Joseph T. Freeman Award Lecture

Health Science Section, Gerontological Society of America

Connections Between Life-Space Mobility, Social Participation, and Health

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VA HEALTH CARE Defining EXCELLENCE in the 21st Century

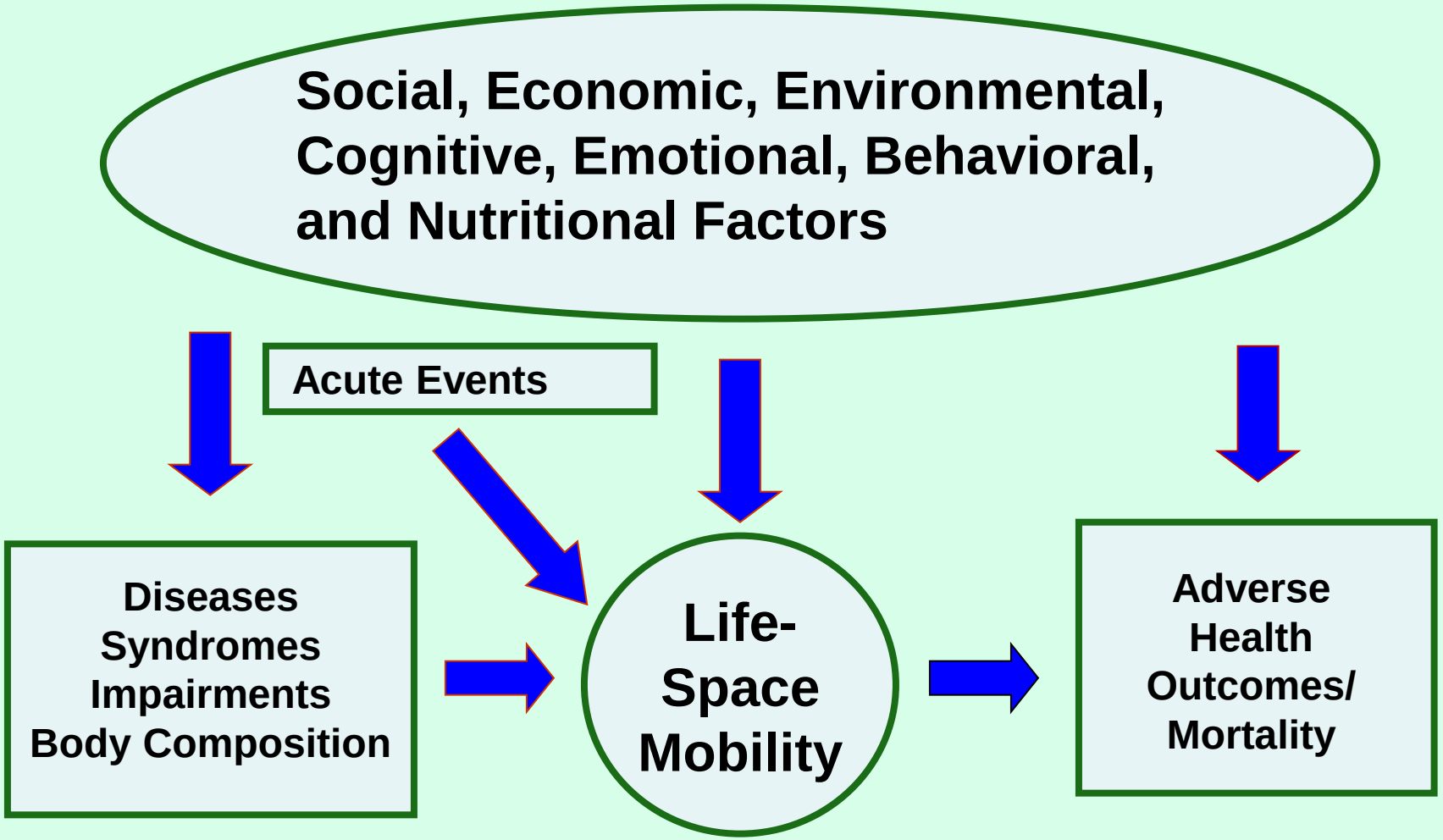
Funding

- **National Institute on Aging, Grant Number R01 AG15062, "Mobility Among Older African Americans and Whites," The University of Alabama at Birmingham (UAB) Study of Aging**

Presentation Goals

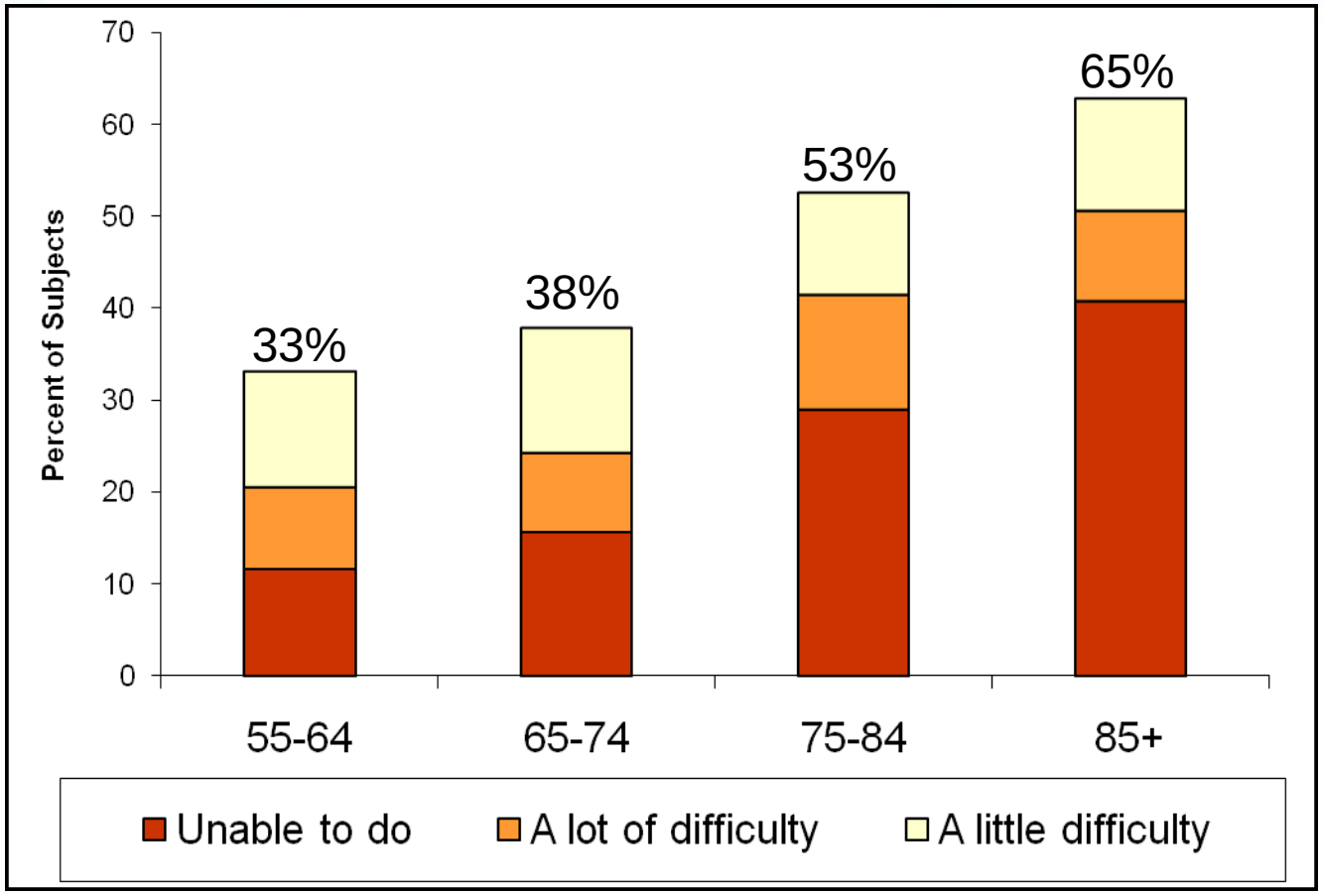
- Describe model guiding the development of the Life-Space Assessment as a measure of community mobility
- Discuss the connections between life-space mobility, quality of life, and social participation
- Present data on life-space as a risk factor for adverse health events among older adults
- Define predictors of life-space change
- Discuss implications for future research and clinical care

Conceptual Model-Central Role of Mobility in Health and Quality of Life



Adapted from *JGIM* 2004;19:1118-1126

Frequency of Difficulty Walking 3-4 Blocks (1/4 Mile) by Age Group – Charting the Course



The Life-Space Assessment

For additional information about the UAB Study of Aging Life-Space Assessment, please contact psawyer@uab.edu.

