Frailty in Older Mexican Americans

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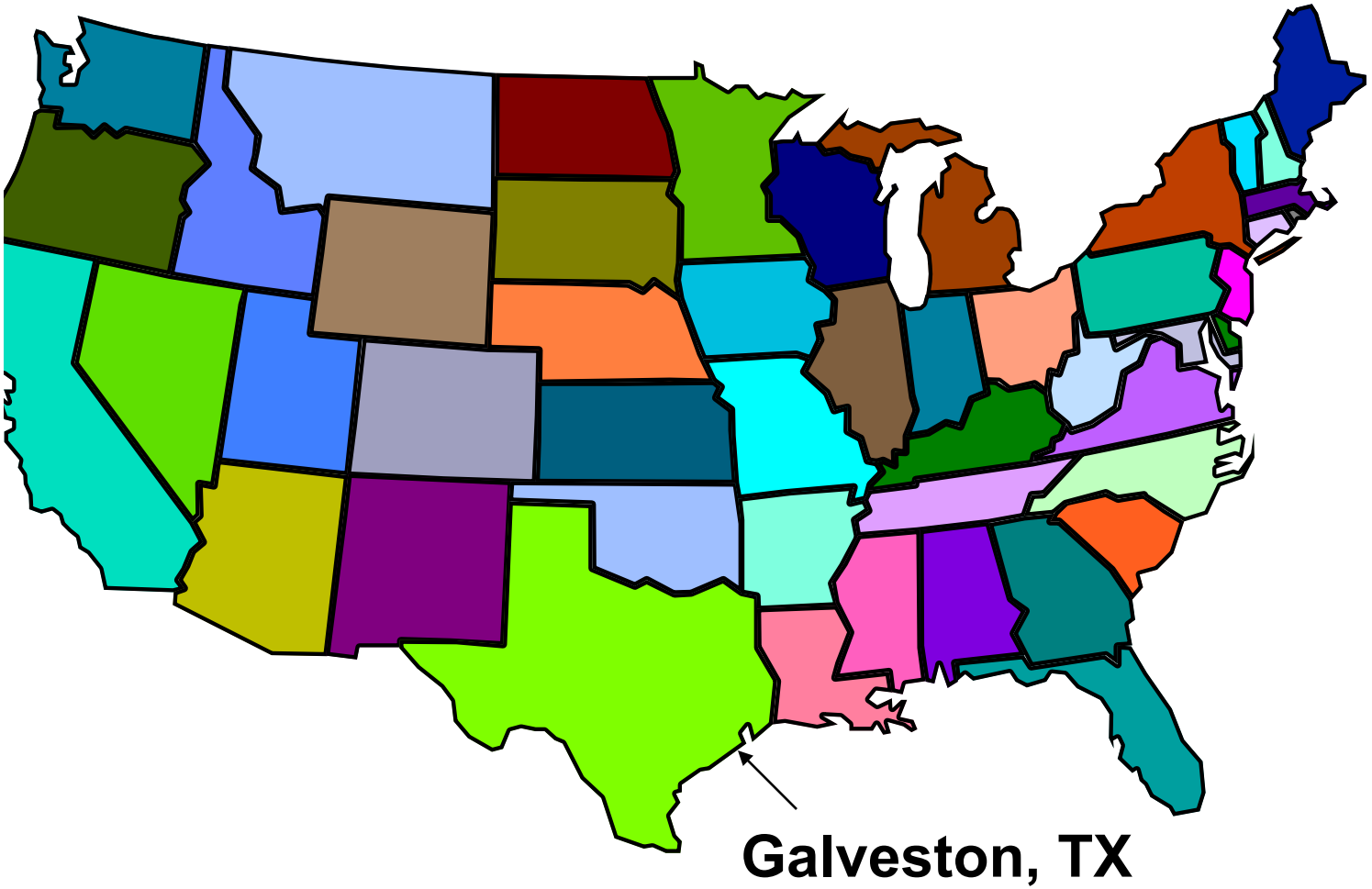
Where is Galveston, TX ?



Galveston, TX

Academic Health Sciences Center

5 hospitals, 796 beds, 41 clinics

Academic Programs:

School of Medicine, School of Nursing, School of Allied Health Sciences, and Graduate School of Biomedical Sciences

Areas of Research: Aging, Tropical/Infectious Disease, Structural Biology, Minority (Hispanic) Health, Neuroscience

Outline

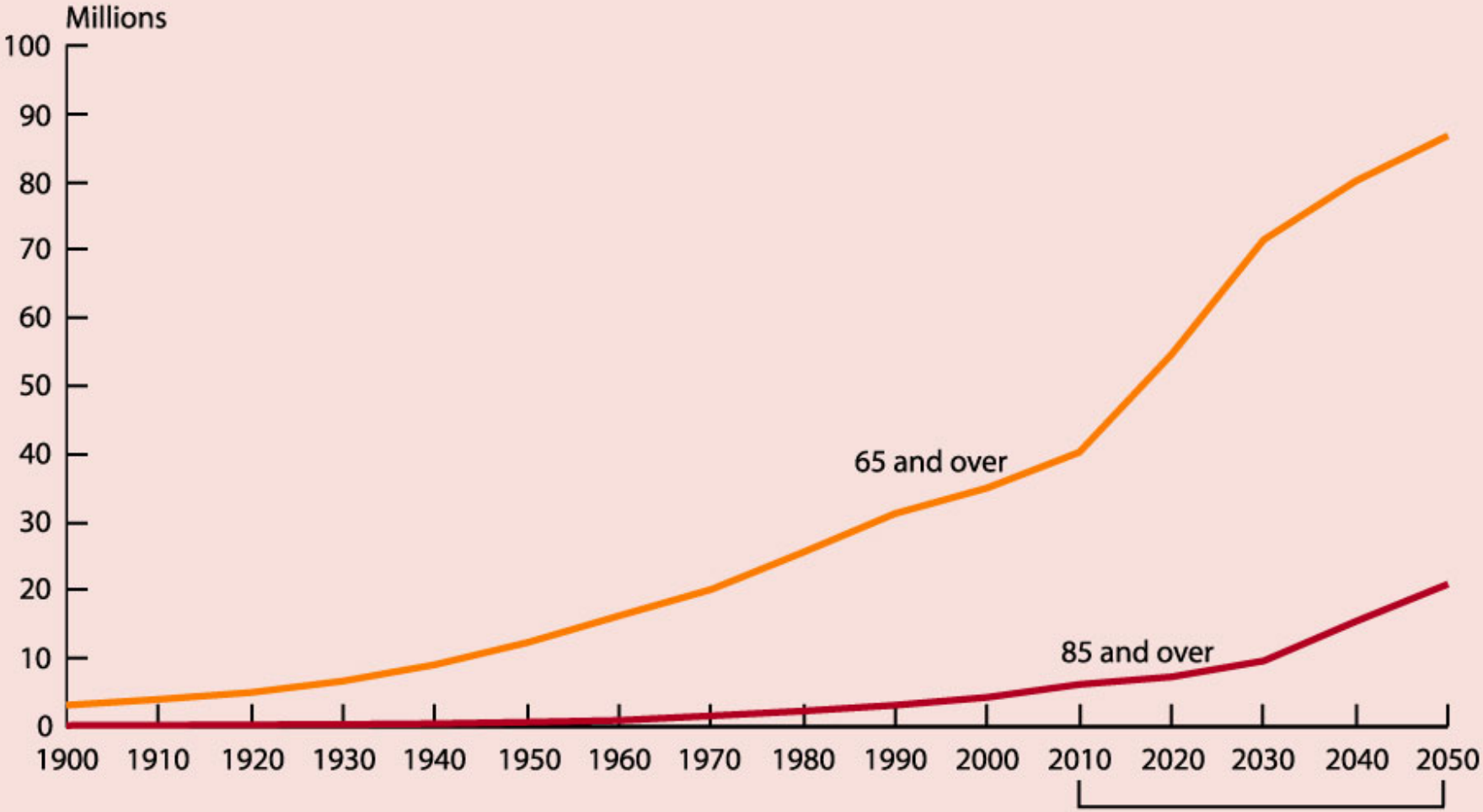
- Introduction and Background
- Previous Research
- Current / Planned Research

