The health of America’s baby boom generation, long linked with concerns about labor force participation, public and private pensions systems, and health care resources, has been increasingly studied in recent years as the oldest among this cohort are reaching retirement age. The well-being of the huge boomer population – some 76 million Americans born between 1946 and 1964 – has far-reaching implications for current programs and resources, as well as those available to the next generation. For example, how long boomers continue in the workforce – and thus their retirement savings – may depend on their health and how that influences their employment capacity. How much demand they will place on the full range of health care delivery and payment systems (including Medicare) will also depend upon their health status. If medical interventions prolong life but do not improve health and independence among the older population, greater longevity for this group could mean more years of disability and higher acute and long-term care costs.

Compared to cohorts that preceded them, the boomers have benefited from a growing standard of living throughout their lives, a multitude of advances in medical technology and care, and significant improvements in educational attainment. They also have been exposed to an increasing public emphasis on taking preventive measures to help stave off and ameliorate chronic debilitation.

Studies examining the age-adjusted prevalence of disability among the elderly have found declines in recent years (Manton, Gu, and Lamb 2006; Freedman, Martin, and Schoeni, 2002; Waidmann and Liu 2000; Waidmann and Manton 1998). Estimates using data from several national studies show small decreases since the mid-1990s in the proportion of the noninstitutionalized elderly (age 70+) with severe disabilities (Freedman et al. 2004; Schoeni, Freedman, and Wallace 2001). Other studies have found an increase in disability-free life expectancy (Crimmins, Saito, and Ingegneri 1997) and a decrease in certain physical limitations related to the onset of disability – such as climbing a flight of stairs (Freedman and Martin 1998).

Although researchers found declines in several types of old-age disability during the 1990s, most declines were among the IADLs, the less severe forms of disability such as doing housework or shopping. Smaller declines in difficulty and help with ADLs among older adults also occurred during this period (Freedman, Schoeni, Crimmins et al. 2004). Reasons for these trends are complex and include advances in medical care as well as changes in socioeconomic factors (Schoeni, Freedman, and Martin 2008).

The evidence on old-age disability trends among the baby boom population is more limited. Some of the most surprising findings were reported by Soldo and colleagues (Soldo et al. 2006), who compared data from early baby boomers (born 1948-1953) to older cohorts (born 1936-1947), each group measured in their 50s. They found overall evidence that the boomers are in poorer health than the earlier cohorts were at the same age, as they were less likely to describe their health as “excellent” or “very good” than were their predecessors. Summarizing his own analysis, Weir (2007) says about these early boomers: “they seem to be in no better health objectively than the cohort twelve years before, and subjectively they feel in worse health.”
Are boomers better off today in terms of their health and physical functioning than previous generations? Will they live longer, healthier, and more disability-free lives than their parents?

In November 2007 a group of prominent researchers met at the University of Michigan in Ann Arbor to discuss recent findings on these questions based on data from the largest national surveys [see sidebar, p. 5]. This workshop was sponsored by the NIA-funded TRENDS network, a community of researchers working to accelerate scientific understanding of old-age disability and health trends.

Although these researchers reported some areas of similarity across studies, they also discussed differences, and possible reasons for these differences. They also looked at other recent studies with similar and disparate findings, attempting to reconcile inconsistencies across national survey data sets and considering ways to improve future data collections and projections. Their discussions are summarized below.

JAY BHATTACHARYA

Bhattacharya reviewed recent trends in disability rates in the under-65 population using data from the National Health and Nutrition Examination (NHANES) and from the National Health Interview Survey (NHIS). Then he compared trends in the prevalence of chronic diseases (measured with biochemical markers and self-reports) among persons with and without disabilities. Disability was defined two ways: (1) self-reports of work limitations, and social limitations caused by cognitive, physical, mental, or emotional problems; and (2) among the population with the aforementioned limitations, inability to perform any of six ADL-like activities (e.g., walking up ten steps, dressing).

He noted that to the extent that disability in younger adults is correlated with chronic disease conditions, the prevalence of disability in this group will have profound implications for Medicare as these cohorts age.

