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Active Life Expectancy In The Older US Population, 1982–2011: Differences Between Blacks And Whites Persisted

ABSTRACT Understanding long-range trends in longevity and disability is useful for projecting the likely impact of the baby-boom generation on long-term care utilization and spending. We examine changes in active life expectancy in the United States from 1982 to 2011 for white and black adults ages sixty-five and older. For whites, longevity increased, disability was postponed to older ages, the locus of care shifted from nursing facilities to community settings, and the proportion of life at older ages spent without disability increased. In contrast, for blacks, longevity increases were accompanied by smaller postponements in disability, and the percentage of remaining life spent active remained stable and well below that of whites. Older black women were especially disadvantaged in 2011 in terms of the proportion of years expected to be lived without disability. Public health measures directed at older black adults—particularly women—are needed to offset impending pressures on the long-term care delivery system as the result of population aging.

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Population aging has elevated concerns about meeting the disability and long-term care needs of older adults in the United States, particularly for less advantaged groups.[1] Older adults who identify as black or African American are of special interest, given that this is the largest racial minority among older adults and is projected to increase from 4.5 million in 2015 to 8.2 million in 2030.[2]

Blacks who reach late life—ages sixty-five and older—experience persistently higher disability rates and greater unmet needs for help with daily tasks, compared with whites in this age group, as well as greater barriers to accessing preferred community-based sites of long-term care.[1,3–6] Black women face especially elevated risks.[7,8]

The reasons for these black-white differences are complex. For instance, relative to their white peers, blacks have fewer economic resources and are more likely to be dually eligible for Medicare and Medicaid. They also are more likely to have been in worse health and uninsured earlier in life, to have higher rates of obesity and other cardiovascular risk factors, and to have fewer social ties, relative to their white peers.[9–14] Moreover, the residential concentration of blacks in the United States is high, and related inequities in neighborhood resources—including access to medical and long-term care—reinforce black-white disparities.[6,15]

Several studies have documented shifts in black-white disparities in late-life disability over the past few decades, but the studies do not give a clear picture of the longer-range trend and whether it has improved over time. For example, estimates based on data from the National Long Term Care Survey showed declines between 1982 and 1999 in age-adjusted disparities in the percentages of blacks and nonblacks who had mod-

erate or severe disabilities or lived in an institution.[4] For the period from the late 1990s through 2006, however, estimates based on data from the National Health Interview Survey showed increases in the gap between community-based older blacks and whites in percentages needing help with routine household activities.[5]

A largely separate literature has considered changes in the life expectancy of older blacks and older whites. According to the National Center for Health Statistics, in 2011 life expectancy at birth for whites (79.0 years) exceeded that for blacks (75.3 years) by 3.7 years—a gap that has been narrowing from a peak of 7.1 years in 1993.[16] About one-third of this gap is due to differences in mortality at ages sixty-five and older. Investigations into reasons for the continued gap have pointed to geographic variation in socioeconomic status and environmental exposures, inequitable access to medical care and public health interventions, educational differences that lead to disparities in income and wealth, and differences in chronic disease profiles.[17–20]

Measures of active life expectancy—that is, the remaining years of life to be spent without disability—combine mortality and disability rates into summary measures that are useful in assessing needs for long-term care over time and across groups. Such measures convey information about whether survival changes are accompanied by a compression or expansion in the number and proportion of years an individual can expect to live without disability. Recent studies have found an expansion since the 1980s in the expected number of years of active life at age sixty-five for both men and women.[21,22] However, studies that focus on trends in active life expectancy by race are rare. One recent exception that examined a relatively short period (1999–2008) found a persistent gap in years of active life of about six years that favored whites over blacks.[23]

In this study we characterized black-white differences in both late-life mortality and disability in the United States over nearly three decades (1982–2011). We examined changes in the chance of survival beyond age sixty-five overall and without disability, the prevalence of disability, and the number and percentage of remaining years expected to be lived without disability. We also evaluated changes in active life expectancy for groups by race and sex and examined numbers of years expected to be lived with disability by severity of limitations.

