

Physical Activity in Older Adults: *Opportunities to Promote Healthy Aging*

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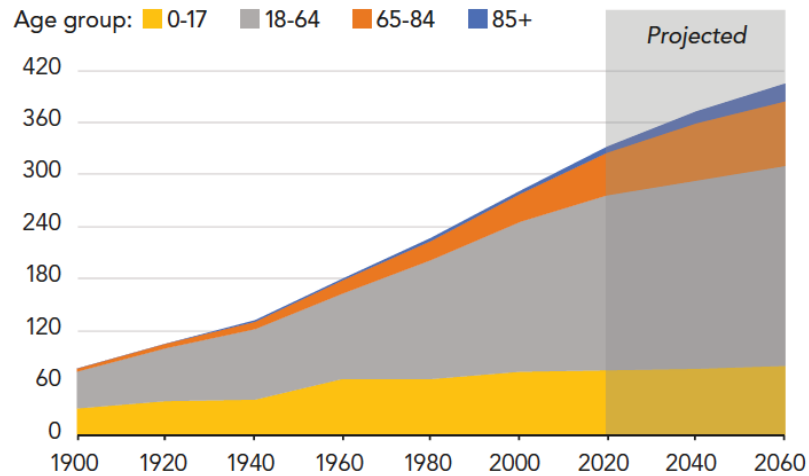
Geriatric Healthcare Series, NW Geriatric Workforce Enhancement Center

Outline

- Population aging
 - Active life expectancy
- Physical activity
 - Definitions
 - Guidelines
 - Evidence
- Exercise interventions
- Resources

The Number of Older Adults Is Increasing Rapidly Relative to Children

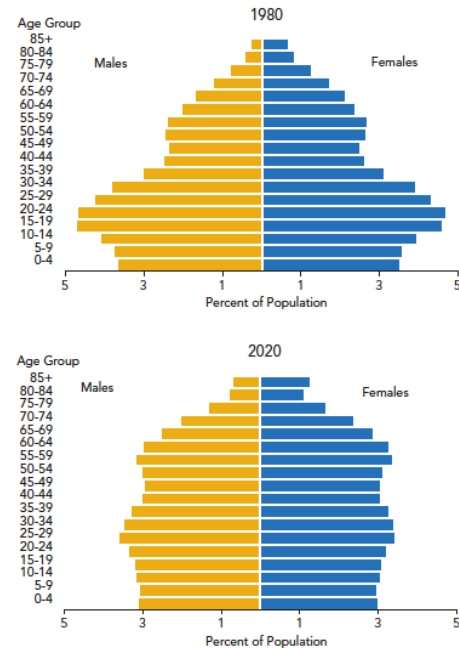
U.S. Population by Age Group (millions), 1900 to 2060



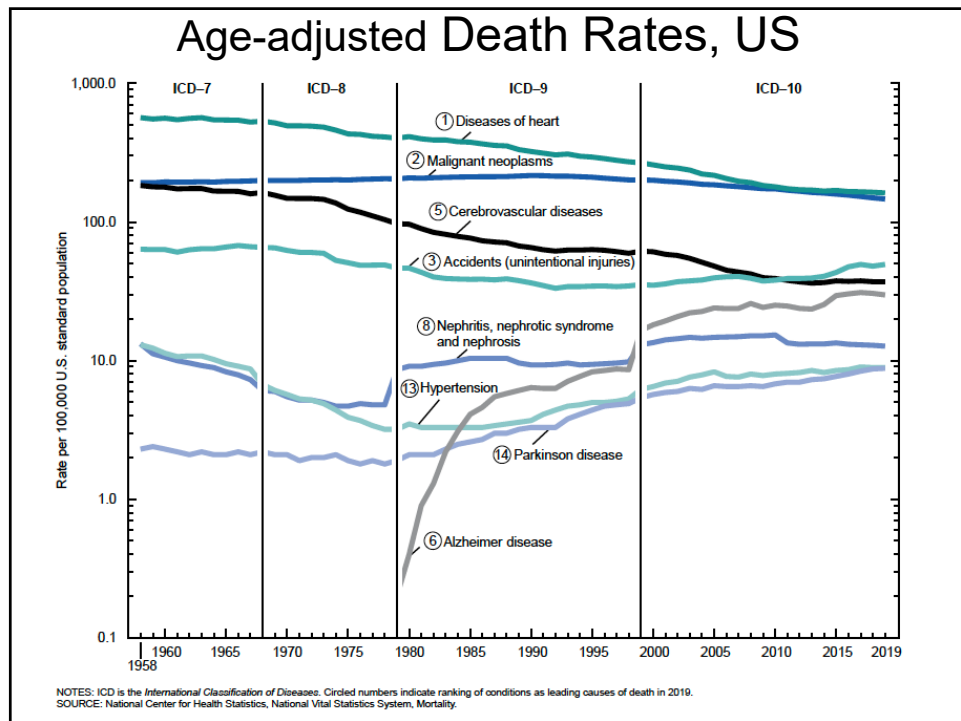
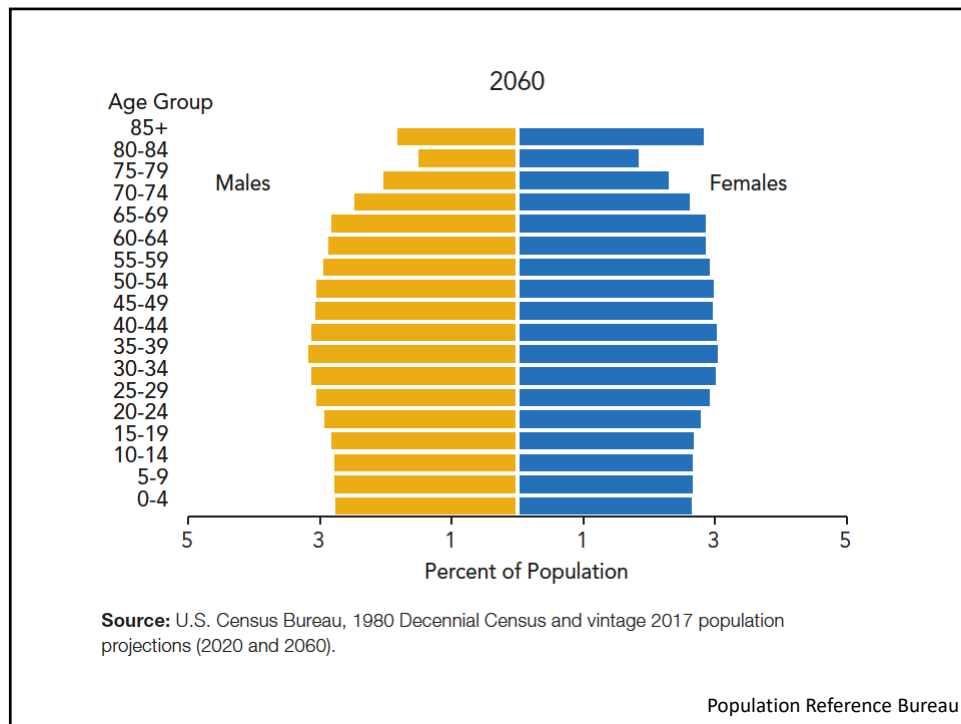
Source: U.S. Census Bureau, decennial censuses and vintage 2017 population projections (2020-2060).

