PENNSTATE *Social Science*
RESEARCH INSTITUTE

Untangling the Associations between Physical Health , Health Care System Distrust, and Self-rated Health for the Elderly: A GWR Approach

Tse-Chuan Yang
Stephen A. Matthews
The Pennsylvania State University

PENNSTATE POPULATION RESEARCH INSTITUTE

Outline

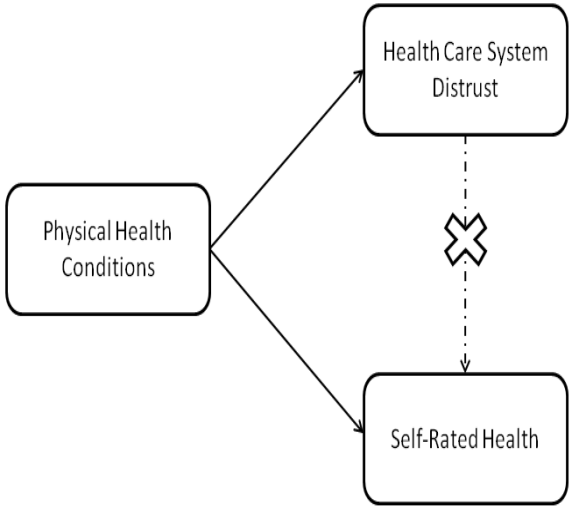
- Introduction
  - Shortcomings in the literature
  - Theoretical significance and hypotheses
- Research design and methods
  - Methodological significance
  - Data, measures, and modeling
- Spatial and non-spatial analytic results
- Conclusions

Introduction

Shortcomings in the Literature

- Health care system distrust
  - New development in recent years
- Lack of spatial perspective
  - Global and single level models
- Physical health is an imperative but overlooked factor.

Theoretical Significance and Main Hypotheses



- Health care system distrust varies locally and its association with self-rated health varies across space.
- Physical health is a shared determinant of self-rated health and health care system distrust.

PENNSTATE *Social Science*
RESEARCH INSTITUTE

Design and Methods

Data: The Philadelphia Health Management Corporation's 2008 Survey of the elderly

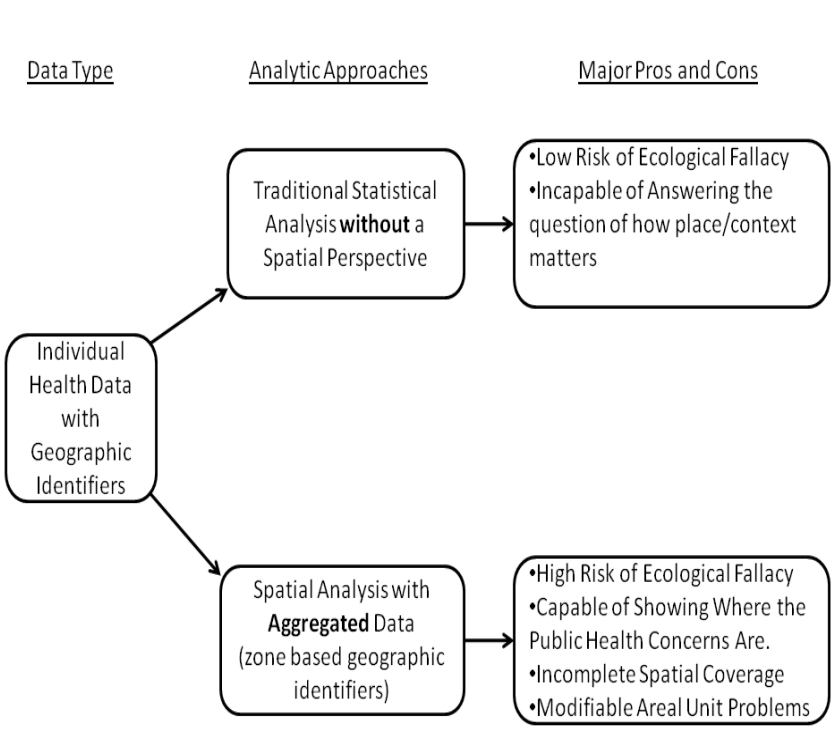
Areas: Bucks, Chester, Delaware, Montgomery, and Philadelphia County.

