Frailty: A Public Health Perspective

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ALMA

June 18, 2006

Frailty

- What is it?
- Why is it important?
- How can it be diagnosed?
- What is its natural history?
- How can it be treated?

What is Frailty?

Fried, Tangen, Walston, et al, *J Geron, 2001*

Hammerman, *Annals, 1999*

- Definition: biologic syndrome of decreased reserve and resistance to stressors
- Result: vulnerability to adverse outcomes
- Markers:
  - physical: declines in lean body mass, strength, endurance, balance, walking, activity
  - physiologic: inflammatory, hormonal

Why is Frailty Important?

Fried, Tangen, Walston, et al, *J Geron, 2001*

- High prevalence with increasing age
- High risk for adverse health outcomes
  - Mortality
  - Institutionalization
  - Falls
  - Hospitalization

Frailty, Disease, Environment and Disability

Albert, *AJPH, 2002*

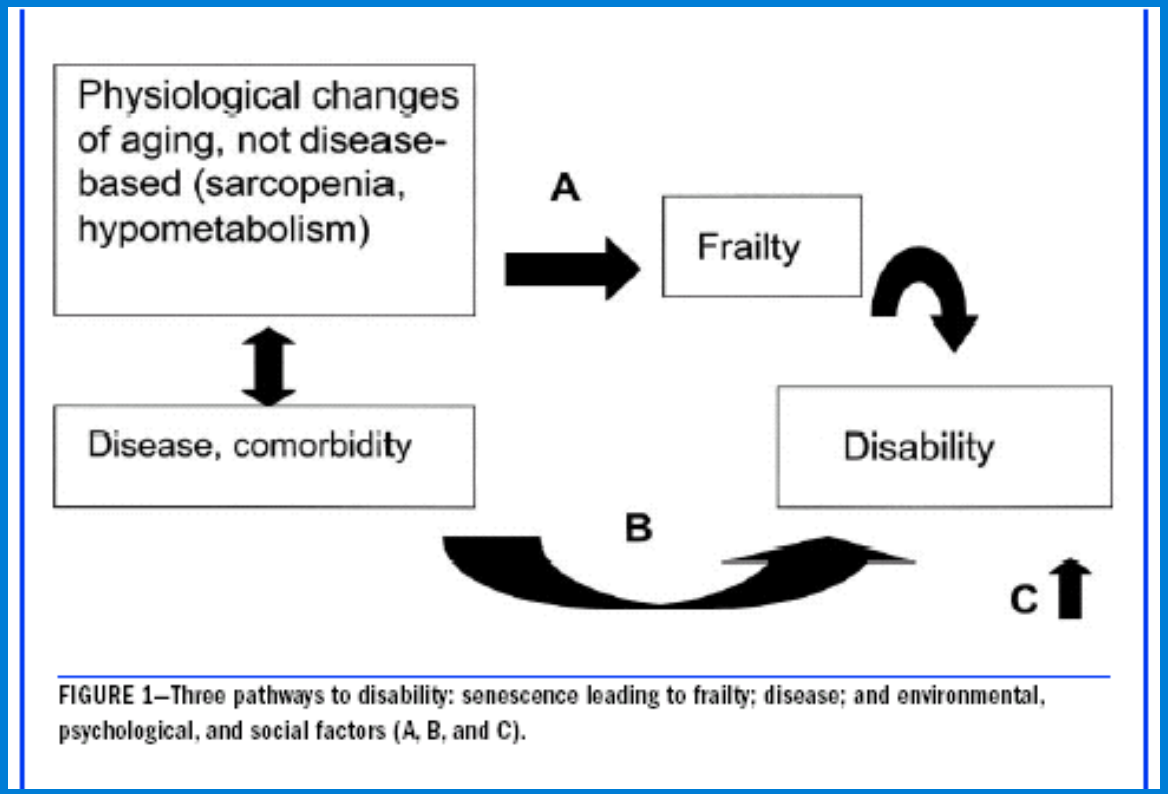


FIGURE 1—Three pathways to disability: senescence leading to frailty; disease; and environmental, psychological, and social factors (A, B, and C).