He found no evidence of decreasing disability prevalence from 1999 to 2006 in the not-yet-elderly population. He did find evidence linking disease and disability prevalence. Compared with age-matched persons without disabilities, those with disabilities had a higher prevalence of diabetes, hypertension, heart disease, stroke, and COPD. They did not, however, have higher serum cholesterol or body fat. Bhattacharya suggests that if a greater number of adults with disabilities live into old age, this trend could counteract the projected reduction in Medicare expenditures due to declines in later-life disability.

LINDA MARTIN

In their investigation of health trends over recent decades of those ages 40 to 59, Martin, Freedman, Schoeni, and Andreski used mortality data from vital statistics and self-reports of health from the National Health Interview Survey (NHIS). Health measures included were poor/fair health (the two lowest of five response categories); nine diseases and conditions; difficulty with physical functioning; and need for help with activities of daily living. Consistent measures were available from 1982 to 2005 for mortality and from 1982 to 2006 for poor/fair health. All other measures covered the period 1997-2006.

Martin reported that they found declines in mortality rates at every age from 40 to 59, with survival improvements particularly striking at older ages. They found a similar pattern of declines for reports of poor/fair health. Trends in the other indicators varied by measure, period, and age group. In particular, the prevalence of four conditions – cardiovascular disease, obesity, lung problems, and diabetes – increased significantly, but the authors noted increases in the first and last may reflect progress in diagnosis and treatment. Functional limitations and disability showed little change 1997-2006, although ADL disability increased for those ages 50 to 54.

Finally, they suggested that the improvements in some measures and stability in others are consistent with improvements in standard of living and medical care over the last quarter century.

KATRINA WALSEMANN

Using data from four waves of the Americans Changing Lives (ACL) survey, fielded 1986—2001, Katrina Walsemann looked at trends in disability, poor health, and obesity among two groups of middle-aged Americans: 40-54 year olds and 55-64 year olds. She also considered racial health disparities in these trends.

In her analysis, Walsemann compared ACL measures and estimates for self-rated health and ADL limitation to those obtained from other national surveys and found them quite comparable. Among the 40-54 year olds, several trends seemed difficult to reconcile, such as between-wave changes in ability to climb stairs. Others were strikingly consistent, such as significant declines in the reporting for excellent health (most of which seemed attributable to
declines among blacks), greater reported difficulty with bathing and walking, a rise in having one or more life-threatening conditions, and steep increases in obesity. In the older middle-aged group, the 55-64 year olds, Walsemann found a similar upward trend in obesity, but declining reports of poor/fair health and declining functional impairment (seen only for whites).

LOIS VERBRUGGE

Verbrugge discussed her recent work (with Ezra Golberstein) examining the interrelationship of trends in time use and ADL/IADL disabilities for three midlife age groups: 50-54 years, 55-59 years, and 60-64 years. They used data from the HRS Consumption and Activities Mail Survey (CAMS), a panel study conducted biennially from 2001 onward, which gathers data on the time spent on 33 activities in obligatory activities such as personal care, sleeping and walking; committed activities such as paid work and household work; and discretionary activities such as socializing, public service, exercise, and hobbies. Their goal was to understand the experience and progression of disability across a full range of activities and age groups.

For trends in time use, they found little change in activities across three waves (2001-2005) for 50-54 year olds, with the exception of significant increase in walking. The 55-59 year olds significantly decreased the time spent in paid work activities and showed some increases in entertainment and leisure activities. The 60-64 year olds exhibited more change in activity levels than the two younger age groups. They significantly increased the time spent in personal care and leisure activities, and significantly decreased socializing and public service.

In terms of prevalence of disabilities, Verbrugge and Golberstein found no trends across waves for the three age groups, and no age gradient in ADL and IADL disabilities (means, or percents with any).

Disability severity (no IADL/ADL, IADL only, any ADL) was correlated with an increase in time spent on personal care and decreases in paid work, entertainment, and sleep/naps. When comparing the no-disability group to the any-disability group, the same activities showed differences. They also found that as IADL and ADL counts increase, personal care time increased, while paid work, entertainment, sports, repairs and yard work, and sleep/naps decreased (ordered by strength of results).

