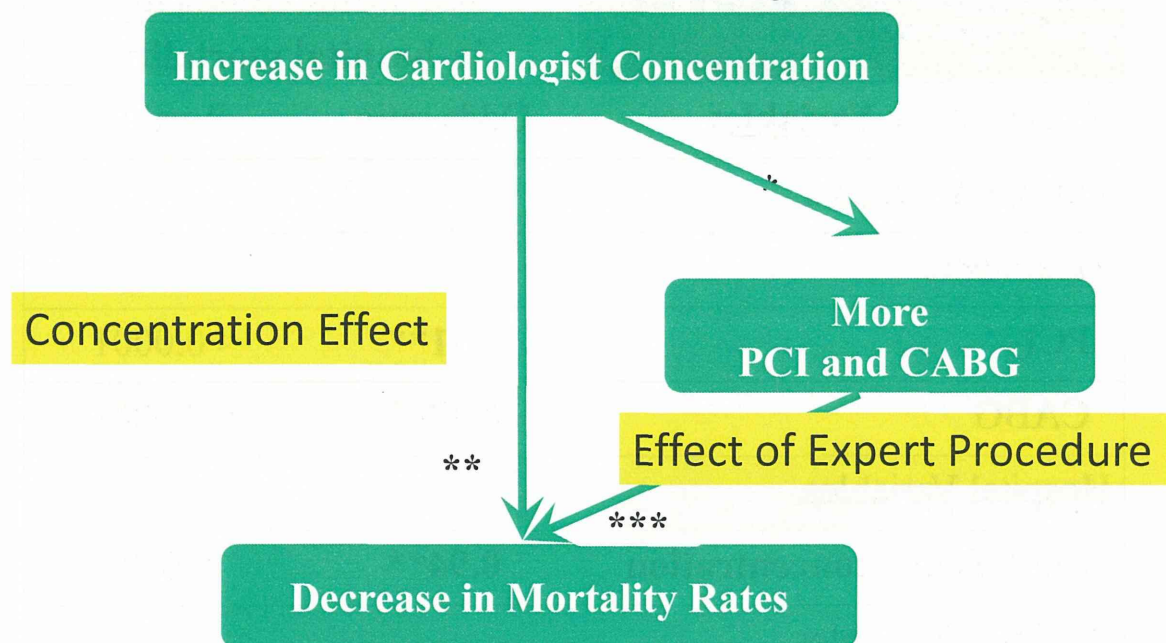


## Possible Mechanism of Cardiologist Concentration on Quality of Care



\*p<.05, \*\*p<.01, \*\*\*p<.001.

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## Possible Mechanism of Cardiologist Concentration on Quality of Care

A higher cardiologist concentration is associated with improved quality of care even after adjusting for invasive procedure utilization.

- The **capacity** gets larger (eg, 24-hr 365-dy coverage),
- and amplified by “Teamwork”.
- More professional knowledge and skills will be shared and improved particularly in a interactively-learning organization.
- Individual’s **professional growth** will be facilitated

## Conclusions

- Hospital competition and cardiologist concentration may independently have a favorable effect on **risk-adjusted mortality (quality)**.
- No evidence was found on supplier-induced over-supply due to hospital competition in a region
- Understanding these factors may guide us in formulating appropriate measures to reduce unwarranted variations.

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## Question 2

Higher Spending (Cost) is  
necessary for Higher Quality ?

In health care, the association between Quality and spending is not clearly known yet.

