

Data HIGHLIGHT

Utilization of Z Codes for Social Determinants of Health among a Sample of Medicare Advantage Enrollees, 2017 and 2019

Executive Summary

The Healthy People 2030 Initiative defines social determinants of health (SDOH) as “the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.”¹ One potential source of this information is ICD-10-CM Z codes, which identify non-medical factors (e.g., socioeconomic conditions) that may influence a patient's health status. CMS has considerable interest in the use of Z codes for SDOH, with one recent CMS infographic describing them as part of the “data journey to better outcomes.”² Prior work published as CMS data highlights have documented the use of Z codes in the Medicare fee for service (FFS) population during 2017 and 2019.^{3,4} In this report, we build on this work by analyzing use of Z codes in a sample of Medicare Advantage (MA) enrollees from 2016 through 2019 using the OptumLabs Data Warehouse (OLDW), with closer exploration of data from 2017 and 2019. This sample is drawn from MA enrollees covered by a single, nationwide insurer.

Consistent with prior findings using Medicare FFS data, we find low rates of Z code utilization in MA at the enrollee-level and the claims-level. Among our sample, only 0.94% of MA enrollees in 2017 and 1.07% of MA enrollees in 2019 had one or more medical claims with ICD-10-CM Z codes for SDOH, henceforth “Z codes,” which represents a 14.4% increase from 2017 to 2019. Only 0.080% of medical claims in 2017 and 0.076% of medical claims in 2019 had Z codes. In both 2017 and 2019, the most common Z code was Z60.2 (Problems related to living alone), followed

by Z63.4 (Disappearance and death of a family member), Z59.0 (Homelessness) and Z63.0 (Problems in relationship with spouse or partner). Of note, this study analyzed only the use of Z codes to document SDOH, and these risk factors may be documented elsewhere by clinicians, for example using open fields in electronic health records.

In terms of the demographics of MA enrollees in the sample data with Z code claims, compared to all MA enrollees in the OLDW, the oldest (aged 85 years and older) and youngest (aged 18-64 years) enrollees appeared overrepresented among those with any Z code claim. Enrollees with any Z code claim also appeared to be disproportionately female, Black, residents of lower-income households or residents of lower-median educational attainment neighborhoods. Nearly two thirds of enrollees experiencing homelessness were aged 18-64 years, but only small proportions of enrollees with these social determinants of health were aged 85 years and older. Additionally, nearly one third of enrollees with problems related to living alone were in the group aged 85 years and older. Enrollees with Z codes for homelessness also appeared to be disproportionately male, Black and residents of metropolitan areas. However, due to the small numbers of enrollees with any Z code claims and high rates of missing demographic data for enrollees with some Z codes, these findings should not be interpreted as representative of the true prevalence of the social determinants of health described, nor the demographic composition of MA enrollees with these risk factors.

In addition to their relatively recent introduction and changing guidance on their use, one potential explanation for low utilization of Z codes may be the lack of explicit financial incentives for their use. Recent changes to evaluation and management (E&M) coding altered the basis on which providers could bill for higher-intensity services (and higher payment) to focus on the time spent with the patient or the complexity of medical decision-making required. As social determinants of health are among the factors driving complexity of medical decision-making, these changes may add some incentive to record Z codes. Future research should identify and describe the providers currently using Z codes in order to generate insights into how to increase uptake.

Introduction

The National Committee for Quality Assurance (NCQA) has an ongoing collaboration with the Centers for Medicare & Medicaid Services' (CMS) Office of Minority Health (OMH) to develop a research portfolio focused on investigating disparities in the prevention and management of diabetes. Prior work resulting from this collaboration has identified priority measurement areas and found substantial disparities in diabetes care and management outcomes by race and ethnicity, income, and dual eligibility status, among other key sociodemographic factors.^{5,6}

These findings are consistent with prior work that had identified associations between sociodemographic factors and diabetes prevalence⁷⁻⁹ and health outcomes like diabetes-related complications.¹⁰ Moreover, they indicate that there are sociodemographic factors that serve as upstream drivers of diabetes-related outcomes and health disparities. However, one major challenge in investigating the specific causes or correlates of observed disparities is the lack of consistent, reliable social determinants of health (SDOH) data.

One potential source of SDOH information is Z codes, which document various psychosocial and socioeconomic risks related to social, economic, and environmental determinants of health (e.g., literacy, housing, occupational risk factors). These codes were introduced to allow physicians to capture data on SDOH within administrative claims, recognizing that these factors influence health and may be of interest in risk-adjustment models.¹¹ CMS has considerable interest in the use of Z codes for SDOH, with one recent CMS infographic describing them as part of the “data journey to better outcomes.”² Prior work published as CMS data highlights documented the use of these Z codes among the Medicare Fee-for-Service (FFS) population at the enrollee and claims levels during 2017 and 2019.^{3,4} In this report, we build on this previous work by examining utilization of Z codes in Medicare Advantage (MA) from 2016-2019. Additionally, we provide descriptions of the sociodemographic profile of MA enrollees who had one or more Z code claims. Both sets of analyses used the OptumLabs Data Warehouse (OLDW).

Health Outcomes and Social Determinants of Health Prevalence

The Healthy People 2030 Initiative defines social determinants of health (SDOH) as “the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.”¹¹ These conditions include factors like socioeconomic status, education, income, neighborhood conditions and a range of other social forces that exert major influence on population health and health disparities.¹² In this same framework, social risk factors are *adverse* conditions that may lead to worse health outcomes.¹³

Evidence suggests that access to basic social, economic, and environmental resources enhances quality of life and population health outcomes. However, these resources, such as affordable housing, public safety, food security, access to local health services, toxin-free environments, and access to education, are not distributed equitably across sociodemographic strata. The National Academy of Medicine (NAM) reports that 80 to 90 percent of modifiable contributors to health outcomes for a population are social factors.¹⁴ A 2018 survey found that 68% of Americans face at least one challenge related to social factors, and 52% are considered

moderate to high risk in at least one such category.¹⁵ However, inconsistent screening for social risk factors and social needs across health care organizations complicates measuring their prevalence.¹⁶

The ultimate result of unfair distribution of resources and unmet social needs is health disparities with worse health outcomes disproportionately occurring in communities of color and other vulnerable communities. Homelessness, the most extreme form of housing insecurity, is associated with a higher prevalence of chronic illness and a higher mortality rate when compared with the general population.^{17,18} Life expectancy gaps between parts of the U.S. have also grown since the 1980's. The gap between counties with the highest and lowest life expectancies is roughly 20 years, and some cities (like New Orleans) have even larger disparities between neighborhoods.¹⁹ One possible reason for the stark difference is variable neighborhood conditions that impact physical access to healthy food and the ability to safely play and exercise outdoors. One study demonstrated that the availability of chain supermarkets in predominantly Black and Hispanic neighborhoods is 32 and 52% of the availability, respectively, in predominantly White neighborhoods.²⁰ Environmental exposures may also play a role in neighborhood-level disparities. Black, Hispanic, and low-income Americans are more likely to live in areas with higher concentrations of pollutants, as compared to non-Hispanic Whites.²¹ A recent study found that endocrine-disrupting chemicals in distressed neighborhoods may play a role in metabolic risks for diabetes.²²

Cohort studies have observed incremental (dose-dependent) increases in health with increasing social advantage, further suggesting that there may be a causal relationship between social risk factors and poor health outcomes.²³ For example, one study showed that the presence of social risk factors (e.g. low income and low education) leads to a dose-dependent increase in risk of combined all-cause mortality and adverse cardiovascular disease events.²⁴

Cost and Social Determinants of Health

Access to timely, high-quality care is necessary to reduce health care expenditures that are associated with utilization of low-value, high-cost care such as emergency department (ED) visits and hospital readmissions. Utilizers of low-value care are often complex patients who have multiple comorbidities and depend heavily on social services and supports.²⁵ One study observed that adults with complex health conditions are disproportionately less educated, low income, publicly insured, and have fair or poor self-reported health.²⁶ Another study demonstrated that patients living in high-poverty neighborhoods are 24% more likely to be readmitted to the hospital, even after adjusting for demographic and clinical characteristics.²⁷

Additionally, individuals experience variable access to care based on factors such as socioeconomic status, residential location, and race and ethnicity. According to the Agency for Healthcare Research and Quality's (AHRQ) 2018 National Healthcare Quality and Disparities Report, low-income individuals experienced worse access to care compared with high-income individuals for 19 out of 20 access measures, with health insurance measures demonstrating the greatest disparity between the two groups.²⁸

Health Systems Responses

Health systems have taken note of the significant costs associated with unaddressed social risk factors as well. Research by Horwitz and colleagues documented \$2.5 billion in spending by health systems from 2017-2019 on programs to address housing, education, employment, food insecurity and other areas.²⁹ However, implementation of programs to address social risk factors is hampered by a lack of consistent data. This was a key finding from the March 2020 HHS Assistant Secretary for Planning and Evaluation's (ASPE) March 2020 report, *Social Risk Factors and Performance in Medicare's Value-Based Purchasing Program*³⁰. The ASPE report points to three main categories of sources of demographic characteristics and SDOH/ social risk factor data: enrollment, assessment, and claims data from CMS; data from providers and plans; and alternative sources of government data such as those collected by the Social Security Administration (SSA) or area-level data aggregated in the American Community Survey (ACS). In particular, it highlights the opportunity presented by the introduction of ICD-10 Z codes for socioeconomic circumstances, which capture many of the constructs in the Protocol for Responding to and Assessing Patients' Assets, Risk and Experiences (PRAPARE) screening tool.³¹

Given the importance of SDOH to health outcomes and health care utilization, and the relative scarcity of consistent data on these factors, it is essential to understand how Z codes for SDOH are being used in clinical practice.

Methods

This study examined the rate of utilization of Z codes for SDOH among sample Medicare Advantage (MA) enrollees, expressed as the percent of claims and enrollees with any Z codes for SDOH annually from 2016-2019. Additionally, the analysis identified the five most used Z codes in each year. For 2017 and 2019, we conducted a more detailed assessment of the use of Z codes for SDOH, stratifying by sociodemographic characteristics and the five most used Z codes. We present stacked bar charts describing the population of MA enrollees overall, the population of MA enrollees with Z code claims, and the population of MA enrollees with each of the five most utilized Z codes in 2017 and 2019.

Data Sources

Analyses were conducted using the OptumLabs[®] Data Warehouse (OLDW). The OLDW contains de-identified, longitudinal health information on a diverse mixture of enrollees covered by a single, nationwide insurer.ⁱ The OLDW includes medical and pharmacy claims and enrollment records, as well as socioeconomic status, laboratory results and electronic health records for a subset of MA enrollees. In each year, the study population was comprised of MA enrollees aged 18 years and older who were enrolled in medical benefits for at least 11 months (334 days).

i OptumLabs and OptumLabs Data Warehouse (OLDW) Descriptions and Citation. Cambridge, MA: n.p., May 2019. PDF. Reproduced with permission from OptumLabs.

Outcome: Use of Z Codes for SDOH

We identified medical claims with at least one ICD-10-CM Z code for SDOH. The 97 Z codes fall into the following nine broad categories:

- Z55 Problems related to education and literacy
- Z56 Problems related to employment and unemployment
- Z57 Occupational exposure to risk factors
- Z59 Problems related to housing and economic circumstances
- Z60 Problems related to social environment
- Z62 Problems related to upbringing
- Z63 Other problems related to primary support group, including family circumstances
- Z64 Problems related to certain psychosocial circumstances
- Z65 Problems related to other psychosocial circumstances

To ensure consistency in the granularity of codes used, we identified the five most utilized Z codes at the three-digit level (e.g., Z59.0 [Homelessness]). For Z codes recorded at the four- or five-digit level, the three-digit heading was used (e.g. Z62.21 [Child in welfare custody], Z62.22 [Institutional upbringing], and Z62.29 [Other upbringing away from parents] would appear under Z62.2 [Upbringing away from parents]).