1. Introduction and Background

Frailty has been identified as an important health problem and is associated with disability, institutionalization and mortality in older adults. Rates for frailty increase with age and range from 15 percent for persons 65 years of age, to 80 percent for persons 90 years and older.

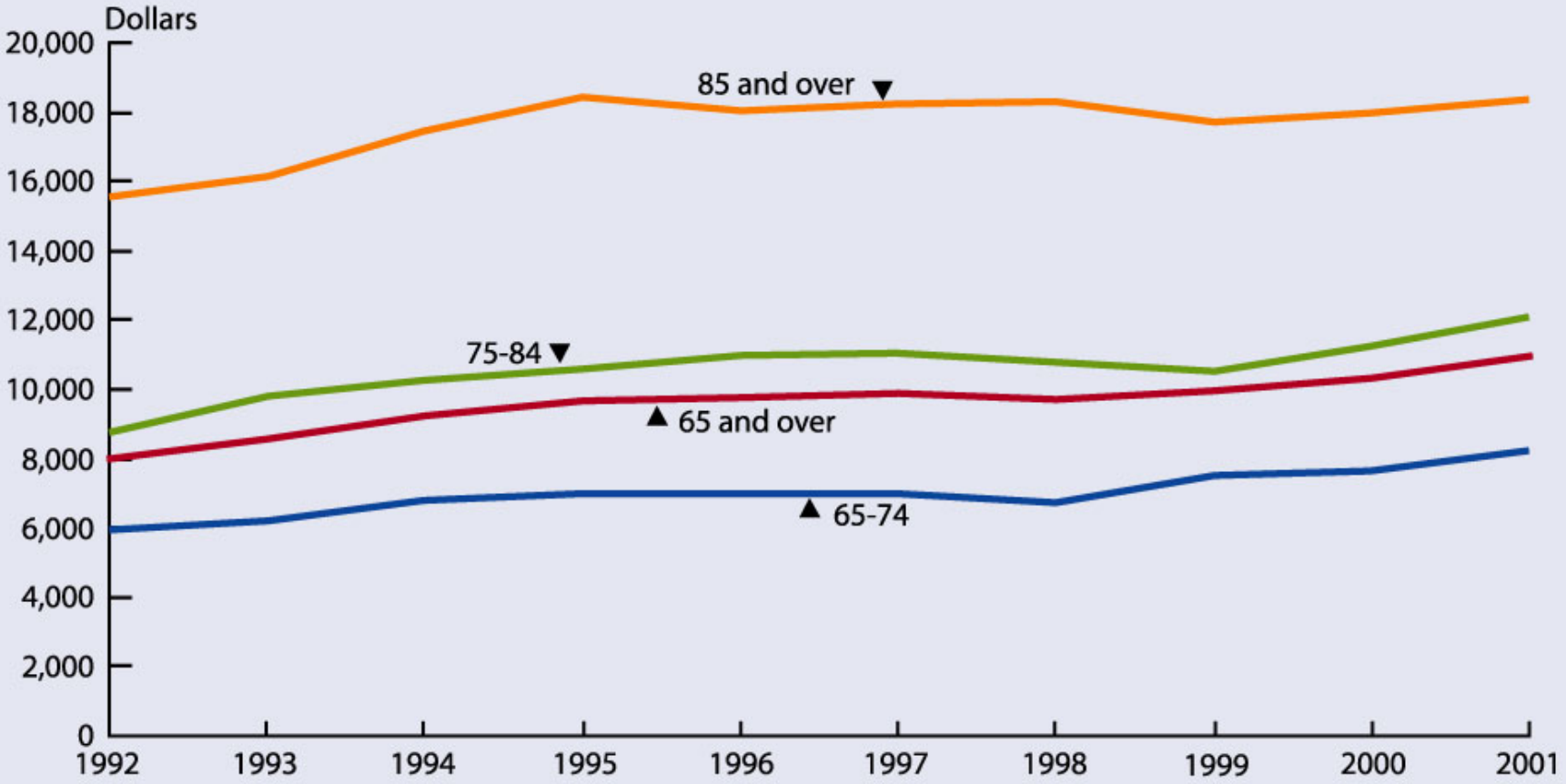
Hamerman D. Toward an understanding of frailty. *Ann Intern Med* 1999; 130:945-950.

Number of people age 65 and over, by age group, selected years 1900-2000 and projected 2010-2050



Note: Data for 2010-2050 are projections of the population.
Reference population: These data refer to the resident population.
Source: U.S. Census Bureau, Decennial Census and Projections.

Average annual health care costs for Medicare enrollees age 65 and over, in 2001 dollars, by age group, 1992-2001



Note: Data include both out-of-pocket costs and costs covered by insurance. Dollars are inflation-adjusted to 2001 using the Consumer Price Index (Series CPI-U-RS).

Reference population: These data refer to Medicare enrollees.

Source: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey.


Defining Frailty

Frailty

"The term 'frailty' has been used clinically as a global concept to describe a condition, common in the very old, of impaired strength, endurance, balance, vulnerability to trauma and other stressors, and high risk for morbidity, disability, and mortality."