Study Data And Methods

DATA We used data from the 1982 and 2004 National Long Term Care Surveys and the 2011 National Health and Aging Trends Study. The surveys were designed to track long-term disability trends in the United States. For both surveys, nationally representative samples of adults ages sixty-five and older were drawn from the Medicare enrollment files. The samples represent enrollees in all settings, including institutions.

The National Long Term Care Survey was first conducted in 1982, and its sample was replenished to achieve cross-sectional representation in each of five subsequent waves through 2004, its final year.[24] The study included a brief disability screening interview that was administered in 1982 and 2004 to all people in the sample. Screening data are available for 19,650 respondents in 1982 and for 15,993 in 2004 (response rates of 87.3 percent and 80.6 percent, respectively).

The National Health and Aging Trends Study was first conducted in 2011 with 8,245 Medicare beneficiaries (response rate: 70.9 percent).[25] Of the respondents, 8,077 either completed the study's interview or were living in a nursing home. A facility staff member completed a facility questionnaire for people in the latter group. Another 168 participants were living in residential care settings other than nursing homes and had only a facility questionnaire completed; the nonresponse weights for other participants in such settings have been adjusted to account for these cases.

MEASURES We used the same questions to measure activity limitations in both studies. Respondents were told: "The next few questions are about your ability to do everyday activities without help. By help, I mean either the help of another person, including the people who live with you, or the help of special equipment." They were then asked if they had any problem in performing the following activities without help: eating, getting in or out of bed, getting in or out of chairs, walking around inside, going outside, dressing, bathing, and getting to the bathroom or using the toilet. They were also asked if they were able to perform the following activities without help: preparing meals, doing laundry, doing light housework, shopping for groceries, managing money, taking medicine, and making telephone calls. For each negative response, respondents were asked: "Does a disability or a health problem keep you from [the activity]?"

We considered respondents to have a limitation if they reported a problem with (or said they couldn't or didn't perform) any of the personal care activities, were unable to carry out a household activity because of disability or health, or lived in a nursing facility.[26] For our analysis of active life expectancy, we defined the following three levels of severity of limitation: moderate, severe, and living in a nursing facility. Having a

moderate disability was defined as having a problem performing only one or two personal care activities or being unable to carry out any household activity. Having a severe disability was defined as having a problem carrying out three or more personal care activities.

The National Long Term Care Survey recorded deaths in its 1984 file, from the 1984 survey round and linkages to administrative records through that year; thus, it allowed calculations of a two-year mortality rate. The National Health and Aging Trends Study recorded mortality during follow-up attempts in 2012 and 2013, so it also allowed calculations of a two-year mortality rate. We approximated one-year mortality rates in 1982 and 2011 by using half of the two-year rate calculated from each survey. Comparisons between these mortality rates and vital statistics suggest good agreement for both time periods.[16,27]

In both surveys, race was self-reported, and multiple race selections were allowed. We used this information to identify respondents who reported only white race (hereafter, white respondents) and those who reported any mention of black or African American race (hereafter, black respondents).

ANALYTIC SAMPLE Respondents who reported other races alone or in combination with white were omitted from the analytic sample. The final samples consisted of 17,723 whites and 1,651 blacks in 1982, 14,151 whites and 1,129 blacks in 2004, and 5,801 whites and 1,825 blacks in 2011.

STATISTICAL METHODS We calculated survival curves and life expectancy using standard abridged (five-year) life table methods.[28] To apportion life expectancy into years to be lived with and without disability, we implemented the widely used Sullivan method,[29] which divides person-years expected to be lived in each age group according to the percentage of people in each age group with and without disability. We decomposed changes in active life expectancy for whites and blacks into changes in mortality and changes in disability.[30] We repeated the active life expectancy analysis using the measures described above of moderate and severe disability and of living in a nursing facility.

