A tale of two halves: Age-specific trends in limitations to daily activities in older Americans by race and ethnicity 2000-2009 and 2010-2018

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**Abstract**

Background. During the first decade of the 2000s, the prevalence of limitations in daily activities increased among older Americans. It is unclear whether these adverse have continued after 2010, and how trends differ by age group, sex, and race/ethnicity.

Data and Methods: Using data from the National Health Interview Survey (NHIS), from 2000 to 2018, we modeled the age-specific prevalences of limitations to activities of daily living (ADL) and limitations on instrumental activities of daily living (IADL) by decade, sex, age group and race/ethnicity. We assessed differences in trends between 2000-2010 and 2010-2018 for adults aged 50 plus.

Results: Between 2000-2018 the average prevalence of limitations to daily activities and instrumental limitations remained stable, but with substantive age-specific differences, with non-Hispanic Blacks and Hispanics having higher ADL and IADL prevalence. We identified an increasing trend over time in most limitations for the 50-64 age group, affecting mostly non-Hispanic Whites (with prevalence increases across the decade ranging between 27.6% and 51.3%) and Non-Hispanic Blacks in 2000-2010 (with prevalence increases across the decade ranging between 29.3% and 72.6%) and Hispanics in 2010-2018 (with relative increases ranging between 21.6% and 59.4%), with the latter groups presenting largest overall prevalence increases. For other age groups, we could not identify a clear trend, but increases were observed in some cases for non-Hispanic Blacks and Hispanics, widening the gap with non-Hispanic Whites.

Conclusions: Behind the stagnant overall prevalence of both types of limitations, age-specific trends might be telling that minorities from younger generations are presenting higher levels of functional limitations when compared to non-Hispanic whites, potentially foreshadowing a greater burden for future care needs.

**Introduction**

After improvements in the first decade of the 2000s, the subsequent stagnation in life expectancy has become one of the more closely followed stories in many health-related disciplines (Abrams et al., 2023; Case & Deaton, 2015, 2017; Mehta et al., 2020). However, another important story is that of trends in morbidity and disability among middle- and older-aged Americans, which has not been followed as closely.

During the 1980s and 1990s, improvements in mortality were accompanied by sizeable declines in disability prevalence (Freedman et al., 2002; Martin, Schoeni, et al., 2010; Schoeni et al., 2001; Waidmann & Liu, 2000). Educational expansion in the United States has been identified as a key contributor to these earlier declines (Freedman et al., 2002; Martin et al., 2010; Schoeni et al., 2001), as too have been improvements in medical care and earlier-in-life health (cite).

The first decade of the 2000s brought about a shift in disability trends. Studies have highlighted that limitations in activities of daily living (ADLs) and instrumental activities of daily living (IADLs) among Americans under aged 70 years stopped declining (Freedman et al., 2013; Lakdawalla et al., 2004; Martin, Freedman, et al., 2010; Seeman et al., 2010; Tsai, 2017). Declines were still evident among those over aged 70 years.

Less is known about disability trends after 2010 when U.S. life expectancy increases began to stagnate. Moreover, disruptive events, like the U.S. economic crisis of 2008, are known for their detrimental effects on population health (Frasquilho et al., 2016; McAlpine et al., 2018). It is acknowledged that the effects of the 2008 economic crisis have contributed to the stagnation in mortality observed in the U.S. population in recent years (Case & Deaton, 2015, 2017). However, it remains unclear whether this event also is also associated with a turning point for disability trends.

Because health is not distributed evenly across populations, investigating how disability trends have changed across sex, age, race, and ethnicity is also critical to gaining a better understanding of the dynamics of health and care needs among older Americans. Non-Hispanic Black and Hispanic men and women have higher prevalences of disability compared to non-Hispanic Whites (Abraído-Lanza et al., 1999; Chinn & Hummer, 2016; Hayward et al., 2014; Ostchega et al., 2000; Sharma et al., 2023).

Previous recent studies have shown that the race and ethnicity gap in functional limitations between non-Hispanic Whites, non-Hispanic Blacks, and Hispanics did not significantly decrease between 1999 and 2018, with non-Hispanic Blacks showing the highest prevalences in physical limitations (Mahajan et al., 2021). However, the study did not analyze how racial and ethnic disparities may be differential across age groups or whether the rate of change remained consistent over time. Tsai (2017) found an increasing trend in ADL limitation prevalence between 2000 and 2014 for the population aged 65+ from all educational levels (except for those with high education), but did not study any racial disparities, interaction effects by gender nor changes that could occur within the analyzed period.