Sociodemographic Characteristics

Our analyses of the use of Z codes were stratified by age, gender, race and ethnicity, rurality, household income and neighborhood-level education. Age in each year was calculated using year of birth for each enrollee; month and day of birth are unavailable in the OLDW. The age groups were defined as 18-64, 65-74, 75-84, 85+ years. Race and ethnicity designations are defined using the Research Triangle Institute (RTI) variable contained in the CMS Medicare Beneficiary Summary File (MBSF), which classifies enrollees as White, Black, Asian/Pacific Islander, Hispanic, American Indian/Alaska Native, Other or Unknown. Due to small numbers, American Indian/Alaska Native individuals are included in the Unknown/Other category in this analysis. The RTI definitions are based on Social Security Administration data and are enhanced using an algorithm based on name and geography information to increase identification of Asian/Pacific Islander and Hispanic enrollees.³² Rurality is based on enrollees' addresses and is classified as metropolitan area, micropolitan area, small town or rural area. In the following analyses we combined the latter three categories, comparing enrollees residing in metropolitan versus non-metropolitan areas.

OptumLabs contracts with a third-party vendor that uses public and private consumer data (including credit card statements, loan amounts, and loan payments) to impute annual household income. The imputed value is assigned at the household level, with households defined as individuals with the same surname living at the same street address. The OLDW includes 5 household income categories: under \$40,000, \$40,000 to \$74,999, \$75,000 to

\$124,999, \$125,000 to \$199,999, and \$200,000 or more. Due to small sample size in the highest income category, we combined the latter two categories in the analyses. The imputed household income data include missing values, potentially due to missingness in the variables used to predict income.

Neighborhood education was ascertained from the ACS and is defined as the median level of education achieved among all residents aged 25 years and older within a specified census block group. All individuals in the same census block group are assigned the same education level, regardless of age. The categories are less than high school, high school or GED, some college, bachelor's degree or higher. Due to small sample size in the less than high school education category, we combined the first two categories in the analyses.

Physician/Provider Characteristics

We summarized the place of service for physician/provider claims with Z code claims. Each physician/provider claim in the OLDW includes a standardized code indicating the place of service, such as office, inpatient hospital, outpatient hospital, emergency room, etc. Due to small sample sizes, assisted living facilities, custodial care facilities, group homes, homeless shelters, nursing facilities and skilled nursing facilities were combined into a single "nursing or congregate living facility" category. "Inpatient psychiatric facilities" includes both inpatient psychiatric facilities and psychiatric facility partial hospitalizations. Additionally, we summarized provider specialty for non-institutional physician/provider claims with Z code claims.

Results

The results section is organized as follows. Section I presents overall utilization of Z codes at the enrollee and claim levels, and the five most utilized Z codes from 2016-2019. Section II presents detailed sociodemographic analyses of MA enrollees overall, MA enrollees with at least one Z code, and MA enrollees with each of the five most used Z codes, in 2017. These sociodemographic characteristics are age group, gender, rurality of residence, imputed household income, and median neighborhood-level educational attainment. Section II concludes with the proportion of MA claims (in the sample) with Z code claims by place of service and provider type, in 2017. Section III repeats similar analyses with these sociodemographic characteristics, place of service and provider type using 2019 MA data.

I. Overall Z Codes Utilization and Most Used Z Codes

Figure 1: Percent of MA enrollees with at least one claim with Z code, 2016-2019

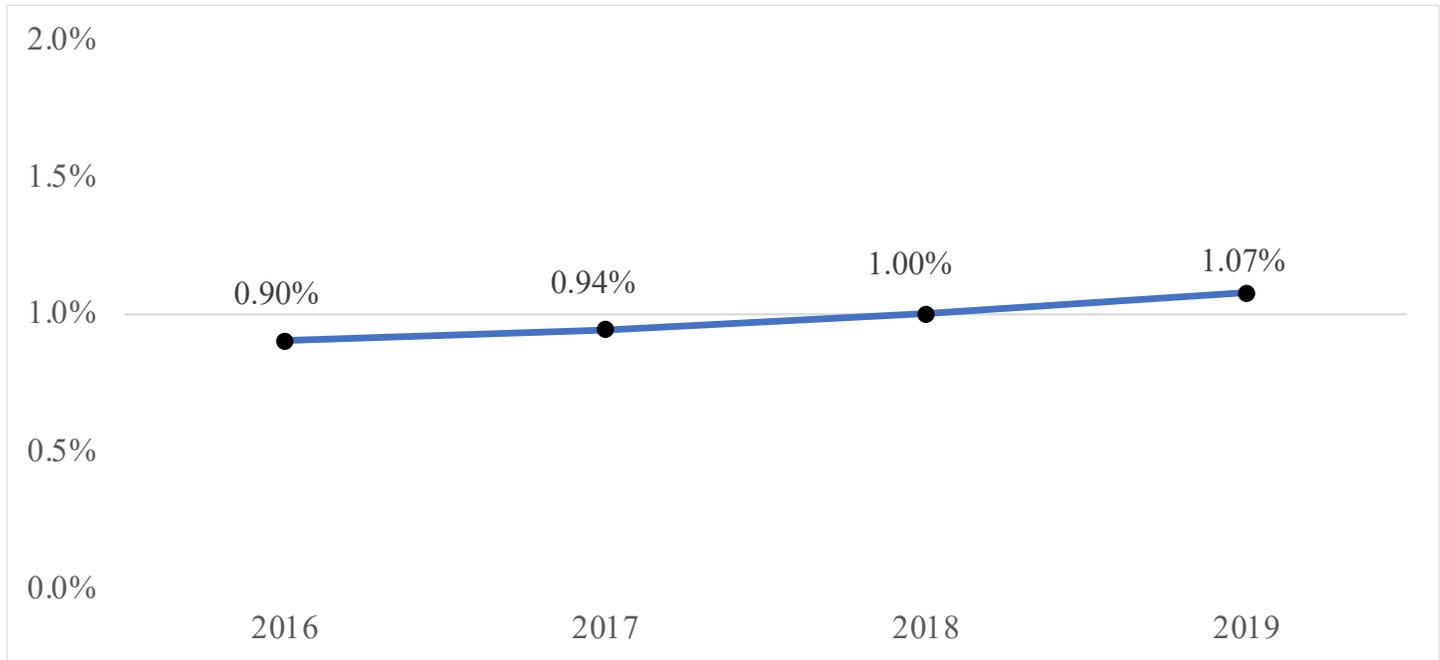


Figure 2: Percent of MA claims with ICD-10-CM Z codes, 2016-2019



About 1% of MA enrollees within this sample had at least one claim with Z codes in each year. Growth in Z code use in this sample was very slow, increasing only 0.17 percentage points from 0.90% in 2016 to 1.07% in 2019 (Figure 1). The trend in MA medical claims with Z codes for SDOH as a percentage of total MA medical claims was similarly flat in the sample from 2016-2019 (0.080% in 2016 and 0.076% in 2019) (Figure 2). Numbers of enrollees and claims with any Z codes in each of these years are presented in Appendix Tables 1 and 2.

Table 1: Five Most Used Z Codes Among MA Enrollees, 2016-2019

Top 5 utilized Z codes in 2019		Ranking by Year			
Z code	Description	2016	2017	2018	2019
Z60.2	Problems related to living alone	1	1	1	1
Z63.4	Disappearance and death of family member	2	2	2	2
Z59.0	Homelessness	3	3	3	3
Z63.0	Problems in relationship with spouse or partner	7	4	4	4
Z62.8	Other specified problems related to upbringing	6	6	5	5

Note: Top 5 based on number of claims, not number of enrollees

The five most used Z codes in this sample were relatively stable from 2016-2019, with the same top five in 2018 and 2019, and four of the five were among the most used in 2017 as well. Additionally, while the order differed, the four most used Z codes in 2017-2019 among MA enrollees in the sample were also among the five most utilized Z codes among Medicare FFS enrollees in 2019.⁴

Table 2. Five Most Used Z Codes Among MA Enrollees, 2017

		Enrollees with a Z code claim (N=31,590)		Z code claims (N=94,595)	
Z code	Description	Count	%	Count	%
Z60.2	Problems related to living alone	9,191	29.1%	34,324	36.3%
Z63.4	Disappearance and death of family member	4,852	15.4%	11,233	11.9%
Z59.0	Homelessness	2,595	8.2%	8,399	8.9%
Z63.0	Problems in relationship with spouse or partner	1,302	4.1%	4,926	5.2%
Z65.8	Other specified problems related to psychosocial circumstances	1,599	5.1%	4,228	4.5%

Note: Top 5 based on number of claims, not number of enrollees

The number of enrollees and number of claims in the sample with the five most used Z codes in 2017 are shown in Table 2. The most used Z code (Z60.2 [Problems related to living alone]) appeared on 34,324 medical claims, representing 36.3% of Z code claims and 0.03% of all MA claims, and 29.1% of enrollees with Z code claims and 0.27% of all MA enrollees in 2017. Note that the five most utilized Z codes in the sample in 2017 vary by age group (18-64 years, 65 years and older), and stratified tables presenting the most used codes appear in Appendix Tables 3 and 4.

Table 3. Five Most Used Z Codes Among MA Enrollees, 2019

		Enrollees with a Z code claim (N=41,746)		Z code claims (N=111,880)	
Z code	Description	Count	%	Count	%
Z60.2	Problems related to living alone	9,775	23.4%	26,543	23.7%
Z63.4	Disappearance and death of family member	7,036	16.9%	17,313	15.5%
Z59.0	Homelessness	3,207	7.7%	10,936	9.8%
Z63.0	Problems in relationship with spouse or partner	1,711	4.1%	6,501	5.8%
Z62.8	Other specified problems related to upbringing	2,216	5.3%	6,344	5.7%

Note: Top 5 based on number of claims, not number of enrollees

Table 3 provides additional detail on the five most used Z codes among MA enrollees in the sample in 2019. Four of the five most used codes were consistent with the 2017 list shown in Table 2, with Z62.8 (Other specified problems related to upbringing) emerging as the fifth most used in 2019. The most used codes vary by age and stratified tables appear in Appendix Tables 5 and 6.

SII. Sociodemographic and Physician/Provider Analysis, 2017

Figure 3: Proportion of MA Enrollees with Z Code Claims by Age Group, 2017

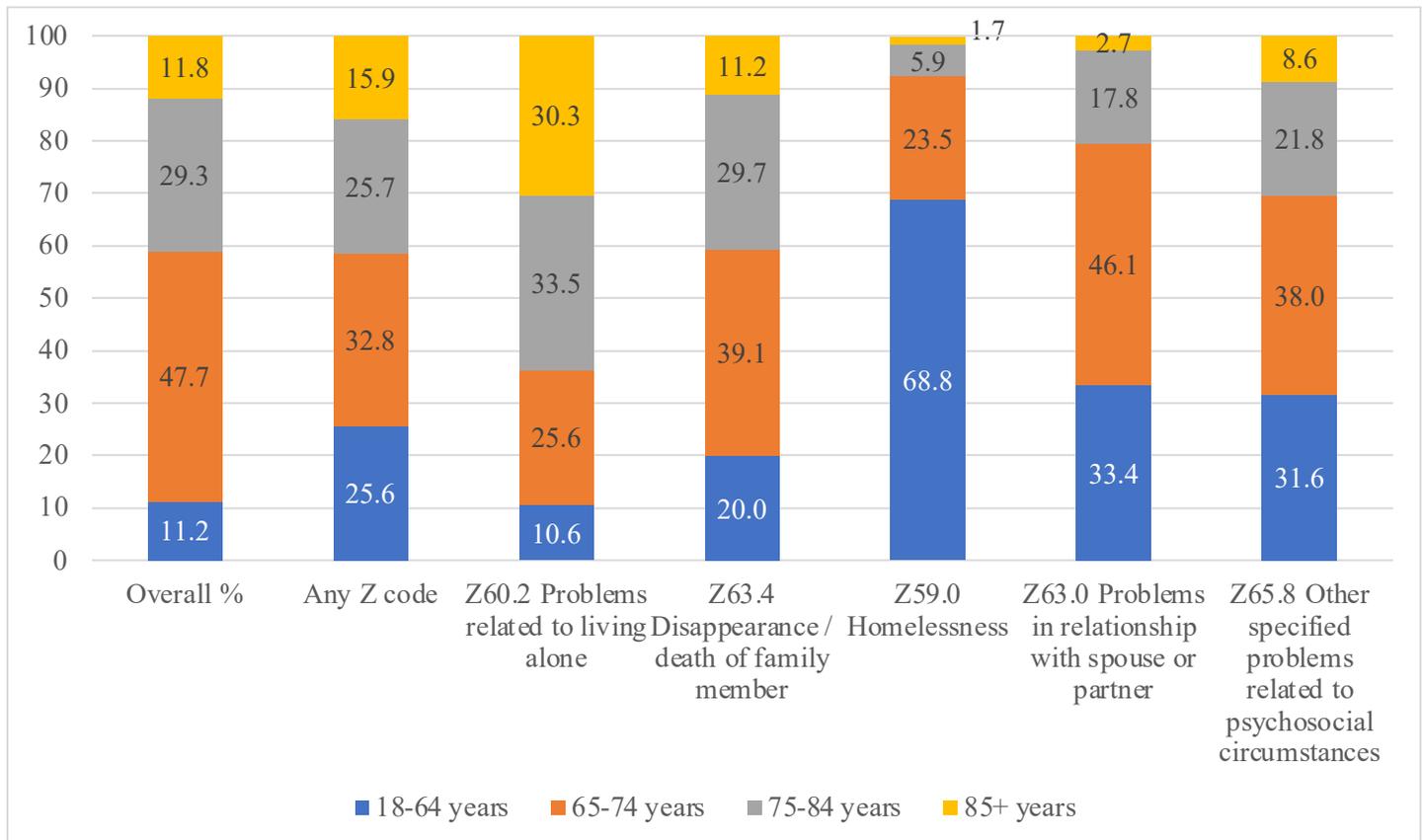


Figure 3 presents the composition by age group of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2017. Compared to MA enrollees in the overall sample, those with any Z code claims appeared to be disproportionately in the youngest age group (25.6% vs. 11.2%). MA enrollees with code Z60.2 (Problems related to living alone) appeared to be disproportionately in the oldest age group, whereas those with Z59.0 (Homelessness), Z63.0 (Problems in relationship with spouse or partner) or Z65.8 (Other specified problems related to psychosocial circumstances) appeared to be disproportionately in the youngest age group. Given these very stark differences by age group, we also present the five most used Z codes by age group (enrollees aged 18-64 years and those aged 65 years and older) in the Appendix.

