Healthy Life Expectancy among Older Americans in Rural and Urban Areas

Sarah B. Laditka, PhD

James N. Laditka, DA, PhD

Keith Elder, PhD

Bankole Olatosi, MHA

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rnold School of Public Health
CHSPR / Office for the Study of Aging

SOUTH CAROLIN

Background

- **Evidence that the prevalence of disability and morbidity may be higher in rural areas.**
- **Access and availability for health care and other services is more limited in rural areas.**
- **Recent work emphasizes the urban health "advantage."**
- **Few studies have examined effects of areas of residence on healthy life expectancy.**

Urban "Health Advantage" versus Urban "Health Penalty" – Emerging Evidence

Proximity of wealth helps sustain social organizations in neighborhoods, increase political power to attract funding, support civil groups.

Greater social support and cohesion.

Improved access to services and commodities, fruits and vegetables.

Better environment for physical activity.

Greater political mobilization for health services.

Sources: Vlahov & Galea, J Urban Health, 2002; Vlahov et al. J Urban Health 2005

Objectives

To investigate differences in HLE, ILE, and TLE, among groups of older individuals in rural or urban areas

To examine the health burden of area of residence throughout the older life course, and the differential impact of residence area within and between groups

Data

NLTCS (1982, 1984, 1989, 1999), n ≈ 6,300

Representative sample of Americans with 1+ ADL impairments at baseline (having lasted, or expected to last, 3 or more months at the time of the baseline survey).

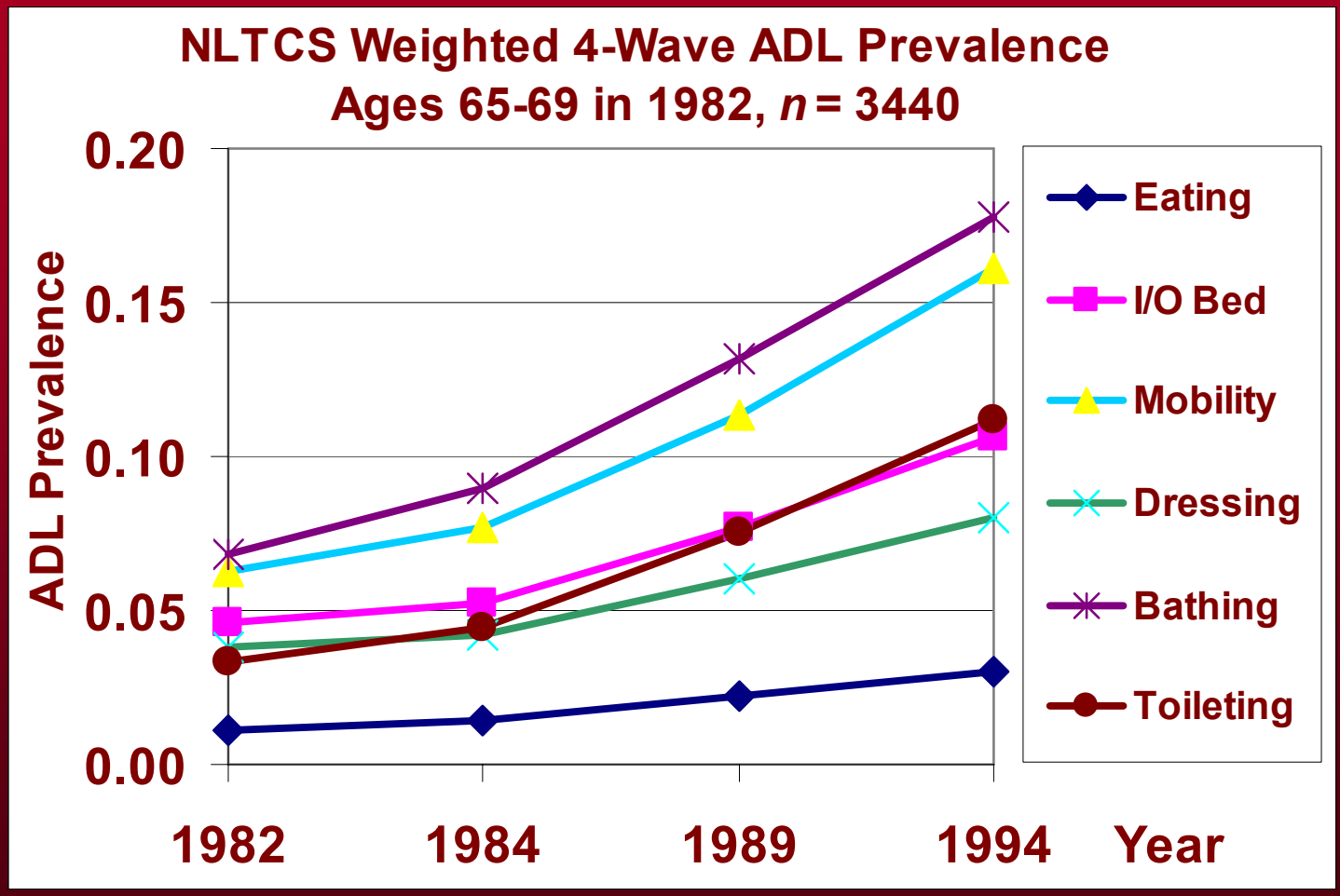
Many of these individuals recovered by the time of the 1984 follow-up.

