

# Epidemiology of Coccidioidomycosis In Maricopa County, AZ – 2006-2011

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**Maricopa County  
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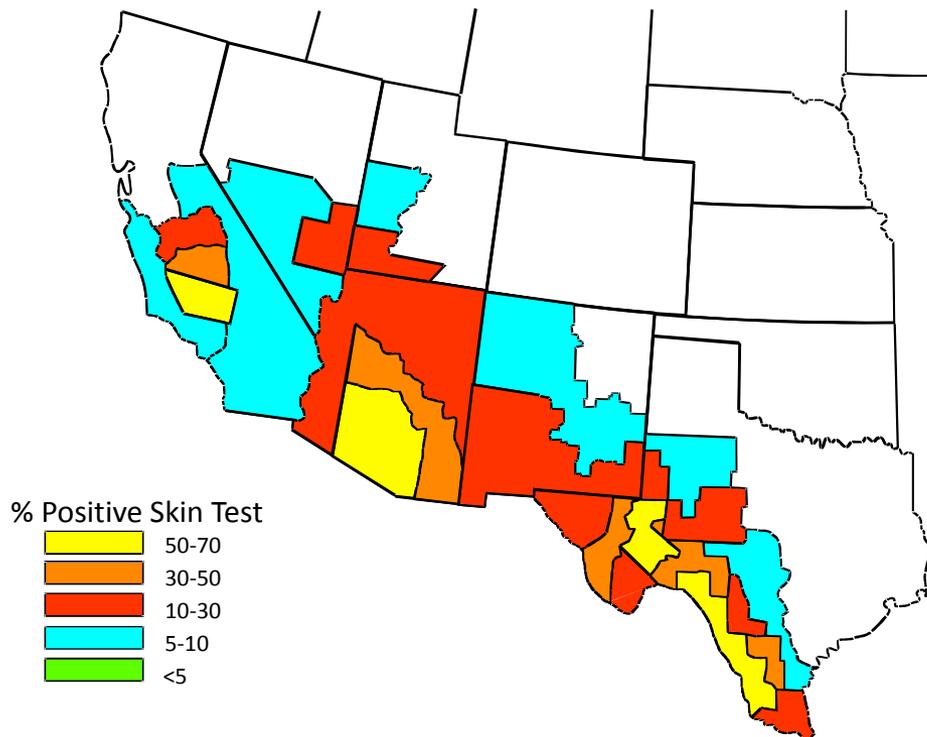
# Coccidioidomycosis (Valley Fever)



- Respiratory infection caused by fungus in soil
- Varying presentations:
  - Asymptomatic
  - Mild flu-like illness
  - Skin lesions
  - Chronic pneumonia
  - Meningitis
  - Bone or joint infection



# Coccidioidomycosis Epidemiology



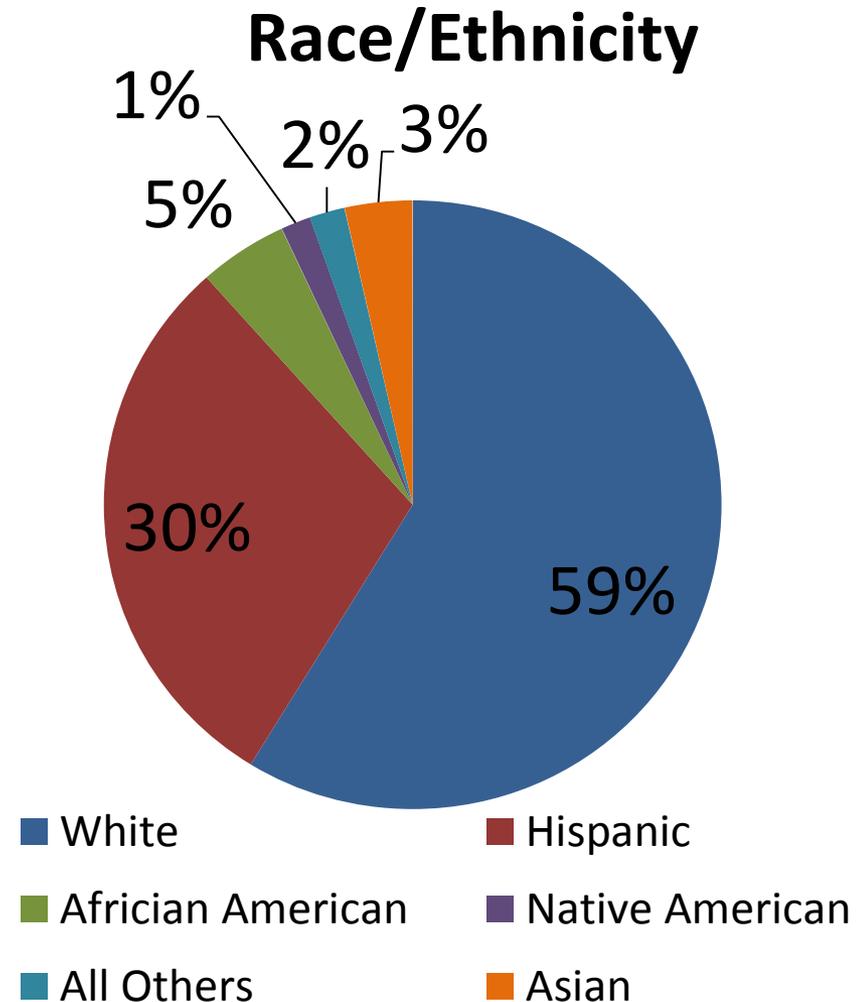
P. Q. Edwards and C. E. Palmer. Prevalence of sensitivity to coccidioidin, with special reference to specific and nonspecific reactions to coccidioidin and to histoplasmin. *Dis.Chest* 31:35-60, 1957

- Caused by a fungus found in “thermic” soil
  - *C. immitis* (California)
  - *C. posadasii* (Arizona)
- Endemic areas:
  - Southwestern US
  - Mexico
  - parts of Central & South America

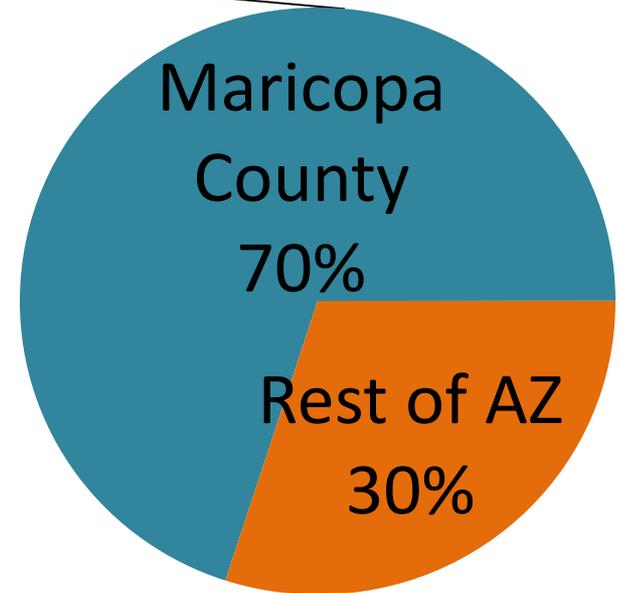
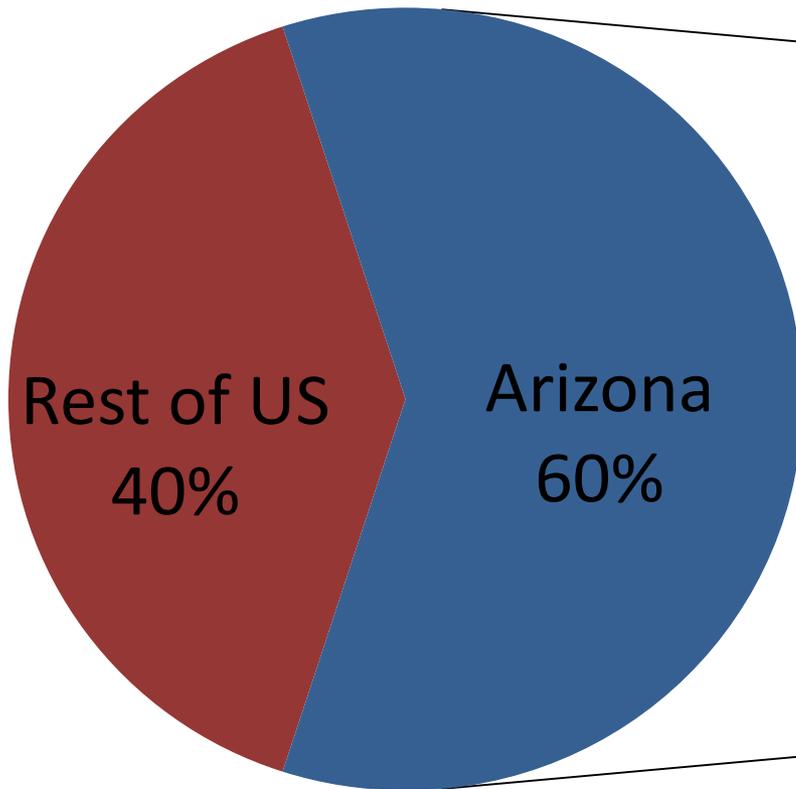
# Maricopa County



