The Ecological Effects of Religion on Health & Mortality in China

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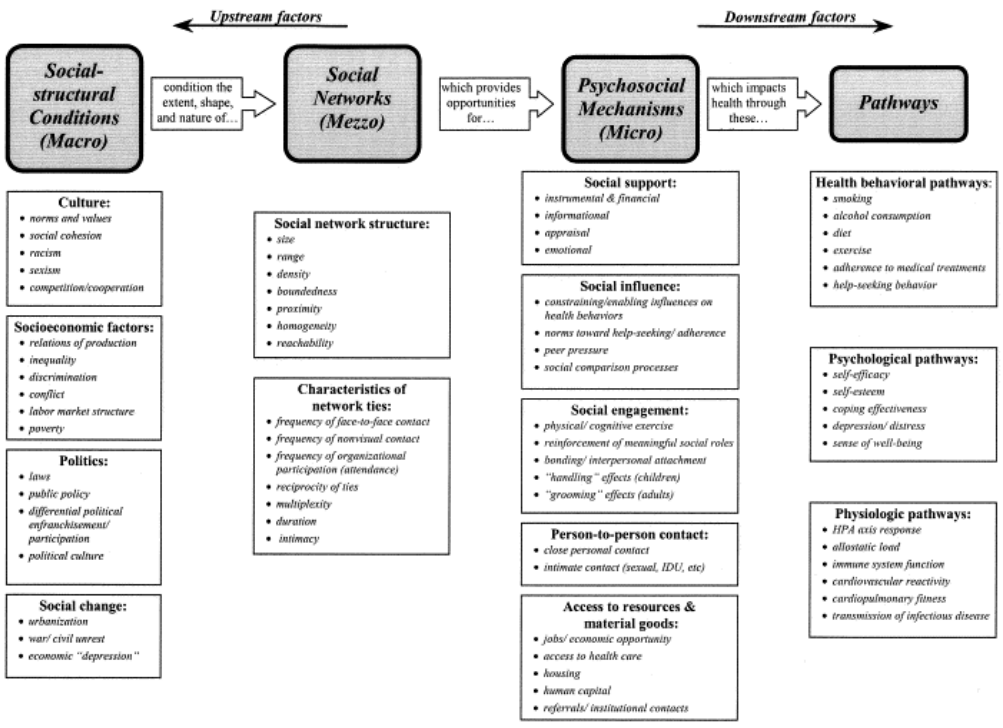
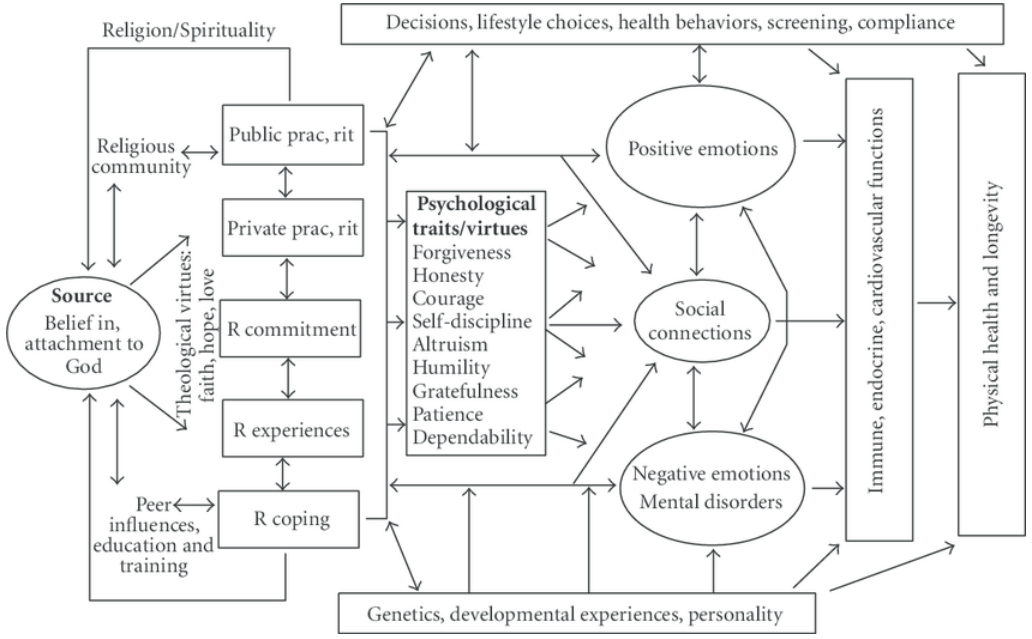
AMAP Brownbag
March 30, 2021

