

# Longitudinal Survey Data in China

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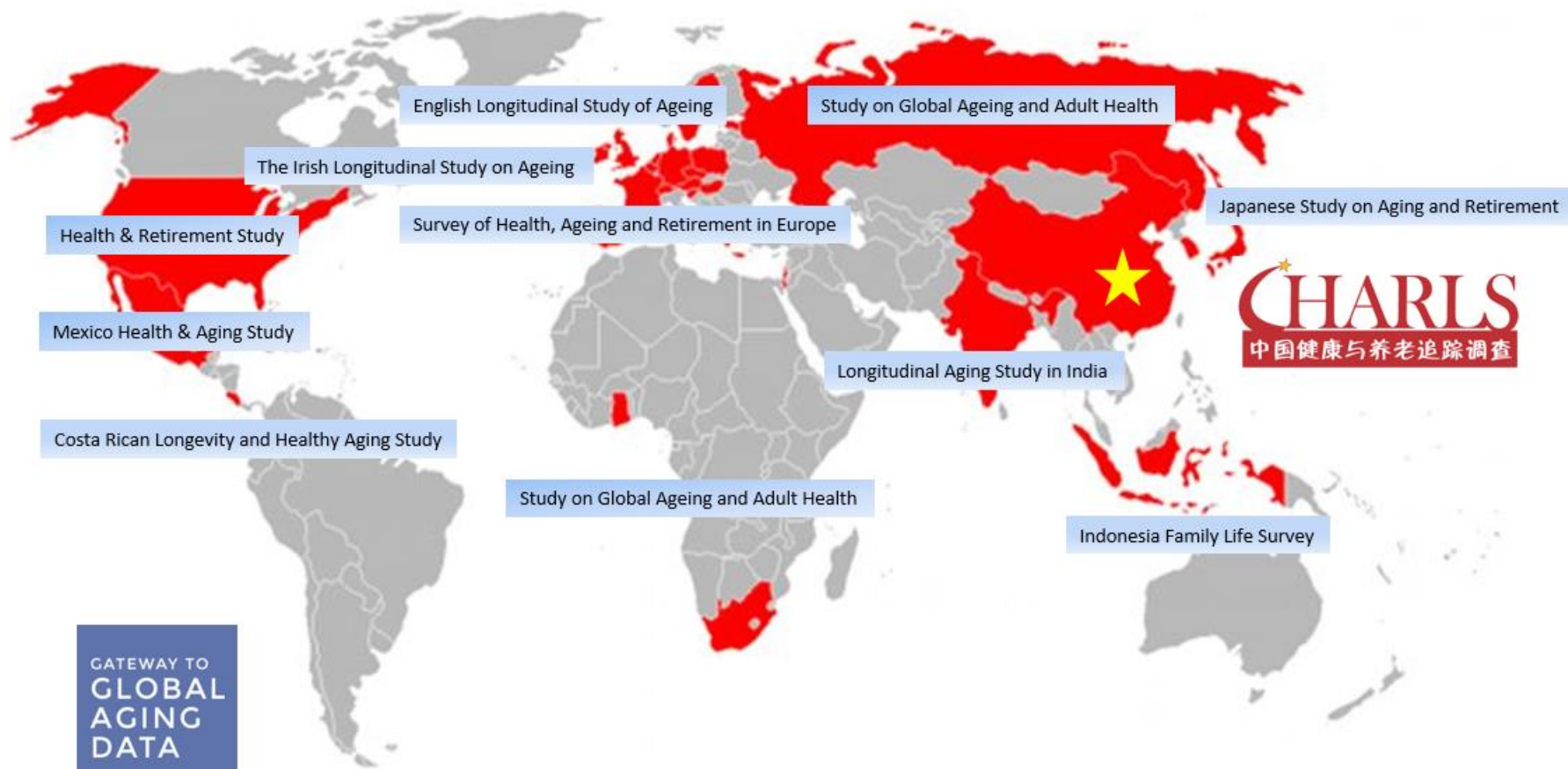
## 1. China Health and Retirement Longitudinal Study

- Overview
- Research Examples

# China Health And Retirement Longitudinal Study

# HRS Sister Studies

## Health and Retirement Studies around the World



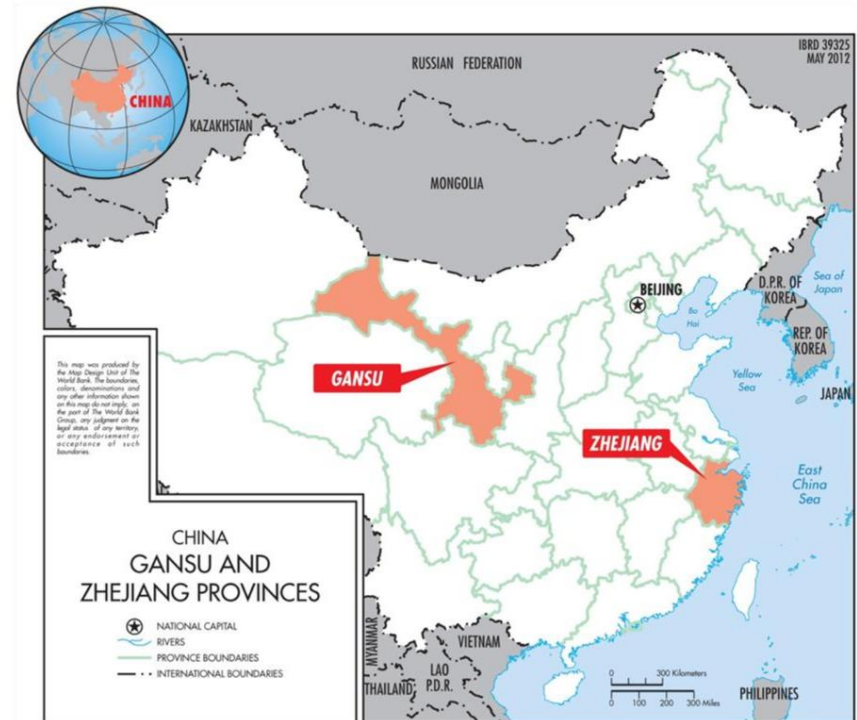
# CHARLS: Design & Target Population

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- Collect a high quality nationally representative sample of Chinese residents to serve the needs of scientific research on the elderly.
- Longitudinal survey
  - Pilot survey in 2008
  - National survey in 2011
- Community-dwelling adults aged  $\geq 45$  years

# CHARLS: Pilot Survey

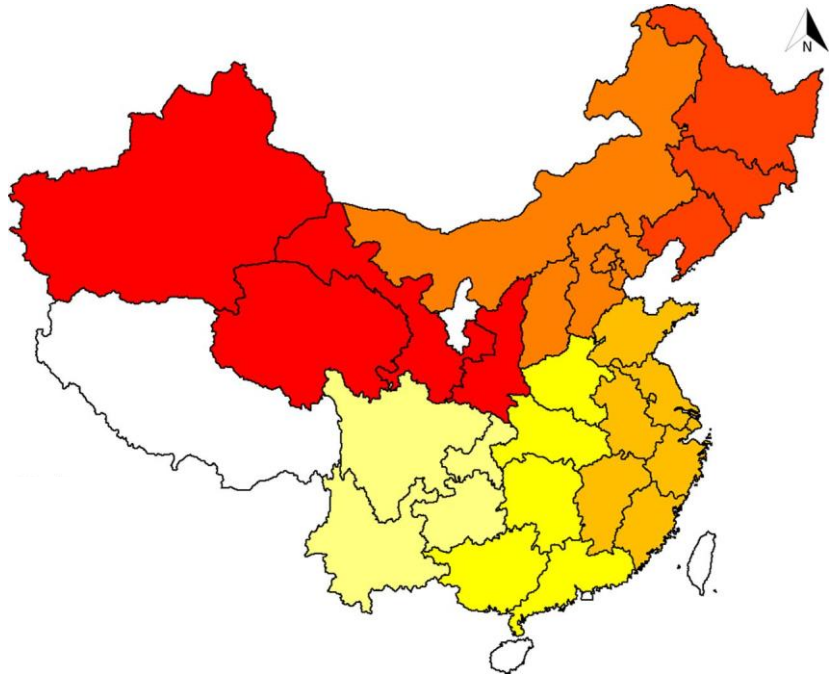
- 2008 (followed in 2012)
- Gansu and Zhejiang
- 32 counties/districts
- 95 communities/villages
- N = 2,685 (1,570 households)
- Response rate: 85%



