

# Z Codes Utilization among Medicare Fee-for-Service (FFS) Beneficiaries in 2017

## Background

Social determinants of health (SDOH) refer to the conditions of an individual's living, learning, and working environments that affect one's health risks and outcomes.<sup>1</sup> SDOH are now widely recognized as important predictors in clinical care and positive conditions are associated with improved patient outcomes and reduced costs.<sup>2</sup> Conversely worse conditions have been shown to negatively affect outcomes, such as hospital readmissions rates, length of stay, and use of post-acute care but SDOH data collection lacks standardization and reimbursement across clinical settings.<sup>3</sup> A 2014 National Academies of Medicine (NAM) report suggested that the collection of SDOH data in an electronic health record (EHR) is necessary to empower providers to address health disparities and to support further research into the health effects of SDOH.<sup>4</sup> Data collection using SDOH screening tools is quite common across settings, but this captured information is not consistently translated to standardized data due to lack of technical specifications based on industry consensus.<sup>5,6</sup>

The published literature on SDOH coding practices in ambulatory care identifies current challenges to consistent data collection. Some of these barriers to SDOH include the lack of a standardized EHR-based screening tool, lack of and multiplicity of codes, and lack of knowledge among providers and medical coders. Reducing reliance on clinicians to capture SDOH, improving provider and medical coder education, and filling gaps in codes, among other policy-based interventions, would likely improve the reporting of SDOH coding across care settings. Given this deficiency, International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes present an opportunity to capture standardized data and quantify the proportion of beneficiaries impacted by SDOH by way of the Z codes.

Z codes are a subset of ICD-10-CM codes, used as reason codes to capture "factors that influence health status and contact with health services."<sup>7</sup> They apply to all health care settings and must be accompanied by any performed procedure codes.<sup>8</sup> Within the full set of Z codes, Z55-65 described in Table 1

## Key Findings:

- Among 33.7 million total Medicare FFS beneficiaries in 2017, approximately 1.4% had claims with Z codes.
- The 5 most utilized Z codes were:
  - Z59.0 - Homelessness
  - Z60.2 - Problems related to living alone
  - Z63.4 - Disappearance and death of family member
  - Z65.8 - Other specified problems related to psychosocial circumstances, and
  - Z63.0 - Problems in relationship with spouse or partner
- Of the 467,136 Medicare FFS beneficiaries with Z code claims, 334,373 individuals (72%) had hypertension and 248,726 individuals (53%) had depression.
- Of the 467,136 Medicare FFS beneficiaries with Z code claims, 349,658 individuals (75%) were not dual eligible and 117,478 were dual eligible (25%).
- Of the 467,136 Medicare FFS beneficiaries with Z code claims, 161,559 individuals (35%) were under 65 years of age.
- Z59.0 homelessness was the only Z code with a higher utilization for males than females.
- Significant disparities are observed in Z59.0 - Homelessness among blacks, Hispanics and American Indians/Alaska Natives as well as in Z63.4 - Disappearance and death of family members among American Indians/Alaska Natives.

Data Source:  
Estimates produced using 100 percent Medicare FFS claims data from 2017 for beneficiaries aged 18-75 years living in the contiguous United States.

specifically assess SDOH by identifying individuals with potentially hazardous socioeconomic and psychosocial circumstances.<sup>8</sup> Throughout the remaining figures and text of this report, Z codes will refer specifically to this category of SDOH-associated Z codes. As shown in Table 1, there are nine categories of Z codes related to SDOH and several sub-codes, comprising a total of 97 granular codes.<sup>9</sup> For example, Z55 (problems related to education and literacy) is further broken out into seven sub-codes including:

- Z55.0 Illiteracy and low-level literacy
- Z55.1 Schooling unavailable or unattainable
- Z55.2 Failed school examinations
- Z55.3 Underachievement in school
- Z55.4 Educational maladjustment and discord with teachers and classmates
- Z55.8 Other problems related to education and literacy
- Z55.9 Problems related to education and literacy, unspecified

In light of the growing awareness of the importance of SDOH in patient health outcomes, and the need for the collection and documentation of this data in clinical settings to improve patient care, this study analyzes the utilization of Z codes in 2016 and 2017 among Medicare fee-for-services (FFS) beneficiaries. Z codes did not exist prior to implementation of the ICD-10-CM codes in 2015. Their precursors were V codes, which are described in the ICD-9-CM chapter “Supplementary Classification of Factors Influencing Health Status and Contact with Health Services.” The new more expanded Z codes were first available in 2016 Medicare claims.

The unique beneficiary count for Z code utilization was 446,171 in 2016. In 2017, the beneficiary count increased by 4.69% to 467,136, thus representing 1.4 percent of 33.7 million total beneficiaries in CY2017. While 2016 Medicare FFS claims data was analyzed, this data highlight only presents the more recent 2017 data, due to this marginal increase in Z code utilization. This study first uses claim counts to identify the top five most utilized Z codes in 2017. It then presents unique beneficiary counts for all SDOH Z codes and these five specific Z codes across various demographic characteristics, including chronic conditions, dual eligibility under Medicare and Medicaid, age, sex and race.