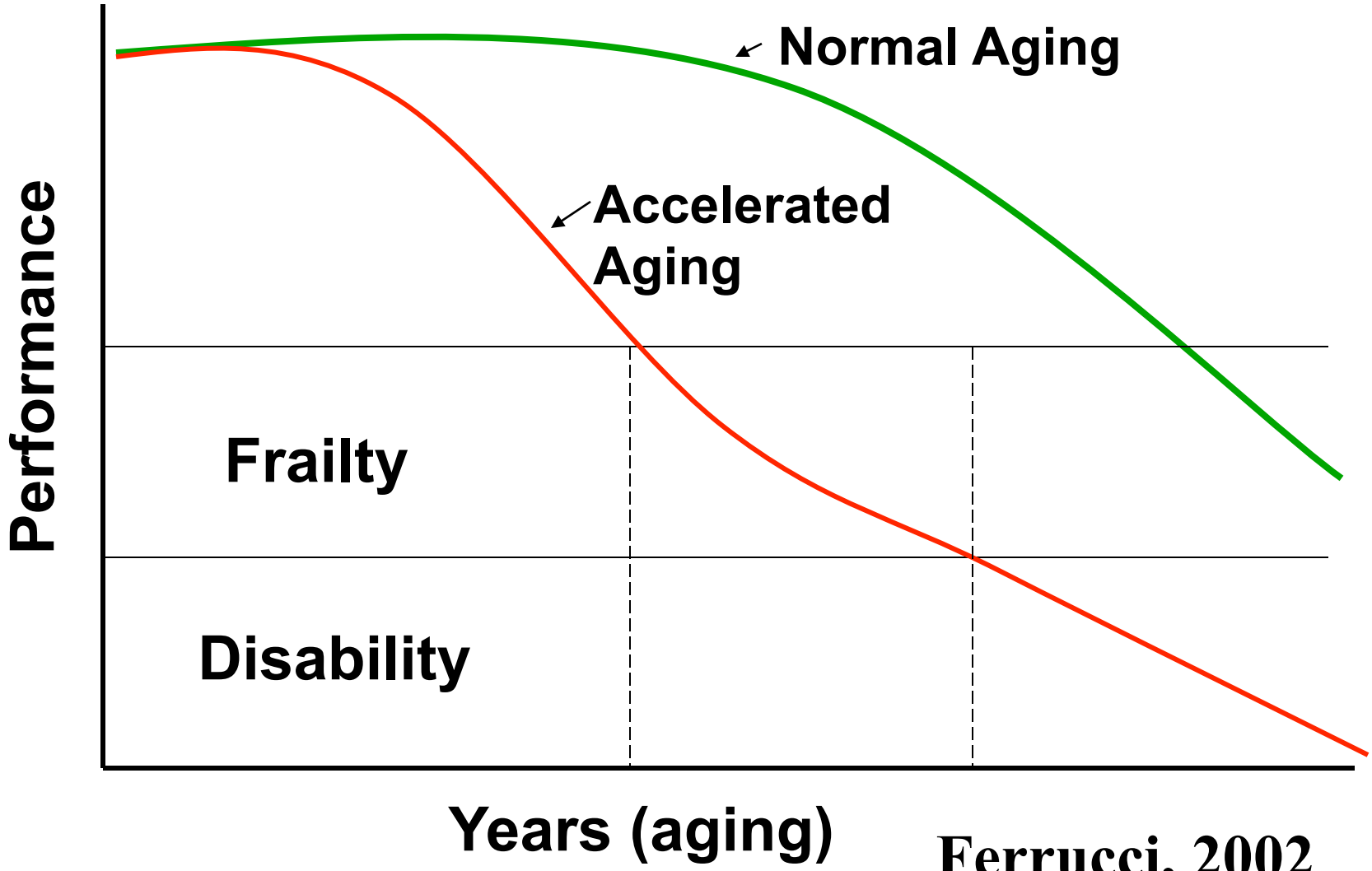
CFDA 93.866, PA-03-122, National Institute on Aging, 2003

Frailty

- **Exact incidence and prevalence values for frailty are difficult to determine because of inconsistencies in how frailty is defined.**

- **Definitions of frailty range from general descriptions to a specific syndrome (phenotype).**

Frailty as Accelerated Aging

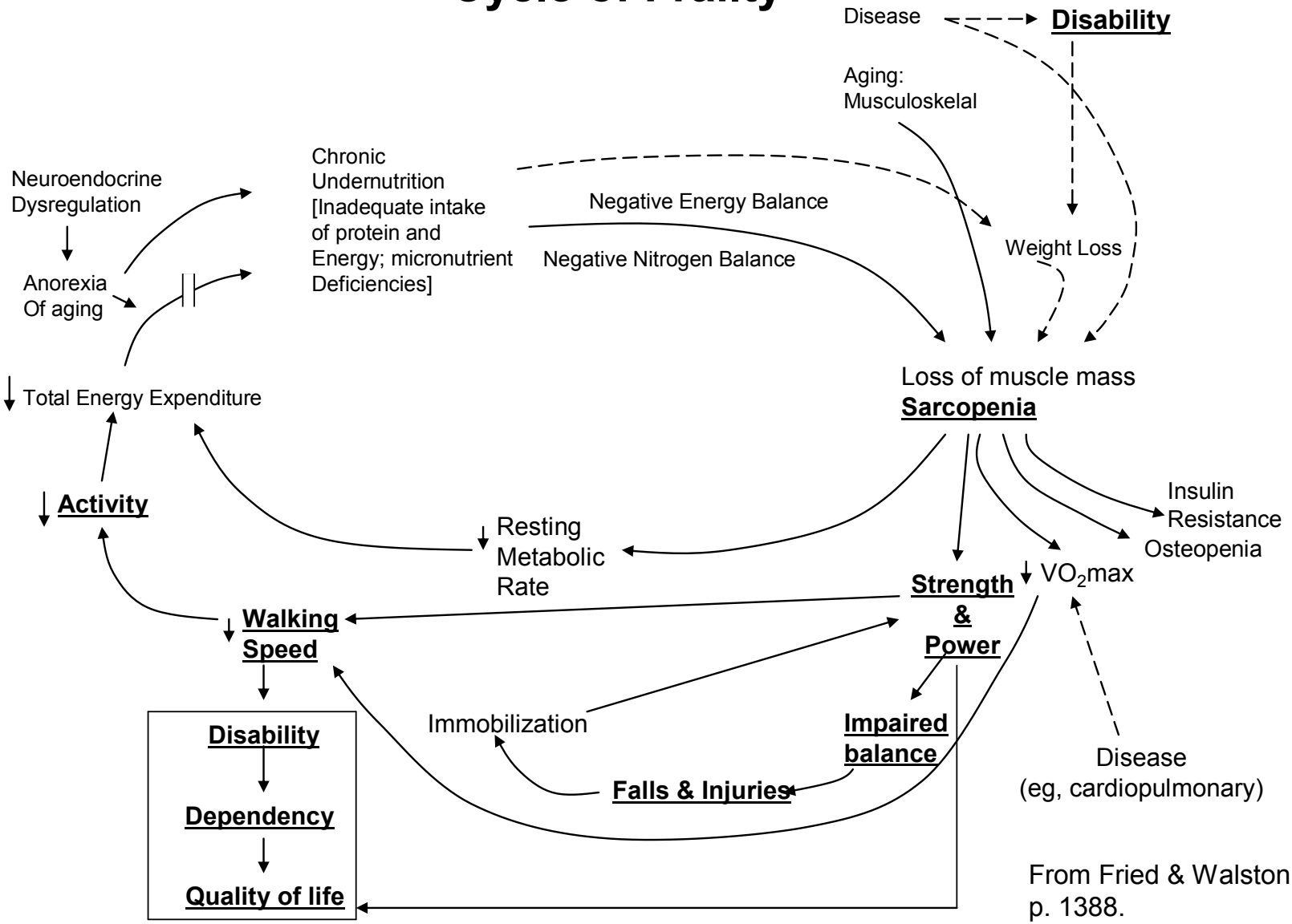


Ferrucci, 2002

Fried and colleagues proposed a 'cycle of frailty' and identified operational criteria for assessing frailty.