# CHARLS: National Survey

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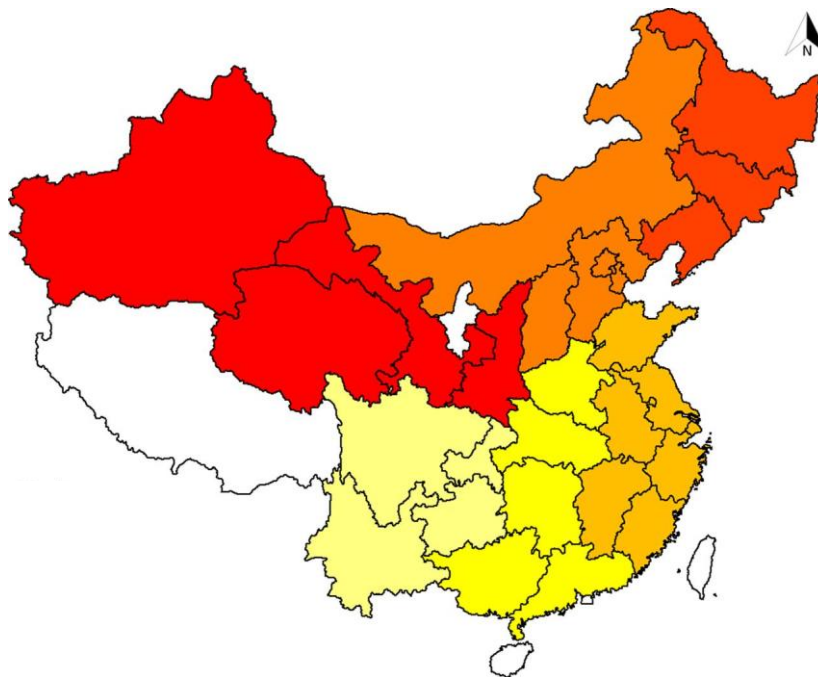
- Baseline: 2011-2012
- Follow-ups: 2013 & 2015
- 28 provinces
- 150 counties/districts
- 450 communities/villages
- N = 17,708 (10,257 households)
- Response rate: 80.5%



# CHARLS: Life History Survey

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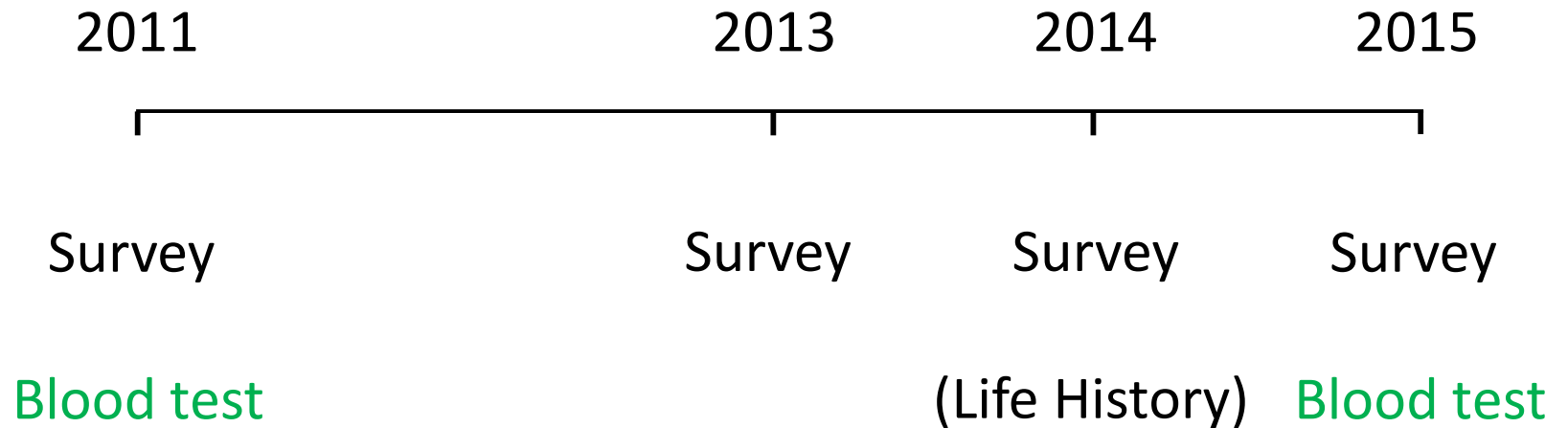
- 2014
- All alive participants in 11 & 13
- Only survey
- N = 20,948





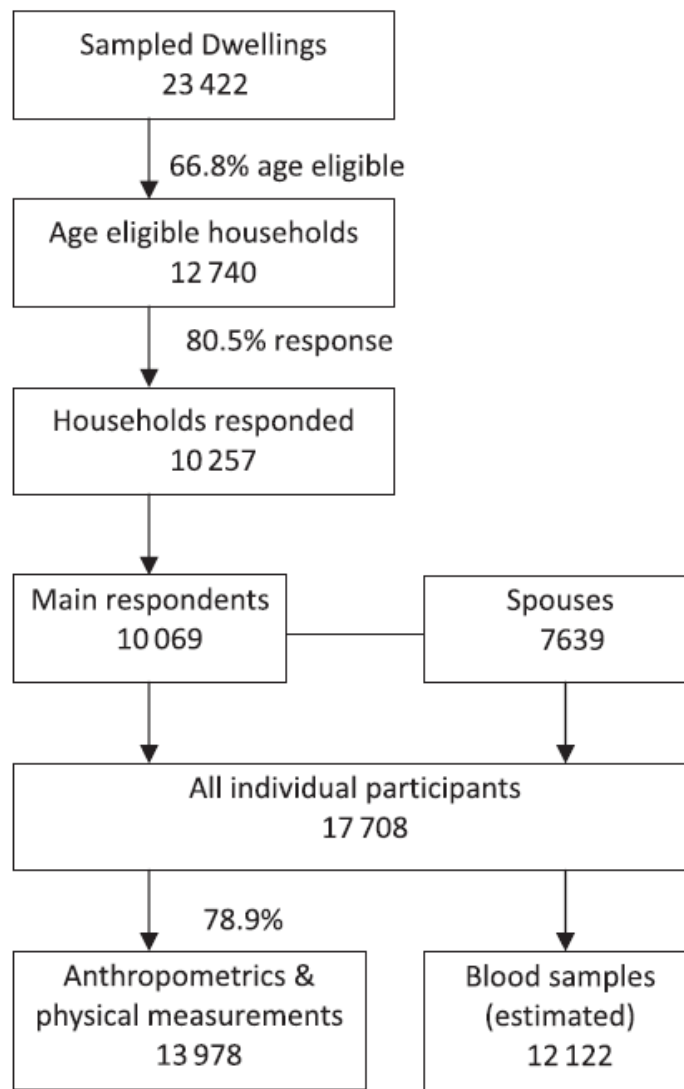
# CHARLS: Timeline (National Survey)

