

# The Implications of an Aging Physician Population for Patient Outcomes

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# Introduction

- Background (AAMC Workforce Center, 2008)
  - Workforce demographics are one driver of physician supply
  - As the physician population ages retirements will increase
  - Delaying retirement may partially mitigate the expected physician shortfall
- What are the implications of delayed retirement for the efficiency/quality of care?

# Introduction

- There is evidence that performance declines with time since graduation from medical school
  - Systematic review of the literature by Choudhry, Fletcher, Soumerai (Ann Int Med, 2005)
    - MEDLINE search of all papers from 1966 to 2004 plus references in the identified papers
    - Found 62 studies that were related to the topic

# Introduction

- 12 studies of knowledge
  - All reported a decline in knowledge
- 24 studies of adherence to standards for diagnosis, screening, prevention
  - 15 show physicians in practice longer adhere less to standards
- 19 studies of adherence to standards of appropriate therapy
  - 14 found a partially or consistently negative association
- 7 studies of patient outcomes
  - 4 found a partially or consistently negative association

# Introduction

- Weakest evidence for performance decline is in the area of patient outcomes
- Purpose of this study
  - Develop additional data speaking to the outcomes of clinical care for physicians of different ages
    - Two conditions: Congestive heart failure (CHF) and acute myocardial infarction (AMI)
    - Two outcomes: Length of stay and in-hospital mortality

# Methods

- Retrospective observational study based on two datasets
  - Pennsylvania Health Care Cost Containment Council (PHC4)
    - All CHF and AMI (without transfer) hospitalizations (N=244,151) from 1/1/2003 to 12/31/2006 in Pennsylvania
    - Treated in 184 institutions
    - Probability of death for each patient
      - MediQual™ Atlas Admission Severity
    - In-hospital mortality and length of stay (LOS)