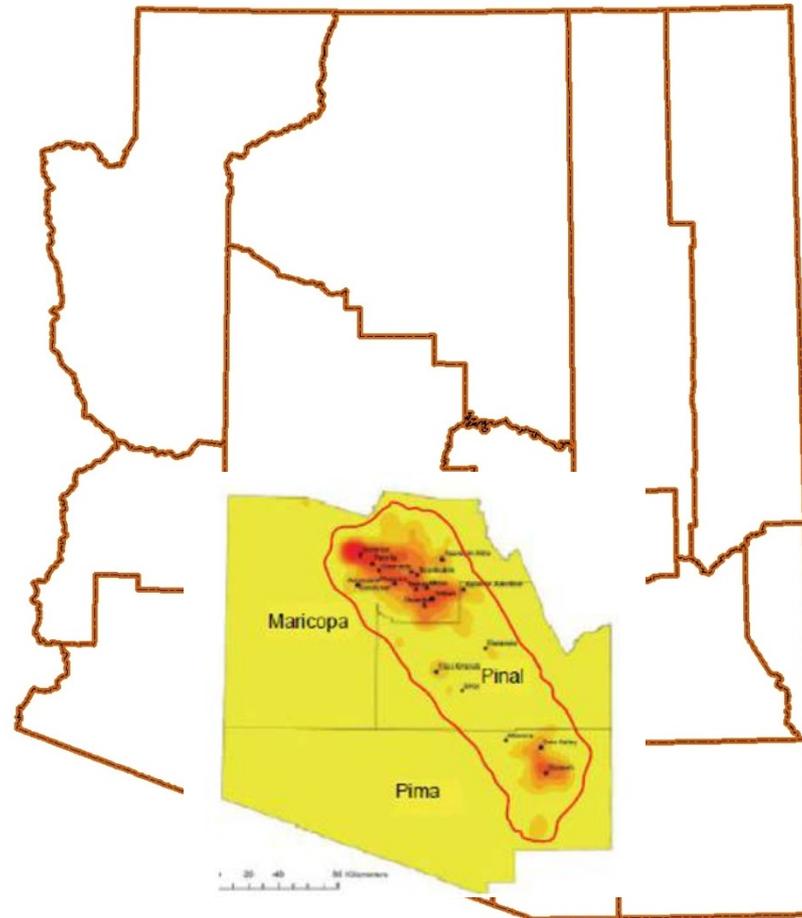
- 3.8 million people
  - 60% of the Arizona population
- ~9,000 miles<sup>2</sup>
  - 7.7" rain/year
  - Avg temp 72.6F



# Distribution of cases by residence in the United States



# Maricopa County in Arizona



# Background



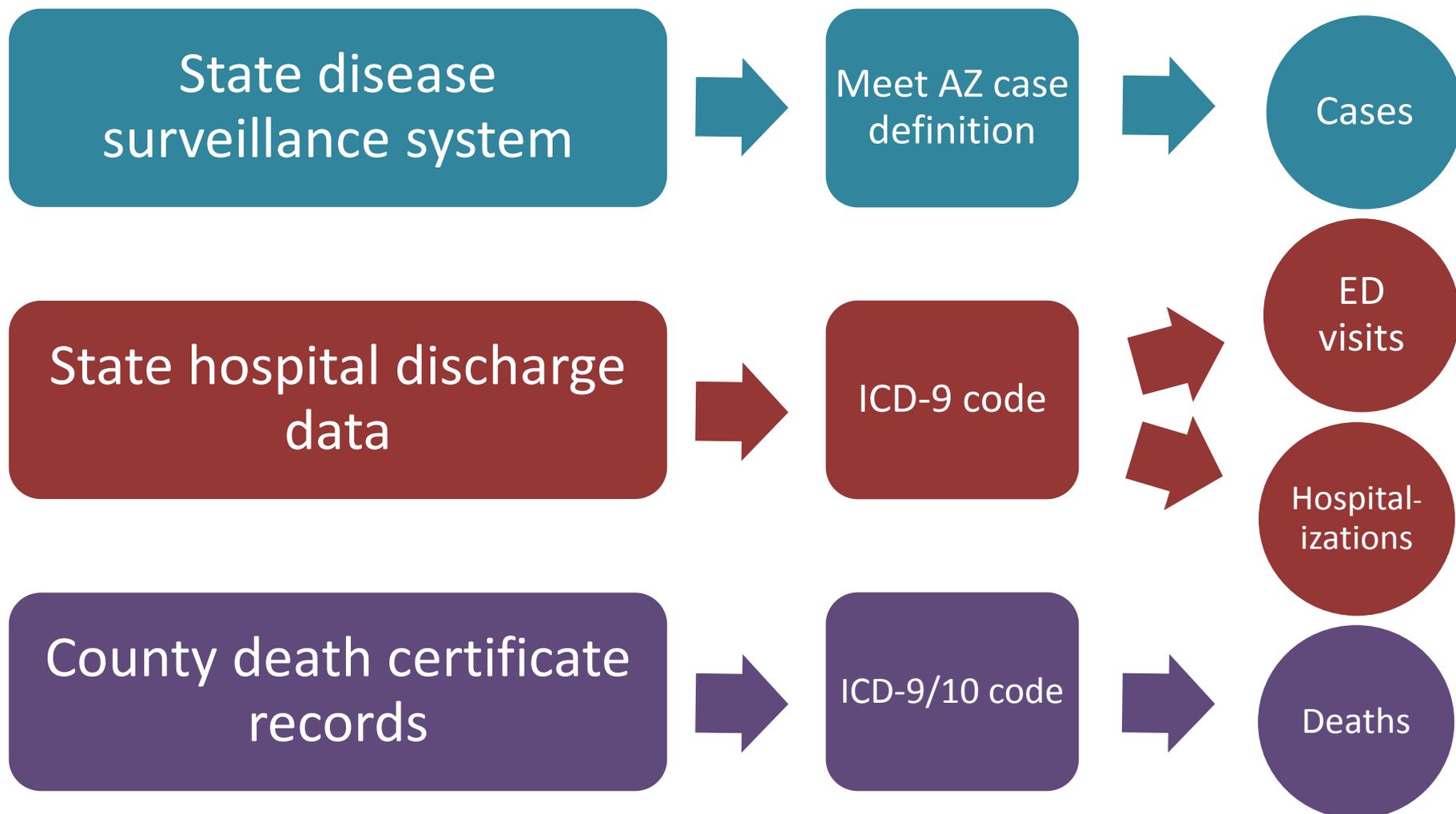
- Arizona cocci reported rates have been steadily increasing since 1997 when lab reportable
- Several reporting changes have made increased rates difficult to interpret
  - In 2009 a major laboratory began reporting EIA results without confirmation by immunodiffusion
- Recent publication by Huang et al . suggested Hispanics and Native Americans have an increased risk of death due to cocci

# Objectives



- To evaluate whether the reported coccidioidomycosis (cocci) increase is due to increased disease burden vs. reporting
- To investigate the risk of severe disease in Hispanics and Native Americans

# Data sources and population for Maricopa County residents, 2006-2011



# Methodology



- Datasets de-duplicated at person level
- Crude rates
  - based on Maricopa County population
- Age-adjusted rates
  - standardized using NCHS 2000 US standard population
- Linear regression to test for trend over study period
- Rate Ratios (RR) and 95% Confidence interval
  - for year to year comparisons
- ANOVA
  - for mean rates between Race/Ethnicity groups

# Sources of Data/Methodology



- PRIMARY events used only for analysis
  - HDD – only individuals with ICD-9 code in “primary discharge diagnosis” included in analysis
  - Death – only individuals with ICD-9/ICD-10 code in “cause of death” included in analysis

## CAUSE OF DEATH (See instructions and examples)

32. **PART I.** Enter the chain of events—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line. Add additional lines if necessary.

