Predictors of Survival after a Diagnosis of Dementia

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"Reflections" Photo Series

Tom Hussey (photographer)

https://www.tomhussey.com/

CHAO Laboratory
Community Health & Aging Outcomes

Graduate Research Assistants

Data Sources and Linkages

Publicly Available Data

- Area Deprivation Index (ADI) Census Block Group/Neighborhood Level
- Alternative measures of socioeconomic status and social determinants of health
- State policies and programs associated with upstream or present day care of older adults and other special populations

Working Towards →

CMS (Medicare) – Restricted Data

- Beneficiary summary
- MedPAR
- Chronic conditions
- Assessment
- Hospice

- 9-digit zip code history
- Death
- Dementia Diagnosis
- Chronic conditions history

Person-level health care utilization and trajectory of care file:
Health insurance, functional status & caregiver involvement during hospital swing bed, inpatient rehab, nursing home, home health & hospice stays
+ Historical data on chronic conditions & social determinants of health
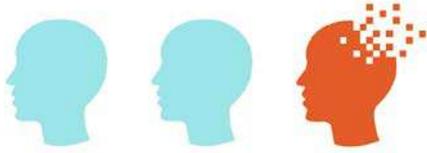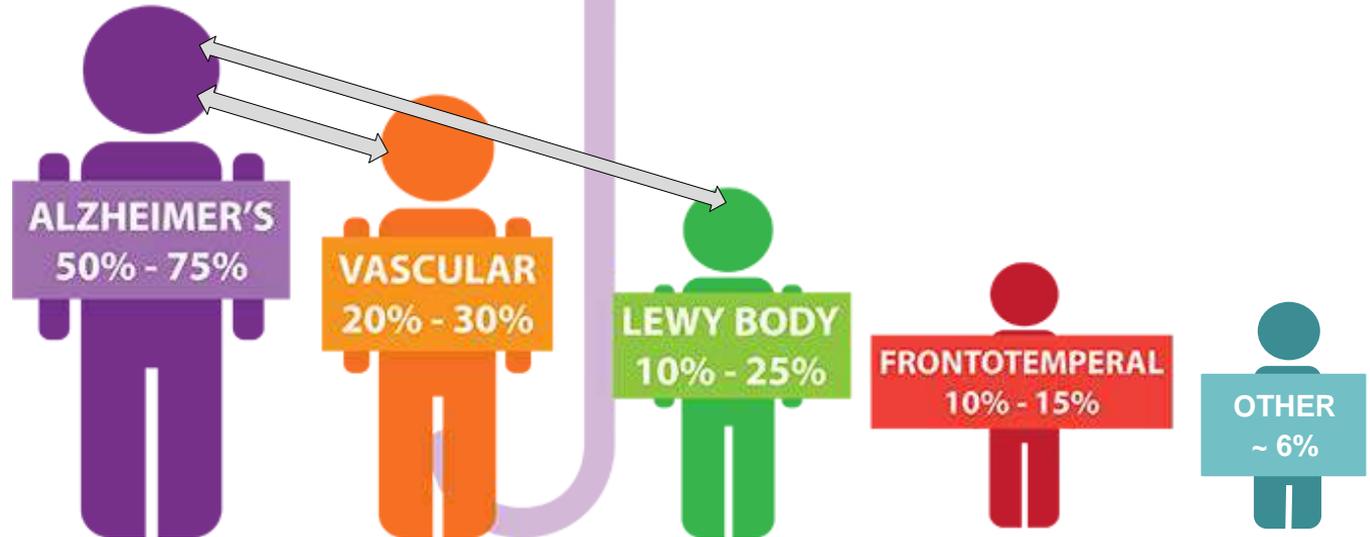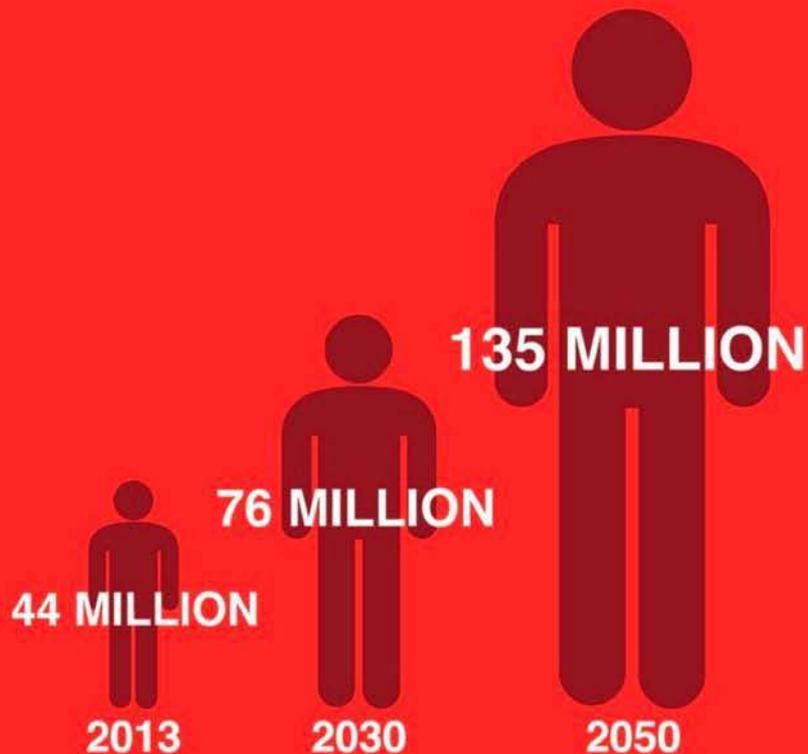
Study Population: U.S. Medicare 2013
65+ at time of first dementia diagnosis

