# Understanding the Utilization and Impacts of Home and Community Based Care Among Racial and Ethnic Dually Eligible Populations Using Home and Community-Based Services

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CENTER FOR CONSUMER ENGAGEMENT *in health innovation*
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*Research bridging policy and practice*

# Executive Summary

We provide new and updated information on the utilization of home and community-based care (HCBS) among older adults age 50 and over with long-term services and supports (LTSS) needs. Our particular focus is on an understudied yet particularly vulnerable population — people of color who are also dually eligible for Medicare and Medicaid. We conduct quantitative analyses using data from the 2010 to 2018 waves of the Health and Retirement Study (HRS), a nationally representative longitudinal survey of individuals age 50 and over which enables us to generalize results to the entire population. We identify whether and in what magnitude disparities exist in access to HCBS for dually eligible beneficiaries of color, whether patterns have changed over time, if there are differences by region or urban/rural residence status, and whether individuals of color have similar or different experiences compared to White beneficiaries. We also uncover factors associated with any differences in utilization and experience.

## Key findings include:

- The racial/ethnic composition of dually eligible beneficiaries has been shifting over the last decade towards an increasingly diverse and somewhat younger population, leading to a decline in the prevalence of LTSS needs among the dually eligible population.

- There are significant differences across racial and ethnic groups regarding whether and how LTSS needs were met. Hispanic beneficiaries stand out in their much higher reliance on informal (family) care to meet their LTSS needs rather than on HCBS. They are only half as likely to report unmet LTSS needs, despite relying much more heavily on family care.

- As the prevalence of HCBS utilization across this population has declined, the reported level of unmet need has increased. Yet, the odds of reporting an unmet need decline as individuals report higher levels of LTSS needs. Thus, as LTSS needs increase, they are more likely to be met by either or both informal (family) and paid HCBS.

- While many factors influence the use of HCBS, having a usual source of care is a key element of reducing racial/ethnic disparities in HCBS utilization

and in reducing reported unmet LTSS need. This is particularly true for people of color, who often avoid care due to issues of distrust, misinformation, and low expectations regarding outcomes.

- Beneficiaries who switched from Medicare fee-for-service to managed care had a significant increase in HCBS utilization. What is key about managed care effectiveness is its ability to procure and help maintain a usual source of care for beneficiaries.

- The groups that fare the best in managed care plans that successfully provide a usual source of care, are non-Hispanic Black and Hispanic beneficiaries. Thus, managed care may provide a particularly important point of leverage for reducing racial and ethnic disparities in HCBS utilization among dually eligible beneficiaries.

# Introduction

In our prior report to Arnold Ventures entitled, "Racial and Ethnic Disparities in Access to Home and Community-Based Services (HCBS) Among Medicare and Medicaid Dual Eligible Populations: An Environmental Scan of the Literature", we found a consensus among studies highlighting disparities in spending, access and outcomes associated with HCBS utilization. Specifically, the literature showed that racial and ethnic minorities are more likely to have unmet needs, less access to a wide variety of HCBS (and other types of care), have poorer health outcomes, and use and spend less on specific types of HCBS. As pointed out however, few explorations focused specifically on dually eligible beneficiaries, data collection on HCBS has been inconsistent, limited in scope, and often not standardized, and thereby making some study results more difficult to interpret. As well, many studies are based on analyses and datasets that are cross-sectional (rather than longitudinal) and often more than a decade old.

There have been dramatic changes in the healthcare landscape in recent years. Some of the more important include: the implementation of the Affordable Care Act; the dramatic growth in Medicare Advantage (MA) plans and state-based managed long-term services and supports (LTSS) programs; a plethora of new models designed to align financial and delivery incentives for individuals who are dually eligible for Medicare and Medicaid, and; the rebalancing of public financing (Medicaid) away from institutional care toward HCBS. As well, there is much greater awareness of racial and ethnic disparities in the delivery of health care services (including the parameters of access, quality, costs/spending and equity) in general and HCBS in particular, and a renewed focus on trying to address these issues. For these reasons, it is particularly important to update our knowledge and understanding of this most vulnerable of populations – dually eligible beneficiaries of color who utilize HCBS.

To that end, here we present information derived from analyses of a large longitudinal national dataset that oversamples racial and ethnic populations to explore and better understand both the utilization and impact of HCBS among Medicare-Medicaid enrollees from communities of color. Because this is such an understudied area, the generation of new quantitative (and qualitative) information will enable policymakers to develop better-informed policies to address racial and ethnic disparities in a set of services that are widely recognized as instrumental in helping people age in place in their homes and communities.

## Purpose

The purpose of this study is to provide new and updated information on HCBS utilization with a focus on people of color who are also dually eligible for Medicare and Medicaid. The key questions guiding our analyses include the following:

1. What disparities exist in access to home and community-based services (HCBS) for dually eligible beneficiaries of color?

2. When controlling for other socio-demographic characteristics, what is the magnitude of race and ethnic disparities in accessing and utilizing HCBS, and how has this changed over time?

3. How do potential race and ethnic disparities in HCBS access and service setting among dually eligible individuals differ by geography (region) and residence type (urban/suburban versus rural)?

4. How does the experience of individuals of color differ or mirror the experience of others and what are the factors associated with any differences in utilization and experience?

## Methods

*Data and Sample*

To address these research questions, we undertook a quantitative analysis utilizing data from the 2010 through 2018 waves of the Health and Retirement Study (HRS). This nationally representative, panel study of middle-aged and older adults (50 years of age and older) in the U.S. contains longitudinal data collected biennially since 1998. It has detailed information gathered on a variety of sociodemographic, health, economic, family/support, and lifestyle factors. To achieve a representative sample, the HRS has an oversample of African Americans and Hispanics. The variables that we draw from are obtained from both the core HRS survey and from data files created by the RAND Center for the Study of Aging.

We focused on data from 2010 forward because of the passage of the Patient Protection and Affordable Care Act (ACA) in 2010 which significantly changed the health care landscape and utilization trends since its implementation, in part by

significantly expanding Medicaid coverage. It did not make sense to look at data prior to 2010 since it would be very difficult to disentangle effects attributable to the change in the law from those associated with underlying trends before its passage. The most recent 2018 HRS sample of community-dwelling dually eligible beneficiaries aged 50 and older (N=1,429) was analyzed to describe their population characteristics and to examine these characteristics for potential differences in LTSS needs and home and community-based service (HCBS) utilization with a focus on racial and ethnic differences.

The 2010 through 2018 waves of HRS were analyzed to further understand long-term patterns in LTSS needs and HCBS utilization among dually eligible beneficiaries; specifically, exploring the longitudinal nature of any observed racial and ethnic disparities and how they are changing over time, we also identify factors that may moderate these disparities. Cross-wave data weights provided by the HRS were applied to adjust for the differential probability of selection and non-response in each wave and minimize potential bias.

*Measures*

The main variables for our analyses centered on measuring levels of LTSS need among dually eligible beneficiaries and whether and how LTSS needs were being met ("need met status"). Levels of LTSS needs were defined based on Instrumental Activities of Daily Living (IADLs), Activities of Daily Living (ADLs), and cognitive impairment in the following groupings:

- No LTSS Need: having no IADLs, no ADLs, and no cognitive impairment
- Low LTSS Need: having 1 or more IADLs, no ADLs, and no cognitive impairment
- Moderate LTSS Need: having 1 or more ADLs with any number of IADLs, and/or mild-to-moderate cognitive impairment.
- High LTSS Need: having 2 or more ADLs with any number of IADLs, and/or severe cognitive impairment.

"Need met status" was defined based on whether help was being received for LTSS needs and what kind of help in the following groupings:

- Need Met by Informal Care: receiving any help for LTSS needs (as defined above) from unpaid family/friends, but not utilizing any HCBS.
- Need Met by HCBS: utilizing any HCBS for LTSS needs even if also receiving help from informal care.

- Need Unmet – reporting LTSS needs, but receiving no help from informal care and/or HCBS.

It is important to note that the "Need met status" is designed to identify how needs are being addressed – formal, family or not at all – and not whether they are being addressed *adequately* or in whole or in part.

In the analyses that follow, we focus on these variables to describe the population: Age, Sex, Race and Ethnicity,[1] Education, Marital Status, Children living nearby, Retirement Status, Region of Residence, Rural Residence Status, Household Income, Net Wealth, Poverty Status, Government Benefits Status, Self-Rated Health, Chronic Conditions, Cognitive Impairment, Functional Limitations, Depression, Usual Source of Care Status, Managed Care/Fee-for-Service Status. Appendix A summarizes the way each is defined and measured in the descriptive and multivariate analyses.

*Analytical Strategy*

We first employed descriptive and bivariate analyses to characterize the sample of dually eligible beneficiaries and to observe any significant differences in the characteristics listed above based on what level of LTSS needs they have and whether or not they utilize formal paid HCBS for those needs (i.e. need met status). The descriptive and bivariate analyses specifically focus on identifying any key initial differences in race and ethnicity when it comes to the level of LTSS needs and the "need met" status. We also used descriptive and bivariate analyses longitudinally (2010 to 2018) to observe any patterns of change in the population of dually eligible beneficiaries over time and to understand long-term racial and ethnic disparity patterns in LTSS needs and HCBS utilization. Finally, we undertook multivariate analyses using a series of cross-sectional and lagged variables regression models (as well as longitudinal linear regression models looking at changes in variables over time) to (1) identify predictors of unmet LTSS need and HCBS utilization; (2) observe any racial and ethnic differences in unmet need and HCBS utilization that persist after controlling for comprehensive sociodemographic characteristics, and; (3) explore the possibility of managed care status and usual source of care status as moderators of racial and ethnic differences and HCBS utilization.

[1] One of the limitations of the HRS is that race and ethnicity are considered together which precludes us from disentangling ethnicities based on the categories provided by the HRS and small sample sizes. For that reason, we will refer to them both throughout the paper.

# Results

### *(1) LTSS Needs Among Dual Eligible Beneficiaries: Longitudinal Trends and Race Differences*

The 2018 wave of HRS survey data shows that the dually eligible beneficiaries sample is diverse with relatively poor health and low financial resources. As shown in Table 1 (Total Sample column), the sample had a mean age of approximately 70 and was comprised of a majority of females (64%) and people of color (32% non-Hispanic White, 35% non-Hispanic Black, 28% Hispanic, 5% non-Hispanic other)[2]. Only about one third of the sample was married/partnered (29%) while the rest was divorced (30%), widowed (28%) or never married (13%). Over half of the sample reported being in fair or poor health (58%) and beneficiaries reported an average of 3 chronic conditions, 1 ADL limitation, and 2 IADL limitations. As expected given the means-tested nature of the Medicaid program, average household income ($23,889; median of $14,448) and average total net wealth ($87,279; median of $3,200) were fairly low with 42% of the sample falling below the Federal Poverty Line (FPL) and 42% reporting the receipt of government benefits.

Looking at levels of LTSS Needs among dually eligible beneficiaries in Table 1, the data shows that males, non-Hispanic Black, higher educated, married/partnered, non-retired, higher income and net wealth, and healthier beneficiaries were significantly more likely to have no LTSS needs than their respective counterparts. In contrast, females, non-Hispanic White, less educated, unmarried/unpartnered, retired, lower income and net wealth, and poorer health beneficiaries were significantly more likely to have high LTSS needs. Further, those who reported having a usual source of care were significantly more likely to have lower levels of LTSS need.

[2] The category non-Hispanic other is not disaggregated enough to enable us to distinguish between Asian Americans, Pacific Islanders, and Native Americans in the sample.

**Table 1: 2018 Sample Characteristics for All Dually Eligible Beneficiaries 50 and over By LTSS Need Level Status**

| | No Need (N=686) | Low Need (N=138) | Moderate Need (N=191) | High Need (N=414) | Total Sample (N=1,429) |
|---|---|---|---|---|---|
| Age (mean) | 69.0 | 67.8* | 68.2 | 72.5* | 69.7 |
| *Median* | *68.0* | *66.0* | *66.0* | *72.0* | *68.0* |
| Female | 44.3%* | 9.8% | 15.0%* | 30.9%* | 64.1% |
| Male | 54.6%* | 9.6% | 10.3%* | 25.5%* | 35.9% |
| Non-Hispanic White | 44.0%* | 9.9% | 13.5% | 32.6% | 31.6% |
| Non-Hispanic Black | 52.1%* | 9.9% | 13.3% | 24.7%* | 34.8% |
| Non-Hispanic Other | 33.8%* | 20.8%* | 13.0% | 32.4% | 5.4% |
| Hispanic | 49.6%* | 7.2%* | 13.4% | 29.8%* | 28.2% |
| Education Years (mean) | 11.6 | 11.4 | 10.7* | 10.4* | 11.1 |
| *Median* | *12.0* | *12.0* | *12.0* | *11.0** | 12.0 |
| Married/Partnered | 52.9%* | 8.6% | 12.4% | 26.1%* | 29.3% |
| Divorced | 48.1% | 9.9% | 12.9% | 29.1% | 29.7% |
| Widowed | 43.0%* | 10.0% | 12.8% | 34.3%* | 28.1% |
| Never Married | 48.1% | 9.2% | 13.2% | 29.5% | 12.9% |
| Household Income (mean) | $28,256* | $24,754* | $19,008* | $18,603* | $23,889 |
| *Median* | *$15,824** | *$14,448** | *$12,918** | *$13,614** | $14,448 |
| Net Wealth (mean) | $124,569* | $56,947* | $60,070* | $51,532* | $87,279 |
| *Median* | *$10,000** | *$2,400** | *$1,000** | *$725** | *$3,200* |
| Below Federal Poverty Line (FPL) | 46.2%* | 10.8%* | 14.6%* | 28.4% | 42.1% |
| *Above FPL* | *49.3%** | *8.9%** | *12.3%** | *29.4%* | *57.9%* |
| Receives Government Benefits | 45.1%* | 11.3%* | 15.9%* | 27.7% | 42.2% |
| *No Government Benefits* | *50.1%** | *8.6%** | *11.4%** | *29.9%* | *57.8%* |
| Retired | 46.0%* | 9.6% | 12.7%* | 31.7%* | 71.2% |
| *Not Retired* | *52.9%** | *10.0%* | *14.8%** | *22.3%** | *28.8%* |
| Fair/Poor Self-Rated Health | 35.5%* | 9.2% | 15.7%* | 39.7%* | 57.2% |
| *Excellent/Good Self-Rated Health* | *64.7%** | *10.5%* | *10.1%** | *14.7%** | *42.8%* |
| Chronic Conditions (Mean) | 2.8* | 3.4 | 3.7 | 4.1* | 3.3 |
| *Median* | *3.0** | *3.5* | *4.0* | *4.0* | *3.0* |

