

# **Rural - Urban Differences in Function and Mortality Among Older Adults in China: Why Do Rural Chinese Have Poorer Health?**

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# STUDY FOCUS

- **Do rural/urban differences in social and economic environment spill over to influence disparities among the older population?**
- **Analysis 1: Examine difference in LE and ALE across rural and urban sample**
- **Analysis 2: Test a multivariate transition model to explain rural/urban differences**

# BACKGROUND

- In developed countries: Studies report a rural advantage in mortality and health

The mortality advantage is sustained after adjusting for socioeconomic and demographic characteristics  
(e.g. Hayward, Pienta and McLaughlin, 1997; Smith et al. 1995)

- In developing countries: The subject has received less attention

General understanding is health profiles differ, urbanites have lower mortality and prevalence of disease  
(e.g. Montgomery et al 2003)

# CHINESE CONTEXT

- **Dismantling cooperative medical system in rural China has had hurt health care**  
**(e.g. Beach 2001; Cook and Dummer 2003; Shi 1996)**
- **The crisis in rural health care would lead one to hypothesize that urbanites have a health advantage**  
**(e.g. Meng et al. 2000; Yi et al. 2002; Zimmer and Kwong 2004)**
- **Only a small number of examinations of China in past REVES meetings. All use Sullivan method**

# Data: Beijing Longitudinal Study on Aging



- Beijing Municipal area
- One district chosen per region  
urban- Xuan Wu  
suburban- Da Xing  
mountainous- Haiui Rou
- N = 3,257 in 1992
- Follow-ups in 1994 and 1997

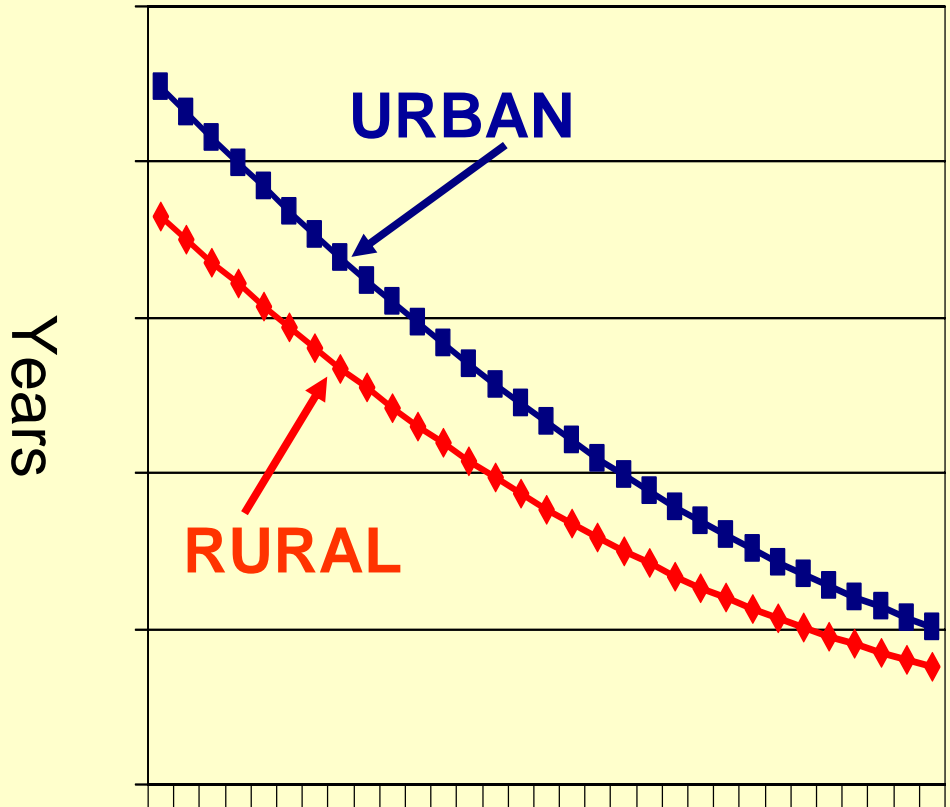
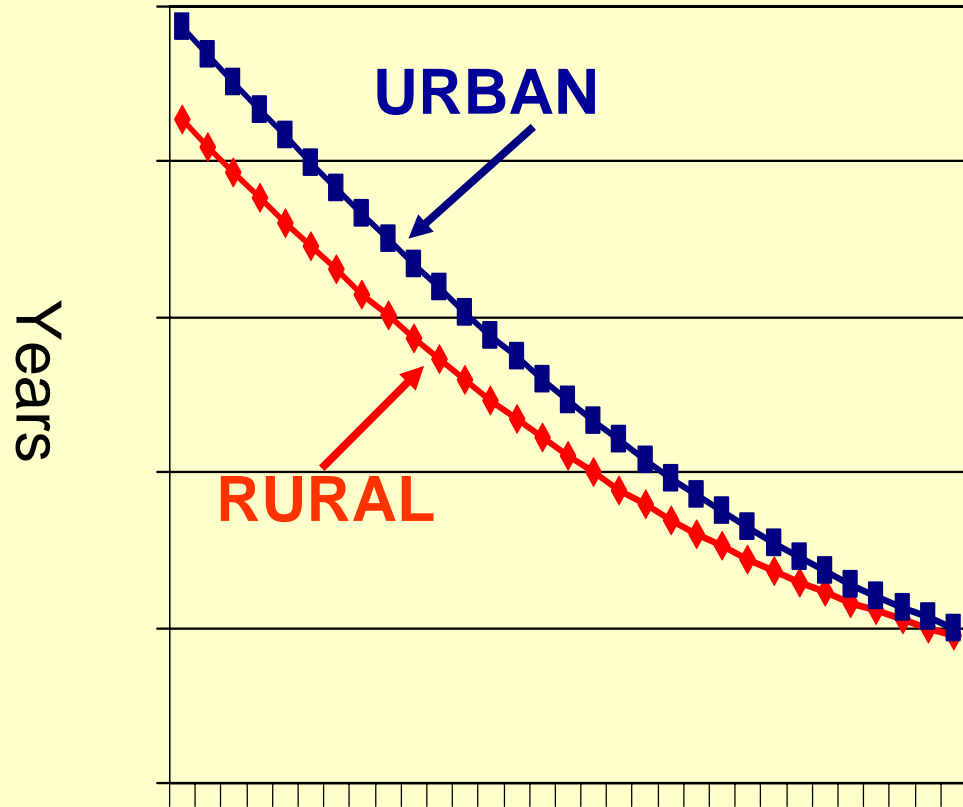
# Determining Active Life Expectancy

