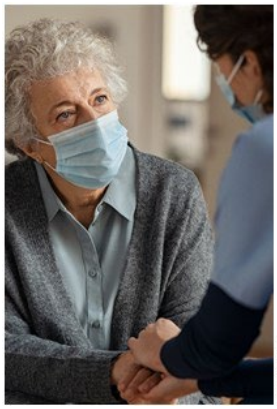

Factors Predicting APS Involvement Among Persons Receiving Long-Term Services and Supports

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ADULT PROTECTIVE SERVICES (APS) investigates reports of self-neglect, financial exploitation, neglect (abandonment and non-self-neglect), or abuse (improper use of restraint, mental abuse, physical abuse, or sexual abuse) of vulnerable adults in Washington State.[1] Recent national estimates suggest the prevalence of abuse and neglect, including self-neglect, of vulnerable adults is approximately 10 percent (Acierno et al. 2009), with many cases not reported for investigation (Storey 2020). In Washington State in 2018, the APS program administered by the DSHS Aging and Long-Term Support Administration (ALTSA) received 60,038 reports of abuse and neglect. Analysis of the factors associated with increased or decreased risk of abuse and neglect can inform forecasts of future investigation volume, help quantify potential underreporting, and identify points of intervention.

This report is part of a series of analyses examining factors associated with the risk of being identified as an alleged or substantiated victim in an APS investigation. This report extends earlier descriptive analyses and predictive modeling (Bauer et al. 2022a, Bauer et al. 2022b) to better understand the association between potential risk and protective factors and APS outcomes among persons receiving Medicaid-paid long-term services and supports (LTSS), including services provided through ALTSA and the DSHS Developmental Disabilities Administration (DDA). Informed by findings from the previous reports, separate risk models are estimated by age group, allegation type (self-neglect and non-self-neglect), and substantiation status.

In interpreting the results reported here, it is important to note that identified relationships between risk factors and outcomes are not necessarily causal. Statistical associations may reflect:

- The association between a risk factor or service setting and the volume of interactions with health care providers subject to mandated reporting requirements;
- Causal impacts on the risk of experiencing abuse, neglect, self-neglect, or exploitation; or
- Receipt of treatment as a consequence of experiencing abuse or neglect.

For example, while it would be reasonable to interpret the significantly increased risk of self-neglect associated with persons with an alcohol use disorder to be causal, interpretation of the positive association with emergency department (ED) visits is more complex. An ED visit may be the consequence of abuse or neglect and is a point of contact with providers who are mandated to report abuse or neglect. It would be inappropriate to conclude that ED visits *cause* abuse or neglect.

[1] For more information on the Adult Protective Services program administered in Washington State by the DSHS Aging and Long-Term Support Administration, or to report suspected abuse or neglect, visit https://www.dshs.wa.gov/altsa/adult-protective-services-aps.

Key Findings

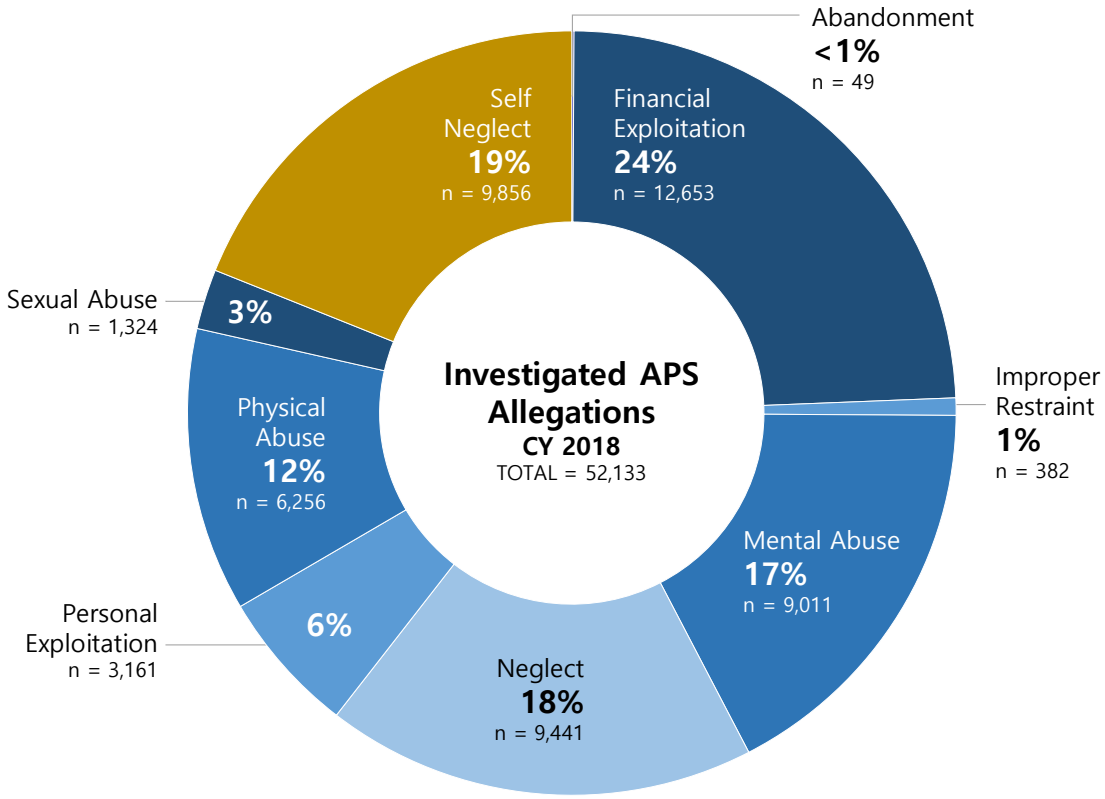
1. **Recidivism.** In most models, prior APS involvement was the strongest predictor of future involvement of an LTSS recipient as an alleged victim in an APS investigation. Compared to LTSS recipients without prior APS involvement, LTSS recipients *with* prior APS involvement had 2 to 4 times the odds of subsequent APS involvement, depending on the APS outcome, age group, and LTSS service setting examined.
2. **Behavior support needs.** Behavior support needs, as indicated by behavioral point scores captured in assessment data, were associated with significantly increased risk of involvement in an APS investigation for in-home and community residential clients. Increased risk was observed for both adults under 60 and elders aged 60 and above. Other assessment-based characteristics were significant predictors of APS involvement among persons served in in-home or community residential settings, depending on the APS outcome and age group examined.
3. **Race/ethnicity.** In most cases where race/ethnicity effects were statistically significant, effects were associated with reduced risk of involvement as an alleged victim in an APS investigation for LTSS recipients from BIPOC communities, relative to the experience of non-Hispanic White LTSS recipients. The two exceptions to this general result were the finding of increased risk of involvement in non-self-neglect APS investigations for American Indian or Alaska Native elders served in in-home LTSS settings and increased risk of non-self-neglect APS investigations for Black elders served in community residential settings.
4. **Mental illness and substance use disorders.** Although significant risk factors varied depending on the LTSS service setting and age group, mental illness and substance use disorders were associated with relatively modest but statistically significant increased risk of involvement in APS allegations in all LTSS settings.
5. **Cognitive impairments.** Alzheimer's disease was associated with increased risk of involvement in a self-neglect investigation among elders served in in-home LTSS settings. Alzheimer's and traumatic brain injury were also associated with increased risk of involvement in non-self-neglect allegations among elders served in in-home LTSS settings.
6. **Intellectual and developmental disabilities.** In most models, intellectual and developmental disabilities were associated with increased risk of involvement in an APS investigation.
7. **Diagnosis-based functional support needs and frailty indicators.** Bed confinement and wheelchair use were often associated with increased risk of involvement in an APS investigation.
8. **Health service utilization.** Emergency department (ED), skilled nursing home visits, and nursing respite services were often associated with increased risk of involvement as an alleged victim in an APS investigation. Among persons served in in-home or community residential settings, use of Medicare skilled nursing facility services was associated with increased risk of involvement in an APS investigation. However, clients using ALTSA nursing home services were less likely to be involved in an APS investigation if they also received Medicare skilled nursing facility services during the outcome year.
9. **Physical conditions.** Skin conditions (pressure ulcers, burns, and non-pressure ulcers associated with vascular disease and diabetes) were most commonly associated with increased risk of involvement in an APS investigation.
10. **Predictive accuracy.** Predictive accuracy was strong for models of self-neglect, with C-statistics at or above 0.85. Models for non-self-neglect allegations had significantly lower predictive accuracy.

Adult Protective Services in Washington State

APS receives and investigates reports of abandonment, abuse, financial exploitation, neglect, and self-neglect of vulnerable adults and provides protective services and legal remedies to protect vulnerable adults as described in RCW 74.34. In 2018, APS received 60,038 reports and conducted 41,953 investigations that reviewed 52,133 allegations. The total count of allegations within a year is always larger than the total number of investigations, as one investigation may include multiple allegations. Figure 1 below shows the distribution of the types of self-neglect (yellow) allegations and non-self-neglect allegations by type (shades of blue) investigated in 2018.

FIGURE 1

APS Allegations in CY 2018



Defining Vulnerable Adults

Washington State formally defines vulnerable adults by law (see 74.34 RCW) as:

- An individual who is 60 years of age or older with a functional, mental, or physical inability to care for themselves; OR
- An individual who is over the age of 18 AND
  - Has been found incapacitated OR
  - Has a development disability, including intellectual disabilities, autism, or other similar conditions OR
  - Lives in a DSHS-licensed facility (such as an adult family home, assisted living facility, or nursing home) OR
  - Receives in-home services through a licensed home health, hospice, or home care agency OR
  - Self-directs their own care and receives services from a personal aide.

Given the potential differences in risk factors for abuse and neglect between adults ages 18-59 and elders ages 60 and older under this definition, separate analyses will be conducted for these two populations. We note that other researchers studying risk factors associated with vulnerable adult abuse and neglect also emphasized the importance of studying elders and younger adults with disabilities separately (Lachs et al. 1996, Lachs et al. 1997).

Categories of APS Outcomes

Abuse and neglect allegations were derived from data in the Tracking Incidents of Vulnerable Adults (TIVA) database maintained by the APS division of DSHS. Nine different types of allegations are tracked in TIVA, as indicated in Figure 1 on the preceding page. We calibrated predictive models, separately for adults under 60 and elders aged 60 or above, for the following APS outcomes:

- **Any self-neglect allegation:** involved in a self-neglect investigation regardless of finding (other types of neglect are not included).
- **Any other allegation:** involved as an alleged victim in an investigation with a non-self-neglect allegation such as financial exploitation, neglect (abandonment and non-self-neglect), or abuse (improper use of restraint, mental abuse, physical abuse, personal exploitation, or sexual abuse), regardless of finding.

