

بِنامِ خُدا

Demography and Epidemiology

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اپیدمیولوژیست

TABLE 5-1**Actual and Projected Growth of the Older
1900–2050 (Millions)**

	TOTAL POPULATION (ALL AGES)	≥65 YEARS	
		Number	% of Total
1900	76.1	3.1	4.1
1950	152.3	12.3	8.2
2000	276.1	34.9	12.6
2050	403.7	82.0	20.3

SOURCE: Bureau of Economic Analysis, U.S. Census Bureau, and World Bank.

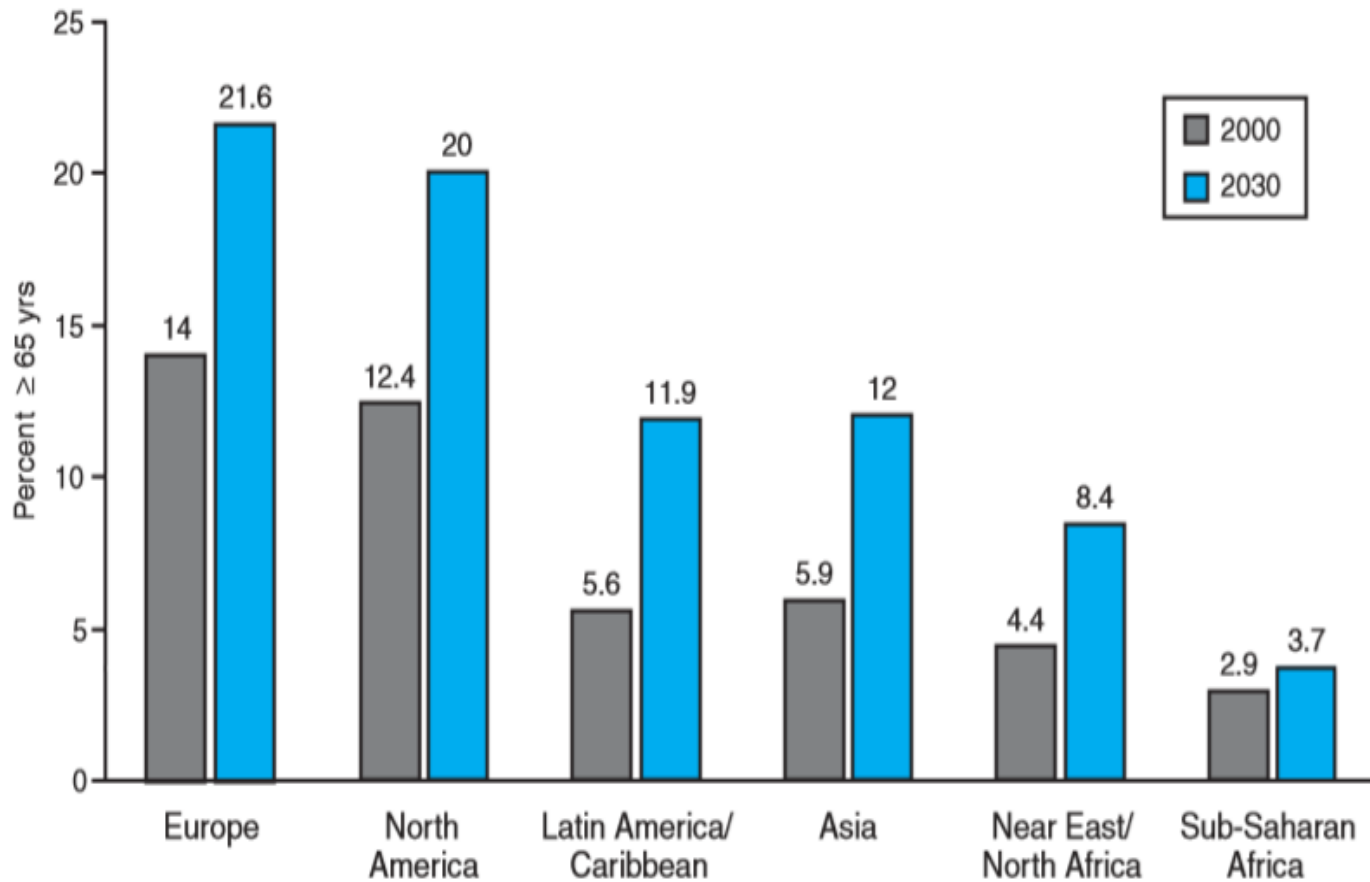
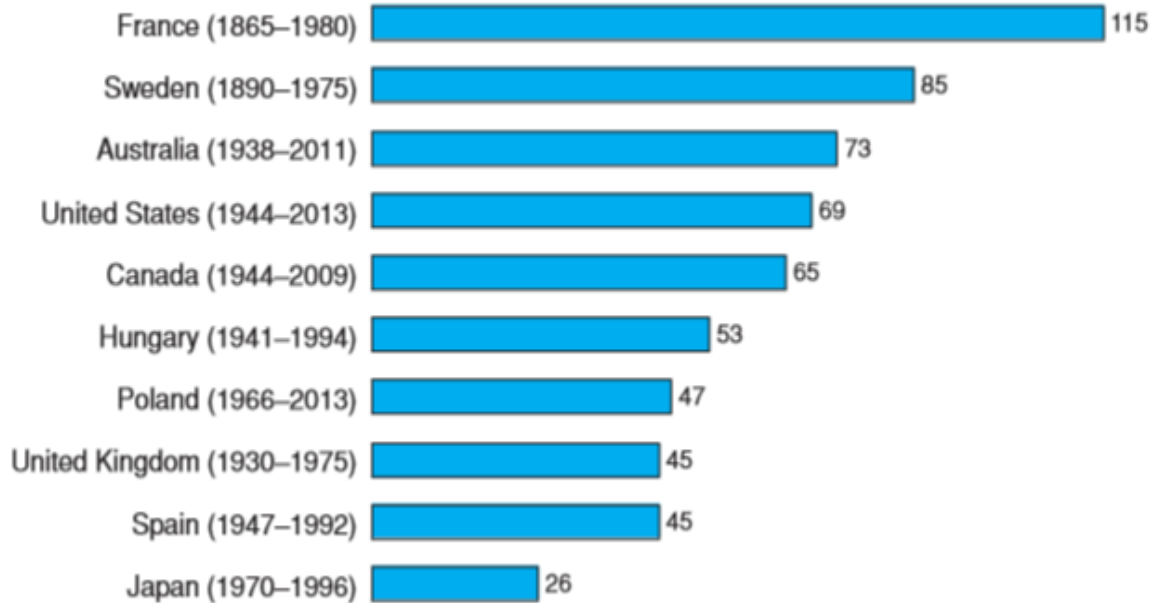


FIGURE 5-1. Percent of population age 65 yrs and older, 2000 and projected for 2030. U.S. Census Bureau, 2004, "Life Tables," International Data Base, at <http://www.census.gov/ipc/www/idbnew.html> Accessed on February 21, 2007.

Developed countries



Developing countries



FIGURE 5-2. Speed of aging: number of years and time period in which percent of population aged 65 and over doubled or will double from 7% to 14%. Reprinted with permission from Kinsella K, Velkoff VA. *An Aging World: 2001*. U.S. Census Bureau, Series P95/01-1. Washington, DC: US Government Printing Office; 2001.

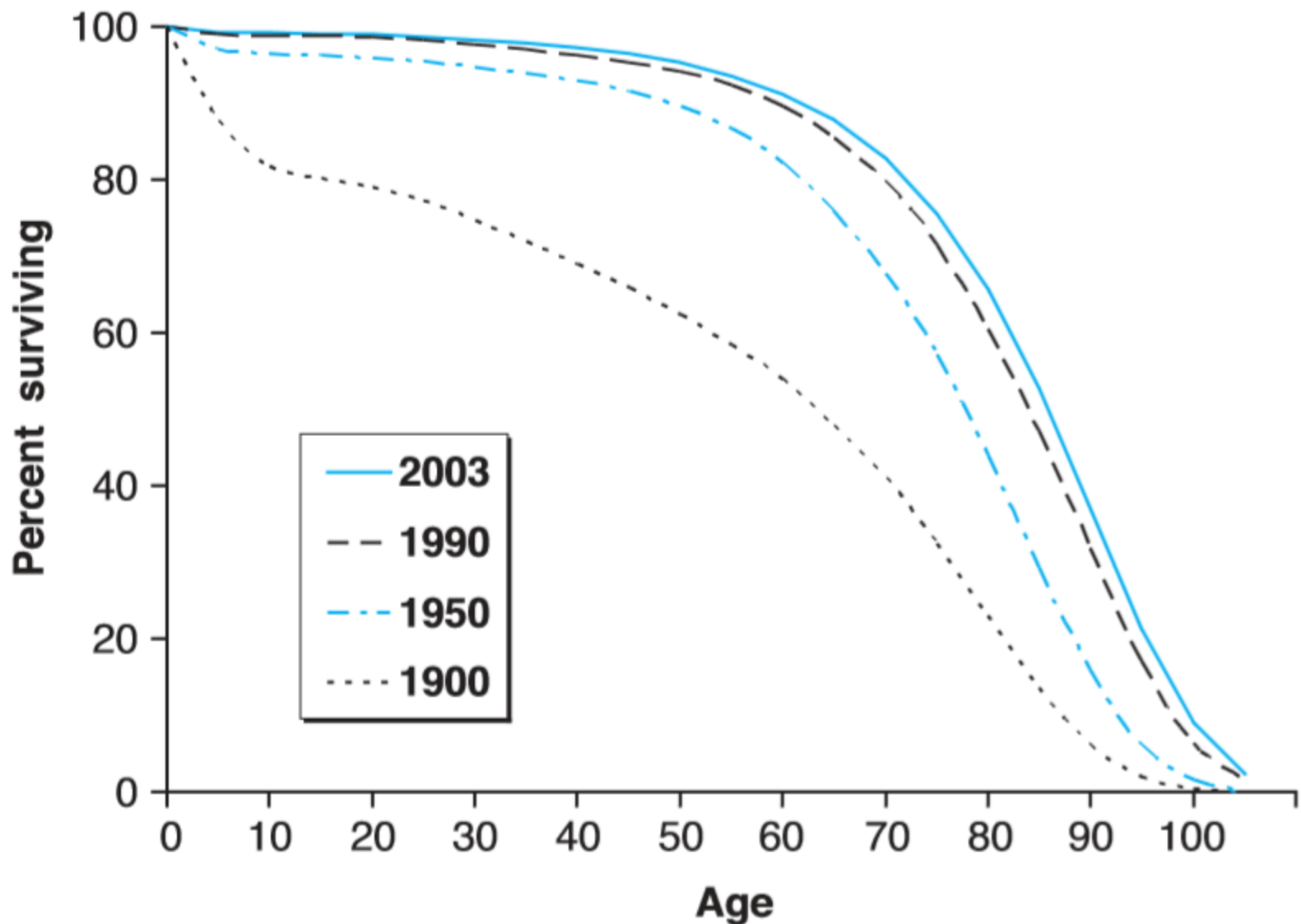


FIGURE 5-3. Survival curves for U.S. population. *Arias E. United States Life Tables, 2003. National Vital Statistics Reports, vol. 54, no. 14. Hyattsville, MD: National Center for Health Statistics; 2006.*

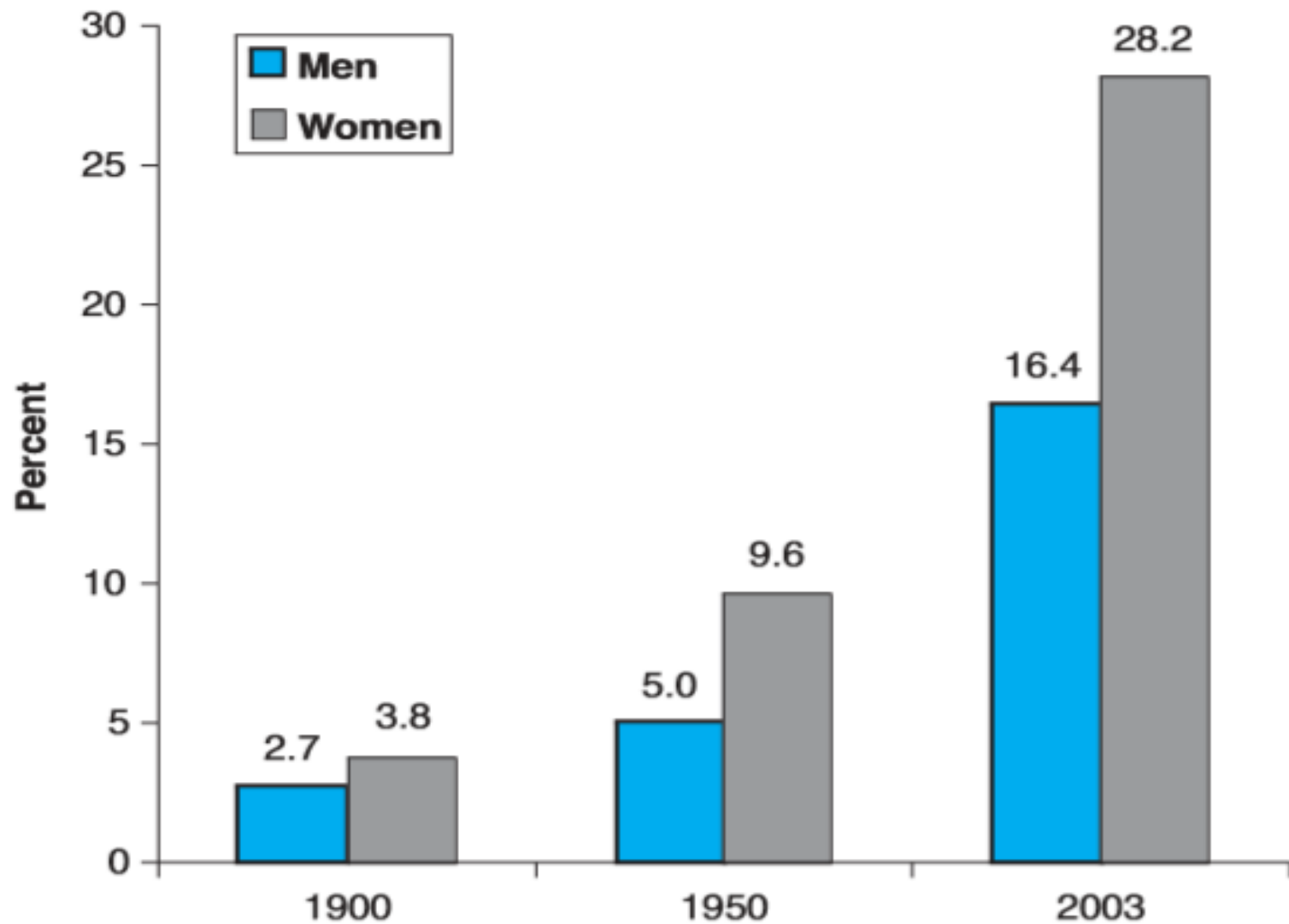


FIGURE 5-4. Probability of 50-year-old living to 90 yrs, 1900 to 2003. Computed from U.S. life tables in Arias E. *United States Life Tables, 2003*. National Vital Statistics Reports, vol. 54, no. 14. Hyattsville, MD: National Center for Health Statistics; 2006.

