Homelessness and Medicaid Churn

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Objectives: To identify ICD-10-CM diagnostic codes associated with the social determinants of health (SDOH), determine frequency of use of the code for homelessness across time, and examine the frequency of interrupted periods of Medicaid eligibility (ie, Medicaid churn) for beneficiaries with and without this code.

Design: Retrospective data analyses of New York State (NYS) Medicaid claims data for years 2006-2017 to determine reliable indicators of SDOH hypothesized to affect Medicaid churn, and for years 2016-2017 to examine frequency of Medicaid churn among patients with and without an indicator for homelessness.

Methods: Analyses were conducted to assess the frequency of use and pattern of New York State Medicaid claims submission for SDOH codes. Analyses were conducted for Medicaid claims submitted for years 2016-2017 for Medicaid patients with and without a homeless code (ie, ICD-10-CM Z59.0) in 2017.

Main Outcome Measures: Any interruption in the eligibility for Medicaid insurance (Medicaid churn), assessed via client identification numbers (CIN) for continuity.

Results: ICD-9-CM / ICD-10-CM codes for lack of housing / homelessness demonstrated linear reliability over time (ie, for years 2006-2017) with increased usage. In 2016-2017, 22.9% of New York Medicaid patients with a homelessness code in 2017 experienced at least one interruption of Medicaid eligibility, while 18.8% of Medicaid patients without a homelessness code experienced Medicaid churn.

Conclusions: Medicaid policies would do well to take into consideration the barriers to continued enrollment for the Medicaid population. Measures ought to be enacted to reduce Medicaid churn, especially for individuals experiencing homelessness.

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Introduction

The Medicaid program was signed into law by President Lyndon B. Johnson on July 30, 1965, more than a half century ago.[1] Established along with Medicare by the Social Security Amendments of 1965 and authorized as Title XIX of the Social Security Act, Medicaid was initially formulated to cover the medical expenses for aged, blind, and disabled individuals and parents and dependent children receiving public assistance.[1] A defining feature of the Medicaid program is its hybrid structure, involving a mix of federal and state financing and control.[1] The numbers of children and adults enrolled in the program has greatly expanded over time.[1,2] By December 2019, fully 63,901,512 individuals were enrolled in Medicaid,[3] but with substantial state variation in access to coverage and care for disadvantaged Americans.[1]

The Patient Protection and Affordable Care Act (ACA) was signed into law by President Barack Obama on March 23, 2010,[2] thereby expanding Medicaid coverage to formerly ineligible groups, including childless adults.[4,5] Medicaid expansion enrollees often face complex medical, dental, and behavioral health needs owing to the social determinants of health (SDOH), eg, economic and housing instability, racism and other forms of discrimination, low educational attainment, inadequate nutrition, and unsafe physical and social environments.[4-9] The dynamic nature of Medicaid enrollment is a direct result of such challenges. For instance, many low-income adults hold several part-time positions with variable hours, thereby increasing their susceptibility to coverage interruptions when their eligibility is re-evaluated.[10]

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Further, in order to receive Medicaid benefits in a given state, recipients are required to provide information to establish program eligibility, including documentation regarding state residence and income requirements. In New York State, for example, Medicaid recipients may receive notices by mail more frequently than once a year requiring that eligibility information be furnished.[11] Failure to complete the requested paperwork often results in a loss of eligibility.[11] Interruptions in Medicaid coverage has been referred to as "churning."[12]

With attention focused on transitioning to value-based contracting in the Medicaid program,[13] including in New York State, maintaining uninterrupted access to Medicaid premiums is critical, especially for higher risk patients in value-based contracts. The objectives of this study were to identify International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) diagnostic codes associated with the SDOH, determine frequency of use of the code for homelessness across time, and examine the frequency of interrupted periods of Medicaid eligibility (ie, Medicaid churn) for beneficiaries with and without this code.