Previous research has indicated that self-neglect should be studied separately from other abuse types (Sommerfeld et al. 2014; Anthony et al. 2009; and Dyer et al. 2007) due to differences between the nature of self-neglect, relative to neglect or abuse that involves a perpetrator. Combining all allegation types into a single category could obscure important differences in risk patterns.

A Conceptual Framework for APS Risk Models

The conceptual model described below provides a framework for interpreting the predictive models provided in this report.

FIGURE 2

Conceptual Adult Protective Service Risk Model

General Population	Vulnerable Adults	Abuse and Neglect Outcomes
1. Demographics and socio-economic status **2. Risk factors** • Functional support needs • Cognitive impairments • Mental illness • Substance Use Disorders • Intellectual and Developmental Disabilities • Complex medical conditions	**1. Functional, physical, or cognitive impairments** **2. Intellectual and Developmental Disabilities** **3. Receives licensed residential or in-home care, or self-directed care**	**Outcomes** • Any self-neglect allegation • Any substantiated self-neglect allegation • Any other allegation of abuse, neglect, or exploitation) • Any substantiated other allegation

- **Reduced Form Model (A → C)**. This type of model directly estimates the association between risk factors and APS outcomes, without modeling the relationship between those risk factors and the likelihood that a person would be considered a vulnerable adult eligible for APS services.
- **Vulnerable Adult Model (B → C).** This type of model estimates the association between risk factors and APS outcomes among persons meeting vulnerability criteria.

This report focuses on the experiences of persons receiving long-term services and supports who by definition meet vulnerable adult criteria defined in 74.34 RCW. In other words, this report examines a set of vulnerable adult models. Prior analyses (Bauer et al. 2022a, Bauer et al. 2022b) focused on reduced form models describing the association between potential risk and protective factors and APS outcomes without explicitly modeling the likelihood that a person would be considered a vulnerable adult eligible for APS services.

Note that a strong *association* does not necessarily mean a particular risk factor is the *cause* of the increased risk of APS involvement. Whether a risk factor is causal or not, identifying the association is helpful in predicting future APS involvement and identifying strategies that might help improve safety for vulnerable adults. Prior analyses in this series (Bauer et al. 2022b) found that the most powerful predictor of future involvement of a Medicare beneficiary as an alleged victim in an APS investigation is prior APS involvement. The odds of a person having future involvement with APS were 4.8-10.8 times higher for persons with prior APS involvement compared to persons without prior APS involvement. The second most impactful set of risk factors (odds ratio range from 2.3-6.8) were poverty-related indicators, including receipt of Part D subsidies and residence-based income proxies. These were strongly associated with both self-neglect and involvement in other types of APS investigations.

Other important factors included substance use disorders and schizophrenia and related psychiatric disorders which were strong risk factors for self-neglect. Alzheimer's was a significant risk factor for involvement in non-self-neglect APS allegations among persons ages 60 and above. Intellectual and developmental disabilities were also generally associated with increased risk of involvement as an alleged victim in non-self-neglect APS investigations. In most analyses where findings were statistically significant, persons from BIPOC communities had a reduced risk of involvement in APS investigations. The exception is a finding of increased risk of involvement as an alleged victim in non-self-neglect investigations for Black and American Indian or Alaska Native beneficiaries ages 60 and above.

This set of analyses builds on the prior results by focusing on how the relationship between risk/protective factors and APS outcomes varies by LTSS setting. We evaluated potential risk and protective factors for APS involvement in several domains including:

- Demographics (age, gender, race, and ethnicity)
- Use of disability-related durable medical equipment (DME)
- Diagnosed disabling central nervous system conditions such as Alzheimer's
- Intellectual and developmental disabilities
- Sensory and mobility impairments
- Frailty-related diagnoses (e.g., failure to thrive, altered mental status)
- Medical comorbidities (e.g., cardiovascular diseases, diabetes)
- Mental illness (e.g., schizophrenia, bipolar disorder, depression)
- Substance use disorders (e.g., alcohol use disorder, opioid use disorder)
- Medical service utilization (e.g., ED visits, hospitalizations, skilled nursing facility stays)
- Characteristics from the Comprehensive Assessment Reporting Evaluation (CARE) assessment data system, including but not limited to activities of daily living (ADL) scores, behavior scores, cognitive performance scale (CPS) scores.

Because everyone in the study population was enrolled in Medicaid, there is less variation in income relative to prior analyses examining the experience of Medicare beneficiaries (Bauer et al. 2022b). As a result, income proxies were dropped from this set of analyses.

Risk factors derived from health care claims and encounter data were constructed from:

- Chronic Illness and Disability Payment System (CDPS) and Medicaid-Rx risk groups,[2]
- Medicare Master Beneficiary Summary File[3] (MBSF) Condition files,
- MBSF Cost and Utilization files,
- Medicaid service utilization data derived from the ProviderOne system,
- DME code sets, and
- Frailty codes sets from various published sources.

Risk factors derived from health service data were identified using integrated Medicare and Medicaid claims data. Risk factors were flagged for an individual if they appeared in either data source. The risk model structure is largely "concurrent" in that most risk factors and predicted APS outcomes are measured in the same year. The one exception is the inclusion of indicators of prior APS allegations experienced in the immediately preceding year.

There is some overlap between the CDPS and MBSF condition categories. The CDPS groups often distinguish between the severity of a condition (e.g., diabetes low and medium). The MBSF conditions are often more specific (e.g., schizophrenia vs "psychiatric high"). The Medicaid-Rx indicators, based on national drug codes, identify treated conditions based on primary on-label usage.

The study population was restricted to Medicaid LTSS recipients during calendar years 2016-2018. We also required at least 6 months of Medicare fee-for-service or Medicaid coverage during both the outcome year and the prior year. In-home clients included persons receiving ALTSA-funded in-home services or DDA-funded personal care services. Residential LTSS clients included persons served in ALTSA- and DDA-funded community residential settings. Nursing home clients included persons served in ALTSA settings.

We estimated models for self-neglect by age group for in-home clients, and models of other (non-self-neglect) APS allegations by age group separately for persons served in in-home, community residential, and nursing home settings. For persons served in in-home and community residential settings, models include several factors derived from the CARE assessment data system. Clients may have more than one CARE assessment in a given year. The CARE variables used in the model were taken from the last assessment in effect during the outcome year. The CARE assessment is not used for nursing home clients, and we did not have access to Minimum Data Set nursing facility assessment data for this study.

For persons involved in an APS referral, their LTSS setting was attributed based on their service setting at the time of the APS referral. For LTSS recipients in the study population who did not experience an APS referral, their LTSS setting was assigned based on the type of LTSS service used most extensively in the outcome year. Information on the timing of specific alleged incidents of abuse, neglect, or maltreatment was not available, and in some cases an alleged victim may have been in a different service setting at the time of the events resulting in an APS referral.

The models were estimated using logistic regression. Machine learning techniques (stepwise selection) were used to identify which factors provide the best prediction of APS involvement. The estimated models have a varying degree of accuracy. Predictive accuracy was strong for models of self-neglect, with C-statistics ranging from 0.850 to 0.865. Models for non-self-neglect allegation types had significantly lower predictive accuracy, with C-statistics ranging from 0.686 for elders in nursing facility settings to 0.789 for elders in in-home settings.

[2] More information about CDPS and Medicaid-Rx risk groups is provided in the Technical Notes at the end of this report.
[3] More information about the Medicare Master Beneficiary Summary File is provided in the Technical Notes at the end of this report.

The C-statistic is a widely used measure of predictive accuracy for logistic regression models. The higher the C-statistic, the better the model can discriminate between persons who experience the outcome of interest and persons who do not. More information about the interpretation of the C-statistic is provided in the Technical Notes at the end of this report.

Odds ratios from the estimated predictive models are summarized in the figures that follow. The figures are designed to convey the magnitude and directionality of the relationship between different characteristics and APS outcomes. In particular, the figures highlight the interpretation of odds ratios that take a value of less than one. For example, an odds ratio of 0.5 has the equivalent magnitude of an odds ratio of 2.0, but in the direction of reduced risk of the outcome. We sometimes refer to characteristics associated with a reduced risk of APS involvement as "protective" factors.

Given the relatively large number of observations available for analysis, even small effect sizes may be statistically significant. Setting a minimum effect-size threshold for reporting helps focus the discussion on factors with a stronger association with APS involvement. Risk factors are reported in the figures below if they were statistically significant at the 90 percent level, were associated with an effect on the odds of APS involvement of at least 20 percent, and had a prevalence of at least one percent among persons experiencing APS involvement.

It is important to note that the relationships reported here are not necessarily causal. In the context of the "vulnerable adult" models examined in this report, statistical associations between risk factors, LTSS service settings, and outcomes may reflect:

- The relationship between the condition or LTSS service setting and the volume of interactions with health care providers subject to mandated reporting requirements;
- Causal impacts on the risk of experiencing abuse, neglect, self-neglect, or exploitation (e.g., alcohol use disorder increasing the risk of self-neglect); or
- Receipt of treatment as a consequence of the experience of abuse or neglect (e.g., ED visits or receipt of skilled nursing home visits).

What Is an Odds Ratio?

EXAMPLE: In a hypothetical population, 5 percent of persons with an alcohol use disorder were involved in a self-neglect investigation, compared to 3 percent of persons without an alcohol use disorder.

- **Odds Ratio = (0.05/(1-0.05))/(0.03/(1-0.03)) = 1.7**

In this hypothetical population, the odds of being involved in a self-neglect allegation is 70 percent higher for persons with an alcohol use disorder, relative to persons without an alcohol use disorder. Note that the odds ratios reported below are regression-adjusted to identify the independent association between individual risk factors and APS outcomes.