| N = 4,349,565	White	Asian/PI	Black	Hispanic
Number (population)	3,456,373	125,944	442,402	324,846
Female, percent	65.2	64.2	66.8	65.2
Survival, years ($\bar{x}$, interquartile range)	5.3, 2.4-7.7	5.6, 2.3-7.6	5.7, 2.6-8.4	5.9, 2.7-8.7
Age at diagnosis ($\bar{x}$, s.d.)	80.0 (7.8)	78.8 (7.7)	77.8 (7.9)	77.5 (7.6)

Age distribution at time of diagnosis

Legend:
- 90+
- 85-89
- 80-84
- 75-79
- 70-74
- 65-69

White   Asian/PI   Black   Hispanic
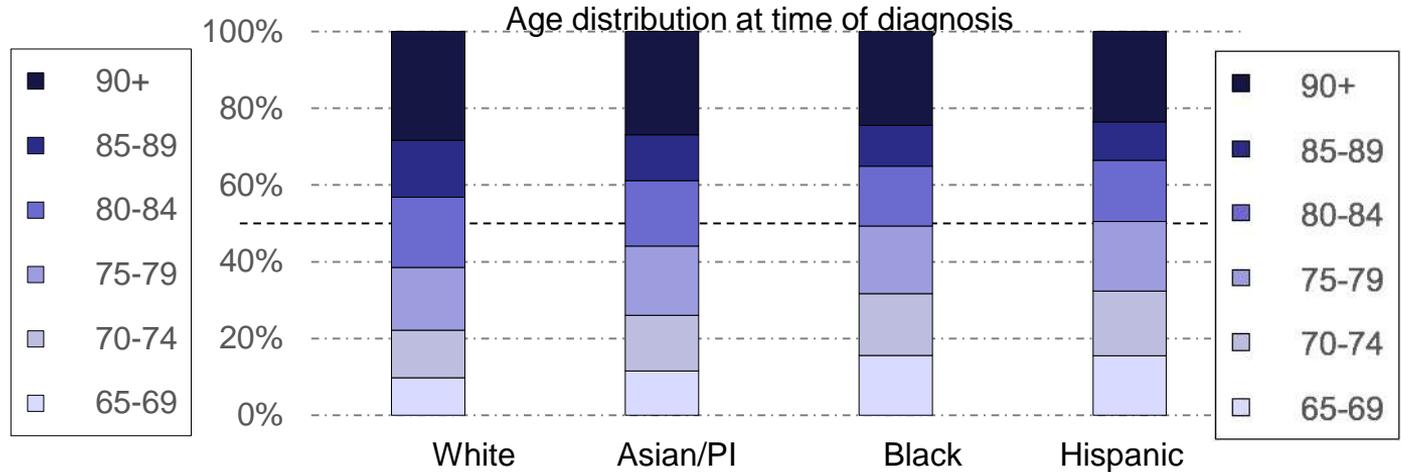
Survival Probability by Race/Ethnicity (RTI)

Logrank p <.0001

Hispnc
Asn/PI
Black
White
AmInd

¿Hispanic Paradox or
Latino Mortality Advantage?