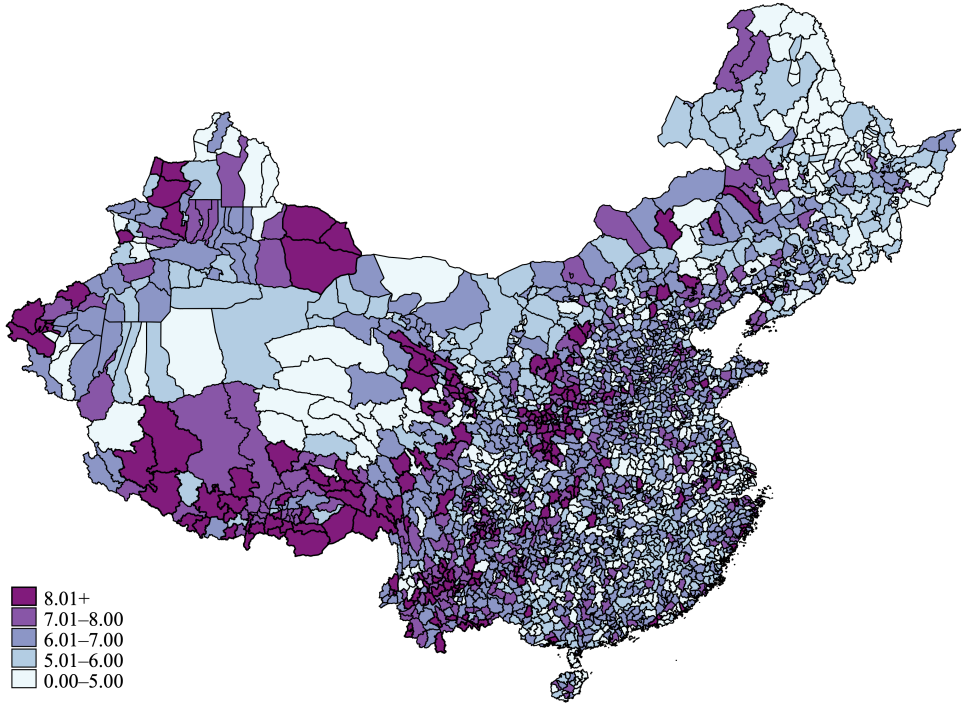


Socio-ecological Model of Place Effects on Health (Berkman et al. 2000)