**Table 1 — continued**

| | No Need (N=686) | Low Need (N=138) | Moderate Need (N=191) | High Need (N=414) | Total Sample (N=1,429) |
|---|---|---|---|---|---|
| Activities of Daily Living Limitations (ADLs) (mean) | 0.0* | 0.0 | 1.0 | 3.3* | 1.2 |
| *Median* | *0.0** | *0.0* | *1.0* | *3.0** | *1.0* |
| Instrumental ADLs (mean) | 0.0* | 1.6 | 1.9 | 5.8* | 2.2 |
| *Median* | *0.0** | *1.0* | *1.5* | *5.0** | *1.0* |
| Cognitive Impairment | 0.0%* | 0.0%* | 45.1%* | 54.9%* | 5.0% |
| *No Cognitive Impairment* | *49.0%** | *9.4%** | *13.3%** | *28.4%** | *95.0%* |
| Depression | 32.4%* | 11.2%* | 16.5%* | 39.8%* | 34.3% |
| *No Depression* | *56.1%** | *8.9%** | *11.6%** | *23.3%** | *65.7%* |
| Has Usual Source of Care | 48.8%* | 10.1%* | 14.8%* | 26.4%* | 79.1% |
| *No Usual Source of Care* | *45.2%** | *8.4%** | *7.7%** | *38.8%** | *20.9%* |
| Has Managed Care Plan | 48.0% | 9.1% | 14.2% | 28.7% | 48.3% |
| *Fee-for-Service* | *48.0%* | *10.3%* | *12.4%* | *29.2%* | *51.7%* |
| Northeast | 48.5% | 10.6% | 11.9% | 28.9%* | 19.4% |
| Midwest | 46.9% | 10.3% | 17.4%* | 25.4% | 17.0% |
| South | 52.2%* | 8.4%* | 13.0%* | 26.4% | 43.2% |
| West | 47.1% | 12.5%* | 14.1% | 26.2% | 20.4% |
| Rural Residence | 47.0% | 10.2% | 11.2%* | 31.6%* | 21.9% |
| *Urban/Suburban Residence* | *48.3%* | *9.6%* | *13.9%** | *28.2%** | *78.1%* |
| Resident Child or Child Living Nearby | 45.8%* | 9.5% | 14.1%* | 30.7%* | 61.2% |
| *No Resident Child or Child Living Nearby* | *51.5%** | *10.1%* | *12.1%** | *26.3%** | *38.8%* |

*Significant t-test difference at p<0.05.

In order to better understand these findings regarding LTSS needs among beneficiaries, particularly when exploring racial and ethnic differences, it is important to consider them in the larger context of how the population of dually eligible beneficiaries has changed over time. Figure 1 presents LTSS need levels among dually eligible beneficiaries from 2010 to 2018. While low and moderate LTSS need levels stay relatively stable over this time period, there is a notable decline in beneficiaries with high LTSS needs paired with an increase in beneficiaries with no LTSS needs. This is in large part explained by the observation that the mean age of dually eligible beneficiaries among those age 50 and over has also decreased by approximately 3 years over this same time period (Figure 2). In fact, the mean age of Dual Eligible beneficiaries in 2010 was 72.3 years, which corresponds to the mean age of high LTSS need beneficiaries in Table 1 of 72.5 years. Similarly, the mean age of beneficiaries in 2018 was 69.7 years, which corresponds to the mean age of 69.0 years for those with no LTSS needs in Table 1. This is likely related to changes in those eligible for Medicaid coverage due to expansions associated with the Affordable Care Act.

Figure 1: LTSS Need Levels for All Dually Eligible Beneficiaries Age 50 and over — 2010 to 2018

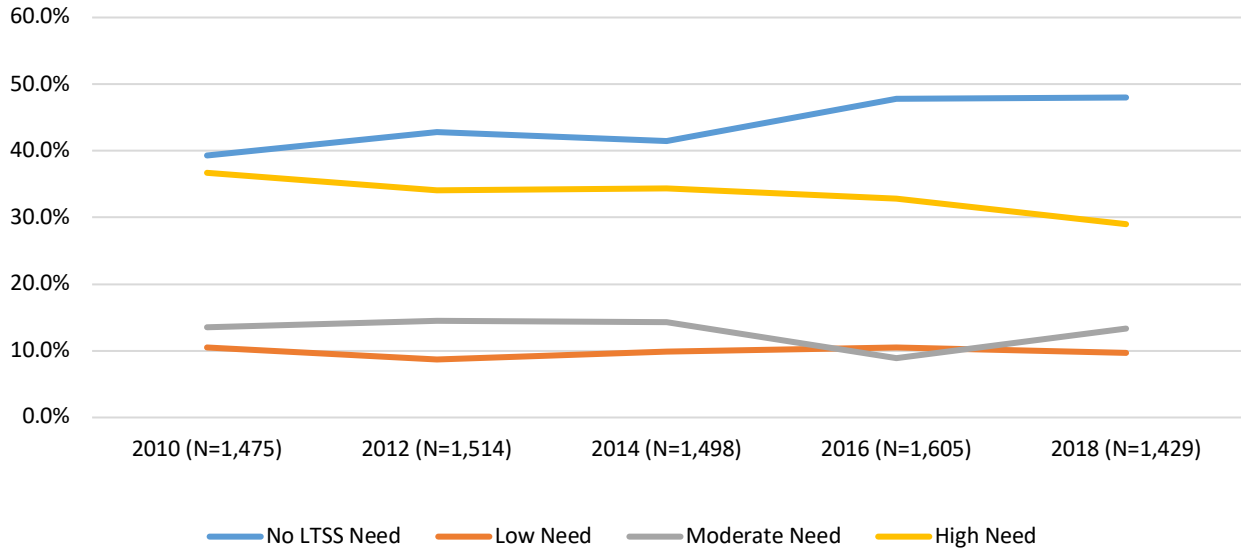



Figure 2: Mean Age for All Dually Eligible Beneficiaries age 50 and over from 2010 to 2018

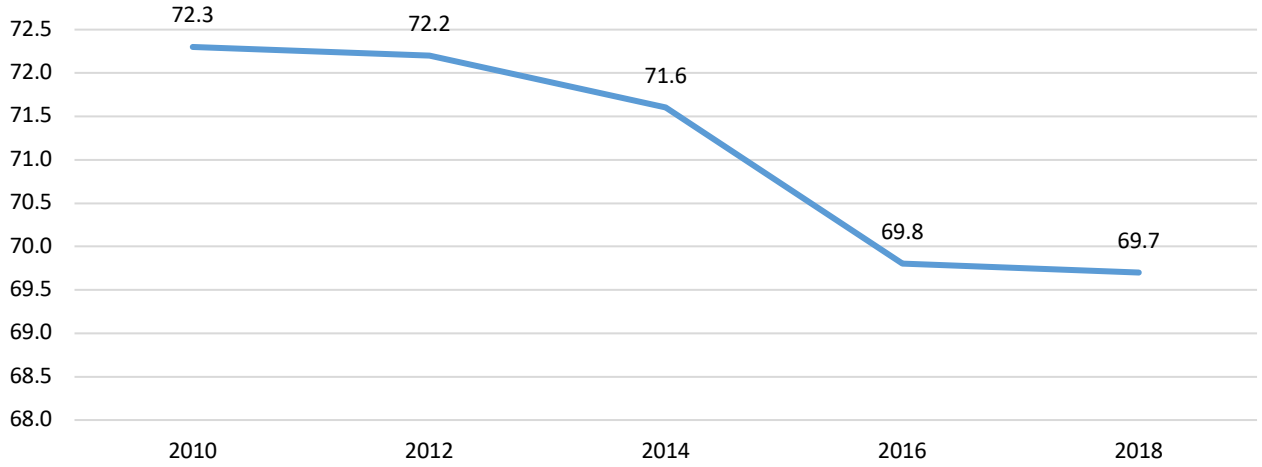
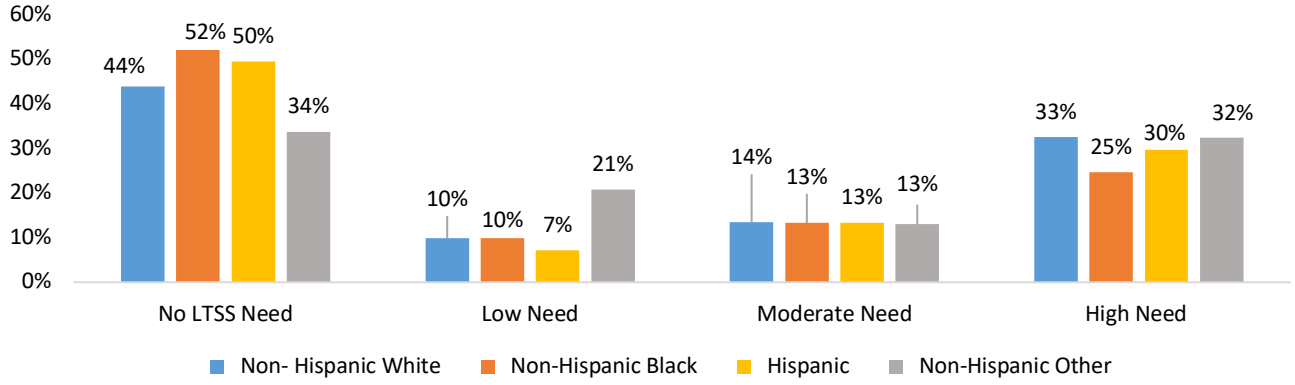


Figure 3 highlights LTSS need levels by race and ethnicity among the dually eligible population. As noted previously, non-Hispanic Black individuals have the highest rates of no LTSS needs (52%) and the lowest rates of high need (25%). Hispanics have the second highest rate of no LTSS needs (50%) and second lowest rate of high LTSS needs (30%). In comparison, non-Hispanic Whites were the race group with the greatest percentage of those with high LTSS needs (33%) and second lowest percentage of those with no LTSS need (44%). Although non-Hispanic Other individuals generally follow LTSS need patterns similar to that of non-Hispanic Whites, they have a strikingly higher percentage of low LTSS needs compared to the other race/ethnic groups. Again, it is important to note that the findings of non-Hispanic Other beneficiaries in this study are constrained by the small sample of this particular group which is a limitation of this analysis. Again, it is critical to interpret these racial and ethnic differences in LTSS need level within the context of how the population of dually eligible beneficiaries has changed over time.

Figure 3: 2018 LTSS Need Level for All Dually Eligible Beneficiaires by Race and Ethnicity




The HRS data shows that the racial and ethnic distribution of dually eligible beneficiaries has shifted towards being increasingly diverse from 2010 to 2018 (Figure 4). The percentage of non-Hispanic Whites decreased from 40% to 32% during this time period with the largest increase among beneficiaries of color observed for Hispanics (24% to 28%). The increase in racial and ethnic diversity among the population of dually eligible beneficiaries is notable because beneficiaries of color are significantly younger than non-Hispanic White beneficiaries.

As shown in Figure 5, a much higher percentage of non-Hispanic White beneficiaries were age 75 and older (45.3%) in 2018 compared to non-Hispanic Black (25.2%), non-Hispanic Other (27.8%), and Hispanic beneficiaries (34.3%). Higher percentages of beneficiaries of color were observed in younger age categories than for non-Hispanic Whites. These findings suggest that while non-Hispanic White beneficiaries may have higher levels of LTSS need than non-white beneficiaries, this is primarily due to the fact that they are older and are more likely to survive to ages where LTSS needs become more numerous. In addition to the growth in somewhat younger beneficiaries of color among the population of dually eligible beneficiaries, it is also possible that Dual Eligible enrollment is generally happening at younger ages when individuals have fewer LTSS needs.