Nonetheless, this cohort is more impaired than the average older American.

This cohort is of interest because it is most likely to require long term care services

Cohort ADL Prevalence, U.S. 1982-1994

(Includes “cannot do”, receives help, or uses assistive device)



Source: Authors’ analysis, 1982-1999 National Long-Term Care Survey

Challenges of Longitudinal Data

Months

1 2 3 4 5 . . . 24 48

Persons Surveyed

A . U . . . . . I . . . I

B . . . I . D

C I . . . . . ? . U . .

U=Unimpaired; I=Impaired; D=Dead

Analytical Strategy, Overview

1. Estimate parameters of functional status transition
2. Conduct microsimulation
3. Analyze simulated population

Analytical Strategy, 1a

Estimate functional status transition parameters

Identify embedded Markov chain that most closely reproduces the observed data

Estimation with maximum likelihood

Trichotomous logistic regression

- Unimpaired
- Impaired (1+ ADL limitations)
- Dead

Analytical Strategy, 1b

Functional status transition probabilities

An individual of a given age, gender, rural or urban residence, and current functional status has a certain probability of remaining in the same functional status from one month to the next, another probability for transitioning to a different status, and another for dying.

Monthly probabilities, estimated from the lived experience of a nationally representative sample of impaired older Americans.

Analytical Strategy, 2a
Microsimulation

1. Baseline simulated population disability profile equal to impaired American population at age 65, separately by rural/urban residence and gender.
2. Based on estimated monthly transition probabilities.
3. For each month, generate transition probability for each possible state in the next month, *given the current month's status, age, sex, rura/lurban residence.*
4. Map these *Ps* onto 0-1 interval & random draw.
5. Repeat until death.
6. Simulate 1 million *individual lives* for each group (e.g., rural women), from age 65 through death.