**Table 1. Z Codes and Sub-Codes Related to Social Determinants of Health**

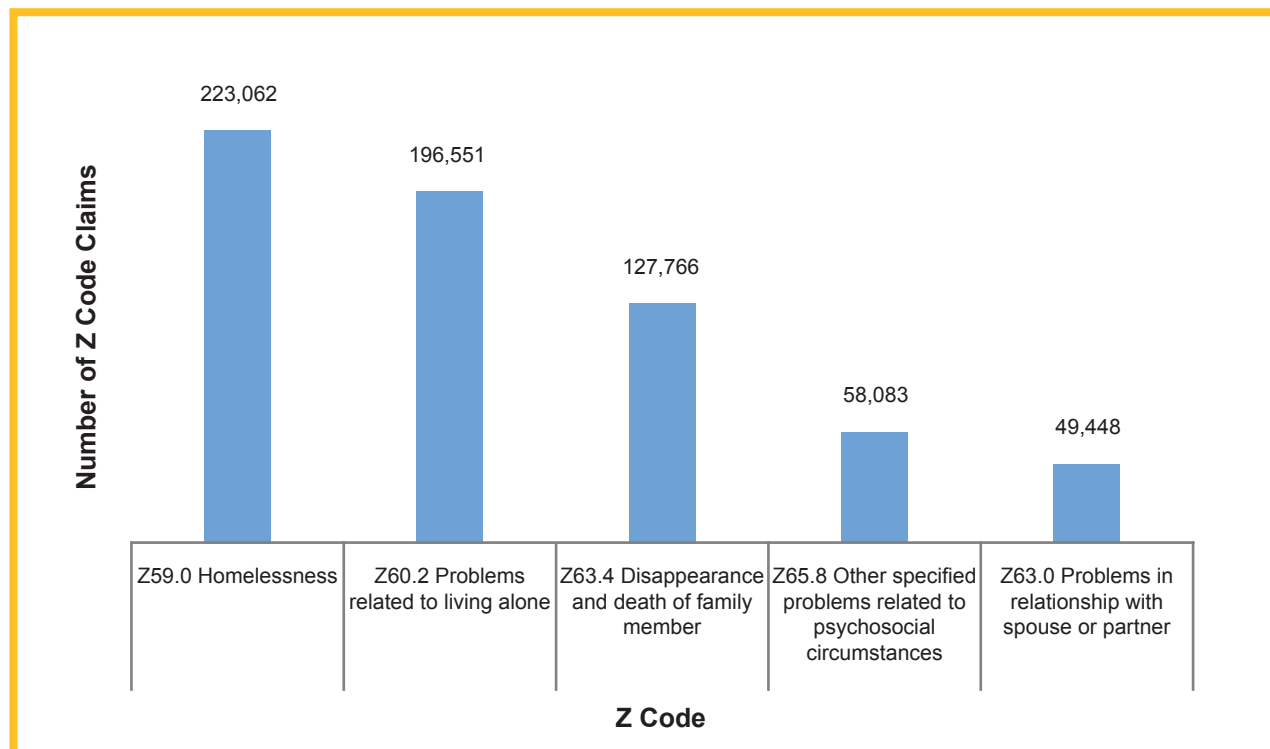
| ICD-10 | Description   | Number of Sub-Codes |
|--------|---|---------------------|
| Z55    | Problems related to education and literacy                                      | 7                   |
| Z56    | Problems related to employment and unemployment                                 | 12                  |
| Z57    | Occupational exposure to risk factors   | 12                  |
| Z59    | Problems related to housing and economic circumstances                          | 10                  |
| Z60    | Problems related to social environment  | 7                   |
| Z62    | Problems related to upbringing  | 24                  |
| Z63    | Other problems related to primary support group, including family circumstances | 14                  |
| Z64    | Problems related to certain psychosocial circumstances                          | 3                   |
| Z65    | Problems related to other psychosocial circumstances                            | 8                   |

## Methods

The data source for this study is Medicare claims and enrollment data obtained from the CMS Chronic Condition Data Warehouse (CCW) ([www.ccwdata.org](http://www.ccwdata.org)). Within the CCW environment, SAS Enterprise Guide (V.9.4; SAS, Cary, NC) was used to produce utilization and beneficiary statistics. Specifically, we used complete (100 percent) FFS claims data in the Geographic Variation Database (GVDB), which covers both Medicare Part A inpatient hospital care, post-acute care (such as skilled nursing facility care and home health) and hospice care, and Medicare Part B, which primarily covers physician services, outpatient hospital care, and durable medical equipment, to identify beneficiaries with ICD-10 diagnosis codes within the Z55-65 set related to socioeconomic and psychosocial circumstances, capturing information on SDOH.<sup>10</sup> The CCW contains a unique beneficiary identifier that was used to link claims with individual level beneficiary files containing demographic, enrollment and chronic condition data. The files used were for calendar years 2016 and 2017.