TABLE 5-2**Life Expectancy in 2003 (Years)**

AGE	MALE			FEMALE		
	All	White	Black	All	White	Black
At birth	74.8	75.3	69.0	80.1	80.5	76.1
At 65 yrs	16.8	16.9	14.9	19.8	19.8	18.5
At 75 yrs	10.5	10.5	9.8	12.6	12.6	12.4
At 85 yrs	6.0	5.9	6.4	7.2	7.1	7.8

Source: Arias, E. *United States Life Tables, 2003*. National Vital Statistics Reports, Vol. 54, No. 14. Hyattsville, MD: National Center for Health Statistics; 2006.

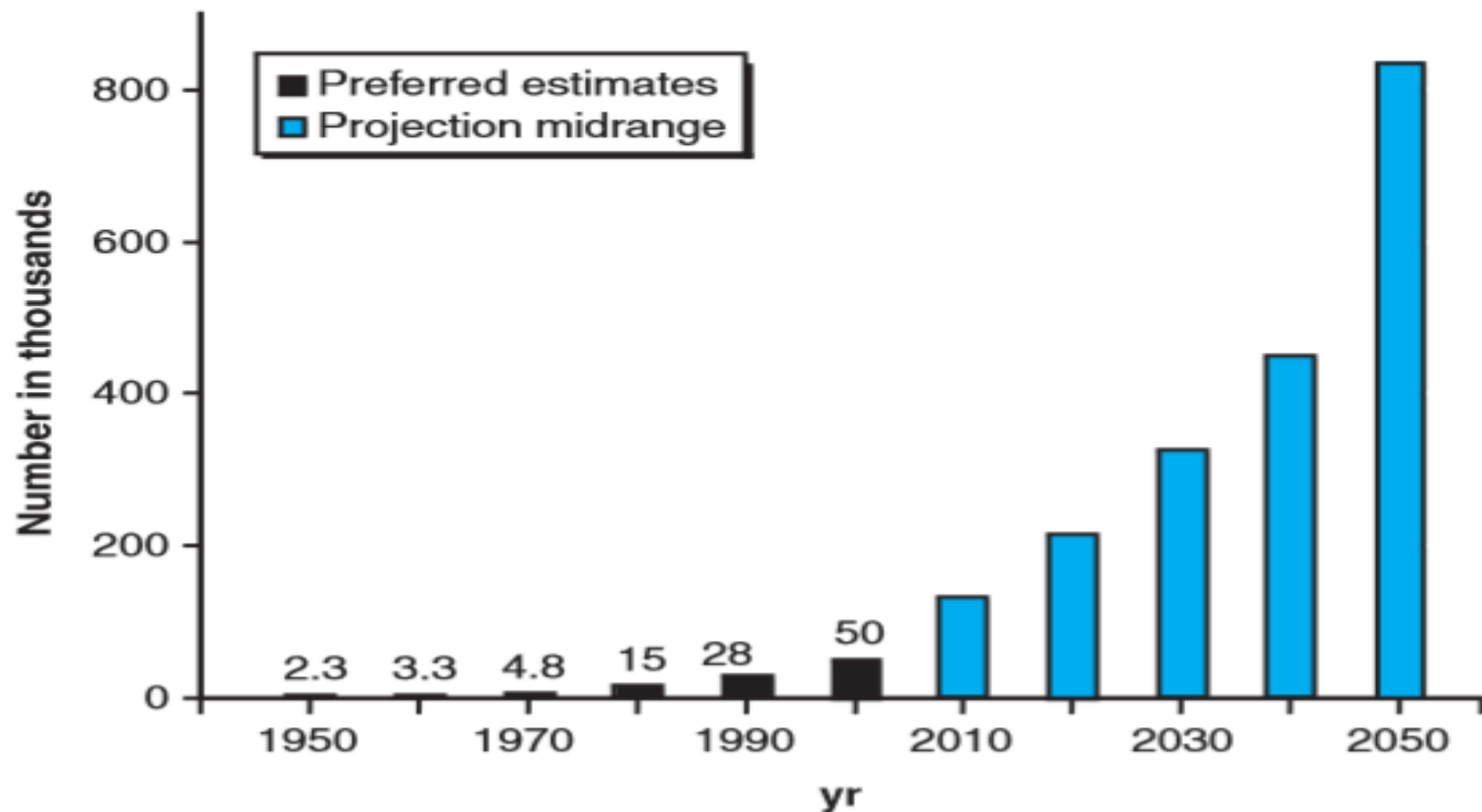


FIGURE 5-5. Number (thousands) of centenarians in the United States using preferred estimates (1950–2000) and midrange projections (2010–2050). Projected numbers adapted from Day JC. Population Projections of the United States by Age, Sex, Race, and Hispanic Origin: 1995–2050, U.S. Bureau of the Census, Current Population Reports, P25–1130. Washington, DC: U.S. Government Printing Office; 1996. Preferred estimates for 1950–2000 acquired from He W, Sungupta M, Velkoff VA, DeBarros KA. U.S. Census Bureau, Current Population Reports, P23-209, 65+ in the United States, 2005. Washington, DC: U.S. Government Printing Office; 2005.

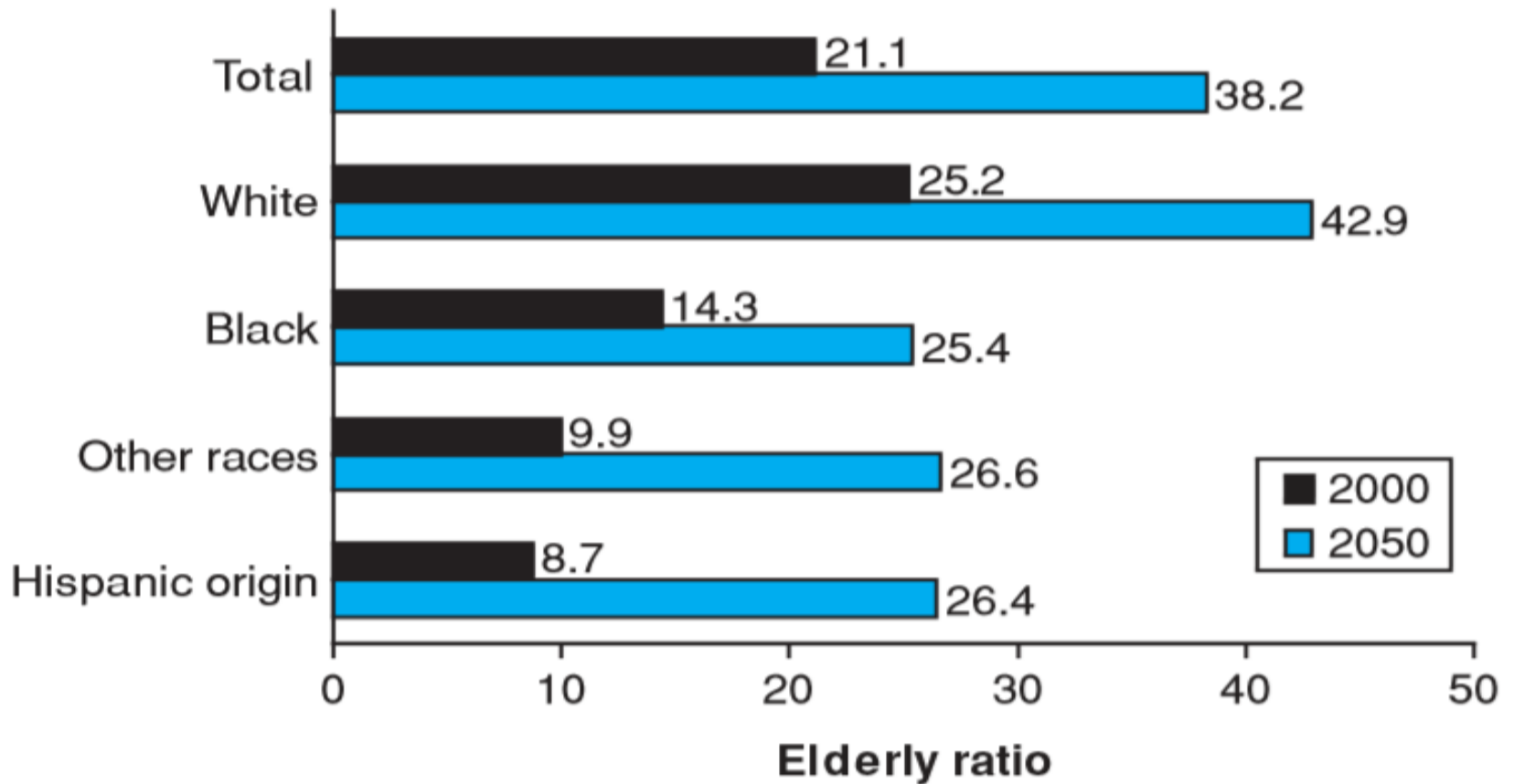


FIGURE 5-6. Elderly ratio: number of persons aged 65 yrs and older divided by number of persons aged 20 to 64, times 100. *He W, Sungupta M, Velkoff VA, DeBarros KA. U.S. Census Bureau, Current Population Reports, P23-209, 65+ in the United States, 2005. Washington, DC: U.S. Government Printing Office; 2005.*

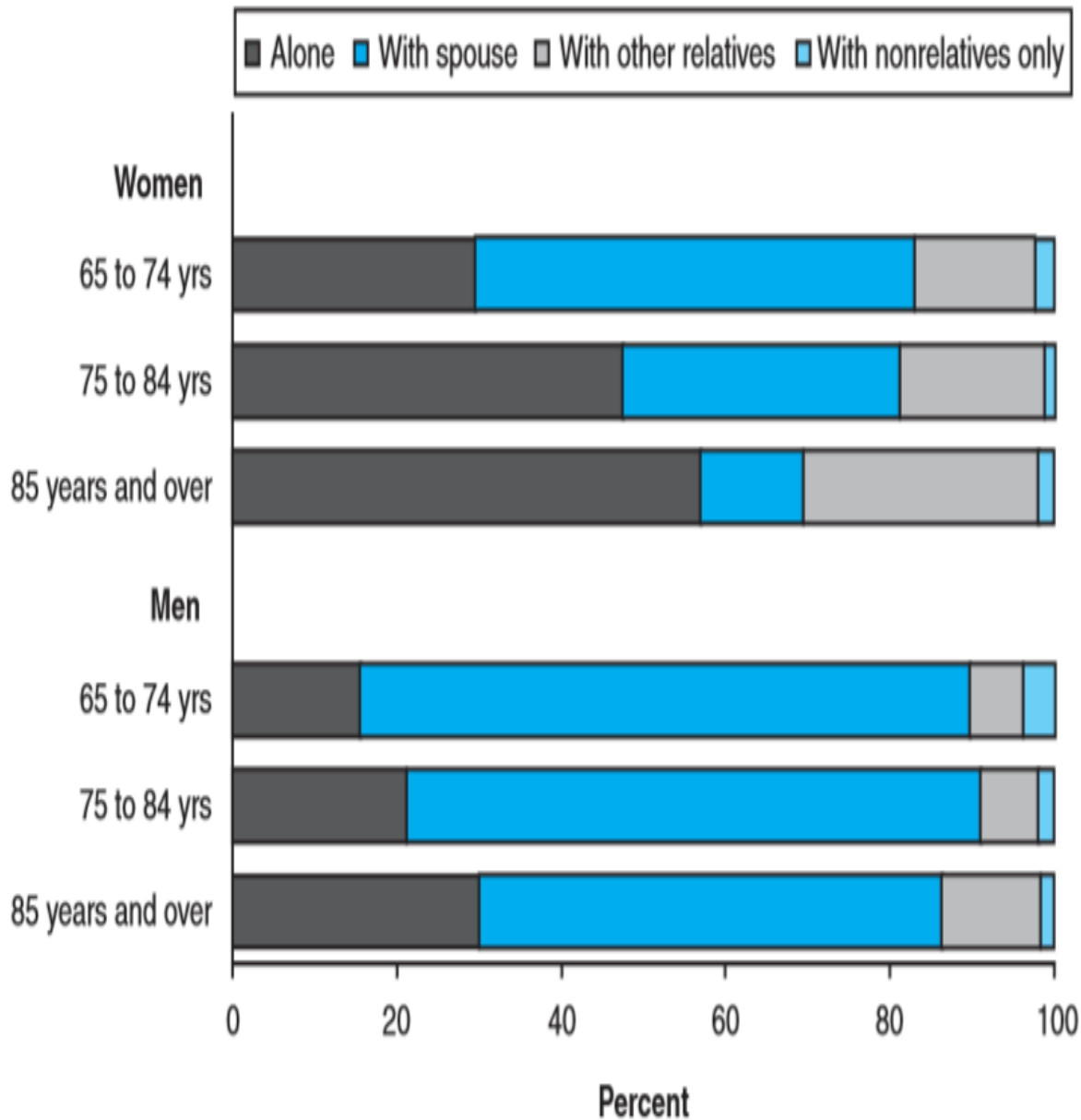


FIGURE 5-7. Living arrangements of community-dwelling persons 65 yrs and over United States, 2003. U.S. Census Bureau, 2003a, Current Population Survey, Annual Social and Economic Supplement, detailed tables.