Figure 4: Proportion of MA Enrollees with Z Code Claims by Gender, 2017

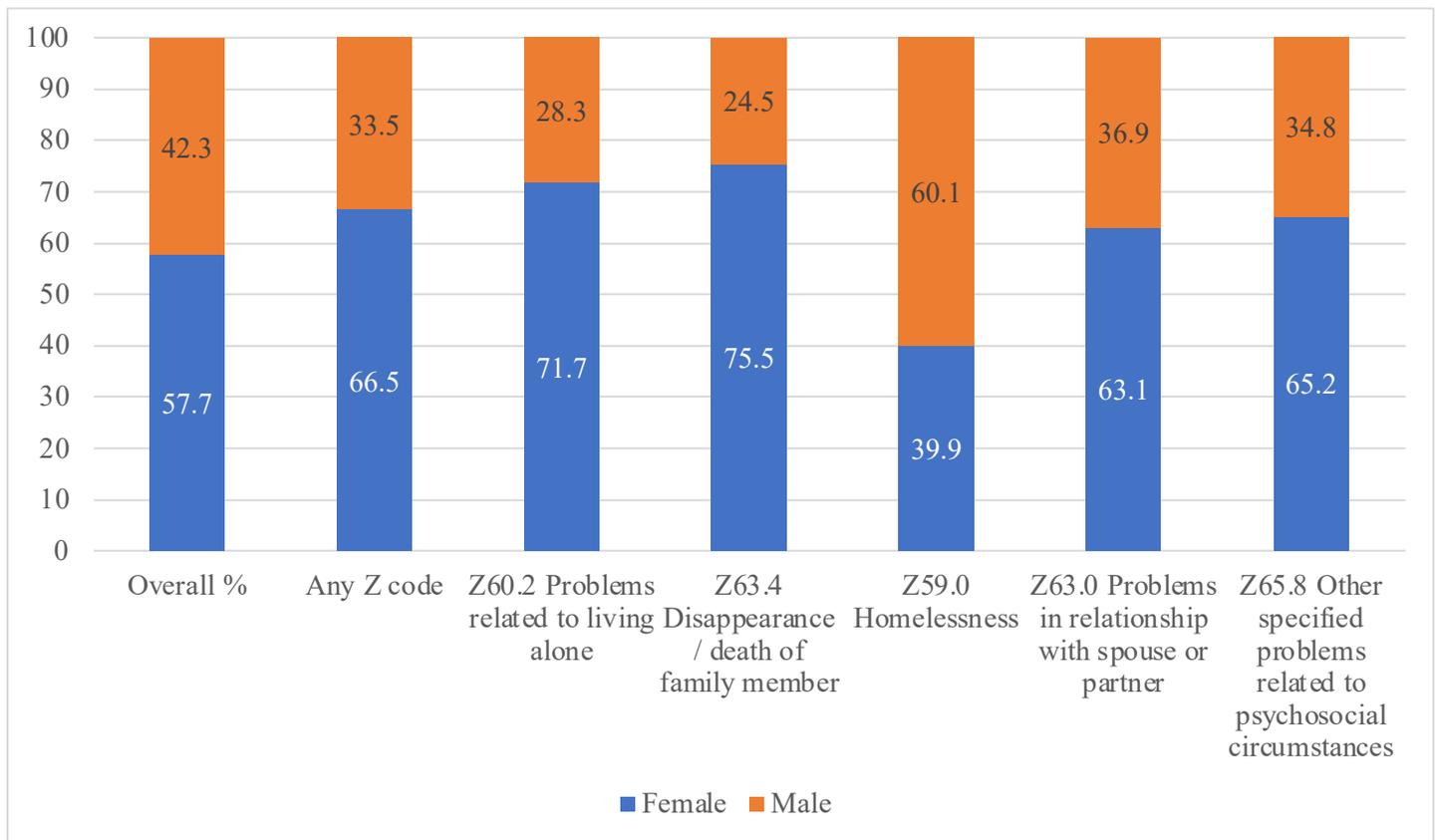
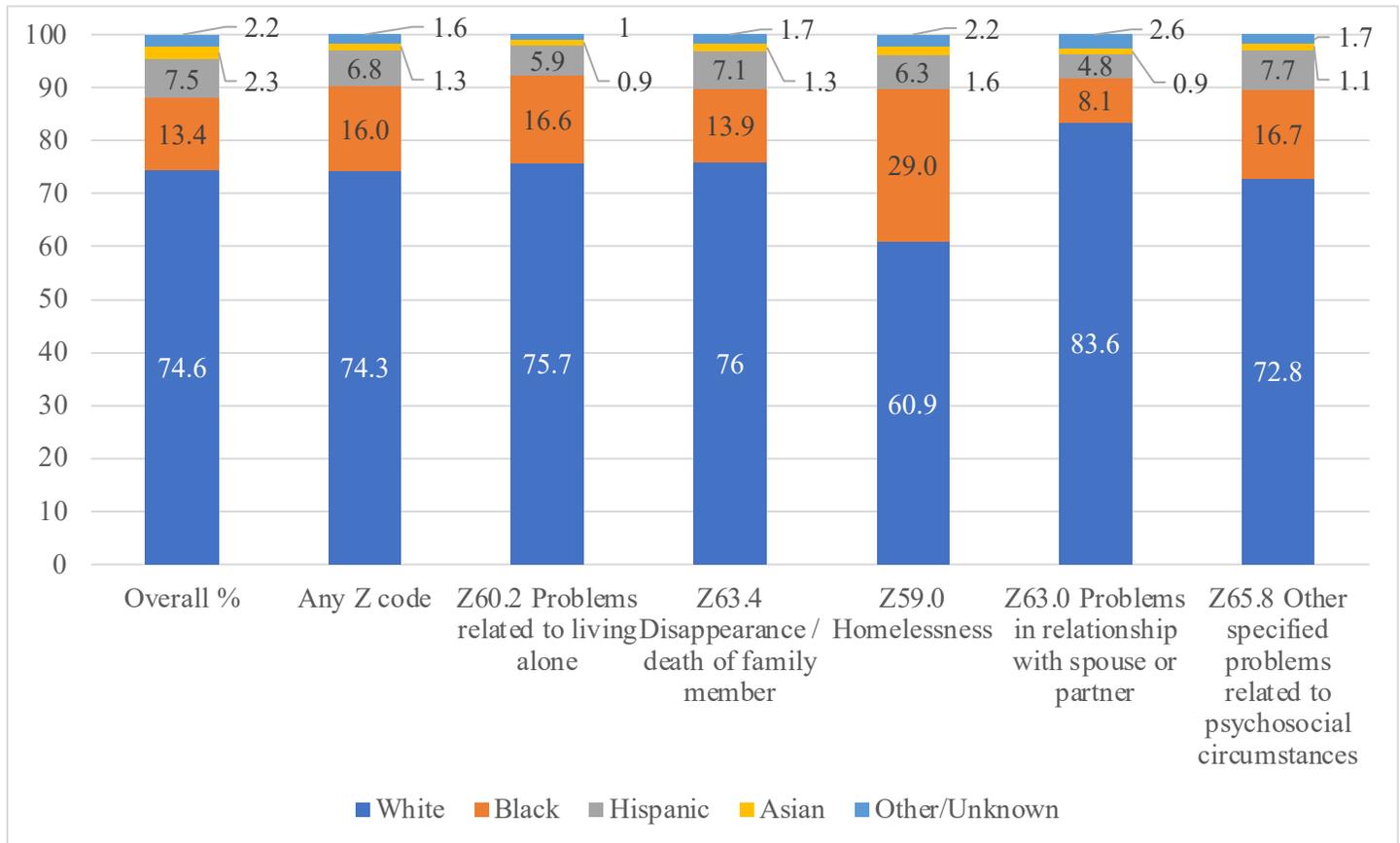


Figure 4 presents the composition by gender of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2017. Compared to MA enrollees in the overall sample, those with any Z code claims appeared to be disproportionately female. MA enrollees with four of the five most used Z codes appeared to be disproportionately female as well. Among MA enrollees with Z59.0 (Homelessness), however, this relationship was inverted, and male enrollees made up over 60% of this group.

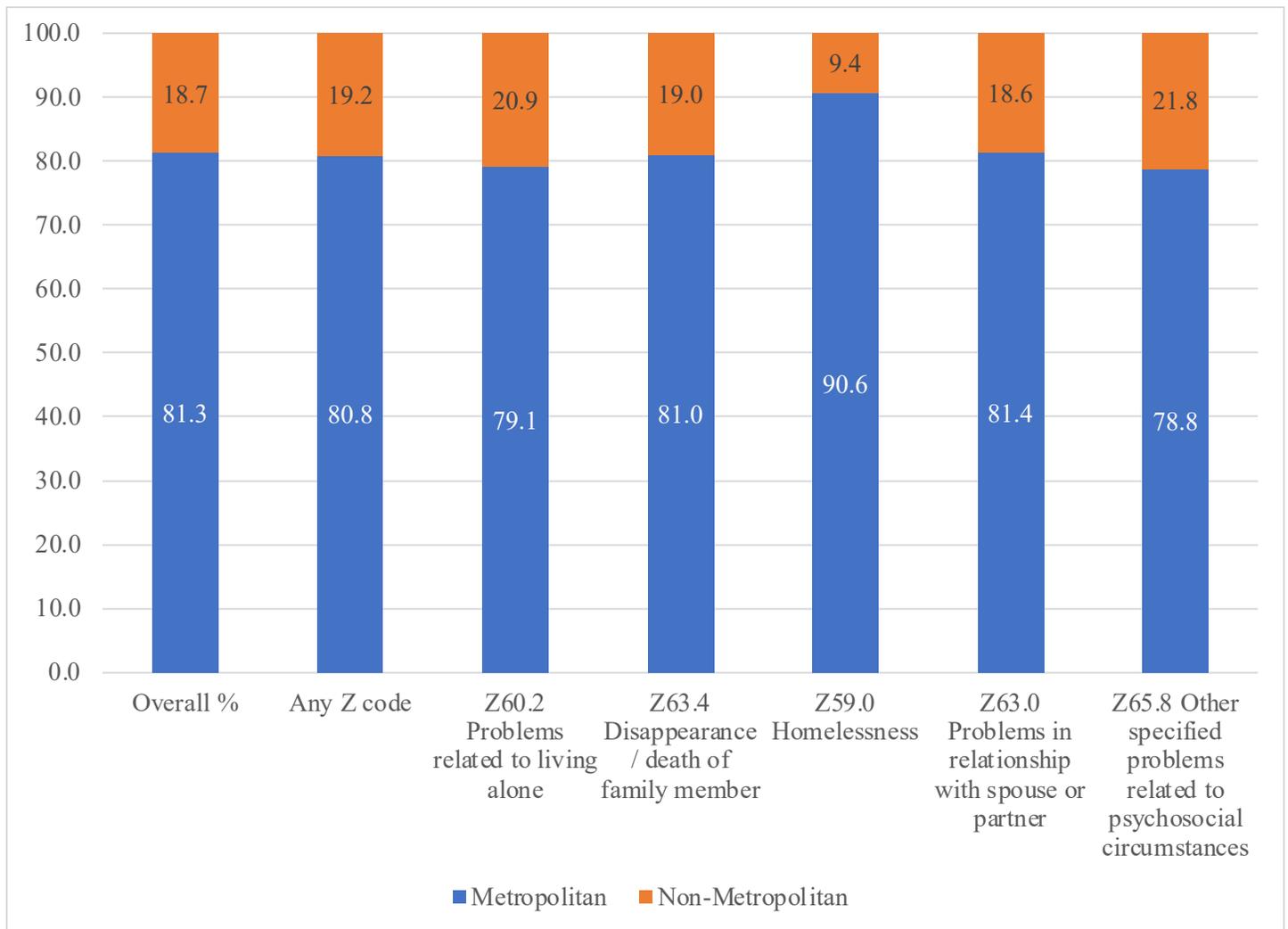
Figure 5: Proportion of MA Enrollees with Z Code Claims by Race and Ethnicity, 2017



