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Examining the Effects of the Social Determinants of Health and Insurance Status on Health, Mortality, and Care Utilization

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Background

- Mortality have not continued to improve for US populations.

- Health insurance and socioeconomic factors are known to contribute to the differences between population groups.
  - Affordable Care Act (ACA) of 2010 resulted in over 90% of the US population having health insurance in 2017
  - Life expectancy has varied for adults across the US

- Social determinants of health (SDH) influence individual and population health and include the following six domains:
  - Economic stability
  - Neighborhood and physical environment
  - Education
  - Community and social context
  - Food access
  - Access to the healthcare system

- Current SDH measures incorporate four to five domains while a gap in knowledge exists in the understanding of interaction between health insurance and SDH on health and care utilization.

Objectives

- Conduct a literature review of the effects of health insurance and SDH on health outcomes, specifically, mortality and care utilization rates.

- Develop a SDH composite measure, encompassing the six domains and assess its prediction of mortality and care utilization.

- Evaluate the combined and separate effects of insurance status and SDH on clinical outcomes among adults with two high cost chronic diseases (cardiovascular disease and cerebrovascular disease) and care utilization.

Data and Methods

- New York and California - Inpatient (1995 to 2016) and Emergency (2005 to 2016) linked to mortality – all-payer data

- US Census (2000 and 2010) – population data at ZIP code

- American Community Survey by the US Census Annual Data (2005 to 2015) – population data at ZIP code

- US Department of Agriculture Food Access Research Atlas (2000 and 2010) – food access data at ZIP code level

Aim 1: Develop an index measure of SDH encompassing six domains in a composite measure
- Using principal component analysis to incorporate variables of the six SDH domains into one composite measure

Aim 2: Assess the power of both individual SDH domains and a SDH composite measure to predict mortality and care utilization and develop optimal weighting for the domains of the composite measure
- Using multivariable regression analysis and logistic regression to examine prediction of mortality.
- Using negative binomial regression to examine utilization by SES measure.

Aim 3: Evaluate the interaction of health insurance with levels of SDH as predictors of mortality and utilization among adults with cardiovascular and cerebrovascular disease.
- Using multivariable regression analysis, logistic regression, and negative binomial regression to examine the interaction between insurance status and SDH.

## Figure I. Conceptual Framework and SDH Process Map
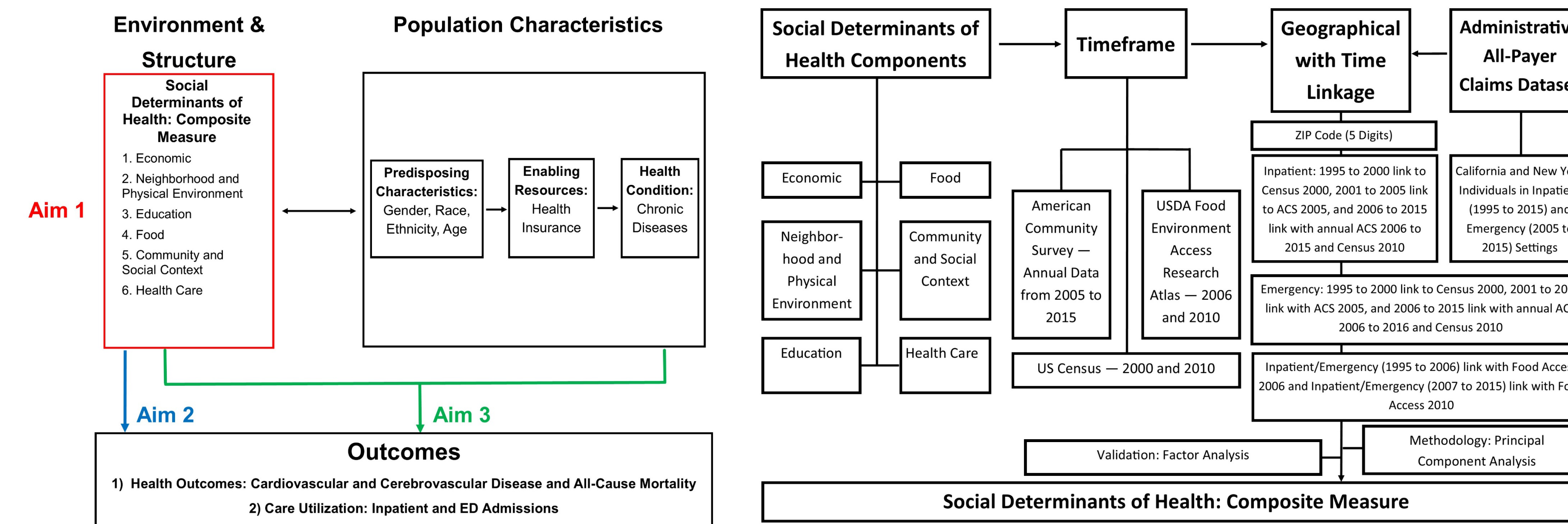
Preliminary Results

Table 1: Initial Review Results

Summary of Review Findings				
Search Phase	Health Insurance on Health	Health Insurance on Utilization	Social and Economic Factors on Health	Social and Economic Factors on Utilization
Search results from Pubmed, Embase, and Web of Science	57,789	15,607	40,827	6,741
Final Review	27	29	14	16