Analytical Strategy, 2b

Microsimulation

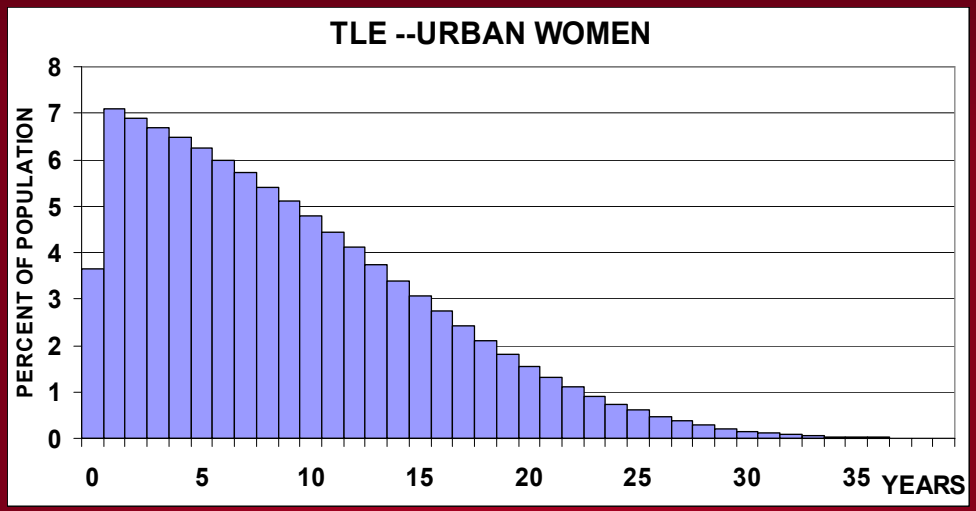
Having created the simulated population, apply standard population measures:

- Mean number of months unimpaired
- Mean number of months impaired
- Mean number of months to death
- Variation around means

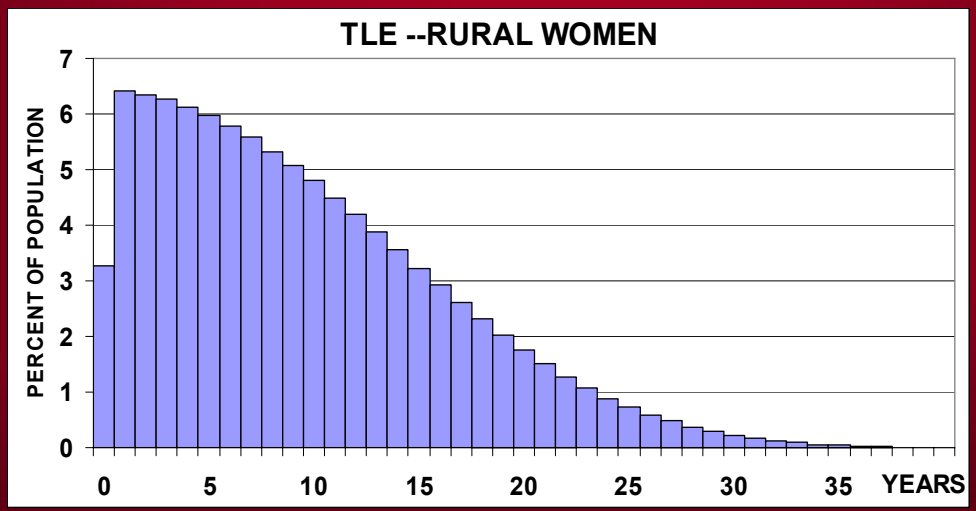
Results ~ TLE, ALE, ILE in Years

	TLE		ALE		ILE	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
R-Female	9.55	(6.93)	4.07	(4.65)	5.50	(5.13)
U-Female	8.99	(6.66)	3.83	(4.33)	5.18	(4.86)
% diff., R-U	6.15		6.09		6.17	
R-Male	6.83	(5.44)	3.51	(4.23)	3.34	(3.64)
R-Male	6.36	(5.13)	3.28	(3.89)	3.09	(3.41)
% diff., R-U	7.43		6.91		7.95	