Survival Probability

Years since first diagnosis with dementia
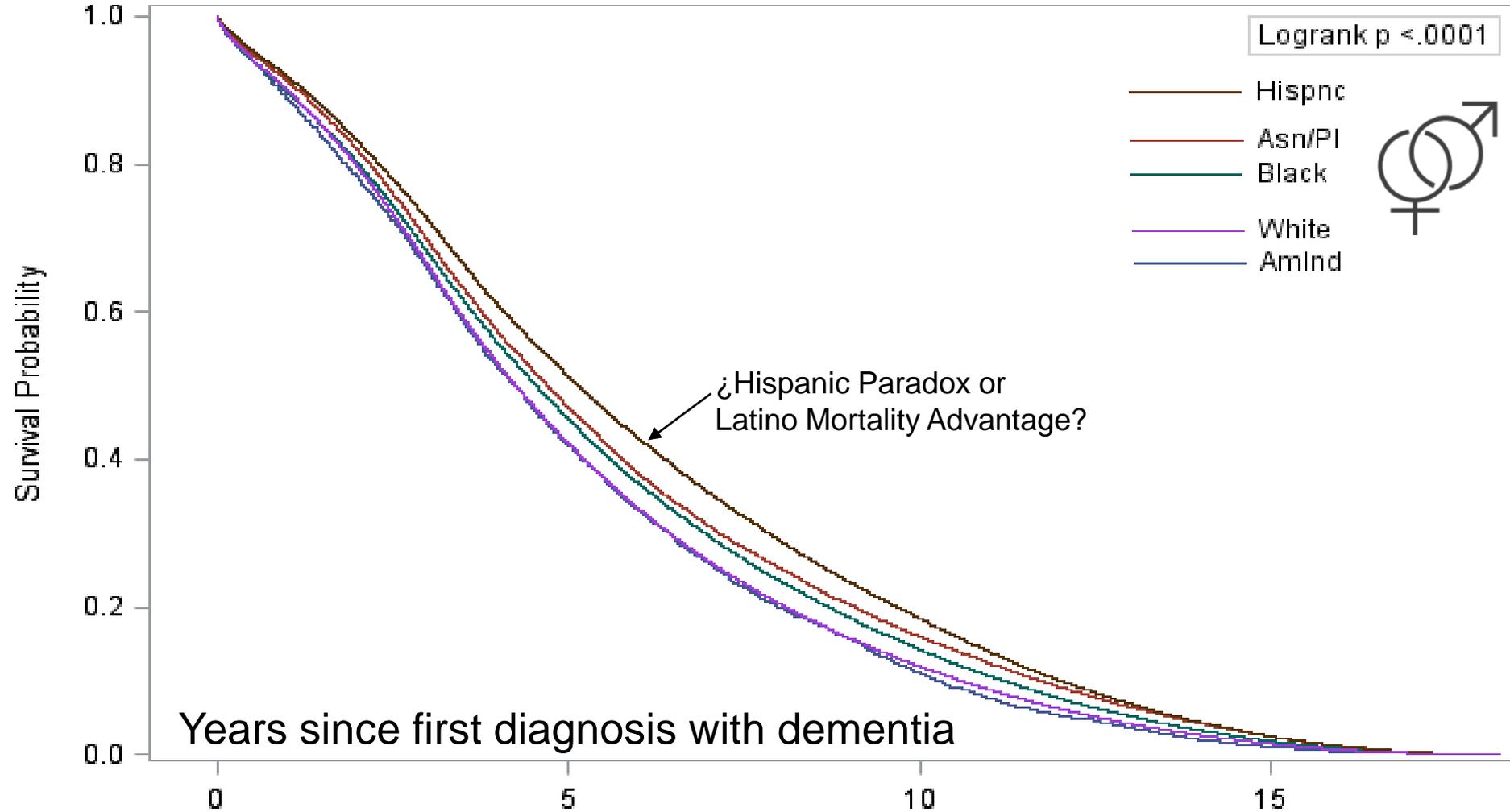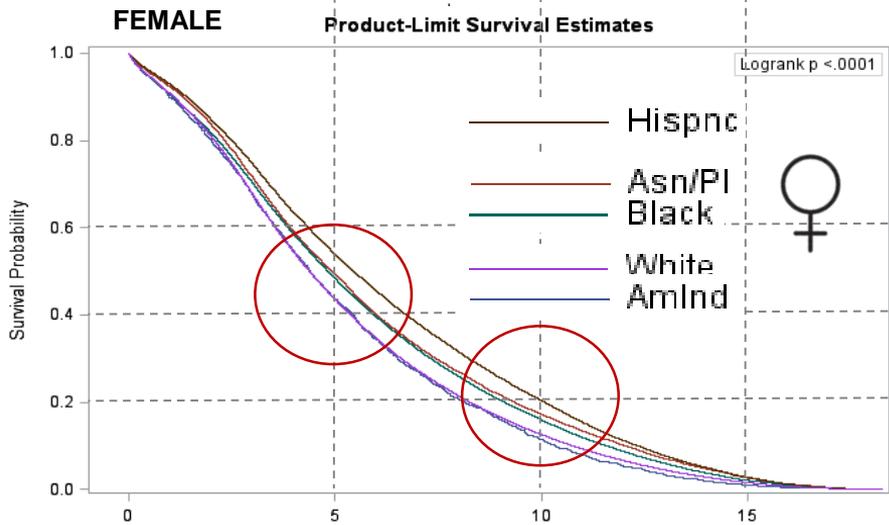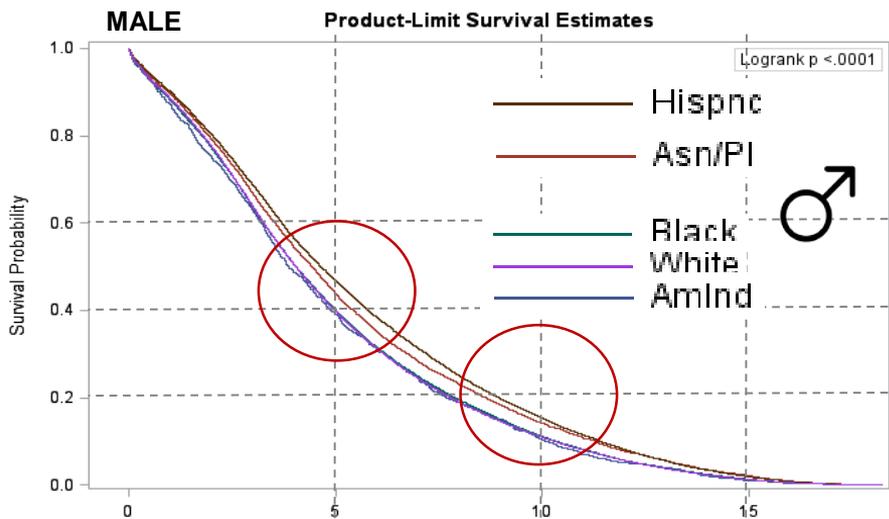
Can you spot the differences?