- **Definition of ‘active’:** Ability to do the following:
  - Eat**
  - Dress**
  - Get on/off bed**
  - Bathe**
  - Walk 300 meters**
  - Walk up/down stairs**
- **LE and ALE estimated for rural and urban areas, adjusting for age and sex**
- **Software: IMaCh version 0.96d**

# Life Expectancy Estimates by Residence, Age and Sex

## Women

## Men



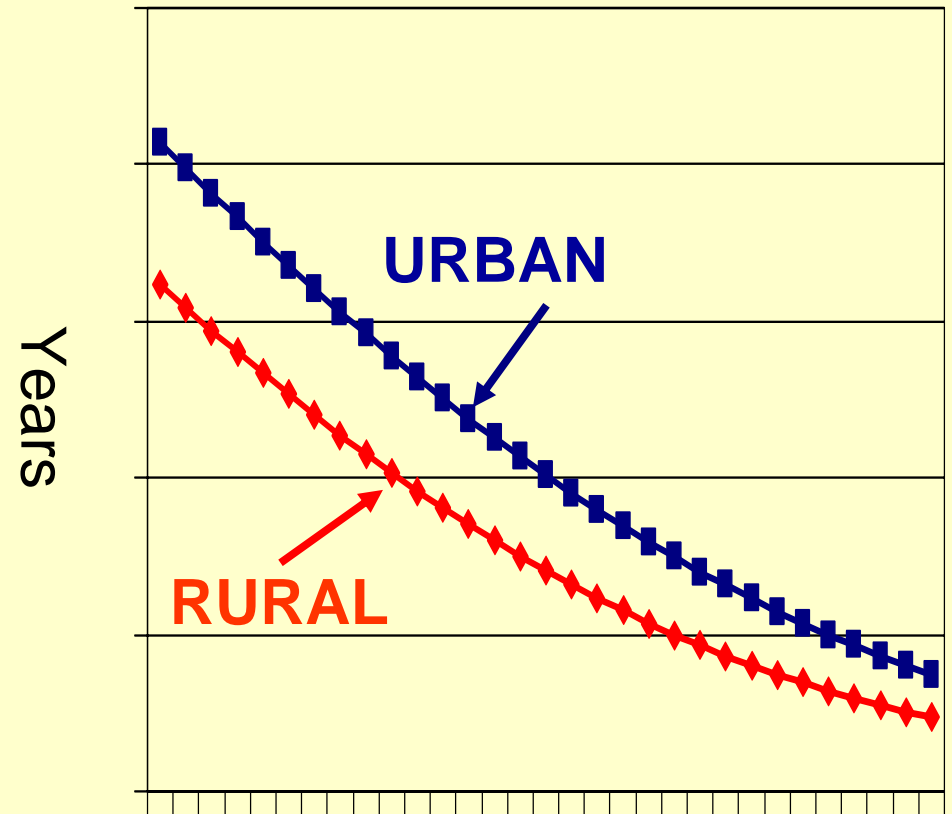
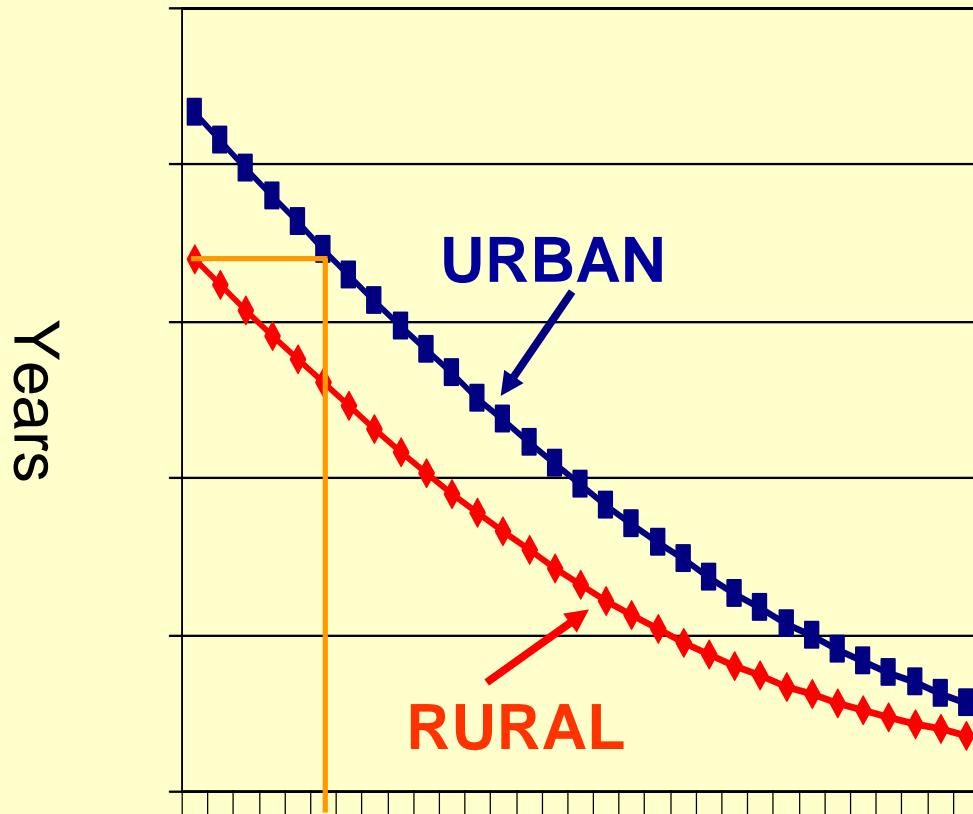
Age