Note: Other/Unknown includes American Indian/Alaska Native enrollees

Figure 5 presents the composition by race and ethnicity of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2017. Compared to MA enrollees overall, those with any Z code claims appeared to be disproportionately Black. MA enrollees with three of the five most used Z codes appeared to be disproportionately Black, and among MA enrollees with Z59.0 (Homelessness), this relationship was particularly pronounced. MA enrollees with Z63.0 (Problems in relationship with spouse or partner) appeared to be disproportionately White.

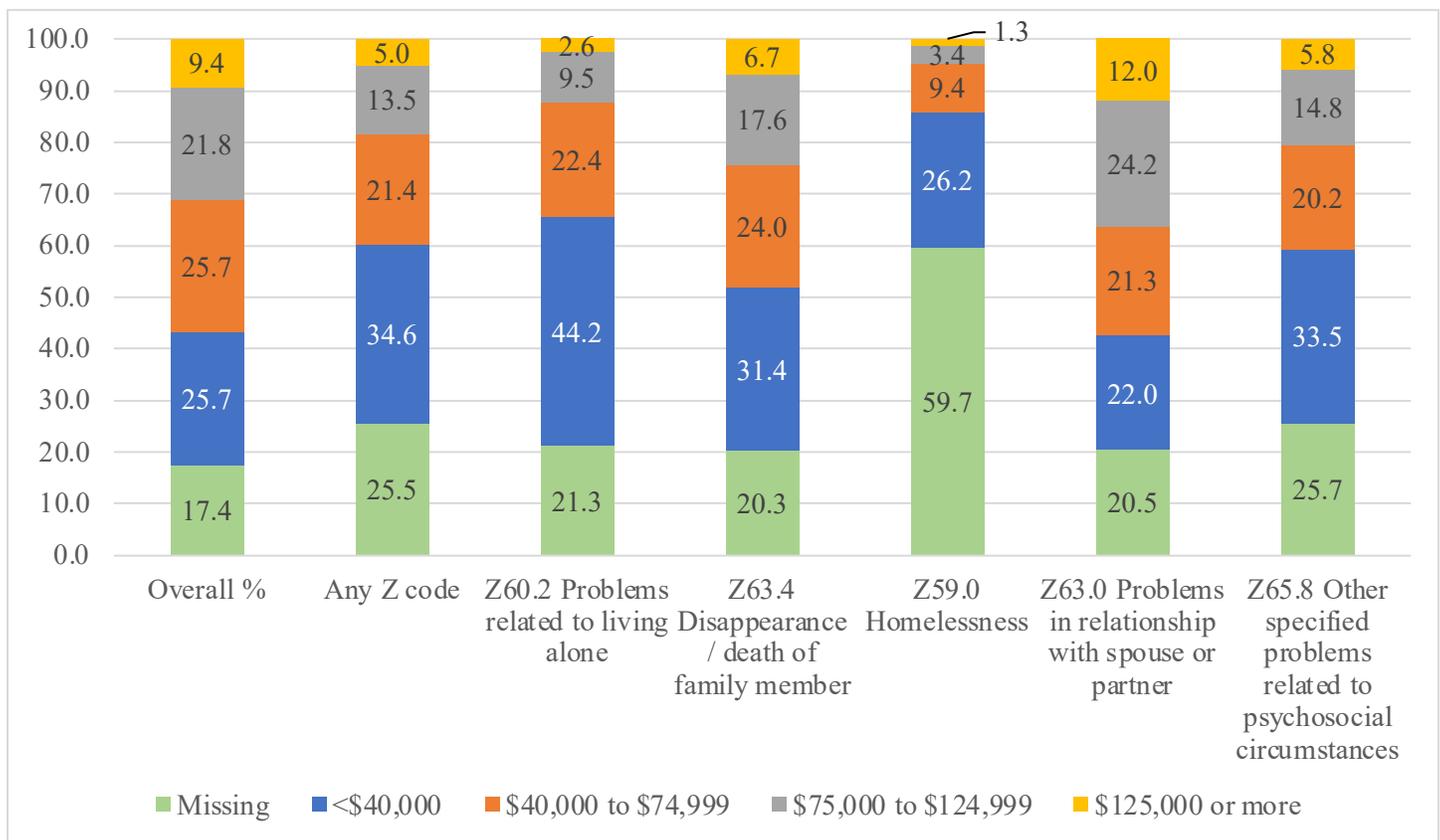
Figure 6: Proportion of MA Enrollees with Z Code Claims by Rurality, 2017



Note: Non-metropolitan includes micropolitan, small town and rural

Figure 6 presents the composition by rurality of residence of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2017. The proportion of enrollees in metropolitan and non-metropolitan areas appeared to be similar among the MA population overall, those with Z code claims, and those with four of the five top Z codes.

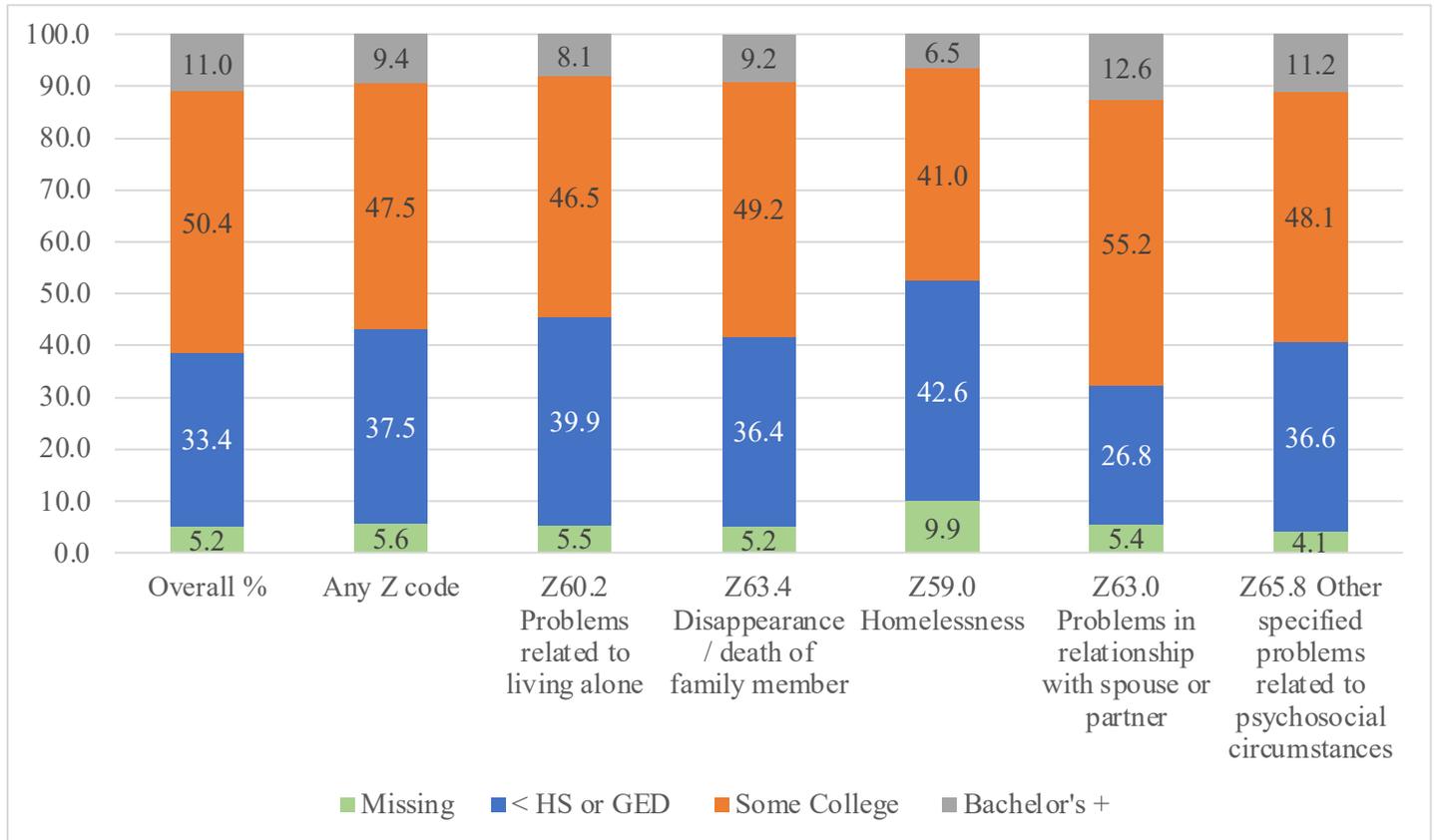
Figure 7: Proportion of MA Enrollees with Z Code Claims by Imputed Household Income, 2017



Note: Household income is imputed by a third-party vendor using a proprietary model.

Figure 7 presents the composition by imputed household income of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2017. Due to substantial missingness of imputed household income data, particularly among enrollees experiencing homelessness (59.7%), these results should be interpreted with caution. Compared to MA enrollees in the overall sample, those with any Z code claims tended to be in the lowest income group (25.7% vs. 34.6%) or had missing data (17.4% vs. 25.5%). Enrollees with Z60.2 (Problems related to living alone), Z63.4 (Disappearance/death of a family member) or Z65.8 (Other specified problems related to psychosocial circumstances) appeared to be disproportionately in the lowest income group. Enrollees with Z59.0 (Homelessness) appeared to disproportionately have missing data (17.4% vs. 59.7%).