We also estimated active life expectancy by both race and sex. To have ample precision for these latter calculations, we used three ten-year age groups (ages 65–74, 75–84, and 85 and older) instead of five-year age groups. Sex-specific estimates and tests of differences across years within race and across races within a given year are provided in the online Appendix.[31]

We standardized disability prevalence estimates in each of the three survey years to the 2010 age distribution of the white population. We calculated age-adjusted estimates of having any disability, having limitations in each activity, having moderate and severe disability, and residing in a nursing facility.

We calculated estimates using survey weights that take into account differential probabilities of selection and differential nonresponse.[32,33] Reported significance is based on standard errors that reflect the complex designs of the surveys.

LIMITATIONS There were two measurement-related issues for which we could not fully control, although we believe that they were unlikely to account for our findings. First, screening in the National Long Term Care Survey took place largely by telephone, whereas interviews for the National Health and Aging Trends Study were conducted in person. Second, the screening questions in the National Health and Aging Trends Study were asked near the end of each interview. In contrast, the National Long Term Care Survey asked the questions as a screen to determine which respondents would proceed to a more detailed interview. A review of experimental evidence suggested that the interview mode was unlikely to have substantial effects.[34] Furthermore, the results of an analysis of detailed interview responses to both surveys were not consistent with significant distortion of our findings related to question placement.[35]

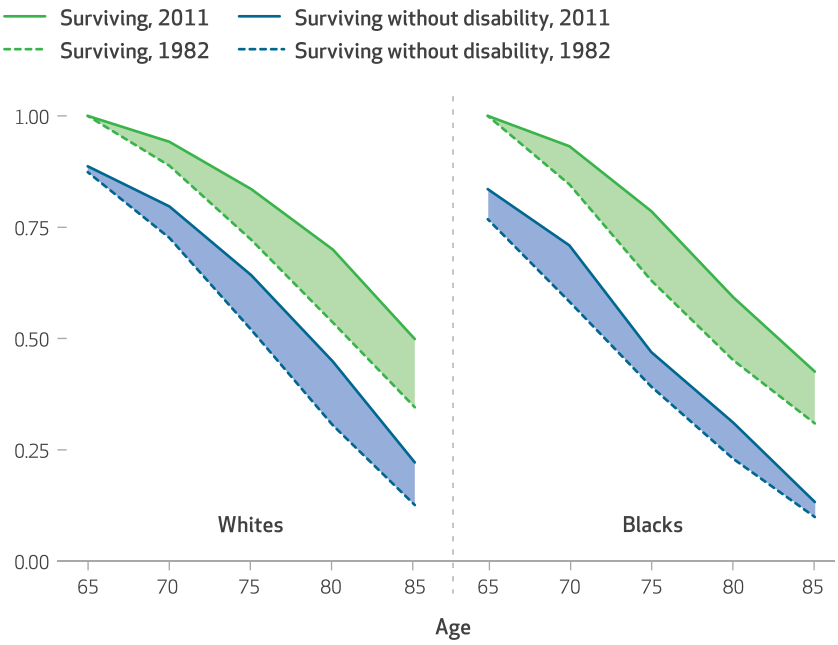
Study Results

Between 1982 and 2011, expected survival beyond age sixty-five improved for both whites and blacks (Exhibit 1). However, expected survival without disability increased more for whites than for blacks. For whites, life expectancy increased only slightly more than active life expectancy, but for blacks, the increase in survival was about twice as large as the increase in survival without disability.

During the same period, disability prevalence first declined for whites and blacks and then began to reverse course, although to varying degrees for the two races (Exhibit 2). When we controlled for differences in age structure over time between whites and blacks, we found that the percentage of whites ages sixty-five and older living with an activity limitation fell by 6.7 percentage points from 1982 to 2004 and then rose by 2.5 percentage points from 2004 to 2011. Compared to whites, for blacks the improvement between 1982 and 2004 was larger (9.8 percentage points), but the reversal between 2004 and 2011 also was far larger (6.9 percentage points). As a result, the age-adjusted disability gap between whites and blacks first narrowed by 3.1 percentage points and then widened by 4.3 percent-

EXHIBIT 1

One-year probability of surviving and of surviving without disability, US whites and blacks, 1982 and 2011



SOURCE Authors' analysis of data from the 1982 National Long Term Care Survey and the 2011 National Health and Aging Trends Study. **NOTE** Estimates are conditional on surviving to age sixty-five.

age points.