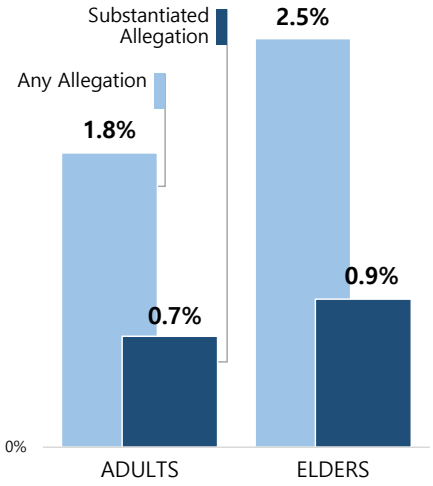
Adult Protective Services Outcomes by Setting

Self-neglect outcomes are relevant for persons receiving in-home personal care services. Persons are not generally subject to self-neglect investigations while residing in community residential or nursing facility settings. Figure 2 describes the proportion of persons in the study population involved in an APS self-neglect allegation on an annual basis, among persons receiving ALTSA- or DDA-funded in-home personal care services in the three-year period spanning calendar years 2016 to 2018.

FIGURE 2.

Proportion Experiencing Self-Neglect Among In-Home Service Clients

Calendar Years 2016-2018



Self-neglect allegations are relatively rare, experienced on an annual basis by about 2 precent of elders and adults under 60 receiving in-home LTSS services. Although relatively rare, self-neglect allegations are far more likely to be substantiated than other types of APS allegations, with 37 percent of self-neglect allegations being substantiated over the three-year study period.

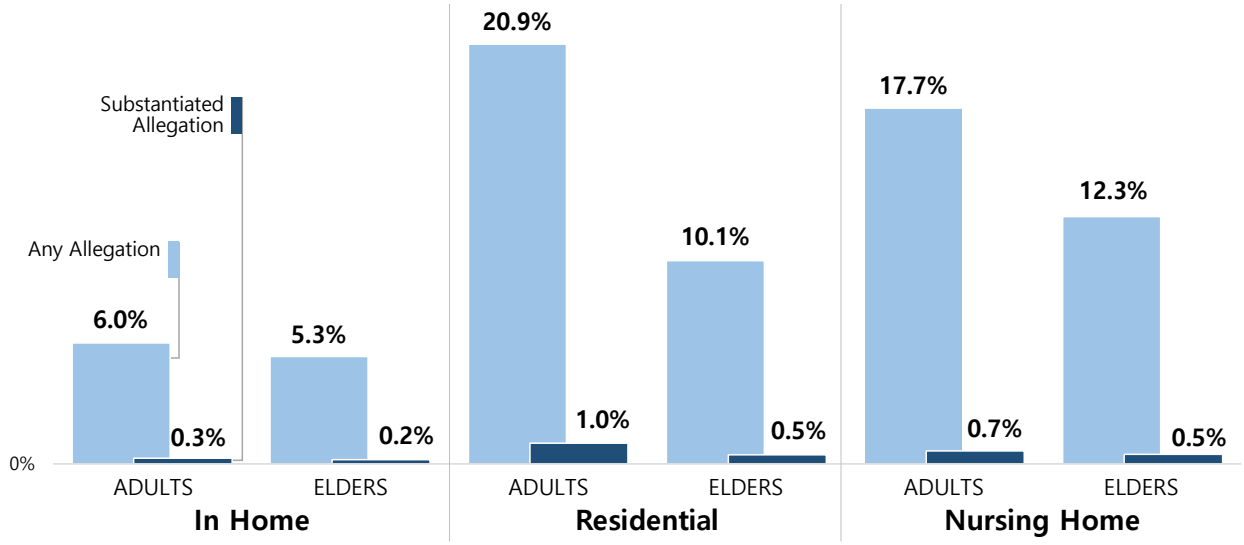
Figure 3 describes the annual proportion of persons involved in a non-self-neglect allegation, by LTSS setting. Residential LTSS clients include persons served in ALTSA- and DDA-funded settings. Nursing home clients include persons in ALTSA settings.

Non-self-neglect allegations are most frequently observed among adults under 60 served in community residential or nursing home settings, and are less common among persons served in in-home personal care settings. Non-self-neglect allegations are rarely substantiated, with fewer than five percent of investigations resulting in a substantiated finding over the three-year study period. Differences across LTSS settings in non-self-neglect allegation rates may be at least partially due to differences in risk factor prevalence among the populations served.

FIGURE 3.

Proportion Experiencing Other* APS Allegations, by LTSS Setting

Calendar Years 2016-2018



*Other allegations include financial exploitation, neglect (abandonment and non-self-neglect), or abuse (improper use of restraint, mental abuse, physical abuse, personal exploitation, or sexual abuse).

Factors Predicting Involvement in a Self-Neglect Investigation Among Adults Under 60 Receiving In-Home Services

Recidivism. Prior APS involvement was the most powerful predictor of future involvement in an APS self-neglect investigation (Figure 4). Adults under 60 receiving in-home services with a prior APS referral have 3.4 times the odds of a subsequent APS referral for self-neglect, compared to persons who were not referred to APS in the prior year.

Physical conditions. Among adults under 60 receiving in-home services, high impact pulmonary conditions, skin conditions, infections, multiple sclerosis, and Parkinson's disease were associated with increased risk of involvement in a self-neglect investigation. Relevant skin conditions include pressure ulcers and non-pressure chronic ulcers of the feet and legs, likely caused by vascular diseases and diabetes.

Behavioral health conditions. Schizophrenia, bipolar disorder, depression, and alcohol and drug use disorders were associated with increased risk of involvement in APS self-neglect allegations among adults under 60 receiving in-home services.

Cognitive and intellectual/developmental conditions. Developmental delays were associated with increased risk of involvement in APS self-neglect allegations among adults under 60 receiving in-home services.

Functional limitations and frailty indicators. Bed confinement, mobility limitations, and wheelchair use were associated with increased risk of involvement in APS self-neglect allegations among adults under 60 receiving in-home services, as were diagnoses of failure to thrive and altered mental status.

CARE Assessment Indicators. High behavior point scores were among the most powerful predictors of increased risk of involvement in an APS self-neglect investigation among adults under 60 receiving in-home services. Persons identified with deteriorating health status were at increased risk of self-neglect, while persons self-reporting excellent health status were at *reduced* risk. Higher ADL scores associated with greater ADL support needs were associated with a significantly *reduced* risk of involvement in a self-neglect investigation, as were higher CPS scores indicating significant cognitive impairment. Recognition of the impact of ADL support needs and cognitive impairment on a person's ability to provide self-care may explain why these risk factors were associated with reduced risk of involvement in self-neglect investigations.

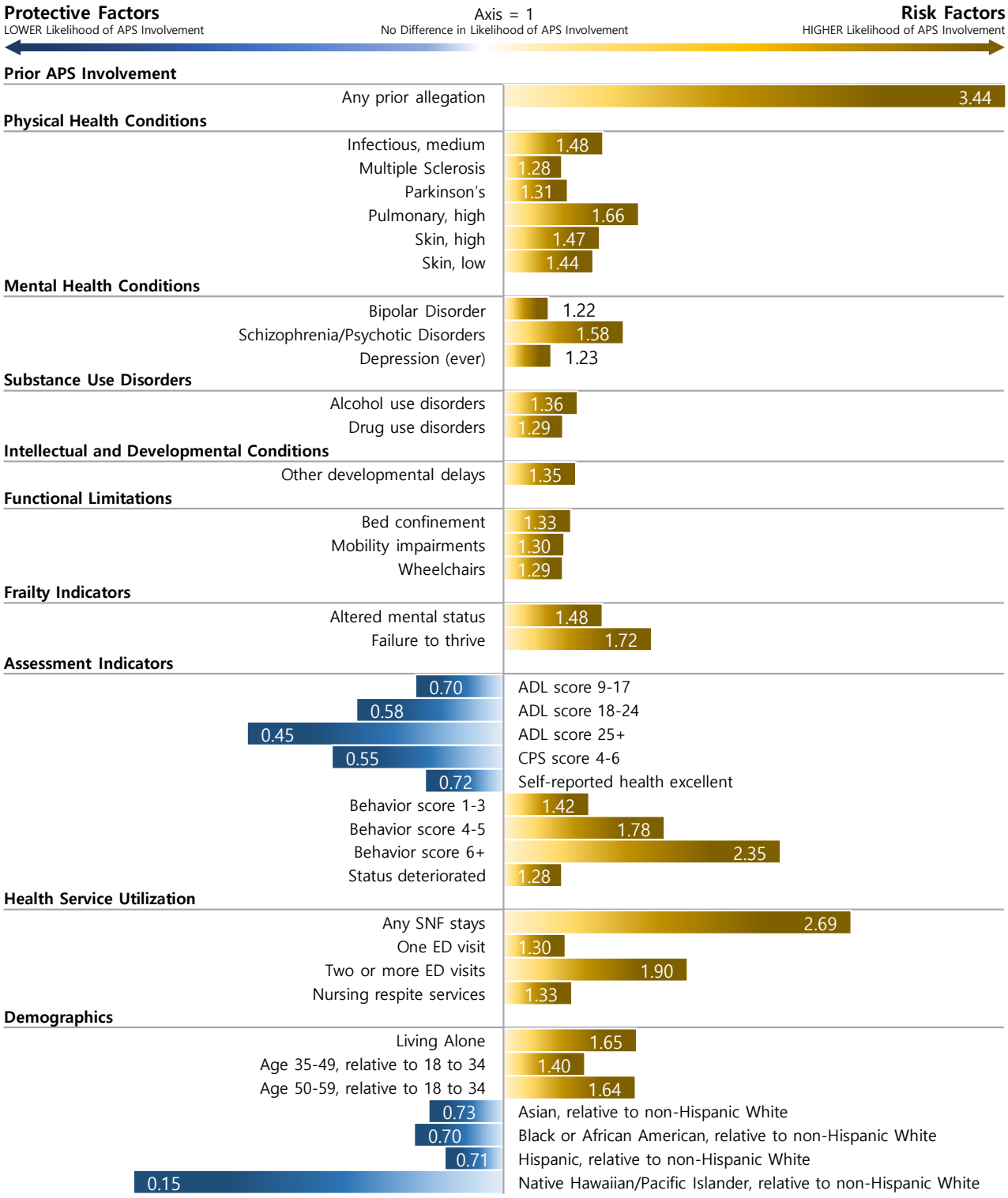
Health service utilization. ED use, receipt of Medicare skilled nursing facility services, and use of nursing respite services were associated with increased risk of involvement in an APS self-neglect investigation among adults under 60 receiving in-home services. Again, it is important to note that it would be inappropriate to infer that use of these services causes self-neglect.