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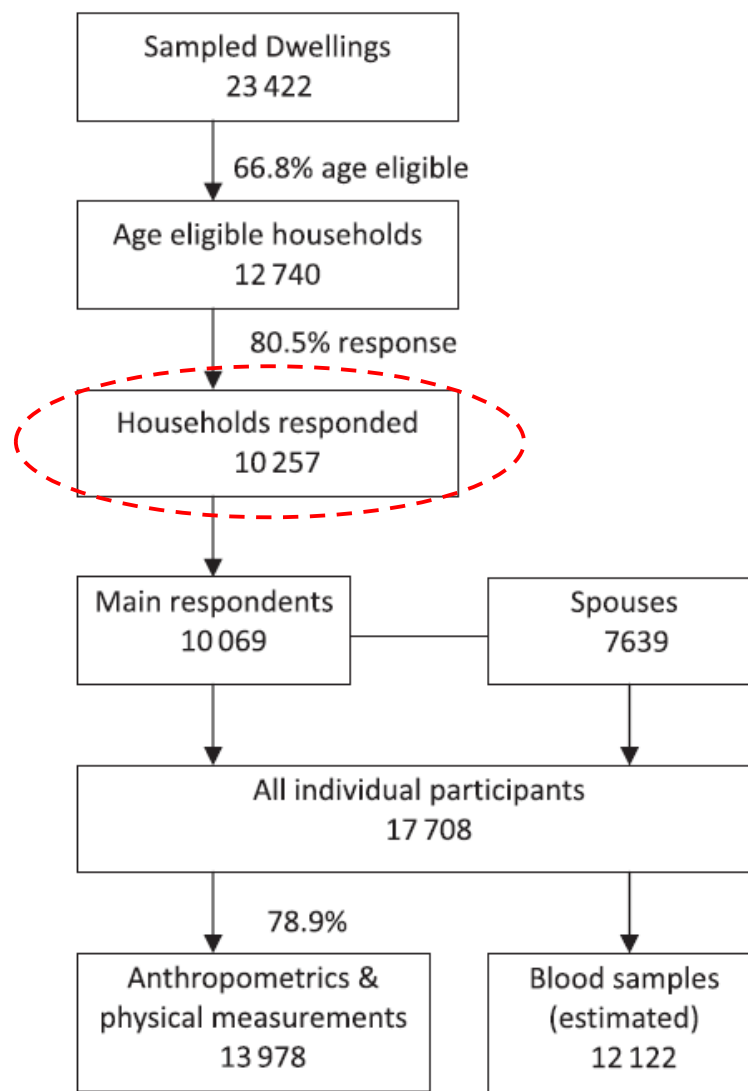
# CHARLS: Response Rate

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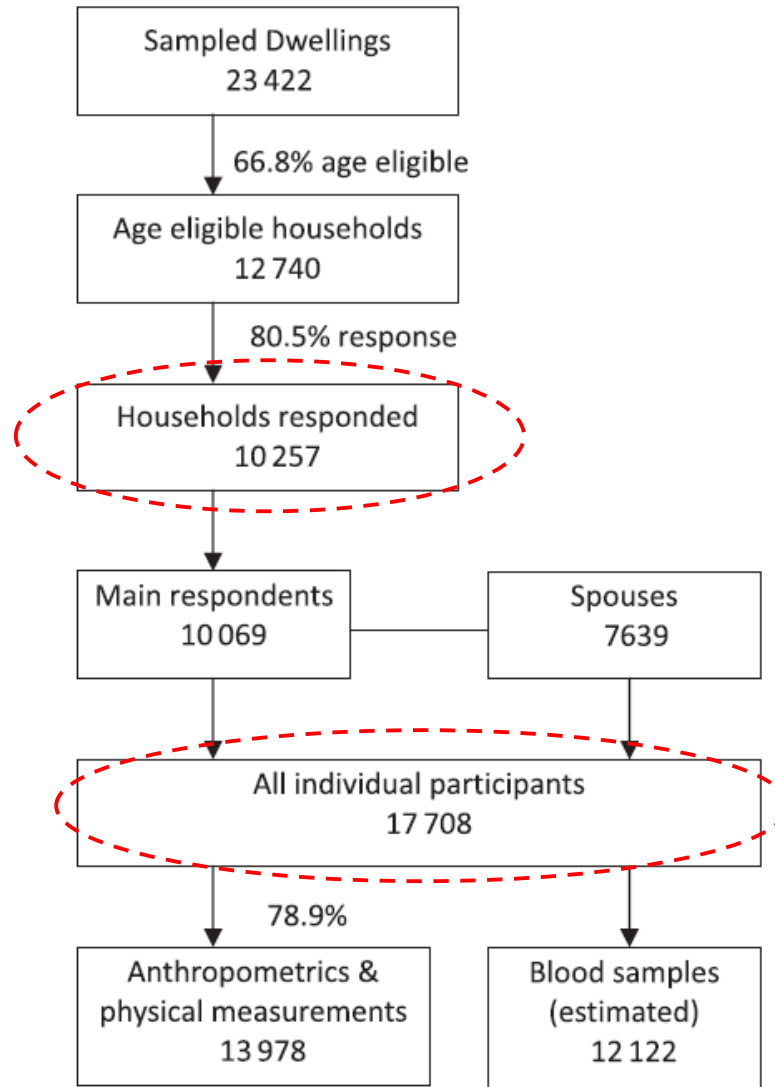
# CHARLS: Response Rate

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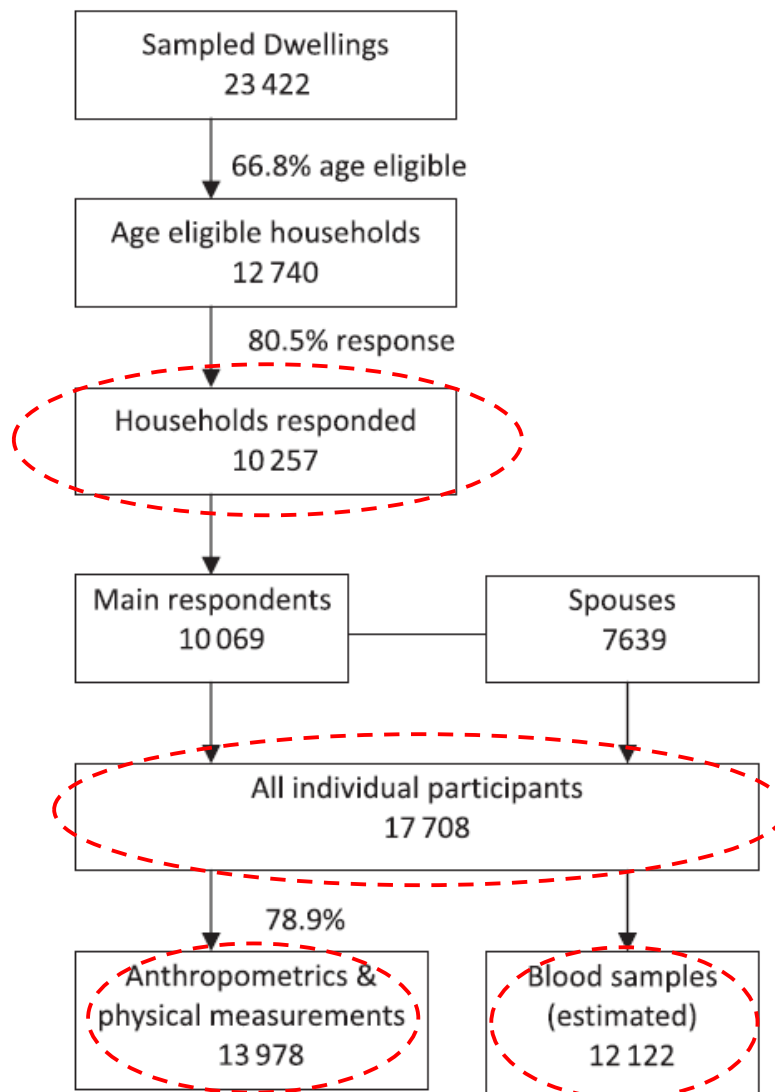
# CHARLS: Response Rate

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# CHARLS: Response Rate

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# CHARLS: What Has Been Measured?