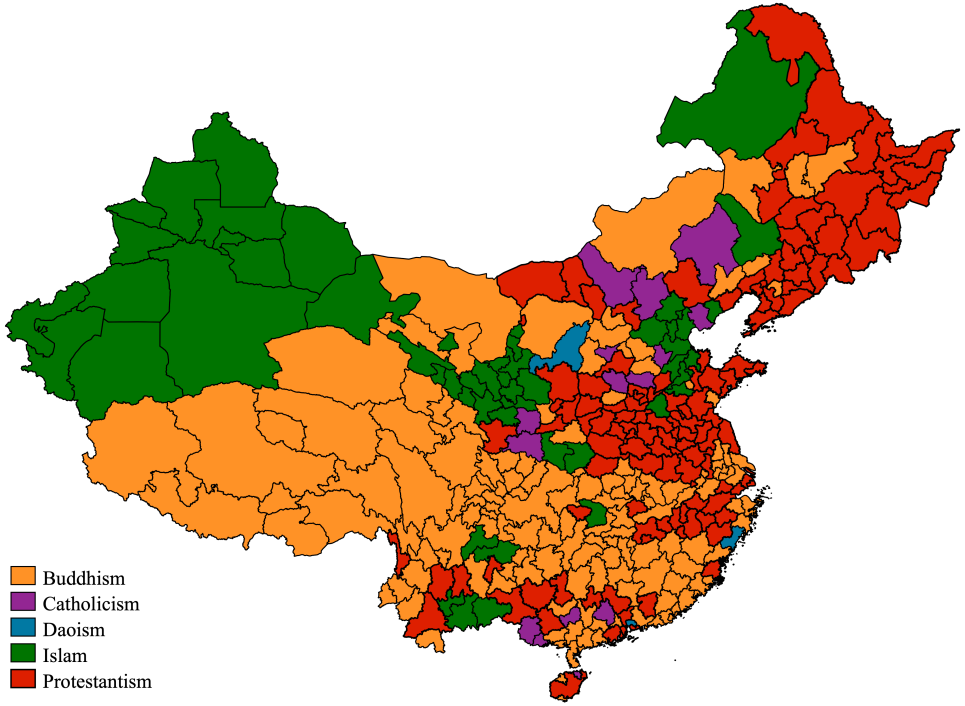
Religion/Spirituality & Physical Health Model (Koenig et al. 2012)

Mortality Rate 2001



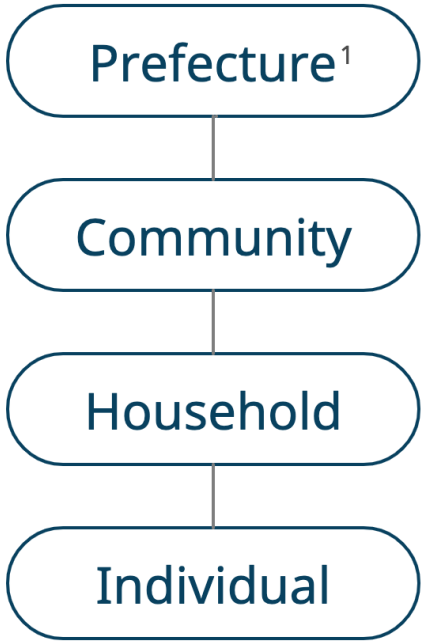
Data Source: China Population Census 2000.

Predominant Religion 2004



Data Source: Online Spiritual Atlas of China (OSAC) 2019 (Yang et al. 2019).

How is the religious environment of Chinese prefectures associated with the self-rated health of middle-age and older adults?



Religious Environment (*n* = 87)
IV: # sites per 10k people for each religion

Community Characteristics (*n* = 175)
Controls: demographics, per capita income

Household Characteristics (*n* = 3,724)
Controls: household income/expenditures

Individual Characteristics (*n* = 5,968)
DV: self-rated health (4 ordered categories)
Controls: religious affiliation, age (45+), marital status, education, employment, hukou, ethnicity

