

# Unlocking the Data Chest: Using HMSA Data to Address Public Health Issues

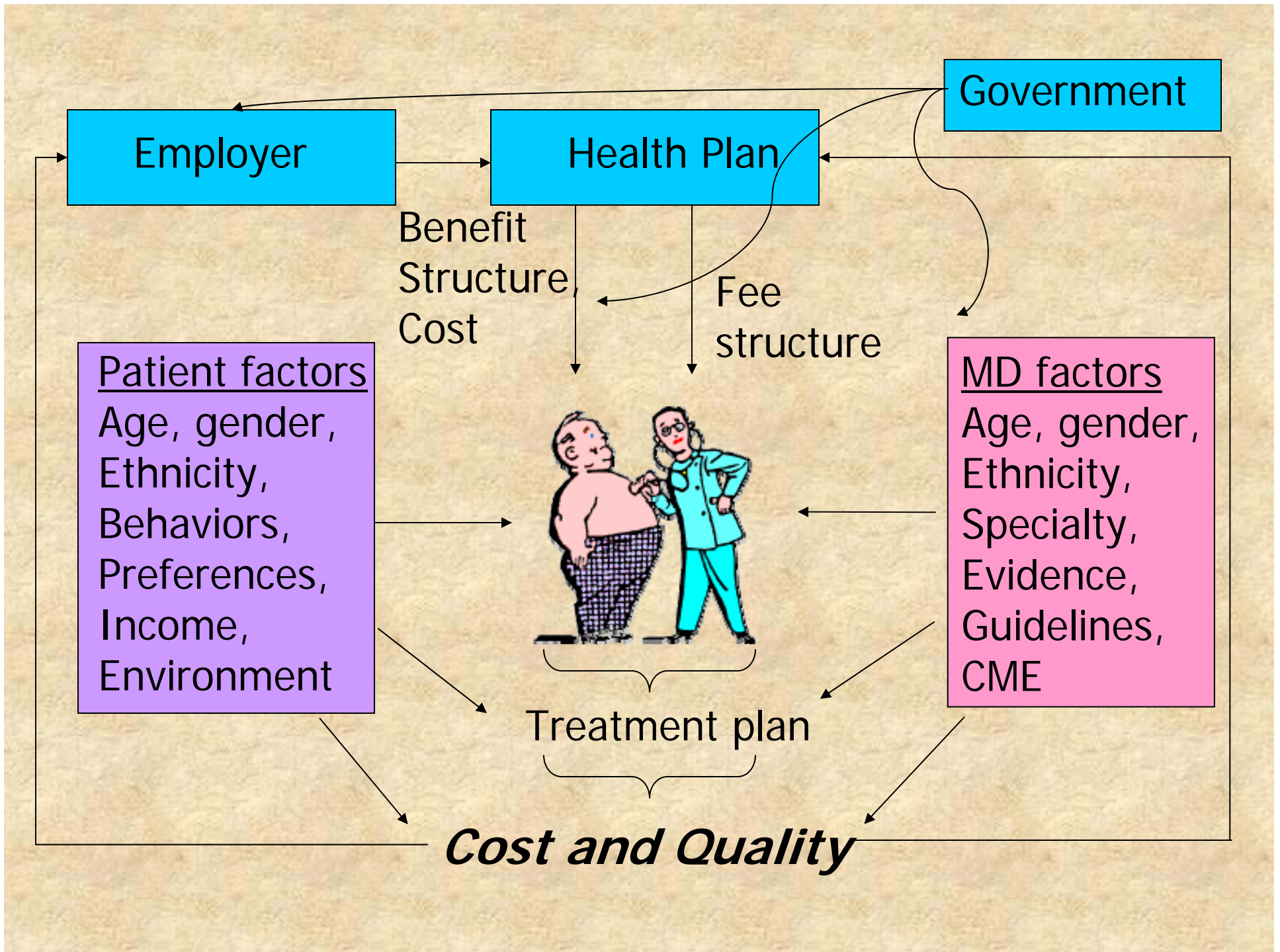
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Public Health Faculty Colloquium Series

Sept 18, 2008

# Objectives

- To describe type of data found at HMSA and how it is used for health services research
- To review findings from 3 studies



# Why Research at HMSA?

- Improves quality of care
- Reduces inefficiencies through detection of overuse, underuse, and misuse
- Increases rigor in planning/documentation
- Supports key decisions
- Encourages evidence-based approaches

# Patient Information

- Age
- Gender
- Geographic location
- Chronic condition flags
  - Diabetes
  - Coronary Artery Disease
  - Congestive Heart Failure
  - Chronic Kidney Disease
  - Chronic Obstructive Pulmonary Disorder
  - Asthma
- Diagnoses
- Employer
- Type of coverage (HMO, PPO etc)
- Morbidity level
- PCP or physician seen most often
- Enrollment dates

# Physician information

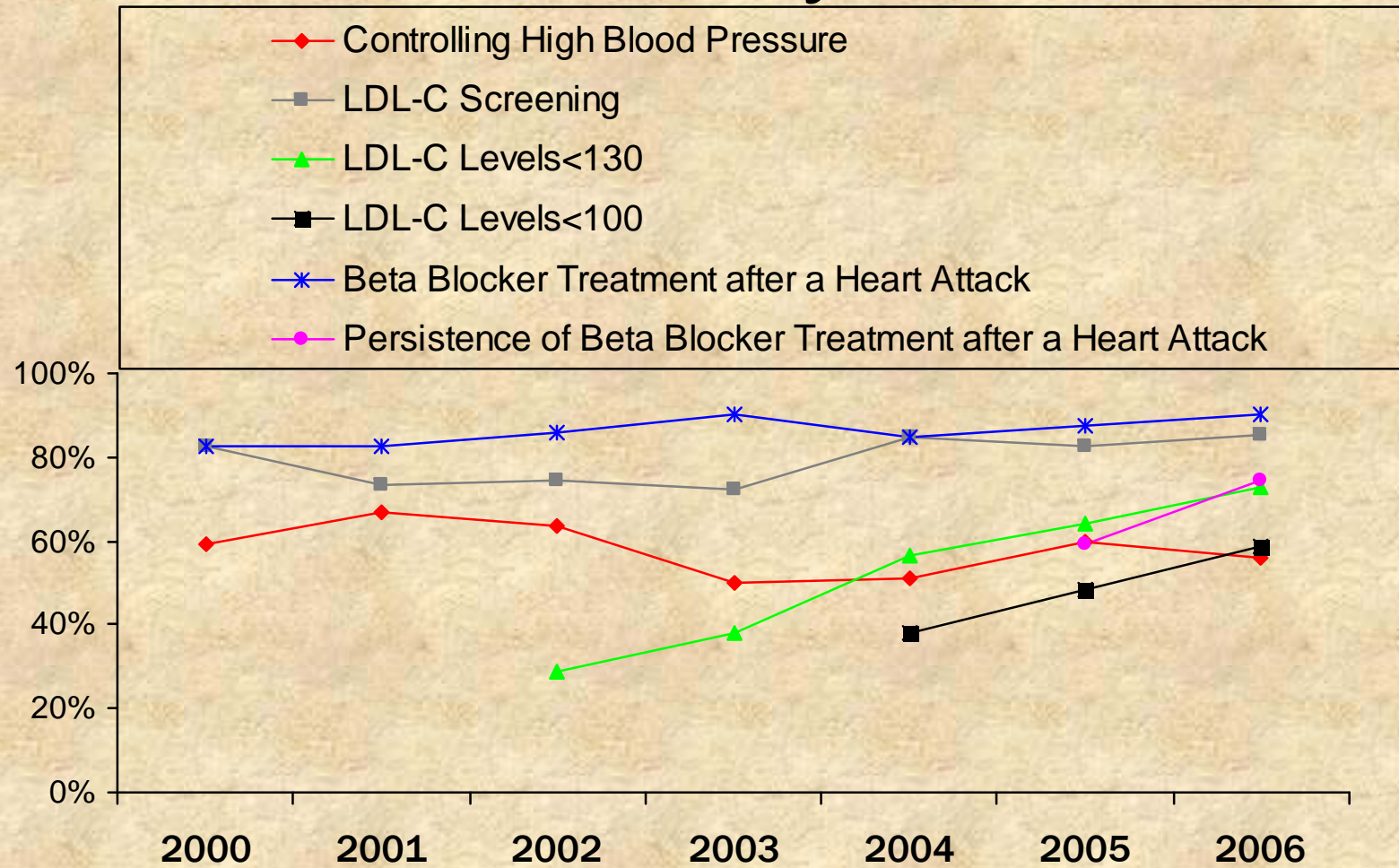


- Specialty
- Date of birth
- Gender
- Ethnicity (for some)