Total Participants: 3,257

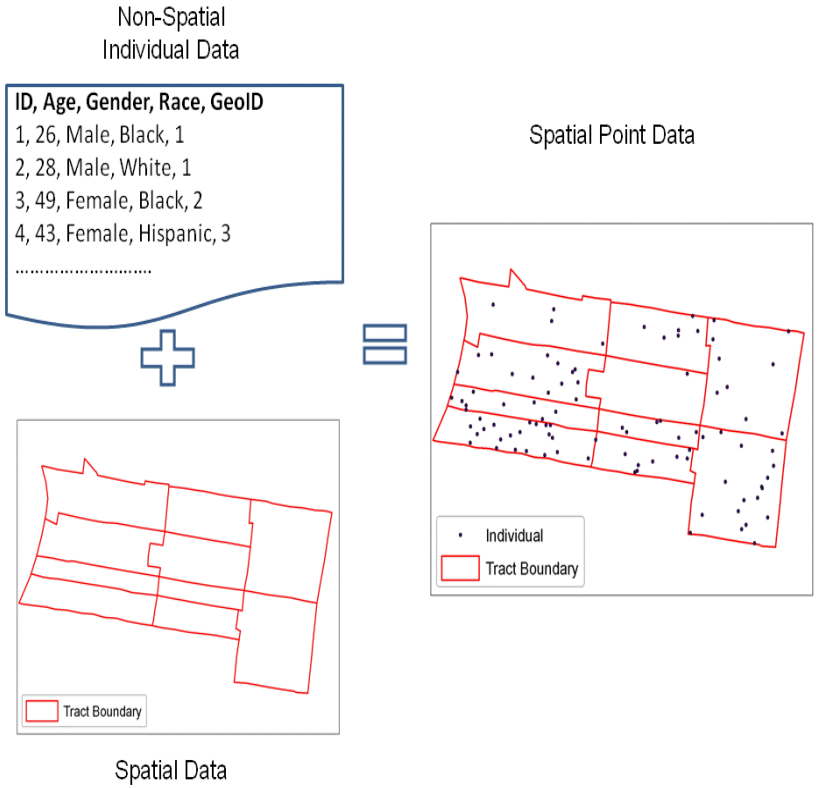
PENNSTATE POPULATION RESEARCH INSTITUTE

Methodological Significance

Traditional Approach



New Approach



Measures (I)

- Self-rated health: a dichotomous variable
  - Excellent/good vs. fair/poor
- Health care system distrust: A nine-item scale developed in 2008. The factor score is used in the analysis.
- Demographic variables: gender, age, race, and marital status

Measures (II)

- Socioeconomic variables: poverty, employment status, and educational attainment
- Physical health: chronic diseases, high blood cholesterol, depression (10 items), and instrumental activities of daily living (IADL, 7 items).

Analytic Strategy

- Non-spatial analysis
- Descriptive spatial analysis: cartography
- Global and geographically weighted logistic regression methods:
  - Showing the global model results and mapping the GWR estimates

$$\log\left(\frac{y_i}{1-y_i}\right) = \beta_{0i}(u_i, v_i) + \sum_{n=1}^{k} \beta_{ni}(u_{i,} v_i) x_{ni}$$