This Research Note examines age-specific disability trends among adults aged 50 and older by sex, age group, and race/ethnicity in the United States from 2000 to 2018. We had two key objectives. The first was to investigate whether disability trends changed between the decades of 2000-2010 and 2010-2018. The second was to investigate changes over time in racial/ethnic disparities in disability.

**Methods**

We used data from the National Health Interview Survey (NHIS), a large national in-person survey that provides population-based estimates of health in the United States. With weighting, each NHIS survey is nationally representative of the non-institutionalized U.S. population of the 50 states and the District of Columbia. NHIS data have been harmonized in the Integrated Public Use Microdata Series (IPUMS) data library, which is free to use and download and was used in this analysis (which can be found in <https://nhis.ipums.org/nhis/>).

The presence of difficulties in performing tasks of daily life independently has traditionally been used to monitor disability levels and trends in population studies (Edemekong et al., 2023). We analyze limitations in Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs). Limitations in ADLs include impairments in basic tasks, such as toileting or feeding oneself, whereas IADLs emphasize the interaction between functional ability and social or economic tasks, such as paying bills or housekeeping. We used the set of self-reported questions related to needing help with ADLs and IADLs, separately. Requiring assistance with at least one of the activities described in each question was considered as having a disability.

Public-use files of the NHIS top-code age at 85 years, hence we excluded those 85 years and over as we did not have information on how the age distribution of this group changed over time. We also restricted the analyses to the three racial/ethnic groups (non-Hispanic whites, non-Hispanic blacks, Hispanics) because other racial/ethnic groups were deemed to have an insufficient sample size for the granularity of our models. After filtering, the overall size of the sample was 512,279 observations between 2000 and 2018.

Analyses were stratified by sex (female, male) and age group (50-64, 65-74, and 75-84). We estimated a series of logistic regression models predicting an ADL or IADL prevalence, separately, for the years 2000, 2010, and 2018. The models included age measured in single years, race/ethnicity (non-Hispanic whites, non-Hispanic blacks, Hispanics), and calendar year measured in single years. We additionally included an interaction between calendar year and a dummy variable for decade (with the period comprehended between 2000-2009 coded as 0) to investigate whether the trend differs by decade. We allowed trends to vary by race/ethnic by including an interaction of race/ethnicity with the calendar year and the dummy variable for decade. The models presented interaction terms across years and race and ethnicity, including an additional interaction of years and race and ethnicity for the years between 2010 and 2018 (resulting in a second slope after the year 2010, which was done by centering the year variable in 2010). The models controlled for educational attainment and nativity (U.S.-born and foreign-born, using an average as the reference values for models). Educational attainment was constructed with three categories: low (less than GED or high school diploma, with numeric value 0 in the models), middle (from GED or high school diploma to some college or associate degree but not the completion of a bachelor’s degree, with numeric value 1, serving as the reference category for our model estimates, being the most common value for educational attainment), and high (bachelor’s degree and beyond, with numeric value 2 in the models). Cross-sectional sample weights were used to make the trends comparable over time. We used the R statistical software for our statistical analyses (R Core Team, 2015).

**Results**

Table 1 presents the descriptive statistics for some of the numeric variables in the sample, split by decade and age group. Changes in the population across the decade were minimal, with very similar values for the share of females (53 to 54%), average age (62.9 and 62.6 years respectively), average prevalence of ADL and IADL limitations (3% and 6%, respectively), average educational attainment (1.13 to 1.01) and the share of U.S. born population (87% in each decade). Regarding race and ethnicity, 69% of the sample was non-Hispanic White, 12.2% non-Hispanic Black, and 6.4% and 12.4% Hispanic.

Table 1: Descriptive characteristics of the sample by decade and age group

There are variable trends based on the results of Tables 2-4 (which can also be observed in Figures 1-6). Overall, women presented a higher prevalence of functional limitations than men), and non-Hispanic Blacks presented the highest prevalence in most cases.