IMMEDIATE CAUSE (Final disease or condition resulting in death) →

a. Rupture of myocardium

Due to (or as a consequence of):

b. Acute myocardial infarction

Due to (or as a consequence of):

c. Coronary artery thrombosis

Due to (or as a consequence of):

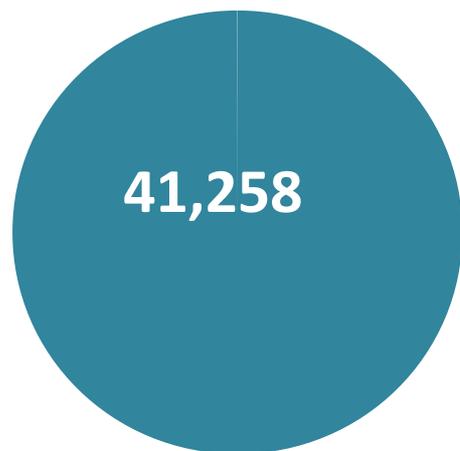
d. Atherosclerotic coronary artery disease

Sequentially list conditions, if any, leading to the cause listed on line a. Enter the **UNDERLYING CAUSE** (disease or injury that initiated the events resulting in death) **LAST**

# Burden of coccidioidomycosis in Maricopa County, 2006-2011

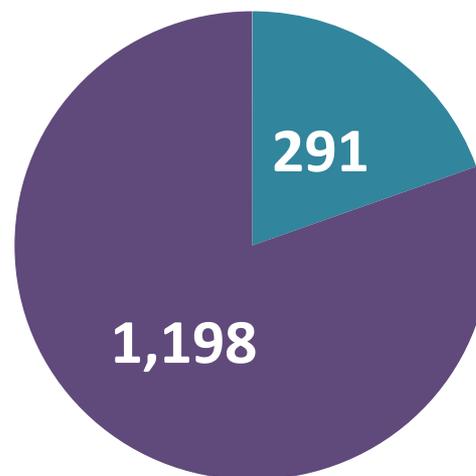


## Cases



■ All

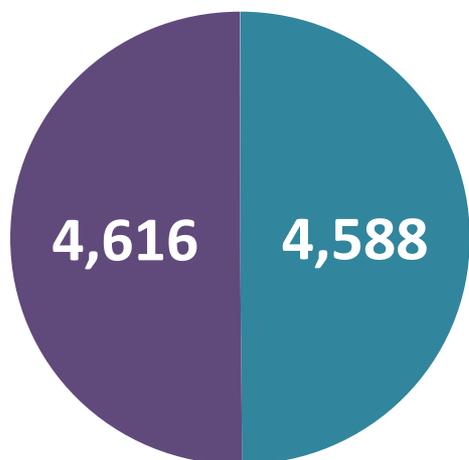
## ED visits



■ Primary

■ Other dx

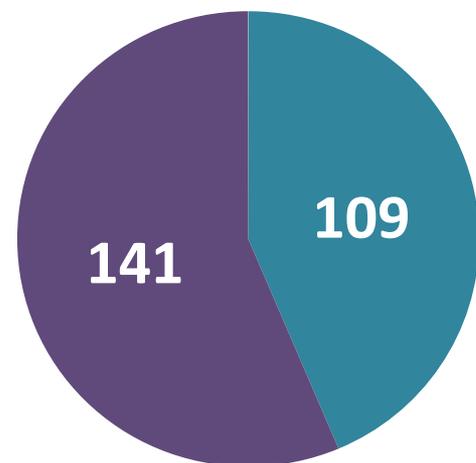
## Hospitalizations



■ Primary

■ Other dx

## Deaths



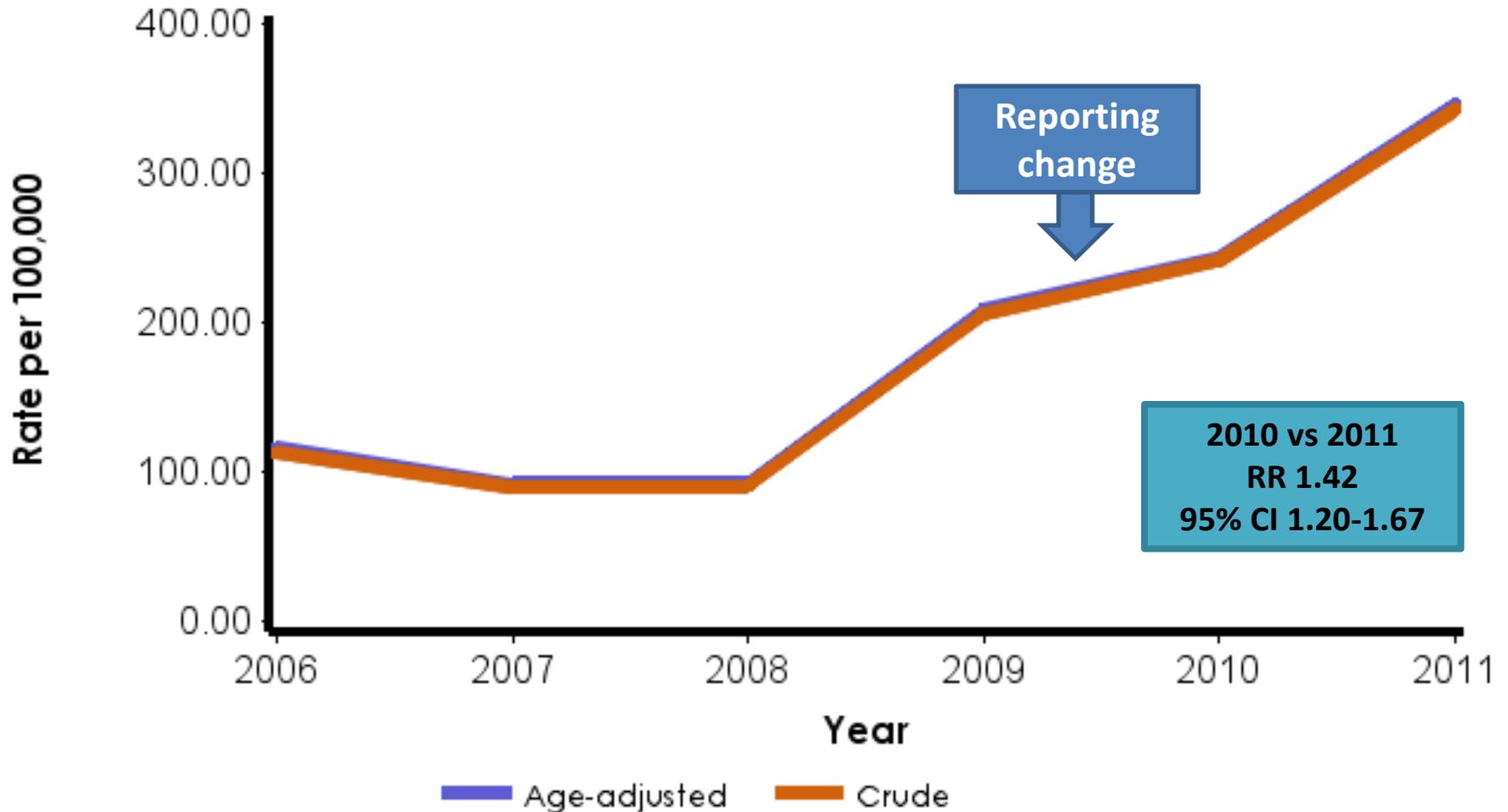
■ Primary

■ Contributing

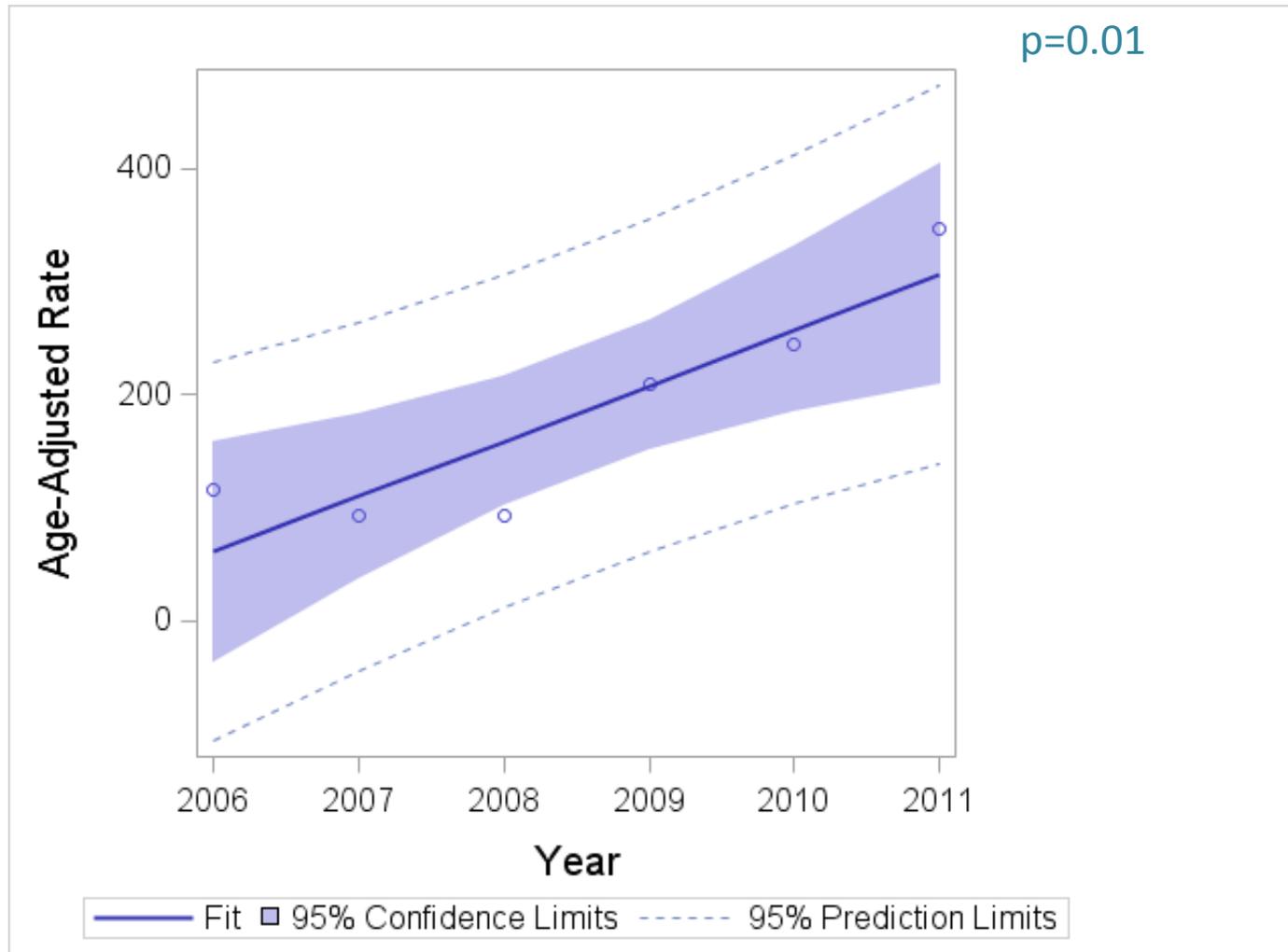


# Rates of Coccidioidomycosis

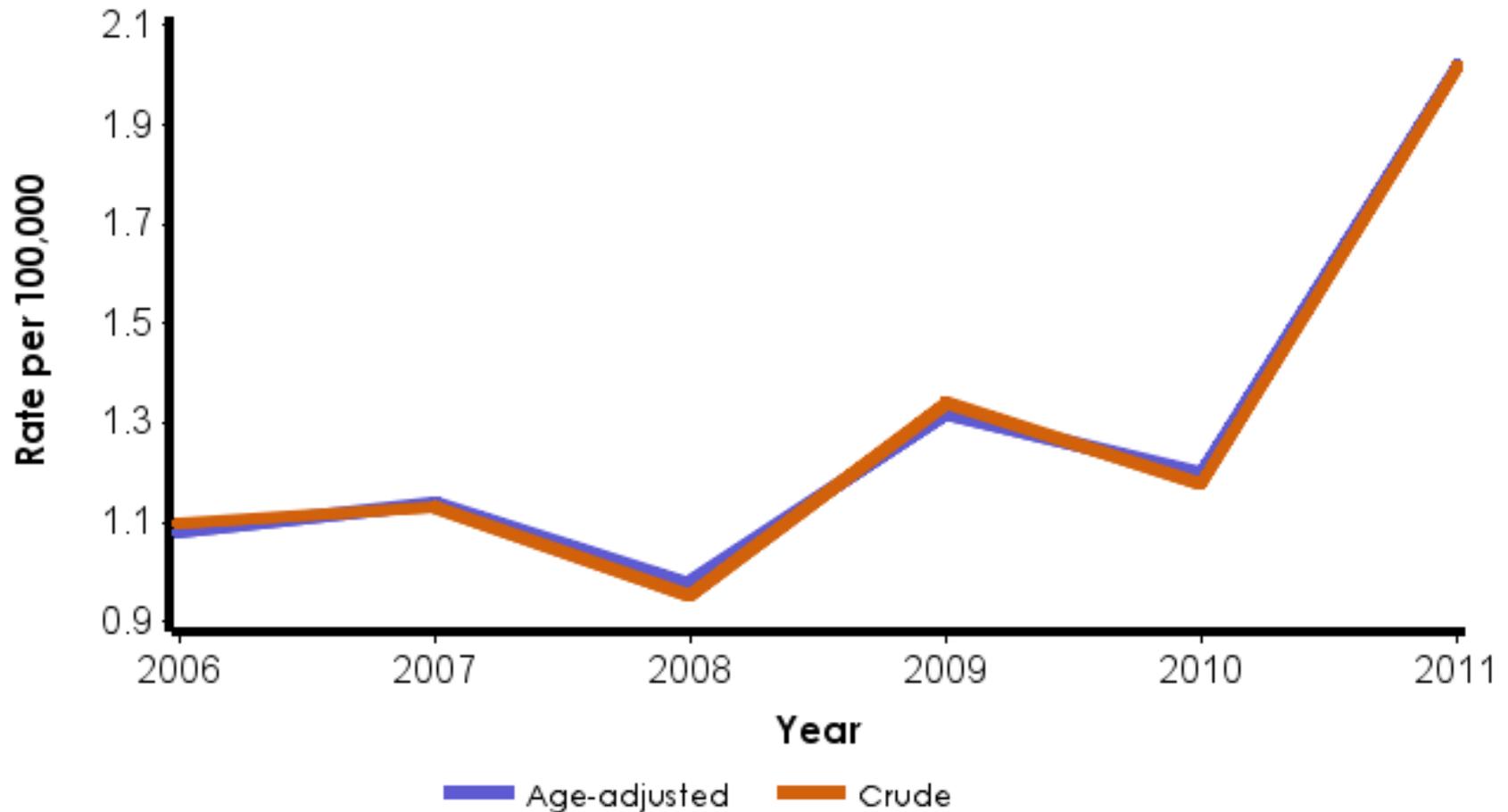
# Rates of reported cases of coccidioidomycosis in Maricopa County, 2006-2011



