studies

- Opportunistic
- Descriptive
- Atheoretical
- Cross-sectional
- Focus on utilization

Inferential studies

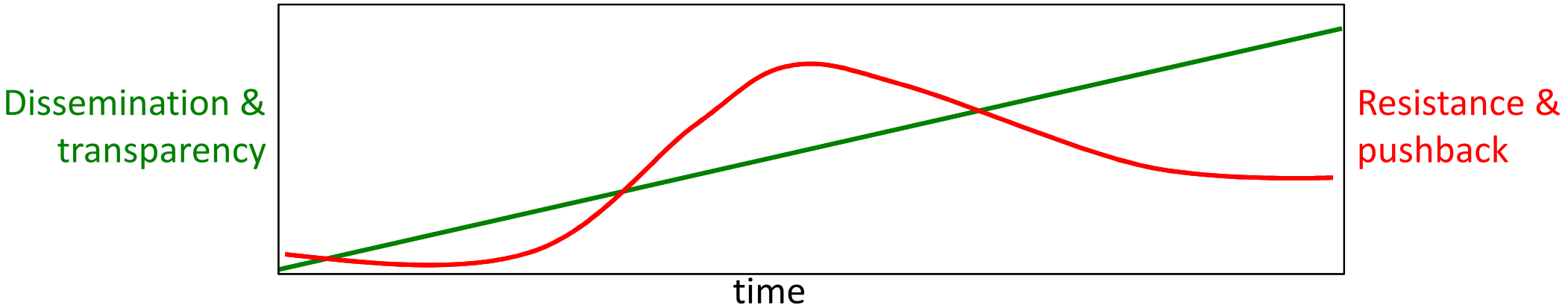
- Shift to cohort and longitudinal design.
- Analysis with multi-level models and econometrics
- Outcomes beyond utilization -- health outcomes, cost, and/or resource inputs

Causal theories

- Causes often vary by clinical area and by health system.
- Causes are controversial because they are linked to accountability.

Developed remedies

- Remedies linked to causal theories.
- Establishes the value of studies (finally).
- Requires continued surveillance of utilization & outcomes.



John E. Wennberg