In sum, all three types of disability indicators (grades of severity, no disability vs ADL/IADL disability, and IADL/ADL counts) were linked to the same activities: personal care, sleep/naps, paid work, repairs/yard work, entertainment, and sports.

Martin et al. suggested that the improvements in some measures and stability in others are consistent with improvements in standard of living and medical care over the last quarter century.

Verbrugge also touched on her published study (with Li-shou Yang) of disability duration and timing among adults using data from the National Health Interview Survey Disability Supplement. They found the greatest diversity in disability in the middle aged U.S. population. For all current ages and durations of disability, they found that poor health had greatest effect on social participation. In comparing child-onset and adult-onset disability, they found greater numbers of disabilities, but generally better health and at least as much social participation, among those with long-duration disability.

Verbrugge suggested that large-scale surveys should collect more psychosocial data on midlife persons with disability to assess their feelings of social integration with their age group and with the general population with disabilities—information helpful for program planning and disability policy.

JIM LUBITZ

Jim Lubitz presented analyses drawn from the National Center for Health Statistics (NCHS) Trends in Health and Aging web site, which encapsulates data from various national surveys. He (with Ellen Kramarow) examined trends over different time periods for a variety of self-reported and objectively measured health indicators for the ‘near elderly’ (ages 45-65) and the ‘new elderly’ (ages 65-74), often by gender. These include trends in reports of fair/poor health; need for help with IADLs; difficulty in physical functioning; mortality rates; smoking prevalence; history of heart attack or stroke; cancer and stroke deaths; and prevalence of heart disease, diabetes, hypertension, arthritis, high cholesterol, and obesity. He taps data from both the NHANES and NHIS.
Trends in health indicators for the near elderly were somewhat mixed. Death rates continued to decline for men and women, while trends in risk factors showed a mixed picture. He found substantial increases in obesity prevalence for both men and women since 1960. He found increases in diabetes prevalence among men (but not women). The percentage with high cholesterol dropped for both men and women. The percent with high blood pressure rose for women, but not men. In addition, the percentage reporting fair or poor health has leveled off, after a decline of many years.

Lubitz stated it was important to determine whether the long-term improvements found in smoking and some heart disease risk factors may help offset the increases in obesity and diabetes among the near and new elderly in the upcoming decades. He suggested the need for refinements to data collection and analysis to clarify apparent inconsistencies in trends. In particular, he discussed the utility of algorithms that amalgamate measures of interrelated health indicators into a risk assessment score, such as Framingham Heart Study instrument for estimating 10-year risk of developing coronary heart disease.

**SUMMARIZING THE EVIDENCE**

The evidence at the meeting was drawn from the major surveys used to examine health trends in the US, including new data never before examined. Health is multi-dimensional, and the surveys differ in the measures they employ. The evidence on health trends for the near-elderly population varies somewhat across these different measures and sources. However, in general, the evidence does not support the conclusion that levels of disability and health among baby boomers are worse than they were for older cohorts measured at the same age. In fact, some dimensions of health have shown improvements. At the same time, given the substantial gains in factors that are closely associated with health and disability, like socio-economic status, perhaps it is surprising that the gains in health and disability have not been larger nor observed across a broader set of health outcomes.

**THE ROAD AHEAD**

Recent biomedical advances and the future breakthroughs they portend suggest an unprecedented furtherance in the nation’s ability to prevent and treat disease – even in the next few decades. This could mean significant improvements in population health and functional ability, and a decrease in the resources devoted to health care. Medical advances protective of conditions that contribute to older-age disability – arthritis, COPD, heart disease, diabetes, Alzheimer’s, etc. – are particularly promising for the boomer generation.

Even in this optimistic scenario, however, steep increases in the number of older Americans and rises in obesity will have offsetting effects on population-level health and disability. Although the late-life health of the baby boom generation will not fully unfold for several decades, projecting their future status – and the health care delivery and payment systems necessary to meet it – are of key importance to policymakers, program administrators, and health care providers and insurers.