Demographics. Relative to persons under the age of 35 receiving in-home services, adults between the ages of 35 and 59 were more likely to be involved in an APS self-neglect investigation, as were persons identified as living alone. Native Hawaiian, Pacific Islander, Asian, Black and Hispanic adults receiving in-home services were less likely, relative to non-Hispanic White adults receiving in-home services, to be involved in an APS self-neglect investigation.

FIGURE 4.

Selected Adjusted Odds of Self-Neglect for Adult In-Home Clients

Calendar Years 2016-2018 (combined)



NOTE: Factors included in the figure have adjusted odds greater than or equal to 1.20 (or less than or equal to 0.83 for protective factors), significant coefficients (p-value less than or equal to 10 percent), and prevalence of at least 1 percent among those with the outcome.

Factors Predicting Involvement in a Self-Neglect Investigation Among Elders Aged 60 and Above Receiving In-Home Services

Recidivism. Prior APS involvement was a powerful predictor of future involvement in an APS self-neglect investigation (Figure 5). Elders receiving in-home services with a prior APS referral have more than 4 times the odds of a subsequent APS referral for self-neglect, compared to elders who were not referred to APS in the prior year.

Physical conditions. Among elders receiving in-home services, skin conditions were associated with increased risk of involvement in a self-neglect investigation. Relevant skin conditions include burns and non-pressure chronic ulcers of the feet and legs, likely caused by vascular diseases and diabetes.

Behavioral health conditions. Personality disorders and drug and alcohol use disorders were associated with increased risk of involvement in APS self-neglect allegations among elders receiving in-home services.

Cognitive and intellectual/developmental conditions. Alzheimer's disease was associated with increased risk of involvement in APS self-neglect allegations among elders receiving in-home services.

Functional limitations and frailty indicators. Wheelchair use was associated with increased risk of involvement in APS self-neglect allegations among elders receiving in-home services, as were diagnoses of failure to thrive and altered mental status.

CARE Assessment Indicators. High behavior point scores were among the most powerful predictors of increased risk of involvement in an APS self-neglect investigation among elders receiving in-home services. Elders identified with deteriorating health status were at increased risk of self-neglect. Higher ADL scores associated with greater ADL support needs were associated with a significantly *reduced* risk of involvement in a self-neglect investigation, as were higher CPS scores indicating significant cognitive impairment. Again, recognition of the impact of high ADL support needs and significant cognitive impairment on a person's ability to provide self-care may explain why these risk factors were associated with reduced risk of involvement in self-neglect investigations. Elders identified with exceptional care needs were also at reduced risk of self-neglect. Counterintuitively, elders providing a self-reported health status of "excellent" were *more likely* to be involved in a self-neglect investigation.

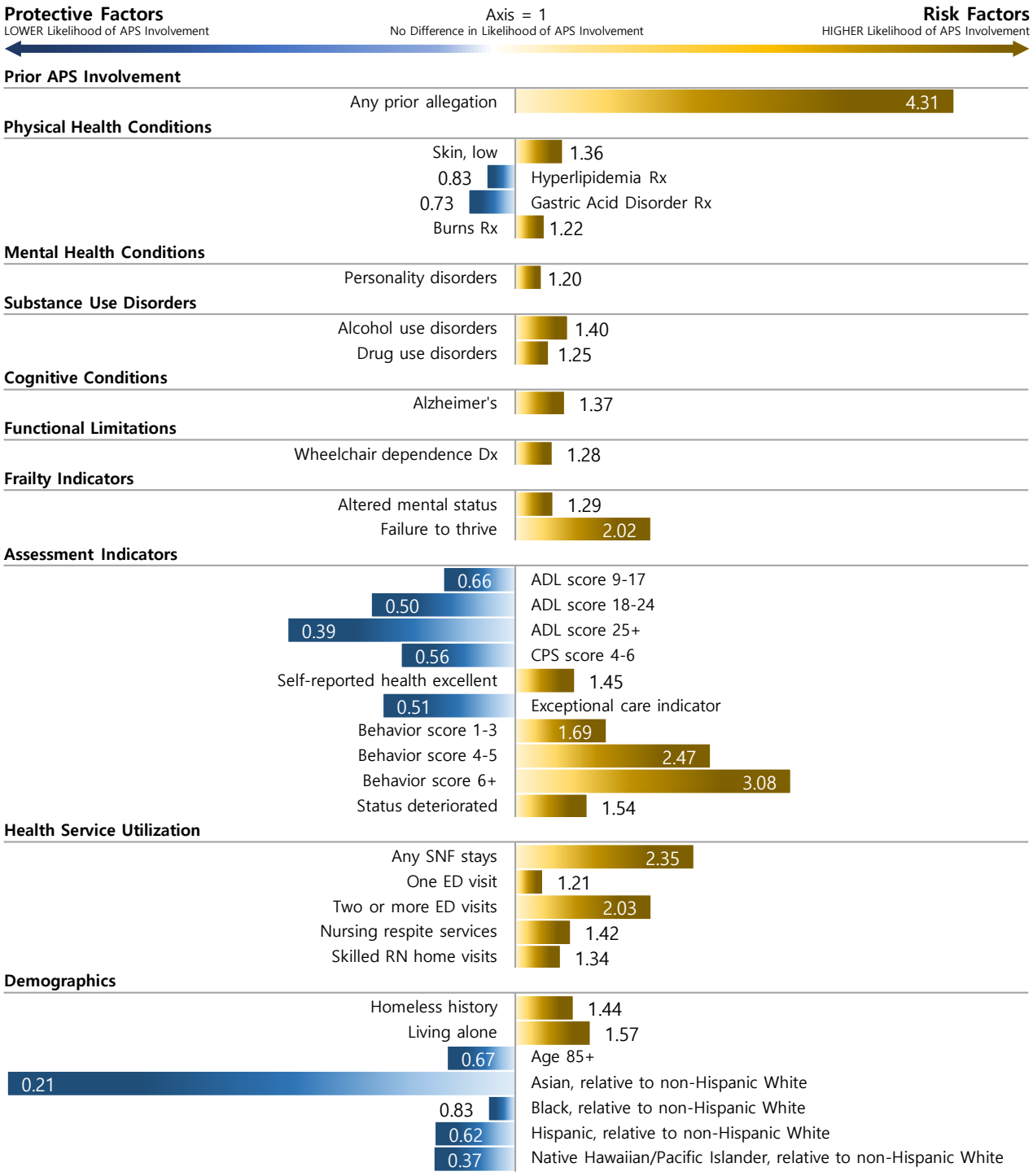
Health service utilization. ED use, receipt of Medicare skilled nursing facility services, skilled nursing home visits, and use of nursing respite services were associated with increased risk of involvement in an APS self-neglect investigation among elders receiving in-home services. Again, it is important to recognize that it would be inappropriate to infer that use of these services causes self-neglect.

Demographics. Relative to persons aged 60 to 84, Elders aged 85 and above receiving in-home services were less likely to be involved in an APS self-neglect investigation. Elders with a history of homelessness or living alone were more likely to be involved in a self-neglect investigation. Native Hawaiian, Pacific Islander, Asian, Black and Hispanic elders receiving in-home services were less likely, relative to non-Hispanic White elders receiving in-home services, to be involved in an APS self-neglect investigation.

FIGURE 5.

Selected Adjusted Odds of Self-Neglect for Elder In-Home Clients

Calendar Years 2016-2018 (combined)



NOTE: Factors included in the figure have adjusted odds greater than or equal to 1.20 (or less than or equal to 0.83 for protective factors), significant coefficients (p-value less than or equal to 10 percent), and prevalence of at least 1 percent among those with the outcome.

Factors Predicting Involvement in a Non-Self-Neglect APS Investigations Among Adults Under 60 Receiving In-Home Services

Recidivism. Prior APS involvement was the most powerful predictor of future involvement in non-self-neglect APS investigations among adults under 60 receiving in-home services (Figure 6). Persons with prior APS involvement have 4 times the odds of being an alleged victim in a subsequent APS non-self-neglect investigation, compared to persons who were not involved with APS in the prior year.

Physical conditions. Among adults under 60 receiving in-home services, high-impact pulmonary conditions were associated with a relatively modest increased risk of involvement in a non-self-neglect APS investigation.

Behavioral health conditions. Post-traumatic stress disorder (PTSD) and depression were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving in-home services.

Cognitive and intellectual/developmental conditions. Intellectual disabilities and developmental delays were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving in-home services.

Functional limitations and frailty indicators. Visual impairment, wheelchair dependence, and the effects of cerebrovascular disease were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving in-home services.

CARE Assessment Indicators. High behavior point scores were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving in-home services. Higher CPS scores were associated with reduced risk of involvement in a non-self-neglect APS investigation.