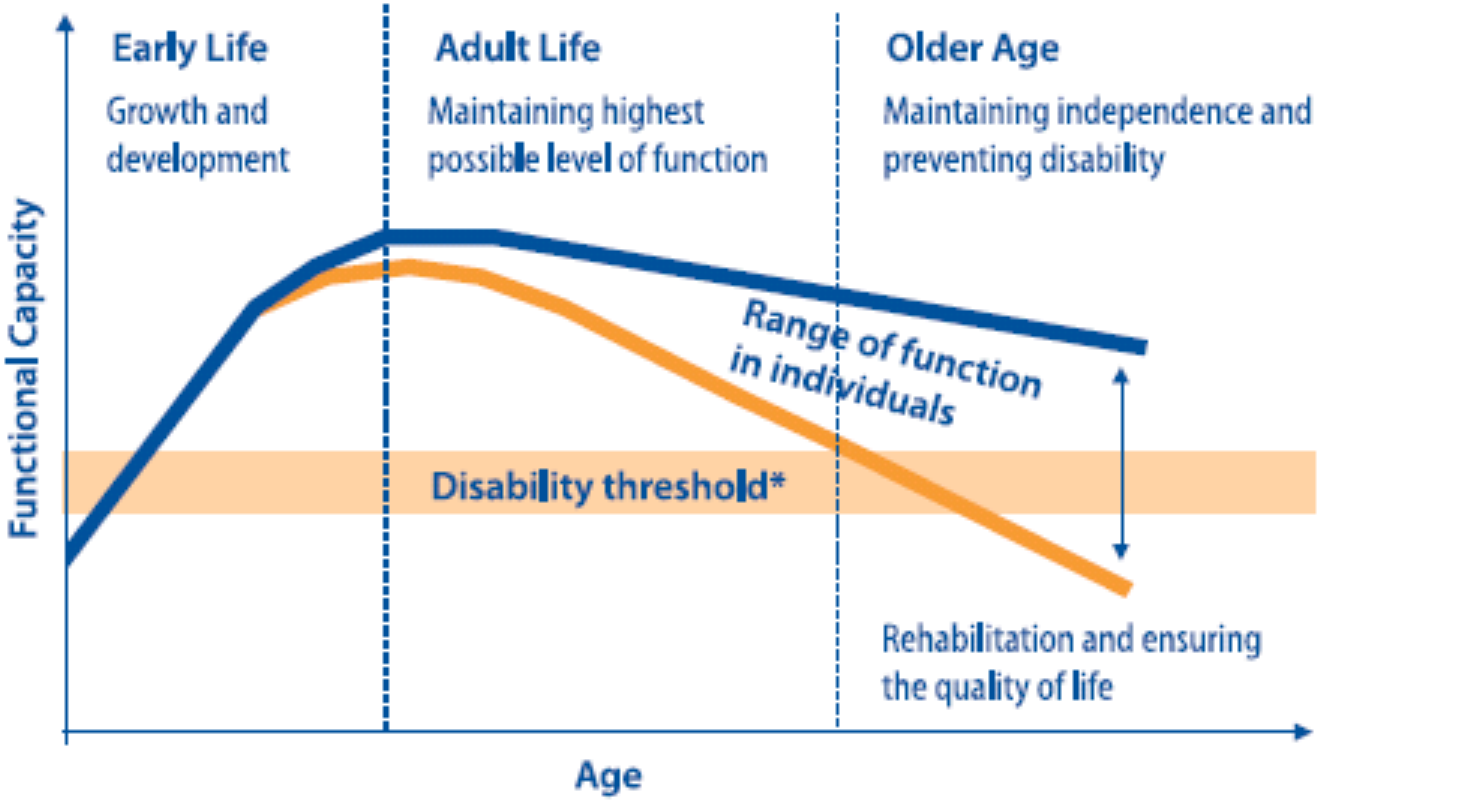
- Pathway A : senescence → frailty → disability
- Pathway B : disease → disability
- Pathway C : environment → disability

Frailty, Disease, Environment and Disability

Albert, *AJPH, 2002*

- Disability - difficulty with IADLs and ADLs that can affect independence
- Senescence - physiological changes of aging that can lead to frailty, a risk factor for disability
- Chronic disease - the major cause of disability in old age
- Environment - a contributor to disability