Figure 4: Race and Ethnicity Distribution of Dually Eligible Beneficiaries 2010 to 2018

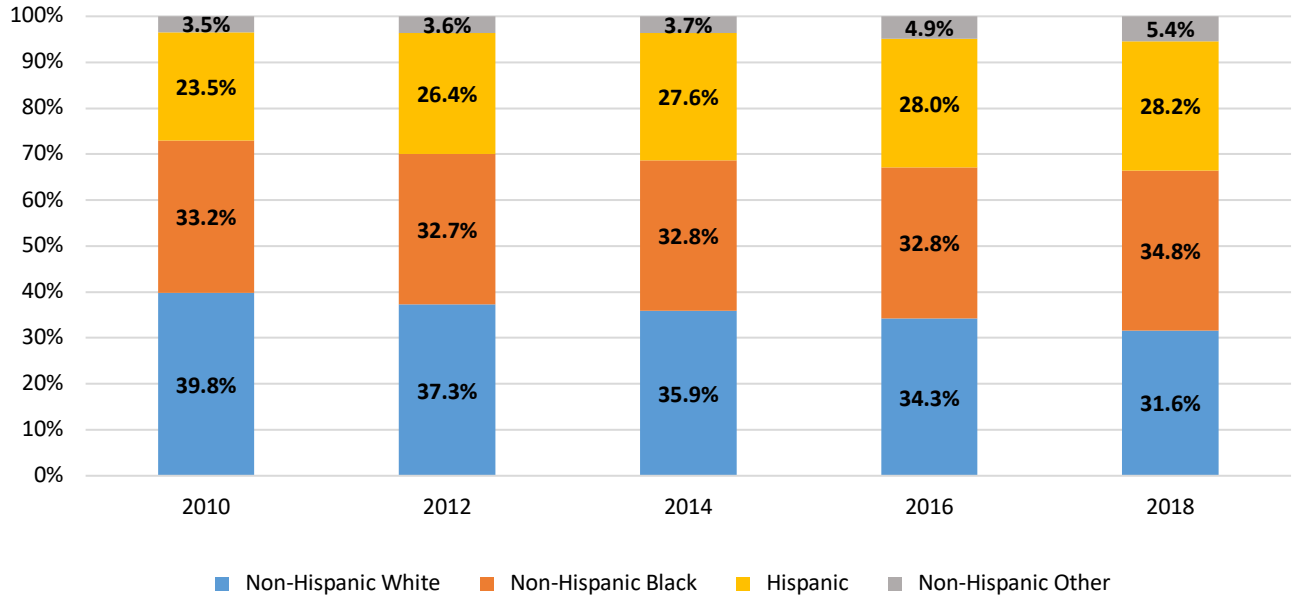
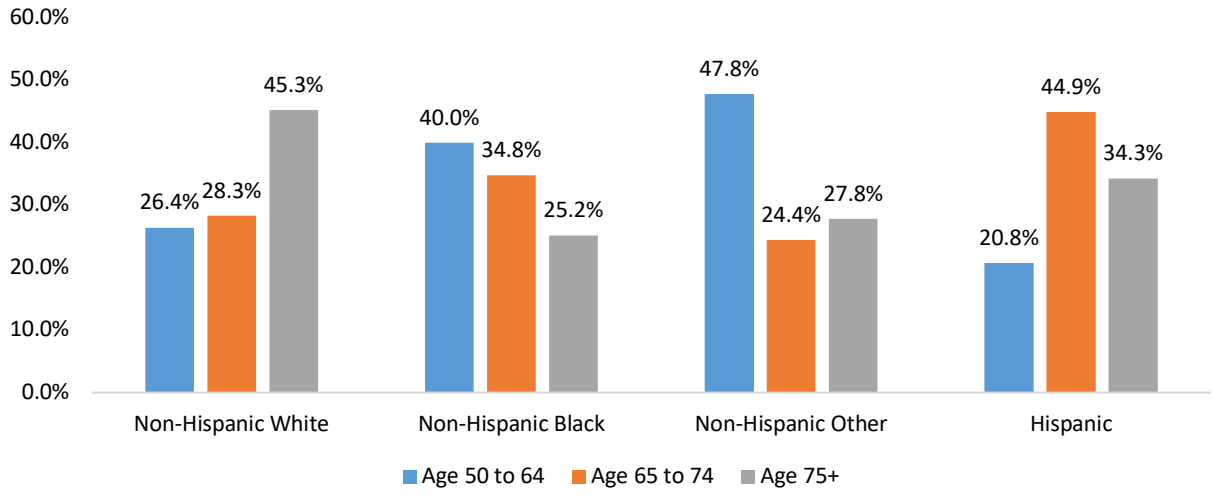


Figure 5: 2018 Age Distribution for All Dually Eligible Beneficiaries by Race and Ethnicity




*(2) Meeting LTSS Needs Among Dually Eligible Beneficiaries: Longitudinal Trends and Race and Ethnic Differences*

After identifying differences in LTSS need levels among dually eligible beneficiaries, we employed cross-sectional and longitudinal analysis to explore whether and how LTSS needs were being met with particular attention on determining whether there were racial and ethnic differences in HCBS utilization. For this analysis we primarily focused on dually eligible beneficiaries with one or more ADL limitations (i.e., moderate or high LTSS need level) since those with only IADL needs (i.e., low LTSS need level) rarely used HCBS services.

Table 2 presents the 2018 sample characteristics of dually eligible beneficiaries with one or more ADL limitations by the status of whether/how their LTSS needs were met. The data shows that beneficiaries who were younger, male, non-Hispanic Other, unmarried/unpartnered, lower income (but higher net wealth), not retired, living in rural areas (as well as in the Midwest region), in better health, or had no children living nearby were significantly more likely to have unmet LTSS needs compared to their respective counterparts. Further, those with a usual source of care and those who had a managed care plan were significantly less likely to have unmet needs.

Among beneficiaries whose LTSS needs were being met (Table 2), those who were older, female, non-Hispanic White, unmarried/unpartnered, higher income (but lower net wealth), retired, in poorer health, living in urban/suburban areas (as well as in the Northeast and Midwest regions), or had no children living nearby were more likely to utilize HCBS than their respective counterparts who were more likely to use informal care instead.

Perhaps most striking in Table 2 (and further presented in Figure 6) are the race and ethnic differences in whether LTSS needs were being met. Non-Hispanic Other beneficiaries reported the highest unmet need at 56% and also reported the lowest percentage of HCBS use (15%). Non-Hispanic Whites had the highest reported HCBS use, at 30% and were the only group that utilized HCBS more than family care to meet their LTSS needs.

Hispanic beneficiaries are particularly notable in that they rely most often on family care (50%) and report unmet need at roughly half the rate as any other race/ethnic group. Non-Hispanic Black beneficiaries had the second highest percentages of utilization for both HCBS (26%) and informal care (34%).

**Table 2: 2018 Characteristics for Dually Eligible Beneficiaries with LTSS Needs (1+ ADLs) — By Need Met Status**

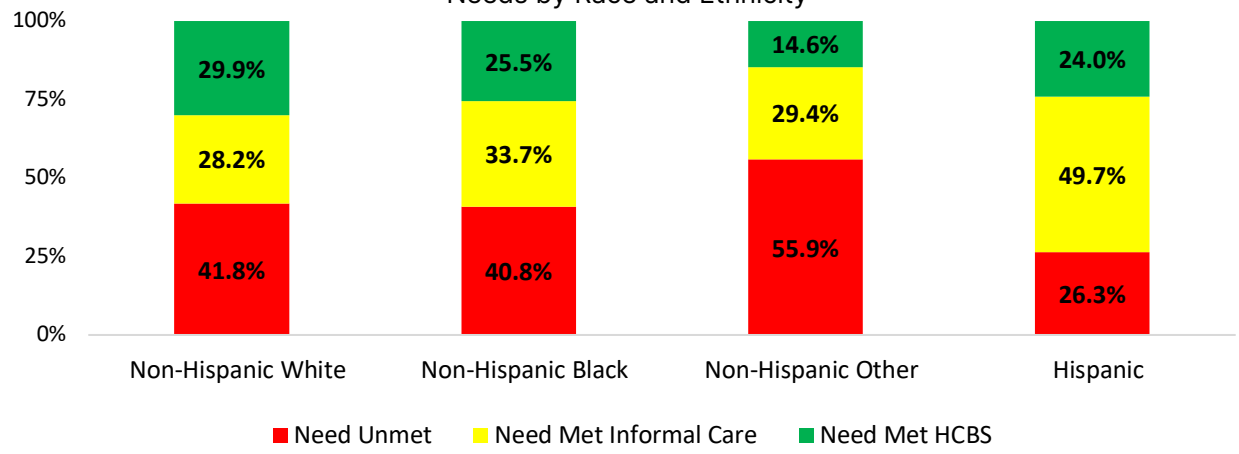
| Dually Eligible Beneficiaries with Moderate/Severe LTSS Needs (1+ ADLs) N= (604) | Need Unmet (N=227) | Need Met Informal Care (N=221) | Need Met HCBS (N=156) |
|---|---|---|---|
| Age (mean) | 68.0* | 70.5* | 73.6* |
| *Median* | *66.0** | *67.5** | *74.5** |
| Female | 36.7%* | 35.5%* | 27.8%* |
| Male | 39.4%* | 39.4%* | 21.1%* |
| Non-Hispanic White | 41.8%* | 28.2%* | 29.9%* |
| Non-Hispanic Black | 40.8%* | 33.7%* | 25.5%* |
| Non-Hispanic Other | 55.9%* | 29.4%* | 14.6%* |
| Hispanic | 26.3%* | 49.7%* | 24.0%* |
| Education Years (mean) | 11.3* | 9.7* | 10.2* |
| *Median* | *12.0** | *10.0** | *11.0** |
| Married | 30.5%* | 47.4%* | 22.1%* |
| Divorced | 34.2%* | 39.0%* | 26.8%* |
| Widowed | 32.9%* | 35.4%* | 31.7%* |
| Never Married | 36.4%* | 37.8%* | 25.9%* |
| Household Income (mean) | $16,972* | $18,326* | $20,699* |
| *Median* | *$12,172** | *$14,340** | *$13,665** |
| Net Wealth (mean) | $68,298* | $46,616* | $41,595* |
| *Median* | *$800** | *$600** | *$425** |
| Below Federal Poverty Line (FPL) | 42.5%* | 34.7%* | 22.8%* |
| *Above FPL* | *33.4%** | *38.3%** | *28.2%** |
| Receives Government Benefits | 43.8%* | 33.1%* | 23.1%* |
| *No Government Benefits* | *32.2%** | *39.7%** | *28.0%** |
| Retired | 35.5%* | 36.9% | 27.6%* |
| *Not Retired* | *43.5%** | *36.1%* | *20.4%** |
| Fair/Poor Self-Rated Health | 33.6%* | 38.5%* | 27.8%* |
| *Excellent/Good Self-Rated Health* | *50.0%** | *30.9%** | *19.1%** |

**Table 2 — Continued**

| Dually Eligible Beneficiaries with Moderate/Severe LTSS Needs (1+ ADLs) N= (604) | Need Unmet (N=227) | Need Met Informal Care (N=221) | Need Met HCBS (N=156) |
|---|---|---|---|
| Chronic Conditions (Mean) | 3.7* | 3.9 | 4.2* |
| *Median* | *4.0* | *4.0* | *4.0* |
| Activities of Daily Living Limitations (ADLs) (mean) | 1.7* | 2.9* | 3.3* |
| *Median* | *1.0** | *3.0* | *3.0* |
| Instrumental ADLs (mean) | 2.4* | 4.9* | 5.6* |
| *Median* | *2.0** | *4.6** | *5.0** |
| Cognitive Impairment | 23.1%* | 35.9% | 41.0%* |
| *No Cognitive Impairment* | *38.6%** | *36.7%* | *24.6%** |
| Depression | 39.9%* | 37.3% | 22.9%* |
| *No Depression* | *35.5%** | *36.1%* | *28.4%** |
| Has Usual Source of Care | 25.8%* | 34.2%* | 40.0%* |
| *No Usual Source of Care* | *27.3%** | *49.1%** | *23.6%** |
| Has Managed Care Plan | 25.6%* | 36.0%* | 38.4%* |
| *Fee-for-Service* | *36.0%** | *33.3%** | *30.7%** |
| Northeast | 37.9% | 27.4% | 34.7%* |
| Midwest | 44.7%* | 25.5% | 29.8%* |
| South | 38.7% | 40.9%* | 20.4%* |
| West | 38.0% | 41.0%* | 21.0%* |
| Rural Residence | 38.5%* | 36.8% | 24.8%* |
| *Urban/Suburban Residence* | *33.8%** | *37.6%* | *28.6%** |
| Resident Child or Child Living Nearby | 33.8%* | 37.3%* | 29.0%* |
| *No Resident Child or Child Living Nearby* | *40.2%** | *23.5%** | *36.3%** |

*Significant t-test difference at p<0.05

Figure 6: 2018 Need Met Status for Dually Eligible Beneficiaries with LTSS Needs by Race and Ethnicity




Note: Figure based on having LTSS Need defined as 1+ ADLs

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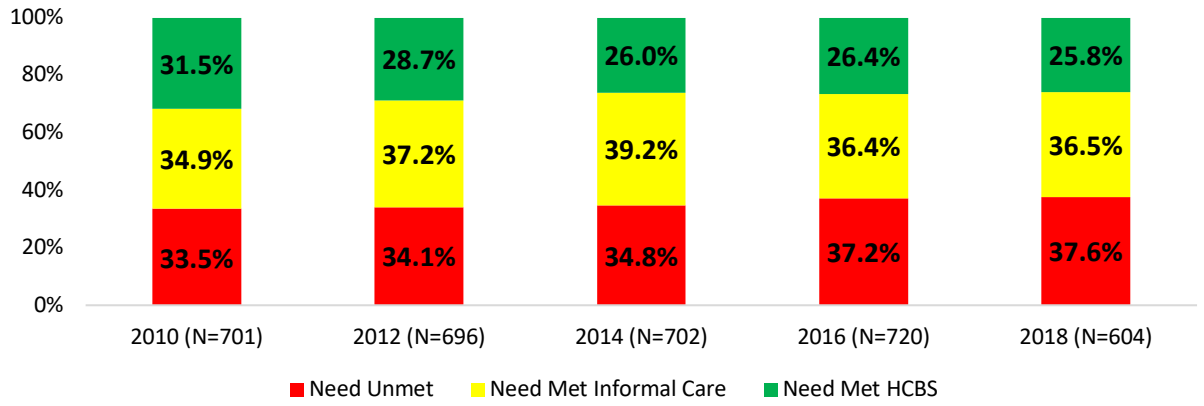
Looking longitudinally at need met status among dually eligible beneficiaries from 2010 to 2018 (Figure 7), significant patterns of change were observed in unmet need and in HCBS utilization. While the reported percentage of LTSS needs being met by informal care remained relatively stable over this time period, there was a steady growth in unmet need and a decline in HCBS utilization. Although this may seemingly indicate a troubling decrease in HCBS utilization among beneficiaries, it is important to consider that the growing diversity and younger age of the population of dually eligible beneficiaries over time (discussed in the section above) factors into these trends such that there may be a growing number of beneficiaries who have fewer LTSS needs and thus greater potential for these needs to go unmet or be met by informal care.

Additional longitudinal trend figures for need met status among all dually eligible beneficiaries as well as for stratifications of low and high LTSS need groups and racial and ethnic groups can be found in Appendix B (Appendix Figures 1 through 11).

Figure 7: Need Met Status for Dually Eligible Beneficaires with LTSS Needs (2010 to 2018)




Note: Figure based on having LTSS Need defined as 1+ ADLs.