# Hospital Spending & Quality of Care

(1) Acute Myocardial Infarction / Hospital

(2) Ischemic Stroke / Region

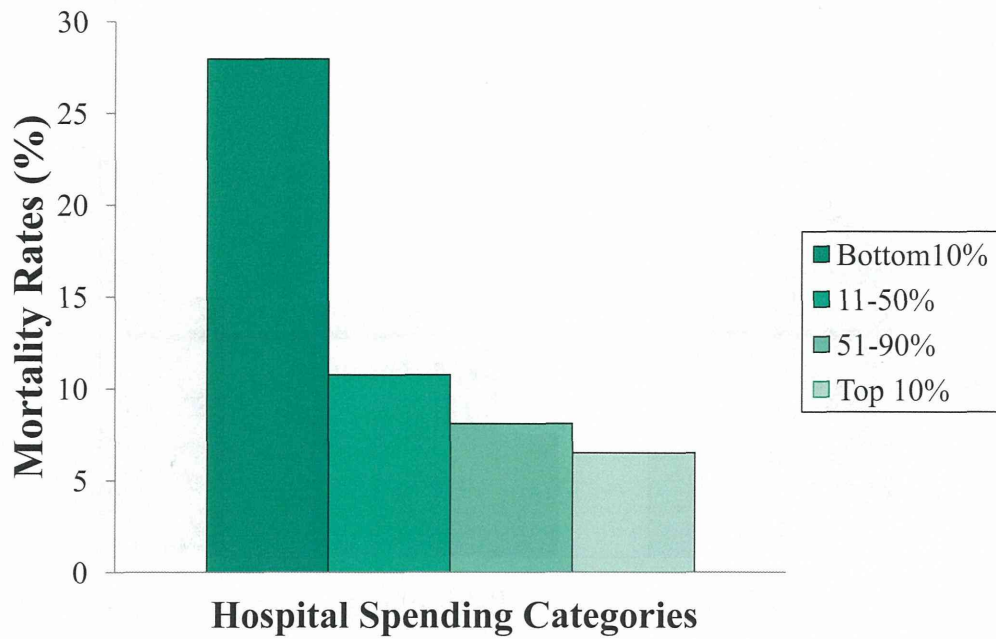
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(1) Acute Myocardial Infarction

**Hospital Variation**

## AMI / Hospital Variation

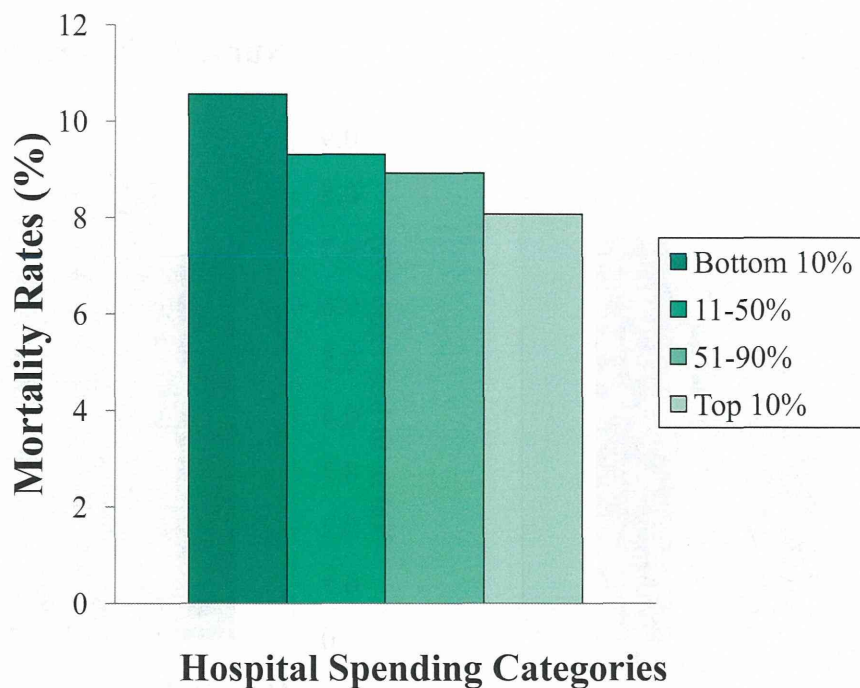
Observed (Crude) 30-day In-hospital Mortality Rates  
by Hospital Spending Category