Functional Capacity and Aging



Survival By Functional Status

Pressley, Patrick, *J Clin Epi, 1999*

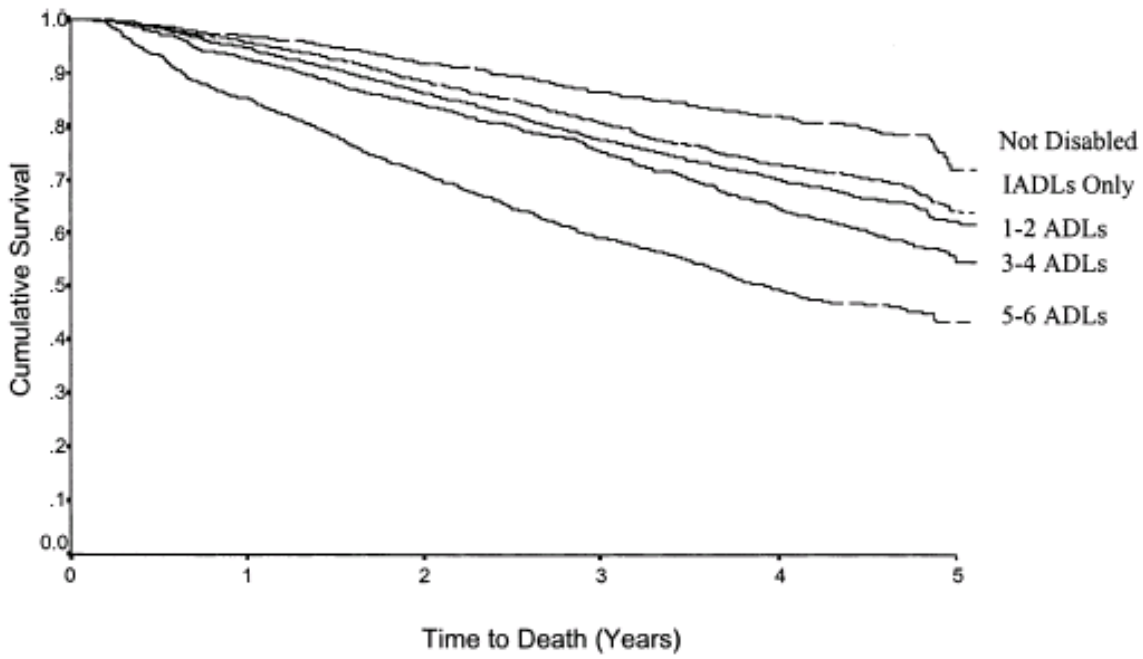
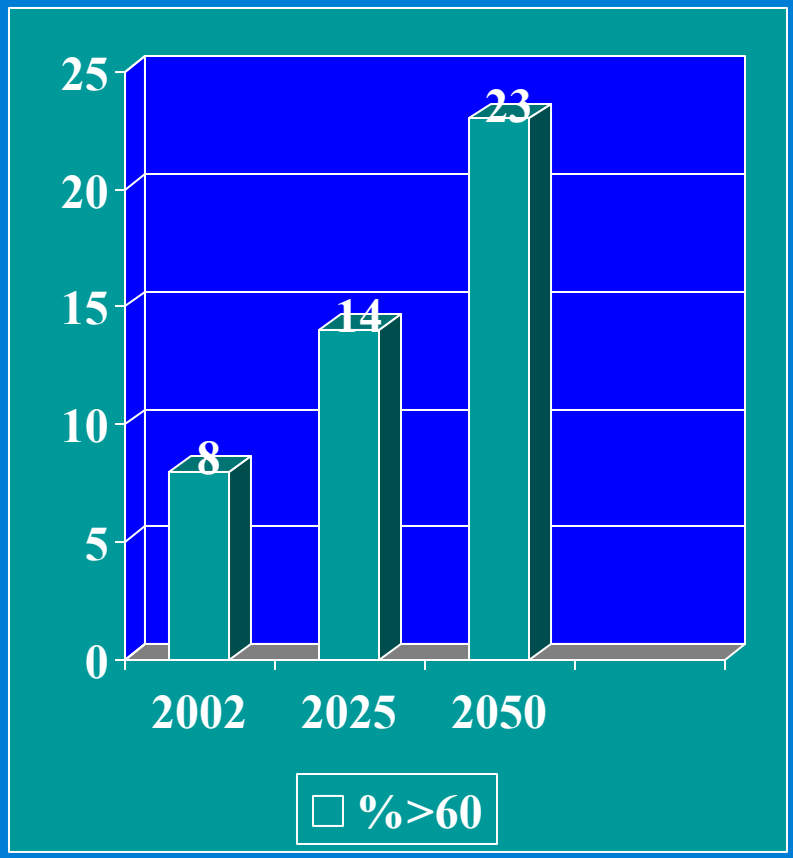


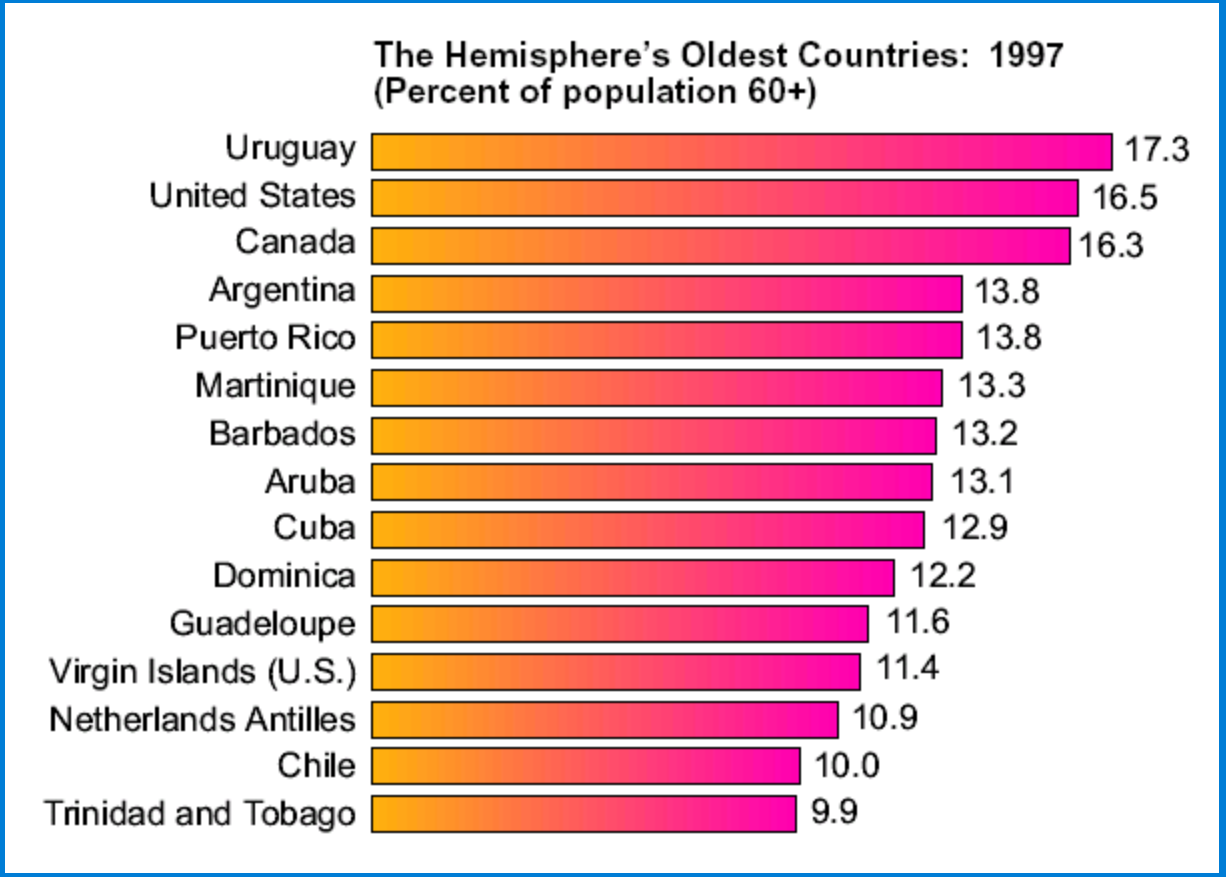
FIGURE 5. Adjusted 5-year survival by functional status: Not disabled, IADL limitations only, 1–2 ADL limitations, 3–4 ADL limitations, and 5–6 ADL limitations. Curves are adjusted for age, race, gender, education, number of baseline conditions, and highest risk condition occurring during follow-up.