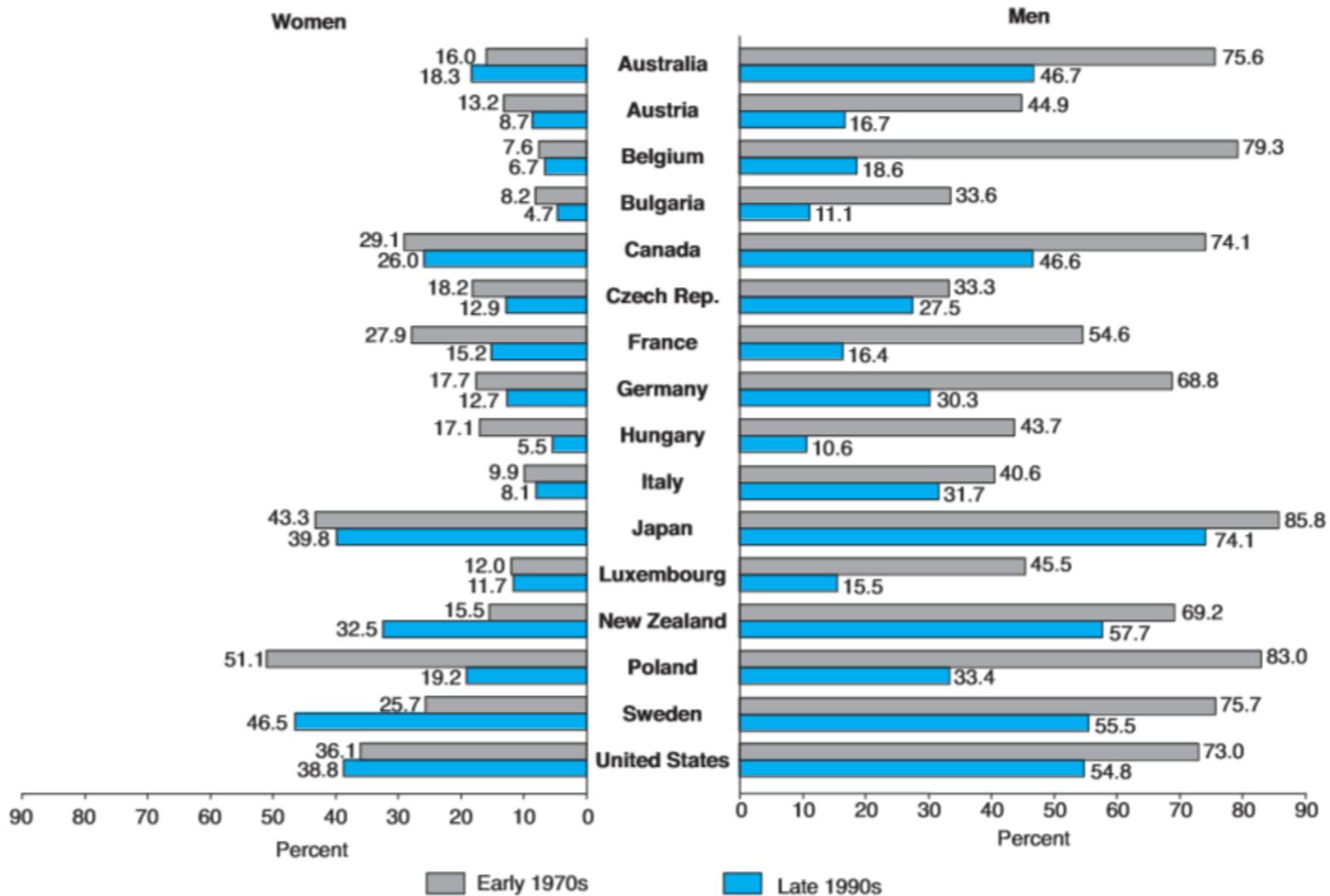


FIGURE 5-8. Labor force participation rates for men and women aged 60–64 yrs in developed countries, early 1970s and late 1990s. Reprinted with permission from Kinsella K, Velkoff VA. *An Aging World: 2001*. U.S. Census Bureau, Series P95/01–1. Washington, DC: US Government Printing Office; 2001.

TABLE 5-3**Leading Causes of Death Among Persons at Least 65 Yrs Old in 2004**

CAUSE OF DEATH	NUMBER OF DEATHS	DEATH RATE (PER 100,000 POPULATION)	% OF ALL DEATHS IN PERSONS ≥65 YRS
Heart disease	533 302	1536.5	30.4
Malignant neoplasms	385 847	1111.6	22.0
Cerebrovascular disease	130 538	376.1	7.4
Chronic lower respiratory disease	105 197	303.1	6.0
Alzheimer's disease	65 313	188.2	3.7
Diabetes mellitus	53 956	155.5	3.1
Influenza and pneumonia	52 760	152.0	3.0
Nephritis, nephrotic syndrome, and nephrosis	35 105	101.1	2.0
All other accidents	27 939	80.5	1.6
Septicemia	25 644	73.9	1.5
Motor vehicle accidents	7 081	20.4	0.4
All other causes (residual)	332 987	959.4	19.0
Total	1 755 669	5058	100.0

Source: Miniño AM, Heron M, Murphy SL, Kochanek KD. Deaths: Final data for 2004. Health E-Stats. Hyattsville, MD: National Center for Health Statistics; 2006.

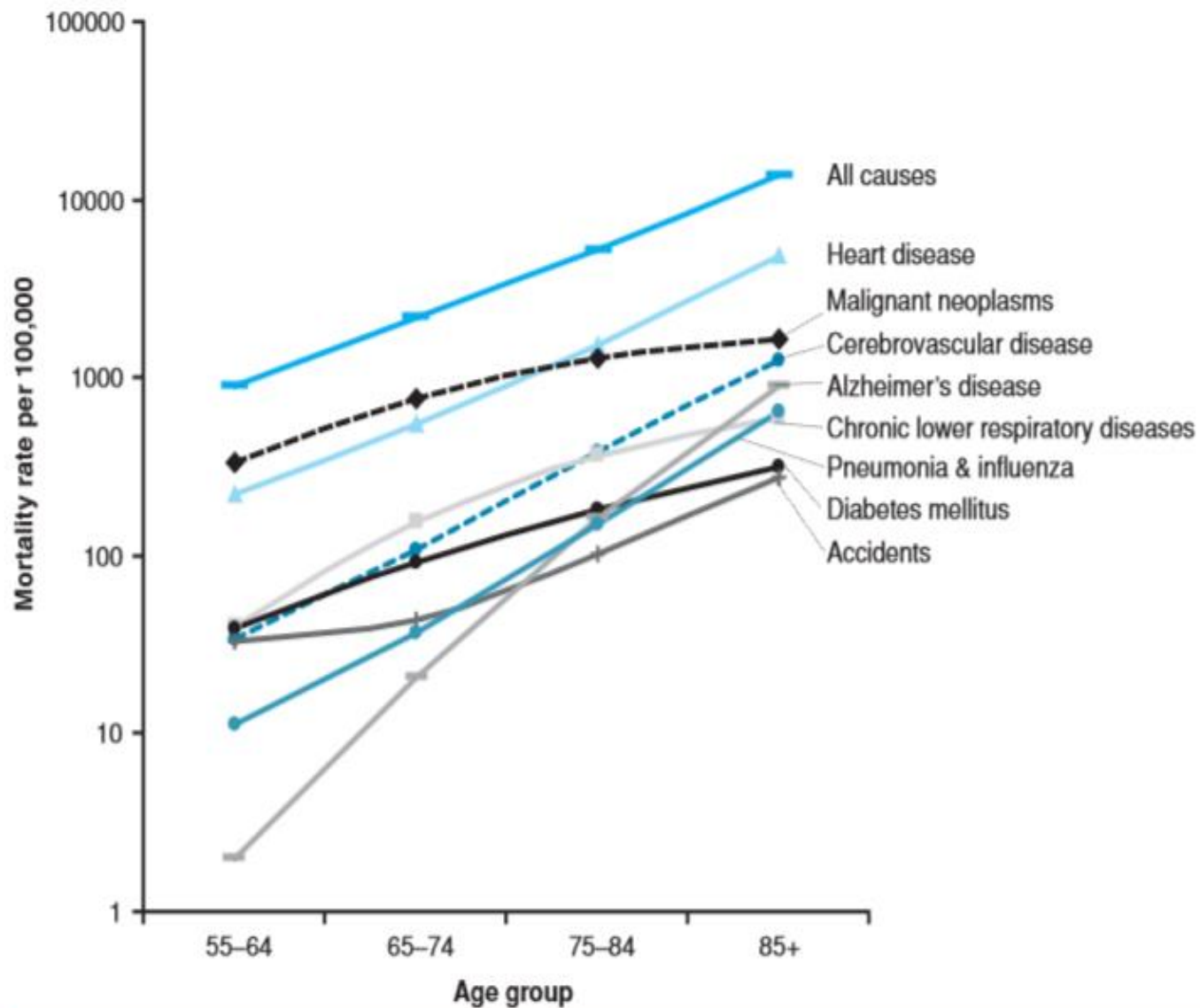


FIGURE 5-9. Age-specific death rates for leading cause of death in the older population, United States, 2004. Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System; Vital statistics of the United States, 2004 annual mortality file.

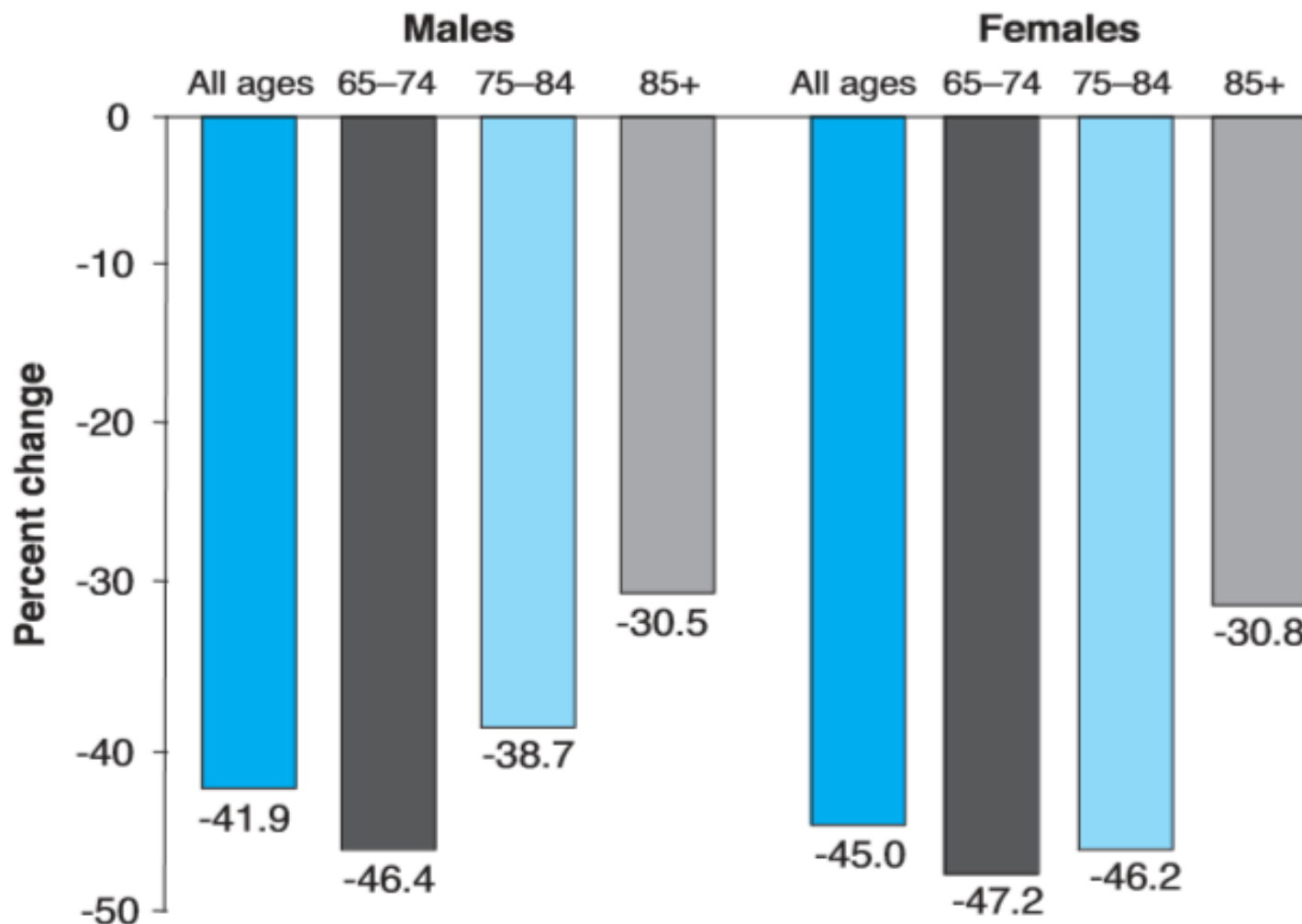


FIGURE 5-11. Percent change in mortality rates, United States, 1950–2004, for all ages (age-adjusted using yr 2000 standard population) and for older age groups. Calculated from data in National Center for Health Statistics. *Health, United States, 2006 with Chartbook on Trends in the Health of Americans*. Hyattsville, MD: National Center for Health Statistics; 2006.

TABLE 5-4**Age-Adjusted* and Age-Specific Mortality, U.S., During 1950 and 2004 and the Percent Change**

		1950	2004	CHANGE
Diseases of the Heart				
Males				
	All ages	697.0	267.9	-61.6
	65-74	2292.3	723.8	-68.4
	75-84	4825.0	1893.6	-60.8
	85+	9659.8	5239.3	-45.8
Females				
	All ages	484.7	177.3	-63.4
	65-74	1419.3	388.6	-72.6
	75-84	3872.0	1245.6	-67.8
	85+	8796.1	4741.5	-46.1
Cerebrovascular Disease				
Males				
	All ages	186.4	50.4	-73.0
	65-74	589.6	121.1	-79.5
	75-84	1543.6	402.9	-73.9
	85+	3048.6	1118.1	-63.3
Females				
	All ages	175.8	48.9	-72.2
	65-74	522.1	96.6	-81.5
	75-84	1462.2	374.9	-74.4
	85+	2949.4	1303.4	-55.8
Malignant Neoplasms				
Males				
	All ages	208.1	227.7	9.4
	65-74	791.5	907.6	14.7
	75-84	1332.6	1662.1	24.7
	85+	1668.3	2349.5	40.8
Females				
	All ages	182.3	157.4	-13.7
	65-74	612.3	627.1	2.4
	75-84	1007.7	1023.5	1.6
	85+	1299.7	1340.1	3.1

*Data for "all ages" is age-adjusted by using the U.S. 2000 standard population.

Source: National Center for Health Statistics. *Health, United States, 2006 with Chartbook on Trends in the Health of Americans*. Hyattsville, MD: National Center for Health Statistics; 2006.