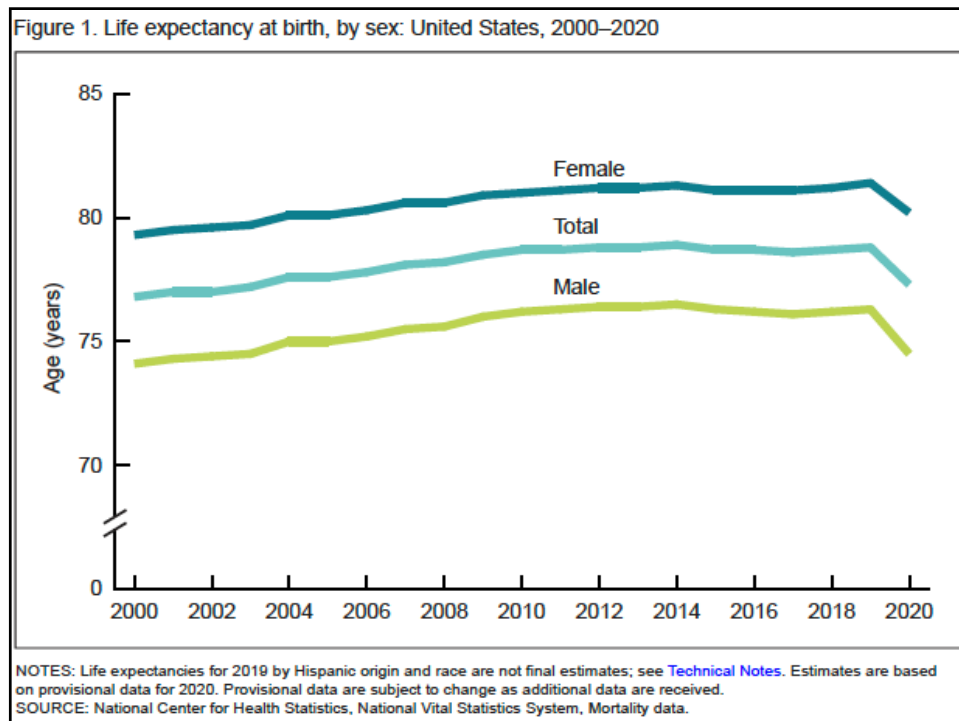
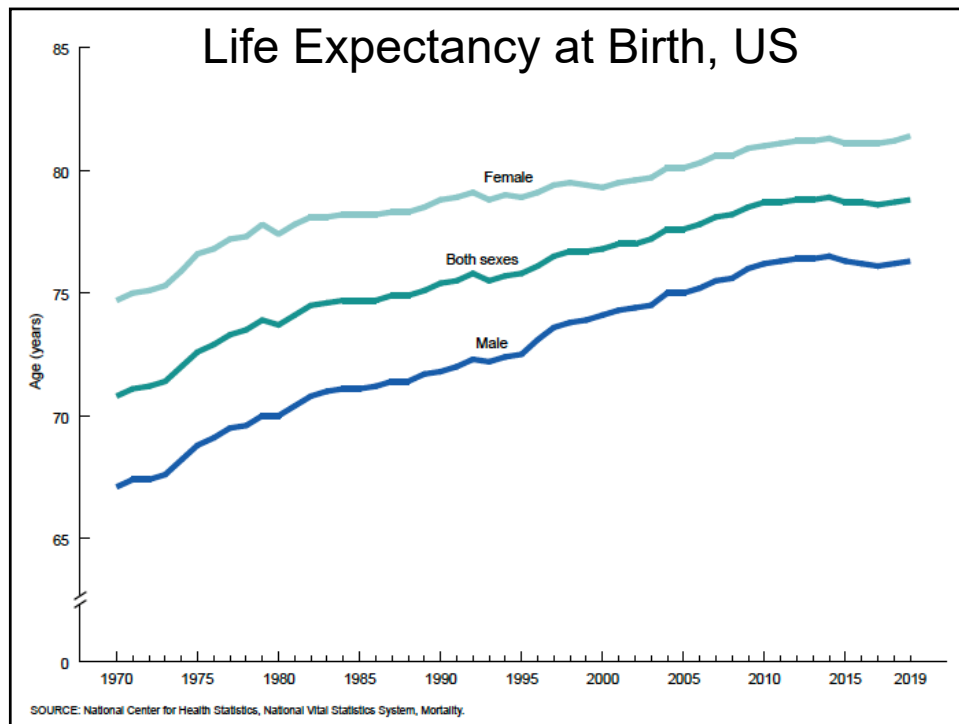
The U.S. Population Is Shifting to Older Age Groups

U.S. Population by Age and Sex (%), 1980, 2020, and 2060



Source: Population Reference Bureau



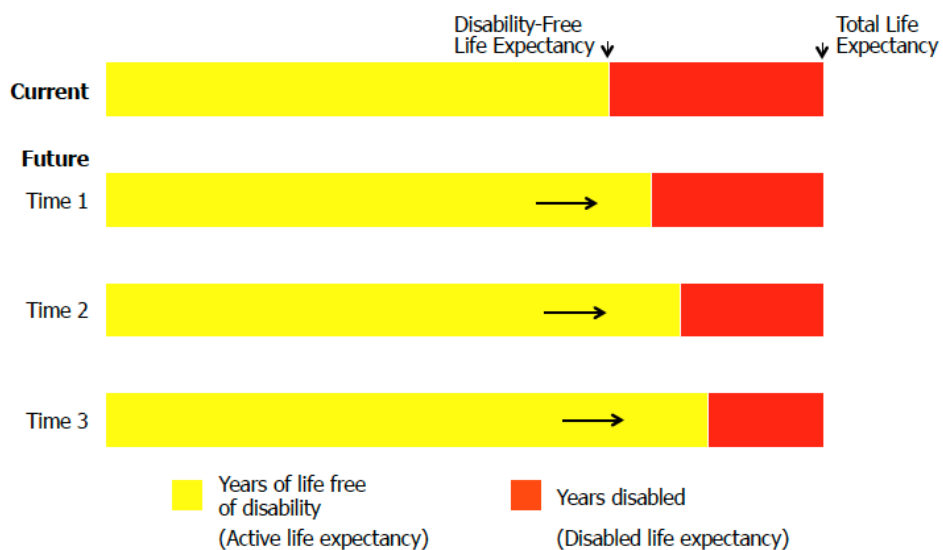


Compression of morbidity

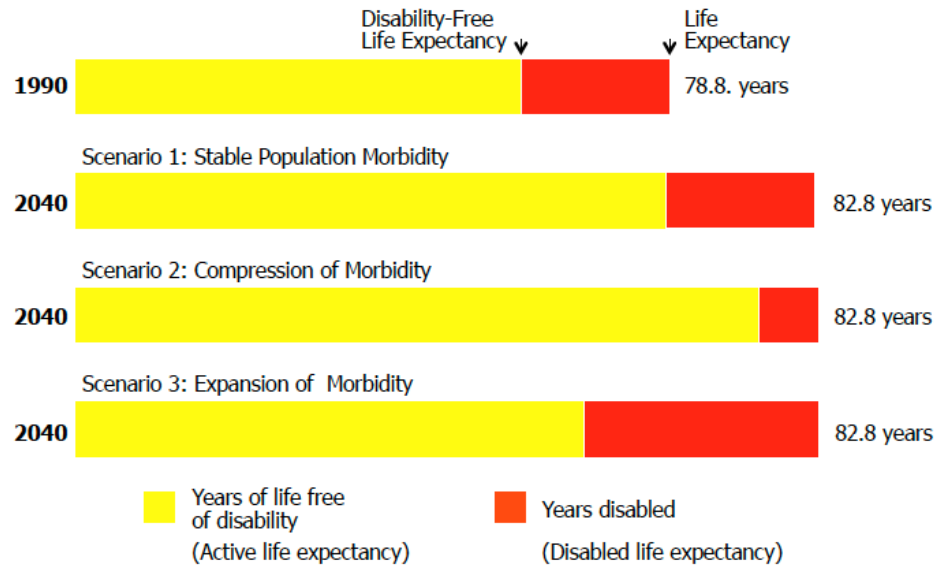
Fries J. *NEJM* 1980; 303:130-35.