Aging in the Region
PAHO, 2002

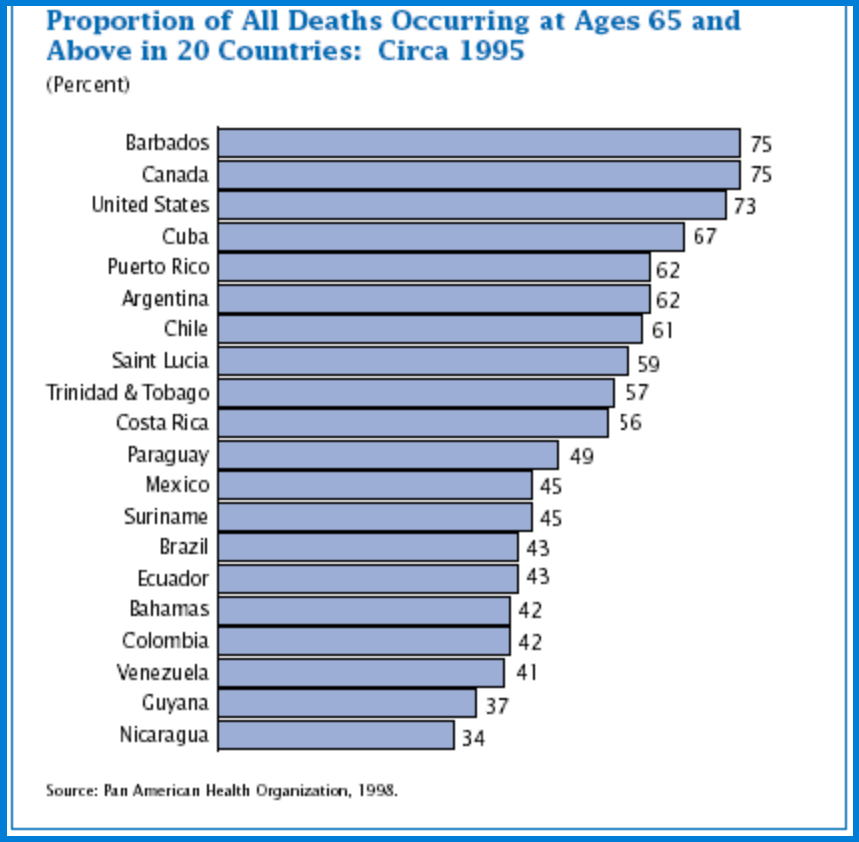
Among developing countries, demographic change is most evident in Latin America and the Caribbean



Aging in the Americas



Pan American Deaths: percent at 65+



Disease-related Disability in Latin America, 1990

TABLE 15

Percentage distribution of years lived with a disability due to noncommunicable diseases, adjusted by severity of the disability, by cause group, total population and population 45 to 59 years and 60 years and older, by sex, Latin America and the Caribbean, 1990.

		Men		Women	
Group of causes	All ages	45–59	60 years and older	45–59	60 years and older
Neuropsychiatric conditions	51.5	25.9	20.6	23.7	22.2
Cardiovascular diseases	3.5	7.4	15.5	5.0	9.7
Sense organ diseases	2.0	3.1	12.9	3.8	14.1
Respiratory diseases	9.1	9.5	12.0	8.2	8.8
Musculoskeletal diseases	10.3	22.8	10.1	32.9	17.7
Digestive diseases	6.3	12.7	8.7	10.2	9.5
Malignant neoplasms	1.2	1.9	7.0	2.8	4.0
Diabetes mellitus	2.0	4.7	5.7	5.4	5.6
Oral conditions	3.5	1.0	2.4	1.0	2.7
Genitourinary diseases	1.9	8.0	2.1	1.6	1.6
Endocrine disorders	3.1	1.7	1.9	3.0	2.6
Congenital anomalies	4.2	0.0	0.0	0.0	0.0

Source: Murray C., López A, eds. Volume 1: *The Global Burden of Disease*. In: *Gobal Burden of Disease and Injury Series*. Cambridge, Massachusetts: Harvard University Press; 1996.