# Process/Outcome Measures

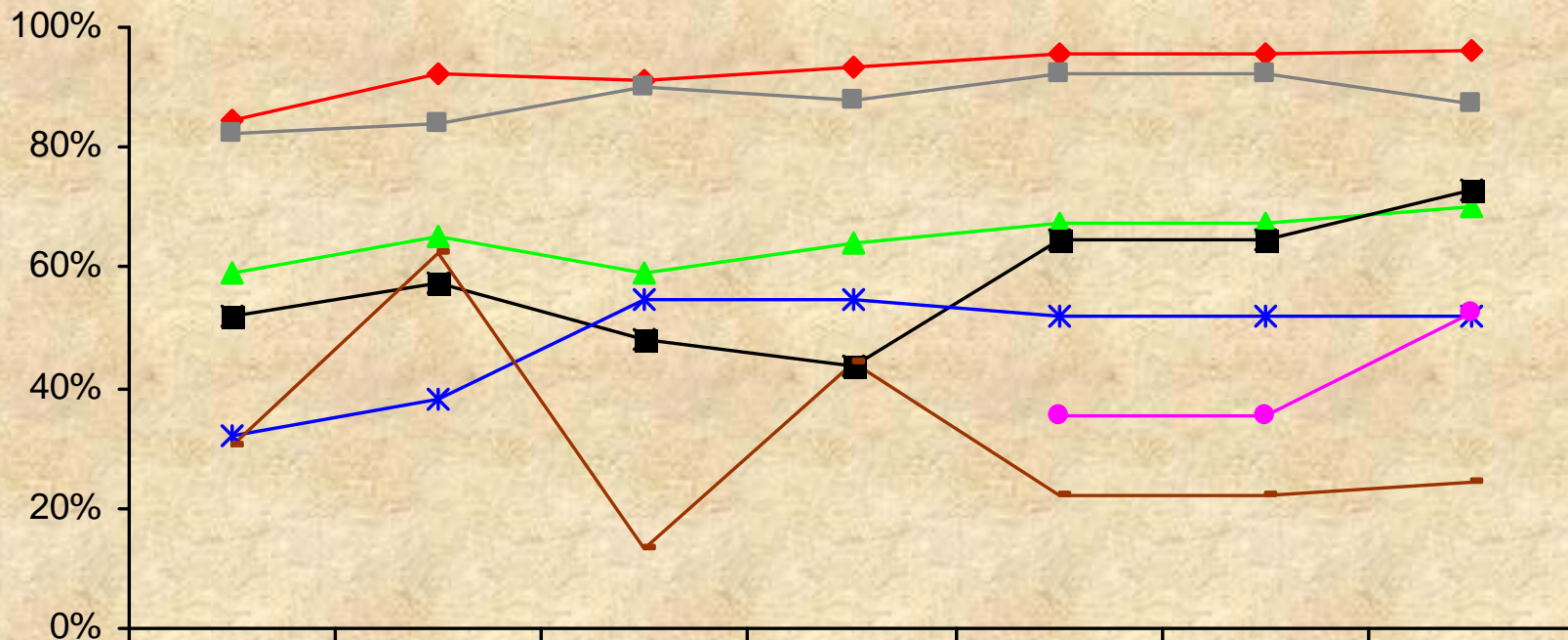
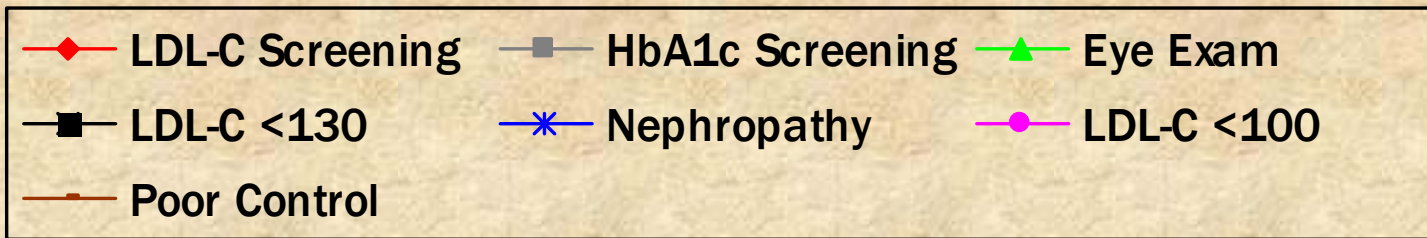
- Lab values (LDL cholesterol; A1C, etc)
- Adverse events
  - AMI, unstable angina, death
- Pharmaceutical data
  - Compliance with medication
- Patient satisfaction
- Utilization
  - Hospitalizations, ED visits, Procedures
  - Preventive screenings

# CAD Quality of Care



Note: Elderly Members Enrolled in 65C Plus

# Diabetes Quality of Care



Note: Elderly Members Enrolled in 65C Plus

# Data gaps

- Not know smoking status, BMI, health habits, blood pressure level
- Over-the-counter drug use (aspirin)
- Free samples of medication
- Physician notes

**Cost Savings from Flu  
Vaccination of High Risk  
Members**

# Objective

- The goal of influenza immunization programs targeted at high-risk people is to avert serious consequences of infection, such as complications and death
- The objective of this study is to compare the flu-related costs of high risk members who received a flu vaccination to those who did not

# Methodology

- The eligible population included members continuously enrolled during the period July 1, 2006 through June 30, 2007 for Commercial lines of business (HMO, PPO and 65C Plus)
- High risk members included in this study were (n=96,503):
  - ***People 50 years of age and older,***
  - ***People of any age with certain chronic health conditions (such as asthma, diabetes, or heart disease)***

CDC's Advisory Committee on Immunization Practices (ACIP)

# Methodology (continued)

- Vaccinated members were identified as those who received a rendered service for influenza vaccination (90655, 90656, 90657, 90658, 90660 or G0008)
- Paid cost from October 1, 2006 through May 31, 2007 for flu or flu-related conditions.
- Flu and flu-related conditions were identified by ICD-9 diagnosis codes and include otitis media and sinusitis, acute respiratory diseases, pneumonia and influenza, all respiratory diseases, upper/lower respiratory tract infections and chronic lower respiratory diseases.
- Drugs for flu or flu-related conditions include antibiotics, analgesics and antivirals

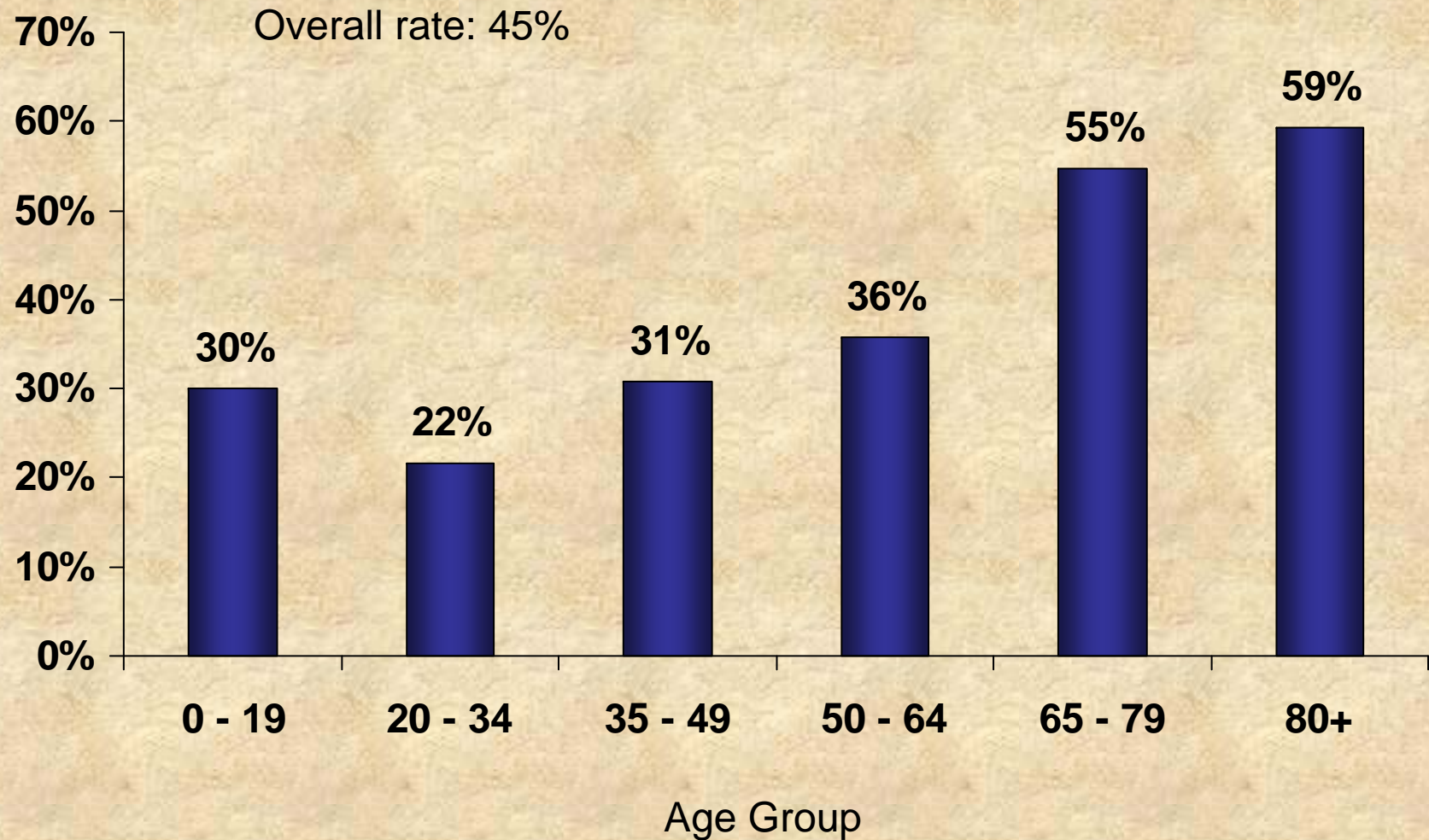
<b>Classification Category</b>	<b>Detailed Description (when applicable)</b>	<b>ICD-9 Codes</b>
Otitis media and sinusitis		381-383, 461
Acute Respiratory Diseases		460-466
Pneumonia & Influenza		480 – 487
All Respiratory Diseases		460 – 519
Upper Respiratory Tract Infections	Viral Infections not otherwise specified Acute pharyngitis, tonsillitis Acute URI of multiple or unspecified location Acute Influenza with other respiratory manifestations	79 462-463 465 487.1
Lower Respiratory Tract Infections	Acute Laryngitis, tracheitis Acute bronchitis, bronchiolitis Chronic lower respiratory diseases Empyema, Pleurisy, Pneumothorax, Abscess of lung and mediastinum Post inflammatory pulmonary fibrosis, Other alveolar and parietoalveolar pneumonopathy Other diseases of lung	464 466 490-496 510-513 515-516 518
Chronic Lower Respiratory Diseases		490-496