Table 2 presents the predicted probabilities for the prevalence of ADL and IADL limitations by race and ethnicity from the year 2000 and the predicted trends across the decade for the age group 50-64, stratified by sex and the predicted trends across each decade. These predictions were based on the results from models 1 to 12 (the coefficients for the models are available in the supplementary material, along with Figures 1 to 3, which highlight the overall trend). While these models also controlled for nativity and educational attainment, we estimated the marginal probabilities based on the average values of these covariates, as shown in the Table. We presented the baseline prevalence values for 2000, 2010 and 2019, along with the relative change in prevalence, highlighting significant variations (defined as trends that are different from the baseline considering a 95% confidence interval) across each decade and also comparing the estimate of 2018 with the value for the year 2000.

Table 2 : Predicted ADL and IADL prevalence and Relative Change by sex, race and ethnicity for years 2000, 2010 and 2018, group aged 50-64

The 50-64 age group presented a slow but steady increase of prevalence of ADL and IADL limitations during 2000-2010 for male non-Hispanic Blacks. The group presented the largest baseline prevalences, with values of 1.94 and 2.30 for ADL and IADL respectively by year 2000, with relative increases of 60.3% and 46.4% for ADL and IADL. For females, we observed an average relative increase of 72.6% and 29.3% for ADL and IADL between 2000 and 2010. However, after the first decade, the slope of sustained increase for non-Hispanic Blacks mostly stagnated or slowed, with deviation of trends being non-significant. Non-Hispanic Whites also presented increases in a similar direction, but with a smaller baseline prevalence (with values ranging between 0.75 and 2 prevalence points lower) and possibly lower relative increases than their non-Hispanic Black counterparts. In the first decade we observed an ADL relative increase of 49.1% and 51.3% by the end of the first decade for males and females respectively (representing increases of 0.8 prevalence points in each case). We also observed an increase for IADL for males and females, representing increases of 32.8% and 27.6% by the end of the decade. However, just like for non-Hispanic Blacks, those trends halted during the 2010-2018 period.

Hispanics, however, presented baseline levels for ADL and IADL in 2000 comparable to non-Hispanic Whites, which were also stagnant over the decade. However, since 2010, they presented the largest increases in prevalence for females (for males we could not establish a clear deviation from the previous trend although increases seemed to be apparent), with relative increases of 59.5% and 35.4% for ADL and IADL between 2010 and 2018, representing an overall change of 83.6% and 48.5% for the whole 18-year period, but with estimated prevalences still below the ones observed for non-Hispanic Blacks.

Table 3 : Predicted ADL and IADL prevalence and Relative Change by sex, race and ethnicity for years 2000, 2010 and 2018, group aged 65-74

Table 3 presented the results for the for the 65-74 age group. Once again, non-Hispanic Blacks had higher baseline prevalences than non-Hispanic Whites and Hispanics, with differences above one prevalence point in all cases (and almost doubling the baseline estimates of the remaining groups for female IADL).

Within this age group, in most cases we could not observe a clear prevalence trend. However, we can point out that ADL limitations among females have increased for non-Hispanic Whites during the first decade with an increase of 37.7%, only to stagnate between 2010 and 2018, like the 50-64 age group). Moreover, we also found a prevalence increase for non-Hispanic Blacks in the 18-year period (with an overall increase of 58.7%), possibly driven by increases in both decades, representing the largest increase of all groups the analyzed period.

For Hispanics, while we could not establish a clear deviation from the baseline (arguably due to sample size), the trend suggests possible strong increases in prevalence between 2010 and 2018, representing possible increases above 40% in all cases for the 18-year period, representing the largest gains of all groups (except ADL for females).

Table 4 : Predicted ADL and IADL prevalence and Relative Change by sex, race and ethnicity for years 2000, 2010 and 2018, group aged 75-84

Table 4 analyzed trends for the 75-84 age group, which presented a markedly higher prevalence in the year 2000 for ADL and IADL limitations, with baseline prevalence estimates almost doubling or doubling the ones observed for the 65-74 age group, Non-Hispanic Blacks presented the highest values (except ADL for males, slightly under the estimate for Hispanics), with an ADL of 11.6 percent points, doubling the estimate for non-Hispanic whites, and a IADL for females of 23.4 percent points, almost a 9 point gap compared to non-Hispanic Whites and Hispanics.