ADL Limitations in Older Adults in Latin American Cities, 2001

PAHO SABE Survey, 2001

Table 13. Percentage of persons over 60 years of age by number of limitations in their basic activities of the daily life (abvd) and age according to cities.

Cities	0 60-74	0 75+	1–2 60-74	1–2 75+	3+ 60-74	3+ 75+
Bridgetown	90	76	7	14	2	7
Buenos Aires	87	70	9	20	4	9
Mexico City.	85	63	10	20	4	16
Montevideo	86	73	11	20	2	6
Santiago	80	61	13	21	6	16
Sao Paulo	85	67	12	19	4	14

Source: PAHO. SABE Survey, 2001

Mobility Limitations, 2001

PAHO SABE Survey, 2001

Table 16. Percentage of people over 60 years of age by type of difficulty in carrying out certain physical activities according to cities

Cities	Difficulty or inability to walk a block	Inability to go up a floor by stairs	Difficulty or inability to raise from a chair	Inability to stoop	Inability to extend arms above the shoulders
Bridgetown	11	16	26	33	10
Buenos Aires	14	25	30	42	12
Mexico City.	14	26	42	50	18
Montevideo	11	26	36	39	15
Santiago	16	30	44	56	20
Sao Paulo	17	33	36	51	15

Source: PAHO. SABE Survey, 2001

How is Frailty Diagnosed?

Fried, Tangen, Walston, et al, *J Geron, 2001*

- Three of the following:
  - Unintentional weight loss
  - Muscle weakness
  - Slow walking speed
  - Exhaustion
  - Low physical activity

From the US Cardiovascular Health Study

How is Frailty Diagnosed?

Jones, Song, Rockwood, et al, *JAGS, 2004*

- FI-CGA (Frailty Index – Comprehensive Geriatric Assessment) uses CGA scored and stratified
  - Mild (0-7)
  - Moderate (7-13)
  - Severe (13+)
- Domains included cognition, mood, comorbidity, communication, mobility, balance, bowel and bladder, ADLs, IADLs, nutrition and social resources

From an RCT in Nova Scotia

How is Frailty Diagnosed?

Rockwood, Song, MacKnight, et al, *CMAJ, 2005*

- 7-Point CSHA Clinical Frailty Scale (clinical judgment-based)
  - Very fit
  - Well
  - Well, with treated comorbid disease
  - Apparently vulnerable
  - Mildly frail
  - Moderately frail
  - Severely frail

From the Canadian Study of Health and Aging

Box 1: The CSHA Clinical Frailty Scale

1 *Very fit* — robust, active, energetic, well motivated and fit; these people commonly exercise regularly and are in the most fit group for their age

2 *Well* — without active disease, but less fit than people in category 1

3 *Well, with treated comorbid disease* — disease symptoms are well controlled compared with those in category 4

4 *Apparently vulnerable* — although not frankly dependent, these people commonly complain of being "slowed up" or have disease symptoms

5 *Mildly frail* — with limited dependence on others for instrumental activities of daily living

6 *Moderately frail* — help is needed with both instrumental and non-instrumental activities of daily living

7 *Severely frail* — completely dependent on others for the activities of daily living, or terminally ill

Note: CSHA = Canadian Study of Health and Aging.