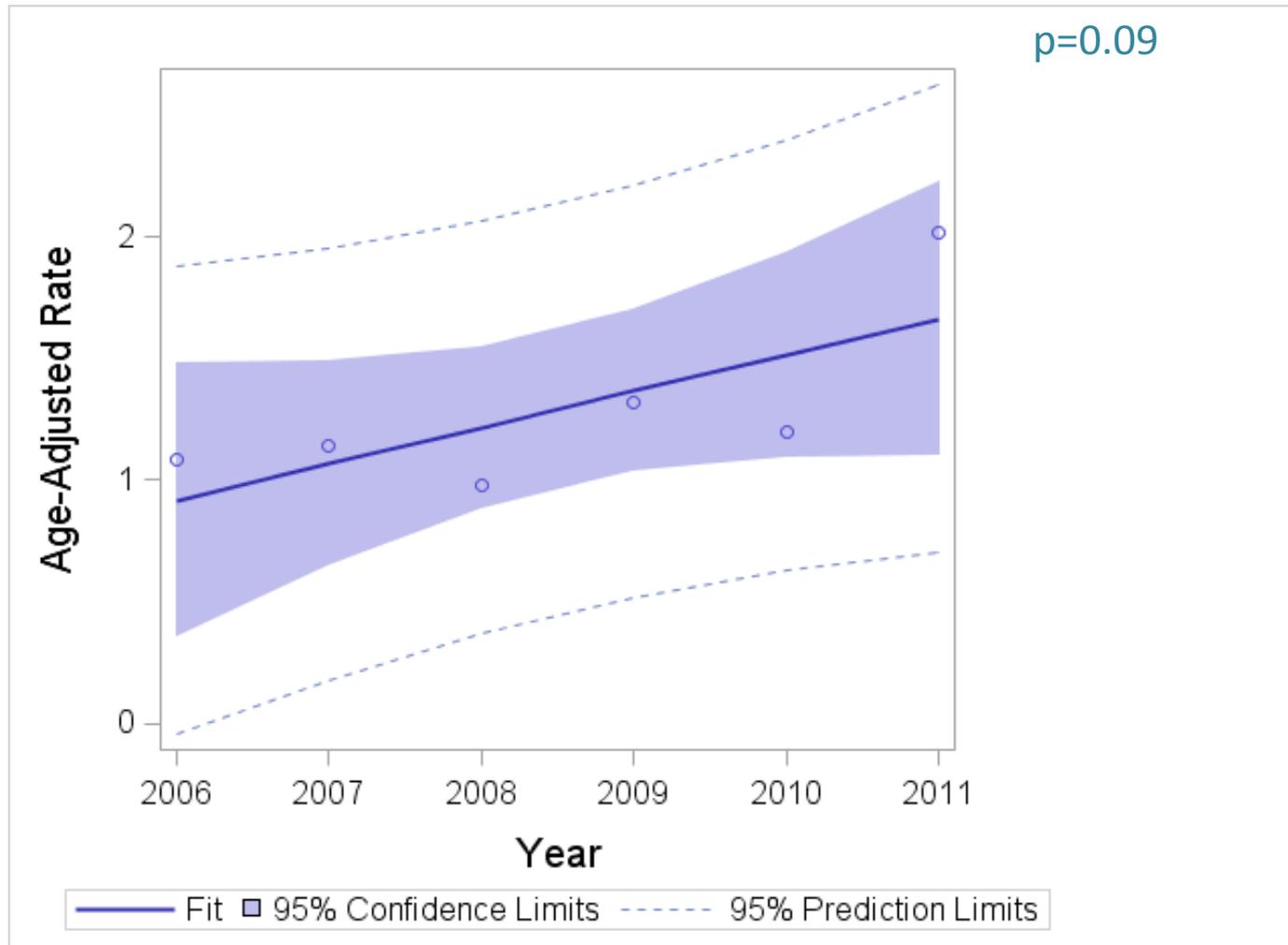
# Trend analysis for age-adjusted rates of cases



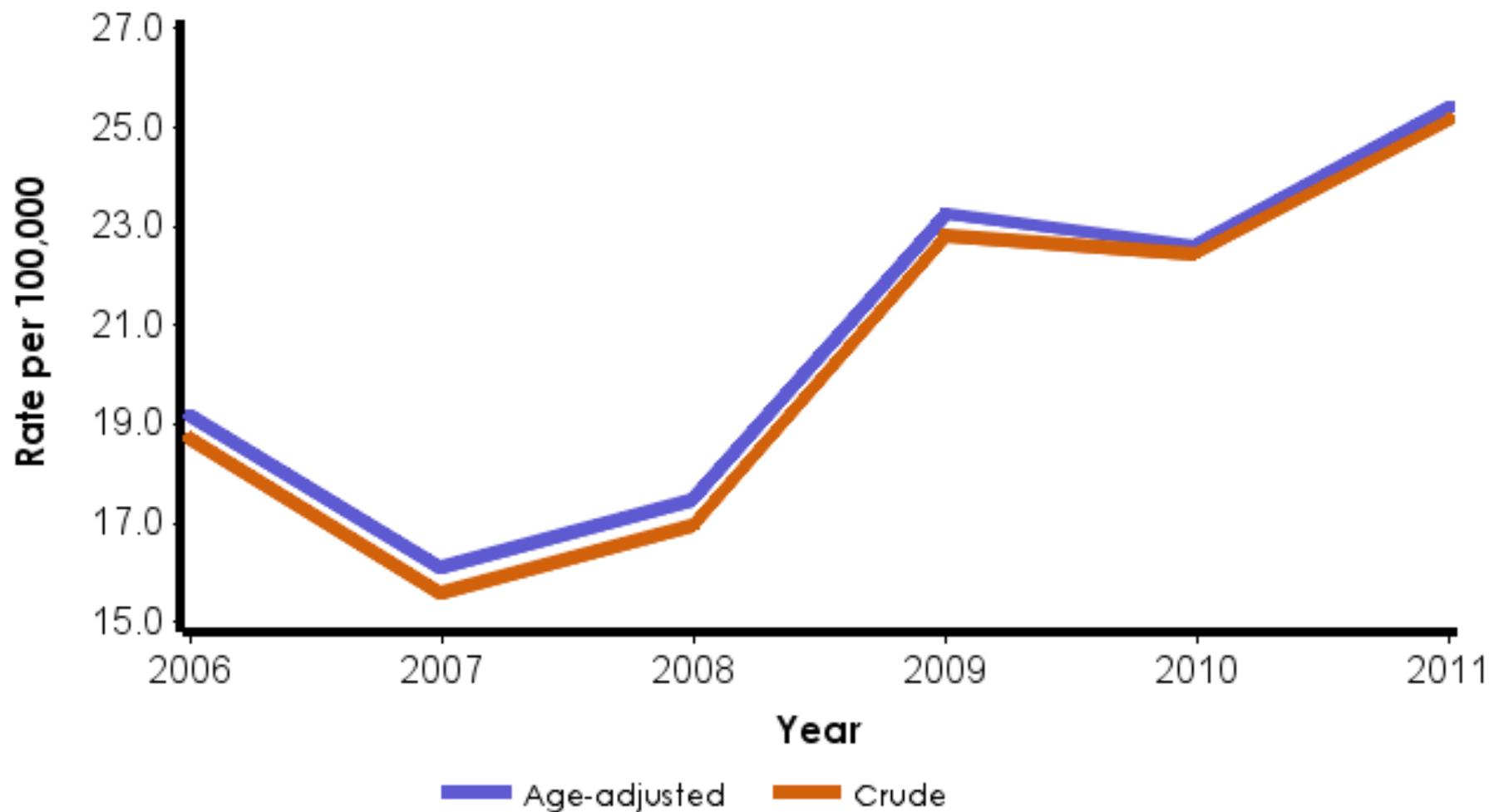
# Rates of emergency department visits from coccidioidomycosis in Maricopa County, 2006-2011