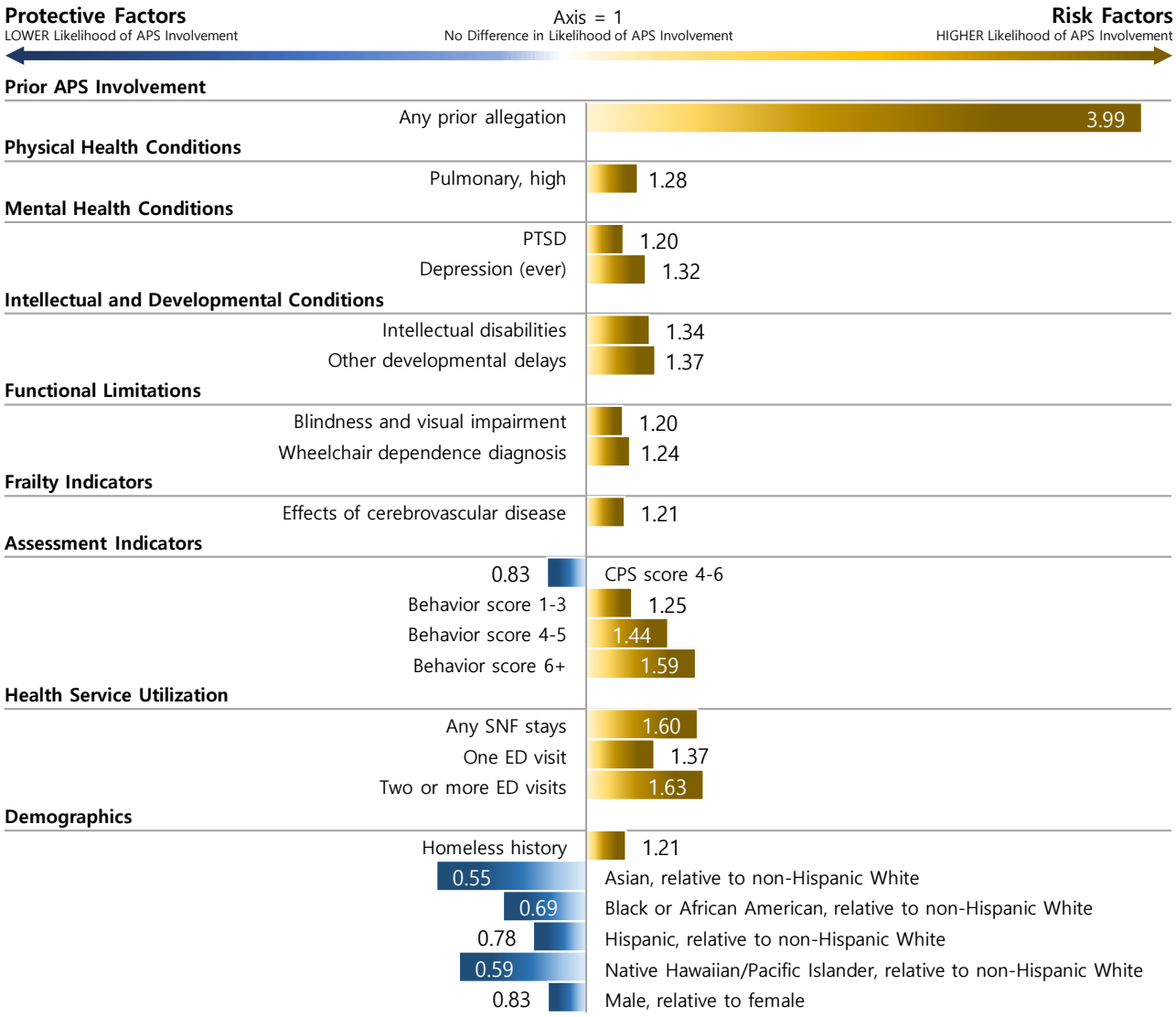
Health service utilization. ED use and receipt of Medicare skilled nursing facility services were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving in-home services.

Demographics. Adults under 60 receiving in-home services with a history of homelessness were more likely to be involved in a non-self-neglect APS investigation. Native Hawaiian, Pacific Islander, Asian, Black, and Hispanic adults receiving in-home services were less likely, relative to non-Hispanic White adults receiving in-home services, to be involved in a non-self-neglect APS investigation. Men were less likely than women to be involved as an alleged victim in a non-self-neglect APS investigation.

FIGURE 6.

Selected Adjusted Odds of Other APS Allegations for Adult In-Home Clients

Calendar Years 2016-2018 (combined)



NOTE: Factors included in the figure have adjusted odds greater than or equal to 1.20 (or less than or equal to 0.83 for protective factors), significant coefficients (p-value less than or equal to 10 percent), and prevalence of at least 1 percent among those with the outcome.

Factors Predicting Involvement in a Non-Self-Neglect Investigation Among Elders Aged 60 and Above Receiving In-Home Services

Recidivism. Prior APS involvement was again a powerful predictor of future involvement in a non-self-neglect APS investigation (Figure 7). Elders with prior APS involvement receiving in-home services have more than 4 times the odds of being an alleged victim in a subsequent APS non-self-neglect investigation, compared to elders who were not involved with APS in the prior year.

Physical conditions. Among elders receiving in-home services, high-impact skin conditions (pressure ulcers) were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation.

Behavioral health conditions. Among elders receiving in-home services, depression and drug use disorders were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation.

Cognitive and intellectual/developmental conditions. Alzheimer's and traumatic brain injury were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation among elders receiving in-home services. Developmental and intellectual disabilities were also associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation.

Functional limitations and frailty indicators. Hospital bed use, bed confinement, and failure to thrive diagnoses were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation among elders receiving in-home services.

CARE Assessment Indicators. High behavior point scores were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation among elders receiving in-home services. Elders identified with deteriorating health status were also at increased risk of involvement in non-self-neglect APS investigations. Elders providing a self-reported health status of "poor" were somewhat less likely to be involved as an alleged victim in a non-self-neglect APS investigation.

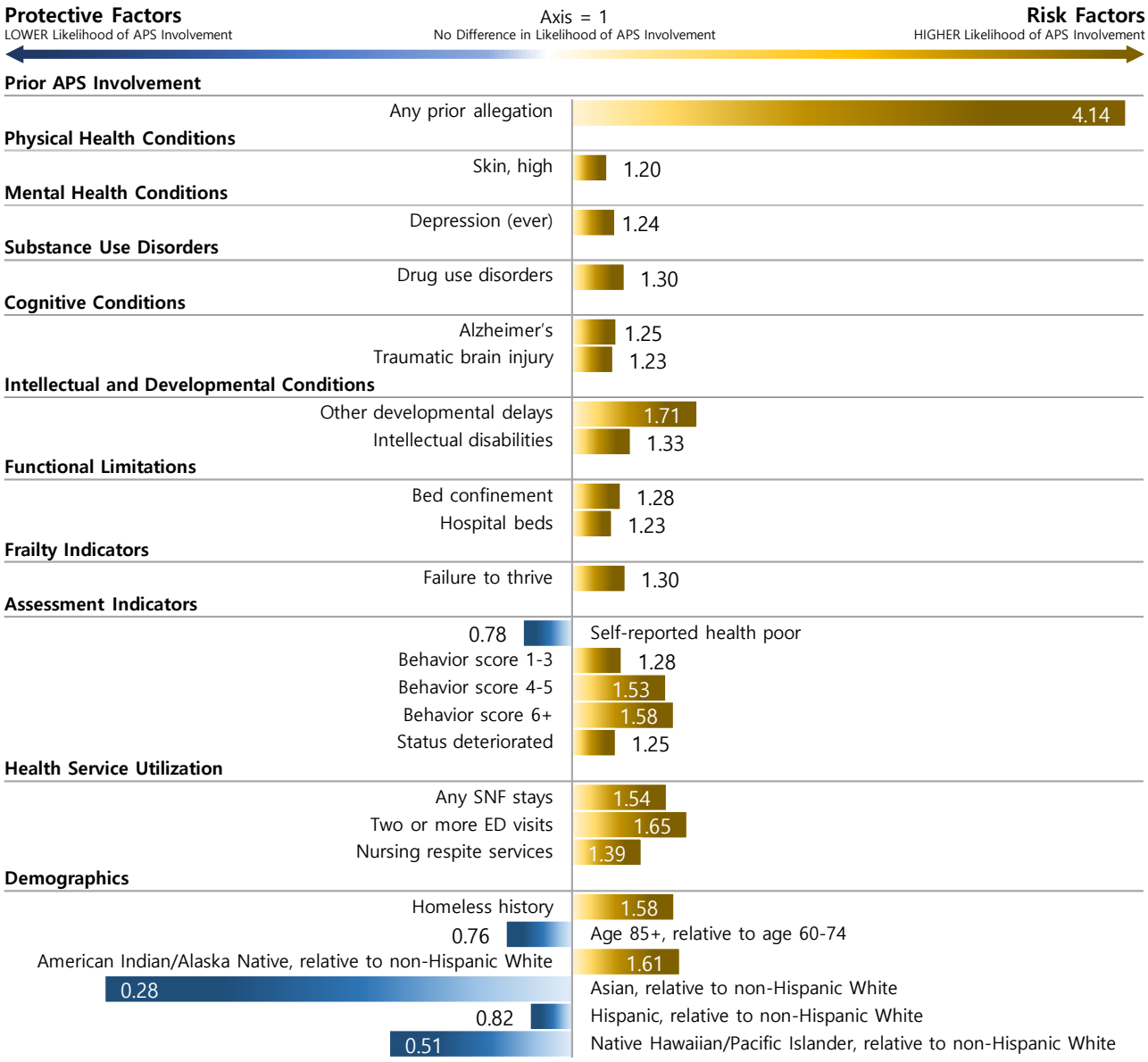
Health service utilization. ED use, receipt of Medicare skilled nursing facility services, and use of nursing respite services were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation among elders receiving in-home services.

Demographics. Relative to persons aged 60 to 84, Elders aged 85 and above receiving in-home services were less likely to be involved as an alleged victim in a non-self-neglect APS investigation. Elders with a history of homelessness were more likely to be involved in a non-self-neglect APS investigation. Asian, Hispanic, and Native Hawaiian or Other Pacific Islander elders receiving in-home services were less likely, relative to non-Hispanic White elders receiving in-home services, to be involved as an alleged victim in a non-self-neglect APS investigation. American Indian or Alaska Native elders receiving in-home services were *more likely* to be involved as an alleged victim in a non-self-neglect APS investigation.

FIGURE 7.

Selected Adjusted Odds of Other Allegations for Elder In-Home Clients

Calendar Years 2016-2018 (combined)



NOTE: Factors included in the figure have adjusted odds greater than or equal to 1.20 (or less than or equal to 0.83 for protective factors), significant coefficients (p-value less than or equal to 10 percent), and prevalence of at least 1 percent among those with the outcome.

Factors Predicting Involvement in a Non-Self-Neglect APS Investigations Among Adults Under 60 Receiving Community Residential Services

Recidivism. Prior APS involvement was the most powerful predictor of future involvement in non-self-neglect APS investigations among adults under 60 receiving community residential services (Figure 8). Persons with prior APS involvement have more than twice the odds of being an alleged victim in a subsequent APS non-self-neglect investigation, compared to persons who were not involved with APS in the prior year.

Physical conditions. Among adults under 60 receiving community residential services, high-impact gastrointestinal conditions (e.g., liver transplant or gastronomy status) were associated with reduced risk of involvement in a non-self-neglect APS investigation. High-impact pulmonary conditions, seizure disorders, and muscular dystrophy were associated with increased risk.

Behavioral health conditions. Post-traumatic stress disorder, depression, and drug use disorders were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving community residential services. Receipt of antipsychotic or anti-mania medications was associated with reduced risk.

Cognitive and intellectual/developmental conditions. Alzheimer's and learning disabilities were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving community residential services.

Functional limitations and frailty indicators. Spinal cord injury and weight loss were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving community residential services.