In the majority of cases, we could not observe a clear trend, which might result in an apparent stagnation over the 18 years analyzed, with the exception of IADL prevalence changes for Hispanic females, with an observed relative increase of 62.2% in 2018 compared to 2000 (which could be representing a 5-point prevalence increase), driven by increases in both decades but possibly largest increases were found in 2000-2010. IADL prevalence for Hispanic females also seemed to be much higher by 2018 than in 2000 in a similar trend as ADL, but we cannot ascertain it based on our sample size. For males, we observed stagnation or a possible small decline of prevalence in both ADL and IADL.

For non-Hispanic Whites, we observed very little change over the 18-year period in almost all cases, with no clear-cut variations. For non-Hispanic Blacks, while there might be some decline in IADL prevalence for both males and females between 2000 and 2018, the opposite might be happening for ADL, with slight (but might not be different from the baseline estimates) increases driven by the 2000-2010 period and stagnating between 2010-2018. Combined with the apparent increase we observed for Hispanics, this means that the gap with non-Hispanic Whites might have increased in some cases by 2018.

Regarding the role of educational attainment, all models had a clear association between higher educational attainment and presenting a lower prevalence of ADL and IADL limitations. As mentioned in the methods section, our estimates are based on the most common category of educational attainment, which is those who had a from GED or high school but not completed a bachelor’s degree. For those with an educational attainment of less than GED or high school diploma, we obtained baseline increases between of 2.5 and 5 points of ADL and IADL depending on the case. The relationship between nativity and a lower or higher prevalence was less ubiquitous, but in most cases U.S.-born individuals presented lower probabilities of having ADL and IADL limitations at higher age groups.

**Discussion and Limitations**

Understanding quality of life and monitoring health trends in older populations are critical for establishing adequate present and future health policies, including those addressing health care needs, caregiving, pension systems, and other aspects of public health. Learning how each ADL and IADL affects an individual’s ability to perform self-care can help determine the need for daily assistance. Moreover, it can help older or disabled individuals determine their eligibility for state and federal assistance programs (Berger et al., 2015; Katz, 1983). Adequately measuring the state of poor health in a population has been (and still is) a contested topic. Unlike mortality, which has a clear definition based on a single event that is undeniable (dying), the state of poor health encompasses a gamut of different definitions. Poor health can be operationalized by the presence of disabilities, functional limitations, chronic conditions, or self-ratings of health or wellbeing. As a result, evidence about trends in poor health can be inconclusive, particularly when definitions embrace different dimensions of well-being and poor health. This ambiguity is partially due to the subjective nature of assessments, but also because these definitions may represent different dimensions of impairment, especially given the presence of mechanisms and technologies that mitigate or control for such difficulties and might change the respondants’ perspective. Furthermore, there are variable trends across age, gender and race/ethnicity that might not always go in the same direction.

With that in mind, the main finding of this study suggests that behind an apparent stagnation in the overall prevalence of functional limitations and instrumental functional limitations (Tsai, 2017), age-specific trends indicate that younger generations had a higher increase of functional limitations prevalence between 2000 and 2018, potentially forecasting greater healthcare needs among younger age groups in the future. Previous research has highlighted the increase in the prevalence of functional limitations among Americans aged 65 and older (Tsai, 2017), but it did not consider differences by race and ethnicity or that individuals aged 50 to 64 were the group with the highest average increase in ADL and IADL limitations over time. While in most cases prevalence in this age group has increased sensibly for all three subgroups, the increase was larger for the non-Hispanic Blacks during the 2000-2009 period, with an apparent stagnation in 2010-2018 (but still with relative increases of near 50% or more between 2000 and 2018). For the Hispanics, the average increase in prevalence was observed between 2010 and 2018 (with relative increases between 21.6% and 59.5% depending on the case), in both cases widening the ADL prevalence gap with non-Hispanic Whites over time for both sexes and the IADL prevalence gap for females. While non-Hispanic Whites in the 50-64 age group also presented an increase in ADL and IADL limitations from 2000 to 2010, this trend stalled from 2010 to 2018, indicating that the adopted use of assistive technologies to cope with limitations might have resulted in this stagnation, just like for their non-Hispanic Black counterparts. Overall, non-Hispanic Whites presented lower levels of ADL and IADL limitations compared to other racial and ethnic groups, despite experiencing relative stagnation and slight increases, thus highlighting their health advantage in this century.