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## Demographic

- Residence
- Education
- Marital status
- Family
- Children
- Siblings

## Work

- Occupation
- Work history
- Retirement
- Pension

## Income

- Income
- Assets
- Expenditures

## Healthcare

- Insurance
- Medical cost
- Healthcare Utilization

# CHARLS: What Has Been Measured?

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## Health

Lifestyle  
Chronic diseases  
Cognition  
Physical function (gait, grip, peak flow)  
Cognition  
Depression  
Functional impairment  
ADL & IADL  
Functional limitation  
Geriatric syndrome

## Biomarkers

White blood cell  
Hemoglobin  
Hematocrit  
Platelets  
Lipids  
Creatinine & Cystatin C  
C-reactive protein (CRP)  
Uric acid  
Blood urea nitrogen  
Blood pressure

# CHARLS: Sample Description

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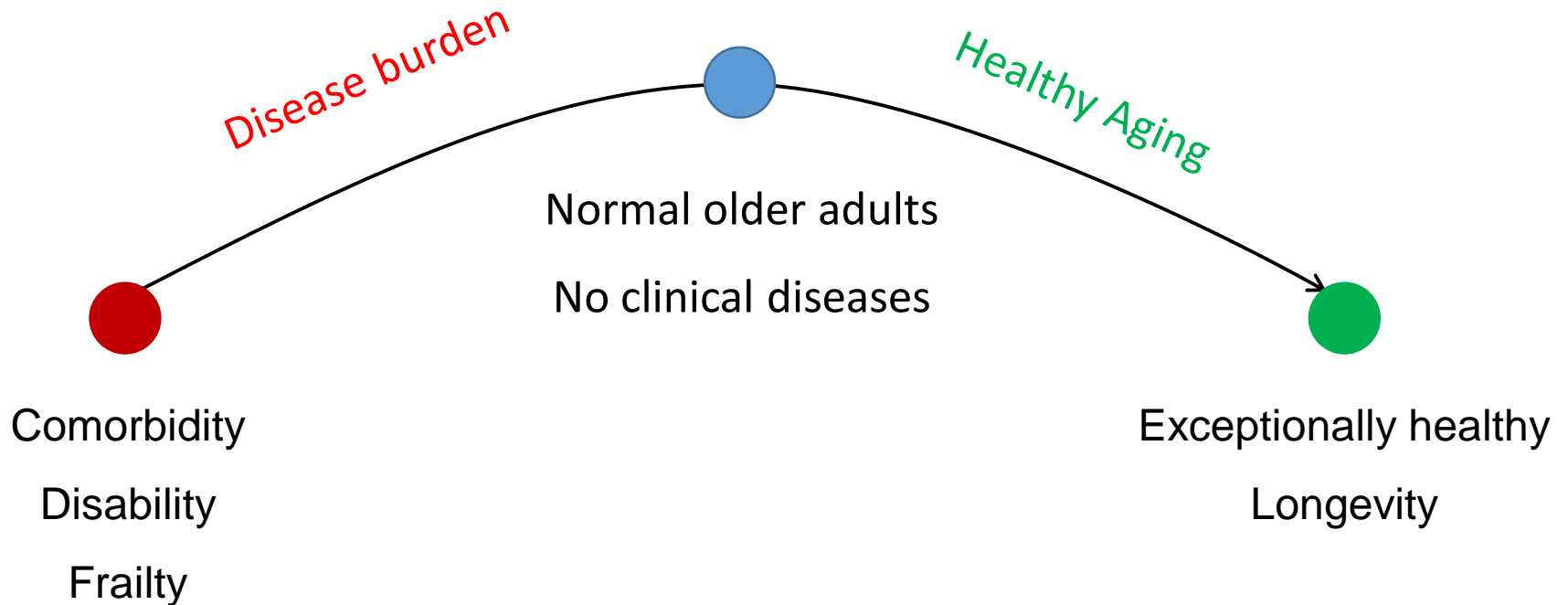
Age Category	Age Structure	
	CHARLS	Census
46–50	22.1	23.8
51–55	16.3	17.8
56–60	19.9	18.3
61–65	14.5	13.2
65+	27.2	26.8
66–70	10.1	9.3
70+	17.2	17.6
All	100.0	100.0



# **CHARLS: Research Example #1**

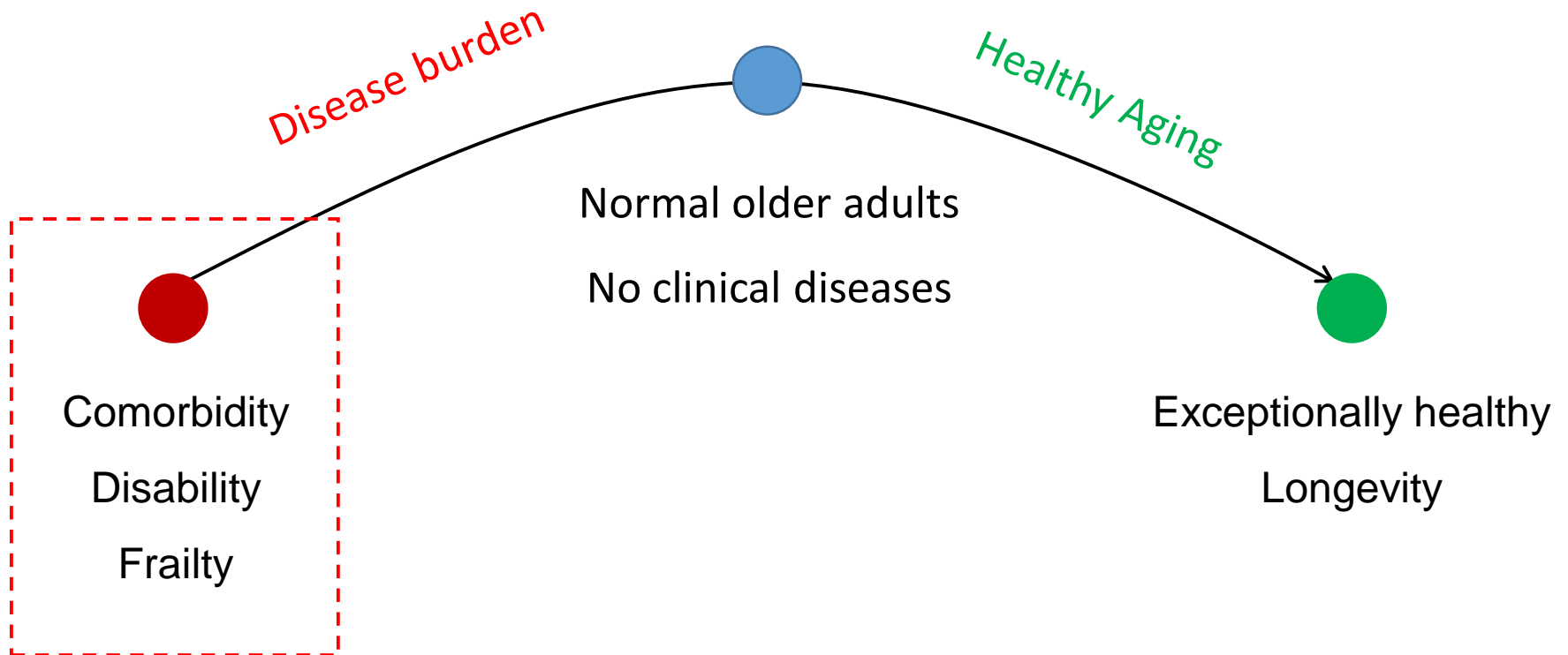
# Opportunities in the CHARLS

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# Opportunities in the CHARLS