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In order to gain deeper insight into what factors into dually eligible beneficiaries having unmet needs, we utilized both cross-sectional and lagged variable regression analyses. Table 3 presents logistic regression results for predictors of unmet need among dually eligible beneficiaries who had any level of LTSS need (i.e., one or more limitations in IADLs or ADLs). The findings were in line with those of the bivariate analyses above. Those with higher levels of LTSS need had significantly lower unmet needs, that is, they were more likely to seek out care to meet their needs; specifically, the odds of having unmet need were 36% lower for each level increase in LTSS need. Compared to their non-Hispanic White counterparts, Hispanic beneficiaries had 37% lower odds of having unmet LTSS needs; no other significant racial and ethnic difference were observed.

Being divorced was associated with 54% higher odds of having unmet LTSS needs, as was having lower income (87% to 95% higher odds), and living in the Midwest (78% higher odds). Particularly interesting was that having a usual source or care was significantly associated with 53% lower odds of having unmet LTSS needs, the variable in the model with the greatest odds reduction.

**Table 3: Cross-sectional Logistic Regression for Predictors of Unmet Need among Dually Eligible Beneficiaries with any LTSS Needs in 2018**

| Dependent Variable: 2018 Unmet Need (1=yes, 0=no) | N= 743 | |
|---|---|---|
| Independent Variables 2018 | Odds Ratio | Significance Level |
| Need Level (1 to 3; 1=low need; 3=high need) | 0.64* | 0.01 |
| Age | 0.99 | 0.18 |
| Female | 0.84 | 0.38 |
| Non-Hispanic Black | 0.86 | 0.49 |
| Non-Hispanic Other | 1.12 | 0.75 |
| Hispanic | 0.63* | 0.03 |
| Education Years | 1.01 | 0.61 |
| Divorced | 1.54* | 0.04 |
| Widowed | 1.19 | 0.52 |
| Never Married | 1.35 | 0.33 |
| Household Income Less than $10k | 1.95* | 0.01 |
| Household Income $10k to $20K | 1.87* | 0.01 |
| Net Wealth Less than $25k | 0.77 | 0.23 |
| Net Wealth $25k to $50K | 0.75 | 0.43 |
| Retired | 0.80 | 0.27 |
| Fair/Poor Self-Rated Health | 0.76 | 0.18 |
| Chronic Conditions | 0.91 | 0.13 |
| Depression | 1.20 | 0.32 |
| Midwest Residence | 1.78* | 0.05 |
| South Residence | 1.69 | 0.13 |
| West Residence | 1.44 | 0.20 |
| Rural Residence | 0.77 | 0.24 |
| Resident Child or Child Living Nearby | 0.76 | 0.12 |
| Has Managed Care Plan | 1.07 | 0.70 |
| Has Usual Source of Care | 0.47* | 0.00 |
| *Model* $R^2$ | 0.84 | |

*Significant predictor of having unmet need.

**Notes:** Reference groups are Male, NH White, Married, Household Income over $20k, Net Wealth over $50K, Not Retired, Excellent/Good Self-Rated Health, No Depression, Northeast Region, Urban/Suburban Residence, No Resident Child or Child Nearby, No Usual Source of Care, Fee-for-Service Plan. Any LTSS Needs includes those with any IADLs and/or ADLs.

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Table 4 presents the results of a lagged variable logistic regression which analyses the same variables above in 2016 in predicting unmet LTSS need in 2018 among dually eligible beneficiaries who had any LTSS needs from 2016 to 2018. This type of regression model provides for a better assessment of the casual

direction of any significant effects and can also separate out effects that are time relative or time sensitive. In the results of this model, there are fewer significant predictors when examining which variables in 2016 significantly impacted whether someone had unmet LTSS needs on 2018.

In line with cross-sectional findings, those with higher levels of LTSS need in 2016 had lower odds of unmet LTSS needs in 2018 (26% lower odds for each increased level of need). Paired with the cross-sectional results, this is indicative of greater LTSS needs being a driver for seeking care for those needs. Along those lines, beneficiaries who were older in 2016 had lower odds of having unmet LTSS needs (2% lower odds for every additional year of age). Hispanic beneficiaries had 29% lower odds of unmet LTSS needs. Once again, having a usual source of care was the variable associated with having the lowest odds of having unmet LTSS needs (23% lower odds).

**Table 4: Lagged Variable Logistic Regression for Predictors of Unmet Need among Dually Eligible Beneficiaries with any LTSS Needs from 2016 to 2018**

| Dependent Variable: 2018 Unmet Need (1=yes, 0=no) (N=1,609) | | |
|---|---|---|
| **Independent Variables 2016** | **Odds Ratio** | **Significance Level** |
| Need Level (1 to 3; 1=low need; 3=high need) | 0.84* | 0.01 |
| Age | 0.98* | 0.02 |
| Female | 0.99 | 0.95 |
| NH Black | 0.96 | 0.85 |
| NH Other | 1.34 | 0.40 |
| Hispanic | 0.81* | 0.04 |
| Education Years | 1.00 | 0.96 |
| Divorced | 1.38 | 0.20 |
| Widowed | 1.11 | 0.69 |
| Never Married | 1.35 | 0.34 |
| Household Income Less than $10k | 0.68 | 0.17 |
| Household Income $10k to $20K | 1.29 | 0.23 |
| Net Wealth Less than $25k | 0.92 | 0.69 |
| Net Wealth $25k to $50K | 1.36 | 0.37 |
| Retired | 1.25 | 0.28 |
| Fair/Poor Self-Rated Health | 0.86 | 0.46 |
| Chronic Conditions | 0.97 | 0.56 |
| Depression | 1.38 | 0.09 |

**Table 4 — Continued**

| Dependent Variable: 2018 Unmet Need (1=yes, 0=no) (N=1,609) | | |
|---|---|---|
| **Independent Variables 2016** | **Odds Ratio** | **Significance Level** |
| | | |
| | | |
| Midwest Residence | 1.14 | 0.66 |
| South Residence | 1.14 | 0.61 |
| West Residence | 0.97 | 0.93 |
| Rural Residence | 0.82 | 0.38 |
| Resident Child or Child Living Nearby | 0.94 | 0.75 |
| Has Managed Care Plan | 1.08 | 0.67 |
| Has Usual Source of Care | 0.77* | 0.03 |
| *Model* $R^2$ | 0.72 | |

*Significant predictor of having unmet need.

**Notes:** Reference groups are Male, NH White, Married, Household Income over $20k, Net Wealth over $50K, Not Retired, Excellent/Good Self-Rated Health, No Depression, Northeast Region, Urban/Suburban Residence, No Resident Child or Child Nearby, No Usual Source of Care, Fee-for-Service Plan. Any LTSS Needs includes those with any IADLs and/or ADLs.

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Taken together, the bivariate and regression findings regarding levels of LTSS needs among dually eligible beneficiaries and what predicts whether those needs are being met or not laid the groundwork for better understanding potential differences in the utilization of HCBS. In particular, differences in Hispanic beneficiaries' LTSS needs stood out among race and ethnic groups. So did the impact of having a usual source of care, which could be related to whether someone was enrolled in managed care versus fee-for-service Medicare. As such, these latter results are further considered in the section that follows.

*(3) Race and Ethnic Differences in HCBS Utilization among Dually Eligible Beneficiaries: The Moderating Role of Managed Care and Having a Usual Source of Care*

To investigate the main research question of whether there are racial and ethnic differences in HCBS utilization among dually eligible beneficiaries after accounting for sociodemographic factors, we first employed cross-sectional logistic regressions to analyze predictors of HCBS utilization among all dually eligible beneficiaries in 2018. In order to further explore the impact of having a usual source of care (and to separate out any potential effects of managed care), we utilized a series of three cross-sectional logistic regression models (see Table 5). In Model 1, all of the independent variables/control measures are included in the regression model except for usual source of care to provide a baseline measure of each variable's effect on HCBS use. Then in Model 2, the variable for having a usual source of care is added and this allows for identifying any variables whose effect size changes once having a usual source of care is added to the model. In Model 3, interaction terms are tested for the potential moderating effect of having a usual source of care on any variables that showed a notable change in effect size in Model 2 — when usual source of care was first added into the model. Whether or not an interaction term is significant in Model 3 is the way to determine whether having a usual source of care has an impact on HCBS use as a moderating factor.

**Table 5: Cross-sectional Logistic Regression for Predictors of HCBS Use among Dually Eligible Beneficiaries in 2018**

| Dependent Variable (2018 HCBS use 1=yes, 0=no) | MODEL 1 | | MODEL 2 | | MODEL 3 | |
|---|---|---|---|---|---|---|
| Independent Variables 2018 | Odds Ratio | Sig. | Odds Ratio | Sig. | Odds Ratio | Sig. |
| Need Level (0 to 3; 0=no need; 3=high need) | 1.56 | 0.00 | 1.58 | 0.00 | 1.57 | 0.00 |
| Age | 1.03 | 0.00 | 1.03 | 0.00 | 1.03 | 0.00 |
| Female | 1.10 | 0.57 | 1.09 | 0.61 | 1.09 | 0.61 |
| NH Black | 0.79 | 0.09 | 0.82 | 0.06 | 0.84 | 0.06 |
| NH Other | 0.79 | 0.48 | 0.79 | 0.48 | 0.78 | 0.47 |
| Hispanic | 0.65 | 0.03 | 0.71 | 0.05 | 0.75 | 0.05 |
| Education Years | 1.01 | 0.61 | 1.01 | 0.66 | 1.01 | 0.64 |
| Divorced | 1.03 | 0.88 | 1.03 | 0.88 | 1.03 | 0.87 |
| Widowed | 1.39 | 0.04 | 1.39 | 0.04 | 1.38 | 0.04 |
| Never Married | 1.17 | 0.54 | 1.17 | 0.54 | 1.18 | 0.53 |
| Household Income | 1.00 | 0.08 | 1.00 | 0.09 | 1.00 | 0.08 |
| Net Wealth Less than $25k | 1.52 | 0.02 | 1.52 | 0.02 | 1.53 | 0.03 |
| Net Wealth $25k to $50K | 0.90 | 0.74 | 0.89 | 0.71 | 0.90 | 0.75 |
| Retired | 1.15 | 0.43 | 1.16 | 0.40 | 1.15 | 0.44 |
| Fair/Poor Self-Rated Health | 1.49 | 0.02 | 1.49 | 0.02 | 1.50 | 0.02 |
| Chronic Conditions | 1.13 | 0.01 | 1.13 | 0.02 | 1.12 | 0.02 |
| Depression | 1.06 | 0.71 | 1.07 | 0.66 | 1.07 | 0.66 |
| Midwest Residence | 0.95 | 0.82 | 0.94 | 0.78 | 0.92 | 0.73 |
| South Residence | 0.81 | 0.27 | 0.81 | 0.28 | 0.79 | 0.29 |
| West Residence | 0.71 | 0.25 | 0.71 | 0.25 | 0.70 | 0.26 |
| Rural Residence | 0.86 | 0.44 | 0.87 | 0.47 | 0.88 | 0.51 |
| Resident Child or Child Living Nearby | 0.98 | 0.58 | 0.98 | 0.58 | 0.98 | 0.58 |
| Has Managed Care Plan | 1.10 | 0.51 | 1.09 | 0.59 | 1.08 | 0.59 |
| Has Usual Source of Care | | | 1.40 | 0.03 | 1.38 | 0.03 |
| NH Black & Usual Source of Care Interaction | | | | | 0.60 | 0.03 |
| Hispanic & Usual Source of Care Interaction | | | | | 0.72 | 0.02 |
| NH Other & Usual Source of Care Interaction | | | | | 0.89 | 0.36 |
| *Model R2* | 0.68 | | 0.70 | | 0.72 | |

*Significant predictor of having unmet need; OR=Odds Ratio

**Note:** Reference groups are Male, NH White, Married, Net Wealth over $50K, Not Retired, Excellent/Good Self-Rated Health, No Depression, Northeast Region, Urban/Suburban Residence, No Resident Child or Child Nearby, No Usual Source of Care, Fee-for-Service Plan.

In Model 1 of Table 5, we see similar results regarding the factors predicting HCBS utilization as well as being significantly associated with unmet LTSS needs. Again, dually eligible beneficiaries with higher levels of LTSS needs had significantly higher odds of utilizing HCBS (56% higher odds with each increase in level of LTSS need). Older age was associated with higher odds of HCBS use (3% higher odds for each year of additional age) as well being widowed (39% higher odds)

and having net wealth under $25,000 (52% higher odds). As would be expected, beneficiaries who reported fair/poor health had 49% higher odds of HCBS use as did those with more chronic conditions (13% higher odds for each additional chronic condition). Once again, the only significant ethnic difference once sociodemographic factors were controlled for was observed among Hispanic beneficiaries who had 35% lower odds of utilizing HCBS compared to non-Hispanic whites. Also of note was that managed care was not a significant predictor of HCBS use.

In Model 2 of Table 5, adding the variable for usual source of care did not substantially change the effect sizes/significance levels of any other variables on HCBS use except for race or ethnicity variables. First, those with a usual source of care had 40% higher odds of using HCBS. Adding usual source of care into the model also reduced both the effect size and significance level of being Hispanic. Thus, were tested in Model 3 to determine whether having a usual source of care moderates the associations between race and ethnicity and HCBS use.

Model 3, which tests interaction terms for usual source of care and each race and ethnic group, shows that the interaction terms for Hispanic beneficiaries and usual source of care as well as non-Hispanic Black beneficiaries and usual source of care are significant. The results illustrate that having a usual source of care weakens the association between Hispanic beneficiaries and lower odds of HCBS use. In other words, among Hispanic beneficiaries, having a usual source of care increases the odds of utilizing HCBS. The findings are more complicated for non-Hispanic Black beneficiaries. There were no significant differences in HCBS utilization observed in Models 1 and 2 for non-Hispanic Black beneficiaries compared to non-Hispanic White beneficiaries, but the interaction of usual source of care and non-Hispanic Black beneficiaries is significant. This indicates that White and Black race differences exist in HCBS use among dually eligible beneficiaries, but are dependent on usual source of care status (and cannot be disentangled from usual source of care status in their interpretation). Specifically, the findings show that when non-Hispanic Black beneficiaries have a usual source of care, they have higher odds than non-Hispanic White beneficiaries of utilizing HCBS. The opposite is also true such that when non-Hispanic Black beneficiaries don't have a usual source of care, they have lower odds than non-Hispanic White beneficiaries of utilizing HCBS. No significant findings were observed for non-Hispanic Other beneficiaries across these cross-sectional models.