These considerations are especially relevant because some individuals aged 50-64 might not be Medicare-eligible due to their age, resulting in additional inequality.

For the 65-74 age group, between 2000 and 2018 both non-Hispanic Blacks and Hispanics presented higher increases of ADL and IADL limitations in most cases than non-Hispanic Whites, which is also consistent with previous findings (Borrell, 2006, p. 200; Mahajan et al., 2021; Okoro et al., 2018). However, the dynamics across each decade between 2000 to 2010 and 2010 to 2018 were not as clear as for the 50-64 group, with increases that were observed in the first decade, the second decade or both, depending on the case. However, in most cases, Hispanics presented an apparent large prevalence increase between 2010 and 2018 (except IADL limitations for females) indicating that the combination of factors that resulted in the previous stagnation of prevalence has been waning since the 2010s. Non-Hispanic Whites had a slight increase in ADL prevalence for females between 2000 and 2010, just as observed for the 50-64 age group, but also stagnated between the 2010-2018, suggesting that this group also benefited from the same technologies as their younger counterparts. In the rest of cases, non-Hispanic Whites had a decreasing or stagnating prevalence over the two decades, widening the racial gap for that age group. For the 75-84 age group, apparent declines or stagnation in prevalence were observed in ADL and IADL in most cases, with the exceptions of Hispanic females, possibly increasing the gap.

While other studies have found that Hispanics presented a lower prevalence of limitations than non-Hispanics in the overall population (Akresh & Frank, 2008; Goyat et al., 2016; Mahajan et al., 2021), we observed a reversal in this trend among some age groups, with Hispanics presenting a higher yearly increase for ADL and IADL limitations, especially for women, which was consistent with other findings (Chinn & Hummer, 2016; Melvin et al., 2014). This indicates that as Hispanics age, they might be adopting the ADL and IADL patterns of other population groups, such as non-Hispanic Whites, at a very rapid pace based on the relative change across the 2010-2018 period.

In addition to disparities by race and ethnicity, it is important to note the *male-female health-mortality paradox*, where the apparent advantage that women have over men in terms of mortality is reversed when considering the morbidity or disability gradient (Di Lego et al., 2020; Van Oyen et al., 2013). This paradox highlights that living longer does not necessarily equate to living healthier lives. And this paper confirms that in all cases, females presented a higher prevalence of limitations in IADL and ADL than their male counterparts, with little evidence that suggests that the sex gap in morbidity might be waning any time soon.

The limitations of this study are mostly related to the data. On some occasions, sample size issues limit the scope of our findings, because we are not sure if the observed trends are clear and significant (especially between non-Hispanic Blacks and Hispanics at higher age groups since they have a smaller population size). While our findings are representative of the overall population, it is still not clear in most cases if deviation from stagnation is significant in most cases. There is also the possibility of errors in self-reporting and sampling. Additionally, we did not consider the institutionalized population, who are more likely to have limitations in ADLs and IADLs. Previous studies have highlighted the role of nativity when considering differences between Hispanic and non-Hispanic women (Akresh & Frank, 2008; Melvin et al., 2014), we wanted to highlight broader trends rather than controlling for each specific racial or ethnic group. Therefore, due to the potential for type I error stemming from unaddressed heterogeneity within the chosen categories and model selections, our findings should be considered descriptive rather than causal.

Despite these limitations, we believe this study contributes valuable insights into the persistent racial and ethnic inequalities in functional limitations among aging Americans, and mostly against minority groups and younger cohorts. The U.S. population is simultaneously aging and increasing in racial and ethnic diversity. Our findings can potentially inform policies aimed at mitigating these disparities and improving the wellbeing of the increasingly diverse population aged 50 and older.