1. The number of very old persons will not increase
2. The average period of diminished vigor will decrease
3. Chronic disease will occupy a smaller proportion of the life span
4. Need for medical care in later life will decrease

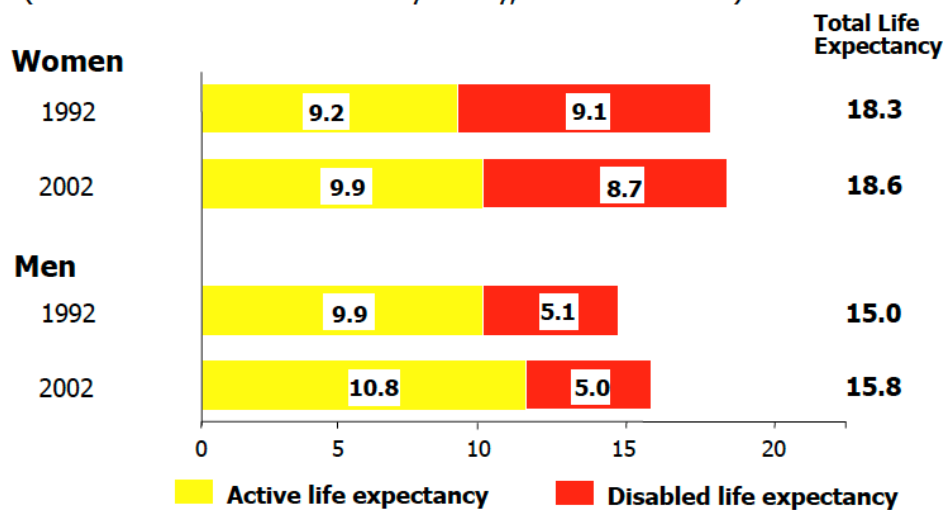
Compression of morbidity scenario



Scenarios for change in population burden of disability from 1990 to 2040

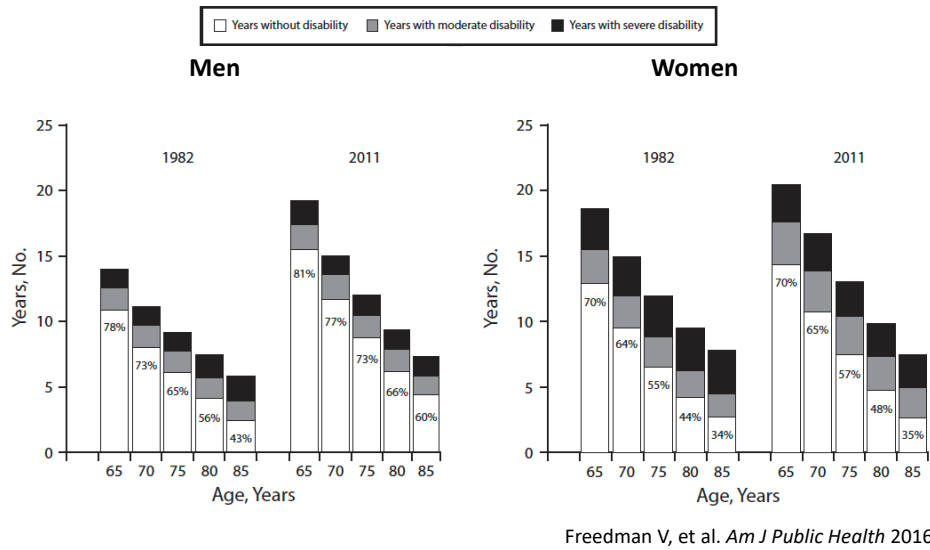


Total active and disabled life expectancy (Medicare Current Beneficiary Study, 1992 and 2002)

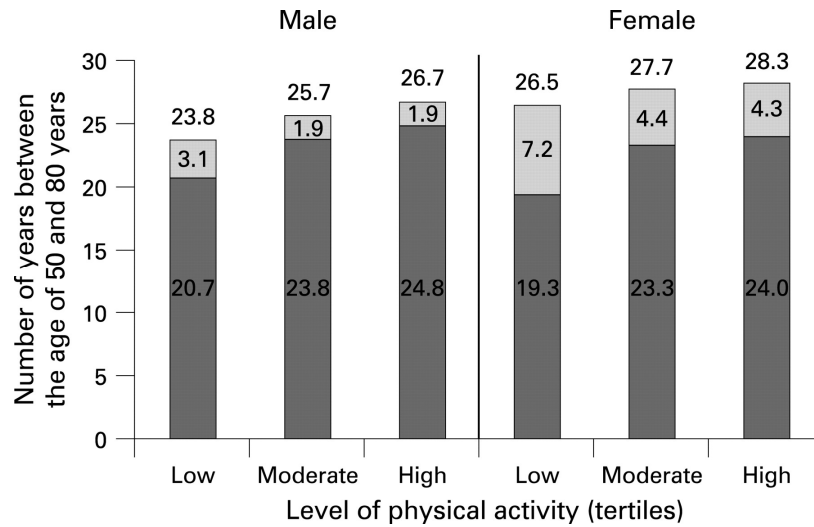


Source: Cai and Lubitz. *Demography* 2007; 44: 479-95.

Expected Number of Years Lived without Disability, US 1982 and 2011



Partial life expectancy, years without and years with disability according to level of physical activity.



Nusselder W J et al. *J Epidemiol Community Health* 2008;62:823-828



What do we mean by “physical activity”?

- Physical activity is any body movement performed by skeletal muscles that expends energy
- Exercise is physical activity with the primary purpose of improving or maintaining physical fitness or performance

Key Physical Activity Guidelines for Americans, 2nd Edition (2018)

- Move more and sit less throughout the day
- Adults should do at least 150 minutes a week of moderate-intensity, or 75 minutes a week of vigorous-intensity aerobic physical activity
- Adults should also do muscle-strengthening activities of moderate or greater intensity and that involve all major muscle groups on 2 or more days a week

<https://www.health.gov/PAGuidelines/>

Key Physical Activity Guidelines for Americans, 2nd Edition (2018)

- Older adults should do multicomponent physical activity that includes balance training as well as aerobic and muscle-strengthening activities

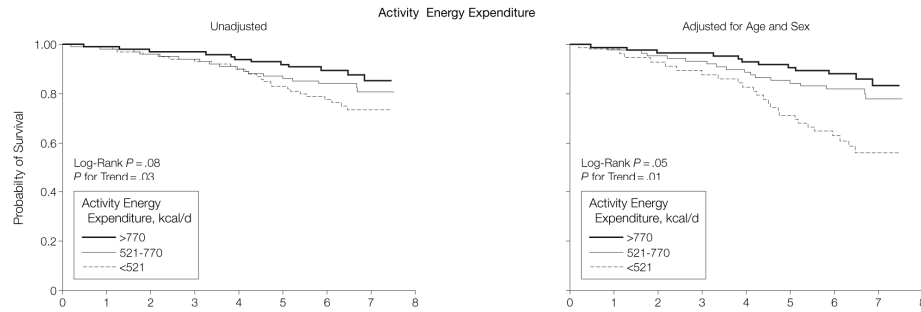
<https://www.health.gov/PAGuidelines/>

Figure 1-1. Percentage of U.S. Adults Ages 18 Years or Older Who Met the Aerobic and Muscle-Strengthening Guidelines, 2008–2016