We used this same modeling approach to also look at lagged variable logistic regression models where the independent/control variables were measured in 2016 to predict HCBS use in 2018 among those who were Dual Eligible beneficiaries throughout that time period. The results were the same as those seen in the cross-sectional regression analysis of Table 5 with only small differences in the effect sizes of the significant predictors. The results are provided in Appendix B (Appendix Table 1).

To further investigate potential causal direction and the way in which the significant predictors of HCBS use unfold over a longer time period, we completed longitudinal ordinary least squares (OLS) regression analysis. Specifically, we analyzed the change in independent/control measures from 2014 to 2018 in predicting the change in HCBS use during the same period. In order to take away the potentially confounding effect of becoming a new dually eligible beneficiary, we only included beneficiaries in the analysis who had been dually eligible beneficiaries throughout the entire time period of 2014 to 2018. Once again, we employed the same series of three regression models to decipher the impact of having a usual source of care by strategically adding this variable into the model and determining its significance as a moderator.

In Model 1 of Table 6, findings are generally consistent with those in the cross-sectional and lagged regression models. Beneficiaries whose LTSS need levels increased during 2014 to 2018 had increases in HCBS use over the same time period. Increases in age, becoming widowed, and increases in chronic conditions over time were significantly associated with increases in HCBS use. As in prior findings, Hispanic beneficiaries had significantly less HCBS utilization over time than their non-Hispanic White counterparts with no significant findings for the other race and ethnic groups. Also of interest was that moving to a rural residence was significantly associated with less HCBS use over time, likely due to fewer resource availability in these areas. Unlike in the prior regression analyses where managed care was captured at a static time point measuring whether a beneficiary was enrolled in a managed care plan or not, this type pf regression models captures the effect of a beneficiary changing their care plan to managed care. As seen in Model 1 (Table 6), beneficiaries who changed to managed care during 2010 to 2018 had a significant increase in HCBS utilization during this same time period.

## Table 6: Longitudinal OLS Regression Predicting Change in HCBS Use Among Dually Eligible Beneficiaries from 2014 to 2018

| Dependent Variable: Change in HCBS use 2014 to 2018 (N=621) | MODEL 1 | | | MODEL 2 | | | MODEL 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| **Independent Variables: Change from 2014 to 2018** | *B* | **SE B** | **Sig.** | *B* | **SE B** | **Sig.** | *B* | **SE B** | **Sig.** |
| Need Level (0 to 3; 0=no need; 3=high need) | 0.22* | 0.08 | 0.01 | 0.22* | 0.08 | 0.01 | 0.22* | 0.07 | 0.01 |
| Age | 0.01* | 0.00 | 0.01 | 0.01* | 0.00 | 0.01 | 0.01* | 0.00 | 0.01 |
| Female | 0.05 | 0.08 | 0.51 | 0.05 | 0.08 | 0.52 | 0.06 | 0.09 | 0.52 |
| Non-Hispanic Black | -0.11 | 0.10 | 0.29 | -0.11 | 0.10 | 0.29 | -0.12 | 0.10 | 0.28 |
| Non-Hispanic Other | -0.22 | 0.18 | 0.23 | -0.22 | 0.19 | 0.24 | -0.22 | 0.19 | 0.24 |
| Hispanic | -0.11* | 0.04 | 0.03 | -0.15* | 0.04 | 0.03 | -0.16* | 0.04 | 0.03 |
| Education Years | 0.00 | 0.01 | 0.35 | 0.00 | 0.01 | 0.35 | 0.00 | 0.01 | 0.35 |
| Divorced | 0.33 | 0.22 | 0.14 | 0.33 | 0.23 | 0.15 | 0.33 | 0.23 | 0.15 |
| Widowed | 0.33* | 0.15 | 0.04 | 0.33* | 0.15 | 0.04 | 0.33* | 0.16 | 0.04 |
| Never Married | 0.44 | 0.22 | 0.14 | 0.45 | 0.26 | 0.09 | 0.44 | 0.27 | 0.10 |
| Household Income (log) | 0.02 | 0.02 | 0.49 | 0.02 | 0.02 | 0.49 | 0.02 | 0.02 | 0.49 |
| Net Wealth (log) | 0.00 | 0.02 | 0.87 | 0.00 | 0.02 | 0.87 | 0.00 | 0.02 | 0.87 |
| Retired | 0.01 | 0.07 | 0.87 | 0.01 | 0.07 | 0.87 | 0.01 | 0.08 | 0.88 |
| Fair/Poor Self-Rated Health | 0.08 | 0.07 | 0.28 | 0.08 | 0.08 | 0.29 | 0.08 | 0.08 | 0.29 |
| Chronic Conditions | 0.11* | 0.05 | 0.03 | 0.11* | 0.05 | 0.03 | 0.11* | 0.05 | 0.03 |
| Depression | -0.12 | 0.07 | 0.09 | -0.12 | 0.07 | 0.09 | -0.13 | 0.07 | 0.09 |
| Midwest Residence | 0.04 | 0.14 | 0.79 | 0.04 | 0.14 | 0.79 | 0.04 | 0.14 | 0.79 |
| South Residence | -0.03 | 0.12 | 0.79 | -0.03 | 0.12 | 0.80 | -0.04 | 0.12 | 0.80 |
| West Residence | -0.03 | 0.15 | 0.85 | -0.03 | 0.15 | 0.84 | -0.03 | 0.15 | 0.84 |
| Rural Residence | -0.20* | 0.09 | 0.03 | -0.20* | 0.09 | 0.03 | -0.21* | 0.08 | 0.03 |
| Resident Child or Child Living Nearby | -0.07 | 0.10 | 0.46 | -0.07 | 0.10 | 0.48 | -0.07 | 0.09 | 0.47 |
| Has Managed Care Plan | 0.17* | 0.06 | 0.01 | 0.11* | 0.04 | 0.04 | 0.12* | 0.05 | 0.04 |
| Has Usual Source of Care | | | | 0.25* | 0.08 | 0.01 | 0.24* | 0.08 | 0.01 |
| Non-Hispanic Black & Usual Source of Care Interaction | | | | | | | -0.11 | 0.06 | 0.07 |
| Hispanic & Usual Source of Care Interaction | | | | | | | -0.28* | 0.09 | 0.02 |
| Non-Hispanic Other & Usual Source of Care Interaction | | | | | | | -0.09 | 0.08 | 0.54 |
| Managed Care & Usual Source of Care Interaction | | | | | | | 0.30* | 0.12 | 0.02 |
| *Adjusted* $R^2$ | 0.4 | | | 0.42 | | | 0.45 | | |

*Significant predictor of having unmet need. B= unadjusted Beta coefficient; SE B= Standard Error; Sig.= significance level.

**Notes:** Reference groups are Male, NH White, Married, Not Retired, Excellent/Good Self-Rated Health, No Depression, Northeast Region, Urban/Suburban Residence, No Resident Child or Child Nearby, No Usual Source of Care, Fee-for-Service Plan.

Model 2 of Table 6, also shows that having a change in usual source of care during 2010 to 2018 had its own significant independent effect on the change in HCBS use during that time period; specifically, beneficiaries who acquired a usual source of care had increases in HCBS utilization. Adding the variable for change in usual source of care into the model only had a substantial impact on the effect sizes/significance levels of race/ethnicity variables and managed care. Thus, interaction terms for change in usual source of care with each race/ethnic group and with change in managed care were tested in Model 3. Results will enable us to understand whether having a usual source of care acts as a moderator.

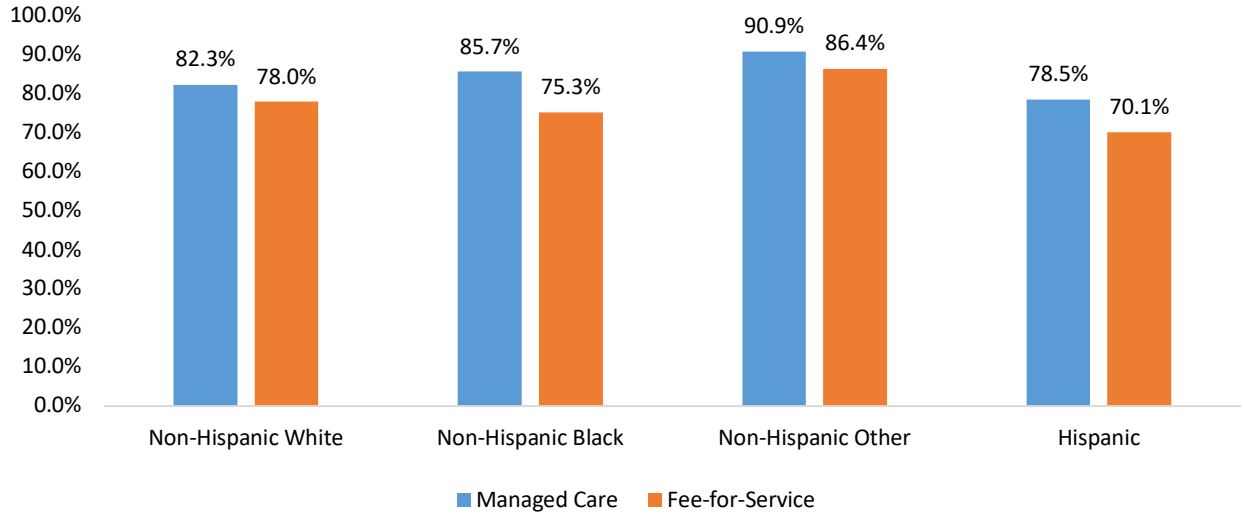
Model 3 results show that the interaction terms for Hispanic beneficiaries, non-Hispanic Black beneficiaries, and change in managed care with change in usual source of care are all significant. This indicates that acquiring a usual source of care weakens the association between Hispanic beneficiaries and less HCBS use over time. In other words, among Hispanic beneficiaries, acquiring a usual source of care during 2010 to 2018 increased HCBS use during that same period.

Once again, the findings are more complex for non-Hispanic Black beneficiaries. There were no significant differences in change in HCBS utilization from 2014 to 2018 observed in Models 1 and 2 for non-Hispanic Black beneficiaries compared to non-Hispanic White beneficiaries, but the interaction of change in usual source of care and non-Hispanic Black beneficiaries is significant. This indicates that White and Black race differences exist in changes in HCBS use over time among dually eligible beneficiaries, but are dependent on changes on usual source of care status. Specifically, the findings show that when non-Hispanic Black beneficiaries acquired a usual source of care during 2010 to 2018, they had greater increases in HCBS utilization during that same time period than non-Hispanic Whites. Further, when non-Hispanic Black beneficiaries lose a usual source of care from 2010 to 2018s, they had greater decreases in HCBS use during this time period than their non-Hispanic White counterparts. No significant findings were observed for non-Hispanic Other beneficiaries across these longitudinal change models.

Also of great interest is that the interaction between change in usual source of care and change in managed care is significant and indicates that acquiring a usual source of care strengthens the association between switching to a managed care plan and increased HCBS use over time. These results strongly suggest that the critical component in the association between switching to a managed care plan and increased HCBS use is whether or not the acquisition of a usual source of care also occurred in that transition.

Given the above findings regarding racial and ethnic differences in HBCS use among dually eligible beneficiaries and the impact of usual source of care, we examined the 2018 percentages of dually eligible beneficiaries with a usual source of care broken down by race, ethnicity and managed care plan status. Figure 8 shows that dually eligible beneficiaries in managed care plans are significantly more likely to have a usual source of care than beneficiaries in fee-for-service plans. While this finding is true across race groups, the data highlight the fact that managed care plans are particularly effective in providing a usual source of care for non-Hispanic Black beneficiaries and Hispanic beneficiaries compared to fee-for-service plans. The full 2018 sample characteristics for all dually eligible beneficiaries by managed care versus fee-for-service status are provided in Appendix B (Appendix Table 2).

Figure 8: 2018 Percentage of Dually Eligible Beneficiaires with a Usual Source of Care by Managed Care Status, Race and Ethnicity



## Limitations

It is important to note that the study has a number of limitations, primarily related to the data source. Because the HRS captures data every two years, we are unable to track trends in utilization within each two-year period, so we are likely missing a level of nuance in the use of services over time. Second, because we are focusing in on a very specific sub-set of the population, we have a relatively small sample size for one group in particular, the non-Hispanic Other race group. This means that results for this group must be interpreted with caution. Moreover, and perhaps most importantly, the HRS does not consider race and ethnicity separately, but instead they are considered together. This encumbers our ability to disentangle ethnicities based on the categories provided by the HRS and the small sample sizes. For that reason, we will refer to them both throughout the paper. Third, the HRS is based on a national sampling method so that results cannot be applied to specific states. Finally, because the variable used to identify HCBS users is based on a general question regarding whether someone is receiving any HCBS, we are unable to completely distinguish the specific needs that the services are addressing. Even so, the analyses presented here paint a more complete and accurate picture of current and trending HCBS use among the population of beneficiaries dually eligible for Medicare and Medicaid.

## Conclusions

The analyses presented here point to a dynamic change in the profile of individuals age 50 and over who are dually eligible for Medicare and Medicaid which has implications for utilization of HCBS. The racial and ethnic composition of dually eligible beneficiaries has been shifting over the last decade towards an increasingly diverse population, which is important because beneficiaries of color are significantly younger than non-Hispanic White beneficiaries. The implication is that the prevalence of LTSS needs among the dually eligible population is actually declining due to the younger population age mix and because persons of color are less likely to survive to ages where LTSS needs become more prevalent.

Even among individuals with LTSS needs we found significant differences across racial and ethnic groups regarding whether and how these needs were met. Hispanic beneficiaries stand out in their much higher reliance on informal (family) care to meet their LTSS needs. They are far less likely to access HCBS than other

groups. Surprisingly, they are only half as likely to report that they have unmet LTSS needs, despite relying much more heavily on family care.