43

## AMI / Hospital Variation

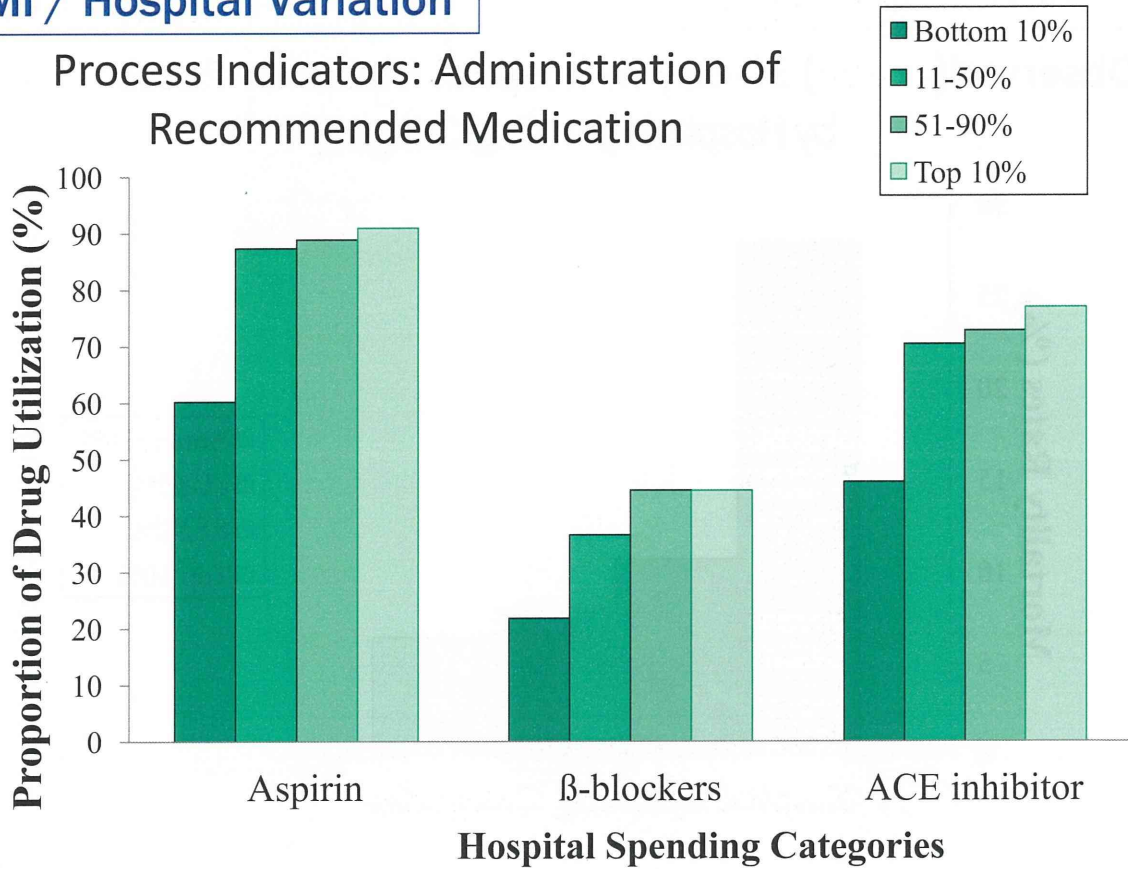
30-day Risk-adjusted In-hospital Mortality Rates



44

## AMI / Hospital Variation

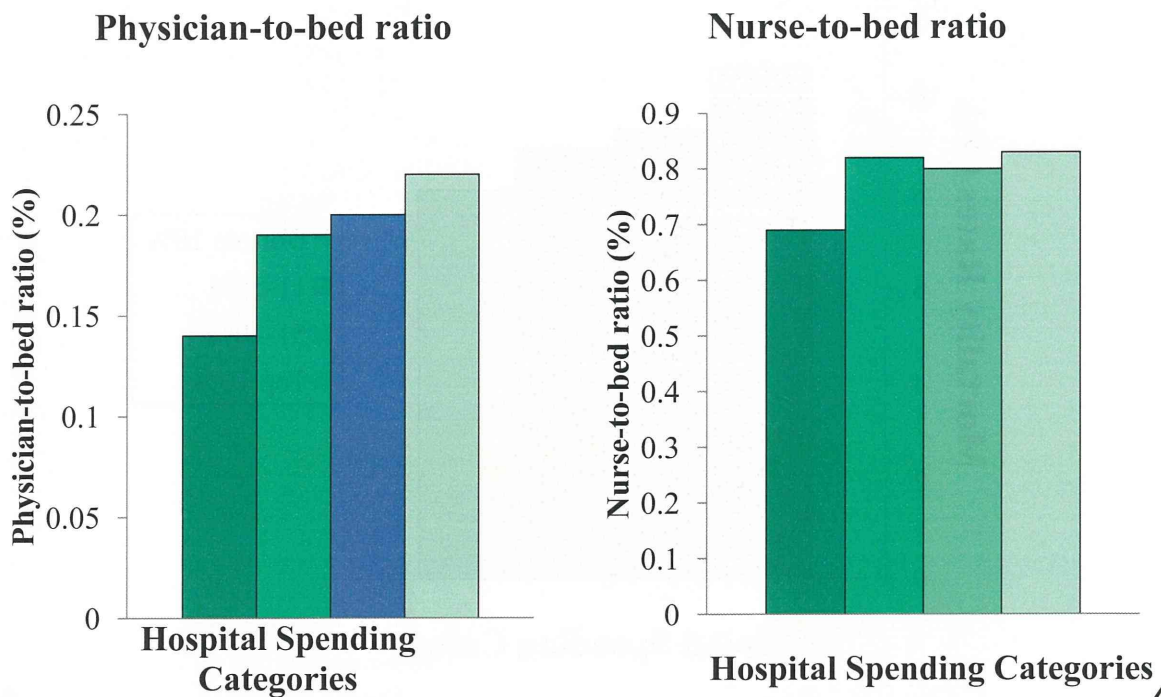
### Process Indicators: Administration of Recommended Medication