# Adjusted Care Group (ACG) Morbidity Level

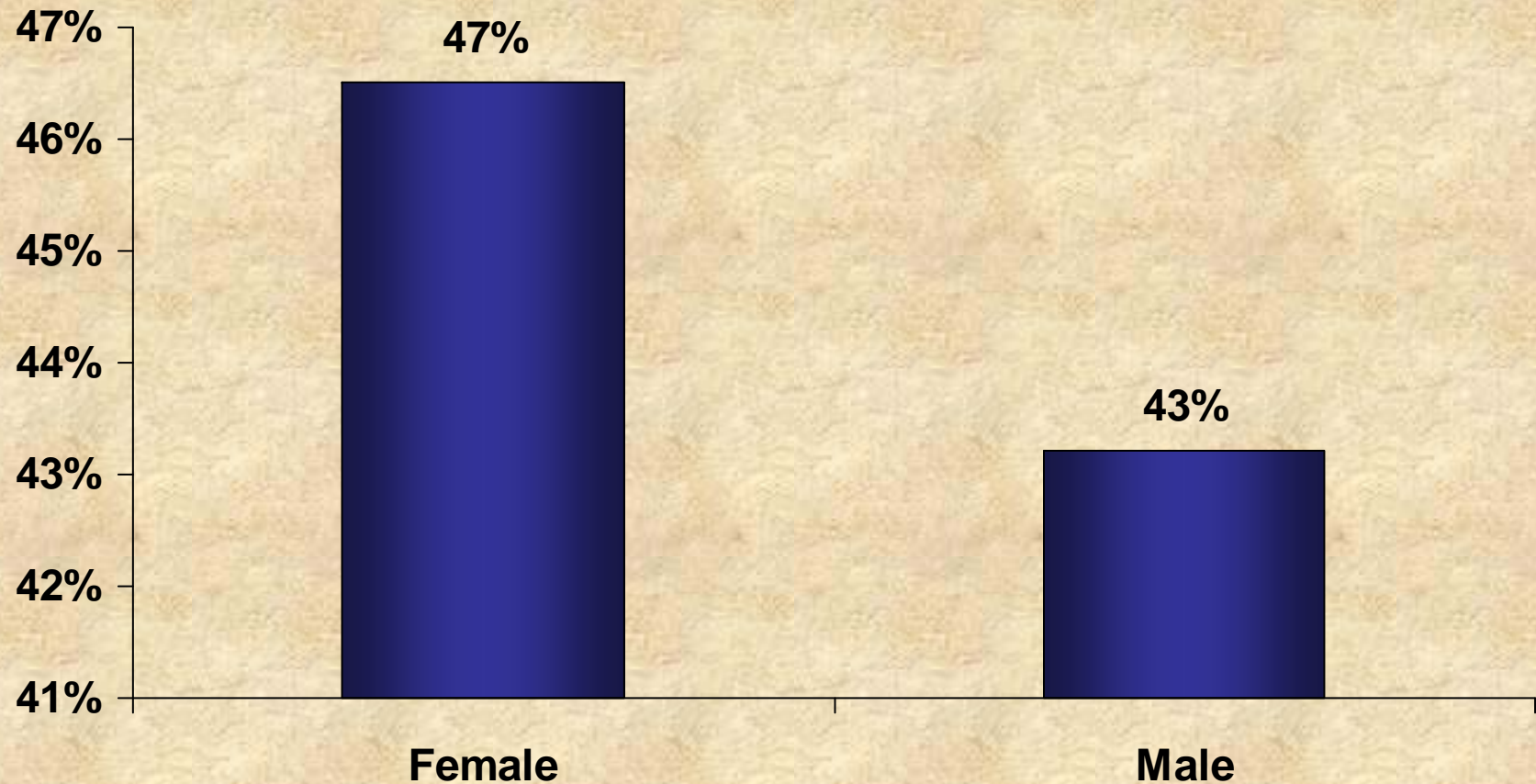
- Johns Hopkins University Adjusted Care Group assigns a morbidity level based on a member's mix of diagnoses over a year
- Levels range from 0 to 5, with 5 considered the highest morbidity level

(see [www.acg.jhsph.edu](http://www.acg.jhsph.edu))

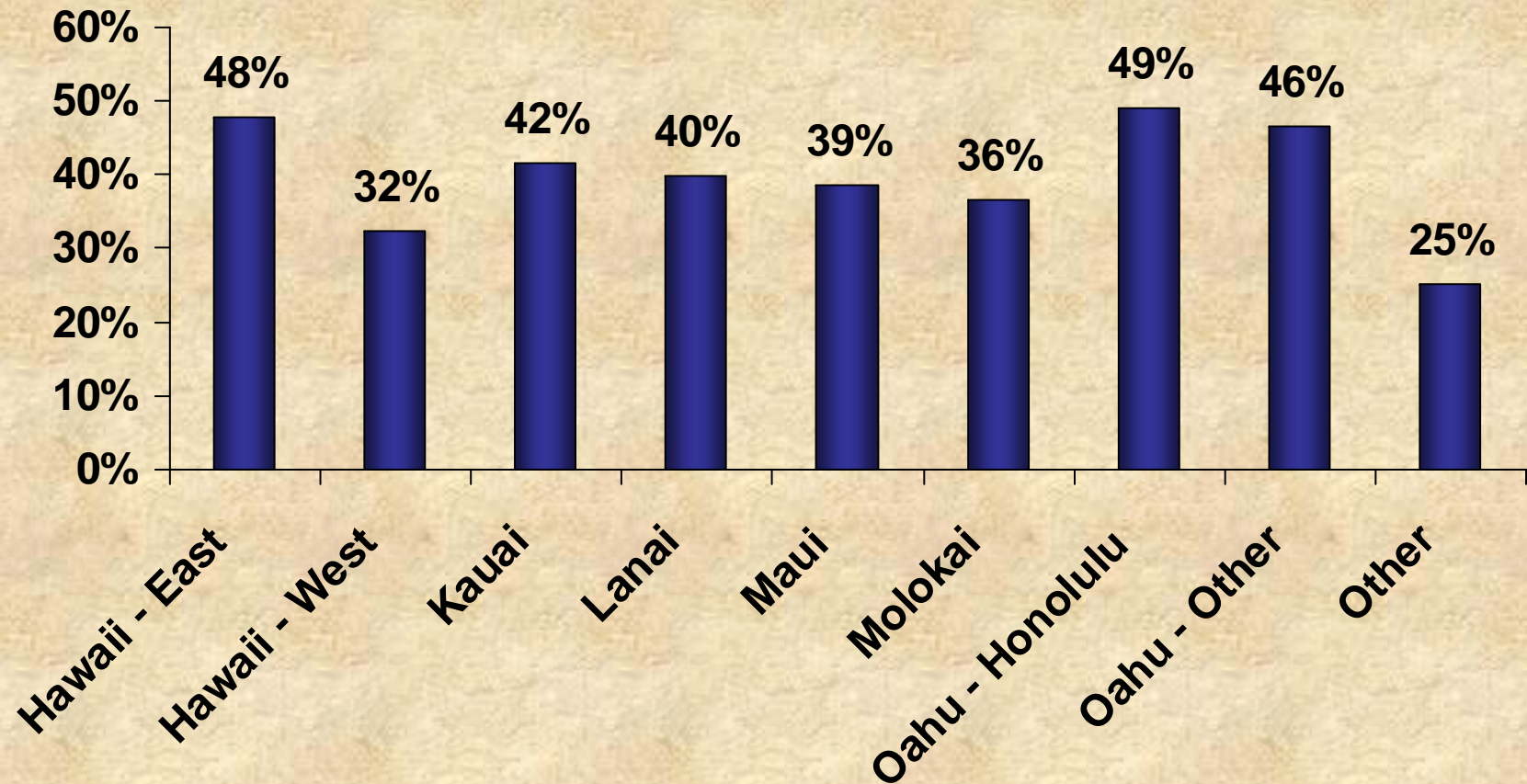
# Percent of High Risk Members Vaccinated Related to Age