Fried LP, Tangen CM, Walston J, Newman AB, Hirsch C, Gottdiener J, et al. Frailty in older adults: evidence for a phenotype. *J Gerontol A Biol Sci Med Sci* 2001; 56:M146-M156.

Cycle of Frailty



From Fried & Walston p. 1388.

Areas of overlap with the Enabling-Disabling Model are in bold.

Frailty

Advantage of the Fried et al. approach:

1) **Criteria are comprehensive and multifactorial, recognizing that multiple systems contribute to frailty;**
2) **Criteria provide a practical definition that can be applied in community settings; and**
3) **Criteria represent the most widely used method to operationally define frailty in the geriatric/gerontology literature.**

2. Previous Research

An earlier grant focused on examining the process of becoming disabled in a sample of Mexican American older adults from the Hispanic Established Populations Epidemiological Study of the Elderly (EPESE).

Previous Research

- **We examined several variables in 622 Mexican American older adults; two waves of data were collected.**

- **The goal was to determine the relationship among variables associated with pathology, impairment, functional limitations, and disability with Health Related Quality of Life.**

Reliability of Muscle Testing

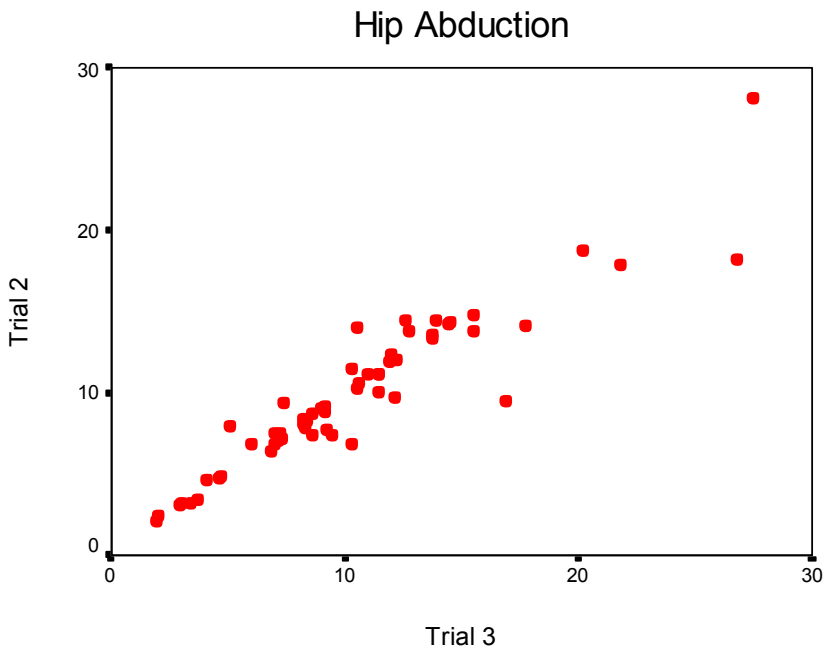
- **It was important to establish the reliability/consistency of muscle testing older adults in the community setting.**

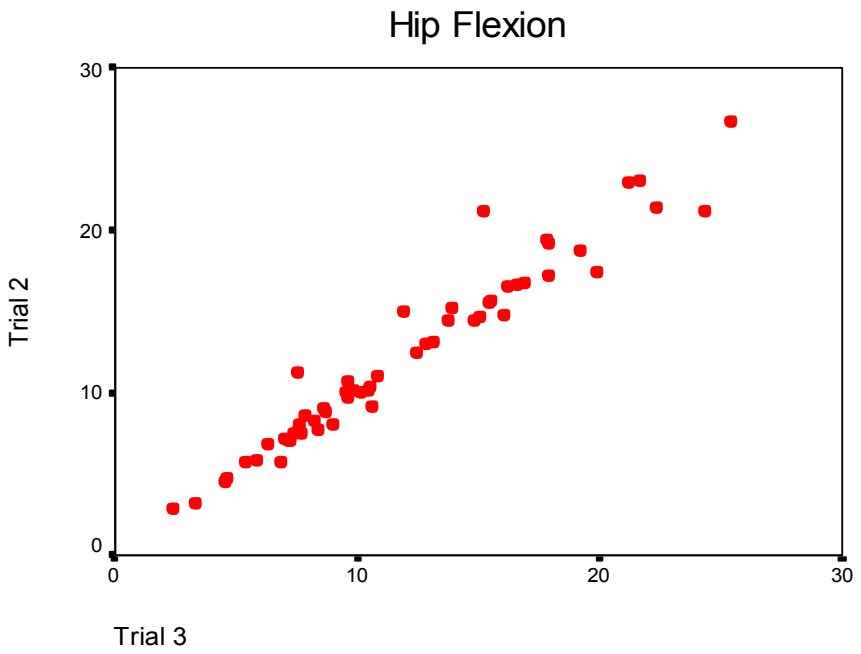
Muscle Strength

A manual muscle testing device was used to measure upper and lower extremity strength in participating subjects.

Three lower extremity and two upper extremity positions were tested by trained raters. All testing was done in the seated position.

Reliability of Muscle Testing





Ottenbacher, KJ, Branch LG, Ray, LR, Gonzales, VA, Peek, MK, Hinman, MR. The reliability of upper and lower extremity strength testing in a community survey of older adults. *Archives of Physical Medicine and Rehabilitation* 2002; 83:1423-1427.