Between 1982 and 2011, striking differences between the races in patterns of nursing facility use occurred. The share of whites living in such facilities declined from 7.2 percent to 2.9 percent (Exhibit 2), whereas there was no change for blacks. Moreover, whites experienced declines between 1982 and 2011 in limitations for every personal care and household activity included in the analysis, whereas blacks experienced declines in only two of the personal care activity limitations and four of the household activity limitations.

In the reversal between 2004 and 2011, four activities were involved for whites, compared to six for blacks (Exhibit 2). For instance, blacks but not whites experienced increases in having a problem getting in or out of chairs and being unable to do laundry, do light housework, and shop for groceries without help.

Years expected to be lived without disability increased from 1982 to 2011 for both whites and blacks at age sixty-five. Whites gained 2.8 years of life without disability (from 12.2 to 15.0), while blacks gained 2.2 years (from 9.8 to 12.0) (Exhibit 3). About three-fourths of the increase in years lived without disability was due to improved survival (72 percent of the increase for whites and 78 percent for blacks), and the rest of the change was accounted for by shifts in disability prevalence over the study period (data not shown).

The percentage of remaining life expected to be lived without disability at age sixty-five was higher for whites than for blacks in both 1982 (74 percent versus 65 percent) and 2011 (76 percent versus 67 percent) (Exhibit 3). In addition, at all ages, whites experienced increases between 1982 and 2011 in the percentage of years expected to be lived without limitations, and the magnitude of gains increased with age. Blacks experienced no such gains.

Analyses stratified by sex suggest that there were gaps between blacks and whites for both men and women in the number of years expected to be lived at age sixty-five without disability in 1982 and in 2011 (results are in the Appendix).[31] Moreover, that number increased by several years for white and black men and by nearly one and a half years for white women, but by less than a year for black women. The percentage of remaining life expected to be active at age sixty-five increased significantly only for white males, who could expect to live 82 percent of their remaining years without disability in 2011. In contrast, at age sixty-five black women could expect to live only 62 percent of their remaining years without disability in 2011—a percentage that was 9 percentage points lower than the comparable figure for white women and 12 percentage points lower than that for black men. Similarly, at age eighty-five the percentage of expected years without disability improved only for white men, reaching 62 percent in 2011. In that year, black women at age eighty-five could expect to live only one-quarter of their remaining years without disability.

The expected number of remaining years to be lived with disability at age sixty-five increased between 1982 and 2011 for both whites and blacks—by 0.4 and 0.8 year, respectively (Exhibit 4). For whites, the years expected to be lived with moderate or severe disability at age sixty-five increased, but the years to be lived in a nursing facility fell. At age eighty-five the expected number of years to be lived with disability declined by 0.5 year for whites. That decline was accompanied by a decrease in the expected number of years in a nursing facility and an increase in severe disability in other settings. For blacks at age eighty-five, there was no change in the total number of years expected to be lived with disability overall or by severity level.

Discussion

Older blacks and older whites in the United States have experienced different disability pat-

EXHIBIT 2

Age-adjusted percentages of US whites and blacks ages 65 and older with specific types of activity limitations, 1982, 2004, and 2011