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# Aims

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- Create a valid frailty assessment among Chinese older adults
- Estimate the prevalence of frailty in China

# Measurements

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**Slowness**



**Weakness**



**Exhaustion**



**Inactivity**



**Shrinking**



0

**Non-frail**

1-2

**Prefrail**

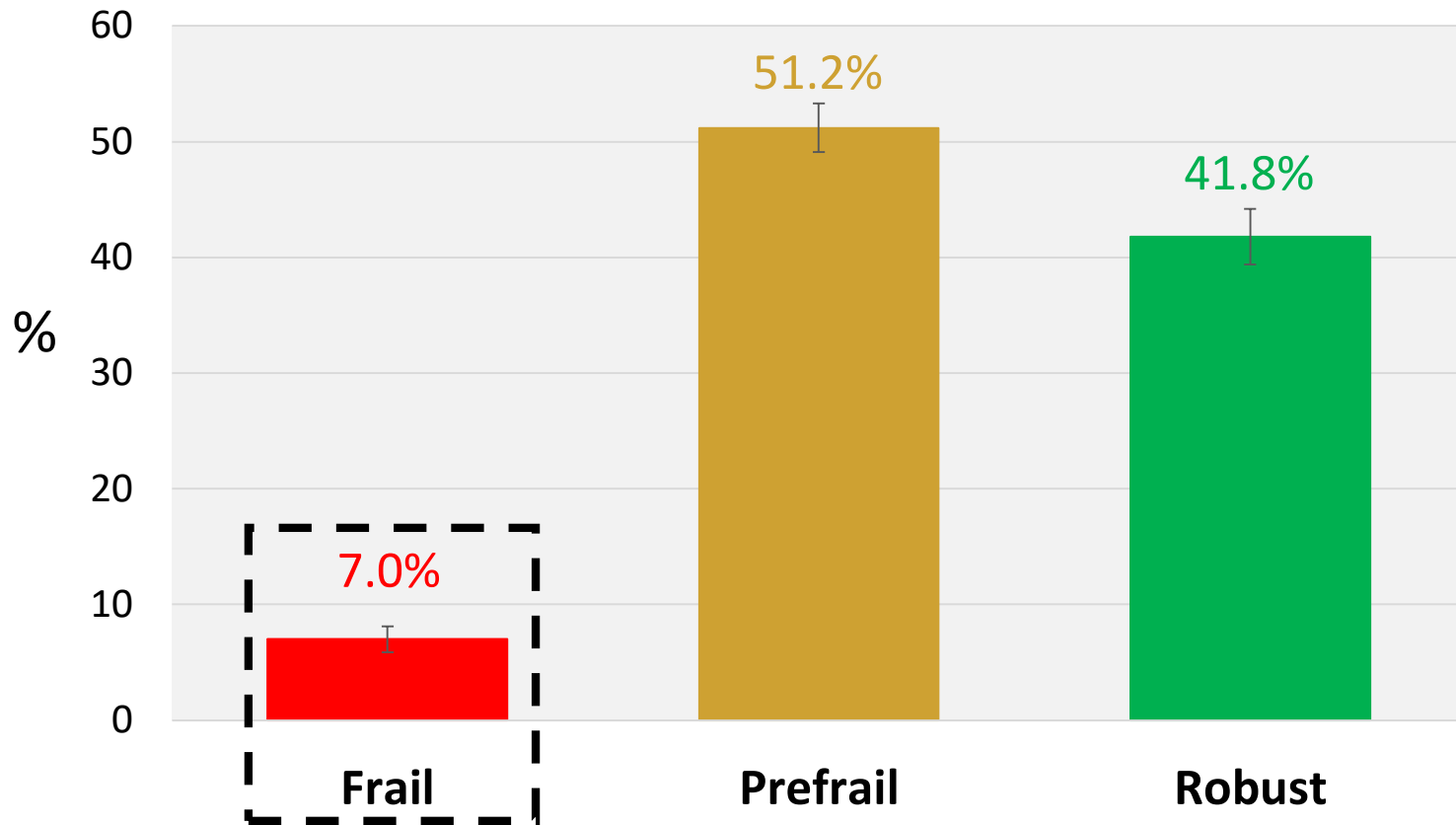
3-5

**Frail**

# Prevalence of Frailty

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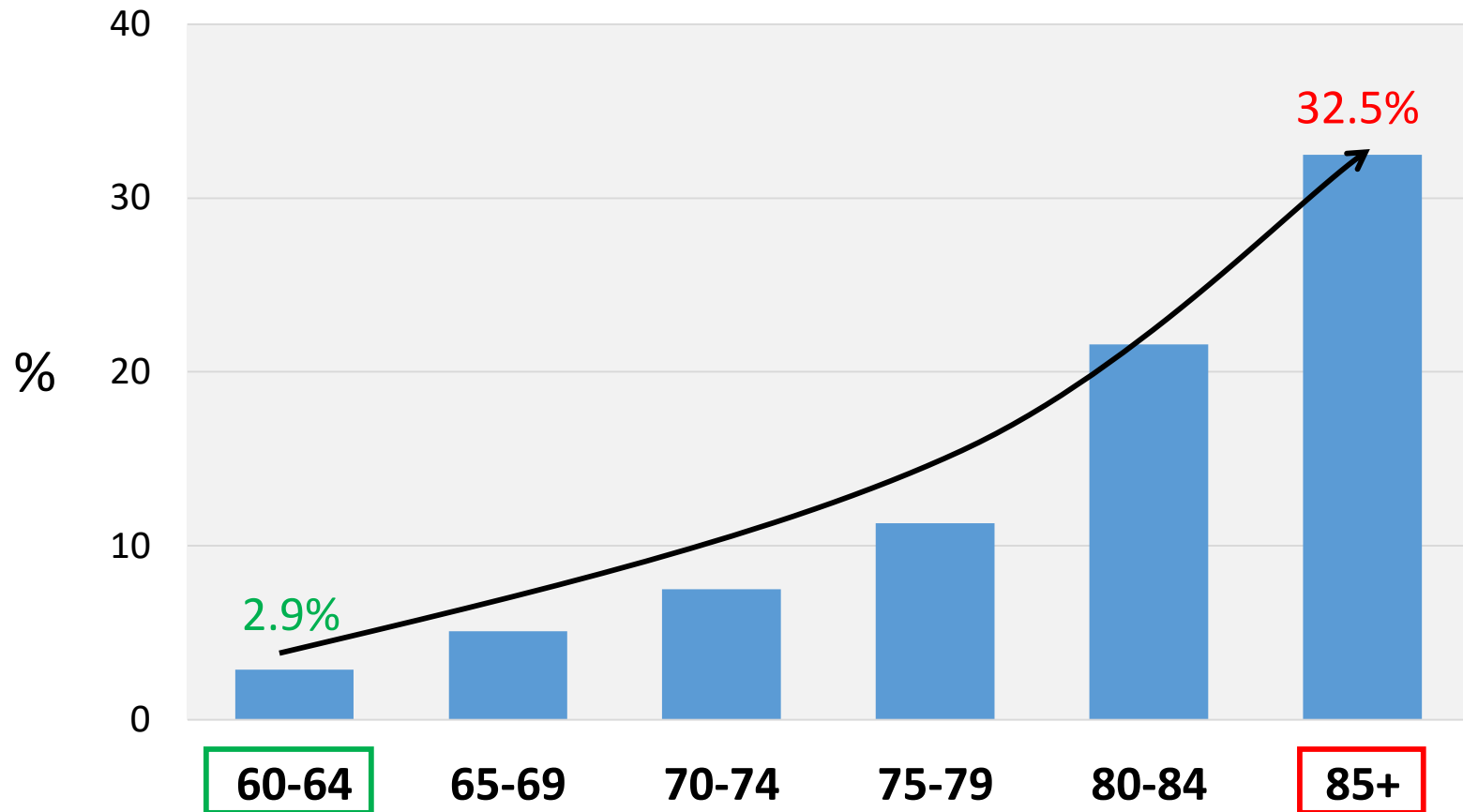
Community-dwelling Chinese adults aged  $\geq 60$  years in 2011 (n = 5,301)