The issue of unmet need is complicated. As the prevalence of HCBS utilization across this population has declined, the reported level of unmet need (i.e., needs that are not addressed through the provision of care) has increased. Yet, the odds of reporting an unmet need decline as individuals report higher levels of LTSS needs. Both the cross-sectional and longitudinal analyses showed this to be the case. The implication is that having greater LTSS need is strong catalyst for seeking care for those needs, but at lower levels of functional impairments, individuals are willing to forgo having their needs met.

A major theme emerging from the analysis is the criticality of having a usual source of care. Results indicate that having a usual source of care is a key element of reducing racial and ethnic disparities in HCBS utilization and in reducing unmet LTSS need. In the case of non-Hispanic Black beneficiaries compared to non-Hispanic White beneficiaries, having a usual source of care has the potential to significantly reverse disparities in utilization of HCBS. The counterfactual is also true: when non-Hispanic Black beneficiaries lose their usual source of care, they experience greater decreases in HCBS utilization than do their non-Hispanic White counterparts. Regarding Hispanic beneficiaries, having a usual source of care increases the odds of utilizing HCBS.

Finally, the role of managed care in reducing disparities in HCBS use is complex. On the one hand, cross-sectional analysis showed that enrollment in managed care in and of itself, is not a significant predictor of HCBS use. Over time, however, beneficiaries who switched from Medicare fee-for-service to managed care had a significant increase in HCBS utilization. Our modeling indicates that what is key about managed care effectiveness is its ability to procure a usual source of care for beneficiaries, something that indeed is far more likely in the managed care context. Beneficiaries in managed care who do not have a usual source of care are no more likely to access HCBS than their counterparts in fee-for-service Medicare. Moreover, the groups that fare the best in managed care plans that successfully provide a usual source of care, are non-Hispanic Black and Hispanic beneficiaries. Thus, managed care may provide a particularly important point of leverage for reducing racial/ethnic disparities in HCBS utilization among Dual Eligible beneficiaries.

## Appendix A — Independent/Control Variable Definitions and Measurement

**Age:** continuous variable measurement of age in years.

**Sex:** dichotomous variables for female (1=yes; 0=no) and male (1=yes; 0=no).

**Race and Ethnicity:** dichotomous variables (1=yes; 0=no) for each of the following mutually exclusive race/ethnic groups: non-Hispanic White, non-Hispanic Black, non-Hispanic Other, Hispanic.

**Education:** continuous variable measurement of years of education.

**Marital Status:** dichotomous variables (1=yes; 0=no) for each of the following mutually exclusive marital status groups: Married/Partnered, Divorced, Widowed, Never Married.

**Resident Child/Children Living Nearby:** dichotomous variable for whether or not an adult child in living in the respondent's household or within 10 miles of the respondent's primary residence (1=yes; 0=no).

**Retirement Status:** dichotomous variable for whether respondent is fully retired (1=yes; 0=no).

**Region of Residence:** dichotomous variables (1=yes; 0=no) for each of the following mutually exclusive residence in US Census region groups: Northeast, Midwest, South, West.

**Rural Residence Status:** dichotomous mutually exclusive variables for rural residence (1=yes; 0=no) and urban/suburban residence (1=yes; 0=no).

**Household Income:** continuous variable measurement in US dollars of all household income. For regression modeling there are two additional ways in which household income was measured: 1) In dichotomous variables (1=yes; 0=no) for each of the following mutually exclusive household income groups: Less than $10,000, $10,000 to $20,000, and More than $20,000; 2) The natural log of household income was utilized to reduce skewness in changes in household income over time.

**Net Wealth:** continuous variable measurement in US dollars of all property and financial assets minus any debts. For regression modeling there are two additional ways in which net wealth was measured: 1) In dichotomous variables (1=yes; 0=no) for each of the following mutually exclusive net wealth groups: Less than

$25,000, $25,000 to $50,000, and More than $50,000; 2) The natural log of net wealth was utilized to reduce skewness in changes in net wealth over time.

**Poverty Status:** dichotomous variable for whether respondent household income is below the Federal Poverty Line (1=yes; 0=no).

**Government Benefits Status:** dichotomous variable for whether respondent is receiving any government benefits (1=yes; 0=no) which include: Social Security Disability Insurance (SSDI), food stamps, welfare, and veterans' benefits.

**Self-Rated Health**: dichotomous variables (1=yes; 0=no) for each of the following mutually exclusive self-rated health groups: fair/poor health and excellent/good health.

**Chronic Conditions:** count variable measuring the self-reported total number of the following eight conditions: high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems, and arthritis.

**Cognitive Impairment:** dichotomous variables (1=yes; 0=no) for each of the following mutually exclusive cognition status groups: No Cognitive Impairment (total cognition score of 12 or higher), Mild-to-Moderate Cognitive Impairment (total cognition score of 7 to 11), Severe Cognitive Impairment (total cognition score of 6 or less). The Total Cognition Score ranges from 0 to 35 and is based on the following cognitive tasks: word recall, serial 7's, backwards counting, date/month/year/weekday knowledge, President/Vice President naming, and the summary score of the Mini Mental Status Exam.

**Functional Limitations:** two count variables measuring the self-reported total number of ADLs and IADLs. ADLs include difficulty with the following 5 activities: bathing, dressing, eating, getting in/out of bed, and walking across a room. IADLs include difficulty with the following 5 activities: using the phone, managing money, taking medications, shopping for groceries, and preparing hot meals.

**Depression:** dichotomous variable for whether respondent has depression based on scoring 3 or higher on the CES-D (1=yes; 0=no).

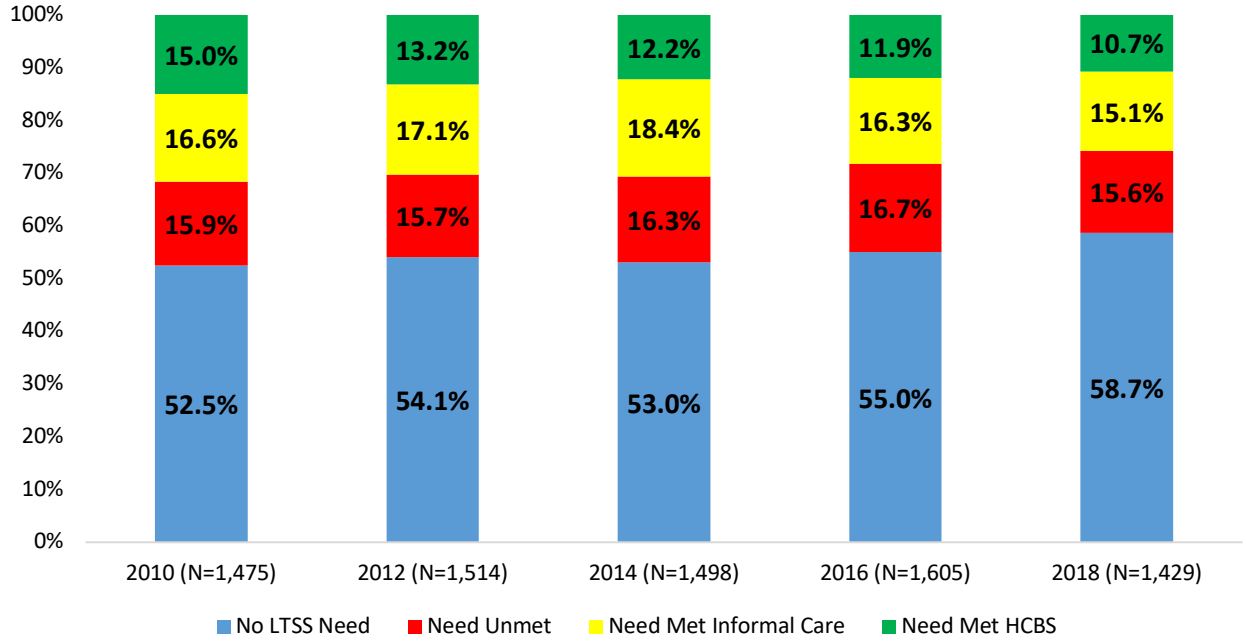
**Usual Source of Care Status:** dichotomous variable for whether respondent reports having a usual source of health care (1=yes; 0=no).

**Managed Care Status:** dichotomous variables (1=yes; 0=no) for each of the following mutually exclusive managed care status groups: Managed Care and Fee-for-Service.

# Appendix B - Additional Analyses

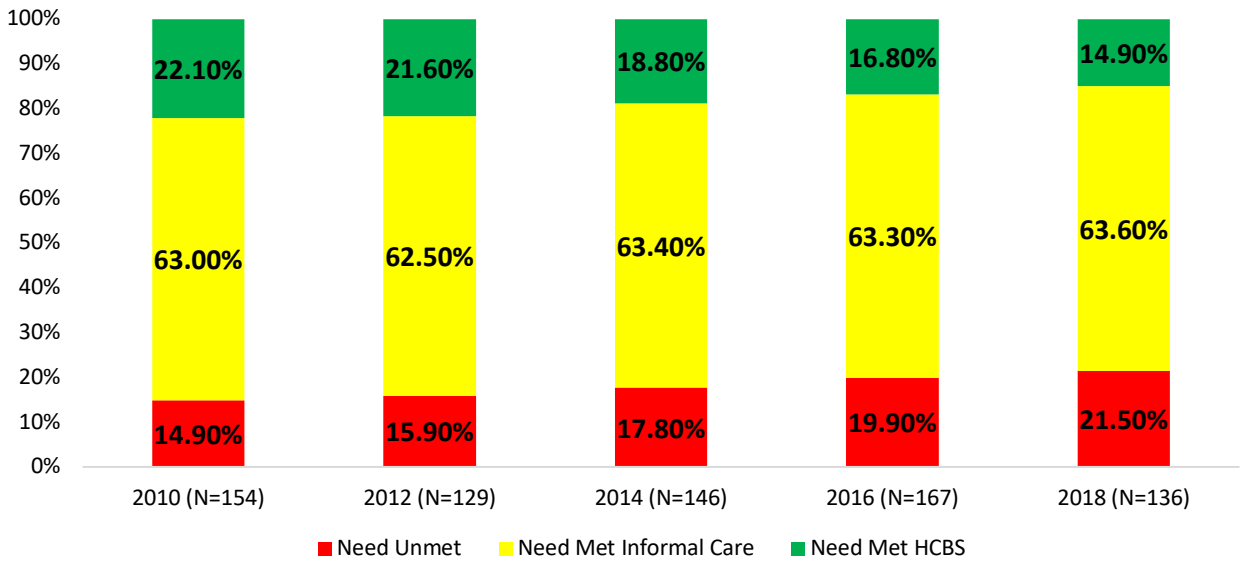
*Figures for 2010 to 2018 Need Met Status among All Dually Eligible Beneficiaries, Low LTSS Need Only Beneficiaries and High LTSS Need Only Beneficiaries*

Appendix Figure 1: Need Met Status for All Dual Eligibles (2010 to 2018)

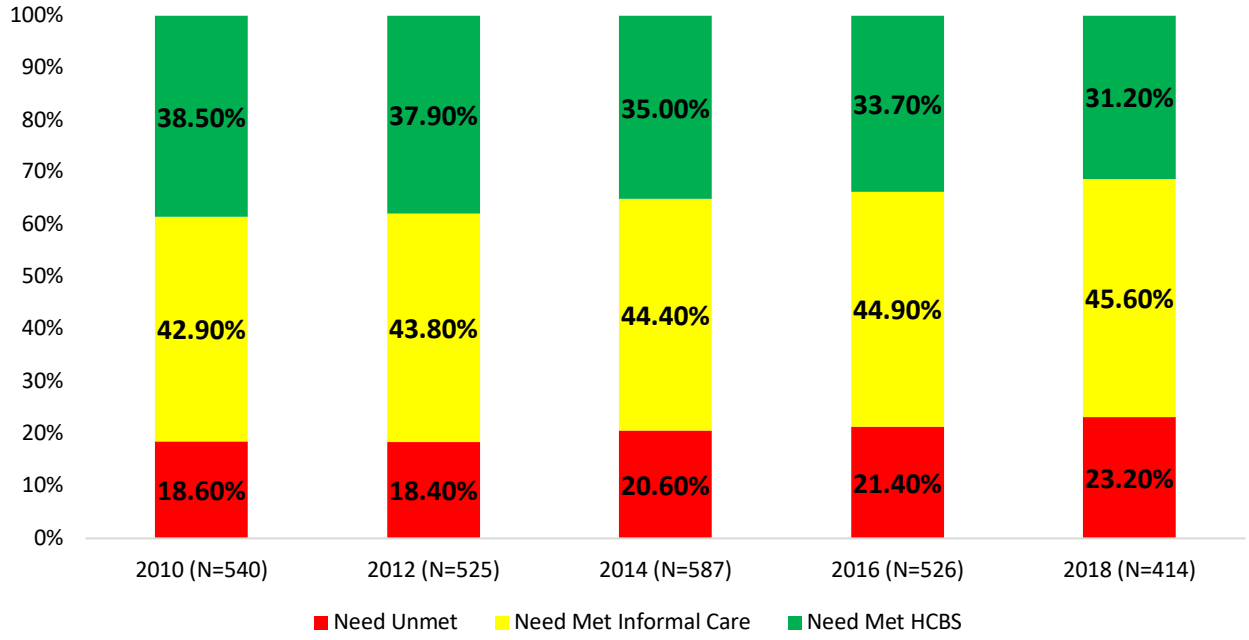



**Note:** Figure based on having LTSS Needs defined as 1+ ADLs.

Appendix Figure 2: Need Met Status for Dually Eligibles with Low LTSS Needs Only (2010 to 2018)