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Table 1: Descriptive characteristics of the NHIS sample by decade and age group

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Age Group | Decade | Mean | | | | | | Standard Deviation | | | | | |
| % Females | Age | LADL | IADL | Education | Nativity | % Females | Age | LADL | IADL | Education | Nativity |
| 50-64 | 2000-2009 | 0.52 | 56.7 | 0.02 | 0.04 | 1.16 | 0.86 | 0.50 | 4.28 | 0.15 | 0.21 | 0.63 | 0.35 |
| 50-64 | 2010-2018 | 0.52 | 56.1 | 0.02 | 0.04 | 1.09 | 0.86 | 0.50 | 4.26 | 0.13 | 0.19 | 0.65 | 0.35 |
| 65-74 | 2000-2009 | 0.53 | 69.0 | 0.04 | 0.06 | 1.13 | 0.89 | 0.50 | 2.83 | 0.19 | 0.25 | 0.65 | 0.31 |
| 65-74 | 2010-2018 | 0.54 | 69.1 | 0.04 | 0.07 | 0.91 | 0.87 | 0.50 | 2.88 | 0.18 | 0.25 | 0.67 | 0.33 |
| 75-84 | 2000-2009 | 0.56 | 78.9 | 0.08 | 0.14 | 0.99 | 0.89 | 0.50 | 2.83 | 0.27 | 0.34 | 0.67 | 0.31 |
| 75-84 | 2010-2018 | 0.59 | 78.9 | 0.08 | 0.15 | 0.82 | 0.89 | 0.49 | 2.79 | 0.27 | 0.36 | 0.67 | 0.31 |
| All | 2000-2009 | 0.53 | 62.9 | 0.03 | 0.06 | 1.13 | 0.87 | 0.50 | 9.04 | 0.18 | 0.24 | 0.65 | 0.34 |
| All | 2010-2018 | 0.54 | 62.6 | 0.03 | 0.06 | 1.01 | 0.87 | 0.50 | 9.48 | 0.17 | 0.24 | 0.67 | 0.34 |

Table 2 : Predicted ADL and IADL prevalence and Relative Change by sex, race and ethnicity for years 2000, 2010 and 2018, group aged 50-64

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ADL | | Prevalence 2000 | Prevalence 2010 | Prevalence 2018 | Relative Change 2000-2010 | Relative Change 2010-2018 | Relative Change 2000.2018 |
| Males | NH Whites | 1.20 (1.03;1.36) | 1.79\* (1.62;1.97) | 1.92 (1.70;2.14) | 49.1\* (19.1;91.2) | 7.3  (-13.7;32.1) | 60.00\* (25.00;107.77) |
|  | NH Blacks | 1.94 (1.39;2.49) | 3.11\* (2.55;3.66) | 2.92 (2.31;3.86) | 60.3\* (2.4;163.3) | -6.1  (-36.9;38.9) | 50.52  (-7.23;154.68) |
|  | Hispanics | 1.28 (0.78;1.77) | 1.43 (1.06;1.80) | 2.05 (1.54;2.56) | 11.7  (-40.1;130.7) | 43.3  (-14.4;141.5) | 60.16  (-12.99;228.21) |
| Females | NH Whites | 1.44 (1.27;1.61) | 2.18\* (1.99;2.36) | 2.21 (1.98;2.44) | 51.3\* (23.6;85.8) | 1.38  (-16.1;22.6) | 53.47\* (22.98;92.13) |
|  | NH Blacks | 2.30 (1.77;2.83) | 3.97\* (3.41;4.54) | 4.04 (3.37;4.71) | 72.6\* (20.5;156.5) | 1.76  (-25.8;38.1) | 75.65\* (19.08;166.10) |
|  | Hispanics | 1.65 (1.14;2.16) | 1.90 (1.50;2.30) | 3.03\* (2.42;3.64) | 15.15  (-30.56;101.75) | 59.47\* (5.22;142.67) | 83.64\* (12.04;219.30) |
| IADL | |  |  |  |  |  |  |
| Males | NH Whites | 2.50 (2.25;2.74) | 3.32\* (3.09;3.55) | 3.45 (3.15;3.74) | 32.8\*  (12.8;57.8) | 3.9  (-11.3;21.0) | 38.00\* (14.96;66.22) |
|  | NH Blacks | 3.56 (2.81;4.31) | 5.21\* (4.51;5.91) | 5.90 (5.02;6.79) | 46.4\* (4.6;110.3) | 13.2  (-15.1;50.5) | 65.73\* (16.47;141.64) |
|  | Hispanics | 2.38 (1.70;3.07) | 2.55 (2.05;3.04) | 3.10 (2.48;3.72) | 7.1  (-33.2;78.8) | 21.6  (-18.4;81.5) | 30.25  (-19.22;118.82) |
| Females | NH Whites | 3.95 (3.65;4.25) | 5.04\* (4.77;5.32) | 5.15 (4.8;5.50) | 27.6\* (12.2;45.7) | 2.18  (-9.8;15.3) | 30.38\* (12.94;50.68) |
|  | NH Blacks | 6.07 (5.18;6.97) | 7.85\* (7.07;8.64) | 6.92 (6.05;7.78) | 29.3\* (1.43;66.8) | -11.8  (-30.0;10.0) | 14.00  (-13.20;50.19) |
|  | Hispanics | 3.63 (2.84;4.41) | 3.98 (3.39;4.58) | 5.39\* (4.59;6.20) | 9.6  (-23.1;61.3) | 35.4\* (0.22;82.9) | 48.48\* (4.08;118.31) |