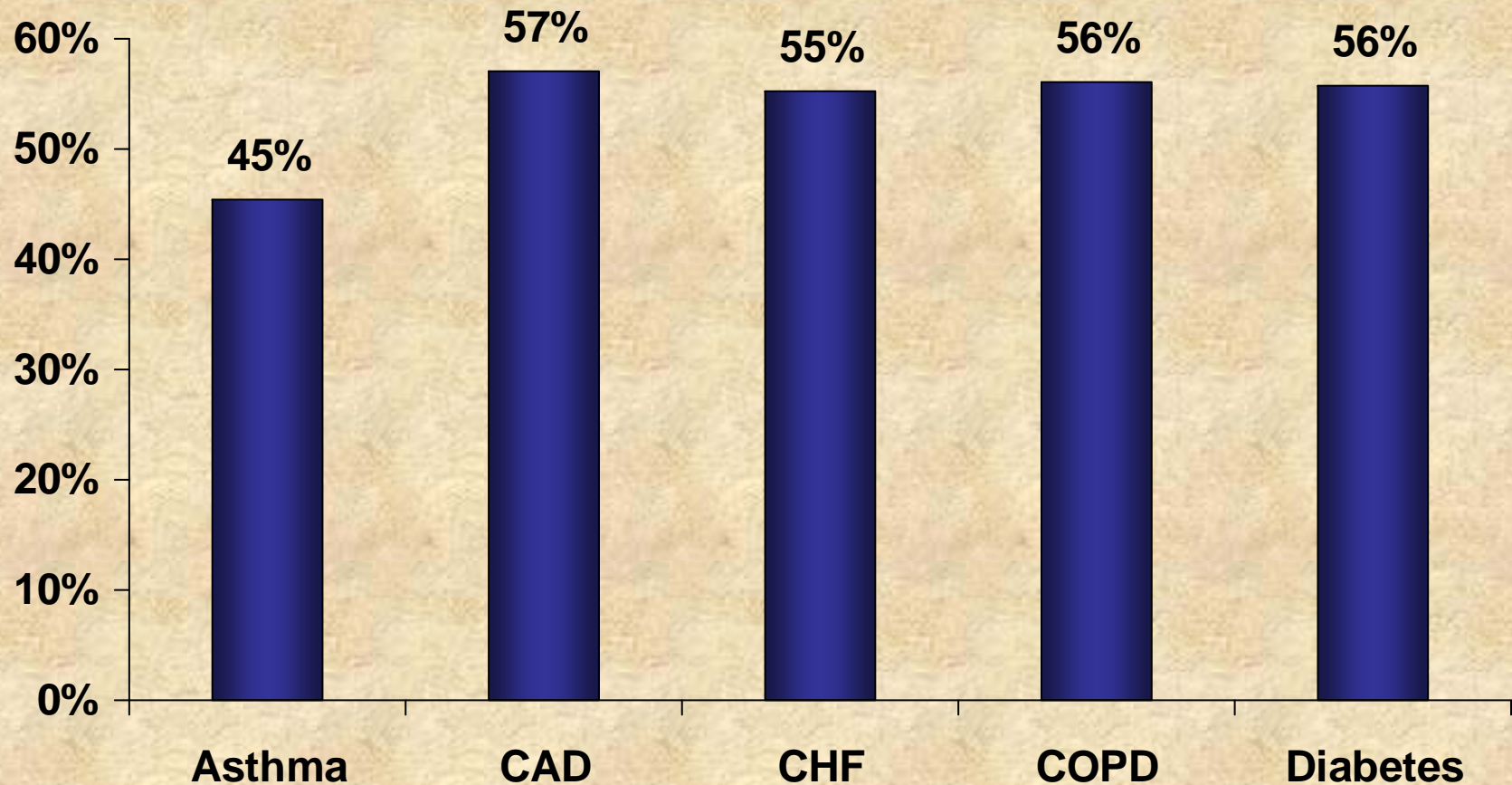
# Vaccination Rates Related to Gender



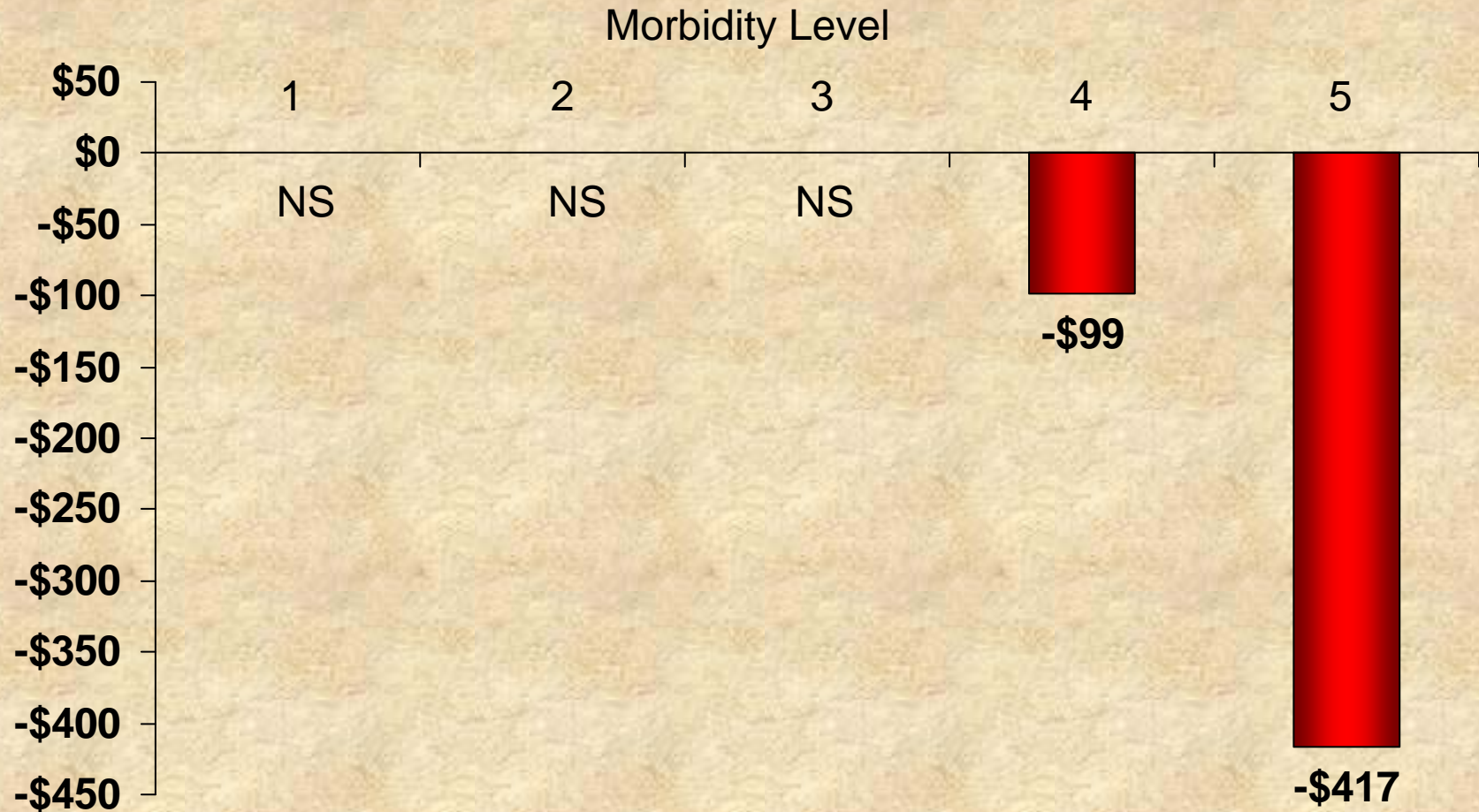
# Vaccination Rates Related to Region



# Vaccination Rates Related to Chronic Condition



# Cost Savings from Flu Vaccination Related to Morbidity Level



Paid cost from October 1, 2006 through May 31, 2007 for flu or flu-related conditions

# Overall Cost Savings From Flu Vaccination

## **Total Cost Savings =**

Count of vaccinated w/ morb4

x Avg Cost Savings of vaccinated w/ morb4)

+

(Count of vaccinated w/ morb5

x Avg Cost Savings of vaccinated w/ morb5)

=(8,158 members x \$99.39) + (10,917 members x \$417.70)

= \$5,370,855

## **Net Savings=**

Total Cost Savings – (Individual vaccination cost

x Total # Vaccinated)

= \$5,370,855 – (\$31.00 x 43,464 members)

= **\$4,023,471**

# Additional Opportunity

Additional Savings =

(Count of unvaccinated w/ morb4 x Avg Cost Savings of vaccinated w/ morb4)

+

(Count of unvaccinated w/ morb5 x Avg Cost Savings of vaccinated w/ morb5)

= (6,934 members x \$99.39) + (7,692 members x \$417.70)

= \$3,902,119

Getting to Goal For LDL  
Cholesterol Among Diabetic  
Patients

# Objective

- Despite the guidelines for LDL cholesterol, many diabetic patients do not achieve target levels.
- The goal of this study was to identify the characteristics of members with diabetes who have not gotten to goal in terms of LDL level ( $<100\text{mg/dl}$ ) in order to facilitate the development of targeted interventions.

# Methodology

- This cross-sectional retrospective analysis combined claims and enrollment data with laboratory results.
- The study population consisted of members over age 18, who were enrolled in the HMO, PPO, or Medicare cost contract of a large health plan in Hawaii.
- To be included, they had to be identified as having diabetes and had to have received at least one LDL screening in 2006 (n=34,975).
- If a patient had more than one LDL screening in 2006, we took the average of the tests.