Hazard Ratios for Comorbidities

Stratified by Sex, Fully Adjusted Models (race, age, State, ADI)

Stroke/TIA		
Cataract		
Hypothyroid		
Depression		
Chronic Obstructive Pulmonary Disease		
Acute Myocardial Infarction		
Congestive Heart Failure		
Hypertension		
Chronic Kidney Disease		
Anemia		
Diabetes		
Hyperlipidemia		
Obesity		
Peripheral Vascular Disease		

Note: 2013 national data, 10% random sample; ***$p < 0.001$

About the 2013 Area Deprivation Index (ADI)
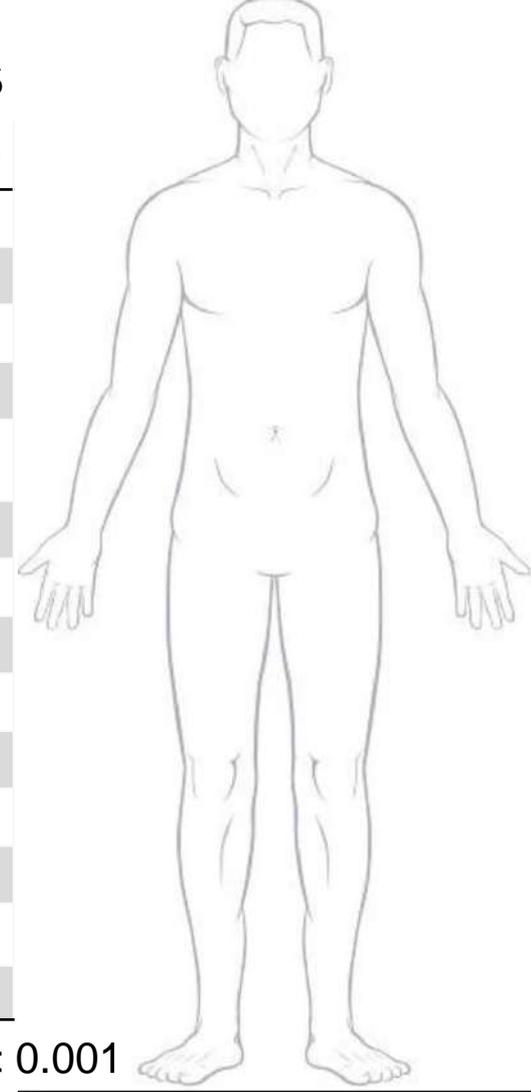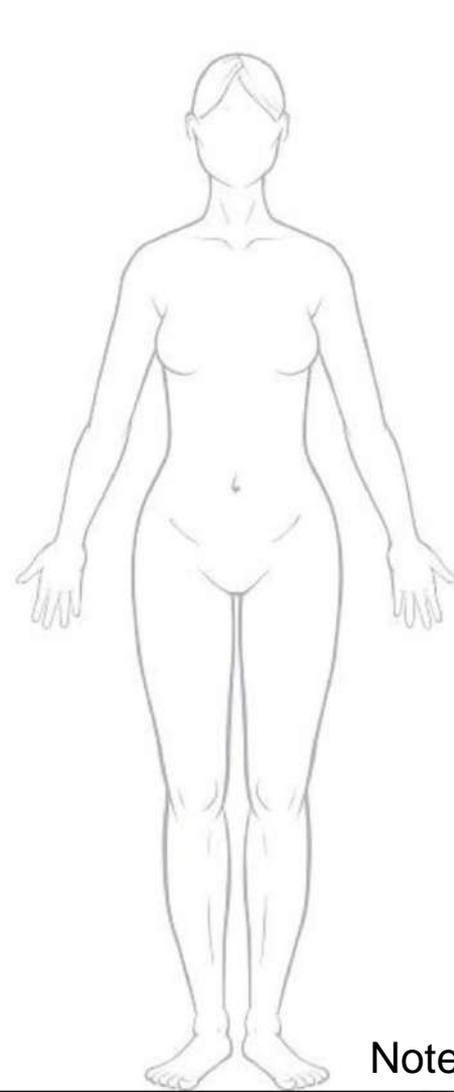
The Area Deprivation Index (ADI) is based on a measure created by the Health Resources & Services Administration (HRSA) over two decades ago for primarily county-level use, but refined, adapted, and validated to the Census block group/ neighborhood level by **Amy Kind, MD, PhD** and her research team at the University of Wisconsin-Madison. It allows for rankings of neighborhoods by socioeconomic status disadvantage in a region of interest (e.g. at the state or national level). It includes factors for the theoretical **domains of income, education, employment, and housing quality**. It can be used to inform health delivery and policy, especially for the most disadvantaged neighborhood groups.