Key: \* implies a deviation from the baseline estimated values with 95% Confidence Interval

Table 3 : Predicted ADL and IADL prevalence and Relative Change by sex, race and ethnicity for years 2000, 2010 and 2018, group aged 65-74

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ADL | | Prevalence 2000 | Prevalence 2010 | Prevalence 2018 | Relative Change 2000-2010 | Relative Change 2010-2018 | Relative Change 2000.2018 |
| Males | NH Whites | 2.64 (1.87-3.41) | 2.55 (1.96;3.14) | 3.08 (2.31;3.86) | -3.41  (-42.52;67.91) | 20.8  (-26.43;96.94) | 16.67  (-32.26;106.42) |
|  | NH Blacks | 4.47 (1.83;7.11) | 4.20 (1.77;6.64) | 5.01 (2.22;7.81) | -6.04  (-75.11;262.84) | 19.29  (-66.57;341.24) | 12.08  (-68.78;326.78) |
|  | Hispanics | 3.04 (0.50;6.02) | 3.06 (0.85;5.28) | 4.52 (2.09;6.95) | 0.66  (-86.29;956.00) | 47.71  (-60.42;717.65) | 48.68  (-66.29;1290.0) |
| Females | NH Whites | 2.31 (1.99;2.62) | 3.18\* (2.86;3.51) | 2.90 (2.55;3.25) | 37.66\* (9.16;76.38) | -8.81  (-27.35;13.64) | 25.54  (-2.67;63.32) |
|  | NH Blacks | 4.80 (3.60;6.01) | 5.66 (4.61;6.72) | 7.62 (6.17;9.06) | 17.92  (-23.29;86.67) | 34.63  (-8.18;96.53) | 58.75\* (2.66;151.67) |
|  | Hispanics | 3.47 (2.35;4.58) | 3.93 (3.01;4.85) | 5.20 (3.99;6.41) | 13.26  (-34.28;106.38) | 32.3  (-17.73;112.96) | 49.86  (-12.88;172.77) |
| IADL | |  |  |  |  |  |  |
|  |  |  |  |  |
| Males | NH Whites | 4.34 (3.84;4.85) | 3.93 (3.55;4.31) | 4.67 (4.17;5.16) | -9.45  (-26.8;12.2) | 18.8  (-3.25;45.3) | 7.60  (-14.02;34.38) |
|  | NH Blacks | 5.75 (4.16;7.35) | 6.77 (5.38;8.15) | 7.51 (5.87;9.15) | 17.74  (-26.80;95.91) | 10.93  (-27.98;70.07) | 30.61  (-20.14;119.95) |
|  | Hispanics | 4.20 (2.76;5.65) | 5.03 (3.81;6.26) | 6.08 (4.60;7.56) | 19.76  (-32.57;126.81) | 20.87  (-26.52;98.43) | 44.76  (-18.58;173.91) |
| Females | NH Whites | 5.90 (5.39;6.41) | 6.66 (6.20;7.12) | 6.15 (5.65;6.65) | 12.88  (-3.20;32.10) | -7.66  (-20.65;7.26) | 4.24  (-11.86;23.38) |
|  | NH Blacks | 10.33 (8.53;12.12) | 10.69 (9.24;12.14) | 11.17 (9.49;12.86) | 3.48  (-23.76;42.32) | 4.49  (-21.83;39.18) | 8.13  (-21.70;50.76) |
|  | Hispanics | 5.87 (4.43;7.30) | 8.01 (6.67;9.35) | 8.44 (6.94;9.95) | 36.46  (-8.63;111.06) | 5.37  (-25.78;49.18) | 43.78  (-4.93;124.60) |