PENNSTATE *Social Science*
RESEARCH INSTITUTE

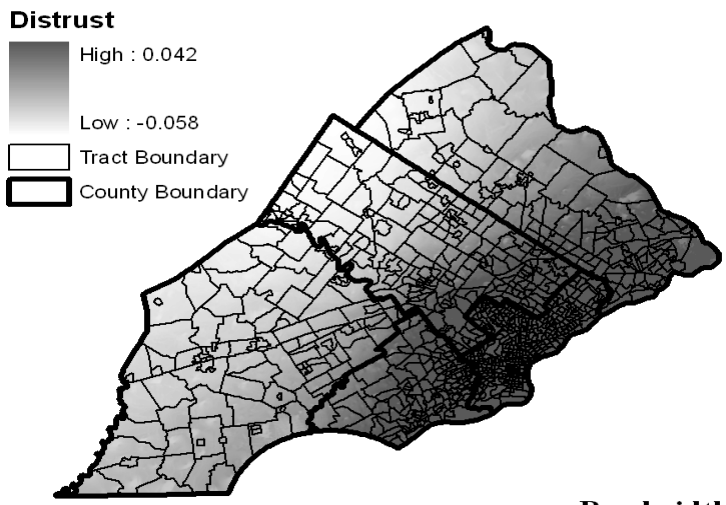
Analytic Results

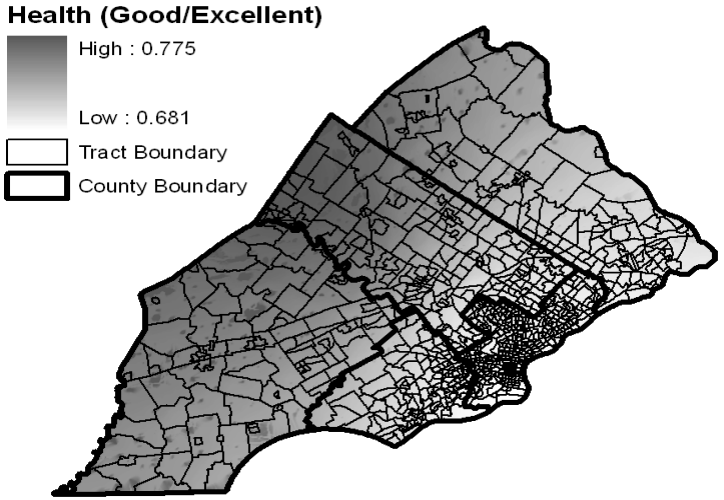
PENNSTATE POPULATION RESEARCH INSTITUTE

Non-Spatial Descriptive Results

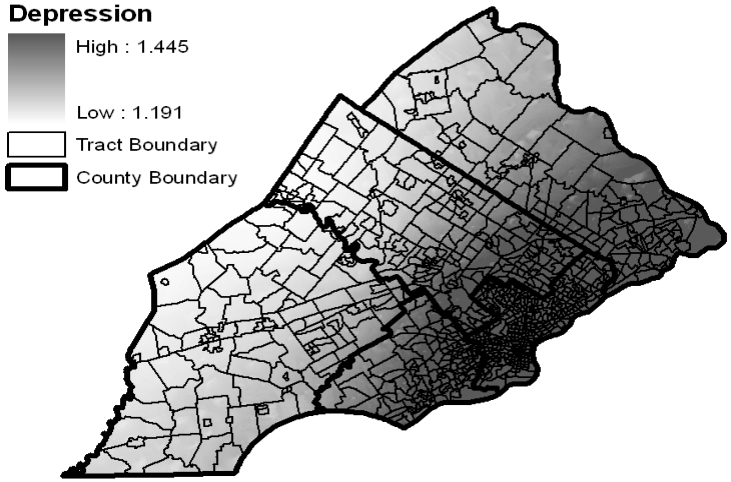
	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable				
Health Care System Distrust	-2.15	2.19	.00	.71
Demographic Variables				
Gender (1=males)	0.00	1.00	.33	.47
Age	60.00	100.00	70.84	8.26
Race (1=black, 0=non-black)	0.00	1.00	.19	.40
Marital Status (ref=single)				
Married	0.00	1.00	.44	.50
Widowed	0.00	1.00	.30	.46
Divorced	0.00	1.00	.11	.31
Socioeconomic Variables				
Poverty (1=poor, 0=non-poor)	0.00	1.00	.07	.26
Employment (1=employed)	0.00	1.00	.26	.44
Educational Attainments				
High School Diploma	0.00	1.00	.39	.49
Some College	0.00	1.00	.18	.38
Associate/Bachelor	0.00	1.00	.17	.38
Post-college	0.00	1.00	.13	.34
Physical Health Conditions				
Chronic Diseases (1=yes, 0=no)	0.00	1.00	.33	.47
High Blood Cholesterol	0.00	1.00	.45	.50
Depression Symptoms	0.00	10.00	1.34	1.83
IADL	0.00	7.00	.48	1.10