Adapted Model Used in Previous Research

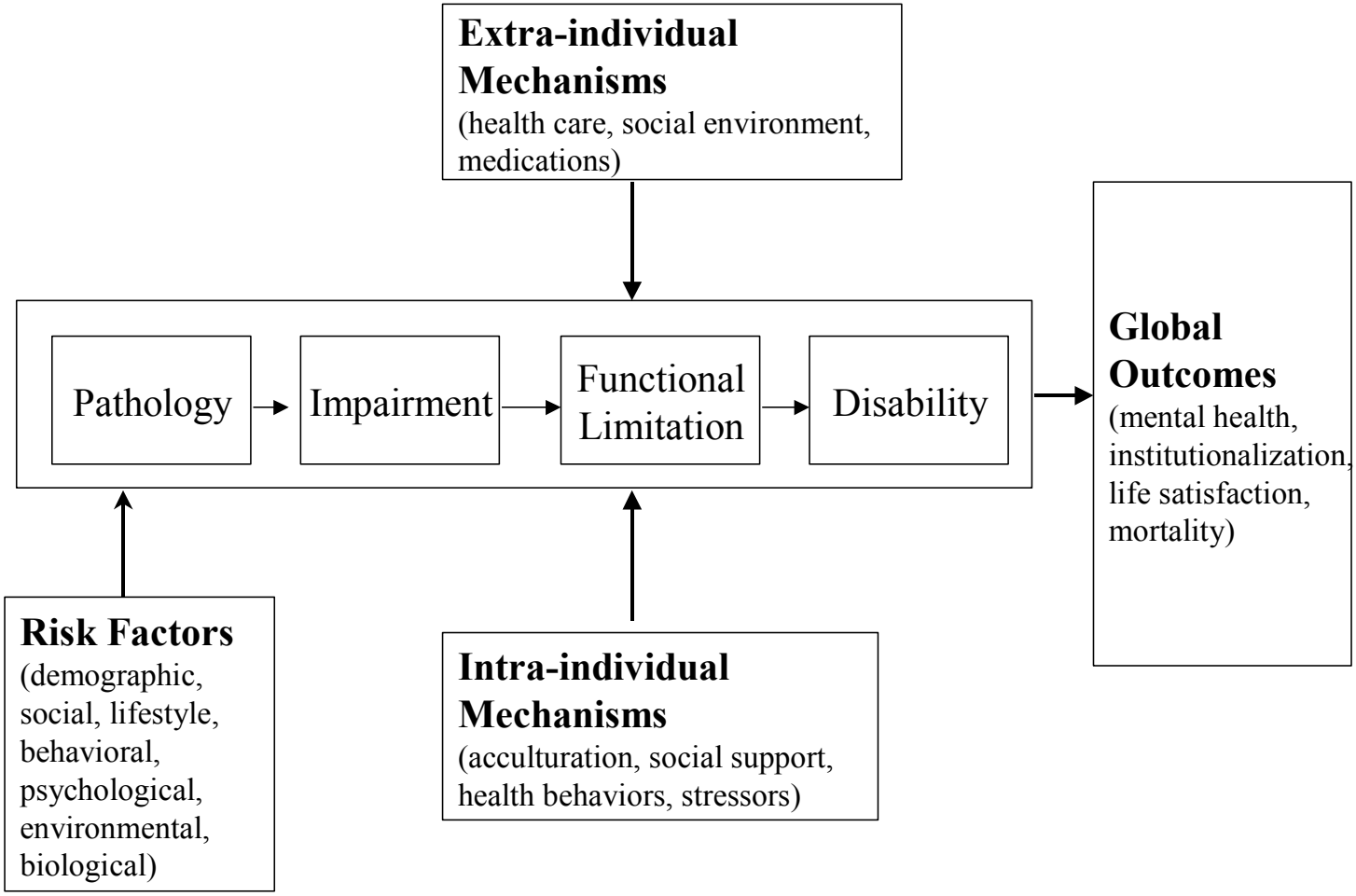


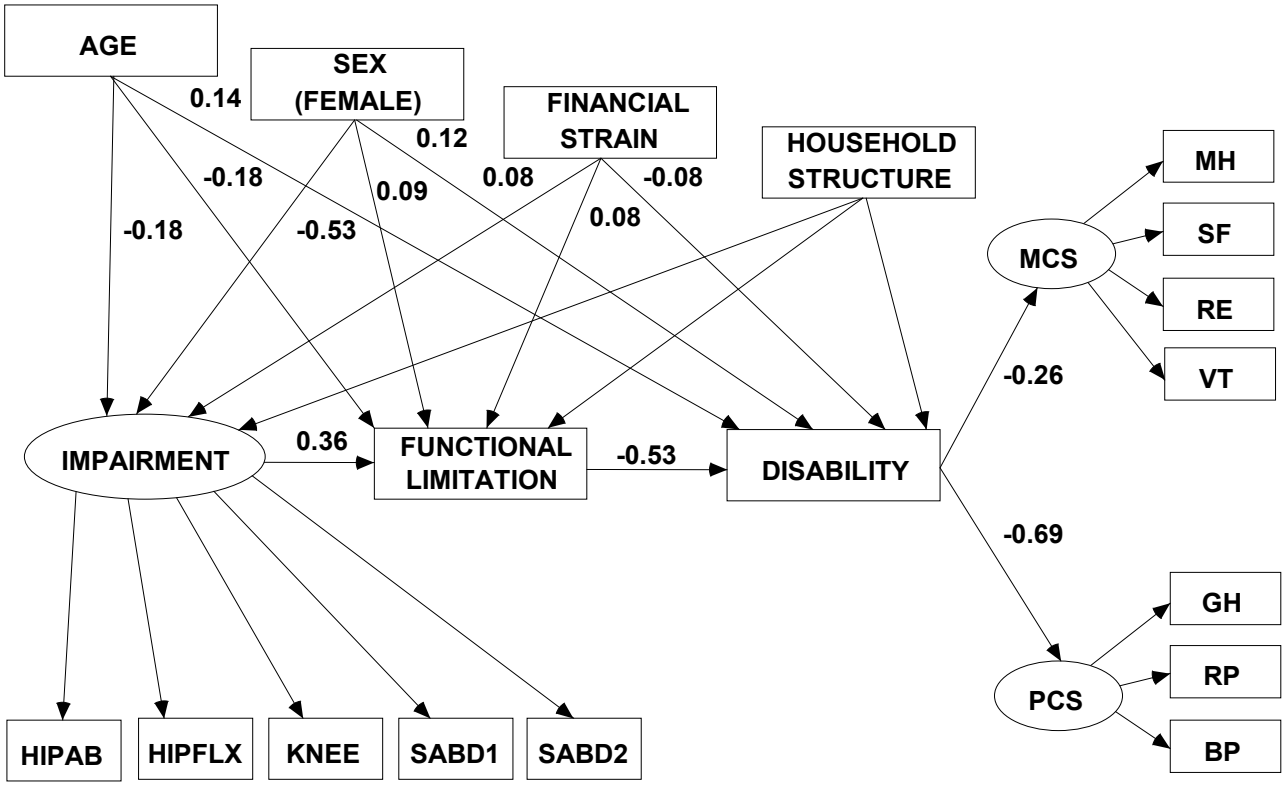
Figure 1. The Disablement Process Adapted from Verbrugge and Jette, 1994

- **Methods.** A structural equation model approach was used (AMOS 4) with data collected on 622 Mexican Americans residing in the southwest, aged 71 and older.

- **Results.** The results show support for the Disablement Process Model. Impairment was significantly associated with functional limitation (β = .36, z value = 7.2), which was significantly associated with disability (β = -.53, z value = 16.1). Finally, disability was significantly related to both physical and mental components of health related quality of life (SF-36) (β = -.69, z value = 23.4; β = -.26, z value = 6.5, respectively).

Findings

Disablement Process in Older Mexican Americans



Structural Equation Model showing relationship between variables from the enabling-disabling study of Mexican American older adults.