UAB Study of Aging Life-Space Assessment

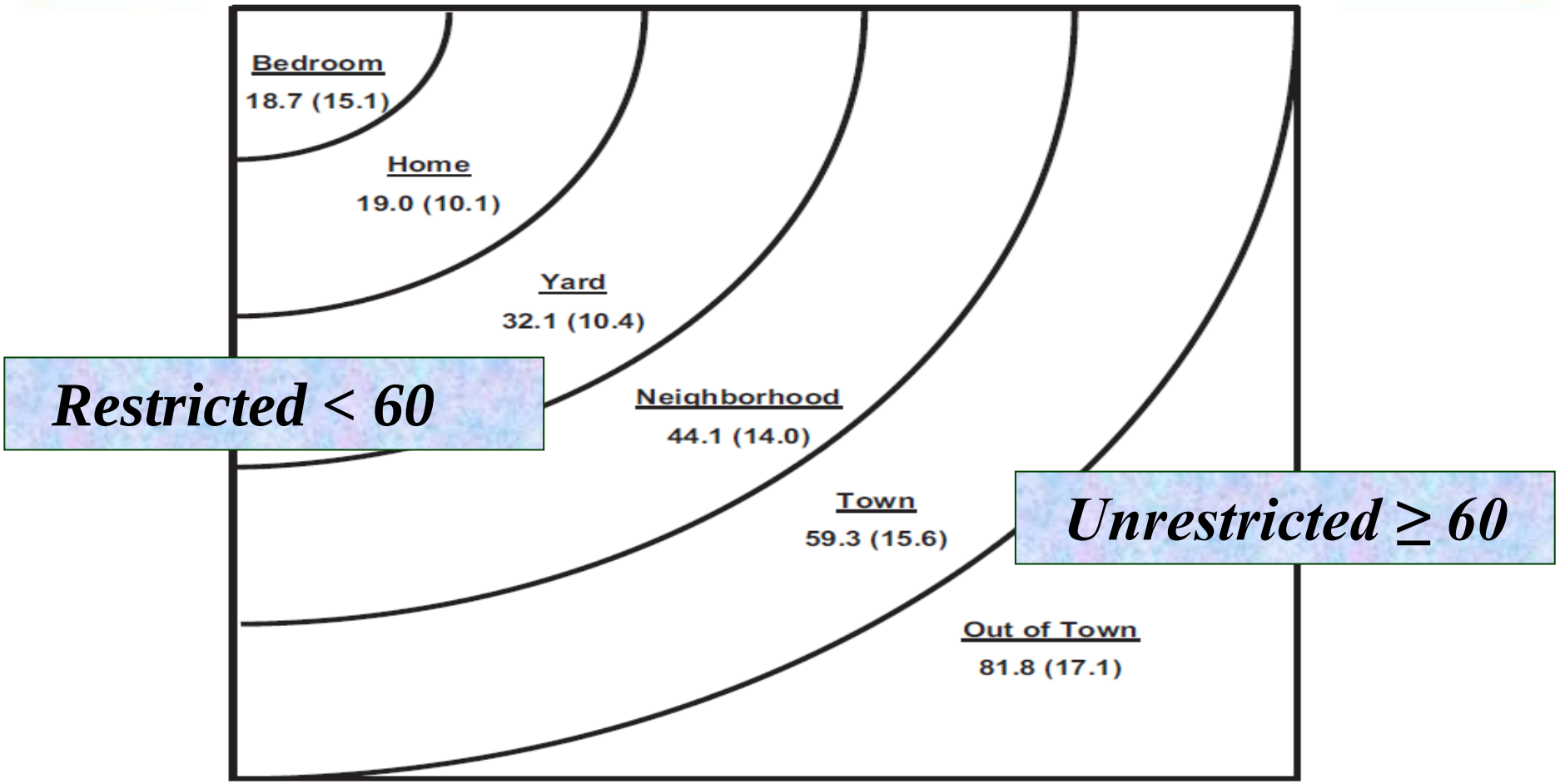
Name:	Date:

These questions refer to your activities just within the past month.

LIFE-SPACE LEVEL			FREQUENCY				INDEPENDENCE	SCORE
During the past four weeks, have you been to . . .			**How often did you get there?**				**Did you use aids or equipment? Did you need help from another person?**	Level X Frequency X Independence
Life-Space Level 1. . . **Other rooms of your home besides the room where you sleep?**	Yes 1	No 0	Less than 1 /week 1	1-3 times /week 2	4-6 times /week 3	Daily 4	1 = personal assistance 1.5 = equipment only 2 = no equipment or personal assistance	
Score	_____ X		_____			X	_____ =	*Level 1 Score*
Life-Space Level 2. . . **An area outside your home such as your porch, deck or patio, hallway (of an apartment building) or garage, in your own yard or driveway?**	Yes 2	No 0	Less than 1 /week 1	1-3 times /week 2	4-6 times /week 3	Daily 4	1 = Personal assistance 1.5 = Equipment only 2 = No equipment or personal assistance	
Score	_____ X		_____			X	_____ =	*Level 2 Score*
Life-Space Level 3. . . **Places in your neighborhood, other than your own yard or apartment building?**	Yes 3	No 0	Less than 1 /week 1	1-3 times /week 2	4-6 times /week 3	Daily 4	1 = Personal assistance 1.5 = Equipment only 2 = No equipment or personal assistance	
Score	_____ X		_____			X	_____ =	*Level 3 Score*
Life-Space Level 4. . . **Places outside your neighborhood, but within your town?**	Yes 4	No 0	Less than 1 /week 1	1-3 times /week 2	4-6 times /week 3	Daily 4	1 = Personal assistance 1.5 = Equipment only 2 = No equipment or personal assistance	
Score	_____ X		_____			X	_____ =	*Level 4 Score*
Life-Space Level 5. . . **Places outside your town?**	Yes 5	No 0	Less than 1 /week 1	1-3 times /week 2	4-6 times /week 3	Daily 4	1 = Personal assistance 1.5 = Equipment only 2 = No equipment or personal assistance	
Score	_____ X		_____			X	_____ =	*Level 5 Score*
							TOTAL SCORE (ADD)	*Sum of Levels*

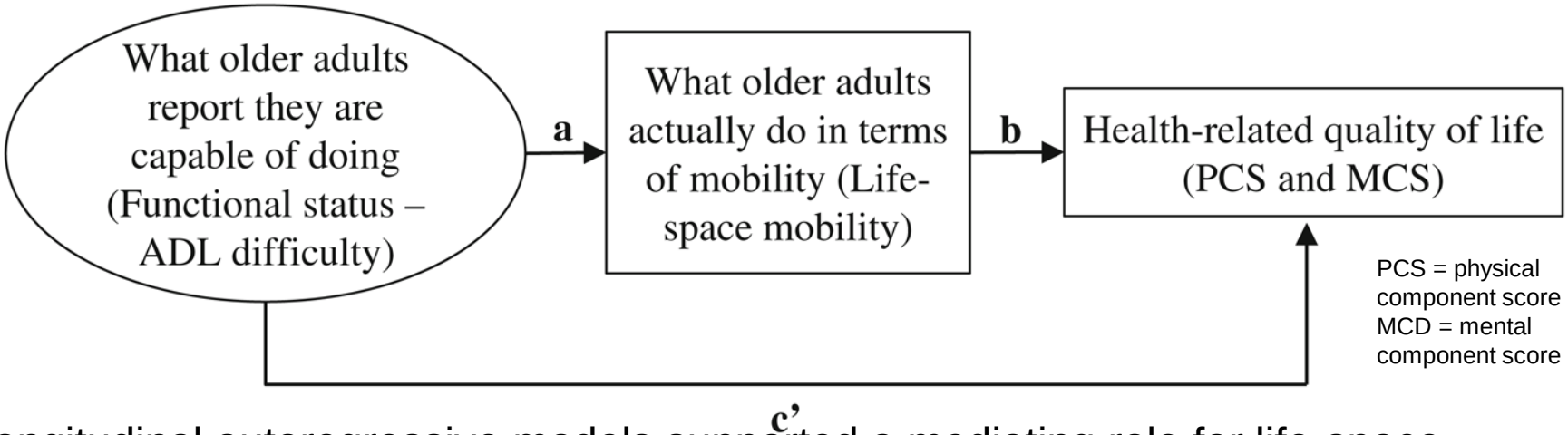
Physical Therapy. 2005; 85:1008–1019.