CARE Assessment Indicators. High behavior point scores and self-reported poor health status were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving community residential services. Presence of an exceptional care need indicator was associated with reduced risk of involvement in a non-self-neglect APS investigation.

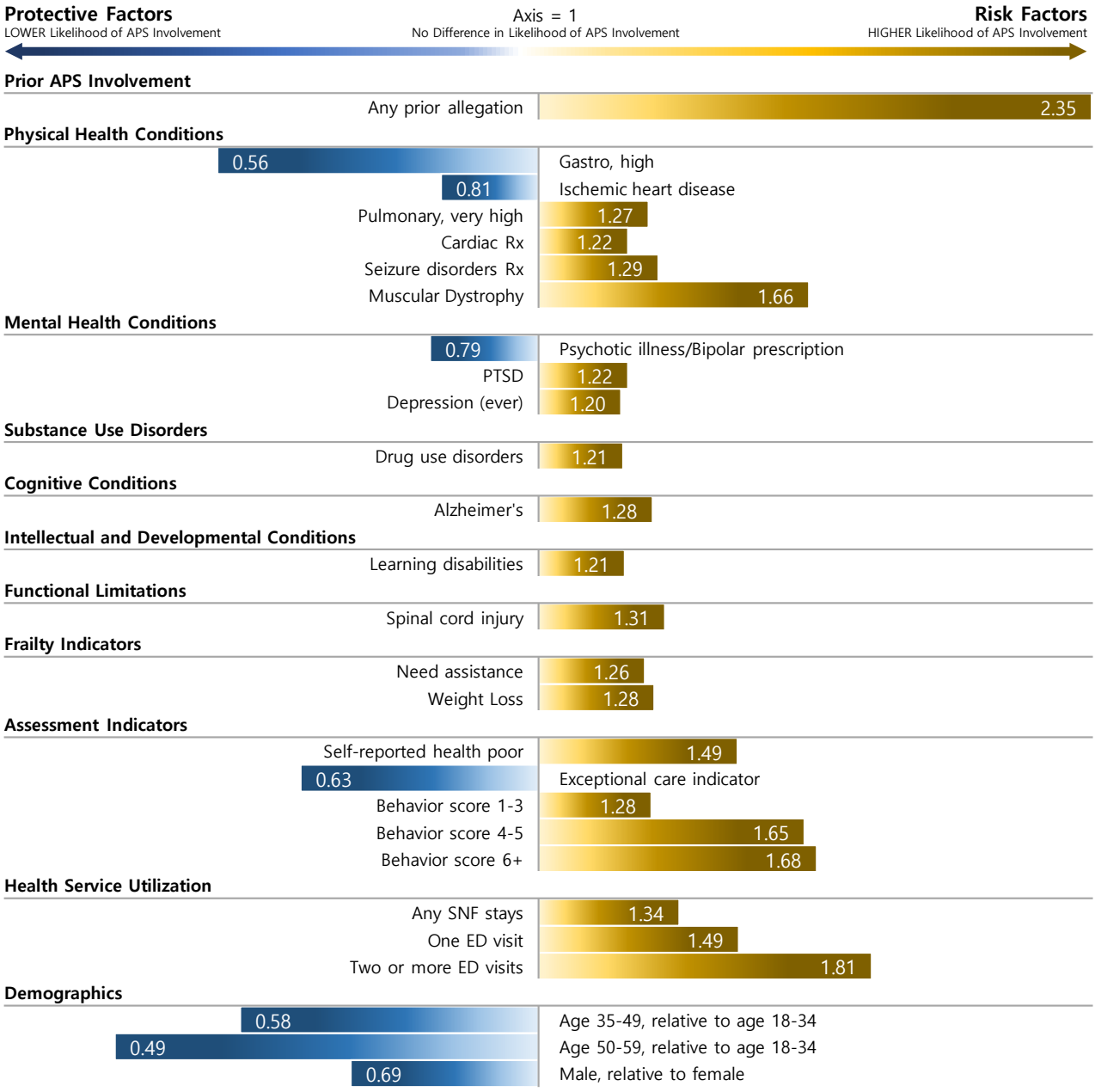
Health service utilization. ED use and receipt of Medicare skilled nursing facility services were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving community residential services.

Demographics. Among adults under 60 receiving community residential services, persons aged 35 to 59 were less likely than persons under the age of 35 to be involved as an alleged victim in a non-self-neglect APS investigation. Men were less likely than women to be involved as an alleged victim in a non-self-neglect APS investigation.

FIGURE 8.

Selected Adjusted Odds of Other Allegations for Adult Residential Clients

Calendar Years 2016-2018 (combined)



NOTE: Factors included in the figure have adjusted odds greater than or equal to 1.20 (or less than or equal to 0.83 for protective factors), significant coefficients (p-value less than or equal to 10 percent), and prevalence of at least 1 percent among those with the outcome.

Factors Predicting Involvement in a Non-Self-Neglect Investigation Among Elders Aged 60 and Above Receiving Community Residential Services

Recidivism. Prior APS involvement was again a powerful predictor of future involvement in a non-self-neglect APS investigation (Figure 9). Elders with prior APS involvement receiving community residential services have more than twice the odds of being an alleged victim in a subsequent APS non-self-neglect investigation, compared to elders who were not involved with APS in the prior year.

Physical conditions. Among elders receiving community residential services, high-impact skin conditions (pressure ulcers) and migraines were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation. End-stage renal disease (ESRD) and receipt of cancer treatment were associated with reduced risk of involvement as an alleged victim in a non-self-neglect APS investigation.

Behavioral health conditions. Among elders receiving community residential services, post-traumatic stress disorder was associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation.

Cognitive and intellectual/developmental conditions. No cognitive or intellectual/developmental conditions met the significance threshold for inclusion in Figure 9.

Functional limitations and frailty indicators. Bed confinement and falls were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation among elders receiving community residential services.

CARE Assessment Indicators. High behavior point scores were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation among elders receiving community residential services. Elders assessed to have exceptional care needs were less likely to be involved as an alleged victim in a non-self-neglect APS investigation.

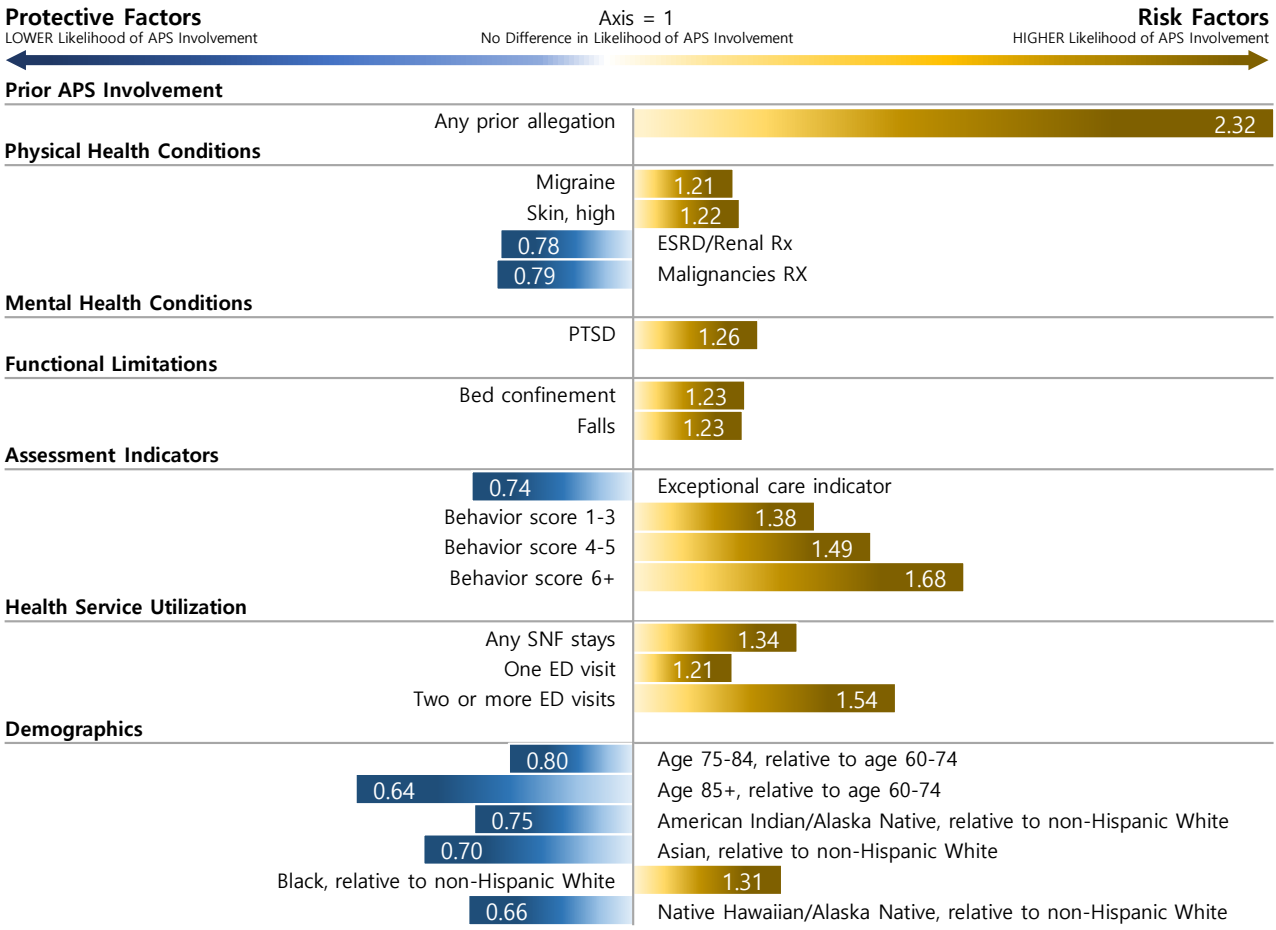
Health service utilization. ED use and receipt of Medicare skilled nursing facility services were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation among elders receiving community residential services.

Demographics. Relative to persons aged 60 to 74, Elders aged 75 and above receiving community residential services were less likely to be involved as an alleged victim in a non-self-neglect APS investigation. Asian, Hispanic, and Native Hawaiian or Other Pacific Islander elders receiving community residential services were less likely, relative to non-Hispanic White elders, to be involved as an alleged victim in a non-self-neglect APS investigation. Black elders were more likely, relative to non-Hispanic White elders, to be involved as an alleged victim in a non-self-neglect APS investigation.