Age

# Active Life By Residence, Age, and Sex

**Women**

**Men**



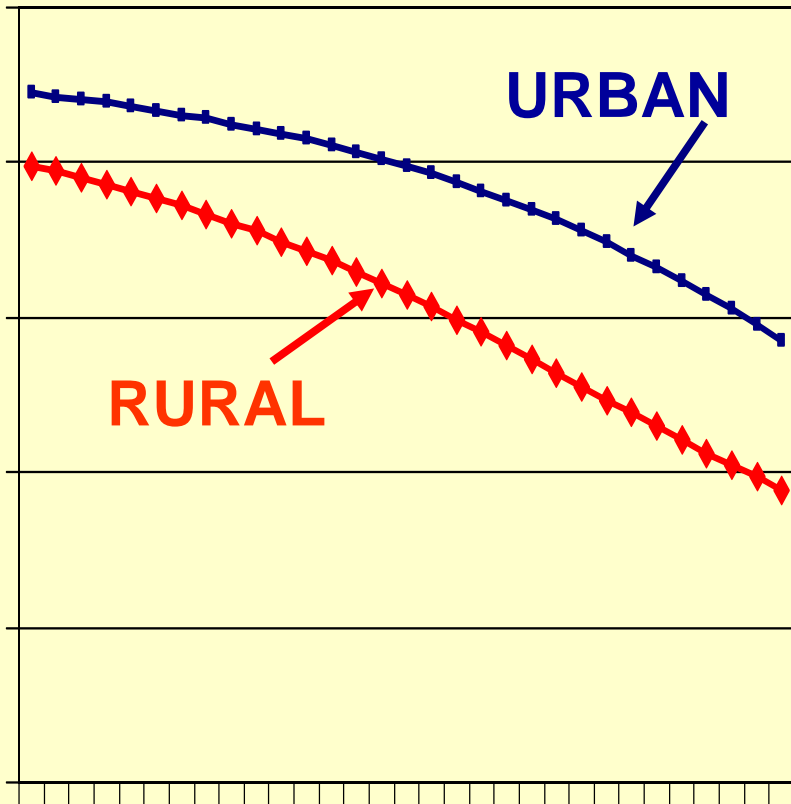
Age

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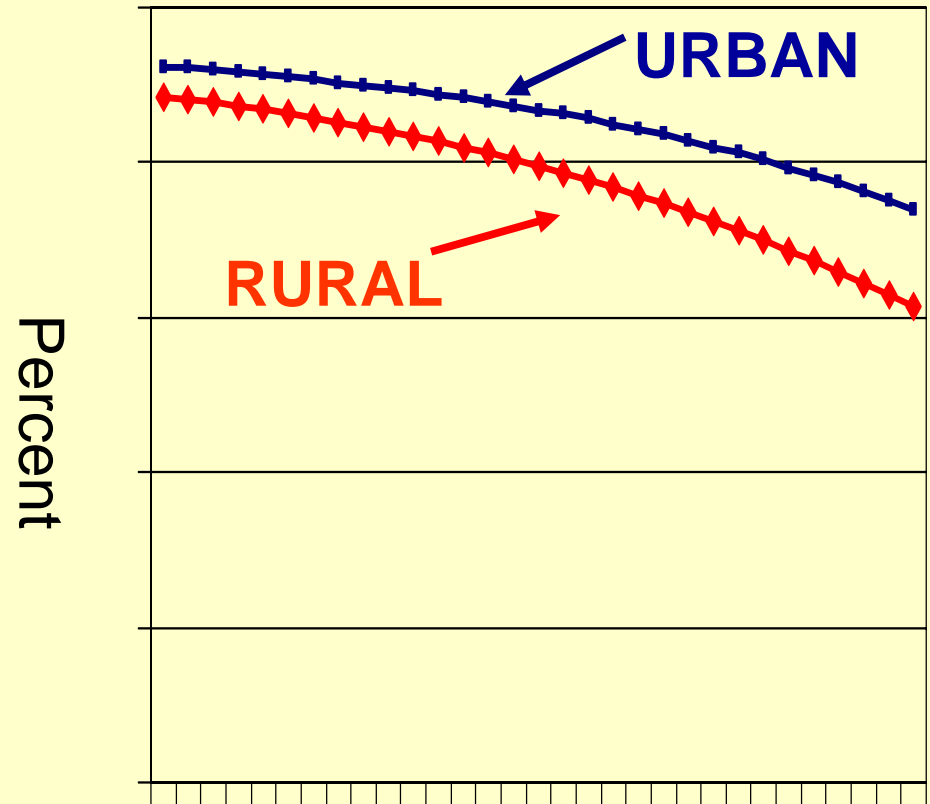