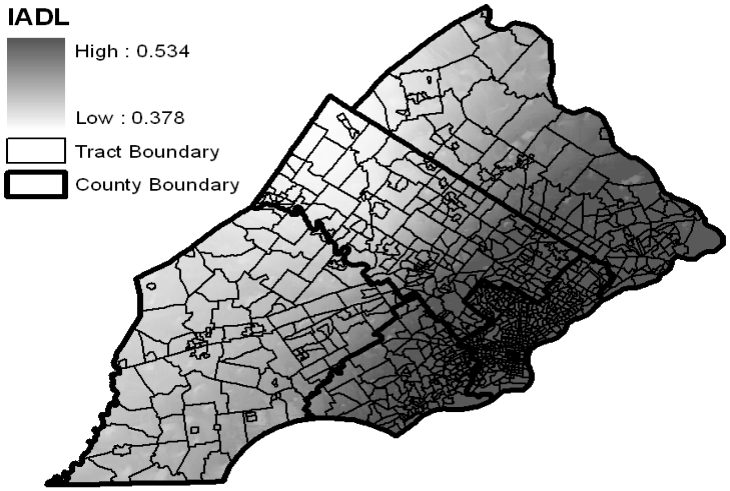
Spatial Descriptive Results (III)





Bandwidth=3,000





Auxiliary Findings

- As the bandwidth increased, the highest distrust score intensified along the southeastern edge of the study area along the Delaware River/New Jersey border.
- Health care system was negatively associated with self-rated health.
- Distrust varies across space.