Mean Life-Space Scores (SD) By Life-Space Level Achieved Independently



Adapted from *Am J Kidney Dis.* 2014 Mar;63(3):429-36

Life-Space Mobility Mediates Association Between Activities of Daily Living (ADL) and Health Related Quality of Life (HRQOL)



Longitudinal autoregressive models supported a mediating role for life-space mobility in the relationship between functional status and HRQoL. Functional status limitations might cause diminished HRQoL in part by limiting mobility. Mobility limitations may precede functional status limitations in addition to being a consequence thereof. **Bentley J et al. *Qual Life Res*. 2013 Sep;22(7):1621-32.**

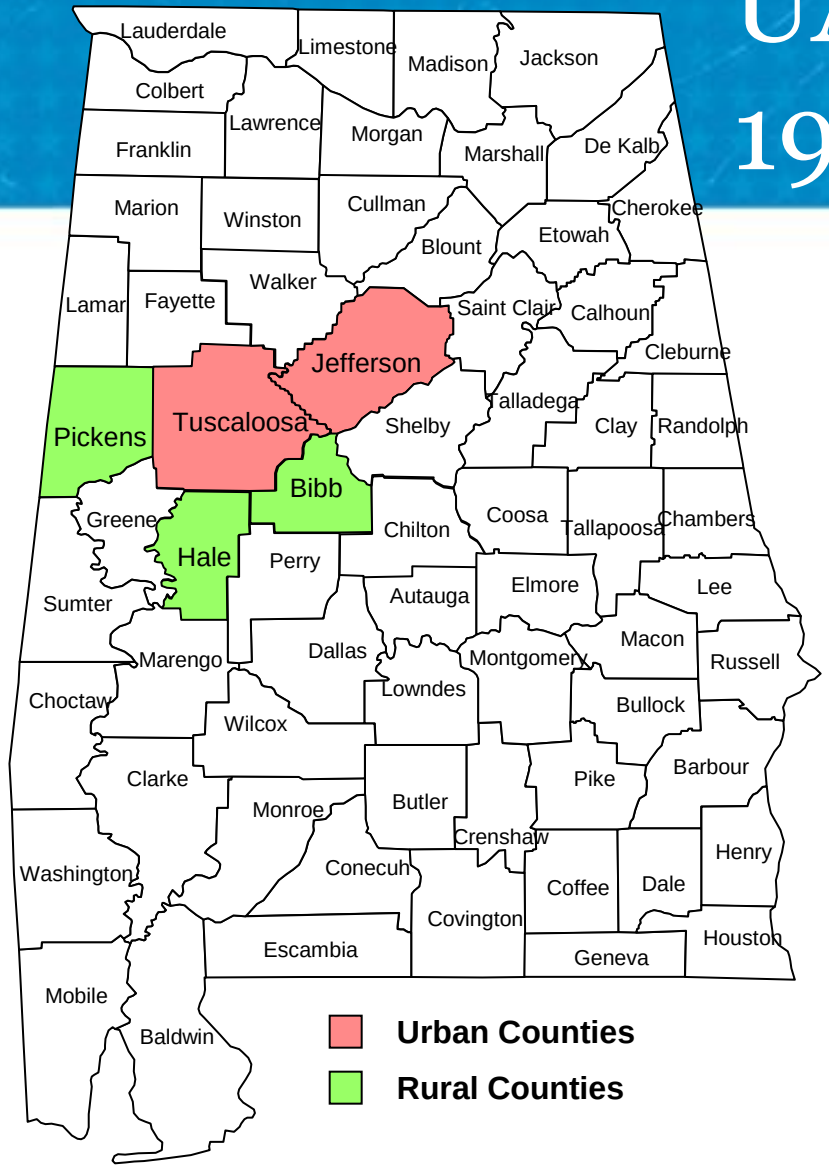
International Society for Quality of Life Research (ISOQOL) Outstanding Article of the Year Award

Social Participation and Life-Space

Measure	≥60	<60
Moderate or Very Active Socially	100%	22%
Regular Religious Service Attendance (≥1 time/week)	79%	48%
No Religious Service Attendance	4%	18%

From: Resilience in Mobility in the Context of Chronic Disease and Aging: Cross-Sectional and Prospective Findings from the UAB Study of Aging. In P.S. Fry, C.L.M. Keyes (Eds) *New Frontiers of Resilient Aging*. *Life Strengths and Wellness in Late Life* (pp 310-229), New York Cambridge University Press, Nov 2010.

UAB Study of Aging 1999-2009



A longitudinal observational study of health and mobility.

Participants were selected using a stratified, random sampling of Medicare beneficiaries living in 5 counties in Alabama.

The study over-sampled males, African Americans, and rural residents.

UAB Study of Aging Participants

Methods

- Comprehensive, in-depth, baseline and 4-year in-home assessments.
- Telephone follow-up interviews at six-month intervals up through 8.5 years after baseline.

Methods

Medical conditions were identified and verified at baseline through multiple procedures:

- **self-report during interview and taking a specific medication for that condition; or**
- **reported on the questionnaire returned by the participant's primary care physician; or**
- **indicated as a diagnosis on a previous hospital discharge summary**

Follow-up Assessments

- **6-month follow-up telephone interviews**
- **973 persons completed at least one follow-up interview**
  - **12,039 interviews completed over 8 years**
    - **873 persons with vital status known at year 8**
    - **425 persons completed all interviews**
    - **7 persons with no follow-up and unconfirmed vital status at 8 years**
- **382 confirmed deaths at 8 years**
  - **Reported deaths confirmed with the Social Security Death Index**