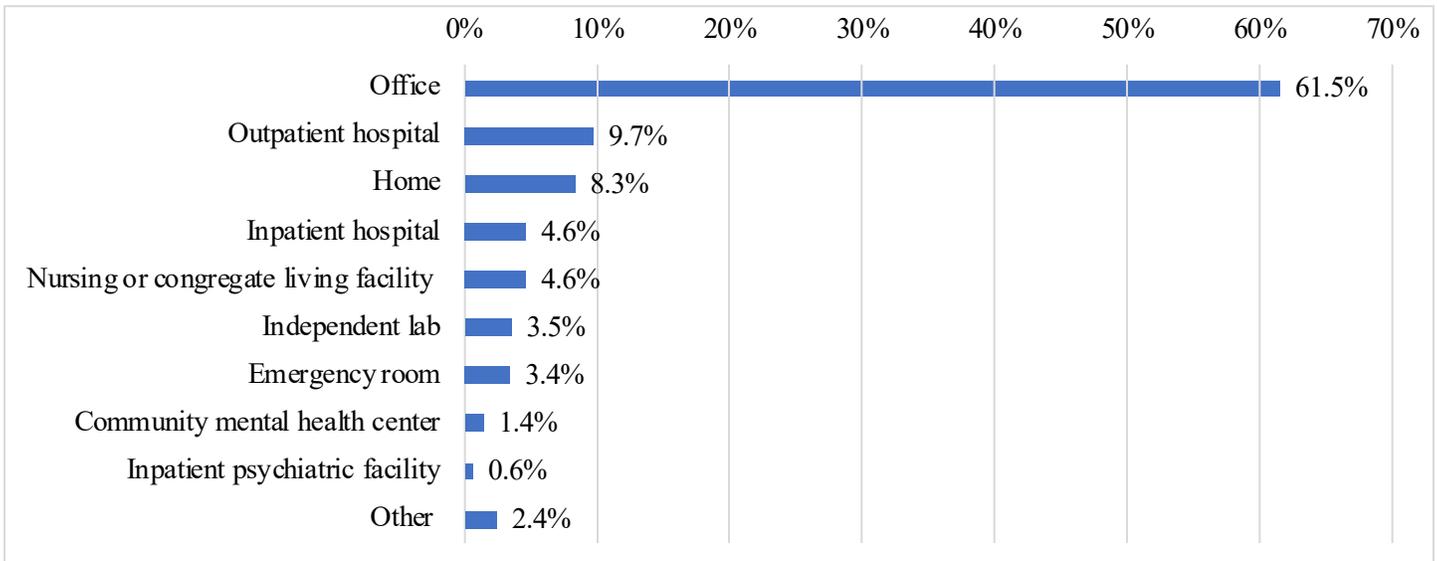
Figure 8: Proportion of MA Enrollees with Z Code Claims by Neighborhood Educational Attainment, 2017



Note: Neighborhood-level median education obtained from the American Community Survey

Figure 8 presents the composition by median neighborhood-level educational attainment of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2017. Enrollees with utilization of Z63.0 (Problems in relationship with spouse or partner) appeared to disproportionately reside in higher educational attainment neighborhoods, while enrollees with claims for the other four Z codes appeared to disproportionately reside in lower education neighborhoods. Enrollees residing in lower-educational attainment neighborhoods appeared to be particularly overrepresented among those with utilization of Z59.0 (Homelessness).

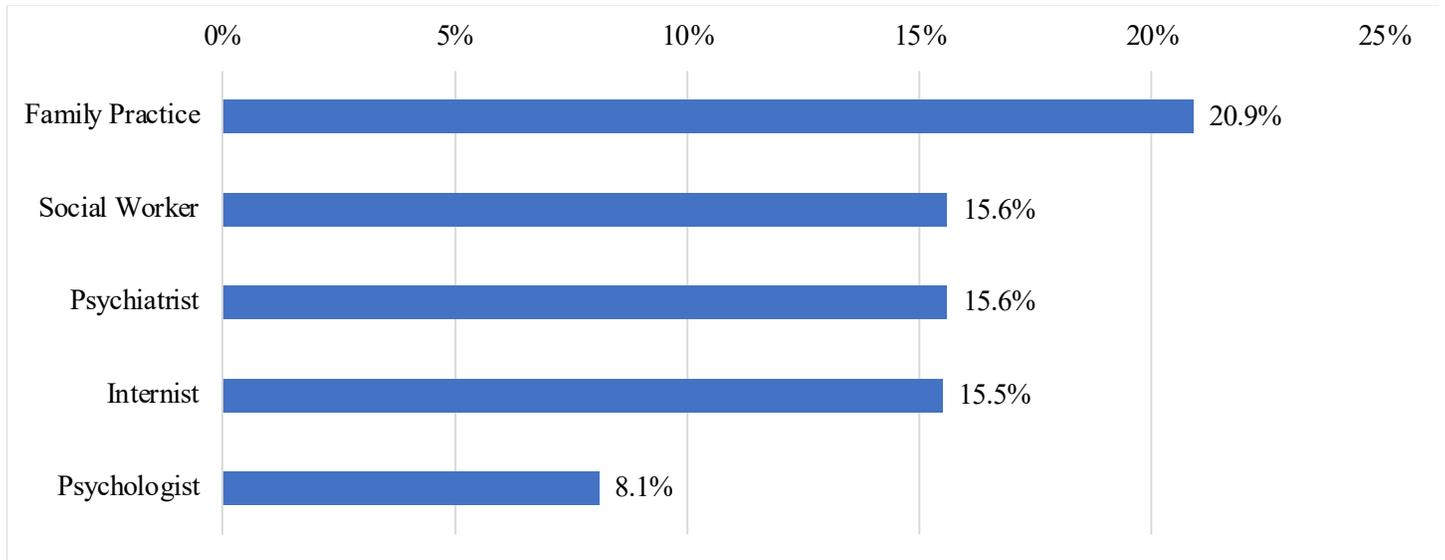
Figure 9: Proportion of Physician/Provider Claims with Z Code Claims by Place of Service, 2017



Note: Nursing or congregate living facility includes assisted living facility, custodial care facility, group home, homeless shelter, nursing facility and skilled nursing facility. Inpatient psychiatric facility includes both inpatient psychiatric facility and psychiatric facility partial hospitalization.

Figure 9 shows the place of service recorded on Z codes physician/provider medical claims in 2017. Physician offices were the most common place of service, constituting 61.5% of claims, followed by outpatient hospital (9.7%) and home (8.3%).

Figure 10: Proportion of Non-Institutional Physician/Provider Claims with Z Code Claims by Provider Type, 2017



Note: Facility/institutional claims were excluded from this analysis

Figure 10 summarizes the five most common physician/provider types on non-institutional claims with Z code claims within the sample in 2017. Primary care providers (family practitioners and internists) accounted for a combined 36.4% of non-institutional physician/provider Z codes claims. Mental health providers (psychiatrists and psychologists) accounted for a combined 23.7% of non-institutional physician/provider Z codes claims in the sample.

III. Detailed Demographic, Place of Service and Provider Type Analysis, 2019

Figure 11: Proportion of MA Enrollees with Z Code Claims by Age Group, 2019

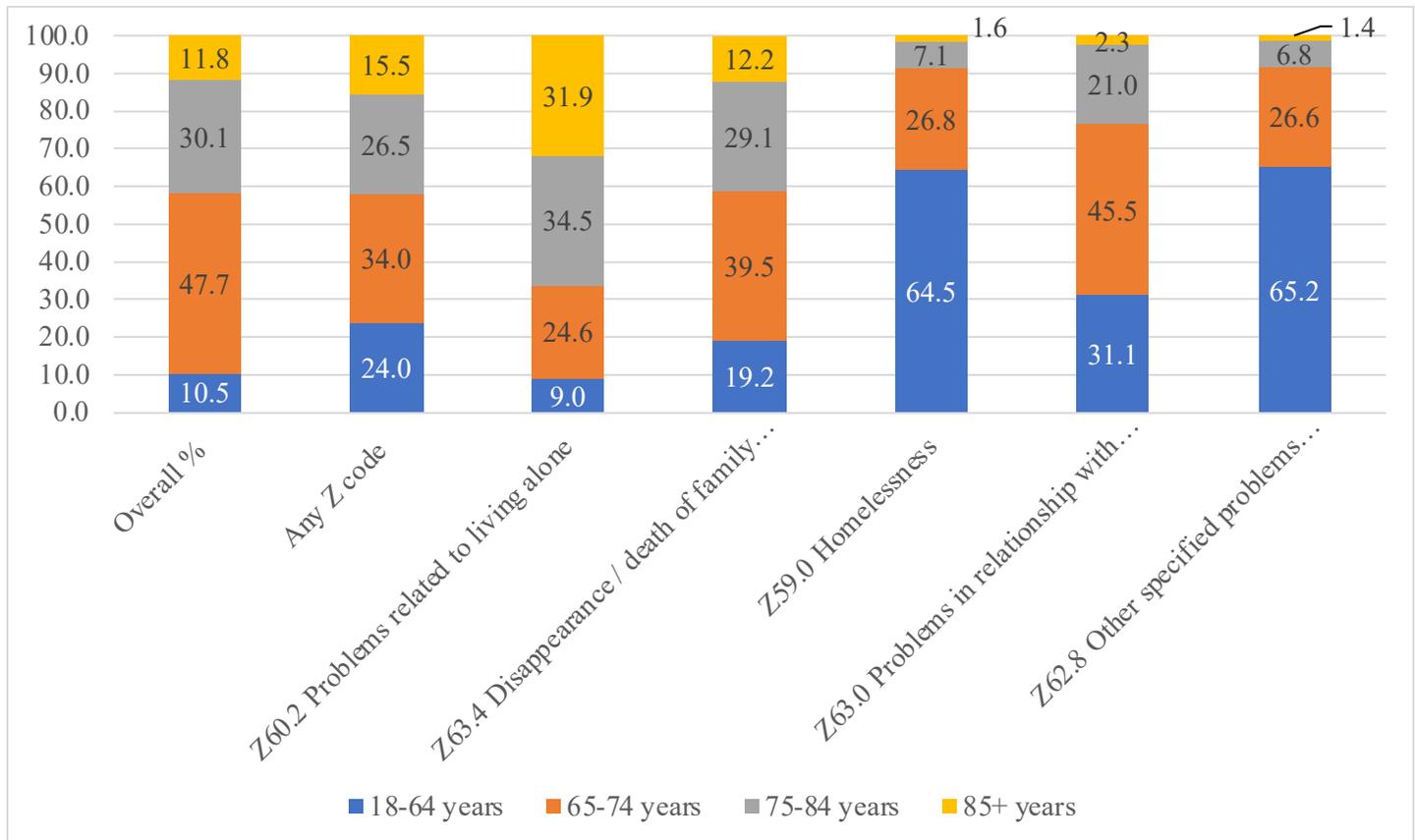


Figure 11 presents the composition by age group of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2019. Compared to MA enrollees overall, those with any Z code claims appeared to be disproportionately in the youngest age group (10.5% vs. 24.0%). MA enrollees with code Z60.2 (Problems related to living alone) appeared to be disproportionately in the oldest age group, whereas those with Z59.0 (Homelessness), Z63.0 (Problems in relationship with spouse or partner) or Z62.8 (Other specified problems related to upbringing) appeared to be disproportionately in the youngest age group. Given these stark differences by age group, we also present the five most used Z codes by age group (enrollees aged 18-64 years and those aged 65 years and older) in the Appendix.