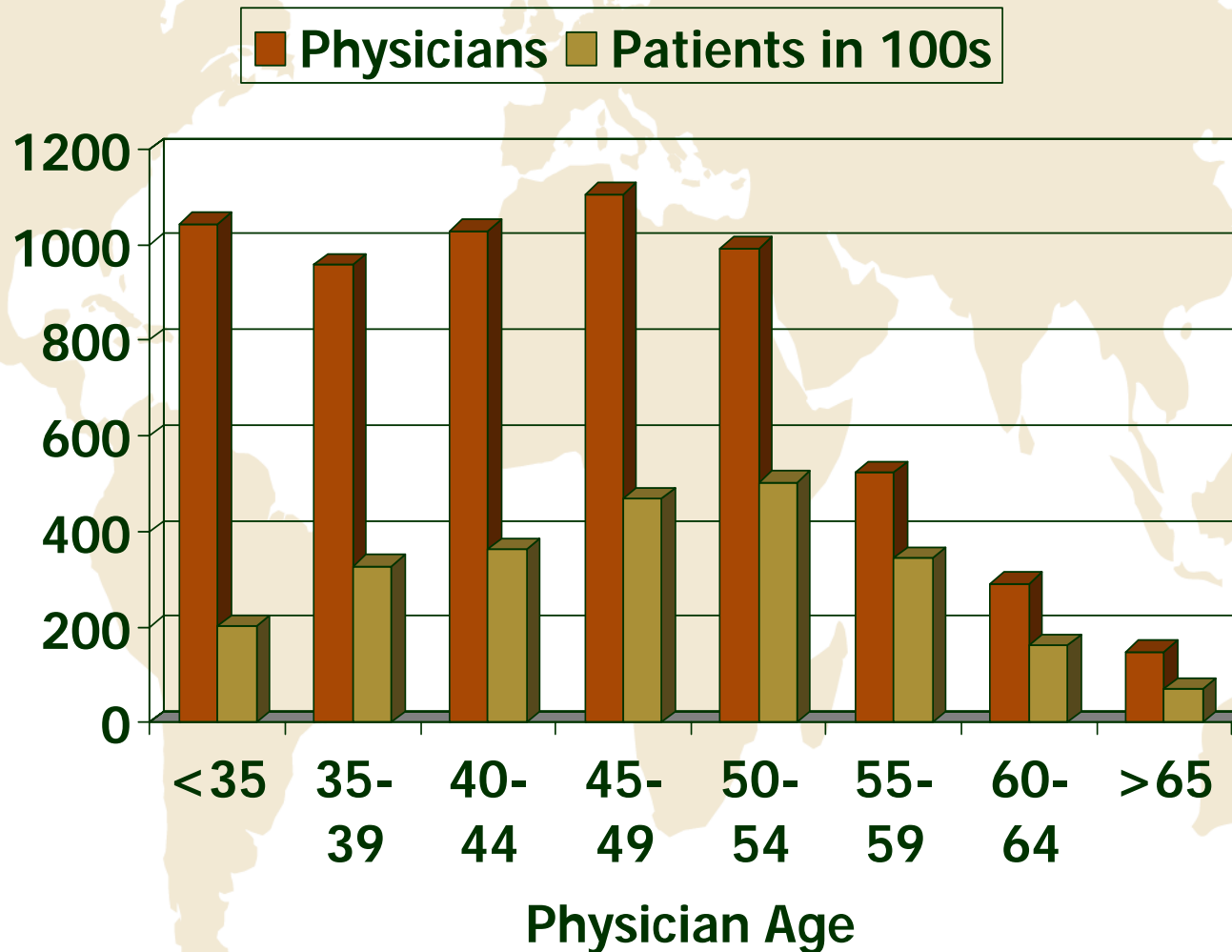
# Methods

- PHC4 data were matched to the AMA Masterfile
  - Analyses limited to internists, family physicians, and cardiologists who graduated 1958+
  - For 6113 physicians, year of birth, level of specialization, Board certification were available
- Calculated age, institutional volume, and physician volume for CHF and AMI