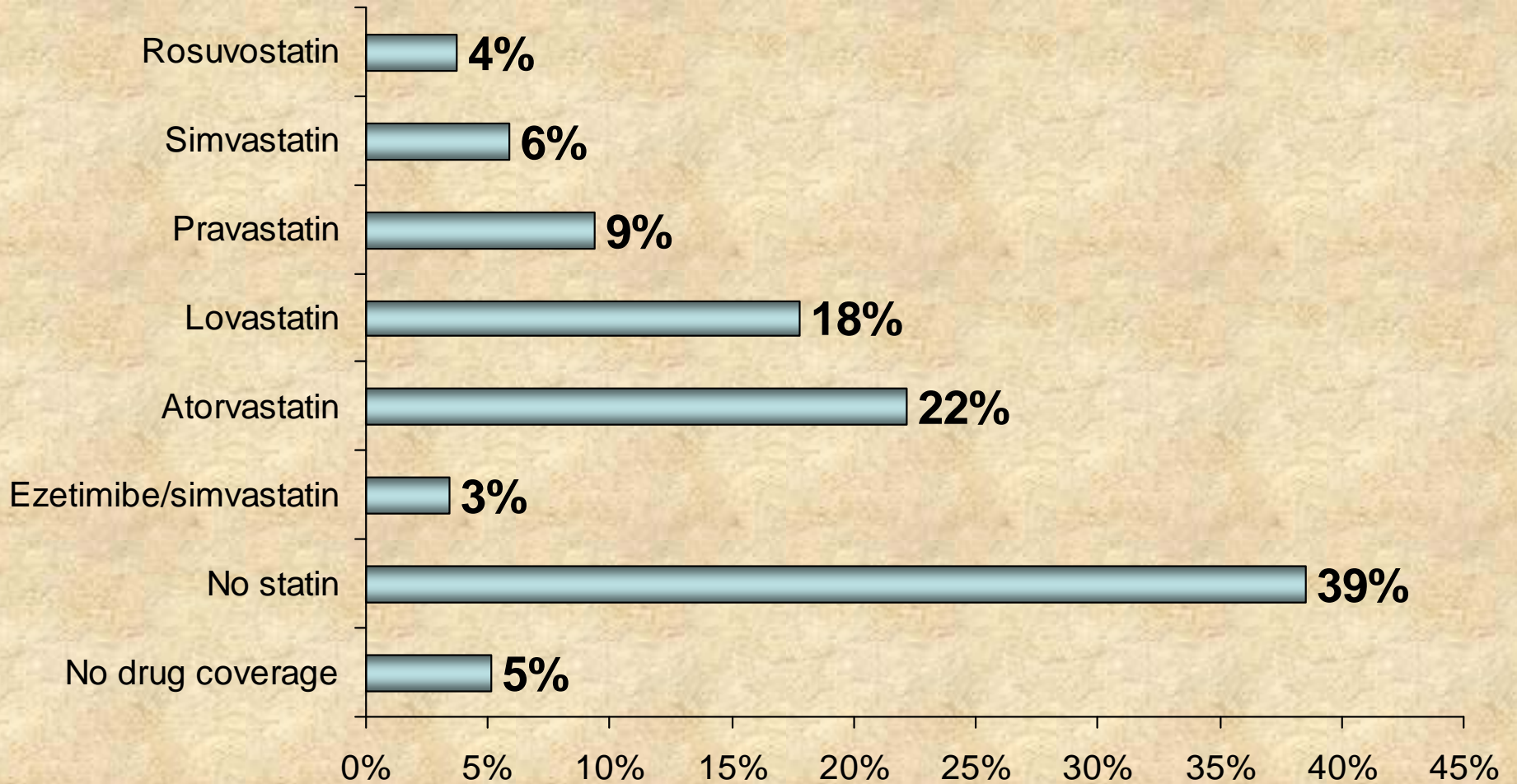
# Methodology (continued)

- We estimated a multivariable logistic regression, with being at goal for LDL in 2006 as the dependent variable.
- Independent variables included:
  - Patient age
  - Gender
  - Region of Hawaii
  - Coronary artery disease (CAD)
  - Congestive heart failure (CHF)
  - Asthma
  - Coronary Artery Bypass Graft (CABG)
  - Percutaneous coronary intervention (PCI)
  - Stroke
  - Acute myocardial infarction(AMI)
  - Depression

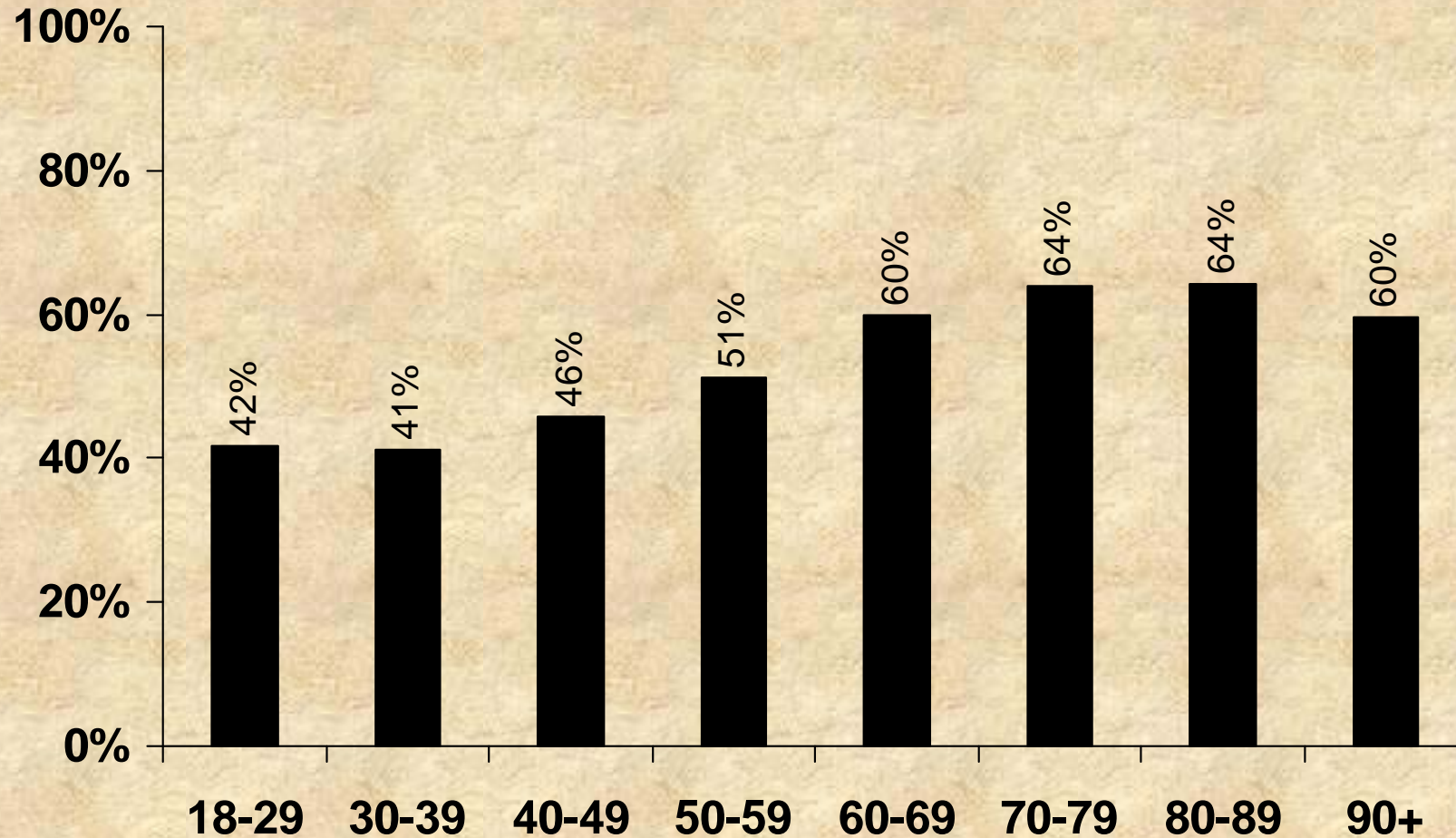
# Study Population

- Mean age = 63.8 years
- 49% female
- 33% Honolulu; 36% other Oahu; 10% Hawaii – West; 8% Maui
- 23% CAD; 11% CHF; 11% asthma; 3% depression
- Overall, 56.9% with at least one screening in 2006 had LDL levels <100mg/dl.