Rockwood, K. et al. CMAJ 2005;173:489-495

CMAJ·JAMC

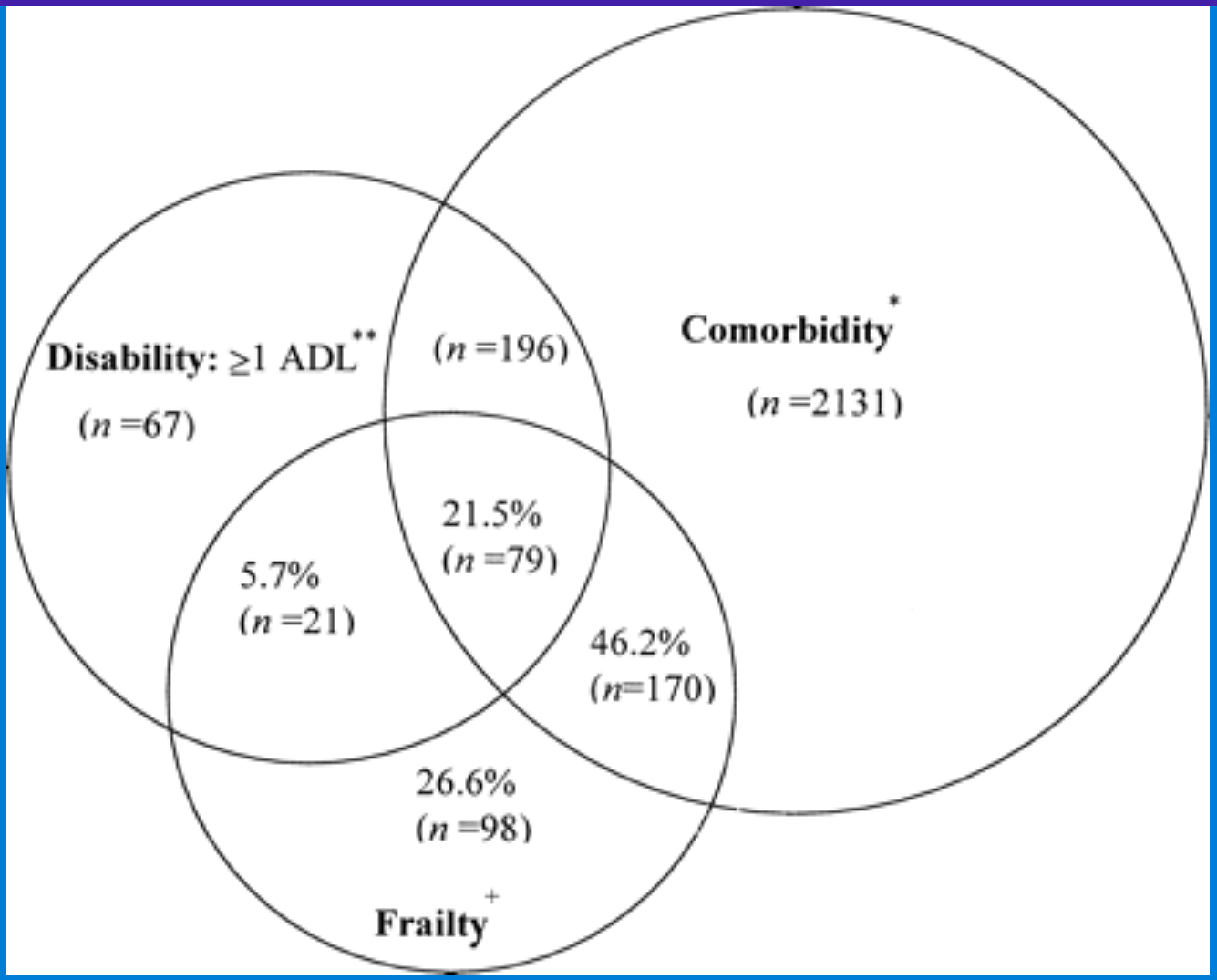
Disability, Frailty, or Comorbidity?

Fried, Ferrucci, Darer, et al, *J Gerontol, 2004*

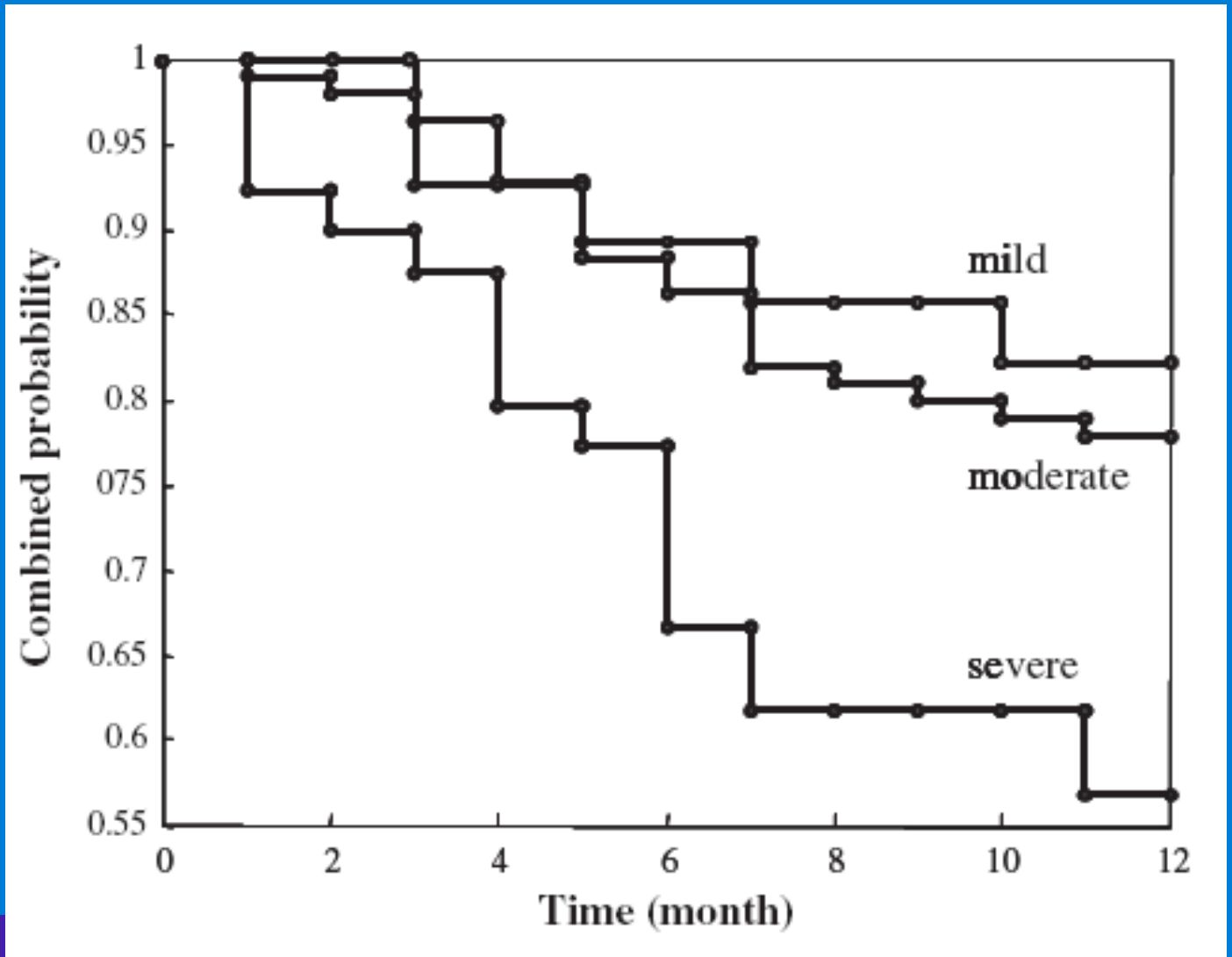
- Disability – difficulty or dependency in carrying out tasks of independent life
- Frailty – a state of high vulnerability for adverse health outcomes
- Comorbidity- concurrent presence of multiple diagnosed diseases