2013 Area Deprivation Index (ADI) National vs. State Versions

Decile 1 (Least Disadvantaged)

Decile 10 (Most Disadvantaged)
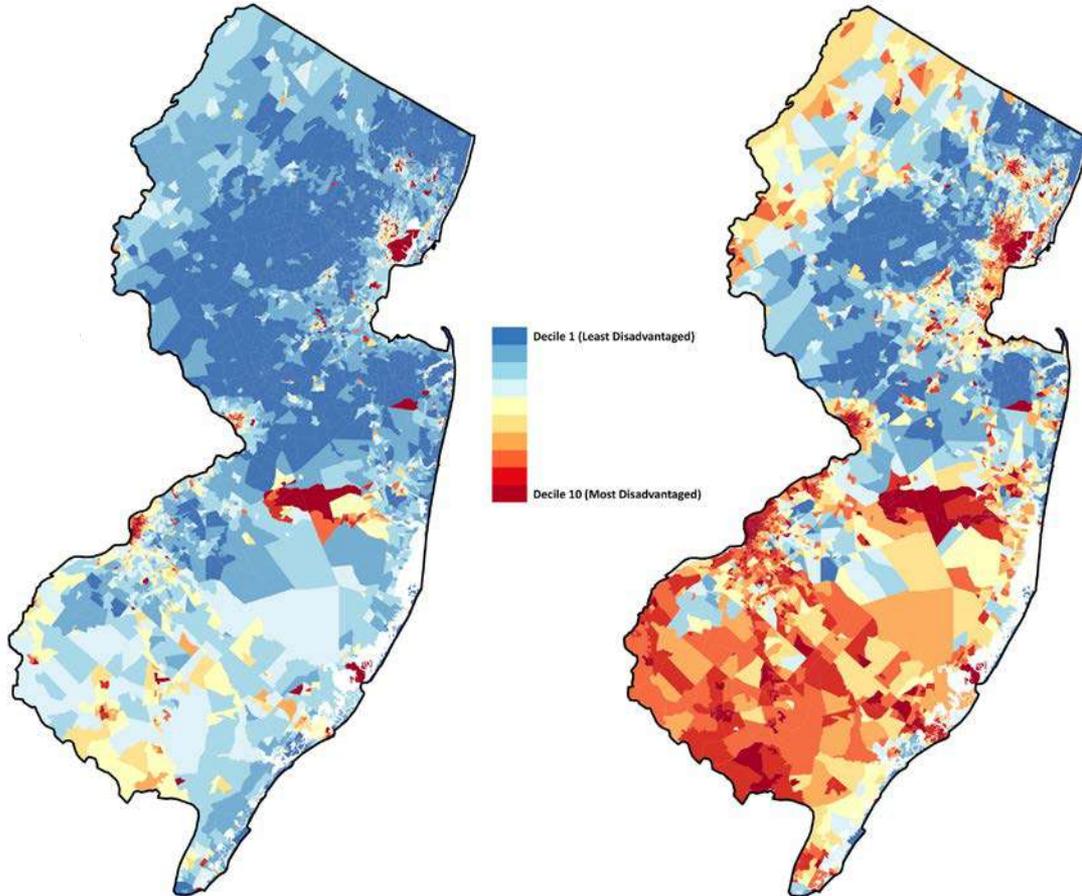
Is Central Jersey a Real Place?