- **Conclusions.** Muscle strength as a measure of impairment and the SF-36 as a measure of health related quality of life are important factors in understanding disability in older Mexican Americans.

Peek MK, Patel K, Ottenbacher KJ. Expanding the disablement process model among older Mexican Americans. *Journal of Gerontology: Medical Sciences.* 2005;60A:334-339.

Previous Research (continued)

Once we established the association between muscle strength, disability, and health related quality of life, the next step was to examine the relationship with frailty.

There are physical health (e.g., diabetes, obesity) and environmental/social factors (diet, family networks) that are known to differ in Mexican American older adults in the U.S. population. These factors may impact the development of frailty in this ethnic group.

The purpose of the next study was to provide a systematic examination of frailty in a large well-defined sample of Mexican American older adults.

- **Objective:** Identify sociodemographic characteristics and health status variables associated with frailty in Mexican American older adults.

- **Design:** A prospective population-based survey was used to collect data from a sample of older adults living in the Southwest.

- **Subjects:** 551 non-institutionalized Mexican American men and women aged 70 and older participating in the Hispanic Established Population Epidemiological Study of the Elderly (EPESE) were interviewed in 2001 and 2002.

Primary Measures

- Sociodemographic characteristics
- Comorbidities
- Functional status (ADL & IADL)
- Muscle strength
- Short Physical Performance Battery
- SF-36
- Frailty Index

Primary Measures

- **Frailty Index**

  Adapted from Fried et al., included weight loss, exhaustion, grip strength and walking speed (no measure of physical activity)

  Scores: 0 = not frail, 1 = pre-frail, 2 – 4 = frail.

The analyses were:

Cross-sectional – examining the relationship among variables at one time period (2000).

Longitudinal – determine the ability to predict frailty over a period of 1 year.

Results

- **Men**

  Significant predictors of frailty in men were disability (ADL/IADL), upper extremity strength, comorbidity, and MMSE score (X^2 = 109.30, p < .001, Nagelkerke R^2 = 0.37).

  Lower extremity strength (p = 0.08)