## Results

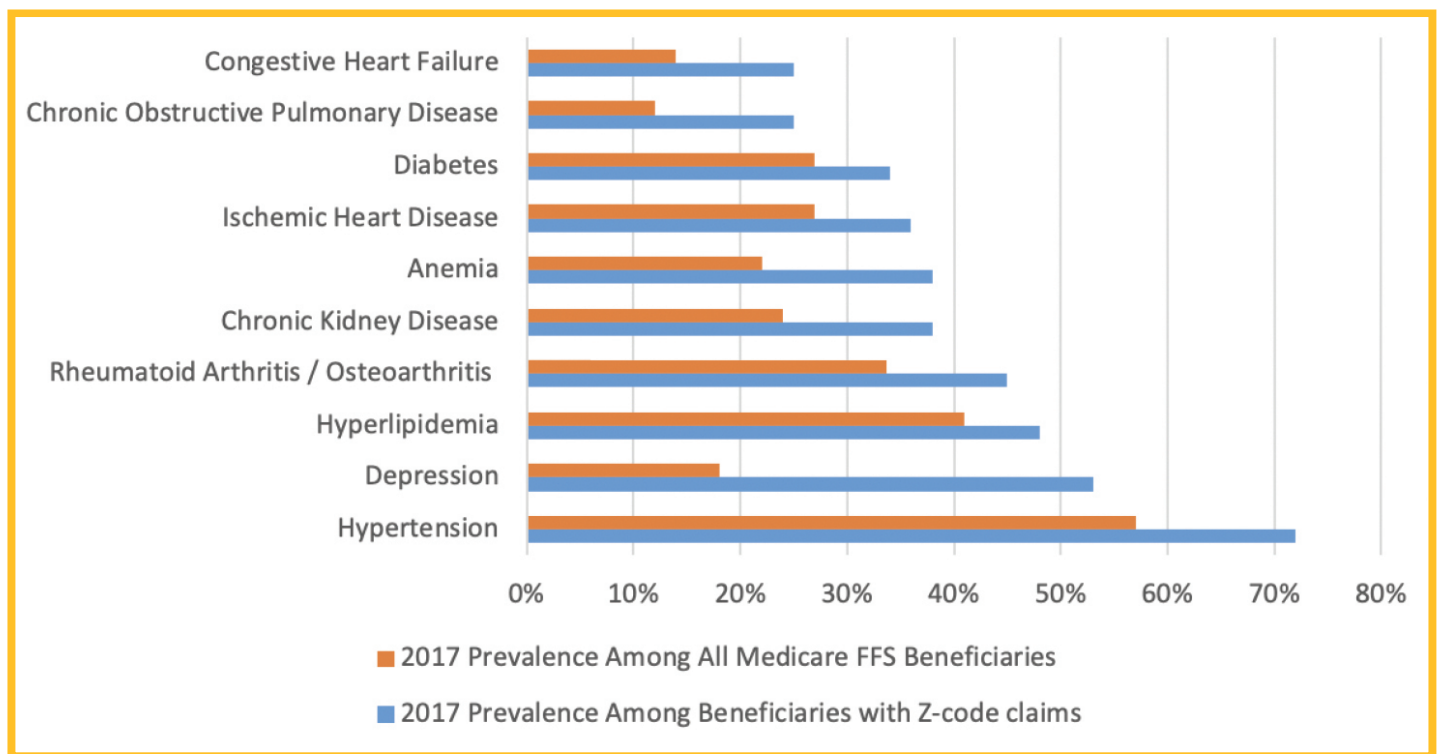
Figure 1. Medicare FFS Diagnosis Code Counts for Top 5 Z Codes in 2017



Among Medicare FFS beneficiaries in 2017, the top 5 most utilized Z codes were:

- Homelessness (Z59.0) – 223,062 claims
- Problems related to living alone (Z60.2) – 196,551 claims
- Disappearance and death of family member (Z63.4) – 127,766 claims
- Other specified problems related to psychosocial circumstances (Z65.8) – 58,083 claims
- Problems in relationship with spouse or partner (Z63.0) – 49,448 claims

**Figure 2. Top 10 Chronic Conditions among Medicare FFS Beneficiaries with Z Codes in 2017**



Among the 33.7 million total Medicare FFS beneficiaries in 2017, the top 10 chronic conditions were:

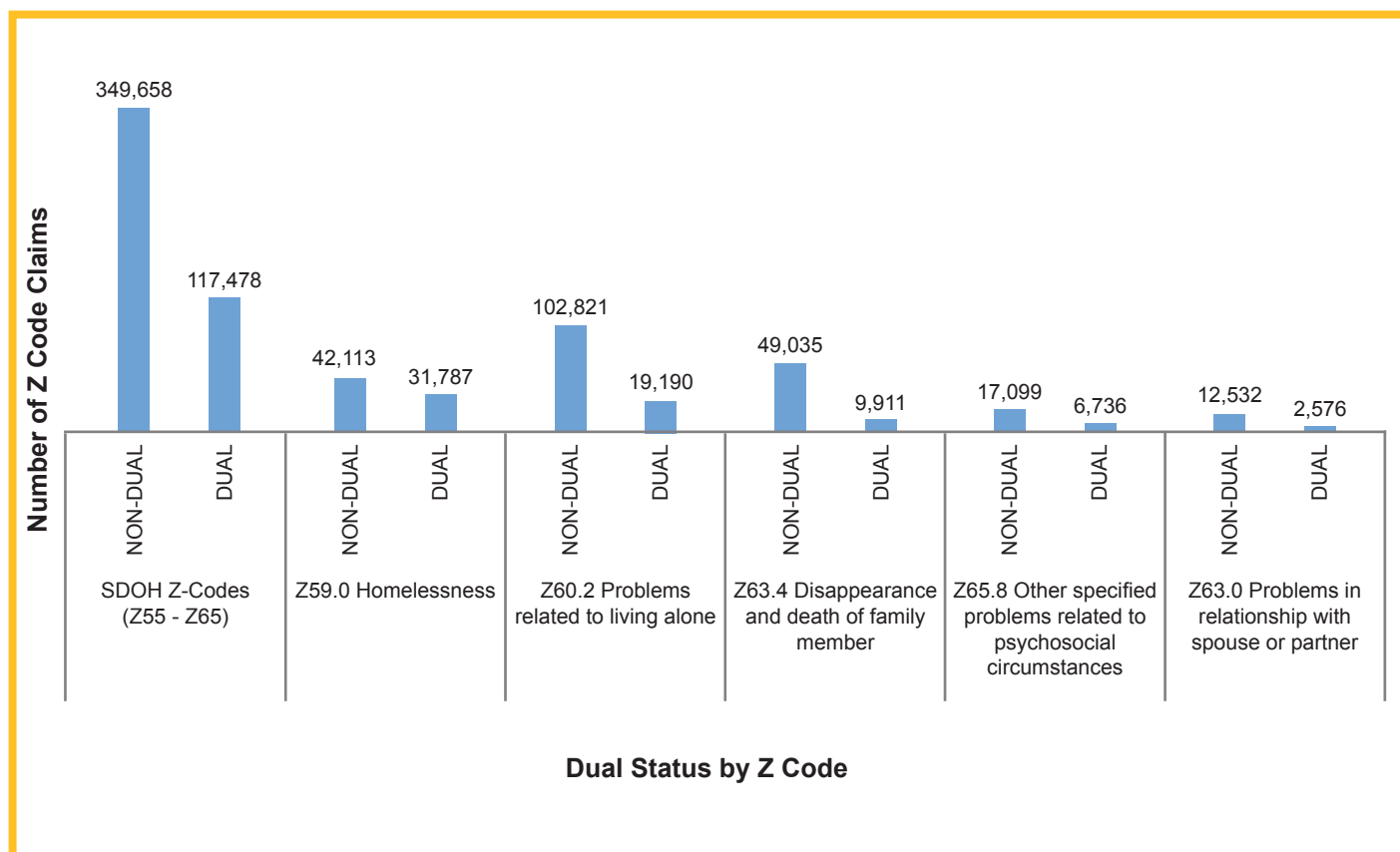
- Hypertension (57%)
- Hyperlipidemia (41%)
- Rheumatoid Arthritis/Osteoarthritis (33%)
- Diabetes (27%)
- Ischemic Heart Disease (27%)
- Chronic Kidney Disease (24%)
- Anemia (22%)
- Depression (18%)
- Congestive Heart Failure (14%)
- Chronic Obstructive Pulmonary Disease (12%)

Among the 467,136 Medicare FFS beneficiaries with Z code claims in 2017, the top 10 chronic conditions were:

- Hypertension (72%)
- Depression (53%)
- Hyperlipidemia (48%)
- Rheumatoid Arthritis/Osteoarthritis (45%)
- Chronic Kidney Disease (38%)
- Anemia (38%)
- Ischemic Heart Disease (36%)
- Diabetes (34%)
- Chronic Obstructive Pulmonary Disease (25%)
- Congestive Heart Failure (25%)

Many beneficiaries have more than one chronic condition.

**Figure 3. Dual Status Distribution among Medicare FFS Beneficiaries with Top 5 Z Codes in 2017**



In this study, dual status refers to beneficiaries who were eligible for both Medicare and Medicaid during the entire calendar year. Of the 33.7 million total Medicare FFS beneficiaries in 2017, 3.9 million (11.7 percent) were dual eligible and 29.8 million (88.3 percent) were not dual eligible. There were more non-dual beneficiaries than dual beneficiaries across the Z codes. The most noteworthy findings are restated below.