Global Logistic Models

Significant

Still Significant

Effect Disappears

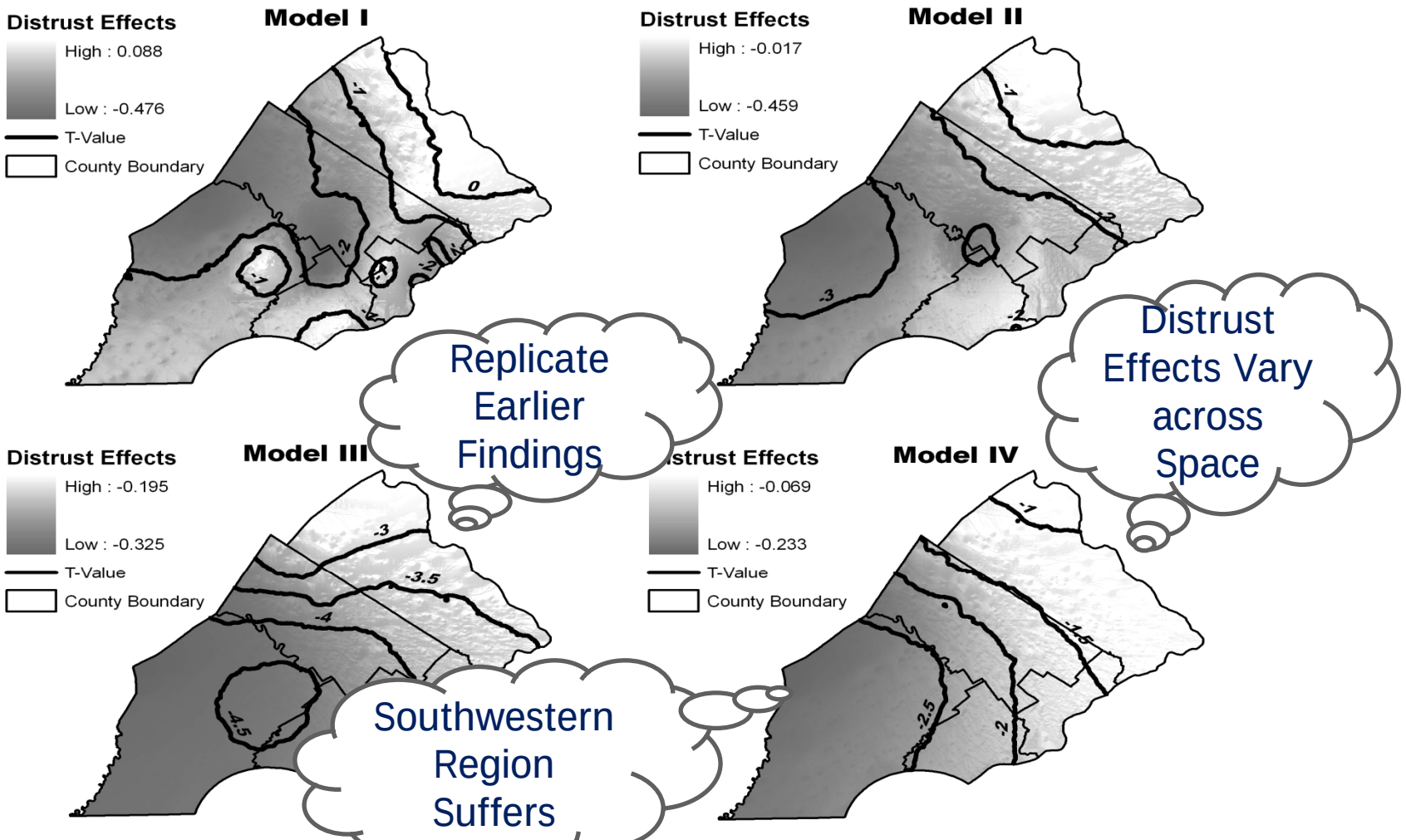
Variable	VIF				Model II Coefficient	S.D. Error							
Constant		0.91		***	1.772	0.358	***	-0.37			0.94		*
Distrust	1.077	-0.247	0.055	***	-0.231	0.057	***	-0.257	0.060	***	-0.125	0.067	
Demographic Variables													
Male	1.094				-0.218	0.087	*	-0.296	0.091	**	-0.419	0.101	***
Age	1.346				-0.012	0.005	*	0.006	0.005		0.007	0.006	
Black	1.110				-0.648	0.095	***	-0.422	0.101	***	-0.435	0.112	**
Married	2.246				0.497	0.116	***	0.340	0.122	**	0.261	0.135	
Widowed	2.280				0.000	0.124		0.028	0.130		0.076	0.144	
Divorced	1.506				0.056	0.151		-0.061	0.159		0.064	0.179	
Socioeconomic Variables													
Poverty	1.117							-0.468	0.148	**	-0.283	0.169	
Employed	1.216							0.973	0.115	***	0.724	0.125	***
High School	2.731							0.554			0.463	0.137	***
Some College	2.209										022	0.166	***
College	2.216										42	0.171	***
Post-college	2.070										46	0.196	***
Physical Health Conditions													
Chronic Diseases	1.089										-1.346	0.093	***
High Blood Cholesterol	1.095										-0.336	0.092	***
Depression	1.179										-0.198	0.025	***
IADL	1.172										-0.414	0.043	***
Global AIC		3885.213			3792.622			3576.221			3032.984		
GWR AIC		3815.938			3762.772			3569.546			3024.299		

* p<.05; ** p<.01; *** p<.001

Confound with Distrust

Great Improvement

GWR Logistic Map



Conclusions and Discussion

Contributions

- We not only replicate the earlier findings but also uncover the role of physical health conditions.
  - Among the elderly, controlling for physical health makes the distrust effect disappear.
- We use spatial randomization to convert non-spatial geocodes into spatial points and implement both traditional and spatial analyses.

Conclusions

- Our study demonstrates the non-stationary associations between health care system distrust and self-rated health.
- Health care system distrust and its effect on self-rated health vary across space.
- Physical health is an antecedent extraneous factor for both health care system distrust and self-rated health.

Caveats

- Longitudinal data are required to further clarify the causality.
- Different measurement of distrust may yield different results.
- More efforts should be made to explore the relationships between distrust and other health outcomes.
- Comparative studies/national data

Thank You!

Questions and Comments