# Drug Use

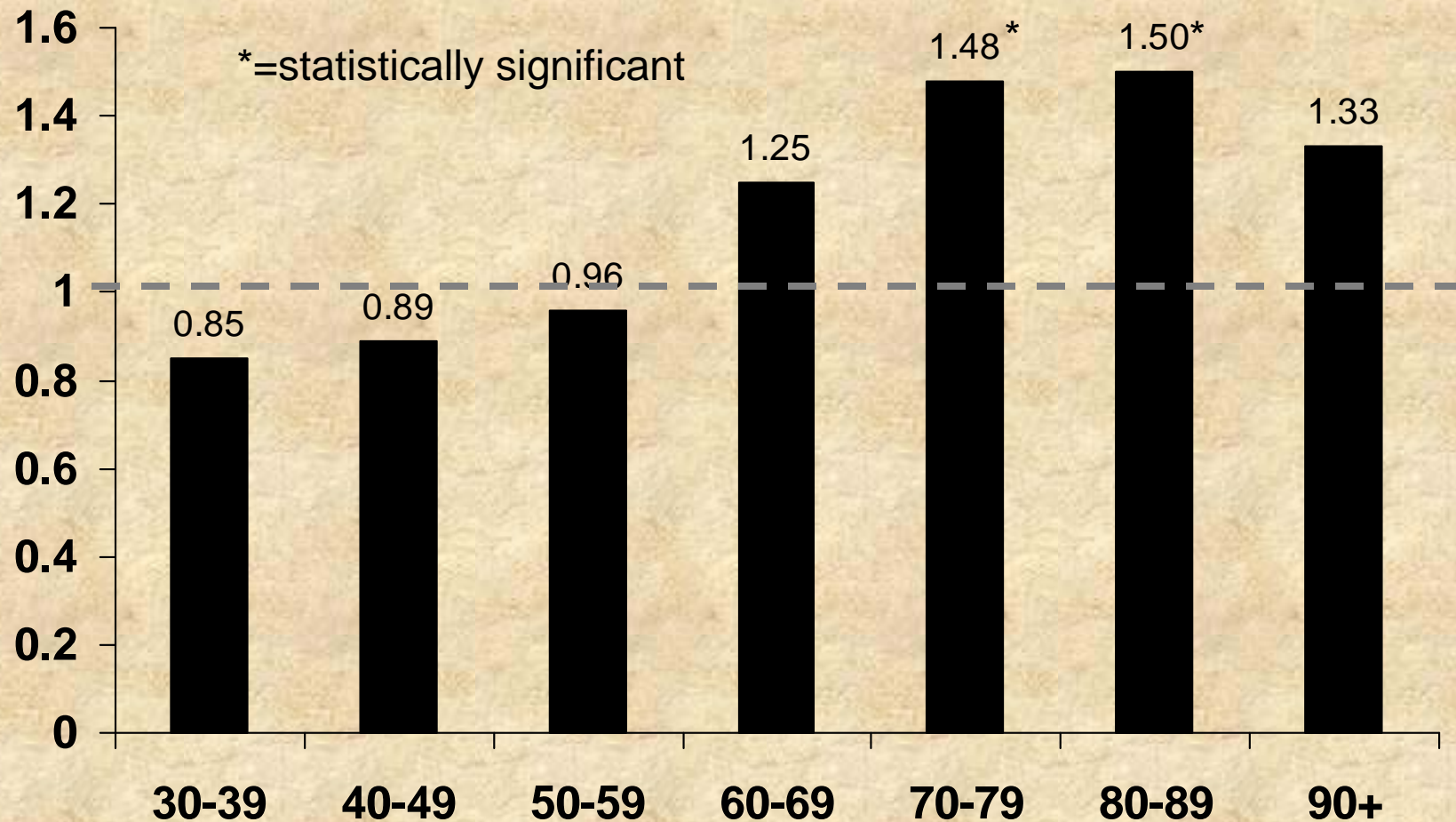


# Percent Getting to Goal Related to Age



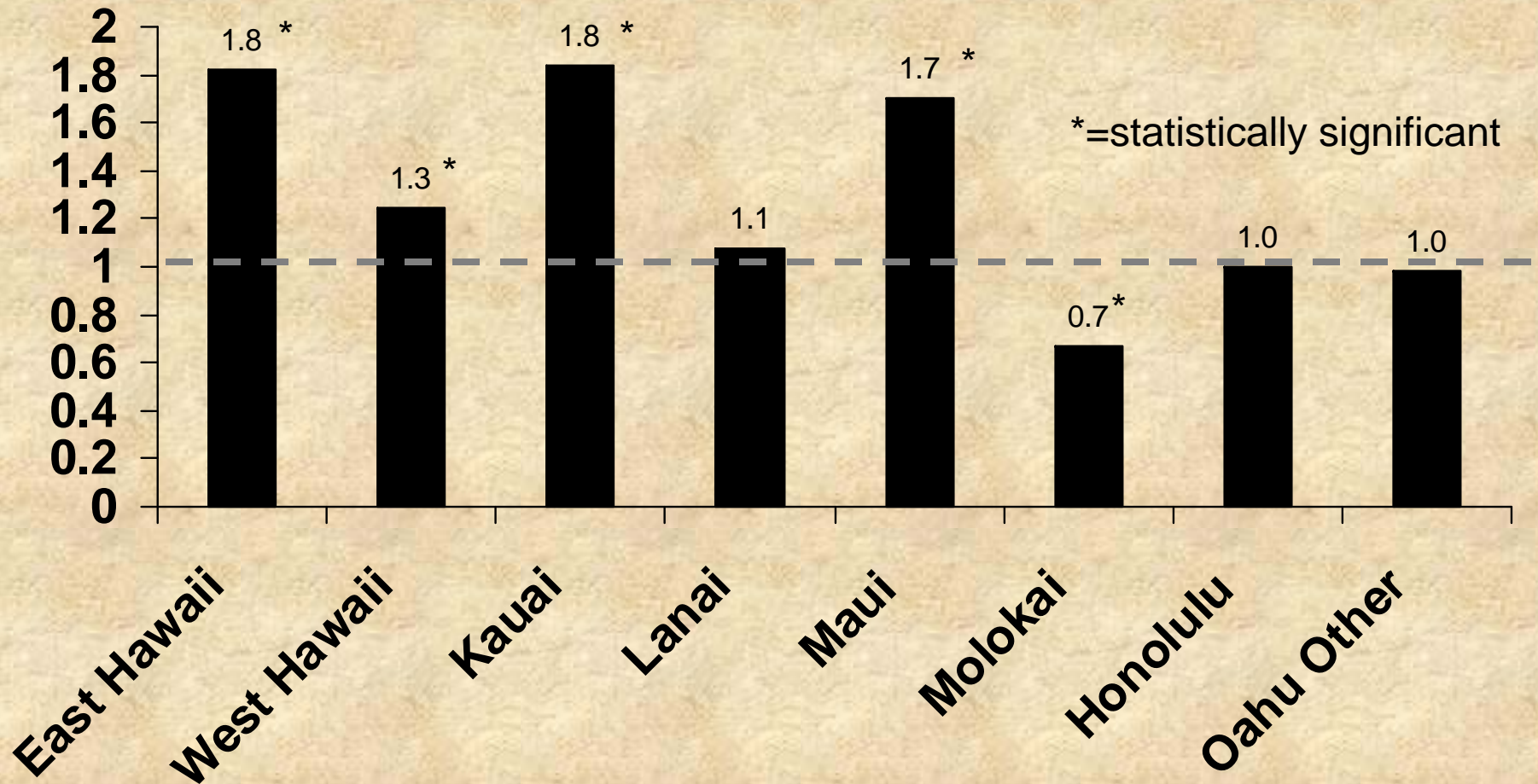
Note: Younger patients are less likely to be at goal.

# Odds Ratio of Getting to Goal for LDL Cholesterol Related to Age, Adjusted



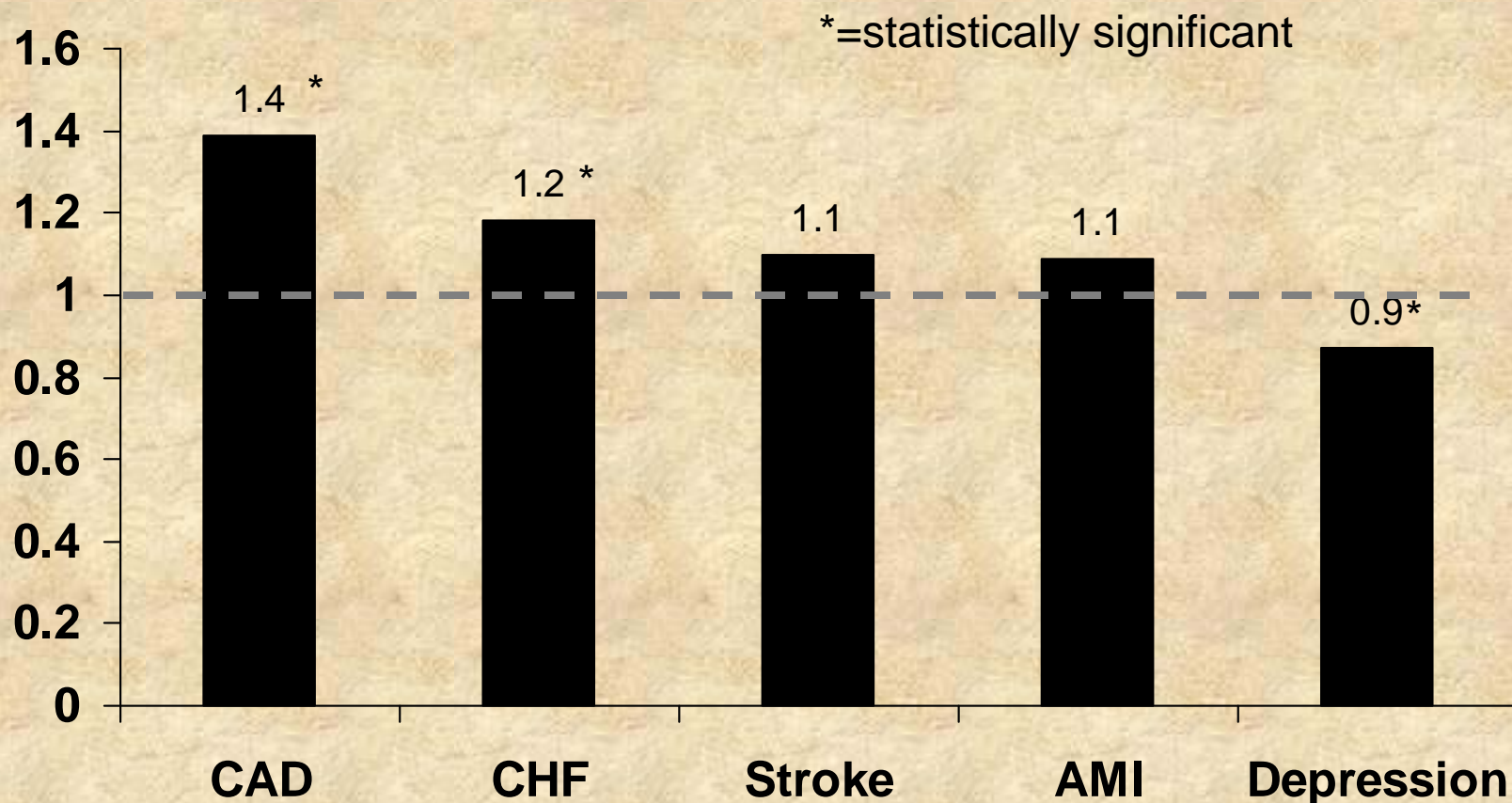
Note: Members 18-29 are the reference group. Members under age 70 are less likely to be at goal than older ones. Females OR 0.88 [0.84-0.92]

# Odds Ratio Getting to Goal Related to Region, Adjusted



Note: Reference is Honolulu. Molokai and Oahu are areas to target.