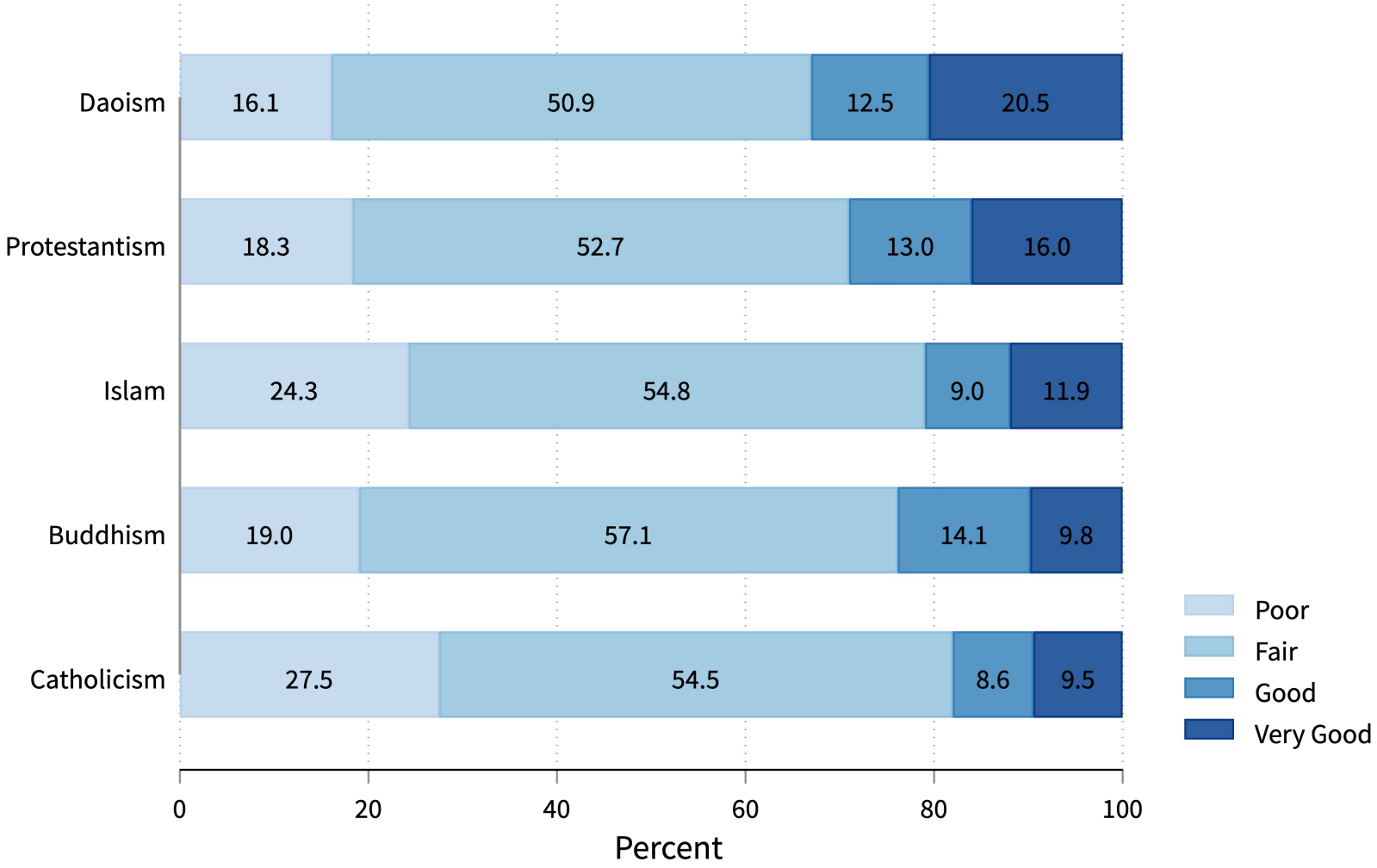
Online Spiritual Atlas of China (2004)[2]

prefecture GB code

China Health and Retirement Longitudinal Study (Wave 3, 2015)[3]