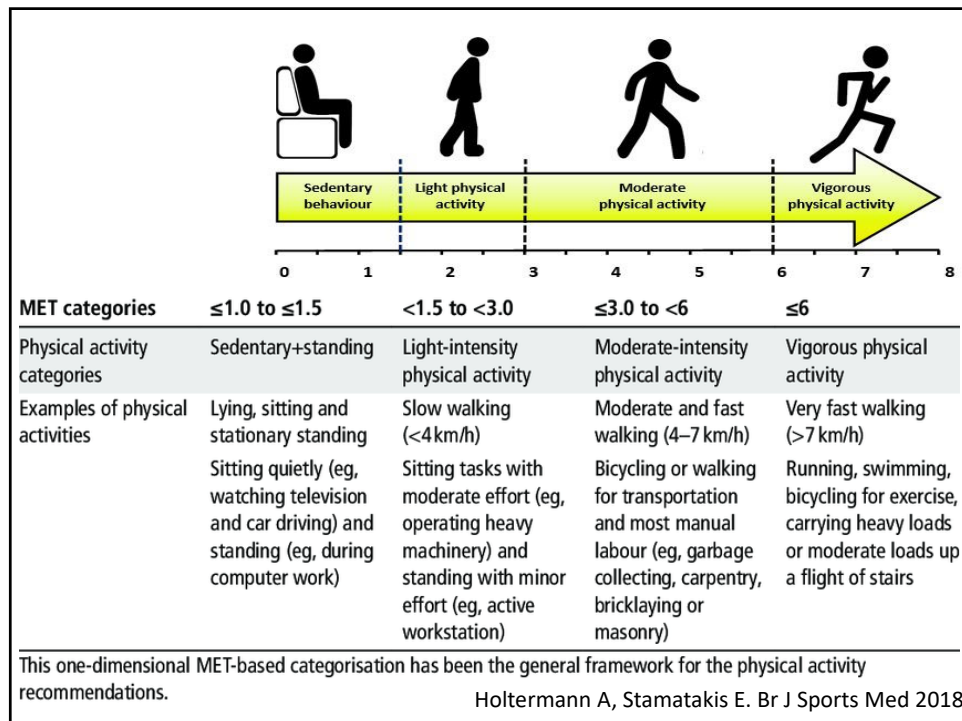


Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey (NHIS).

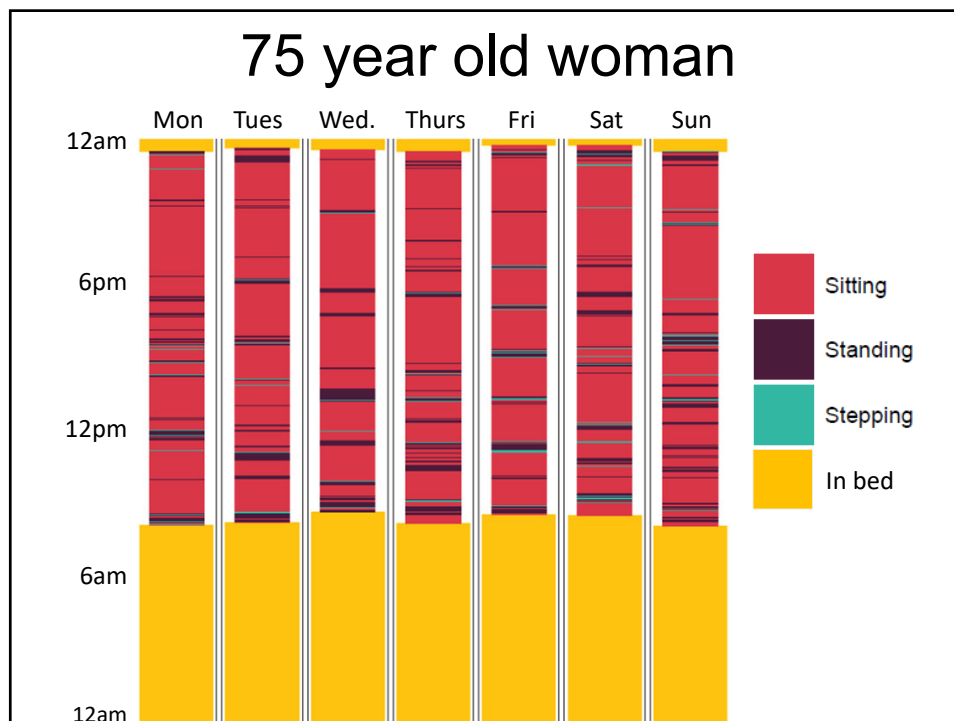
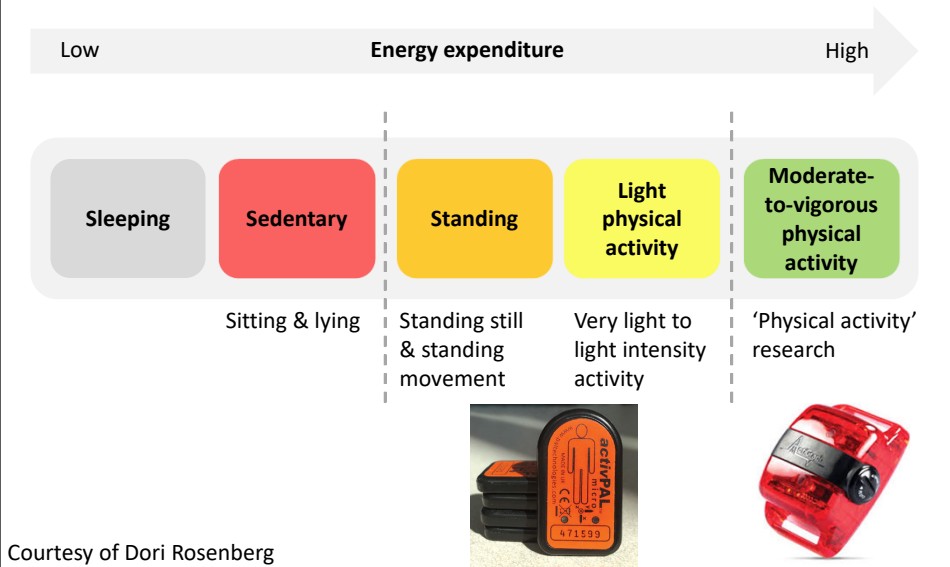
Daily energy expenditure and mortality in older adults (N=301)