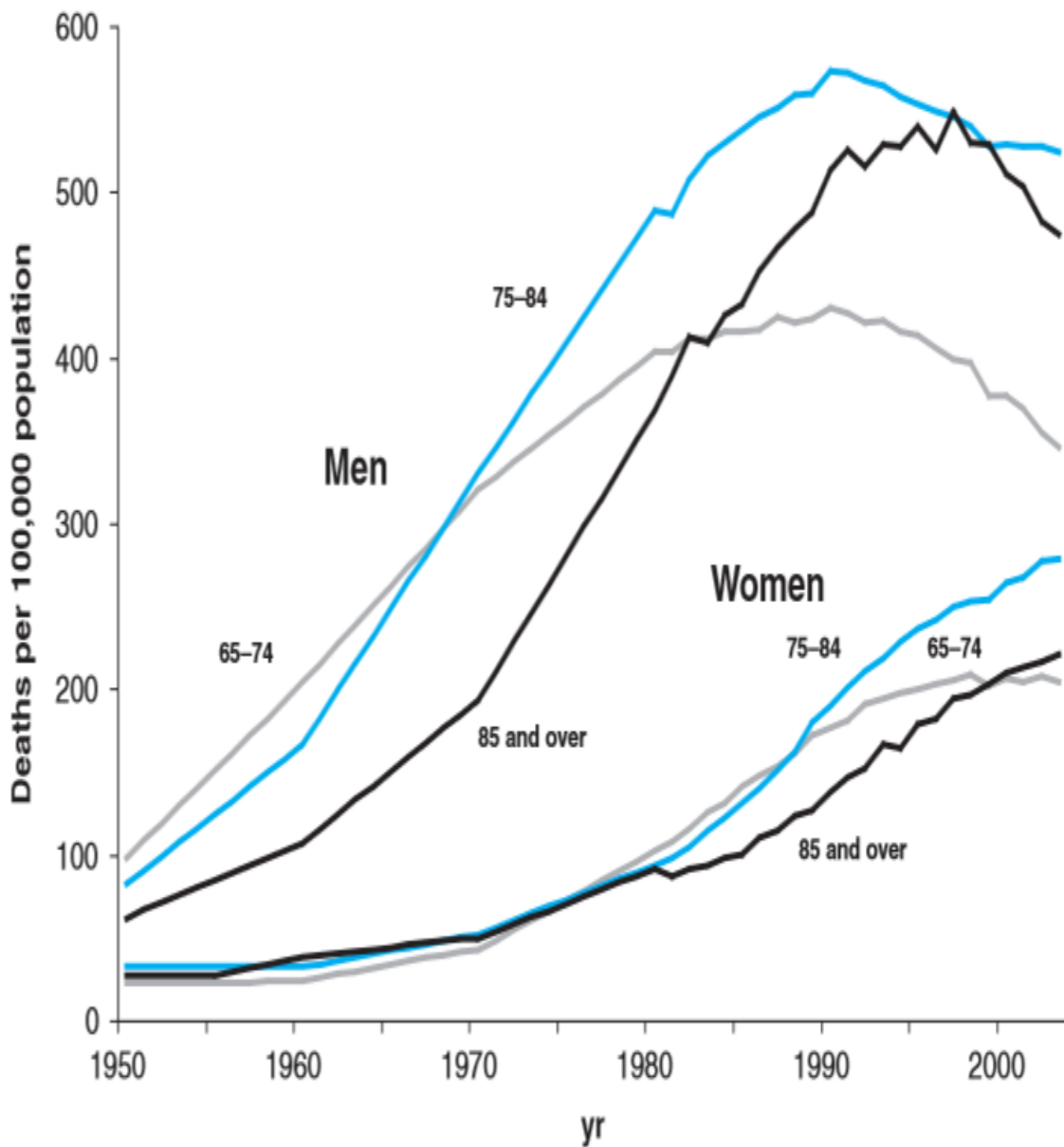


FIGURE 5-12. Mortality rate for malignant neoplasms of the trachea, bronchus, and lung by age, sex, and year: United States, 1950–2004. Miniño AM, Heron M, Murphy SL, Kochanek KD. Deaths: Final data for 2004. *Health E-Stats*. Hyattsville, MD: National Center for Health Statistics; 2006.

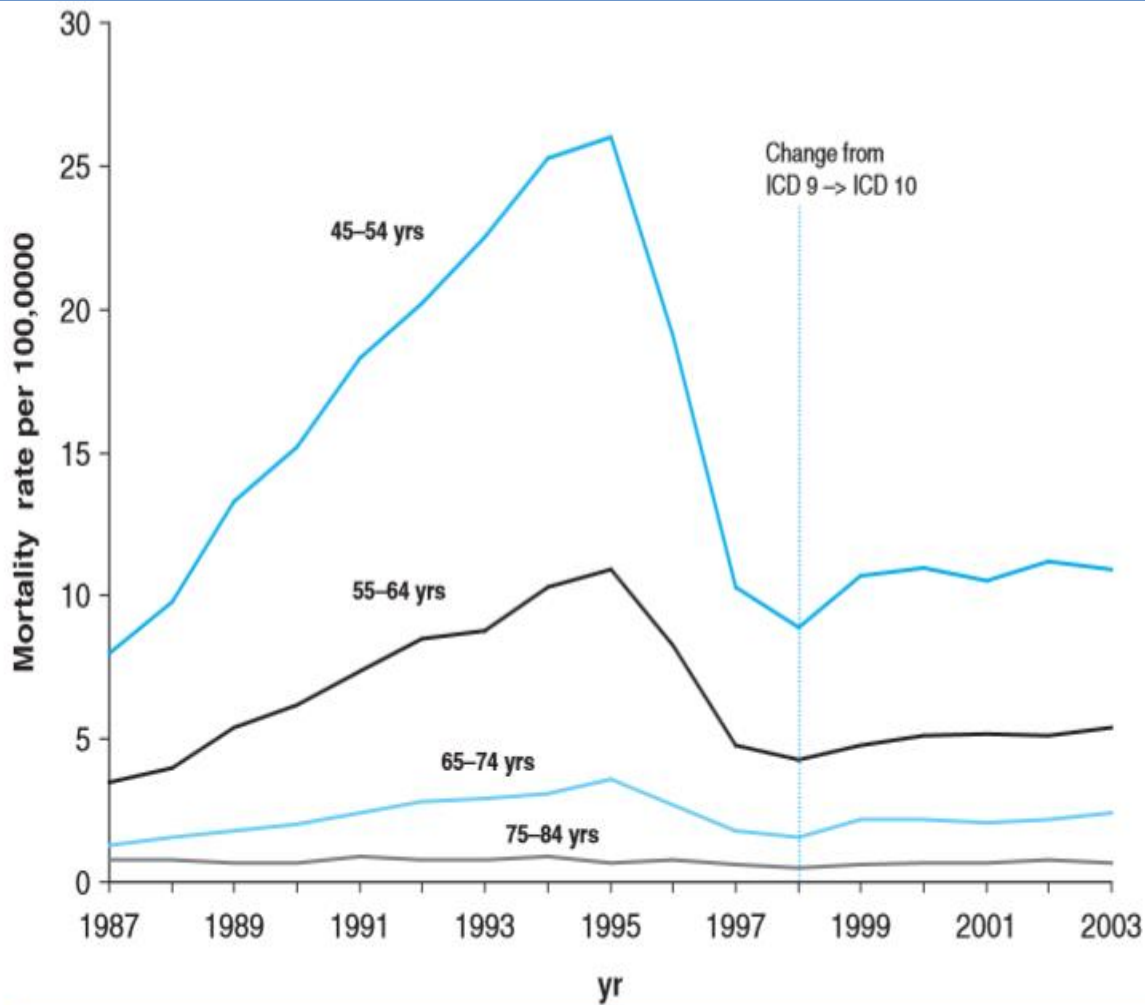


FIGURE 5-13. Mortality rate for HIV/AIDS by age and year in the United States, 1987–2003. Miniño AM, Heron M, Murphy SL, Kochanek KD. Deaths: Final data for 2004. *Health E-Stats*. Hyattsville, MD: National Center for Health Statistics; 2006.

TABLE 5-5**Most Commonly Reported Chronic Conditions Per 100 Persons 65+ Yrs in 2005**

CONDITION	MALE	FEMALE
Hypertension	44.6	51.1
Arthritis diagnosis	40.4	51.4
Chronic joint symptoms	39.7	47.7
Coronary heart disease	24.3	16.5
Cancer (any type)	23.2	17.5
Vision impairment	14.9	18.7
Diabetes	16.9	14.7
Sinusitis	11.5	16.0
Ulcers	13.1	10.4
Hearing impairment	14.8	8.4
Stroke	8.9	8.2
Emphysema	6.3	4.1
Chronic bronchitis	4.5	6.3
Kidney disorders	4.1	3.9
Liver disease	1.4	1.4

Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, sample adult questionnaire. Trends in Health and Aging. <http://www.cdc.gov/nchs/agingact.htm>. Accessed February 21, 2007.

TABLE 5-6**Ambulatory Medical Visits, Reasons for the Visit* and Drug Prescription According To Age Group, and Hospital Discharges By Age Group, U.S., 2004**

AGE GROUP	AVERAGE NUMBER OF VISITS PER PERSON PER YR[†]	PERCENT VISITS FOR ACUTE PROBLEMS	PERCENT VISITS FOR CHRONIC PROBLEMS (ROUTINE OR FLARE-UP)	PERCENT OF VISITS WITH 4+ DRUGS PRESCRIBED OR CONTINUED (1999)	NUMBER OF HOSPITAL DISCHARGES PER 1000 POPULATION
<15	2.4	51.7	18.5	5.3	42.3
15-24	1.7	40.5	24.9	3.0	74.2
25-44	2.4	36.2	33.4	5.6	86.6
45-64	3.8	30.8	47.6	15.0	117.8
65-74	6.2	24.6	56.3	21.6	259.2
75+	7.3	26.2	58.0	24.6	427.0

*Table does not account for pre- or postsurgery/injury follow-up, nonillness care, or unknown reason for visit.

[†]Per person estimates utilizing 2000 census numbers.

Sources: Hing E, Cherry DK, Woodwell DA. *National Ambulatory Medical Care Survey: 2004 summary. Advance data from vital and health statistics; no 374.* Hyattsville, MD: National Center for Health Statistics; 2006.

Cherry DK, Burt CW, Woodwell DA. *National Ambulatory Medical Care Survey: 1999 summary. Advance data from vital and health statistics; no. 322.* Hyattsville, Maryland: National Center for Health Statistics; 2001.

Lolak LJ, DeFrances CJ, Hall MJ. *National Hospital Discharge Survey: 2004 Annual Summary with Detailed Diagnosis and Procedure Data.* National Center for Health Statistics. *Vital Health Stat.* 2006;13(151).

TABLE 5-7**Top Reasons for Ambulatory Medical Visits to Physician Offices, Hospital Outpatient Departments, and Emergency Departments in the United States, 2001-02**

	65-74 YEARS OF AGE			75+ YEARS OF AGE		
	Number of Visits (in thousands)	Percent	Number of Visits per 100 Persons	Number of Visits (in thousands)	Percent	Number of Visits per 100 Persons
Essential hypertension	10 587	8.5	58.6	10 617	8.1	67.3
Diabetes mellitus	7 448	6.0	41.3	6 935	5.3	43.9
Arthropathies and related disorders	5 336	4.3	29.6	5 586	4.3	35.4
Malignant neoplasms	4 577	3.7	25.4	5 552	4.2	35.2
Ischemic heart disease	4 246	3.4	23.5	5 171	4.0	32.8
Heart disease, excluding ischemic	3 698	3.0	20.5	4 518	3.5	28.6
Spinal disorders	3 544	2.8	19.6	4 021	3.1	25.5
Cataract	3 522	2.8	19.5	3 430	2.6	21.7
Rheumatisms, excluding back	3 070	2.5	17.0	3 220	2.5	20.4
Disorders of lipid metabolism	2 463	2.0	13.6	2 185	1.7	13.8
Injury	11 342	9.1	62.8	13 258	10.1	84.0
All other	64 819	52.0	421.8	66 134	50.6	419.1
All visits	124 652	100.0	690	130 627	100.0	828

Source: Schappert SM, Burt CW. Ambulatory care visits to physician offices, hospital outpatient departments, and emergency departments: United States, 2001-2002. National Center for Health Statistics. Vital Health Stat. 2006;13(159).

TABLE 5-8**The Ten Leading Causes of Hospitalization in Persons Aged 65 and Older, First Listed Diagnosis. United States, 2004**

	DISCHARGE RATE PER 10,000 POPULATION
1. Heart disease	767.9
Acute myocardial infarction	126.6
Coronary atherosclerosis	158.6
Cardiac dysrhythmias	145.0
Congestive heart failure	225.0
2. Pneumonia	220.4
3. Cerebrovascular disease	175.6
4. Malignant neoplasms	172.2
5. Fractures, all sites	147.0
Fractures, neck, of femur	79.6
6. Osteoarthritis and allied disorders	117.7
7. Chronic bronchitis	88.9
8. Septicemia	78.5
9. Volume depletion	67.6
10. Psychoses	60.7

Source: Lolak UJ, DeFrances CJ, Hall MJ. National Hospital Discharge Survey: 2004 Annual Summary with Detailed Diagnosis and Procedure Data. National Center for Health Statistics. *Vital Health Stat.* 2006;13(151).

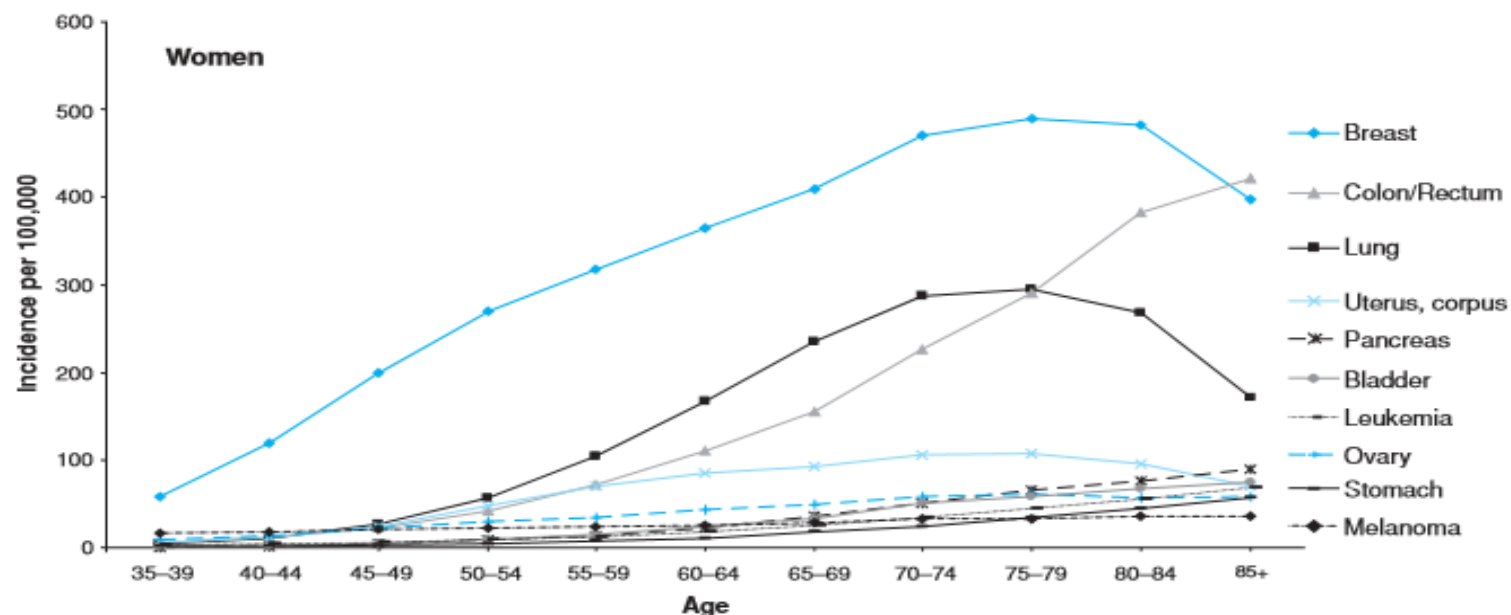
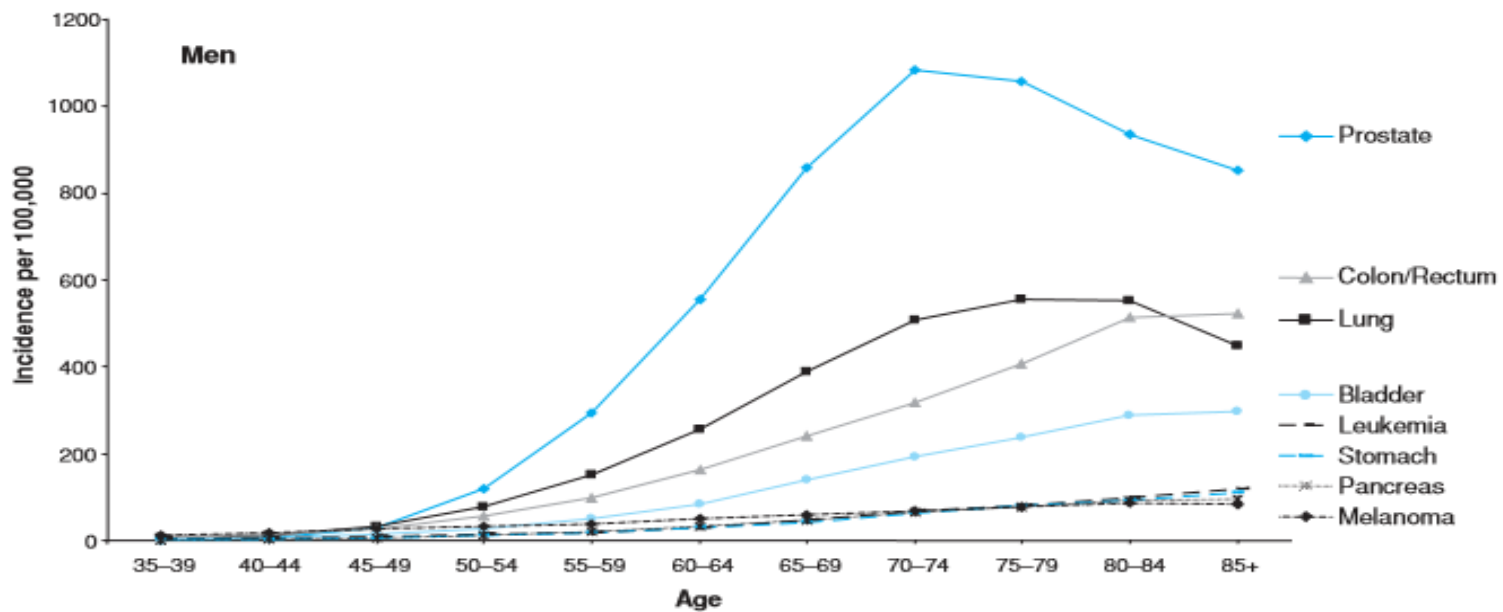