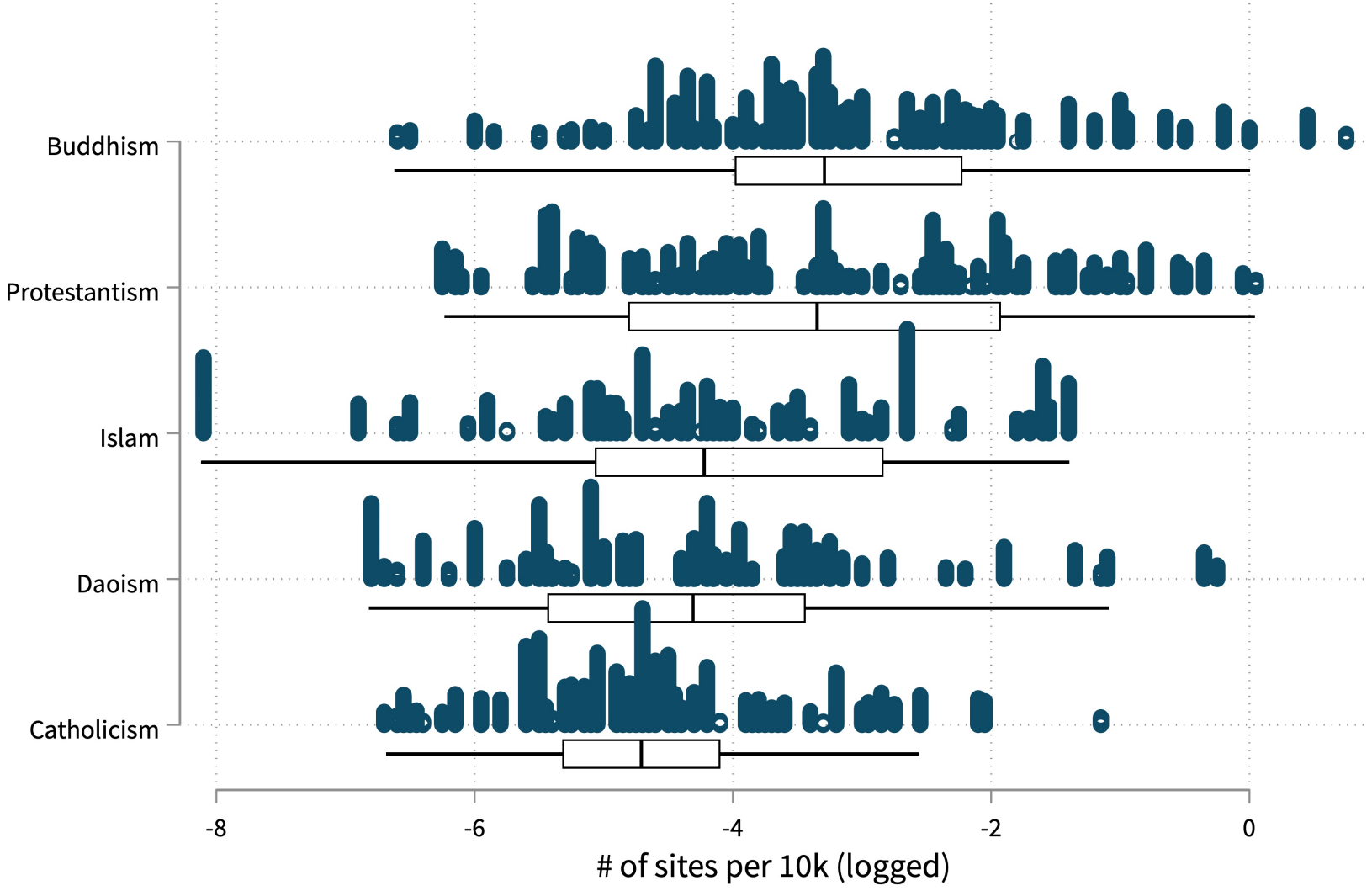
1 Administrative subdivisions of China's provinces
2 Online Spiritual Atlas of China (OSAC) https://purr.purdue.edu/publications/3210/2
3 Individual religious affiliation only measured in 2014 Life History questionnaire; China Health and Retirement Longitudinal Study (CHARLS) http://charls.pku.edu.cn/

Self-rated Health in Prefectures where the Predominant Religion is...