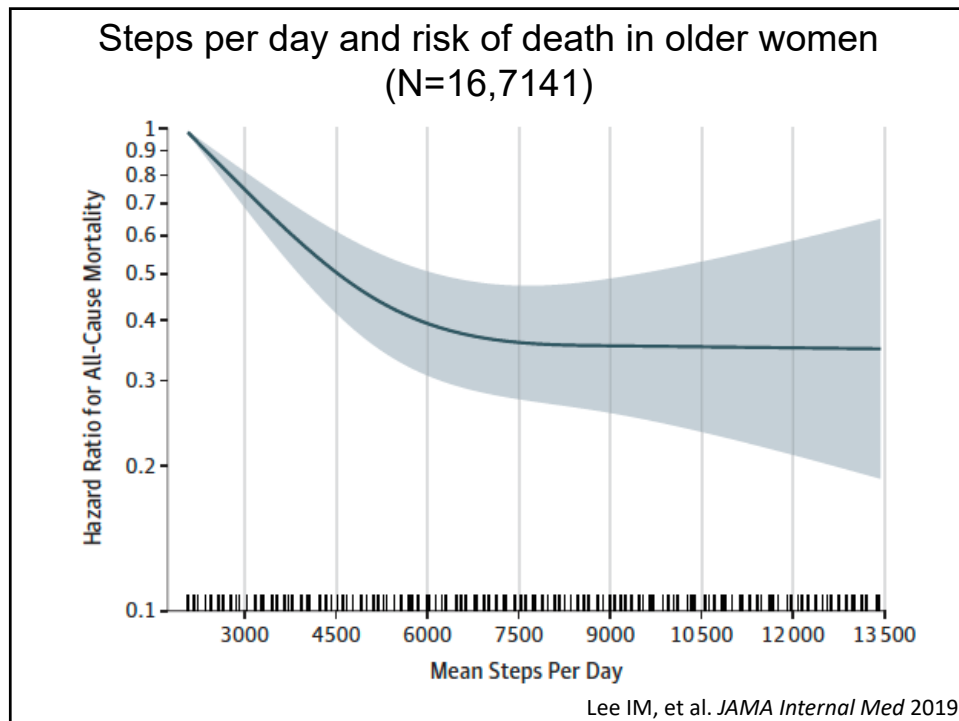
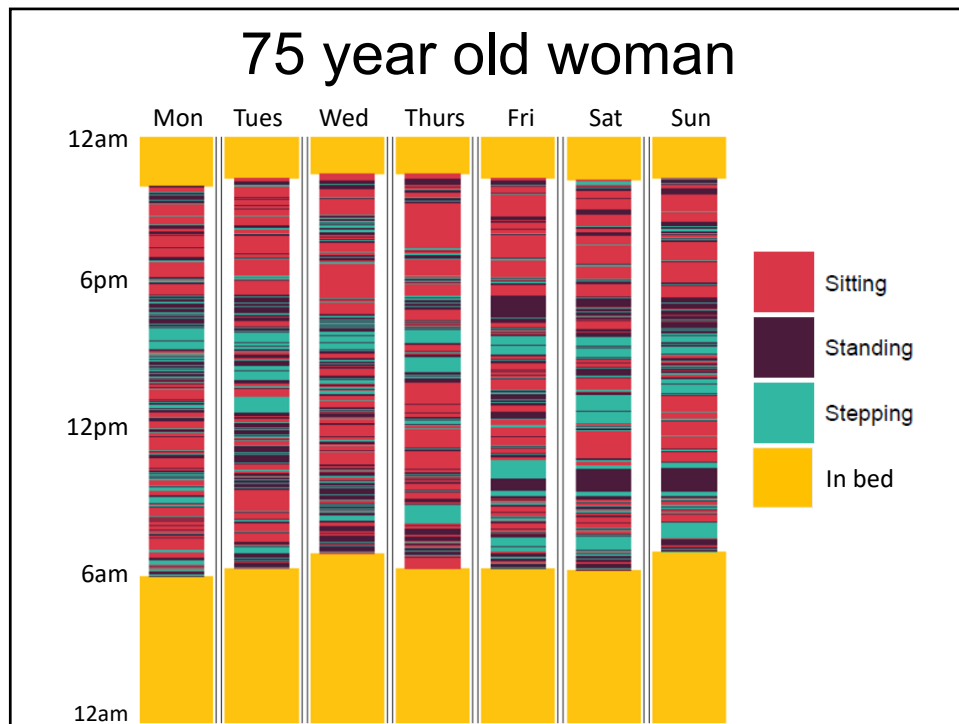


Manini T, Everhart J, Patel K, et al. JAMA 2006

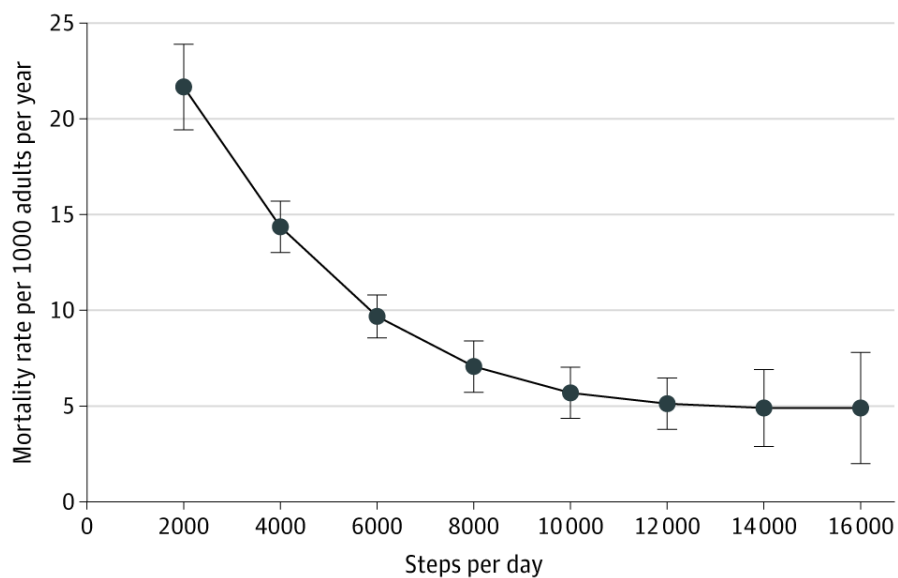


Measuring the Spectrum of Physical Activity



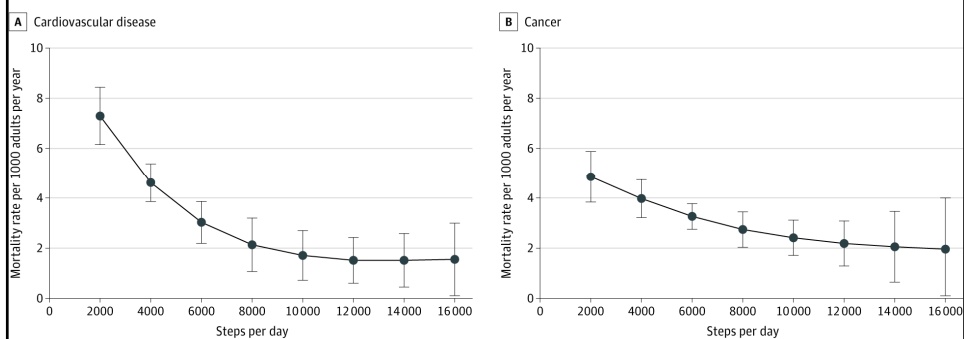


Steps per day and risk of death in US adults (N=4,840)