Of the 467,136 Medicare FFS beneficiaries with Z code claims:

- 117,478 were dual eligible (25%)
- 349,658 beneficiaries were not dual eligible (75%)

Of the 122,011 Medicare FFS beneficiaries with Z60.2 problems related to living alone:

- 19,190 beneficiaries were dual eligible (16%)
- 102,821 beneficiaries were not dual eligible (84%)

Of the 58,946 Medicare FFS beneficiaries with Z63.4 disappearance and death of a family member:

- 9,911 beneficiaries were dual eligible (17%)
- 49,035 beneficiaries were not dual eligible (83%)

Of the 23,835 Medicare FFS beneficiaries with Z65.8 other specified problems related to psychosocial circumstances:

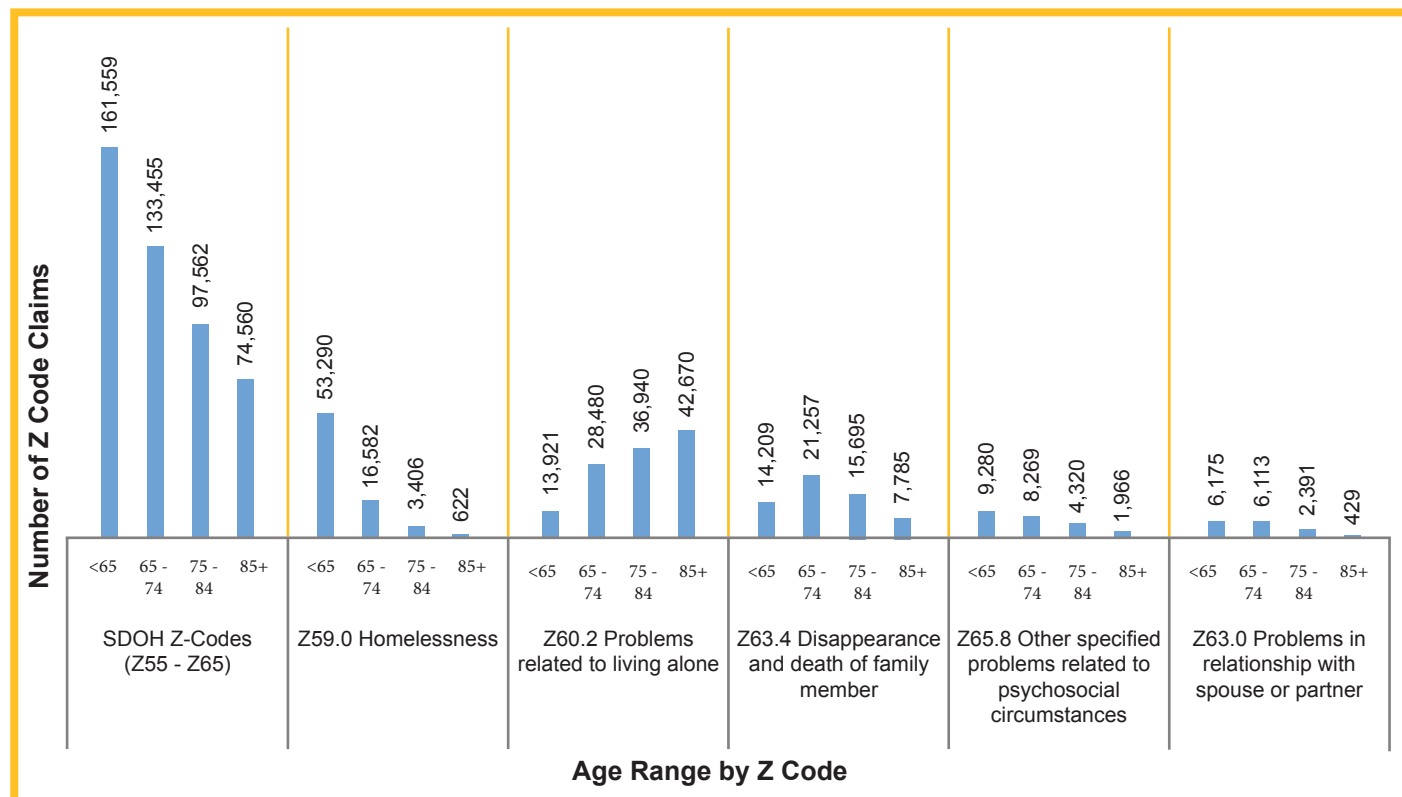
- 6,736 were dual eligible (28%)
- 17,099 were not dual eligible (72%)

Of the 15,108 Medicare FFS beneficiaries with Z63.0 problems in relationship with spouse or partner:

- 2,576 beneficiaries were dual eligible (17%)
- 12,532 beneficiaries were not dual eligible (83%)



**Figure 4. Age Distribution among Medicare FFS Beneficiaries with Top 5 Z codes in 2017**



Of the 33.7 million total Medicare FFS beneficiaries in 2017:

- 5.3 million beneficiaries were under 65 (16%)
- 15.3 million beneficiaries were between 65 and 74 (45%)
- 8.7 million beneficiaries were between 75 and 84 (26%)
- 4.4 million beneficiaries were over 85 (13%)

Of the 467,136 Medicare FFS beneficiaries with Z codes in 2017:

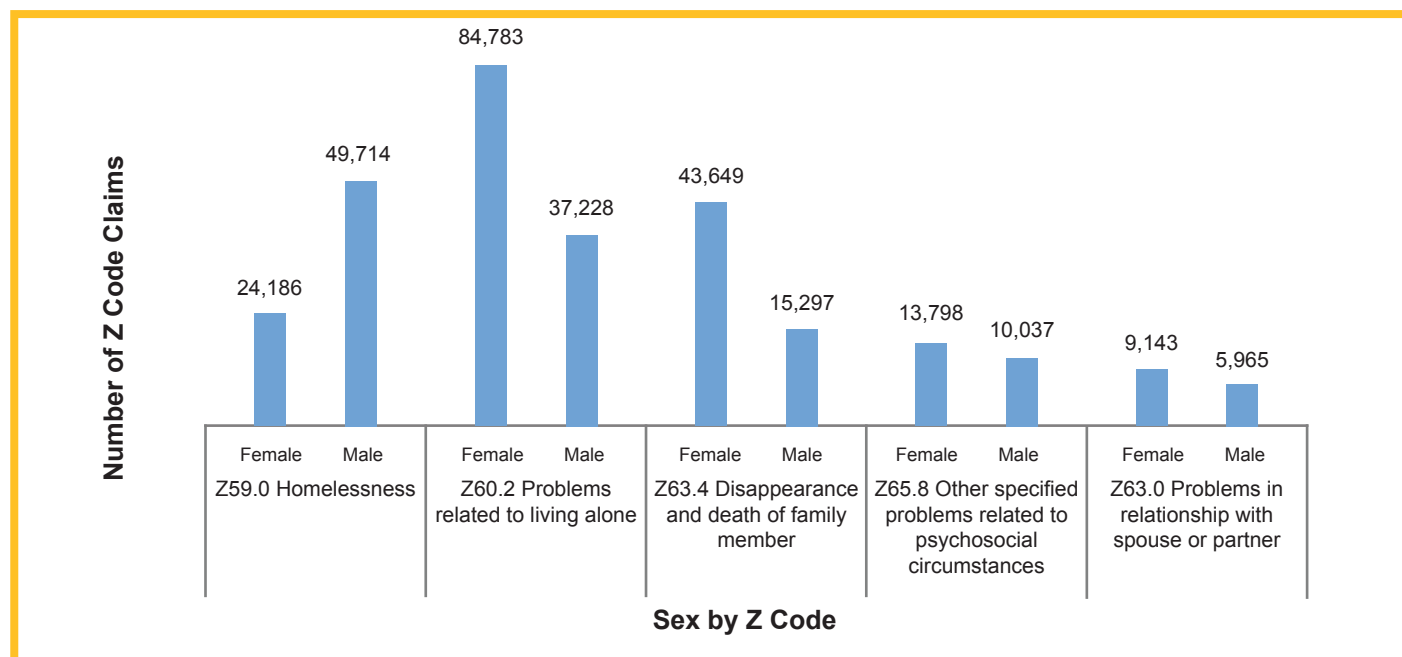
- 161,559 beneficiaries were under 65 (35%)
- 133,455 beneficiaries were between 65 and 74 (28%)
- 97,562 beneficiaries were between 75 and 84 (21%)
- 74,560 beneficiaries were over 85 (16%)

While the general relationship between Z code usage and age was inverse, problems related to living alone was the one exception. Among the 122,011 Medicare FFS beneficiaries with Z60.2 in 2017:

- 13,921 beneficiaries were under 65 (11%)
- 28,480 beneficiaries were between 65 and 74 (23%)
- 36,940 beneficiaries were between 75 and 84 (30%)
- 42,670 beneficiaries were over 85 (36%)



**Figure 5. Sex Distribution among Medicare FFS Beneficiaries with Top 5 Z Codes in 2017**



Of the 33.7 million total Medicare FFS beneficiaries in 2017, 18.5 million (55%) were female and 15.2 million (45%) were male. Of the 467,136 Medicare FFS beneficiaries with Z codes in 2017, 281,517 (60%) were females and 185,619 (40%) were males. Below are the sex distributions for each of the top 5 Z codes. Homelessness was the only Z code with a higher utilization for males than females. The most noteworthy findings are stated below.

Of the 73,900 Medicare FFS beneficiaries with Z59.0 homelessness:

- 24,186 beneficiaries were female (33%)
- 49,714 beneficiaries were male (67%)