Note: $\chi^2(12, N = 5{,}968) = 83.40$, $p < .001$

Number of Religious Sites in Chinese Prefectures



Mixed-effects Ordered Logistic Regression Models

- Ordered dependent variable (4 categories of self-rated health: poor, fair, good, very good)
  - Brant tests indicates no violation of the parallel regression assumption (i.e., ordered relationship exists between IVs and DV).
- Random intercept models with 4 levels of data (prefecture, community, household, individual)
  - Likelihood-ratio tests indicate that four-level models are preferred over the three-level and two-level models.
  - These models account for the nested/clustered structure of the data.

Variance Components Model

- Intraclass Correlation Coeficient (ICC) = .05
  - Individuals' self-rated health within prefectures are not much more similar to each other than to individuals in other prefectures.

Odds Ratios from Random Intercept Ordered Logit Models Predicting Self-Rated Heath

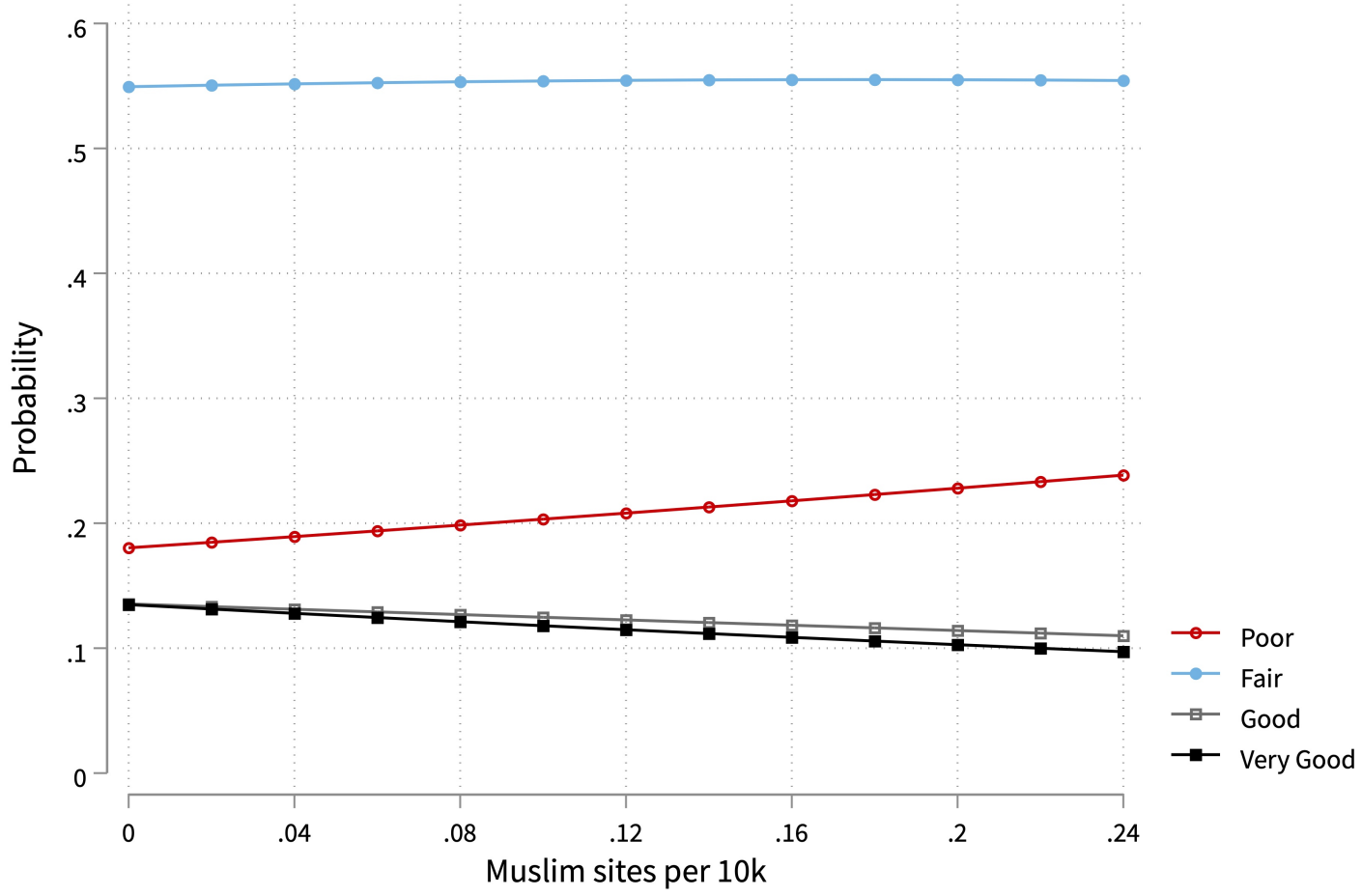
	(1)	(2)	(3)	(4)	(5)	(6)
Fixed Effects						
Buddhist sites/10k	1.133					0.676
	(0.234)					(0.263)
Catholic sites/10k		0.616				0.128
		(1.067)				(0.295)
Protestant sites/10k			1.391			1.545
			(0.406)			(0.585)
Muslim sites/10k				0.220		0.170^{+}
				(0.211)		(0.160)
Daoist sites/10k					2.700*	4.559*
					(1.241)	(3.194)
Random Effects						
Variance Components						
Level 4 Intercept	1.163*	1.169*	1.161*	1.153*	1.147*	1.129*
	(0.0487)	(0.0491)	(0.0478)	(0.0473)	(0.0456)	(0.0424)
Level 3 Intercept	1.019	1.017	1.019	1.020	1.020	1.019
	(0.0265)	(0.0261)	(0.0265)	(0.0267)	(0.0267)	(0.0266)
Level 2 Intercept	2.589*	2.589*	2.589*	2.600*	2.587*	2.602*
	(0.356)	(0.356)	(0.356)	(0.358)	(0.356)	(0.358)
Observations	5968	5968	5968	5968	5968	5968