Wu et al. J Gerontol Med Sci. (2018)

# Prevalence of Frailty by Age

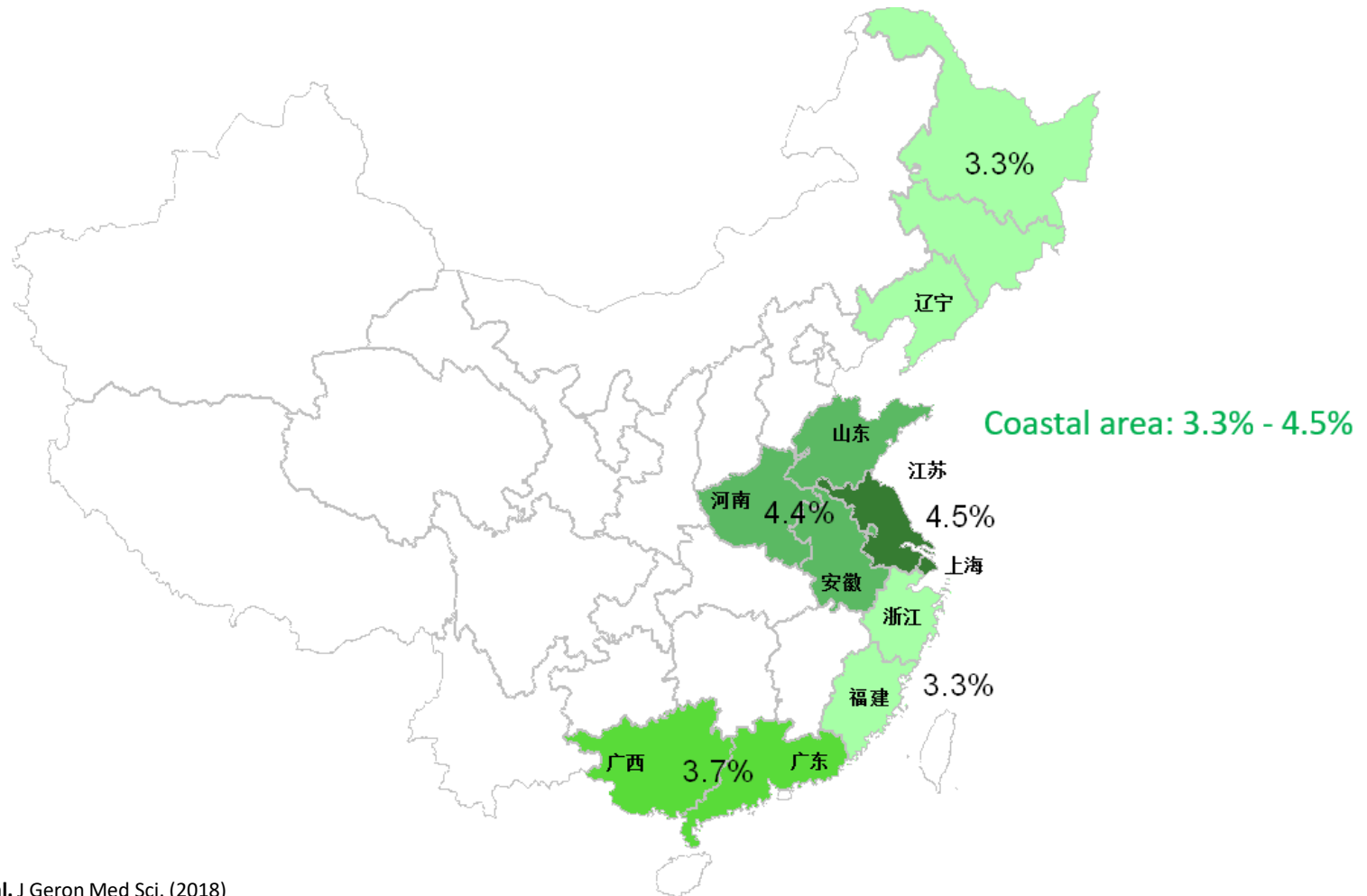
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Wu et al. J Geron Med Sci. (2018)

# Prevalence of Frailty by Region

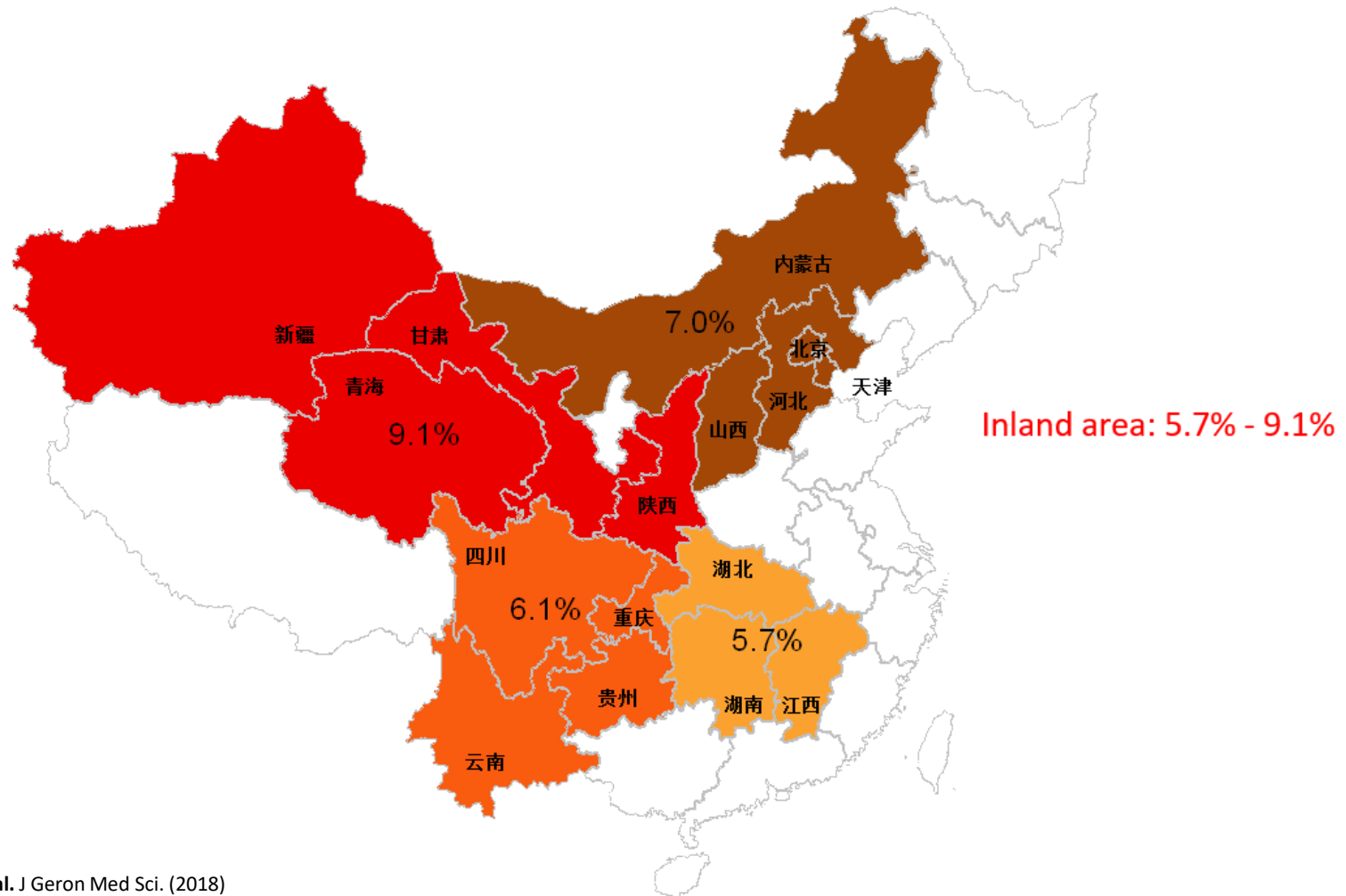
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# Prevalence of Frailty by Region