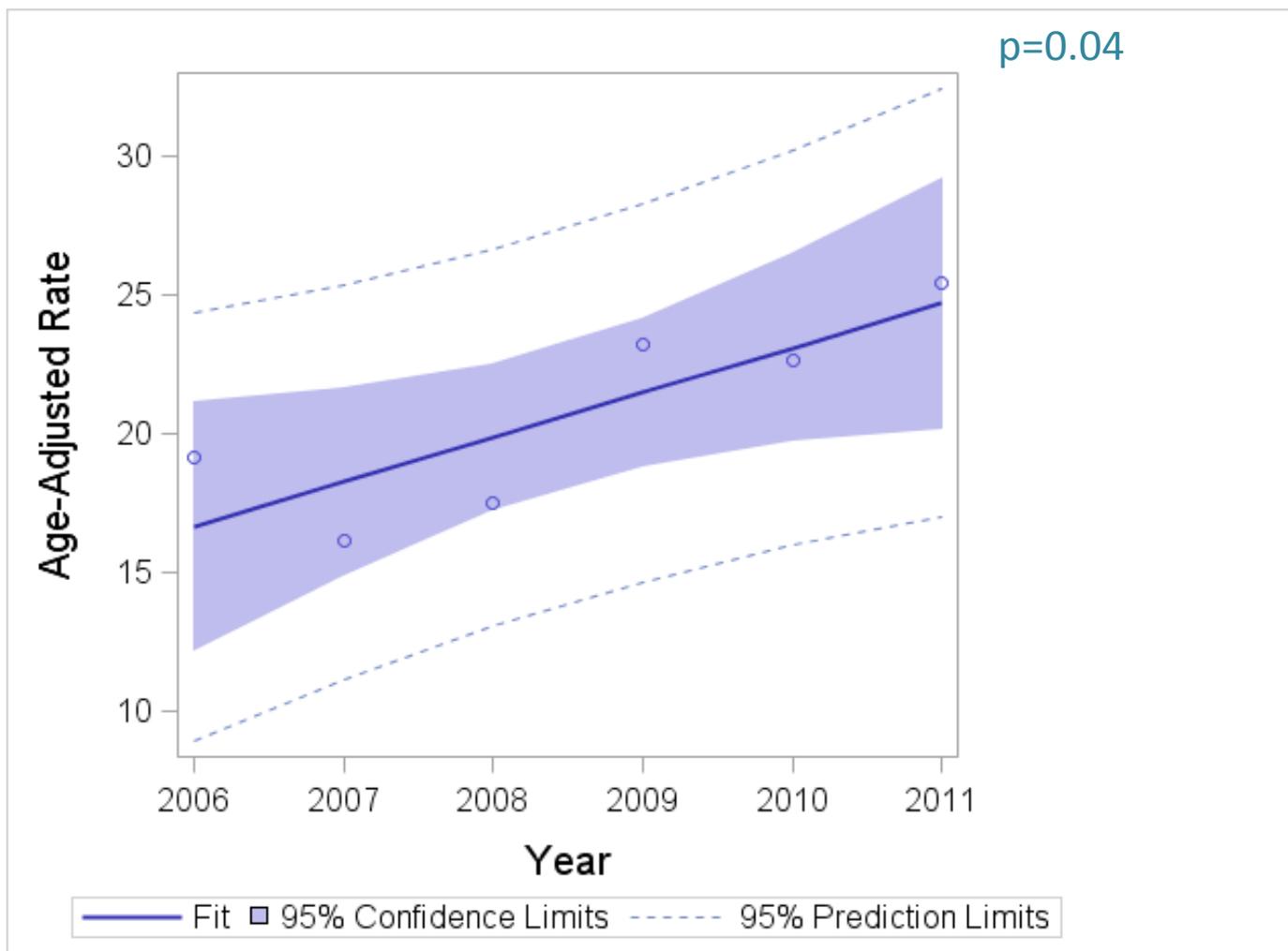
# Trend analysis of age-adjusted rates for ED visits



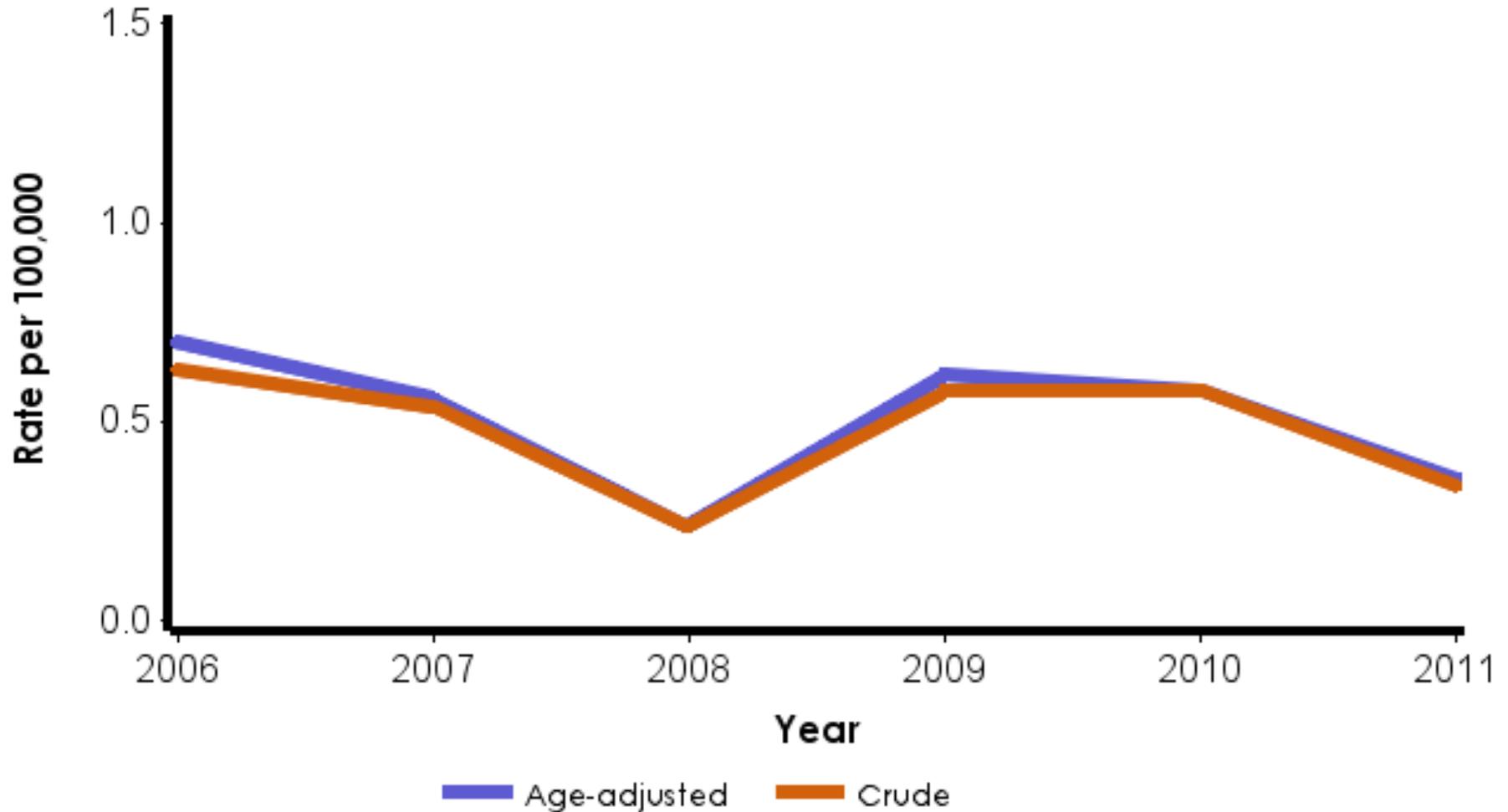
# Rates of hospitalizations from coccidioidomycosis in Maricopa County, 2006-2011