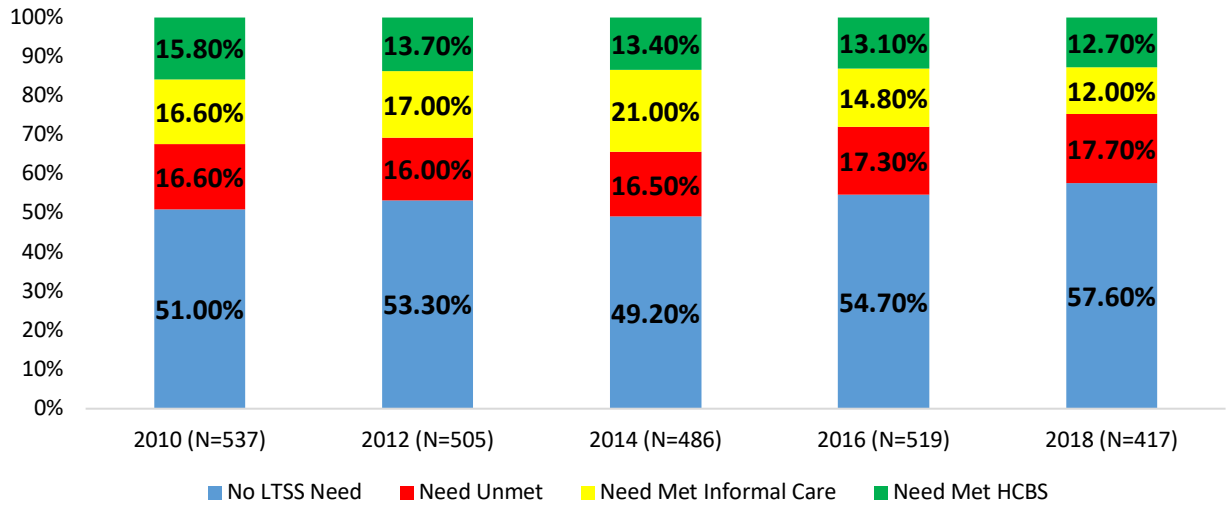



Appendix Figure 3: Need Met Status for Dually Eligible Beneficiaires with High LTSS Needs Only (2010 to 2018)



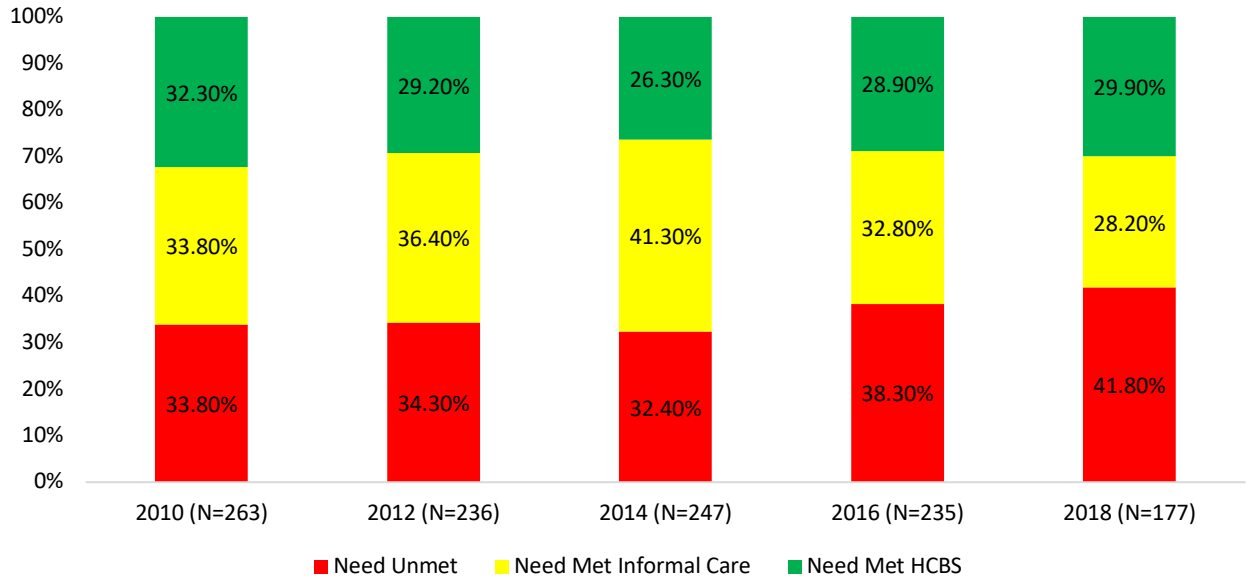
*Figures for 2010 to 2018 Need Met Status among All Dually Eligible Beneficiaries and Dually Eligible Beneficiaries with LTSS Needs by Race and Ethnicity*

Appendix Figure 4: Need Met Status for All Non-Hispanic White Dually Eligible Beneficiaries (2010 to 2018)



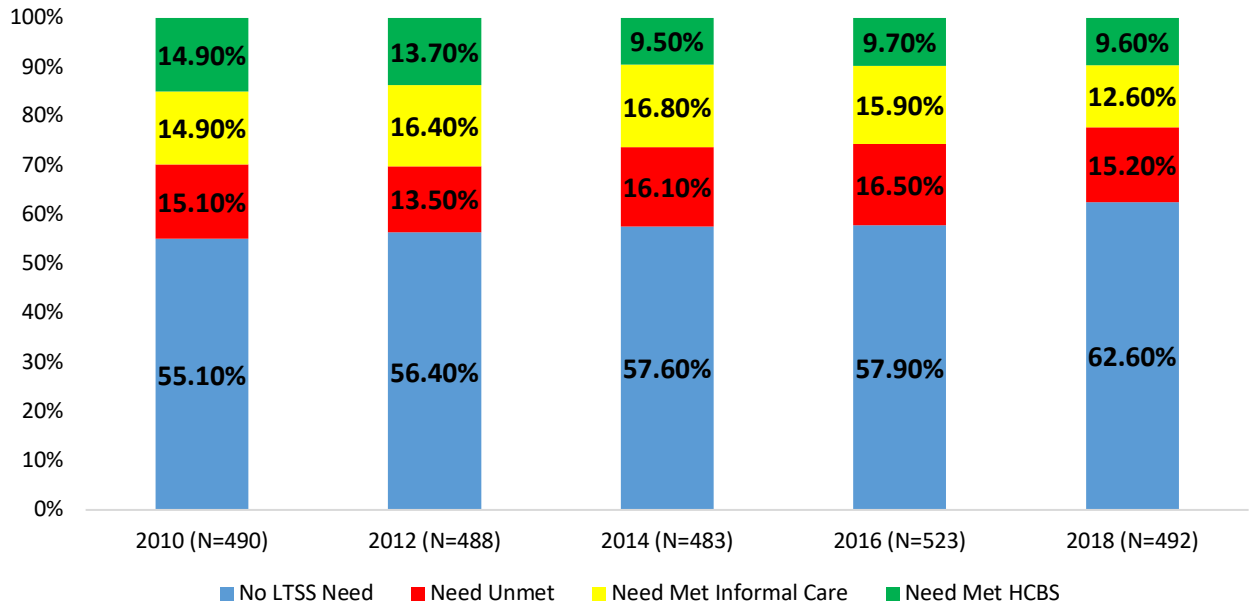

**Note:** Figure based on having LTSS Needs defined as 1+ ADLs.

Appendix Figure 5: Need Met Status for Non-Hispanic White Dually Eligible Beneficiaires with LTSS Needs (2010 to 2018)



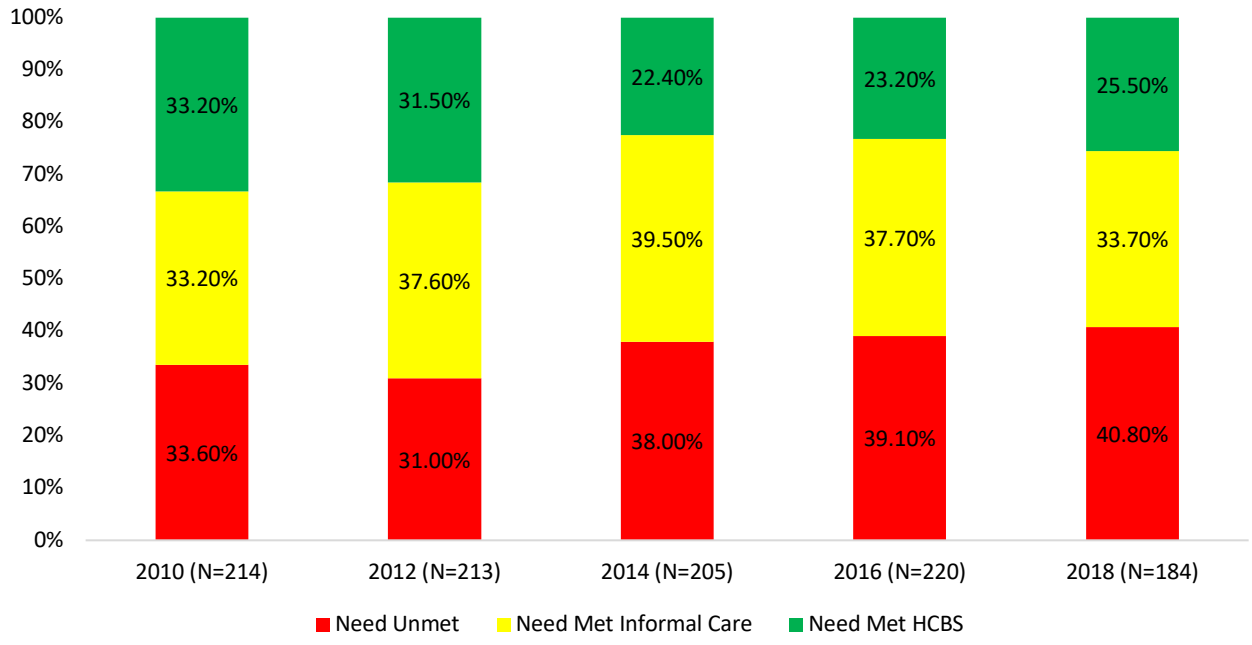

**Note:** Figure based on having LTSS Needs defined as 1+ ADLs.

Appendix Figure 6: Need Met Status for All Non-Hispanic Black Dually Eligible Beneficiaires (2010 to 2018)



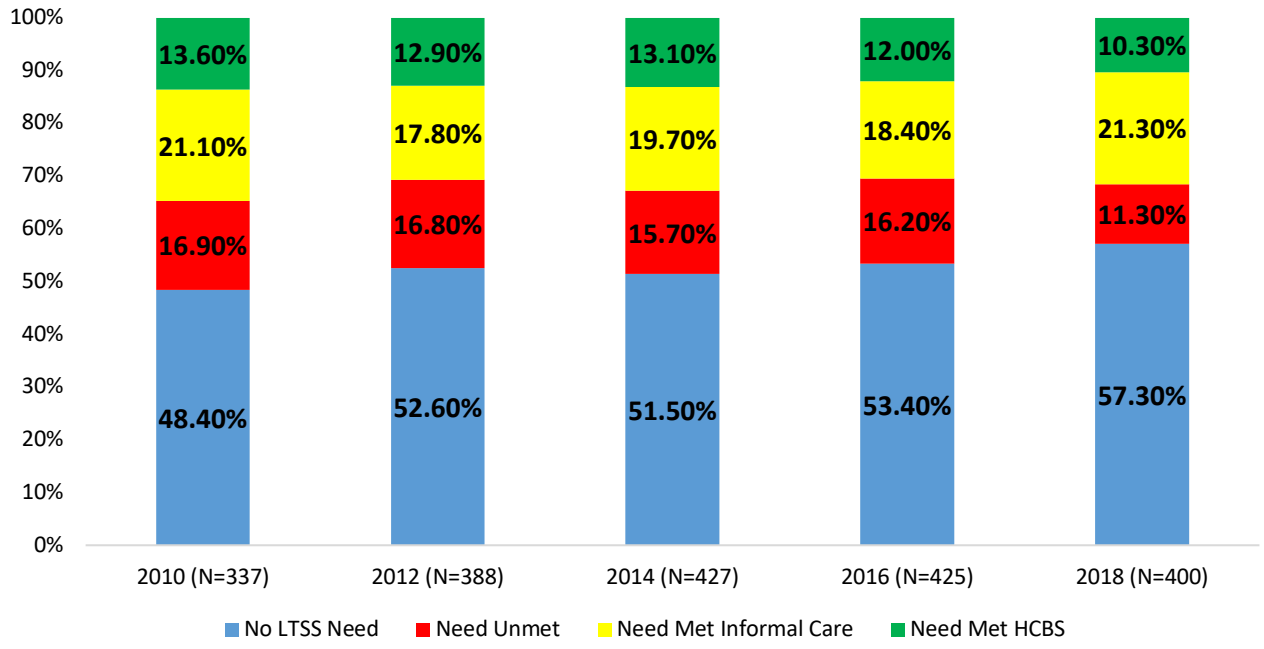

**Note:** Figure based on having LTSS Needs defined as 1+ ADLs.

Appendix Figure 7: Need Met Status for Non-Hispanic Black Dually Eligible Beneficiaires with LTSS Needs (2010 to 2018)



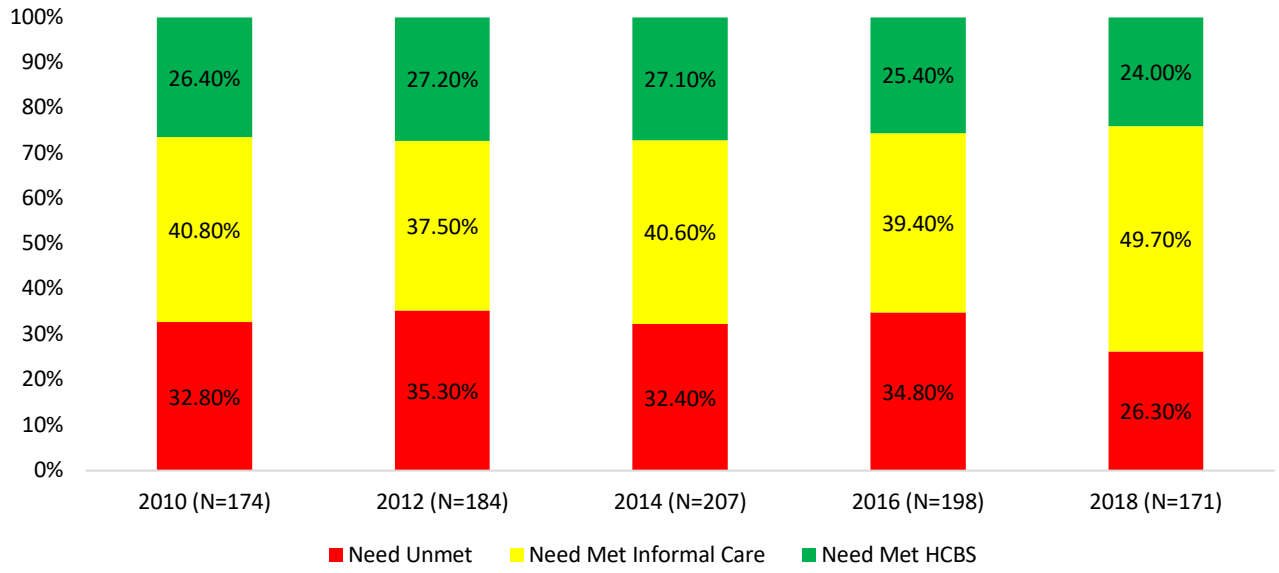

**Note:** Figure based on having LTSS Needs defined as 1+ ADLs.

Appendix Figure 8: Need Met Status for All Hispanic Dually Eligible Beneficiaries (2010 to 2018)