Figure 12: Proportion of MA Enrollees with Z Code Claims by Gender, 2019

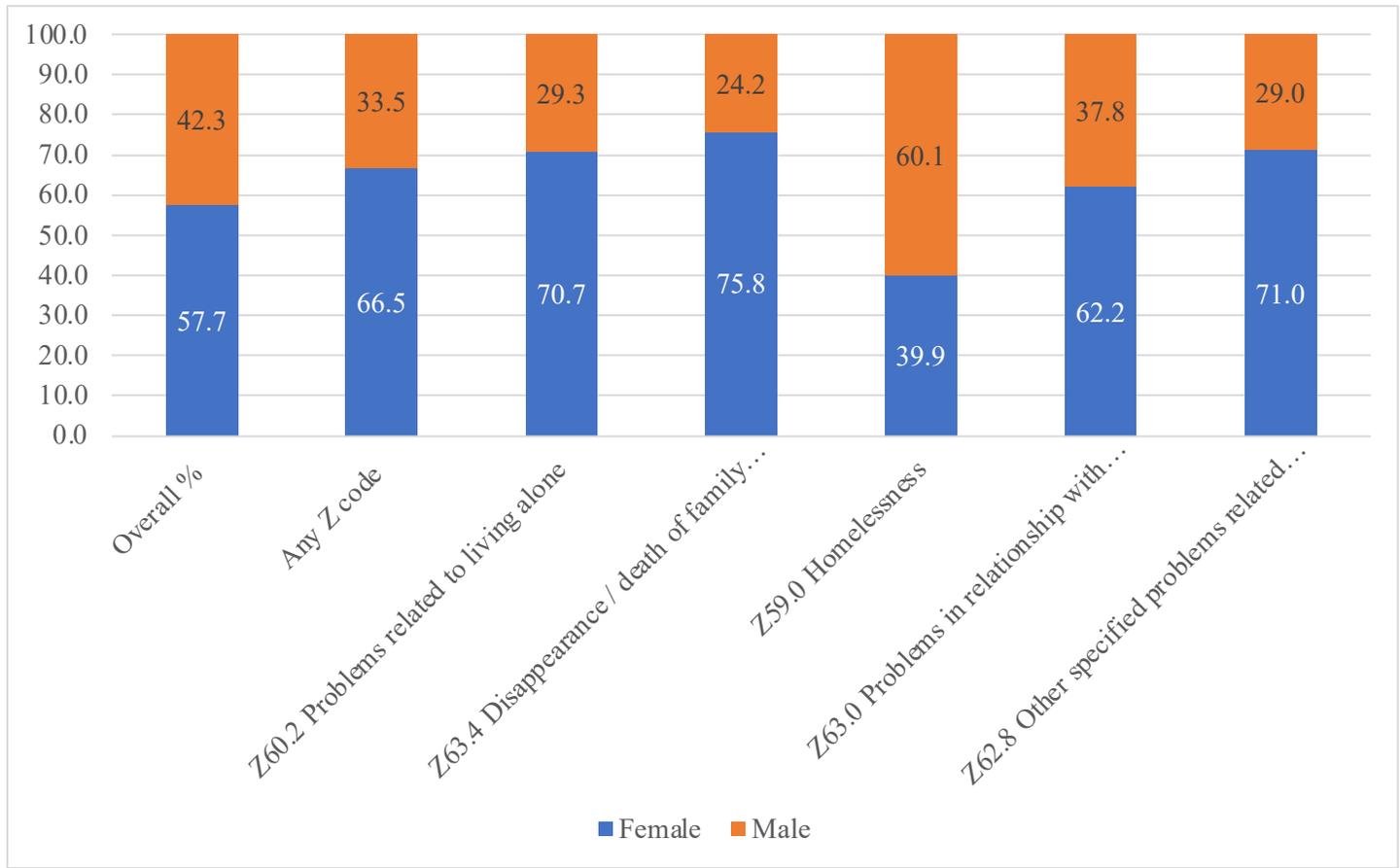
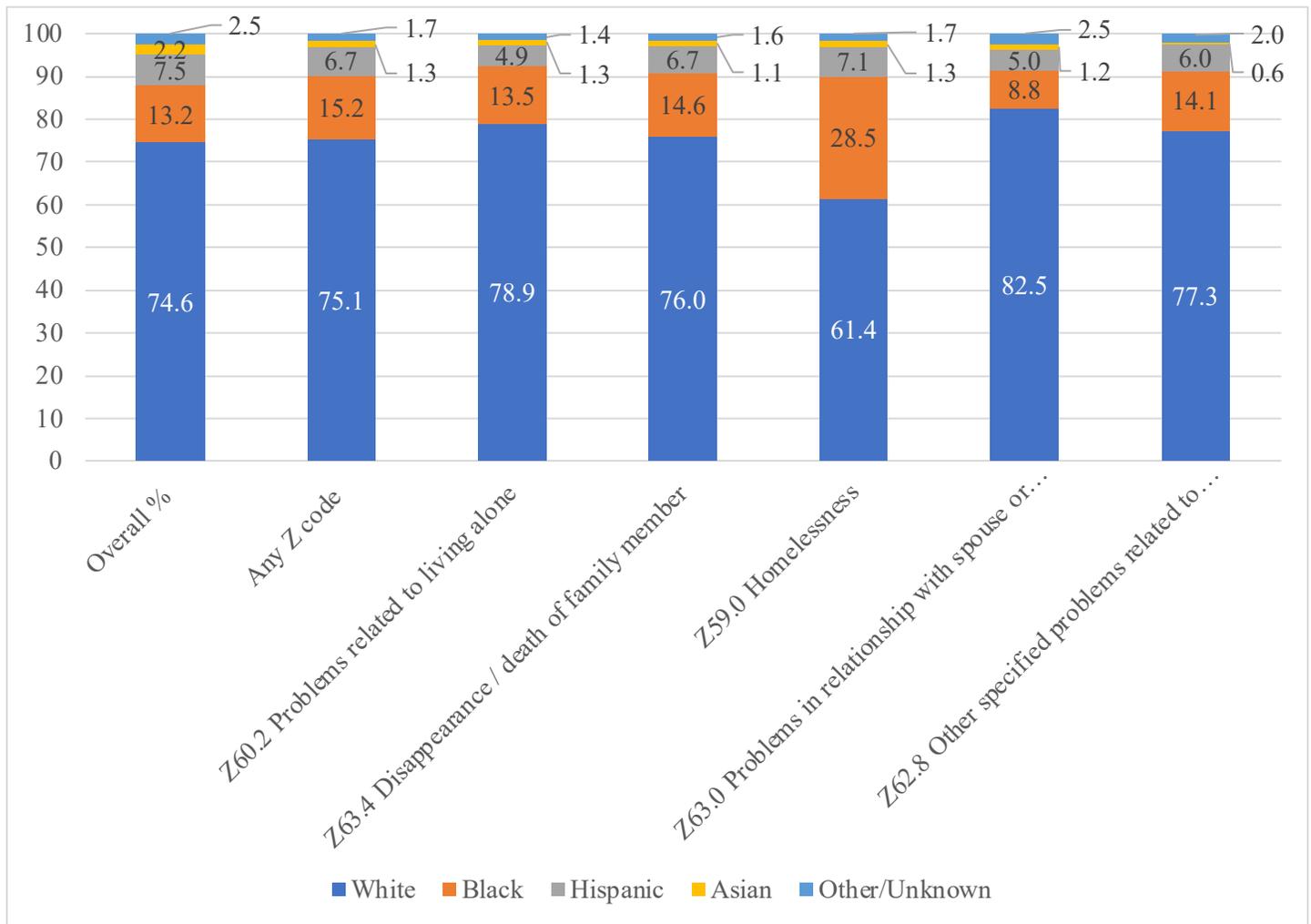


Figure 12 presents the composition by gender of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2019. Compared to MA enrollees in the overall sample, those with any Z code claims appeared to be disproportionately female (57.7% vs. 66.5%). MA enrollees with four of the five most used Z codes appeared to be disproportionately female as well. However, MA enrollees with Z59.0 (Homelessness) appeared to be disproportionately male (42.3% vs. 60.1%).

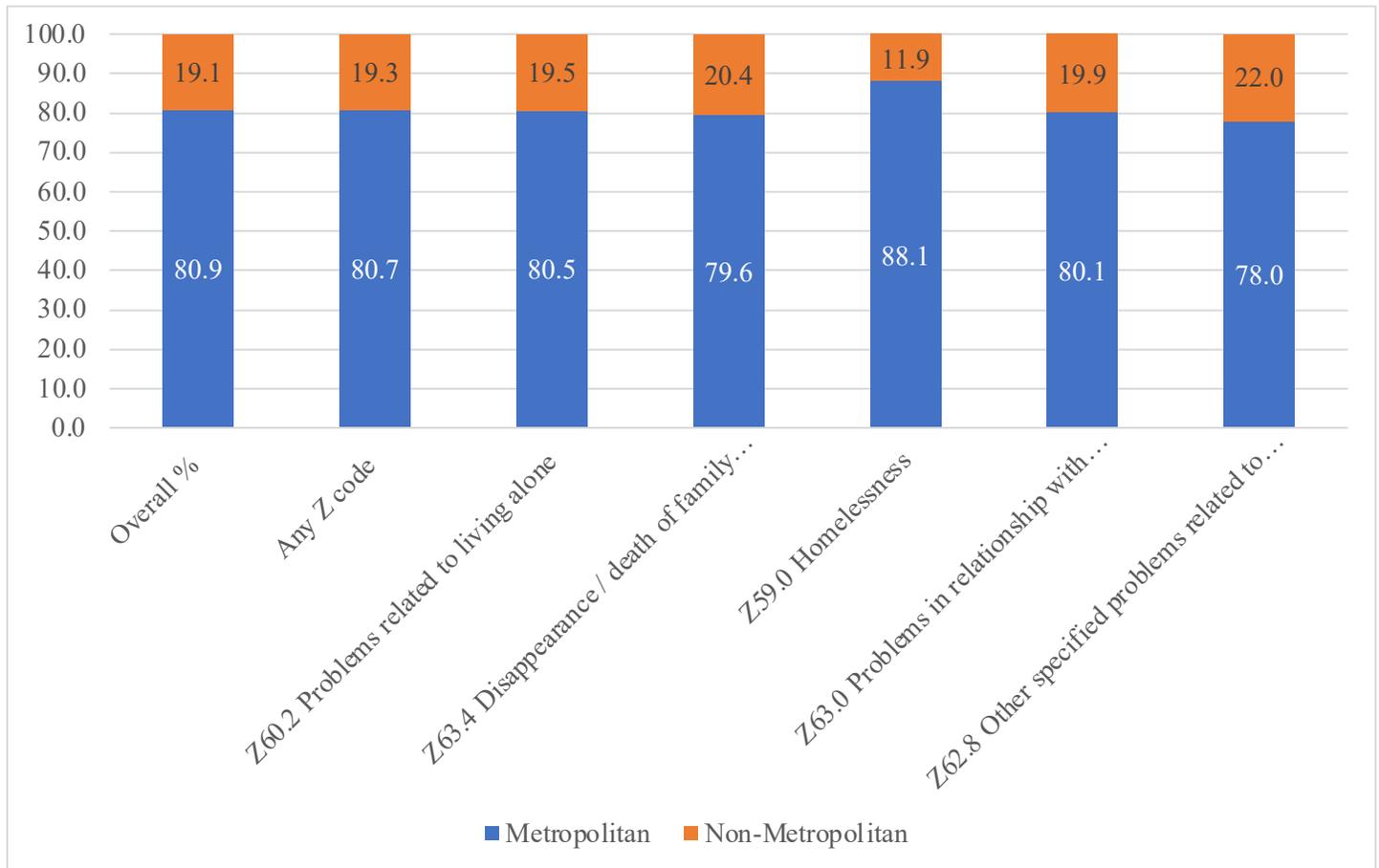
Figure 13: Proportion of MA Enrollees with Z Code Claims by Race and Ethnicity, 2019



Note: Other/Unknown includes American Indian/Alaska Native enrollees

Figure 13 presents the composition by race and ethnicity of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2019. Compared to MA enrollees overall, those with any Z code claims appeared to be disproportionately Black. MA enrollees with three of the five most used Z codes appeared to be disproportionately Black, and among MA enrollees with Z59.0 (Homelessness), this relationship was particularly pronounced. MA enrollees with Z63.0 (Problems in relationship with spouse or partner) appeared to be disproportionately White.

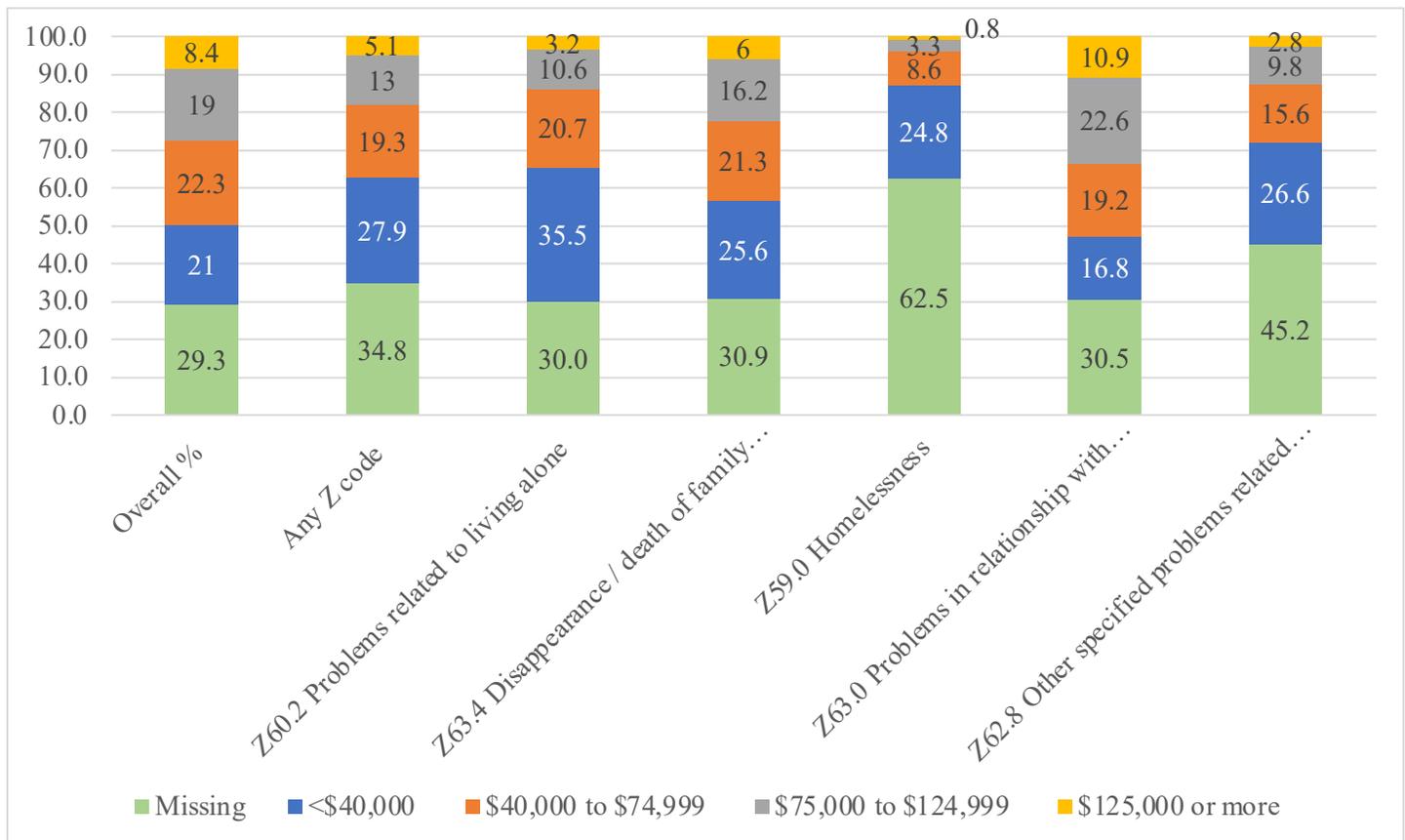
Figure 14: Proportion of MA Enrollees with Z Code Claims by Rurality, 2019



Note: Non-metropolitan includes micropolitan, small town and rural

Figure 14 presents the composition by rurality of residence of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes, in 2019. The proportion of enrollees in metropolitan and non-metropolitan areas was similar except for Z59.0 (Homelessness).