Methods

A multi-step process was used to identify SDOH associated with interrupted Medicaid eligibility. First, ICD-10-CM diagnostic code categories associated with the SDOH were selected from the full set of Z00-Z99, ie, factors influencing health status and contact with health services. Second, ICD-10-CM Z diagnostic codes within the selected Z diagnostic code categories were closely examined, and patient factors not directly related to the SDOH were eliminated. Third, since there are similarities between ICD-10-CM Z diagnostic codes and International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) V diagnostic codes, ie, nonmedical factors potentially associated with medical outcomes, a crosswalk of ICD-10-CM Z diagnostic codes and ICD-9-CM V diagnostic codes for similar diagnoses was created in order to understand changes over time in the use of candidate SDOH diagnostic codes.

Fourth, using the previously selected set of ICD-10-CM Z diagnostic codes and categories representative of the SDOH, a retrospective analysis of New York State Medicaid claims was conducted from a de-identified dataset obtained through the Chronic Conditions Data Warehouse.[14] Specifically, the frequencies of the ICD-10-CM Z diagnostic codes and categories representative of the SDOH were calculated for 2017. Then, the use of ICD-9-CM V diagnostic codes / ICD-10-CM Z diagnostic codes associated with the SDOH was examined over the time period 2006-2017 to ascertain if there were any patterns in claims submission for these codes. Finally, the top nine codes that represented those with a frequency above 1% of all SDOH codes were evaluated for any associations with changes in Medicaid churn, as described next.

Medicaid churn was quantified using a validated process previously described[10] for the time period of 2016-2017. Eligible patients were Medicaid recipients aged 18-64 years and had active Medicaid coverage both at the first month and the last month of the two-year period examined, ie, January 2016 and December 2017. We assessed demographic factors, including age, sex, and race, for included patients. The number of months of Medicaid eligibility was the core measure. Medicaid recipients who were eligible at the beginning of the period were reviewed for ongoing monthly eligibility based on their Client Identification Numbers (CIN) for continuity. Any gap in Medicaid coverage was identified as an interruption in eligibility and thus constituted Medicaid churn.

All New York State Medicaid claims were then reviewed for the presence of SDOH diagnostic codes during the one-year period from January 1, 2017 through December 31, 2017. Patients with these codes were assessed for Medicaid churn during the two-year period January 2016 through December 2017. In particular, patients with and without the ICD-10-CM Z59.0 diagnostic code for homelessness were assessed for Medicaid churn. To validate this code in a specific sample, we assessed the frequency of its use in our own health system for 2,671 patients who responded to the OCHIN SDOH screening question: "In the last month, have you slept outside, in a shelter, or in a place not meant for sleeping?" At the time of screening, 89 patients answered this question affirmatively and 42 patients had an ICD-10-CM code Z59.0 for that visit. As compared with this gold standard question, we found the ICD-10-CM code Z59.0 had a

sensitivity of 47% and both a specificity and positive predictive value of 100% for detection of homelessness.

Data Analysis

This study employed analysis of New York State Medicaid claims data for years 2006-2017. We estimated rates of homelessness codes over time by dividing the number of claims with Z59.0 codes by number of beneficiaries in each year. Data analyses involved summarizing enrollment and claims information about Medicaid recipients. Tabulations and summary analyses were used without adjustment to produce descriptive statistics. We used chi-squared tests to compare frequency of interruptions in Medicaid eligibility between patients with and without an ICD-10-CM code for homelessness.

Results

A total of 13 ICD-10-CM diagnostic code categories associated with the SDOH were selected from Z00-Z99, ie, factors influencing health status and contact with health services (Table 1). The selected categories included, for example, Z55 (problems related to education and literacy), Z56 (problems related to employment and unemployment), Z57 (occupational exposure to risk factors), and Z59 (problems related to housing and economic circumstances).

After reviewing the full set of ICD-10-CM diagnostic codes within the 13 selected categories, patient factors not consistent with the SDOH were eliminated, eg, Z91.81 (history of falling), Z91.01 (food allergy status), Z72.0 (tobacco use), Z72.5 (high risk sexual behavior), Z72.81 (antisocial behavior), Z72.82 (problems related to sleep), and Z57 (occupational exposure to risk factors). In the end, 96 ICD-10-CM Z diagnostic codes were deemed suitable for inclusion in the SDOH claims analysis.