45

## AMI / Hospital Variation

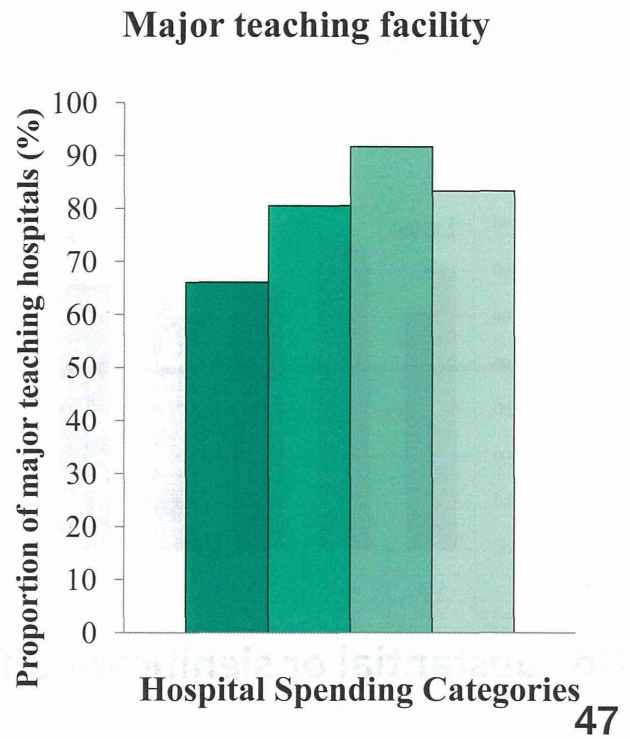
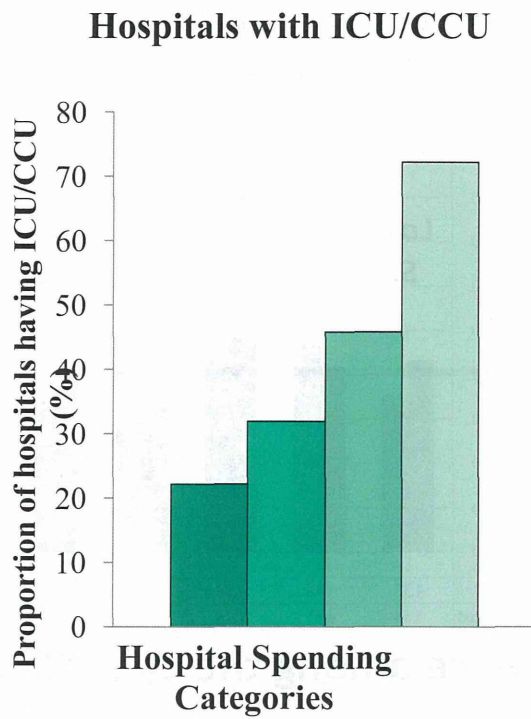
### Hospital Characteristics According to Hospital Spending