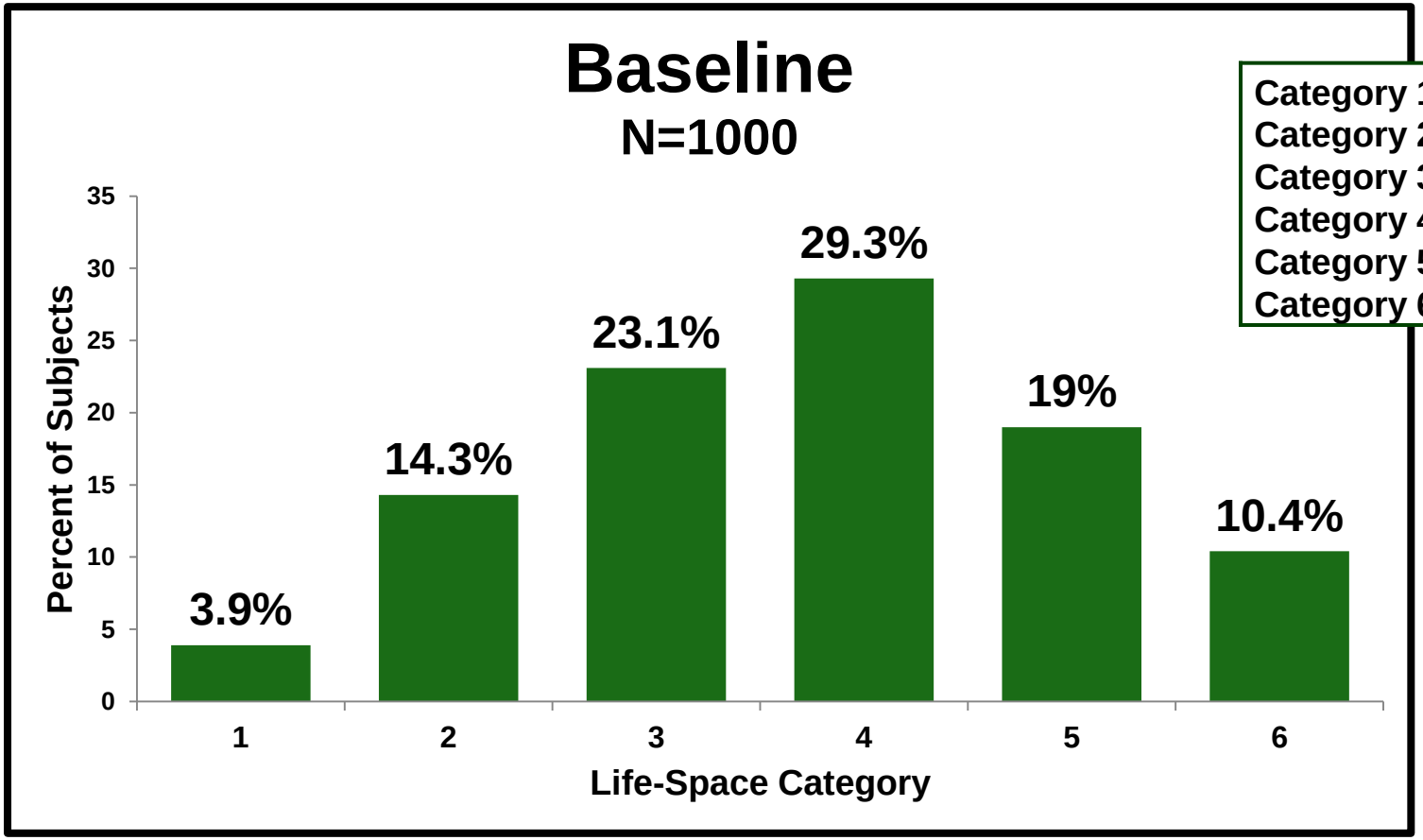
UAB Study of Aging
Sample Description
N=1000

Age (Mean ± SD)	75.3 ± 6.7
African-American	50%
Female	50%
Rural Residence	51%
Married	51%
Education < 7th Grade	20%
> 12th Grade	50%
Income < $8000/year	23%
> $40,000/year	12%

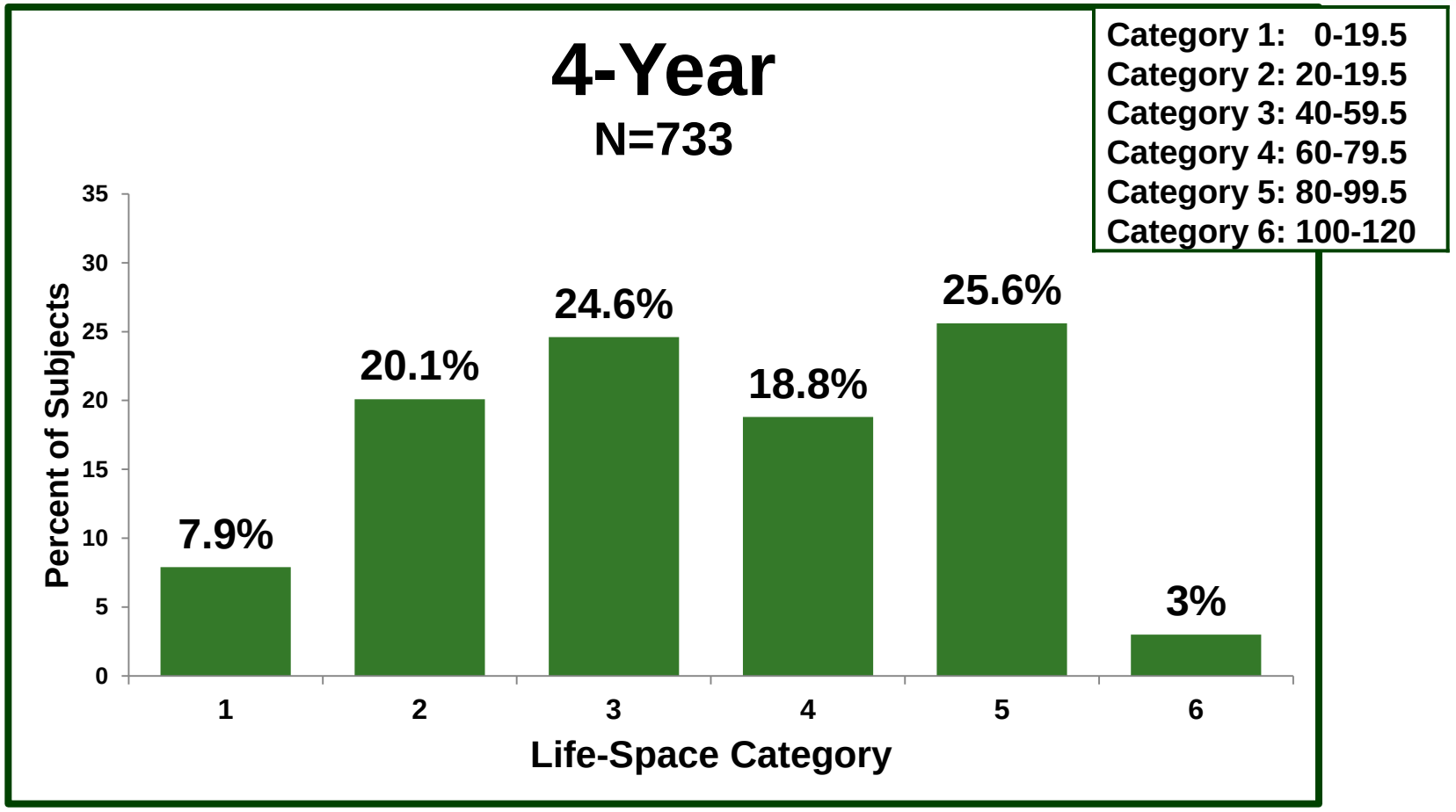
Baseline Prevalence of Common Conditions

Hypertension	**71%**
Arthritis / Gout	**49%**
Gastrointestinal Disease	**26%**
Diabetes	**25%**
Cancer History (not including skin)	**18%**
Cardiac Arrhythmia	**14%**
COPD / Asthma	**14%**
Heart Failure	**13%**