# Odds Ratio of Getting to Goal and History of Disease, Adjusted



Note: Members with depression are less likely to be at goal for LDL.

# Summary

- Groups not at goal for LDL:
  - No statin use
  - Age < 70
  - Female
  - Living on Molokai
  - Having depression

**The Effectiveness of a  
Physician P4P Program in  
Increasing Quality of Care  
and Improving Outcomes**

# Background

- Many health plans use P4P programs to improve quality
  - ~50% of physicians in HMOs (Rosenthal et al)
  - ~25% of all physicians (Terry et al)
- CMS have invested \$21 million in P4P demonstration projects and plan to adopt P4P programs
- However, few studies assessed the impact of P4P programs

# HMSA's P4P Program

- PPO pay for performance program -1998 to present
- Participation is voluntary
- Provides physicians with additional 1.5% to 7.5% of their base professional fees based on performance
- In 2001, P4P program added incentives for improvement
- Maximum MD award = \$16,000

# P4P Distribution of Points

Quality Indicators	Maximum 40 points
A. Clinical Measures	(25)
B. Member Rating	(10)
C. Board Certification	( 5)
Patient Satisfaction	Maximum 30 points
Business Operations w/HMSA	Maximum 15 points
A. Hawaii Healthcare Information Network (HHIN) participation	( 5)
B. Electronic Media Claims (EMC) participation	( 5)
C. Lines of Business with HMSA	( 5)
Practice Patterns	Maximum 15 points
A. Medical Utilization Report	( 5)
B. Formulary Compliance Report	(10)

# Type of Clinical Quality Indicators

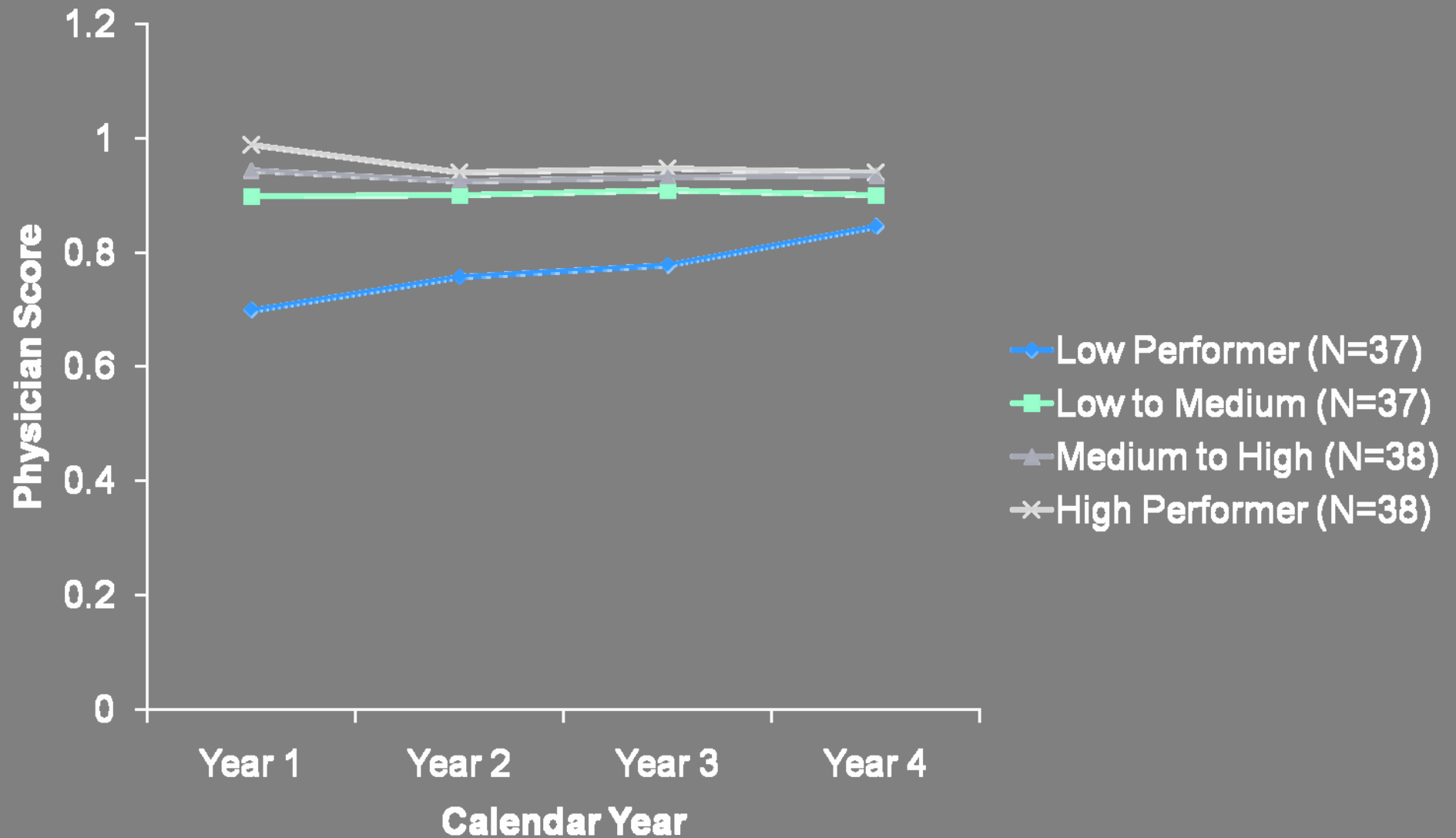
## Measure Focus

- Prevention
- Early Detection
- Chronic Care Management
- Appropriate Clinical Evaluation
- Ambulatory Care Follow-up
- Appropriate Clinical Care
- Medication Management
- Over-utilization

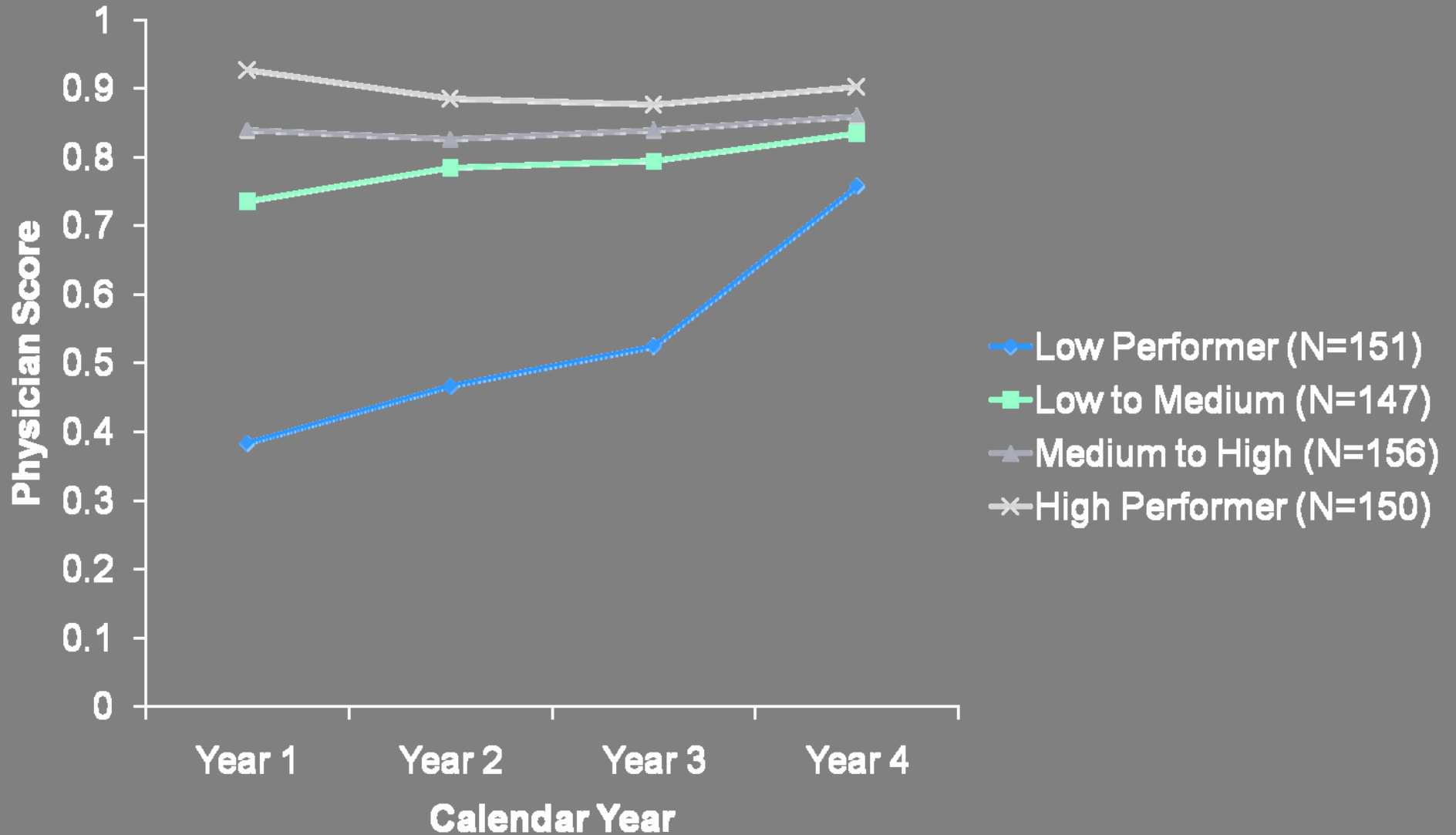
## Representative Indicator

- Childhood Immunizations: MMR, VZV
- Mammography Screening
- ACE Inhibitor Use in Patients with CHF
- Evaluation of Thyroid Nodule
- Follow-up After Hospitalization for Mental Illness
- Radiation Tx After Breast Conserving Surgery
- Compliance with Glaucoma Medications
- X-ray Prior to MRI/CT Scan for Low Back Pain