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## AMI / Hospital Variation

### Hospital Characteristics According to Hospital Spending



47

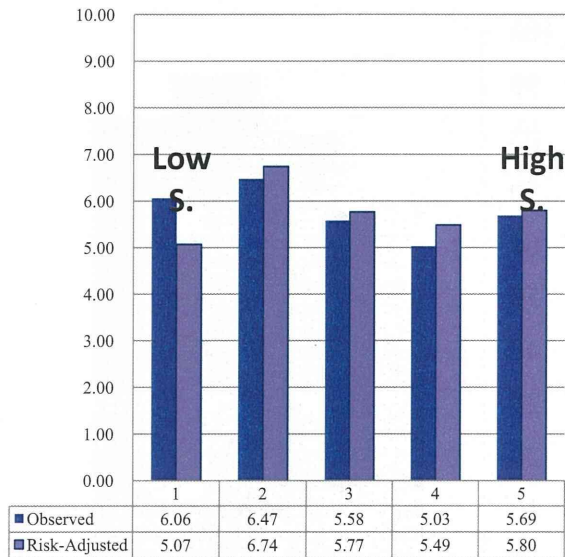
## (2) Ischemic Stroke

### Regional Variation

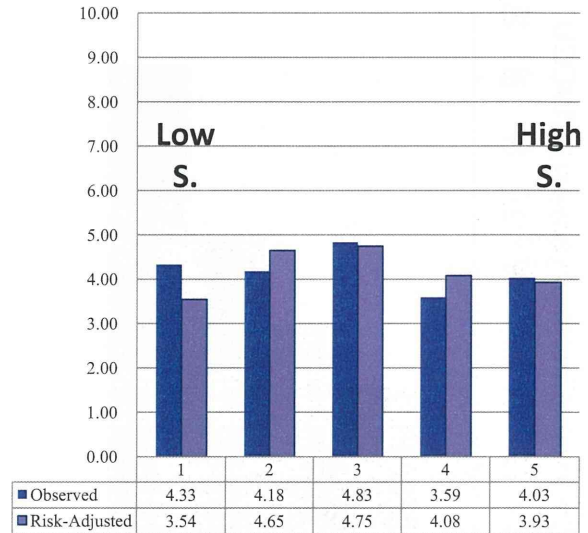
## Stroke/ Regional Variation

# Observed vs. Risk-adjusted Mortality

### In-Hospital Mortality



C-statistics = .73-.74  
30 day In-Hospital RA  
Mortality



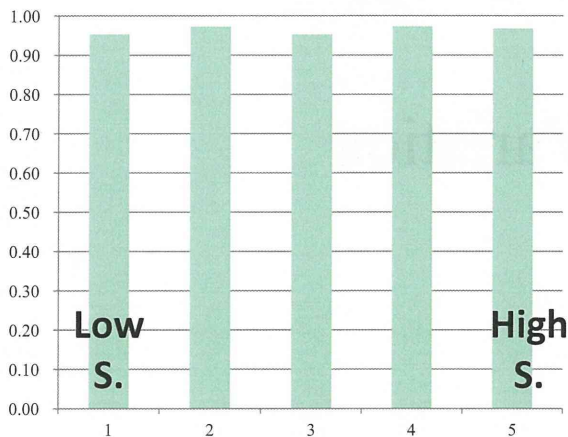
No substantial or significant difference among the Quintiles

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## Stroke/ Regional Variation

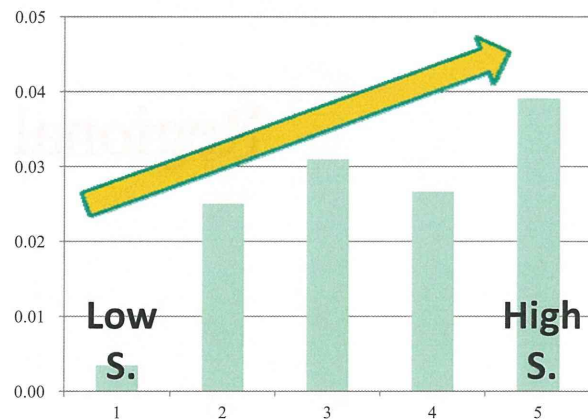
# Variations in Process Indicators by Spending Quintiles