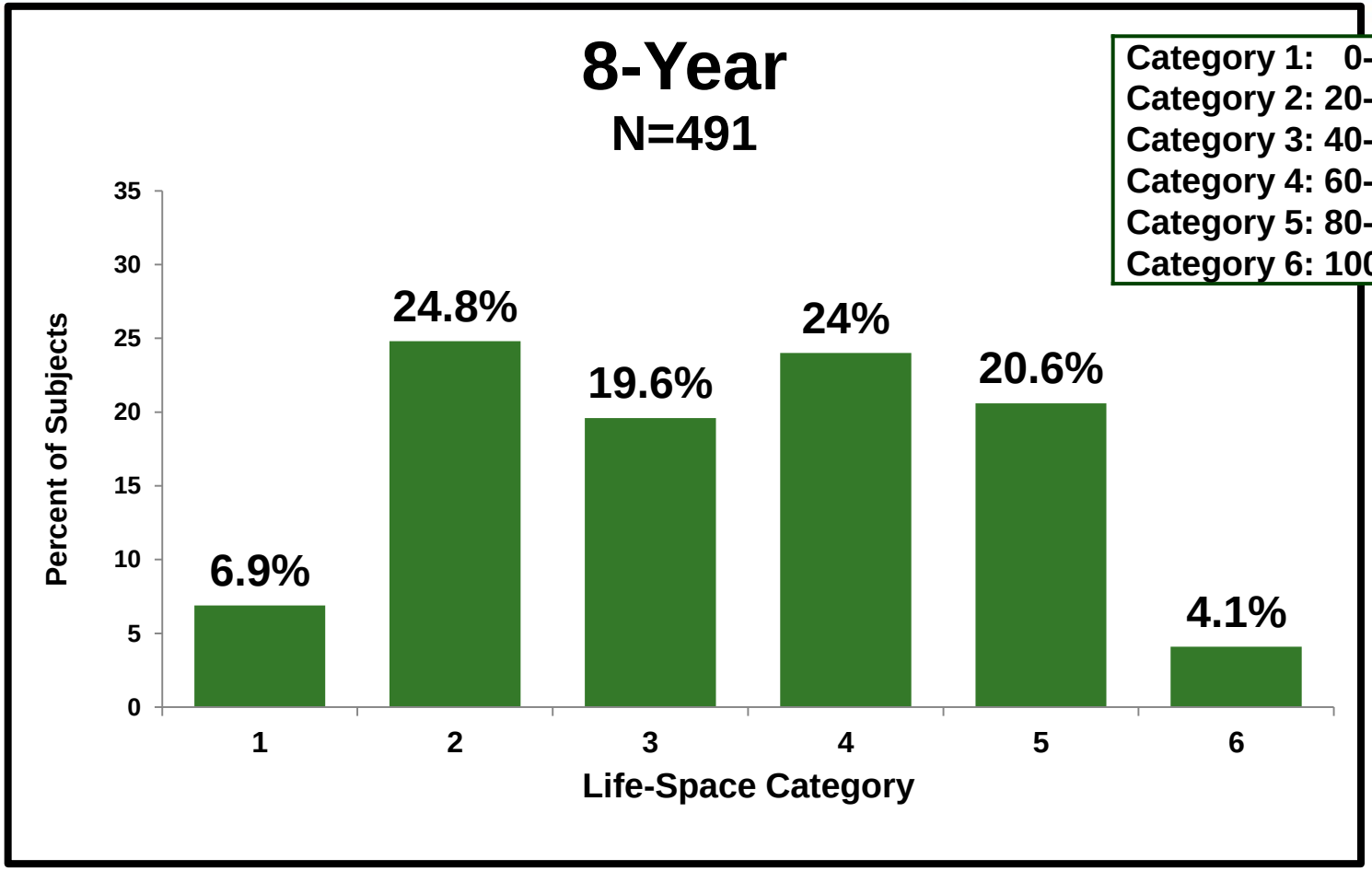
Distribution of Life-Space



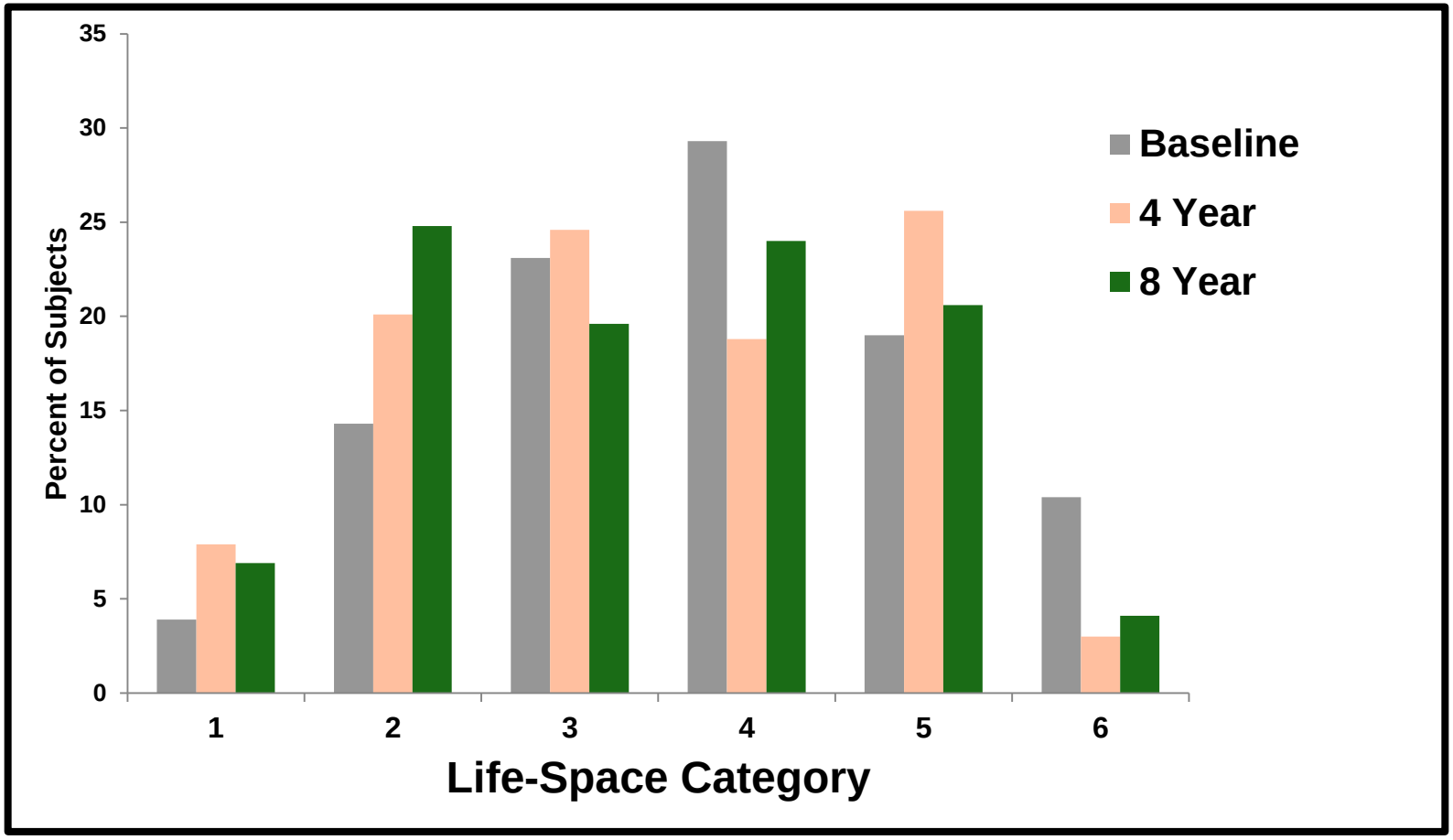
Distribution of Life-Space



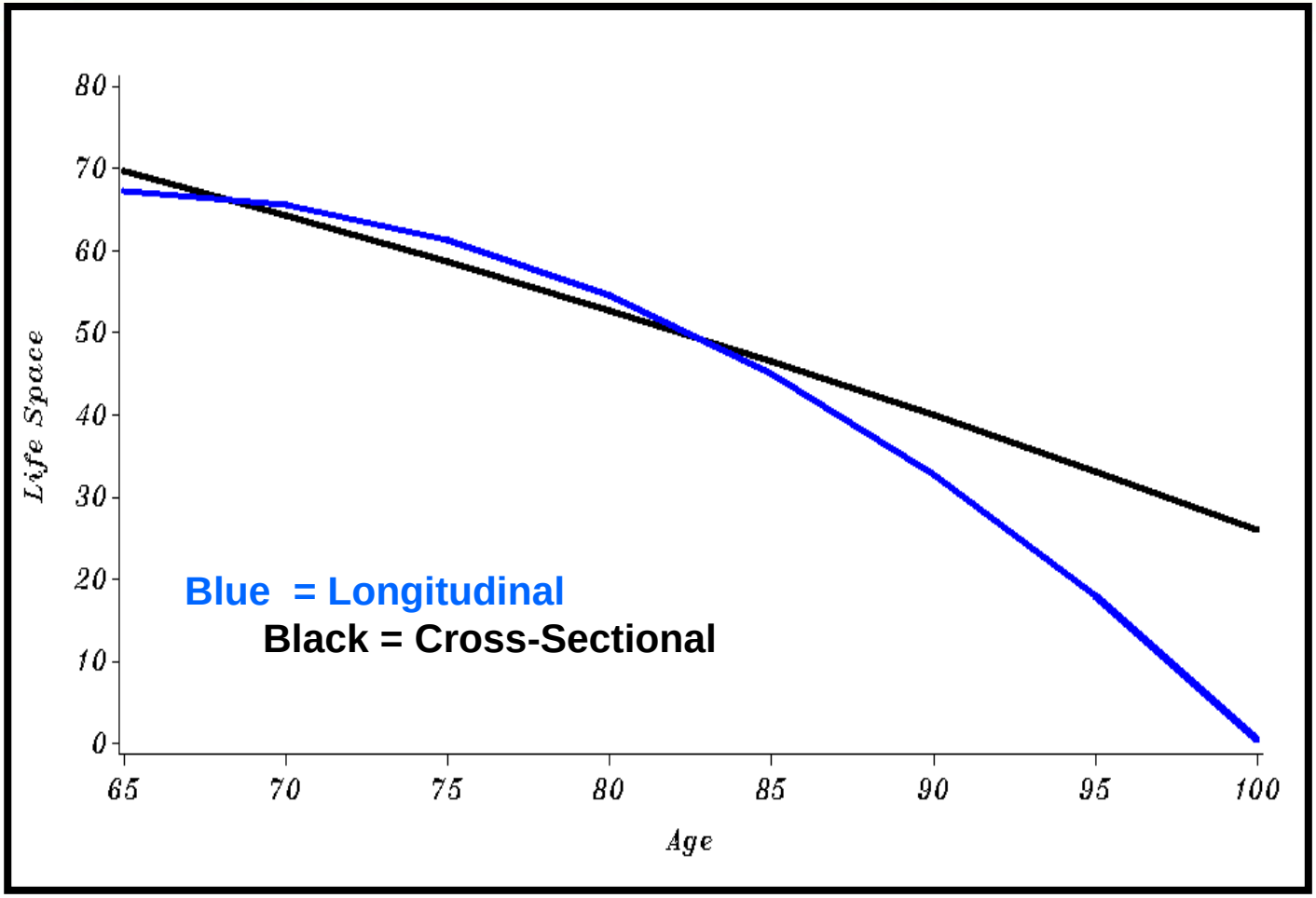