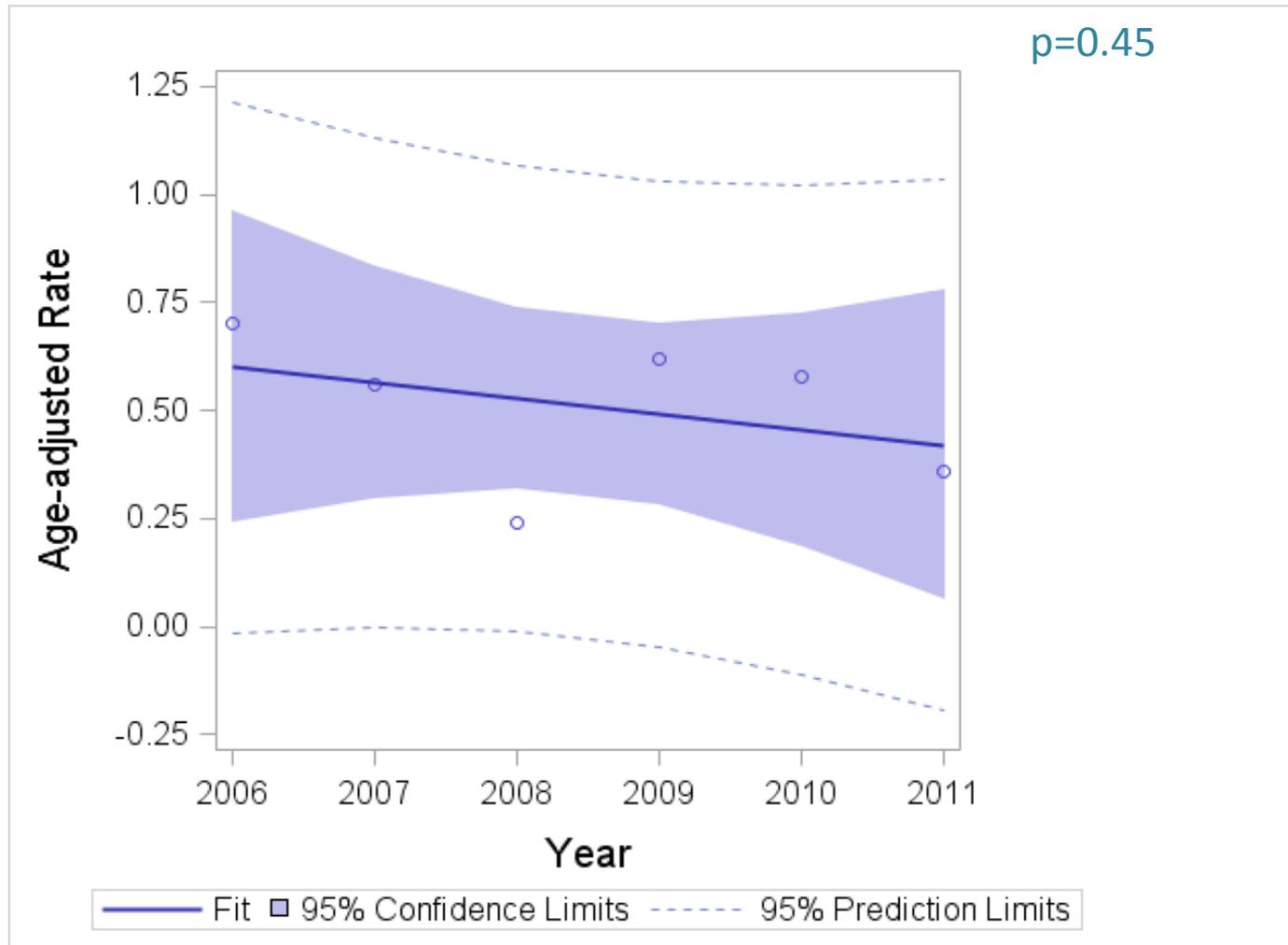
# Trend analysis of age-adjusted rates for hospitalizations



# Rates of deaths from coccidioidomycosis in Maricopa County, 2006-2011



# Trend analysis of age-adjusted rates of deaths





# Race/Ethnicity Comparisons

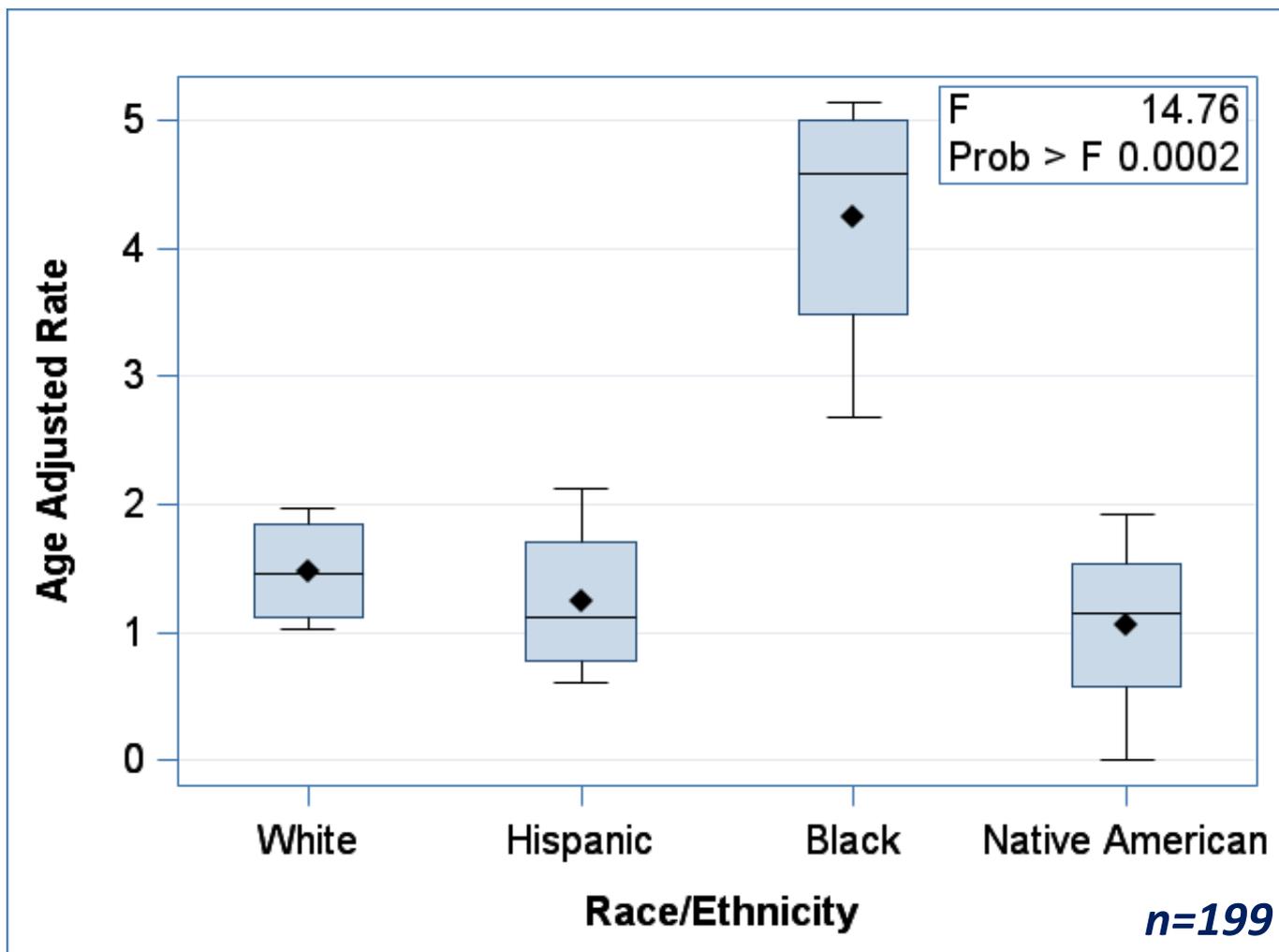
# Comparison of Average Age-Adjusted Case Rates of Cocci by Race/Ethnicity\*