A crosswalk of ICD-10-CM Z codes and ICD-9-CM V codes for comparable diagnoses was created. While similarities existed between the ICD-10-CM Z codes and ICD-9-CM V codes for nonmedical factors potentially associated with medical outcomes, there was not always an ICD-9-CM V code equivalent for every candidate ICD-10-CM Z code, and even when there was, it was usually only an approximate match.

The frequency and percentage of the selected ICD-10-CM Z codes in New York State Medicaid claims data during 2017 were calculated. The top nine codes that represented those with a frequency above 1% of all SDOH codes were ranked in order of frequency (Table 2). Unfortunately, the prevalence of SDOH coding for most candidate factors thought to impact Medicaid churn were not reliably present. An exception was the ICD-9-CM / ICD-10-CM diagnostic code associated with lack of housing (V60.0) / homelessness (Z59.0), which demonstrated linear reliability across time and suggested a consistent data point for evaluating the impact of the SDOH on Medicaid churn (Figure 1).

Note that during the time period 2006-2017, the use of the lack of housing / homelessness diagnostic code steadily increased in prevalence

Table 1. Identified ICD-10-CM diagnostic code categories and descriptions associated with the social determinants of health selected from factors influencing health status and contact with health services (Z00-Z99)

Category	Description
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
Z72	Problems related to lifestyle
Z74	Problems related to care provider dependency
Z75	Problems related to medical facilities and other health care
Z91	Personal risk factors, not elsewhere classified

ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

Table 2. Frequency and percentage of ICD-10-CM Z codes for social determinants of health (SDOH) in New York State Medicaid claims data for Year 2017, listed in order of frequency

Z Code	Description	Frequency	% SDOH claims
Z74.1	Need for assistance with personal care	1,690,479	62.7%
Z65.8	Other problems related to psychosocial circumstances	101,680	3.8%
Z59.0	Homelessness	92,069	3.4%
Z74.2	Need for assist at home & no house member able to render care	86,423	3.2%
Z74.01	Bed confinement status	71,862	2.7%
Z63.9	Problem related to primary support group, unspecified	70,410	2.6%
Z60.2	Problems related to living alone	64,259	2.4%
Z75.3	Unavailability and inaccessibility of health-care facilities	52,714	2.0%
Z74.09	Other reduced mobility	42,171	1.6%
Z56.0	Unemployment, unspecified	34,923	1.3%

ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification

from year to year (Figure 1). Claims for one year were chosen for the purpose of examining the association between homelessness and Medicaid churn, in this case, year 2017, the most recent year of data availability. Patients with confirmed Medicaid eligibility at both the beginning of the measurement period (January 2016) and at the end of the measurement period (December 2017) were included in the analysis.

Of the 2,518,620 patients who met inclusion criteria, 17,879 (0.7%) had a Z59.0 homelessness code. Baseline demographic information is shown in Table 3. Of patients with the homelessness Z59.0 code present in year 2017, 4,099 patients (22.9%) experienced one or more months of interrupted Medicaid eligibility during years 2016-2017. Of the 2,500,741 individual patients without the homelessness Z59.0 code present in year 2017, 470,078 patients (18.8%) ex-