Distribution of Life-Space



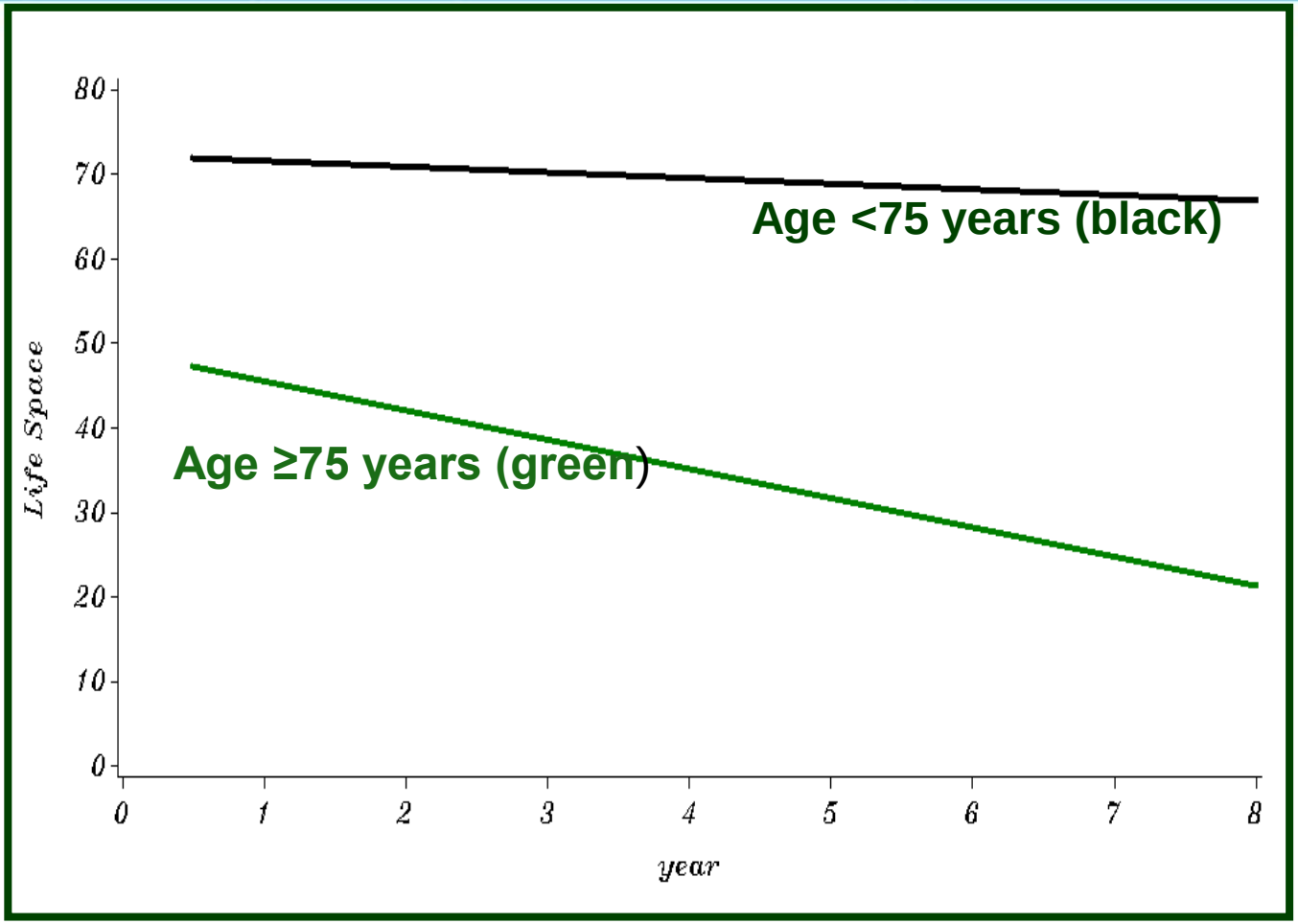
Distribution of Life-Space



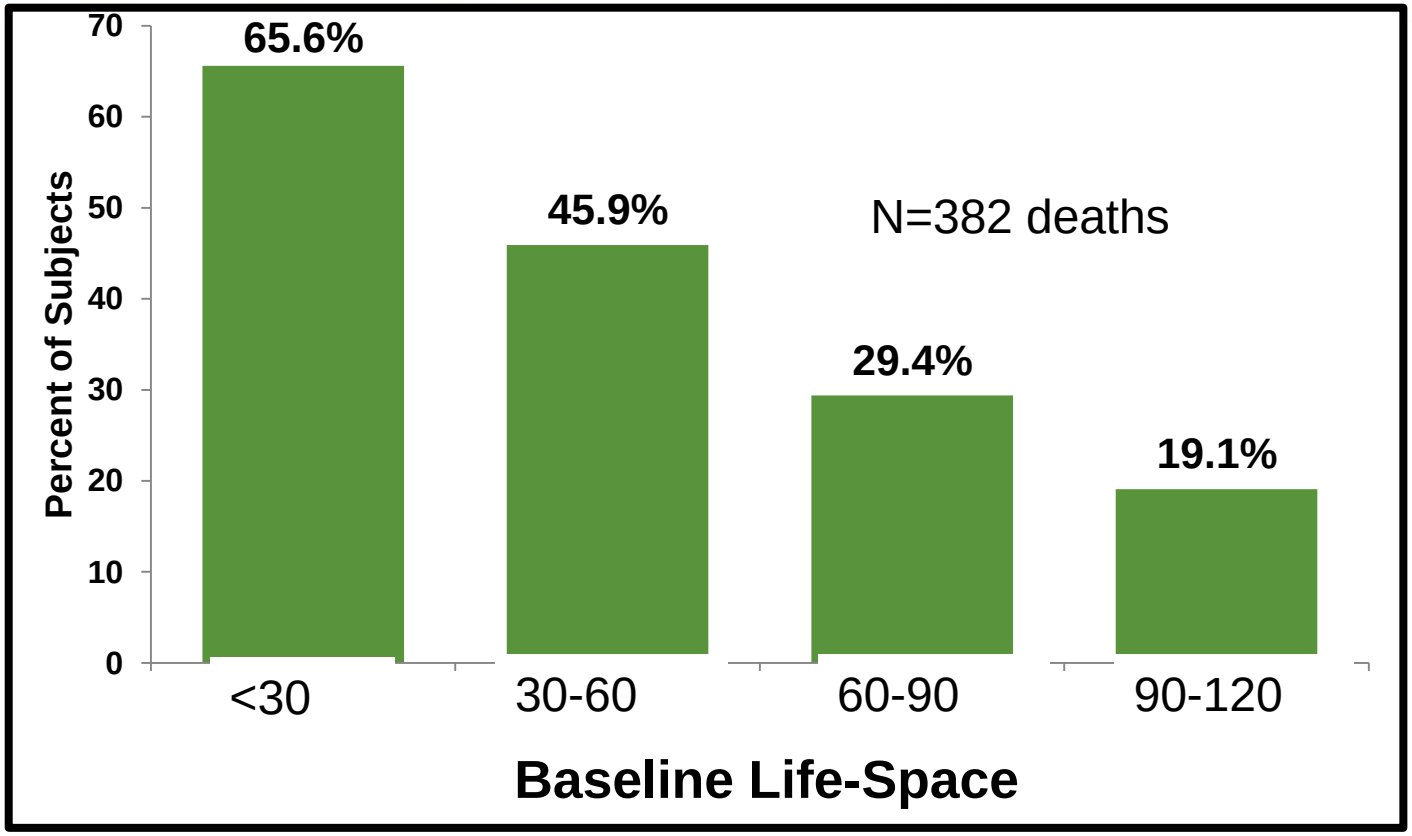
Random Effects Regression Models of Life-Space Trajectories