Survival Probability across SES at time of Dementia Diagnosis
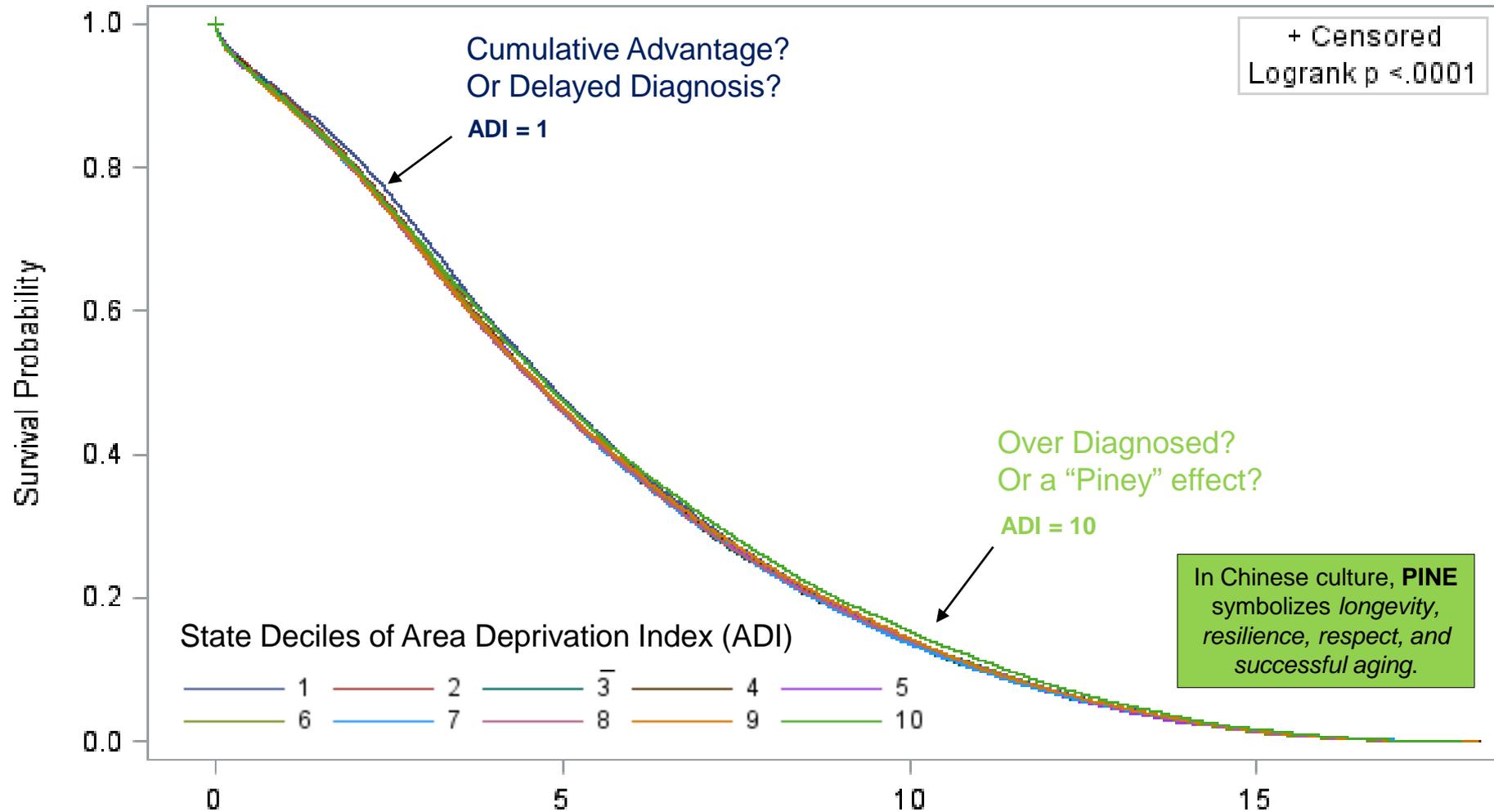
Hazard Ratios for State Effects – Fully Adjusted Models

Reference Group (CA)

Legend:
- 0.87–0.91
- 0.96–1.04
- 1.04–1.07
- 1.09–1.11
- 1.13–1.16
- 1.18–1.20
- 1.25

Created with mapchart.net ©
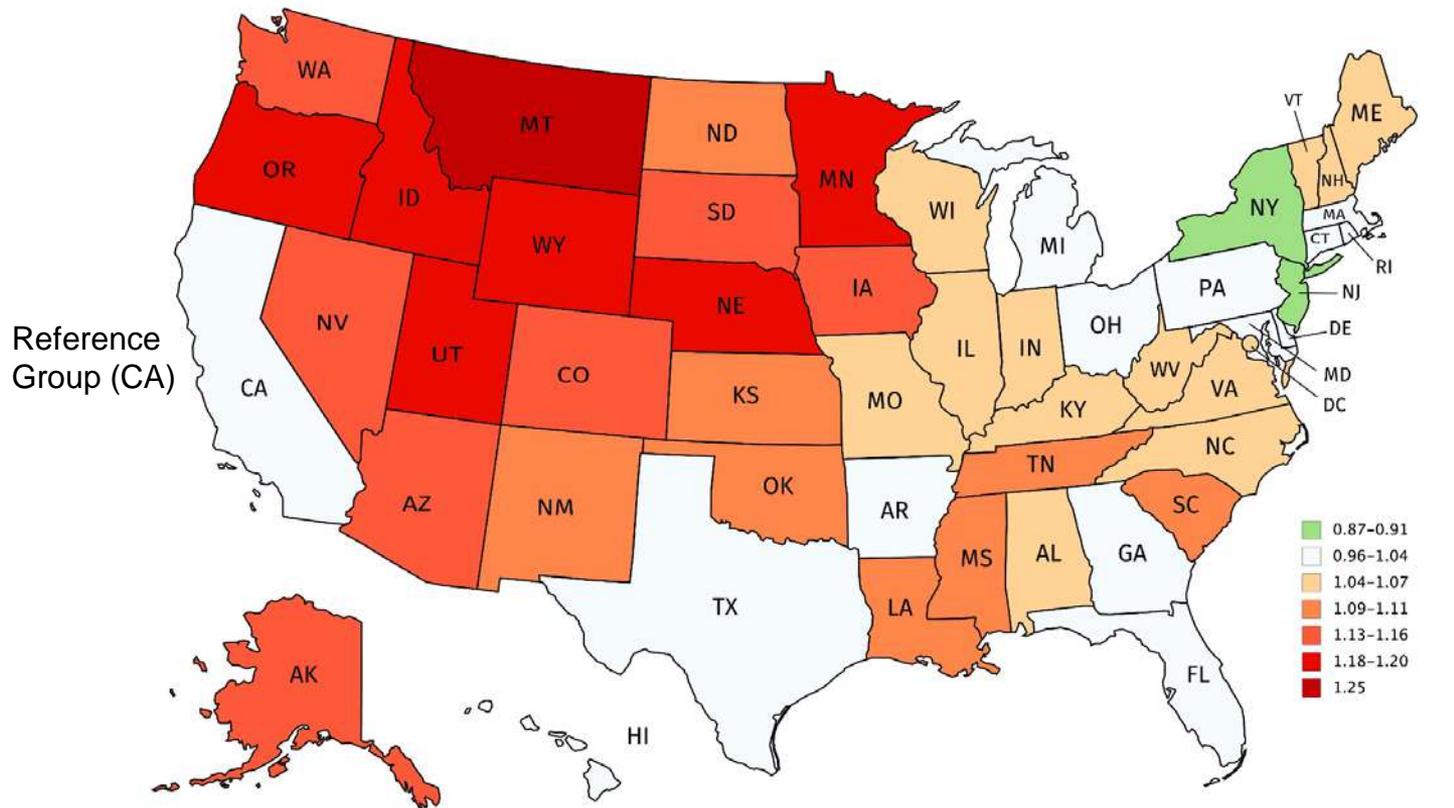
Variation in Survival across Race & Ethnicity (RTI)