Odd ratios for fixed components; Standard errors in parentheses; All models include all control variables

$^{+}p < 0.10$, * $p < 0.05$

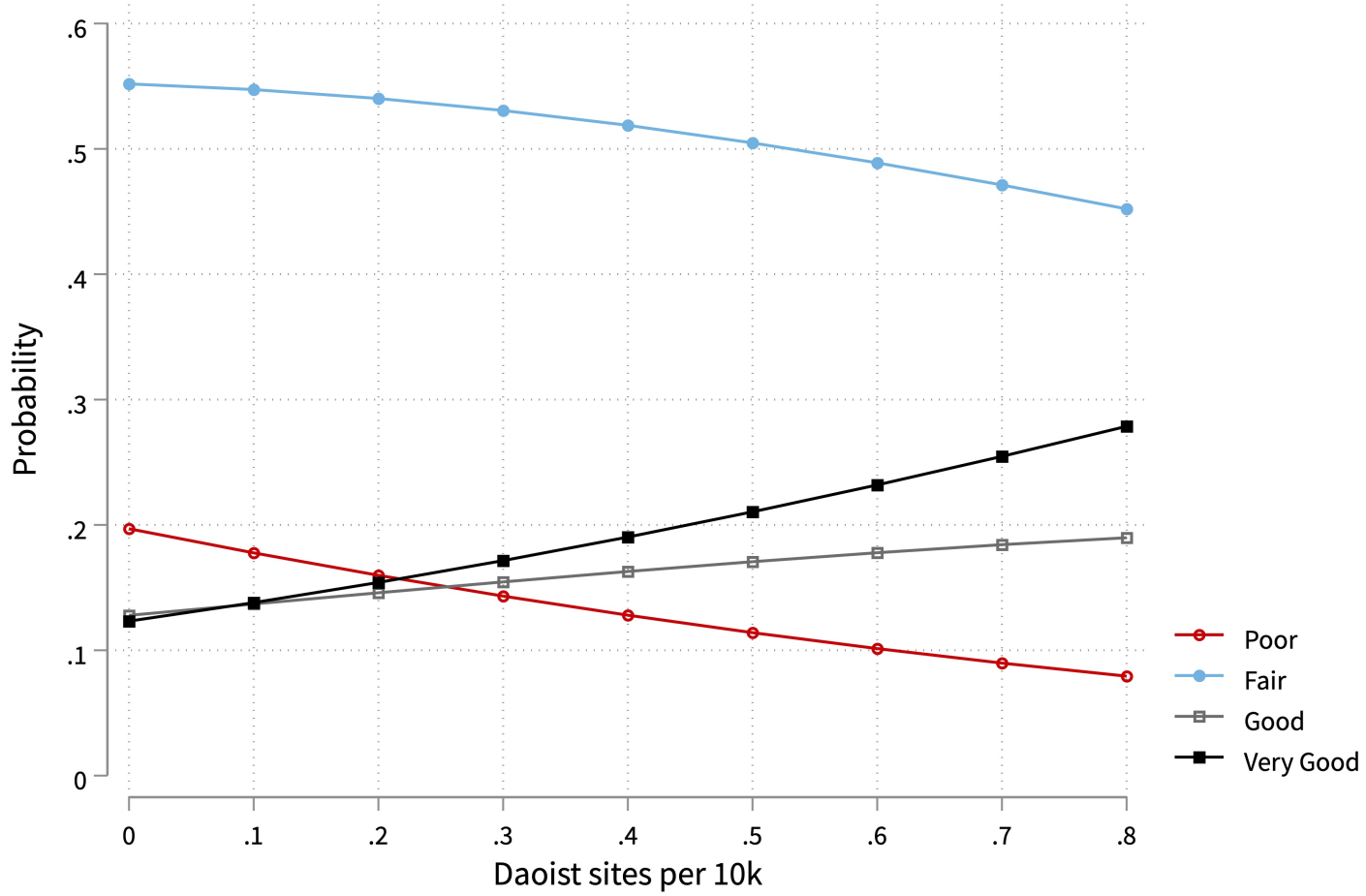
Predicted Probabilities of Self-Rated Heath - Muslim sites

Random Intercept Ordered Logit Model



Predicted Probabilities of Self-Rated Heath - Daoist sites

Random Intercept Ordered Logit Model



Average Marginal Effects of Religious Sites on Self-Rated Health

	Islam	Daoism
	+SD	+SD
Poor	0.015^{+}	-0.022*
Fair	0.003*	-0.007^{+}
Good	-0.007^{+}	0.011*
Very Good	-0.011^{+}	0.019*

Note: $^{+}$ $p < .10$, * $p < .05$; AMEs calculated from Model 6 using observed values.

For each SD increase in Muslims sites per 10k, there is a .015 increase in probability of having **poor** health and a .011 decrease in probability of having **very good** health (both $p < .10$).

For each SD increase in Daoist sites per 10k, there is a .019 increase in probability of having **very good** health and a .022 decrease in probability of having **poor** health (both $p < .05$).

Preliminary Conclusions

Increased concentration of Muslim sites in Chinese prefectures is associated with lower levels of self-rated health among older Chinese adults.

Increased concentration of Daoist sites in Chinese prefectures is associated with higher levels of self-rated health among older Chinese adults.

No evidence that the concentration of Buddhist, Protestant, or Catholic sites is associated with self-rated health among older Chinese adults.

Future Analyses

- Additional measures of health for older adults in CHARLS
    - Scales of functional limitations: Activities of Daily Living (ADLs) & Instrumental Activities of Daily Living (IADLs)
    - Count of Chronic Illnesses
- Different effects by individual religious affiliation?
    - Data limitations: only 8.5% report affiliation (5.8% are Buddhist)
- Mediation analyses to test explanatory mechanisms and social pathways that link these associations (i.e., social support, social participation, health behaviors).
- Spatial dependencies?

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