### CT or MRI Scans



Spending  
Quintiles

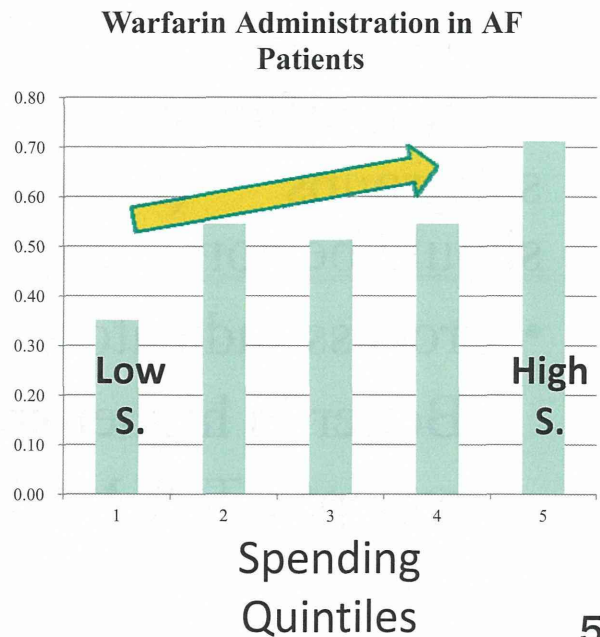
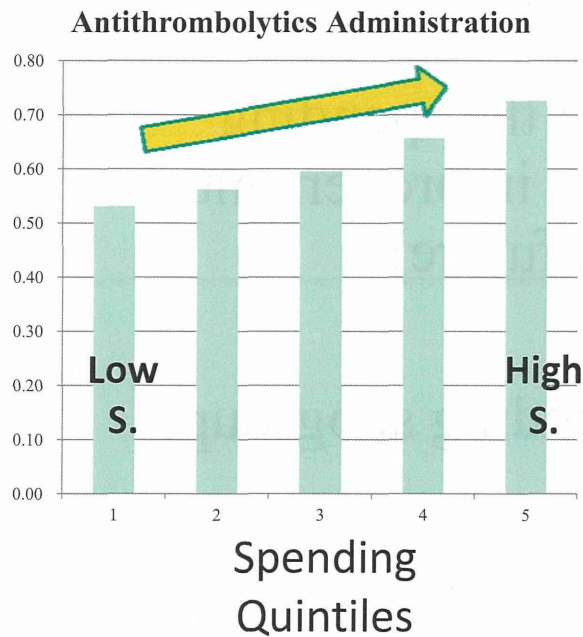
### t-PA Administration



Spending  
Quintiles

**Stroke/ Regional Variation**

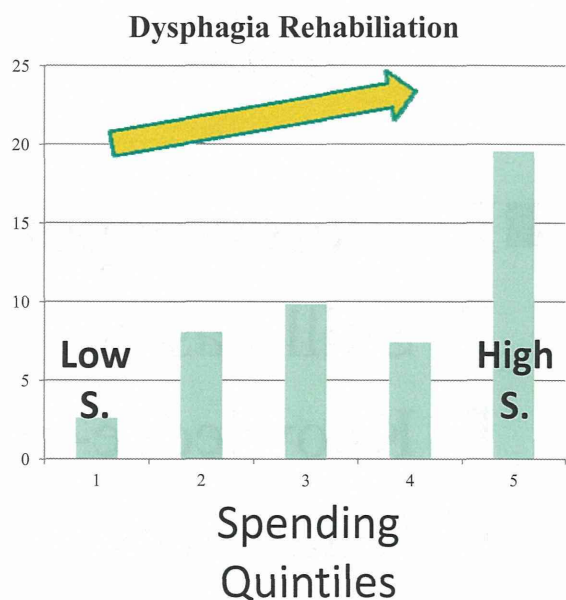
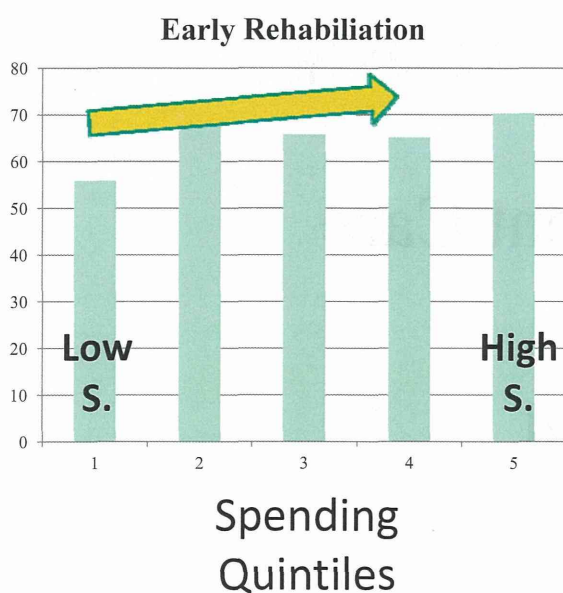
## Variations in Process Indicators by Spending Quintiles



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**Stroke/ Regional Variation**

## Variations in Process Indicators by Spending Quintiles



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## Summary (Stroke/Regions)

- Mortality - already low -  
Not different among the spending subgroups (Function improvement should be compared in future)
- Process Indicators  
Better in higher spending subgroup, except CT & MRI