FIGURE 9.

Selected Adjusted Odds of Other Allegations for Elder Residential Clients

Calendar Years 2016-2018 (combined)



NOTE: Factors included in the figure have adjusted odds greater than or equal to 1.20 (or less than or equal to 0.83 for protective factors), significant coefficients (p-value less than or equal to 10 percent), and prevalence of at least 1 percent among those with the outcome.

Factors Predicting Involvement in a Non-Self-Neglect APS Investigations Among Adults Under 60 Receiving Nursing Home Services

Recidivism. Prior APS involvement was the most powerful predictor of future involvement in non-self-neglect APS investigations among adults under 60 receiving nursing home services (Figure 10). Persons with prior APS involvement have more than twice the odds of being an alleged victim in a subsequent APS non-self-neglect investigation, compared to persons who were not involved with APS in the prior year.

Physical conditions. Among adults under 60 receiving nursing home services, cystic fibrosis, bladder conditions, chronic pain, and high-impact skin conditions (pressure ulcers) were associated with increased risk of involvement in a non-self-neglect APS investigation. Several chronic health conditions were associated with reduced risk of involvement in a non-self-neglect APS investigation, including cerebral palsy, type 1 diabetes, pulmonary conditions, and osteoporosis.

Behavioral health conditions. Among adults under 60 receiving nursing home services, depression was associated with increased risk of involvement in a non-self-neglect APS investigation. Receipt of medication to treat alcohol use disorder was associated with decreased risk.

Cognitive and intellectual/developmental conditions. Autism spectrum disorder, and intellectual and developmental disabilities were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving nursing home services. Traumatic brain injury was associated with reduced risk.

Functional limitations and frailty indicators. Bed confinement, hospital bed use, and wheelchair use were associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving nursing home services.

CARE Assessment Indicators. CARE assessments are conducted for persons receiving in-home or community residential services and are not conducted for nursing home residents.

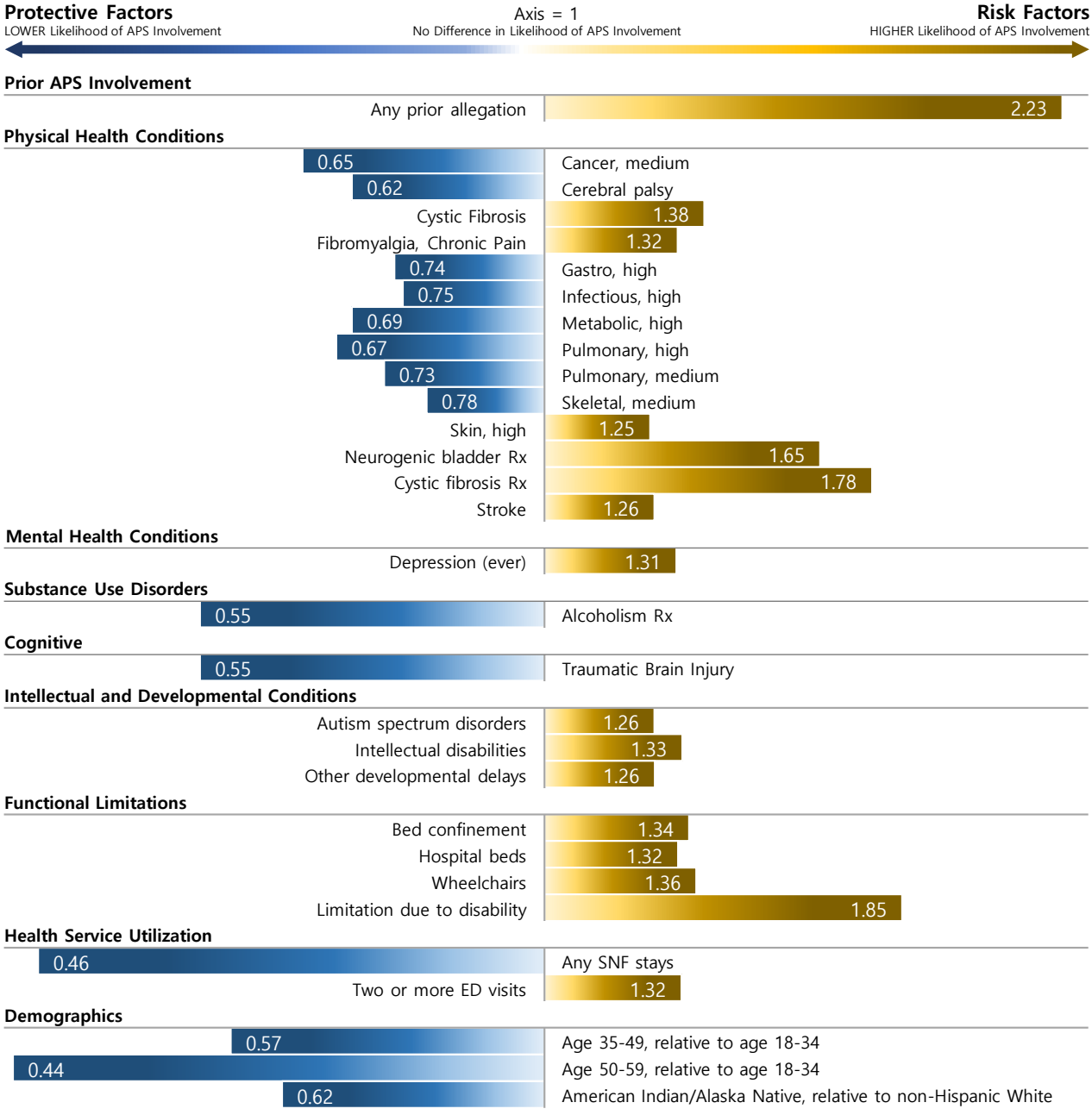
Health service utilization. ED use was associated with increased risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving nursing home services. Receipt of Medicare-paid skilled nursing facility services was associated with a significantly *reduced* risk of involvement in a non-self-neglect APS investigation among adults under 60 receiving nursing home services.

Demographics. Among adults under 60 receiving nursing home services, persons aged 35 to 59 were less likely than persons under the age of 35 to be involved as an alleged victim in a non-self-neglect APS investigation. American Indian and Alaska Native adults under 60 receiving nursing home services were significantly less likely than non-Hispanic White adults to be involved as an alleged victim in a non-self-neglect APS investigation.

FIGURE 10.

Selected Adjusted Odds of Other Allegations for Adult Nursing Home Clients

Calendar Years 2016-2018 (combined)



NOTE: Factors included in the figure have adjusted odds greater than or equal to 1.20 (or less than or equal to 0.83 for protective factors), significant coefficients (p-value less than or equal to 10 percent), and prevalence of at least 1 percent among those with the outcome.

Factors Predicting Involvement in a Non-Self-Neglect Investigation Among Elders Aged 60 and Above Receiving Nursing Home Services

Recidivism. Prior APS involvement was again a strong predictor of future involvement in a non-self-neglect APS investigation (Figure 11). Elders with prior APS involvement receiving nursing home services have almost twice the odds of being an alleged victim in a subsequent APS non-self-neglect investigation, compared to elders who were not involved with APS in the prior year.

Physical conditions. Among elders receiving nursing home services, high-impact cancer, renal, and gastrointestinal conditions were associated with reduced risk of involvement as an alleged victim in a non-self-neglect APS investigation.

Behavioral health conditions. Among adults elders receiving nursing home services, depression was associated with increased risk of involvement in a non-self-neglect APS investigation.

Cognitive and intellectual/developmental conditions. Learning disabilities and autism spectrum disorder were associated with increased risk of involvement in a non-self-neglect APS investigation among Elders receiving nursing home services.

Functional limitations and frailty indicators. Use of a commode chair or hospital bed and spinal cord injury were associated with increased risk of involvement as an alleged victim in a non-self-neglect APS investigation among elders receiving nursing home services.

CARE Assessment Indicators. CARE assessments are conducted for persons receiving in-home or community residential services and are not conducted for nursing home residents.

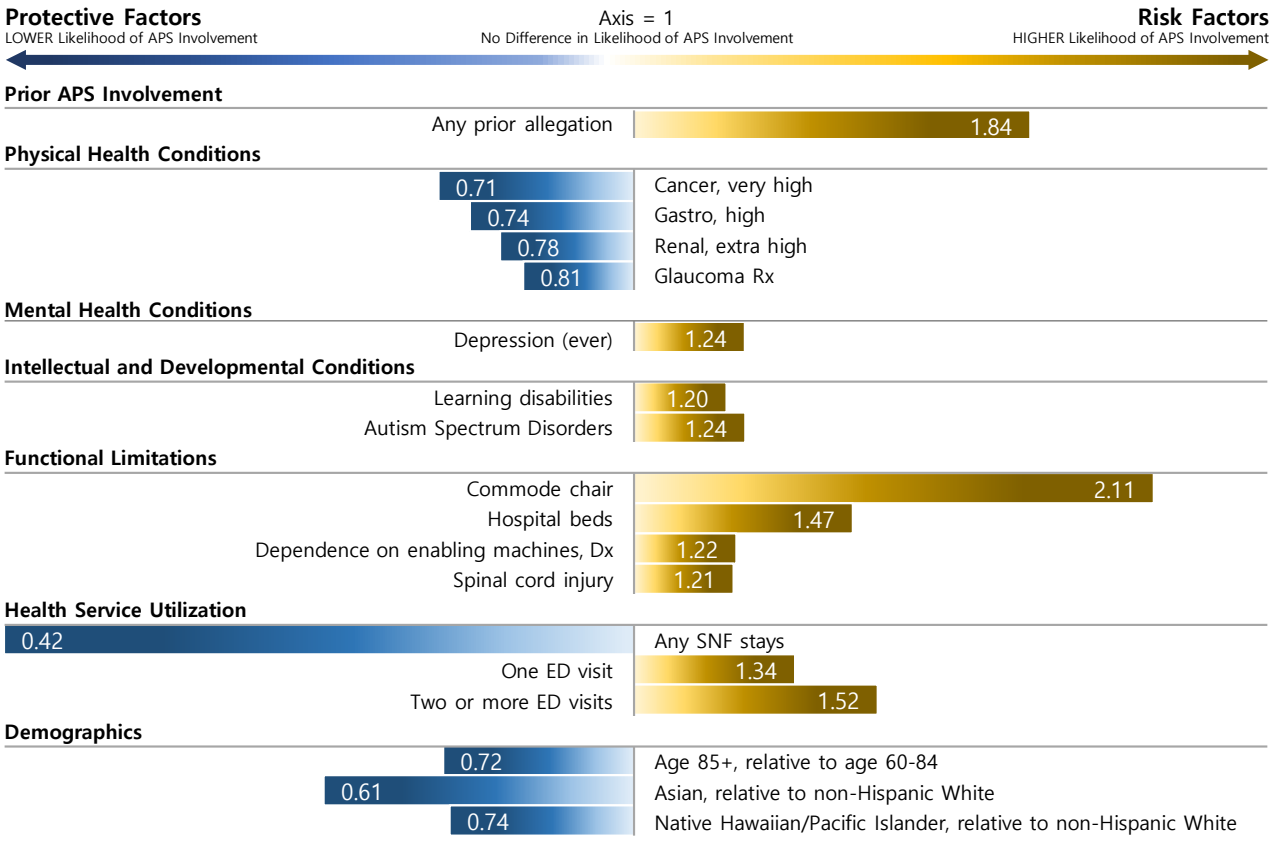
Health service utilization. ED use was associated with increased risk of involvement in a non-self-neglect APS investigation among elders receiving nursing home services. Receipt of Medicare-paid skilled nursing facility services was associated with a significantly *reduced* risk of involvement in a non-self-neglect APS investigation among elders receiving nursing home services.