Hazard Ratios, Fully Adjusted Models (demographics, comorbidities, ADI, State)					
	Race	+Sex, Age	+CCW	+ADI^2	+State
Black	0.90***	0.94***	0.92***	0.92***	0.92***
Hispanic	0.86***	0.89***	0.83***	0.83***	0.83***
Asian	0.91***	0.90***	0.91***	0.91***	0.91***
Male		1.27***	1.24***	1.24***	1.24***
AIC (Model Fit)					

Note: 2013 national data, 10% random sample; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Variation in Survival across Sex, Race & Ethnicity (RTI) Stratified by Age at Diagnosis with Dementia

| Hazard Ratios, Fully Adjusted Models (comorbidities, State, ADI)				
Age	**Male**	White	**Black**	**Hispanic**	**Asian**
65-69	1.20***	(ref)	1.00	0.925*	1.02
70-74	1.28***	(ref)	1.05*	0.908***	0.91
75-79	1.32***	(ref)	1.02	0.919***	0.95
80-84	1.34***	(ref)	0.95**	0.967	0.92*
85-89	1.35***	(ref)	0.85***	0.896***	0.92*
90+	1.14***	(ref)	0.87***	0.839***	0.92**

Note: 2013 national data, 10% random sample; *p < 0.05, **p < 0.01, ***p < 0.001

Variation in Survival across Race & Ethnicity, Stratified by Sex

Hazard Ratios, Stepped Models (demographics, +++)			
	+Comorbidities	+ADI^2	+State
Black Male	0.97*	0.97*	0.97*
Black Female	0.90***	0.90***	0.91***
Hispanic Male	0.91***	0.91***	0.91***
Hispanic Female	0.88***	0.88***	0.88***
Asian Male	0.89***	0.89***	0.89***
Asian Female	0.86*	0.96*	0.96*

Note: 2013 national data, 10% random sample; *p < 0.05, **p < 0.01, ***p < 0.001

Variation in Health Services Utilization, Last Year of Life by Race/Ethnicity for People Living with Dementia
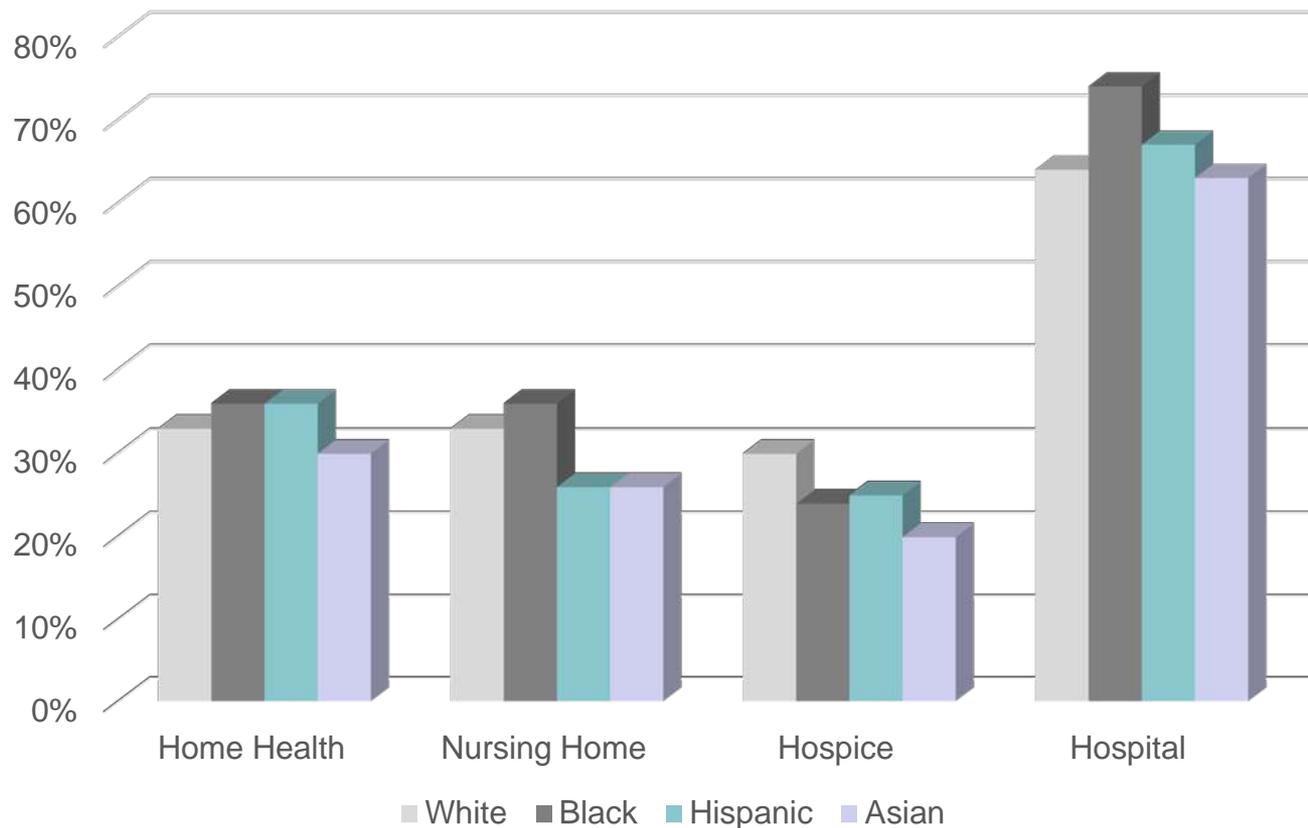
Variation in Survival across Use of Home Health, Stratified by Sex