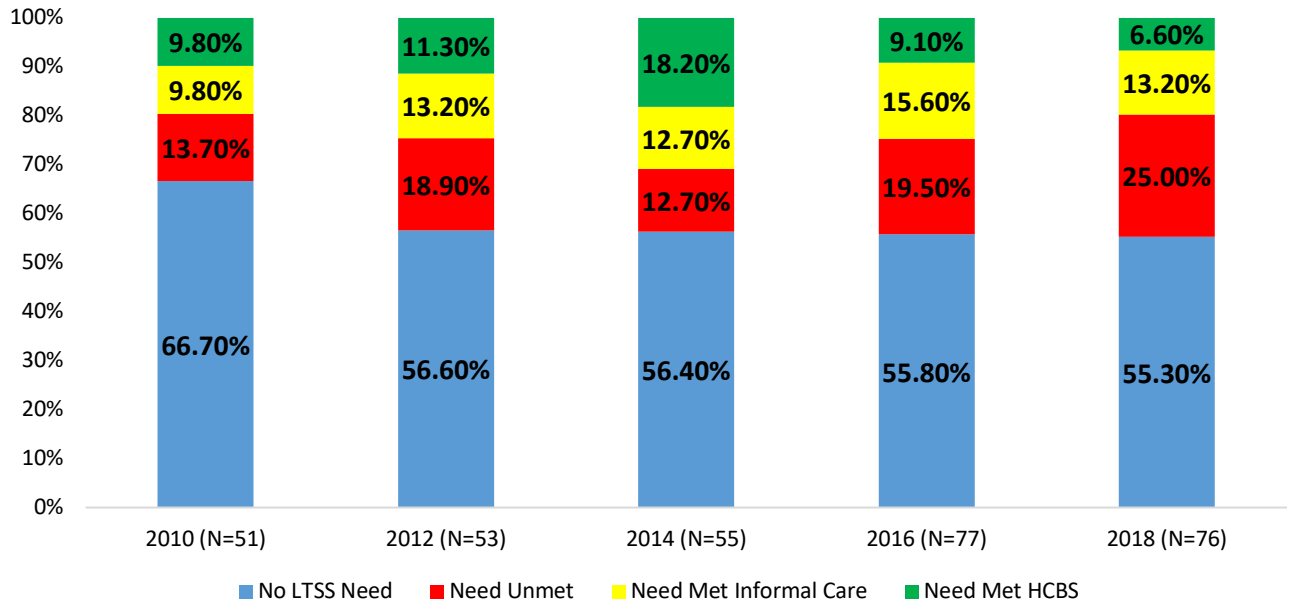

**Note:** Figure based on having LTSS Needs defined as 1+ ADLs.

Appendix Figure 9: Need Met Status for Hispanic Dually Eligible Beneficiaires with LTSS Needs (2010 to 2018)



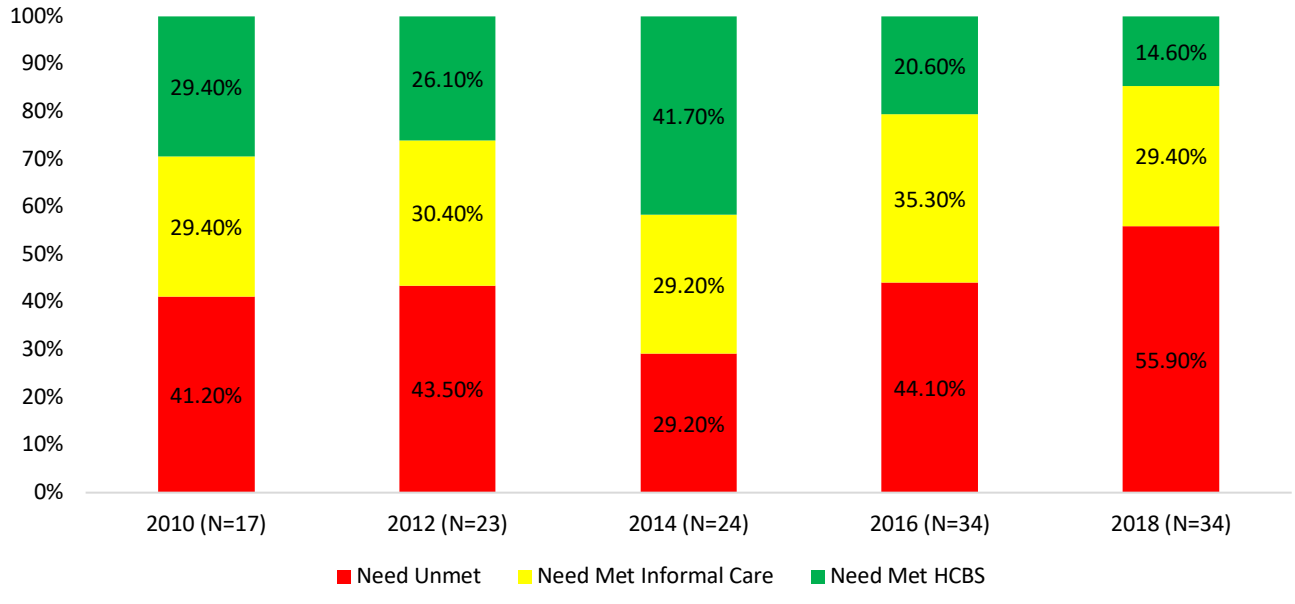

**Note:** Figure based on having LTSS Needs defined as 1+ ADLs.

Appendix Figure 10: Need Met Status for All Non-Hispanic Other Dually Eligible Beneficiares (2010 to 2018)




**Note:** Figure based on having LTSS Needs defined as 1+ ADLs.

Appendix Figure 11: Need Met Status for Non-Hispanic Other Dually Eligible Beneficiaries with LTSS Needs (2010 to 2018)




**Note:** Figure based on having LTSS Needs defined as 1+ ADLs.

## Appendix Table 1: Lagged Variable Logistic Regression for Predictors of HCBS Utilization among All Dually Eligible Beneficiaries from 2016 to 2018

| Dependent Variable: 2018 HCBS use (1=yes, 0=no) (N=1,106) | MODEL 1 | | MODEL 2 | | MODEL 3 | |
|---|---|---|---|---|---|---|
| Independent Variables 2016 | Odds Ratio | Sig. | Odds Ratio | Sig. | Odds Ratio | Sig. |
| Need Level (0 to 3; 0=no need; 3=high need) | 1.33* | 0.00 | 1.33* | 0.00 | 1.34* | 0.00 |
| Age | 1.03* | 0.00 | 1.03* | 0.00 | 1.03* | 0.00 |
| Female | 1.11 | 0.53 | 1.11 | 0.54 | 1.10 | 0.57 |
| Non-Hispanic Black | 0.72 | 0.07 | 0.75 | 0.06 | 0.77 | 0.06 |
| Non-Hispanic Other | 0.82 | 0.55 | 0.82 | 0.55 | 0.82 | 0.55 |
| Hispanic | 0.56* | 0.01 | 0.64* | 0.02 | 0.65* | 0.01 |
| Education Years | 1.00 | 0.89 | 1.00 | 0.90 | 1.00 | 0.87 |
| Divorced | 1.04 | 0.84 | 1.05 | 0.83 | 1.05 | 0.81 |
| Widowed | 1.27* | 0.03 | 1.27* | 0.03 | 1.28* | 0.03 |
| Never Married | 0.98 | 0.93 | 0.98 | 0.93 | 0.99 | 0.96 |
| Household Income | 1.00 | 0.11 | 1.00 | 0.11 | 1.00 | 0.09 |
| Net Wealth Less than $25k | 1.54* | 0.02 | 1.54* | 0.02 | 1.54* | 0.02 |
| Net Wealth $25k to $50K | 0.72 | 0.31 | 0.72 | 0.31 | 0.72 | 0.30 |
| Retired | 1.19 | 0.32 | 1.19 | 0.32 | 1.18 | 0.33 |
| Fair/Poor Self-Rated Health | 1.25* | 0.02 | 1.25* | 0.02 | 1.26* | 0.02 |
| Chronic Conditions | 1.15* | 0.02 | 1.15* | 0.02 | 1.14* | 0.02 |
| Depression | 1.04 | 0.81 | 1.04 | 0.81 | 1.03 | 0.86 |
| Midwest Residence | 0.85 | 0.49 | 0.85 | 0.49 | 0.83 | 0.44 |
| South Residence | 0.82 | 0.31 | 0.82 | 0.32 | 0.80 | 0.26 |
| West Residence | 0.72 | 0.16 | 0.72 | 0.16 | 0.69 | 0.12 |
| Rural Residence | 0.82 | 0.29 | 0.82 | 0.28 | 0.83 | 0.32 |
| Resident Child or Child Living Nearby | 0.89 | 0.64 | 0.88 | 0.65 | 0.87 | 0.67 |
| Has Managed Care Plan | 1.12 | 0.19 | 1.13 | 0.19 | 1.13 | 0.18 |
| Has Usual Source of Care | | | 1.44* | 0.03 | 1.43* | 0.03 |
| NH Black & Usual Source of Care Interaction | | | | | 0.56* | 0.04 |
| Hispanic & Usual Source of Care Interaction | | | | | 0.75* | 0.02 |
| NH Other & Usual Source of Care Interaction | | | | | 0.78 | 0.44 |
| *Model $R^2$* | 0.72 | | 0.74 | | 0.75 | |

*Significant predictor of having unmet need.

**Note:** Reference groups are Male, NH White, Married, Net Wealth over $50K, Not Retired, Excellent/Good Self-Rated Health, No Depression, Northeast Region, Urban/Suburban Residence, No Resident Child or Child Nearby, No Usual Source of Care, Fee-for-Service Plan.

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## Appendix Table 2: 2018 Dual Eligible Sample Characteristics by Managed Care Status

| 2018 All Dually Eligible Beneficiaries (N=1,429) | Managed Care (N=690) | Fee-for-Service (N=739) |
|---|---|---|
| No Need | 48.3% | 51.7% |
| Low Need | 45.3%* | 54.7%* |
| Moderate Need | 51.6%* | 48.4%* |
| High Need | 47.8% | 52.2% |
| Unmet Need | 49.3% | 50.7% |
| Need Met Informal Care | 48.6% | 51.4% |
| Need Met HCBS | 50.7% | 49.3% |
| Age (mean) | 69.2* | 70.2* |
| *Median* | *67.0** | *68.0** |
| Female | 48.5% | 51.5% |
| Male | 48.0% | 52.0% |
| NH White | 41.8%* | 58.2%* |
| NH Black | 57.5%* | 42.5%* |
| NH Other | 57.1%* | 42.9%* |
| Hispanic | 45.2%* | 54.8%* |
| Education Years (mean) | 11.4 | 10.9 |
| *Median* | *12.0* | *12.0* |
| Married | 45.7% | 54.3% |
| Divorced | 47.3% | 52.7% |
| Widowed | 45.5% | 54.5% |
| Never Married | 47.3% | 52.7% |
| Household Income (mean) | $24,115 | $23,679 |
| *Median* | *$14,400* | *$14,556* |
| Net Wealth (mean) | $83,156* | $91,129* |
| *Median* | *$2,690** | *$4,000** |
| Below Federal Poverty Line (FPL) | 47.3% | 52.7% |
| *Above FPL* | *49.0%* | *51.0%* |
| Receives Government Benefits | 50.7%* | 49.3%* |
| *No Government Benefits* | *46.5%** | *53.5%** |
| Retired | 49.0%* | 51.0%* |
| *Not Retired* | *46.6%** | *53.4%** |
| Fair/Poor Self-Rated Health | 46.6%* | 53.4%* |
| *Excellent/Good Self-Rated Health* | *50.5%** | *49.5%** |
| Chronic Conditions (Mean) | 3.4 | 3.3 |
| *Median* | *3.0* | *3.0* |
| Activities of Daily Living Limitations (ADLs) (mean) | 1.1 | 1.1 |
| *Median* | *0.0* | *0.0* |
| Instrumental ADLs (mean) | 2.0 | 2.1 |
| *Median* | *0.0* | *0.0* |
| Cognitive Impairment | 40.8%* | 59.2%* |
| *No Cognitive Impairment* | *48.7%** | *51.3%** |
| Depression | 50.2% | 49.8% |
| *No Depression* | *47.3%* | *52.7%* |

## Appendix Table 2 – Continued

| 2018 All Dually Eligible Beneficiaries (N=1,429) | Managed Care (N=690) | Fee-for-Service (N=739) |
|---|---|---|
| Has Usual Source of Care | 50.5%* | 49.5%* |
| *No Usual Source of Care* | *39.8%** | *60.2%** |
| Northeast | 52.8%* | 47.2%* |
| Midwest | 48.2% | 51.8% |
| South | 48.2% | 51.1% |
| West | 44.9%* | 55.1%* |
| Rural Residence | 34.8%* | 65.2%* |
| *Urban/Suburban Residence* | *52.1%** | *47.9%** |
| Resident Child or Child Living Nearby | 48.6% | 51.4% |
| *No Resident Child or Child Living Nearby* | *47.7%* | *52.3%* |

*Significant t-test difference at p<0.05.