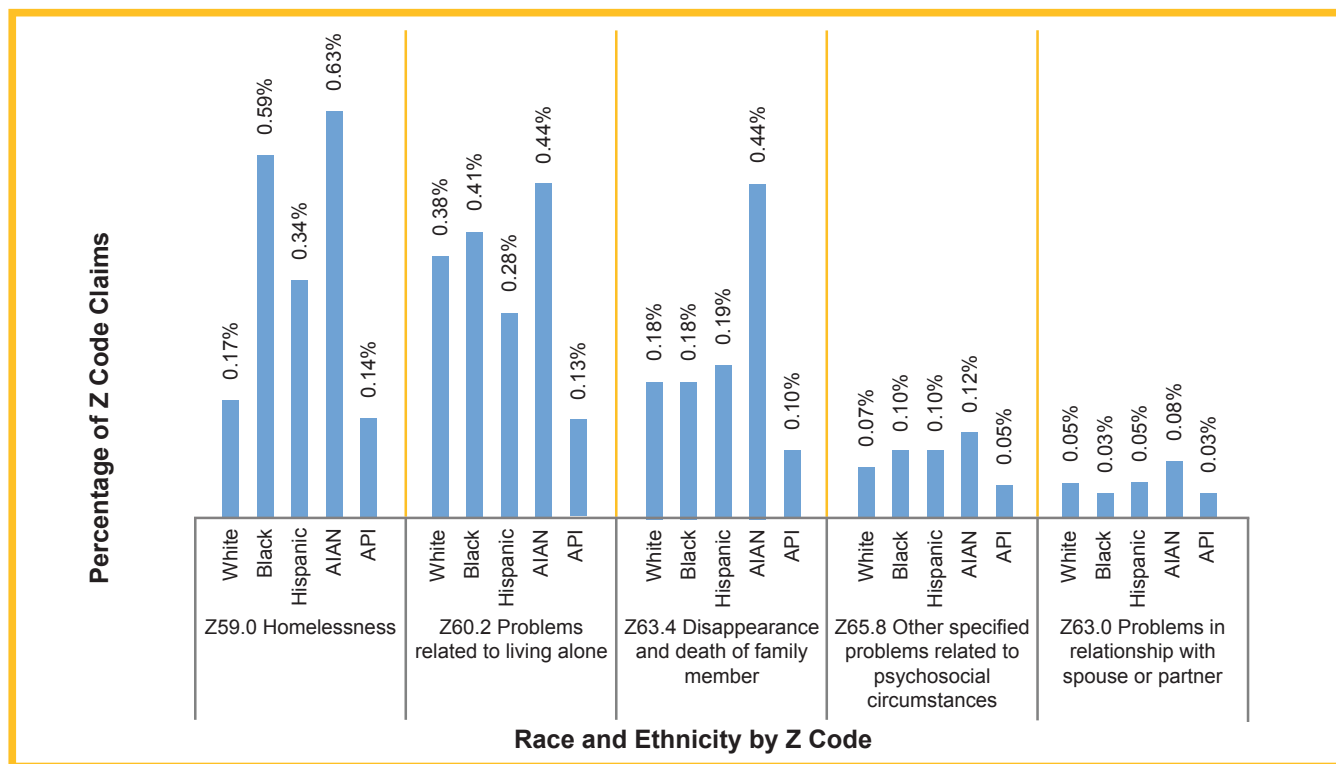
Of the 122,011 Medicare FFS beneficiaries with Z60.2 problems related to living alone:

- 84,783 beneficiaries were female (69%)
- 37,228 beneficiaries were male (31%)

Of the 58,946 Medicare FFS beneficiaries with Z63.4 disappearance and death of a family member:

- 43,649 beneficiaries were female (74%)
- 15,297 beneficiaries were male (26%)

**Figure 6. Race and Ethnicity Proportions among Medicare FFS Beneficiaries with Top 5 Z Codes in 2017**



Of the 33.7 million total Medicare FFS beneficiaries in 2017:

- 26.8 million beneficiaries were white (80%)
- 3.3 million beneficiaries were black (9%)
- 1.9 million beneficiaries were Hispanic (6%)
- 852,817 beneficiaries were Asian/Pacific Islander (API) (3%)
- 194,754 beneficiaries were American Indian/Alaska Native (AI/AN) (1%)

Of the 467,136 Medicare FFS beneficiaries with Z codes in 2017:

- 353,885 beneficiaries were white (76%)
- 62,569 beneficiaries were black (13%)
- 31,526 beneficiaries were Hispanic (1%)
- 7,213 beneficiaries were API (<1%)
- 5,055 beneficiaries were AI/AN (<1%)

Although the representation of the minority groups in the top five Z codes is relatively low compared to the overall Medicare FFS population, with the exception of blacks, the rates were highest for AI/AN and lowest for APIs. Significant disparities are observed in Z59.0 homelessness among blacks, Hispanics, and AI/ANs, as well as in Z63.4 disappearance and death of family members among AI/ANs. The proportion of black and AI/ANs with homelessness was more than three times higher than non-Hispanic white beneficiaries.

## Conclusion

This study represents the first analysis of Medicare FFS claims data for the utilization of Z codes. It identified 467,136 unique Medicare FFS beneficiaries with Z code claims in 2017, representing only 1.4 percent of the total FFS population. Among the claims identified, the five most utilized Z codes (Figure 1) are homelessness, problems related to living alone, disappearance and death of family member, other specified problems related to psychosocial circumstances, and problems in relationship with spouse or partner.