# Percent Of Life In Active State by Residence, Age, and Sex

## Women



## Men



Age

Age

# Multivariate Maximum Likelihood Estimation of Cross-Sectional Model

## Functional Status Outcome

No functional limitation, Wave 1, 1992

No functional limitation, Wave 2, 1994

VERSUS

Has functional limitation, Wave 1, 1992

Has functional limitation, Wave 2, 1994

# Base Cross-Sectional Model for Having a Functional Limitation

	<u>Log odds ratio</u>
<b><i>Urban residence</i></b>	<b>-.687**</b>
<b>Age</b>	<b>+.130**</b>
<b>Is Female</b>	<b>+.759**</b>
<b>Year of observation is 1994</b>	<b>-.491**</b>

\*\*  $p < .01$    \*  $p < .05$    ^  $p < .10$

# Multivariate Maximum Likelihood Estimation of Transition Model

**Data at origin**

**Outcome at follow-up**

Wave 1, 1992

Wave 2, 1994

Has no functional limitation

Has no functional limitation

Has a functional limitation

Has a functional limitation

Died prior to follow-up

Wave 2, 1994

Wave 3, 1992

Has no functional limitation

Has no functional limitation

Has a functional limitation

Has a functional limitation

Died prior to follow-up

# Base Transition Model for Having a Functional Limitation and Mortality (Log Odds Ratios)

	<b>Has limitation versus <u>No limitation</u></b>	<b>Died versus <u>No limitation</u></b>
<b><i>Urban residence</i></b>	<b>-.888**</b>	<b>-.630**</b>
<b>Age</b>	<b>+.073**</b>	<b>+.106**</b>
<b>Is Female</b>	<b>+.374**</b>	<b>-.408**</b>
<b>Year of origin is 1994</b>	<b>+.728**</b>	<b>+.612**</b>
<b>Has limitation at origin</b>	<b>+2.214**</b>	<b>+2.229**</b>
<b>Urban X Has limitation at origin</b>	<b>+.988**</b>	<b>+.846**</b>