Key: \* implies a deviation from the baseline estimated values with 95% Confidence Interval

Table 4 : Predicted ADL and IADL prevalence and Relative Change by sex, race and ethnicity for years 2000, 2010 and 2018, group aged 75-84

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ADL | | Prevalence in 2000 | Prevalence in 2010 | Prevalence in 2018 | Relative Change 2000-2010 | Relative Change 2010-2018 | | Relative Change 2000.2018 |
| Males | NH Whites | 5.81 (5.04;6.58) | 5.07 (4.48;5.66) | 5.83 (5.06;6.61) | -12.74  (-31.91;12.30) | 14.99  (-10.60;47.54) | | 0.34  (-23.10;31.15) |
|  | NH Blacks | 6.84 (4.20;9.48) | 8.38 (5.95;10.81) | 8.34 (5.54;11.13) | 22.51  (-37.24;157.38) | -0.48  (-48.75;87.06) | | 21.93  (-41.56;165.00) |
|  | Hispanics | 7.60 (4.45;10.76) | 7.51 (5.29;9.73) | 6.81 (4.38;9.24) | -1.18  (-50.84;118.65) | -9.32  (-54.98;74.67) | -10.39  (-59.29;107.64) | |
| Females | NH Whites | 5.78 (5.20;6.37) | 6.17 (5.65;6.69) | 6.53 (5.86;7.20) | 6.75  (-11.30;28.65) | 5.83  (-12.41;27.43) | | 12.98  (-8.01;38.46) |
|  | NH Blacks | 11.64 (9.12;14.15) | 12.64 (10.56;14.71) | 13.14 (10.61;15.68) | 8.59  (-25.37;61.29) | 3.96  (-27.87;48.48) | | 12.89  (-25.02;71.93) |
|  | Hispanics | 8.42 (5.91;10.92) | 11.65 (9.39;13.91) | 13.66 (10.97;16.36) | 38.36  (-14.01;135.36) | 17.25  (-21.14;74.23) | | 62.23\* (0.46;176.82) |
| IADL | |  |  |  |  |  | |  |
|  |  |  |  | |  |
| Males | NH Whites | 9.28 (8.34;10.23) | 7.86 (7.15;8.57) | 9.08 (8.14;10.02) | -15.30  (-30.11;2.76) | 15.52  (-5.02;40.14) | | -2.16  (-20.43;20.14) |
|  | NH Blacks | 13.82 (10.19;17.45) | 13.07 (10.21;15.93) | 12.08 (8.88;15.27) | -5.43  (-41.49;56.33) | -7.57 (44.26;49.56) | | -12.59  (-49.11;49.85) |
|  | Hispanics | 10.51 (6.95;14.07) | 9.68 (7.29;12.07) | 8.81 (6.16;11.45) | -7.90  (-48.19;73.67) | -8.99  (-48.96;57.06) | | -16.18  (-56.22;64.75) |
| Females | NH Whites | 14.65 (13.72;15.58) | 13.40 (12.65;14.14) | 13.01 (12.09;13.93) | -8.53  (-18.81;3.06) | -2.91  (-14.50;10.12) | | -11.19  (-22.40;1.53) |
|  | NH Blacks | 23.37 (19.90;26.84) | 21.36 (18.77;23.95) | 20.01 (16.99;23.02) | -8.60  (-30.07;20.35) | -6.32  (-29.06;22.64) | | -14.38  (-36.70;15.68) |
|  | Hispanics | 14.30 (11.04;17.56) | 18.22 (15.45;20.98) | 19.07 (15.98;22.16) | 27.41  (-12.02;90.04) | 4.67  (-23.83;43.43) | | 33.36  (-9.00;100.72) |

Key: \* implies a deviation from the baseline estimated values with 95% Confidence Interval

List of Figures (Supplementary Material):

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