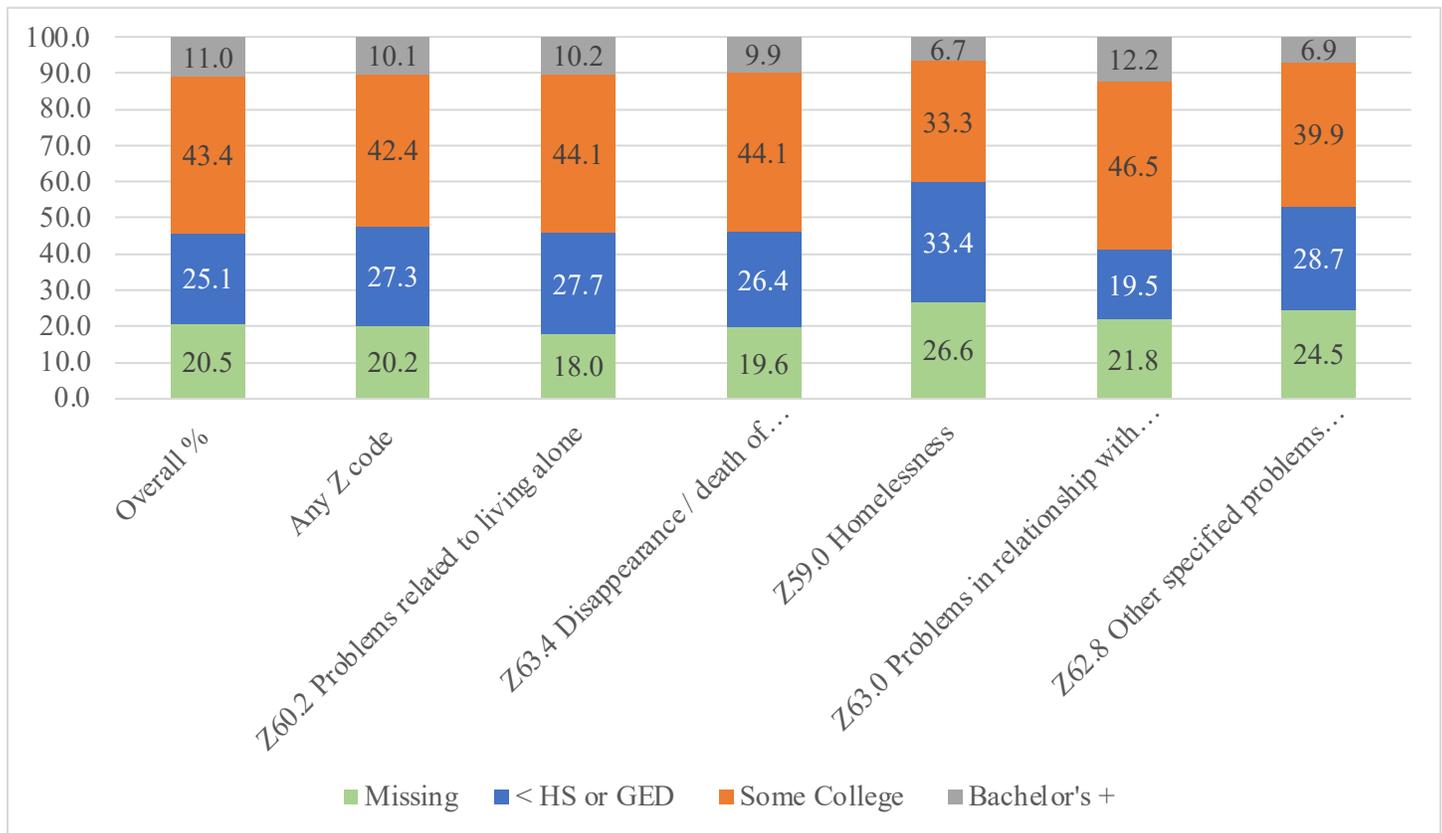
Figure 15: Proportion of MA Enrollees with Z Code Claims by Imputed Household Income, 2019



Note: Household income is imputed by a third-party vendor using a proprietary model.

Figure 15 presents the composition by imputed household income of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2019. Due to substantial missingness of imputed household income data, particularly among enrollees experiencing homelessness, these results should be interpreted with caution. Compared to MA enrollees in the overall sample, those with any Z code claims appeared to be disproportionately in the lowest income group (21.0% vs. 27.9%) or to have missing data (29.3% vs. 34.8%). Enrollees with four of the five specified Z codes appeared to be disproportionately in the lowest income group, while enrollees from the top two income groups appeared to be overrepresented among those with code Z63.0 (Problems in relationship with spouse or partner). Enrollees with Z59.0 (Homelessness) were much more likely to have missing data, as were those with Z62.8 (Other specified problems related to upbringing).

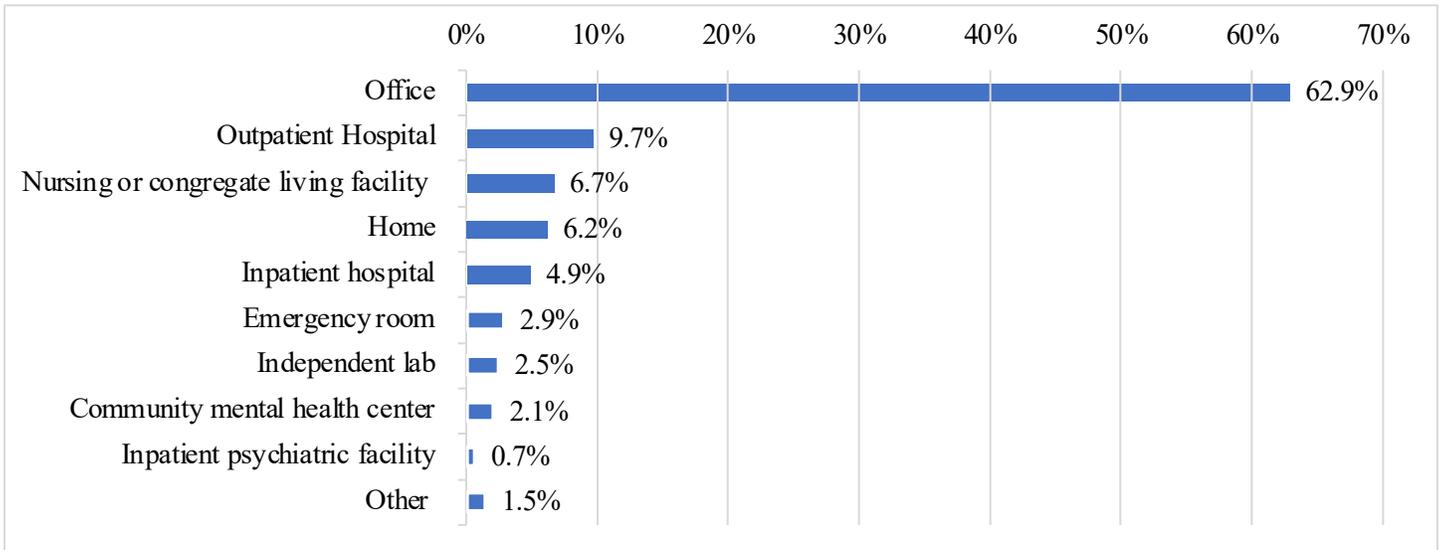
Figure 16: MA Enrollees with Z Code Claims by Neighborhood Educational Attainment, 2019



Note: Neighborhood-level median education obtained from the American Community Survey

Figure 16 presents the composition by median neighborhood-level educational attainment of the MA sample overall, the MA enrollees with any Z code claims, and the MA enrollees with each of the five most used Z codes in 2019. Due to substantial missingness of neighborhood education data, particularly among enrollees experiencing homelessness, these results should be interpreted with caution. Roughly 20% of enrollees were missing data in each group, except for enrollees with code Z59.0 (Homelessness), among whom 26.6% were missing education data. Enrollees with any Z code claims and four of the five most used codes appeared to disproportionately reside in lower education neighborhoods, particularly among those with Z59.0 (Homelessness). Enrollees with utilization of Z63.0 (Problems in relationship with spouse or partner) appeared to disproportionately reside in higher educational attainment neighborhoods.

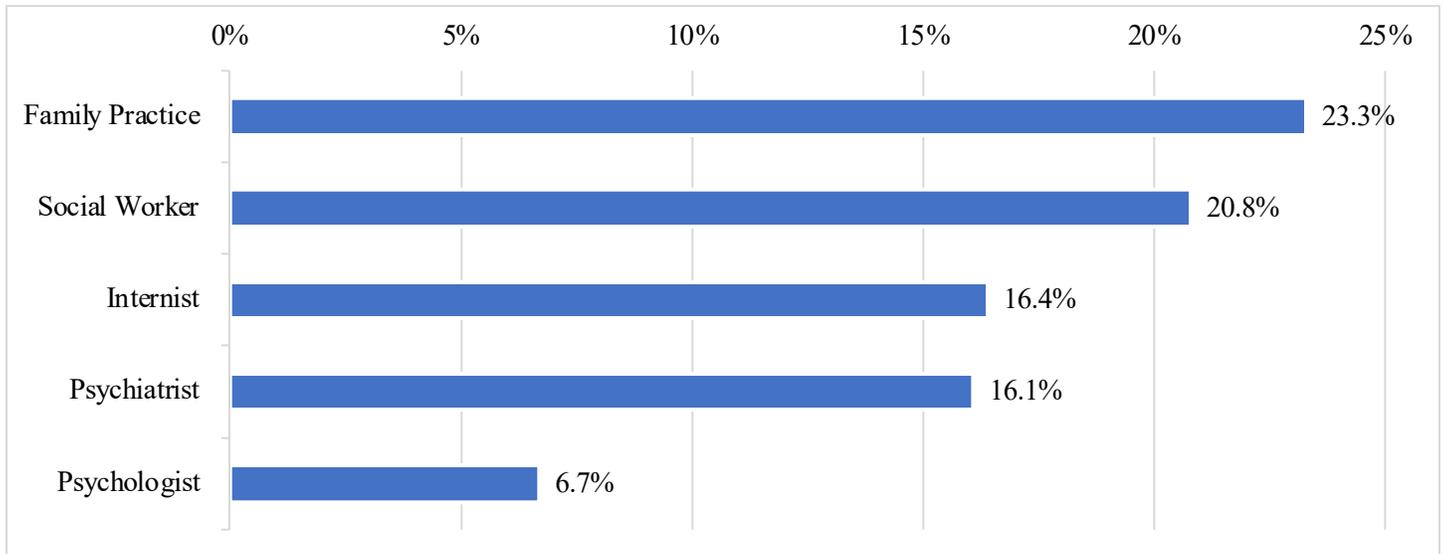
Figure 17: Physician/Provider Claims with Z Code Claims by Place of Service, 2019



Note: Nursing or congregate living facility includes assisted living facility, custodial care facility, group home, homeless shelter, nursing facility and skilled nursing facility. Inpatient psychiatric facility includes both inpatient psychiatric facility and psychiatric facility partial hospitalization.