The findings of this study may represent an undercount of assessments of the patient social needs. A recent study found that 24% of hospitals and 16% of physician practices screened for food insecurity, housing instability, utilities, transportation, and interpersonal violence.<sup>11</sup> While more screening may occur, it is less clear to what extent the needs are being documented and shared among providers. Social determinants of health are associated with patient outcomes like hospital readmission rates and cost of care, and is the subject of growing interest among providers, health plans, payers, and community based organizations throughout the health system. SDOH data collection can lead to an increase in patient referrals to supportive services, and help identify population-level trends that have both health and cost implications.<sup>12,13</sup>

A number of challenges and potential solutions exist to increase the recording of SDOH with Z codes. In addition to this quantitative study, CMS held a listening session with interdisciplinary experts including health plans, EHR vendors, and providers to gain a better understanding of the factors that contribute to low utilization. Participants noted a general lack of awareness of the Z codes, and confusion as to who could document social needs. Several participants were unaware that the FY 2019 ICD-10-CM Official Guidelines for Coding and Reporting stated that clinicians other than the patient's provider could document social determinants of health. This would include but not be limited to nurses, social workers, psychologists, and dietitians. These guidelines were approved by the American Hospital Association, the American Health Information Management Association, CMS, and National Center for Health Statistics.<sup>8</sup>

This data highlight provides insight into the limited documentation of social determinants of health for Medicare FFS beneficiaries. However, more widely adopted and consistent documentation is needed to more comprehensively identify social needs, and monitor progress in addressing them. Collaboration between beneficiaries, community groups, and health care providers will be necessary to adequately address the social determinants of health, and ultimately to improve health outcomes.

## References

1. Centers for Disease Control and Prevention. Social Determinants of Health. <https://www.cdc.gov/nchs/data/icd/social-determinants-of-health.pdf>
2. Olson DP, Oldfield BJ, Navarro SM. Standardizing Social Determinants Of Health Assessments. Health Affairs Blog. doi:10.1377/hblog20190311.823116
3. Torres JM, Lawlor J, Colvin JD, et al. ICD Social Codes: An underutilized resource for tracking social needs. *Med Care*. 2017;55(9):810-816. doi:10.1097/MLR.0000000000000764
4. Institute of Medicine of the National Academies. Capturing social and behavioral domains in electronic health records: Phase 1 (2014). Washington (DC); 2014.
5. Committee on Accounting for Socioeconomic Status in Medicare Payment Programs. Accounting for Social Risk Factors in Medicare Payment. Washington, DC: National Academies of Sciences, Engineering, and Medicine; 2016.
6. Gottlieb L, Tobey R, Cantor J, et al. Integrating social and medical data to improve population health: opportunities And barriers. *Health Affairs (Millwood)*. 2016 Nov 1;35(11):2116-2123.
7. ICD-10-CM Codes. Factors influencing health status and contact with health services. <https://www.icd10data.com/ICD10CM/Codes/Z00-Z99>
8. ICD-10-CM Official Guidelines for Coding and Reporting FY 2019. (October 1, 2018 - September 30, 2019). <https://www.cms.gov/Medicare/Coding/ICD10/Downloads/2019-ICD10-Coding-Guidelines-.pdf>
9. ICD-10-CM Codes. <https://www.icd10data.com/ICD10CM/Codes/Z00-Z99/Z55-Z65>
10. Virnig, B. and H. Parsons. Strengths and Limitations of CMS Administrative Data in Research. [cited 2019]; Available from: <https://www.resdac.org/articles/strengths-and-limitations-cms-administrative-data-research>
11. Frazee TK, Brewster AL, and Lewis VA. Prevalence of Screening for Food Insecurity, Housing Instability, Utility Needs, Transportation Needs, and Interpersonal Violence by US Physician Practices and Hospitals. *JAMA Netw Open*. 2019;2(9):e1911514. doi:10.1001/jamanetworkopen.2019.11514.
12. Olson DP, Oldfield BJ, Navarro SM. Standardizing Social Determinants Of Health Assessments. Health Affairs Blog. doi:10.1377/hblog20190311.823116
13. Torres JM, Lawlor J, Colvin JD, et al. ICD Social Codes: An underutilized resource for tracking social needs. *Med Care*. 2017;55(9):810-816. doi:10.1097/MLR.0000000000000764

## About the Authors

Carla Hodge and Meagan Khau are with the Centers for Medicare & Medicaid Services Office of Minority Health. James Mathew was an intern with the Centers for Medicare & Medicaid Services Office of Minority Health.

## Suggested Citation

Mathew, J, Hodge, C, and Khau, M. Z Codes Utilization among Medicare Fee-for-Service (FFS) Beneficiaries in 2017. CMS OMH Data Highlight No. 17. Baltimore, MD: CMS Office of Minority Health. 2019.

## Disclaimer

This work was sponsored by the Centers for Medicare & Medicaid Services Office of Minority Health.

## CMS Office of Minority Health

7500 Security Blvd.  
MS S2-12-17  
Baltimore, MD 21244  
HealthEquityTA@cms.hhs.gov  
[go.cms.gov/cms-omh](https://go.cms.gov/cms-omh)