**Improving Data, Improving Trend Projections**

Conducting comparable data analyses across large national surveys is challenging because of variation among these surveys in the periods of data collection, the sample type (in particular, whether the institutionalized population is included), the measures used for health and disability, the survey design (e.g., repeated cross-sectional vs. panel design), the interview methods employed, and the handling of missing data. Researchers have found that making relatively small changes in analytic methodology can yield significant differences in results across surveys.

Also, interpretations of data are challenging given that self-reports of disease or disability reflect not only changes in the actual health and capacity of the population, but expanded awareness of chronic illness, better diagnostics, the use of adaptive technologies, and perhaps growing expectations for well-being. Collecting self-reports on the presence of diseases, a common way to gauge health status, says little about future needs for long-term care without clinical information on the severity or treatment of the diseases reported (although self-assessments of health are correlated to current demand for health resources). And as mentioned, measures of functional ability, which may indicate the cumulative effect of health ability and diseases, are not consistently defined nor measured across national surveys or even survey years.
For example, in gathering information on ADL and IADL limitations, surveys variously ask respondents about their difficulty in performing certain activities (either with or without accommodation), about their need for help in performing activities, or about their use of assistive equipment or technologies to perform functions. Surveys also vary in which specific activities or functions are measured to gauge disability.

Small differences in how limitations are measured may affect both estimations of disability trends and projections of need for related services. For example, individuals who report they are unable to walk without help or use of a walking aid may be distinct in important ways from those reporting some difficulty walking. Comparing or combining these two groups in analyses may muddy interpretations about underlying functioning or causal mechanisms of disability, and resultant implications for independent living.

**Recommendations**

Foremost, these researchers noted the need to be able to analyze comparable indicators of health across time and across surveys. They also discussed the need to explore disparities between objective and self-reported measures of health among the near elderly, to more clearly distinguish community and institutional settings in surveys, and to harmonize key measures across settings.

Clarifying distinctions among trends in disease, functional limitations, and disability – and their interrelationships – will help policymakers and program officials anticipate the relative demand for specialized medical care services, pharmaceutical interventions, physical therapy and rehabilitation services, assistive or adaptive mechanisms, and home- or institution-based long-term care services.

Relatedly, these researchers discussed the importance of ascertaining how the growing use of assistive technologies and modern conveniences such as microwave ovens has affected functionality, or the perception of functionality, among boomers. Since disability is the gap between an individual’s functional capacity and the demands of the environment, trends in disability reflect both personal and contextual changes. Contextual factors – especially technologies that facilitate daily living activities among the moderately impaired – may in fact help explain why some analyses indicate that IADL functioning has improved in recent decades while ADL functioning has not.

**Baby Boomers**

Birth years: 1946-1964
Current size: 76 million; 26% of U.S. population
Race/ethnicity: 17% racial minority; 10% Hispanic
Projected number living in 2030: 58 million, age 66 to 84
Projected proportion of U.S. population in 2030: 26%

**ADL**: Activities of Daily Living. Normal day-to-day activities, including feeding oneself, dressing, grooming, bathing, getting into or out of a bed or chair, and using the toilet.

**IADL**: Instrumental Activities of Daily Living. Activities related to independent living, including preparing meals, managing money, taking medication, shopping, doing housework, and using a telephone.

**Americans’ Changing Lives** (ACL) survey, a longitudinal panel study of the relationships between aging, health, and social conditions, began in 1986 and completed a fourth wave of data collection for a nationally representative sample of adults in 2002. ACL data are used to examine how a range of health behaviors, psychosocial factors, life events, social relationships, leisure activities, and other factors affect the overall health of middle-aged and late life Americans. [http://www.icpsr.umich.edu/cocoon/ICPSR-STUDY/04690.xml](http://www.icpsr.umich.edu/cocoon/ICPSR-STUDY/04690.xml)

**Health and Retirement Study** (HRS), conducted at the University of Michigan with funding from the National Institute on Aging, is a national panel study that surveys more than 22,000 Americans over the age of 50 every two years. The study investigates aging American’s physical and mental health, insurance coverage, financial status, family support systems, labor market status, and retirement planning. It has been conducted since 1992. [http://hrsonline.isr.umich.edu/](http://hrsonline.isr.umich.edu/)