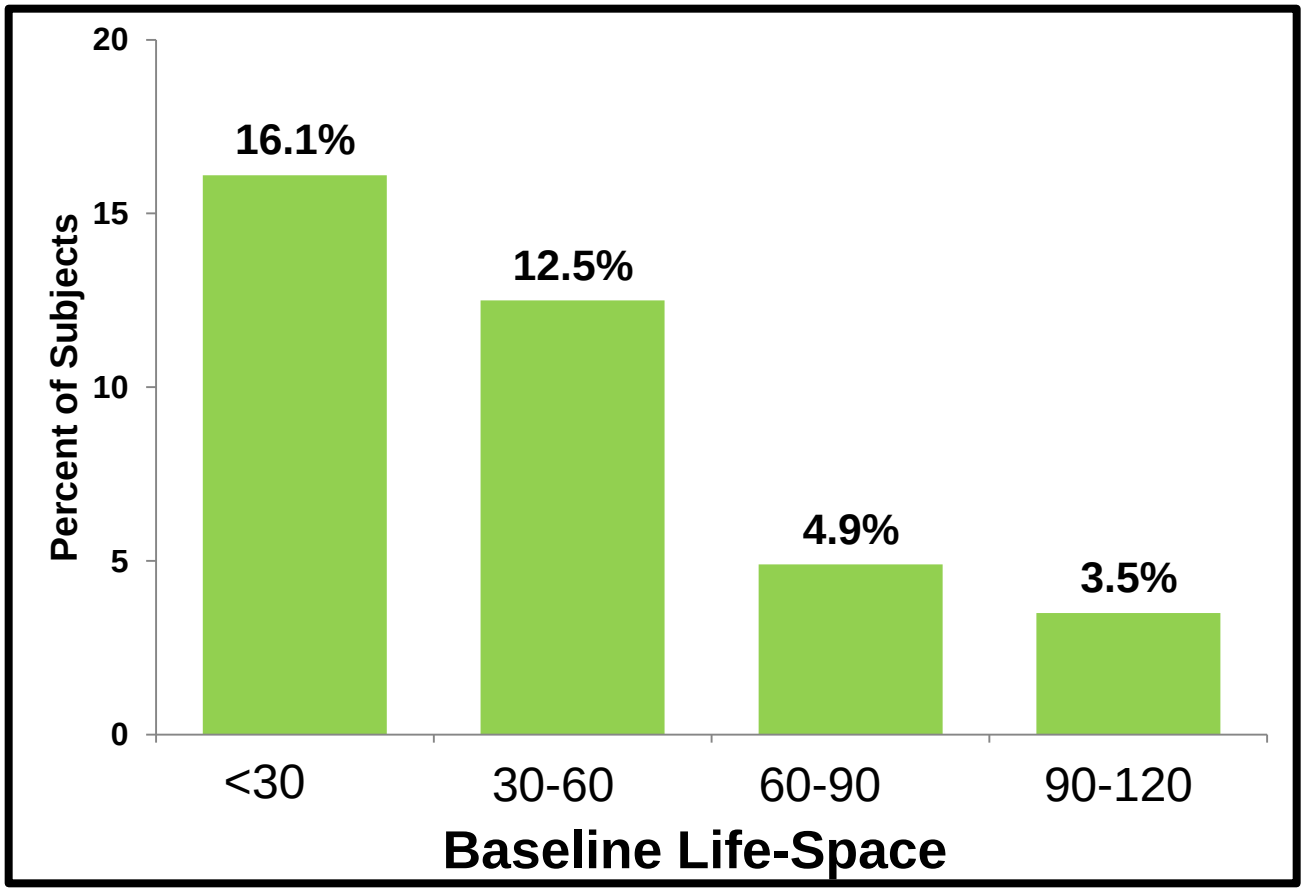
8-Year Life-Space Trajectory by Age



Baseline Life-Space and 8-Year Mortality



Baseline Life-Space and Nursing Home Admissions over 8 Years



J Aging Health, 25(6):907-920, August 2013

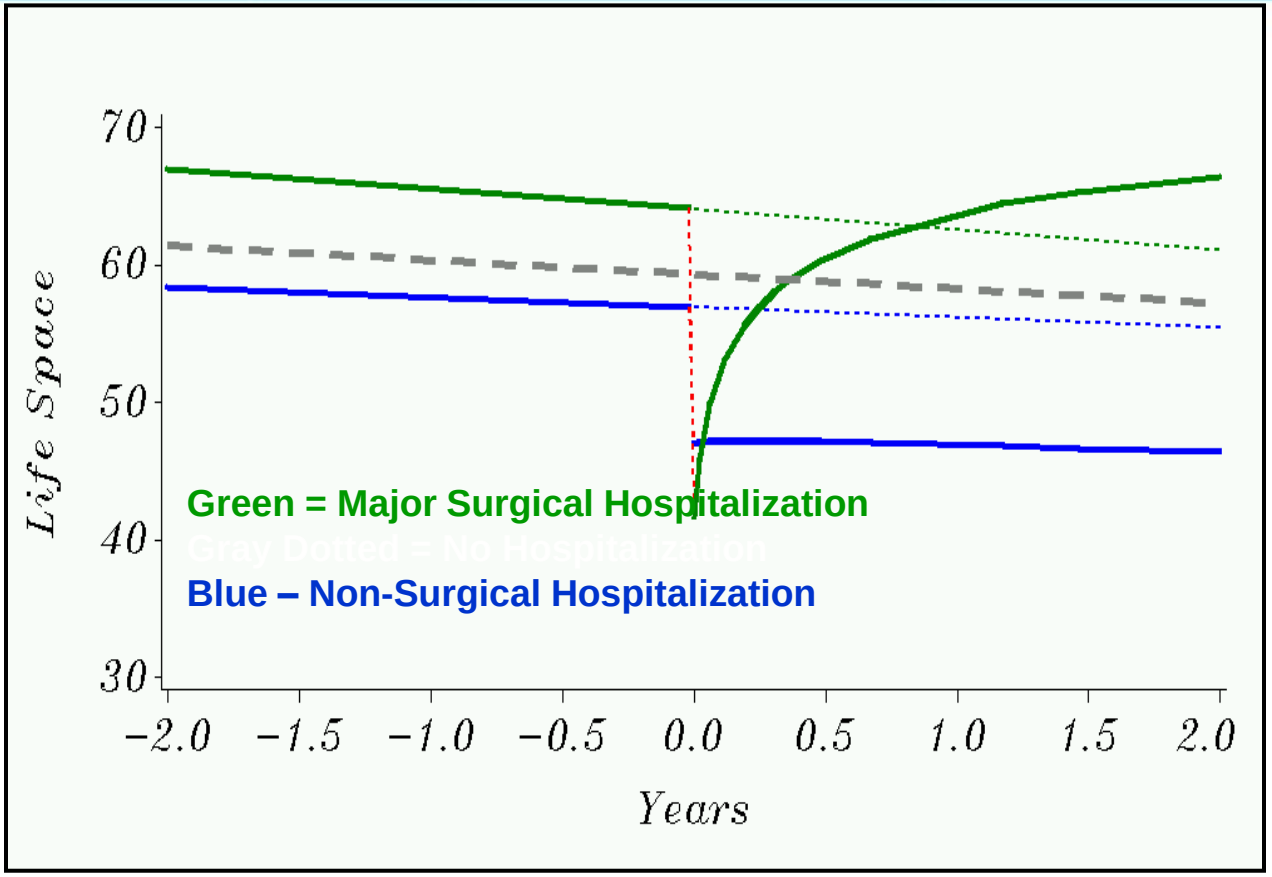
Impact of Falls and Fractures on 6-Month Change in Life-Space