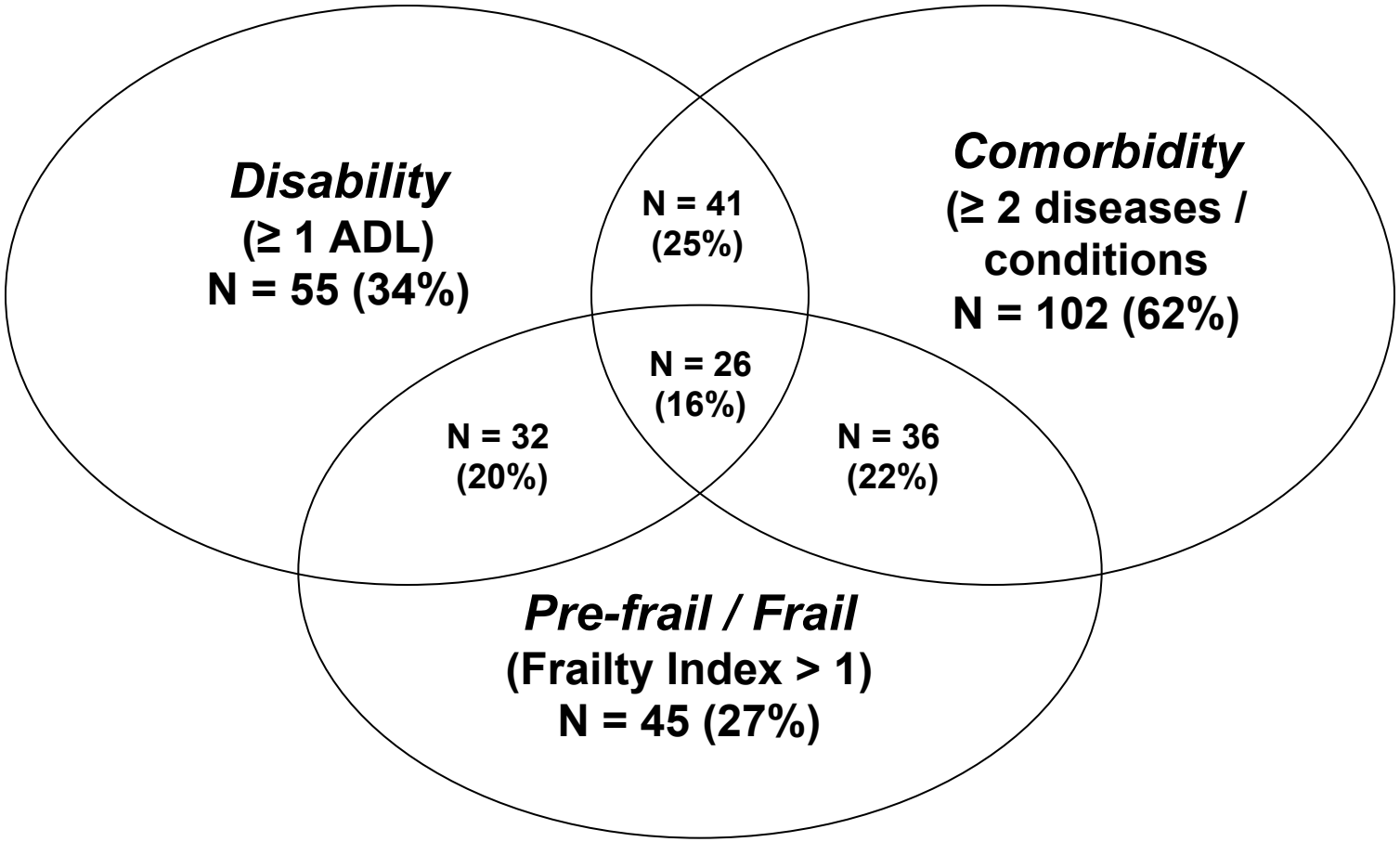
Results

- **Women**

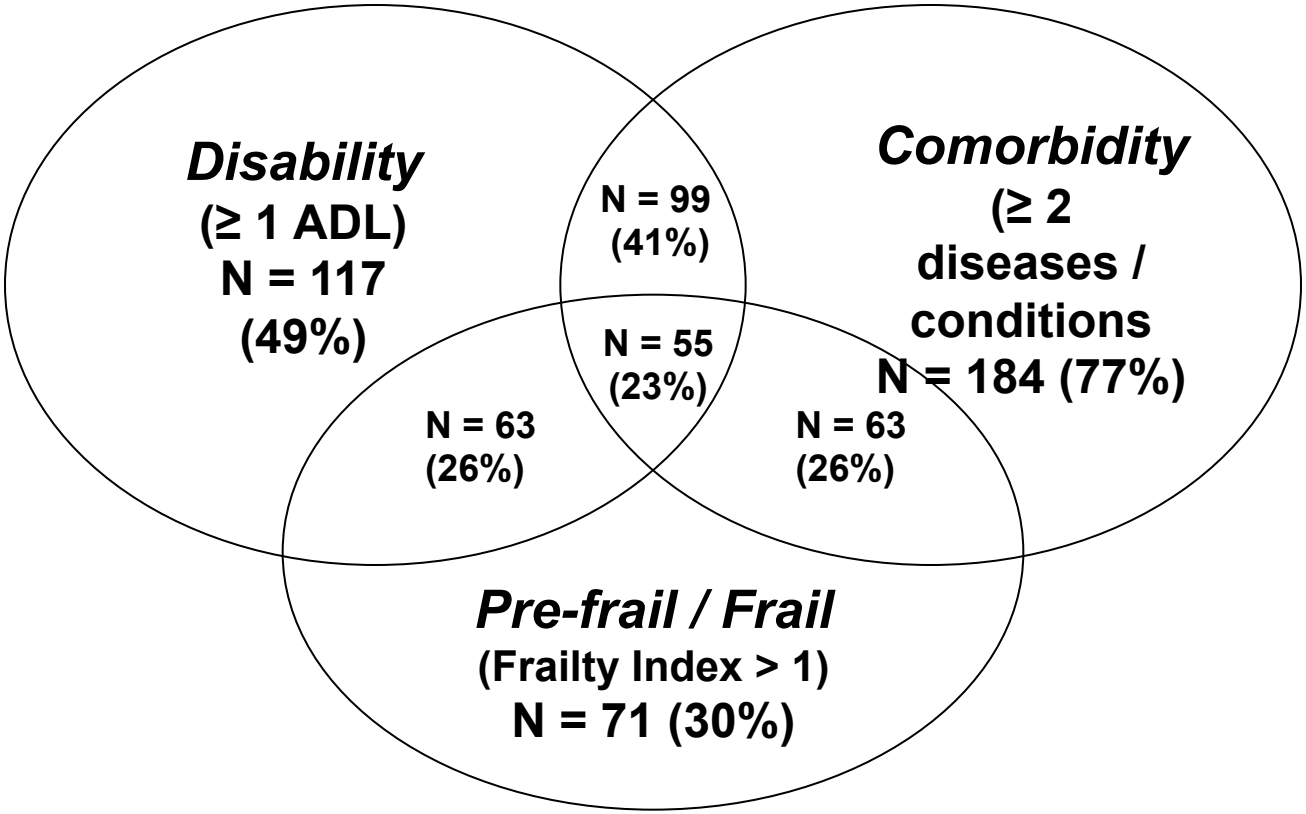
  Significant predictors of frailty for women included disability (ADL/IADL), lower extremity strength, and body mass index (BMI) (X^2 = 67.70, p < .001, Nagelkerke R^2 = 0.29).

Age (p = 0.06), MMSE (p = 0.09).

Males


Disability
(≥ 1 ADL)
N = 55 (34%)
Comorbidity
(≥ 2 diseases / conditions
N = 102 (62%)
N = 41
(25%)
N = 26
(16%)
N = 32
(20%)
N = 36
(22%)
Pre-frail / Frail
(Frailty Index > 1)
N = 45 (27%)

Females


Disability
(≥ 1 ADL)
N = 117
(49%)
Comorbidity
(≥ 2
diseases /
conditions
N = 184 (77%)
Pre-frail / Frail
(Frailty Index > 1)
N = 71 (30%)
N = 99
(41%)
N = 55
(23%)
N = 63
(26%)
N = 63
(26%)

Results

At one year follow-up, the discriminant function models correctly classified 84% of males and 79% of females as frail.

Males		
*Actual Status**	*Predicted Status*	
	Not Frail	Frail
Not Frail	99 (60%)	19 (12%)
Frail	8 (5%)	38 (23%)
Predictor variables in model: POMA, upper extremity strength, disability (ADL scale), SF-36 Mental Component, and education. Model correctly classified 84.1% of cases. Wilks λ = 0.50, X^2 = 99.60, *df*= 5, *p* <.000.		

Limitations

- **Small sample (N = 551)**
- **Short time interval between assessment (1 year)**
- **Adapted Frailty Index (did not included measure of physical activity)**

Ottenbacher, K.J., Ostir, G.V., Peek, M.K., Al Snih, S., Raji, M.A., Markides, K.S. (2005). Frailty in older Mexican Americans. *Journal of the American Geriatrics Society,* 53, 1524-1531.