Disability, Frailty, or Comorbidity?

Fried, Ferrucci, Darer, et al, *J Gerontol, 2004*

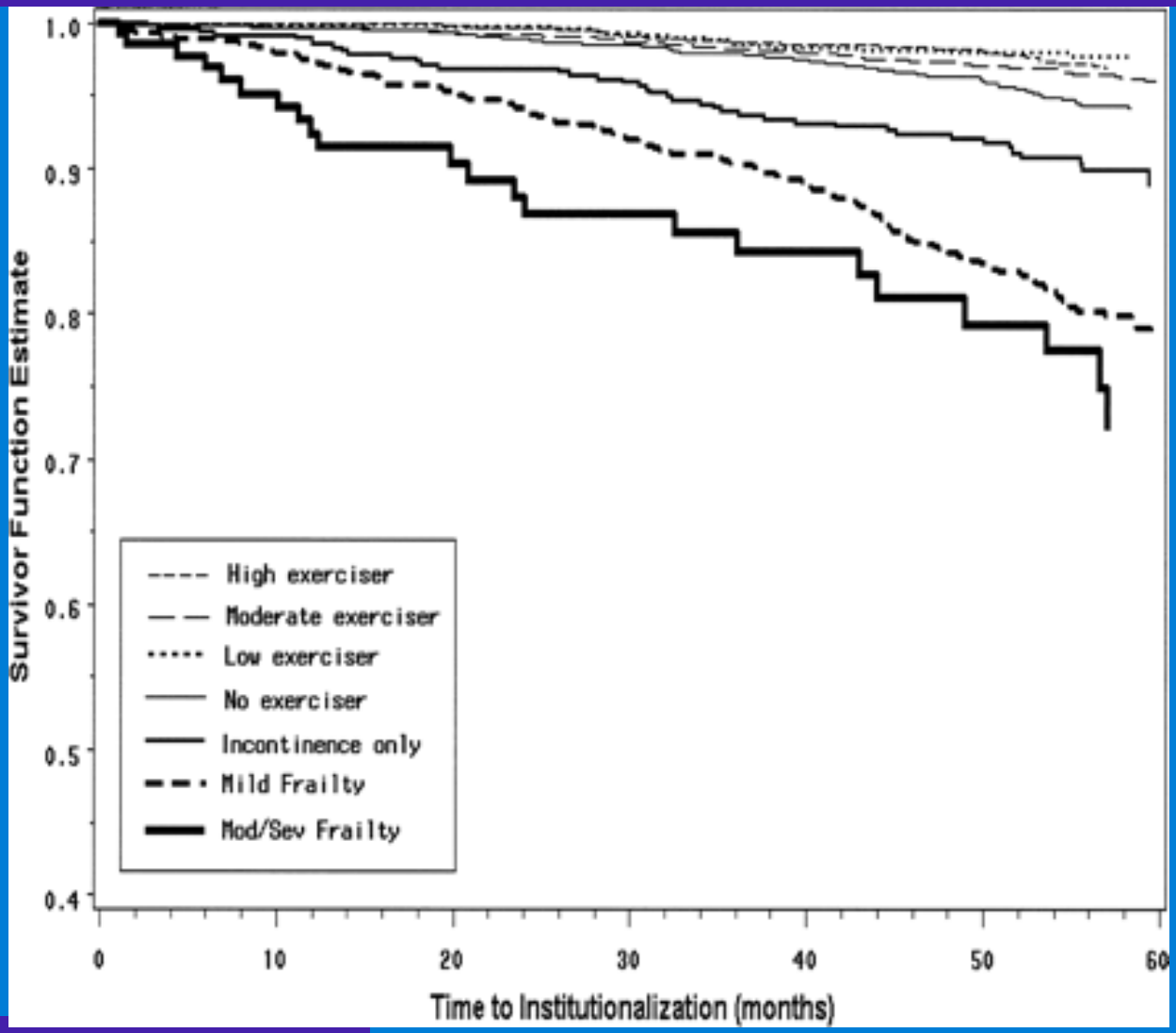


What is the Natural History of Frailty? Jones, Song, Rockwood, et al, *JAGS, 2004*