FIGURE 5-14. Incidence rates of specific cancers in men (top panel) and women (bottom panel) by age. SEER Cancer Statistics Review 1973–1998. Surveillance, Epidemiology and End Results Program, National Cancer Institute. http://seer.cancer.gov/csr/1973_1998/ Accessed on March 7, 2007.

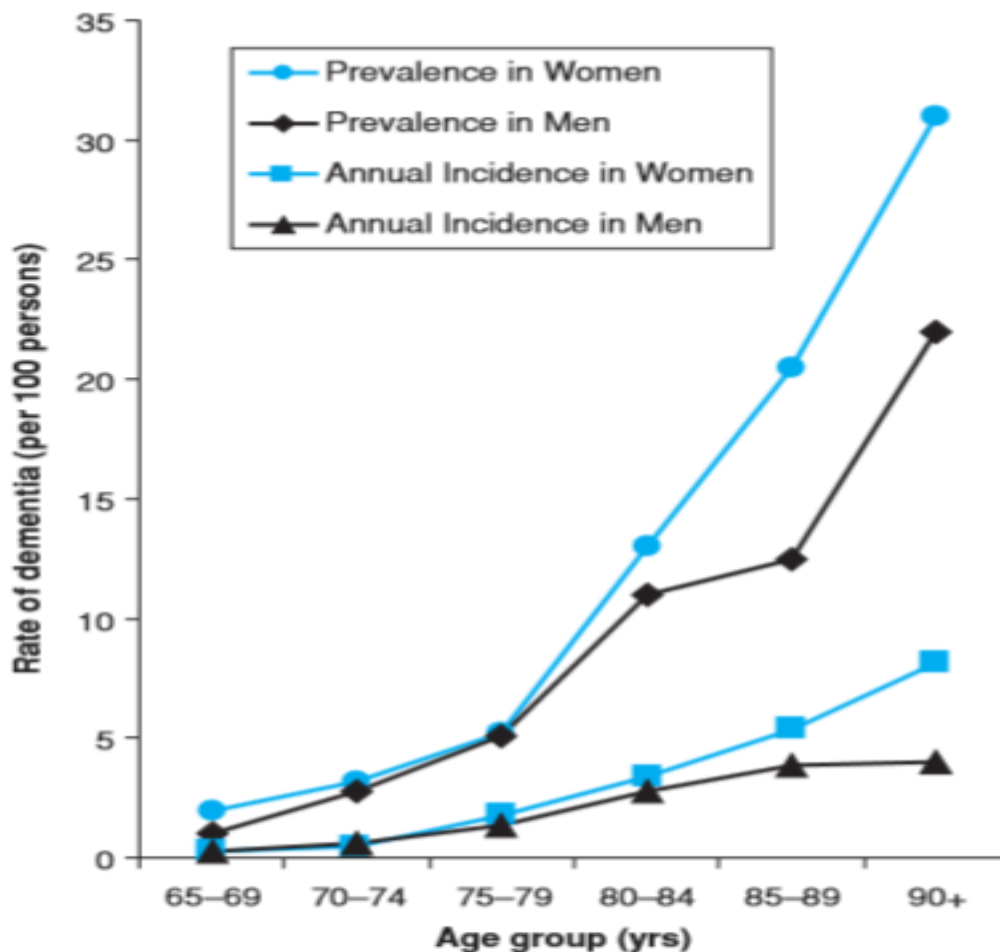


FIGURE 5-15. Age- and gender-specific prevalence and annual incidence of dementia in persons aged 65 and older. Data from pooled analyses of 11 studies carried out in eight European countries (prevalence) and in eight studies in seven countries (incidence). Adapted with permission from Lobo A, Launer U, et al. Prevalence of dementia and major subtypes in Europe: A collaborative study of population-based cohorts. *Neurology*. 2000;54(suppl 5):S4. Fratiglioni L, Launer U, et al. Incidence of dementia and major subtypes in Europe: A collaborative study of population-based cohorts. *Neurology*. 2000;54(suppl 5):S10.

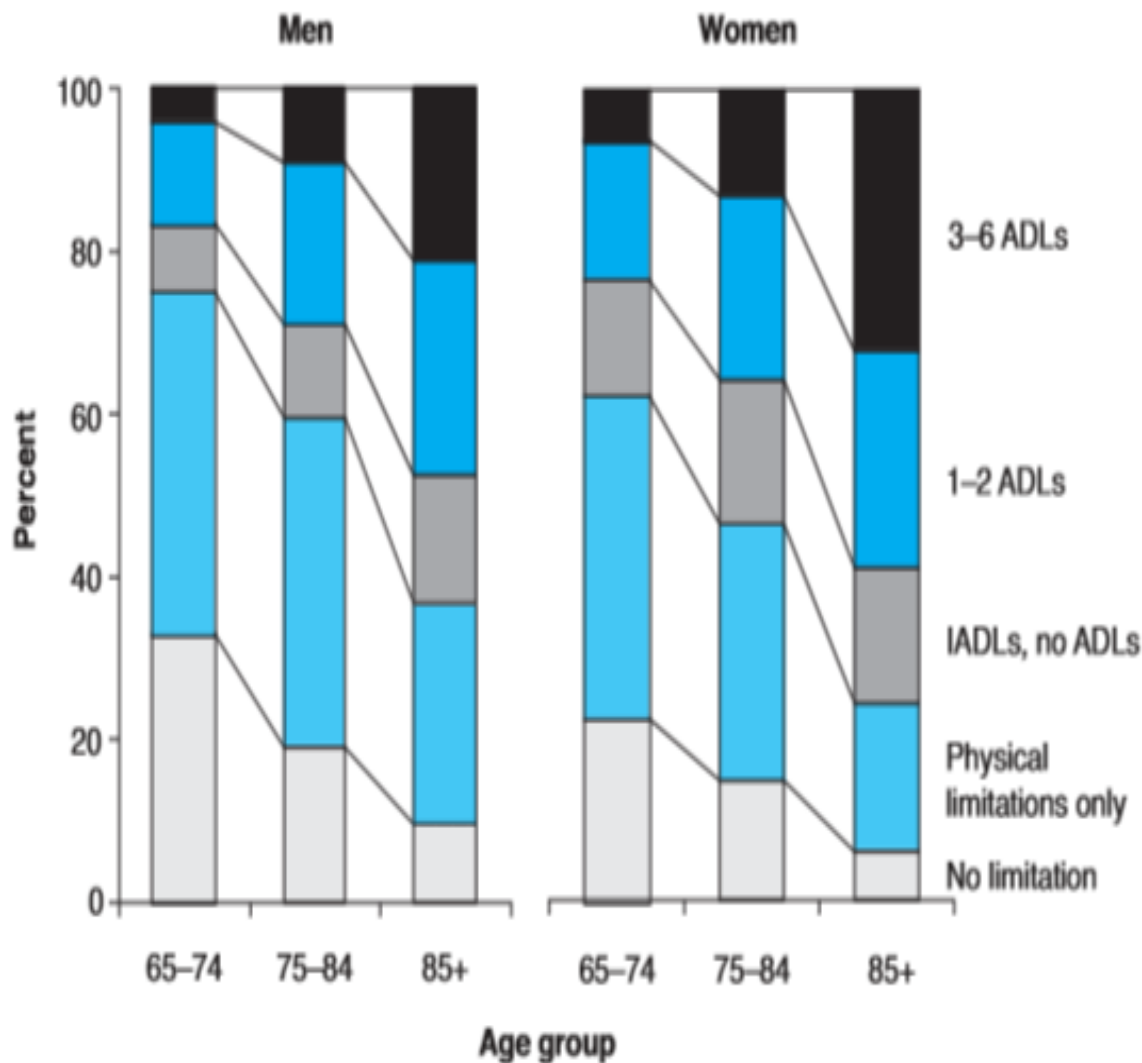


FIGURE 5-16. Physical limitations and disability according to age and sex, U.S., 2004. Physical limitations are defined as any difficulty doing one or more of the following: stooping, lifting, reaching, grasping, and walking 1/4 mile. Instrumental activities of daily living (IADLs) are defined as any difficulty doing one or more of the following: using the telephone, doing light housework, doing heavy housework, preparing meals, shopping, and managing money. Activities of daily living (ADLs) are defined as any difficulty doing one or more of the following: bathing or showering, dressing, eating, getting in or out of bed or chair, walking across a room, and using the toilet. Functional limitations of Medicare beneficiaries by age, residence, sex, race, and ethnicity from the Medicare Current Beneficiary Survey, 1992-2004. (MAHSE04) National Center for Health Statistics, Trends in Health and Aging. <http://www.cdc.gov/nchs/agingact.htm>. Accessed on February 21, 2007.

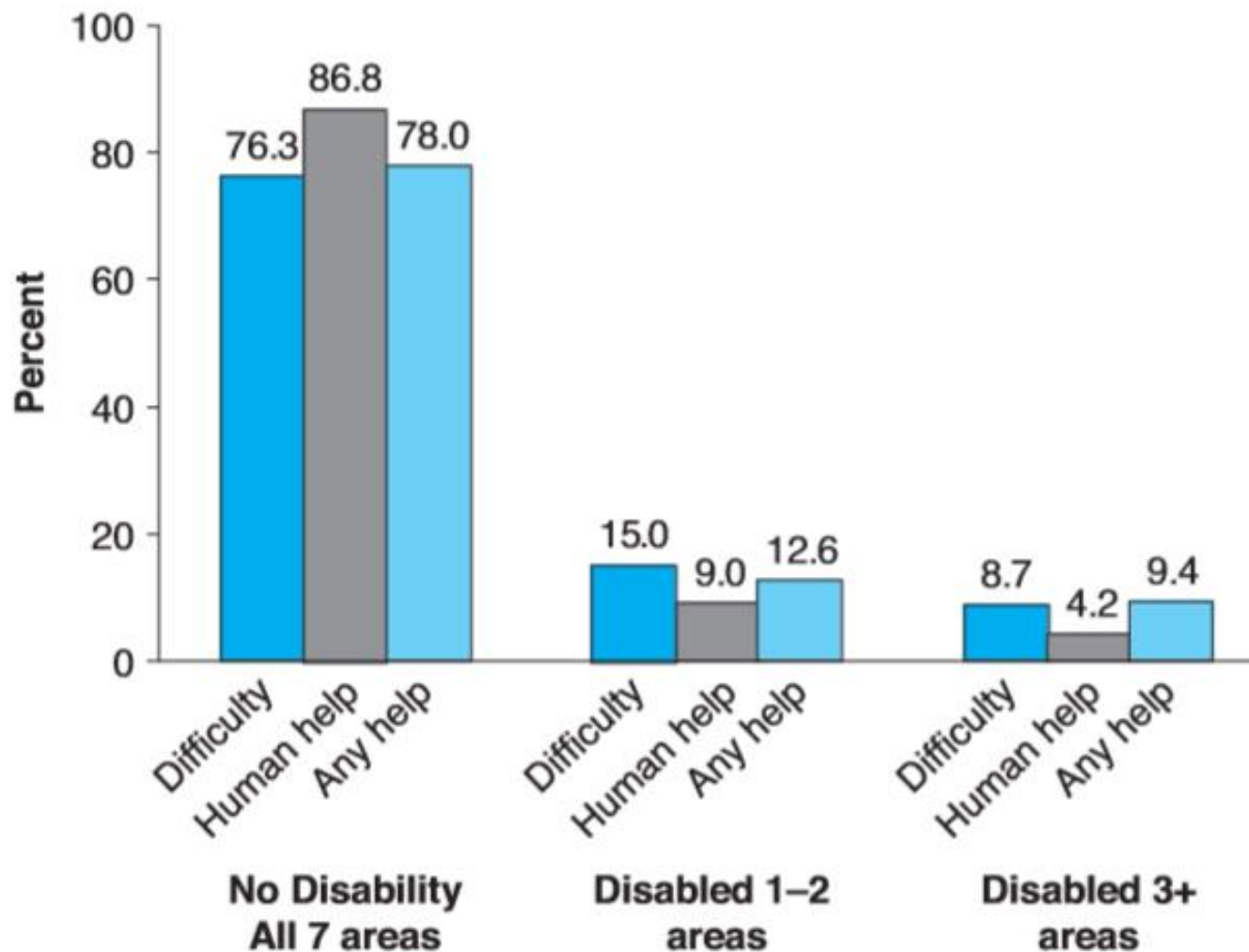


FIGURE 5-17. Disability estimates using three different measurements methods. Reprinted with permission from Jette AM. How measurement techniques influence estimates of disability in older populations. *Soc Sci Med.* 1994;38:937.