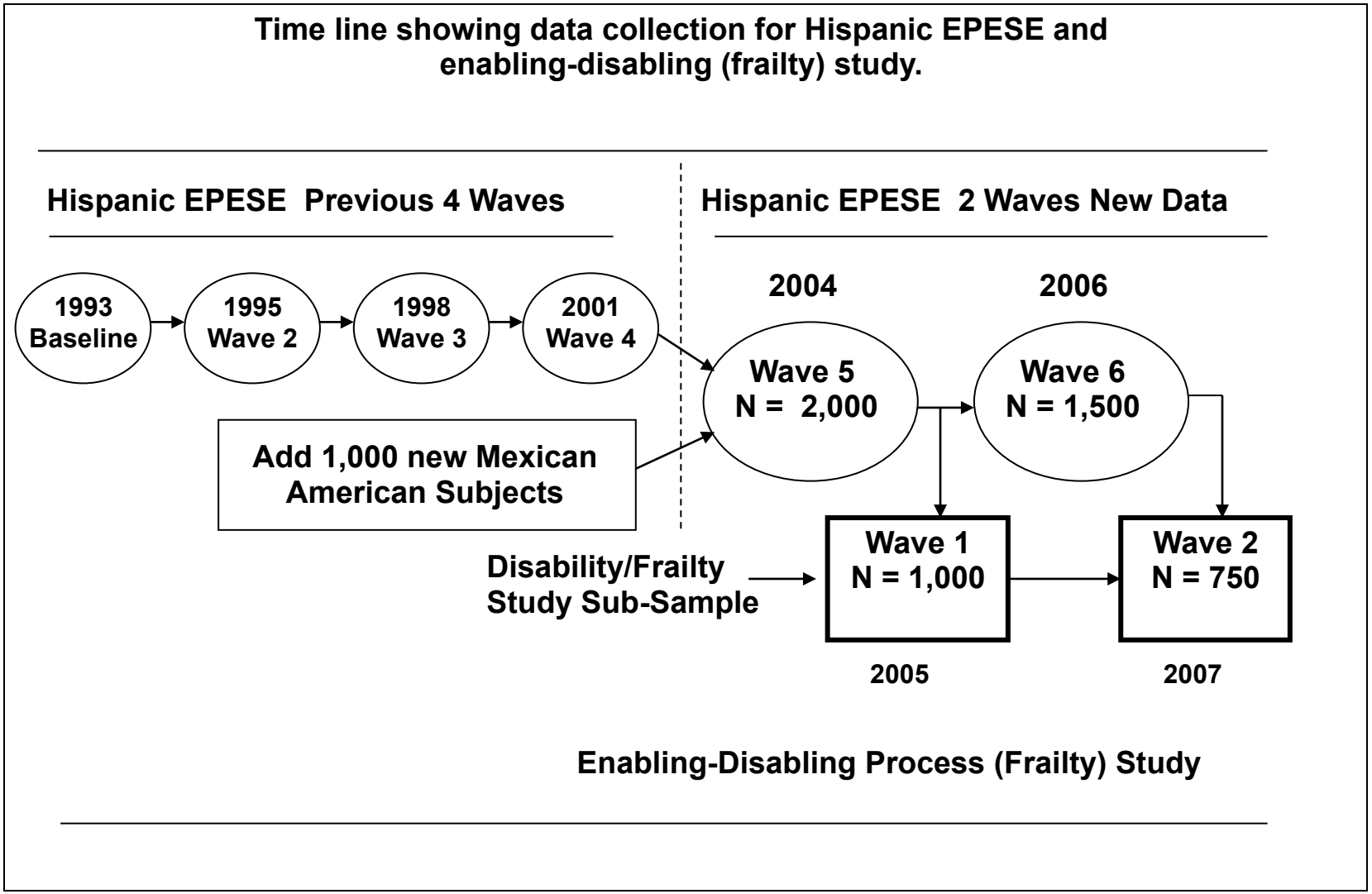
3. Current / Planned Research

Specific Aims

- **Apply a standard definition of frailty in a well defined sample of Mexican American older adults, and**

- **Examine the impact of frailty on disability, health related quality of life, institutionalization, and mortality in Mexican American older adults cross-sectionally and longitudinally.**

Relationship to Hispanic EPESE



Frailty Index

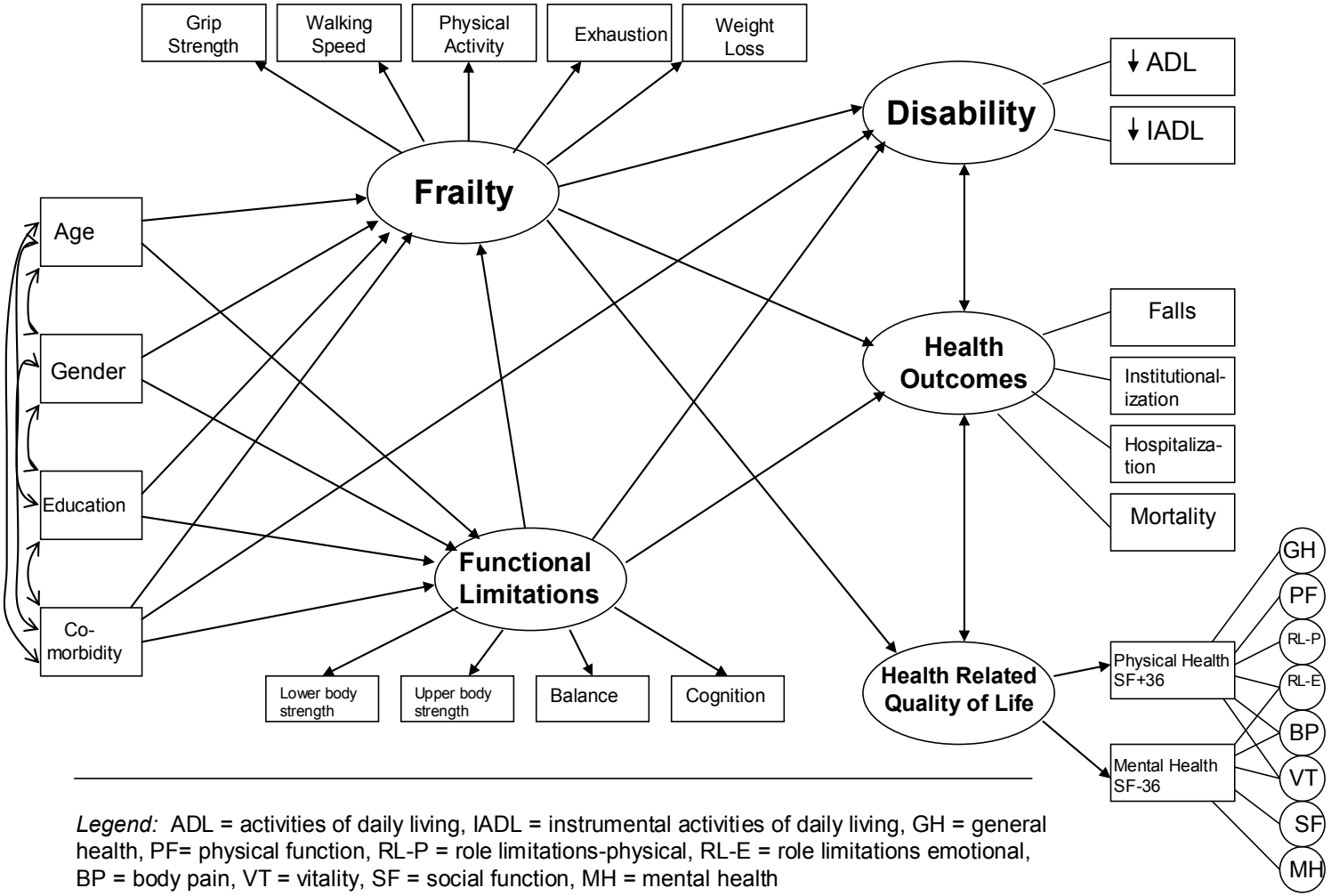
(5 items – Fried & Walston)

- Weight loss
- Exhaustion (CES-D questions)
- Physical activity
- Timed walk
- Grip strength

Variables and Proposed Analytical Model

General Analytical Model Showing Relationships Among Variables.

Does not Include Time Points.



Legend: ADL = activities of daily living, IADL = instrumental activities of daily living, GH = general health, PF= physical function, RL-P = role limitations-physical, RL-E = role limitations emotional, BP = body pain, VT = vitality, SF = social function, MH = mental health

Summary

- Persons 80 years and older are the fastest growing segment of the U.S. population.
- The proportion of Mexican American older adults over 75 years of age is increasing at a rate double that of the non-Hispanic white population.
- Frailty and disability are significant health concerns for older adults.

Summary

- **Little is currently known about how frailty develops or the impact of frailty on adverse health outcomes in minority populations.**
- **Mexican American older adults have unique health profiles (↑risk of diabetes and obesity) and cultural experiences (diet, social networks) that may influence the onset of frailty, or the interaction of frailty and disability.**

Goal

"If distinct pathophysiologic or functional changes can be shown to contribute to the clinical features of frailty, it may be possible to develop and test interventions that provide additional benefits beyond those obtained from treatments for currently recognized diseases in old age."

CFDA 93.866, PA-03-122, National Institute on Aging, 2003

Research Team

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Linda Fried (consultant)

NIH, National Institute on Aging (R01 AG017638)

THE END

www.aging.utmb.edu.

http://sahs.utmb.edu/download/frailty.pps