**National Health Interview Survey** (NHIS), conducted continuously since 1957 and by the National Center for Health Statistics since 1960, monitors the health of non-institutionalized Americans via cross-sectional household interviews. NHIS data are collected annually from about 43,000 households encompassing about 106,000 individuals. The NHIS fielded from 1982-1996 included a set of basic health and demographic items and a set or sets of selected items on health topics in response to public health data needs. The NHIS was largely revised in 1997 to collect more detailed and in-depth information on health topics. [http://www.cdc.gov/nchs/nhis.htm](http://www.cdc.gov/nchs/nhis.htm)

**National Health and Nutrition Examination Survey** (NHANES), conducted annually since 1999 and periodically from 1971 to 1994 by the National Center for Health Statistics, assesses participants’ physical and mental health, functional limitations, dietary habits and nutrition status, drug use, sexual behaviors, and other special topics introduced in different survey waves. Throughout its history, the NHANES has used a variety of interview methods, including in-person/in-home, telephone, and computer assisted. [http://www.cdc.gov/nchs/nhanes.htm](http://www.cdc.gov/nchs/nhanes.htm)
The group discussed the utility of incorporating into direct interviews simple tests of physical functioning (e.g., balance, strength, and range of motion), respiratory capacity, vision and hearing, and cognition (e.g., memory). In addition, Bhattacharya reported on his use of bio-chemical markers (from blood draws), along with self-reports, in analyzing links between disability and incidence of diabetes, hypertension, heart disease, stroke, COPD, high cholesterol, and obesity.

The researchers discussed the growing importance of measuring depression in national surveys of boomer cohorts. Depression in the older population is a major concern because of its prevalence, its under-diagnosis, and its association with physical disabilities and other adverse health outcomes. One estimate using HRS data (Dunlop et al. 2005) indicates that depressed adults age 54–65 have more than four times the risk of ADL disability than their non-depressed counterparts, much of this association explained by the simultaneous presence of treatable health conditions. Other estimates find about 14% of community-dwelling people over age 65 have depression, with only a small fraction getting treated for it. The lack of diagnosis and treatment for depression is of particular concern given the demonstrated effectiveness of antidepressants and other therapeutic interventions in improving physical and cognitive functioning in depressed older people. Using standardized depression scales across national surveys of the elderly would integrate another key dimension of functional ability with more traditional demographic and behavioral data used in modeling health trends.

Trends in socioeconomic and demographic disparities in health comprise another area of concern among these researchers. In analyses of NHIS data, Schoeni et al. (2005) found that even as old-age disability rates declined generally over the past two decades, the decline was largest among those with higher income and education, contributing to greater socioeconomic disparities in disability. Walsemann’s trend analyses using ACL data showed remarkable health and disability disparities by race, education, and measures of financial difficulties among middle-aged Americans, suggesting the importance of these analyses for national disease prevention programs, public health guidelines, and health insurance programs. Generating cross-sectional time series data with consistent measures of health and disability will help researchers decompose trends with regard to these and other characteristics such as occupation, income, behavior, and stress, and indicate how the effects of these characteristics may shift over time and generations of elderly.

Other researchers noted the importance of identifying biological processes likely to mediate socioeconomic status differences in a variety of health outcomes. Research integrating biological, epidemiologic, and medical data with demographic, social, economic, behavioral, and psychosocial factors will facilitate not only trend prediction but the design of effective interventions to reduce health disparities. In this regard, developing operational survey measures of medical risks (e.g., diabetes, CVD) and biological risks (e.g., allostatic load scores, telomere length), as well as models that reflect an integrative approach to measuring population health, will provide more complex explanations of sources of health differences.