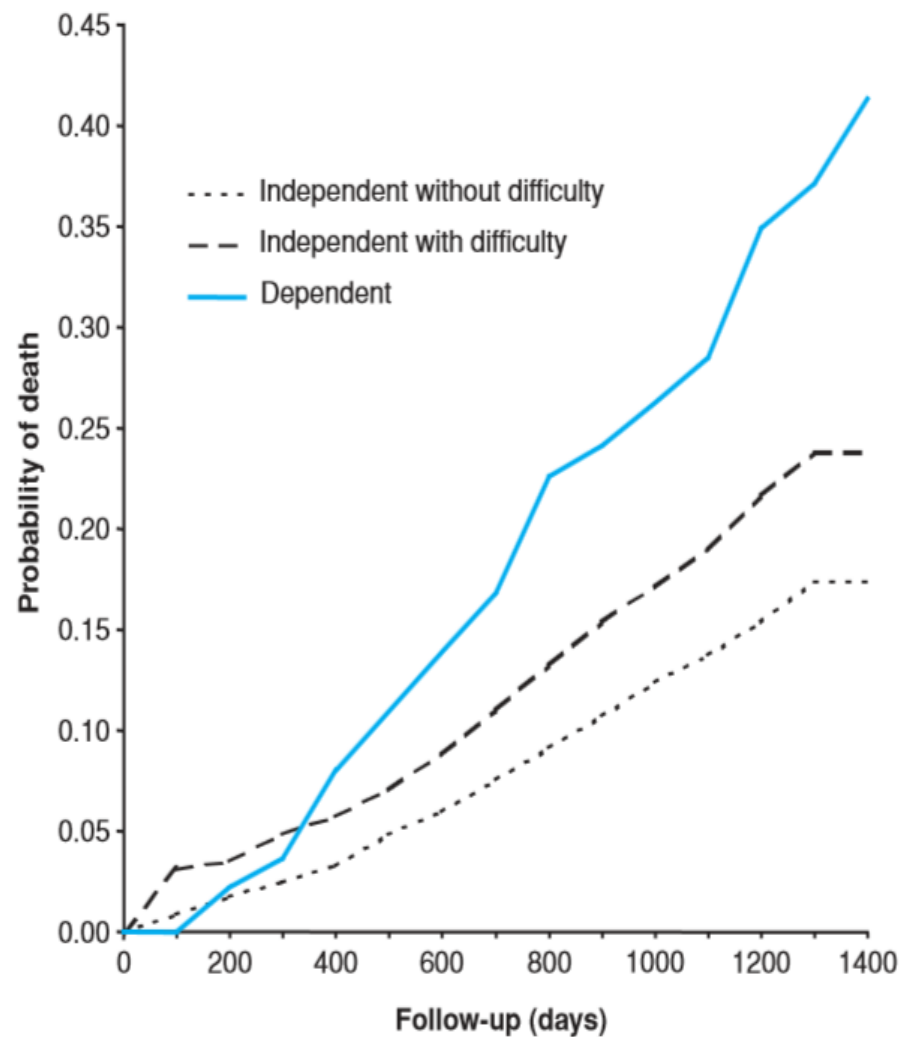
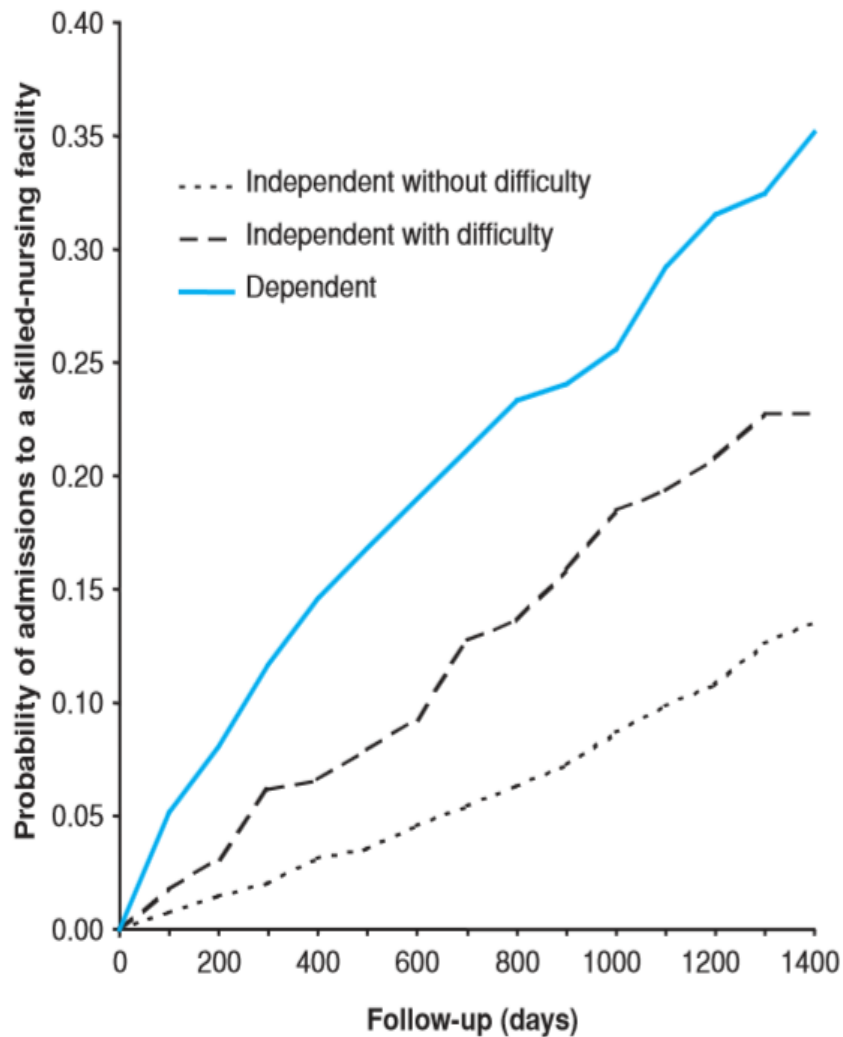


FIGURE 5-18. Cumulative probability of admission to a skilled-nursing facility (left) and death (right) for three basic activities of daily living groups. Reprinted with permission from Gill TM, Robison JT, et al. Difficulty and dependence: Two components of the disability continuum among community-living older persons. *Ann Intern Med.* 1998;128:96.

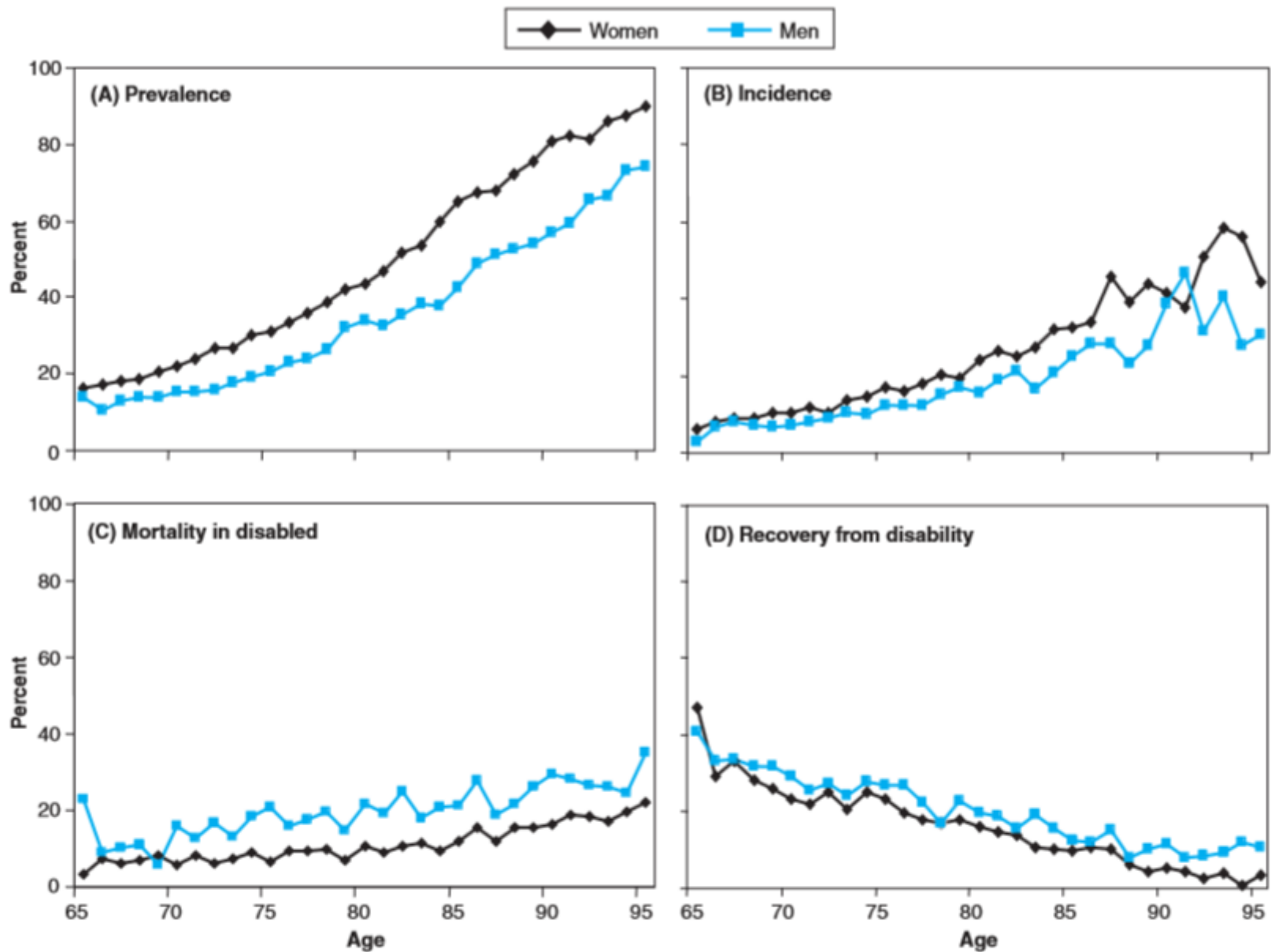


FIGURE 5-19. Women's and men's prevalence of mobility disability (a), 1-year incidence among nondisabled persons (b), and 1-year mortality (c) and recovery (d) among disabled persons, by age. Established Populations for the Epidemiologic Study of the Elderly. Reprinted with permission from Leveille SG, Penninx BW, et al. Sex differences in the prevalence of mobility disability in old age: the dynamics of incidence, recovery, and mortality. *J Gerontol B Psychol Sci Soc Sci.* 2000;55:S41.

TABLE 5-9

Risk Factors for Functional Status Decline

Behavioral Risk Factors and Individual Characteristics

- Low physical activity
- Smoking
- High and low body mass index, weight loss
- Heavy and no alcohol consumption
- Increased age
- Lower socioeconomic status (income, education)
- High medication use
- Poor self-rated health
- Reduced social contacts

Chronic Conditions

- Cardiovascular disease
 - Hypertension
 - Coronary heart disease
 - Myocardial infarction
 - Angina pectoris
 - Congestive heart failure
 - Stroke
 - Intermittent claudication
- Osteoarthritis
- Hip fracture
- Diabetes
- Chronic obstructive pulmonary disease
- Cancer
- Visual impairment
- Depression
- Cognitive impairment

Comorbidity

Source: Stuck et al., *Soc Sci Med.* 1999;48:445-469.

Condition responsible for limitation

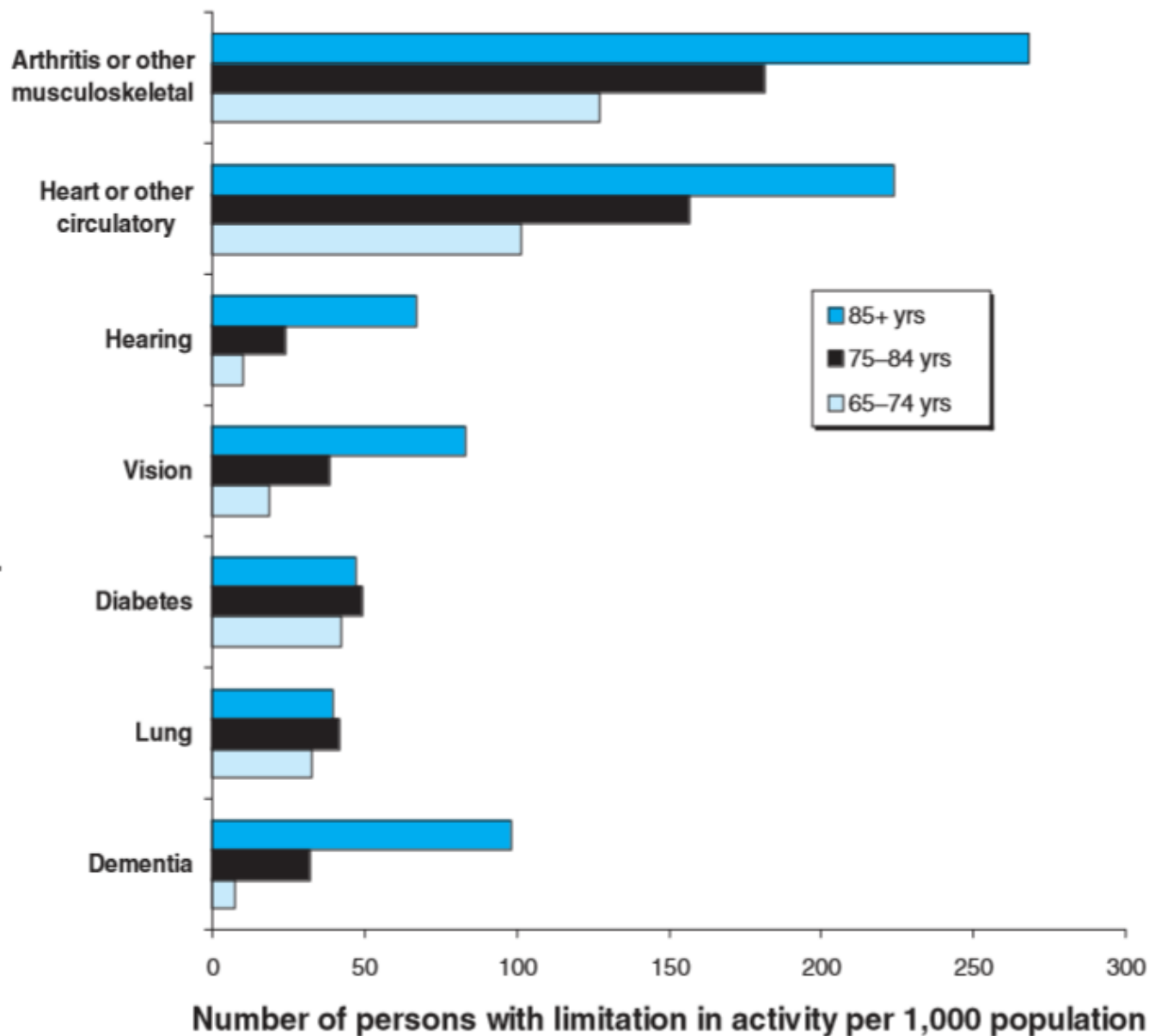


FIGURE 5-20. Reported chronic conditions responsible for self-reported activity limitation by age group: NHIS, 2003–2004. Activity limitation defined as work limitations or need for assistance with ADLs (eating, bathing, dressing, and getting around inside the home) or IADLs (household chores, doing necessary business, and shopping or running errands). If any limitations are identified, the respondent is asked to specify the health condition(s) causing the limitation(s) and indicate how long he or she has had each specified condition. U.S. Census Bureau 2004, National Health Interview Survey, 1997–2000, Prevalence of selected chronic conditions by age, sex, race, and Hispanic origin: United States, Data Warehouse on Trends in Health and Aging, NHICO1c, National Center for Health Statistics. Accessed on February 21, 2007.