Figure 17 shows the place of service recorded on Z codes physician/provider medical claims in 2019. Physician offices were the most common place of service, constituting 62.9% of claims, followed by outpatient hospital (9.7%) and nursing or congregate living facility (6.7%).

Figure 18: Non-Institutional Physician/Provider Claims with Z Code Claims by Provider Type, 2019



Note: Facility/institutional claims were excluded from this analysis

Figure 18 summarizes the five most common physician/provider types on non-institutional claims with Z codes in 2019. Primary care providers (family practitioners and internists) accounted for a combined 39.7% of non-institutional physician/provider Z codes claims in the sample. Mental health providers (psychiatrists and psychologists) accounted for 22.8% of non-institutional physician/provider Z codes claims.

Discussion

CMS has considerable interest in the use of Z codes, indicating that they are a tool for potentially improving quality and experience of care, and describing them as part of the “data journey to better outcomes.”² As a result, understanding how Z codes are currently used across CMS programs is of critical importance.

These analyses build on prior studies of Z code utilization which analyzed their use among Medicare FFS enrollees in 2017 and 2019.^{3,4} Those studies found very low rates of utilization of Z codes: 1.39% of Medicare FFS enrollees in 2017 and 1.59% of Medicare FFS enrollees in 2019 had any utilization of Z codes. Among MA enrollees in our sample, we found even lower rates of Z code utilization: 0.94% in 2017 and 1.07% in 2019. Use of Z codes was growing at a similar rate among Medicare FFS and MA enrollees in our sample (13.8% vs 14.4% growth in the percent of enrollees with any Z codes, from 2017 to 2019).

Three of the five most used Z codes among MA enrollees were consistent from 2016-2019: Z60.2 (Problems related to living alone), Z63.4 (Disappearance and death of family member) and Z59.0 (Homelessness). These three Z codes were also among the five most used among Medicare FFS enrollees in 2019, though in a different order (ranked third, second and first, respectively).

Compared to MA enrollees in the OLDW overall, MA enrollees with any Z code claims appeared to be disproportionately younger (age 18-64 years), female, Black, residents of lower-income households or residents of lower-median educational attainment neighborhoods. Proportions of metropolitan vs non-metropolitan residents were similar among MA enrollees in the overall sample and among those with any Z code claims. Examination of the five most utilized Z codes showed that nearly two thirds of enrollees with Z code claims for homelessness (both 2017 and 2019) and other specified problems related to upbringing (in 2019) were aged 18-64 years. Additionally, nearly one third of enrollees with problems related to living alone were aged 85 years and older. Enrollees with Z code claims for homelessness also appeared to be disproportionately male, Black and residents of metropolitan areas.

These analyses also provide some insight into the clinical settings in which Z codes were used. A physician's office was the most common place of service in which Z codes were recorded in both 2017 and 2019 in the sample. Primary care physicians (internists and family practitioners), mental health practitioners (psychologists and psychiatrists) and social workers were the most common specialties making use of Z codes in non-institutional claims in 2017 and 2019.

Several factors likely contribute to the low rates of utilization of Z codes observed in this study and in the analyses of Medicare FFS data cited above. Z codes were recently introduced in 2016, and guidance regarding their use has evolved considerably in that time. Initially, Z codes could only be used if the patient's SDOH were documented by a physician. However, in 2018, the list of eligible providers was expanded to include non-physician practitioners like nurses and case managers; the list of eligible “clinicians” was further clarified in October 2019.³³ As a result, many providers may have been unaware that they were eligible to use Z codes for much of our study period. It is also important to consider that this study analyzed only the use of Z codes to document SDOH, and these risk factors may be documented elsewhere by clinicians, for example using open fields in electronic health records. Providers may view Z codes as duplicative of existing documentation and future research could explore whether providers view these tools as complements or substitutes.

Additionally, providers lack direct financial incentives to document SDOH using Z codes. However, this may be changing. Priority Health, a commercial insurer in Michigan, began offering financial incentives to providers who use an approved screening tool for SDOH and record at least one Z code for 5% of their covered patients in 2021.³⁴ Recent changes to guidelines for coding physician visits for evaluation and management (E&M) services could provide additional incentive for using Z codes. These changes, which went into effect in 2021, altered the basis on which providers could bill for higher-intensity services (and higher reimbursement) to focus on the time spent with the patient or the complexity of medical decision-making required. Patients' SDOH are among those factors a provider can include in their consideration of the complexity of medical decision making needed.³⁵ Payers and policymakers should be cognizant of potential unintended consequences of such incentive systems – such as over-coding or perverse incentives to avoid addressing social needs³⁶ – but these recent developments provide examples of approaches to increasing use of Z codes.

In addition to considerations of how best to incentive uptake of Z codes, future research should seek to better describe the providers who currently use Z codes. One recent study compared the characteristics of hospitals that did and did not use Z codes in 2016 and 2017, and found that hospitals that used Z codes tended to be larger, located in urban areas, and treat more patients with Medicaid or who lacked insurance.³⁷

While these are useful insights, the analyses of MA data presented in this report indicate that significant numbers of Z code claims were generated in non-hospital settings. As a result, there is considerable value in extending these analyses beyond hospitals. Identifying providers most likely to use Z codes and describing their demographic characteristics, practice characteristics and the characteristics of their patients could help generate insights to improve uptake of Z codes for social determinants. Future research could also explore how documentation of SDOH using Z codes influences the patterns of treatment and referrals that patients receive.

Limitations

The analyses described in this report have several important limitations. First, the analysis was limited to enrollees aged 18 years and older who were enrolled in MA medical benefits for 11 months in a given calendar year by a single insurer. If enrollees with SDOH were more likely to switch MA plans or move to coverage under Medicare FFS, they would no longer appear in our analytic sample, potentially leading to underestimation of the use of Z codes. Because the data used in this study were also drawn from a single insurer offering MA coverage, there could also be concerns about the generalizability of the results to enrollees of other MA plans.

These analyses also reflect a limited sample of MA enrollees drawn from a single, nationwide insurer. As a result, this sample may not be representative of the MA population as a whole. Additionally, while these analyses provide clear evidence on low utilization of Z codes and slow growth in Z codes utilization, the demographic characteristics among enrollees with specified Z codes should be interpreted with caution. The sample sizes were quite small, with fewer than 10,000 enrollees in the group with Z60.2 (Problems related to living alone) in 2019, despite it being the most used Z code. Enrollees with Z codes also represent a substantial undercounting of the prevalence of the SDOH represented by those codes. For example, a recent analysis of the Medicare Current Beneficiary Survey found that nearly one in ten Medicare enrollees aged 65

and older were food insecure.³⁸ Despite this fact, Z59.4 (Lack of adequate food and safe drinking water) did not appear among the top five Z codes, meaning that it appeared on fewer than 6,344 claims out of nearly 150 million total MA claims in 2019. As a result, these analyses suggest that Z codes are not ready to be used as a surveillance tool for SDOH likely do not offer a representative sample of MA enrollees with these SDOH.

There were also substantial issues with missing data for imputed household income and neighborhood educational attainment (shown in green in the bar charts). For example, imputed household income data are missing for 34.8% of enrollees with Z codes in the 2019 data. One potential cause of this is the processes by which these data are generated in the OLDW. OptumLabs contracted with a third-party vendor that used public and private consumer data (including credit card statements, loan amounts, and loan payments) to impute annual household income. If enrollees with adverse SDOH (particularly those like homelessness) were less likely to have access to credit, they would also be more likely to lack these data used in these imputations.

Conclusion

Since their introduction in 2016, providers have made only limited use of Z codes for SDOH and social risk factors among Medicare Advantage enrollees. Within the sample data, only 0.94% of enrollees had one or more Z codes recorded in 2017, and the proportion had only grown to 1.07% in 2019. We also observe considerable variation in the use of Z codes by setting of care and provider type. In addition to their relatively recent introduction and changing guidance on their use, one potential explanation for low utilization of Z codes may be the lack of explicit financial incentives for their use. Recent changes to E&M coding may add some incentive to record Z codes, and at least one commercial payer is piloting financial incentives to providers for reaching certain thresholds of Z code use among their attributed patients.

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Appendix

Appendix Table 1. Count and percentage of MA enrollees with at least one claim with ICD-10 Z code(s) for SDOH by year, 2016-2019

	2016	2017	2018	2019
Number of MA enrollees with a Z Code claim	24,321	31,590	36,533	41,746
Number of MA enrollees	2,697,212	3,356,938	3,658,084	3,885,229
% of MA enrollees with a Z code claim	0.902%	0.941%	1.00%	1.07%

Appendix Table 2. Count and percentage of claims for MA enrollees with ICD-10 Z code(s) for SDOH by year, 2016-2019

	2016	2017	2018	2019
Number of MA claims with a Z code	74,268	94,595	103,722	111,880
Number of MA claims	93,051,406	118,257,491	135,046,190	146,535,375
% of MA medical claims with a Z code	0.080%	0.080%	0.077%	0.076%

Appendix Table 3. Top 5 utilized Z codes in 2017 among MA enrollees aged 65 years and older (n=23,513)

		Z code claims (N=69,455)		Enrollees with a Z code claim (N=23,513)	
Z code	Description	Count	%	Count	%
Z60.2	Problems related to living alone	30,638	44.1%	8,213	34.9%
Z63.4	Disappearance and death of family member	8,562	12.3%	3,879	16.5%
Z63.0	Problems in relationship with spouse or partner	3,245	4.7%	867	3.7%
Z59.9	Problems related to housing and economic circumstances, unspecified	2,853	4.1%	502	2.1%
Z65.8	Other specified problems related to psychosocial circumstances	2,801	4.0%	1,067	4.5%

Note: Top 5 based on number of claims, not number of enrollees.

Appendix Table 4. Top 5 utilized Z code in 2017 among MA enrollees aged 18-64 years (n=8,077)

		Z code claims (N=25,140)		Enrollees with a Z code claim (N=8,077)	
Z code	Description	Count	%	Count	%
Z59.0	Homelessness	5,906	23.5%	1,786	22.1%
Z60.2	Problems related to living alone	3,686	14.7%	978	12.1%
Z63.4	Disappearance and death of family member	2,671	10.6%	973	12.0%
Z62.8	Other specified problems related to upbringing	2,603	10.4%	1,052	13.0%
Z63.0	Problems in relationship with spouse or partner	1,681	6.7%	435	5.4%

Note: Top 5 based on number of claims, not number of enrollees.

Appendix Table 5 Top 5 utilized Z codes in 2019 among MA enrollees aged 65 years and older (N=31,716)

		Z code claims (N=80,181)		Enrollees age 65+ with a Z code claim (N=31,716)	
Z code	Description	Count	%	Count	%
Z60.2	Problems related to living alone	23,996	29.9	8,899	28.1
Z63.4	Disappearance and death of family member	13,477	16.8	5,684	17.9
Z63.6	Dependent relative needing care at home	5,285	6.6	2,632	8.3
Z63.0	Problems in relationship with spouse or partner	4,335	5.4	1,179	3.7
Z63.7	Other stressful life events affecting family & household	3,881	4.8	1,993	6.3

Note: Top 5 based on number of claims, not number of enrollees

Appendix Table 6. Top 5 utilized Z codes in 2019 among MA enrollees aged 18-64 years (N=10,030)

		Z code claims (N=31,699)		Enrollees with a Z code claim (N=10,030)	
Z code	Description	Count	%	Count	%
Z59.0	Homelessness	7,324	23.1	2,069	20.6
Z62.8	Other specified problems related to upbringing	3,894	12.3	1,445	14.5
Z63.4	Disappearance and death of family member	3,836	12.1	1,352	13.5
Z60.2	Problems related to living alone	2,547	8.0	876	8.7
Z63.0	Problems in relationship with spouse or partner	2,166	6.8	532	5.3

Note: Top 5 based on number of claims, not number of enrollees