Given that population aging is occurring in many countries as fertility and mortality rates fall, Jean-Marie Robine noted the importance of international collaborations – in particular, between the U.S. and the European Union – to harmonize survey designs and measures across large-scale national health surveys. Comparisons of health and disability trends across aging populations in various settings may be particularly enlightening on the effects of social, institutional, and other contextual variables. The Survey of Health, Ageing and Retirement in Europe (SHARE), a four-year-old cross-national data collection designed along the lines of the HRS, represents such an international effort, with 14 EU countries currently participating. While researchers involved in extant national and regional datasets on aging (e.g., HRS, SHARE, ELSA and the Korean Longitudinal Study of Aging) have initiated harmonization efforts, ex ante comparability can only be established during the development stage.

Creating better estimations of trends in health and disability for the baby boom generation is much more than an academic exercise. Much is predicated on trends in the health of the today’s middle-aged adults. As public health professionals gauge current and future needs for remedial and preventive care; as policy makers consider how to ensure the long-term vitality of Medicare, Social Security, and other social support mechanisms; and as health care professions project need for types of practitioners and service configurations, clarity about trends in specific measures of health and independence – based on knowledge about what is driving trends – is essential.
REFERENCES


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TRENDS Workshop Attendees: George Alter, Research Professor, ISR, University of Michigan; Jay Bhattacharya, Assistant Professor, Center for Primary Care and Outcomes Research, Stanford University; Antonio Camara, Post-doctoral Researcher, Centre d’Estudis Demographics (Barcelona), Phillipa Clark, Research Assistant Professor, ISR, University of Michigan; Jenn Dowd, Post-doctoral Fellow, Population Studies Center, University of Michigan; Ezra Golberstein, doctoral student, University of Michigan; Albert Hermalin, Research Professor Emeritus, Population Studies Center, University of Michigan; Mary Beth Landrum, Associate Professor of Biostatistics, Department of Health Care Policy, Harvard University; James Lubitz, Distinguished Consultant and Acting Chief, Aging and Chronic Disease Statistics Branch, National Center for Health Statistics; Bo Maclnnis, Post-doctoral Fellow, Population Studies Center, University of Michigan; Linda Martin, Senior Fellow, RAND Corporation; Jean-Marie Robine, Research Director, French National Institute of Health and Medical Research; Robert Schoeni, Professor of Economics and Research Professor, ISR, University of Michigan; Brenda Spillman, Senior Research Associate, Urban Institute; Jeff Strickland, Post-doctoral Fellow, Population Studies Center, University of Michigan; Mark VanLandingham, Professor of International Health, Tulane University; Lois Verbrugge, Research Professor Emerita and Senior Distinguished Research Scientist Emerita, Institute of Gerontology, University of Michigan; Timothy Waidmann, Senior Research Associate, Urban Institute; Katrina Walsemann, Assistant Professor, Department of Health Promotion, Education, and Behavior University of South Carolina; Anna Zajacova, Postdoctoral Fellow, Population Studies Center, University of Michigan.

Additional TRENDS network scholars (not in attendance) include: John Bound, Professor of Economics, University of Michigan; Eileen Crimmins, Director, USC/UCLA Center on Biodemography and Population Health, University of Southern California; Vicki Freedman, Professor, School of Public Health, University of Medicine and Dentistry of New Jersey; Mark Hayward, Director, Population Research Center, University of Texas at Austin; Christine Himes, Chair and Professor, Sociology, Syracuse University; Kenneth Manton, Scientific Director, Center for Demographic Studies, Duke University; Mary Beth Ofstedal, Associate Research Scientist, Survey Research Center and the Population Studies Center, University of Michigan; Robert Wallace, Professor of Epidemiology, University of Iowa; Douglas Wolf, Associate Director, Aging Studies Program, Center for Policy Research, Syracuse University.

Supported by the National Institute on Aging, TRENDS is a network of researchers working to accelerate scientific understanding of old-age disability trends. We do this in three broad ways.

▶ We conduct original research, looking for the causes and consequences of past, current, and future disability trends.

▶ We review findings from new studies, reconciling differences across studies and populations in the U.S. and abroad.

▶ We create an environment that is collegial, facilitating open discussion of salient issues and cutting-edge research.

In particular, we are focused on fostering international and cross-institutional collaboration to enhance our understanding of trends in old-age disability, and providing a mechanism for interactive discussion.

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