Event	Unadjusted Life-Space Change	Adjusted* Life-Space Change
No Event	**-1.2**	**N/A**
Fall	**-3.2**	**-3.6**
Injurious Fall	**-6.1**	**-4.7**
Fracture	**-14.1**	**-14.2**
Hip Fracture	**-20.6**	**-23.6**

***Models control for age at the start of the interval, gender, race, rural/urban residence, married, transportation difficulty, comorbidity score, symptoms, cognition, and GDS; adjusted LS change was significant for falls, injurious falls, fracture, and hip fracture with p<.001 for all.**

J Am Geriatr Soc; 62-919-923, May 2014

Hospitalization and Life-Space Change



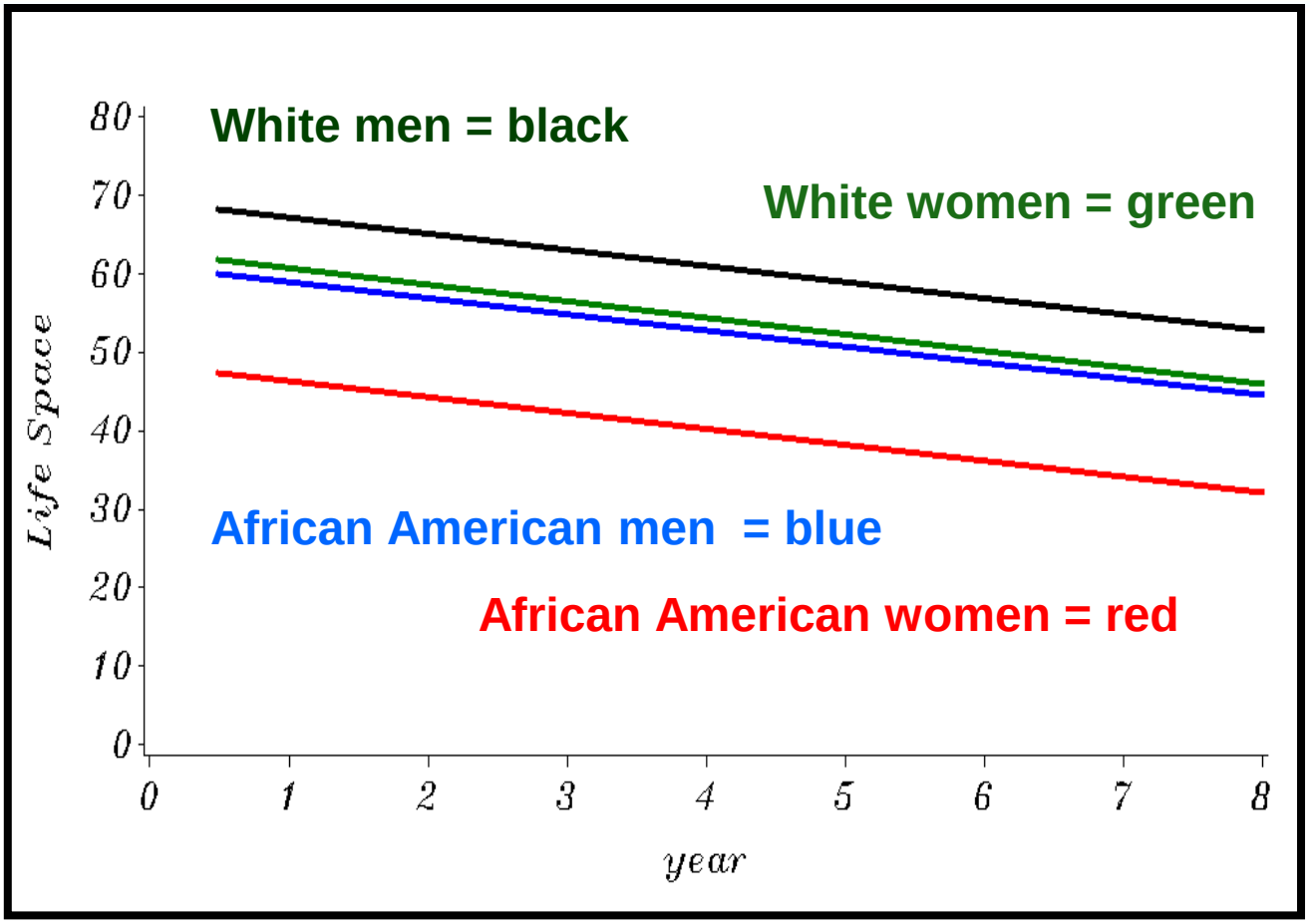
***Ann Intern Med* 150(6):372-378; March 2009.**

Significant Predictors of Maintenance of Life-Space ≥60 Over Four Years

Factors	Odds Ratio
Younger Age (years)	0.907
Income	1.134
Transportation Difficulty	0.195
Comorbidity Count	0.744
Symptom Count	0.906
Mini Mental State Exam	1.126
Smoking Pack Years	0.993

Adjusted for race, sex, residence, education, marital status, unintentional weight loss, Geriatric Depression Score, Arthritis Impact Measurement Scale (AIMS) Anxiety Score

Life-Space Trajectories By Race and Sex



Baseline Predictors of Life-Space Change Over 8.5 Years of Follow-Up By Race

African American	White
Age	Age
Income and Transportation Difficulty	No Socio-Economic Predictors
Diabetes, Kidney Disease, Stroke, Arthritis	Heart Failure, GI Disease, Cataracts
BMI < 20, BMI > 30	BMI < 20
No Health Behavior Predictors	Leisure Time Physical Activity

Summary and Conclusions

- The Life-Space Assessment provides a reliable, valid assessment of community mobility that is sensitive to important changes associated with aging
- Life-space mobility reflects quality of life and social participation
- Life-space predicts nursing home admissions and mortality

Summary and Conclusions

- Acute events such as hospitalizations, falls and fractures are associated with declines in life-space
- Changes in life-space are reflective of the clinical severity of the health event
- Predictors of life-space change include age, income, transportation difficulty, co-morbidity, symptoms, cognitive status, and smoking

Summary and Conclusions

- Older African Americans have lower life-space mobility than older Whites
- The slope of life-space trajectories are similar for African American and White older adults
- Age is a common predictor of life-space declines for both African Americans and Whites, but other predictors of life-space decline differ by race

Implications for Research and Patient Care

- Life-space mobility has potential as a prognostic tool and as an outcome measure
- We need to understand the mechanisms of recovery of life-space after acute declines and to develop effective interventions to maintain life-space

Implications for Research and Patient Care

- Potentially modifiable risk factors for life-space declines (transportation availability, improved chronic disease management, untreated symptoms, nutritional status, smoking, physical activity) should be targets for interventions to optimize mobility and reduce health disparities among community-dwelling older adults

UAB Study of Aging Research Team (1998-2014)

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