# Methods

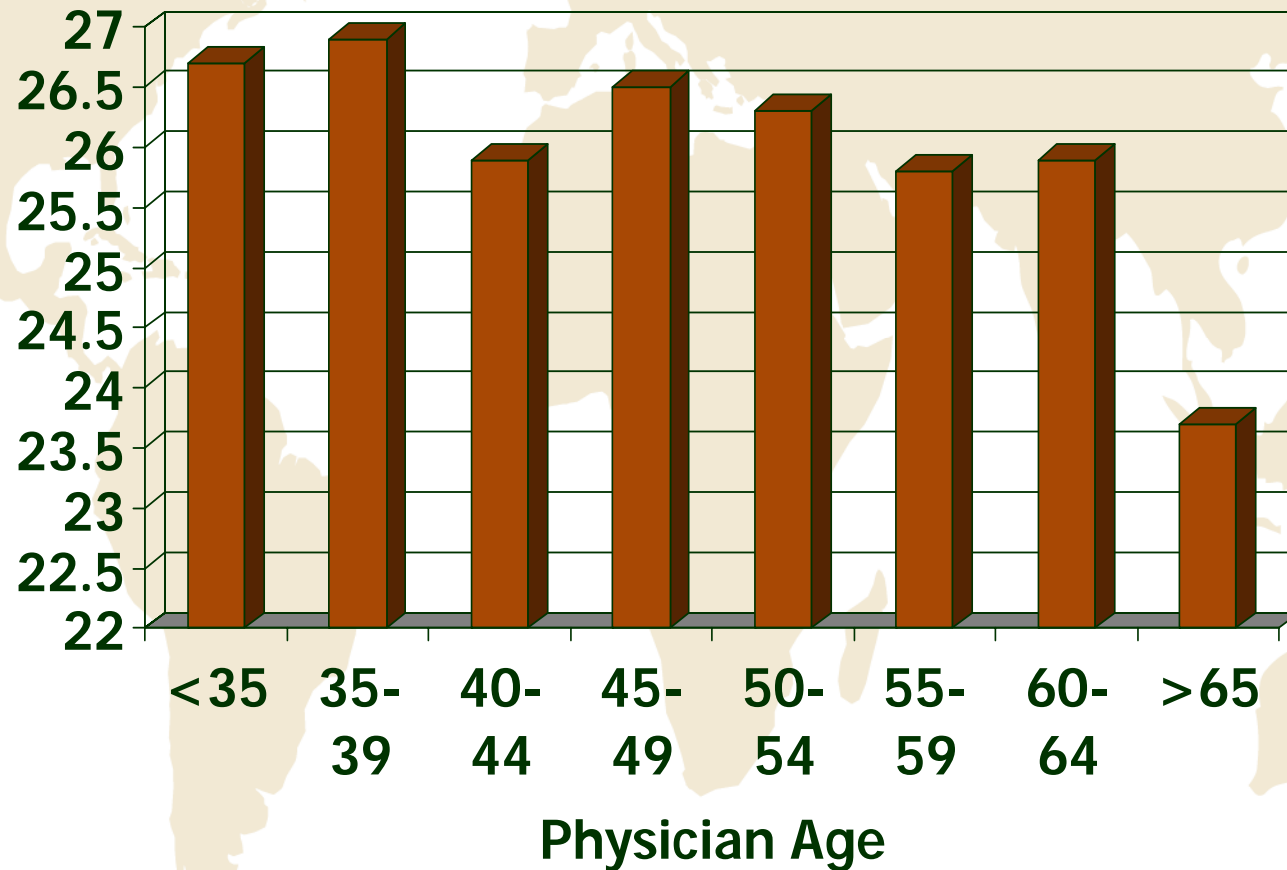
- Analyses
  - Descriptive
    - Age by number of physicians and patients, mortality, length of stay (LOS), severity of illness
  - Multivariate analysis to adjust for clustering (patients within physicians and physicians within hospital) plus severity of illness, institutional volume...
    - For mortality, log-link GEE
    - For LOS, identity-link GEE
      - Natural log transformation and deaths excluded