	White						Black					
	Year			Difference			Year			Difference		
	1982	2004	2011	1982 vs. 2004	2004 vs. 2011	1982 vs. 2011	1982	2004	2011	1982 vs. 2004	2004 vs. 2011	1982 vs. 2011
ALL LIMITATIONS												
Any	26.3%	19.6%	22.1%	***	***	***	35.0%	25.2%	32.1%	***	***	**
Moderate[a]	12.4	10.1	12.3	***	***		19.5	11.4	17.7	***	***	
Severe[b]	6.7	5.8	6.9	***	***		10.9	8.7	10.0	*		
In a nursing facility	7.2	3.6	2.9	***	***	***	4.6	5.1	4.4			
PERSONAL CARE ACTIVITY LIMITATIONS[c]												
Eating	6.5	3.9	3.8	***		***	5.8	5.8	6.0			
Getting in or out of bed	8.8	5.5	6.2	***	**	***	9.4	8.9	9.8			
Getting in or out of chairs	9.4	6.4	6.8	***		***	9.8	9.4	11.3		*	
Walking around inside	12.3	8.9	7.7	***	***	***	14.8	12.5	11.4	*		***
Going outside	16.1	11.9	11.7	***		***	21.1	16.2	17.2	***		***
Dressing	8.8	5.6	6.8	***	***	***	10.4	8.7	11.5	*	***	
Bathing	11.2	7.3	7.5	***		***	13.4	10.4	12.2	***		
Toileting	8.2	5.3	5.2	***		***	9.6	8.5	9.4			
HOUSEHOLD ACTIVITY LIMITATIONS[d]												
Preparing meals	11.1	7.3	7.5	***		***	14.8	11.6	13.0	***		*
Doing laundry	13.3	7.9	8.5	***		***	18.9	12.8	15.0	***	*	***
Doing light housework	10.4	6.8	6.6	***		***	13.5	11.2	12.8	***	**	
Shopping for groceries	16.8	10.8	11.2	***		***	22.8	15.7	18.1	***	*	***
Managing money	10.0	6.7	7.6	***	**	***	13.3	11.1	13.3	**	**	
Taking medicine	8.6	5.9	6.6	***	*	***	9.9	9.7	11.4			
Making telephone calls	9.4	5.5	4.9	***	*	***	12.6	8.2	8.2	***		***

SOURCE Authors' analysis of data from the 1982 and 2004 National Long Term Care Surveys and the 2011 National Health and Aging Trends Study. **NOTES** Estimates were adjusted to the age distribution for whites based on the 2010 census. Individuals in nursing facilities were assumed to have all limitations. [a]Limited only in household activities or in one or two personal care activities. [b]Limited in three or more personal care activities. [c]Having any problem in performing an activity without help or cannot or does not perform an activity. [d]Being unable to perform an activity without help because of a disability or health problem. *$p < 0.10$ **$p < 0.05$ ***$p < 0.01$

terns since the early 1980s, as longevity has increased. For older whites, disability has been postponed to older ages, and the proportion of life expected to be lived without disability has increased. However, for older blacks, longevity increases have been accompanied by smaller postponements in disability, and the proportion of remaining life to be spent active has remained stable—about two-thirds at age sixty-five and one-third at age eighty-five. Consequently, the proportion of life expected to be active for older blacks continues to remain well below the proportion for older whites.

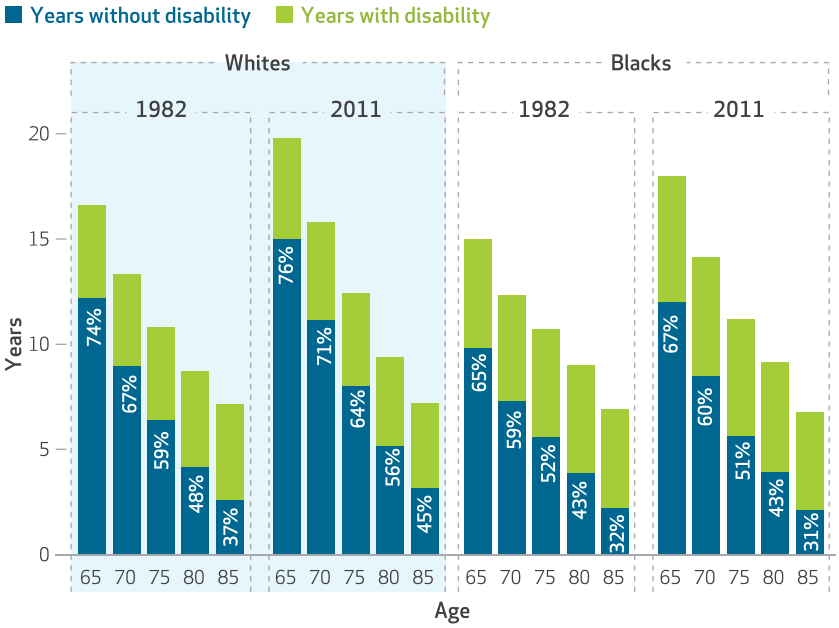
These findings add to the results of studies that have examined trends in active life expectancy by race for shorter time periods.[23] On balance, our findings are consistent with previous studies that found a persistent gap in both the expected number and percentage of years to be spent active that favored whites over blacks. We found that over nearly three decades these gaps persisted at age sixty-five and increased at older ages because of improvements experienced by whites but not by blacks. We also found that for both races, the increases from 1982 to 2011 in active years were driven largely by declines in mortality and not by shifts in disability.