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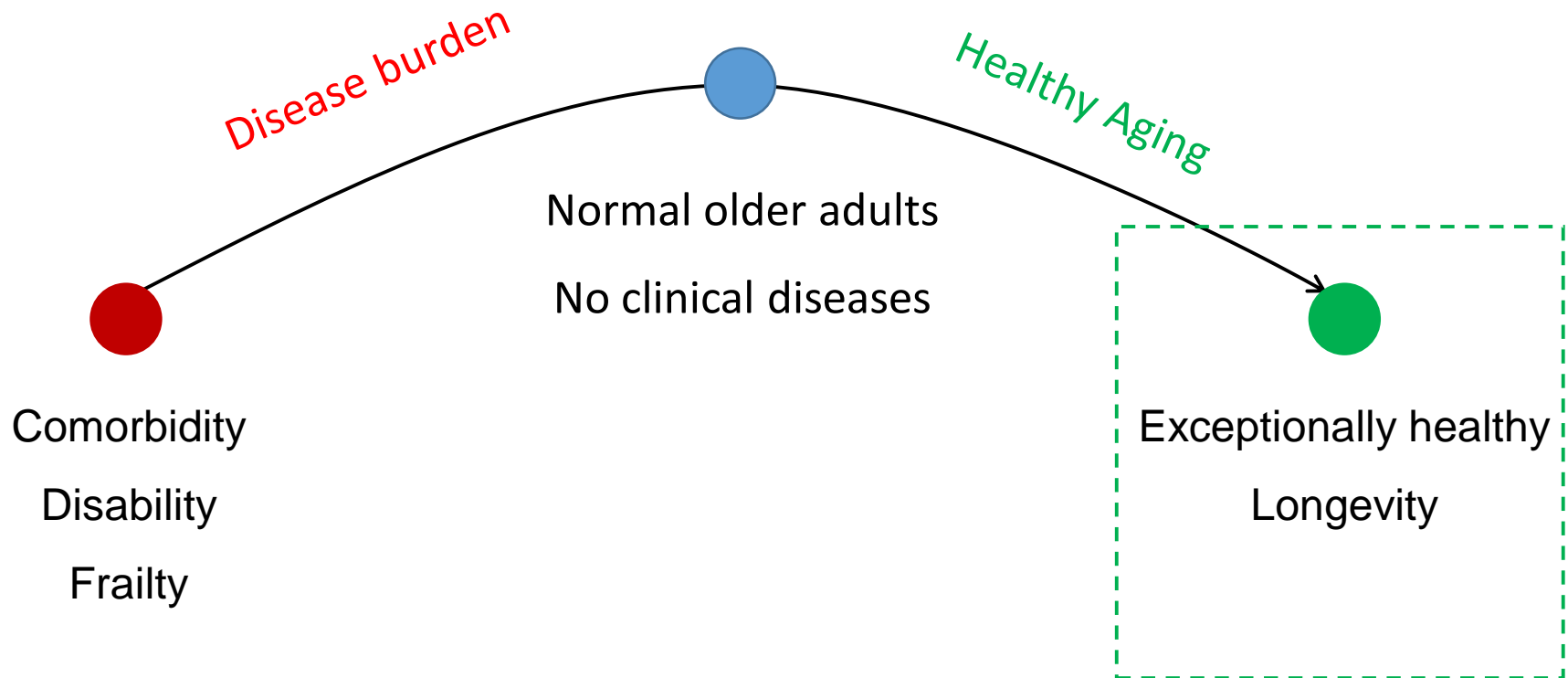


Wu et al. J Gerontol Med Sci. (2018)

## **CHARLS: Research Example #2**

# Opportunities in the CHARLS

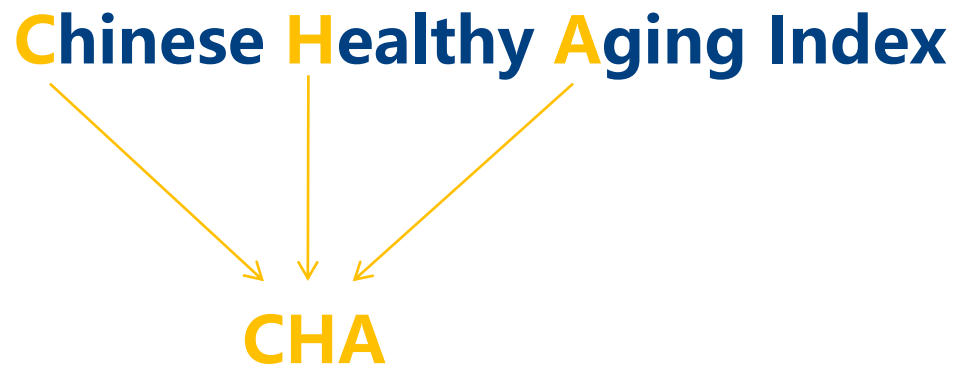
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# Aims

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Create an index for measuring healthy aging



# Index of Healthy Aging in Chinese Older Adults: China Health and Retirement Longitudinal Study

Chenkai Wu, PhD, MPH, MS,\*  Anne B. Newman, MD, MPH,<sup>†</sup> Bi-Rong Dong, MD,<sup>‡</sup> and Michelle C. Odden, PhD<sup>§</sup>

Biomarkers
Systolic BP
Peak flow
Cognitive function
Creatinine
Glucose
CRP

# CHA Index: Construction

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Biomarkers	Score	Total score
Systolic BP	0-2	0 (healthiest) – 12 (unhealthiest)
Peak flow	0-2	
Cognition	0-2	
Creatinine	0-2	
Glucose	0-2	
CRP	0-2	