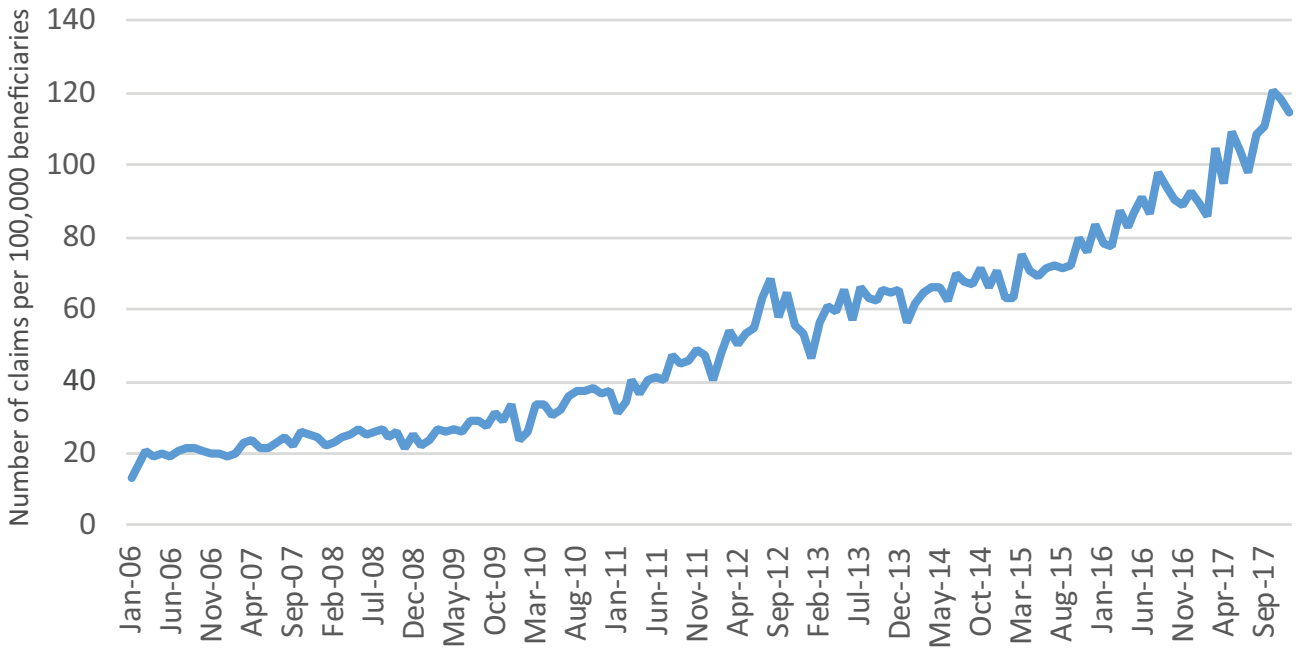

Figure 1. Lack of housing / homelessness in New York State Medicaid claims, 2006-2017

perienced one or more months of interrupted Medicaid eligibility during years 2016-2017. Of individuals who had ever experienced a gap in Medicaid coverage, patients without a homelessness Z59.0 code tended to have fewer months of eligibility (Table 4).

Table 3. Characteristics of Medicaid beneficiaries with and without an ICD-10-CM code for homelessness (Z59.0) in 2017

	No homelessness code	Homelessness code (Z59.0)
N	2,500,741	17,879
Age, yrs		
18-39	51.8%	41.5%
40-54	28.4%	36.9%
55-64	19.8%	21.7%
Female	56.9%	37.9%
Race/Ethnicity		
Black/African American	18.6%	37.2%
Hispanic	12.3%	18.5%
White	31.4%	26.7%
Asian	11.0%	1.4%
Other	5.3%	5.0%
Unknown	21.4%	11.2%

Discussion

A key finding in the analyses presented here is that ICD-10-CM diagnostic codes for the SDOH represent a potential opportunity for identifying subgroups of patients at risk of losing Medicaid eligibility, and likely also for identifying other risks, but they have not been systematically implemented by health systems to date. Nonetheless, the results of this study indicate that the use of ICD-10-CM diagnostic codes for the SDOH is increasing over time. Suggested reasons for this increase include enhanced awareness of SDOH codes by providers,[15] and greater appreciation of the profound effects of the SDOH on medical, dental, and behavioral health outcomes and health equity.[16]

This study also suggests that Medicaid recipients who have a claim that includes an ICD-10-CM code for homelessness have higher rates of interruption in Medicaid coverage when compared with Medicaid recipients who do not have a claim that includes an ICD-10-CM code for homelessness, even though eligibility gaps tended to be shorter among beneficiaries who were homeless. It is hoped that with more complete reporting of ICD-10-CM diagnostic codes for the SDOH and better ability to track Medicaid recipients without a permanent address, more rigorous analysis of this methodology might be possible.