Our analysis also suggests that the black-white gaps persisted during the study period in large part because of the lack of progress for older black women in gaining years of active life. This finding is consistent with previous research demonstrating that black women experience a unique disability trajectory in later life that reflects accelerated impairment at older ages.[8] We add to this literature by pointing out that in the aggregate, older black women have not experienced the gains seen for other groups since the early 1980s in either the number of years of active life or the percentage of life expected to be active.

A few additional encouraging findings also emerged from our study, but they were limited to whites. For that group, we found a dramatic change from 1982 to 2011 in the locus of care from nursing facilities to community settings and, at age eighty-five, declines in expected years lived with disability. Whites and blacks also experienced an increase over time in the number of years expected to be lived without disability at

EXHIBIT 3

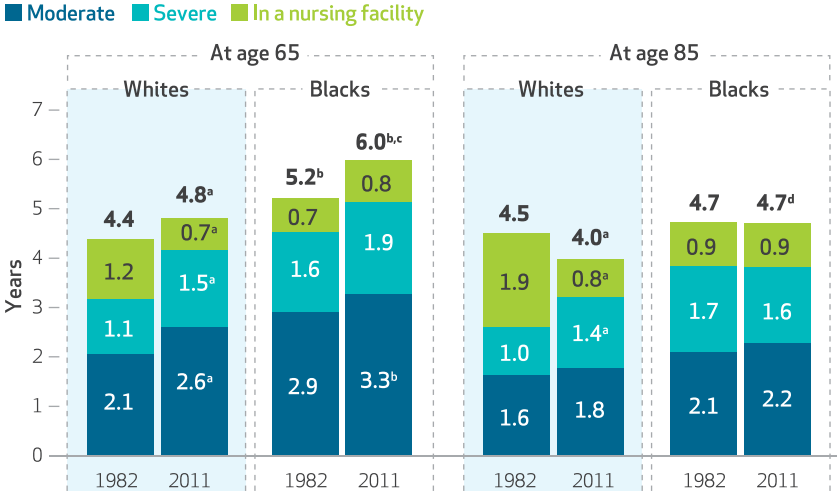
Expected number of remaining years lived with and without disability and percentage of remaining years expected to be lived without disability, US whites and blacks, 1982 and 2011



SOURCE Authors' analysis of data from the 1982 National Long Term Care Survey and the 2011 National Health and Aging Trends Study.

EXHIBIT 4

Expected number of remaining years lived with disability at age 65 and age 85, by severity of disability, US whites and blacks, 1982 and 2011



SOURCE Authors' analysis of data from the 1982 National Long Term Care Survey and the 2011 National Health and Aging Trends Study. [a]$p < 0.01$ for difference from 1982 (same race). [b]$p < 0.01$ for difference from whites (same year). [c]$p < 0.10$ for difference from 1982 (same race). [d]$p < 0.05$ for difference from whites (same year).

age sixty-five. However, for blacks the percentage of years expected to be lived without disability at age sixty-five remained stable and below that of whites at all ages. Moreover, unlike for whites, for blacks the expected number of years to be lived with disability at age eighty-five did not decline over the study period.