Remaining Years of Life at Age 65

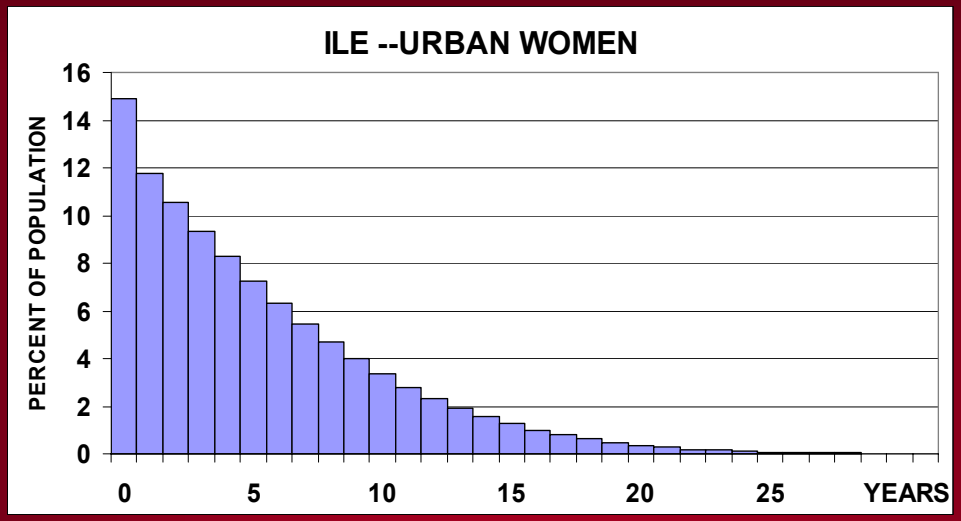


Urban Women

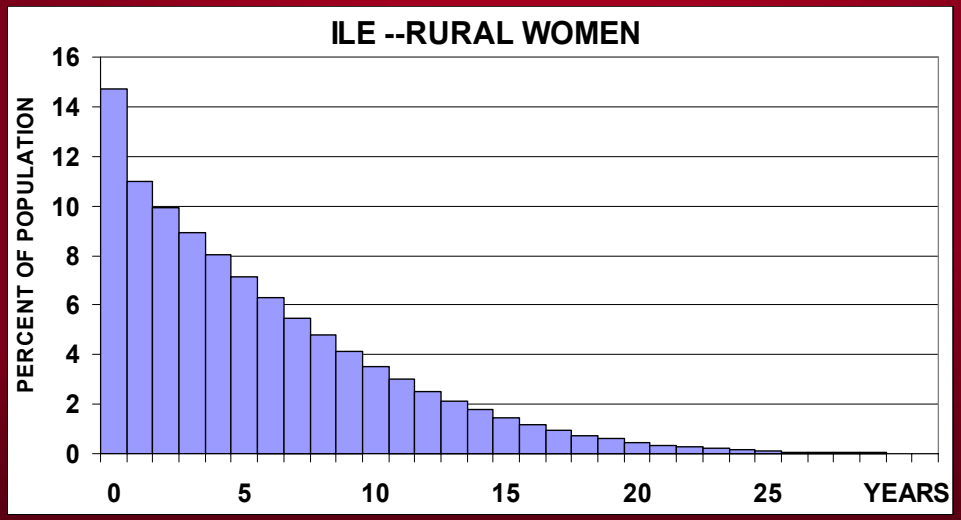


Rural Women

Remaining Years of *Unimpaired* Life



Urban Women



Rural Women

Results

In both urban and rural areas, compared with men, women live longer, and live a greater proportion of remaining life impaired.

At age 65, rural women live 6% longer than urban women, divided about equally between ILE and ALE.

At age 65, rural men live about 7.4% longer than urban men, with a slightly larger proportion of remaining life spent impaired.

Rural women live about 4 more months with impairment than urban women.

Rural men live about 3 more months with impairment than urban men.

Limitations

Baseline sample did not include those institutionalized.

Conditional on having lived to age 65

- More of those dying before age 65 may have resided in either rural or urban areas
- Those who resided in rural areas who died before age 65 may have had greater disease burden
- Thus, findings may underestimate life course impact of rural residence

Simplifying first-order Markov assumption.

Need for expanded state model, including moderately and severely impaired, with additional controls, race/ethnicity, and education.

Policy Implications

National costs of services for “extra time” lived with impairment for rural residents may be great.

National Costs ≈ (costs of long term care
+ health care and therapies,
+ informal caregiving,
+ lost work and health effects for caregivers,
+ assistive devices)

x (3 to 4 months) x (number of older rural residents).

National need for services is greater in rural areas than in urban areas, yet services are generally less available and accessible in rural areas.

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~ Thank You ~

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