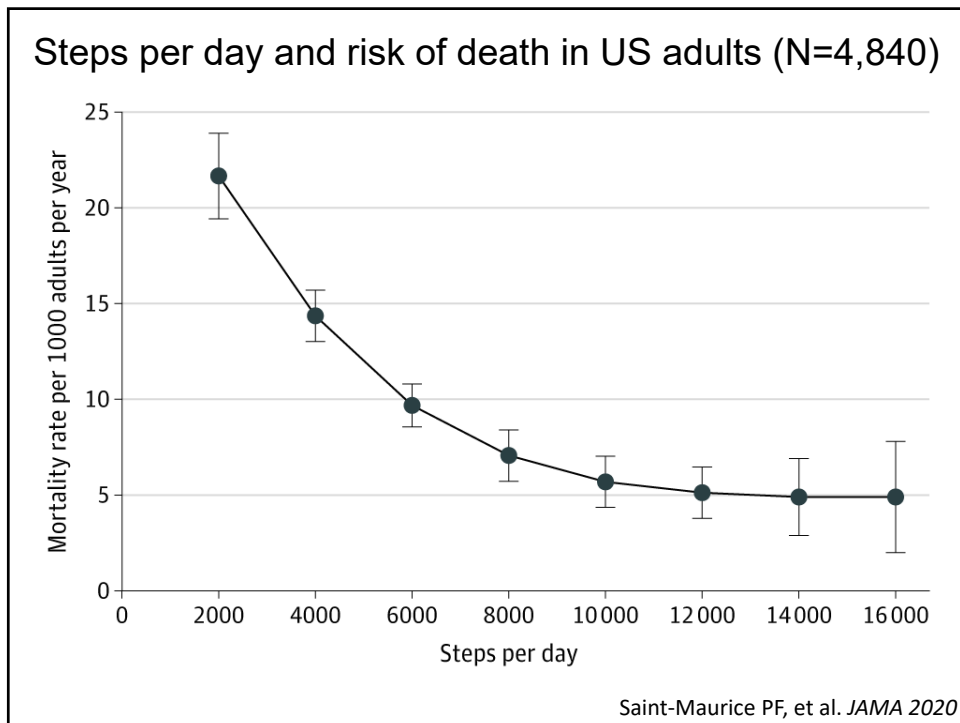
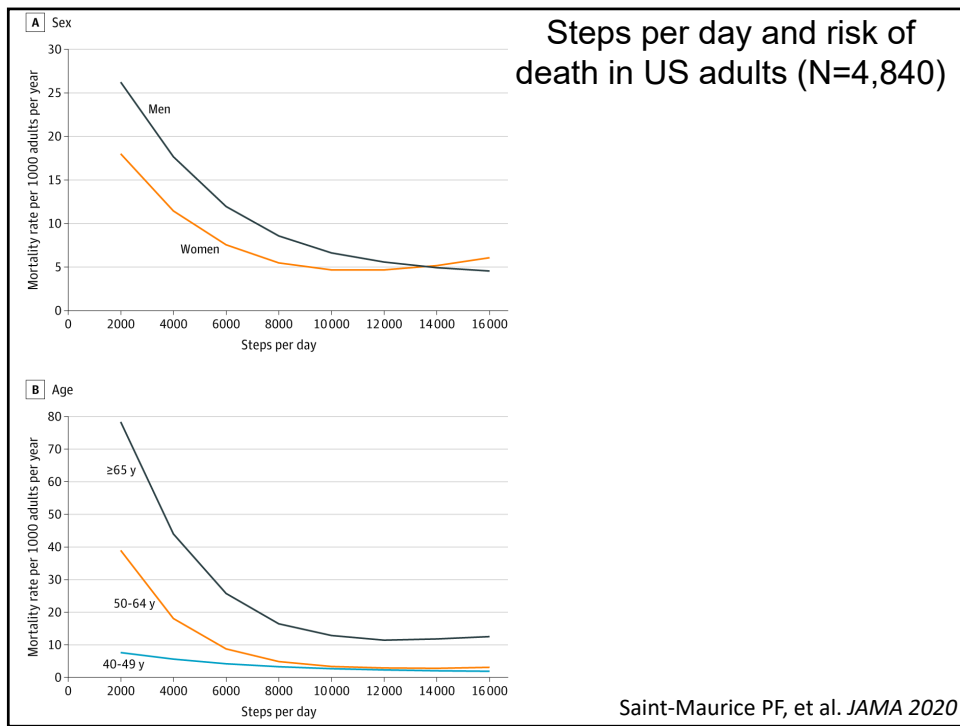


Saint-Maurice PF, et al. JAMA 2020

Steps per day and risk of deaths from CVD and cancer in US adults (N=4,840)



Saint-Maurice PF, et al. JAMA 2020



Dose-response associations between different measures of physical activity and mortality

Ekelund U et al. BMJ 2019

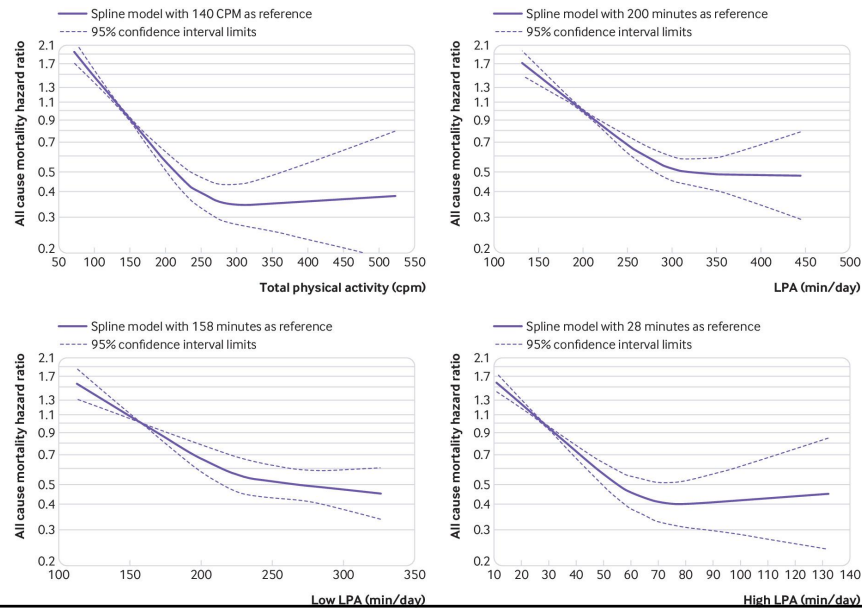
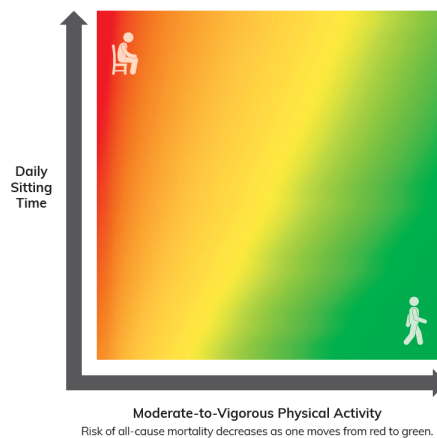
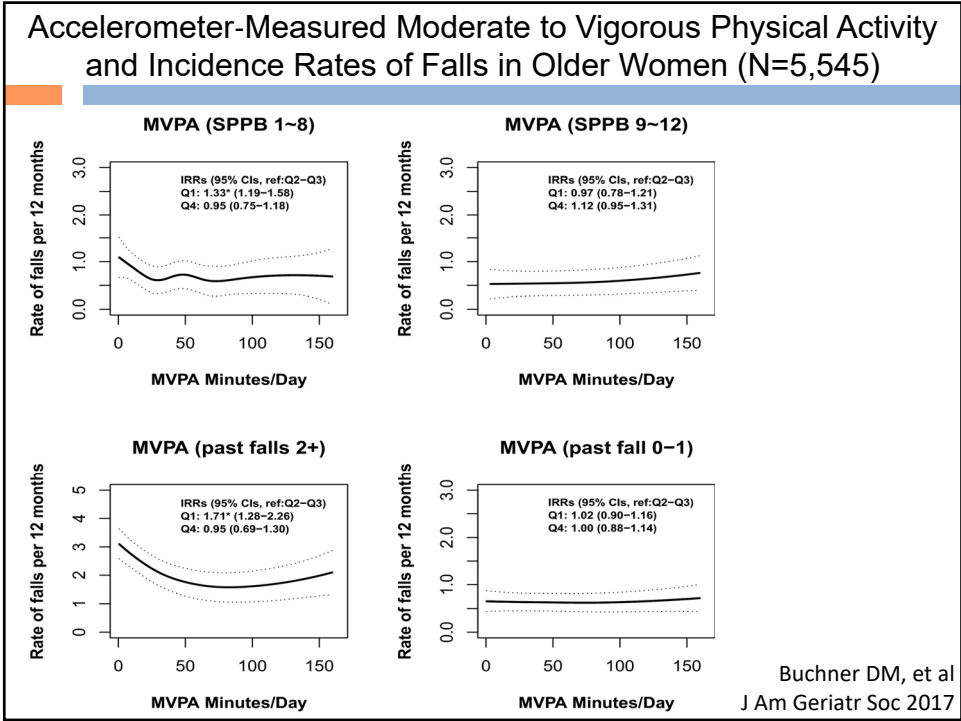
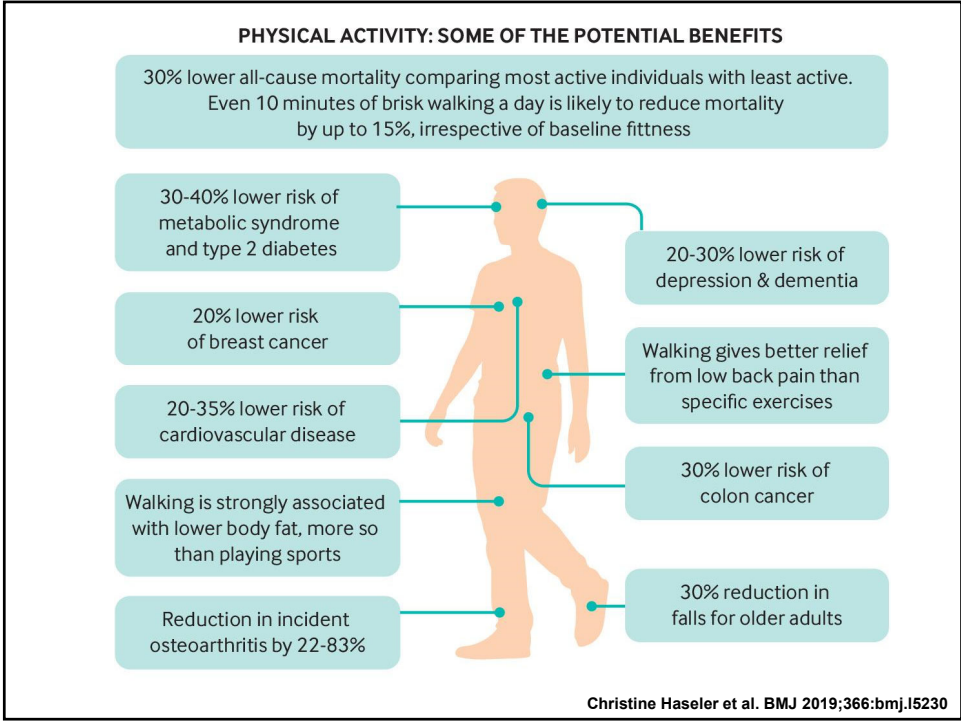
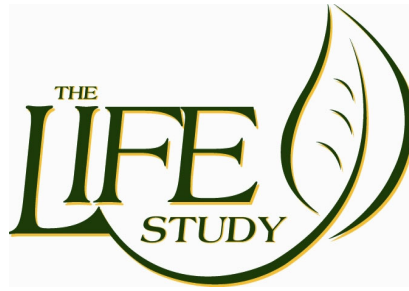