The stagnation for older black adults may be linked in part to the reversal they experienced from 2004 to 2011 in limitations in several activities that are especially important for living in the community: the ability to do laundry, do light housework, and shop for groceries without help. Blacks also experienced no change from 1982 to 2011 in their rates of nursing facility use. The finding of differential reductions in nursing facility use for blacks and whites in the aggregate mirror the increased use of assisted living and community-based care alternatives by whites over this period.[6,36] This trend is particularly concerning because of previously documented racial disparities in the quality of nursing home care and the high public cost associated with nursing facility use.[36,37] Moreover, the finding underscores the need for policies that address continued disparities by race in access to preferred community alternatives.[6]

Because we had only three cross-sectional sets of consistent measures, we could not examine the role of disability onset and recovery in changes in active life expectancy or turning points for changes in disability prevalence. Nonetheless, we found that mortality shifts were more important than changes in disability for estimated changes in active life expectancy. Other studies have provided evidence that downward trends in the prevalence of moderate disability observed during the 1990s flattened or reversed in the early 2000s.[38]

Our findings highlight the need for health policies and public health interventions that might further improve the functioning and reduce the needs for long-term care of the older US population, particularly blacks. Indeed, the existing health care delivery and financing system was set up not to promote optimal functioning, but to focus on the treatment and to some degree, more recently, the prevention of disease. For example, assistive devices, home modifications, and home safety programs have traditionally been covered by Medicare or Medicaid only in limited circumstances. In addition, they do not historically fall under the purview of physicians, but instead require coordination among physical and other therapists and social services. Consequently, for many years, options to make home environments more supportive have often not been accessible to less advantaged segments of the older population, whose members are at ele-

vated risk for developing disability.

A number of innovations aimed at improving the quality of care for the older population were recently introduced in both Medicare and Medicaid. Spurred in part by provisions of the Affordable Care Act, new value-based payment structures and new models for integrated whole-person care to improve management of chronic conditions and the coordination of health, behavioral, and supportive services are being implemented.[39] For people dually eligible for Medicare and Medicaid, there is an enhanced focus on integrating service delivery by the two programs to improve access to and coordination of supportive, social, and medical services for older adults with complex medical and functional needs. The extent to which reforms will expand access to assistance with functioning remains to be seen. Continued monitoring of disparities in active life expectancy in the wake of these reforms is an important task.

Focusing on new payment incentives and delivery system reforms alone, however, is unlikely to spur sufficient improvements to substantially close the gap between older black and white Americans. This is especially true for older black women, who lag behind other groups in both the years and the percentage of life expected to be lived without disability. Some researchers have argued that to narrow racial health disparities, both individual behavior and community-level barriers to improvement should be targeted, and not only health-related but also social and economic factors need be addressed.[15,40] Several studies have argued that targeting contributing factors that have their roots much earlier in life is needed to address disparities in late-life disability.[41,42] Our findings suggest that pinpointing which measures would be most effective in reducing dependence among older blacks—particularly older black women—is necessary and likely to be an important step toward offsetting impending pressures on the long-term care delivery system as a result of population aging.

Conclusion

The proportion of remaining years to be lived without disability increased for older white Americans from 1982 to 2011. In contrast, for older blacks the percentage of remaining life spent active remained stable and well below that of whites. Black women were especially disadvantaged, since they had only small gains in the expected number and no gain in the expected proportion of remaining years to be spent without disability. Given that the baby-boom generation's long-term care demands are expected to peak in 2030, our findings support the need to continue closely monitoring the needs of older adults and the efficacy of health system reforms in meeting them. In the shorter run, improvements in medical, social, and support services may be able to affect functioning and health trajectories, quality of life, and costs of care for all older people. In the longer run, additional policies to address the root causes of late-life disability earlier in life—particularly those that disadvantage black women—may also be needed to reduce the late-life disparities in active life that have persisted since the early 1980s. ■

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NOTES

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