### hypothetical concepts

to explain (some part of) quality variation

Resource → Quality

#### ■ Resource-dependent Care

- Skill-based
- Knowledge-based
- Material-based

## Resource-Dependent Care

- Resource-dependent care describes the type of care that is directly affected by the presence and quantity of resources available.
- These resources include expertise (e.g., cardiologists) and manpower, knowledge, medical materials such as medication and equipments, and facilities (e.g., catheterization laboratories and CCUs).
- Three components:
  - 1) Skill-based
  - 2) Knowledge-based
  - 3) Material-based

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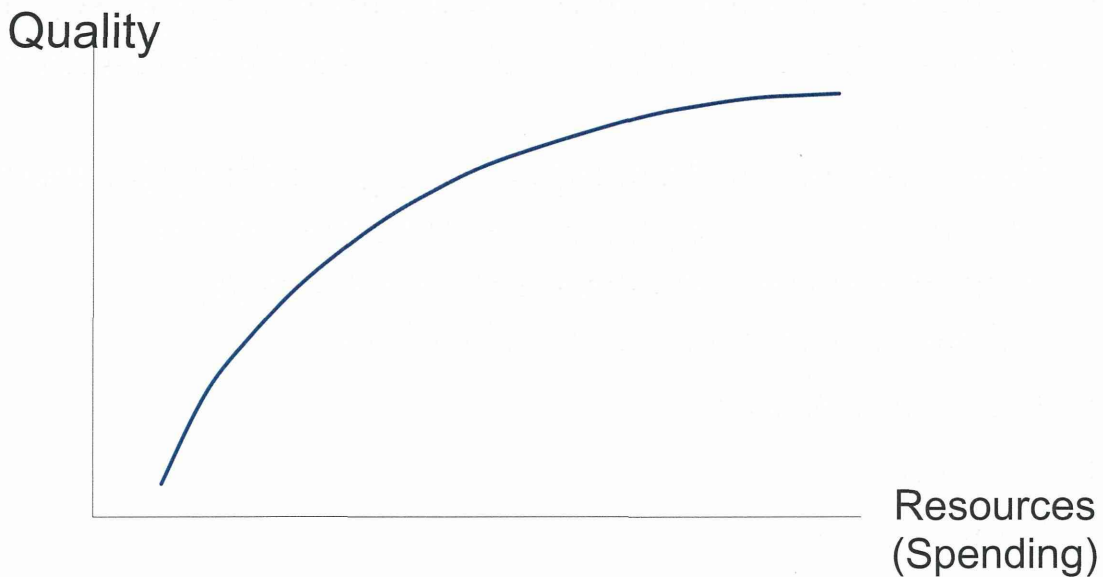
## Resource-Dependent Care (Skill-based)

- Dependent on the availability of resources such as cardiologists, PCI expert, stroke specialist, rehab therapists, etc.
- This type of care depends on **expert manpower**.
- It takes **time and energy** to acquire the skills.
- Quality of this type of care would be expected to rise with increased health care spending
- Usually, “**dose-response**” type

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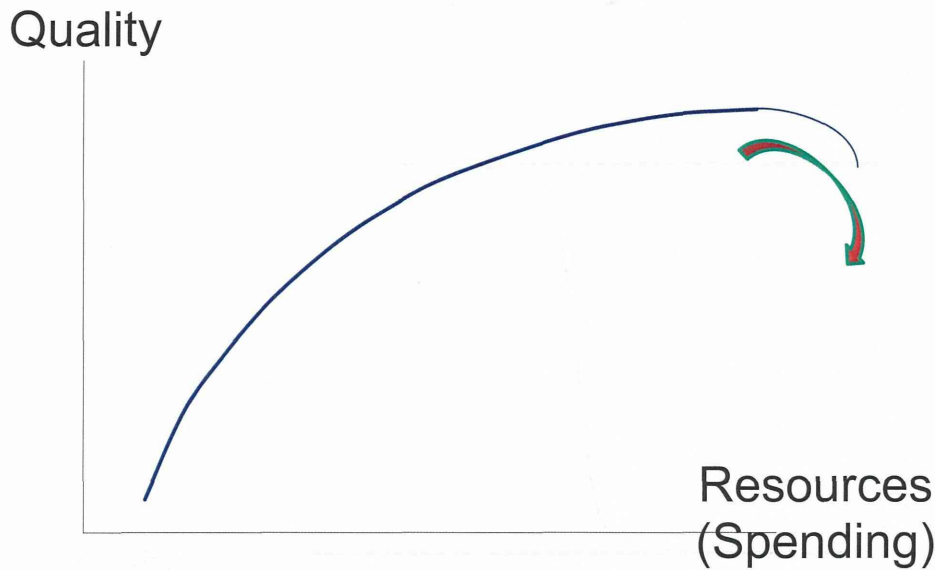
## “Dose-response” Type



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- The lack of health care resources likely accounted for the observed underuse in treatment, resulting in lower health care spending and quality of care.
- In contrast, hospitals with adequate medical resources were more likely to provide sufficient care and were thereby associated with higher spending and better quality of care.
- However, incremental improvement may be getting marginal.