Outcomes of Frailty

Rockwood, Howlett, MacKnight, et al, *J Gerontol, 2004*



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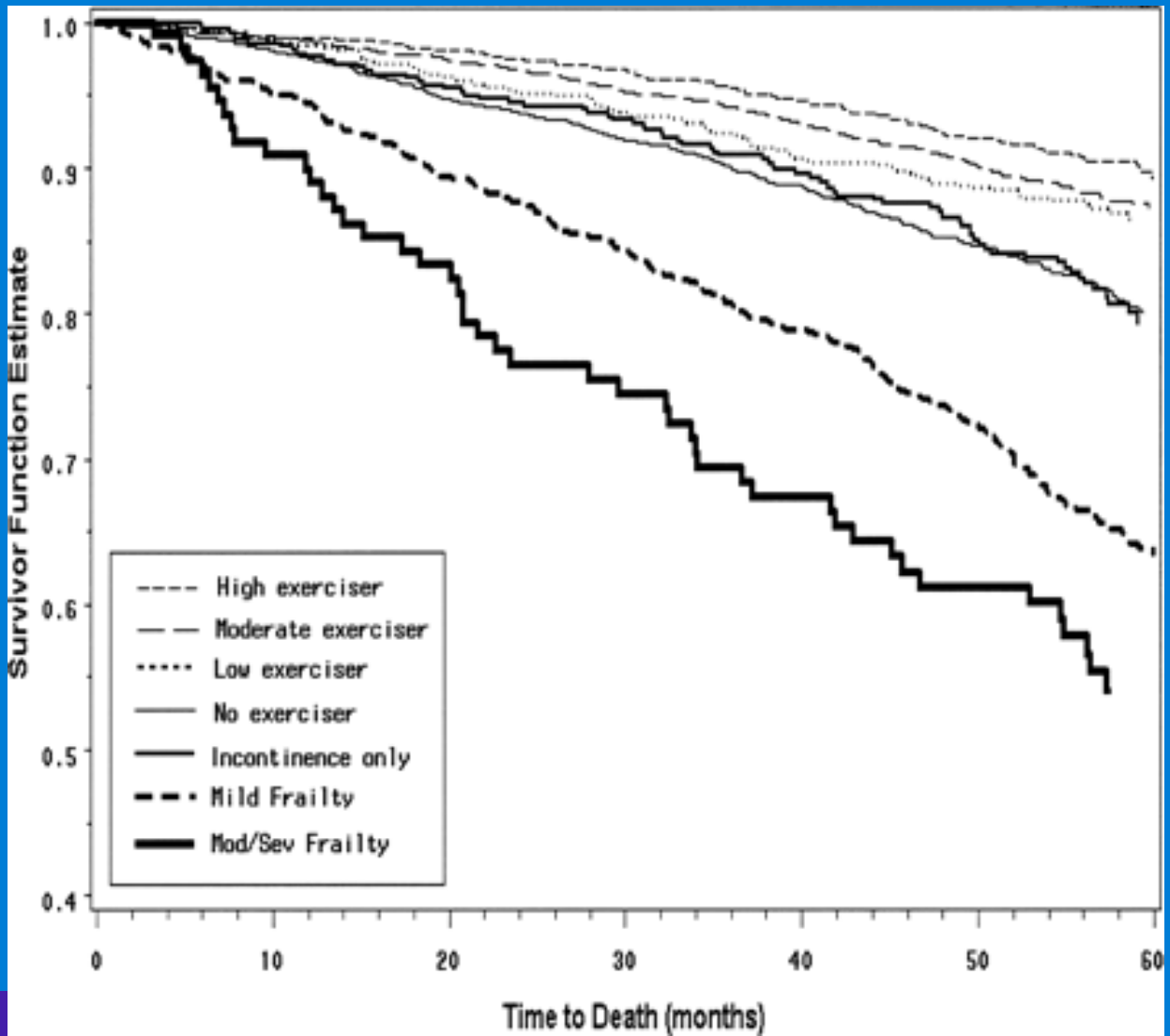

Frailty, Disease, Environment and Disability: Public Health Strategies

Albert, *AJPH, 2002*

- Pathway A: Senescence and Frailty
  - primary promotion for healthy aging - exercise, cognitive activity, healthy diet
  - interventions for osteoporosis, heart disease
- Pathway B: Chronic Disease (dementia, stroke, heart disease and cancer)
  - lifestyle changes to reduce risk
  - screening for early treatment
  - disease management to minimize disability

Frailty, Disease, Environment and Disability: Public Health Strategies

Albert, *AJPH, 2002*

- Pathway C: Physical, Social and Psychological Environment
  - assistive devices
  - community access
  - understanding of compensatory processes

Frailty as a Public Health Issue: Conclusions

- Significant risk factor for disability/death
- Probably multi-factorial
- Modifiable through multiple pathways?
- Important problem for Latin America's aging population