Figure 1-3. Relationship Among Moderate-to-Vigorous Physical Activity, Sitting Time, and Risk of All-Cause Mortality in Adults



Source: This heat map is adapted from data found in Ekelund U, Steene-Johannessen J, Brown WJ. Does physical activity attenuate, or even eliminate, the detrimental association of sitting time with mortality? A harmonized meta-analysis of data from more than 1 million men and women. *Lancet*. 2016;388:1302-1310. doi:10.1016/S0140-6736(16)30370-1.





Lifestyle Interventions and Independence For Elders

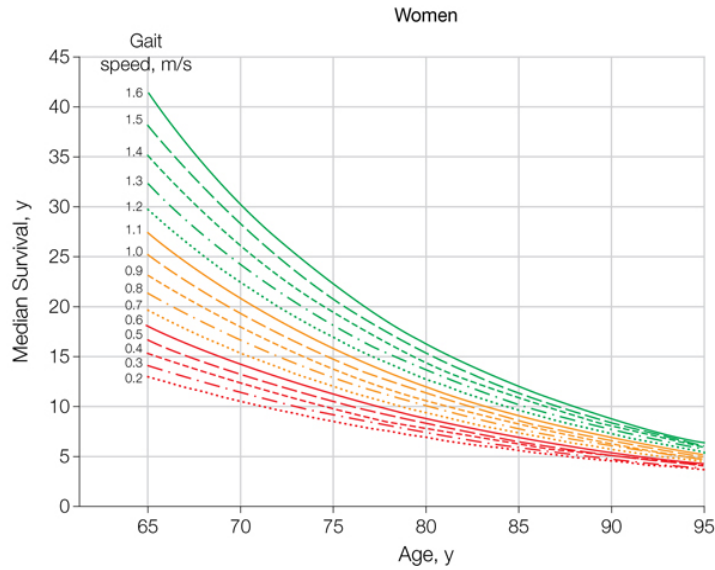
A Randomized Clinical Trial of Exercise to Prevent Mobility Disability
in Non-disabled Older Persons with Functional Limitations

Mobility Function as a Unifying Concept in Gerontology

- Walking is a complex activity in the human, taking a full year to develop after birth.
- It is an important function for survival that it is supported by multiple redundant systems that can be called on to maintain mobility when problems occur in specific components.
- Mobility loss may serve as a unifying biomarker of age-related accumulation of impairments in multiple physiologic systems, chronic diseases and disuse/deconditioning.
- Preferred walking speed is a simple, highly reproducible measure of mobility.

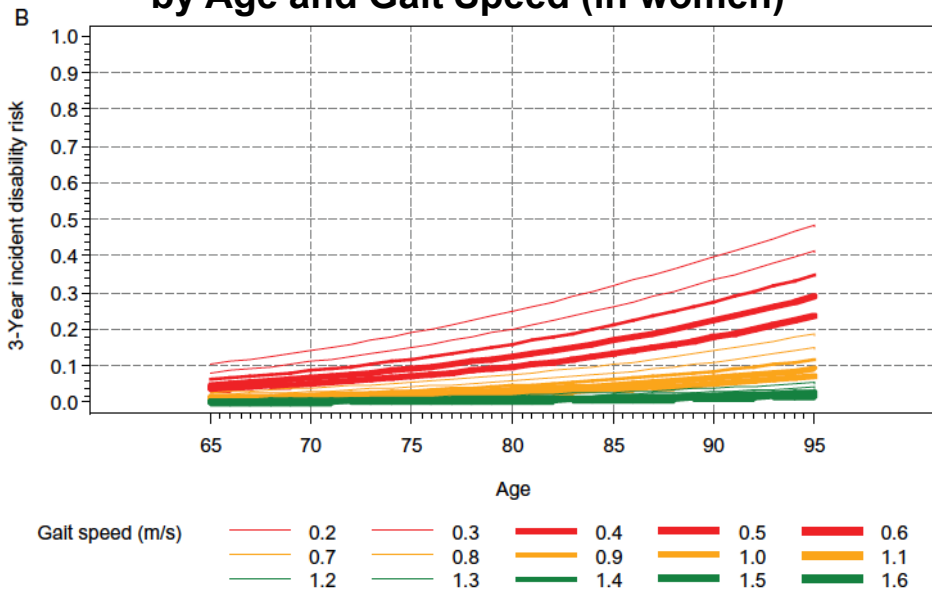
Courtesy of Jack Guralnik

Predicted Median Life Expectancy by Age and Gait Speed (N=34,485; 9 cohorts)