# Number of Physicians and Patients in PA by Age Group

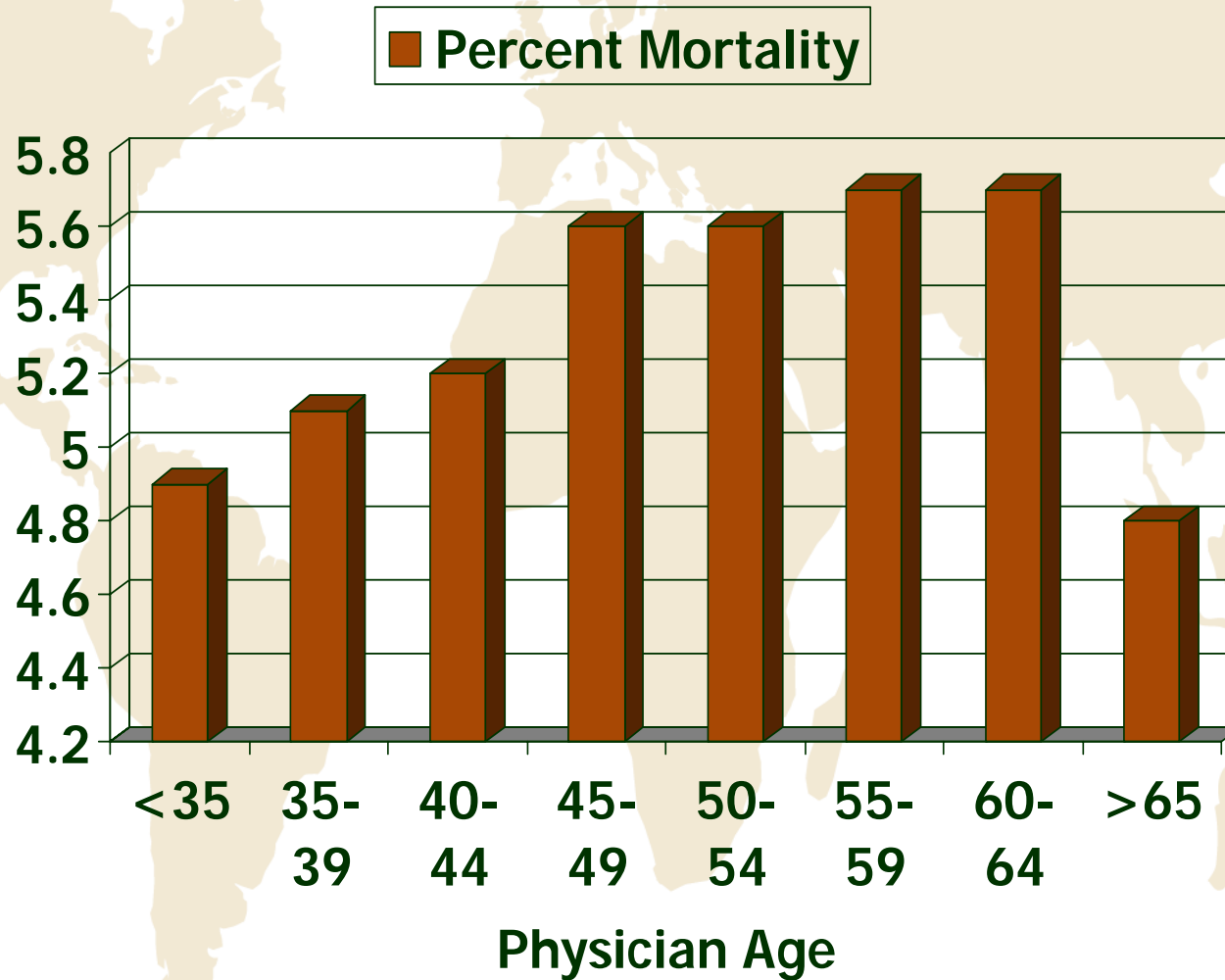


# Severity of Illness by Physician Age

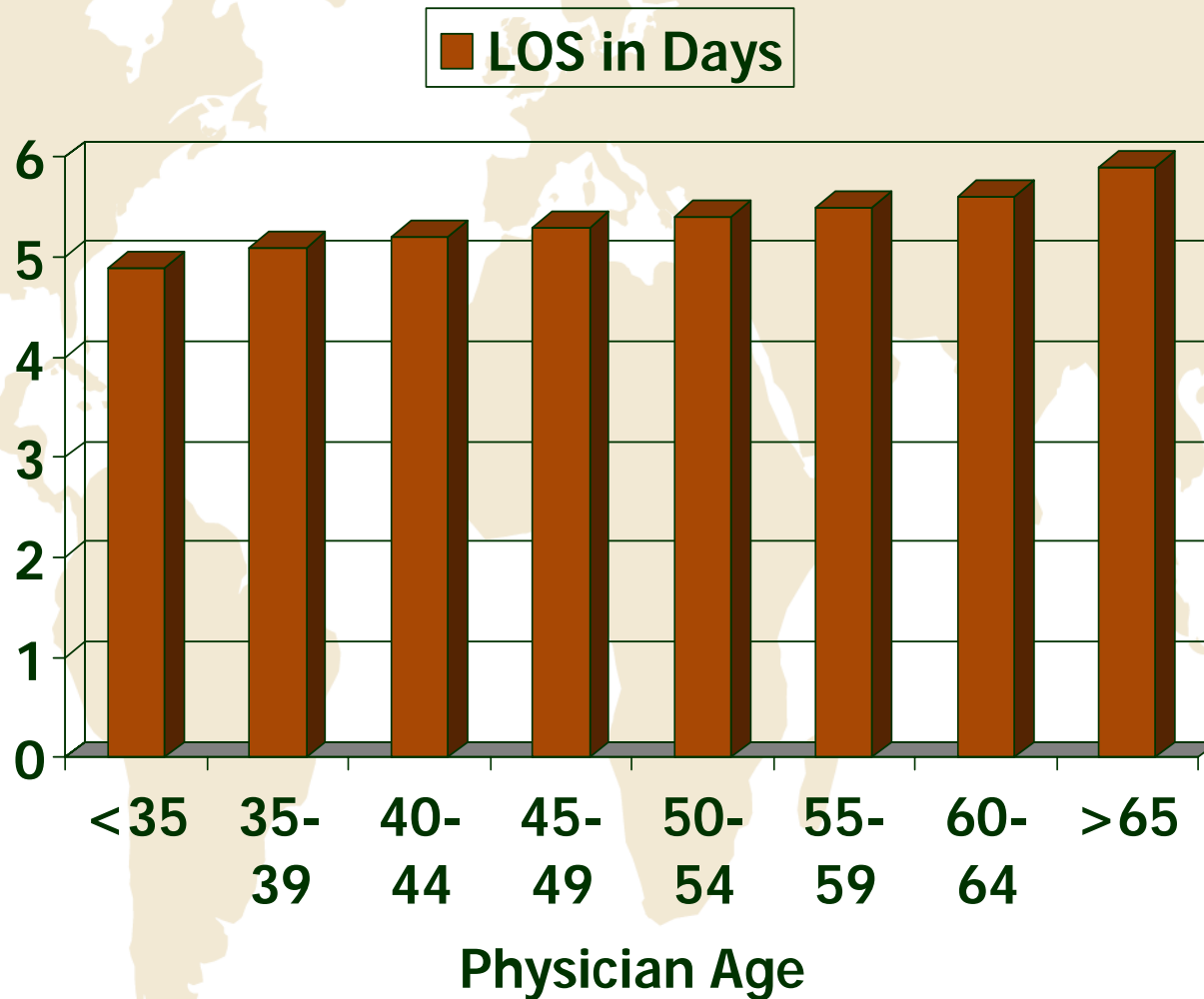
■ Percentage of Patients with Probability of Death  $> .058$



# Mortality by Physician Age



# Length of Stay by Physician Age



# Results of GEE for Mortality

- Covariates
  - Condition (CHF/AMI)\*\*
  - Severity of illness
    - Minimal, moderate\*\*, severe\*\*, maximal\*\*
  - Institutional volume\*\*
  - Physician volume\*\*
  - Cardiologist
  - Board certified\*\*
- Physician age\*\*
- After adjustment for all other variables, each additional year of physician age was associated with a .56% increase in relative risk for patient mortality

Statistically significant\*\*

# Results of GEE for Length of Stay

- Covariates
  - Condition (CHF/AMI)\*\*
  - Severity of illness
    - Minimal, moderate\*\*, severe\*\*, maximal\*\*
  - Institutional volume\*\*
  - Physician volume\*\*
  - Cardiologist
  - Board certified
- Physician age\*\*
- After adjustment for all other variables, each additional year of physician age was associated an increase of .026 days of hospital stay

Statistically significant\*\*

# Summary

## ■ Purpose

- To examine the relationship between physician age and clinical outcomes

## ■ Results

- Increasing physician age is associated with increased patient mortality and length of stay
- Relationships persist even after taking account of severity of illness, level of specialization, Board certification, institutional and physician volume

# Summary



## ■ Limitations

- There are potential confounders that might not have been included in the study
- Only two conditions were studied and they were in an inpatient setting
  - What about outpatient care?
- Study compared physicians with each other, not the untreated course

# Conclusions

- Delaying retirement as a means to increase the workforce has implications for the quality and efficiency of care
- Future work
  - What is the best way to deploy the workforce as it approaches retirement?
  - Will maintenance of competence programs influence these results?
    - If so, should they be mandatory?