***n=199***

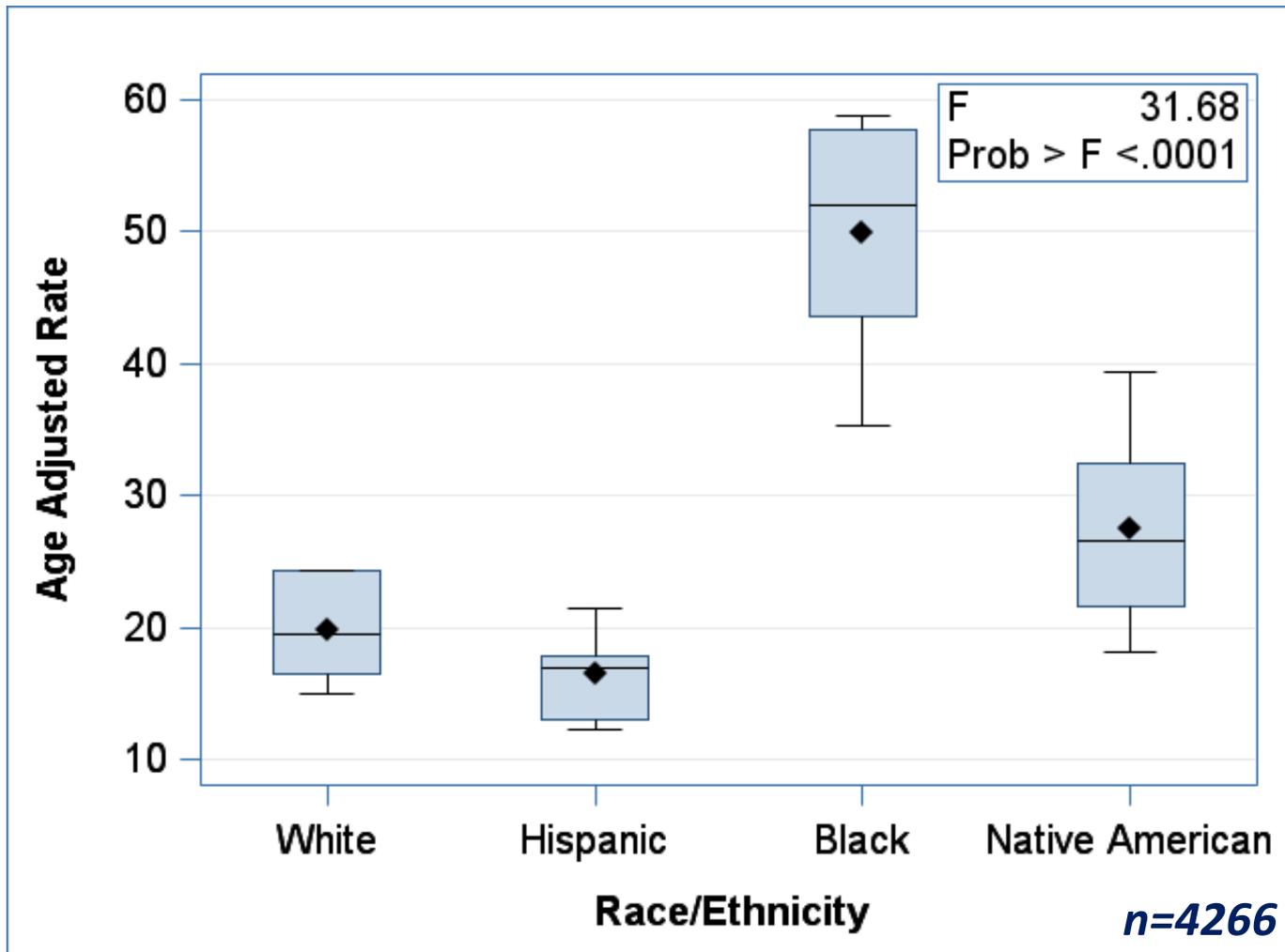
\*Data from 2008-2011 due to missing race/ethnicity data for ED visits

# Comparison of Average Age-Adjusted ED Visit Rates of Cocci by Race/Ethnicity\*

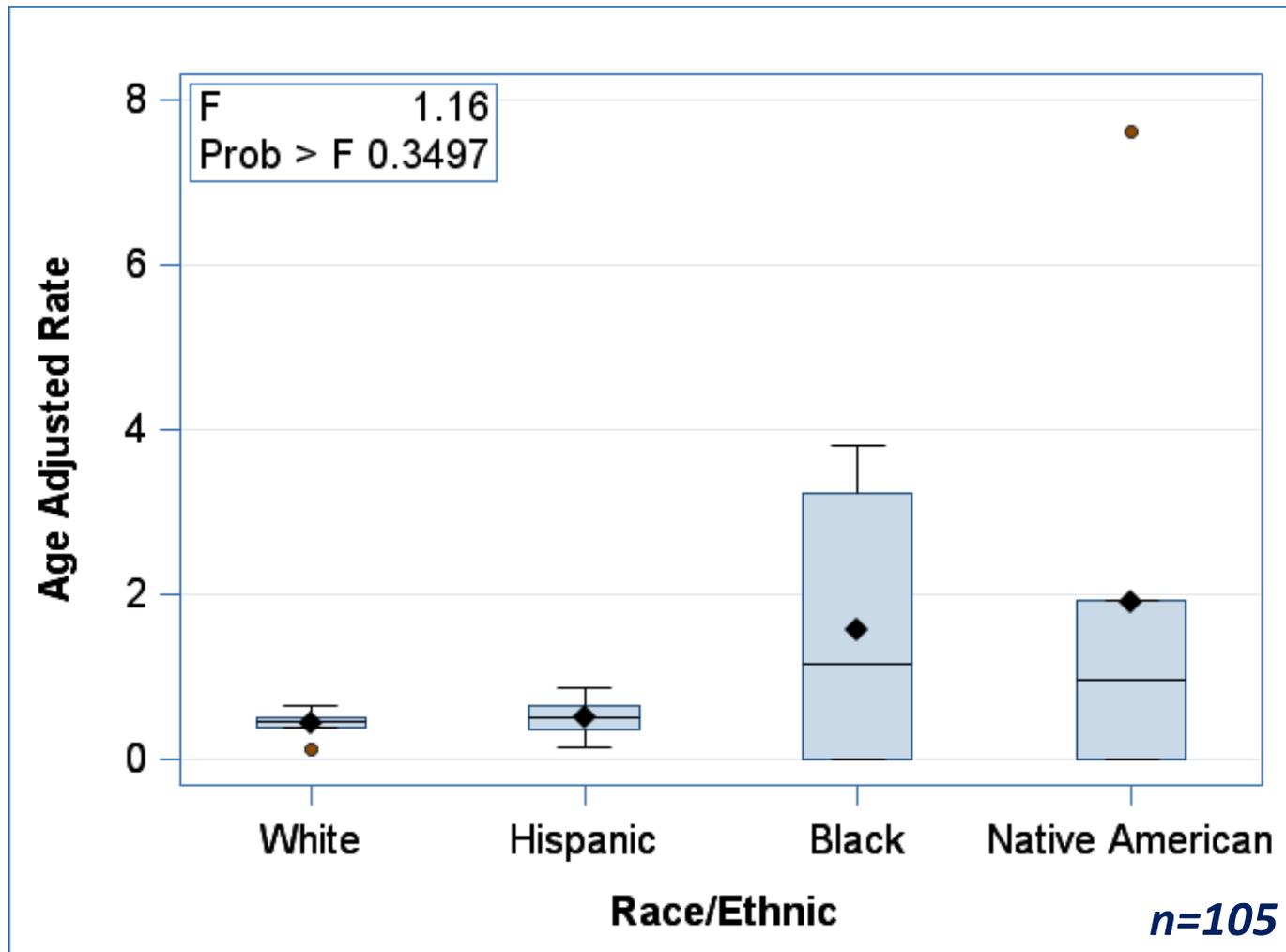


\*Data from 2008-2011 due to missing race/ethnicity data for ED visits

# Comparison of Average Age-Adjusted Hospitalization Rates of Cocci by Race/Ethnicity



# Comparison of Average Age-Adjusted Death Rates from Cocci by Race/Ethnicity



# Limitations



- Cases
  - AZ case definition does not include clinical component
  - Do not have complete Race/Ethnicity data
- HDD
  - Federal (IHS) facilities, potentially underrepresenting Native American populations
- Data sources are collected for different purposes with different methods, e.g. Race/Ethnicity
- Methodological changes over study period
  - Information collected
  - Race/Ethnicity classification

# Conclusions



- Reported cases of cocci continue to increase despite stable laboratory reporting methods
- Severe/hospitalized cocci in MC has increased significantly over the last 6 years, independent of disease reporting changes
- African Americans and Native Americans are at higher risk for hospitalization due to cocci
- Cocci deaths have remained stable over time

# Questions?