Although the findings from these analyses of claims data cannot imply causality, they do suggest one potential mechanism for the previously described adverse effects of housing insecurity and homelessness on health:[17-19] reduced access to care through interrupted Medicaid coverage. As per a recent report, "Medicaid can also link individuals to community-based organizations that meet social needs, such as housing or nutrition services. States and managed care organizations can use this flexibility to build partnerships across sectors, such as partnering with housing agencies and other service providers."[20, p. 1]

Medicaid churn is also a problem for providers and care delivery systems moving from fee-for-service to value-based contracting, as it increases emergency room visits and hospitalizations, disrupts continuity of care, and thus worsens the health of economically disadvantaged adults and children with chronic disease.[21-23] In other words, Medicaid churn increases the likelihood that deprived families and individuals only access care when they are in pain or crisis, rather than managing their conditions with support from providers through ongoing visits and consultations. In a shared savings

Table 4. Frequency of interruption in Medicaid eligibility among Medicaid beneficiaries with and without an ICD-10-CM code for homelessness (Z59.0) in 2017

	No homelessness code	Homelessness code (Z59.0)	P
Any interruption in eligibility	18.8%	22.9%	<.001
Months of eligibility			<.001
2-10	1.5%	0.7%	
11-15	3.2%	2.6%	
16-20	5.2%	6.9%	
21-23	9.0%	12.7%	
24	81.2%	77.1%	

or full-risk contract, the cost of providing care for a population must be less than the insurance premium for that group, whereas Medicaid churn increases the overall cost of care.[24,25] Interrupted coverage undermines the premium necessary to provide critical services that vulnerable patients need.

New York State has already enacted certain measures to reduce churn in the Medicaid population, including simplifying the application process and providing support for individuals with serious mental illness.[26] Unfortunately, however, 14 states have not expanded Medicaid eligibility criteria to cover all low-income adults,[27] leading to the so-called Medicaid gap. This population is both ineligible for Medicaid and too poor to afford premium subsidies through the federal Health Insurance Marketplace. One study found that the North Carolina Medicaid gap population reported numerous health care access barriers and lower use of preventive care.[28] Also disconcerting is that nine states have imposed work requirements for Medicaid beneficiaries, with the policy in other states pending approval or under review.[29] In Arkansas, the state that imposed the first-ever Medicaid work requirements in 2018, the policy was found to be associated with significant losses in health insurance coverage in the initial six months of its passage, but no significant change in employment resulted.[30] Rigorous evaluation of this policy is being urged.[31]

Study Limitations

Certain limitations of this study merit consideration. First, only New York State Medicaid claims were reviewed and analyzed, given that the authors practice at a health care organization in New York State. Medicaid claims data from other states ought to be examined to understand more about the relationships between homelessness and other SDOH with Medicaid churn. Second, our analyses are observational and do not account for differences between beneficiaries with and without ICD-10-CM codes for homelessness. As a result, our findings should be considered exploratory. Third, one inclusion criterion was the requirement of Medicaid enrollment in both January 2016 and December 2017. This criterion limited capture of beneficiaries who experienced Medicaid churn with long-term disenrollment; however, it also ensured that we did not include beneficiaries who had disenrolled for other reasons, such as obtaining other insurance. Fourth, our definition of homelessness was based on diagnostic coding. Based on a select sample of patients from our own health system, we found that while such codes have good positive predictive value, the sensitivity was less than 50%. Similarly, prior studies have suggested that the use of ICD codes to detect homelessness were accurate when present but missed many cases. As a result, it is likely that there is severe underreporting of SDOH codes in New York State Medicaid claims, which may have affected our results. It is notable that the total number of people experiencing homelessness in New York State rose from 29,490 in 2007 to 92,091 in 2019 (a 47.1% increase) [32] and, while it is aligned with the steadily increasing use of the homelessness diagnostic code from 2006 to 2017 reported here, homelessness was at a much higher level. Thus, the frequencies of the use ICD-10-CM diagnostic codes for the SDOH in New York State Medicaid claims reported here ought not be interpreted as the frequencies of SDOH challenges experienced by the New York State Medicaid population.