|	+Comorbidities	+ADI^2	+State	+Home Health
Black Male	0.97*	0.97*	0.97*	
Black Female	0.90***	0.90***	0.91***	
Hispanic Male	0.91***	0.91***	0.91***	
Hispanic Female	0.88***	0.88***	0.88***	
Asian Male	0.89***	0.89***	0.89***	
Asian Female	0.86*	0.96*	0.96*	
Home Health (Males)				
Home Health (Females)				

Note: 2013 national data, 10% random sample; *p < 0.05, **p < 0.01, ***p < 0.001

Variation in Survival across Sex & Age at time of Diagnosis, Stratified by Race & Use of Home Health Care

	White	+HH	Black	+HH	Hispanic	+HH	Asian	+HH
Hazard Ratios, Fully Adjusted Models (comorbidities, State, ADI) (+ Home Health)								
Male	1.29***		1.36***		1.29***		1.17***	
70-74	0.88***		0.91***		0.89***		0.85***	
75-79	0.96***		0.97***		1.00		0.90***	
80-84	1.21***		1.14***		1.26***		1.13***	
85-89	1.66***		1.47***		1.70***		1.59***	
90+	1.63***		1.36***		1.48***		1.51***	

Next Steps
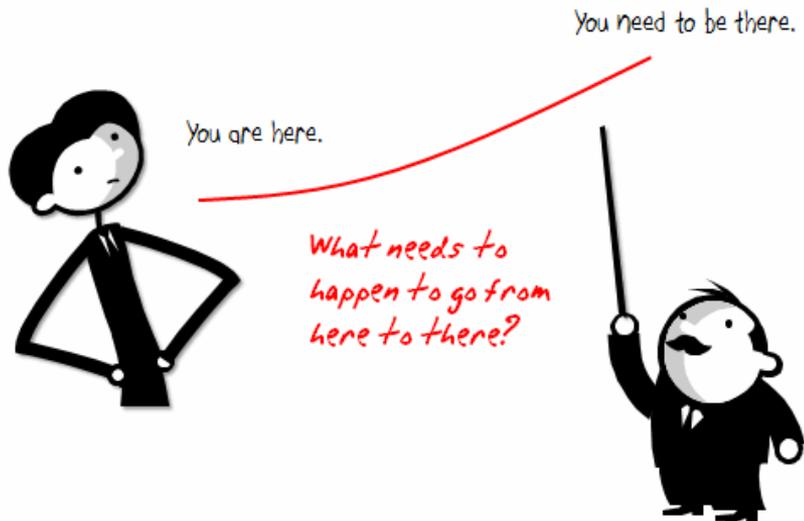
1. Build person-level trajectory files of health service utilization over multiple years for people living with dementia

2. Complete supplemental work to build state health policy library database related to healthy aging
(data enrichment at state level)

3. Complete supplemental work to impute ethnicity detail based on residential history & self-reported race
(data enrichment at person level)

4. Complete supplemental work on social determinants of health
(contextual data enrichment at person level)

Next Leaps –
Seeking Collaborators

Adding focus on people living with dementia and HIV/AIDS (long time survivors and people diagnosed after age 65) *team forming now

Your Ideas - What else could we do?
(with you!)

Wish List

1. Assessments to complete trajectory file (Hospital Swing Beds & Inpatient Rehabilitation) ($10K/yr x 4 years= $40K)

2. National Death Index Data ($10K/yr x 10 years = $100K)

3. Funding for Trajectories of Dementia Care Project ($750K/yr x 4 years = $3M)

4. Funding for Trajectories of Care Center *Multi-Project* ($3M/yr x 5 years = $15M)

Thank you!

Follow Olga Jarrín Montaner and the Community Health and Aging Outcomes Laboratory on Twitter

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