Table 2: Data Summary

Summary of Study Population *(CA ED data not available)			
	NY Inpatient (1995-2014)	NY ED (2007-2014)	CA Inpatient (1995-2011)
Gender (Male)	6,107,004 (46.6%)	5,763,330 (46.8%)	5,647,980 (36.2%)
(Female)	6,987,636 (54.4%)	6,558,959 (53.2%)	9,945,368 (63.8%)
Race (White)	8,069,490 (61.6%)	6,617,016 (53.7%)	11,217,675 (71.9%)
Black/African	2,220,854 (17.0%)	2,554,739 (20.7%)	1,175,992 (7.5%)
Asian	363,435 (2.8%)	439,810 (3.6%)	1,363,152 (8.7%)
Other	2,392,143 (18.3%)	2,650,010 (21.5%)	1,776,928 (11.5%)
Ethnicity (Hispanic)	1,278,323 (9.8%)	1,811,075 (14.7%)	3,469,769 (22.3%)
(Not Hispanic)	10,284,686 (78.5%)	9,466,022 (76.8%)	11,739,460 (75.3%)

Figure 2. Trends in Mortality, Utilization, and Poverty
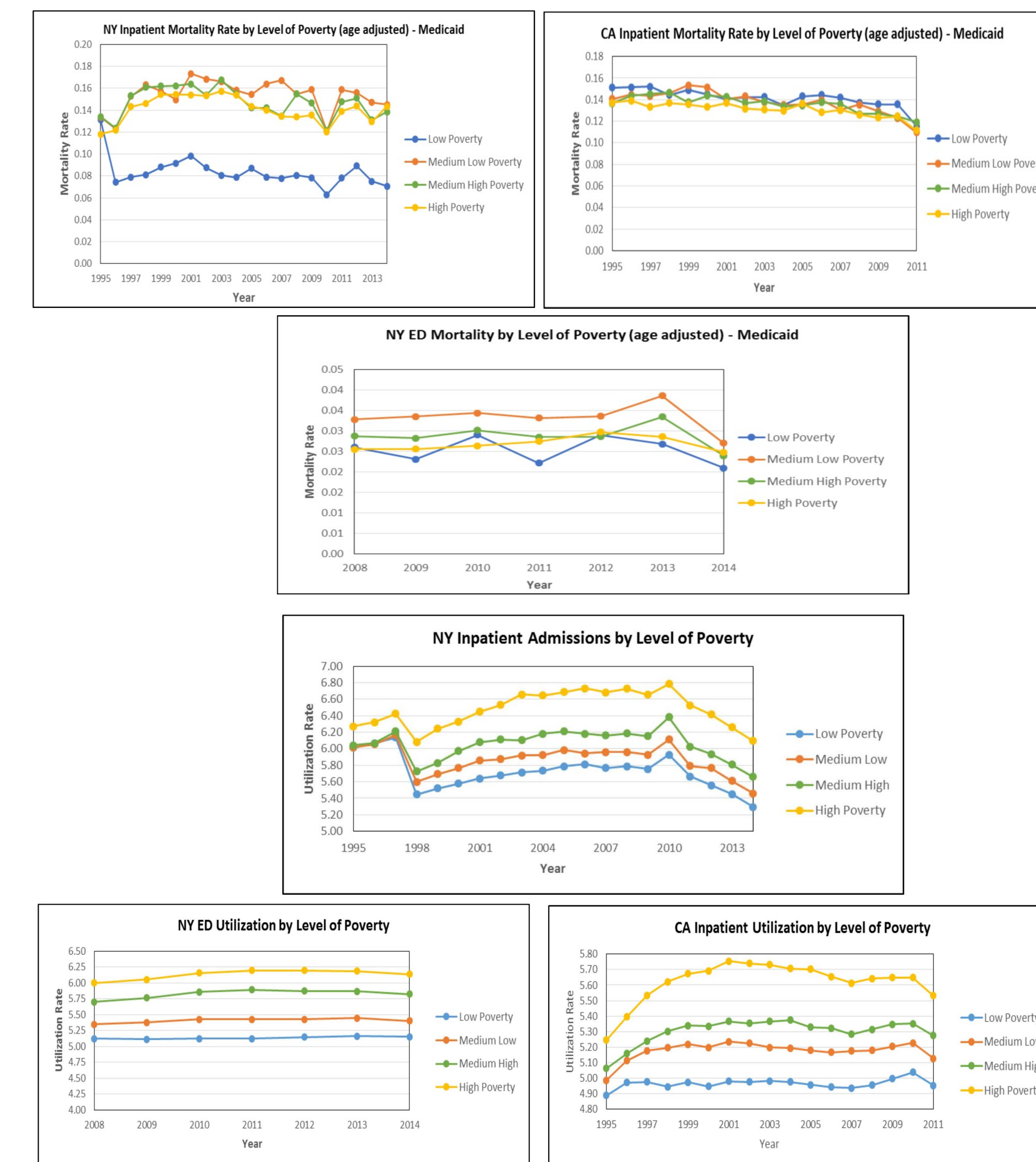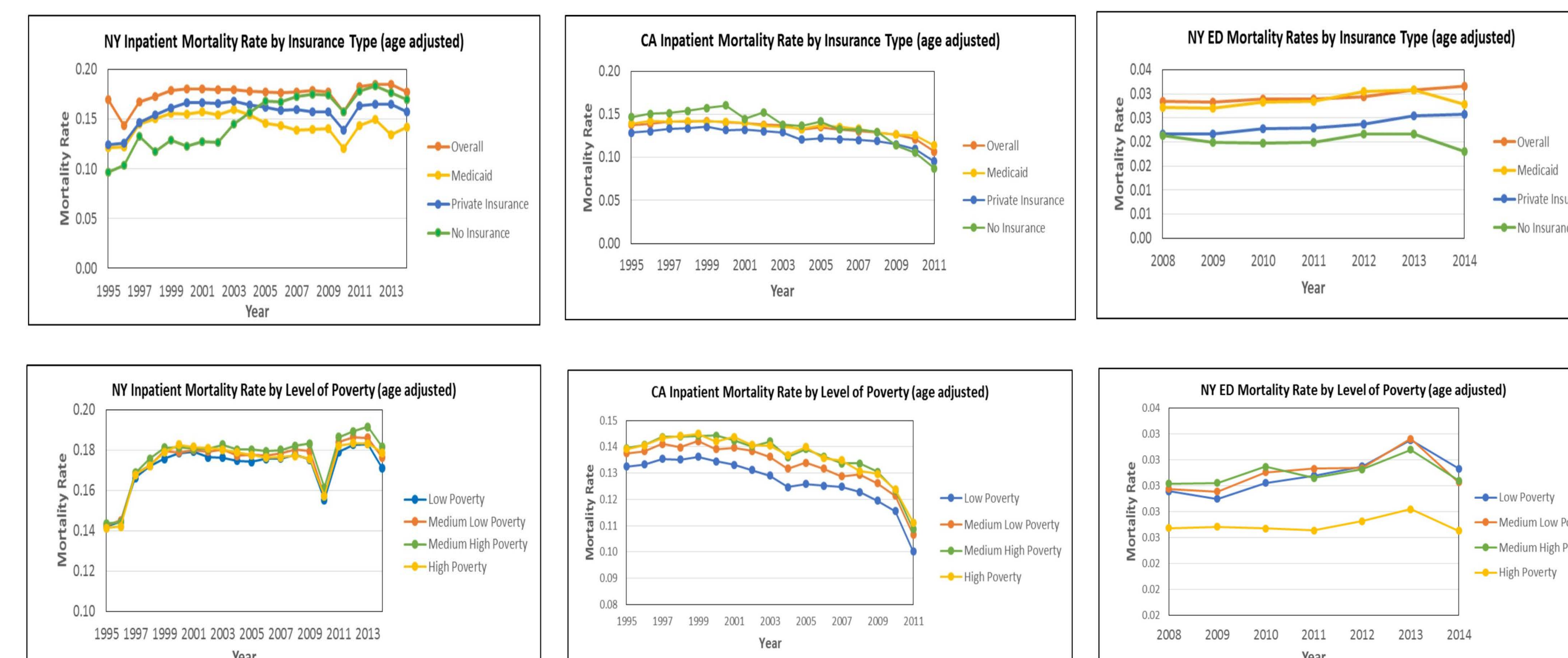
Conclusion and Discussion

- Most prior studies show an association between health insurance and improved health outcomes, with increased healthcare utilization
  - Socioeconomic factors including SDH influence health outcomes, but more studies are needed to examine the effects on care utilization

- Our preliminary results show that private health insurance and living in low poverty regions are associated with lower mortality rates while having Medicaid may improve mortality, among those living in high poverty regions.

- Care utilization rates are greatest among those with Medicaid or living in high poverty regions.

- Further work is underway to examine differences in mortality and utilization by levels of SDH and health insurance.

Limitations

- Dataset does not include primary care visits, resulting in lack of ability to account for the effect of preventive care on health outcomes.

- Hospitalized population may be sicker and have higher utilization of care, leading to higher mortality.

- Social determinants were assigned at the ZIP code, not individual