This study contributes to a growing body of implementation research on the SDOH toward improving patient care. A recent study found that it was feasible to use the questionnaire recommended by the Institute of Medicine to capture social and behavioral determinants of health, in that question order did not significantly impact participant responses, time to complete the questionnaire was brief, and non-response rate was low.[33] A randomized clinical trial evaluated a pediatric social needs screening and in-person resource navigation program and found that the intervention significantly decreased reports of social needs for families and significantly improved the overall health status of children (as reported by caregivers), compared with an active control at four months after enrollment.[34] Finally, using comprehensive claims and electronic health record (EHR) data from a large multihospital academic health system, researchers found that patients with social risk factors detected through physician notes were substantially more prevalent than currently identified through ICD-9-CD billing codes alone, and that the incrementally identified patients were at high hospital readmission risk.[35]

At Family Health Centers at NYU Langone, a federally qualified health center network in Brooklyn, NY, the Adult Primary Care Program and the Behavioral Health Program includes questions from the OCHIN SDOH screening questionnaire as part of its new patient and psychosocial processes, respectively. Depending upon the responses provided, patient refer-

rals are made to care management and/or the Family Support Center. In both the Department of Pediatrics and the Department of Dental Medicine, pilot studies are underway to screen families for SDOH and make indicated referrals, including to the Family Support Center. With the planned integration of the EHR across services this year, opportunities exist to include standard questions on the SDOH that can be accessed by medical, dental, and behavioral health providers and conduct implementation research to optimize adaptation across settings. Pilot studies are currently underway. This may improve patient care, outcomes, and population health in multiple ways, including by: 1) permitting greater precision in diagnoses that may improve treatment; 2) facilitating more effective shared decision-making; 3) assisting clinicians to identify risk factors such as depression and tobacco use; 4) prompting clinical team members to refer patients to the Family Support Center, the New York City Department of Health and Mental Hygiene, or a community organization that helps to address problems such as financial strain or intimate partner violence; 5) expanding the capacity of NYU Langone Health to tailor services to the needs of its patient populations; and 6) broadening the patient context available to researchers using EHR data.[15]

Conclusion

Medicaid churn adversely affects both patients and delivery systems.[4,10,21-23] The purpose of the Medicaid program is to provide medical assistance to eligible individuals.[20] On its own, Medicaid cannot be expected to fill the egregious gaps left by historically underfunded housing, nutrition, and other social services, which have been exposed and widened during the ongoing coronavirus 19 (COVID-19) pandemic. Political advocacy is needed to compel federal, state, and local governments to provide more funding for programs that directly address social needs, such as affordable housing programs.[20]

Nonetheless, Medicaid can help address identified SDOH needs in innovative ways. At the beneficiary level, Medicaid can help enrollees obtain the care they need.[20] At the system level, Medicaid can help build the infrastructure to facilitate partnerships and data sharing across medical and other service providers that are necessary to improve coordination across programs and help enrollees obtain the services they need.[20] At the legislative level, changes are needed to the process of re-evaluating Medicaid eligibility. The most vulnerable patients should receive presumptive Medicaid eligibility, potentially identified through screening for the SDOH. Very poor and homeless Medicaid recipients have high rates of medical, dental, and behavioral health needs that complicate timely response to excessive Medicaid eligibility and work demands.[4,28] It is therefore imperative that health care payment and delivery models are streamlined and integrated, especially in the face of the ongoing and conjoined health, economic, racial justice, and humanitarian crises that disproportionately impact already disadvantaged individuals and families.

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Conflict of Interest

No conflicts of interest to report.

Author Contributions

Research concept and design: Dapkins; Acquisition of data: Dapkins; Data analysis and interpretation: Dapkins, Blecker; Manuscript draft: Dapkins, Blecker; Administrative: Dapkins, Blecker Supervision: Dapkins

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