\*\* p < .01   \* p < .05   ^ p < .10

# Five Domains and Their Indicators

## **1. Support**

Marital status  
Living arrangement  
Has a harmonious family  
Has a confidant

## **2. Socioeconomics**

Education  
Income  
Occupation  
Work status

## **3. Behaviors**

Smoking  
Drinking  
Eating fruits and vegetables

## **4. Access**

Has insurance  
Difficulty paying medical expenses  
Health care satisfaction

## **5. Conditions**

Life threatening  
Debilitating

# Selected Distributions by Rural/Urban Residence

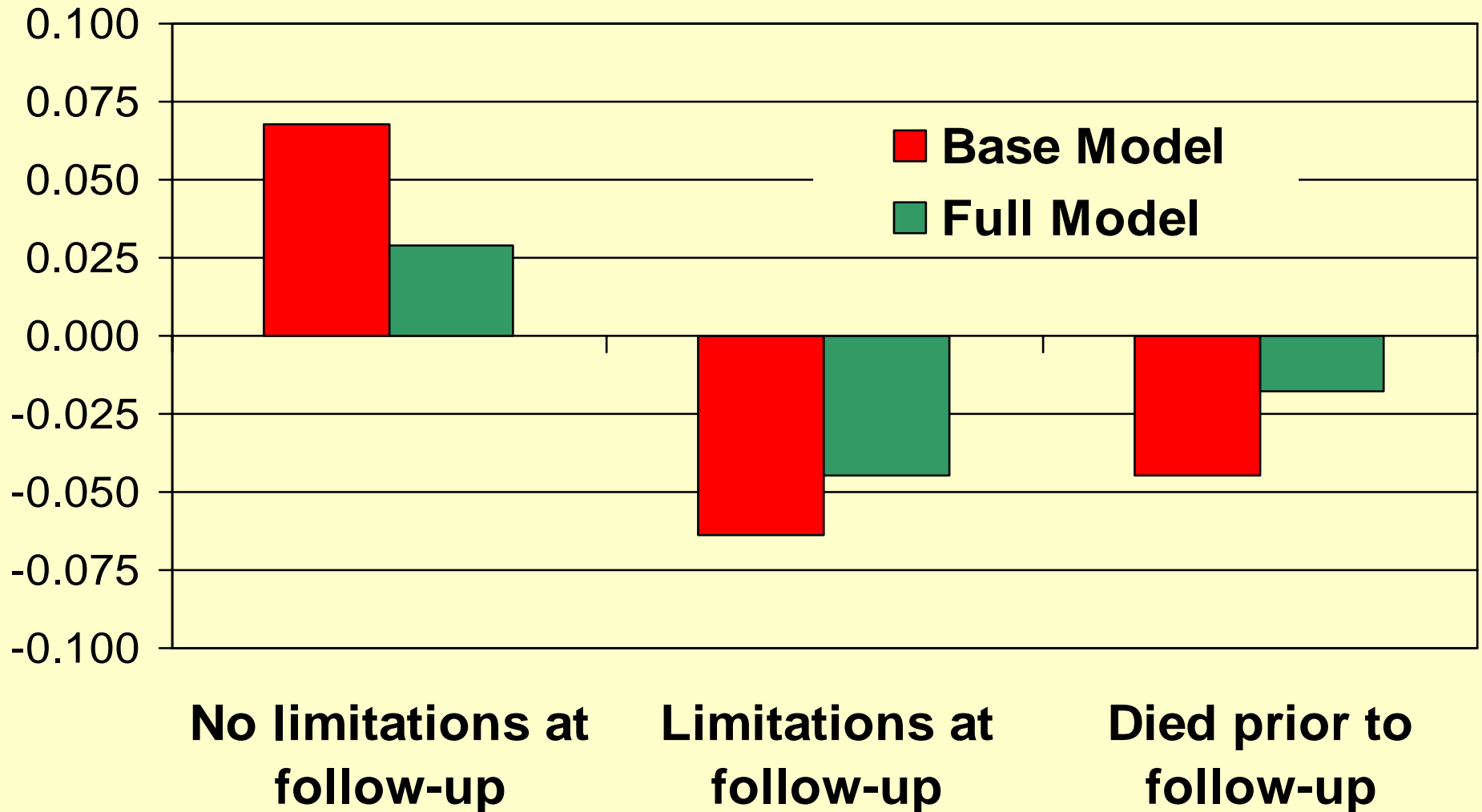
	<b>Rural (N=2954)</b>	<b>Urban (N=3004)</b>
<b>Lives alone</b>	<b>35%</b>	<b>27%</b>
<b>Has education</b>	<b>27%</b>	<b>74%</b>
<b>Eats fruits and vegetables</b>	<b>28%</b>	<b>64%</b>
<b>Has insurance</b>	<b>11%</b>	<b>90%</b>
<b>Has life threatening condition</b>	<b>27%</b>	<b>45%</b>

# Urban Log Odds Ratios for Different Models

	Having limitations vs. <u>Having no limitations</u>	Dying vs. <u>Having no limitations</u>
Base	<b>-.888**</b>	<b>-.630**</b>
Base + Support	<b>-.868**</b>	<b>-.546**</b>
Base + Socioeconomics	<b>-.649**</b>	<b>-.236</b>
Base + Behaviors	<b>-.851**</b>	<b>-.542**</b>
Base + Access	<b>-.672**</b>	<b>-.455**</b>
Base + Conditions	<b>-1.026**</b>	<b>-.822**</b>
Full model	<b>-.590**</b>	<b>-.281</b>



# Marginal Effects Of Urban Residence For Those Originating Without Functional Limitations



# Summary/Conclusion

- 1. There is an urban advantage in mortality and function**
- 2. Findings consistent with expectations if availability of health care drives health outcomes**
- 3. Socioeconomic status and access explain much of the influence of urban residence**
- 4. Social support and health behaviors explain effect on mortality but not function**
- 5. Residual effects may be a function of community-level characteristics**

**Thank you for your attention**

# Marginal Effects Of Urban Residence For Those Originating With Functional Limitations