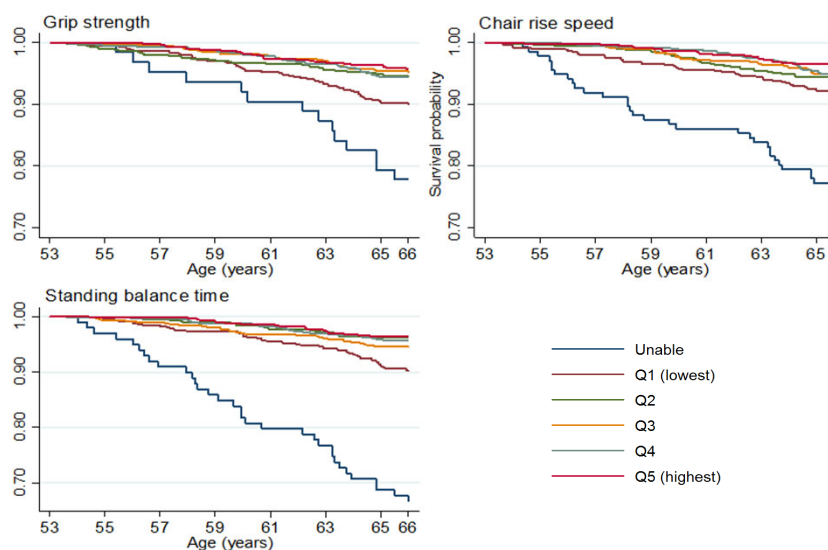
Studenski S, Perrera S, Patel KV, et al. JAMA 2011;305:50-58

Predicted Risk of Disability by Age and Gait Speed (in women)



Perrera S, Patel KV, et al. J Gerontol Series A Biol Sci Med Sci 2016

Physical Capacity at Age 53 and Risk of Death (British birth cohort study; N=2,766; 177 deaths)

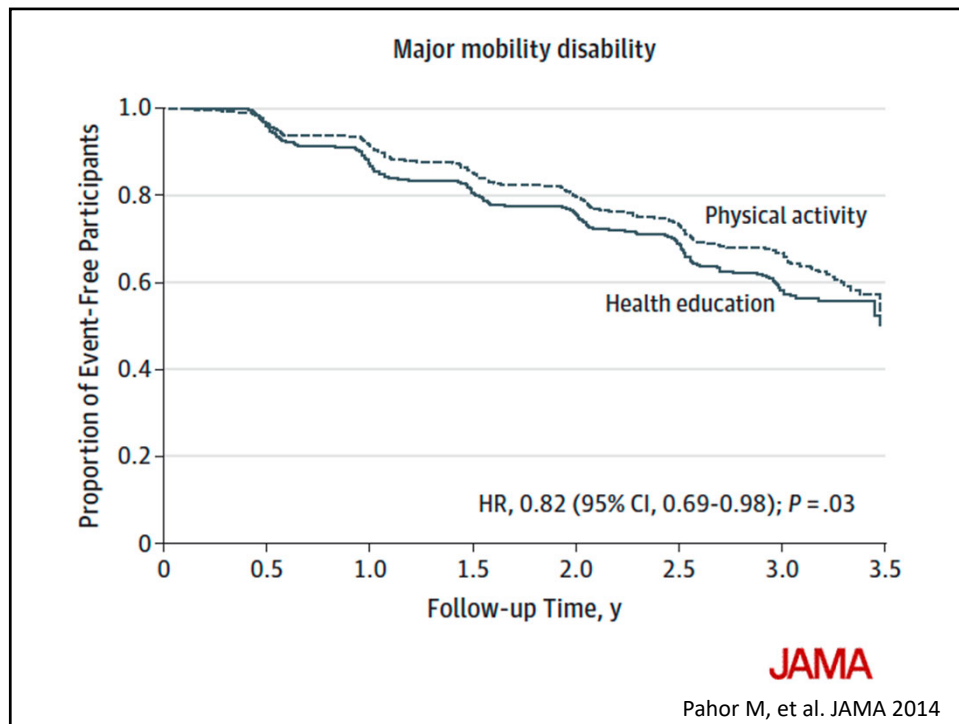


Cooper RC, Patel KV, et al. BMJ 2014

Mobility Disability: Loss of ability to walk 400 m

Older people who lose mobility:

- Are less likely to remain in the community
- Have higher rates of subsequent morbidity and mortality
- Have poorer quality of life
- Have greater health care costs and utilization
- Unable to walk for exercise



Enhance Fitness (EF)



- A community-based exercise program tailored to older adults
 - Group-based classes held for 1-hour, 3 times per week
 - Balance, strength, and endurance training
 - CDC recommended
 - >800 sites nationally
 - <https://projectenhance.org/enhancefitness/>
- Demonstrated to improve physical capacity and health-related quality of life (Wallace JI, Buchner DM, Grothaus L, et al. 1998; Shumway-Cook A, Silver IF, LeMier M, et al. 2007; Belza B, Snyder S, Thompson M, Logerfo J. 2010)

Adaptation of EnhanceFitness for Remote Delivery to Rural Older Adults

- Screened 27 and enrolled 15 (55.6%) older adults
- Median age = 70 years (IQR: 67-75) and 14 (93%) were women
- 5 (33%) did not have access to broadband
- 13 (86.7%) completed 12 weeks of tele-EF
- Median class attendance rate was 91% (IQR: 85-94%)
- Clinically meaningful improvements
 - Knee pain
 - Knee function
 - Timed Up and Go
- All were "very satisfied" with tele-EF
- No serious adverse events

Enhance Fitness (EF)



- To receive information on referring older patients to our ongoing studies in Washington state, please scan this QR code



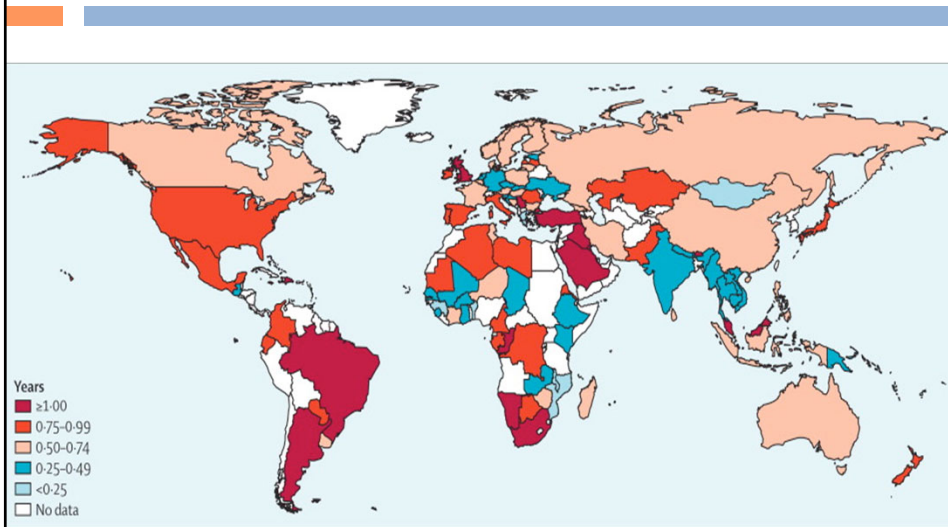


- <https://www.nia.nih.gov/health/exercise-physical-activity>
- Sample exercises with videos
- Tip sheets
- Motivational and planning tools

Exercise Prescription

- Primary care counseling is most effective when presented as a prescription and followed up with periodic inquiries
- Exercise is Medicine
 - <https://www.exerciseismedicine.org/>

Estimated gains in life expectancy worldwide with elimination of physical inactivity



Lee IM, et al. Lancet 2012

THANK YOU! kvpatel@uw.edu