# Supplier-Induced Oversupply



**The criteria of over-resources are difficult to set, unless deteriorating effects are observed.**

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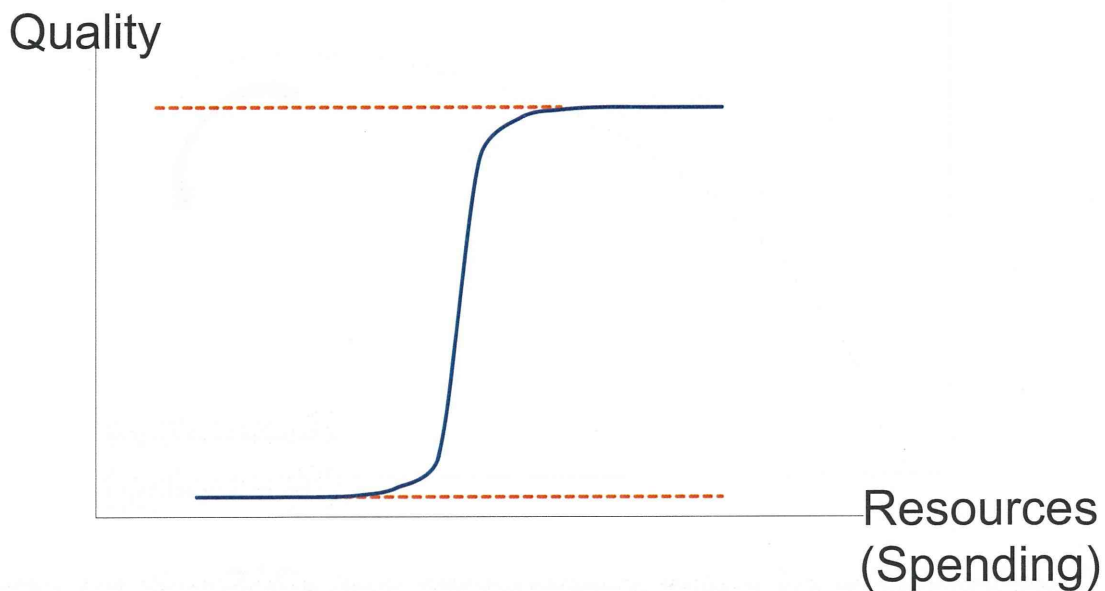
## Resource-Dependent Care (Knowledge-based)

- Quality of care dependent on the spread of knowledge for health care professionals (e.g., the use of aspirin for AMI)
- For this type of care, the introduction of effective treatment approaches can be implemented with minimal expenses (as far as the material is not expensive)
- spending Usually, “threshold” type

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## “Threshold” Type



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## Resource-Dependent Care (Material-Based)

- Dependent on the availability of resources such as CT scanners, MRIs, etc.
- Quality of this type of care would be expected to rise with increased health care spending (as far as the material is expensive)
- Usually, “threshold” type

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## Resource-Dependent Care

- A cause of **variation** of some practice is resource-dependency.
- We call such practice as “resource-dependent” care.
- This concept will explain variation well from the supply side
- rather in an **under-supply situation**
  - before supplier-inducement occurs
  - before patient preference occurs

## Resource-Dependent Care

- Components :
  - Skill-based
  - Knowledge-based
  - Material-based
- Types of relation to **Quality**:
  - “dose-response” type
  - “threshold” type

# SUMMARY

- **Accreditation** seems to have worked effectively for patient safety and quality.
- **Government** together with Professional Organizations initiated various Functions for quality & safety.
- **Professions** voluntarily facilitated and utilized these opportunities for quality/safety improvement
- **Data Infrastructure** for quality measures are being developed for forthcoming/promising effective utilization

**Thank you very much  
for your attention**



## 研究成果の刊行に関する一覧表



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