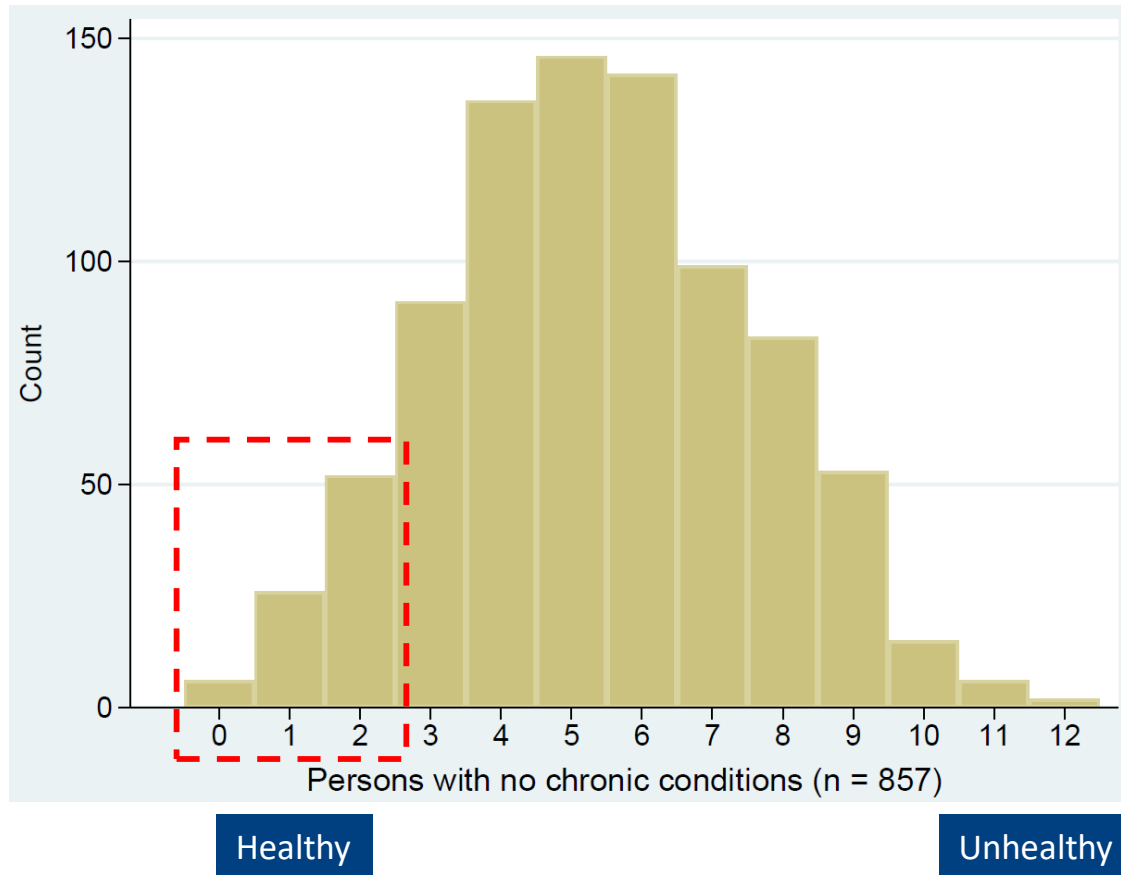
Scoring criteria: sex-specific tertiles

# CHA Index: Predictive Validity

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	Unadjusted	Adjusted
	OR (95% CI)	
Death	1.36 (1.25, 1.48)	1.28 (1.15, 1.42)
ADL disability	1.12 (1.04, 1.23)	1.02 (0.94, 1.12)
IADL disability	1.18 (1.12, 1.26)	1.11 (1.04, 1.18)

# No Clinically Diagnosed Diseases (N=857)

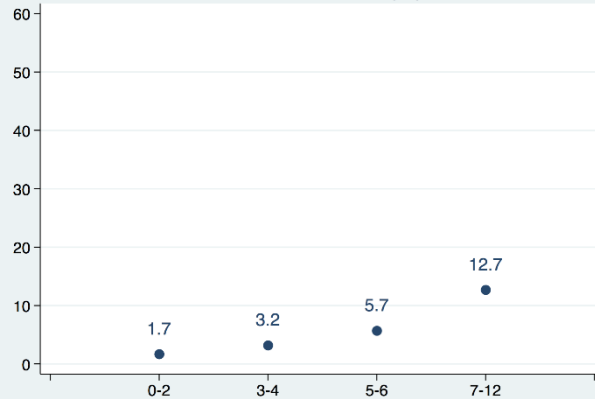


Wu et al. J Am Geriatr Soc. (2018)

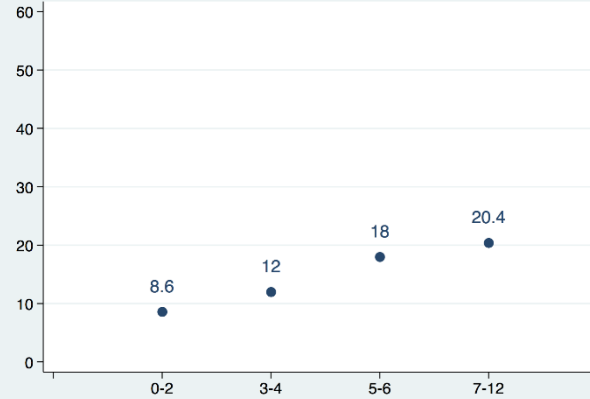


# No Clinically Diagnosed Diseases (N=857)

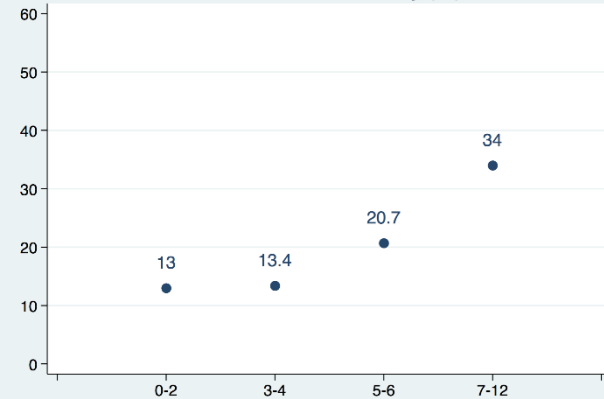
Death in 4 Years (%)



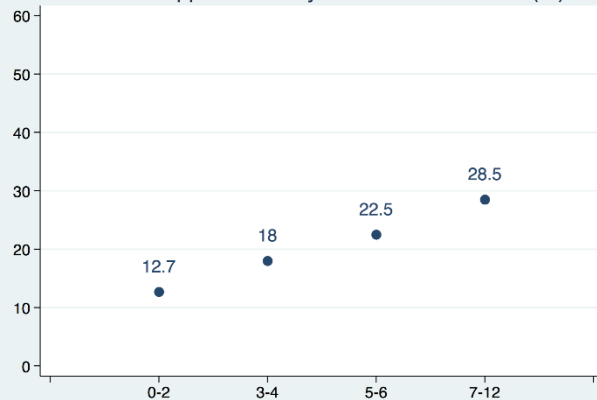
Incident ADL Disability (%)



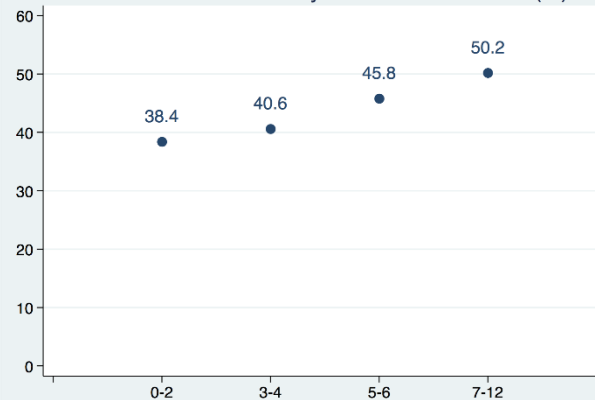
Incident IADL Disability (%)



Incident Upper Extremity Functional Limitation (%)



Incident Lower Extremity Functional Limitation (%)



Wu et al. J Am Geriatr Soc. (2018)

# **CHARLS: Research Example #3**

# Aims

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To examine the associations of **early life risk factors** with **frailty** in later life.

**2014 Life History Survey**

# Measurements

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## Early life risk factors

**Education**



**Family's financial situation**



**Domestic violence**



**Health**



**Neighborhood**



## Frailty

**Slowness**



**Weakness**



**Exhaustion**



**Inactivity**



**Shrinking**



# Results

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Frail vs. Non-frail	Relative Risk (95% CI)
<b>Childhood health</b>	
Worse	2.01 (1.48, 2.72)
About average	Ref.
Better	0.73 (0.57, 0.94)
<b>Neighborhood</b>	
Willing to help	0.45 (0.23, 0.85)
Close-knit	0.40 (0.22, 0.73)
Clean and attractive	0.26 (0.14, 0.47)
<b>Education</b>	
Illiterate	Ref.
Primary school	0.67 (0.51, 0.86)
Middle school	0.42 (0.28, 0.63)
High school or above	0.20 (0.10, 0.39)



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