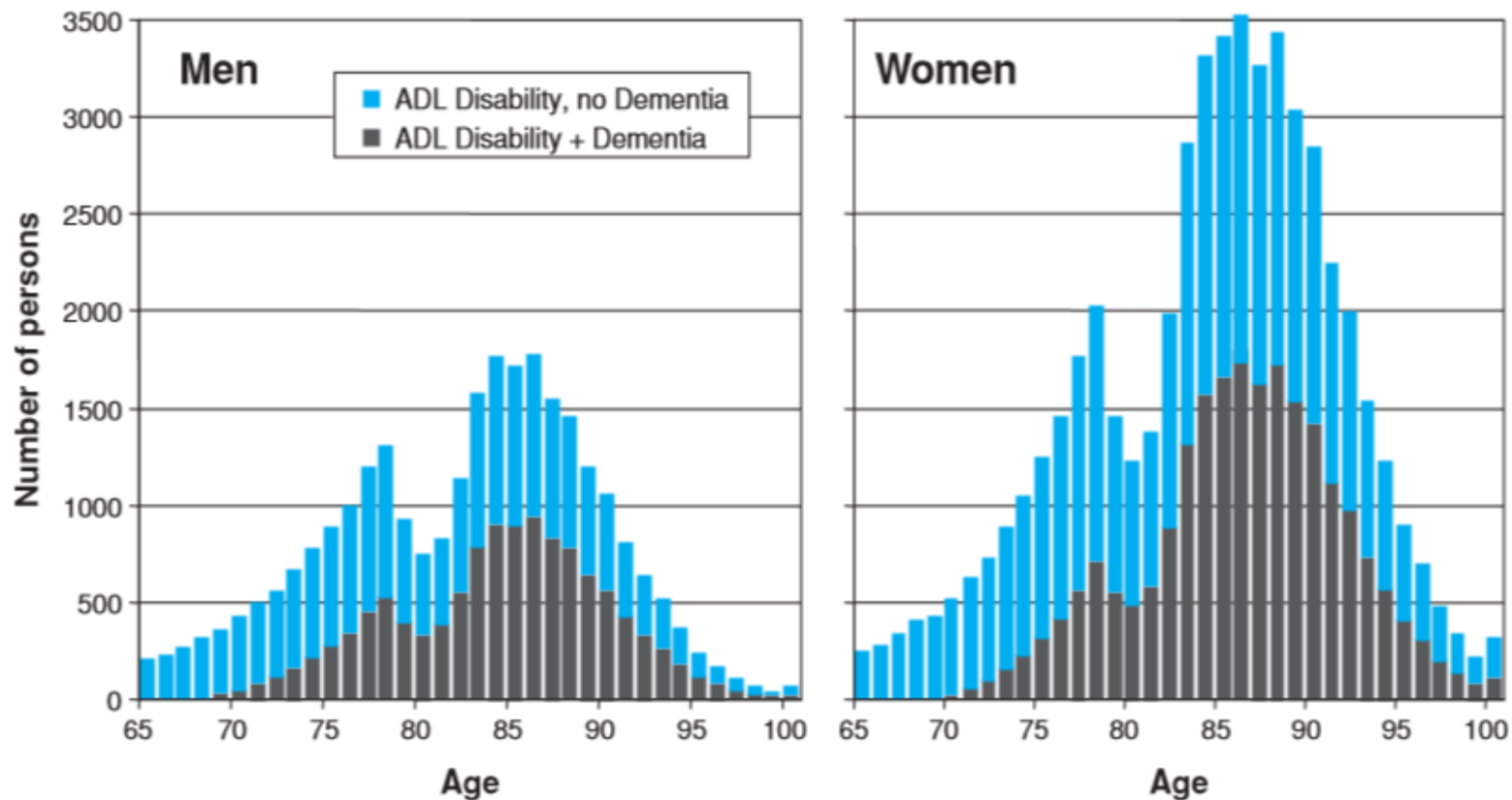


FIGURE 5-21. Estimated number of men and women with activities of daily living disability (need for help of another person) with and without an additional diagnosis of dementia according to age, Tuscany, Italy, 1999. The figure was obtained by applying estimates from three large population-based epidemiologic studies in the Tuscany population, the Italian Longitudinal Study on Aging, JCARE Dicomano, and InCHIANTI. The original analyses and population estimates are from Istituto Nazionale di Statistica: National Statistical Institute of Italy, 1999. Internet address www.istat.it. Accessed February 21, 2007.

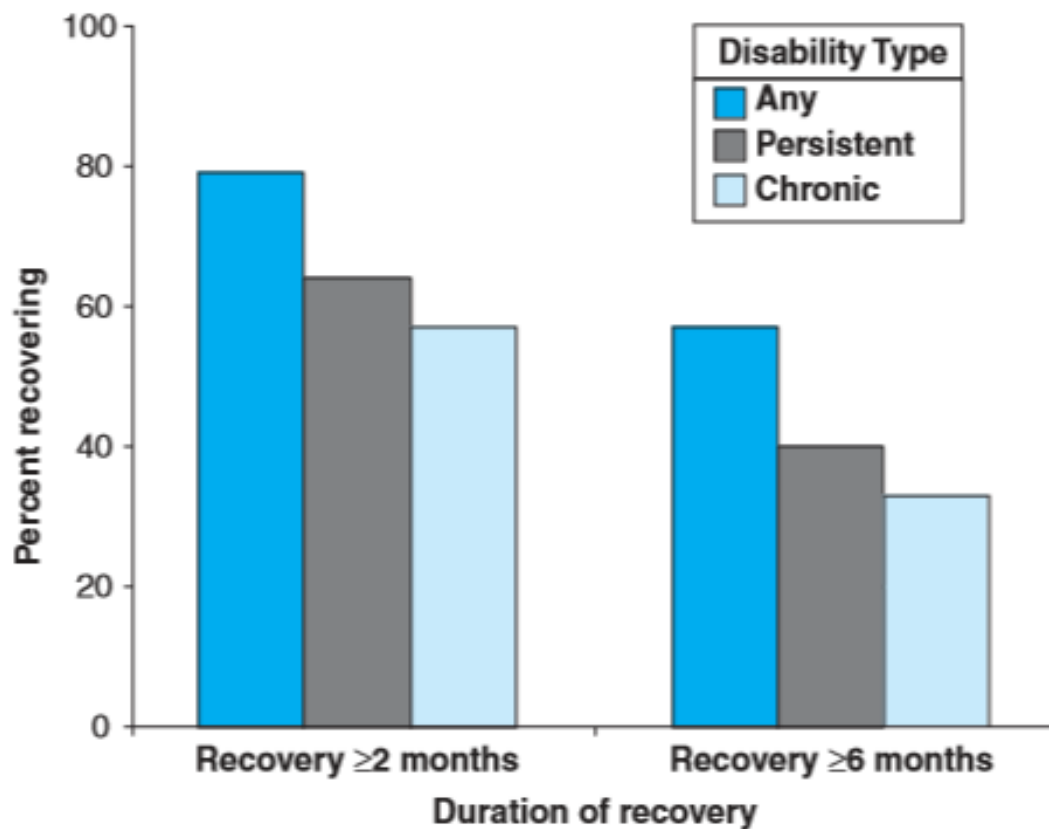


FIGURE 5-22. Percent recovering function after 2 months and after 6 months according to disability type. Any disability is defined at monthly visits as any new need for help or inability to perform one or more of the following ADLs: bathing, dressing, walking, and transferring. “Persistent” disability is defined as a new disability that was present for at least two consecutive months. “Chronic” disability is defined as a new disability that was present for at least 3 consecutive months. Adapted from Hardy SE, Gill TM. Recovery from disability among community-dwelling older persons. *JAMA*. 2004;291:1596–1602.

depression, and good social support have all been associated with a

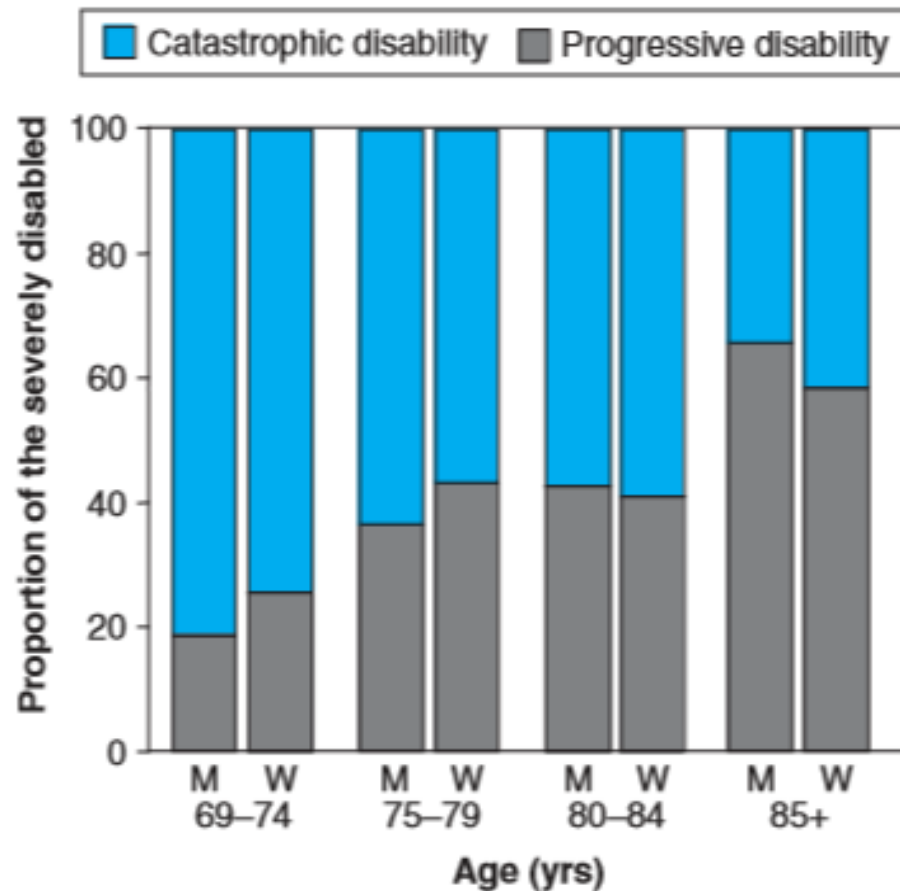


FIGURE 5-23. Proportion of population needing help with three or more activities of daily living (ADL) who have catastrophic disability (no ADL disability in preceding year) and progressive disability (need for help with one or two ADL in previous year), by age and gender. Reprinted with permission from Ferrucci L, et al. *Progressive versus catastrophic disability: a longitudinal view of the disablement process.* *J Gerontol A Biol Sci Med Sci.* 1996;51:M123.

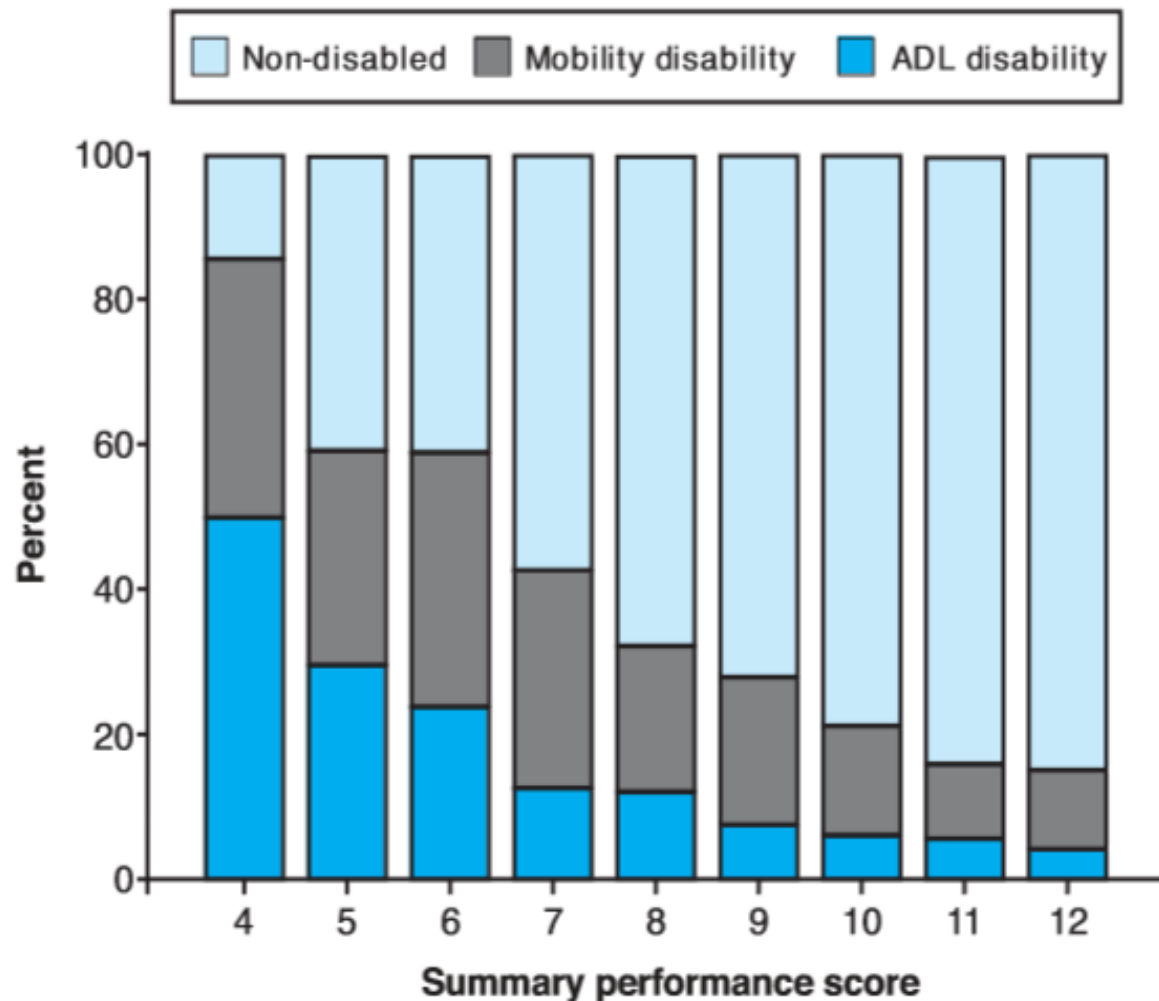


FIGURE 5-24. Disability status at four years according to baseline summary performance score in persons age 71 and older with no disability at baseline. Reprinted with permission from Guralnik JM, Ferrucci L, et al. Lower extremity function in persons over the age of 70 yrs as a predictor of subsequent disability. *N Engl J Med.* 1995;332:556.