Demographics. Relative to persons aged 60 to 84, Elders aged 85 and above receiving nursing home services were less likely to be involved as an alleged victim in a non-self-neglect APS investigation. Asian and Native Hawaiian or Other Pacific Islander elders receiving nursing home services were less likely, relative to non-Hispanic White elders receiving nursing home services, to be involved as an alleged victim in a non-self-neglect APS investigation.

FIGURE 11.

Selected Adjusted Odds of Other Allegations for Elderly Nursing Home Clients

Calendar Years 2016-2018 (combined)



NOTE: Factors included in the figure have adjusted odds greater than or equal to 1.20 (or less than or equal to 0.83 for protective factors), significant coefficients (p-value less than or equal to 10 percent), and prevalence of at least 1 percent among those with the outcome.

Summary of Key Findings

Recidivism. In most models, prior APS involvement was the strongest predictor of future involvement of an LTSS recipient as an alleged victim in an APS investigation. Compared to LTSS recipients without prior APS involvement, LTSS recipients with prior APS involvement had 2 to 4 times the odds of subsequent APS involvement, depending on the APS outcome, age group, and LTSS service setting examined.

Behavior support needs. Behavior support needs, as indicated by behavioral point scores captured in CARE assessment data, were associated with significantly increased risk of involvement in an APS investigation for in-home and community residential clients. Increased risk was observed for both adults under 60 and elders aged 60 and above. Other CARE assessment characteristics were significant predictors of APS involvement among persons served in in-home or community residential settings, depending on the APS outcome and age group examined.

Race/ethnicity. In most cases where race/ethnicity effects were statistically significant, effects were associated with reduced risk of involvement as an alleged victim in an APS investigation for LTSS recipients from BIPOC communities, relative to the experience of non-Hispanic White LTSS recipients. The two exceptions to this general result were the finding of increased risk of involvement in non-self-neglect APS investigations for American Indian or Alaska Native elders served in in-home LTSS settings and increased risk of non-self-neglect APS investigations for Black elders served in community residential settings.

Mental illness and substance use disorders. Although significant risk factors varied depending on the LTSS service setting and age group, mental illness and substance use disorders were associated with relatively modest but statistically significant increased risk of involvement in APS allegations in all LTSS settings.

Cognitive impairments. Alzheimer's disease was associated with increased risk of involvement in a self-neglect investigation among elders served in in-home LTSS settings. Alzheimer's and traumatic brain injury were also associated with increased risk of involvement in non-self-neglect allegations among elders served in in-home LTSS settings.

Intellectual and developmental disabilities. In most models, intellectual and developmental disabilities were associated with increased risk of involvement in an APS investigation.

Diagnosis-based functional support needs and frailty indicators. Bed confinement and wheelchair use were often associated with increased risk of involvement in an APS investigation.

Health service utilization. Emergency department, skilled nursing home visits, and nursing respite services were often associated with increased risk of involvement in an APS investigation. Among persons served in in-home or community residential settings, use of Medicare skilled nursing facility services was associated with increased risk of involvement in an APS investigation. However, clients using ALTSA nursing home services were less likely to be involved in an APS investigation if they also received Medicare skilled nursing facility services during the outcome year.

Physical conditions. Skin conditions (pressure ulcers, burns, and non-pressure ulcers associated with vascular disease and diabetes) were most commonly associated with increased risk of involvement in an APS investigation.

Predictive accuracy. Predictive accuracy was strong for models of self-neglect, with C-statistics at or above 0.85. Models for non-self-neglect allegations had significantly lower predictive accuracy.

Comparison with prior findings from models of APS involvement among Medicare beneficiaries. The models presented in this report for Medicaid LTSS recipients show some similarities and

differences relative to the APS risk models estimated for Medicare beneficiaries in Bauer et al. 2022b. For example, among adults under 60, Alzheimer's changed from being a protective factor for self-neglect in the Medicare population to not being a statistically significant predictor of self-neglect among persons receiving in-home personal care services.

There are some key points to keep in mind in interpreting differences between the two sets of predictive models. First, the Medicaid LTSS population is a much smaller and relatively more homogenous population than the broader, partially overlapping universe of Medicare beneficiaries. In particular, all Medicaid LTSS clients meet "vulnerable adult" criteria defining eligibility for APS services. This observation may partially account for the relatively low predictive power of models of non-self-neglect risk, and the reduced (but still powerful) role of recidivism in the statistical models for Medicaid LTSS recipients.

Second, adding risk factors derived from CARE assessment data altered the relationship between diagnosis-based behavioral health indicators and risk of APS involvement for some populations. Although CARE behavior point scores were important in all models, their inclusion had the greatest impact in dampening effects associated with mental illness diagnoses in models of self-neglect for adults and elders receiving in-home services. These results suggest that behavior support needs identified by the CARE assessment capture an important dimension of the relationship between APS involvement and mental illness. For example, these results are consistent with the conclusion that interventions that meet a person's mental health needs and reduce behavior support needs will reduce risk of self-neglect. In addition, the CARE behavior point score is a composite score. Future iterations of this report will examine the underlying behaviors that contribute to the composite score to determine whether there are specific behaviors that may be driving the relationship between the score and risk of APS involvement.

Finally, we note that the models presented in this report for Medicaid LTSS recipients used a "concurrent" time structure, with the exception of measurement of prior APS involvement. This means that most risk factors and APS experiences were measured in the same "outcome" year. This approach was chosen to increase the likelihood that any incident resulting in APS involvement in the outcome year occurred while persons were receiving Medicaid LTSS services. Prior models developed for Medicare beneficiaries used a "prospective" time structure, relating risk factors from a prior "base" year to APS involvement in the subsequent "outcome" year.

Chronic Illness and Disability Payment System (CDPS) and Medicaid-Rx risk classification systems. The CDPS is a diagnostic classification system developed by researchers at the University of California at San Diego, designed to support risk-based capitated payment systems for Medicaid beneficiaries. The CDPS categorizes ICD-9 and ICD-10 diagnosis codes into approximately 20 major physical and behavioral health condition categories. Examples of major diagnostic categories include cardiovascular disease, diabetes, psychiatric disorders, and substance use disorders. Within major diagnostic categories, conditions are further organized into levels of severity. For example, schizophrenia is grouped into the "Psychiatric High" risk group, while bipolar affective disorder is grouped into the "Psychiatric Medium" risk group.

The Medicaid-Rx is a pharmacy classification system, also developed by researchers at the University of California at San Diego to support risk-based capitated payment systems for Medicaid beneficiaries. The Medicaid-Rx categorizes medications into 45 pharmacy risk groups based on primary on-label usage. Examples of pharmacy risk groups include medications to treat cardiovascular disorders (e.g., ace inhibitors, beta blockers, nitrates, digitalis, vasodilators) and medications to treat schizophrenia or bipolar disorders (e.g., antipsychotic medications and lithium). More information about the CDPS and Medicaid-Rx is available from the University of California at San Diego at https://hwsph.ucsd.edu/research/programs-groups/cdps.html.

Medicare Master Beneficiary Summary Files (MBSF). Medicare MBSF files were obtained from the Research Data Assistance Center (ResDAC) at the University of Minnesota. ResDAC is a Centers for Medicare and Medicaid Services (CMS) contractor providing assistance to academic, non-profit, for-profit, and government researchers in accessing and using CMS data. The MBSF file set includes information about Medicare program enrollment, chronic conditions, cost, and utilization. Chronic conditions are identified using the CMS Chronic Conditions Data Warehouse (CCW) diagnostic classification system and a supplementary condition set identifying other chronic or potentially disabling conditions. The original CCW condition set includes physical health conditions that tend to be more prevalent among elders (e.g., acute myocardial infarction, Alzheimer's disease, and diabetes). The supplemental condition set includes other disabling conditions, notably psychiatric, substance use, and intellectual and developmental disorders. More information about the CCW is available at https://www2.ccwdata.org/web/guest/condition-categories-chronic. More information about the MBSF supplemental conditions is available at https://resdac.org/cms-data/files/mbsf-other-conditions.

Interpretation of the concordance statistic. The concordance statistic (C-statistic) is a widely used measure of predictive accuracy for logistic regression models. "Concordance" means that a person who experiences the outcome (e.g., APS involvement) has a higher predicted probability of that outcome than a person who does not experience the outcome. The C-statistic is the proportion of pairs of individuals for which the person who experiences the outcome has a higher predicted probability than the person who does not experience the outcome, among all possible pairs in which one person experiences the outcome of interest and the other one does not. The higher the C-statistic, the better the model can discriminate between subjects who experience the outcome of interest and subjects who do not. It is important to note that the C-statistic is not a measure of the predictive accuracy of the model for a given individual. Specifically, the C-statistic is not a measure of the proportion of persons who experienced the outcome who were predicted to be more likely to experience the outcome than to not experience the outcome.

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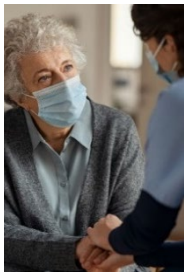

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