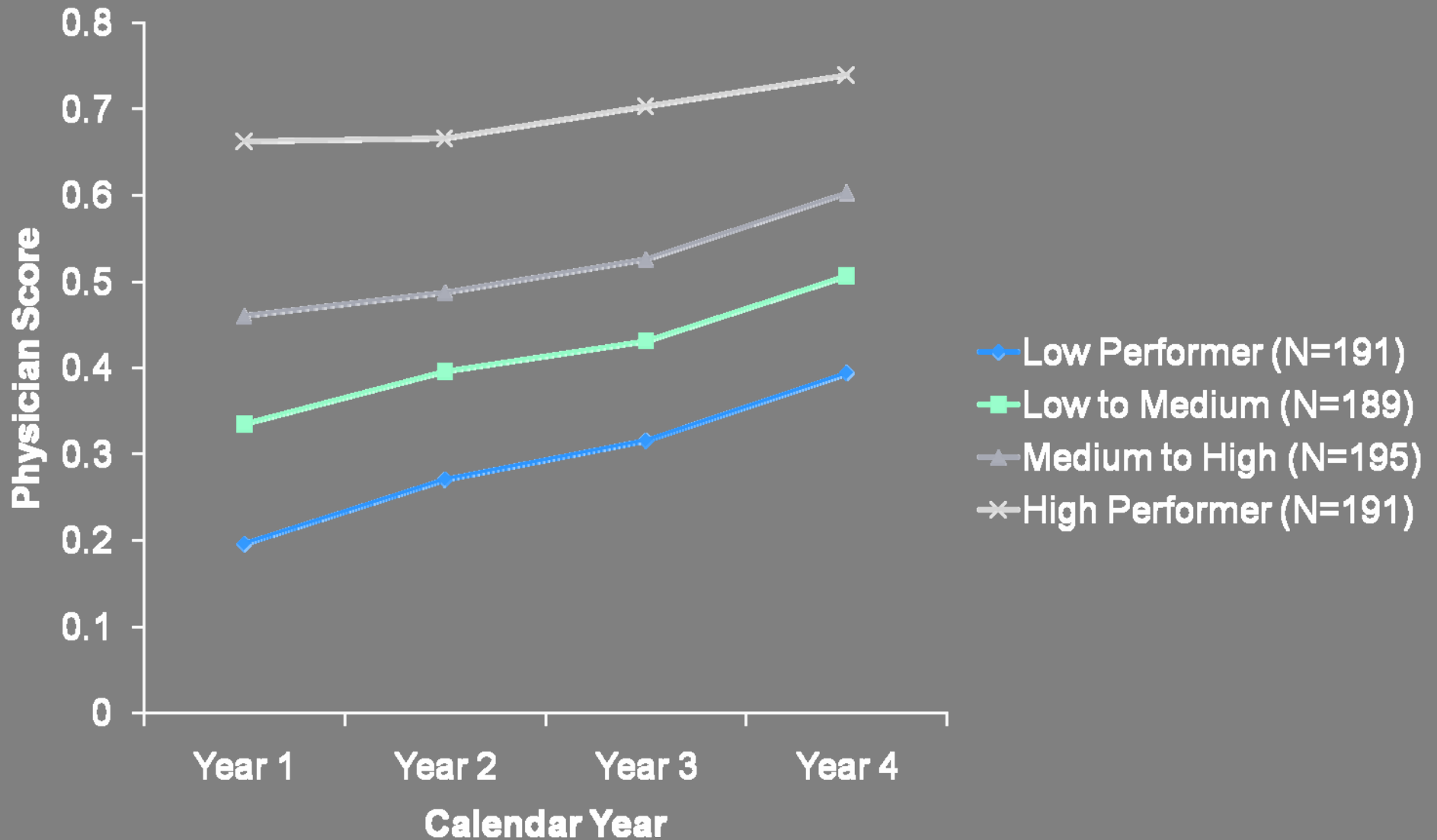
# Receipt of MMR Vaccine



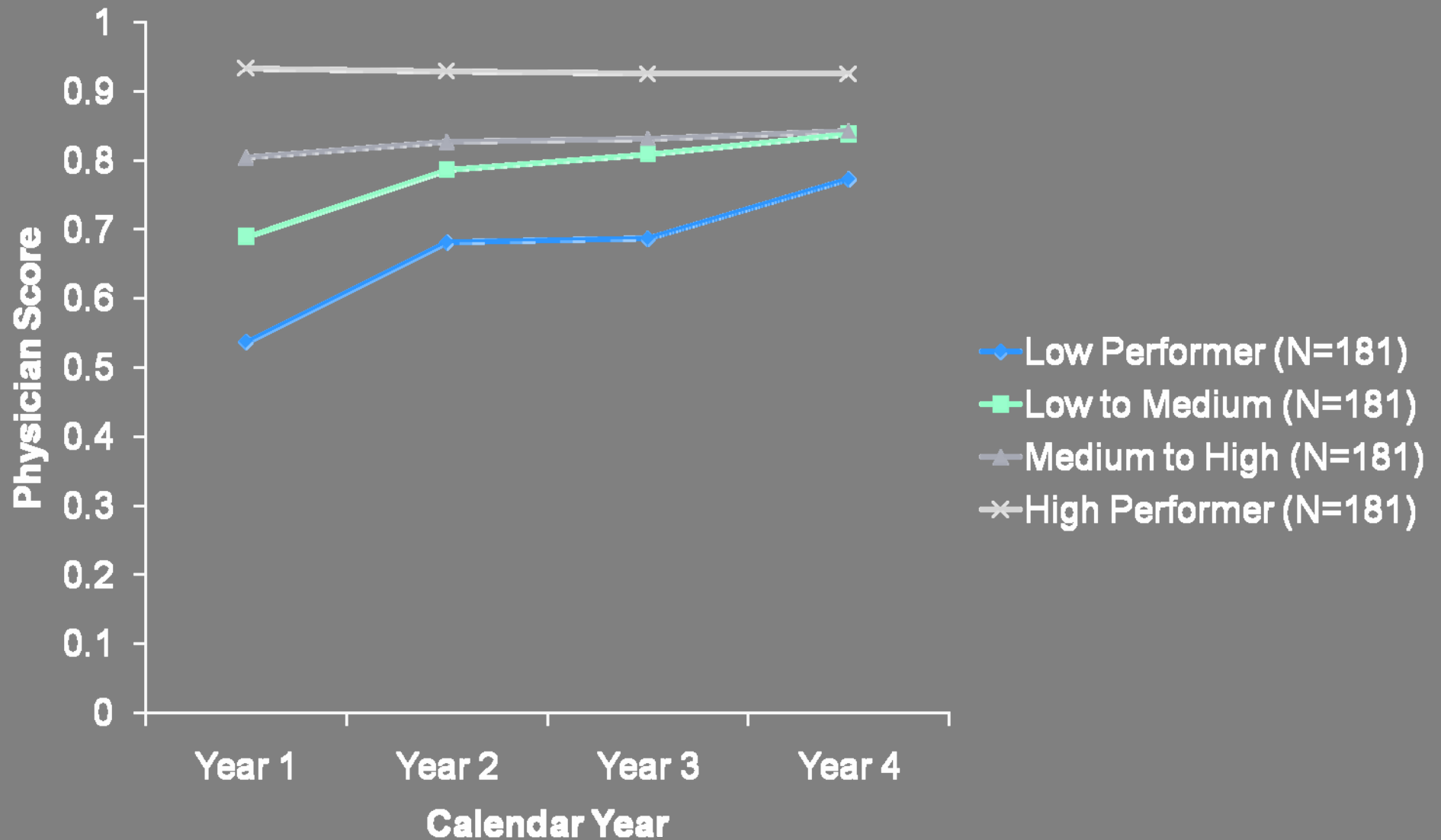
# Receipt of at least 2 HbA1c



# Receipt of Colorectal Cancer Screening



# Receipt of Pap Smear



# Part II: Objectives

- Investigate the effectiveness of the P4P program in improving the quality of care for diabetic patients
- Assess the impact of receiving these quality care processes on the rate of hospitalizations

# Methods – Data and Sample

- Administrative claims data 1999-2006.
- Study sample
  - Diabetic members 18-75 years as defined by HEDIS
  - Saw either P4P-participating or non-P4P-participating providers exclusively

# Methods – Statistical Analyses

1) Logistic regression with clustering at patient level:

*Receipt of quality care (y/n) = Saw P4P-participating provider (y/n) + covariates*

2) Random effects negative binomial models with clustering at patient level:

*Number of hospitalizations = Receipt of quality care + covariates*

## Impact of Seeing P4P-Participating Providers on Receipt of Quality Care

	<b>Receipt of Quality Care (n = 208,997 patient years) Odd Ratio (95% CI)</b>
Seeing P4P- participating	1.16 (1.11-1.22) <sup>***</sup>

	<b># of Hospitalization (n =165,636 patient years) Incident Rate Ratios (95%CI)</b>
Receipt of quality care in the year prior	0.80 (0.78-0.83) <sup>***</sup>

Adjusted for age, gender, Elixhauser comorbidity Index, # of outpatient visits in 1 year # of distinct primary care physicians seen, saw endocrinologists, insulin dependence , and calendar year.

# Summary

- This study support previously published study in showing that P4P program can be effective in increasing the likelihood that members will receive quality care processes (Gilmore et al 2007)
- This study showed a positive association between receipt of appropriate laboratory monitoring and decrease likelihood of hospitalization

Any Questions?