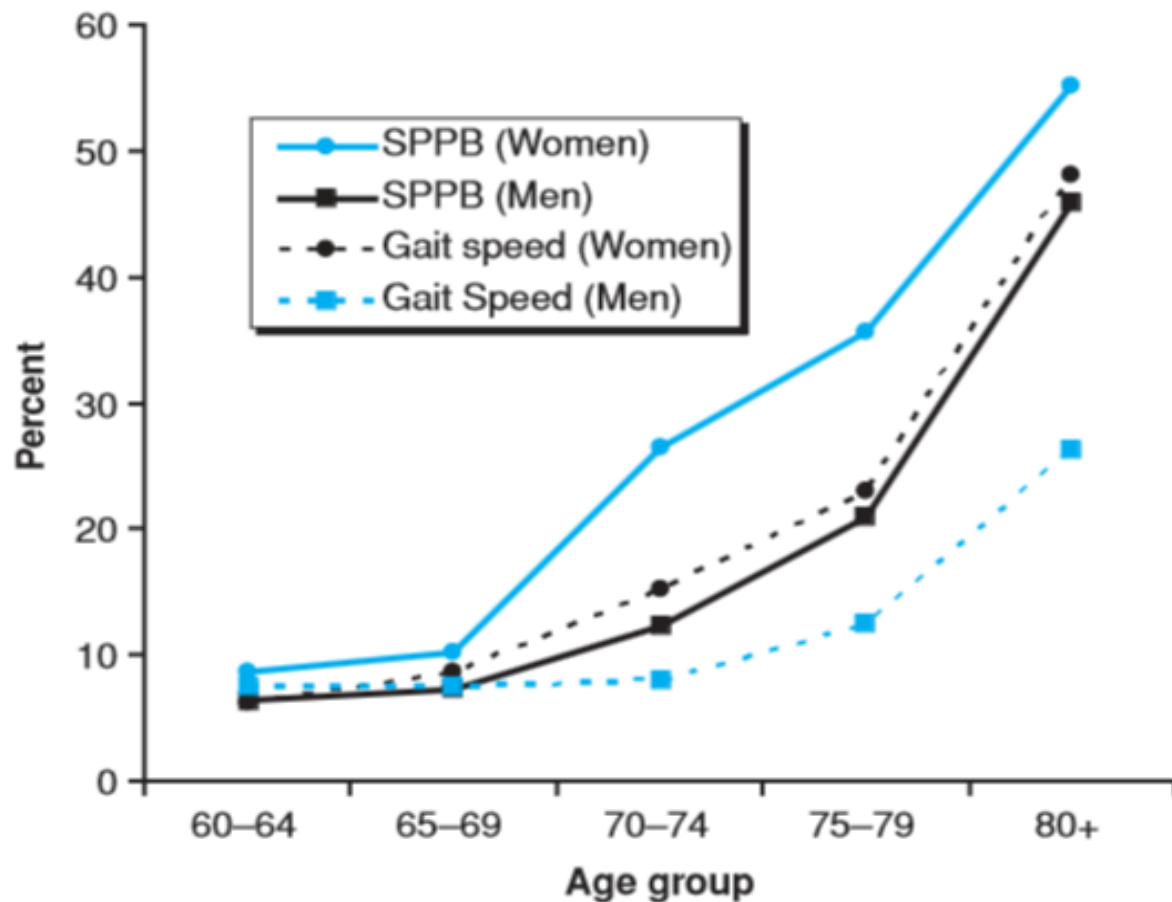


FIGURE 5-25. Percent of men and women with Short Physical Performance Battery score ≤ 8 and gait speed ≤ 0.5 m/s: England, 2002–2003. Institute for Fiscal Studies. Retirement, health, and relationships of the older population in England. The 2004 English Longitudinal Study of Aging (Wave 2). Tunbridge Well: Petersons, 2006. http://www.ifs.org.uk/elsa/report_wave2.php Accessed on February 21, 2007.

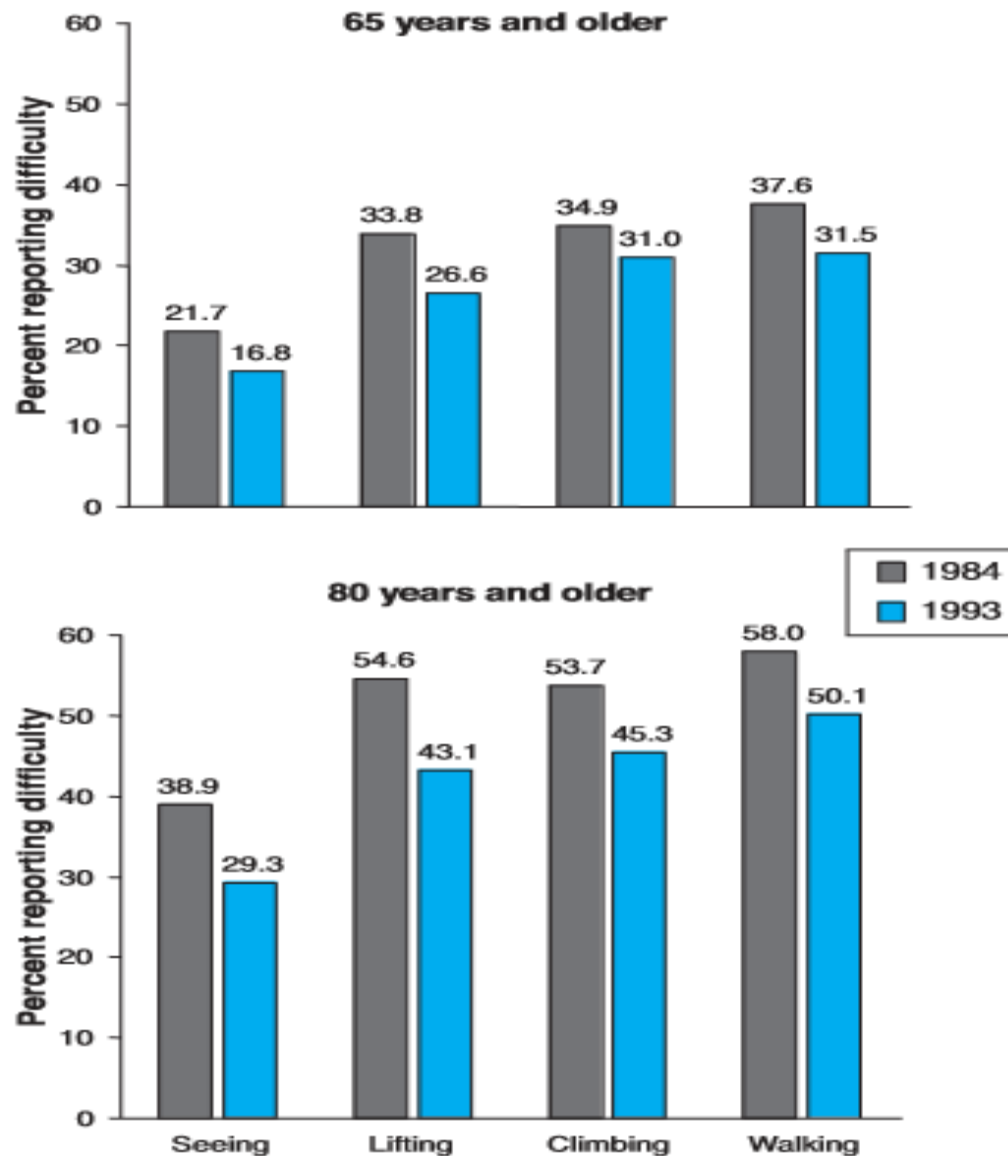


FIGURE 5-26. Prevalence of functional limitations, United States, 1984 and 1993. Data from Freedman VA, Martin LG. *Understanding trends in functional limitations among older Americans.* *Am J Public Health.* 1998; 88:1457.

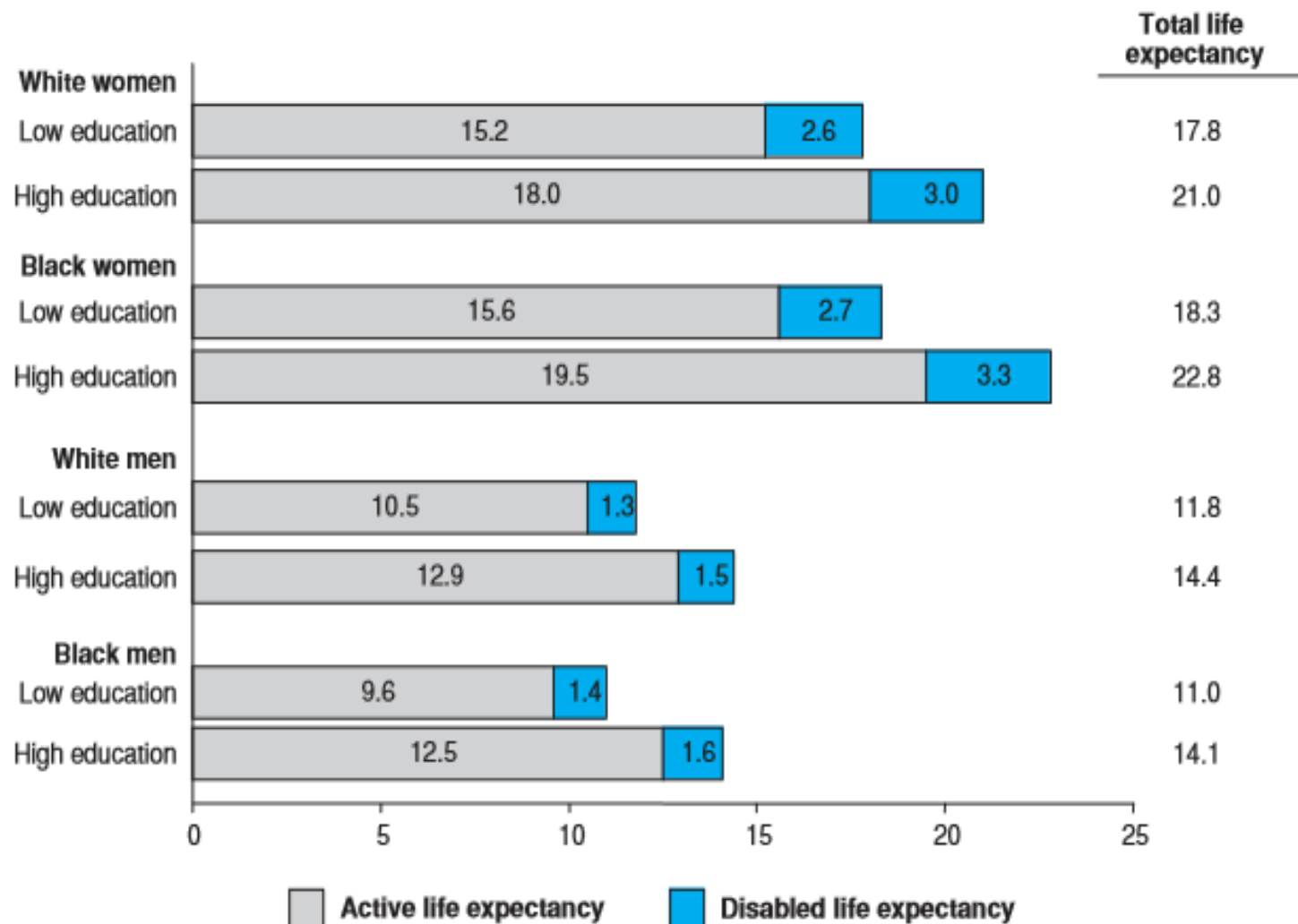


FIGURE 5-27. Total life expectancy, active (nondisabled) life expectancy, and disabled life expectancy at age 65 yrs according to gender, race, and educational status. Lower education defined as less than 12 yrs of school, and higher education as 12 or more years of school. Data from Guralnik JM, Land KC, et al. Educational status and active life expectancy in older blacks and whites. *N Engl J Med.* 1993;329:110.

TABLE 5-10

Behavioral Risk Factors in Middle-Aged and Older Persons, United States, 2004–2005

	PERCENT OF AGE GROUP			
	35–44 (yr)	45–54 (yr)	55–64 (yr)	65+ (yr)
Alcoholic beverages				
≥ One drink within the past 30 days	60.9	58.3	53.0	39.3
Men >2/day Women >1/day	5.1	4.7	4.2	2.9
5+ at one time	16.1	11.9	7.9	3.0
Cholesterol check				
Past 5 yrs	72.1	82.9	90.2	92.9
Never	21.7	11.6	6.5	4.9
BMI				
Overweight (25.0–29.9)	37.7	39.2	41.7	40.0
Obese (≥30.0)	25.3	27.0	29.3	20.3
Physical activities				
30+ moderate (5x) or 20+ vigor (3x)	49.7	51.5	55.3	61.0
20+ vigorous (3x)	29.9	56.6	21.1	14.1
Past month	78.6	76.9	73.4	65.9
Fruits and vegetables				
5 or more times per day	20.1	22.4	24.8	31.0
Dental visit in last year	72.4	74.4	72.5	66.1
Smoking status				
Everyday	17.7	17.2	14.6	6.6
Some days	5.4	5.0	3.8	2.2
Former	18.7	26.1	36.1	41.6
Never	57.9	49.8	46.1	48.8
Immunization				
Flu in past year	—	—	—	65.5
Pneumonia ever	—	—	—	65.7
Use of seatbelts ^a				
Always	69.5	70.9	70.3	74.4
Nearly always	13.9	14.2	13.4	12.1
Sometimes	7.5	7.5	7.4	5.3
Seldom	3.5	3.2	3.1	2.5
Never	3.8	3.5	3.5	3.2
Smoke detector in home ^a	97.1	96.1	94.9	93.5
Among persons with smoke detectors				
Smoke detector tested, past year ^a	82.7	81.6	82.7	82.7

	PERCENT OF AGE GROUP			
	40-49 (yr)	50-59 (yr)	60-64 (yr)	65+ (yr)
PSA test				
Within past 2 yrs	24.9	57.5	70.6	74.8
Colorectal screening				
Stool tested	—	21.6	29.8	30.4
Sigmoidoscopy or colonoscopy	—	42.3	55.7	63.2
Mammogram, ever*	80.1	88.5	88.8	84.3
<i>Among women who had a mammogram</i>				
Last mammogram ^a				
Past year	58	70.8	71.5	65.4
1-2 yrs	22.6	15.2	13.9	18.2
2-3 yrs	7.3	4.1	3.8	5.2
3-5 yrs	5.6	3.8	3	3.8
5+ yrs ago	5.7	4.5	5.5	7.2

*Most recent BRFSS data 1997.

Source: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2005. <http://apps.nccd.cdc.gov/brfss/index.asp>